

Food insecurity in households with persons with disabilities in a situation of extreme vulnerability in Brazil: a secondary cross-sectional analysis



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Summary

Background Inequities in access to education, work and health care are striking among persons with disabilities, making this population more vulnerable to poverty, lack of access to basic services and violation of rights such as access to food. Household food insecurity (HFI), marked by precarious income, has increased among persons with disabilities. In Brazil, the Continuous Cash Benefit (In Portuguese, Benefício de Prestação Continuada - BPC) is the guarantee of a minimum wage for persons with disabilities as a measure to promote social security and access to income in a situation of extreme poverty. Thus, the objective of this study was to assess HFI among persons with disabilities in extreme poverty in Brazil.

Methods A cross-sectional study with national representation was carried out with data from the 2017/2018 Family Budget Survey, with moderate and severe food insecurity as the dependent variable, and the situation of food insecurity measured using the Brazilian Food Insecurity Scale. Prevalence and odds ratio estimates were generated with 99% confidence intervals.

Findings Approximately 25% of households experienced HFI, with a higher prevalence in the North Region (41%), receiving up to 1 income quintile (36.6%), with a female (26.2%) and black person (31%) as a reference. The analysis model found that region, per capita household income, and social benefits received in the household were statistically significant factors.

Interpretation The BPC proved to be an important source of household income for persons with disabilities living in extreme poverty in Brazil: in almost three-quarters of the households, it was the only social benefit received, and, for most of them, it represented more than half of the total household income.

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Keywords: Brazil; Disabled persons; Food insecurity; Poverty; Social vulnerability

Introduction

Persons with disabilities (PWD) experience worse living conditions, such as poor education, unequal employment opportunities and inadequate access to health care.¹⁻³ Their required disability-related services are often neglected, and their everyday lives are surrounded by exclusion, violence, abuse, prejudice, or disrespect because of their

disabilities.¹ In addition, they have a higher cost of living associated with health care and rehabilitation, assistive devices, special diets, personal assistance, transport, and other specific needs than non-disabled person. As a result, this population is more likely to face poverty, including poor housing, lack of access to safe water and sanitation, and limited financial resources for food.¹⁻³

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Research in context

Evidence before this study

Inequities in access to education, work and health care are striking among persons with disabilities (PWD) in Brazil, making this population more vulnerable to poverty and household food insecurity (HFI). Previous studies have indicated that in households with PWD unable to work, exposure to HFI is greater, that is, income limitation implies food insecurity. Income transfer programs have been adopted in some countries as income guarantee measures. In Brazil, the Continuous Cash Benefit (In Portuguese, Benefício de Prestação Continuada - BPC) is the guarantee of a minimum wage for person with disabilities as a measure to promote social security and access to income in a situation of extreme poverty. Considering limited access to income for PWD, the relationship between income and HFI and the importance of social policies to reduce inequalities, we searched Pubmed and Scielo databases for articles published in English and Portuguese, in the last 10 years, that have investigated HFI, the sociodemographic profile and economic conditions of PWD. As search terms, "Persons with Disabilities", "Food Insecurity", "Poverty" and "Social Vulnerability" were used. There are still few studies that investigate the sociodemographic and economic conditions of PWD and that relate it to exposure to HFI. For data analysis, we used public data from a nationally representative survey of the Brazilian population called the Family Budget Survey (Pesquisa de Orçamentos Familiares - POF), one of the most important surveys in the country. Although, the POF does not directly investigate the presence of PWD in households and we

considered those with BPC beneficiaries under the age of 65, as the only eligibility criterion for receiving the benefit would be disability.

Added value of this study

We highlight the originality of the study, the socioeconomic conditions and food insecurity of households with PWD in Brazil had not yet been investigated. In fact, studies on inequalities in health and nutrition of PWD in Brazil are scarce, evidencing the social invisibility of this population. Evidence suggests that BPC is an important source of household income for person with disabilities living in extreme poverty in Brazil and can contribute to the food security of this population.

