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# Food Insecurity amid the COVID-19 Pandemic: Food Charity, Government Assistance, and Employment

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Pour atténuer les conséquences de la pandémie de COVID-19 (la maladie à coronavirus 2019), le gouvernement fédéral a mis en place plusieurs programmes d'aide financière, accordant notamment des ressources financières sans précédent aux organismes de bienfaisance en alimentation. À l'aide des données de l'enquête 2 de la série d'enquêtes sur les perspectives canadiennes, nous étudions les caractéristiques liées à la démographie, à l'emploi et au comportement qui peuvent être associées à l'insécurité alimentaire en avril-mai 2020. Nous constatons qu'un quart des personnes en situation de précarité d'emploi ont vécu de l'insécurité alimentaire, condition liée de près aux perturbations du revenu d'emploi, aux graves difficultés financières et au recours aux organismes de bienfaisance en alimentation attribuables à la pandémie. Pourtant, la grande majorité des ménages touchés par l'insécurité alimentaire n'ont pas déclaré recevoir d'aide alimentaire caritative de quelque nature. Un soutien financier accru pour les ménages à faible revenu réduirait l'insécurité alimentaire et atténuerait les répercussions négatives de la pandémie.

**Mots clés :** PCU, coronavirus, assurance emploi, banque alimentaire, distanciation physique, travail à domicile

To mitigate the effects of the coronavirus disease 2019 (COVID-19) pandemic, the federal government has implemented several financial assistance programs, including unprecedented funding to food charities. Using the Canadian Perspectives Survey Series 2, we examine the demographic, employment, and behavioural characteristics associated with food insecurity in April–May 2020. We find that one-quarter of job-insecure individuals experienced food insecurity that was strongly associated with pandemic-related disruptions to employment income, major financial hardship, and use of food charity, yet the vast majority of food-insecure households did not report receiving any charitable food assistance. Increased financial support for low-income households would reduce food insecurity and mitigate negative repercussions of the pandemic.

**Keywords:** CERB, coronavirus, Employment Insurance, food bank, social distancing, work from home

## Introduction

The coronavirus disease 2019 (COVID-19) pandemic dealt a heavy blow to the Canadian labour market, and with that have come concerns about growing household food insecurity. The pandemic led to a 15 percent decline in employment and a 32 percent drop in worked hours among non-senior adults between February and April 2020 (Lemieux et al. 2020). Some workers – typically the higher-wage white-collar workers and professionals – moved to work from home, a privilege not afforded to all (Gallacher

and Hossain 2020). Half of the job losses occurred in the bottom earnings quartile, disproportionately affecting the younger, hourly paid, non-unionized workers from the accommodation and food service sectors (Lemieux et al. 2020). Between February and May 2020, business ownership decreased by 14.8 percent for incorporated entities and by 10.1 percent for unincorporated entities, with particularly pronounced impacts on women, immigrants, and less-educated people (Beland, Fakorede, and Mikola 2020). In Quebec, where the pandemic hit the hardest

during the early stage, more than one-fifth of the workers lost jobs, and nearly one-third experienced a change in employment status between March and May 2020; low-income households and workers in construction and accommodation bore the brunt of the burden (Achou et al. 2020). Although many workers laid off between February and April 2020 regained employment by July of the same year, recently unemployed people and those who were out of the labour force before the pandemic had difficulty finding employment; this was especially true for women and young people (Brochu, Cr chet, and Deng 2020). The gender employment gap widened between February and May 2020 among Canadian parents of young children, most visibly among those who were less educated (Qian and Fuller 2020).

Before the pandemic, 12.7 percent of Canadian households had experienced some degree of food insecurity; that is, they were unable to reliably afford the food they needed (Tarasuk and Mitchell 2020). Those most at risk were households with inadequate and insecure incomes and few assets (Tarasuk, Fafard St-Germain, and Mitchell 2019). Almost two-thirds of food-insecure households were reliant on employment income (Tarasuk and Mitchell 2020), with low-wage, part-time, temporary, and racialized workers at particularly high risk (McIntyre, Bartoo, and Emery 2012). Between March and May 2020, nearly half of the residents in the ten provinces felt the impact of COVID-19 on their ability to meet financial obligations or essential needs (Zajacova et al. 2020). Experiences of food insecurity were reported by one in seven people living in the ten provinces in the 30 days leading up to early May (Statistics Canada 2020c).

There were several differences between this assessment of food insecurity during the pandemic and the pre-pandemic national monitoring of food insecurity (Statistics Canada 2020c). Taking these differences into account, Statistics Canada's comparison of the results in May with population data on food insecurity before the pandemic suggests that there was a 39 percent increase in the prevalence of the problem (Statistics Canada 2020c). This is concerning given that food insecurity is strongly correlated with negative health outcomes in Canada, including poorer mental health (Jessiman-Perreault and McIntyre 2017; McIntyre et al. 2017; Men, Elgar, and Tarasuk 2021; Men et al. 2020b; Polsky and Gilmour 2020; Tarasuk et al. 2013; Tarasuk, Cheng, et al. 2018; Zajacova et al. 2020), chronic pain (Men et al. 2021), diabetes (Dowd, Zajacova, and Aiello 2009; Gucciardi et al. 2009; Tait et al. 2018), increased likelihood of hospitalization for acute and chronic conditions (Kirkpatrick, McIntyre, and Potestio 2010; Men et al. 2020b; Tarasuk, Cheng, et al. 2018), and premature deaths from infectious diseases and other causes (Men et al. 2020a; Men and Tarasuk 2020). Food insecurity could potentially heighten the risk of COVID-19 infection through immunologic decline driven by nutrient

inadequacy. The infection risk could also be higher among food-insecure versus food-secure individuals because the former are more likely to live and, if employed, work in relatively crowded conditions with increased probability of physical contact (Nagata, Seligman, and Weiser 2020).

As the pandemic took root in Canada in March 2020, the federal government implemented a series of measures to provide income supports to individuals whose livelihoods were affected by local and provincial policies to minimize viral transmission (B land et al. 2020; Robson 2020). Employment Insurance (EI; Canada 2020c), the traditional wage replacement tool for involuntarily unemployed workers, was made more generous and accessible: the maximum duration of the regular benefit was doubled, and medical proof was waived for sickness benefit applications (Robson 2020). In addition, the Canadian Emergency Response Benefit (CERB) was introduced in early April 2020, providing \$500 per week for up to 16 weeks to Canadians aged 15 years or older who received at least \$5,000 in work income in 2019 or in the 12 months before their CERB application (Robson 2020). CERB targeted workers not receiving EI; one could receive either CERB or EI but not both at the same time (Robson 2020). By early October 2020, there had been 8.90 million applicants for CERB and a total of \$81.64 billion paid in CERB benefits (Canada 2020a). CERB was reported to be most beneficial to lower-income households and those with COVID-driven job losses (Achou et al. 2020). In addition to EI and CERB, the federal government introduced one-time top-ups to the goods and services tax credit, harmonized sales tax credit, and Canada Child Benefit, wage subsidies to employers, and loan repayment deferrals (Robson 2020).

Along with the financial assistance to individuals and businesses, there has been unprecedented funding for organizations operating charitable food assistance programs. On 3 April 2020, the federal government announced the Emergency Food Security Fund, providing \$100 million for food banks and other charitable food providers (Canada 2020b). In October, they added another \$100 million to the fund (Agriculture and Agri-Food Canada 2020). The timing of these announcements coincided with Easter and Thanksgiving, and the announcements included appeals for the public to donate to these organizations. The federal government also announced \$350 million for community organizations serving vulnerable groups, \$50 million to support surplus food redistribution (Canada 2020b), and additional funds for food programs in northern and Indigenous communities (Agriculture and Agri-Food Canada 2020; Canada 2020b, 2020d). In addition, several provincial governments committed funds to food charities (Executive Council 2020; Gillespie 2020; St Denis 2020).

Although Canada has had food banks for 40 years (Riches 1985), the relation of federal and provincial governments to these charities before the pandemic could be best described as "facilitative" (Tarasuk, Fafard

St-Germain, and Loopstra 2019). Small amounts of funding were awarded through infrastructure and project grants, but the primary government support to food banks and other community food programs came from provincial and territorial legislation enacted to encourage food donations (McIntyre, Patterson, et al. 2016). This legislation included “Good Samaritan” laws absolving corporate donors of liability for the health and safety of their food donations (BC Centre for Disease Control 2019); more recent legislation in some provinces provided tax credits to local producers for food donations to food charities (Environment and Climate Change Canada 2019).

The limited investment of public funds in food banks and other community food programs before the pandemic is supported by evidence suggesting that food charity is not an effective means to manage, let alone reduce, household food insecurity. In March 2019, there were 1.1 million visits to food banks in Canada (Food Banks Canada 2019), which was one-quarter the number of people affected by household food insecurity (Tarasuk and Mitchell 2020). Similar ratios have been charted in earlier population surveys in which both food insecurity and food bank usage were measured (McIntyre, Connor, and Warren 2000; Rainville and Brink 2001; Tarasuk et al. 2019; Vozoris and Tarasuk 2003; Rainville and Brink 2001; Tarasuk, Fafard St-Germain, and Loopstra 2019). Going to a food bank appears to be a strategy of last resort, most commonly used by those experiencing severe food insecurity (i.e., absolute food deprivation; Farahbakhsh et al. 2017; Ford, Lardeau, and Vanderbilt 2012; Loopstra and Tarasuk 2012; Matern and Iman 2016; Roncarolo, Bisset, and Potvin 2016; Tsang, Holt, and Azevedo 2011), but even among this group, the majority do not report using food banks (Loopstra and Tarasuk 2012; Tarasuk, Fafard St-Germain, and Loopstra 2019). Moreover, there is no indication that the receipt of food charity takes households out of a state of food insecurity. Persistent unmet food needs and significant levels of food deprivation are commonly reported among food bank users despite the receipt of assistance (Holmes et al. 2018; Loopstra and Tarasuk 2012; Williams et al. 2012; Williams, McIntyre, and Glanville 2010). These findings are consistent with reports from food bank operators that demands for their help typically outstrip available supplies (Food Banks Canada 2013; Matern and Iman 2016; Tarasuk et al. 2014). As the federal government intensifies its funding to food banks and other food charities as a means to address food insecurity, it is important to understand how household food insecurity relates to Canada’s pandemic response more broadly and to the provision of food charity in particular.

Drawing on data from Statistics Canada’s Canadian Perspectives Survey Series (CPSS), we undertook this study to (a) describe how household food insecurity relates to household characteristics, individuals’ current employment circumstances, and their applications for

federal unemployment benefits; (b) describe the relationship of household food insecurity to broader financial hardships and the use of food charity; and (c) examine the relationship between food insecurity and personal preventive measures taken to minimize risk of COVID-19 infection.

