Food insecurity and associated factors among public policies beneficiaries in the municipality of Petropolis-RJ, Brazil

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Abstract

Brazil produces enough food to feed its population. However, millions of Brazilians continue to suffer from hunger. To combat poverty and hunger, innovative programs have been launched by the government. This cross-sectional study aimed to investigate the prevalence of food insecurity (FI) among beneficiaries of two local programs to combat hunger: food supply (FS) and popular restaurant (PR) as well as to establish the association between food insecurity and some markers of social inequality. In the municipality of Petropolis-RJ, Brazil, 195 families that benefit from these programs were assessed to investigate the FI by the Brazilian Food Insecurity Scale (EBIA). Socioeconomic and demographic variables were also evaluated. The prevalence of FI was 42.9% in the families that benefit from PR and 72.2% in the families included in the FS program. The number of family members, presence of family members under 20 and 6 years, economic level, family monthly per capita income, race of the head of the family, home ownership, type of construction and number of rooms of the household were significantly associated with food insecurity ($p<0.05$). Ensuring food security demands crucial coordinated actions involving the appropriate linkage between the structural policies and emergency interventions. It is not an easy task, especially in Brazil, historically marked by social inequality. The results were important to identify the most vulnerable families that should be prioritized for assistance measures. The first step has been taken, but much more remains to be done. Simple tools such as EBIA can be used to monitor and combat inequality.

Key words: Food Security. Social Inequity. Public policies. Nutrition Programs.

Introduction

According to the National Council for Food Security and Nutrition, Food and Nutrition Security (FNS) is the right of all citizens to regular and permanent access to quality food in sufficient quantity, without compromising access to other essential needs, based on health promotion, respecting eating practices, cultural diversity and environmental, economic and social sustainability.[1]

Although Brazil is 100% self-sufficient in food, IBGE data show that 39.8% of its citizens, equivalent to approximately 72 million people live in food insecurity (FI).[2] The Food and Agriculture Organization (FAO) estimates that Brazil has enough to provide up to 3,113 kcal/day per capita, well above the recommended minimum of 1,850 kcal/day. However, it is observed that 6% of brazilians (11.9 million) have a calorie intake continuously below this minimum recommendation.[3]

Access to food is the main determinant of FI in Brazil. The FNS is compromised when access to food is irregular or insufficient, or in cases where it is costly and undermines much of the total family income, hurting the satisfaction of other basic needs for a decent life. Increased access to food should be performed by increasing the purchasing power of the population and the reduction of the cost of food. However, these two mechanisms do not exclude the need for emergency programs to combat hunger.[4,5]

The "Fome Zero" program was created in 2003 with the main goal of eradicating hunger by mobilizing political, financial, technical and other resources. Recently, it was replaced by the "Brasil sem Miséria" program. The "Fome Zero" combined structural policies - aimed at tackling the root causes of hunger and poverty, specific policies - serving the needs of families in relation to acute situations of hunger and misery, and local policies - carried out by state and local governments based on local needs.[6]

Among the initiatives for cheaper meals, soup kitchens and alternative marketing channels have shown to be effective. Popular restaurants offer cooked meals of good quality, low cost, and are directed to the low income public who lives in urban areas, aiming to complement or provide part of their daily nutritional needs. Alternative marketing channels, such as low price shops and farmers markets, seek to provide quality food at a low cost to the population that has no permanent means to buy food in the private network.[4,7] Both actions contribute to increased production and distribution of food by small and medium enterprises, generating employment and income. Moreover, they also promote healthy eating habits and strengthening citizenship and the human right to adequate food.[1,8,9]

The present study aimed to investigate the prevalence of FI among the beneficiaries of the two local programs: food supply and popular restaurants, as well as establish the association between FI and some markers of social inequality.

Methodology

A sectional study was conducted between July and October 2009, with 195 beneficiary families of two local programs to combat hunger in the city of Petrópolis, RJ, Brazil. The convenience sample consisted of 90 families enrolled in the program for food supply - "Cesta Cheia, Família Feliz" (CCFF) -, living in the coverage area of a Family Health Strategy unit, and 105 recipients of the only Popular restaurant (PR) in the city. One representative from each family, aged over 18 years, with good knowledge on the family's eating dynamics, was interviewed.

