

Impact of COVID-19 Pandemic on Nutritional Status of 5.2 Million Brazilian Children: A Quasi-Experimental Interrupted Time-Series Study

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OVERVIEW



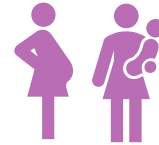
55.777.848

NUMBER OF INDIVIDUALS IN FAMILIES
BENEFITING FROM THE **BOLSA
FAMÍLIA PROGRAM (PBF)**



34.078.204 (45%)

NUMBER OF PEOPLE WITH HEALTH PROFILE
(children under 7 years old and women)



25.085.408 (74%)

NUMBER OF WOMEN WITH HEALTH
PROFILES



8.992.796 (26%)

NUMBER OF CHILDREN WITH HEALTH
PROFILE



5.041.652 (99%)

CHILDREN WITH UPDATED
VACCINATION STATUS



5.069.215 (56%)

NUMBER OF CHILDREN MONITORED

4.970.321 (98%)

CHILDREN WITH NUTRITIONAL DATA

Our
focus



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OBJECTIVE

To estimate the **impact of the COVID-19 pandemic** on the coverage of **health conditionalities monitoring** and the **nutritional status** indicators of beneficiaries in the Bolsa Família Program.

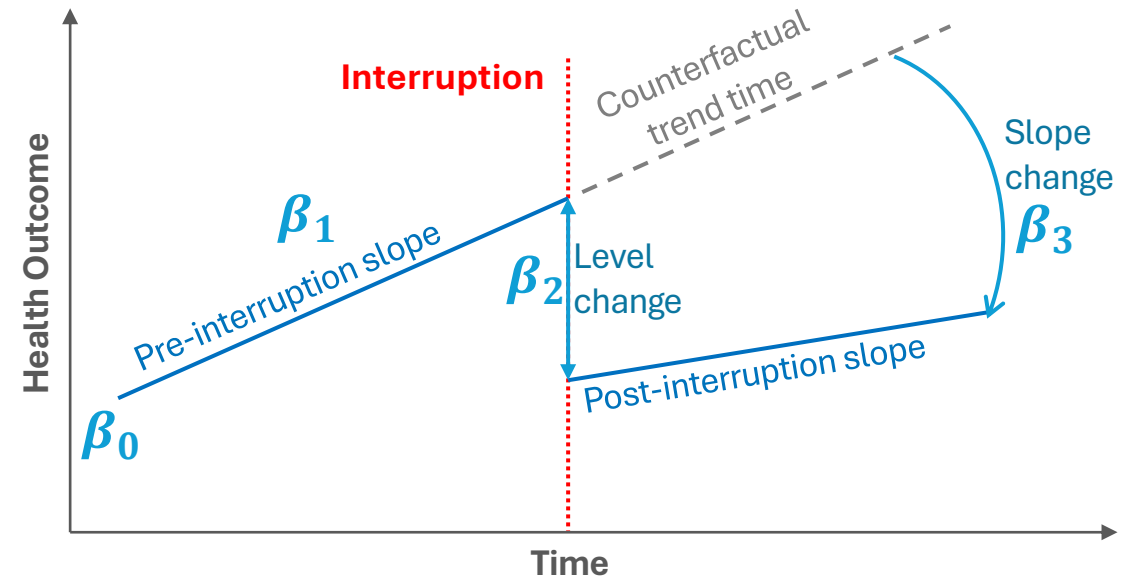
DATA

Microdata of 5,219,295 children under 7 years old from 2009-2023 were retrieved from the Food and Nutrition Surveillance System (**SISVAN**). This data was aggregated **quarterly**, from 2009.q1 through 2023.q4

