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MEASURING POVERTY WITH A MATERIAL DEPRIVATION INDEX (MDI): AN UPDATED INDEX FOR CANADA

Geranda Notten, Graduate School of Public and International Affairs, University of Ottawa

Sofia Seer, Food Banks Canada

Michael Mendelson, Maytree Fellow

Richard Matern, Food Banks Canada

Andrew Parkin, Environics Institute

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Abstract

Households' circumstances can differ greatly from one another because of factors such as debt and assets, disability, availability of family support, housing situation, and many other variables. An income measure of poverty—for example, Canada's Market Basket Measure (MBM)—cannot account for these multiple circumstances, even when adjusted for a few factors such as local cost of living and rental costs. An income measure of poverty can assess only a limited number of *inputs* into a household's standard of living. Consequently, an income-based measure of poverty may not adequately reflect the real-life standard of living of many households and therefore may not be able to accurately assess the extent of poverty in Canada.

A material deprivation index (MDI), in contrast, assesses a household's standard of living according to whether it has and can afford the goods, services, and activities that a household with a minimally acceptable standard of living in Canada would be expected to have or use. An MDI is an assessment of *outcomes* and may act as a useful complement when measuring the extent of poverty by income. This study develops an MDI by drawing on best practices in international literature, reflecting decades of use of MDIs in Europe and elsewhere. It then uses this MDI to evaluate poverty in Canada.

The data used in this study are based on a 2023 survey that included questions about a series of factual situations, such as whether a respondent's household can afford to eat meat, chicken, fish, or a vegetarian equivalent every other day. The MDI reflects the percentage of respondents who cannot afford at least a threshold number of items. This study derives a threshold of two items by comparing deprivation to other variables associated with a poverty-level standard of living.

The findings in this study are that approximately one in four Canadians aged 18 and older cannot afford two or more items that most people view as necessary to achieve an acceptable (i.e., above poverty-level) standard of living in Canada. Correlates with poverty, measured as material deprivation, include challenges in paying for housing and debts, a shorter duration of living in one's dwelling, a younger age, lower health outcomes and lower overall well-being, higher stress levels, being a caregiver, and having a recent experience of unemployment and/or more precarious employment. Furthermore, material deprivation rates are higher among respondents with pessimistic attitudes about the future and their own agency, and those less trusting of others.

Keywords: Poverty, material deprivation, food insecurity, economic hardship, low income

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List of Abbreviations

BOM	Bristol Optimal Method
CCHS	Canadian Community Health Survey
CIS	Canadian Income Survey
ICC	Item Characteristic Curves
IRT	Item Response Theory
LIM	Low-Income Measure
MBM	Market Basket Measure
MDI	Material Deprivation Index
USDA	United States Department of Agriculture

1. Introduction

This report contains an evaluation of the current extent of poverty in Canada assessed by a material deprivation index (MDI). An MDI assesses a household's standard of living according to the goods, services, and activities it has, participates in or uses, and can afford.

Most assessments of poverty are based on setting an income level below which a household is said to be in poverty, but income is an *input* into a household's standard of living; it is not the same as a standard of living. Households may have many different kinds and amounts of inputs beyond their reported income and can have widely differing needs. A household may attain a *higher* standard of living than its reported income would suggest if, for example, it can access financial or in-kind resources from family, it has assets, it has other unreported income, or it has access to subsidized goods and services, thus reducing its out-of-pocket spending. Conversely, a household's standard of living may be *lower* than indicated for the "average" household with a similar income if, for example, it has higher expenses because of debt, or extra expenses because of disability, health-related needs, caregiving needs, or above-average housing costs. Dozens of factors can affect a household's standard of living either positively or negatively beyond its reported income.

Many of these factors and their impacts have been discussed in the scholarly literature on poverty. For example, Brandolini et al. (2010) and Rothwell and Robson (2018) discuss savings and access to credit; Paulus et al. (2010) and Hajizadeh and Edmonds (2019) discuss access to non-monetary resources, such as subsidized goods and services; and Kalil and Ryan (2010) identify social networks that may supplement income or reduce the need for spending. In terms of factors that increase the likelihood of poverty for a given level of income, She and Livermore (2007) note that chronic illness or disability often necessitates higher levels of spending, and Pressman and Scott (2009) note that debt payments eat into a household's income. In addition, generating income from employment can result in considerable expenses that may not be entirely accounted for by an income-based poverty measure, such as childcare and transport (Allen & Farber, 2019; Beaujot et al., 2013).

An alternative to using an income-based poverty measure is to look at *outcomes* rather than inputs—that is, the goods, services, and activities that a household has and uses or participates in. This is what an MDI does. Material deprivation can reflect households' unique and highly diverse circumstances (Notten & Kaplan, 2021). Income-based poverty measures, however, can account for only some of the differences between households (Corak, 2018; Council on Aging of Ottawa, 2018).

An income-based poverty indicator can only reflect a household's unique circumstances if the information it collects includes the specific circumstances in which that specific household's needs or resources differ from those of the average household and then incorporates that information into its assessment of the household's standard of living. Given practical limitations and the myriad substantive differences among households, only a few of the most important characteristics can be reflected—for example, renting versus owning housing—while other differences, such as debt and non-financial assistance from family, must be ignored. Also, the core of an income-based poverty measure is an accurate estimate of households' actual income,

but it is well established that household income is often underestimated because, for example, households do not respond to questions about certain items or they underreport their income (Brzozowski & Crossley, 2011).

However, outcome-based poverty indicators are also far from perfect. Outcome-based poverty measurement requires surveys, and the accuracy of any survey depends on many factors, not least survey response rates. For example, psychological and social considerations such as shame may lead to systemic underreporting of deprivation (Breunig & McKibbin, 2011; Guio, 2009). The ideal approach may therefore be to use an MDI in tandem with income-based measures so that the two methodologies function as complementary ways to better understand and measure poverty.

In this report, an MDI based on best practices as established in a large body of international research is developed. The data for this study come from two online surveys (referred to as the Phase One and Phase Two surveys), interviews, and focus groups and were collected between October 2022 and May 2023. The Phase One survey, conducted in October 2022, asked respondents what items would be indicative of an acceptable standard of living in Canada. Their responses provided the data required to develop a list of deprivation items for the Phase Two survey. The Phase Two survey, conducted in April and May 2023, provided estimates of the extent of material deprivation in Canada by asking respondents which items on the list they did not have, or do, because they could not afford them (as opposed to a personal preference not to acquire, or do, those items).

The Phase Two survey coincided with the immediate post-pandemic period and the impact of inflation on the purchasing power of Canadians. Both surveys were conducted online and weighted against the 2021 census, which has the best population data available. However, the rapid growth of the Canadian population over the last few years may mean that the weighting does not accurately reflect the actual population at the time of the survey. Furthermore, because the data were collected online, the sample may be biased toward respondents who are digitally connected and/or are proficient in English or French.

Our study is unique in several respects:

- It identifies the list of deprivation items to be included in the index empirically, by asking Canadians for their opinions in the Phase One survey.
- The Phase Two survey includes information about other known indicators of living standards including income (before taxes), food insecurity (six-item scale), economic hardship, and perceived income adequacy. We were able to use this information to develop a robust material deprivation scale and analysis of the relationship between material deprivation and other indicators of living standards.
- This study provides a first-time glimpse of the relationship between material deprivation on the one hand and housing, health and overall well-being, caregiving and employment, and perceptions and attitudes about one's life and trust in others in Canada on the other.

The results of the Phase Two survey showed that one in four respondents could not afford two or more items that most Canadians view as reflective of an acceptable standard of living in Canada.

This indicates a much higher level of material deprivation than that revealed by similar research based on 2013 data (Notten & Kaplan, 2021). It is also substantially higher than the poverty rate according to the Market Basket Measure (MBM), Canada's official income-based poverty measure, which measured a poverty rate of 7.4 per cent in 2021.[1] The Phase Two survey additionally showed that poverty, measured as material deprivation, is associated with a person's individual circumstances, such as having difficulty paying for housing and debt, living in the same place for a shorter time and being younger, having lower health outcomes and overall well-being, having higher stress levels, being a caregiver, and having a recent experience of unemployment and/or more precarious employment. Furthermore, it showed that respondents experiencing higher material deprivation rates had more pessimistic attitudes about the future and their agency and were less trusting of others.

In this paper, we first review the literature on material deprivation and poverty measurement (section 2), then discuss the process of data collection and provide descriptive statistics (section 3). In section 4 we present the criteria to which a material deprivation scale should adhere and report the results on how our scale performs according to these criteria. This analysis yields a scale consisting of 11 deprivation items. In section 5 we look at the two empirical methods we employed to identify the optimal threshold separating the population that is categorized as materially deprived from the population that is not materially deprived. We used this analysis to select a deprivation threshold of two items. In section 6 we use the MDI we developed to present estimates of the level of material deprivation in Canada, its correlates, its overlap with other measures of material well-being, and its relationship with respondents' circumstances and their attitudes and perceptions. In section 7 we present our conclusions.

[1] Statistics Canada. Table 11-10-0135-01. Table 11-10-0135-01. Low income statistics by age, sex and economic family type https://doi.org/10.25318/1110013501-eng. Accessed November 30, 2023.

2. Measuring Poverty by Measuring Deprivation

Almost all poverty statistics in North America use income-based measures of poverty, but this is not standard practice elsewhere in the world. For example, in much of Europe, a material deprivation index (MDI) is used alongside income to measure poverty. Extensive research in several countries over the past several decades has shown that there is only a modest association between income measures of poverty and outcome-based indicators of poverty, such as material deprivation. Most of this research has concluded that both types of measures should be used to provide the most accurate understanding of poverty (Alkire et al., 2015; Bossert et al., 2013; Fusco et al., 2011; Nolan & Whelan, 2010; Notten & Kaplan, 2021; Saunders & Brown, 2020).

The Low-Income Measure (LIM) is an income-based poverty measure that arbitrarily denotes 50 per cent of median after-tax income, adjusted for household size, as a poverty line. Owing to its convenience, the LIM is often used for international comparisons of poverty. However, it has many self-evident shortcomings, most notably the issue of whether an income above the median income necessarily, or even usually, allows a household to have an above-poverty-level standard of living. Equally pertinent is the issue of whether an income below 50 per cent of the median income necessarily implies a below-poverty-level standard of living. There is no reason to suppose that the answer to these two questions is positive for all, or even most, households. Even for international comparisons, the LIM falls short since, for example, it does not consider differences between countries in government services such as health care and education.

In Canada, the Market Basket Measure (MBM) is a less arbitrary income-based poverty measure that has been adopted as the official poverty line by the federal and provincial governments. The MBM is an amount of income equal to the cost of purchasing the goods, services, and activities considered necessary for a modest but acceptable standard of living for a reference household. Beyond household size, the MBM includes a limited number of variables such as rental versus home ownership (with or without a mortgage), community cost of living, market rental costs, and so on. The judgment about what goods, services, and activities constitute an acceptable standard of living is a normative one and is made by Statistics Canada after broad consultation with stakeholders (Djidel et al., 2020).

A material deprivation measure of poverty also requires normative judgment. Several goods, services, and activities must be identified as indicators of an acceptable standard of living for most Canadians. These items are not life-or-death necessities but rather items that would separate households with a poverty-level standard of living from those with an acceptable standard of living. For example, a person who cannot afford to buy adequate food a few times a month will survive, but a person who cannot afford sufficient nutrition over many months will develop malnutrition.

If by "basic necessity" we mean a "life-or-death" requirement, an inability to buy adequate food a few times per month would not represent the lack of a "basic necessity," since life will continue despite this level of deprivation. This is not to diminish in any way the importance of the latter circumstance. The point is that when they are defined as necessities for the continuation of life, "basic necessities" cannot be the measure of an acceptable standard of living in a country as wealthy as Canada. Being unable to afford food a few times a month is indicative of a

poverty-level standard of living in Canada, even though it is not a life-or-death situation. Consequently, a deprivation index should not consist of items that are *basic necessities*. Instead, it should consist of items that are necessary for an *acceptable standard of living* in Canada.

In establishing an MDI, the objective is to identify a number of observable items that in combination constitute a way of measuring deprivation that reflects the overall standard of living in Canada (Berthoud & Bryan, 2011; Heisz & Langevin, 2009). As noted, in our research, the selection of items was based on responses to the Phase One survey in which respondents evaluated a longer list of items in terms of their necessity for an acceptable standard of living. A material deprivation measure of poverty must specify a deprivation threshold—that is, a number of items that a household does not have or cannot access—below which a household will be considered to be living in poverty (Alkire & Foster, 2011; Guio et al., 2016). We used several techniques to establish the number and type of items and the threshold, which we discuss in detail in this paper. (Note that although the standard terminology is "material deprivation," "material" is used in its broadest sense: the deprivation index includes goods, services, and activities.)

3. Data Collection

We collected the quantitative data for this study from two surveys, referred to as the Phase One and Phase Two surveys, administered online.

In the Phase One survey, we asked Canadians about 19 goods and services they would expect to find in a household with a decent standard of living in Canada. This allowed us to identify which items most Canadians felt a household with an acceptable standard of living would ordinarily have, be able to undertake or be able to participate in. We then conducted several focus group discussions and interviews with the survey respondents, which gave us a deeper understanding of the reasoning behind the survey responses. We used these quantitative and qualitative insights to reduce the list to 14 items and to improve the wording of the items.

In the Phase Two survey, we asked respondents which of the items on the amended list they had or participated in. For any items they did not have or participate in, we asked if that was because they could not afford them (as opposed to being a personal preference).

Throughout the survey development and data analysis process we consulted several times with the project's advisory committee. This committee consisted of people with a range of expertise in areas such as social policy, national well-being statistics, food insecurity, Indigenous policy, and lived experience. The committee members, listed alphabetically and accompanied by their professional affiliation, were Mike Creek (Working for Change), Ginger Gosnell-Myers (Fellow, Simon Fraser University, Morris J. Wosk Centre for Dialogue), Andrew Heisz (Statistics Canada), Julie Kaplan (Statistics Canada), Garima Talwar Kapoor (Maytree Foundation), and Merryn Maynard (Maple Leaf Centre for Action for Food Security).

3.1 Phase One Survey

The Phase One survey was conducted online by Elemental DCI between October 22 and October 31, 2022, and had 2,000 respondents.[2] The sample was designed to be broadly representative of the Canadian population aged 18 and older in terms of factors such as age and gender.[3] In addition, regional quotas that oversampled smaller provinces were established. All calculations involved the use of a weighted sample that aligned the surveyed respondents to Canada's 2021 census population by age, gender, province, and educational attainment. (See Appendix A for the questions in the Phase One survey.)[4]

The core of the Phase One survey was a list of 19 household items.[5] We constructed this list after reviewing previous material deprivation surveys in Canada and countries with comparable living

[2] Elemental DCI uses the Canadian panel of Dynata. Panel participants gain points by doing surveys, and they can then use the points to get cash or prizes. Respondents to our surveys all received the same incentive.
[3] Both surveys started with a set of screening questions (age, gender, province, etc.), and for each characteristic there was a maximum quota. Once a quota was reached, the survey ended for a respondent who indicated having that characteristic.
[4] Appendix A and other appendices referred to in this report are online available in a separate document.
[5] The list also included an additional six child-specific deprivation items. The child-specific items will be analyzed in a separate paper focusing on child deprivation.

standards[6] and research using Canadian micro-data for material deprivation research (Notten, 2015; Notten & Kaplan, 2021; Notten et al., 2017). We added the 19th item — "the ability to participate in special events that are important to people from their own ethnic, cultural or religious group, several times a year" — following the first consultation with our advisory committee. We included this item because participation in such events may be especially important for some groups (e.g., Indigenous people, recent immigrants) and they may experience financial or other barriers to participation.

Our goal was to use the results of the Phase One survey and discussions from subsequent focus groups and interviews to select 10–15 household deprivation items for the Phase Two survey. The methodology we used to construct a deprivation index requires a range, but not a complete listing, of items indicative of a decent standard of living (Guio et al., 2016; see also section 4).

In the Phase One survey, respondents were asked the following question about each of the 19 items:

In order for someone to have a decent standard of living in Canada, how necessary do you think it is that they have each of the following items? Please indicate if you think this item is:

- *Absolutely necessary, no one should have to do without it*
- *Necessary*
- *Desirable but not necessary*
- *Not at all necessary*
- *Cannot say*

In addition to the 19 items, the survey also included questions about sociodemographic information, food insecurity, economic hardship (including the use of charities for assistance), disability, and overall well-being. These questions helped us assess how representative our sample was compared to samples used in other surveys conducted by the Environics Institute and Food Banks Canada. It also enabled us to assess whether there were systematic differences in responses to the deprivation items according to respondent characteristics. Table 1 contains selected characteristics of the respondents in the sample.

[6] We would like to thank Dave Gordon (University of Bristol) for sharing his two lists containing the questions used for household and child deprivation items used in many surveys from many jurisdictions across the world.

Table 1. Respondents' characteristics (%)

	Characteristics	Phase One survey (%)	Phase Two survey (%)	2021 census weight targets (%)
Region (0-A3)	Atlantic	7	7	6.5
	Quebec	23	23	23.1
	Ontario	38	38	38.6
	Manitoba and Saskatchewan	7	7	6.7
	Alberta	11	11	11.6
	British Columbia	14	14	13.6
Age (0-A2)	18–29	15	16	18.2
	30–44	31	30	25.0
	45–59	23	26	24.6
	60+	31	29	32.2
Gender (0-A1)	Male	49	48	48.8
	Female	51	51	51.2
Education (4-D2)	Trades/some PSE, HS, or less	47	48	48.3
	College	23	23	23.2
	University	30	29	28.6
Household type (0-A7 & 4-D12)	Couples with children	30	27	28.5
	Couples no children	37	39	28.8
	Singles parents	11	8	9.8
	Single no children	22	27	33.0
Racial identity (4-D5)	White	82	73	70.2
	Racialized	19	27	25.5
Indigenous (0-A4a)	Yes	5	5	4.4
Current Home (4-D11)	Owned by member of household	68	71	71.8
	Rented	32	29	28.2
In Canada (4-D3)	1st generation	17	29	29.8
	2nd generation	18	15	14.8
	3rd generation plus	65	55	55.3

	Characteristics	Phase One survey (%)	Phase Two survey (%)	2021 census weight targets (%)
Disability (4-D6)	Always/often limits	14	12	N/A
	Occasionally limits	22	24	
	No	65	64	
Well-being index[7] (1-5)	Score of 3 or less	9	7	N/A
	Just above 3 to 6	28	40	
	Just above 6 to 8	41	34	
	Above 8	23	20	
Household income (4-D8)	Less than $30K	18	17	N/A
	$30–$60K	26	25	
	$60–100K	29	32	
	$100K plus	27	27	
Income adequacy (4-D10)	Good enough	34	36	N/A
	Just enough	37	38	
	Stretched/hard time	29	27	
Employment status (4-D1)	Employed	60	61	N/A
	Unemployed	3	5	
	Not in labour force	39	35	

Source: Phase One survey (N=2,000), Phase Two survey (N=4,625), and 2021 census.
Note: Respondents answering "Cannot say" were coded as missing. The percentage of missing values varies by variable and is under 5 per cent for most variables, with larger percentages for racial identify (Phase Two survey: 12.5 per cent), household type (Phase One survey: 10 per cent), household income (Phase Two survey: 7 per cent). Due to rounding, categories may not add up to 100. Grey shaded cells indicate which characteristics of the 2021 census population are targeted for constructing the survey weights. Survey results are weighted. The codes in parentheses under respondents' characteristics refer to the section and questions in the Phase One survey (see Appendix A). Children included family members under age 19.

3.2 Focus Groups and Interviews

After a preliminary analysis of the Phase One survey, we connected with 30 respondents from that survey to ask them to participate in focus groups and interviews. They represented a sub-sample of the respondents who had indicated they were willing to participate in a follow-up focus group or interview and had responded "yes" to question 13 of the Phase One survey, thus signalling that they were at risk of food insecurity.[8]

[7] The well-being index is based on respondents' average score for seven well-being items listed in question 5 of the Phase One survey (scale 0–10).
[8] Q13: In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money to buy food?

We divided this group into those who had responded "often" or "sometimes" to question 14B of the Phase One survey and those who had responded otherwise. The aim was to include both participants who were likely to turn to a charity organization (such as a food bank or a thrift store) because they were short of money and those who were not to see if their experiences of material deprivation were distinct. Only five respondents fell into the latter category, and they were interviewed individually.