## Methods

### Study Population and Sample

The CPSS is a short cross-sectional survey that Statistics Canada is administering online through email invitation to track the economic and health impacts of the COVID-19 pandemic, among other goals (Statistics Canada 2020b). The CPSS draws a probability sample from respondents to the Labour Force Survey 2019, which is representative of 98 percent of the non-institutionalized off-reserve population of the ten provinces. Of those, 22.9 percent accepted the invitation to participate in the second CPSS survey (CPSS-2) on food insecurity, employment, COVID-19 prevention, and other pandemic-related topics. Between 4 May and 10 May 2020, 63.5 percent of the invitees, or 4,600 respondents aged 15 years or older, completed CPSS-2 (Statistics Canada 2020a). We excluded 120 individuals with missing answers to food insecurity questions and another 70 with missing answers for the other studied variables. The analytic sample thus consisted of 4,410 individuals, of whom 2,620 were either working or absent from work in the reference week (27 April–3 May 2020).

### Measurements

Household food insecurity in the past 30 days was measured by a six-item questionnaire adapted from the 18-item questionnaire routinely used to monitor 12-month food insecurity in Canada (Health Canada 2007; USDA ERS 2012). Respondents were asked about the experience of food inadequacy of all household members (food did not last, cannot afford balanced meals), all adults in the household (frequency of cutting meal size or skipping meal), and themselves (eat less than they should, go hungry). All questions included a clause to establish that the experience occurred because there was not enough money for food. Respondents with an affirmative answer to any question were classified as food insecure. We used the count of affirmative answers to gauge severity of food insecurity among food-insecure households, exploiting the well-validated scalar property of these questions (Hamilton et al. 1997). The six-item questionnaire has been validated as an acceptable substitute for the 18-item version to identify food-insecure households, although it falls short in detecting the least and most severe levels of food insecurity and food insecurity experienced by children in families (USDA ERS 2012). We analyzed food insecurity first as a left-hand-side outcome of demographic and employment characteristics and then as a right-hand-side predictor of

financial hardship, receipt of charitable food assistance, and COVID-19 prevention measures.

We adjusted for household demographics, respondents' personal demographics, and personal employment in models predicting food insecurity status and severity. Household demographics included presence of children younger than 18 years (presence, absence), household size (one person, two people, three people, four or more people), dwelling type (single detached; double, row, terrace; apartment or flat; others), and urbanicity (urban, rural). Personal demographics included sex (male, female), age (in ten-year intervals from 15 to 74 y, then 75 y and older), education (high school incomplete, high school diploma, some college, bachelor's degree or more), marital status (married; common-law; never married; divorced, separated, widowed), and immigrant status (Canadian born, immigrant). Employment characteristics included work location (moved work from outside to home, always worked from home, currently working outside, absent from work, not working), absence from work in the reference week (absent for non-COVID reasons, absent due to COVID-related business closure or layoff, absent due to COVID-related personal reasons, not working), job insecurity (does not expect to lose job, unsure, might lose job, not working), and submission of an application for CERB or EI since March 15 (none; CERB; regular EI; other EI related to sickness, caregiving, compassionate care, work sharing, or other miscellaneous benefits). For households with multiple members, respondent's personal characteristics served as an imperfect proxy of household characteristics.

We also examined food insecurity as a predictor of financial hardship, receipt of charitable food assistance, and respondent's adoption of measures to prevent COVID-19 infection, adjusting for demographic characteristics. The impact of the pandemic on individuals' abilities to meet financial obligations or essential needs, including rent or mortgage payments, utilities, and groceries, was dichotomized into "moderate or major hardship" and "minor hardship, no hardship, or 'too soon to tell.'" We also recoded this variable to assess major hardship versus all else. Food charity use was a binary variable indicating whether the respondent or any other household member accessed free food or meals from a community organization in the past 30 days. An additional outcome assessed repeated receipt of food charity (twice or more vs. once or none). Preventive measures for COVID-19 practiced by respondents included stocking up on essentials at a grocery store or pharmacy; filling prescriptions; making a plan to care for ill family members; making a plan for other non-household members; making a plan for communication with family, friends, and neighbours; avoiding leaving the house for non-essential reasons; practicing physical distancing in public; avoiding crowds and large gatherings; washing hands more regularly; avoiding

touching face; cancelling travel; working from home; other unlisted measures; and none of the above measures. All these variables were dichotomized.

### Statistical Analyses

We described the prevalence of outcomes by food insecurity status and computed food insecurity rate and severity level by demographic and employment categories. Student's *t*-tests were performed to evaluate the statistical difference in food insecurity rate and severity. We then used two-part regression on the food insecurity count variable to estimate the odds of experiencing food insecurity (logit model on any vs. no affirmative answer to food insecurity questions) and, conditional on being food insecure, the odds of reporting more severe food insecurity (log-linear model on count of affirmative answers to food insecurity questions, ranging from 1 to 6, if food insecure) by different demographic and employment characteristics. Demographic variables were entered into the model progressively, first with household characteristics, followed by the respondent characteristics. The four employment variables were analyzed one at a time, with and without adjustment of demographic covariates. For sensitivity analyses, we limited the sample to those working in the reference week to rule out the possible confounding noise from non-working people. We also experimented with adding back individuals with missing employment data to verify their impact on the estimates.

We further set food insecurity status as a binary predictor to examine its relationship with food charity use, financial hardship, and COVID-19 preventive measures, with and without adjustment of demographic covariates.

Because of the non-normality of regression disturbances, we used person weights and 1,000-repetition bootstrapping to generate standard deviations for descriptive statistics and standard errors for regression coefficients. Analyses were done in the Statistics Canada Research Data Centre at the University of Toronto using Stata SE Version 15.1 (StataCorp LLC, College Station, TX). Following Statistics Canada's rules, numbers of observations were rounded to provide an additional layer of identity protection for respondents.

## Results

### Sample Description

Demographic and employment characteristics of the study sample, their use of food charity, experience of financial hardship, and measures taken to prevent COVID-19 infection are summarized by food insecurity status in [Table 1](#).

### Socio-Demographic Predictors of Food Insecurity

The prevalence and severity of food insecurity differed by household and respondent demographic characteristics

**Table 1:** Weighted Characteristics on Demographics, Employment, Food Charity Use, Financial Hardships, and COVID-19 Prevention by Food Insecurity Status

Characteristics	Food Secure (n = 3,870)	Food Insecure (n = 540)	Total (N = 4,410)
<b>Household demographics</b>			
Presence of children aged < 18 y			
Household with children	32.6 (46.9)	46.5 (49.9)	34.6 (47.6)
Household size			
1	14.8 (35.5)	18.2 (38.7)	15.3 (36.0)
2	53.8 (49.9)	37.5 (48.5)	51.5 (50.0)
3	18.1 (38.5)	22.0 (41.4)	18.7 (39.0)
≥ 4	13.3 (33.9)	22.3 (41.7)	14.6 (35.3)
Dwelling type			
Single detached	65.3 (47.6)	53.3 (49.9)	63.6 (48.1)
Double, row, or terrace	12.1 (32.6)	16.7 (37.3)	12.7 (33.3)
Apartment or flat	18.4 (38.8)	25.9 (43.9)	19.5 (39.6)
Other dwelling types	4.2 (20.1)	4.1 (19.8)	4.2 (20.1)
Urbanicity			
Rural resident	15.7 (36.4)	19.0 (39.3)	16.2 (36.8)
<b>Personal demographics</b>			
Sex			
Female	50.8 (50.0)	47.5 (50.0)	50.3 (50.0)
Immigrant status			
Immigrant	23.6 (42.4)	24.0 (42.7)	23.6 (42.5)
Age, y			
15–24	13.9 (34.6)	18.0 (38.5)	14.5 (35.2)
25–34	15.2 (35.9)	26.8 (44.3)	16.9 (37.5)
35–44	15.8 (36.5)	19.9 (40.0)	16.4 (37.0)
45–54	15.7 (36.4)	14.0 (34.8)	15.4 (36.1)
55–64	17.2 (37.8)	13.3 (34.0)	16.7 (37.3)
65–74	16.1 (36.8)	5.3 (22.5)	14.6 (35.3)
≥ 75	6.0 (23.8)	2.6 (15.9)	5.5 (22.9)
Marital status			
Married	53.7 (49.9)	35.4 (47.9)	51.1 (50.0)
Common-law	11.3 (31.6)	12.7 (33.3)	11.5 (31.9)
Single, never married	25.5 (43.6)	40.5 (49.1)	27.6 (44.7)
Divorced, separated, widowed	9.5 (29.3)	11.4 (31.8)	9.8 (29.7)
Education			
High school incomplete	13.1 (33.7)	18.8 (39.1)	13.9 (34.6)
High school diploma	19.5 (39.6)	20.2 (40.2)	19.6 (39.7)
Some college	37.4 (48.4)	38.2 (48.6)	37.5 (48.4)
Bachelor's degree	30.0 (45.8)	22.8 (42.0)	29.0 (45.4)
<b>Employment</b>			
Work location			
From outside to home	16.2 (36.9)	4.7 (21.3)	14.6 (35.3)
Remain at home	10.5 (30.7)	7.9 (27.0)	10.1 (30.2)
Currently outside	21.9 (41.4)	21.1 (40.8)	21.8 (41.3)
Absent from work	9.0 (28.6)	16.7 (37.3)	10.1 (30.1)
Not working	42.4 (49.4)	49.6 (50.0)	43.4 (49.6)
Absence from work			
Worked without absence	48.9 (50.0)	35.1 (47.8)	46.9 (49.9)
Non-COVID-related absence	2.8 (16.6)	1.7 (13.0)	2.7 (16.1)

(Continued)

