Governmental programmes associated with food insecurity among communities of descendants of enslaved blacks in Brazil

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Abstract

Objective: To assess the access to government programmes and their association with food insecurity (FI) in families from *quilombolas* communities in Brazil.
Design: An analysis of secondary data from the 2011 *Quilombolas* Census was performed in Brazilian territories. The Brazilian Household Food Insecurity Measurement Scale (*Escala Brasileira de Insegurança Alimentar*, EBIA) was used to assess the household FI status. The relationships of governmental programmes with the levels of FI were estimated using logistic regression models.
Setting: Greater national survey census of food and nutritional security of the recognised *Quilombolas* Brazilian territories.
Participants: Totally, 8743 *quilombolas* families.
Results: The prevalence of household FI was 86·1 % (moderate/severe FI: 55·9 %, 95 % CI 54·8, 56·9). After adjustment for socio-demographic variables, access to rural development programmes (Food Acquisition Program: OR: 0·6, 95 % CI 0·4, 0·8, *P*-value < 0·01) and health programmes (Center for Family Health Support: OR: 0·5, 95 % CI 0·5, 0·7, *P*-value < 0·001) is inversely and significantly associated with moderate/severe FI. The Brazilian conditional cash transfer programme (*Bolsa Família*) was associated with *quilombolas* families with moderate/severe levels of FI (OR: 3·3, 95 % CI 2·8, 4·0, *P*-value < 0·001).
Conclusions: The prevalence of FI was high among *quilombolas* families. Despite reduced participation in governmental programmes, rural development, agriculture and conditional cash transfer programmes are fundamental to the autonomy of *quilombolas* communities. In spite of the low participation, when families are able to access these programmes, the study revealed the importance of these initiatives in reducing the likelihood of severe levels of FI.

Quilombolas communities were formed during the colonial period in resistance to the slave system to which black slaves from Africa were subjected in Brazil[1]. Despite the abolition of slavery in 1888, only after a century, through the Federal Constitution of 1988, did *quilombolas* acquire official recognition of their identity and the right to own their own land[2]. This population lives in communities called *quilombos*, which mostly comprise black-skinned and brown-skinned descendants of the enslaved, maintain the form of social organisation of their ancestors and have unique relations with the land and specific cultural practices[3].

Brazil owes a historic debt to *quilombolas*. They exist in a context of ethnic–racial discrimination and social exclusion, have the worst socio-economic indicators and, as one of the most evident problems, experience food insecurity (FI)[4–8]. With a goal of combatting hunger, poverty and FI, the Brazilian government has invested in public policies aimed at guaranteeing food and nutrition security (FNS) as an intervention strategy[9–11]. Evaluation of FI at the household level through hunger perception scales, such as the Brazilian Household Food Insecurity Measurement Scale (*Escala Brasileira de Insegurança Alimentar,* EBIA), has been established as an adequate approach for evaluating this outcome among population surveys[12–15].

The Brazilian national FI survey[16] revealed a picture of inequality. Populations of people with black or brown skin had a much higher prevalence of FI than populations of other colour/race. These data reinforce the historical social and racial inequities in the country[17]. The relationship

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between colour/race and FI is complex and interconnected with other determining factors, including poverty and public policies that guarantee access to health and food[18].

There is little information about this population. To date, the existing studies suggest that the population is socio-economically vulnerable, in addition to experiencing difficulties accessing their territories and having adequate food access and health[4–8]. However, there are still knowledge gaps regarding access to FNS related to governmental programmes (GP) as a way of reducing hunger and poverty in this group. The objective of the current study was to assess access to GP and their association with FI among *quilombolas*. The analyses of the GP presented in this research investigated whether *quilombolas* families were able to access GP and, among those that did, how this related to the FI in their homes.

Methods

Microdata from a national survey, the *Quilombolas* Census[19], that was carried out from April to November 2011 were used. The target population was represented by 169 *quilombolas* communities, which corresponded to 9193 families that had received judicial titles for their territories between 1995 and 2009[20]. More methodological details were published in the technical report of the *Quilombolas* Census[20]. The current study did not consider families without a member who declared themselves *quilombolas* (n 2510; 2·7 %), living outside the *quilombo* territory (n 75; 0·9 %), whose head of household was a teenager (age < 15 years; n 3; 0·03 %) or with missing data (n 121; 1·3 %). Thus, a final sample of 8743 families (95·1 %) was considered.

The EBIA was established as a tool for measuring household FI in population studies[19]. It is an experience-based scale adapted from the US Household Food Security Survey Module that has been validated for use in the Brazilian population since 2003[21–23]. The theoretical underpinning of this instrument is that it considers FI to be a progressive phenomenon experienced at the household level with different levels of severity[24]. As FNS is a multidimensional issue, it is challenging to define instruments that can measure it at the population level. The EBIA measures the prevalence of FI, but it does not cover the 'nutrition' dimension of the FNS so that households can be classified according to food security or FI level[21]. The FNS is considered in its broad concept to dialogue with FI and to guide public policies to promote health, nutrition and healthy eating. The FI measure, performed by the EBIA, is used to monitor food security in population studies.

