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Household food insecurity among persons with disabilities in Canada: Findings from the 2021 Canadian Income Survey

by Shikha Gupta, Daphne Fernandes, Nicole Aitken, and Lawson Greenberg

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Correction notice

In the article "**Household food insecurity among persons with disabilities in Canada: Findings from the 2021 Canadian Income Survey**" published on August 21, 2024, Corrections are required to Tables 1 and 3 as well as updates within the text.

The following corrections have been made:

- removing reference to cognitive disabilities in the text,
- updating mental-health related and pain-related and removing 2 rows of data from Table 1 and 3 (data for the grouped physical and cognitive disabilities).
- added a definition of the immigrant population

These changes are made to address the concern that it is unclear that there is a hierarchical relationship for physical and cognitive disabilities.

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ABSTRACT

Background

Income-related food insecurity is an important determinant of health. Persons with disabilities are at a higher risk of experiencing household food insecurity (HFI) than those without disabilities. The main objectives of this study were to estimate the prevalence of HFI for persons with different types, numbers, and severity of disabilities, and to examine sociodemographic correlates of HFI among this group.

Data and methods

Data from the 2021 Canadian Income Survey (CIS) were used. Disability status was assessed using the short version of the Disability Screening Questions module for one randomly selected household respondent. The Household Food Security Survey Module measured HFI as marginal, moderate, or severe. Weighted descriptive and multivariable analyses were conducted to estimate the prevalence of HFI and analyze the association between various socioeconomic factors and HFI among the study sample.

Results

Among CIS participants with disabilities (30% of the total CIS sample: 31 million persons), 26% reported some level of HFI, including 8% with severe HFI. The prevalence of HFI was 13% among those without disabilities. The prevalence of HFI was highest among those with a learning, memory, or seeing disability, at around 36% for each of those types. Levels of HFI were higher for those with more severe disabilities and with a greater number of disabilities. For persons with disabilities, the odds of HFI were two times higher, compared with persons without disabilities (adjusted odds ratio [AOR]: 2.5 [95% confidence interval (CI): 2.2, 2.7]), after adjustment for a range of sociodemographic covariates. Persons with disabilities who were in the lowest income quintile (AOR: 4.0 [95% CI: 3.2, 4.9]) and aged 45 to 54 (AOR: 2.9 [95% CI: 2.1, 4.1]) had the highest odds of HFI, compared with other persons with disabilities living in wealthier households and those aged 65 and older, respectively. Other risk factors included being in a one-parent household, living in the Prairies, and living in a dwelling not owned by the household.

Interpretation

HFI prevalence among CIS participants with disabilities was higher than for persons without disabilities, even after adjustment for well-documented sociodemographic risk factors. Consistent monitoring of HFI among persons with disabilities can help inform any ongoing or newly developed poverty reduction strategies for this population.

Keywords

Food insecurity, Canada, disability, poverty, cross-sectional studies, epidemiology, social determinants of health

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What is already known on this subject?

- Food insecurity is a persistent public health issue and is associated with multiple poor health and social outcomes.
- Persons with disabilities are vulnerable to household food insecurity (HFI).

What does this study add?

- The study estimates HFI prevalence for Canadian Income Survey (CIS) participants with disabilities, by type, number, and severity of disabilities, which has not been examined in a Canadian sample before.
- The study reveals that CIS participants with disabilities have 2.5 times higher odds of HFI than those without disabilities, even after accounting for various sociodemographic factors such as age, sex, marital status, household education, region of residence, and income.

Food insecurity is a persistent public health issue in Canada. It has been defined as an inability to acquire or consume an adequate quality or a sufficient quantity of food, or the uncertainty that one will be able to do so, because of financial constraints.[1] It is a marker of both deprivation and impoverishment and is an important social determinant of health.[2] Household food insecurity (HFI) has been found to be associated with poor self-rated physical and mental health, suicidal thoughts and attempts, high health care service use, and mortality.[3–8] Over 6.9 million individuals in Canada lived in a household that experienced varying degrees of HFI from 2021 to 2022.[9]

Studies have shown that some populations, including persons with disabilities, are at a higher risk of experiencing food insecurity than others. A review of 106 studies conducted across several countries found that disability consistently increased the odds of HFI by 1.18 to 5.21 times, depending on the type of disability.[10] Other studies from the United States and the United Kingdom concluded that every additional disability was linked to higher odds of food insecurity.[11,12] Findings from the 2019 Canadian Income Survey (CIS) indicated that persons with disabilities had significantly higher levels of moderate or severe HFI than the general population (17.5% vs. 10.0% for all persons aged 16 and older).[13] However, this analysis did not measure HFI by type or severity of disabilities.

Globally, persons with disabilities face multidimensional poverty that is measured through income, education, assets, and expenditures.[14] Persons with disabilities have higher economic needs and lower economic resources, compared with persons without disabilities, and often ration their resources on food or medications to manage basic living expenses.[15–17] A study from Canada reported that, in 2015, persons aged 25 to 64 with disabilities were more likely to be living in poverty (14% to 28%, depending on the severity of disabilities) than their peers without disabilities (10%).[18] Another recent study found that families in which a person with a disability was the major income earner were more likely to report food insecurity—30% vs. 18% for all Canadian families.[19]

Despite food insecurity being a pertinent concern for persons with disabilities, little research has been done to examine food insecurity in the context of disability and social determinants in Canada. Previous studies have looked at food insecurity among families of persons with disabilities, often lacking differentiation by disability type or severity. In addition, earlier research lacked a multivariable approach for understanding the relations between various social determinants associated with HFI for persons with disabilities. Therefore, this study draws on data from the 2021 CIS and aims to (1) estimate the prevalence of marginal, moderate, and severe HFI among persons with disabilities; (2) examine variation in levels of HFI for individuals with different types, numbers, and severity of disabilities; and (3) analyze the association between various socioeconomic factors and HFI among persons with disabilities.