Of the thirty participants in the sub-sample, eleven participated in two focus group discussions on February 9, 2023 (one focus group consisted of eight participants and the other focus group, three), and four participated in interviews held on February 13–14, 2023. Seven of these participants were female and eight were male.[9] Respondents were paid $100 each as compensation for their participation in the focus groups or interviews.

The aim of the focus group discussions and interviews was to help us better understand the reasoning behind the responses provided in the survey, and to assess whether certain items were seen as more necessary than others and whether the survey questions could be better phrased. We were particularly interested in understanding the reasoning of people who likely had lived experience in making hard choices because of insufficient financial resources. This was because cross-tabulations of the percentage of Phase One survey respondents who identified an item as "necessary" or "absolutely necessary" regularly showed that respondents with high-poverty-risk characteristics were more likely to respond in this way, suggesting a difference in views compared to the average view in the sample. Comments from the focus group discussions and the interview responses supported this observation.

Appendix B contains the open-ended questions and prompts used in the focus group discussions and interviews and qualitative summary notes. The questions focused on two types of items:

- Items that were seemingly similar to one another (e.g., questions about clothing).
- Items that were identified as "necessary" and "absolutely necessary" by around 50 per cent, or less, of the general population, and by close to 50 per cent or more of those with characteristics associated with a higher risk of living in poverty.

The focus group discussions and interviews informed us that the phrasing of some deprivation items needed to be revised (e.g., to address a lack of clarity and/or relevance; see Appendix D). They also provided valuable input into which items were debated, which seemingly similar deprivation items were easier or more difficult to obtain in another way if there was not enough money to purchase them, and the consequences of not being able to afford certain items. This formed part of the information we used to select the shorter list of deprivation items for the Phase Two survey (see Appendix D).

3.3 Phase Two Survey

The Phase Two survey was conducted online by Elemental DCI between April 18 and May 17, 2023, and had 4,625 respondents. The sample was designed to be broadly representative of the Canadian population aged 18 and older by factors such as age and gender. However, this survey

[9] One focus group consisted of four female and four male participants; the other consisted of three male participants. One male and three female participants were interviewed.

had quotas by region that overrepresented smaller provinces, and, unlike the Phase One survey, oversampled the following groups: single parents, adults between the ages of 25 and 64 living in one-person households, and people identifying as Indigenous, Black, or South Asian. These groups were oversampled because they are often at higher risk of poverty and oversampling increases the accuracy of estimates about smaller population groups. Unless otherwise mentioned, all calculations involved the use of a weight variable that was adjusted for age, gender, province, educational attainment, immigration background, racial and Indigenous identity, household type, and home ownership. (See Appendix C for the Phase Two survey questions.)

The questions in this survey concerned 14 household deprivation items. Respondents were asked whether they had, used or participated in each item (yes/no/cannot say).[10] Those who responded "no" were then asked whether this was "because you cannot afford it, or for some other reason?" Respondents who selected "because you cannot afford it" were considered deprived for that item. Respondents answered the deprivation questions in randomized order.

This Phase Two survey also collected information about sociodemographic characteristics and respondents' well-being and, in considerably more detail than the Phase One survey, information about their employment situation, food insecurity (six-item scale), economic hardship, income, debt, housing, health, and caregiving responsibilities. This information enabled us to create a profile of those experiencing material deprivation and to study the association between material deprivation and related phenomena such as low income, food insecurity, economic hardship, housing costs, etc. (see section 6). The information about respondents' material circumstances also plays a key role in the validity and additivity tests of the deprivation indicators (see section 4) and as additional variables in the methodology to find the optimal deprivation threshold range (see section 5). Table 1 (above) describes selected characteristics of respondents in the Phase Two sample.

Table 2 contains keywords that describe the deprivation items included in the Phase One and Two surveys. Appendix D contains more detail about the methodology we used to select items for the Phase Two survey and where we made changes to the wording used to describe items compared to that used in the Phase One survey.

[10] For the household items, the first question referred to "you," "everyone in your household," and "every adult in your household," according to what seemed most appropriate (for example, "you" if it was a single person household).

Table 2. Household deprivation items in the Phase One and Phase Two surveys

Phase One survey		Phase Two survey
1	Shoes	Shoes
2	Bills on time	Bills on time
3	Comfortable temperature	Comfortable temperature
4	Regular dental treatment	**Regular dental care**
5	Electrical goods	Electrical goods
6	Getting around	Getting around
7	Meat / fish / vegetarian	Meat / fish / vegetarian
8	Unexpected expense	Unexpected expense
9	Appropriate clothes	Appropriate clothes
10	Reliable Internet	Reliable Internet
11	Money on self	Money on self
12	Furniture	Furniture
13	Special events	**Celebrations / occasions**
14	Small gifts	Small gifts
15	Winter coat	Not included in Phase Two survey
16	Medicines	Not included in Phase Two survey
17	Fruit / vegetables	Not included in Phase Two survey
18	Mobile phone	Not included in Phase Two survey
19	Friends / family	Not included in Phase Two survey

Notes: Items printed in bold were described in different terms than they were in the Phase One survey.

3.3.1 Material deprivation

Table 3 lists the 14 material deprivation items, the survey questions, and the incidence of deprivation for each item. The footwear, Internet, and transportation items have deprivation rates of between 2 and 4 per cent. The meat, clothes, bills, temperature, gifts, and occasions or celebrations items have deprivation rates of between 6 and 10 per cent. The dental care, furniture, electrical, and spending money items have deprivation rates of around 18 per cent, and the unexpected expense item has a deprivation rate of 21.7 per cent. This broad range of deprivation rates is consistent with figures in other data sets. It is a desirable feature because such variation means the degree or severity of material deprivation can be measured in addition to the prevalence of deprivation (see section 4.3).

Table 3. Material deprivation items in the Phase Two survey and incidence rates

Item	Question(s)	% of respondents who cannot afford item, standard error in brackets	Number of records
Meat	Are you/is everyone in your household able to eat meat or fish or a vegetarian equivalent at least every other day?	6.7 (0.37)	4,525
Clothes	Do you/does everyone in your household have appropriate clothes to wear for special occasions, such as a job interview, wedding, or funeral?	10.1 (0.45)	4,448
Footwear	Do you/does everyone in your household have at least one pair of properly fitting shoes and at least one pair of winter boots?	3.7 (0.29)	4,555
Dental care	Are you/is everyone in your household able to get regular dental care, including teeth-cleaning and fillings, at least once a year?	18.1 (0.58)	4,421
Temperature	Are you able to keep your house or apartment at a comfortable temperature all year round?	7.2 (0.4)	4,519
Furniture	If any of your furniture got damaged or broken, would you be able to repair or replace it?	18.9 (0.59)	4,177
Electrical	If any of the electrical goods in your household broke, would you be able to repair or replace it?	18.8 (0.61)	4,212
Internet	Do you have a reliable Internet connection at home?	2.1 (0.23)	4,562
Transportation	Are you/is everyone in your household able to get around your community whenever you/they need to?	3.6 (0.27)	4,518
Spending money	If you wanted to, could you spend a small amount of money each week on yourself?	18.6 (0.59)	4,405

Unexpected expense	If you had an unexpected expense today of $500, could you cover this from your own resources?	21.7 (0.64)	4,381
Bills	Are you currently able to pay your bills on time?	8.8 (0.44)	4,481
Gifts	Are you able to buy some small gifts for family or friends at least once a year?	8 .0 (0.41)	4,502
Special occasions	Are you able to participate in celebrations or other occasions that are important to people from your social, ethnic, cultural, or religious group?	7.9 (0.41)	4,255

Source: Phase Two survey, calculations by authors.
Notes: Percentages calculated from weighted counts of respondents. Standard errors are in parentheses and are calculated using 1,000 replicate bootstrap weights.

While the item deprivation rates from our study are not strictly comparable to those of the 2013 Canadian Survey of Economic Well-Being (the last available rates for Canada) because of differences in the survey instruments used, it does appear that deprivation levels in 2023 are considerably higher than they were in 2013. The item "unexpected expense," for example, has a deprivation rate of 21.7 per cent in 2023 and 16.5 per cent in 2013. This question was the same in both surveys. Moreover, this same item has also been included by Statistics Canada in the Canadian Social Survey on Quality of Life and Cost of Living, where it registered 26 per cent in the fall of 2022.[11]

Table 4 shows the incidence of the total number of deprivations experienced by respondents, ranging from none to all 14 items. Six out of ten Canadians do not experience any of these deprivation items, while four of ten Canadians experience at least one. One out of those four experiences only a single deprivation item. The remaining approximately 30 per cent of Canadians experience two or more deprivation items. A little more than one fifth of Canadians experience an even larger number of deprivation items (three or more). Respondents missing information on all material deprivation items were excluded from the sample.

[11] Statistics Canada. (2023, February 13). One in four Canadians are unable to cover an unexpected expense of $500. *The Daily*. https://www150.statcan.gc.ca/n1/daily-quotidien/230213/dq230213b-eng.htm, accessed 18 August 2023.

Table 4. Incidence and cumulative total number of deprivation items

Number of deprivation items	% of respondents with number of deprivation items, standard error in brackets	Cumulative total number of deprivation items (% of respondents)
0	60.14 (0.71)	100
1	10.75 (0.46)	39.86
2	6.76 (0.36)	29.11
3	5.70 (0.36)	22.35
4	4.30 (0.31)	16.65
5	3.98 (0.28)	12.35
6	2.17 (0.23)	8.37
7	1.78 (0.20)	6.20
8	1.41 (0.19)	4.42
9	0.95 (0.15)	3.01
10	1.04 (0.14)	2.06
11	0.53 (0.11)	1.02
12	0.10 (0.08)	0.49
13	0.32 (0.08)	0.39
14	0.06 (0.05)	0.06

Source: Phase Two survey, calculations by authors. Number of records is 4,614.
Notes: Standard errors calculated using 1,000 replicate bootstrap weights. Proportions calculated from weighted counts of respondents.

3.3.2 Food insecurity (six-item module)

To measure food insecurity, we used the six-item module developed by the Economic Research Service of the United States Department of Agriculture (USDA) (Economic Research Service, 2012).[12] This is a short form of the eighteen-item module that is also used in Canada and has very similar wording (Office of Nutrition Policy and Promotion, 2007). A key difference is that the questions in the six-item module focus on adults in the household, whereas the eighteen-item module also has eight child-focused questions. Another important difference is that the six-item module has one less question indicative of marginal food insecurity (worrying about running out of food before getting money to buy more) and excludes the two adult-oriented questions that determine the severest food insecurity (losing weight and not eating for a whole day). For these reasons, our food-insecurity estimates are not fully comparable to those in the Canadian Income Survey (CIS) or the Canadian Community Health Survey (CCHS).

[12] Statistics Canada used the six-item module to measure food insecurity during the COVID-19 pandemic. See Food insecurity during the COVID-19 pandemic, May 2020 [Archived content]. https://www150.statcan.gc.ca/n1/pub/45-28-0001/2020001/article/00039-eng.htm. Accessed March 1, 2023.

Table 5 shows the incidence of responses to food-insecurity items. About one in every three respondents experienced running out of food (36.1%) or not being able to afford balanced meals (35.9%). Table 6 shows that the total number of affirmative responses to the food-insecurity questions declines gradually from zero (54%) to five (5.3%) items, but it is 10.6% for six food-insecurity items.

Table 5. Food-insecurity questions (six-item module) and incidence of food insecurity

Question	Responses indicating hardship	% of respondents experiencing food insecurity, standard error in parentheses	Number of records
The food that I/we bought just didn't last, and I/we didn't have money to get more. —Was that often, sometimes, or never true for you/your household in the last 12 months?	"Sometimes" or "often"	36.1 (0.72)	4,546
I/we couldn't afford to eat balanced meals. —Was that often, sometimes, or never true for you/your household in the last 12 months?	"Sometimes" or "often"	35.2 (0.75)	4,519
In the last 12 months, since last April, did you/you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?	"Yes"	23.2 (0.64)	4,472
How often did this happen? —Almost every month, some months but not every month, or in only 1 or 2 months?	"Almost every month" or "some months but not every month"	82.7 (1.13)	995
In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?	"Yes"	25.9 (0.68)	4,483
In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for food?	"Yes"	18.7 (0.65)	4,481

Source: Phase Two survey, calculations by authors.
Notes: Proportions calculated from weighted counts of respondents. Sample excludes respondents with missing information for all food-insecurity questions. The fourth question was only asked to respondents who replied "Yes" to the third question.

Table 6. Total incidence of food insecurity and cumulative total number of food-insecurity items

Number of food-insecurity items	% of respondents	Cumulative total number of items (% of respondents)
0	54.0	100
1	11.4	46.0
2	8.9	34.7
3	4.6	30.1
4	5.3	24.8
5	5.3	19.5
6	10.6	8.9

Source: Phase Two survey, calculations by authors. Number of records is 4,598.
Notes: Proportions calculated from weighted counts of respondents. Sample excludes respondents with missing information for all food-insecurity questions. The fourth question was only asked to respondents who replied "Yes" to the third question.

Table 7 shows that there is a rather strong relationship between food insecurity and material deprivation. Whereas 44.4 per cent of respondents report zero problems with both food insecurity and material deprivation, 30.5 per cent report one or more items for both, as indicated by the dark shaded border in Table 7. About 25 per cent of the respondents report at least one item of food insecurity but no items of material deprivation, and vice versa. Among this 25 percent, 15.7 per cent report one or more food-insecurity items but no material deprivation (light grey horizontal border) and 9.3 per cent report one or more deprivation items but no food insecurity (light grey vertical border). For this research we mainly use a binary indicator of food insecurity, counting respondents with two or more affirmative responses as food-insecure and those reporting zero or one as food-secure, which yields a food-insecurity rate of 34.8 per cent (see Table 8). This also reflects the USDA threshold definition of food-insecure (Economic Research Service, 2012).

Table 7. Incidence of the total number of deprivation items by incidence of the total number of food-insecurity items (% of respondents)

Number of material deprivation items	Number of food-insecurity items							
	0	1	2	3	4	5	6	Total
0	44.4	6.2	3.5	1.2	1.3	0.8	2.7	60.2
1	4.6	1.9	1.5	0.9	0.5	0.7	0.5	10.6
2	2.1	1.2	1.0	0.6	0.7	0.7	0.5	6.8
3	1.1	1.0	1.1	0.7	0.4	0.8	0.7	5.7
4	0.6	0.5	0.7	0.3	0.7	0.7	0.8	4.3
5	0.6	0.3	0.6	0.3	0.8	0.5	0.9	4.0
6 to 10	0.3	0.3	0.6	0.5	0.8	1.1	3.8	7.4
11 to 14	0.0	0.0	0.0	0.0	0.1	0.0	0.8	1.0
Total	53.7	11.5	9.0	4.6	5.3	5.4	10.7	100.0

Source: Phase Two survey, calculations by authors. Number of records is 4,597.
Notes: Respondents missing information on all food-insecurity items or all material deprivation items were excluded from the sample. Total percentages may not add up to 100 due to rounding. Respondents with 6–14 material deprivation items were grouped for data quality. Note that for each number of food-insecurity items, the proportions generally continue to decline with the number of material deprivation items from 6 items to 14.

Table 8. Binary variables and incidence rates

	%	Total number of records
Food-insecure	34.8 (0.71)	4,598
Economic hardship	36.7 (0.75)	4,590
Income is below LIM	16.5 (0.62)	3,873
Income is inadequate	25.9 (0.64)	4,473

Source: Phase Two survey, calculations by authors.
Notes: Standard errors are in parentheses. Standard errors calculated using 1,000 replicate bootstrap weights.

3.3.3 Income before taxes

The income reported in our survey is annual household income before taxes as provided by the respondents. It therefore does not reflect after-tax income, which is used for most income-based poverty lines. The figures are also likely an underestimate of gross income because it is easy to forget incidental income or to lack exact knowledge about the income of every household member. Low-income estimates based on our data are therefore less reliable than those provided by Statistics Canada's CIS (see Table 8, above).[13] However, these limitations are not a major concern given this research's primary focus on material deprivation.

[13] This number is nonetheless very comparable to the estimate reported by Notten, Charest, and Heisz (2017, p. 34, n. 17) from the 2013 Canadian Survey of Economic Well-being (CSEW) (see

Income and material deprivation are inversely related. Figure 1 shows a near linear relationship between the number of deprivations experienced and the median income of households at each level of deprivation. Similarly, the average number of deprivations gradually declines for higher income quintiles, reaching 0.42 deprivations for the richest respondents (see Table 9). Likewise, the share of those experiencing zero deprivations rises gradually by income quintile. Respondents from the lowest income quintile represented 21.8 per cent of respondents and those in the fifth — that is, the highest — income quintile represented 19.9 per cent of respondents. Among the respondents in the lowest quintile, 6.8 per cent experienced zero deprivations, compared to 14.3 per cent of respondents in the fifth quintile. Notten, Charest and Heisz (2017, p. 15, Table 6) find a similar relation using similar income and material deprivation concepts.

https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5206), a survey that had the same limitations regarding the income information collected, which the authors were able to verify with the Canadian Income Survey data from the same reference year. By construction, LIM poverty measures do not change much over time.

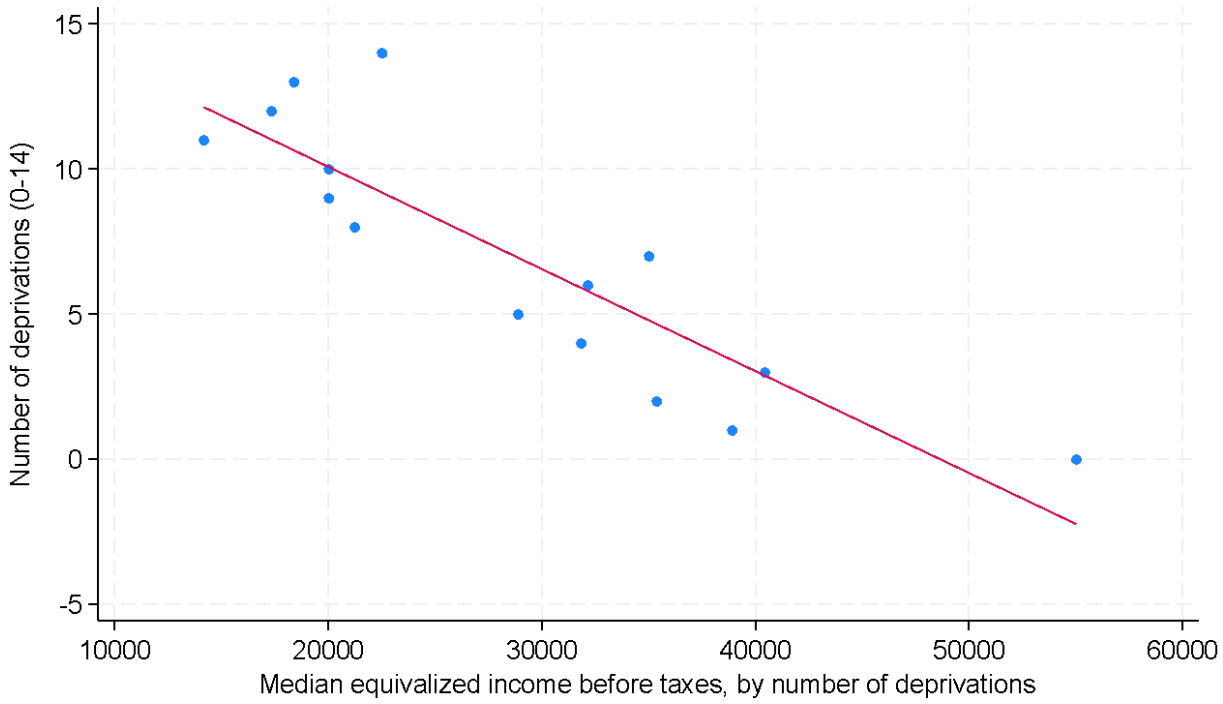

Figure 1. Median household income per deprivation level

Source: Phase Two survey, calculations by authors.
Note: Each dot represents the median income for a specific number of deprivations. There are 15 dots, varying from the median income at zero deprivations (about $55,000) to the median income at 14 deprivations (about $23,000). We take the median because the average is sensitive to outliers with high(er) incomes in smaller groups.