Implications of all the available evidence

The vulnerability of the population with disabilities impacts access to food insecurity. The HFI investigation, considering the quantitative, qualitative and psychological dimensions of access to food conditional on sufficient family income to purchase food, may be related to the living and health conditions of this population, including access to social security through the BPC. The findings suggest the relevance of generating visibility to a group under-discussed in the academic field, contributing to the discussion on social inequalities and public policies for minorities in Brazil. Highlighting the importance of the BPC for access to income, contributing to the reduction of inequalities and the most serious levels of HFI of the PWD.

Disability is consistently related to an increase in household food insecurity (HFI) across different populations and geographic settings,^{2,4,5} with a higher risk among younger disabled adults and those with mental disabilities.^{2,4} In the United States in the years 2009/2010, HFI was higher both in households with a working-age adult with a disability that prevented work (33.5%) and in those with a labour force-excluded working-age adult (24.8%) than in households with no working-age adult with a disability (12.0%).⁶ In 2018, these numbers barely changed: HFI was present in 33.0% of households with a member with work-limiting disabilities and 22.4% of those with disabled working-age adults in the labour force.⁷

To minimize these inequities, many countries around the world, such as Chile, Bangladesh, India, and South Africa, provide income support for PWD through unconditional cash transfers.^{1,8} In Brazil, this income support is provided by the Continuous Cash Benefit (In Portuguese, Benefício de Prestação Continuada - BPC) for persons with all types of disabilities in great poverty who have a monthly per capita family income below a quarter of the current minimum wage⁹⁻¹¹ (in 2018, was

equivalent to \$238.5 Brazilian reais - BRL or \$74.5 United States dollars USD, considering its average price of \$3.2 in January of the same year).

Although there are other benefits guaranteed by law in Brazil, BPC is the only one intended for PWD living in great poverty. Providing the amount of one minimum monthly salary to these subjects, BPC is the only social assistance benefit guaranteed by the Brazilian Federal Constitution of 1988.⁹⁻¹¹ It represents approximately 80% of the family budget of PWD, and for almost half of them, it is the only source of family income.¹⁰

Studies on the sociodemographic characteristics, living conditions and health of BPC beneficiaries, that is, PWD in a situation of extreme poverty in Brazil, are scarce.¹²⁻¹⁴ However, the impact of this benefit on improving living conditions, reducing poverty and mitigating the income inequality of beneficiary families was shown to be significant.¹⁵⁻²¹

The current dimension of HFI and its associated factors in BPC beneficiaries still need to be studied to guide decision-making in public policies and to quantify the care provided by health and social care professionals to PWD in situations of extreme social vulnerability. The

hypothesis of this study is that families composed of PWD are more exposed to HFI.

Thus, the aim was to investigate the prevalence of HFI and the socio-demographic and economic conditions of PWD in great poverty in Brazil based on data from the Family Budget Survey 2017/2018.

Methods

This was a cross-sectional population-based observational and analytical study with an analysis of public domain microdata from the 2017/2018 Family Budget Survey developed by the Brazilian Institute of Geography and Statistics (IBGE). The STROBE reporting standard (Strengthening the Reporting of Observational Studies in Epidemiology) was adopted to guide the research design.

Based on the census sectors of the 2010 Brazilian Demographic Census, the IBGE defined a single sample for the other population surveys, called the master sample, consisting of a set of primary sampling units. Thus, in the household budget survey, the two-stage cluster sampling design, with geographic and statistical stratification, defined the primary sampling units and permanent private households, from the master sample. The primary sampling units of the 2017/2018 Family Budget Survey were selected by simple random sampling. Likewise, private households were selected, which correspond to private households, selected for each primary unit of private units with probability proportional to the number of private households in the sector. A total of 57,920 Brazilian households were interviewed from July 2017 to July 2018 and made up the sample, classifying the 2017/2018 Family Budget Survey as one of the largest population-based surveys in Brazil.^{22–24} More details on the design of the household budget survey can be found in the first results release report released by the IBGE.²⁴

A total of 2178 households were identified with at least one resident receiving BPC. Among these households, only those with beneficiaries under 65 years of age ($n = 1251$) were included in the study. We adopted this criterion to ensure that BPC was received due to the presence of a disability and not due to age since the 2017/2018 Family Budget Survey did not have any questions to investigate directly the presence of PWD in the household. Thus, households in which no resident was a beneficiary of the BPC or that had beneficiaries aged 65 or over were considered ineligible.¹⁰

