Disability Considerations for Measuring Poverty in Canada Using the Market Basket Measure

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Abstract

Persons with disability (PWD) in Canada experience disproportionately high poverty rates. Poverty measures are often used to benchmark income assistance levels and social policies across Canada. The Market Basket Measure (MBM) is the official poverty measure in Canada that accounts for differences in family composition and geography. It does not, however, account for cost-incurring factors like disabilities, despite the evidence of differences in daily living costs. PWD experiencing poverty have additional needs to reduce barriers to full participation in society that can translate to higher basic costs for daily living. Given that poverty measures like the MBM may assess eligibility for income support or eligibility for public housing, these measures need to reflect how the cost of living differs for PWD. To critically analyze disability-specific considerations for the Canadian poverty line, we assess the MBM within the context of persons with disabilities. To identify differences in consumption patterns and family composition for PWD, a population based cross-sectional analysis was conducted using data from the 2017 Canadian Survey on Disability. Analysis assessed for bias within the MBM based on the basket contents, family composition and disability severity. PWD experience two times higher poverty rates, worse housing outcomes and incur higher and additional expenses for basic needs of daily living than persons without disability. The MBM underestimates the true poverty rate for persons with disabilities as it does not account for all their additional costs and does not represent their average family composition.

Keywords Persons with disabilities · Poverty measurement · Market Basket Measure

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1 Introduction

Adequate income is critical to ensuring full participation in society and meeting UN Convention on Rights of Persons with Disabilities commitments to adequate standard of living and social protection. Persons with disability in Canada experience disproportionately high poverty rates or phrased another way, have a greater likelihood of living with inadequate income (Berrigan et al., 2020). The negative health and social consequences of living in poverty are well-documented and include food and housing insecurity, increased risks of disease, and higher mortality rates.

Poverty measures are designed to indicate what income levels are required to participate in society and meet basic needs. However, many persons with disabilities face barriers to full participation in society that are beyond those accounted for in standard measures of poverty. These additional needs translate to higher basic costs for daily living making standard measures of poverty inadequate for describing the experiences of persons with disabilities (Mitra et al., 2017). Costs associated with disability must be captured in poverty measures to ensure fairness in comparisons of income adequacy because these indicators are often used to determine income support levels, access to services, or eligibility for public housing. Poverty measures need to reflect the cost-of-living experiences for persons with disabilities.

In Canada, the Official Poverty Line is determined using an instrument of poverty measurement called the Market Basket Measure (MBM).¹ We hypothesize that the MBM does not adequately capture costs associated with all the basic needs of persons with disabilities living with poverty in Canada. To investigate this question, our analysis uses the 2017 Canadian Survey on Disability (CSD) to estimate current MBM determined poverty rates and characterized additional needs across disability severity and family composition. Since the MBM is an instrument designed to account for regional differences in basic need costs, we focus on one Canadian province, British Columbia (BC).

The objective of this paper is to identify potential sources of bias for persons with disabilities when measuring poverty. We do not attempt to develop a measure of poverty that is more appropriate for measuring income poverty experienced by persons with disability. Developing a new metric to reflect the poverty line for persons without disabilities, would require a dataset with the specific intent of calculating the additional costs of disability. The CSD has elements of such a dataset but does not provide enough data to assess these costs in its current state. We do hope, however, that by identifying sources of bias in the measure of poverty currently in use, we encourage policymakers to show greater discretion in how they apply that measure.

We believe our findings have important implications for public policies relevant to persons with disabilities. Measures of poverty are often used as a gateway through which people must pass to gain access to social benefits. If the measure of poverty does not accurately identify the true state of need for people with disabilities, then programs of social assistance will fail to satisfy the goal of horizontal equity by providing an equivalent level of support to persons with, and without disabilities. This paper also contributes to the international literature by demonstrating a disability-specific account of the poverty measure

¹ Canada has two other poverty measures, namely the Low Income Cut-off (known as LICO) and Low Income Measure (known as LIM). These are less commonly used measures since the adoption of the MBM as the Official Poverty Line in Canada but still appear in Canadian sources.

used in Canada. To our knowledge, no other article describes the impact of the Canadian MBM to persons with disabilities and social programs within a province to this extent.

1.1 Poverty Among Persons with Disabilities in Canada

As of 2017, 6.2 million of the 28 million Canadians above 15 years old currently live with a disability, of which 16.6% live with poverty as determined by the MBM (Morris et al., 2018; National Advisory Council on Poverty, 2021). Persons with disabilities experience higher rates than total Canadian population, which is estimated to be 11%. Persons with severe disabilities in Canada exhibit even higher poverty rates than those with less severe or no disabilities (Morris et al., 2018; Wall, 2017). Government transfers comprise an estimated two-thirds of the total income of working-age (16–64 year old), low-income persons with disabilities (Crawford, 2013). Persons with disabilities are less likely to participate in the labour force as only 59 percent are employed in 2018, compared to 80 percent of persons without disabilities (Morris et al., 2018). Those with severe disabilities experience even lower labour force participation (31%), while those with mild disabilities more closely resemble that of persons without disabilities (75%). Age is an important factor for poverty among persons with disabilities as 27.6 percent of individuals age 15–24 with severe disabilities are in poverty compared to 10.4 percent of those age 65 and above with severe disabilities (Morris et al., 2018). Single persons with disabilities who live alone experience some of the highest poverty rates.