Nevertheless, the EBIA has consistently been shown to be psychometrically valid[21,23], which reinforces its suitability for monitoring FI through prevalence studies, identifying risk groups, such as *quilombolas* communities[6] and studying the causes (e.g. poverty) and consequences (e.g. dietary and health outcomes) of FI[25–27]. It is a scale composed of fourteen dichotomous items (yes/no) for households with children and/or adolescents under 18 years of age and eight items for households with only adults. Based on the sum of affirmative responses to the EBIA, households were classified into four categories: food security, mild FI, moderate FI and severe FI. In the current study, the categories of moderate and severe FI were considered together due to interest in discussing the most severe levels of FI.

The GP related to FNS promotion were identified and categorised into four groups. The GP constituting a set of actions planned to guarantee the offer of and access to food for the entire population and promote nutrition and health were selected. These GP were categorised according to their area of activity and are in the guidelines of the FNS policy proposed by the working group of the Brazilian National Council for Food and Nutrition Security[28,29]. The GP were evaluated through questions considering the participation of *quilombolas* in 'rural development' programmes, including the National Program of Family Agriculture Strengthening (*Programa Nacional de Fortalecimento da Agricultura Familiar*), the Food Acquisition Program (*Programa de Aquisição de Alimentos*), Family Farm Insurance (*Seguro da Agricultura Familiar*), Rural Technical Assistance and Extension (*Assistência Técnica e Extensão Rural*) and crop guarantee (*Garantia-safra*); in 'health' programmes, including home visits by a community health agent (*agentes comunitários de saúde*) and the Center for Family Health Support (*Estratégia Saúde da Família*); in 'food or water supply' programs, including food baskets (*cestas de alimentos*) and the Cisterns Program (*Programa Cisternas*); and in 'income increase' programs, including Brazilian conditional cash transfer (*Bolsa Família*) and Continued Benefit Transfer (*Benefício de Prestação Continuada*).

Considering that GP have different eligibility criteria, that is, that some are specific to families with different types of vulnerability (e.g. poverty or extreme poverty, participation in family farming, presence of individuals with low education, presence of elderly people or families living in specific regions), the current study assessed eleven GP independently. Participation in the programmes was considered according to an affirmative response for one or more policies within each of the above categories.

The groups, GP, characteristics, goals and target audience are described in Fig. 1. The rural development categories cover five policies related to family farming, as they operate with rural credit lines and infrastructure and technical assistance[30–33]. The health category was composed of two GP considering policies for the promotion, prevention and surveillance of health and quality of life[32,34]. Another two GP comprised the food or water supply group, which included donations of basic food baskets for emergency situations and the production of cisterns with rainwater harvesting for low-income and socially vulnerable families[31,32]. The income increase group was organised considering the programmes that adopt initiatives to supplement the beneficiaries' income in the short and long terms[32,35].

Group*	Governmental programmes	Characteristics and goals	Target audience
Rural development	National Program of Family Agriculture Strengthening	Offer credit for investment in equipment and improvements in properties, increase generation, generate income and improve the use of family labour	Traditional communities, farmers and family farmers
	Food Acquisition Program	Federal Government purchases milk from family farming cooperatives or associations and communities linked to the National Program of Family Agriculture Strengthening and donates to people in situations of food and nutritional insecurity	Families with children, nursing mothers, pregnant women or the elderly, registered in the Federal Government's social program system, beneficiaries of the Family Cash Transfer and individuals served by social assistance networks receive milk donations
	Family Farm Insurance	Assist producers who have their crops affected by climatic adversities	Family farmers who access agricultural funding funding linked to the National Program of Family Agriculture Strengthening
	Rural Technical Assistance and Extension	Technical assistance services to improve production, strengthen family farming, improve income and promote sustainable development	Rural and traditional producers, family farmers, settlers, *quilombolas* and indigenous
	Crop Guarantee	Guarantee income for farmers who have suffered crop losses due to drought or excessive water.	Family farmers residing in municipalities affected by drought or floods and who had severe loss in agriculture of a product
Health	Home visit by a community health agent	Members of the Primary Health Care team and the community, know the territory and the population, identify health problems, guide families and refer them to the health unit for more detailed assessment. They also follow the conditionalities of the Bolsa Família Program	General population
	Center for Family Health Support	Health strategy focused on Primary Health Care, strengthens the entry to the Brazilian Unified Health System through the actions of multiprofessional health teams and promotes quality of life and health for the entire population	General population
Food or water supply	Food Baskets	Ensure food distribution to specific population groups that are in an emergency, such as hunger and social vulnerability.	Families of landless rural workers, traditional communities and victims of public calamities
	Cisterns Program	Facilitate access to drinking water for consumption and food production in dry areas through low-cost technology for rainwater storage in cisterns	Low-income rural families in the Brazilian semiarid affected by drought or lack of drinking water with priority for traditional peoples and communities
Income increase	Brazilian conditional cash transfer (*Bolsa Família*)	Monthly income transfer that varies according to the number of eligible individuals in the household	Families with per capita income below the poverty line
	Continued Benefit Transfer	Transfer of a monthly minimum wage	Elderly or people of any age with physical, mental or sensory impairments