Table 9. Number of deprivation items by quintile

Number of deprivation items	% of respondents in quintiles					
	First quintile	Second quintile	Third quintile	Fourth quintile	Fifth quintile	All quintiles
0	6.8	9.6	12.7	14.3	16.9	60.3
1	3.2	2.7	2.0	1.8	1.3	11.0
2	2.1	1.7	1.1	1.0	0.6	6.5
3	1.9	1.0	1.3	1.3	0.4	5.8
4	1.5	1.4	0.4	0.6	0.2	4.2
5	1.7	1.0	0.8	0.2	0.0	3.7
6 to 10	3.7	1.6	0.9	0.7	0.5	7.4
11 to 14	0.8	0.3	0.0	0.0	0.0	1.2
Average Number of deprivation items	3.08 (0.112)	1.77 (0.097)	1.04 (0.076)	0.84 (0.062)	0.42 (0.047)	1.46 (0.041)

Source: Phase Two survey, calculations by authors. Number of records is 3,877.
Notes: Standard errors are in parentheses. Standard errors calculated using 1,000 replicate bootstrap weights. Proportions calculated from weighted counts of respondents. Respondents missing information on all material deprivation items were excluded from the sample. Percentages may not add up to 100 due to rounding. Adjusted household income was calculated by dividing total household income by the square root of the household size and then assigning this value to each member of the household.

3.3.4 Economic hardship

Table 10 lists questions in the form of three strategies for dealing with hardship and the incidence rates for each one: asking for financial help from friends or relatives (24.7%), turning to a charity (18.1%), and borrowing or selling possessions (26.9%). These incidence rates are much higher than comparable incidence rates in 2013 (i.e., responses to similar questions), suggesting a deterioration in living standards (Notten et al., 2017, p. 16, Table 7).

Table 10. Economic hardship questions and incidence

Question	Responses indicating hardship	% population with hardship, standard error in brackets	Total number of records
Did you ever ask for financial help from friends or relatives for day-to-day expenses because you were short of money?	"Sometimes" or "often"	24.7 (0.66)	4,554
Did you ever have to turn to a charity organization because you were short of money?	"Sometimes" or "often"	18.1 (0.57)	4,547
Did you ever borrow money or sell something you owned because you were short of money for day-to-day expenses?	"Sometimes" or "often"	26.9 (0.69)	4,561

Source: Phase Two survey, calculations by authors.
Notes: Standard errors calculated using 1,000 replicate bootstrap weights. Proportions calculated from weighted counts of respondents. Each question was preceded by "In the past 12 months (. . .)". Sample excludes respondents with missing information for all economic hardship questions.

Table 11 illustrates the positive relationship between economic hardship and material deprivation. Whereas 49.3 per cent of survey respondents reported neither deprivation nor economic hardship, 25.8 per cent reported both, as indicated by the dark grey border. Furthermore, 10.7 per cent used economic hardship strategies without experiencing any deprivation (light grey horizontal border) and 14 per cent experienced some level of material deprivation without reporting economic hardship (light grey vertical border). In the remainder of this paper, we use the economic hardship information in the form of a binary variable, indicating a respondent as experiencing economic hardship when they answer affirmatively to one or more of these strategies (see Table 8, above).

Table 11. Incidence of the total number of deprivation items by incidence of the total number of economic hardship indicators (% of respondents)

Number of material deprivation items	Number of economic hardship indicators				
	0	1	2	3	Total
0	49.3	4.8	2.2	3.7	60.0
1	5.8	2.8	1.3	0.9	10.8
2	2.6	1.6	1.7	0.8	6.8
3	2.0	1.0	2.0	0.6	5.7
4	1.4	1.2	1.1	0.6	4.3
5	0.9	0.9	1.4	0.8	4.0
6–10	1.2	1.7	2.3	2.2	7.4
11–14	0.1	0.2	0.3	0.4	1.0
Total	63.3	14.3	12.4	10.0	100.0

Source: Phase Two survey, calculations by authors. Number of records is 4,587.
Notes: Standard errors are in parentheses. Standard errors calculated using 1,000 replicate bootstrap weights. Proportions calculated from weighted counts of respondents. Respondents missing information on all material deprivation items or all economic hardship items were excluded from the sample. Total percentages may not add up due to rounding. Respondents with 6–14 material deprivation items were grouped for data quality. Note that for each number of economic hardship items, the proportions generally continue to decline with the number of material deprivation items from 6 items to 14.

3.3.5 Income adequacy

The measure for income adequacy is based on a subjective survey question that asked respondents to assess their household income (see Table 12). About three in four respondents answered that their income is good enough (35.8%) or just enough (37.5%); 18.9 per cent stated they are stretched and 7.8 per cent that they are having a hard time. Among those reporting that their income is not enough, four out of five also reported one or more deprivations (see Table 13, dark grey borders). Of those respondents who stated that their income is good enough, two in three were not experiencing any deprivations (white borders). And while 4.7% of respondents said they were not experiencing any deprivation despite reporting that their income is not enough (light gray horizontal border), 18 per cent of respondents stated that their income is enough but reported some level of material deprivation (light gray vertical border). In section 5 we define income adequacy. We group those who said their income is not enough and are stretched with those who said their income is not enough and are having a hard time; combined, they account for 25.9 per cent of respondents (see Table 8, above).

Table 12. Income inadequacy and incidence

Which of the following best describes your total household income at the present time?	%
Good enough for you and you can save from it	35.8 (0.69)
Just enough for you, so that you do not have major problems	37.5 (0.72)
Not enough for you and you are stretched	18.9 (0.57)
Not enough for you and you are having a hard time	7.8 (0.40)
Total number of records	4,473

Source: Phase Two survey, calculations by authors.
Notes: Standard errors are in parentheses. Standard errors calculated using 1,000 replicate bootstrap weights. Proportions calculated from weighted counts of respondents.

Table 13. Incidence of the total number of deprivation items by incidence of income adequacy (% of respondents)

Number of material deprivation items	Income adequacy				
	Good enough for you and you can save from it	Just enough for you, so that you do not have major problems	Not enough for you and you are stretched	Not enough for you and you are having a hard time	Total
0	32.0	23.2	4.1	0.6	59.9
1	1.9	5.9	2.5	0.5	10.8
2	1.1	2.8	2.4	0.5	6.8
3	0.3	2.3	2.6	0.6	5.8
4	0.3	1.6	1.8	0.5	4.2
5	0.1	1.1	2.1	0.8	4.0
6 to 10	0.0	0.6	3.4	3.4	7.5
11 to 14	0.0	0.0	0.2	0.8	1.0
Total	35.8	37.4	18.9	7.9	100.0

Source: Phase Two survey, calculations by authors. Total number of records 4,470.
Notes: Standard errors are in parentheses. Standard errors calculated using 1,000 replicate bootstrap weights. Proportions calculated from weighted counts of respondents. Respondents missing information on all material deprivation items were excluded from the sample. Total percentages may not add up due to rounding. Respondents with 6–14 material deprivation items were grouped for data quality.

4. Constructing the Deprivation Index[14]

Following the methodology of Guio et al. (2016), we used four criteria to determine which items to include in the deprivation index: suitability, validity, reliability, and additivity. The suitability criterion states that an item should be considered reflective of an acceptable standard of living by a large part of the (Canadian) population. The validity criterion states that an item should be sufficiently strongly related to other known aspects associated with a poverty-level standard of living such as food insecurity, economic hardship, or low income. The reliability criterion requires that each deprivation item and the material deprivation scale relate to a single underlying (latent) concept. The additivity criterion requires that people who are experiencing more deprivation items should, on average, be worse off than people who are experiencing fewer deprivations.

4.1 Suitability

As a criterion, suitability ensures that index items reflect a sufficiently broad consensus that the item is a necessary component of a minimum acceptable living standard in Canadian society. Collecting data on items seen as necessary to a minimum acceptable living standard was the main purpose of the Phase One survey. The second column in Table 14 shows the percentage of respondents in the overall survey who viewed an item as necessary or very necessary for people to have an acceptable standard of living in Canada today. The percentages vary from very high agreement (about 90%) for items such as a winter coat and the ability to pay bills on time to between 40 and 50 per cent for items such as the ability to participate in events, buy small gifts, or have family or friends over.

An often used threshold value for the suitability test is whether more than 50 per cent of the population deems an item as (very) necessary (Guio et al., 2016). According to this threshold, the three items rated by less than 50 per cent of respondents as (very) necessary would fail that test. However, a deeper analysis of the quantitative data and the information gathered from the focus group discussions and interviews suggests that people who are more likely to experience poverty are also more likely to rate some items as necessary or absolutely necessary than people who are less likely to experience poverty.[15] Table 14 lists the views of four such groups. In many cases, the rates are 5 to 10 percentage points higher than for the overall group and are over 50 per cent. Of particular interest is the item "participation in special events," which is seen as necessary by 70 per cent of Indigenous respondents compared to 46 per cent of respondents overall.[16] Because these higher necessity rates likely reflect an experience-informed view, our assessment places a higher value on the responses of people who are more likely to experience poverty. On this ground we conclude that most items unarguably pass the suitability test, while three items pass

[14] The text in section 4 is adapted from section 4 in "Material deprivation in Canada" (Notten et al., 2017), which describes the construction of an MDI using the 2013 Canadian Survey of Economic Well-being (CSEW).
[15] In a similar vein, we find that households with children and young adults are more likely to view child deprivation items as (very) necessary than households with only (older) adults, and that younger respondents are more likely than older respondents to view Internet access and mobile phones as necessary (results not provided here).
[16] A reminder that the phrasing of this item changed between the Phase One and Two surveys (see Appendix D).

because often more than 50 per cent of respondents with a high poverty risk deem them necessities.[17]

[17] The full table of cross-tabulations is available on request (Table: X1_SUM2. SUMMARY TABLE: Absolutely necessary + Necessary (Top 2), starting at row 2425).

Table 14. Respondents assessing items as "absolutely necessary" or "necessary" (%) in Phase One survey

Item	Total sample	Income < $30K	Recent immigrants	Racialized	Indigenous
A winter coat, good enough to keep someone warm and dry, for each member of the family/household	93	94	92	91	84
At least one pair of properly fitting shoes, and at least one a pair of winter boots, for each member of the family	92	93	87	90	80
The ability to pay their bills on time	89	89	85	87	80
The ability to keep their house or apartment at a comfortable temperature	89	90	88	86	80
All medicines prescribed by their doctor	88	88	87	84	75
Regular dental treatment, including teeth-cleaning and fillings	82	84	72	79	74
Able to replace or repair broken electrical goods (such as a refrigerator or washing machine)	82	84	83	78	71
The ability to get around their community, either by having a car or by taking the bus or equivalent mode of transportation	82	83	76	81	77
Fresh fruit or vegetables every day	81	83	84	83	71
Meat or fish or vegetarian equivalent every other day	78	79	80	77	73
The ability to cover an unexpected expense today of $500 from their own savings account	72	78	86	74	69

Item	Total sample	Income < $30K	Recent immigrants	Racialized	Indigenous
Appropriate clothes to wear for special occasions, such as a job interview or a wedding or funeral	63	73	70	66	67
Reliable Internet connection at home	61	65	72	69	59
A small amount of money to spend on themselves	56	65	71	62	64
A mobile phone (with a basic talk and text plan)	53	63	75	66	67
Being able to replace broken or damaged furniture	52	60	65	54	62
The ability to participate in special events that are important to people from their own ethnic, cultural, or religious group, several times a year	46	51	62	54	70
The ability to buy some small gifts for family or friends at least once a year	43	55	50	46	57
The ability to have friends or family round for a meal or drink at least once a month	40	50	55	48	53
Sample size	2,000	331	89	391	102

Source: Phase One survey, calculations by Elemental.
Note: Ranked in order of the percentage of respondents assessing the item as "absolutely necessary" or "necessary." Respondents answering "cannot say," which accounts for 1–3 per cent of the sample per item, are included in the base of the calculations

4.2 Validity

The validity tests assess whether each deprivation item exhibits a statistically significant relationship with independent variables known to be associated with poverty (Guio et al., 2016). We tested this by running a series of binary logistic regressions, using the deprivation item as a dependent variable and (sequentially) one of three independent variables known to be correlated with material deprivation. We used the following validity indicators:

- Food insecurity is measured with at least one affirmative response to the six-item module. The questions address different levels of food insecurity, varying from "food not lasting and having no money to get more" to "experiencing hunger because there was not enough money for food." The only Canadian survey concurrently measuring both food insecurity and material hardship finds evidence of a relationship between the two (Loopstra & Tarasuk, 2013).
- Low-income status is measured by the Low-Income Measure before tax (LIM-BT). Low income is regularly, though not necessarily, a cause of material deprivation. Of the commonly used low-income indicators in Canada, the LIM threshold is generally highest (50% of median income before taxes); it is also the only one we can calculate with these data. However, previous research using Ontario data indicated that the statistical relationship between material deprivation and different low-income indicators is very similar, which suggests that the choice of low-income indicator is unlikely to influence the outcome of the test (Notten, 2015).
- Economic hardship as measured with one or more positive answers to three questions asking the respondent whether they: 1) asked for financial help from friends or relatives to meet day-to-day expenses; 2) had to turn to a charity organization (such as a food bank or thrift store); or 3) borrowed money or sold something they owned because they were short of money. Previous research on material deprivation in Canada documents a strong relationship between economic hardship and material deprivation (Notten & Kaplan, 2022; Notten, Geranda & Kaplan, 2021).

All the deprivation items pass these tests of validity (see Table 15). All coefficients in the 42 regressions are statistically significant at a 1 per cent level. The associations for the food-insecurity variables are stronger than those for the economic hardship and LIM variable (higher odds ratios).

Table 15. Binary logistic regressions between deprivation items and three validation variables

Deprivation item	Variable associated with poverty	Odds ratio
Meat	Household Food Security Status	36.9
	Below LIM	5.6
	Economic hardship	7.6
Appropriate clothes	Household Food Security Status	9.7
	Below LIM	5.0
	Economic hardship	6.6
Shoes	Household Food Security Status	26.8
	Below LIM	5.1
	Economic hardship	10.7
Dental care	Household Food Security Status	5.1
	Below LIM	4.4
	Economic hardship	4.3
Comfortable temperature	Household Food Security Status	10.5
	Below LIM	3.4
	Economic hardship	4.7
Furniture	Household Food Security Status	9.7
	Below LIM	4.5
	Economic hardship	7.5
Electrical goods	Household Food Security Status	8.9
	Below LIM	5.3
	Economic hardship	7.7
Internet connection	Household Food Security Status	12.9
	Below LIM	3.6
	Economic hardship	5.5
Getting around	Household Food Security Status	15.1
	Below LIM	7.4
	Economic hardship	11.0
Money on yourself	Household Food Security Status	7.2
	Below LIM	3.5
	Economic hardship	5.4

Deprivation item	Variable associated with poverty	Odds ratio
Unexpected expense	Household Food Security Status	9.4
	Below LIM	6.1
	Economic hardship	10.3
Pay bills	Household Food Security Status	17.4
	Below LIM	5.2
	Economic hardship	17.6
Small gifts	Household Food Security Status	14.8
	Below LIM	4.3
	Economic hardship	8.0
Celebrations/occasions	Household Food Security Status	12.7
	Below LIM	3.9
	Economic hardship	6.8

Source: Phase Two survey, calculations by authors.
Notes: The odds ratio is the predicted change in odds for a unit increase in the predictor. For example, the odds of a person who is food-insecure lacking the item "meat" are 36.9 times greater than for someone who is not food-insecure. All coefficients were tested as statistically significant from zero.

4.3 Reliability

We tested the reliability of the material deprivation scale using Cronbach's alpha to measure the internal consistency of the scale (Nunally & Bernstein, 1978). This test assesses whether the group of deprivation items measures one latent construct (material deprivation). An alpha of 0.70 or higher is considered satisfactory. Cronbach's alpha is well above this threshold level for the entire sample (0.882), and for each province (results not shown, available on request). All items add value to the scale, except reliable Internet, whose exclusion would lead to a higher alpha than that of the 14-item scale (see Table 16).

We use Item Response Theory (IRT) to test the reliability of each deprivation item on the deprivation scale. "IRT is a set of statistical models which describes the relationship between a person's response to the questionnaire items and an unobserved latent trait" (Guio et al., 2016, p. 224). The IRT model assumes that deprivation can be measured indirectly by using survey responses about a person's ability to afford specific items (Guio et al., 2016, p. 226). We applied a unidimensional two-parameter IRT test (in Stata), which jointly estimates the severity (also called difficulty) and discrimination for each deprivation item.[18]

[18] We tested the appropriateness of the one-dimensionality assumption using factor analysis (results not shown, available on request). As is common, the factor analysis identified multiple latent variables but the likelihood-ratio

Severity refers to the likelihood that a person will lack the item in question. As material deprivation levels can be higher or lower for different households, it is desirable to include items with different levels of severity on one scale. We follow Guio et al. (2016) in setting a severity threshold of three standard deviations because items with a larger standard deviation capture deprivation levels that are only experienced by a very small population, thereby reducing the statistical reliability of the item.[19] The results of the IRT models indicate that the 14 items do differ in terms of severity scores (evaluated at a probability of item deprivation of 0.5) and that the scores for most items lie within three standard deviations. Reliable Internet service was the only item for which the severity score was above three standard deviations (3.19).

Table 16. Cronbach's alpha

Item	Cronbach's alpha
All 14 items	0.870
Excluding item	
Meat	0.862
Appropriate clothes	0.858
Shoes	0.868
Dental care	0.861
Comfortable temperature	0.865
Furniture	0.851
Electrical goods	0.851
Reliable Internet	0.871
Getting around	0.868
Money on yourself	0.855
Unexpected expense	0.854
Pay bills	0.860
Small gifts	0.861
Celebrations/occasions	0.861

Source: Phase Two survey, calculations by authors.

test testing a maximum likelihood factor model with one factor (the first) versus a saturated model indicated that none of the other factors add sufficient value to the model. The eigenvalue of the first factor is 5.05, whereas that of the second factor is 0.6.

[19] This threshold follows the three-sigma rule, which, in the case of a normal distribution, implies that 99.7% of a population's scores are expected to lie within three standard deviations.

The discrimination parameter measures how well a specific item differentiates between a deprived and a non-deprived person and can be transformed into a correlation between the item and the latent variable (a poverty-level standard of living) (Cox, 2008). Following Guio et al. (2016), we used a correlation of 0.4[20] to distinguish between items that discriminate sufficiently or otherwise. The correlations for all items are well above this threshold (0.74 or higher), with Internet having the lowest correlation, at 0.63.

The Item Characteristic Curves (ICC) in Figure 2 offer a visualization of the performance of each item on the severity and discrimination parameters. Desirable characteristics of a scale are that the item curves are spread out horizontally (indicating different severity scores) while being vertically steep around the inflection point (indicating high discrimination scores). A reliable MDI is thus characterized by a series of S-shaped curves with a broad horizontal spread. Most curves fit this pattern, except for the right-most curve (Internet) whose inflection point occurs beyond the desired level of material deprivation of three standard deviations. The flat slope for the Internet item further signals that this item does not discriminate significantly between deprived and non-deprived respondents. That also holds for the items dental care and temperature, albeit it to a lesser extent.