Poverty reduction is a shared federal and provincial government priority. In 2018, the Government of Canada committed to reducing poverty by 50 percent by 2030 and established the MBM as Canada's official poverty measure (Government of Canada, 2018; Poverty Reduction Act, 2019). Many provincial governments also adopted the MBM for poverty reduction strategies. For example, the BC government passed the Poverty Reduction Strategy Act (2018), committing to reduce MBM poverty rates before 2024 (Government of British Columbia, 2019). However questions arose during consultations on the MBM, whether the MBM, which is being used for measuring progress toward these goals, recognizes the basic needs of persons with disabilities and is an adequate benchmark for this population (Heisz, 2019).

1.2 The Market Basket Measure (MBM)

The MBM is a relative measure of poverty designed to establish a poverty line, whereby individuals are deemed impoverished if their income does not meet this threshold. The MBM poverty line (MBM Level) estimates a household's ability to afford an essential, but modest basket of goods-and-services. This basket contains goods defined by five categories: food; clothing and footwear; transportation costs; shelter costs; and other necessary goods (Statistics Canada, 2017b). The prices of items within the basket are updated each year using data from each of the 50 geographic regions in Canada (Zhang & Hatfield, 2014).

Poverty rates are then calculated by comparing each household's MBM Level to their MBM (Disposable) Income. The MBM Income is a calculation of after-tax disposable income that is equal to the sum of employment and non-employment income minus taxes

and non-discretionary spending.² If MBM Income is lower than MBM Level, a person is identified as impoverished (visualized in Supplementary Fig. 1). MBM Levels vary across Canada by two factors, family composition/size and geographic region. Further explanation of MBM Level and Income calculations is provided in Sect. 2.4.

2 Methods

2.1 Study Design

We conducted a cross-sectional population-based analysis of data from the Statistics Canada 2017 Canadian Survey on Disability. Our analysis described differences in consumption patterns and family composition between persons with disabilities and persons without disabilities and implications for the MBM based on the basket contents, family composition and disability severity.

2.2 The Canadian Survey on Disability (CSD)

The CSD is a national repeated cross-sectional survey of Canadians over 15 years of age and above, whose everyday activities are limited by disability (Cloutier et al., 2018). It focuses on four broad themes: disability characteristics, supports and barriers, education, and employment (Cloutier et al., 2018). Participants were recruited from the 2016 Census Long-Form Questionnaire by individuals who reported a long-term condition or difficulty on the Activities of Daily Living question, then met the criteria provided by a set of disability screening questions (Berrigan et al., 2020; Grondin, 2016). Additional information related to the development and administration of the 2017 CSD is available in the survey user guide (Cloutier et al., 2018). Variables from the 2016 Census were provided for a sample of the population without disabilities to facilitate comparisons between groups with and without disability (Cloutier et al., 2018). Data was collected from March 1st to August 31st, 2017 using an internet-based electronic questionnaire.³ The 2017 CSD had a 69.5 percent response rate corresponding to approximately 50,000 participants (Cloutier et al., 2018).

2.3 Participants

Inclusion in our sample required participants to reside in BC during the data period and self-report a disability. BC was the geographic region for this study because Canadian provinces administer most social policy and it is large province with legislation using the MBM (Government of British Columbia, 2019). BC comprises five of Canada's fifty

² Non employment income includes sources like government transfers. Non-discretionary spending includes but is not limited to child support, pension plan contributions, uninsured medical expenses, employment insurance. Taxes included are total income taxes paid; the personal portion of payroll taxes; other mandatory payroll deductions, such as contributions to employer-sponsored pension plans, supplementary health plans, and union dues.

³ Internet-based questionnaires are an online method of survey administration where respondents navigate a series of web-based screens on which questions are asked.

MBM geographic regions (Hatfield et al., 2010). To identify BC residents, we used the 2016 Census province of residence indicator. BC respondents created the “all persons with disabilities” and “all persons without disabilities”. Persons with disabilities were identified using the disability screening questions.

2.4 Variables

Descriptive variables: We assigned disability severity with a self-reported variable from the 2017 CSD containing four options: very severe, severe, moderate, and mild. Family composition was assigned by the 2016 Census, household type variable. Common-law and married couples were combined for the “couple” category. Some individuals had ambiguous family compositions, such as those in multi-census households. These respondents were labelled “unclassified” and excluded from the family composition subgroup analysis. Income, housing, and demographic information were defined using census variables for descriptive statistics and poverty rate estimates.

MBM variables: Variables for the MBM essential, modest goods-and-services basket consisting of five categories: food; clothing and footwear; transportation costs; shelter costs; and other necessary goods. CSD-specific variables informed persons with disabilities nondiscretionary spending on shelter costs and other goods. The basket’s “other goods” category includes all required items not captured in the other four categories. Examples are personal care, furnishings, home entertainment, education supplies, and other medicines (Hatfield et al., 2010). Other goods include many additional supports persons with disabilities require for daily life that are not captured by reductions to MBM Income through non-discretionary spending. This category is valued at 75 percent of the family-equivalency-adjusted cost of food plus clothing and footwear.

