Effects of a conditional cash transfer programme on child nutrition in Brazil

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Objective To examine the association between Brazil's *Bolsa Família* programme (BFP), which is the world's largest conditional cash transfer programme, and the anthropometric indicators of nutritional status in children.

Methods Using the opportunity provided by vaccination campaigns, the Brazilian government promotes Health and Nutrition Days to estimate the prevalence of anthropometric deficits in children. Data collected in 2005–2006 for 22 375 impoverished children under 5 years of age were employed to estimate nutritional outcomes among recipients of *Bolsa Família*. All variables under study, namely child birth weight, lack of birth certificate, educational level and gender of family head, access to piped water and electricity, height for age, weight for age and weight for height, were converted into binary variables for regression analysis.

Findings Children from families exposed to the BFP were 26% more likely to have normal height for age than those from non-exposed families; this difference also applied to weight for age. No statistically significant deficit in weight for height was found. Stratification by age group revealed 19% and 41% higher odds of having normal height for age at 12–35 and 36–59 months of age, respectively, in children receiving *Bolsa Familia*, and no difference at 0–11 months of age.

Conclusion The BFP can lead to better nutritional outcomes in children 12 to 59 months of age. Longitudinal studies are needed to confirm these findings.

Abstracts in عربي, 中文, Français, Русский and Español at the end of each article.

Introduction

Recently, conditional cash transfer programmes have sparked considerable interest. This social protection strategy has been used both to promote social development and on humanitarian grounds.[1] Within a span of 10 years conditional cash transfer programmes have become the social intervention of choice in Latin America, which has set examples in this respect for other developing regions.[2] From 2001 to 2003 Brazil created four cash transfer programmes that were merged into the *Bolsa Familia* programme (BFP)[3] in late 2003 and subsequently expanded. The new programme has combined management and implementation processes and was devised for the purpose of: (i) promoting access to the public services network, particularly in health, education and social protection; (ii) combating hunger and promoting food and nutrition security; (iii) stimulating the sustained empowerment of families living in poverty and extreme poverty; (iv) fighting poverty; (v) promoting synergistic social action between governmental and nongovernmental sectors.[4] The BFP seeks to invest in human capital, by associating cash transfers with educational goals and uptake of health services.

The BFP is the world's largest conditional cash transfer programme. It reaches all 5564 municipalities in the 27 states of Brazil and about 11 million families,[5] or roughly 46 million people (25% of the Brazilian population). The programme's legislation guarantees direct cash transfers to: (i) families in poverty or extreme poverty (household income per capita below 44.00 United States dollars, US$, and below US$ 22.00, respectively, in 2005–06); (ii) families composed of children from 0 to 15 years of age; and (iii) families with a pregnant or lactating woman. In 2008, the age group for the children was extended to 17 years. In most cases the cash transfer is paid to the reference female of the family group. The per capita income cut-offs and the values of cash transferred are readjusted every two years or so, by decree. The value per family depends on the poverty threshold and family composition. No nutrition supplement is distributed. Details of how the BFP operates are presented in a World Bank publication.[6]

Once a family enrols, it must comply with certain health and education conditions to remain in the programme: (i) a minimum school attendance of 85% of the monthly school hours for children 7 to 17 years old; (ii) a health and nutrition agenda for beneficiary families with pregnant women, nursing mothers or children under 7 years of age (pre-natal care, vaccination, health and nutrition surveillance).[4]

Every two years the information in the Unified Registry (*CadUnico*) must be updated with each family's most recent address, employment and socioeconomic status. This activity is organized by the local social services, and family payments can be suspended or cancelled if there is evidence of child labour, fraud or the deliberate provision of incorrect information, if the family's socioeconomic conditions improve (resulting in ineligibility for BFP), or if a family fails to comply with established conditions.

Some studies have examined the effects of the BFP on poverty and inequity,[7] food expenditure,[8,9] education and health service uptake[8] and food security.[10,11] Most of these publications were recently reviewed.[5] Their results will be presented and discussed elsewhere in this manuscript.