Methods

Data source and concepts

The CIS is a cross-sectional annual survey developed to provide a portrait of the income and income sources of Canadians aged 16 and older, with their individual and household characteristics. The CIS is administered to a subsample of Labour Force Survey (LFS) respondents. The LFS is a compulsory survey, and its sample is selected using stratified, multi-stage probability sampling. The CIS is conducted nationwide, excluding persons living on reserves and other Indigenous settlements in the provinces, the institutionalized population, and households in extremely remote areas with very low population density. The 2021 CIS response rate was 70.8%, with a final sample size of about 55,000 households. The 2021

CIS data were collected from January to June 2022 for the 2021 reference year. The CIS covers the territories, but 2022 data for the territories were not yet available at the time of the development of this paper.

The CIS questionnaire is completed by a responsible member of the household for all household members, and then the Disability Screening Questions (DSQ) module is administered to one randomly selected person in the household aged 16 or older. Thus, this study was conducted on a subsample of 2021 CIS respondents for whom the DSQ module was administered. Specific survey weights have been created for disability-specific analysis that render this sample representative of all individuals aged 16 and older in Canada. Detailed information on survey methodology, survey weights, and survey administration can be found on Statistics Canada's Canadian Income Survey (CIS) web page. Note that the 2022 Canadian Survey on Disability (CSD) is considered the official source for estimates on the prevalence of disability. According to the 2022 CSD, 27% of Canadians aged 15 and older had one or more disabilities.

The unit of analysis for this study was the individual. While food insecurity is measured at the household level, the unit of analysis was chosen to be individuals rather than households for two reasons: (1) disability, the main focus of the study, is measured at an individual level, and (2) survey weights created specifically for disability-related analysis can only be used for estimation at the individual level.

The CIS uses the shorter version of the DSQ module to identify persons with one or more of the following disability types: hearing, seeing, mobility, flexibility, dexterity, pain-related, learning, mental-health related, memory, developmental, and unknown disabilities. The DSQ module defines disability based on the social model approach and takes a person's level of functional difficulty and their subjective assessment of the

Table 1
Sample characteristics of Canadian Income Survey respondents with disabilities aged 16 years and older, 2021

Characteristics	Proportions (%)	95% confidence interval from	to
Type of disability			
Seeing	13.8	12.9	14.8
Hearing	13.5	12.7	14.3
Mobility	31.0	29.7	32.3
Flexibility	28.4	27.2	29.7
Dexterity	14.2	13.3	15.1
Pain-related	60.9	59.6	62.3
Learning	15.4	14.3	16.5
Developmental	4.4	3.8	5.1
Memory	10.9	10.0	11.8
Mental-health related	34.4	33.0	35.8
Unknown	4.5	4.0	5.1
Severity of disability			
Mild	50.3	48.8	51.8
Moderate	18.9	17.8	20.1
Severe	15.8	14.8	16.8
Very severe	14.4	13.5	15.3
Number of disabilities			
One	44.5	43.0	46.0
Two or three	34.9	33.5	36.2
More than three	20.6	19.5	21.8
Age group			
16 to 24 years	9.4	8.5	10.2
25 to 34 years	13.2	12.2	14.1
35 to 44 years	13.3	12.5	14.1
45 to 54 years	15.1	14.2	16.0
55 to 64 years	18.0	17.2	18.8
65 years and older	31.1	30.2	32.0
Sex			
Women	54.9	53.8	56.0
Men	45.1	44.0	46.2
Marital status			
Common-law union	10.0	9.2	10.8
Separated or divorced	10.3	9.6	11.0
Widowed	8.2	7.6	8.8
Single (never married)	27.0	25.7	28.2
Married	44.5	43.1	46.0
Immigrant status			
Immigrant	24.6	23.1	26.0
Non-immigrant	75.4	74.0	76.9

Notes: Individuals can have more than one disability type; therefore, proportions for types of disabilities would not add up to 100%. The economic family type is based on the characteristics (age and sex) of the major economic earner and their relationship to other family members (if applicable). Economic family types consist of economic families and persons not in economic families. "Non-senior" families are those where the major income earner is younger than 65 years of age. The "other" category includes persons not in economic families and persons in senior families, where the major income earner is aged 65 years or older.The Prairies consist of the provinces of Manitoba, Saskatchewan, and Alberta. The Atlantic region consists of the provinces of Newfoundland and Labrador, New Brunswick, Prince Edward Island, and Nova Scotia.
Source: Canadian Income Survey, 2021.

Table 1
Sample characteristics of Canadian Income Survey respondents with disabilities aged 16 years and older, 2021 (continue)

Characteristics	Proportions (%)	95% confidence interval from	to
Indigenous person living off reserve			
Yes	3.2	2.8	3.6
No	96.8	96.4	97.2
Highest household education			
Less than high school	17.3	16.3	18.3
High school diploma	26.4	25.2	27.6
Trades or college certificate	30.8	29.5	32.2
University degree	25.5	24.2	26.7
Dwelling tenure			
Not owned	30.8	29.4	32.1
Owned	69.2	67.9	70.6
Dwelling type			
Row or terrace house or duplex	14.2	13.1	15.3
Apartment	22.5	21.2	23.7
Other	4.2	3.6	4.8
Single-detached house	59.2	57.7	60.6
Economic family type			
Non-senior couple with no children or relatives	13.2	12.4	14.0
Non-senior couple with children	19.1	17.8	20.3
One parent	4.5	3.9	5.1
Other	63.2	62.0	64.5
Economic family size			
One person	23.4	22.4	24.5
Two persons	34.3	33.2	35.5
Three persons	16.6	15.5	17.7
Four persons or more	25.6	24.0	27.1
Disposable income quintile			
1 (lowest)	15.5	14.6	16.5
2	18.1	17.0	19.2
3	19.3	18.2	20.4
4	21.4	20.2	22.5
5 (highest)	25.7	24.4	27.0
Labour force status			
Employed	47.3	45.9	48.7
Unemployed	3.9	3.3	4.5
Not in the labour force	48.6	47.3	50.0
Major source of income			
No income	1.4	1.0	1.8
Wages, salaries, or self-employment income	42.1	40.8	43.4
Government transfers	41.5	40.1	42.9
Investment or other income	3.0	2.5	3.4
Private retirement pensions	9.8	9.1	10.4
Sex of major earner in the household			
Female	44.3	42.9	45.8
Male	55.7	54.2	57.1
Urban or rural residence			
Rural area	17.0	15.9	18.1
Population centre	83.0	81.9	84.1
Region			
British Columbia	14.9	14.1	15.7
Prairies	18.0	17.2	18.8
Ontario	40.5	39.2	41.7
Quebec	19.0	18.0	20.1
Atlantic	7.6	7.3	8.0