MBM level was determined using Statistics Canada calculated MBM Levels for a narrowly defined reference family, an adult man and woman aged 25–49 with two children (girl aged nine and boy aged 13) (Statistics Canada, 2015). If a household does not consist of this specific structure, they are a “non-reference family” and the MBM Level is calculated with a family equivalency scale adjustment.⁴ We used Statistics Canada estimates for MBM Levels for reference families in British Columbia, then adjusted for price differences in large versus small communities. Currently there is no adjustment or consideration for persons with disabilities when estimating MBM levels, despite evidence that disability leads to extra costs for individuals and households with disabilities.

Core-housing need means a household lives in one of two types of inadequate housing—(1) *housing suitability*, failing to meet the Canadian National Occupancy Standard, or (2) *poor (dwelling) condition*, living in a home in need of “major repairs”⁵—and their before-tax income is insufficient to access acceptable housing (> 30 percent of before-tax income required for inadequate housing) (Canadian Mortgage & Housing Corporation, 2019a, 2019b; Statistics Canada, 2016). An additional variable called ‘home in need of

⁴ The family equivalence scale adjustment used by the MBM relies on a square root scale. This implies that, for instance, a household of four persons has expenditure needs that are twice as large as a single person household. Importantly, this adjustment does not make allowance for the age or gender of family members, nor does it account for the presence of disability.

⁵ Examples of major repairs include plumbing, mechanical, structural, or electrical issues.

repair', was created with respondents who indicated their homes needed "major repairs" or "minor repairs".⁶

There was insufficient information to discern differences between persons with disabilities and persons without disabilities in food, clothing, and transportation components of the MBM.

2.5 Analysis

Analysis was performed in a secured location with anonymized survey microdata files, accessible only to deemed employees of Statistics Canada (Statistics Canada, 2019). Exporting 2017 CSD data required vetting by Statistics Canada analysts to ensure privacy and data reliability. Data with sample sizes smaller than ten were not releasable, instead replaced with an "X". Furthermore, data was required to meet minimum reliability thresholds, namely, the coefficient of variation (CV) test.⁷ Data with a CV between 16.6 and 33.3 percent was marked "E", indicating readers should use caution regarding the value. Data with a CV of over 33.3 percent was unreportable; however, this did not occur for any statistics in this study.

We report demographic characteristics, poverty rates and the MBM measure components of nondiscretionary spending on shelter costs and other goods. Data in this study consists of means and proportions with their respective 95 percent confidence intervals (CI), and in some cases, survey-weighted counts. All calculations were completed using Statistics Canada guidelines. Since CSD respondents represent a sample of the larger population, a set of 1,000 unique bootstrapped weights accounted for sample variability. Means, proportions, and counts presented reflect the aggregation of these 1,000 respondent-specific weights to create CI from bootstrapped standard errors (SE).⁸ We provide CI for all reported means and proportions based on bootstrapped 95 percent CI using the STATA 'svyset' command.

3 Results

3.1 Participants

Total sample of participants included BC respondents comprising "all persons with disabilities" ($n=926,100$) and "all persons without disabilities" ($n=2,820,260$). Among persons with disabilities disability severity was described with a self-reported variable from the 2017 CSD containing four options: very severe ($n=194,290$), severe ($n=193,530$), moderate ($n=184,620$) and mild ($n=353,660$).

⁶ Examples of minor repairs include missing or loose floor tiles, bricks or shingles, defective steps, railing or siding.

⁷ CV is measure dispersion in a set of data and is equal to the standard error of a mean or proportion divided by the mean or proportion value.

⁸ This is because many commonly used tests such as the *chi-squared* tests do not adequately account for the sample variability in survey data.

Table 1 Descriptive statistics of B.C. respondents to the 2017 Canadian Survey on Disability. Sample sizes are weighted estimates using STATCAN guidelines

Disability status	Group	Percentage of disability status in group (%)	Average age (years)	Percentage female (%)	Percentage primary household maintainer (%)
Persons without disability (PWOD)	Singles, no children	16.4	46.9 (± 0.9)	49.1	81.5 (± 1.8)
	Singles, with children	8.5	37.2 (± 1.1)	62.1	45.2 (± 3.4)
	Couple, no children	26.9	54.3 (± 0.5)	49.1	47.5 (± 1.9)
	Couple, with children	41.0	39.1 (± 0.4)	48.6	36.0 (± 1.4)
Persons with disability (PWD)	All persons with disabilities	100	44.6 (± 0.2)	50.2	46.2 (± 0.9)
	Singles, no children	26.1	57.8 (± 1.5)	60.7	90.2 (± 2.8)
	Singles, with children	10.5	45.9 (± 2.2)	68.7	52.0 (± 7.2)
	Couple, no children	32.4	63.0 (± 1.1)	49.8	50.3 (± 4.1)
Persons with disability (PWD)	Couple, with children	26.3	45.2 (± 1.4)	50.1	38.4 (± 4.3)
	All persons with disabilities	100	55.0 (± 0.5)	55.0	56.5 (± 2.2)
	Very severe	21.0	59.9 (± 1.6)	57.5	56.7 (± 4.5)
	Severe	20.9	55.3 (± 1.4)	54.7	52.4 (± 5.1)
Persons with disability (PWD)	Moderate	19.9	55.8 (± 1.8)	52.5	57.4 (± 5.3)
	Mild	38.2	51.7 (± 1.3)	55.2	58.3 (± 3.9)
	—	—	47.2	51.4	48.7
	Total	—	—	—	—