Since 2005 the Brazilian government has promoted periodic surveys known as Health and Nutrition Days to estimate the prevalence of anthropometric deficits in children up to the age of 5 years using the window of opportunity offered by National Immunization Days.[12] This strategy saves time and money

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because the immunization activities guarantee countrywide mobilization and the personnel, health facilities and equipment necessary to conduct the surveys. Therefore, combining these two mass activities improves efficient use of public resources. In Brazil vaccination coverage during National Immunization Days is well above 95%, which makes selection bias during a Health and Nutrition Day highly unlikely.[12]

The objective of this study is to identify potential associations between enrolment in the BFP and the anthropometric indicators height for age, weight for age and weight for height in children under 5 years of age.

Methods

We employed data sets from four cross-sectional Health and Nutrition Day surveys, which included 22 927 children from 419 municipalities in 23 Brazilian states. Of the sampled children, 30.1% lived in rural areas. During the original investigations, conducted in 2005–2006, population-based probabilistic samples of children less than 5 years of age were selected. Sample sizes were calculated for statistical power as described in the original publications[12–16] and they allowed inferences to be drawn for more than three million children.[12] The surveys focused on low-income regions and underprivileged populations in Brazil: 277 municipalities in the north-eastern semi-arid region; 75 agrarian reform settlements in 40 north-eastern municipalities; 60 rural *quilombola* (Maroon) communities distributed nationwide, and 42 small municipalities in the Amazon state (North Region).

Details of data collection and quality control procedures were reported elsewhere.[14] In short, local teams of five people were trained to collect data during National Immunization Days. Special attention was given to taking two anthropometric measurements for each child, as recommended by the World Health Organization (WHO). A two-page questionnaire collected information about both parents' educational background; access to household goods, public services and social benefits; birth weight and growth monitoring (from the Child Health Card); breastfeeding; common childhood diseases and compliance with prenatal care.[14] Questionnaires were scanned to build the data set. The reliability of the anthropometric data was checked by calculating the absolute

difference between the two anthropometric measurements. If this was greater than 1 cm in height (172 cases) or 0.2 kg in weight (213 cases), the measurements were considered imprecise.[14] Modelling with polynomial and linear regression was used to exclude these imprecise measurements and verify average height and weight measurements against age.[14] Anthro 2006 software (WHO, Geneva, Switzerland) was employed to assess nutritional status in accordance with the

WHO Child Growth Standards.[17] The anthropometric indices were expressed as Z scores, which represent standard deviations (SDs) of the reference population, with the cut-off set at less than −2.00 SD as recommended by WHO.[18]

After the four databases were unified and thoroughly verified, the final integrated data set included 22 375 children under 5 with validated data (97.6% of total). Missing or incomplete data for any of the independent variables

Table 1. **Social, demographic and health characteristics of children under 5 years of age included in exposed to *Bolsa Família* programme, Brazil, 2005–2006**

Characteristic	All children (*n* = 22 375)	Exposed (*n* = 9152)	Not exposed (*n* = 13 223)	Difference in % points	P
Gender					
Male (%)	48.7	48.4	49.0	–	0.385
Female (%)	51.3	51.6	51.0		
Age (months)					
0–11	39.3	31.2	44.8	+13.4	< 0.000
12–35	33.2	33.5	33.1		
36–59	27.5	35.3	22.1		
Possession of birth certificate					
Yes	92.6	93.8	91.7	–2.1	< 0.000
No	7.4	6.2	8.3		
Birth weight (from Child Health Card)					
Normal (≥ 2.5 kg)	92.8	93.0	92.7	–	0.554
Low (< 2.5 kg)	7.2	7.0	7.3	–	
Nutritional deficit (below −2.00 SD)					
Height for age	12.6	14.5	11.1	–3.4	< 0.000
Weight for age	4.7	5.5	4.0	–1.5	< 0.000
Weight for height	2.9	2.8	3.0	–	0.295
Possession of Child Health Card					
Yes, in hands	97.5	97.7	97.4	–	0.227
Yes, did not show	2.2	2.0	2.3	–	
No	0.3	0.3	0.4	–	
Family head schooling					
No schooling	15.9	20.4	12.8	–7.6	< 0.000
1–4 years	37.5	45.0	32.3	–	
5–8 years	26.1	23.3	28.0	–	
≥ 9 years	20.6	11.3	26.9	+15.6	
Family head gender					
Male	75.3	74.3	76.1	+1.8	0.003
Female	24.7	25.7	23.9	–	
House with electricity					
Yes	89.6	87.9	90.7	+2.8	< 0.000
No	10.4	12.1	9.3	–	
House with piped water					
Yes	59.7	57.1	61.5	+4.4	< 0.000
No	40.3	42.9	38.5	–	