Notes: Individuals can have more than one disability type; therefore, proportions for types of disabilities would not add up to 100%. The economic family type is based on the characteristics (age and sex) of the major economic earner and their relationship to other family members (if applicable). Economic family types consist of economic families and persons not in economic families. "Non-senior" families are those where the major income earner is younger than 65 years of age. The "other" category includes persons not in economic families and persons in senior families, where the major income earner is aged 65 years or older.The Prairies consist of the provinces of Manitoba, Saskatchewan, and Alberta. The Atlantic region consists of the provinces of Newfoundland and Labrador, New Brunswick, Prince Edward Island, and Nova Scotia.
Source: Canadian Income Survey, 2021.

effect of this difficulty on their daily activities into account.[20] The definition of disability refers to difficulties or limitations that have lasted, or are expected to last, for six months or more.

In this study, "food insecurity" refers to marginal, moderate, or severe food insecurity.[21] The Household Food Security Survey Module (HFSSM) included in the CIS is a validated measure of HFI. It contains 18 questions designed to measure food insecurity resulting from limited financial resources. Questions in the HFSSM refer to a household's experience over the past 12 months.[21] Based on a household's experience, food insecurity is classified into three categories:

- marginal food insecurity: worry about running out of food or limited food selection because of a lack of money for food
- moderate food insecurity: compromise in quality or quantity of food because of a lack of money for food

- severe food insecurity: miss meals; reduce food intake; and, at the most extreme, go a day or more without food.

The independent variables used in the analysis are associated with the randomly selected person in the household for whom the DSQ module was administered. These variables include age, sex, marital status, immigrant status, Indigenous identity, type of household, number of household members, highest household education, income quintile, source of income, labour force status, sex of major income earner in the household, dwelling type, home ownership, provincial region, and urban or rural residence. The selection of independent variables was informed by the literature on HFI determinants in the general population, as well as among those with disabilities.

Indigenous persons are defined as those who reported having a First Nations, Métis or Inuk (Inuit) identity. A pan-Indigenous approach is used in the analysis because of sample size limitations. Results could not be separated for First Nations individuals, Métis and Inuit (Inuk). The Indigenous Peoples Survey is the official source for disability data for First Nations persons living off reserve, Métis and Inuit.

Economic family refers to a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law union, adoption or a foster relationship.

Income quintiles were created based on the adjusted disposable income of the economic family. Disposable income was used because it considers non-discretionary expenses such as medical and child care expenses and annual shelter costs by tenure type adjustment. Disposable income was adjusted for economic family size.

Immigrants refers to people who are, or have been, landed immigrants in Canada. A landed immigrant is a person who has been granted the right to live in Canada permanently by immigration authorities. Canadian citizens by birth and non-permanent residents (persons from another country who live in Canada and have a work or study permit, or are claiming refugee status, as well as family members living here with them) are not landed immigrants.

Disability-related variables include disability status of the respondent, type of disability, severity of disability, and number of disabilities. Severity of disability refers to a ranking based on the presence and severity of distinct types of disabilities related to a health problem or condition that has lasted, or is expected to last, for six months or more. The degree of severity increases with the frequency of the limitation and the level of difficulty. The more types of disability a person reports, the higher the global severity class. Note that the name assigned to each class is intended to facilitate use of severity score and is not label or judgement concerning the person's level of disability.

Statistical analysis

Proportions and 95% confidence intervals (CIs) were estimated to examine levels of HFI among the study population. Non-overlapping CIs were used to make a conservative estimate to identify significant differences. Multivariable logistic regression was used to examine the association of HFI with common sociodemographic risk factors. For the multivariate analyses, marginal, moderate, and severe food insecurity responses were combined to create a binary outcome variable that was coded as "yes" for HFI present and "no" for HFI absent. Two multivariable models were tested. The first included all participants, i.e., those with and without disabilities. The second model examined the sociodemographic correlates of food insecurity among persons with disabilities only. Person-level survey weights and 1,000 bootstrap weights created specifically for disability-related analysis were used to achieve population representativeness and to estimate sampling variance. Any missing data for key variables, including food security status, were imputed using a nearest neighbour approach. All analyses were conducted using SAS version 9.4.

Results

The total weighted sample size for this study was around 31 million, which included 9.3 million persons with disabilities (30% of the total CIS sample) and 21.8 million persons without disabilities. Characteristics of the CIS sample of persons with disabilities are provided in Table 1.

Of the total CIS sample of persons with disabilities, 26.4% lived in a food insecure household, compared with 12.5% of those without disabilities (Table 2). Almost 8% of persons with disabilities reported severe levels of HFI, compared with 2% of persons without disabilities.