Average age, female percentage and percentage primary household maintainer rounded to the nearest tenth decimal place. Both persons with disabilities groups are comprised of the same respondents using a different grouping classification. The “ $\pm$ ” term indicates the positive and negative 95% confidence interval range. Children are defined as any unmarried individual, regardless of age, who lives with his or her parent(s) and has no children in the same household. Source: Author calculations, Canadian Survey on Disability (2017)

Fig. 1 Poverty rates in B.C. according to the Market Basket Measure poverty line, by disability status, family composition, 2016. “NC” = No Children, “WC” = With Children. Error bars indicate the 95% confidence interval range of values. Children are defined as any unmarried individual, regardless of age, who lives with his or her parent(s) and has no children in the same household. Source: Author calculations, Canadian Survey on Disability (2017)

3.2 Demographic Statistics

Table 1 depicts differences in demographic information between persons with and without disability in BC. Family composition differed between groups; a higher proportion of persons with disabilities were single than persons without disabilities (36.5% vs. 24.9%), when combining singles with and without children. Additionally, fewer persons with disabilities had children (35.8% vs. 49.5%), as seen by combining single and coupled parents. Persons with disabilities tended to be older than persons without disabilities, on average, by more than ten years. There were gender differences as a greater proportion of persons with disabilities were reported to be female (55.0%) than that of persons without disabilities (50.2%). A greater proportion of persons with disabilities lived in small or medium population centres (32% vs. 23%), fewer persons with disabilities lived in urban cities (55% vs. 65%), but rural proportions were similar (13% vs. 12%). A larger proportion of persons with disabilities (56.5%) were the primary maintainers of their household than persons without disabilities (46.2%).

A wide range of disability types were reported, such as pain (64.9%), mobility (41.1%), developmental (5.5%), and seeing (27.5%). Many persons with disabilities lived with multiple disability types and were classified as such. Mild disabilities were the most common, while the prevalence of persons with moderate, severe, and very severe disabilities were similar (Table 1).

A greater proportion of persons without disabilities than persons with disabilities reported paid working hours as an employee or self-employed individual (63.6% vs.

40.2%). The proportion of individuals who did not report paid working hours was greater among those with more severe disabilities (very severe=81.5%, severe=70.3%, moderate=55.3%, and mild=46.3%). Of individuals reporting working hours, fewer persons with disabilities worked 40 or more hours per week (49.0% vs 58.5%), and more persons with disabilities worked less than 29 h per week (29.0% vs. 14.3%).

3.3 MBM Poverty Rates

In 2016, more than 530,000 BC residents of the 3.75 million weighted population fell below the MBM poverty line as it is currently defined. Persons with disabilities experienced 42 percent higher poverty rates (18.5%) than persons without disabilities (13.0%) (Fig. 1). Singles were also overrepresented in poverty. Groups of singles faced up to 3.75 times higher poverty rates than couples. Poverty rates also varied by disability severity. Persons with very severe disabilities experienced nearly twice the poverty rate of those with mild disabilities (14.1% vs. 26.5%).

Despite higher overall poverty rates among persons with disabilities, persons without disabilities faced deeper poverty (\$8973 vs. \$12,066 below the MBM poverty line) (Supplementary Fig. 4). Between groups there was little difference in the depth of poverty among couples. Singles drove the observed differences between persons with disabilities and persons without disabilities. Singles with and without children faced lower average-depth-of-poverty among persons with disabilities than persons without disabilities, but the difference was much smaller as a proportion of the MBM Level. There was no observable difference in depth of poverty across disability severity. Supplementary Fig. 2 depicts these depth of poverty patterns.

3.4 MBM Costs

Table 2 reports the proportion of persons with disabilities who need caregiving service and those who report using caregiving services. More than half of persons with disabilities (52.4%) required caregiving for at least one activity of daily living. In general, caregiving usage rates were greater among persons with disabilities with higher disability severity (very severe disabilities=87.6%, mild disabilities=27.6%). Many persons with disabilities who required caregiving experienced unmet needs; nearly two-thirds indicated they require a greater number of caregiving services. Of those requiring more services, 43.3 percent did not receive any caregiving for at least one category of needs.

More than 153,000 BC residents with disability receiving caregiving services (36.1%) incurred out-of-pocket expenses. Nearly one-in-four persons with disabilities spent more than \$2000 per year on caregiving services. A higher proportion of individuals with very severe disabilities spent above this threshold (34.0%). More than one-in-ten of all persons with disabilities with caregiving expenses (and 21.4 percent of persons with very severe disabilities), spent greater than \$5000 per year.