SD, standard deviation.

under study led to the loss of 2.4% of the children. The frequencies of social and demographic characteristics were calculated with SPSS (SPSS Inc., Chicago, United States of America). The χ^2 test was used when appropriate, with correction for continuity, and the significance level was set at $P < 0.05$.

For the statistical analysis based on logistic regression, height for age, weight for age and weight for height were the dependent variables. These were converted to binary variables and classified as adequate if ≥ -2.00 SD, according to WHO recommendations. We then estimated the odds ratios (ORs) among the children exposed and not exposed to the following variables: (i) BFP cash transfer (independent variable); and the following intervening variables: (ii) birth weight > 2.5 kg; (iii) lack of birth certificate; (iv) family head schooling ≥ 5 years; (v) male family head, (vi) household with electrical supply; (vii) household with piped water. Birth weight was included in the model because it acts as an intervening variable (i.e. children with low birth weight may require many months, or even years, to catch up with adequate growth). The other intervening variables were included in the model as proxies of the families' socioeconomic status and household environmental conditions. We investigated the relationship between these six intervening variables and the three dependent variables to explore possible causal links on which to base more robust studies. The statistical package SAS (SAS Institute, Cary, USA) was used to perform regression analysis and to estimate 95% confidence intervals (CIs).

The Health and Nutrition Day protocols were approved by the ethics committees of the National School of Public Health and the National Amazonian Research Institute. Children's guardians were informed about the survey and signed informed consent forms. Anthropometric results were revealed to them immediately and severe cases of underweight were referred to the primary-health-care service.

Results

Table 1 shows the social, demographic and health characteristics of the children studied as a function of exposure to the BFP. Health and Nutrition Day activities were designed to reach subgroups of underprivileged and impoverished popu-

Table 2. Odds ratios (OR) for adequate height for age, weight for age and weight for height in children under 5 years of age, by various exposure variables, Brazil, 2005–2006

Characteristic	OR	95% CI	P
Adequate height for age (≥ −2.00 SD)			
Exposure to BFP	1.26	1.16–1.37	< 0.0001
Normal birth weight (≥ 2.5 kg)	3.51	3.11–3.96	< 0.0001
Lack of birth certificate	0.82	0.71–0.95	0.0096
Family head schooling ≥ 5 years	0.72	0.66–0.79	< 0.0001
Male family head	0.96	0.87–1.05	0.3426
House with electricity	0.77	0.68–0.87	< 0.0001
House with piped water	0.90	0.82–0.98	0.0155
Adequate weight for age (≥ −2.00 SD)			
Exposure to BFP	1.26	1.10–1.44	0.0010
Normal birth weight (≥ 2.5 kg)	4.55	3.87–5.35	< 0.0001
Lack of birth certificate	0.70	0.56–0.88	0.0017
Family head schooling ≥ 5 years	0.70	0.61–0.81	< 0.0001
Male family head	0.88	0.76–1.02	0.0866
House with electricity	0.65	0.54–0.78	< 0.0001
House with piped water	0.88	0.77–1.01	0.0716
Adequate weight for height (≥ −2.00 SD)			
Exposure to BFP	0.96	0.81–1.14	0.6426
Normal birth weight (≥ 2.5 kg)	2.23	1.76–2.83	< 0.0001
Lack of birth certificate	0.72	0.54–0.94	0.0180
Family head schooling ≥ 5 years	1.06	0.89–1.26	0.5046
Male family head	1.07	0.88–1.30	0.4805
House with electricity	0.88	0.68–1.15	0.3457
House with piped water	1.15	0.96–1.37	0.1241

BFP, *Bolsa Família* programme; CI, confidence interval; SD, standard deviation.

lations, as evidenced by the social and economic indicators disclosed.

Many of the variables tested did not differ significantly between groups. There was large and significant disproportion in child age group and family head schooling. The later difference confirms that BFP is well targeted.