**Table 1:** Continued

Characteristics	Food Secure (n = 3,870)	Food Insecure (n = 540)	Total (N = 4,410)
Absence due to COVID-19: business closure or layoff	4.5 (20.8)	12.6 (33.2)	5.7 (23.1)
Absence due to COVID-19: personal reasons	1.3 (11.5)	1.0 (10.1)	1.3 (11.3)
Not working	42.4 (49.4)	49.6 (50.0)	43.4 (49.6)
Job insecurity			
Does not expect to lose job	38.9 (48.7)	19.9 (39.9)	36.1 (48.0)
Unsure if will lose job	10.9 (31.2)	14.6 (35.3)	11.5 (31.9)
Might lose job	7.8 (26.8)	16.0 (36.7)	9.0 (28.6)
Not working	42.4 (49.4)	49.6 (50.0)	43.4 (49.6)
CERB and EI application			
No CERB or EI applied	83.9 (36.7)	64.5 (47.9)	81.2 (39.1)
CERB applied	9.9 (29.9)	23.0 (42.1)	11.8 (32.2)
Regular EI applied	4.4 (20.5)	7.8 (26.9)	4.9 (21.5)
Other EI applied	1.8 (13.2)	4.7 (21.2)	2.2 (14.7)
Food charity use			
Used food charity at least once	0.4 (6.6)	7.4 (26.2)	1.4 (11.9)
Used food charity more than once	0.2 (4.3)	4.3 (20.4)	0.8 (8.8)
Financial hardship			
Moderate or major financial hardship	19.2 (39.4)	59.5 (49.1)	25.0 (43.3)
Major financial hardship	6.3 (24.3)	26.3 (44.1)	9.2 (28.9)
COVID-19 prevention measures			
Stocked up on essentials	62.4 (48.4)	60.1 (49.0)	62.1 (48.5)
Filled prescriptions	34.6 (47.6)	36.4 (48.2)	34.9 (47.7)
Have plan to care for ill relatives	11.5 (31.9)	16.8 (37.4)	12.2 (32.8)
Have plan to care for other relatives	18.5 (38.8)	15.7 (36.4)	18.1 (38.5)
Have plan to communicate with others	51.6 (50.0)	47.9 (50.0)	51.1 (50.0)
Avoided leaving home	87.1 (33.5)	86.1 (34.6)	87.0 (33.6)
Used physical distancing in public	94.3 (23.3)	83.0 (37.6)	92.6 (26.1)
Avoided crowds and large gathering	91.5 (27.8)	86.9 (33.8)	90.9 (28.8)
Washed hands more regularly	95.0 (21.7)	94.4 (22.9)	94.9 (21.9)
Avoided touching face	73.6 (44.1)	69.0 (46.3)	72.9 (44.4)
Cancelled trip	43.4 (49.6)	41.6 (49.3)	43.1 (49.5)
Worked from home	31.6 (46.5)	17.6 (38.2)	29.6 (45.6)
Other risk-reducing measures	5.7 (23.2)	9.9 (29.9)	6.3 (24.3)
No measure taken	0.4 (6.4)	1.6 (12.5)	0.6 (7.6)

Notes: COVID-19 = coronavirus disease 2019; CERB = Canadian Emergency Response Benefit; EI = Employment Insurance. Standard deviations are shown in parentheses.

Source: Authors' calculations based on Canadian Perspectives Survey Series 2.

(Table 2). Households with children; households with one person or more than two people; and residents of an apartment, flat, double, row, or terrace had higher rates of food insecurity than childless households, two-person households, and residents of single detached housing, respectively. Food insecurity was more common among younger and unmarried respondents than among older and married respondents. Among food-insecure respondents, greater severity of food insecurity was observed among one-person versus two-person households, urban versus rural residents, women versus men, and those aged 35–54 years versus those aged 25–34 years.

We regressed food insecurity severity on all the household characteristics at once (reduced model) and subsequently added all the personal demographic characteristics on top (full model) (Table 3). When all household characteristics were considered simultaneously, households with children; larger households; those living in apartments, flats, double, row, or terrace housing; and rural residents were more likely to be food insecure than households without children, two-person households, those living in single detached houses, and urban residents, respectively. The principal change in these results when we adjusted for respondents' demographic

**Table 2:** Weighted Percentages of People Who Were Food Insecure in the Overall Sample and Weighted Count of Affirmative Answers to Food Insecurity Questions in the Food-Insecure Sub-Sample, by Demographic and Employment Categories

Demographic or Employment Category	Food Insecure, % (SD) (n = 4,410)	Food Insecurity Count (SD) If Food Insecure (n = 540)
Overall sample	14.4 (35.1)	2.326 (1.604)
Household demographics		
Presence of children aged < 18 y		
Household without children (ref.)	11.8 (32.2)	2.280 (1.591)
Household with children	19.3 (39.5)**	2.379 (1.621)
Household size		
1	17.1 (37.7)**	2.675 (1.770)*
2 (ref.)	10.5 (30.6)	2.112 (1.618)
3	16.9 (37.6)*	2.249 (1.280)
≥ 4	22.0 (41.5)**	2.477 (1.691)
Dwelling type		
Single detached (ref.)	12.1 (32.6)	2.281 (1.597)
Double, row, or terrace	18.9 (39.2)*	2.144 (1.601)
Apartment or flat	19.1 (39.4)**	2.472 (1.604)
Other dwelling types	13.9 (34.7)	2.732 (1.679)
Urbanicity		
Urban resident (ref.)	13.9 (34.6)	2.423 (1.649)
Rural resident	16.9 (37.5)	1.914 (1.326)*
Personal demographics		
Sex		
Male (ref.)	15.2 (35.9)	2.122 (1.560)
Female	13.6 (34.3)	2.552 (1.625)*
Immigrant status		
Canadian born (ref.)	14.3 (35.0)	2.323 (1.589)
Immigrant	14.6 (35.3)	2.337 (1.658)
Age, y		
15–24	17.9 (38.4)	2.078 (1.308)
25–34 (ref.)	22.8 (42.0)	1.967 (1.292)
35–44	17.5 (38.0)	2.651 (1.728)**
45–54	13.1 (33.7)*	2.907 (1.989)*
55–64	11.5 (31.9)**	2.352 (1.660)
65–74	5.3 (22.4)***	1.957 (1.653)
≥ 75	6.7 (25.1)***	2.744 (1.476)
Marital status		
Married (ref.)	10.0 (30.0)	2.224 (1.573)
Common-law	15.9 (36.6)	2.142 (1.548)
Single, never married	21.1 (40.8)***	2.232 (1.463)
Divorced, separated, widowed	16.8 (37.4)*	3.183 (1.975)
Education		
High school incomplete	19.5 (39.7)	2.044 (1.366)
High school diploma (ref.)	14.8 (35.6)	2.354 (1.714)
Some college	14.7 (35.4)	2.422 (1.652)
Bachelor's degree	11.3 (31.7)	2.373 (1.600)*
Employment		
Work location		
From outside to home (ref.)	4.7 (21.1)	1.769 (1.471)
Remain at home	11.2 (31.6)*	2.229 (1.909)

(Continued)



**Table 2:** Continued

Demographic or Employment Category	Food Insecure, % (SD) (n = 4,410)	Food Insecurity Count (SD) If Food Insecure (n = 540)
Currently outside	13.9 (34.7)***	2.134 (1.302)
Absent from work	23.8 (42.7)***	2.185 (1.479)
Not working	16.4 (37.1)***	2.524 (1.700)*
Absence from work		
Worked without absence (ref.)	10.8 (31.0)	2.099 (1.472)
Non-COVID-related absence	9.3 (29.1)	3.266 (2.484)
Absence due to COVID-19: business closure or layoff	32.0 (46.7)***	2.013 (1.268)
Absence due to COVID-19: personal reasons	11.4 (32.0)	2.803 (1.515)
Not working	16.4 (37.1)**	2.524 (1.700)
Job insecurity		
Might keep job (ref.)	7.9 (27.0)	1.829 (1.219)
Unsure if will lose job	18.3 (38.7)**	2.111 (1.511)
Might lose job	25.6 (43.7)***	2.527 (1.667)**
Not working	16.4 (37.1)***	2.524 (1.700)**
CERB and EI application		
No CERB or EI applied (ref.)	11.4 (31.8)	2.437 (1.680)
CERB applied	28.1 (45.0)***	2.074 (1.391)
Regular EI applied	23.0 (42.2)*	1.933 (1.424)
Other EI applied	30.7 (46.4)*	2.684 (1.622)

Notes: Standard deviations are shown in parentheses. Significant differences from the reference groups are indicated by asterisks. ref. = reference; COVID-19 = coronavirus disease 2019; CERB = Canadian Emergency Response Benefit; EI = Employment Insurance.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Source: Authors' calculations based on Canadian Perspectives Survey Series 2.

**Table 3:** Two-Part Regression on Demographic Predictors of Food Insecurity (N = 4,410)

Demographic Predictors	Reduced Model		Full Model	
	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity
Household demographics				
Presence of children aged < 18 y				
Households without children (ref.)	1.00	1.00	1.00	1.00
Households with children	1.839*** (0.330)	1.103 (0.094)	1.698** (0.324)	1.146 (0.123)
Household size				
1	1.691** (0.296)	1.266* (0.124)	0.886 (0.239)	1.020 (0.148)
2 (ref.)	1.00	1.00	1.00	1.00
3	1.831* (0.431)	1.175 (0.121)	1.725* (0.442)	1.134 (0.133)
≥ 4	2.447** (0.744)	1.189 (0.164)	2.639** (0.903)	1.136 (0.165)
Dwelling type				
Single detached (ref.)	1.00	1.00	1.00	1.00
Double, row, or terrace	1.850** (0.435)	0.849 (0.105)	1.712* (0.444)	0.878 (0.113)

(Continued)

**Table 3:** Continued

Demographic Predictors	Reduced Model		Full Model	
	Logit:Any Insecurity	Log-Linear: Severity	Logit:Any Insecurity	Log-Linear: Severity
Apartment or flat	2.257*** (0.474)	1.021 (0.114)	2.158*** (0.487)	1.062 (0.126)
Other dwelling types	1.482 (0.460)	1.211 (0.182)	1.415 (0.496)	1.148 (0.182)
Residence region				
Urban (ref.)	1.00	1.00	1.00	1.00
Rural	1.670* (0.377)	0.813* (0.081)	1.613* (0.358)	0.813 (0.086)
Personal demographics				
Sex				
Male (ref.)			1.00	1.00
Female			0.794 (0.137)	1.136 (0.092)
Age, y				
15–24			0.219** (0.101)	0.961 (0.151)
25–34 (ref.)			1.00	1.00
35–44			0.806 (0.198)	1.325* (0.154)
45–54			0.542* (0.156)	1.349* (0.194)
55–64			0.577* (0.160)	1.253 (0.186)
65–74			0.248*** (0.088)	1.017 (0.182)
≥ 75			0.281* (0.150)	1.534 (0.347)
Education				
High school incomplete			1.288 (0.437)	0.975 (0.145)
High school diploma (ref.)			1.00	1.00
Some college			0.879 (0.201)	1.002 (0.105)
Bachelor's degree			0.607 (0.160)	1.029 (0.136)
Marital status				
Married (ref.)			1.00	1.00
Common-law			1.313 (0.350)	1.018 (0.150)
Single, never married			2.278** (0.649)	1.190 (0.153)
Divorced, separated, widowed			2.693** (0.884)	1.373 (0.248)

*(Continued)*

**Table 3:** Continued

Demographic Predictors	Reduced Model		Full Model	
	Logit:Any Insecurity	Log-Linear: Severity	Logit:Any Insecurity	Log-Linear: Severity
Immigrant status				
Canadian-born (ref.)			1.00	1.00
Immigrant			0.962 (0.200)	0.898 (0.107)

Notes: The table shows exponentiated coefficients from two-part regressions, where the first part is a logit regression on binary outcome “any food insecurity” and the second part is a log-linear model on “food insecurity severity” (count variable ranging from 1 to 6) conditional on any food insecurity. Models were weighted by person weights and bootstrapped for 1,000 times. Standard errors are in parentheses. The *p*-values are against the null hypothesis that the coefficient equals 1. Ref. = reference.