Table 2
Proportion of Canadian Income Survey respondents aged 16 years and older reporting experience of household food insecurity by disability status, Canada excluding the territories, 2021

	Persons with disabilities			Persons without disabilities†		
		95% confidence interval			95% confidence interval	
Household food security status	%	from	to	%	from	to
Food secure	73.6 *	72.3	74.9	87.5	86.9	88.2
Food insecure	26.4 *	25.1	27.7	12.5	11.8	13.1
Marginal	6.5 *	5.7	7.2	4.5	4.0	4.9
Moderate	12.2 *	11.1	13.2	6.0	5.5	6.5
Severe	7.8 *	7.0	8.5	2.0	1.7	2.2

† reference category
* significantly different from reference category ($p < 0.05$)
Source: Canadian Income Survey, 2021.

Depending on the type of disability, prevalence of HFI for persons with disabilities ranged from 16% to 36% in 2021 (Table 3). Those with a learning, memory, or seeing disability had the highest prevalence of overall HFI, at around 36% for each of those types. Persons with developmental disabilities had the highest level of severe HFI (20%). There were no differences in the prevalence of marginal HFI between disability severity subgroups, but the prevalence of severe HFI increased as severity of disability increased. The prevalence of HFI for persons with three or more disabilities was almost twice the prevalence of HFI for persons with one disability. The prevalence of severe HFI was 2.8 times greater among persons with three or more disabilities than among those with a single disability (13.6% vs. 4.8%). The prevalence of marginal HFI was similar across persons with different numbers of disabilities.

Table 4 presents the prevalence of marginal, moderate, and severe HFI among persons with disabilities, disaggregated by demographic and socioeconomic characteristics. Certain sociodemographic subgroups with disabilities faced higher levels of severe HFI, including persons younger than 65; those who were separated, divorced, or single; those who were living alone; those receiving government transfers as their main source of income; those identified as Indigenous; those living in the Prairies; those living in a non-owned dwelling or an apartment; those in a one-parent family; those living with lower levels of disposable income; those who were unemployed; and those living in urban population centres. No significant differences were found for HFI between males and females. However, a higher proportion of households where females were the major income earner vs. males experienced marginal (8.2% vs. 5.1%) or moderate (14.3% vs. 10.5%) HFI. Furthermore, a higher proportion of immigrants with disabilities, compared with non-immigrants with disabilities, reported marginal (9.7% vs. 5.4%) or moderate (14.9% vs. 11.3%) HFI, but a lower proportion reported severe HFI (5.0% vs. 8.7%).

Further to descriptive analysis, two multivariate analyses were conducted. The first multivariable model, based on the full analytic sample, revealed that the odds of HFI for persons with disabilities were 2.5 times higher, compared with persons without disabilities, after accounting for all sociodemographic factors under study (Table 5, Model 1). Age, income, labour force status, Indigenous status, highest household education, and source of income were important predictors of HFI among the total population, along with other factors shown in Table 5. However, other covariates, including sex, marital status, immigrant status, sex of major income earner, and urban or rural residence, were no longer significant.

Model 2, which included persons with disabilities only, showed that age and income were the strongest predictors of HFI for this group. Persons with disabilities who were in the lower income quintiles and younger than 65 had higher odds of HFI, compared with those in wealthier households and those aged 65 and older, respectively. Persons with very severe disabilities (adjusted odds ratio [AOR]: 1.8) and more than three disabilities (AOR: 1.7) also had elevated odds of HFI. Other factors associated with HFI for persons with disabilities included economic family type, dwelling ownership, and region of residence. Persons with disabilities in one-parent households (AOR: 2.1) and those living in a dwelling not owned by the household (AOR: 1.8) were significantly more likely to face HFI than non-senior couples living with no children or relatives

Table 3
Proportion of Canadian Income Survey respondents with disabilities aged 16 years and older reporting experience of household food insecurity by type, severity, and number of disabilities, Canada excluding the territories, 2021

	Household food insecurity status											
	Any insecurity			Marginal			Moderate			Severe		
		95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval	
	%	from	to	%	from	to	%	from	to	%	from	to
Type of disability												
Seeing	35.5	27.8	43.1	7.4	5.4	9.3	18.4	14.7	22.0	9.8	7.7	11.8
Hearing	26.0	19.7	32.4	5.7	3.6	7.8	12.4	9.9	15.0	7.9	6.2	9.6
Mobility	30.7	26.2	35.2	7.0	5.8	8.3	13.9	12.1	15.8	9.8	8.4	11.2
Flexibility	31.4	26.6	36.1	7.0	5.7	8.3	14.2	12.3	16.1	10.2	8.6	11.8
Dexterity	32.3	25.9	38.8	6.4	4.6	8.2	15.3	12.6	17.9	10.7	8.7	12.7
Pain-related	29.2	25.8	32.6	7.1	6.1	8.1	13.1	11.8	14.4	9.0	7.9	10.1
Learning	36.3	29.2	43.5	6.0	4.5	7.6	16.6	13.5	19.7	13.7	11.2	16.2
Developmental	34.6	22.6	46.7	2.5	1.1	4.0	12.3	7.4	17.1	19.8	14.1	25.6
Memory	35.9	27.5	44.3	5.2	3.3	7.0	16.9	13.3	20.4	13.9	10.8	16.9
Mental-health related	34.3	29.7	38.8	5.9	4.9	6.8	15.7	13.7	17.6	12.7	11.1	14.3
Unknown	16.7	7.7	25.6	5.0	2.9	7.1	9.0	4.4	13.7	2.6	0.4	4.8
Severity of disability												
Mild†	20.1	17.1	23.2	5.9	4.9	6.9	9.3	8.1	10.5	4.9	4.0	5.8
Moderate	27.9	21.6	34.1	6.9	4.9	8.9	12.8	10.2	15.4	8.2 *	6.5	9.8
Severe	34.5 *	27.6	41.5	6.8	5.2	8.5	17.9 *	14.7	21.1	9.8 *	7.7	12.0
Very severe	37.7 *	30.6	44.7	7.7	5.6	9.7	15.0 *	12.4	17.6	15.0 *	12.6	17.4
Number of disabilities												
One†	20.1	16.6	23.6	6.3	5.1	7.5	9.0	7.6	10.3	4.8	3.9	5.8
Two or three	27.7	23.6	31.8	6.7	5.6	7.8	12.9 *	11.2	14.7	8.1 *	6.8	9.3
More than three	37.8 *	31.5	44.0	6.4	4.9	8.0	17.7 *	15.1	20.3	13.6 *	11.6	15.7