Table 2 shows the results of regression analyses with adjustments for six health, social and economic variables. A child aged less than 5 years enrolled in the BFP had a 26% higher chance of having adequate height for age and weight for age than a child not enrolled. No association was found between enrolment in the BFP and weight for height.

Independent of exposure to the BFP, normal birth weight and lack of a birth certificate were associated with all the anthropometric indicators examined. Children with normal birth weight were from 2.2 to 4.5 times more likely to have adequate anthropometric indices. Children with low birth weight started life at a disadvantage and would require months or years to reach adequate weight and height for age. The lack of a birth certificate was significantly associated

with deficits in all three anthropometric indicators. Family head schooling of at least 5 years was associated with inadequate height for age and weight for age.

When we stratified by age group, children older than 12 months enrolled in the BFP were more likely to have adequate height for age than children the same age who were not enrolled; however, this effect was not seen in children less than 12 months of age (Table 3). Children aged 12–35 months and 36–59 months enrolled in the BFP had 19% and 41% higher chances of having adequate height for age, respectively, than children not exposed to the BFP. As expected, birth weight was associated with height for age much more strongly during the first year of life than at older ages.

The lack of a birth certificate during the first year of life showed no association with height for age. However, it was associated with 57% and 59% higher chances of having low height for age in children aged 12–35 and 36–59 months, respectively. The lack of the certificate later in childhood is probably an indicator of extreme poverty and of residence in an isolated area; both of which prevent families from

Table 3. **Odds ratios (OR) for adequate height for age (≥ −2.00 SD) in children under 5 years of age by age group and various exposure variables, Brazil, 2005–2006**

Characteristic	OR	95% CI	P
Age 0–11 months (n = 8794)			
Exposed to BFP	1.12	0.95–1.31	0.1787
Normal birth weight (≥ 2.5 kg)	6.23	5.11–7.59	< 0.0001
Lack of birth certificate	0.92	0.75–1.14	0.4613
Family head schooling ≥ 5 years	0.67	0.57–0.79	< 0.0001
Male family head	0.88	0.75–1.05	0.1553
House with electricity	0.88	0.69–1.11	0.2865
House with piped water	0.85	0.73–0.99	0.0431
Age 12–35 months (n = 7428)			
Exposed to BFP	1.19	1.04–1.37	0.0100
Normal birth weight (≥ 2.5 kg)	2.87	2.36–3.49	< 0.0001
Lack of birth certificate	0.43	0.32–0.57	< 0.0001
Family head schooling ≥ 5 years	0.77	0.66–0.88	0.0002
Male family head	1.10	0.94–1.29	0.2487
House with electricity	0.76	0.63–0.93	0.0100
House with piped water	0.90	0.78–1.06	0.1480
Age 36–59 months (n = 6153)			
Exposed to BFP	1.41	1.20–1.66	< 0.0001
Normal birth weight (≥ 2.5 kg)	2.04	1.59–2.62	< 0.0001
Lack of birth certificate	0.41	0.26–0.65	0.0002
Family head schooling ≥ 5 years	0.71	0.60–0.85	0.0001
Male family head	0.88	0.74–1.04	0.1369
House with electricity	0.72	0.57–0.90	0.0045
House with piped water	0.99	0.84–1.17	0.9532

BFP, *Bolsa Família* programme; CI, confidence interval (Wald); SD, standard deviation.

obtaining the certificates and also lead to inadequate growth.

Co-linearity was tested for and is very unlikely. Cramer´s *V* coefficients were calculated pairwise for the studied variables and varied from 0.0205 to 0.2226. The highest value was obtained when exposure to the BFP was compared with the schooling of the head of household.

Cross-sectional studies present inherent limitations. In this particular case the length of exposure to BFP cash transfers was not determined, and neither were the possible biases related to enrolment in cash transfer programmes other than the BFP, however unlikely. In addition, some variables that could not be measured, such as family income, food consumption and nutritional status before BFP enrolment, may account for some of the residual confounding.