A standardized questionnaire, with questions related to food security in the last three months and the family's socioeconomic conditions, was used. The FI was assessed by the Brazilian Food Insecurity Scale (BFIS), an adapted version of the scale proposed by the United States Department of Agriculture,[10] validated for application in urban areas in Brazil[11]. The instrument consists of 15 questions directed to a family member, with the goal of capturing, through the answers, the different dimensions of household food (in)security.

Among the 15 items of the instrument, nine are related to adults of the household and six are for the children. In each question of the scale, referring to the last three months, response options "yes" and "no" are assigned. If the answer is affirmative, the frequency of occurrence of the event is recorded in the period, with the following possible answers: "Almost every day", "a few days" and "only one or two days." The family was then classified into different levels of food security - food security, mild FI (fear of experiencing food insecurity in the near future), moderate FI (restriction on the amount of food in the family) or severe FI (hunger among adults and/or children in the family) as the sum of positive responses.[11]

Socioeconomic and demographic variables were also measured, including family composition, economic class, income, race/color, employment, education and marital status (of the head of the family), housing and sanitation, use of supermarkets or other resources for shopping for food and participating in other government social programs.

The economic class, according to Critério-Brasil (Brazilian Association of Market Research - ABEP) was classified as A, B, C, D and E, in descending order according to purchasing power. This equates to an average monthly income of US$ 1,600 for Class A, US$ 700 for Class B, US$ 290 for Class C, US$ 150 for Class A and US$ 80 for Class E.[12]

The prevalence of different levels of food (in)security was calculated into subgroups according to the socioeconomic and demographic variables. The chi-square test was used to assess the distribution of proportions of food (in) security was statistically different between the categories evaluated. We considered a p-value <0.05. The R 2.10.1 *software* was used for data analysis.

The project was approved by the Department of Labor, Social Welfare and Citizenship in the municipality of Petropolis and the Ethics Committee of the Faculty of Medicine of Petropolis, Faculty Arthur Sá Earp Neto and Hospital Alcides Carneiro. Data collection was performed after signing the consent form by the respondent as set out in Resolution CNS 196/96.

Results

Table 1 shows the results of the distribution of households according to the degree of food (in)security and sociodemographic factors. The prevalence of food insecurity among families benefiting from the popular restaurant (PR) was 42.9%, of which 28.6% had mild FI, 11.4% had moderate FI and 2.9% had severe FI. Among the households included in the food supply program "Cesta Cheia, Família Feliz" (CCFF), 72.2% had FI, being 48.9% mild DI, 16.7% moderate FI and 6.6% severe FI.

Table 1. Food Security Situation and socioeconomic characteristics of households benefited by the Popular restaurant and the food distribution program "Cesta Cheia, Família Feliz" from July to October 2009. Petrópolis, RJ.

Household Characteristic	Popular restaurant		"Cesta Cheia Família Feliz"	
	n	%	n	%
Food Security Situation				
Food Security	60	57.1	25	27.8
Mild Food Insecurity	30	28.6	44	48.9
Moderate Food Insecurity	12	11.4	15	16.7
Severe Food Insecurity	3	2.9	6	6.6

Socioeconomic class (ABEP)#				
A	2	1.9	-	-
B	12	11.5	1	1.1
C	60	57.7	44	50.6
D	29	27.9	38	43.7
E	1	1.0	4	4.6
*Monthly per capita family income (minimum wage)**				
< ¼	3	3.0	36	45.0
¼ – ½	24	24.2	33	41.2
½ – 1	34	34.3	11	13.8
1 +	38	38.4	-	-
Work situation of the head of the family				
Retired	49	46.7	15	16.7
Working	42	40.0	39	43.3
Working informally	4	3.8	13	14.4
Not working / unemployed	10	9.5	23	25.6
Education of the head of the family				
Illiterate / 3rd grade completed	23	22.1	22	25.3
4th grade completed	32	30.8	35	40.2
Primary education completed	17	16.3	19	21.8
Secondary education completed	25	24.0	11	12.6
Higher education completed	7	6.7	-	-
Participation in other programs				
Basic foods received at work	8	7.6	-	-
"Bolsa Família" Program	7	6.7	27	30.0
Other	7	6.7	7	7.8