\* *p* < 0.05; \*\* *p* < 0.01; \*\*\* *p* < 0.001.

Source: Authors' calculations based on Canadian Perspectives Survey Series 2.

characteristics was that single-person households no longer had significantly higher odds of food insecurity than two-person households. Relative to respondents aged 25–34 years, respondents aged 45–64 years were more than 40 percent less likely to be food insecure, whereas those aged 64 years and older and those aged younger than 25 years were more than 70 percent less likely to experience food insecurity. Non-married respondents had more than twice the odds of being food insecure as their married counterparts. Sex, education, and immigrant status were unrelated to food insecurity. Expanding the sample to include individuals with missing data on employment circumstances made little difference to the results (Table A.1).

Conditional on being food insecure, one-person households and urban residents experienced more severe food insecurity than two-person households and rural residents, respectively, but these associations lost statistical significance when respondents' demographic characteristics were considered (Table 3). When both household and respondent characteristics were included in our model, the only significant predictor of more severe food insecurity was respondents' age. Respondents aged 35–54 years were susceptible to more than 30 percent more severe food insecurity than their younger counterparts aged 25–34 years, conditional on any food insecurity.

### **Employment Circumstances Associated with Food Insecurity**

Less than 5 percent of workers who shifted from working outside home to working at home experienced food insecurity, whereas 11.2–13.9 percent of other workers were food insecure (Table 2). Nearly one-quarter of workers absent from work in the last week and one-third of those absent due to layoff or business closure driven by COVID-19 were food insecure. One-quarter of job-insecure individuals experienced food insecurity compared with 7.9 percent of their job-secure counterparts. Food insecurity was at least twice as prevalent among applicants for

CERB or EI as among non-applicants. Among individuals who were not working, 16.4 percent were food insecure; the prevalence was even higher, at 23.8 percent (SD 0.426), when seniors aged 65 years and older were excluded. Non-workers were at higher risk of food insecurity and more severe food insecurity conditional on any food insecurity compared with workers who shifted their work location to home, non-absent workers, or job-secure workers. Among those who were food insecure, job-insecure people and non-working people reported 38 percent more severe food insecurity (0.7 higher count) than their job-secure counterparts.

The immediate employment circumstances of respondents were strongly associated with their household food insecurity; adjustment for household and respondent demographics magnified most associations (Table 4; Table A.2). In comparison with workers who had shifted from working outside the home to working at home, respondents who always worked from home, those currently working outside the home, and those absent from work in the past week were 2.99, 3.20, and 7.15 times more likely to be food insecure, respectively, after taking demographic disparities into account. In addition, after adjusting for demographic characteristics, those working outside home during the pandemic experienced 42 percent more severe food insecurity conditional on being food insecure. People who were not working had 6.46 times higher adjusted odds of food insecurity than workers who had shifted their work location to home. Among those who were food insecure, the level of food insecurity was 50 percent higher for people who were not working than for those who had begun working from home. Relative to workers who were not absent from work in the prior week, workers absent due to COVID-driven business closures and layoffs and individuals who were not working were 4.58 and 2.58 times more likely to be food insecure, respectively, after adjusting for demographic characteristics. Absence due to COVID-related personal reasons was not

**Table 4:** Two-Part Regression on Employment-Related Predictors of Food Insecurity, without and with Demographic Covariates (*N* = 4,410)

Employment-Related Predictors	First Step: Logit on Any Food Insecurity		Second Step: Log-Linear on Food Insecurity Severity	
	Unadjusted	Adjusted	Unadjusted	Adjusted
<b>Work location</b>				
Moved work location from outside to home (ref.)	1.00	1.00	1.00	1.00
Kept working from home	2.580** (0.938)	2.986** (1.129)	1.175 (0.230)	1.164 (0.245)
Working outside home	3.300*** (0.945)	3.196*** (0.978)	1.279 (0.165)	1.424* (0.200)
Absent from work	6.376*** (1.938)	7.151*** (2.254)	1.265 (0.193)	1.343 (0.208)
Not working	4.006*** (1.061)	6.457*** (1.921)	1.436** (0.182)	1.504*** (0.209)
<b>Work absence</b>				
Working without absence (ref.)	1.00	1.00	1.00	1.00
Absent for reasons unrelated to COVID-19	0.848 (0.479)	0.897 (0.545)	1.345 (0.599)	1.394 (0.830)
Absence due to COVID-driven business closure or layoff	3.896*** (1.102)	4.576*** (1.365)	0.991 (0.133)	0.972 (0.113)
Absence due to COVID-related personal reasons	1.064 (0.474)	1.193 (0.613)	1.419* (0.237)	1.470* (0.262)
Not working	1.631** (0.290)	2.581*** (0.590)	1.186* (0.102)	1.163 (0.104)
<b>Job insecurity</b>				
Does not expect to lose job (ref.)	1.00	1.00	1.00	1.00
Unsure if will lose job	2.610*** (0.720)	2.713*** (0.767)	1.106 (0.158)	1.186 (0.146)
Might lose job	3.995*** (0.973)	4.935*** (1.367)	1.327** (0.145)	1.340* (0.159)
Not working	2.286*** (0.436)	3.709*** (0.891)	1.316** (0.120)	1.311** (0.117)
<b>CERB or EI application</b>				
No CERB or EI applied (reference)	1.00	1.00	1.00	1.00
CERB applied	3.023*** (0.659)	2.525*** (0.571)	0.888 (0.089)	0.930 (0.089)
Regular EI applied	2.318** (0.668)	1.797* (0.535)	0.805 (0.105)	0.801 (0.105)
Other EI benefits applied	3.423** (1.469)	3.009* (1.528)	1.168 (0.202)	1.226 (0.227)

Notes: The table shows exponentiated coefficients from two-part regressions, where the first part is a logit regression on binary outcome “any food insecurity” and the second part is a log-linear model on “food insecurity severity” (count variable ranging from 1 to 6) conditional on any food insecurity. Models were weighted by person weights and bootstrapped for 1,000 times. Standard errors are in parentheses. The *p*-values are against the null hypothesis that the coefficient equals 1. The adjusted models controlled for presence of children, household size, dwelling type, urbanicity, and respondent’s personal demographic characteristics, including sex, age, education, marital status, and immigrant status. ref. = reference; COVID-19 = coronavirus disease 2019; CERB = Canadian Emergency Response Benefit; EI = Employment Insurance.

\* *p* < 0.05; \*\* *p* < 0.01; \*\*\* *p* < 0.001.

Source: Authors’ calculations based on Canadian Perspectives Survey Series 2.

associated with food insecurity but was associated with 47 percent greater severity of food insecurity conditional on being food insecure. Workers unsure about whether they would lose their job in the next month and those anticipating job loss were 2.71 and 4.94 times more likely to be food insecure than their job-secure counterparts, respectively, after demographic adjustments. Among the food-insecure workers, those who were job insecure had significantly higher severity of food insecurity. Applicants for CERB, regular EI benefits, and other EI benefits had 2.53, 1.80, and 3.01 times higher adjusted odds of food insecurity, respectively, than non-applicants (Table 4). Among those who were food insecure, application for CERB or EI was unrelated to severity of food insecurity. Limiting the sample to current workers (Table A.3) or expanding the sample to include individuals with missing values in model covariates (Table A.4) made little difference to these results.

### **Food Charity, Financial Hardship, and Personal Protections against COVID-19**

Only 0.4 percent of food-secure households and 7.4 percent of food-insecure households reported receiving any charitable food assistance in the past 30 days; shares of repeated users were 0.2 percent and 4.3 percent, respectively (Table 1). Although the rate of food insecurity was significantly higher among households who received food charity than among those who did not, there was no statistically significant difference in the severity of food insecurity between charitable food assistance recipients from food-insecure households and food-insecure non-recipients (Table 5). Food-insecure households were 18.06 times more likely to have received charitable food assistance at least once and 23.98 times more likely to receive it more than once in the past 30 days (Table 6). Adjustment for demographic characteristics resulted in minor decreases in these odds, but they remained highly significant.

Respondents in 19.2 percent of the food-secure households and 59.5 percent of the food-insecure households reported that the pandemic had a moderate or major impact on their ability to meet financial obligations or essential needs; 6.3 percent of the food-secure households and 26.3 percent of the food-insecure households reported a major impact (Table 1). Among food-insecure households, those reporting major impacts experienced food insecurity that was 35 percent more severe (0.75 higher count) than the others (Table 5). Food insecurity predicted 6.16 times higher odds of experiencing at least moderate hardship in meeting financial obligations and 5.30 times greater odds of having major financial hardship (Table 6). These odds increased slightly with adjustment of demographic heterogeneity.

There were no statistically significant differences by food insecurity status in respondents' reported

engagement in most of the COVID-19 preventive measures assessed in this survey (Table 5). Compared with food-secure individuals, food-insecure individuals were less likely to report practicing physical distancing in public or working from home; they were more likely to report making a plan to care for ill relatives, taking unspecified preventive measures, and taking no preventive action to reduce their exposure to COVID-19 (Table 6). Adjusting for demographic characteristics had little effect on most of these results, but food insecurity became predictive of having filled prescriptions, and it was no longer associated with having a plan to care for ill relatives or taking unspecified preventive measures. Results remained virtually the same after including individuals with missing values for model covariates (Table A.5). Among people reporting food insecurity, those who avoided crowds or large gatherings, washed their hands more regularly, or avoided touching their face had food insecurity of greater severity than those who did not report adopting these preventive measures (Table 5).