* significantly different from reference category ($p < 0.05$)
† reference category
Note: Individuals can have more than one disability type; therefore, no comparisons between disability types can be made.
Source: Canadian Income Survey, 2021.

and those who owned their dwelling, respectively. Associations for those with disabilities between HFI and other covariates such as marital status, immigrant status, Indigenous status, dwelling type, highest household education, labour force status, main source of income, sex of major income earner, and urban or rural residence were no longer significant when other factors were included in the model.

Discussion

This study aimed to estimate the prevalence of marginal, moderate, and severe HFI among persons with disabilities from the CIS; examine any variation in levels of HFI for individuals with different types, numbers, and severity of disabilities; and analyze the association of various demographic and socioeconomic factors related to HFI among persons with disabilities. Results showed that disability was associated with a higher prevalence—as well as more severe forms—of HFI in Canada. More than one-quarter of persons with disabilities who participated in the CIS lived in households with marginal, moderate, or severe food insecurity. This means that adults or children, or both, in the household of a person with a disability experienced some level of food insecurity because of financial constraints. This can range from worrying about running out of food, skipping or reducing the size of meals, and compromising the quality of food, to going a whole day without food. Estimates from the CIS suggest that HFI rates among persons with disabilities have remained consistently higher than those among the general population. In 2019, 18% of persons with disabilities experienced moderate or severe food insecurity in their household[13] and in 2021, the rate was 20%. By contrast,

Table 4
Proportion of Canadian Income Survey respondents with disabilities aged 16 years and older reporting experience of household food insecurity by selected characteristics, Canada excluding the territories, 2021

	Household food insecurity status											
	Any insecurity			Marginal			Moderate			Severe		
		95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval	
Characteristics	%	from	to	%	from	to	%	from	to	%	from	to
Age group												
16 to 24 years	32.7 *	22.6	42.8	4.7	3.0	6.5	19.0 *	13.6	24.4	9.0 *	6.0	11.9
25 to 34 years	30.8 *	23.6	37.8	5.3	3.6	7.0	13.9 *	11.1	16.6	11.6 *	8.9	14.2
35 to 44 years	32.5 *	25.6	39.5	8.9	6.6	11.2	14.2 *	11.4	17.0	9.4 *	7.5	11.3
45 to 54 years	32.9 *	25.4	40.4	8.6	6.0	11.2	14.1 *	11.3	16.8	10.2 *	8.0	12.4
55 to 64 years	27.2 *	21.6	33.0	5.5	4.1	6.9	12.0 *	9.8	14.2	9.7 *	7.6	11.9
65 years and older†	16.4	13.2	19.6	5.9	4.7	7.1	7.7	6.4	9.0	2.8	2.1	3.5
Sex												
Female	27.3	24.1	30.5	7.0	6.0	7.9	13.0	11.6	14.4	7.3	6.4	8.3
Male†	25.2	21.6	29.0	5.8	4.7	6.9	11.1	9.7	12.6	8.3	7.2	9.5
Marital status												
Common-law union	25.5	18.4	32.6	6.2	4.3	8.1	11.1	8.4	13.9	8.2 *	5.8	10.5
Separated or divorced	34.6 *	28.2	41.2	7.3	5.4	9.3	13.6	11.3	15.9	13.7 *	11.5	16.0
Widowed	20.0	12.5	27.6	6.8	4.7	9.0	8.5	5.6	11.4	4.7	2.2	7.2
Single (never married)	33.9	26.4	39.0	6.0	4.9	7.0	15.9 *	13.6	18.2	12.0 *	8.0	13.7
Married†	21.4	17.6	25.1	6.6	5.3	7.9	10.5	8.9	12.0	4.3	3.4	5.2
Immigrant status												
Immigrant	29.6	23.2	36.0	9.7 *	7.5	12.0	14.9 *	12.3	17.5	5.0 *	3.5	6.5
Non-immigrant†	25.4	22.9	27.8	5.4	4.8	6.0	11.3	10.3	12.3	8.7	7.8	9.5
Indigenous person living off reserve												
Yes	44.4 *	31.9	56.8	5.6	3.2	8.0	17.5	12.9	22.1	21.3 *	15.8	26.7
No†	25.8	24.5	27.1	6.5	5.7	7.2	12.0	10.9	13.0	7.3	6.6	8.1
Labour force status												
Employed†	26.4	22.6	30.1	6.5	5.3	7.6	12.7	11.1	14.3	7.2	6.1	8.2
Unemployed	39.5	26.2	52.8	7.2	4.0	10.4	13.7	9.1	18.3	18.6 *	13.1	24.0
Not in the labour force	25.4	22.1	28.8	6.4	5.5	7.4	11.5	10.2	12.9	7.5	6.5	8.5
Highest household education												
Less than high school	30.8	24.2	37.5	6.8	5.3	8.4	14.4 *	11.7	17.1	9.6 *	7.3	12.0
High school diploma	28.1	23.1	33.1	5.8	4.6	7.0	12.2	10.1	14.3	10.1 *	8.5	11.8
Trades or college certificate	27.1	23.0	31.2	6.8	5.5	8.0	12.7	11.0	14.4	7.6 *	6.4	8.7
University degree†	20.8	20.9	25.4	6.5	4.8	8.3	9.9	8.1	11.7	4.4	8.0	5.4
Dwelling tenure												
Not owned	43.0 *	37.5	48.4	8.9 *	7.2	10.5	18.8 *	16.7	20.9	15.3 *	13.6	17.0
Owned†	19.0	16.5	21.6	5.4	4.7	6.1	9.2	8.1	10.3	4.4	3.7	5.2
Dwelling type												
Row or terrace house or duplex	32.3 *	24.6	40.0	7.5	5.4	9.6	15.0 *	11.8	18.2	9.8 *	7.3	12.2
Apartment	37.1 *	31.3	42.9	8.6 *	6.6	10.5	16.3 *	14.1	18.6	12.2 *	10.5	13.9
Other	29.6	19.9	39.8	4.9	3.0	6.7	13.2	8.8	17.5	11.5 *	8.0	15.5
Single-detached house†	20.7	17.8	23.6	5.5	4.7	6.3	9.8	8.6	11.0	5.4	4.5	6.2