Fig. 1 Group, governmental programs, characteristics and goals and target audience. *Free translation of governmental programmes. Sources: Brazil, Lei 10·420, de 10 de abril de 2002; Ministério do Desenvolvimento Agrário, 2010; Secretaria de Políticas de Promoção da Igualdade Racial, 2013; Ribeiro et al., 2017; Brazil, Portaria 2·488, de 21 de outubro de 2011; Brazil, Decreto 6·214, de 26 de setembro de 2007

A structured questionnaire on household socio-demographic characteristics was applied to assess data on the head of household (gender, age, marital status and educational level) and household characteristics (number of residents, number of children under 5 years of age, electricity, adequate sanitation and adequate water supply). Adequate sanitation considered the collection of garbage and sewage in the home. The locations of the households were grouped according to the regions of Brazil (North, Northeast, South/Southeast and Central-West). The South and Southeast regions were considered together due to the small number of *quilombos* in each region and socio-demographic similarity.

Total monthly household income was estimated considering the sum of the income from all household residents (*Bolsa Família* benefit, paid work, pensions, the sale or cultivation of animals and the sale of handicrafts). Monthly household income was categorised as minimum wage multiples, considering the sum of all monthly income for the whole family. The Brazilian minimum wage was $US349·3 (R$545, where R$ is

Brazilian real) in 2011, and the corresponding average US dollar-real exchange rates was R$1·56 per US dollar.

The first step of the analysis consisted of estimating the distribution (%) of FI among the *quilombolas* families in the country and by region. A χ^2 test was performed to investigate the relations between the socio-demographic variables, the region of the country and FI. Descriptive analyses of the *quilombolas*' socio-demographic characteristics and GP were carried out. Subsequently, the prevalence and the respective CI (95 % CI) of the socio-demographic characteristics and access to GP were estimated according to the levels of FI. The three-level household FI-dependent variable considering three categories of FI (food security [reference level], mild and moderate/severe) was used in the bivariate analyses. Considering that the purpose of this article was to investigate whether *quilombolas* families had access to GP and to discuss this access, an analysis of each social programme and its relationship with the reduction of FI was conducted separately.

Multinomial logistic regression analysis was performed to estimate the OR and the 95 % CI. Statistical models were used to estimate the OR of each socio-demographic variable and GP separately considering the different inclusion criteria of the respondents in each program. The adjusted model for the effect of the socio-demographic variables was considered, and the level of 20 % was adopted for inclusion in the final model. The decision to adopt a conservative significance level of 20 % was based on the related literature[36,37]. Model adjustment tests were performed using the Akaike information criterion and variance inflation factor[38]. The analyses were performed using Stata 13.0 statistical software[39].

Results

The prevalence of FI was 86·1 %. The North (67·1 %) and Northeast (48·3 %) regions presented the highest proportions of moderate/severe FI, and the FI in the North region was higher than the national average (55·9 %) and 3·7 times greater than that in the South/Southeast region (14·4 %). Families in the South/Southeast region had 47·3 % food security; that is, they reported not having any concern about the lack of food in the future (Fig. 2).

Low participation in rural development programmes was observed. The coverage of the health GP was greater regarding the actions of home visits by a community health agent (75·0 %); however, 34·9 % of households reported accessing the Center for Family Health Support. The food or water supply GP were not as significant, as 31·9 % received food baskets and only 4·2 % accessed the Cisterns Program. *Bolsa Família* is among the programmes with the largest national coverage, yet 61·3 % of households reported receiving the benefit and 11·2 % accessed Continued Benefit Transfer (Table 1).

Analysis of the socio-demographic variables and FI categories (Table 2) revealed that the heads of household aged 31–40 years, in a married/consensual union, with 1–7 years of schooling, living in homes with ≥ 6 residents, living in homes with the presence of a child under 5, living in homes without electricity, living in homes with adequate sanitation,

with access to filtered water, living in homes located in the North region, or with a total monthly income between > ½ and ≤ 1 minimum wage were more likely to have moderate/severe FI (*P*-value < 0·05). Regarding participation in GP, 44·4 % of families that were included in the Food Acquisition Program were more likely to present mild FI, while those that received crop guarantee; received a home visit by a community health agent or who had received aid from the Center for Family Health Support, food baskets, the Cisterns Program, *Bolsa Família* or the Continued Benefit Transfer were more likely to have moderate/severe FI (*P*-value < 0·05).