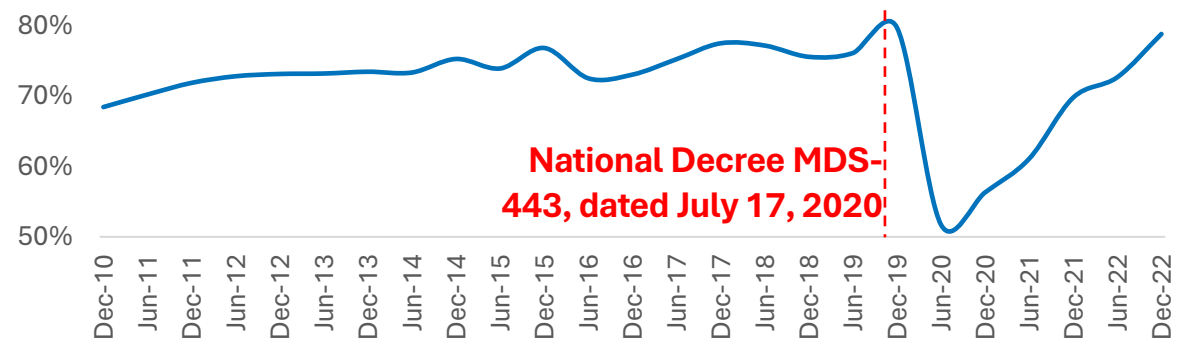
METHODS

An **interrupted time series (ITS)** study was conducted. ITS analyses were performed using Prais-Winsten generalized linear regression models with robust standard errors, which account for first-order autocorrelation. The results were verified using the Durbin-Watson statistic

$$Y_t = \beta_0 + \beta_1 t + \beta_2 D_t + \beta_3 [t - T_I] D_t + \varepsilon_t$$



Graph 1 – Evolution of the percentage of monitoring of health conditionalities in the Bolsa Família Program (PBF). Brazil, 2010 to 2022.



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TIME SERIES BREAKDOWN

Interruption: The interruption point was defined in 2020.q3, corresponding to the national decree MDS-443, published on July 17, 2020, which suspended the mandatory operational procedures for health conditionalities in the BFP to avoid crowds and prevent the collapse of the healthcare system.

Pre-Interruption: Quarters from Q1 2009 to Q2 2020“;

Post-Interruption: From Post-2020.q3 to 2023.q4.

OUTCOMES

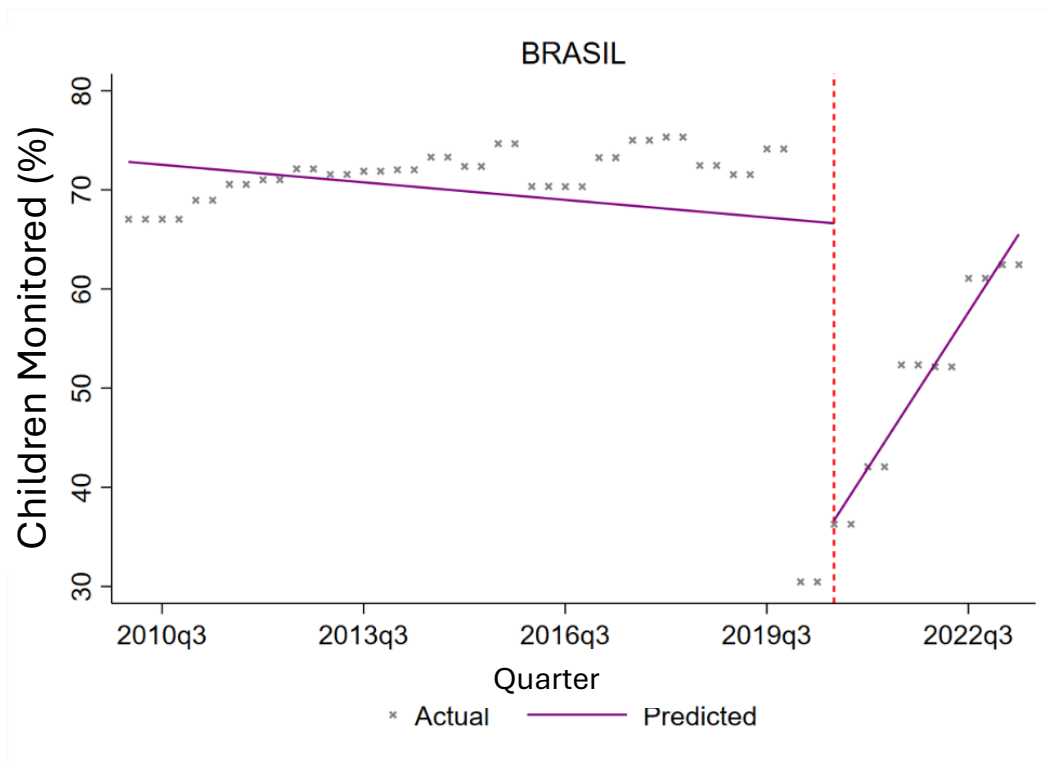
- The percentage of children monitored under the Bolsa Família Program health conditionalities, and
- The overall and subgroup-specific prevalence of **severe thinness** and **obesity** according to Body Mass Index (BMI)-for-age.

ANALYZED SUBGROUPS

- Brazil (overall);
- Gender (boys and girls);
- Race/ethnicity (white, black, brown, among others);
- Region (North, Northeast, South, Southeast...);
- Area (rural and urban); and
- Municipal Human Development Index (HDI).