* significantly different from reference category ($p < 0.05$)

† reference category

s data rounded to zero

Notes: The economic family type is based on the characteristics (age and sex) of the major economic earner and their relationship to other family members (if applicable). Economic family types consist of economic families and persons not in economic families. "Non-senior" families are those where the major income earner is younger than 65 years of age. The "other" category includes persons not in economic families and persons in senior families, where the major income earner is aged 65 years or older. The Prairies consist of the provinces of Manitoba, Saskatchewan, and Alberta. The Atlantic region consists of the provinces of Newfoundland and Labrador, New Brunswick, Prince Edward Island, and Nova Scotia.

Source: Canadian Income Survey, 2021.

Table 4

Proportion of Canadian Income Survey respondents with disabilities aged 16 years and older reporting experience of household food insecurity by selected characteristics, Canada excluding the territories, 2021 (continue)

	Household food insecurity status											
	Any insecurity			Marginal			Moderate			Severe		
		95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval	
Characteristics	%	from	to	%	from	to	%	from	to	%	from	to
Economic family type												
Non-senior couple with no children or relatives†	21.1	15.6	26.5	5.0	3.5	6.4	9.8	7.6	12.1	6.3	4.5	8.1
Non-senior couple with children	27.8	21.4	34.3	7.7	5.4	10.1	14.9 *	12.2	17.6	5.2	3.8	6.6
One parent	53.0 *	38.7	67.3	10.1 *	6.7	13.6	28.2 *	21.3	35.1	14.7 *	10.7	18.7
Other	25.2	22.9	28.1	6.1	5.3	6.9	10.7	9.6	11.8	8.4	8.0	9.4
Economic family size												
One person	32.7	28.8	36.7	6.7	5.7	7.7	12.4	11.0	13.8	13.6 *	12.0	15.2
Two persons	20.2 *	17.1	23.3	5.7	4.8	6.7	9.3 *	8.1	10.6	5.2	4.2	6.1
Three persons	26.2	19.8	32.6	5.8	4.2	7.4	13.8	10.8	16.7	6.6	4.8	8.4
Four persons or more†	29.1	25.5	35.8	7.7	5.5	9.9	14.7	11.9	17.5	6.7	8.0	8.5
Disposable income quintile												
1 (lowest)	48.7 *	42.0	55.6	9.8 *	7.9	11.7	20.8 *	18.2	23.5	18.1 *	15.9	20.4
2	34.4 *	28.6	40.3	7.1 *	5.7	8.5	16.8 *	14.2	19.4	10.5 *	8.6	12.4
3	26.7 *	21.1	32.2	6.8 *	5.3	8.3	12.3 *	10.0	14.6	7.6 *	5.8	9.3
4	21.0 *	20.6	26.6	7.1 *	5.0	9.1	9.9 *	7.6	12.2	4.0	8.0	5.4
5 (highest)†	11.7	7.6	15.6	3.3	2.0	4.5	5.5	3.9	7.0	2.9	1.7	4.1
Major source of income												
No income	32.4	8.4	57.1	11.4	3.1	19.6	15.8	5.3	26.4	5.2	0.0 s	11.1
Wages, salaries, or self-employment income	24.9 *	21.3	28.3	5.9	5.0	6.9	11.8 *	10.3	13.4	7.2 *	6.0	8.4
Government transfers	32.9 *	28.7	37.1	8.0 *	6.6	9.3	14.6 *	13.0	16.3	10.3 *	9.1	11.5
Investment or other income	8.6	2.4	14.9	2.2	0.0	4.5	4.3	2.2	6.4	2.1	0.2	4.0
Private retirement pensions†	10.2	5.6	14.7	3.8	1.9	5.7	4.0	2.7	5.3	2.4	1.0	3.7
Sex of major earner in the household												
Female	30.3	26.5	34.0	8.2 *	7.0	9.4	14.3 *	12.7	15.8	7.8	6.8	8.7
Male†	23.4	20.1	26.5	5.1	4.3	5.9	10.5	9.2	11.7	7.8	6.7	8.9
Urban or rural residence												
Rural area	21.0	17.0	25.0	5.0 *	4.0	5.9	10.8	9.0	12.7	5.2 *	4.0	6.4
Population centre†	27.5	24.7	30.4	6.8	5.9	7.6	12.4	11.3	13.6	8.3	7.4	9.2
Region												
British Columbia	23.1	17.6	28.6	5.7	3.9	7.5	11.3	9.0	13.6	6.1	4.8	7.4
Prairies	28.9	23.8	34.1	5.9	4.6	7.2	11.9	10.0	13.9	11.1 *	9.2	13.0
Ontario†	27.0	22.6	31.4	6.5	5.3	7.7	12.7	10.9	14.6	7.8	6.5	9.1
Quebec	23.3	21.7	28.8	7.0	4.9	9.0	10.7	8.7	12.6	5.6	8.0	7.2
Atlantic	31.6	26.9	36.4	7.8	6.5	9.2	15.0	13.0	16.9	8.8	7.4	10.3