The features of the households of persons with disabilities assisted by the BPC were drawn in relation to the region [North; Northeast; South; Southeast; Center-West], territory [urban area; rural area], number of residents in the household [up to 3 residents; from 4 to 6 residents; 7 or more residents], number of PWD in the household [1 person; more than 1 person] and social benefits received at home [only BPC; BPC and other(s)]. Household income per capita [in quintiles] was calculated considering the sum

of gross monetary and nonmonetary earnings of all family members. The first quintile of income represents 1/5 of the poorest population (lowest income) and the fifth quintile the richest 20% of the population (highest income). The degree of dependence on the BPC for household income [up to 30%, from 30 to 50% and above 50%]. Biological sex defined based on self-report [male; female], racial identity [white; black; asian/indigenous, birracial], and schooling [no schooling; elementary school I/II; high school or university education] of the reference person in the household were also included for analysis, defined as the person considered to be the primarily responsible for the household, that is, the person responsible for the family's decisions, regardless of being the one who received the BPC.^{22–24}

Food insecurity, defined as limited access to safe and nutritious food in sufficient quality and quantity,²⁵ was assessed in this study using the Brazilian Food Insecurity Scale,²⁵ which classifies HFI based on available household income. It is a psychometric scale that assesses the interviewee's perception of access to food, in terms of quality and quantity, in the three months prior to the interview. Composed of 14 dichotomous questions [yes/no], each affirmative answer adds one point to classify the level of HFI in the household or indicate its absence - food security, when all answers are negative.²⁵ Food security is present when there is no concern or possible limitation in access to food, and the HFI can be present in three levels of severity: mild HFI, when there is concern about access to food or replacing food with cheaper options; moderate HFI, when the limitation of food occurs or there is reduced access to food, reflecting a rupture in the dietary pattern; and severe HFI, when access to a sufficient quantity of food is also compromised, which may indicate hunger.²⁵ In this study, the outcome variable was the occurrence of the most severe forms of HFI in the household (moderate or severe HFI), treated dichotomously [yes/no].

Given the complexity of the data from the household budget survey, the sampling unit and the sample weight provided by IBGE were analyzed. The prevalence and respective 99% confidence intervals (99% CI) were estimated for a descriptive analysis of the sociodemographic characteristics of Brazilian households with at least one PWD. To assess the association between the study variables and moderate/severe HFI, the chi-square test was used, and variables that presented p values <0.01 were considered statistically significant. The logistic regression model was used to verify the odds ratio (OR) for the occurrence of moderate/severe HFI. The households in which resident was a beneficiary of the BPC as the exposure variable. The way of controlling the variables used was all study variables were considered in the bivariate model. However, those with p values <0.05 in the bivariate analysis were considered in the adjusted model (region, per capita household income and social benefits at home).

Verification of multilinearity was performed, evaluating independent variables that can correlate. In the adjusted model, the variables were tested together, and a stricter criterion was adopted to verify the associations; those that presented values of $p < 0.01$ were considered significant. Results were expressed as ORs and respective 99% CI.

In the 2017/2018 Family Budget Survey sample, each household represents a group of households in the population, associated with a sample weight or expansion factor.²⁴ The expansion factor allows obtaining estimates for the sample population of the research, thus the sample data are expanded for the Brazilian population.²⁴ The analyses of this study were performed using STATA software version 16.0 (StataCorp LP, College Station, United States) using the Survey Data Analysis command (svy prefix), used before any command, manages the research analysis settings, being able to designate variables that contain information about the research sample design (sample unit and sample weight, for example). The command can also specify characteristics such as the number of sampling stages, sampling method and analysis patterns. Missing data, expected due to the complexity of the survey, were treated by imputation procedures conducted by IBGE. The procedure was used for the attribution of expenditure or income values, when total or partial non-response occurred, as well as for rejected values, identified as response errors in the critical review stage also conducted by IBGE.²⁴

According to Resolution No. 466 of December 12, 2012 from the National Committee of Ethics in Research (CONEP), for studies that use secondary data available in the public domain, as in this study that used data available in the public domain from the Brazilian Institute of Geography and Statistics, approval by a local Ethics Committee CEP-CONEP System is not required.