Caregiving supports were not only received from paid professionals. The most frequent provider of additional caregiving services required varied by family composition (Fig. 2). A greater proportion of persons with disabilities couples received care from family living at home than singles. A higher proportion of singles received caregiving support from family and others living outside their home. There were no clear patterns among differences in additional caregiving support across disability severity.

Table 2 Caregiving services usage, unmet need and expenses by Persons with Disabilities in B.C., 2017

Disability status	Group	Percentage who require caregiving	Percentage with unmet caregiving need	Percentage with non-reimbursed caregiving expense	Percentage spending \$500 to \$2000 on non-reimbursed caregiving expense	Percentage spending more than \$2000 of non-reimbursed caregiving expense
Family composition	Singles, NC	50.2 (± 4.6)	67.6 (± 5.8)	44.0 (± 7.0)	59.8 (± 9.8)	13.2 ^E (± 6.3)
	Singles, WC	60.0 (± 7.3)	62.3 (± 9.4)	29.5 (± 9.1)	31.4 ^E (± 17.8)	29.9 ^E (± 17.2)
	Couple, NC	52.0 (± 4.3)	60.9 (± 5.2)	36.6 (± 6.0)	37.6 (± 9.8)	31.3 (± 9.8)
	Couple, WC	49.8 (± 4.5)	65.2 (± 5.7)	33.5 (± 5.9)	48.5 (± 11.9)	22.5 ^E (± 10.5)
Disability severity	Very severe	87.6 (± 3.1)	74.4 (± 4.3)	42.6 (± 5.2)	39.4 (± 8.1)	34.0 (± 7.9)
	Severe	69.9 (± 4.9)	60.6 (± 6.0)	32.4 (± 6.0)	53.6 (± 11.8)	17.1 ^E (± 10.9)
	Moderate	49.7 (± 5.6)	58.7 (± 7.7)	32.9 (± 8.2)	41.2 ^E (± 15.9)	XX
	Mild	27.6 (± 3.5)	54.8 (± 7.6)	31.7 (± 7.3)	58.4 (± 14.3)	13.7 ^E (± 8.7)
All disability	–	52.4 (± 2.3)	63.9 (± 3.0)	36.1 (± 3.2)	46.2 (± 5.7)	24.1 (± 4.8)

“E” indicates that readers should use caution regarding the value. “XX” indicates a suppressed value because it does not meet Statistics Canada vetting requirements. “NC” = No Children, “WC” = With Children. Children are defined as any unmarried individual, regardless of age, who lives with his or her parent(s) and has no children in the same household. The “±” term indicates the positive and negative 95% confidence interval range. Percentages in column 6 and 7 are a subset of column 5. Source: Author calculations, Canadian Survey on Disability (2017)

Fig. 2 Sources of additional caregiving supports received by persons with disability in B.C. by family composition, 2017. “NC”=No Children, “WC”=With Children. Children are defined as any unmarried individual, regardless of age, who lives with his or her parent(s) and has no children in the same household. Source: Author calculations, Canadian Survey on Disability (2017)

Some groups experienced more core housing need than others (Supplementary Fig. 3). Overall, persons with disabilities faced 76 percent more core-housing need than persons without disabilities. Like the trend in poverty rates, core-housing need was greater for singles than couples by up to 3.7 times. Persons with very severe disabilities also experienced more than two times higher rates of core-housing need than those with mild disabilities.

Housing affordability was the most prevalent issue among those in core-housing need (persons with disabilities = 88.8%, persons without disabilities = 87.4%). Secondary factors differed between groups. Persons without disabilities were 1.6 times more likely than persons with disabilities to fail the unsuitable housing criterion, regardless of core-housing need status. While more persons with disabilities lived in homes that failed the dwelling condition criterion than persons without disabilities (77% higher). The core-housing need indicator fails to capture homes in need of “minor repairs”, which a higher rate of persons with disabilities occupy than persons without disabilities. These patterns are reported in Supplementary Table 1.

Prescription medication use was high among persons with disabilities, as 68.7% use prescription drugs at least once per week. These rates did not vary by family composition but there were differences across disability severity (very severe = 86.8%, severe = 74.5%, moderate = 69.2%, mild = 55.4%). Cost-related prescription drug non-adherence refers to individuals who cannot afford to follow their medication schedule (Law et al., 2012). Persons with disabilities in BC were 37.5 percent more likely to report cost-related prescription drug non-adherence than the national average of 9.6%. Single parents with disabilities (21.5%) and those with very severe disabilities (21.4%) reported the highest proportion of non-adherence in the last 6 months. The full breakdown is provided in Supplementary Fig. 4.