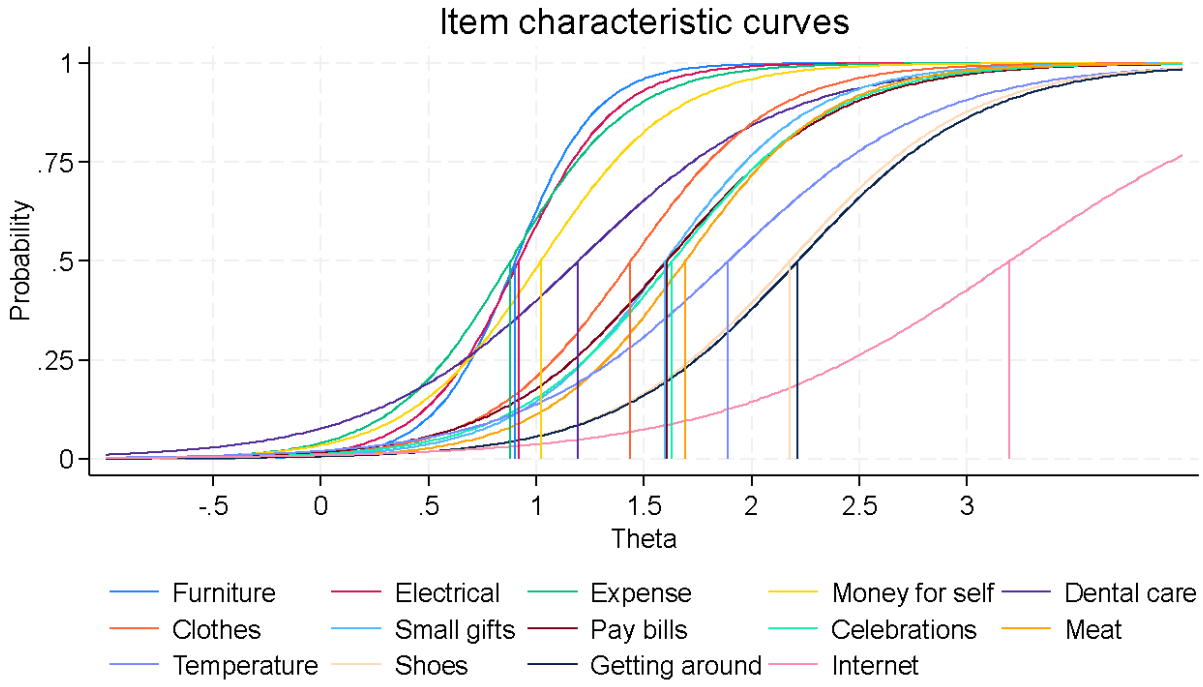

Figure 2. Item characteristics curves, ordered from low to high item severity.

Source: Phase Two survey, calculations by authors.

[20] Evans (1996) suggests a correlation of 0.4 as a cut-off for a modest correlation, whereas Cohen (1988) suggests a cut-off of 0.3.

4.4 Additivity

The additivity criterion requires that people who are experiencing more item deprivations be worse off on average than people who are experiencing fewer deprivations (Guio et al., 2016). We tested this by comparing, for each possible pair of deprivation items, the average income of respondents with zero deprivations to that of respondents with one deprivation (excluding respondents who are deprived in both items), and the average income of respondents with one deprivation to that of respondents deprived in both items (excluding those who are not deprived in either item). For each specification, respondents missing information on one or both deprivation items were excluded from the sample. The *t*-test assesses whether the mean incomes for these groups differ significantly in a statistical sense at a 5 per cent level. These tests show whether we can expect that, on average, households with more deprivations have lower income levels than those with fewer deprivations.

Of 182 specifications, the *t*-test was statistically significant in all the tests comparing the mean income of respondents who reported only one deprivation with that of respondents who reported zero deprivations (91 tests). For the comparison of respondents with one and two deprivations, the test was insignificant in 15 of 91 tests. Table 17 shows that of 15 insignificant tests, the Internet item was involved nine times, which highlights that this item also has challenges meeting the additivity criterion. For the other items with an insignificant *t*-test there is no such concern, because most tests are significant.[21]

[21] We found similar results with additional additivity tests comparing the mean number of affirmative food deprivations (six questions) and the mean number of affirmative economic hardship responses (results not shown here).

Table 17. Deprivation item tests: Summary

Item	Suitability	Validity	Reliability	Additivity
Winter coat	Test: √	Not in Phase Two survey	Not in Phase Two survey	Not in Phase Two survey
Shoes	Test: √	All 3 tests: √	Test 1: √ Test 2: √	Test 1: √ Test 2: √, 4/13 failed
Pay bills	Test: √	All 3 tests: √	Test 1: √ Test 2: √	Test 1: √ Test 2: √, 1/13 failed
Comfortable temperature	Test: √	All 3 tests: √	Test 1: √ Test 2: √, less discriminating	Test 1: √ Test 2: √, 1/13 failed
Medicines prescribed	Test: √	Not in Phase Two survey	Not in Phase Two survey	Not in Phase Two survey
Dental care	Test: √	All 3 tests: √	Test 1: √ Test 2: √, less discriminating	Test 1: √ Test 2: √, 1/13 failed
Electrical goods	Test: √	All 3 tests: √	Test 1: √ Test 2: √	Test 1: √ Test 2: √
Getting around	Test: √	All 3 tests: √	Test 1: √ Test 2: √	Test 1: √ Test 2: √, 2/13 failed
Fresh fruit/vegetables	Test: √	Not in Phase Two survey	Not in Phase Two survey	Not in Phase Two survey
Meat	Test: √	All 3 tests: √	Test 1: √ Test 2: √	Test 1: √ Test 2: √, 2/13 failed
Unexpected expense	Test: √	All 3 tests: √	Test 1: √ Test 2: √	Test 1: √ Test 2: √
Appropriate clothes	Test: √	All 3 tests: √	Test 1: √ Test 2: √	Test 1: √ Test 2: √, 2/13 failed
Reliable Internet	Test: √	All 3 tests: √	Test 1: √ Test 2: Failed	Test 1: √ Test 2: √, 9/13 failed

Item	Suitability	Validity	Reliability	Additivity
Money for yourself	Test: √	All 3 tests: √	Test 1: √ Test 2: √	Test 1: √ Test 2: √, 1/13 failed
Mobile phone	Test: √	Not in Phase Two survey	Not in Phase Two survey	Not in Phase Two survey
Furniture	Test: √	All 3 tests: √	Test 1: √ Test 2: √	Test 1: √ Test 2: √
Celebrations/occasions	Test: √ by higher poverty risk groups	All 3 tests: √	Test 1: √ Test 2: √	Test 1: √ Test 2: √, 3/13 failed
Small gifts	Test: √ by higher poverty risk groups	All 3 tests: √	Test 1: √ Test 2: √	Test 1: √ Test 2: √ 4/13 failed
Friends/family round	Test: √ by higher poverty risk groups	Not in Phase Two survey	Not in Phase Two survey	Not in Phase Two survey

Notes: Suitability test: Percentage of Phase One survey responses that an item is (very) necessary (≥ 50%) by the general population. Groups at higher risk of poverty including groups listed in Table 14 and participants in focus groups and interviews. Validity tests 1–3: A statistically significant (1%) coefficient in a binary logistic regression (dependent variable: deprivation item, independent variable: food-insecure, low-income status [LIM], and economic hardship). Reliability: Test 1: Alpha above 0.7 in Cronbach's alpha test; Test 2: Two-parameter IRT test (country-level) assessing item performance in terms of severity (including items ≤ 3 standard deviations) and discrimination (including items with correlation ≥ 0.4). Additivity: A statistically significant (5%) difference between mean equivalized household incomes of two groups based on a total of 182 *t*-tests. For each possible pair of deprivation items, Test 1 compares the mean incomes of respondents with 0 versus 1 deprivation items, and Test 2 compares mean incomes of respondents with 1 versus 2 deprivation items. Per test, each item was interacted and tested 13 times. The *t*-test was insignificant in 15 of 91 pairs in Test 2.

4.5 Summary of Scientific Tests

There is no gold standard for the optimal number of items to be included in a material deprivation index. Fewer items can help reduce response fatigue in larger surveys such as the Canadian Income Survey (CIS).[22] However, fewer items increases the likelihood that some important items in a, typically, heterogeneous population are not considered. Conversely, the more items included, the higher the chance that two items are strongly correlated, thus questioning the meaning of a household missing a higher number of items. Fourteen items is well within the normal range of many material deprivation indices. For example, New Zealand's MDI has 17 items (Perry, 2016); the EU's current material deprivation index has 13 indicators (Guio et al., 2016); Ontario's index held 10 indicators (Matern et al., 2009a, 2009b), as does the index used by Heisz and Langevin (Heisz & Langevin, 2009).

As we have seen, minor issues were found in only a few of the 14 deprivation items we used (see Table 17, above). None of the items unambiguously fails the four test criteria (suitability, validity, reliability, and additivity). The Internet item passed the suitability and validity tests but failed some of the reliability and additivity tests. As well, reliable Internet had a surprisingly low incidence of deprivation, with only 2 per cent of respondents missing that item (see Table 3, section 3). However, we suspect that selection bias due to the survey method (online questionnaire) may have played a role in the incidence rate for that particular item. Given the low item deprivation rate of reliable Internet, though, the item has only a very small influence on the number of deprived people in Canada (see Table 24, section 5).

Another consideration is that the Item Characteristics Curves (see Figure 2) and the high Cronbach's alpha (see Table 16) suggest that the scale remains reliable even if we exclude (some of the) items that have a very similar level of severity and discrimination. The items unexpected expense, furniture and electrical appliances are all high incidence items (Table 3, section 3) and are the three items with the highest pairwise correlations (see Table 18). It could therefore be argued that dropping one or two of these three items still leaves us with a reliable scale, as one high incidence item remains and Cronbach's alpha remains well over 0.70.

The next section looks at our search for an optimal threshold. Given the information above, we used indices based on 11 and 14 items. The 11-item index excludes Internet, furniture, and electrical appliances.[23] We kept the unexpected expense item because it is general, potentially covering furniture and electrical appliances, and because Statistics Canada collects the item in its quarterly Canadian Social Survey on Quality of Life and Cost of Living and thus provides a more frequent external reference point.

[22] The CIS would be a natural fit for collecting data on material deprivation.

[23] Cronbach's alpha for the 11-item index is 0.8318, compared to 0.8695 for the 14-item index.

Table 18. Correlation between deprivation items

	Meat													
Meat	1	Clothes												
Clothes	0.39	1	Shoes											
Shoes	0.30	0.32	1	Dental										
Dental	0.34	0.41	0.24	1	Temperature									
Temperature	0.27	0.32	0.26	0.25	1	Furniture								
Furniture	0.37	0.44	0.27	0.44	0.33	1	Electrical							
Electrical	0.36	0.45	0.26	0.41	0.30	0.72	1	Internet						
Internet	0.17	0.21	0.14	0.11	0.13	0.14	0.12	1	Getting around					
Getting around	0.33	0.29	0.28	0.24	0.23	0.25	0.24	0.20	1	Money on self				
Money on self	0.36	0.41	0.21	0.40	0.32	0.59	0.50	0.10	0.21	1	Expense			
Expense	0.35	0.42	0.22	0.38	0.25	0.61	0.63	0.13	0.22	0.52	1	Pay bills		
Pay bills	0.30	0.34	0.28	0.30	0.27	0.39	0.38	0.14	0.32	0.40	0.42	1	Small gifts	

	Meat	Clothes	Shoes	Dental	Temperature	Furniture	Electrical	Internet	Getting around	Money on self	Expense	Pay bills	Small gifts	
Small gifts	0.40	0.37	0.29	0.31	0.27	0.43	0.39	0.18	0.27	0.40	0.37	0.31	1	Celebrations
Celebrations	0.37	0.38	0.32	0.30	0.35	0.37	0.35	0.13	0.26	0.39	0.34	0.35	0.42	1

Source: Phase Two survey, calculations by authors.
Note: All correlations are statistically significant from zero at a 5 per cent level using Stata's pairwise correlation syntax (pwcorr, star (0.05) Bonferroni). The light grey shaded cells highlight the comparatively high correlation between the unexpected expense, furniture, and electrical items.

5. Finding an Appropriate Threshold

The material deprivation index serves to evaluate material deprivation, which, in turn, is a way to measure whether a household is likely experiencing a poverty-level standard of living. The role of the deprivation threshold is to distinguish between the population group that is likely to be experiencing a poverty-level stand of living and the group that is not. In other (blunt) words, households above the material threshold are counted as poor, while those below it are not counted as poor.

Setting a threshold has a very large impact on the proportion of the population that we count as having a poverty-level standard of living. Using the 11-item index, 37 per cent of Canadians would be materially deprived using a one-item threshold (see Figure 3). As the threshold increases to six items, this number declines to 5 per cent. Using the 14-item index, 40 per cent of Canadians would be materially deprived using a one-item threshold. As the threshold increases to six items, this number declines to 8 per cent.

Figure 3. Materially deprived at different thresholds, (%).

Source: Phase Two survey, calculations by authors.
Note: The 11-item index excludes reliable Internet, furniture, and electrical goods. Rounded to nearest integer.

Adopting a threshold of material deprivation to allow us to calculate the percentage of materially deprived people in a population simplifies a more complex reality in which there are various degrees of material deprivation. To explore whether we could find an optimal threshold with the current data, we applied two evidence-informed methods. Both methods rely on additional information that has a known statistical association with material deprivation, and both can be applied to our data. This study is the first to apply both methods. The Bristol Optimal Method (BOM) relies on additional information to find the threshold that maximizes differences between

populations classed as poor and non-poor (Gordon, 2006; Nájera & Gordon, 2023). The empirical validation method developed by Notten and Kaplan (2022) relies on additional information to identify groups who are likely correctly identified and those who are not and analyzes how the composition of these groups changes as the threshold gets stricter.

5.1 Methodology 1: Optimal Threshold through the Bristol Optimal Method

The BOM uses a statistical approach to identify the threshold, defining the optimal poverty line "as the division between the 'poor' group and the 'not poor' group that maximises the between group sum of squares and minimises the within group sum of squares" (Gordon, n.d., p. 13). To find the optimal deprivation threshold, this approach requires another indicator of material well-being such as households' income, expenditures, and assets (Gordon, 2006; Nájera & Gordon, 2023).

This method uses logistic regressions on "a succession of groups created by increasing the number of items of which respondents were deprived" (Gordon, n.d., p. 13). The dependent variable in the first logistic regression has a value of zero for people lacking no items and a value of one for people lacking one or more items. The dependent variable in the second regression has a value of zero for people lacking one or no items and a value of one for people lacking two or more items, and so forth.

We performed an analysis for both income and three other variables that are indicative of material well-being. As discussed elsewhere in this paper, income alone is an unreliable indicator of a poverty-level standard of living because of many confounding factors such as debt, assets, family in-kind assistance, unrecorded income, etc. One of the strengths of this study is that we had access to other indicators of a poverty-level standard of living that we can use to determine an optimal threshold number of deprivation items. In addition to income, we included 1) the respondent's food-insecurity status, 2) whether the respondent indicated their household was financially stretched/having a hard time, and 3) whether the respondent indicated their household experienced economic hardship (see Table 8). We also used these variables for the validity tests (see section 4.2) for a similar reason. We estimated logistic regressions for models that used a single variable and for one model that included all four variables.

Table 19 summarizes the values of the likelihood ratio test statistic (LR Chi2). This test statistic assesses the goodness-of-fit of the current model to one containing a constant only, with a higher value indicating a better fit. Since we estimate each model for a succession of six groups, the regression yielding the highest value is the one that maximizes the division between those who are categorized as poor and those who are not.

Table 19. Results for the Bristol Optimal Method, various model specifications

Model	Threshold	LR Chi2 statistic for logistic regression model	
		11-item index	14-item index
Income	**Deprivation score of 1 or more**	**460**	**440**
	Deprivation score of 2 or more	372	420
	Deprivation score of 3 or more	361	358
	Deprivation score of 4 or more	268	367
	Deprivation score of 5 or more	224	317
	Deprivation score of 6 or more	189	225
Food-insecurity status	**Deprivation score of 1 or more**	**1002**	1021
	Deprivation score of 2 or more	1000	**1099**
	Deprivation score of 3 or more	923	1039
	Deprivation score of 4 or more	776	928
	Deprivation score of 5 or more	563	776
	Deprivation score of 6 or more	393	609
Stretched/Hard time	Deprivation score of 1 or more	1151	1131
	Deprivation score of 2 or more	**1196**	**1231**
	Deprivation score of 3 or more	1022	1155
	Deprivation score of 4 or more	863	1023
	Deprivation score of 5 or more	623	962
	Deprivation score of 6 or more	446	769
Economic hardship	**Deprivation score of 1 or more**	**962**	**974**
	Deprivation score of 2 or more	764	908
	Deprivation score of 3 or more	695	775
	Deprivation score of 4 or more	494	654
	Deprivation score of 5 or more	361	571

Model	Threshold	LR Chi2 statistic for logistic regression model	
		11-item index	14-item index
	Deprivation score of 6 or more	274	397
Income **Food-insecurity status** **Stretched/hard time** **Economic hardship**	**Deprivation score of 1 or more**	**1630**	1609
	Deprivation score of 2 or more	1507	**1643**
	Deprivation score of 3 or more	1317	1488
	Deprivation score of 4 or more	1054	1274
	Deprivation score of 5 or more	802	1138
	Deprivation score of 6 or more	602	925

Source: Phase Two survey, calculations by authors.
Note: Logistic regression. All models include a constant, the household's number of adults, and the number of children as regressors, with the latter two variables controlling for inconsistencies in the equivalence scale. Cells printed in bold and with a grey background indicate the optimal threshold within a model specification because it has the highest LR Chi2 statistic. To reduce the effect of outliers, the models including income are estimated excluding equivalized incomes above $100,000 (comprising about 10 per cent of the incomes in the sample).

Following this method, a threshold of one or two deprivations would be optimal. The results show that the optimal threshold depends on the selected material well-being variable(s) and whether we use an index of 11 or 14 items. The two models that include food-insecurity status are sensitive to whether an index of 11 or 14 items was used, with an optimal threshold of one for the 11-item and two for the 14-item index. This finding also indicates that the decision about which items to include in the index also influences, to some extent, the decision about where to set the deprivation threshold.

5.2 Methodology 2: Optimal Threshold through Minimizing Probable Measurement Errors

Finding an optimal threshold through minimizing probable measurement errors builds on the trade-off between two types of measurement error. For any threshold, some people are wrongly identified as poor (false positives) and others are wrongly identified as not poor (false negatives).[24] Efforts to reduce one error automatically increase the size of the other. It is therefore impossible to eliminate both errors simultaneously (Colquhoun, 2017).

[24] This paragraph and the next paraphrase Notten and Kaplan (2022, p. 252).

This method uses additional information in the survey to divide the survey population into likely false positives and likely false negatives and then analyzes changes in the composition of these error groups for different thresholds. As the threshold becomes higher (i.e., more items are included), the material deprivation rates fall. Some of those whose status switches from deprived to not deprived were (likely) false positives who now become (likely) correctly identified. Conversely, some who were (likely) correctly identified, become (likely) false negatives. As the threshold becomes stricter, the proportion of (likely) false positives among those identified as poor declines, whereas that of (likely) false negatives increases. A threshold, or range of thresholds, is optimal when the increase in false negatives is equal to the decrease in false positives. Our research weighted both error types equally.

We used the same additional information as described in the previous sub-section: whether the respondent is food-insecure or food-secure, financially stretched/does not have enough or has just enough/enough, has an income below or above the LIM, has income below or above the median, and experiences economic hardship or not. Note that here we must redefine income as a categorical variable (instead of a continuous variable) and that we work with two definitions (below 50 per cent of the median, below the median).

For example, Table 20 shows that, for a given threshold, a respondent who is identified as deprived and food-insecure is likely correctly identified. Likewise, a respondent who is identified as not deprived and as food-secure is also likely correctly identified. However, a respondent who is identified as deprived but not food-insecure is more likely to be a false positive. Likewise, a respondent who is identified as not deprived but as food-insecure is likely to be a false negative.

Table 20. Likely measurement errors, using food insecurity as additional information

	Food-insecure	**Food-secure**
Materially deprived	Likely correct	Likely false positive
Not materially deprived	Likely false negative	Likely correct

Figure 4 applies the information in Table 20 to the data and the 11-item index. The top panel shows how the population shares of these four groups change as the threshold is increased from one to six deprivation items. As the threshold rises, the population share of likely correctly identified as materially deprived declines (blue), that of likely false positives declines (orange), that of likely false negatives increases (grey), and that of likely correctly identified households who are not materially deprived increases (yellow). The middle panel focuses on the population identified as materially deprived at a given threshold. At a threshold of one deprivation, 24.3 per cent of the population is likely correctly identified as materially deprived because they are also food-insecure. They would become a false negative if they lost their deprivation status with a rise in the threshold. At a threshold of one deprivation, 13 per cent are likely false positives because

they are food-secure. They would become more likely correctly measured (or categorized) if they lost their deprivation status with a rise of the threshold.