Role of the funding source

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Results

The investigated households were predominantly located in urban areas (78.3%; 99% CI 73.5–82.5) and located in the Northeast (43.7%; 99% CI 38.1–49.4) and Southeast Regions (32.0%; 99% CI 26.0–38.5) (Table 1).

The households were mostly composed of up to three residents (55.6%; 99% CI 51.0–60.3) and only one person with a disability (91.3%; 99% CI 88.0–93.7). The reference person in the household was mostly brown (54.9%; 99% CI 49.9–59.7), female (55%; 99% CI 49.7–60.1) and had a low education level (Table 1).

The average per capita household income (which included money received from the BPC) was \$312.73

United States Dollars (USD). In the reference period of the study (January 15, 2018), this amount was equivalent to approximately one Brazilian minimum wage (\$954.00 BLR), considering the average exchange rate of \$3.20 USD during this period. On average, the BPC contributed 45.7% (99% CI 42.9–48.4) of household income, and in 52.9% (52.9%; 99% CI 42.1–63.4) of households, it contributed more than half of the household income. In 74.1% (99% CI 69.3–78.3) of households, the BPC was the only social benefit received (Table 1). Also, 40.8% (99% CI 36.2–45.6) of the households with PWD receiving BPC were in a situation of food security, with 34.1% (99% CI 29.5–39.1) with mild HFI, 16.2% (99% CI 12.6–20.6) with moderate HFI, and 8.9% (99% CI 6.6–11.7) with severe HFI.

In the bivariate analysis, the prevalence of moderate/severe HFI was higher in the North Region (41%; 99% CI 27.8–53.6) and lower in the South Region (9.0%; 99% CI 3.8–19.9). Moderate/severe HFI was also lower in households with per capita household income in the 5th quintile (15.6%; 99% CI 8.8–26.0), that is, among those with the higher income, compared to households in other lower income brackets (Table 2).

When investigating the strength of the association between moderate/severe HFI and sociodemographic variables, there was statistical significance in the crude analysis for region, per capita household income, and social benefits received at the household level (Table 3). After adjustment, the odds ratio of moderate/severe HFI was found to be approximately five times higher in the North Region (OR = 5.5; 99% CI 1.8–16.4) and approximately three times higher in the Central-West (OR = 3.9; 99% CI 1.3–12.0), Northeast (OR = 3.0; 99% CI 1.1–9.0) and Southeast Regions (OR = 3.0; 99% CI 1.0–8.9) compared to the South Region of Brazil (Table 3). In households where the per capita household income was in the 1st quintile (OR = 2.6; 99% CI 1.1–5.8) or in the 2nd quintile (OR = 1.9; 99% CI 1.0–4.3), the odds ratio of moderate/severe HFI was approximately twice as high as in the other income brackets (Table 3).

Discussion

In Brazil, the BPC is a social benefit guaranteed by law, and its main objective is to grant the assisted population the inalienable right to social assistance. This benefit is of paramount importance for PWD, as it guarantees a minimum monthly income for individuals who can prove that they do not have the means to provide for themselves in terms of their livelihood and quality of life.^{9–11}

Thus, in the present study, the BPC proved to be an important source of household income for families with PWD. In almost $\frac{3}{4}$ of the households, BPC was the only social benefit received, and for most of them, it represented more than half of the household income. A similar situation was reported in a study carried out in