#ABEP – Associação Brasileira de Empresas de Pesquisa; *Considering the minimum wage in 2009 (R$ 465 – US$245).

Families included in the CCFF had more unfavorable socioeconomic conditions, compared with the beneficiaries of the PR. The number of people in the household ranged from one to nine people, with mean and standard deviation (SD) of 4.3 ± 1.4 and 2.7 ± 1.5 for the beneficiaries of the CCFF and PR, respectively. About 60% of families included members under 20 years of age in both programs (mean and SD of 2.0 ± 1.3 residents in this age group per household for the CCFF and 0.6 ± 0.9 for the PR).

The dominant economic class in both programs was the C class (representing 57.7% and 50.6% of the beneficiaries of the CCFF and the PR, respectively), followed by the D class (27.9% and 43.7%, respectively). No family included in the CCFF presented per capita income superior to one minimum wage per month; in contrast, that income was more common among the beneficiaries of the PR. In the group of beneficiaries of the CCFF, approximately 25% of household heads had no paid work in the month before the interview or were unemployed, compared with 9.5% in the PR where retirees accounted for 46.7% of the beneficiaries.

The educational level of the heads of families served by the two programs was very low, with a high percentage of people who have studied up to 4th grade (65.5% and 52.9% for CCFF and PR, respectively). Moreover, among the beneficiaries of the CCFF, 30.0% were also receiving assistance from another government social program ("Bolsa Familia" - a federal income transfer program), compared with 6.7% in the PR.

Access to public water supply was reported by 62.9% of the beneficiaries of the PR and 75.6% of the CCFF, noting that 40.0% and 30.0% of households, respectively, had no drinking water. The sewage system was present in approximately 80% of households. A wide access to garbage collection was found, both in PR and CCFF, covering 98.1% and 100% of households, respectively.

Regarding ways of obtaining food, buying food in supermarkets was cited by most beneficiaries of PR (94.3%) and 90% of the beneficiaries of the CCFF. It is important to note that the food supply programs were the main way of getting food to the families included in CCFF (93.3%) and was reported by 32.4% of the beneficiaries of PR.

The bivariate analyzes used to investigate the relationship between FI and sociodemographic factors are shown in Table 2. Poverty was related to the prevalence of FI. Households classified as belonging to classes D and E, and with per capita income less than one quarter of the minimum wage per month, had the highest prevalence of FI. The influence of the number of inhabitants and the presence of persons under 20 years of age, presence of children under 6 in the household in the situation of food (in)security was also observed. A higher prevalence of FI was seen in households with four or more residents (64.1%), with members under 20 years of age (64.7%) and families with children under six years of age (69.7 %). A statistically significant difference in the prevalence of FI according to color/race of the head of the family was also found - 51.5% among whites and 61.9% among blacks or mixed race.

Economic indicators related to housing conditions also played an important role in the situation of food (in)security in the household. Approximately 65% of families who were not owners of their homes, 70% living in unfinished homes and 75% living in households with only one room were experiencing a FI situation.

No association was found between food security and participation in other government programs, but families who received some benefit tended to report higher levels of FI compared with those not included in other programs.

Table 2. Prevalence of food security according to sociodemographic variables of households benefited by the Popular restaurant and the food distribution program "Cesta Cheia, Família Feliz" from July to October 2009. Petrópolis, RJ.