After adjusting for all variables (except gender), we highlight that households with ≥ 6 residents had 23·3 (95 % CI 16·7, 32·4) times higher odds of experiencing moderate/severe FI than those with 1–2 residents. Similarly, the households located in the North region had 11·0 (95 % CI 6·9, 17·7) times higher odds of experiencing moderate or severe FI than those located in the South/Southeast region. *Quilombolas* with access to the Food Acquisition Program and to the Center for Family Health Support presented a protective factor for moderate/severe FI (OR: 0·6, 95 % CI 0·7, 1·7; and OR: 0·5, 95 % CI 0·5, 0·7, respectively). Receiving *Bolsa Família* was significantly associated with the presence of moderate/severe FI (OR: 3·3, 95 % CI 2·8, 4·0) (Table 3). Variance inflation factor test indicated that there was no multicollinearity (variance inflation factor = 1·2)[38].

Discussion

Quilombolas can access any of the GP investigated in the current study. These GP were planned for the general population, which reinforces the importance of policies designed for and focused on the specificities of these communities. Each programme has different characteristics and is related to the promotion of FNS.

The latest national survey that investigated FI in Brazil[16] showed disparities between regions, where the North and Northeast regions had the highest proportions of FI. Considering the moderate/severe FI level, the panorama of
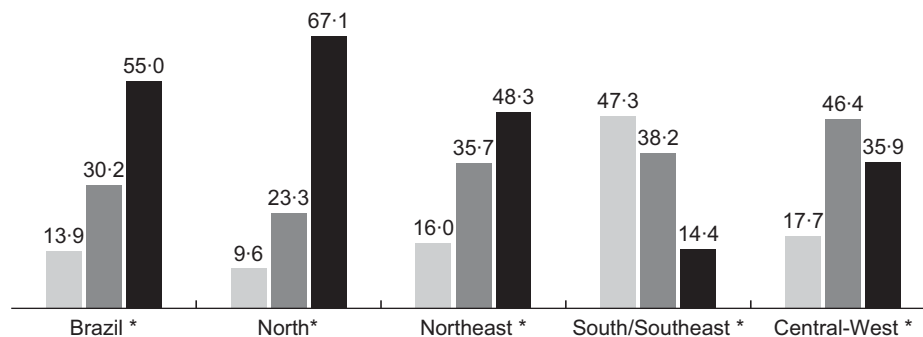

Fig. 2 Distribution (%) of food insecurity (FI) measured by the Brazilian Household Food Insecurity Measurement Scale (*Escala Brasileira de Insegurança Alimentar, EBIA*) among *Quilombolas* families in the country and by regions. Communities of descendants of enslaved blacks in Brazil, 2011. *χ^2 test indicates presence of difference between distribution in Brazil and the regions of the country (*P* < 0·001). ▨, Food security; ▨, mild FI; ▪, moderate/severe FI

Table 1 Descriptive analyses of the household food insecurity, socio-demographic characteristics and governmental programmes of *Quilombolas* families. Communities of descendants of enslaved blacks in Brazil, 2011

Study variable	n	%
Household food insecurity		
Food security	1190	13·9
Mild food insecurity	2585	30·2
Moderate food insecurity	1476	17·3
Severe food insecurity	3300	38·6
Socio-demographic characteristics		
Gender		
Male	5472	62·6
Female	3271	37·4
Age (years)		
15–19	127	1·5
20–30	1786	20·7
31–40	2021	23·4
41–50	1634	19·0
≥ 51	3056	35·4
Marital status		
Married/consensual union	6579	75·5
Single/divorced	2131	24·5
Educational level		
Illiterate/never studied	2031	23·6
1–7	5221	60·7
≥ 8	1345	15·7
Number of residents		
1–2	1796	20·5
3–5	4551	52·1
≥ 6	2396	27·4
Number of children under 5 years		
No child	5452	62·4
≥ 1	3291	37·6
Electricity		
Yes	7144	81·9
No	1581	18·1
Adequate sanitation		
Yes	452	5·2
No	8291	94·8
Adequate water supply		
Yes	5489	63·0
No	3218	37·0
Region		
North	4808	55·0
Northeast	2589	29·6
South/Southeast	344	3·9
Central-West	1002	11·5
Total monthly household income*		
≤ ½ minimum wage	2333	26·7
> ½ and ≤ 1 minimum wage	4880	55·8
> 1 minimum wage	1530	17·5
Access to governmental programmes		
National Program of Family Agriculture Strengthening	498	6·1
Food Acquisition Program	541	6·2
Family Farm Insurance	33	0·4
Rural Technical Assistance and Extension	112	1·4
Crop Guarantee	308	3·8
Home visit by a community health agent	6524	75·0
Center for Family Health Support	3025	34·9
Food baskets	2775	31·9
Cisterns Program	366	4·2
Brazilian conditional cash transfer (*Bolsa Família*)	5341	61·3
Continued Benefit Transfer	973	11·2

*Minimum wage in Brazil in 2011: $US 349.3 (R$ 545 (Brazilian real)).

regional inequality remained in the *quilombolas* population. It is worth mentioning that, in comparison to the other regions, these territories are less favoured socioeconomically,

with high proportions of FI and poor access to health services[16,40].