Regression analyses with adjustments for social and economic variables consistently showed lower rates of inadequate height for age and weight for age in the group exposed to the BFP. An association between exposure to the BFP and weight for height is not expected to occur because the prevalence of wasting is very

low in Brazilian children by WHO standards. However, wasting is related to low birth weight, as expected. Further studies are needed to fully understand why BFP seems to have no effect on children less than one year of age. It may be that in this age group adequate breastfeeding practices have a greater effect than cash transfers.

Discussion

Our findings are consistent with the results of other international studies. Anthropometric outcomes and health service uptake by families enrolled in conditional cash transfer programmes were recently reviewed.[19] The effect on anthropometric outcomes was usually positive, but only in certain subgroups. In Colombia a mean increase in weight was noted among neonates and the exposure to a cash transfer programme was associated with an increase in height-for-age Z score among infants less than 2 years of age. This means that among those exposed to cash transfers, the probability of being malnourished was reduced by 6.9%.[20]

Three analyses of the cash transfer programme in Mexico (which offers a food supplement in addition to cash) showed a positive effect on the height of participants.[21–23] The study, which included children younger than 12 months of age at baseline, showed the greatest benefit among children less than 6 months of age in the poorest category. An exposure of 2 years to the programme at that age resulted in a growth of 1.1 cm more than seen among older children (12–18 months old) exposed to the programme for one year.[21] Another study yielded similar results: children aged 12–36 months gained approximately 1 cm in height after one year of exposure to the programme, whereas children aged 24–36 months at baseline experienced a height increase of 1.22 cm.[22] In a third study children aged 12–36 months were 0.96 cm taller than children from control areas after one year of exposure to the programme. However, the study showed no association between exposure to the programme and stunting.[23] In Nicaragua, the cash transfer programme was associated with a decrease of 6 percentage points in the prevalence of underweight among children less than 5 years of age.[24]

We propose a model to explain how cash transfers occurring at t_0 can affect food acquisition, education, uptake of health services and economic inclusion in the short and long runs (Fig. 1). The immediate effects are probably greater access to food and changes in dietary patterns at t_1. There is empiric evidence that the cash transferred by the BFP results in budgetary improvements[7] that allow families to redirect resources towards purchasing more and better food.[8–11,25]

The Gini index, an indicator of income distribution, remained stable in Brazil for many years but has dropped consistently since 2001, and almost one quarter of the drop is attributable to the BFP.[7] Propensity score analysis used in the baseline study for the BFP showed larger family expenditures among enrolled families than in the comparison group, especially on food (US$ 172 more a year on food items).[8] In another econometric study conducted in a rural area, enrolled families were found to spend US$ 107 more on food per year than the comparison group.[9] A study based on a national representative sample of households enrolled in the BFP showed an increase of 79% in the amount of food
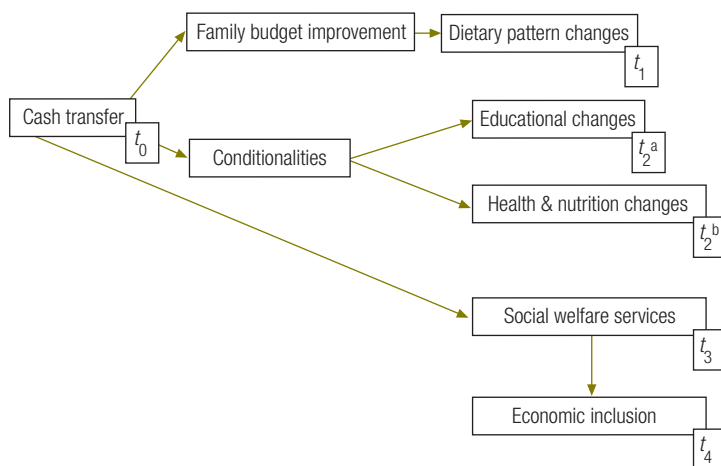
t, time.

purchased by those families that were suffering severe food insecurity at baseline, compared with a 60% increase among families who reported food security.[10] Additional evidence was afforded by the analysis of data on food security from the 2004 National Household Sample Survey. That data showed that the average US$ 30 transferred then by the BFP was associated with a 52% increase in food security among families.[11] Another national study indicated that families in the BFP aspire to consume healthier foods, such as vegetables and fruits.[25] However, manufacturers of foods with low nutritional value have already repositioned themselves in the market and are targeting the emergent "new consumer" class, thereby jeopardizing any healthy change in food consumption patterns among households enrolled in the BFP.