Sociodemographic variables	Category distribution (%)	Food Security (%)	Food Insecurity		*P*-value
			Mild (%)	Moderate or Severe (%)	
Number of household members					
1 – 3	52.8	50.5	29.1	20.4	0.026
4 +	47.2	35.9	47.8	16.3	
Presence of residents under 20 years old					
No	40.5	55.7	25.3	19.0	0.007
Yes	59.5	35.3	46.6	18.1	
Presence of residents under 6 years old					
No	71.3	48.9	30.9	20.1	0.006
Yes	28.7	30.4	55.4	14.3	

Socioeconomic class (ABEP)#					
D – E	37.7	27.8	43.1	29.2	
C	54.5	48.1	39.4	12.5	0.002
A – B	7.9	73.3	13.3	13.3	
*Monthly per capita family income (minimum wage)**					
1 +	21.2	76.3	15.8	7.9	
½ – 1	25.1	48.9	37.8	13.3	< 0,001
¼ – ½	31.8	29.8	45.6	24.6	
< ¼	21.8	23.1	48.7	28.2	
Color/race of the head of the family					
White	50.0	48.5	40.2	11.3	0.033
Black or mixed race	50.0	38.1	36.1	25.8	
Home ownership					
Owner	62.1	48.8	39.7	11.6	0.006
Not owner	37.9	35.1	35.1	29.7	
Construction of housing					
Finished masonry	63.1	51.2	33.3	15.4	0.019
Other	36.9	30.6	45.8	23.6	
Number of rooms (bedrooms and living rooms)					
3 +	55.4	53.7	34.3	12.0	
2	32.3	33.3	47.6	19.0	< 0.001
1	12.3	25.0	29.2	45.8	
Participation in other programs					
Yes	25.6	34.0	42.0	24.0	N/A
No	74.4	46.9	36.6	16.6	

#ABEP – Associação Brasileira de Empresas de Pesquisa; *Considering the minimum wage in 2009 (R$ 465 – US$245).

Discussion

Approximately 43% of families benefiting from the popular restaurant (PR) and 72% of families included in the food supply program (CCFF) were classified in a situation of food insecurity. The socioeconomic and living conditions were less favorable among families assisted by the CCFF - greater participation in other social programs, low education, low income and, consequently, higher prevalence of lower economic classes - could explain the differences found. Moreover, the CCFF program assists families in precarious living conditions previously selected from a municipal registry, while the PR, although aimed primarily at low-income workers (formal and informal) and families at risk of FI, is accessible to the entire population. The prevalence of FI in both groups was higher than that reported by the Household National Sample Survey[2] for the state of Rio de Janeiro (28.3%) and Brazil (34.8%), presumably because the program attracts families more in need.

Studies conducted in other countries with populations vulnerable to FI observed a prevalence similar to that seen in the present study. The prevalence of FI was 76% among families with low and middle-income, with children enrolled in public primary schools in Bogotá, Colombia, [13] and 53.3% in families with at least one child under 12 years old in Peru.[14] Melgar-Quinonez et al., measuring FI in urban and rural areas, reported rates of 70.3% in Bolivia and 35.5% in the Philippines.[15] Piaseu & Mitchell found a prevalence of FI in 55.8% families in areas in need in Thailand.[16] In a study conducted in rural communities in Malaysia, Shariff and Khor identified a FI situation in 58% of families with low income.[17] The high prevalence of FI described above only reinforces that this is a complex and wide ranging problem.

The factors associated with FI included economic level, family income, home ownership, type of construction of housing and number of rooms in the home. These and other socioeconomic indicators were also associated with FI in other national studies[18,19] as well as international studies.[13,20-23] These associations are expected, the relationship with income and other related indicators is conceptual, since the access to food is the main determinant of FI in Brazil.[5] In addition to these indicators, the number of family members, the presence of residents under 20 years old, presence of children under 6 years old and color/race of the head of Family are also associated with FI in this study and have been documented in other researches.[17-19,24,25]