Brazil has been investigating FI through national surveys since 2003, and over the years, it has been possible to observe a significant reduction in FI[16]. However, the most recent census[16] indicated that despite the reduction in moderate/severe FI over the years (2003–2013), in 2018, there was a significant increase in all levels of FI. In addition, there have been indications that Brazil has returned to the list of countries that make up the hunger map[41,42], mainly after budget cuts to social programmes and a decrease in social protection networks. It should be noted that Brazilian population censuses do not include *quilombolas*.

The findings of previous studies that also used the EBIA to measure FI in *quilombos*[7,8,43] corroborate the present data. The authors of those studies also found a high prevalence of FI and referred to the importance of public policies for reversing this situation and fighting hunger, racial inequalities, precarious living conditions and difficulties in accessing services and rights.

An intersectional approach[44,45] is important for the recognition of the historical and cultural complexity that most *quilombolas* communities in Brazil experience daily. This is because members of these communities are black, are mostly descendants of slaves, live marginally in society and live in rural areas and regions with the worst economic and social indicators in the country.

One of the great challenges of affirmative action for *quilombolas* is the development and implementation of policies that meet the specificities of these culturally different communities. Faced with mobilisation and demands for the rights of this segment of the population, since the 2000s, political coordination and regulatory bodies have been created to protect the rights of racial and ethnic groups and the black population[46]. Actions include improving infrastructure, quality of life, local development and productive inclusion, which are coordinated mainly by the Brazil *Quilombolas* Program.

However, the current study revealed the low access of families to GP, especially rural development programmes. These government actions comprise some of the Brazil *Quilombolas* Program's primary tools. They are related to the production and availability of food and are aimed at family farms. According to the law that established the guidelines of the National Family Agriculture Policy[47], *quilombolas* are recognised as beneficiaries of this programme, which indicates that they are an eligible population for GP whose target audience is family farmers. However, it has been questioned whether these programmes were designed to meet the specificities of *quilombolas* or for family farmers.

Food production and access to land are important factors for reducing the consequences of the high prevalence of moderate/severe FI among *quilombolas* since this group has previous knowledge and agricultural practices inherited from their families, which reinforces the importance of valuing these customs and agricultural practices[20]. Thus, the

Table 2 Prevalence (%) and the respective confidence intervals (95 % CI) of the socio-demographic characteristics and access to governmental programmes according to the levels of household food insecurity (FI). Communities of descendants of enslaved blacks in Brazil, 2011