At t_2^a access to basic education is affected. Brazil has good coverage in this respect, but such access could be accelerated (Fig. 1). In one study, propensity scores showed lower rates of school evasion and less engagement in the labour market among children from families enrolled in the BFP. However, these children went through school more slowly.[8] At t_2^b an effect on the coverage of basic health-care services would be noted. Because these services are less accessible than basic education, an effect on their

use occurs at a later time. No significant differences were found between families in the BFP and other families in terms of vaccination coverage.[8] This was predictable, because immunization coverage has been extremely high in Brazil for several decades.

Access to Brazil's Social Welfare Services is even more restricted than access to basic health services. As a result, the use of welfare services occurs later, at t_3. Finally, the effect of the BFP on economic inclusion is felt last of all because of the complexity of the issue and the difficulties of implementing specific policies.

A wide-reaching programme known as "Next Step" (*Próximo Passo*) was launched in 2008–2009. The programme, which involves three ministries and the private sector, aims to provide technical training for adults from families in the BFP and to guarantee them jobs in governmental construction. A total of 229 municipalities are already running the programme.

In Brazil, the BFP seeks to use financial incentives to change certain attitudes and behaviour among impoverished families. It aims, specifically, to: (i) keep them from entering children under 14 years old in the labour market (forbidden by law); (ii) motivate them to have their children complete a secondary education; (iii) incentivize families to use health

services, especially for pregnant women and children under 7 years of age.

Conclusion

The cash transferred can immediately translate into the exercise of minimum social rights with respect to food, clothing, transportation and less fundamental goods and services. The conditions that programme subscribers need to fulfil can induce them to seek public health, education and social assistance services.

The purchase of food for children is often prioritized in families, perhaps because certain requirements have to be fulfilled for continuation in the BFP and because the average number of children per family has decreased as a result of a fertility decline among all social groups across Brazil. This demographic transition leads families to try to preserve the future of the group by providing more food to their children.

Any increase in the utilization of public social services will depend on the extent to which such services are provided. Thus, the ability of the BFP to bring about changes in this respect is limited by the country's capacity to fulfil the increased demand for social services. In Brazil, public service coverage patterns are such that the services tend to reach poor families in the following order: basic education, basic health care, social protection and economic inclusion measures.

Our findings point to the need to guarantee families in the BFP increased access to goods and services conducive to improved nutrition, which should in turn result in improved health. Similarly, to guarantee programme effectiveness, the Brazilian government needs to provide more and better services in the spheres of basic education, health, social protection and inclusion in the labour market. Finally, longitudinal studies designed to evaluate the impact of the BFP are necessary to determine if the nutritional effects observed in our study can indeed be attributed to the conditional cash transfer programmes offered in Brazil. ■

Competing interests: None declared.

ملخص

تأثير برنامج التحويل النقدي المشروط على تغذية الأطفال في البرازيل

الغرض فحص العلاقة بين البرنامج البرازيلي "بولسا فاميليا"، والذي يُعَدُّ أكبر برنامج عالمي للتحويل النقدي المشروط، والمؤشرات المتعلقة بالقياسات البشرية الدالة على الحالة الغذائية للأطفال.

الطريقة باستغلال الفرصة المتاحة أثناء حملات التلقيح، روّجت الحكومة البرازيلية لأيام الصحة والتغذية لتقدير انتشار المؤشرات المتعلقة بالقياسات البشرية الدالة على العوز الغذائي. وقد تم في عامي 2005-2006 جمع معطيات لـ 22375 طفلاً فقيراً في عمر أقل من 5 سنوات، واستخدمت المعطيات لتقدير النتائج الغذائية بين متلقي التحويلات النقدية من برنامج "بولسا فاميليا". وقد جرى تحويل جميع المتغيرات قيد الدراسة إلى متغيرات ثنائية لإجراء تحليل التحوّف، واشتملت هذه المتغيرات بالتحديد على وزن الطفل وقت الولادة، وعدم وجود شهادة ميلاد، ومستوى تعليم وجنس رب الأسرة، وإمكانية الحصول على المياه عبر شبكة مواسير المياه، وتوفر الكهرباء، والطول لقاء العمر، والوزن لقاء العمر، والوزن لقاء الطول.