MAIN RESULTS

Percentage of children monitored under BFP

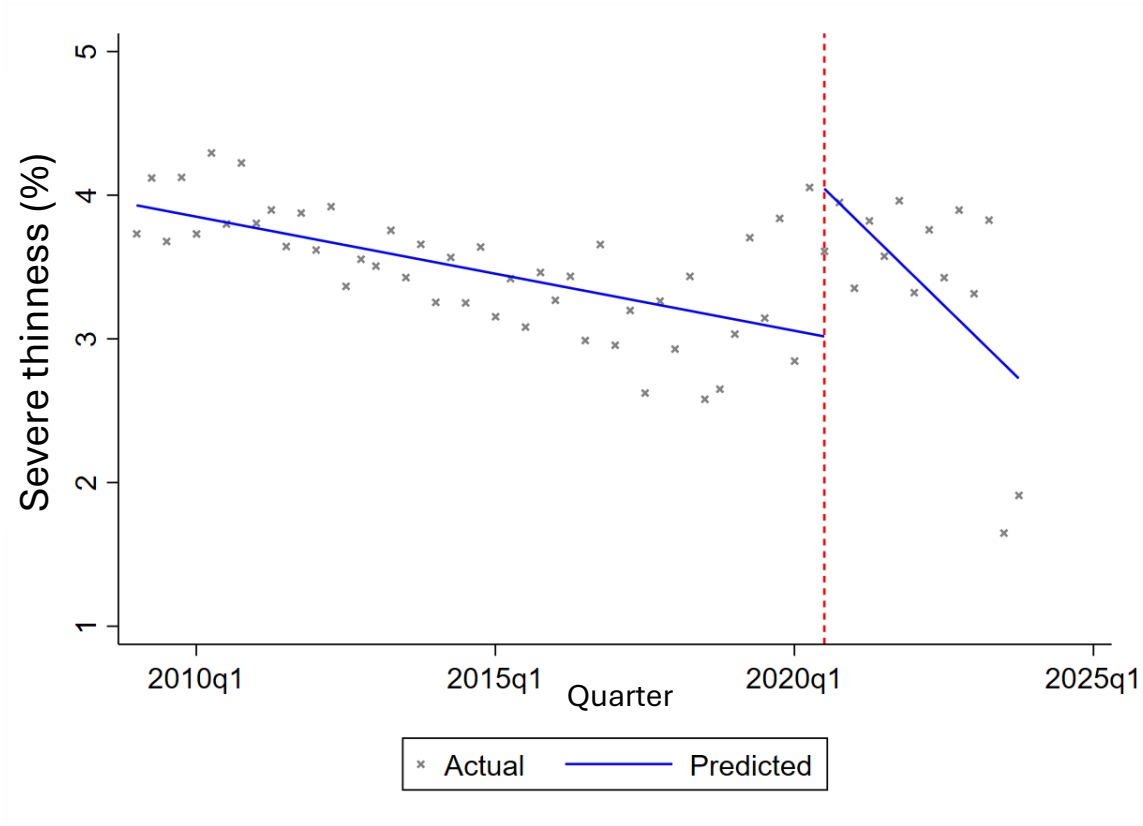


Analysis of the interrupted time series models reveals a statistically significant disruption across all groups and outcomes examined. Specifically, **the COVID-19 pandemic led to a 29.97% reduction** (95% CI: -42.86% to -17.08%) in the monitoring of health conditions for children under 7 years old benefiting from the Bolsa Família Program (BFP). This substantial decline coincided with an increase in the prevalence of **severe thinness** (0.78%, 95% CI: 0.37% to 1.2%) and **obesity** (1.9%, 95% CI: 0.97% to 2.8%).

The post-2020.q3 trends were quite disparate. The coverage of child health monitoring had a strong positive and statistically significant trend, but overall levels were 11.4% **lower than in the pre-pandemic period (2019.q4).**