Variables	n ^a	% ^b	99% CI ^c
Region			
North	185	8.9	6.5–12.0
North east	609	43.7	38.1–49.4
Central-West	143	7.8	5.7–10.6
South	89	7.7	5.4–10.7
Southeast	225	32.0	26.0–38.5
Location of the household			
Urban area	919	78.3	73.5–82.5
Rural area	332	21.7	17.5–26.5
Household per capita income (quintile)^d			
1 (36.3–156.2)	251	18.6	15.1–22.7
2 (156.3–219.0)	250	18.9	15.5–22.9
3 (219.1–300.6)	250	21.2	17.0–26.0
4 (300.7–404.2)	250	20.5	16.8–24.8
5 (404.3–4695.8)	250	20.8	17.0–25.2
BPC contribution to household income			
<30%	57	19.0	9.8–33.7
From 30 to 50%	109	28.1	20.8–36.8
More than 50%	194	52.9	42.1–63.4
Social benefits in household			
Only BPC	916	74.1	69.3–78.3
BPC and others	335	25.9	21.6–30.7
Number of residents			
Up to 3 residents	677	55.6	51.0–60.3
From 4 to 6 residents	474	36.2	31.8–40.7
7 or more residents	100	8.2	5.7–11.6
Number of persons with disabilities in the household			
1 person	1143	91.3	88.0–93.7
More than 1 person	108	8.7	6.3–12.0
Race of the reference person in the household			
White	364	31.4	26.8–36.3
Black	164	13.3	10.0–17.4
Asian/Indigenous	7	0.4	0.1–1.6
Biracial	714	54.9	49.9–59.7
Sex of the reference person in the household			
Male	585	45.0	39.9–50.3
Female	666	55.0	49.7–60.1
Education of the reference person in the household			
No schooling	262	21.3	17.4–25.8
Elementary School I/II	746	61.6	56.8–66.2
High school/University education	243	17.1	14.0–20.7

Note: Sample weights were considered for all variables studied. Brazil, 2017/2018 Family Budget Survey. ^aNumber of observations considering the expanded data. ^bPrevalence. ^c99% Confidence interval. ^dAmounts in United States dollars, considering the average exchange rate of \$3.20 during the survey period.

Table 1: Characteristics of the households with persons with disabilities receiving Continuous Cash Benefit (BPC).

the State of Rio de Janeiro, in which 100% of persons with disabilities were completely dependent on social assistance for their income and this was primarily provided by the BPC, since 80% of households did not receive any other type of benefit.¹³ In Brazil, the Northeast and Southeast regions have the largest population,^{24,26} and in this study presented the highest prevalence of households of PWD receiving social

benefits. This scenario, already reported in previous national studies,¹⁹ may reflect the higher percentage of persons with disabilities in these regions (9.9% and 8.1%, respectively), pointed out by the latest National Study on Health.²⁶

Another point worth mentioning is the regional inequality of moderate/severe HFI observed in this study, which was approximately five times higher in the

Variables	Moderate/severe HFI						p-value ^d
	Yes			No			
	n ^a	% ^b	99% CI ^c	n ^a	%	99% CI ^c	
Region							0.0020
North	76	40.1	27.8–53.6	109	59.9	46.4–72.1	
North east	157	26.6	21.1–32.9	452	73.4	67.1–79.1	
Central-West	28	25.9	15.9–39.3	115	74.1	60.6–84.1	
South	9	9.0	3.8–19.9	80	91.0	80.1–96.2	
Southeast	42	22.5	14.2–33.7	183	77.5	66.3–85.8	
Location of the household							0.7092
Urban area	233	24.8	20.0–30.3	686	75.2	69.7–80.0	
Rural area	79	26.1	19.0–34.8	253	73.9	65.2–81.0	
Household per capita income (quintile) ^e							0.0022
1 (36.3–156.2)	97	36.6	26.7–47.9	154	63.4	52.1–73.3	
2 (156.3–219.0)	74	28.3	20.0–38.3	176	71.7	61.7–80.0	
3 (219.1–300.6)	60	25.4	16.8–36.5	190	74.6	63.5–83.2	
4 (300.7–404.2)	45	20.9	12.7–32.4	205	79.1	67.6–87.2	
5 (404.3–4695.8)	36	15.6	8.8–26.0	214	84.4	73.9–91.2	
BPC contribution to household income							0.0907
<30%	10	17.7	4.9–47.5	47	82.3	52.5–95.1	
From 30 to 50%	20	15.0	7.7–27.2	89	85.0	72.8–92.3	
More than 50%	59	30.4	20.6–42.4	135	69.6	57.6–79.4	
Social benefits of household							0.0081
Only BPC	204	22.4	17.9–27.7	712	77.5	72.3–82.1	
BPC and others	108	32.6	24.1–42.3	227	67.4	57.7–75.9	
Number of residents							0.6146
Up to 3 residents	159	23.8	18.3–30.3	518	76.2	69.7–81.7	
From 4 to 6 residents	123	26.0	20.0–33.0	351	74.0	67.0–80.0	
7 or more residents	30	29.7	14.9–50.4	70	70.3	49.6–85.0	
Number of persons with disabilities in the household							0.6557
1 person	283	25.3	20.9–30.2	860	74.7	69.8–79.1	
More than 1 person	29	23.0	13.1–37.2	79	77.0	62.8–86.9	
Race of the reference person in the household							0.3511
White	76	23.2	16.4–31.8	288	76.8	68.2–83.6	
Black	48	31.0	17.9–48.1	116	69.0	51.9–82.1	
Asian/Indigenous	1	0.4	0.02–4.6	6	95.6	53.7–99.7	
Biracial	187	24.9	19.9–30.8	527	75.0	69.2–80.1	
Sex of the reference person in the household							0.4852
Male	135	23.7	18.1–30.5	450	76.3	69.5–81.9	
Female	177	26.2	20.4–32.9	489	73.8	67.1–79.6	
Education of the reference person in the household							0.4515
No schooling	77	26.7	19.2–35.8	185	73.3	64.1–80.8	
Elementary School I/II	185	26.0	20.6–32.1	561	74.0	67.9–79.3	
High school/University education	50	21.2	12.9–32.7	193	78.8	67.3–87.0	