النتائج كان أطفال الأسر المتلقية للتحويلات النقدية من برنامج "بولسا فاميليا" أوفر حظاً من حيث طولهم الطبيعي لقاء عمرهم بمقدار 26% مقارنة بالأسر التي لم تتلق التحويلات النقدية؛ وقد انطبق هذا الفرق أيضاً على وزن الطفل لقاء العمر. ولم يكتشف نقص يعتد به إحصائياً بين الفريقين من حيث الوزن لقاء الطول. وأظهر تقسيم الأطفال إلى مجموعات بحسب العمر زيادة بمقدار 19% في أرجحية كون الطول طبيعي لقاء العمر في الفئة العمرية 12-35 شهراً، و 41% في الفئة العمرية 36-59 شهراً في أطفال الأسر المتلقية للتحويلات النقدية، بينما لم يوجد اختلاف بين الفريقين في الفئة العمرية 0-11 شهراً.

الاستنتاج التحويلات النقدية المشروطة عبر برنامج "بولسا فاميليا" تؤدي إلى نتائج غذائية أفضل بين الأطفال في عمر 12 إلى 59 شهراً. وهناك حاجة إلى دراسات طولانية للتأكد من هذه النتائج.

摘要

巴西有条件现金补贴计划对儿童营养的影响

目标 研究巴西"家庭津贴计划"(BFP)-世界上最大的有条件现金补贴计划-与儿童营养状况人体测量指标的关联。

方法 利用疫苗活动的机会,巴西政府推广健康和营养日,以评估儿童人体测量缺陷的普遍性。采用2005-2006年期间对22375名5岁以下贫困儿童采集的数据,来评估"家庭津贴"接受人的营养情况。研究的所有变量,即儿童出生体重、出生证明缺失、户主的教育水平和性别、管道供水和电力的使用、年龄别身高、年龄别体重、身高别体重等,都转化为二进制变量用于回归分析。

结果 受益于"家庭津贴计划"家庭中的儿童拥有正常年龄别身高的可能性比比那些未受益于该计划家庭中的儿童要大26%;该差异同样适用于年龄别体重。在身高体重比上未发现非常重大的统计缺陷。按年龄组划分的统计结果表明,在接受"家庭津贴计划"的儿童中,12-35个月以及36-59个月的儿童拥有正常年龄别体重的机率比未接受该计划的儿童要分别高出19%和41%,但0-11个月的儿童并无差异。

结论 "家庭津贴计划"可导致12-59个月的儿童获得更好的营养。另外还需要开展纵向研究来确认这些发现。

Résumé

Effets d'un programme de transfert d'argent conditionnel sur la nutrition des enfants au Brésil

Objectif Examiner l'association entre le programme brésilien *Bolsa Familia* (BFP), qui est le plus grand programme de transfert d'argent conditionnel au monde, et les indicateurs anthropométriques de l'état nutritionnel chez les enfants.

Méthodes Grâce à l'opportunité offerte par les campagnes de vaccination, le gouvernement brésilien promeut les Journées de la Santé et de la Nutrition afin d'évaluer la prévalence des déficits anthropométriques chez les enfants. Les données recueillies sur la période 2005–2006 auprès de 22 375 enfants pauvres de moins de 5 ans ont été utilisées pour estimer les résultats nutritionnels chez les bénéficiaires du programme *Bolsa Familia*. Toutes les variables étudiées, c'est-à-dire le poids à la naissance de l'enfant, l'absence de certificat de naissance, le niveau d'éducation et le sexe du chef de famille, l'accès à l'électricité et à l'eau courante, la taille pour l'âge, le poids pour l'âge et le poids pour la taille, ont été converties en variables binaires pour une analyse de régression.

Résultats Les enfants issus de familles bénéficiant du BFP avaient 26% de plus de chances d'avoir une taille normale pour leur âge que les enfants issus de familles n'en bénéficiant pas. Cette différence s'applique également au poids pour l'âge. Aucun déficit de poids pour la taille significatif du point de vue statistique n'a été détecté. La stratification par groupe d'âge a révélé 19% et 41% de probabilités supplémentaires d'avoir une taille normale pour l'âge à 12–35 et 36–59 mois, respectivement, chez les enfants bénéficiant du programme *Bolsa Familia*, et aucune différence à 0–11 mois.