	Food security			Mild FI			Moderate/severe FI		
	n	%	95 % CI	*n*	%	95 % CI	*n*	%	95 % CI
Socio-demographic characteristics									
Gender									
Male	744	13·9	13·0, 14·9	1603	30·0	28·8, 31·2	2994	56·1	54·7, 57·4
Female	446	13·9	12·7, 15·1	982	30·6	29·0, 32·2	1782	55·5	53·8, 57·2
Age (years)*									
15–19	23	18·9	12·8, 26·8	25	20·5	14·2, 28·6	74	60·7	51·7, 68·9
20–30	210	11·9	10·5, 13·5	427	24·3	22·3, 26·3	1122	63·8	61·5, 66·0
31–40	217	10·8	9·6, 12·3	437	21·8	20·1, 23·7	1348	67·3	65·2, 69·3
41–50	153	9·6	8·2, 11·1	420	26·4	24·2, 28·6	1020	64·0	61·6, 66·3
≥ 51	571	19·3	17·9, 20·7	1233	41·6	39·8, 43·3	1160	39·1	37·4, 40·9
Marital status*									
Married/consensual union	815	12·7	11·9, 13·5	1698	26·4	25·3, 27·5	3923	61·0	59·8, 62·1
Single/divorced	365	17·5	15·9, 19·2	878	42·1	40·0, 44·6	841	40·4	38·3, 42·5
Educational level*									
Illiterate/never studied	310	15·7	14·1, 17·3	766	38·7	36·6, 40·9	902	45·6	43·4, 47·8
1–7	582	11·4	10·5, 12·3	1373	26·9	25·7, 28·1	3158	61·8	60·4, 63·1
≥ 8	265	20·1	18·0, 22·4	405	30·8	28·3, 33·3	647	49·1	46·4, 51·8
Number of residents*									
1–2	451	25·7	23·7, 27·8	1162	66·2	64·0, 68·4	141	8·0	6·9, 9·4
3–5	572	12·9	12·0, 13·9	1126	25·4	24·2, 26·7	2730	61·7	60·2, 63·1
≥ 6	167	7·0	6·1, 8·1	297	12·5	11·3, 13·9	1905	80·4	78·8, 82·0
Number of children under 5 years*									
No child	892	16·9	15·9, 17·9	2040	38·6	37·3, 39·9	2352	44·5	43·2, 45·9
≥ 1	298	9·1	8·1, 10·1	545	16·7	15·4, 18·0	2424	74·2	72·7, 75·7
Electricity*									
Yes	1059	15·2	14·3, 16·0	2084	29·8	28·8, 30·9	3840	55·0	53·8, 56·1
No	129	8·3	7·0, 9·8	496	32·0	29·7, 34·3	927	59·7	57·3, 62·1
Adequate sanitation*									
Yes	172	38·8	34·4, 43·4	152	34·3	30·3, 38·9	119	26·9	22·9, 31·2
No	1018	12·6	11·9, 13·3	2433	30·0	29·0, 31·0	4657	57·4	56·3, 58·5
Adequate water supply*									
Yes	705	13·1	12·2, 14·0	1604	29·8	28·6, 31·0	3074	57·1	55·8, 58·4
No	478	15·2	14·0, 16·6	968	30·9	29·3, 32·5	1688	53·9	52·1, 55·6
Region*									
North	449	9·6	8·8, 10·4	1093	23·3	22·1, 24·5	3148	67·1	65·8, 68·4
Northeast	406	16·0	14·6, 17·5	906	35·7	33·9, 37·6	1226	48·3	46·4, 50·2
South/Southeast	161	47·3	42·1, 52·7	130	38·2	33·2, 43·5	49	14·4	11·0, 18·6
Central-West	174	17·7	15·4, 20·2	456	46·4	43·3, 49·5	353	35·9	33·0, 39·0
Total monthly household income*,†									
≤ ½ minimum wage	455	20·0	18·4, 21·7	886	38·9	36·9, 40·9	937	41·1	39·1, 43·2
> ½ and ≤ 1 minimum wage	406	8·5	7·7, 9·3	1236	25·9	24·7, 27·1	3131	65·6	64·2, 66·9
> 1 minimum wage	329	21·9	19·9, 24·1	463	30·9	28·6, 33·2	708	47·2	44·7, 49·7
Access to governmental programmes									
National Program of Family Agriculture Strengthening	67	13·9	11·1, 17·3	157	32·6	28·5, 36·9	258	53·5	49·1, 57·9
Food Acquisition Program*	109	20·3	17·1, 24·0	238	44·4	40·2, 48·7	189	35·3	31·3, 39·4
Family Farm Insurance	4	12·1	4·6, 28·5	10	30·3	17·0, 48·0	19	57·6	40·2, 73·2
Rural Technical Assistance and Extension	17	15·7	10·0, 23·9	38	35·2	26·7, 44·7	53	49·1	39·7, 58·5
Crop Guarantee*	35	11·5	8·4, 15·7	112	37·0	31·7, 42·6	156	51·5	45·9, 57·1
Home visit by a community health agent*	925	14·5	13·6, 15·4	1949	30·5	29·4, 31·7	3509	55·0	53·8, 56·2
Center for Family Health Support	622	21·0	19·6, 22·5	977	33·0	31·3, 34·7	1362	46·0	44·2, 47·8
Food baskets*	493	18·1	16·7, 19·6	969	35·6	33·8, 37·4	1264	46·4	44·5, 48·2
Cisterns Program*	51	14·4	11·1, 18·4	145	40·9	35·8, 46·2	159	44·8	39·7, 50·0
Brazilian conditional cash transfer (*Bolsa Família*)*	444	8·5	7·7, 9·2	1137	21·7	20·6, 22·8	3665	69·9	6·6, 71·1
Continued Benefit Transfer*	168	17·8	15·5, 20·4	402	42·6	39·5, 45·8	373	39·6	36·5, 42·7

*Analysed variables that showed statistical significance in the bivariate analysis using the χ2 test and considering a significance level of *P* < 0·05.
†Minimum wage in Brazil in 2011: $US 349·3 (R$ 545 (Brazilian real)).

current study emphasises the role of including more investments in social policies that integrate technology and rural development. It is expected that greater food production in the territories can increase family income and, thus, the circulation of money due to the sale and purchase of products from these areas, which will help reduce social vulnerabilities and FI and encourage autonomy and income generation.

There was good coverage of visits by community health agents, and this service was a protective factor against FI. These agents are fundamental in different cultural contexts, such as the investigated population[48]. In a study conducted

Table 3 Unadjusted and adjusted OR and confidence intervals (95 % CI) of the relationship between socio-demographic characteristics and access to governmental programmes according to the levels of household food insecurity. Communities of descendants of enslaved blacks in Brazil, 2011