### **Discussion**

Using data from a pan-provincial Canadian sample surveyed early in the pandemic, we found that household food insecurity was strongly linked to household composition, housing circumstances, and respondent's age, marital status, and employment circumstances. The workers most vulnerable to food insecurity were those who had not been able to move work to home, workers absent from their jobs because of COVID-related business disruptions or layoffs, CERB applicants, and those who believed their loss of work was imminent. We also charted a high prevalence of food insecurity among working-age respondents who were outside the workforce. Food-insecure households were more likely than food-secure households to report that the pandemic had affected their ability to meet financial obligations and essential needs. Food-insecure households were also more likely to have received free food from charities, but only 7 percent reported receiving such assistance. Relative to their food-secure counterparts, food-insecure people were less likely to report working from home or practicing physical distancing in public, potentially exposing themselves to greater risk of COVID-19 infection.

That vulnerability to food insecurity differed markedly in relation to respondents' employment conditions during the early pandemic merits closer examination. An estimated two-fifths of the jobs in Canada may be performed remotely (Gallacher and Hossain 2020), but flexibility to work from home is common mostly among occupations with higher pay. Many people who have been working from home since before the pandemic (e.g., customer service representatives) and those who have continued to work outside home during the pandemic (e.g., essential workers) are in low-wage jobs with

**Table 5:** Weighted Food Insecurity Rate in Overall Sample and Food Insecurity Count in Food -Insecure Sub-Sample, by Food Charity Use Status, Financial Hardship Status, and COVID-19 Prevention Measures.

Food Charity Use, Financial Hardship, and COVID-19 Prevention	Food Insecurity Rate in Overall Sample (n = 4,410)	Food Insecurity Count among Food Insecure (n = 540)
<b>Food charity use and financial hardship</b>		
Did not use food charity (ref.)	0.135 (0.342)	2.292 (1.586)
Used food charity at least once	0.738 (0.443)***	2.753 (1.785)
Did not use food charity more than once (ref.)	0.139 (0.346)	2.289 (1.575)
Used food charity more than once	0.794 (0.410)***	3.148 (2.015)
No, minor, or unknown hardship (ref.)	0.078 (0.268)	2.083 (1.438)
Moderate or major hardship	0.342 (0.475)***	2.491 (1.690)
Non-major or unknown hardship (ref.)	0.117 (0.321)	2.129 (1.466)
Major hardship	0.412 (0.493)***	2.878 (1.835)**
<b>COVID-19 preventive measures</b>		
Did not stock up on essentials (ref.)	0.152 (0.359)	2.240 (1.649)
Stocked up on essentials	0.139 (0.346)	2.384 (1.574)
Did not fill prescriptions (ref.)	0.141 (0.348)	2.218 (1.541)
Filled prescriptions	0.150 (0.357)	2.515 (1.697)
No plan to care for ill relatives (ref.)	0.136 (0.343)	2.327 (1.653)
Have plan to care for ill relatives	0.198 (0.399)	2.322 (1.342)
No plan to care for other relatives (ref.)	0.148 (0.355)	2.292 (1.577)
Have plan to care for other relatives	0.125 (0.331)	2.511 (1.740)
No plan to communicate with others (ref.)	0.153 (0.360)	2.470 (1.702)
Have plan to communicate with others	0.135 (0.342)	2.170 (1.479)
Did not avoid leaving home (ref.)	0.154 (0.361)	2.735 (1.808)
Avoided leaving home	0.142 (0.350)	2.260 (1.561)
Did not use physical distancing in public (ref.)	0.333 (0.472)	2.835 (1.785)
Used physical distancing in public	0.129 (0.335)***	2.222 (1.547)
Did not avoid crowds or large gathering (ref.)	0.207 (0.405)	3.143 (1.917)
Avoided crowds and large gathering	0.138 (0.345)	2.203 (1.516)*
Did not wash hands more regularly (ref.)	0.158 (0.366)	3.908 (1.994)
Washed hands more regularly	0.143 (0.350)	2.233 (1.530)**
Did not avoid touching face (ref.)	0.165 (0.371)	2.834 (1.834)
Avoided touching face	0.136 (0.343)	2.098 (1.434)*
Did not cancel trip (ref.)	0.148 (0.355)	2.354 (1.618)
Cancelled trip	0.139 (0.346)	2.287 (1.588)
Did not work from home (ref.)	0.168 (0.374)	2.364 (1.600)
Worked from home	0.086 (0.280)***	2.148 (1.618)
No other risk-reducing measures (ref.)	0.138 (0.345)	2.319 (1.580)
Other risk-reducing measures	0.227 (0.420)*	2.392 (1.827)
Any measure taken (ref.)	0.142 (0.350)	2.304 (1.592)
No measure taken	0.396 (0.497)	3.671 (1.895)

Notes: Standard deviations are in parentheses. Significant differences from the reference groups are indicated by asterisks. COVID-19 = coronavirus disease 2019; ref. = reference.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Source: Authors' calculations based on Canadian Perspectives Survey Series 2.

inherent risk of food insecurity (McIntyre et al. 2012). We have no data on the pre-pandemic food insecurity status of survey respondents, but the non-working respondents and respondents absent from work because of COVID-related business closures or layoffs may have had

a higher probability of food insecurity than their working counterparts even before the pandemic. However, the increased costs of living and business closures and layoffs that have accompanied the pandemic likely have increased the probability and severity of food insecurity

**Table 6:** Logit Regression Using Food Insecurity Status to Predict Food Charity Use, Financial Hardship, and Preventive Measures for COVID-19, without and with Demographic Covariates ( $N = 4,410$ )

Outcomes Predicted by Food Insecurity	Unadjusted		Adjusted	
	OR	SE	OR	SE
<b>Food charity use</b>				
Used food charity at least once	18.056***	(6.921)	15.924***	(7.609)
Used food charity more than once	23.976***	(13.332)	22.402***	(15.895)
<b>Financial hardship</b>				
Moderate or major hardship	6.164***	(1.059)	6.351***	(1.160)
Major hardship	5.295***	(1.097)	6.061***	(1.505)
<b>COVID-19 preventive measures</b>				
Stocked up on essentials	0.906	(0.147)	1.003	(0.176)
Filled prescriptions	1.080	(0.172)	1.538**	(0.245)
Have plan to care for ill relatives	1.557*	(0.336)	1.504	(0.348)
Have plan to care for other relatives	0.823	(0.155)	0.883	(0.185)
Have plan to communicate with others	0.865	(0.135)	1.025	(0.173)
Avoided leaving home	0.913	(0.191)	1.031	(0.221)
Used physical distancing in public	0.297***	(0.075)	0.320***	(0.084)
Avoided crowds and large gathering	0.613	(0.182)	0.722	(0.200)
Washed hands more regularly	0.890	(0.264)	0.983	(0.311)
Avoided touching face	0.797	(0.151)	0.812	(0.159)
Cancelled trip	0.928	(0.154)	1.021	(0.177)
Worked from home	0.464***	(0.083)	0.394***	(0.079)
Other risk-reducing measures	1.829*	(0.502)	1.749	(0.518)
No measure taken	3.940*	(2.547)	3.827*	(2.113)

Notes: The table shows exponentiated coefficients of the binary food insecurity variable from the unadjusted and the adjusted models. The adjusted models controlled for presence of children, household size, dwelling type, urbanicity, and respondent's personal demographic characteristics, including sex, age, education, marital status, and immigrant status. Models were weighted by person weights and bootstrapped for 1,000 times. Standard errors are in parentheses. The  $p$ -values are against the null hypothesis that the coefficient equals 1. COVID-19 = coronavirus disease 2019; OR = odds ratio; ref. = reference.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Source: Authors' calculations based on Canadian Perspectives Survey Series 2.

among vulnerable workers. The high prevalence of applications to CERB among food-insecure respondents (23 percent) and its associated 2.53 times higher odds of food insecurity among applicants relative to non-applicants highlight the vulnerability of people who lost work and did not qualify for EI. Given the more stringent eligibility criteria for EI (Canada 2020c), some CERB applicants may be EI-ineligible workers who were at higher risk of food insecurity even before the pandemic (e.g., younger, temporary, and informal workers) (Canada 2020a; McIntyre et al. 2012). Simulations have suggested that the CERB may have benefited the bottom income quintile the most by overcompensating for their income loss (MacGee, Pugh, and See 2020), and this income support has anecdotally been suggested as a possible explanation for the reductions in demand reported by some food banks (Food Banks Canada 2020). However, research is needed to determine how the receipt of CERB and the federal programs that have now replaced CERB have affected household food

insecurity. At least one-third of households reliant on EI before the pandemic were food insecure (Tarasuk, Fafard St-Germain, and Mitchell 2019; Tarasuk and Mitchell 2020), so the patterning of CERB and related benefits after CERB should not be presumed to insulate households from food insecurity.

The substantial overlap between job insecurity and food insecurity observed in this study, coupled with our findings on absence from work, indicates that the food insecurity of many households precedes job loss. This is consistent with pre-pandemic monitoring data on food insecurity in Canada showing that 65 percent of food-insecure households were reliant on employment incomes (Tarasuk and Mitchell 2020). Workers in lower-paying jobs such as restaurant wait staff have been hit the hardest by the pandemic (Gallacher and Hossain 2020); many who worked in those jobs would have been food insecure before the pandemic (McIntyre et al. 2012). With the greater instability of employment incomes now, food insecurity

of households reliant on such work could become more severe, with even more deleterious consequences for health and well-being. The strong relationships observed between individuals' employment circumstances and household food insecurity highlight the critical importance of adequate financial supports to protect households who are unable to garner sufficient income through employment from extreme material hardship.

Our findings also point out the elevated risk of food insecurity among people who are not working. This must in part reflect the well-documented high prevalence of food insecurity among households reliant on social assistance and, to a lesser extent, EI and workers' compensation (Tarasuk, Fafard St-Germain, and Mitchell 2019). We could not identify these groups from the CPSS-2 data. One-fifth of our sample were aged older than 65 years, and they made up a substantial proportion of the non-working group. In this study, those aged 65 years and older had significantly lower odds of food insecurity than younger adults, a finding consistent with research showing a protective effect of public pensions against food insecurity among older adults (McIntyre, Dutton, et al. 2016). Removing older adults from the non-working group yielded a much higher prevalence of food insecurity among this group, highlighting the vulnerability of working-age people outside the workforce.

The substantial overlap between household food insecurity and households' difficulties in meeting financial obligations and essential needs more broadly aligns with our understanding of food insecurity as a marker of pervasive financial hardship. It is well established that food-insecure households compromise spending across a broad array of goods and services, not just food (Fafard St-Germain and Tarasuk 2018). Food insecurity is strongly correlated with delayed bill, rent, and mortgage payments (Loopstra and Tarasuk 2013; Tarasuk, Fafard St-Germain, and Loopstra 2019) and cost-related nonadherence to prescription medications (Men et al. 2019). The costs of many basic necessities have risen throughout the pandemic (Ahou et al. 2020), and job loss has created a major income shock to low-resource working families, forcing many to cut spending on food and other essentials.