The bottom panel is key to finding the optimal threshold (range) because it shows how the absolute size of both measurement errors changes as the threshold gets stricter. We deem both error groups to be equally important. Empirically, the optimal threshold is where the increase in false negatives is equal, in a statistical sense, to the decrease in false positives. For a threshold rising from one to two deprivations, 5.4 per cent of respondents become likely false negatives and 6.8 per cent become likely correctly measured. For a further rise in the threshold from two to three deprivations, the percentage of likely false negatives increases by 4.7 percentage points and that of likely false positives decreases by 3.5. Whereas at the first threshold change the decrease in false positives is larger and at the second threshold change the increase in false negatives is larger, the confidence intervals overlap suggests that we cannot exclude the possibility that the groups are equally sized at one or two deprivations and at two or three deprivations (see Appendix E for tables with confidence intervals). For any of the further threshold increases, the increase in likely false negatives is larger than the decrease in false positives. A threshold of one, two, or three items would thus be optimal.

Tables 21 and 22 summarize the results for all variables and the 11-item and 14-item indices, with the last two columns displaying the change in the size of the error groups. A threshold of two or three deprivations is most often found to be optimal. Using the 11-item index, we found a threshold of two or three deprivations for food insecurity, being financially stretched, income below the median, and experiencing economic hardship. The threshold can also be one for food insecurity. It is five or six for an income below the LIM. Using the 14-item index, we found a threshold of two or three deprivations for food insecurity, income below the median, and experiencing economic hardship. The threshold can also be one for experiencing economic hardship. The threshold is one, three, or four deprivations for being financially stretched and five or six for an income below the LIM.

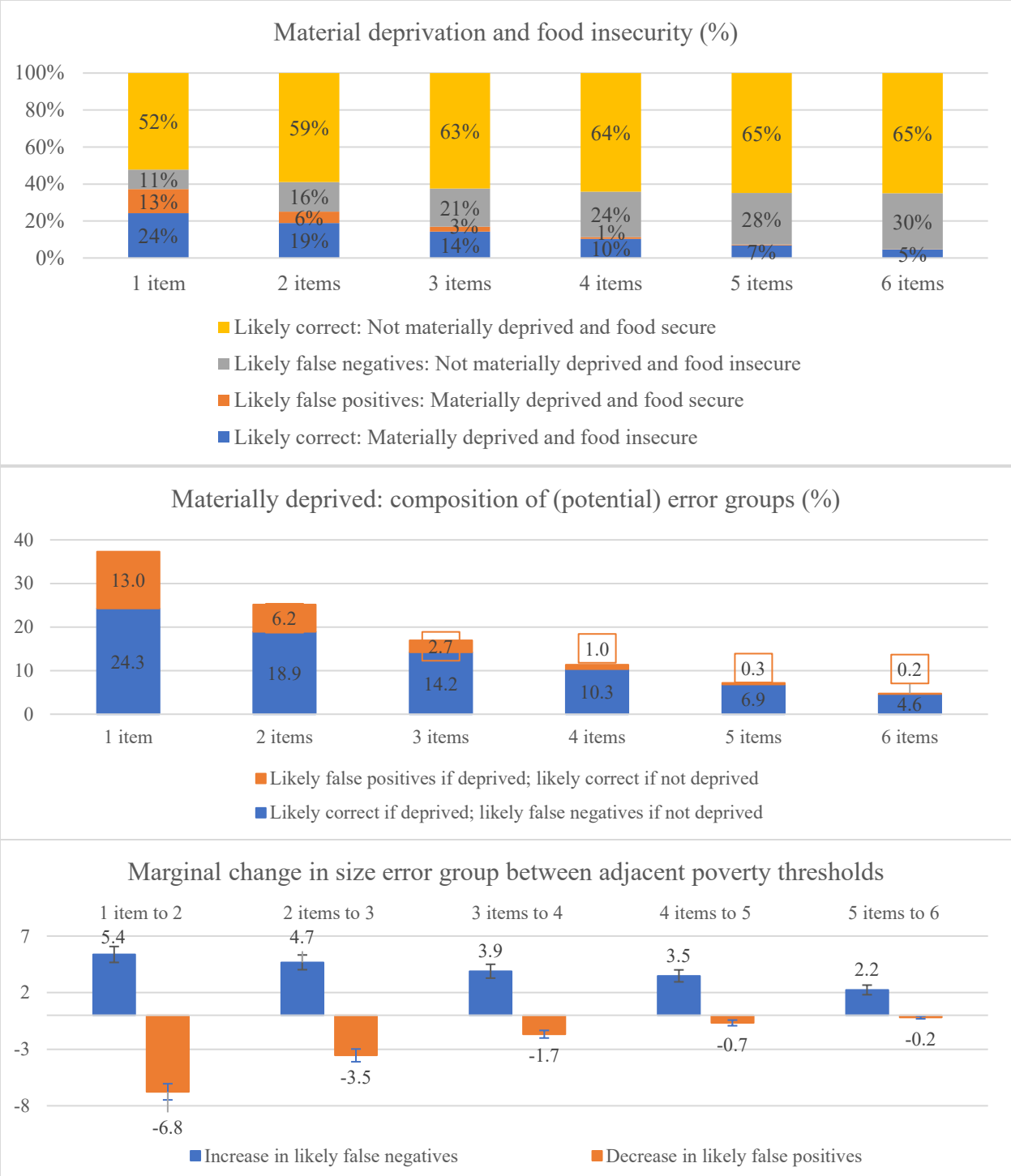

Figure 4. 11-item index: Material deprivation and food insecurity, composition in error groups, change in error groups, by deprivation threshold.

Source: Phase Two survey, calculations by authors.
Notes: Rounded to a single digit. Confidence intervals based on bootstrapped standard errors.

Table 21. 11-items index: Marginal changes in likely false positives and likely false negatives

Threshold	Materially deprived	Likely correct if deprived; likely false negatives if not deprived	Likely false positives if deprived; likely correct if not deprived	Threshold change	Increase in likely false negatives	Decrease in likely false positives
	Of which:	**Food-insecure**	**Food-secure**			
≥ 1	37.3	24.3	13.0			
≥ 2	25.2	18.9	6.2	**1 to 2**	**5.4**	**-6.8**
≥ 3	16.9	14.2	2.7	**2 to 3**	**4.7**	**-3.5**
≥ 4	11.4	10.3	1.0	3 to 4	3.9	-1.7
≥ 5	7.2	6.9	0.3	4 to 5	3.5	-0.7
≥ 6	4.8	4.6	0.2	5 to 6	2.2	-0.2
	Of which:	**Stretched/ Hard time**	**Just enough/ Good**			
≥ 1	37.5	21.4	16.1			
≥ 2	25.3	17.4	7.9	1 to 2	4.0	-8.2
≥ 3	17.0	13.2	3.8	**2 to 3**	**4.2**	**-4.0**
≥ 4	11.4	9.8	1.6	3 to 4	3.4	-2.2
≥ 5	7.4	6.7	0.7	4 to 5	3.1	-0.9
≥ 6	4.9	4.5	0.4	5 to 6	2.2	-0.3
	Of which:	**Under LIM**	**Above LIM**			
≥ 1	37.2	11.9	25.4			
≥ 2	24.6	8.6	16.0	1 to 2	3.3	-9.4
≥ 3	16.9	6.7	10.2	2 to 3	1.9	-5.8
≥ 4	11.1	4.8	6.3	3 to 4	1.9	-3.9
≥ 5	7.3	3.8	3.5	4 to 5	1.0	-2.8
≥ 6	4.9	3.0	2.0	**5 to 6**	**0.8**	**-1.5**
	Of which:	**Under median**	**Above median**			
≥ 1	37.2	25.3	11.9			

Threshold	Materially deprived	Likely correct if deprived; likely false negatives if not deprived	Likely false positives if deprived; likely correct if not deprived	Threshold change	Increase in likely false negatives	Decrease in likely false positives
≥ 2	24.6	17.5	7.1	1 to 2	7.8	-4.8
≥ 3	16.9	13.0	3.8	**2 to 3**	**4.5**	**-3.3**
≥ 4	11.1	8.7	2.4	3 to 4	4.3	-1.4
≥ 5	7.3	5.8	1.5	4 to 5	2.9	-0.9
≥ 6	4.9	4.1	0.8	5 to 6	1.7	-0.7
	Of which:	**Economic hardship**	**No economic hardship**			
≥ 1	37.5	24.7	12.7			
≥ 2	25.2	18.2	7.0	1 to 2	6.5	-5.8
≥ 3	16.9	13.5	3.4	**2 to 3**	**4.7**	**-3.5**
≥ 4	11.4	9.4	2.0	3 to 4	4.1	-1.4
≥ 5	7.2	6.2	1.0	4 to 5	3.1	-1.0
≥ 6	4.8	4.3	0.5	5 to 6	2.0	-0.5

Source: Phase Two survey, calculations by authors.
Notes: Cells with text printed in bold against a grey background indicate the optimal threshold where the increase in false negatives is equal in size, in a statistical sense, to the decrease in false positives (see Appendix E for the confidence intervals). Due to missing values for the additional variables, the percentage of materially deprived (second column) differs somewhat across those variables.

Table 22. 14-items index: Marginal changes in likely false positives and likely false negatives

Threshold	Materially deprived	Likely correct if deprived; likely false negatives if not deprived	Likely false positives if deprived; likely correct if not deprived	Threshold change	Increase in likely false negatives	Decrease in likely false positives
	Of which:	**Food-insecure**	**Food-secure**			
≥ 1	39.8	25.3	14.5			
≥ 2	29.2	21.2	8.0	1 to 2	4.2	-6.5
≥ 3	22.4	17.7	4.7	**2 to 3**	**3.5**	**-3.3**
≥ 4	16.7	14.1	2.7	3 to 4	3.6	-2.1
≥ 5	12.4	10.9	1.5	4 to 5	3.2	-1.2
≥ 6	8.4	7.8	0.6	5 to 6	3.1	-0.9
	Of which:	**Stretched/ Hard time**	**Just enough/ Good**			
≥ 1	40.1	22.0	18.1			
≥ 2	29.3	19.0	10.3	1 to 2	3.0	-7.7
≥ 3	22.6	16.1	6.4	**2 to 3**	**2.9**	**-3.9**
≥ 4	16.8	13.0	3.8	**3 to 4**	**3.1**	**-2.7**
≥ 5	12.6	10.7	1.8	4 to 5	2.3	-1.9
≥ 6	8.5	7.8	0.7	5 to 6	2.9	-1.1
	Of which:	**Under LIM**	**Above LIM**			
≥ 1	39.7	12.3	27.4			
≥ 2	28.7	9.9	18.9	1 to 2	2.4	-8.5
≥ 3	22.2	8.1	14.1	2 to 3	1.8	-4.8
≥ 4	16.4	6.8	9.7	3 to 4	1.3	-4.4
≥ 5	12.3	5.5	6.8	4 to 5	1.3	-2.9
≥ 6	8.6	4.0	4.5	**5 to 6**	**1.5**	**-2.3**
	Of which:	**Under median**	**Above median**			
≥ 1	39.7	26.5	13.2			

Threshold	Materially deprived	Likely correct if deprived; likely false negatives if not deprived	Likely false positives if deprived; likely correct if not deprived	Threshold change	Increase in likely false negatives	Decrease in likely false positives
≥ 2	28.7	20.1	8.6	1 to 2	6.4	-4.6
≥ 3	22.2	16.1	6.1	**2 to 3**	**4.0**	**-2.5**
≥ 4	16.4	12.7	3.7	3 to 4	3.4	-2.4
≥ 5	12.3	9.7	2.6	4 to 5	3.0	-1.1
≥ 6	8.6	6.7	1.9	5 to 6	3.0	-0.7
	Of which:	**Economic hardship**	**No economic hardship**			
≥ 1	40.0	26.0	14.0			
≥ 2	29.2	21.0	8.2	**1 to 2**	**5.0**	**-5.8**
≥ 3	22.4	16.8	5.6	**2 to 3**	**4.2**	**-2.6**
≥ 4	16.7	13.1	3.6	3 to 4	3.7	-2.0
≥ 5	12.4	10.2	2.2	4 to 5	2.9	-1.4
≥ 6	8.4	7.1	1.3	5 to 6	3.1	-0.9

Source: Phase Two survey, calculations by authors.
Notes: Cells with text printed in bold against a grey background indicate the optimal threshold where the increase in false negatives is equal in size, in a statistical sense, to the decrease in false positives (see Appendix E for the confidence intervals). Missing values for the additional variables mean that the percentage of materially deprived (second column) differs somewhat across those variables.

5.3 Summary of the Threshold Analysis

Our survey is unusually rich in additional information for a high-income country, which enables us to cross-validate deprivation thresholds in many ways. It is therefore not surprising that the analysis in this section yields not one but multiple optimal thresholds. The exercises nonetheless helped in narrowing the range of thresholds (see Table 23).

The BOM found a threshold of one in six of the studied iterations and a threshold of two in the four other iterations. The alternative method, analyzing changes in measurement errors, found a threshold of two or three in eight iterations, a threshold of one or two for two iterations, and a threshold of three or higher for three iterations.

Our interpretation is that a threshold of two or three deprivations would be optimal for the following reasons. First, we placed a greater weight on the food-insecurity results because, of all the additional information, food-insecurity status comes closest to material deprivation, both

conceptually and in terms of measurement. The BOM method found a threshold of either one or two deprivations for the models including food insecurity (see Table 19). The measurement error method found a threshold of two or three deprivations based on food insecurity (see Tables 21 and 22). We placed a lower weight on the two exercises indicating a threshold of five or six deprivations, using the LIM as the income cut-off. The academic literature comparing income and material deprivation measures consistently shows that the two concepts are significantly but moderately correlated, implying that material deprivation is certainly possible above low-income thresholds (for Canada, see Notten [2015] and Notten & Kaplan [2021]).

Second, by virtue of focusing on the respondents for whom a marginal change in the threshold matters the most, the changes in measurement errors method seems more relevant than the BOM method. The BOM uses nearly the entire sample (excluding only the highest-income outliers), and thus includes many respondents whose material deprivation status can be considered relatively certain. Their inclusion directly influences the value of test-statistics used to assess goodness-of-fit and thus the optimal threshold. On this ground, an argument can be made in favour of a threshold of two or three deprivations rather than one.

Table 23. Overview of findings from alternative methods for determining an optimal threshold

Optimal threshold	Bristol Optimal Method	Changing measurement errors method
1	6	_
2	4	_
1 or 2	_	2
2 or 3	_	8
3 or 4	_	1
5 or 6	_	2

Further threshold research could involve robustness checks for alternative definitions of the additional information (e.g., a more or less stringent definition of food insecurity, a categorical income definition somewhere between the LIM and the median, etc.) and Monte Carlo simulations for each possible iteration (as done in Nájera & Gordon [2023] and Notten & Kaplan [2022]).

Finally, Table 24 demonstrates by how much the material deprivation rate declines at different threshold levels when excluding a deprivation item from the index. For example, at a threshold of one deprivation, excluding dental care from the 14-item index reduces the material deprivation rate by 3.3 percentage points. The exclusion of higher-incidence items—for example, dental care, unexpected expense, electrical, and furniture—has a larger effect on the percentage of materially deprived whereas excluding a lower incidence item has a very small effect. The last

row in Table 24 shows figures for the 11-item index: at a threshold of two deprivations, excluding the items Internet, furniture, and electrical reduces the material deprivation rate by four percentage points (from 29.0% at 14 items to 25.0% at 11 items).

Table 24. Effect of excluding a deprivation item on the incidence of material deprivation

Deprivation threshold	1	2	3	4	5
14-item scale	39.8%	29.0%	22.3%	16.6%	12.3%
	Percentage point decrease from 14 to 13 items				
Dental care	-3.3	-1.7	-1.9	-2.0	-1.9
Unexpected expense	-2.0	-2.3	-2.9	-3.0	-3.0
Small amount of money	-1.3	-2.0	-2.5	-2.0	-2.6
Electrical	-0.9	-1.7	-2.2	-2.5	-2.4
Furniture	-0.6	-1.5	-2.2	-2.4	-2.7
Temperature	-0.5	-0.6	-0.8	-0.4	-0.9
Bills	-0.2	-0.6	-0.8	-0.8	-1.3
Meat	-0.2	-0.3	-0.3	-0.9	-0.4
Gifts	-0.2	-0.1	-0.6	-0.6	-1.2
Clothes	-0.1	-0.7	-1.0	-0.8	-1.4
Special occasions	-0.1	-0.3	-0.8	-0.6	-0.9
Shoes	-0.1	-0.2	-0.1	-0.2	-0.3
Internet	-0.1	-0.1	-0.1	-0.2	-0.2
Transportation	-0.1	-0.3	-0.2	-0.2	-0.4
	Percentage point decrease when excluding Internet, furniture, and electrical				
11-item scale	-2.4	-4.0	-5.4	-5.3	-5.1

Source: Phase Two survey, calculations by authors.
Notes: Items are sorted from the largest to smallest decline at the one deprivation threshold. Rounded to one digit.

6. Material Deprivation in Canada

Sections 3–5 documented our choices relating to constructing an updated material deprivation index (MDI) for Canada. While they were based on a thorough analysis (deprivations items, scale, threshold) and in accordance with leading academic practices, our choices undoubtedly influenced our estimates of the extent of material deprivation in Canada (Notten & Kaplan, 2022). We will therefore briefly review the most consequential choices we made.

To estimate deprivation levels, we worked with the 11-item index. The actions and methods outlined in section 4 informed our choice of the 11-item index: the Internet item had performance issues on two of four scientific criteria (reliability, additivity), whereas the furniture and electrical items were highly correlated with the unexpected expense item, suggesting a redundancy of items at the least severe end of the scale (reliability).

The actions and methods outlined in section 5 informed our choice of the two-item threshold as a default and the three-item threshold as a robustness check. The findings from the changes in measurement analysis method point to a threshold of two or three. We preferred that method over the Bristol Optimal Method because it focuses strictly on groups whose deprivation status is more sensitive to threshold changes rather than on groups whose deprivation status does not change or changes only with an extreme threshold.

A comparison of item deprivation rates in Table 3 (see section 3) with those of items phrased the same or very similarly in other representative Canadian surveys strongly suggests that material conditions are worse now than in 2013. A threshold of two items as a default yielded a higher and seemingly more realistic deprivation rate for 2023 (25.1%, see Table 25) than a very similar index with a threshold of two items did in 2013 (18.6%), while a threshold of three items resulted in a deprivation rate of 16.9 per cent (see Table 25).

Given that poverty, including material deprivation, is inherently a normative phenomenon, choosing an official index and threshold "is a value judgement and [thus] a political choice" and is thus best left to political decision-makers (Alkire & Santos, 2009, p. 133). Nonetheless, whereas the estimated prevalence of material deprivation may differ considerably in the context of a threshold of two or three deprivations or an 11- or 14-item index, differences in the risk of deprivation for different population characteristics and trends in prevalence over time often tell the same story regardless of which thresholds and indices are used.

6.1 Geographic, Sociodemographic and Economic Risk Factors

Table 25 shows that one in four Canadians aged 18 and older is materially deprived according to the two-item threshold (25.1%, ±1.3), whereas one in six are deprived according to the three-item threshold (16.9%, ±1.1). This is a much higher level of poverty than indicated by Canada's most recent official poverty estimate, which shows that only one in 13 Canadians (7.4% in 2021) has an income below the Market Basket Measure (MBM).[25] Given the phase-out of pandemic benefits and the steep increases in inflation, the expectation is that the MBM estimates, whose threshold is adjusted for consumer inflation, will be higher for 2022 and 2023. (See section 6.2 for further analysis of the relationship between different measures of poverty.)

A multivariate regression analysis shows that provincial/regional differences in material deprivation rates do not differ in a statistically significant way, whereas rural-urban differences do (Appendix F). Respondents living in the Atlantic provinces (27.1%, ±4.7) and Ontario (27.6%, ±2.1) have above-average rates, and those living in Quebec (23.4%, ±2.5), Manitoba and Saskatchewan (20.1%, ±4.2), Alberta (23.4%, ±3.7), and British Columbia (23.78%, ±3.3) have below-average rates. Respondents living in urban areas (23.2%, ±1.5) have a lower risk of material deprivation than those living in rural or remote areas (29.2%, ±2.4).

Material deprivation also varies according to demographic characteristics, with higher deprivation rates for younger age groups, single parents, single-person households (under age 65), Indigenous status, and visible minorities. Deprivation rates are especially high for single parents (44.5%, ± 5.5), single people under age 65 (34.6%, ±3.5), other households (32.8%, ±3.7), Black people (34.4%, ±6.8), and Indigenous people (37.4%, ± 6.4). In contrast, deprivation rates are far below average for people aged over 64 (11.1%, ±2), couples without children (15.3%, ±1.8), and single people aged 65 and older (17.4%, ±4.6).