Even in cities where the human development index (HDI) is considered very high, comparable to developed countries, such as the city of Petrópolis (HDI = 0.804 in 2000),[26] programs that ensure access to food are essential. This need is due to the social inequality problem that plagues mainly developing countries. Unfortunately, despite a fall in the Gini coefficient in Brazil (from 0.64 in 1991 to 0.49 in 2009),[27] there is still a marked inequality and income remains highly concentrated as a result of historically accumulated distortions. In 2006, 10% of the population with the lowest income accounted for only 1% of Brazil's total income, while 10% of workers with higher incomes accounted for 44.4% of total income.[28]

Ensuring food security requires coordinated actions involving the appropriate links between structural policies - such as income distribution, employment generation, regulating the production and distribution of food, land reform, expansion of access to food, among others - and the emergency actions called compensatory policies. It is also essential to control food quality, monitoring nutritional status and health of populations and the promotion of healthy eating habits. In this context, the Food Security Policy in Brazil can be considered innovative, since it not only proposes mitigation measures in the short term, but also aims at structural changes, social inclusion and income distribution to the poor. Other positive aspects are the inclusion of hunger as a priority in the Brazilian political agenda and strengthening the participation and mobilization of society.[29]

The criteria used for the identification of vulnerable populations in the "Fome Zero" program show high sensitivity to poverty and hunger - include individuals who earn less than a dollar a day, the international poverty line established by the World Bank.[6] However, the low specificity in the selection of the target population, despite extending program coverage complicates the evaluation of results and impact.

Between 2001 and 2004, five million Brazilians went out of poverty and the reduction in income inequality was 4%. In 2006, the average income of the poorest 50% of the population has increased 11.99%. The mean income of the richest 10% rose 7.85%.[30] The reduction of inequality is attributed not only to economic growth,[31] but also to the increase in income of the poorest families, sponsored by the "Fome Zero" Program.[32]

Other developments related to food security in Brazil should be mentioned. More than 47 million children are served by the School Meal Program, one of the main sources of food access for poor families. Another program to be highlighted is the Food Acquisition Program, which has enabled 118,000 family farmers to increase their income.[33] In general, the impacts of such programs can be seen in the significant improvement of child health in the country - a reduction of 47% in infant mortality rates between 1990-2006 and a reduction in the proportion of children under two years of age with low weight from 12.7% in 2000 to 3.5% in 2006.[34]

Moreover, the nutritional quality of food is far from ideal, an important requirement of the concept of food security. Dietary diversity is associated with diet quality, and has been linked to many positive outcomes in the health of individuals.[35-37] Trends in food availability in Brazilian households over the past three decades reveal that food groups, including meat, dairy products, fruits and vegetables, are those whose participation in the diet increases uniformly according to the family's income level.[38]

Programs that provide food are criticized for not allowing families to choose their food, so it is essential to evaluate whether all food that is provided is consumed. It should be noted that both programs contribute to improving the quality of food to beneficiaries. In PR, the meals served are designed by nutritionists, and the CCFF distributes only healthy products - fruits, vegetables and eggs. However, including nutritional education actions promoting the adoption of healthy eating practices is essential. We highlight he government's efforts, supported by public policies, should be evaluated for possible adjustments. The investigation of the prevalence of FI in the assisted group represents a key step in this review.

Some limitations should be mentioned. First, the cross-sectional design limits the ability to make causal inferences between FI and the variables that can change over time, such as participation in other government programs and monthly income. Moreover, the lack of control for potential factors of confusion in the analysis allows only to identify differences in the food security situation according to socioeconomic and demographic variables.

Conclusion

The results were important to identify the most vulnerable families that should be prioritized in welfare measures. Furthermore, the high prevalence of FI in certain socioeconomic groups can confirm the inequality that remains in the city and demonstrate that programs are adequately reaching the target group. In the short term, food access in low-income communities is guaranteed.

Ensuring food security is not an easy task, especially in a country historically marked by social inequality such as Brazil. The first step has been taken, but much remains to be done. Simple tools, such as EBIA, can be used to monitor the social inequality and also help governments fight it.

The next steps include efforts to better understand the impact of social programs on household food security. It is also crucial to explore access to quality food at affordable prices among the families included in programs to fight poverty and FI.

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