Despite their significant food and financial hardships, 92.6 percent of food-insecure households in this population-based sample made no use of food charity, and only 4.3 percent received any free food more than once in the past 30 days. The prevalence of food charity use among food-insecure households in this study is slightly lower than the 9.3 percent (95% CI 5.4–15.5) reported by Polsky and Gilmour (2020) in their analysis of CPSS-2, but this discrepancy may be explained by minor differences in the construction of the analytic samples between that study and this one. Both estimates indicate very little overlap between household food insecurity and food charity use. COVID-related disruptions to the work of

volunteer-driven community food programs may have meant that, at the time the CPSS-2 was administered, charitable food assistance was less available than usual in some communities despite rapid allocations of funding from federal and provincial governments early in the pandemic. Previous Canadian studies have reported a 20–30 percent overlap between food insecurity and food bank use (McIntyre et al. 2000; Rainville and Brink 2001; Tarasuk, Fafard St-Germain, and Loopstra 2019; Vozoris and Tarasuk 2003), but these earlier assessments covered a 12-month time frame.

The federal government's spending on food charity programs to date is a tiny fraction of its investments in financial supports to individuals and businesses through the pandemic (Canada 2020b). However, the government's announcements clearly indicate that this funding is intended to address problems of food insecurity (Agriculture and Agri-Food Canada 2020; Canada 2020d), with the October 2020 funding announcement referencing the food insecurity prevalence estimates from CPSS-2 (Canada 2020d). Without more data on the experiences of food insecurity among the households who reported receiving charitable food assistance, we cannot comment on the impact of this assistance for individual recipients. Nevertheless, the fact that the vast majority of food-insecure households reported no receipt of food charity raises serious questions about the federal government's decision to fund charitable food assistance programs as a strategy to address food insecurity during the pandemic.

In addition to referencing increased food insecurity among Canadians because of the pandemic, the federal government has explained that its investments in community-based food charities are necessitated by the higher demands for assistance from and reduced resources among these programs during the pandemic (Agriculture and Agri-Food Canada 2020). These claims are difficult to verify from the publicly available information on the recipient organizations. The bulk of the funding has gone to Food Banks Canada, Children's Breakfast Clubs of Canada, Second Harvest, Community Food Centres of Canada, and the Salvation Army (Agriculture and Agri-Food Canada 2020). Second Harvest reported a two-fold increase in donations over the past year (Second Harvest Food Rescue 2020), and media reports described record-breaking fundraising events for food banks (CBC News 2020; Nersessian 2020; Weverink 2020), but comprehensive data on the recipient organizations' resources are unavailable. Only Food Banks Canada regularly publishes statistics on its clientele, and its most recent national survey did not indicate widespread increases in demand (Food Banks Canada 2020). Between March and June 2020, 33 percent of food banks reported an increase in demand, but 53 percent reported a reduction (Food Banks Canada 2020). How the trends within individual food banks relate to the total number of individuals helped by food



banks is unknown, but given that such a small fraction of food-insecure households ever seek assistance from food charities, changes in their operations should not be expected to parallel changes in the national prevalence or severity of household food insecurity. In Canada, changes in food bank use have historically shown no relationship to changes in the population prevalence of food insecurity (Loopstra and Tarasuk 2015).

Our finding that respondents' food insecurity status was related to their personal preventive measures in response to the threat of COVID infection is consistent with other research. In the United States, social distancing was positively associated with income before the pandemic but negatively so during the pandemic (Weill et al. 2020). Food insecurity has also been associated with poorer housing conditions in previous studies (Deaton, Scholz, and Lipka 2020; Fafard St-Germain and Tarasuk 2020; Kirkpatrick and Tarasuk 2011) and with riskier living and employment conditions in the present study. Although sensitive to the adjustment of demographic covariates, the differential odds of filling prescriptions and having a plan to care for ill relatives are in accordance with the much higher prevalence of chronic health problems among individuals in food-insecure households (Dowd et al. 2009; Gucciardi et al. 2009; Jessiman-Perreault and McIntyre 2017; Kirkpatrick et al. 2010; McIntyre et al. 2017; Men, Elgar, and Tarasuk 2021; Men et al. 2020a, 2020b; Men and Tarasuk 2020; Men et al. 2021; Polsky and Gilmour 2020; Tait et al. 2018; Tarasuk, Cheng, et al. 2018). Those measures were likely taken to cope with existing health issues. We found no evidence that food-insecure individuals were less willing to take actions on COVID-19 prevention and some evidence that individuals with food insecurity of greater severity took more preventive measures than their peers with less severe food insecurity; thus, it seems likely that the lower propensity of food-insecure people to socially distance is due to employment constraints and perhaps a greater need to rely on public transit.

The high prevalence of food insecurity documented in CPSS-2, its strong intersection with pandemic-related disruptions to employment and broader financial hardships, and its weak link to food charity jointly speak to the urgent need for federal interventions to reduce the prevalence and severity of household food insecurity in Canada. Several Canadian studies have documented the sensitivity of household food insecurity to income-based policy interventions that improve the financial circumstances of low-resource households (Brown and Tarasuk 2019; Ionescu-Iltu, Glymour, and Kaufman 2015; Li, Dachner, and Tarasuk 2016; Loopstra, Dachner, and Tarasuk 2015; McIntyre, Dutton, et al. 2016; Men, Urquia, and Tarasuk 2021; Tarasuk, Li, et al. 2018). The receipt of public old-age pensions has been associated with the marked drop in food insecurity and better health among low-income Canadian seniors compared with those aged

younger than 65 years (McIntyre, Dutton, et al. 2016; McIntyre, Kwok, et al. 2016). These findings are consistent with international comparisons documenting lower rates of food insecurity in countries that invest more in social protection programs (Loopstra et al. 2016; Fernald and Gosliner 2019) and have more generous wage-setting policies (Reeves, Loopstra, and Tarasuk 2021). Expanded Unemployment Insurance was longitudinally associated with reduced risk of food hardship among low-income Americans from April to July 2020 (Raifman, Bor, and Venkataramani 2020). The effects of CERB, EI, and other Canadian government relief programs on food insecurity during the pandemic warrant greater examination so that the potential for these income supports to insulate vulnerable households from food insecurity can be maximized.

The public health imperative to address food insecurity is well established, with a large body of research showing relationships between household food insecurity status and serious adverse health outcomes, independent of other well-established social determinants of health such as income and education. Studies in Canada have documented the serious long-term health consequences of hunger among children (Kirkpatrick et al. 2010; McIntyre et al. 2017), and the higher morbidity (Jessiman-Perreault and McIntyre 2017; Kirkpatrick et al. 2010; McIntyre et al. 2017; Men, Elgar, and Tarasuk 2021; Men et al. 2020b; Polsky and Gilmour 2020; Tait et al. 2018; Tarasuk, Cheng, et al. 2018), premature death (Men et al. 2020a; Men and Tarasuk 2020), and health care costs among food-insecure adults (Men et al. 2020b). Food-insecure Canadians reported significantly poorer mental health than their food-secure counterparts before the pandemic (Men, Elgar, and Tarasuk 2021; Men et al. 2020b; Tarasuk, Cheng, et al. 2018; Tarasuk et al. 2013), and earlier analyses of mental health data from CPSS-2 revealed that food-insecure individuals had double the probability of elevated anxiety and triple the odds of reporting fair or poor mental health as their food-secure counterparts during the pandemic (Polsky and Gilmour 2020; Zajacova et al. 2020). Insofar as food-insecure individuals are less able to practice physical distancing or work from home, their risk of COVID infection is heightened (Nagata et al. 2020). Their greater likelihood of having pre-existing health conditions means that food-insecure individuals are also at greater risk of serious illness and death from COVID-19 should they become infected (Baylis et al. 2020). To the extent that the material hardships brought on or exacerbated by the pandemic further constrain food-insecure individuals' abilities to properly manage chronic health problems, the gaps in health and life expectancy between food-secure and food-insecure Canadians can be expected to widen (Leddy et al. 2020; McLinden, Stover, and Hogg 2020). In short, increases in the prevalence and severity of household food insecurity throughout the pandemic will

have serious and lasting consequences for the health and well-being of adults and children affected by this problem.

The demographic profile of food-insecure households identified in this study is broadly consistent with the results of analyses of data from the Canadian Community Health Survey (CCHS), the Statistics Canada survey used to monitor food insecurity before the pandemic (McIntyre et al. 2012; McIntyre, Wu, et al. 2016; Tarasuk, Fafard St-Germain, and Mitchell 2019; Tarasuk and Mitchell 2020). However, there are many differences between the CPSS-2 and the CCHS, including their survey designs, sampling frames, and measurements of household food insecurity. To enable some comparison of food insecurity prevalence during the early pandemic with its prevalence before the pandemic, Statistics Canada generated an estimate of food insecurity prevalence from CCHS 2017–18, working only with responses to the subset of questions asked in the CPSS-2 (i.e., 6 of the 18 questions used in the CCHS) and extracting a sub-sample that was more comparable to the web panel (Statistics Canada 2020c). It reported an apparent change in prevalence from 10.5 percent to 14.6 percent. Statistics Canada’s estimate of 10.5 percent is lower than the national prevalence of 12.7 percent registered in CCHS 2017–18 because it is based on a sub-sample of survey respondents selected to approximate the CPSS-2 sample, and the latter survey sample was biased toward more socio-economically advantaged respondents (Statistics Canada 2020c). In our view, the multiple substantive differences between the CPSS-2 and the CCHS limit the validity of further comparisons between these two surveys. It is very important to understand how the COVID-19 pandemic and related federal and provincial government responses have affected the prevalence and severity of household food insecurity among different population subgroups; comparable data are needed for such analyses.

We acknowledge the limitations of this study. The data are cross-sectional, so causality cannot be inferred from our results. Because food insecurity was assessed at only one point in time over the prior 30 days, we have no way to distinguish newly food-insecure households from those who were already food insecure before the pandemic. The relatively small number of food-insecure households in this sample limited our ability to identify factors associated with more severe forms of food insecurity. The low response rate means that CPSS-2 was subject to nonresponse bias (Statistics Canada 2020a). The reliance on online data collection and the underrepresentation of renters in this survey suggest that the sample was biased toward more affluent households (Statistics Canada 2020a). The six-item food security questionnaire in the CPSS-2 did not discern levels of household food insecurity or children’s experience of food insecurity at home (USDA ERS 2012). Use of the 18-item questionnaire is needed for these tasks. Very limited socio-demographic information was available, particularly at the household

level. The CPSS did not collect data on some key predictors of food insecurity, most notably household income, race, Indigenous identity, and receipt of social assistance. Thus, our characterization of food-insecure households in this study is limited. In addition, the sample did not include territories, so our results cannot be considered nationally representative. More comprehensive monitoring of food insecurity in Canada throughout the pandemic and beyond is essential to inform future policy decisions and evaluate the policies already in place.