The majority of persons with disabilities (66.7%) used assistive devices and aids (ADAA) for activities of daily living in at least one of five categories: hearing, seeing, physical, cognitive, and other. Many used multiple ADAA as 48.8 percent required between two and five ADAA, 21.0 percent used more than six (Table 3). While ADAA costs are often insured by a mix of private or public sources in Canada, 30.8 percent of persons with disabilities had non-reimbursed out-of-pocket expenses. One-in-four spend

Table 3 Use, out-of-pocket expenses and ability to afford assistive devices and aids (ADAA) by persons with disability in B.C., 2017

Disability status	Group	Percentage who use ADAA	Percentage of ADAA users with out-of-pocket expenses	Percentage of ADAA users who cannot afford an ADAA	Percentage spending \$200 to \$1000 on ADAA	Percentage spending more than \$1000 on ADAA
Family composition	Singles, NC	69.4 (± 4.7)	30.5 (± 6.2)	37.0 (± 9.6)	32.0 (± 10.4)	29.2 ^E (± 11.4)
	Singles, WC	63.1 (± 6.9)	24.0 ^E (± 10.2)	20.4 ^E (± 12.3)	XX	XX
	Couple, NC	72.5 (± 4.1)	34.6 (± 5.7)	26.3 (± 8.1)	50.4 (± 9.9)	21.8 ^E (± 7.5)
	Couple, WC	56.6 (± 4.7)	21.9 (± 6.4)	29.5 (± 9.0)	41.2 (± 12.5)	27.0 ^E (± 10.7)
	Very severe	91.1 (± 2.6)	32.6 (± 5.3)	26.3 (± 6.2)	45.5 (± 10.4)	24.9 ^E (± 8.2)
Disability severity	Severe	78.2 (± 4.1)	34.5 (± 6.6)	37.1 (± 10.3)	35.5 (± 11.2)	18.8 ^E (± 9.6)
	Moderate	71.3 (± 4.9)	30.3 (± 8.0)	22.5 ^E (± 10.0)	49.1 (± 15.4)	20.5 ^E (± 10.2)
	Mild	45.4 (± 4.4)	25.9 (± 6.4)	26.2 ^E (± 13.8)	33.9 ^E (± 13.8)	29.8 ^E (± 12.5)
All disability	All disabled	66.7 (± 2.3)	30.8 (± 3.2)	29.2 (± 4.8)	41.7 (± 6.3)	25.1 (± 5.2)

“E” indicates that readers should use caution regarding the value. “XX” indicates a suppressed value because it does not meet Statistics Canada vetting requirements. “NC” = No Children, “WC” = With Children. Children are defined as any unmarried individual, regardless of age, who lives with his or her parent(s) and has no children in the same household. The “±” term indicates the positive and negative 95% confidence interval range. Column three implies at least one ADAA is used/required by the person with disabilities. Column five states there is at least one additional ADAA need that is not met directly due to cost. Source: Author calculations, Canadian Survey on Disability (2017)

more than \$1000 per year on ADAA. There were no discernable differences in spending on ADAA across different family compositions or disability severity.

4 Discussion

4.1 Existing Persons with Disabilities MBM Poverty

People with more severe disabilities and those who do not have a common-law or marital spouse in BC experience higher rates of poverty, which is consistent with published national trends (Crawford, 2013; Morris et al., 2018; Wall, 2017). Persons with disabilities experience overall higher poverty rates and additional costs not captured in the MBM. A contributing factor to differences in poverty rates across disability severity is the employment rate. Given 81.5 percent of individuals with severe disabilities reported no paid employment hours (compared to only 46.3% of those with mild disabilities) it is reasonable to assume their employment incomes would be lower. The proportion of singles in poverty was higher than couples, for both persons with disabilities and persons without disabilities. This may be due, in part, to social programs available to singles failing to meet the MBM poverty line in BC. Single persons with disabilities who receive the maximum benefit provided by social assistance programs in BC, would receive 77% of the income required to meet their MBM Level (Petit & Tedds, 2020). Persons without disabilities were reported to experience deeper poverty than persons with disabilities. We suspect this observation is due, in part, to social programs for persons with disabilities living in BC that provide a higher income benefit than programs designed for persons without disabilities (Petit & Tedds, 2020). A greater proportion of a Canadian persons with disabilities' income is provided by social programs than a persons without disabilities (Berrigan et al., 2020). Couples also experienced greater depth of poverty than singles, likely due to their overall higher MBM Level.

We feel the poverty rates calculated in this study likely underestimate the experiences of persons with disabilities in Canada. The conceptual challenge with any binary poverty measurement is it does not account for precarious living circumstances above the poverty line (Dufour et al., 2021). An illustration of such an individual is the person with an MBM disposable income of \$1 more than their MBM Level. They are not captured in the metric as in poverty, but for all intents and purposes, would live the same life as someone with \$2 less MBM disposable income, classified as impoverished. There are likely several persons with disabilities with income just above the MBM poverty line but incurring higher costs to participate in society than persons without disabilities.

4.2 Updates to the MBM

In 2020 the MBM was updated based on Statistics Canada consultations with interested parties. The result of this process was the creation of the 2018-base for the MBM, which increased the poverty line in all provinces with an updated methodology. Compared to the previous MBM, the updated poverty line designated 810,000 more people to be living below the poverty line (Djidel et al., 2020).