The lower risk of material deprivation for recent—that is, living in Canada for 10 years or less—immigrants (21.5% ± 7.9 compared to 25.5% ± 2.6 for the rest of the population) was found to be statistically significant in a multivariate regression (see Appendix F) but contradicts results found elsewhere (Notten & Kaplan, 2021). Whereas the characteristics of our sample closely follow those of the 2021 census (see Table 1) it is possible that other factors, such as differences in how likely some immigrants are to participate in an online survey, led to biased estimates for this population group.

Economic characteristics such as education, employment, main source of income, and home ownership also have a graded relationship with material deprivation, with higher deprivation rates for respondents with a high school education or less (36%, ±2.7), facing unemployment (55.5%, ±6.5), relying largely on government transfers (55.4%, ±5.5) or other income such as spousal or child support or rental income (40.1%, ±8.4), and living in rented housing (41.8%,

[25] See Statistics Canada. (2023, October 10). *Dimensions of poverty hub*. https://www.statcan.gc.ca/en/topics-start/poverty. Accessed September 18, 2023.

±2.7). Material deprivation rates are well below average for respondents with a university degree (15.3%, ±1.9) and those living in owned housing (18.2%, ±1.3).

Except for the data on recent immigrants, the risk profile of our material deprivation measure is similar to that found in measures based on income poverty measures, food insecurity, and other material deprivation research using Canadian data (Dhunna & Tarasuk, 2021; Notten et al., 2023; Notten & Kaplan, 2021; Tarasuk et al., 2019). Appendix F shows that many of these characteristics have an independent effect on the risk of deprivation while controlling for other characteristics, meaning that even when other factors are taken into account, most of these characteristics are still associated with a greater risk of material deprivation.

Table 25. Material deprivation by geographic and sociodemographic characteristics

	Two-item threshold		Three-item threshold		Population share
	% deprived	CI (±)	% deprived	CI (±)	%
Canada	25.1	1.3	16.9	1.1	100
Region/province					
Atlantic provinces	27.1	4.7	19.6	4.2	7.4
Quebec	23.4	2.5	16.6	2.2	22.9
Ontario	27.6	2.1	17.0	1.8	37.7
Manitoba & Saskatchewan	20.1	4.2	13.7	3.6	7.4
Alberta	23.4	3.7	17.6	3.3	11.0
British Columbia	23.8	3.3	16.7	2.9	13.5
Place of residence					
Urban	23.2	1.5	15.6	1.3	69.6
Rural	29.2	2.4	20.0	2.1	30.4
Age					
18 to 30	30.2	3.3	19.0	2.8	16.1
31 to 44	29.3	2.5	21.1	2.2	27.5
45 to 64	27.7	2.2	18.6	1.9	35.6
65 and above	11.1	2.0	6.8	1.6	20.7
Household type					
Single-Parent Household	44.5	5.5	32.3	5.1	6.9
Two-Parent Household	24.1	2.6	16.2	2.2	23.4
Single-Person Household	29.7	2.8	19.5	2.4	23.0
Single-Person Household (under 65)	34.6	3.5	23.6	3.1	16.8
Single-Person Household (over 65)	17.4	4.6	10.6	3.7	6.2
Couple without Children	15.3	1.8	10.5	1.5	33.4
Other	32.8	3.7	21.5	3.3	13.3
Canada	25.1	1.3	16.9	1.1	100
Background					
Not a recent immigrant	25.5	2.6	17.6	2.3	91.0

	Two-item threshold		Three-item threshold		Population share
	% deprived	CI (±)	% deprived	CI (±)	%
Immigrated 10 years or less	21.5	7.9	10.5	5.9	9.0
South Asian	23.8	4.7	11.4	3.5	6.9
Chinese	11.8	4.2	9.4	3.9	4.9
Black	34.4	6.8	22.9	6.0	4.1
Indigenous	37.4	6.4	27.1	5.8	4.9
Other visible minority	26.5	4.1	16.6	3.4	10.0
White	24.8	1.5	17.0	1.3	69.3
Education					
Some high school or high school	36.0	2.7	27.2	2.5	27.2
Trade or some college	29.3	2.9	19.9	2.5	20.6
College	20.8	2.5	12.5	2.0	22.9
University	15.3	1.9	8.5	1.5	29.2
Employment status					
Full-time, part-time or self	23.9	1.6	15.2	1.3	60.6
Not in labour force — student, retired, homemaker or unemployed and not looking for work	22.8	2.1	15.2	1.8	34.5
Unemployed and looking for work	55.5	6.5	46.6	6.5	4.9
Main source of income					
Employment income	23.1	1.6	14.6	1.3	63.9
Investment and retirement income	19.0	2.3	13.4	2.0	26.2
Government transfers	55.4	5.5	40.7	5.5	7.0
Other	40.1	8.4	28.6	7.7	2.9
Dwelling					
Owned	18.2	1.3	11.5	1.1	71.4
Rented	41.8	2.7	30.0	2.5	28.6

Source: Phase Two survey, calculations by authors.
Notes: CI means confidence interval.

6.2 Material Deprivation in Relation with Other Indicators of Material Well-Being

This section explores the relationship between material deprivation and other indicators of material well-being through cross-tabulations. Income and financial information provide insights into how the risk of material deprivation intersects with financial resources. Material deprivation and food insecurity are similar concepts in that they are both outcomes—that is, they reflect the consumption consequences of not having enough financial resources or having difficult circumstances. Households' strategies to cope with economic hardship provide insight into what households have access to and what they use to make ends meet when they are financially constrained. This is why we used information on food insecurity, income, and economic hardship to test our material deprivation scale (see section 4) and identify our deprivation threshold (see section 5).

6.2.1 Income and finances

In Canada, reported income is traditionally used to measure poverty. While reported income is often the most important financial resource available to households, assets, credit, and assistance from family are three other common resources for financing or otherwise obtaining consumption. None of these or other sources of consumption are incorporated in income poverty measures. The important contribution of reported income toward households' living standards explains why the material deprivation rate among Canadians with low incomes (52%, see Table 26) is much higher than that for those with higher incomes (19%). At the same time, the figures also show that not everyone who has a low income is materially deprived—48% are not—and that having an income above the poverty line does not protect everyone from material deprivation—19% of the population with an income above the poverty line is materially deprived.

Table 26. Material deprivation in relation to income and finances

	Material deprivation rates (%)	Share of those classed as deprived (%)	Share of population (%)
Low-income measure (LIM-BT)			
Income-poor	52	35	17
Not income-poor	19	65	84
Income categories (household income before taxes)			
Under $30,000	53	36	17
$30,000–$59,999	29	28	25
$60,000–$99,999	21	26	32
Over $100,000	10	11	27
Income adequacy			
Income is not enough—stretched or having a hard time	65	69	27
Income is just enough or good enough	11	31	73
Financial situation today compared to 6 months ago			
Worse	45	65	36
Same	14	26	46
Better	12	9	18
Expected future financial situation in the next 6 months			
Worse	45	45	25
Same	18	33	46
Better	19	22	29
Concerned about debt			
Very concerned/Somewhat concerned	41	80	48
Not very concerned/Not at all concerned	10	20	52

Source: Phase Two survey, calculations by authors.

As would be expected, the risk of material deprivation decreases as income increases (see Table 26). One in two respondents with an income below $30,000 is materially deprived; for incomes between $30,000 and $60,000 one in three respondents is deprived; for incomes between $60,000 and $100,000, it is one in four respondents; and above $100,000, it is one in ten respondents. The implication is that a large share of the population classed as materially deprived (57%) has an income of between $30,000 and $100,000.

Income adequacy is a subjective measure of financial strain whereby the respondent judges whether their own income is enough to cover their needs. Table 26 shows that this measure is strongly related to material deprivation in the sense that the material deprivation rate among those reporting that their income is not enough is 65 per cent and that this group comprises 69 per cent of the group classed as materially deprived despite representing only 27 per cent of the total population.[26]

A key reason for income poverty and material deprivation indicators regularly disagreeing is that income ignores the possibility, as previously noted, that a household's standard of living may be supported from multiple sources other than reported income. Material deprivation indicators do not have this blind spot, so they are a useful complement to income poverty statistics. Table 26 indirectly illustrates that respondents who are concerned about debts have a material deprivation rate of 41 per cent and constitute 80 per cent of the population that is classed as deprived. While access to credit may help avoid deprivation, these findings show that concern about debts is very much part of life for most people in Canada who are materially deprived.

The limitations of income as a measure of poverty mean that the magnitude of material precariousness experienced by people with a higher risk of poverty is much more widespread than income indicators of poverty suggest (Notten & Kaplan, 2021). Figure 5 shows the overlap between low income (LIM-BT) and material deprivation rates. Whereas 67 per cent of the overall population is neither income-poor nor materially deprived, this percentage is consistently and considerably lower for respondents in groups that experience a higher risk of poverty. For most groups, the figure lies between 43 and 59 per cent, whereas the figures for those who are unemployed or largely rely on government transfers are 20 per cent and 22 per cent respectively.

Figure 5 also offers a closer analysis of respondents who are identified as poor by one or both measures. For the population as a whole, 33 per cent are either materially deprived and/or income-poor, with the population level of material deprivation (9%+16%=25%) being higher than that of income poverty (9%+8%=17%). As a result of missing information on income, the material deprivation rates may differ somewhat from those in Table 25. For 9 per cent of Canadians, both measures agree that they are poor; for the other 24 per cent, the measures disagree. Sixteen per cent of respondents are material deprived but do not have a low income, and 8 per cent have a low income but are not materially deprived.

Groups with high poverty characteristics generally have a higher prevalence in all three poverty categories. For example, 21 per cent of single-parent households are poor according to income and material deprivation measures, 24 per cent are materially deprived but not income-poor, and 12 per cent are income-poor. The exception is people who identify as Black: 6 per cent are

[26] For those who responded that their household income was not enough, there was a follow-up question that asked them for how long this had been the case, with answer options such as recently, most of last year, etc. Three out of four respondents did not answer this question, which means we cannot analyze this aspect of perceived income inadequacy.

income-poor but not materially deprived, which is lower than the population incidence of 8 per cent. Among respondents who are unemployed or largely rely on government transfers, material deprivation and income poverty indicators have the highest agreement rates of 35 and 37 per cent, respectively. Notably, 24 and 23 per cent, respectively, of these groups have a low income but do not report material deprivation. Access to non-income financial resources may explain why some in these groups avoid deprivation. Lower costs of living (e.g., lower housing costs) could be another reason (see section 6.3), or those groups may experience one deprivation whereas this study set the threshold at two deprivations.

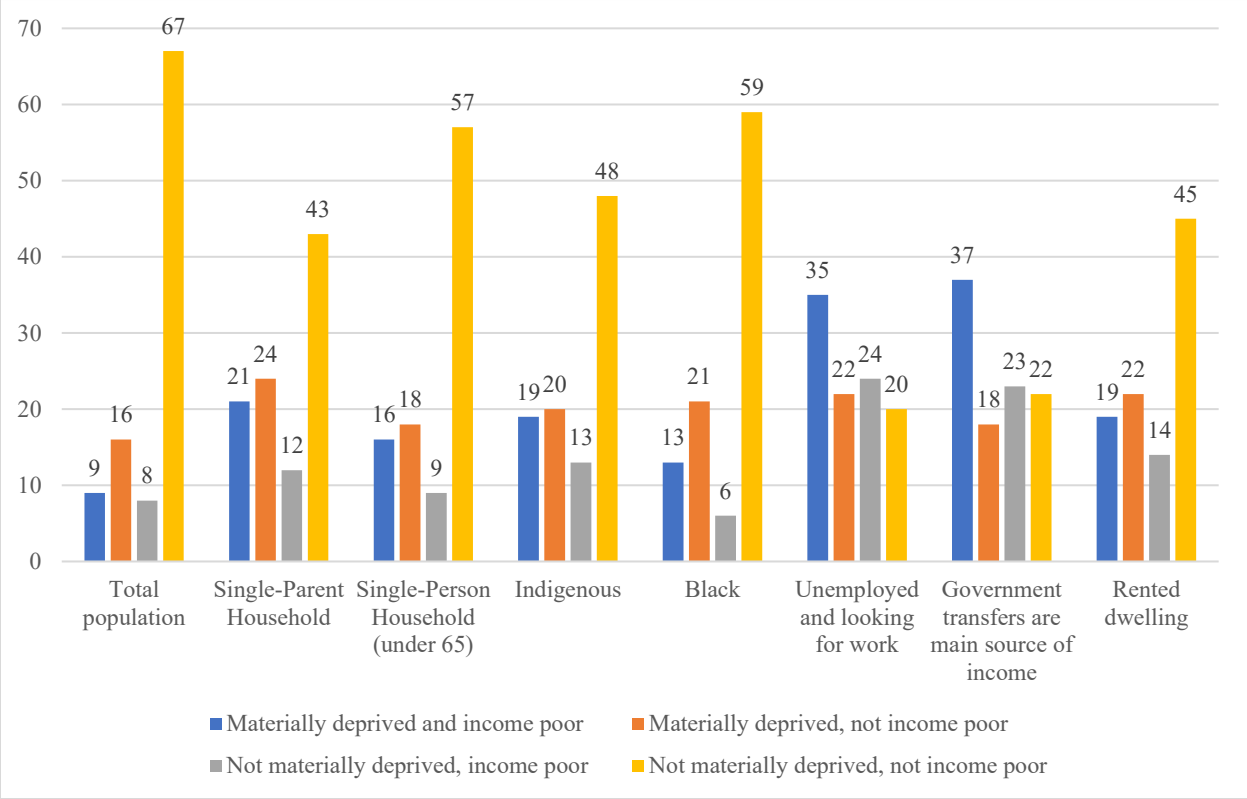

Figure 5. Material deprivation and low income (LIM-BT), overlap (%).

Source: Phase Two survey, calculations by authors.
Notes: Missing income information means the material deprivation rates may differ from those in Table 25.

6.2.2 Food insecurity

The measures of material deprivation and food insecurity in this study are closely related in both conceptual and measurement terms. Both focus on lacking money to afford the things that are indicative of attaining a decent standard of living, but they differ in terms of their scope, with material deprivation capturing a broader range of items. For this reason, the empirical relationship between material deprivation and food insecurity is stronger than that of material

deprivation and income poverty, as illustrated in Table 27. People who are food-insecure have a deprivation rate of 54 per cent, whereas people who are food-secure have a deprivation rate of 10 per cent. People who are food-insecure account for 75 per cent of the group categorized as materially deprived—but they account for only 35 per cent of the overall population. Furthermore, higher levels of food insecurity are correlated with higher rates of material deprivation.

The measures of material deprivation and food insecurity used in this study "agree" on 78 per cent of the population: 19 per cent being identified as both food-insecure and materially deprived and 59 per cent being fine on both accounts (see Figure 6). However, some respondents (6%) could avoid food insecurity but not material deprivation, and others (16%) were food-insecure but not materially deprived. This "disagreement" arises in part because the measures we used use thresholds to create a "have" and a "have not" group. It is likely that proportionately more respondents who are marginally food-insecure reported deprivation than those who have high food security. Likewise, it is likely that proportionately more of the respondents who reported experiencing one deprivation also responded affirmatively to two or more of the food-insecurity questions.

Table 27. Material deprivation in relation to food insecurity

	Deprivation rates (%)	Share of those classed as deprived (%)	Share of population (%)
Food-secure	10	25	65
Food-insecure	54	75	35
Of which:			
High food security	6	14	54
Marginal food security	25	11	11
Low food security	44	33	19
Very low food security	66	42	16

Source: Phase Two survey, calculations by authors.
Notes: Number of affirmative responses to the six food-insecurity questions: high (0), marginal (1), low (2—4), very low (5—6).

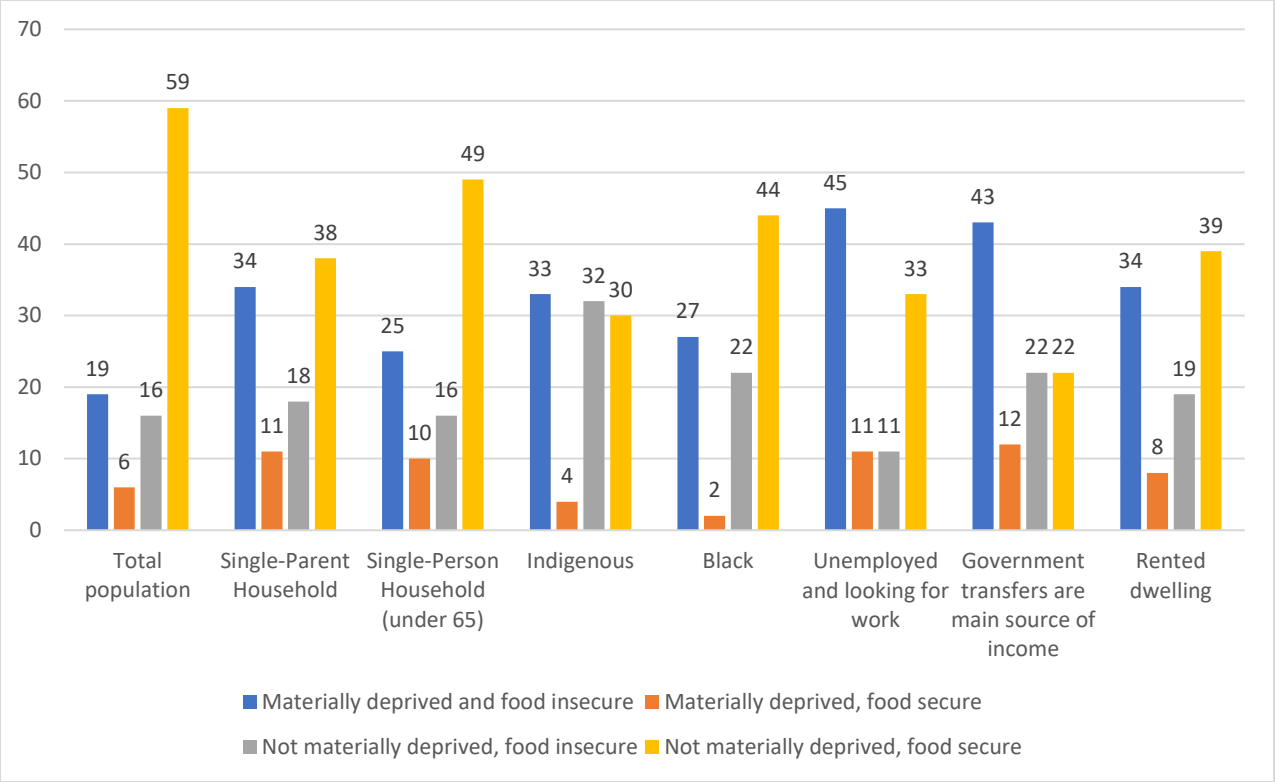

Figure 6. Material deprivation and food insecurity, overlap (%)

Source: Phase Two survey, calculations by authors.
Notes: Missing food insecurity information means the material deprivation rates may differ from those in Table 25.

However, another reason for discrepancies is that people's individual circumstances and preferences differ, so when money is tight, they have different options and/or make different choices about which items to prioritize and which ones to forgo (e.g., heat or eat). This is another reminder of the importance of using multiple indicators of material well-being to monitor poverty and in policymaking.

The disaggregation for groups at high risk of poverty shows that these groups are much more likely to experience material deprivation, food insecurity, or both, compared to the general population (see Figure 6). Particularly striking are the very high incidences of these groups experiencing food insecurity and material deprivation and those experiencing food insecurity but not material deprivation. The figures are particularly high for Indigenous and Black respondents, with 33 and 27 per cent, respectively, of respondents being materially deprived and food-insecure, and 32 and 22 per cent, respectively, being food-insecure but not materially deprived. One potential explanation for this is that when money gets tight, food becomes a much more discretionary expenditure than housing and utilities. As with income poverty, respondents who were unemployed or largely relying on government transfers were much more likely to

experience both material deprivation and food insecurity than either other groups at high risk of poverty or the general population.