## Conclusion

Our findings indicate that the high prevalence of food insecurity charted among Canadian households in early May 2020 was strongly associated with pandemic-related disruptions to employment incomes and that most food-insecure households were also experiencing other major financial hardships. The federal government has responded to concerns about growing food insecurity with income support programs such as CERB and funding for food charities, with differential results in population coverage. More adequate and secure financial support for low-income households would reduce food insecurity and mitigate negative repercussions of the pandemic.

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## Appendix

**Table A.1:** Sensitivity Analysis: Two-Part Regression on Demographic Predictors of Food Insecurity in the Sample, Including Individuals with Missing Employment Data ( $N = 4,480$ )

Demographic Predictors	Sensitivity Analysis	
	Logit: Any Insecurity	Log-Linear: Severity
<b>Household demographics</b>		
Presence of children aged < 18 y (ref. = none)		
Households without children aged < 18 y	1.510*	1.094
	(0.298)	(0.114)
Household size (ref. = 2)		
1	0.986	1.026
	(0.266)	(0.146)
3	1.745*	1.154
	(0.444)	(0.134)
≥ 4	2.924**	1.170
	(0.981)	(0.163)
Dwelling type (ref. = single detached)		
Double, row, or terrace	1.865*	0.900
	(0.479)	(0.115)
Apartment or flat	2.015**	1.058
	(0.462)	(0.124)
Other dwelling types	1.408	1.146
	(0.489)	(0.179)
Residence region (ref. = urban)		
Rural	1.675*	0.83
	(0.368)	(0.086)
<b>Personal demographics</b>		
Sex (ref. = male)		
Female	0.823	1.155
	(0.143)	(0.093)
Age (ref. = 25–34 y)		
15–24	0.227**	0.960
	(0.104)	(0.149)
35–44	0.785	1.290*
	(0.202)	(0.152)
45–54	0.495*	1.271
	(0.153)	(0.179)
55–64	0.511*	1.164
	(0.154)	(0.172)
65–74	0.225***	0.930
	(0.081)	(0.162)
≥ 75	0.255*	1.431
	(0.137)	(0.318)
Education (ref. = high school diploma)		
High school incomplete	1.163	0.951
	(0.386)	(0.139)
Some college	0.824	0.969
	(0.184)	(0.098)
Bachelor's degree	0.558*	0.983
	(0.143)	(0.126)

(Continued)

**Table A.1:** Continued

Demographic Predictors	Sensitivity Analysis	
	Logit: Any Insecurity	Log-Linear: Severity
Marital status (ref. = married)		
Common-law	1.253 (0.337)	0.986 (0.146)
Single, never married	1.984* (0.581)	1.129 (0.144)
Widowed, divorced, separated	2.323** (0.757)	1.35 (0.228)
Immigrant status (ref. = Canadian-born)		
Immigrant	1.006 (0.207)	0.926 (0.107)

Notes: The table shows exponentiated coefficients from two-part regressions, in which the first part is logit regression on the binary outcome “any food insecurity” and the second part is log-linear model on “food insecurity count” (1–6) conditional on any food insecurity. Models were weighted by personal weights and bootstrapped for 1,000 times. Standard errors are shown in parentheses. ref. = reference.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Source: Authors' calculations based on Canadian Perspectives Survey Series 2.

**Table A.2:** Two-Part Regressions on Employment-Related Predictors of Food Insecurity Adjusting for Demographic Covariates ( $N = 4,410$ )

Employment-Related Predictors and Demographic Covariates	Work Location		Work Absence		Job Insecurity		CERB–EI Application	
	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity
Personal employment								
Work location (ref. = moved from outside to home)								
Kept working from home	2.986** (1.129)	1.164 (0.245)						
Working outside home	3.196*** (0.978)	1.424* (0.200)						
Absent from work	7.151*** (2.254)	1.343 (0.208)						
Not working	6.457*** (1.921)	1.504** (0.209)						
Work absence (ref. = working without absence)								
Absent for reasons unrelated to COVID-19			0.897 (0.545)	1.394 (0.830)				
Absence due to COVID-driven business closure or lay-off			4.576*** (1.365)	0.972 (0.113)				
Absence due to COVID-19-related personal reasons			1.193 (0.613)	1.470* (0.262)				
Not working			2.581*** (0.590)	1.163 (0.104)				

(Continued)



Table A.2: Continued

Employment-Related Predictors and Demographic Covariates	Work Location		Work Absence		Job Insecurity		CERB–EI Application	
	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity
Job insecurity (ref. = does not expect to lose job)								
Unsure if will lose job					2.713*** (0.767)	1.186 (0.146)		
Might lose job					4.935*** (1.367)	1.340* (0.159)		
Not working					3.709*** (0.891)	1.311** (0.117)		
CERB or EI application (ref. = none)								
CERB applied							2.525*** (0.571)	0.930 (0.089)
Regular EI applied							1.797* (0.535)	0.801 (0.105)
Other EI benefits applied							3.009* (1.528)	1.226 (0.227)
Household demographics								
Presence of children aged < 18 y (ref. = none)								
Households without children aged < 18 y	1.639* (0.316)	1.143 (0.121)	1.671** (0.325)	1.133 (0.121)	1.727** (0.336)	1.134 (0.121)	1.685** (0.326)	1.156 (0.122)
Household size (ref. = 2 people)								
1	0.964 (0.255)	1.048 (0.151)	0.965 (0.258)	1.043 (0.149)	0.944 (0.257)	1.042 (0.151)	0.949 (0.249)	0.975 (0.141)
3	1.725* (0.450)	1.109 (0.129)	1.783* (0.470)	1.154 (0.126)	1.729* (0.452)	1.130 (0.133)	1.849* (0.469)	1.108 (0.132)
≥ 4	2.645** (0.891)	1.108 (0.152)	2.629** (0.896)	1.121 (0.150)	2.621** (0.853)	1.111 (0.155)	2.662** (0.929)	1.123 (0.162)
Dwelling type (ref. = single detached)								
Double, row, or terrace	1.797* (0.458)	0.877 (0.114)	1.796* (0.465)	0.869 (0.104)	1.854* (0.479)	0.883 (0.111)	1.745* (0.458)	0.889 (0.115)
Apartment or flat	2.106** (0.483)	1.054 (0.122)	2.110** (0.488)	1.057 (0.125)	2.064** (0.464)	1.046 (0.118)	2.093** (0.496)	1.069 (0.124)
Other dwelling types	1.344 (0.470)	1.138 (0.174)	1.486 (0.508)	1.134 (0.189)	1.432 (0.525)	1.171 (0.179)	1.383 (0.476)	1.133 (0.187)
Residence region (ref. = urban)								
Rural	1.566* (0.349)	0.813* (0.085)	1.557* (0.351)	0.845 (0.087)	1.698* (0.392)	0.83 (0.085)	1.600* (0.359)	0.842 (0.088)
Personal demographics								
Sex (ref. = male)								
Female	0.762 (0.132)	1.145 (0.095)	0.725 (0.125)	1.140 (0.092)	0.779 (0.134)	1.144 (0.093)	0.818 (0.140)	1.147 (0.093)
Age (ref. = 25–34 y)								
15–24	0.180*** (0.082)	0.990 (0.156)	0.178*** (0.082)	0.953 (0.144)	0.170*** (0.079)	0.978 (0.155)	0.235** (0.105)	0.921 (0.148)

(Continued)

**Table A.2:** Continued

Employment-Related Predictors and Demographic Covariates	Work Location		Work Absence		Job Insecurity		CERB–EI Application	
	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity
35–44	0.834 (0.202)	1.337* (0.153)	0.882 (0.204)	1.329* (0.157)	0.812 (0.199)	1.335* (0.155)	0.822 (0.200)	1.297* (0.155)
45–54	0.528* (0.147)	1.351* (0.192)	0.551* (0.150)	1.337* (0.188)	0.524* (0.149)	1.347* (0.187)	0.593 (0.166)	1.328* (0.191)
55–64	0.447** (0.130)	1.222 (0.180)	0.472* (0.141)	1.246 (0.179)	0.452** (0.134)	1.241 (0.181)	0.587 (0.161)	1.200 (0.181)
65–74	0.161*** (0.061)	0.969 (0.178)	0.167*** (0.064)	0.968 (0.177)	0.161*** (0.062)	0.995 (0.180)	0.293*** (0.103)	0.977 (0.182)
≥ 75	0.169*** (0.090)	1.498 (0.337)	0.171*** (0.089)	1.524 (0.345)	0.178** (0.097)	1.445 (0.342)	0.340* (0.170)	1.526 (0.349)
Education (ref. = high school diploma)								
High school incomplete	1.319 (0.455)	0.970 (0.144)	1.385 (0.477)	0.987 (0.144)	1.255 (0.437)	0.980 (0.148)	1.410 (0.491)	0.946 (0.139)
Some college	1.000 (0.230)	1.023 (0.107)	1.018 (0.238)	1.019 (0.108)	0.965 (0.226)	1.029 (0.108)	0.909 (0.214)	0.986 (0.103)
Bachelor's degree	0.828 (0.218)	1.109 (0.145)	0.767 (0.208)	1.085 (0.142)	0.759 (0.206)	1.077 (0.133)	0.688 (0.186)	1.021 (0.135)
Marital status (ref. = married)								
Common-law	1.169 (0.313)	1.031 (0.148)	1.216 (0.313)	1.022 (0.150)	1.306 (0.357)	1.055 (0.148)	1.214 (0.328)	1.014 (0.148)
Single, never married	2.056** (0.570)	1.135 (0.146)	2.073** (0.578)	1.146 (0.147)	2.229** (0.617)	1.187 (0.159)	2.131** (0.590)	1.236 (0.156)
Widowed, divorced, separated	2.522** (0.803)	1.310 (0.229)	2.439** (0.778)	1.307 (0.232)	2.576** (0.832)	1.35 (0.242)	2.622** (0.859)	1.425* (0.257)
Immigrant status (ref. = Canadian born)								
Immigrant	0.895 (0.188)	0.886 (0.105)	0.931 (0.196)	0.909 (0.108)	0.802 (0.172)	0.897 (0.105)	0.893 (0.194)	0.920 (0.108)

Notes: The table shows exponentiated coefficients from adjusted two-part regressions, in which the first part is logit regression on binary outcome “any food insecurity” and the second part is log-linear model on “food insecurity count” (1–6) conditional on any food insecurity. Models were weighted by personal weights and bootstrapped for 1,000 times. Standard errors are in parentheses. CERB = Canada Emergency Response Benefit; EI = Employment Insurance; ref. = reference; COVID-19 = coronavirus disease 2019.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Source: Authors' calculations based on Canadian Perspectives Survey Series 2.