* significantly different from reference category ($p < 0.05$)

† reference category

s data rounded to zero

Notes: The economic family type is based on the characteristics (age and sex) of the major economic earner and their relationship to other family members (if applicable). Economic family types consist of economic families and persons not in economic families. "Non-senior" families are those where the major income earner is younger than 65 years of age. The "other" category includes persons not in economic families and persons in senior families, where the major income earner is aged 65 years or older. The Prairies consist of the provinces of Manitoba, Saskatchewan, and Alberta. The Atlantic region consists of the provinces of Newfoundland and Labrador, New Brunswick, Prince Edward Island, and Nova Scotia.

Source: Canadian Income Survey, 2021.

the rate of moderate or severe HFI among the general population in Canada was 10.8% in 2019 and 12.9% in 2021.[22]

The findings from this study are consistent with those of studies from other countries that explored HFI among persons with disabilities. A study using a representative survey of adults aged 16 and older in the United Kingdom found that adults with disabilities had a two to seven times higher risk of facing HFI, compared with those without disabilities.[12] In the United States, 33% of households with a member not in the labour force because of a disability were food insecure in 2018.[23] Another study, using the European Quality of Life Survey of adults living in private households in 35 European countries, found that the prevalence of food insecurity among respondents with disabilities was 16.4%, compared with 8.1% of persons without disabilities in 2007.[24] Note that HFI estimates cannot be directly compared across studies because of differences in time frame, sample size, and definition and measurement of food insecurity and disability.

This study also found that persons with certain disability types, including a learning, memory, developmental, or seeing disability, had the highest HFI levels. These findings align with previous research. For example, Brucker and Nord (2016) found that adults with intellectual and developmental disabilities had significantly higher levels of food insecurity than adults without disabilities, even when controlling for poverty.[25] Heflin and colleagues found that cognitive limitation in managing money was related to an increased likelihood of food insecurity.[26] A recent systematic review has also found a bidirectional relationship between food insecurity and poorer cognitive and executive functioning, as well as depression.[26,27] One study concluded that adults with a seeing disability experienced lower labour force participation than the general population.[28] In another study, trouble seeing was related to an increased likelihood of food insecurity for working-age individuals.[26]

Table 5

Adjusted odds ratios (95% confidence intervals) relating demographic and socioeconomic characteristics to food insecurity among all Canadian Income Survey respondents and those with disabilities aged 16 years and older, Canada excluding the territories, 2021

	Model 1: All persons			Model 2: Persons with disabilities only		
		95% confidence interval			95% confidence interval	
Characteristics	Adjusted odds ratio	from	to	Adjusted odds ratio	from	to
Disability status						
Yes	2.5 *	2.2	2.7	...	...	...
No†	1.0	...	...	...	...	...
Severity of disability						
Mild†	...	...	...	1.0	...	...
Moderate	...	...	...	1.3 *	1.1	1.6
Severe	...	...	...	1.6 *	1.2	2.0
Very severe	...	...	...	1.8 *	1.3	2.5
Unknown severity	...	...	...	0.8	0.3	2.0
Number of disabilities						
One†	...	...	...	1.0	...	...
Two or three	...	...	...	1.2	1.0	1.5
More than three	...	...	...	1.7 *	1.3	2.3
Age group						
16 to 24 years	2.5 *	1.8	3.4	2.7 *	1.6	4.3
25 to 34 years	2.4 *	1.9	3.1	2.6 *	1.8	3.8
35 to 44 years	2.5 *	2.0	3.2	2.4 *	1.6	3.5
45 to 54 years	2.5 *	2.0	3.1	2.9 *	2.1	4.1
55 to 64 years	2.1 *	1.7	2.5	2.1 *	1.6	2.8
65 years and older†	1.0	...	...	1.0	...	...
Indigenous person living off reserve						
Yes	1.4 *	1.1	1.7	1.4	1.0	1.8
No†	1.0	...	...	1.0	...	...
Labour force status						
Unemployed	1.5 *	1.1	1.9	1.1	0.8	1.7
Not in the labour force	0.9	0.8	1.1	0.9	0.7	1.1
Employed†	1.0	...	...	1.0	...	...
Highest household education						
Less than high school	1.5 *	1.3	1.8	1.4	1.0	1.8
High school diploma	1.3 *	1.2	1.6	1.2	1.0	1.5
Trades or college certificate	1.3 *	1.1	1.5	1.2	1.0	1.5
University degree†	1.0	...	...	1.0	1.0	1.0
Dwelling tenure						
Not owned	1.5 *	1.3	1.7	1.8 *	1.5	2.2
Owned†	1.0	...	...	1.0	...	...
Dwelling type						
Row or terrace house or duplex	1.3 *	1.1	1.5	1.2	0.9	1.5
Apartment	1.2	1.0	1.4	1.2	0.9	1.5
Other	1.1	0.9	1.5	1.0	0.7	1.5
Single-detached house†	1.0	...	...	1.0	...	...
Economic family type						
Non-senior couple with no children or relatives†	1.0	...	...	1.0	...	...
Non-senior couple with children	1.2	0.9	1.5	1.1	0.7	1.6
One parent	1.7 *	1.2	2.2	2.1 *	1.3	3.2
Other	1.1	0.9	1.3	1.1	0.8	1.5
Economic family size						
One person	0.8 *	0.6	1.0	0.8	0.6	1.2
Two persons	0.7 *	0.6	0.9	0.6 *	0.5	0.9
Three persons	0.8 *	0.7	1.0	0.8	0.6	1.1
Four persons or more†	1.0	...	...	1.0	...	...
Disposable income quintile						
1 (lowest)	4.0 *	3.2	4.9	4.0 *	3.2	6.1
2	3.0 *	2.4	3.6	2.5 *	1.9	3.7
3	2.3 *	1.8	2.8	2.1 *	1.6	3.0
4	1.7 *	1.4	2.1	1.5 *	1.1	2.2
5 (highest)†	1.0	...	...	1.0	...	...
Main source of income						
No income	1.1	0.6	1.8	1.0	0.4	2.6
Wages, salaries, or self-employment income	1.3	1.0	1.7	1.2	0.8	1.7
Government transfers	1.8 *	1.4	2.2	1.4	1.0	1.9
Investment or other income	0.7	0.4	1.1	0.5	0.3	0.8
Private retirement pensions†	1.0	...	...	1.0	...	...
Region						
British Columbia	0.9	0.8	1.1	0.9	0.7	1.2
Prairies	1.2 *	1.1	1.4	1.2	1.0	1.4
Quebec	0.6 *	0.5	0.7	0.7 *	0.5	0.9
Atlantic	1.3 *	1.2	1.5	1.4 *	1.2	1.7
Ontario†	1.0	...	...	1.0	...	...