6.2.3 Economic hardship

Borrowing from family or friends, turning to a charity organization, or selling assets are common strategies people use when they are short of money: one in four respondents said they borrowed money and/or sold assets and one in five turned to a charity for help (see Table 28, last column). Resorting to such strategies is also associated with a much higher risk of material deprivation: one in two respondents who used this strategy were materially deprived and close to three in four used at least one of the three strategies. However, as shown in Figure 7, a considerable proportion (18%) of respondents who were identified as materially deprived did not report using these strategies, whereas a smaller group (7%) used them but was not identified as materially deprived. Potential explanations for why people who are materially deprived do not resort to such strategies is that they are not available to them, but they may be available and attractive to some respondents who are not identified as deprived. Moreover, even when the strategies are available, some carry stigma (e.g., turning to charity) and so people use other strategies (e.g., cutting down on food).

Table 28. Material deprivation in relation with economic hardship

	Deprivation rates (%)	Share of those classed as deprived (%)	Share of population (%)
In the past 12 months, did you ever ask for financial help from friends or relatives for day-to-day expenses because you were short of money?			
No	18	53	75
Yes, sometimes, or often	48	47	25
In the past 12 months, did you ever have to turn to a charity organization because you were short of money?			
No	19	62	82
Yes, sometimes, or often	53	38	18
In the past 12 months, did you ever borrow money or sell something you owned because you were short of money for day-to-day expenses?			
No	14	42	73
Yes, sometimes, or often	54	58	27
Economic hardship			
Have not made use of financial help, charity or borrowed money	11	28	63
Sometimes or often used financial help from family/friends, charity or borrowed money	50	72	37

Source: Phase Two survey, calculations by authors.

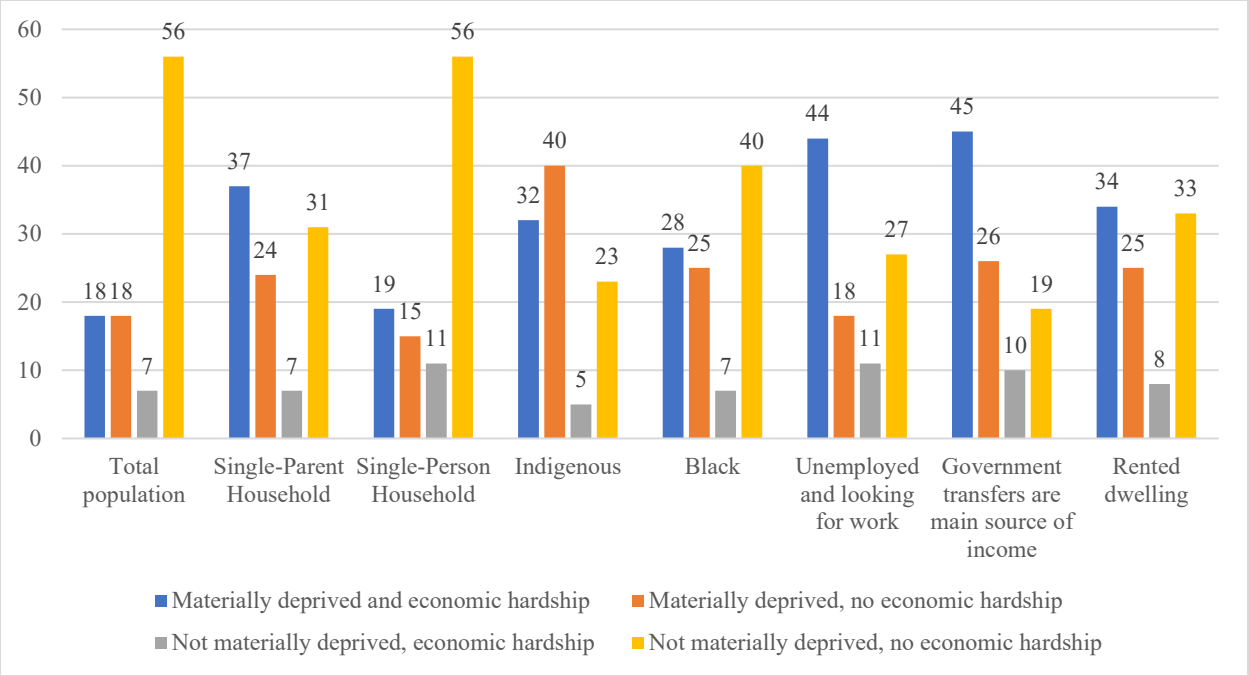

Figure 7. Material deprivation and economic hardship, overlap (%).

Source: Phase Two survey, calculations by authors.
Notes: Missing economic hardship information means the material deprivation rates may differ from those in Table 25.

6.3 How Material Deprivation Intersects with Respondents' Circumstances

The data we collected are unique for Canada and many other wealthy countries because we collected information about the respondents' circumstances such as their employment status, housing, health, and caregiving situation. The latter information provides a further rationale for material deprivation as a useful complement to measures of income poverty and to help us understand poverty more broadly. As noted elsewhere in this report, income indicators do not account for many circumstances that may affect a household's standard of living, such as debt or disability. Material deprivation indicators account for such differences because they measure outcomes resulting from the totality of a household's circumstances, including—but not exclusively—income. The analysis in this section shows how poverty, measured as material deprivation, intersects with challenging situations in people's lives.

6.3.1 Housing

Housing costs typically comprise a significant and inflexible monthly expense for households, whether it takes the form of rent or a mortgage, and non-payment increases the risk of losing that housing. The ability to purchase a home requires the ability to save for a substantial down payment, with or without additional financial help from relatives, and qualifying for a mortgage is easier and cheaper when people have a relatively secure income stream. In our weighted

sample, only 36 per cent of respondents replied that their income is enough to let them save (see Table 12), 15 per cent of (self-)employed respondents had a seasonal, casual, or temporary job, and 24 per cent of respondents indicated that they had experienced a period of unemployment in the past 12 months (see Table 31, last column).

Seven out of 10 respondents lived in owned housing and three out of 10 in rented housing (see Table 29, last column). As noted earlier, and in the literature on poverty more broadly, material deprivation rates among people living in rented housing are much higher than among people living in owned housing (42% versus 19%, see Table 29, second column). About half of the population that is identified as materially deprived (48%, Table 29, third column) lives in rented housing.[27]

What this study newly shows is that material deprivation is also more common among people who have occupied their current home (rented or owned) for a shorter time. Deprivation rates are as high as 32 per cent for those who have lived in their current dwelling for less than two years, compared to 22 per cent for those who have lived in their dwelling for 10 or more years (see Table 29, second column).

One potential reason for this variation lies in demographics. Younger Canadians are more likely to have occupied their dwelling for a shorter time and to be in a life phase where repayment of student debts and childcare costs lay claim to a large proportion of their disposable income. Another potential reason is the nature of rental and owned housing, with longer occupancy often being cheaper due to lower mortgage expenses, regulatory limits on rent increases, or other factors that offer an incentive to occupants to stay put even if their housing needs change.

A comparison of time lived in dwelling by age group provides some evidence for these potential reasons: of those who have lived in their dwelling for less than five years, the over-50s have lower deprivation rates (22%) as do their over-50s peers who have lived in their dwelling for more than five years (20%, see Table 29, second column).

There is also a very strong association between material deprivation and respondents indicating that they have difficulty paying their mortgage or rent: 46 per cent of people in this group are identified as materially deprived (see Table 29, second column). This group constitutes 60 per cent of the population identified as deprived (see Table 29, third column).

Material deprivation among homeowners is below the average rate and is only slightly higher for owners who must make mortgage payments (24%, see Table 29, second column) compared to

[27] In the fall of 2022, 48% of renters in the general population lived in a household that had difficulty meeting their financial needs compared to 35 per cent of all other households. Statistics Canada. (2023, March 7). More Canadians are finding it difficult to meet food, shelter and other necessary expenses. *The Daily*. https://www150.statcan.gc.ca/n1/daily-quotidien/230307/dq230307b-eng.htm. Accessed 11 December 2023. Also, in March 2023, nearly 68% of food bank clients lived in market rent housing. See Food Banks Canada. (n.d.). *User statistics*. https://foodbankscanada.ca/hungercount/data-insights/ca/. Accessed 11 December 2023.

those whose mortgage is paid off (21%).[28] Nonetheless, since home ownership is widespread in Canada, those homeowners who were not paying a mortgage still constituted 38 per cent of all those identified as materially deprived (see Table 29, third column).

Further disaggregating those who reported difficulty paying for their housing between rural and urban areas, we found that deprivation rates among people living in rural areas were 52 per cent, compared to 44 per cent among their urban peers (see Table 29, second column), which explains why their share in the materially deprived group (19%, see Table 29, third column) was higher than their share in the general population (11%, Table 29, third column).

Disaggregation by multiple characteristics such as age and mortgage payments, or difficulty paying rent/mortgage by region or province yielded relatively small differences, which, given the smaller sample sizes, likely do not differ in a statistically significant way (results not shown, available on request).

[28] In a similar vein, research on food insecurity shows that the prevalence of food insecurity is lowest among mortgage-free homeowners (4.3%), rises for homeowners with a mortgage (11.6%), and is highest among renters (28.5%) (Fafard St-Germain & Tarasuk, 2020).

Table 29. Material deprivation in relation to housing

Housing tenure and length of time in residence	Deprivation rates (%)	Share of those classed as deprived (%)	Share of population (%)
Dwelling			
Owned by your family or a member of your household	18	52	71
Rented	42	48	29
Time in dwelling			
Less than 2 years	32	24	19
Between 2 years and less than 5 years	28	21	19
Between 5 years and less than 10 years	24	17	18
10 years or more	22	38	45
Less than 5 years in dwelling by age			
18–30	33	14	11
31–50	32	23	18
51 and above	22	8	9
More than 5 years in dwelling by age			
18–30	25	5	5
31–50	25	21	21
51 and above	20	30	37
Mortgage			
Yes, there are regular mortgage payments	24	17	18
No, there is no mortgage to pay	21	38	45
Difficulty paying rent/mortgage			
Rarely or never experience difficulty paying rent or mortgage	20	40	61
Always or sometimes experience difficulty paying rent or mortgage	46	60	39
Difficulty paying rent/mortgage and rural/urban			
Urban	44	41	28
Rural	52	19	11

Source: Phase Two survey, calculations by authors.

6.3.2 Health

The relation between a household's standard of living and the health of its members is positively associated, with underlying causes potentially reinforcing each other.[29] [30] For example, respondents with poor health, or who had someone in their household with poor health, found it more challenging to find and maintain income-generating activities, especially if the health issue was chronic. Additionally, households with fewer financial resources may not have enough money to afford a healthy lifestyle and/or seek preventive care and therefore experience poorer health outcomes. Also, poorer health may imply additional needs for out-of-pocket spending (e.g., diet, services, or products, including medication not covered by health insurance or provincial health care systems). Therefore, while poorer health may often result in lower household income and vice versa, households with poorer health and income above an income-based poverty line will be designated as "not poor", while a material deprivation indicator may identify the household as having a below-poverty standard of living if their health conditions impose costs that are high enough to substantially reduce their standard of living.

[29] For example, people aged 16 and older who have a disability are more likely to have an income below the MBM threshold (10.6% in 2021, compared to 7.4% in the total population). Statistics Canada. (2023, May 2). Canadian Income Survey 2021. *The Daily*. https://www150.statcan.gc.ca/n1/daily-quotidien/230502/dq230502a-eng.htm. Accessed 8 December 2023.

[30] Similarly, the Maple Leaf Centre for Action on Food Security mentions that "50% of Canadians who struggle with food insecurity have a disability." See https://www.feedopportunity.com/campaign-2022/, accessed December 11, 2023.

Table 30. Material deprivation in relation to health

Health and disability status	Deprivation rates (%)	Share of those classed as deprived (%)	Share of population (%)
Physical health			
Excellent and very good	15	21	35
Good	21	31	36
Fair and poor	42	48	29
Mental health			
Excellent and very good	13	21	40
Good	24	30	31
Fair and poor	44	50	28
Poor or fair mental and physical health	51	35	17
Disability			
No disability	18	47	64
Disability that always, often, or occasionally limits activity	37	53	36
A mental and physical disability	49	9	5
Child/Children disability			
No disability	24	27	28
Disability that always, often, or occasionally limits activity	40	15	9
Stress			
Not at all/not very stressful	11	14	31
A little bit stressful	23	37	41
Quite a bit/extremely stressful	43	49	28
Well-being			
0 to less than 5	53	49	23
5 to less than 8	21	45	55
8 to 10	7	6	23

Source: Phase Two survey, calculations by authors.

The results in Table 30 reflect the intersection between health and deprivation. Starting with self-reported health, material deprivation rates are lowest for respondents who answered that they are

in very good or excellent physical health (15%, see Table 30, second column), higher for those with good physical health (21%), and much higher for those with fair and poor physical health (42%). Consequently, those with fair and poor physical health comprise nearly half of the population identified as materially deprived in Canada (see Table 30, third column), whereas their share in the total population is only 29 per cent (see Table 30, last column). For self-reported mental health, material deprivation rates are highest for those who reported fair or poor mental health (44%, see Table 30, second column). This group constitutes half of the population identified as materially deprived (see Table 30, third column). Material deprivation is even higher for those who reported that both their mental and their physical health is poor or fair (51%, see Table 30, second column). This group comprises 35 per cent of the population identified as deprived (see Table 30, third column) and only 17 per cent of the population (see Table 30, last column).

Respondents who specifically reported having a disability that always/often/occasionally limits their activity had a deprivation rate of 37 per cent (see Table 30, second column) and comprise 53 per cent of the population identified as deprived (see Table 30, last column). People who reported having both a mental and physical disability had an even higher deprivation rate—49 per cent (see Table 30, second column)—though the small population size (5%, see Table 30, last column) likely makes this estimate less accurate. Likewise, respondents who were living with a child whose disability limits the child's activity have a material deprivation rate of 40 per cent (see Table 30, second column). This group comprises only 9 per cent of the population (Table 30, last column), so this estimate is also likely less accurate.

Finally, Table 30 illustrates that poverty is stressful in and of itself and that it also affects broader dimensions of well-being, including stress.[31] The last two cross-tabulations show there is a graded relationship between material deprivation on the one hand and stress levels and well-being on the other. Material deprivation was lowest among those respondents who reported no or little stress (11%, see Table 30, second column), increased for those who reported a little bit stress (23%), and was highest for those who reported experiencing a lot of stress (43%). Overall, half of those identified as materially deprived reported high levels of stress and one third reported some stress (see Table 30, third column). The measure of well-being is a composite of seven questions asking respondents about their levels of satisfaction from 0 to 10 (with 0 being very dissatisfied and 10 being very satisfied) in terms of standard of living, health, achievements in life, personal relationships, safety, feeling part of a community, and future security. These responses were averaged to create a well-being index. The material deprivation rate is 53 per cent (see Table 30, second column) among respondents who reported low levels of well-being (scored 0–5). This group comprises half of the population identified as deprived (see Table 30,

[31] This is consistent with research showing that the likelihood of exposure to food insecurity is associated with work-related and health-related stressful life events (El-Hajj & Benhin, 2021). Moreover, those whose income was in the bottom two income quintiles were significantly more likely to experience extremely stress due to financial issues compared to those in higher income quintiles in 2022 (Uppal, 2023).

third column) but less than one quarter of the general Canadian population (see Table 30, last column).

6.3.3 Activity status, employment characteristics, and caregiving

Material deprivation is very high among those who responded that they were currently unemployed: 56 per cent (see Table 31, second column). While the material deprivation rate is close to the national average among those respondents who were employed, that group comprises 58 per cent of the population identified as materially deprived (see Table 31, third column), a share that is comparable with their share in the overall population (see Table 31, last column). The same holds for those respondents who said they were currently not in the labour force.

These broad categories disguise considerable variation in material deprivation levels experienced by subpopulations that make up part of the employed group and people who are not in the labour force. For example, those respondents who reported seasonal, temporary, or casual employment had considerably higher material deprivation rates than those with a permanent job (33% versus 22%, see Table 31, second column) and accounted for one of every five people who were identified as deprived (see Table 31, third column).[32] Furthermore, a recent episode of unemployment is also associated with a higher risk of deprivation (39%, see Table 31, second column). This group accounts for one in five of all people identified as deprived (see Table 31, third column) and also represents a sizable percentage of the total adult population (14%, see Table 31, last column). Thus, a recent episode of unemployment, even once it has passed, still has repercussions for current living standards. Note that the reference period for the material deprivation items is also 12 months, which could mean that deprivation is still ongoing or has only just ended.

[32] Working households experiencing food insecurity were more likely to include earners reporting multiples jobs and higher job stress (McIntyre et al., 2012). Similarly, people with precarious employment living in low-income households are more likely to have difficulty making ends meet or to experience food insecurity (Lewchuk et al., 2013). Finally, the share of food bank users whose main source of income is employment rose from 12% in 2019 to 17% in 2023 (Food Banks Canada, 2023).

Table 31. Material deprivation in relation to employment

Employment and caregiving status	Deprivation rates (%)	Share of those classed as deprived (%)	Share of population (%)
Employment			
Employment: Full-time, part-time, or self	24	58	61
Not in labour force: student, retired, homemaker, or unemployment and not looking for work	23	31	34
Unemployed and looking for work	56	11	5
Employment type			
Permanent job	22	79	85
Seasonal, temporary, or casual	33	21	15
Period of unemployment in the last 12 months			
No	19	35	45
Yes	39	22	14
Caregiving			
Not providing care to anyone	24	79	83
Providing care to a family member who has an illness or disability	30	21	17

Source: Phase Two survey, calculations by authors.

Finally, caregiving makes it more challenging to engage in income-generating activities, whether through employment or entrepreneurship, because caregiving requires flexibility and takes up a significant amount of time. The costs of hired care, as an alternative to unpaid care, are often also considerable, and so they require substantial financial capacity—assuming the care can be found, is reliable, and is of acceptable quality. These factors likely play a critical role in the higher material deprivation rates for respondents who mentioned that they provide care to a family member with an illness or disability (30%, see Table 31, second column). Representing 17 per cent of the population (see Table 31, last column), these respondents are a relatively small but likely growing subpopulation, as Canada's population is aging.

6.4 Material Deprivation in Relation to Respondents' Perceptions and Attitudes

Material measures of poverty, including material deprivation, focus on an important but certainly not singular aspect of poverty. Section 6.3.2 discussed the graded association between material deprivation and stress levels and overall well-being (see Table 30). This section explores how the

experience of material deprivation intersects with respondents' perceptions and attitudes. This is a unique glimpse of those relationships in Canada.

Table 32. Material deprivation in relation to perceptions and attitudes

Perceptions and attitudes	Deprivation rates (%)	Share of those classed as (%)	Share of population (%)
Have a hopeful view of the future			
Always/Often	15	31	51
Sometimes	30	41	34
Rarely/Never	47	28	15
Are confident in your abilities, even when faced with challenges			
Always/Often	18	44	61
Sometimes	33	40	30
Rarely/Never	46	17	9
Are able to bounce back quickly after hard times			
Always/Often	17	39	58
Sometimes	32	43	33
Rarely/Never	52	19	9
Have people you can depend on to help you when you really need it			
Always/Often	18	44	59
Sometimes	28	31	27
Rarely/Never	48	26	13

Source: Phase Two survey, calculations by authors.

The experience of material deprivation is associated with a less hopeful view of the future, lower confidence in one's abilities, and a lower ability to bounce back after hard times (see Table 32, second column).[33] Moreover, the gradient between these relationships is steep. Material deprivation rates were very high among respondents who are rarely/never hopeful (47%, see Table 32, second column), lower for those who are sometimes hopeful (30%), and lowest for those who are always/often hopeful (15%). There is a similarly strong relationship between

[33] This aligns with the finding in the 2021/2022 Canadian Social Survey (see https://www150.statcan.gc.ca/n1/daily-quotidien/220517/dq220517d-eng.htm, accessed December 19, 2023) that economic challenges are linked to a less hopeful outlook. Similarly, people with lower income adequacy are more likely to report that they do not have a network of people they can depend on, according to the Social Capital in Canada study (see https://www.environicsinstitute.org/projects/project-details/connection-engagement-and-well-being, accessed December 19, 2023).

material deprivation and confidence in one's abilities and the ability to bounce back quickly after hard times. While these results cannot tease out any causal relationships, they clearly illustrate that the experience of material poverty intersects with various aspects of psychological well-being, including life satisfaction and a sense of control over one's own life.