The methodology changes that pertain most to this discussion were updates to the "Shelter", "Other Spending" and "Non-discretionary Goods" (Djidel et al., 2020). The shelter component increased due to inclusion of only 3-bedroom units, not the combination

of 2- and 3-bedroom apartments. Other spending increased by the inclusion of cell phone services. Changes to the non-discretionary goods category of the MBM take three forms: changes to medical expenses, updates to account for Canadians who own their homes and changing capital gains tax inclusions. The change most relevant to persons with disabilities is the adjustment to the medical expenses, whereby people without tax filings for medical expenses will be replaced by a three-year average of expenses from the Survey of Household Spending from the 1990's. While we welcome this change, we feel this income reporting is likely underreported. Over the past 20 years, healthcare expenses on pharmaceuticals have outpaced other spending (Lee et al., 2020). Pharmaceuticals are not covered under the national Medicare system, and thus the majority (approximately 56%) are often paid by private sources including out-of-pocket (Lee et al., 2020).

4.3 MBM Costs Associated with Disability

We feel the MBM underestimates poverty among persons with disabilities because the additional cost associated with disability is not fully captured. Ideally, accounting for diverse severity and functional needs and inequalities within and between households are both essential to accurate poverty measurement (Coudouel et al., 2002). It is not typical for the design of disability support programs to consider severity or different functional needs currently. For example, the Disability Tax Credit is a non-refundable tax credit designed to promote horizontal equity by recognizing persons with disabilities face higher expenses that are out of their control, however it is a set dollar amount that doesn't change with severity or functional needs associated with a disability (Dunn & Zwicker, 2018; Smart & Stabile, 2006). Provincial and federal disability income assistance and support programs recognize these additional costs of daily living for persons with disabilities by providing supplementary support (Torjman, 2018). These higher social assistance payments for persons with disabilities, benchmarked against the same MBM Level as persons without disabilities reduce the measured poverty rate. Designers of social assistance programs should consider the additional cost of disability not only when choosing financial benefits, but also in the metrics used to assess poverty and the impacts on other decisions such as hours of work before benefits are clawed back (Petit et al., 2020).

Our findings highlight some additional costs for persons living with disability, which align with a findings from review across 10 countries (Mitra et al., 2017). Some additional cost is captured by the MBM within the non-discretionary spending category, however, these deductions are standardized for the average Canadian. We conclude there are methodological challenges that reduce the accuracy of realized non-discretionary spending of persons with disabilities living in Canada. Non-discretionary expenses are estimated from tax records and calculated from the Survey of Household Spending (Hatfield et al., 2010). Tax-based methods have important considerations for low-income individuals and persons with disabilities. Both populations are less likely to use tax credits and may have low tax filing rates. For example, the disability tax-credit utilization rate is only 40 percent in Canada (Dunn & Zwicker, 2018). Low-income populations often do not have enough income to write off their medical expenses, so the expenditures of likely underestimated. In consultations for the second revision of the MBM, Statistics Canada has recognized the problems associated with using tax filings to estimate medical expenses and the new methodology will provide an estimate of medical expenses from the 2017 Survey of Household Spending (Djidel et al., 2019). While this is great progress, we believe there is still systematic bias against low income persons with disabilities. The Survey of Household Spending does

not conduct disability-specific sampling for persons with disabilities. In fact, no Canadian disability spending survey has been administered since the 2006 Participation and Activity Limitation Survey, which found 95.3 percent of respondents had out-of-pocket spending due to disability (Roy & Chahin, 2016).

The non-discretionary spending that is captured only accounts for select expenses like some caregiving, assistive devices and aids, and prescription pharmaceuticals. Our analysis suggests significant unmet need and out-of-pocket expense on these categories, despite their integral role in supporting and encouraging full participation in society (World Health Organization, 2020). This unmet need is despite the Government of BC's more than \$5 billion per year of programs and services for persons with disabilities (Government of British Columbia, 2020). Poverty measures based on expenditure (like the MBM) do not capture unmet needs because they are foregone non-discretionary spending.

Caregiving represents a cost to both persons with disabilities and their family members. While our study estimates 36.1 percent of persons with disabilities have non-reimbursed expenses for professional caregiving services, families often provide unpaid services. A persons with disabilities' family composition changes the relation to their most likely caregiver (Sect. 3.4), but the emergent trend is many receive unpaid additional caregiving support from members of their community (Fig. 2). While we highlight unpaid caregiving costs to families, out-of-pocket expenses such as living expenses, health expenses and transportation costs/fuel may also be incurred (Mitra et al., 2017). In addition to the realized caregiving services received, nearly two-thirds of respondents indicated their current caregiving services do not meet their needs (Table 3). Unmet needs are important within the context of poverty measurement as persons with disabilities with low-income are much more likely to have unmet caregiving needs (Turcotte, 2014). Resultantly, out-of-pocket expenses, such as those reported in Table 2, would be much higher for these populations.

4.4 MBM Housing and Family Equivalency Scale

For persons with disabilities, core-housing need is greater with high shelter-cost relative to income and a greater percentage of persons with disabilities live in homes in need of both major and minor repairs. The types of minor repairs described such as defective steps and siding are all problematic for persons with disabilities. While previous research cautions against comparing individual MBM components, based on the way costs equalize, housing is a component that warrants greater attention (Frchet et al., 2010). For example, BC residents face pressures to attain affordable housing, described in Vancouver as "crisis-level affordability" (Royal Bank of Canada, 2018). The MBM is commonly criticized for its undervalued housing component. In recent consultations, 93 percent of respondents across Canada indicated the shelter component value was "too low" (Heisz, 2019). Programs aimed at providing access to affordable housing units ease this burden but, with current funding, do not have the capacity to address these issues. Housing is important to poverty, as rising expenditures on housing (from increased costs) have been shown to reduce food expenditure (Kirkpatrick & Tarasuk, 2011).