	Mild food insecurity				Moderate/severe food insecurity			
	Unadjusted OR	95 % CI	Adjusted OR	95 % CI	Unadjusted OR	95 % CI	Adjusted OR	95 % CI
Socio-demographic characteristics								
Age (years)								
15–19	0·5	0·3, 1·0*	0·4	0·2, 0·7**	0·5	0·3, 0·8**	0·8	0·4,1·5
20–30	1	0·8, 1·3	–		0·9	0·7, 1·0†	1·0	0·7, 1·3
31–40	1·0		1·0		1·0		1·0	
41–50	1·4	1·1, 1·7*	1·1	0·9, 1·5	1·1	0·8, 1·3	–	
≥51	1·1	0·9, 1·3	–		0·3	0·3, 0·4***	0·6	0·4, 0·7***
Marital status								
Married/consensual union	1·0		1·0		1·0		1·0	
Single/divorced	1·1	1·0, 1·3†	1·1	0·9, 1·3	0·5	0·4, 0·6***	1·6	1·3, 2·0***
Educational level								
Illiterate/never studied	1·6	1·3, 1·9***	1·3	1·0, 1·8	1·2	1·0, 1·4†	2·1	1·4, 2·2***
1–7	1·5	1·3, 2·0***	1·2	1·0, 1·5	2·2	1·9, 2·6***	1·7	1·4, 2·8***
≥8	1·0		1·0		1·0		1·0	
Number of residents								
1–2	1·0		1·0		1·0		1·0	
3–5	0·8	0·7, 0·9***	0·7	0·6, 0·9**	15·3	12·3, 18·8***	12·0	9·2, 15·6***
≥6	0·7	0·6, 0·8***	0·6	0·5, 0·9**	36·5	28·5, 46·7***	23·3	16·7, 32·4***
Number of children under 5 years								
No child	1·0		1·0		1·0		1·0	
≥1	0·8	0·7, 0·9**	0·9	0·8, 1·2	3·1	2·7, 3·6***	1·5	1·2, 1·9***
Electricity								
Yes	1·0		1·0		1·0		1·0	
No	2·0	1·6, 2·4***	1·5	1·2, 1·9***	2·0	1·6, 2·4***	1·5	1·2, 2·0***
Adequate sanitation								
Yes	1·0		1·0		1·0		1·0	
No	2·7	2·1, 3·4***	1·5	1·1, 2·0*	6·6	5·2, 8·4***	2·8	2·0, 3·9***
Adequate water supply								
Yes	1·0		1·0		1·0		1·0	
No	0·9	0·8, 1·00·8, 1·0†	0·8	0·7, 1·0*	0·8	0·7, 0·9**	0·9	0·8, 1·1
Region								
North	3·0	2·3, 3·9***	1·6	1·1, 2·20*00	23·0	16·5, 32·2***	11·0	6·9, 17·7***
Northeast	2·8	2·1, 3·6***	1·7	1·2, 2·3**	9·9	7·1, 14·0***	5·1	3·2, 8·1***
South/Southeast	1·0		1·0		1·0		1·0	
Central-West	3·2	2·4, 4·3***	1·7	1·1, 2·5**	6·7	4·6, 9·6***	3·8	2·2, 6·3***
Total monthly household income‡								
≤½ minimum wage	2·2	1·8, 2·6***	1·2	1·0, 1·6*	3·6	3·0, 4·2***	3·1	2·5, 3·9***
>½ and ≤1 minimum wage	1·4	1·1, 1·7***	1·8	1·4, 2·2***	1·0	0·8, 1·1	–	
>1 minimum wage	1·0		1·0		1·0		1·0	
Access to governmental programmes								
National Program of Family Agriculture Strengthening	1·1	0·8, 1·4	–		0·9	0·7, 1·2	–	
Food Acquisition Program	1·0	0·8, 1·3	–		0·4	0·3, 0·5***	0·6	0·4, 0·8***
Family Farm Insurance	1·1	0·4, 3·6	–		1·1	0·4, 3·3	–	
Rural Technical Assistance and Extension	1·0	0·6, 1·8	–		0·7	0·4, 1·3	–	
Crop Guarantee	1·5	1·0, 2·1†	1·5	1·0, 2·2†	1·0	0·7, 1·5	–	
Home visit by a community health agent	0·9	0·7, 1·0†	0·9	0·7, 1·1	0·8	0·7, 0·9**	0·8	0·7, 1·0

Table 3 *Continued*

	Mild food insecurity				Moderate/severe food insecurity			
	Unadjusted OR	95 % CI	Adjusted OR	95 % CI	Unadjusted OR	95 % CI	Adjusted OR	95 % CI
Center for Family Health Support	0·5	0·5, 0·6***	0·7	0·5, 0·8***	0·4	0·3, 0·4***	0·5	0·5, 0·7***
Food baskets	0·8	0·7, 1·0*	0·8	0·7, 1·0*	0·5	0·4, 0·6***	0·8	0·6, 0·9*
Cisterns Program	1·3	1·0, 1·8†	1·4	1·0, 2·1†	0·8	0·6, 1·1	–	
Brazilian conditional cash transfer *Bolsa Família*	1·3	1·1, 1·5***	1·4	1·2, 1·7***	5·5	4·8, 6·3***	3·3	2·8, 4·1***
Continued Benefit Transfer	1·1	0·9, 1·4	–		0·5	0·4, 0·6***	1·2	1·0, 1·6

*$P < 0.05$.
**$P < 0.01$.
***$P < 0.001$.
†$P < 0.20$.
‡Minimum wage in Brazil in 2011: $US 349·3 (R$ 545 (Brazilian real)).

with *quilombolas* from a community in the Northeast region, Amorim *et al.* (2013) observed that when someone fell ill, community agents were very much in demand and that most patients purchased medicines at health centres, reinforcing the importance of this system for this population[49].