**Table A.3:** Sensitivity Analysis: Two-Part Regressions on Employment-Related Predictors of Food Insecurity Among Current Workers, Adjusting for Demographic Characteristics ( $n = 2,620$ )

Employment-Related Predictors and Demographic Covariates	Work Location		Work Absence		Job Insecurity	
	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity
<b>Personal employment</b>						
Work location (ref. = moved from outside to home)						
Kept working from home	2.687*	1.254				
	(1.035)	(0.276)				
Working outside home	3.086***	1.300				
	(0.938)	(0.200)				
Absent from work	6.128***	1.355				
	(1.943)	(0.222)				
Work absence (ref. = working without absence)						
Absent for reasons unrelated to COVID-19						
			0.818	1.244		
			(0.491)	(0.582)		
Absence due to COVID-driven business closure or lay-off						
			4.029***	1.068		
			(1.189)	(0.133)		
Absence due to COVID-related personal reasons						
			1.049	1.550*		
			(0.506)	(0.300)		
Job insecurity (ref. = does not expect to lose job)						
Unsure if will lose job						
					2.466**	1.160
					(0.690)	(0.131)
Might lose job						
					4.298***	1.417**
					(1.184)	(0.175)
<b>Household demographics</b>						
Presence of children aged < 18 y (ref. = none)						
Households without children aged < 18 y						
	1.611	1.102	1.678	1.074	1.730*	1.084
	(0.429)	(0.133)	(0.449)	(0.129)	(0.478)	(0.128)
Household size (ref. = 2)						
1	1.177	0.956	1.197	0.931	1.137	0.917
	(0.414)	(0.185)	(0.430)	(0.178)	(0.427)	(0.179)
3	1.808	1.251	1.935*	1.285	1.833	1.248
	(0.583)	(0.182)	(0.618)	(0.185)	(0.590)	(0.178)
≥ 4	1.701	0.819	1.553	0.833	1.626	0.826
	(0.917)	(0.190)	(0.867)	(0.181)	(0.875)	(0.169)
Dwelling type (ref. = single detached)						
Double, row, or terrace						
	1.225	1.032	1.270	1.035	1.268	1.081
	(0.449)	(0.181)	(0.480)	(0.170)	(0.494)	(0.175)
Apartment or flat						
	1.749	1.102	1.731	1.094	1.658	1.057
	(0.551)	(0.182)	(0.550)	(0.185)	(0.512)	(0.155)
Other dwelling types						
	1.151	1.073	1.342	1.070	1.262	1.119
	(0.540)	(0.205)	(0.620)	(0.212)	(0.644)	(0.196)
Residence region (ref. = urban)						
Rural						
	1.960*	0.783	1.955**	0.812	2.288**	0.791
	(0.522)	(0.103)	(0.506)	(0.105)	(0.631)	(0.100)
<b>Personal demographics</b>						
Sex (ref. = male)						
Female						
	0.983	1.081	0.917	1.069	1.012	1.075
	(0.213)	(0.109)	(0.198)	(0.108)	(0.221)	(0.107)

(Continued)

**Table A.3:** Continued

Employment-Related Predictors and Demographic Covariates	Work Location		Work Absence		Job Insecurity	
	Logit:Any Insecurity	Log-Linear: Severity	Logit:Any Insecurity	Log-Linear: Severity	Logit:Any Insecurity	Log-Linear: Severity
Age (ref. = 25–34 y)						
15–24	0.436 (0.263)	1.210 (0.318)	0.446 (0.271)	1.158 (0.284)	0.404 (0.252)	1.165 (0.303)
35–44	0.850 (0.249)	1.325* (0.179)	0.923 (0.254)	1.333* (0.184)	0.806 (0.244)	1.320* (0.179)
45–54	0.432* (0.147)	1.153 (0.196)	0.462* (0.155)	1.174 (0.195)	0.426* (0.149)	1.160 (0.187)
55–64	0.732 (0.280)	1.159 (0.247)	0.835 (0.322)	1.205 (0.250)	0.788 (0.304)	1.174 (0.245)
≥ 65	0.585 (0.304)	1.265 (0.314)	0.577 (0.311)	1.283 (0.313)	0.571 (0.311)	1.243 (0.264)
Education (ref. = high school diploma)						
High school incomplete	1.876 (0.982)	0.905 (0.219)	2.183 (1.139)	0.913 (0.219)	1.807 (0.990)	0.929 (0.229)
Some college	1.093 (0.332)	0.935 (0.133)	1.150 (0.362)	0.900 (0.133)	1.032 (0.324)	0.930 (0.130)
Bachelor's degree	1.105 (0.403)	0.951 (0.167)	1.006 (0.383)	0.932 (0.164)	0.993 (0.372)	0.930 (0.148)
Marital status (ref. = married)						
Common-law	1.140 (0.436)	0.937 (0.150)	1.184 (0.434)	0.923 (0.149)	1.310 (0.511)	0.994 (0.148)
Single, never married	1.440 (0.513)	1.221 (0.210)	1.474 (0.541)	1.261 (0.212)	1.621 (0.599)	1.354 (0.244)
Widowed, divorced, separated	1.486 (0.602)	1.275 (0.269)	1.318 (0.532)	1.270 (0.261)	1.543 (0.650)	1.420 (0.303)
Immigrant status (ref. = Canadian-born)						
Immigrant	1.467 (0.395)	0.895 (0.127)	1.557 (0.418)	0.911 (0.135)	1.254 (0.350)	0.868 (0.119)

Notes: The table shows exponentiated coefficients from adjusted two-part regressions, in which the first part is logit regression on binary outcome “any food insecurity” and the second part is log-linear model on “food insecurity count” (1–6) conditional on any food insecurity. Models were weighted by personal weights and bootstrapped for 1,000 times. Standard errors are shown in parentheses. ref. = reference; COVID-19 = coronavirus disease 2019.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Source: Authors' calculations based on Canadian Perspectives Survey Series 2.

**Table A.4:** Sensitivity Analysis: Two-Part Regressions on Employment-Related Predictors of Food Insecurity in the Sample Including Individuals with Missing Employment Data (N = 4,480)

Employment-Related Predictors	Work Location		Work Absence		Job Insecurity		CERB–EI Application	
	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity	Logit: Any Insecurity	Log-Linear: Severity
Work location (ref. = moved from outside to home)								
Kept working from home	3.000** (1.136)	1.163 (0.246)						
Working outside home	3.222*** (0.990)	1.414* (0.197)						
Absent from work	7.504*** (2.348)	1.369* (0.209)						
Not working	6.571*** (1.950)	1.507** (0.208)						
Work absence (ref. = working without absence)								
Absent for reasons unrelated to COVID-19			0.905 (0.552)	1.424 (0.849)				
Absence due to COVID-driven business closure or lay-off			4.667*** (1.396)	0.995 (0.115)				
Absence due to COVID-related personal reasons			1.343 (0.649)	1.375 (0.239)				
Not working			2.626*** (0.592)	1.172 (0.105)				
Job insecurity (ref. = does not expect to lose job)								
Unsure if will lose job					2.844*** (0.789)	1.212 (0.146)		
Might lose job					4.985*** (1.377)	1.333* (0.156)		
Not working					3.774*** (0.901)	1.317** (0.118)		
CERB or EI application (ref. = none)								
CERB applied							2.514*** (0.568)	0.926 (0.088)
Regular EI applied							1.818* (0.540)	0.797 (0.104)
Other EI benefits applied							3.015* (1.538)	1.227 (0.226)

Notes: The table shows exponentiated coefficients from adjusted two-part regressions, in which the first part is logit regression on binary outcome “any food insecurity” and the second part is log-linear model on “food insecurity count” conditional on any food insecurity. All models adjusted for presence of children, household size, dwelling type, urbanicity, sex, age, education, marital status, and immigrant status. The coefficients for “not stated” category in the variables were either omitted or collapsed with “not working” category due to confidentiality with small cell sizes. Models were weighted by personal weights and bootstrapped for 1,000 times. Standard errors are shown in parentheses. CERB = Canada Emergency Response Benefit; EI = Employment Insurance; COVID-19 = coronavirus disease 2019.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Source: Authors' calculations based on Canadian Perspectives Survey Series 2.

**Table A.5:** Sensitivity Analysis: Logit Regressions Using Food Insecurity Status to Predict Food Charity Use, Financial Hardship, and Preventive Measures for COVID-19 in the Sample Including Individuals with Missing Employment Data ( $N = 4,480$ )

Outcomes Predicted by Food Insecurity	aOR	SE
Food charity use		
Used food charity	19.513**	(9.631)
Used food charity 2 times	22.215**	(15.706)
Financial hardship <sup>a</sup>		
Moderate or major financial hardship	6.039**	(1.109)
Major financial hardship	5.949**	(1.462)
COVID-19 prevention measures		
Stocked up on essentials	1.031	(0.180)
Filled prescriptions	1.503*	(0.238)
Have plan to care for ill relatives	1.442	(0.338)
Have plan to care for other relatives	0.866	(0.181)
Have plan to communicate with others	0.985	(0.165)
Avoided leaving home	1.061	(0.228)
Used physical distancing in public	0.329**	(0.085)
Avoided crowds and large gathering	0.730	(0.200)
Washed hands more regularly	1.006	(0.316)
Avoided touching face	0.816	(0.158)
Cancelled trip	1.038	(0.178)
Worked from home	0.387**	(0.077)
Other risk-reducing measures	1.701	(0.496)
No action above taken	3.816*	(2.110)

Notes: Models controlled for presence of children, household size, dwelling type, urbanicity, and respondent's personal demographic characteristics, including sex, age, education, marital status, and immigrant status. Models were weighted by personal weights and bootstrapped for 1,000 times. COVID-19 = coronavirus virus disease 2019; aOR = adjusted odds ratio; SE = standard error.

<sup>a</sup>  $n = 4,470$ .

\*  $p < 0.05$ ; \*\* $p < 0.001$ .

Source: Authors' calculations based on Canadian Perspectives Survey Series 2.