Conclusion Le programme BFP peut être à l'origine de meilleurs résultats nutritionnels chez les enfants âgés de 12 à 59 mois. Des études longitudinales sont nécessaires pour confirmer ces résultats.

Резюме

Воздействие бразильской программы обусловленных денежных трансфертов на питание детей

Цель Рассмотреть связь между бразильской программой «Bolsa Familía» (BFP) – крупнейшей в мире программой обусловленных денежных трансфертов – и антропометрическими показателями статуса питания у детей.

Метод Используя возможность, предоставляемую в рамках кампаний по вакцинации, правительство Бразилии проводит Дни здоровья и питания для оценки распространенности отклонений антропометрических показателей детей от нормы в сторону уменьшения. Данные, собранные в 2005–2006 годах о 22 375 детях в возрасте до 5 лет из неблагополучных семей, были использованы для оценки результатов в области питания среди получателей пособия по программе «Bolsa Familía». Все исследовавшиеся

переменные, а именно: масса тела ребенка при рождении, отсутствие свидетельства о рождении, уровень образования и пол главы семьи, доступ к водопроводной воде и электроснабжению, рост – возраст, масса тела – возраст и масса тела – рост, – для проведения регрессионного анализа конвертировались в бинарные переменные.

Результаты У детей из семей, охваченных BFP, была на 26% выше вероятность нормального показателя «рост – возраст», чем у детей из семей, не охваченных программой; такая же разница наблюдалась в отношении показателя «масса тела – возраст». Не было обнаружено какого-либо статистически значимого отклонения в сторону уменьшения в показателях массы тела или роста. Стратификация по возрастным группам выявила более высокие шансы иметь нормальный показатель «рост – возраст», соответственно, на 19 и 41% у детей в возрасте 12–35 и 36–59 месяцев, охваченных программой «Bolsa Familía», и отсутствие различий у детей в возрасте 0–11 месяцев.

Вывод Программы BFP способны вызвать улучшение показателей в отношении питания у детей в возрасте 12–59 месяцев. Для подтверждения этих результатов необходимы лонгитюдные исследования.

Resumen

Efectos de un programa de transferencia condicional en efectivo en la nutrición infantil en Brasil

Objetivo Examinar la relación existente entre el programa brasileño *Bolsa Familia* (PBF), lo mayor programa de transferencia condicional en efectivo del mundo, y los indicadores antropométricos del estado nutricional infantil.

Métodos Aprovechando la oportunidad que brindan las campañas de vacunación, el Gobierno brasileño promueve los Días de Salud y Nutrición para calcular la prevalencia de las deficiencias antropométricas en niños. Los datos recopilados entre 2005 y 2006 en un conjunto de 22 375 niños pobres de menos de cinco años de edad se emplearon para calcular los resultados nutricionales entre los receptores del programa *Bolsa Familia.* Todas las variables sometidas a estudio, como el peso del neonato, la ausencia de certificado de nacimiento, el nivel educativo y el sexo del cabeza de familia, el acceso a la red de agua y electricidad, la altura por edad, el peso por edad y el peso por altura, se convirtieron en variables binarias para realizar un análisis de regresión.

Resultados Los niños procedentes de familias receptoras del PBF tuvieron un 26% más de posibilidades de presentar una altura normal para su edad que aquellos procedentes de familias no receptoras; esta diferencia también se observó en el peso en relación con la edad. No se observó ningún déficit estadísticamente significativo en cuanto al peso por altura. La estratificación por grupos de edad reveló que los niños que recibieron la *Bolsa Familia* tuvieron un 19% y un 41% más de posibilidades de presentar una altura normal en las edades comprendidas entre 12 y 35 meses y entre 36 y 59 meses, respectivamente, y no se observaron diferencias entre los 0 y los 11 meses de edad.

Conclusión El PBF puede generar mejores resultados nutricionales en los niños con edades comprendidas entre los 12 y los 59 meses. Es necesario realizar estudios longitudinales para poder confirmar dichos resultados.

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