... not applicable

* significantly different from reference category ($p < 0.05$)

† reference category

Notes: Food insecurity refers to marginal, moderate, or severe food insecurity. The binary outcome variable was coded as "yes" for household food insecurity (HFI) present and "no" for HFI absent. Factors that were not significantly associated with HFI after multivariable adjustment for both models 1 and 2 are not shown in this table.

Source: Canadian Income Survey, 2021.

This study further revealed that lower income among those with disabilities does increase the risk of HFI. However, even after accounting for income, employment, education, and other demographic characteristics, adults with disabilities had a significantly higher risk of food insecurity than those without disabilities. This finding suggests that there could be other pathways through which disability affects food insecurity, independent of income. For example, persons with disabilities often incur higher health care costs, which can strain their budget and leave insufficient funds for food expenses. Mobility challenges can hinder their ability to access grocery stores and community resources, exacerbating food insecurity.[29,30] Some persons with disabilities require specialized diets or have specific nutritional needs, which can be expensive and harder to fulfill, especially when affordable, accessible, and appropriate food options are limited. In addition, those with disabilities may be less likely to have a social network that can provide assistance during times of need.[31] All these factors have been found strongly associated with food insecurity in previous research.[10,32]

Results from the multivariable analysis also showed that, while labour force status, highest household education, and source of income were important predictors of HFI among the total population, these factors did not reach statistical significance in Model 2. These results support other research, which has found that the income of employed persons with disabilities falls short of that of persons without disabilities who are employed. A study by She and Livermore (2007) using national survey data from the United States showed that the incomes of those with disabilities needed to be at least three times higher to reduce the prevalence of hardship to the level of others with incomes at the poverty level.[33] Furthermore, many persons with disabilities who are employed often work part time and may earn minimum wage. As per a recent Canadian study, persons with disabilities were less likely to work full time and more likely to work part time, compared with persons without disabilities. In addition, full-time workers with disabilities earned less, on average, than their counterparts without disabilities.[34]

Another relevant finding from this study was that Indigenous individuals living off reserve were significantly more likely to experience HFI than other individuals. Previous national studies have shown that the prevalence of HFI is significantly higher among First Nations individuals, Métis, and Inuit living in urban areas.[35–37] Higher food costs in Indigenous communities, barriers to traditional foods, climate change, and contamination fears have impeded access to nutritional foods and contributed to food insecurity.[36] Also, the legacy of colonialism has contributed to the social and economic deprivation of Indigenous persons, manifesting in food insecurity.[38]

The findings from this study have several implications for future research. Given the exploratory and cross-sectional nature of this research, future research should use a distinction-based approach to explore the intersections between disability; HFI; and other social, structural, and cultural determinants of health. Consistent monitoring of HFI among persons with disabilities may inform the development, assessment, or improvement of social programs across jurisdictions. For example, the Canada Disability Benefit is currently being revised.

Study limitations

This study has some limitations that should be considered while interpreting the findings. Within the CIS, the DSQ module is administered for one randomly selected person of the household. Therefore, it cannot be determined whether the household had another member with a disability. Because of the sampling approach used to administer the DSQ module within the CIS, individuals who were chosen to participate overrepresented one-person households. These households had lower income and lower employment rates. However, disability-specific weights were created in the file to account for this limitation. In addition, the reported HFI rates were similar between the individuals who were randomly selected to participate in the DSQ module and those who did not get selected. The 2021 CIS data for the territories were not yet available at the time this paper was developed. The analysis is based on cross-sectional data, and any changes with time or any causal inferences cannot be determined. The CIS does not include any questions about gender identity and sexual orientation, so it was not possible to examine their relationship with food insecurity among persons with disabilities. Lastly, multiple levels of disaggregated analysis were not possible, especially for different racialized and Indigenous groups with disabilities. To overcome this limitation, the authors considered pooling multiple years of data; however, the CIS cycles prior to the 2020 reference year did not include detailed disability variables.

Conclusion

Reducing food insecurity is identified as a key indicator to measure the effectiveness of Canada's first poverty reduction strategy and is also part of the Sustainable Development Goals and Canada's Quality of Life Framework. This study estimated that more than 26% of persons with disabilities aged 16 and older who participated in the 2021 CIS were living in a food insecure household (marginal, moderate, or severe). Among persons with disabilities, those who were younger than 65, had lower income, and had more severe disabilities or multiple disabilities reported particularly high levels of HFI. Consistently monitoring HFI among persons with disabilities can help inform any ongoing or newly developed poverty reduction strategies implemented for this population.

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