Note: Sample weights were considered for all variables studied. Brazil, 2017/2018 Family Budget Survey. ^aNumber of observations considering the expanded data. ^bPrevalence. ^c99% Confidence interval. ^dChi square test. ^eAmounts in United States dollars, considering the average exchange rate of \$3.20 during the survey period.

Table 2: Association between sociodemographic variables and moderate/severe household food insecurity (HFI) in households with persons with disabilities receiving Continuous Cash Benefit (BPC).

North Region, followed to a lesser extent by the North-east, Central-West and Southeast Regions when compared to the South Region of Brazil, the region with the highest socioeconomic indices in the country. The results of the present study follow the national trend

observed in the general population, in which moderate/severe HFI was approximately five times higher in the North and Northeast Regions than in the South Region of Brazil.²³ When evaluating severe HFI in Brazilian regions, Gubert and Pérez-Escamilla (2018) observed a

Variables	Moderate/severe HFI			
	Bivariate model		Adjusted model	
	OR ^a	99% CI ^b	OR	99% CI ^b
Region				
North	6.8 ^e	2.3–19.8	5.5 ^a	1.8–16.4
North east	3.7 ^e	1.4–9.7	3.0 ^e	1.1–9.0
Central-West	3.5 ^e	1.2–10.8	3.9 ^e	1.3–12.0
South	1.0 ^c		1.0 ^c	
Southeast	2.9 ^e	1.0–9.7	3.0 ^e	1.0–8.9
Location of the household				
Urban area	1.0 ^c			
Rural area	1.1	0.6–1.8		
Household per capita income (quintile)^f				
1 (36.3–156.2)	3.1 ^e	1.4–7.0	2.6 ^e	1.1–5.8
2 (156.3–219.0)	2.1 ^e	1.0–4.6	1.9 ^d	1.0–4.3
3 (219.1–300.6)	1.8	0.8–4.2	1.7	0.7–4.1
4 (300.7–404.2)	1.4	0.6–3.4	1.3	0.5–3.2
5 (404.3–4695.8)	1.0 ^c		1.0 ^c	
BPC contribution to household income				
<30%	1.0 ^c			
From 30 to 50%	0.8	0.1–4.3		
More than 50%	2.0	0.4–9.4		
Social benefits of household				
Only BPC	1.0 ^c		1.0 ^c	
BPC and others	1.7 ^e	1.0–2.7	1.3	0.8–2.3
Number of residents				
Up to 3 residents	1.0 ^c			
From 4 to 6 residents	1.1	0.7–1.8		
7 or more residents	1.3	0.5–3.5		
Number of persons with disabilities in the household				
1 person	1.0 ^c			
More than 1 person	0.9	0.4–1.8		
Race of the reference person in the household				
White	1.0 ^c			
Black	1.5	0.6–3.5		
Asian/Indigenous	0.1	0.07–2.9		
Biracial	1.1	0.6–1.8		
Sex of the reference person in the household				
Male	1.0 ^c			
Female	1.1	0.7–1.8		
Education of the reference person in the household				
No schooling	1.3	0.6–2.8		
Elementary School I/II	1.3	0.7–2.5		
High school/University education	1.0 ^c			