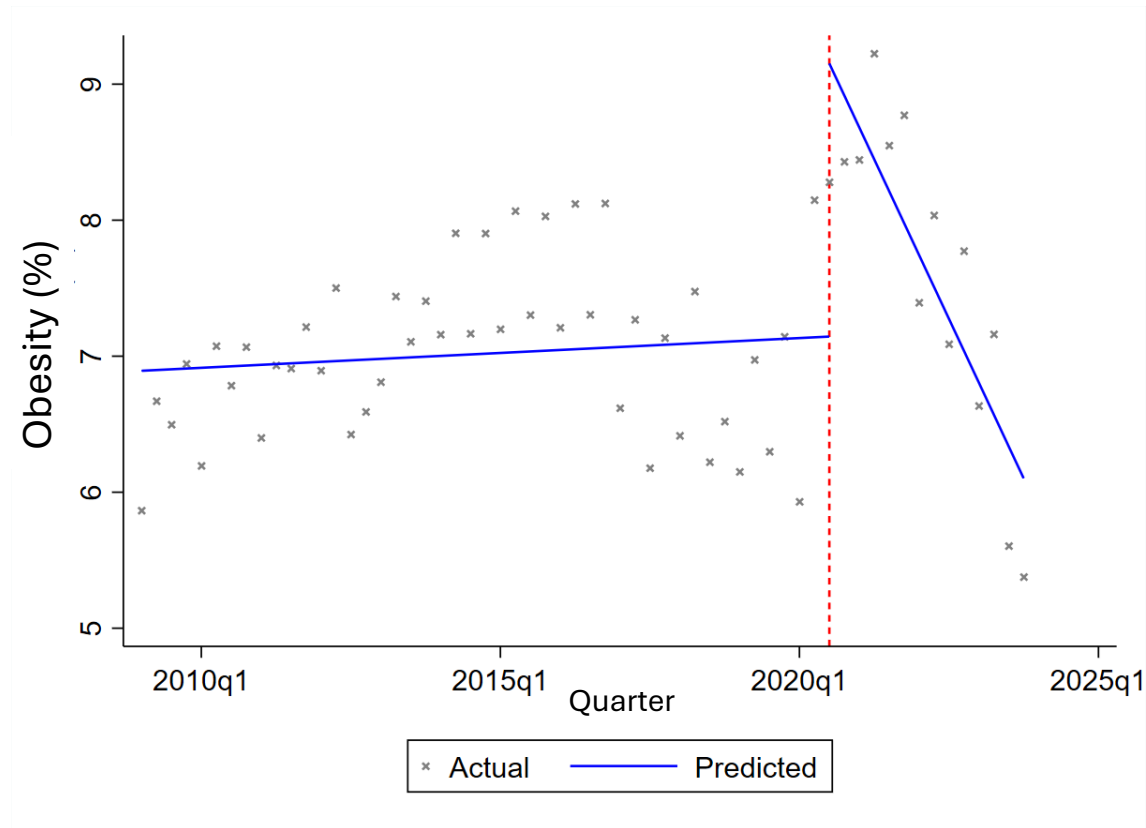
On the other hand, **by 2023.q4, almost all groups had recovered to the pre-pandemic levels** of severe thinness and obesity, except for traditional peoples and communities (e.g. quilombolas, gypsy people).

Severe thinness according to BMI-for-age



The groups most impacted by the prevalence of severe thinness included: **male children** (0.83%, 95% CI: 0.39% to 1.3%), **black and brown-skinned children** (0.77%, 95% CI: 0.35% to 1.2%), those residing in the **Northeast** (0.76%, 95% CI: 0.31% to 1.2%) or Central-West (1.0%, 95% CI: 0.4% to 1.7%), and children living in **municipalities with low Human Development Index (HDI)** (0.98%, 95% CI: 0.24% to 1.7%).

Obesity according to BMI-for-age



The groups most affected by the prevalence of obesity included: **male children** (2.1%, 95% CI: 1.1% to 3.1%), **white-skinned** (2.3%, 95% CI: 1.1% to 3.5%), those residing in the **South** (3.1%, 95% CI: 1.7% to 4.6%), and children living in municipalities with a **very high Human Development Index (HDI)** (2.4%, 95% CI: 1.6% to 3.3%).

DISCUSSION

- **The COVID-19 pandemic has had detrimental effects on the health monitoring and nutrition of Brazilian children.** Despite some recovery, current levels in certain subgroups remain lower than those observed before the pandemic. Addressing these challenges necessitates more equitable policy actions that consider the specific needs of different groups.
- **These results are not homogeneous,** showing greater severity among brown and black male children benefiting from the Bolsa Família Program (PBF) who reside in the Northeast or Central-West regions of Brazil, particularly in municipalities with low to medium Human Development Index (HDI) (marked thinness). Additionally, white male children living in the South in municipalities with a very high HDI exhibit higher rates of obesity.
- **Beyond merely restoring pre-COVID-19 levels, it is essential to enhance the coverage of health conditionalities for children under 7 years old who benefit from the Bolsa Família Program.** Achieving this necessitates targeted actions directed at specific groups.

THANK YOU!

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