There was a low prevalence of access to the Family Health Strategy program; nevertheless, the families that accessed it had protection against moderate/severe FI. Thus, the study highlighted the importance of the actions of multiprofessional health teams in promoting quality of life and health. Therefore, it is possible that with increased access to these health programmes, FI could be reduced in households.

The food baskets programme distributes food to specific population groups that are in emergency situations (e.g. hunger and social vulnerability), and the Cisterns Program[43] was developed to increase water access for families with low incomes in the semiarid Northeast region characterised by long periods of drought. The access of the entire population to a sufficient quality and quantity of food, including water, is a basic assumption of FNS[29]. The low access to these programmes can be explained, first, by the lack of regular distribution of food baskets, the lack of clarity and periodicity in the distribution of baskets and the insufficient amount of food received by families[8,51]. Even so, access to food baskets was a protective factor for families with mild FI, which can be explained by the distribution of baskets affecting food security at home at a more immediate level.

Bolsa Família and the Continued Benefit Transfer program are not specific to *quilombolas* but are policies that guarantee FNS and must be associated with other policies for access to health, education, infrastructure and employment[7]. To access *Bolsa Família*, it is necessary for the family to register in the cadastre for social programmes from the federal government and to comply with health and education conditions, such as monitoring the growth and development of children, keeping their vaccinations up to date and regularly attending school[52]. However, the low infrastructure offered to the communities can make it difficult to comply with these conditionalities and, consequently, block the receipt of the benefits.

Families that accessed *Bolsa Família* were almost three times more likely to experience moderate/severe FI. In fact, the relationship between extreme poverty is strongly associated with severe levels of FI, as demonstrated by the literature[53]. However, the household FI is not considered as an eligibility criterion for receiving the cash transfer in Brazil. The principal eligible criterion of *Bolsa Família* is the low monthly family income below the income cut-off point established by the programme[52], regardless of whether or not they are in severe forms of household FI. Therefore, considering the final adjusted model shown in Table 3, this article corroborated the focus of cash transfer between families with severe forms of FI, as observed in other studies[6,54,55], such as observed among *quilombolas*. However, despite the current study being a cross-sectional study and the impossibility of assessing the longitudinal effect of *Bolsa Família* to reduce FI, it is worth considering that in a recent study carried out by Palmeira *et al.* (2020)[56], the authors observed the effect of the cash transfer in reducing FI among families with strong social vulnerability.

The government's expectations and goals regarding policies were not met. In the data collection period, in 2011, the country was in a political, economic and social scenario marked by the encouragement of social policies aimed at FNS. However, since 2015, the Brazilian government has decreased investments in public policies to reduce FI in the country and to tackle extreme poverty[57], which may have mainly affected vulnerable populations such as *quilombolas*.

The current study has some limitations, the number of families varied for each social programme, which may have underestimated some associations. However, low access to GP should be considered, especially among those related to rural development. As for the population eligible for the Continued Benefit Transfer program, there is no information on which individuals had physical, mental or

sensory disabilities, which can be considered a limitation of the study. Even so, only those who reported having access to the social programme were considered in the analysis. The lack of studies that investigate these communities makes it difficult to compare previous findings with our findings, and previous studies evaluated small samples or isolated quilombos[12–16]. The Quilombolas Census investigated families that were owners of legalised territory and their rights; however, it did not analyse those without land titles that may have had the worst FI statuses and living conditions.

As this was a survey, it was not possible to assess the effectiveness of GP, since the best delineation for this type of investigation would consist of longitudinal data analysis, that is, the assessment of the level of household FI before and after the entry of families in GP whose goal is to reduce FI. Even so, considering that the Quilombolas Census has been the only national survey of FI in the quilombolas population with titled territories since its completion in 2011, it is worth considering the importance of the current study, even in light of its limit of not being able to assume the effectiveness of GP. We hope that our findings can contribute to the debate on racial inequality, FI and social exclusion and to mobilise new studies and more specific and effective GP for communities of descendants of enslaved blacks in Brazil.

Conclusions

Although Brazil is a pioneering country in its actions to confront FI, the scenario of social inequalities in relation to skin colour/race persists. The study's findings reinforced the widespread racial inequalities in access to adequate food and the presence of hunger in addition to highlighting the low education, income and poor sanitation of the investigated families.

The inclusion of quilombolas families in GP was low, which indicated the need to evaluate and reformulate public policies to promote racial equality and social development and to fight hunger that meet the specificities of these people. Among the five programmes that involve the rural development area, only the Food Acquisition Program presented a significant association with protection against moderate/severe FI, as did the health GP that provided access to the Center for Family Health Support. The monitoring and evaluation of FNS indicators and continuing efforts to implement social programmes to fight hunger to reduce the chances of FI are necessary, especially in the current political and social context of the country.

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