Table 33. Material deprivation in relation to trust

Trust in family and others	Deprivation rates (%)	Share of those classed as deprived (%)	Share of population (%)
Trust in family			
Cannot be trusted at all — 1,2	49	10	5
Neutral — 3	34	19	14
Can be trusted a lot — 4,5	22	71	81
Trust in colleagues			
Cannot be trusted at all — 1,2	41	17	10
Neutral — 3	31	41	33
Can be trusted a lot — 4,5	18	42	57
Trust in strangers			
Cannot be trusted at all — 1,2	29	50	44
Neutral — 3	23	36	39
Can be trusted a lot — 4,5	20	14	17
Trust in people from other ethnic groups			
Cannot be trusted at all — 1,2	34	14	10
Neutral — 3	25	40	39
Can be trusted a lot — 4,5	22	46	51
Trust in people with different political views			
Cannot be trusted at all — 1,2	34	26	19
Neutral — 3	25	46	45
Can be trusted a lot — 4,5	20	28	35
Trust in political leaders			
Cannot be trusted at all — 1,2	31	63	50
Neutral — 3	18	24	32
Can be trusted a lot — 4,5	19	14	18

Source: Phase Two survey, calculations by authors.

There is also a strong and graded relationship between material deprivation and respondents' perception of being able to call on people who can help when really needed. Material deprivation (48%, see Table 32, second column) is highest for the relatively small population group who feels they rarely/never can get help when needed (13%, see Table 32, last column), drops to 28 per cent for those who feel they can sometimes get help, and is only 18 per cent for those who feel they can often or always get help.

Material deprivation rates are highest among respondents who reported lower levels of trust in the six surveyed categories (see Table 33, second column). This relationship is also graded from no trust to high trust levels.[34]

We were struck by the material deprivation rates of 49 and 34 per cent (see Table 33, second column) among the relatively small share of the population who reported low(er) levels of trust in family (5% for low trust and 14% for neutral, Table 33, last column). While the smaller sample sizes likely affect the accuracy of these rates, this result suggests that respondents in this group cannot or do not count on family helping them out when needed. A similar pattern emerged for trust in colleagues, with the highest deprivation rates (41%, see Table 33, second column) being found among those who have low trust in colleagues.

The graded relationship between material deprivation and trust in strangers is less steep, with material deprivation rates of 29 per cent for those who have low trust (see Table 33, second column), 23 per cent for those with neutral trust, and 20 per cent for those with a lot of trust. This may arise in part because the share of the overall population who have a low level of trust in strangers is high (44 per cent, Table 33, last column) compared to the proportion who have a low level of trust in family and colleagues (5% and 10% respectively). Or it may be because few people actually rely upon help from strangers in any circumstance.

In turn, the gradient of the relationship between material deprivation and trust in people from different ethnic groups and in people with different political views is not as steep as the material deprivation/trust in family and trust in colleagues gradient. The neutral or high levels of trust in people from different ethnic groups and in people with different political views reflect the majority view in the general population.

When it comes to trust in political leaders, the gradient is in the opposite direction: 50 per cent of the general population do not have a lot of trust in this group (see Table 33, last column). The material deprivation rate for respondents who indicated low levels of trust is 31 per cent (see Table 33, second column), compared to 18–19 per cent for those who have neutral or a lot of

[34] This aligns with the findings from the 2022 Toronto Social Capital Study, which indicated that trust increases in tandem with income levels (see https://www.environicsinstitute.org/projects/project-details/toronto-social-capital-study-2022, accessed December 19, 2023). These and similar data for Canada further show a gradient between trust and respondents' assessment of whether they are better off than their parents, with higher trust levels among those who are better off (Environics Institute. [2022, November 22]. *Toronto social capital study*. https://www.environicsinstitute.org/projects/project-details/toronto-social-capital-study-2022. Calculation by authors).

trust. These numbers suggest that unfavourable material living conditions may in part drive the lack of trust between the population and their leaders.

7. Conclusion

Our research provided an updated measure for material deprivation in Canada. We followed established best practices from a large body of international literature to develop a material deprivation index (MDI) and used data from an online survey conducted in the spring of 2023 to estimate material deprivation in Canada. The analysis provided a unique perspective on material deprivation in Canada. It has rarely been possible to analyze material deprivation rates less than a year after the data have been collected (April/May 2023). To our knowledge, this is also the first research study in the world that simultaneously provides estimates of material deprivation in conjunction with many other recognized indicators of living standards, including income (before taxes), food insecurity (six-item scale), economic hardship, and perceived income adequacy. Furthermore, our research provided a first-time glimpse of the relationship between material deprivation and housing, health and overall well-being, caregiving and employment, perceptions, and attitudes in Canada.

7.1 Research Findings

Among the many insights that emerged from the study, two findings in particular stand out.

Research finding 1: An unacceptable standard of living, which most people would recognize as poverty or near poverty, is more widespread and not congruent with poverty as measured by income-based poverty measures, including Canada's official Market Basket Measure (MBM).

One in four Canadians aged 18 and older is identified as materially deprived when a two-item threshold is used. This level of material deprivation is much higher than that of Canada's MBM poverty rate, which indicates that one in 13 Canadians is income-poor, and the LIM poverty rate, which indicates that one in 10 Canadians is income-poor (latest available estimates, based on 2021 income reference year).[35] Furthermore, not all people whose income is less than income-based poverty lines experience a poverty-level standard of living as assessed by material deprivation, whereas many people with an income above the poverty line are experiencing a standard of living at or near poverty levels, according to the MDI developed in our research.

Reported income is only one input into determining a household's standard of living. The experience of poverty-level living conditions, an outcome, depends on a household's total financial resources (including, but not exclusively, reported income, as well as assets and debt), other resources to which they may have access, and their specific circumstances including any special needs. The MDI assesses outcomes and thereby implicitly takes financial resources, circumstances, and needs into account, while income poverty indicators can only partially account for such heterogeneity among households. An MDI can therefore complement income poverty indicators and allow us to better understand poverty.

Figure 8 illustrates this point. The red and violet circles in the Venn diagram show the groups that are respectively income-poor and materially deprived. Eight per cent are both income-poor

[35] See Statistics Canada. (2023, October 10). *Dimensions of poverty hub*. https://www.statcan.gc.ca/en/topics-start/poverty. Accessed September 18, 2023.

and materially deprived, but another 8 per cent have a low income but are not materially deprived. Seventeen per cent are materially deprived but have an income above the poverty threshold. This means that one third of respondents had a low income, were materially deprived, or both. This figure is considerably higher than each single indicator suggests by itself.

In addition to the red (income-poor) and violet (materially deprived) circles, the green circle in Figure 8 shows the percentage of respondents experiencing food insecurity using the six-item model. Of these three indicators of material well-being, the prevalence of food insecurity is highest, with 35 per cent of respondents being food-insecure—that is, they cannot afford two or more of the six items.

Clearly the overlap between these three material well-being indicators is only partial: an income above the poverty line does not insulate a household from experiencing material deprivation or food insecurity. However, 5 per cent of respondents with a low income were not experiencing either material deprivation or food insecurity. This could be because they have access to other financial and non-financial resources (e.g., assets, help from family), more favourable circumstances and fewer needs. It is also possible that these respondents experience one item of deprivation or some limited food insecurity that was not covered by the questions in our research. No indicator is infallible, so some of these gaps and overlaps may be caused by errors in measurement.

Figure 8 nonetheless shows that outcome-based indicators tell a story that is quite different—and more nuanced—from that told by income-based poverty indicators and shows that poverty, or near poverty, is considerably more widespread and complex than each of these individual indicators suggest.

Materially deprived	25%
Income-poor (LIM-BT)	16%
Food-insecure (6-items)	35%
None	**55%**
At least one of the above	**45%**

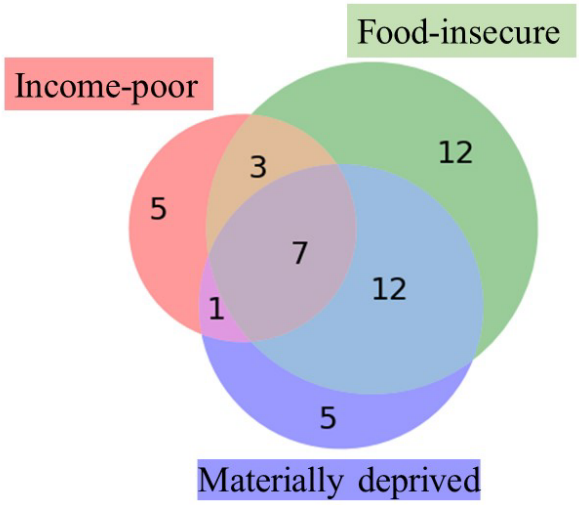

Figure 8.The intersection between material deprivation, income poverty, and food insecurity.

Source: Phase Two survey, calculations by authors.

Research finding 2: Poverty or near poverty is even more widespread among people who have characteristics associated with higher risks of poverty.

Our research confirmed that many people who have characteristics associated with an increased risk of income poverty also have much higher prevalence rates for material deprivation and food insecurity. Figure 9 shows what a higher risk in each of these forms of material poverty implies at the individual level. Whereas 45 per cent of people in the total population experiences at least one form of material poverty, this figure rises to 56–87 per cent among groups of people identified as "at risk." In other words, a large to very large majority of these at-risk groups experience poverty or near poverty.

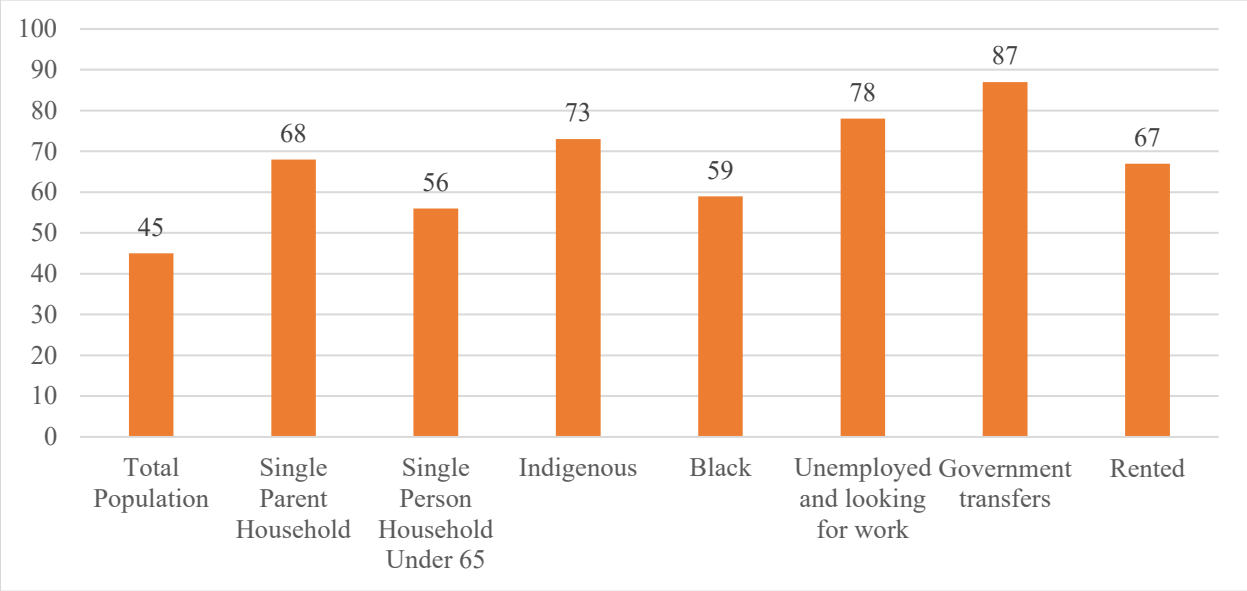

Figure 9. The experience of one or more forms of material poverty (%).

Source: Phase Two survey, calculations by authors.
Note: Included as forms of material poverty are material deprivation (11 items — 2 item threshold), income poverty before tax (LIM-BT), and food insecurity (six-item index).

Our research found that material deprivation rates are higher, and often considerably higher, among respondents whose circumstances and needs pose challenges to their ability to generate the financial resources they need to avoid a poverty-level standard of living and/or require them to spend more money than a more typical household to achieve an acceptable standard of living. In this respect, we find that higher deprivation rates are associated with:

- challenges in paying for housing and debts
- a shorter duration of living in one's dwelling
- a younger age
- lower health outcomes
- lower overall well-being
- higher stress levels

- being a caregiver
- having a recent experience of unemployment and/or more precarious employment
- having pessimistic attitudes about the future and one's own agency
- being less trusting of others

Analyzing the similarities and differences among these and other groups who are identified as being at risk brings us a step closer to better understanding the causes of poverty in Canada. For example, a lack of assets, and therefore greater accumulated debt, may be more prevalent among some at-risk groups, while a need for extra or special social or health services may be a significant challenge for other groups. Better knowledge of the real-life experience of groups of people identified as at risk, and the factors that play a specific role in placing them at risk, will be critical to designing effective and efficient interventions to reduce poverty.

Our findings support a conclusion that an MDI is a much-needed complement to measuring the material dimension of poverty by means of income because people's circumstances are far more complex than income measures of poverty, including Canada's MBM, can take into account.

7.2 Limitations

An important caveat about our research is that the MDI we developed is based on evidence-informed judgments that resulted in an index comprising 11 items and a two-item deprivation threshold. Such judgments in the research process cannot be avoided. We therefore highlighted aspects where the results would (also) enable a different choice and provided additional results using the most likely alternative choices that could be made. The threshold decision in particular is a highly influential judgment, and it is one that is best left to decision-makers (Notten & Kaplan, 2022).

The weighted population characteristics of our data closely resemble the proportions for those aged 18 and older found in the 2021 census and therefore provide nationally representative findings for the adult Canadian population. Nonetheless, given our smaller sample size and different sampling procedures used in surveys such as the Canadian Income Survey (CIS), it is possible that certain population groups are underrepresented in our data. In addition, we collected data by means of an online survey, which means that populations with no or more restricted access to the Internet and/or no or lower digital literacy may be underrepresented. Furthermore, Canada's fast and largely immigration-driven population growth in the past two years has likely shifted the composition of the population considerably in terms of age, immigration history, and race. Both points may explain our study's finding that recent immigrants have a lower level of material deprivation rate than those who did not, which contradicts results in other Canadian poverty research studies.

Unlike data from surveys such as the CIS, our data cannot provide nationally representative estimates at the household level or for the population aged below 18. Also, unlike Statistics

Canada survey data, we cannot link our survey to tax data and thus improve the accuracy of our self-reported income data. Furthermore, our self-reported income was pre-tax while all important income-based poverty definitions are after-tax. This also means that our computations of adult equivalent income and the low-income threshold (LIM-BT) are not as accurate as we would like. Hence, our cross-tabulations with income measures such as the LIM-BT must be treated as indicative rather than definitive.

Finally, an MDI is generally not suited for use in contexts of program delivery such as the screening of applicants for program participation, or the creation of programs aiming to reduce specific item deprivations such as deprivation in food items.

7.3 Policy Implications and Recommendations

Our research has implications for public policy in Canada, particularly in relation to measuring the scope and evolution of poverty, understanding the extent and nature of material disadvantage experienced by at-risk groups, and influencing the role that public policies (could) play in reducing poverty.[36]

Our research indicates that there is considerable uncertainty around how accurately income poverty indicators can identify households' specific needs and circumstances. With such indicators playing a prominent role in governments' poverty reduction agendas, this is a robust reason for governments to include an MDI in their reporting on poverty reduction.

Our research also found much higher rates of material disadvantage among at-risk groups, which suggests that policymakers may be underestimating the degree of material precariousness among these groups. This happens even though they often specifically monitor poverty for such groups by disaggregated poverty statistics (e.g., single-parent households, Indigenous Peoples). Knowing that poverty or near poverty is more widespread may strengthen arguments in favour of better designed eligibility criteria to qualify for government transfers, subsidies, or services. Likewise, such understanding may also reinforce arguments against rapid tapering of income-tested benefits (e.g., the Ontario Child Benefit or the Canada Workers Benefit).

Moreover, the suite of policy responses to poverty and to the risk of poverty that is most effective likely varies according to those differences in financial resources, needs, and circumstances. A more accurate understanding of the degree of material precariousness and the needs and circumstances giving rise to it could inform policy responses in a broad range of policy domains (e.g., housing, health care, consumer debt, employer benefit/insurance gaps).

There are likely also considerable implications for policy development and evaluation. By not including data assessed through an outcome-based measure of poverty such as material deprivation, policymakers and researchers are failing to account for the impacts of policies,

[36] In discussing the policy implications, this section also draws from the conclusion in Notten and Kaplan (2021, pp. 14–15).

which means their policy analyses are biased, which in turn may lead to biased policy trade-offs by decision-makers. Impacts may be underestimated because benefits of programs accruing to Canadians above the income-poverty threshold are not counted as poverty reduction. Impacts are also more likely to be underestimated for programs that help keep money in Canadian's pockets (e.g., subsidized childcare, PharmaCare, dental care). An MDI can measure such impacts.

Missed impacts create further bias in considerations about cost-effectiveness. When a program's effectiveness is underestimated, the program appears more costly. Programs that assist many Canadians who are identified as materially deprived may not seem to give a lot of value if many of the recipients or beneficiaries have an income above the income poverty threshold. Moreover, overlooking some impacts means that any trading-off of the costs and benefits of different types of programs may be unknowingly skewed favourably toward one type of program (e.g., government transfers because they are picked up by income-based poverty measures, while services such as childcare subsidies are not reflected in income-based poverty measures).

At this stage we can only speculate about how having an outcome-based measure of poverty such as material deprivation would affect policymaking. However, given the relatively large gaps and partial overlaps between households that are identified as low-income and materially deprived, the effect could be substantial and also lead to different policy choices.

We therefore recommend:

a) That Statistics Canada, with the assistance of Employment and Social Development Canada, develop and maintain an MDI, alongside the existing income-based poverty measures. This action would include regularly reviewing and updating the MDI to reflect current Canadian standards of living.
b) That a material deprivation module be included in the long form of the census and a material deprivation module be incorporated in an appropriate existing Statistics Canada annual survey. A material deprivation module could easily and inexpensively be added to the Canadian Income Survey (CIS), for example.
c) That other survey instruments that collect information about Canadians' health, finances, expenditures, quality of life, etc. include this material deprivation module on a recurring or ad hoc basis as appropriate.
d) That the Canadian government incorporate an MDI into their official poverty reduction strategy as part of the indicator portfolio to assess levels of poverty in Canada.

Putting these recommendations into practice would enable the scope and evolution of material deprivation over time and across population groups to be tracked consistently. It would also facilitate a deeper understanding of how different expressions of material poverty—for example, low income, food insecurity, and material deprivation—are related.

In addition, putting our recommendations into practice would also enable more timely production and release of outcome-based poverty statistics such as material deprivation and food

insecurity. This would be possible because, unlike the MBM and the LIM, these statistics do not require linkages with tax-filing data. Over the last few years, annual poverty statistics have been released 13–17 months after year end. Material deprivation statistics have a potentially much quicker turnaround time. The release of such statistics is especially relevant when there are rapid changes to households' material circumstances—as seems currently to be the case—and recent indicators such as increased use of food banks do not correspond with out-of-date income-based poverty figures.

Our recommendations would further enable a better understanding of the role played by financial resources, differential needs, and circumstances of Canadians who are experiencing an unacceptable standard of living in Canada. Implementing our recommendations would enable improved evaluation of the effect of policy initiatives, both during the development phase and after implementation. If the federal government provided such information regularly, provincial, territorial, and municipal governments and researchers could use it to better design and evaluate government programs. The charitable and non-profit sector could also use this information to good effect when designing and evaluating their initiatives.

Our research provides a solid foundation for the development of an MDI for Canada, as our methodology included many of the steps needed to develop such a measure. Indeed, our research is the most rigorous that is available for Canada to date. However, the development of a *national* index requires both broader consultation during the creation stage and mechanisms for keeping it current over time. In addition to a national index, there is also the possibility of developing deprivation scales for specific population groups and/or specific regions such as the Canadian territories. International experiences suggest the usefulness of population-specific deprivation scales — for example, for children in Europe (Guio et al., 2018) and seniors in the United Kingdom (Kotecha et al., 2013). No matter how thorough the research process is and however broad the consultations are, though, there will always be a grey area of consequential methodological choices for which the evidence is inconclusive and on which stakeholders' views are divided. Such final choices require value judgments and are thus best left to political decision-makers (Notten & Kaplan, 2022).

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