Note: Sample weights were considered for all variables studied. Brazil, 2017/2018 Family Budget Survey. ^aOdds ratio. ^b99% Confidence interval. ^cReference category. ^dp-value < 0.05. ^ep-value < 0.01. ^fAmounts in US dollars, considering the average exchange rate of \$3.20 US dollars during the survey period.

Table 3: Odds Ratios (OR) and 99% confidence intervals (CI) of the association between sociodemographic variables and moderate/severe household food insecurity (HFI) in households with persons with disabilities receiving Continuous Cash Benefit (BPC).

heterogeneous distribution profile, highlighting an increased prevalence in the Northeast (6.7%) compared to the South Region (1.9%). They also highlighted a marked difference in the distribution of intraregional prevalence of severe HFI, with large discrepancies between municipalities in the Northeast Region

(18.6%–0.8%) and smaller differences between municipalities in the Southeast Region (0.7%–4.9%).²⁷

In Brazil, the distribution of HFI is based on the inequities of society. In strata of greater economic, social and demographic vulnerability, the prevalence of HFI tends to be higher.²³ In this study, for the Southeast

and Central-West Regions, the prevalence of moderate/severe HFI observed in PWD receiving BPC was higher than that observed in the general population in these regions (8.7% and 12%, respectively²³), when compared to the South Region.

Other factors may contribute to sociodemographic inequalities in receiving BPC benefits, such as differences related to the dissemination of information about benefit programs to the population, little access to places where PWD can apply for the benefit, low availability of professionals for medical expert evaluation, heterogeneity in the form of assessment of disability and incapacity for work, among others. In addition, the social movements of PWD and support organizations in different regions of the country tend to be heterogeneous and heavily influenced by the historical and social formation of each region, which directly impacts access to education and health.^{2,16}

The receipt of BPC benefits by PWD occurred more frequently in urban regions, which accounts for 83.2% of PWD in Brazil.²⁶ But although the majority of PWD live in urban areas, the proportion of benefit receivers is still likely to be related to its greater ease of access in urban areas, since these are the sites in Brazil that concentrate the best services of health, transportation, education, and others. The rural regions of the country still have limited geographic access to social and health services, which are also more precarious when compared to urban areas. In rural areas, the absence of Brazilian civil registration documents is also common, which creates obstacles to requesting the benefit; in addition, difficulties related to topography, the road system or the absence of social security agencies within a reasonable distance are obstacles in accessing medical evaluation points that allow person to receive the benefit.¹⁶

In this study, almost 60% of households of PWD receiving BPC had some degree of HFI, a prevalence similar to that of a household-based survey (64%) developed in 2009 involving 961 PWD receiving BPC benefits in 543 Brazilian municipalities.¹⁴ The magnitude of HFI identified in this study was almost double that observed in the Brazilian population (36.7%)²³ and also exceeded the prevalence of HFI of PWD indicated in international studies (between 22.4% and 33.5%).^{6,7} This fact highlights the extreme social vulnerability that PWD dependent on social benefits endure in Brazil. The high HFI values also express the changes in eating patterns resulting, among other factors, from political crises in the country, culminating in a lack of food at home. Hunger, then, seems to reach higher levels than those found in households that do not have PWD.²⁷