Notably, fewer persons with disabilities than persons without disabilities live in a family resembling the MBM reference family household. As such, a greater proportion of persons with disabilities rely on the family equivalency scale to estimate their poverty line than the rest of the population. Using this scale, housing for a single individual is valued at half of

the reference family.⁹ Since bachelor apartments rent for 62 to 85 percent of two-bedroom apartments across BC in 2019, the MBM implies singles are not living alone (Canadian Mortgage & Housing Corporation, 2020). Individuals with low income find alternative housing, like roommates, however, persons with disabilities do not experience the same options when seeking housing and may need support in their living arrangement. Persons with disabilities are, more often than persons without disabilities, forced by their circumstances to take whatever living arrangements are available (Fisher et al., 2019). “Many ‘choose’ between institutional or group home settings, and life with their parents or other family members” (Torjman, 2018). Insufficient accessibility measures and affordable housing options for result in a lack of opportunities to live independently with a friend and/or personal support assistant (Torjman, 2018). Consequently, many persons with disabilities live in an institutional setting, a group not captured in our sample given the limitations in the CSD.

4.5 Revising the MBM for Persons with Disabilities

Future directions for revising the MBM for persons with disabilities would consist of two parts: (1) quantifying the additional costs incurred by persons with disabilities and (2) modifications to the MBM to reflect the additional costs incurred by persons with disabilities. First, as suggested by Mitra et al., (2017) data is essential to estimate the extra costs of disability (Mitra et al., 2017). Surveys that could be modified to collect the data necessary for this analysis. For example, in Canada disability-specific collection of the Survey of Household Spending (SHS) could be created using the same screening questions for the 2017 CSD or SHS sections included within the next iteration of the CSD. This would inform how much additional income is required for persons with disabilities to reach a similar standard of living to a persons without disabilities.

Second, a disability modifier to the MBM Level is needed. Based on our analysis, the most appropriate modification to the MBM would include different poverty lines for persons with more severe and less severe disabilities, based on the former having increased barriers and costs to participate in society. A sensitivity analysis could be constructed with a range of additional costs for persons with disabilities (based on previously published data) to estimate poverty levels using different modifiers than the family equivalency scale. These modifiers would address two issues discussed throughout the present study. The MBM reference family bears no resemblance to the average family containing a person with disabilities. The second issue is that the family equivalency scale used in the MBM, the square root rule, is not sensitive to differences in expenses for persons with disabilities and their families. Statistics Canada has indicated an agenda for ongoing research to improve the methodology for different family sizes and the other goods component of the basket (Djidel et al., 2020). Opportunities to conduct further research into persons with disabilities considerations may prove to be a prudent course, one in four BC residents are persons with disabilities, yet this population account for nearly one-third of BC residents living with poverty by current measurement. This overrepresentation is more apparent among those with increased severity of disabilities.

⁹ The reference family shelter-component is the median rental value of a two and three-bedroom apartment.

4.6 Data Limitations

CSD sampling limitations are important to recognize for this analysis. This survey cannot reach homeless populations, indigenous populations living on-reserve, persons in long-term care and nursing home, and persons living in institutions (i.e., correctional facilities, religious facilities, or other collective dwellings) (Statistics Canada, 2017a, 2018). These demographics are likely to include many impoverished, low-income persons with disabilities because, for example, those in collective dwellings are likely some of the most severe persons with disabilities.

The 2017 CSD is the second iteration of this cross-sectional survey; however, comparisons are not allowed because of sampling methodology changes. Resultantly, we cannot follow trends such as poverty rate changes over time. The use of self-reported variables may introduce additional error within estimates. Lastly, the CSD was conducted in 2017 so it does not reflect the experiences of persons with disabilities after the introduction of the 2018 Poverty Reduction Strategy, a major policy in Canada.

5 Conclusion

As the MBM assumes all individuals are healthy and there is currently not a disability identifier in the MBM analysis, we suspect poverty rates among persons with disabilities are underestimated. While this study focuses on the MBM, findings are important to consider for other poverty measures. Importantly, this underestimation is despite the reality that persons with disabilities already experience higher rates of poverty than those without disabilities. Another important implication of this study is the need to clarify what basic needs should be considered for persons with disabilities and that simply raising earnings above the MBM level does not necessarily mean a persons with disabilities will not be impoverished.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11205-022-02900-1>.

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Data Availability Data were retrieved through the Statistics Canada—Research Data Centres Program. Only deemed employees of Statistics Canada can access microdata files. All outputs were validated and vetted by Statistics Canada analysts. Information regarding the Research Data Centres can be found here <https://www.statcan.gc.ca/eng/microdata/data-centres>.

Code Availability Code can be provided upon request.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval Not applicable.

Consent to Participate Not applicable.

Consent for Publication Not applicable.

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