It was also observed that the lower the household income, the greater the frequency of HFI: in the poorest families, with a per capita household income in the 1st or 2nd quintile, moderate/severe HFI was approximately twice as high as in other families. Given the

inequities that permeate the lives of PWD, these results highlight the fact that social benefits are the main source of income for these individuals. That is, these social benefits may be insufficient to mitigate social inequalities and prevent HFI and hunger. PWD may need a higher income to overcome the material hardship imposed by their disability and maintain food security than persons without disabilities, as observed in a previous study by She and Livermore (2007).²⁸ According to these authors, for a PWD incapable of working to reach the same level of food security as a person without disability, both on the poverty line, the annual income of the PWD would need to be more than 2.5 times higher. Thus, the disregard of the intersectional barriers that permeate social vulnerability among PWD makes disability benefits often inadequate to prevent HFI across the population.² In Brazil, Law 14176 was enacted in 2021, which increases the limit value of monthly family income per capita to request the benefit from $\frac{1}{4}$ minimum wage to $\frac{1}{2}$ minimum wage. This measure seeks to increase the breadth of BPC coverage for PWDs, and its impacts should be investigated in future research.²⁹

It is important to highlight that the 2017/2018 Family Budget Survey form did not contain questions about the presence of PWD in Brazilian households. Therefore, an inherent limitation of this study was the assessment of only BPC beneficiaries under 65 years of age, since elderly person above this age without disabilities living in great poverty can also receive this benefit. By restricting the age of the beneficiaries to less than 65 years of age, we assumed that the only reason for receiving BPC was the presence of a disability. As the total number of PWD in the survey was unknown, it was not possible to estimate the prevalence of HFI in all Brazilian households with PWD and in households of PWD living in great poverty and not receiving BPC, as well as comparing the HFI between PWD receiving and not receiving BPC. Therefore, the presence of households with BPC beneficiaries over 65 years of age and with a disability can not be ruled out and would infer a level of underestimation to our results. Yet, the known reduced information and access to BPC and the significant level of PWD living in great poverty and not receiving BPC was not captured in the survey and suggests our estimated number would be underestimated. Furthermore, the stratification of data by sex and race of residents of the person of reference was limited by the size of the sample.

Still, this study innovatively presents the magnitude of HFI for the most vulnerable PWD in the country, which has never been addressed in Brazilian population studies. This directly contributes to the development and implementation of public policies aimed at reducing poverty and guaranteeing human rights, especially in a population that experiences numerous prejudices in society. The development of transversal

policies including PWD is a challenging topic for public health policy-makers in Brazil, especially in the context of public policy dismantling since 2016. The political crises that have widened since 2018 and more recently the COVID-19 pandemic make the situation more difficult, and the perspective is that, in the coming years, person with extreme vulnerability will suffer even more from an increase in food insecurity, thereby increasing social inequalities in Brazil.³⁰

Households of persons with disabilities who receive the Continuous Cash Benefit have a high prevalence of food insecurity, which is unequal in magnitude in different regions of the country. These individuals depend heavily on this social benefit; however, it seems to be insufficient to prevent food insecurity in the households of persons with disabilities in Brazil.

The fragility of social policies in guaranteeing social rights of this population is accentuated by the absence of studies and national surveys on the impact of the Continuous Cash Benefit on the health, nutrition and food security of persons with disabilities. Interdisciplinary and intersectoral discussions in civil society and academia are essential to guide public policies aimed at population equity, reducing prejudice and fighting hunger and poverty, especially in Brazil.

Contributors

U.V.B. conceived the idea and design of the study, contributed to the administration and execution of the project, interpreted the statistical data and wrote the manuscript. E.C.d.S.A.R. contributed to the analysis and the interpretation of statistical data, in the execution and visualization of the manuscript and helped in the writing of the manuscript. A.V.d.A.R. contributed to the curation and analysis of the data, applying statistical and computational techniques, interpreted the data and assisted in the writing of the manuscript. R.S.-C. contributes to the methodology and design of the study and to the interpretation of statistical data. A.A.F. contributes to the supervision, coordination and planning of the study, methodology and study design, interpretation of statistical data and writing of the manuscript. All authors who assisted in writing the manuscript and read and approved the final manuscript.

Data sharing statement

This study analyzed public domain microdata from the Family Budget Survey (2018), made available by the Brazilian Institute of Geography of Statistics at its electronic address <https://www.ibge.gov.br/estatisticas/sociais/saude/24786-pesquisa-de-orcamentos-familiares-2.html?&t=microdados>.

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Declaration of interests

All authors declare that there is no conflict of interest.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.lana.2022.100417>.

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