Brazil's Conditional Cash Transfer: the effects of the first 20 years on health and projections for the SDGs in 2030

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OVERVIEW

- **Background**: 2024 marked the 20th anniversary of Brazil's decree law n° 10,836/2004, which created the Bolsa Família Program (BFP) – one of the world's largest Conditional Cash Transfer (CCT) initiatives.

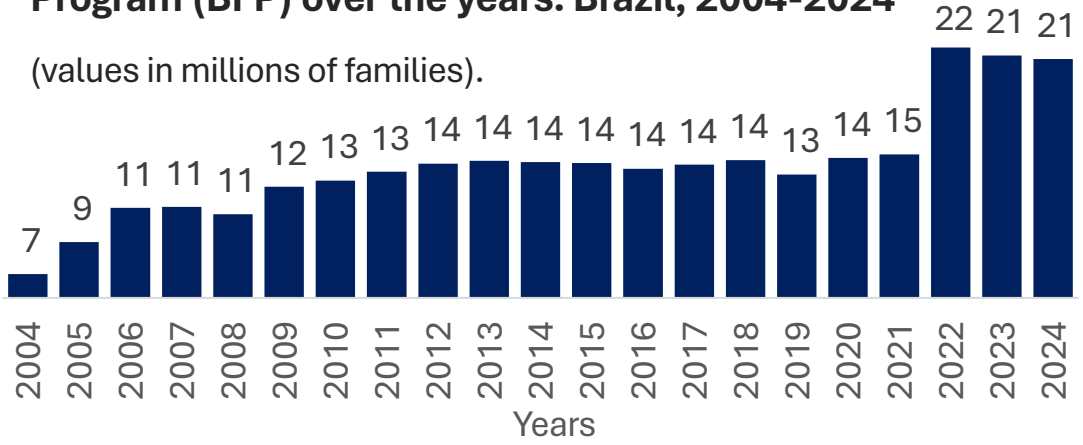
- **Objective:** To evaluate the effects of two decades of nationwide BFP implementation on hospitalization and mortality rates in Brazil, and to forecast the impact on health of alternative implementation scenarios up to 2030, the target year for the UN Sustainable Development Goals (SDGs).

- **Design**: This study integrated a retrospective impact evaluation (ex-post) with forecasting analyses (ex-ante). The ex-post impact evaluation had a longitudinal ecological design, whereby municipalities (unit of analysis) were observed over time.
  - **Health outcomes:** Age-standardized all-cause **mortality** and **hospitalization** rates were calculated for the entire population and by age group, namely, under-5, 5 to 69, and 70 and above were used as dependent variables.
  - **Control variables**: All relevant time-variant demographic, socioeconomic, and healthcare-adjusting variables according to the literature, were included in the models.
  - **Exposure Variable 1**: BFP target coverage (total of people benefiting divided by total of people in poverty).
  - **Exposure Variable 2**: BFP adequacy (amount spent divided by total of people benefiting).
  - **Exposure Variable 3**: Combination between BFP target coverage and adequacy.

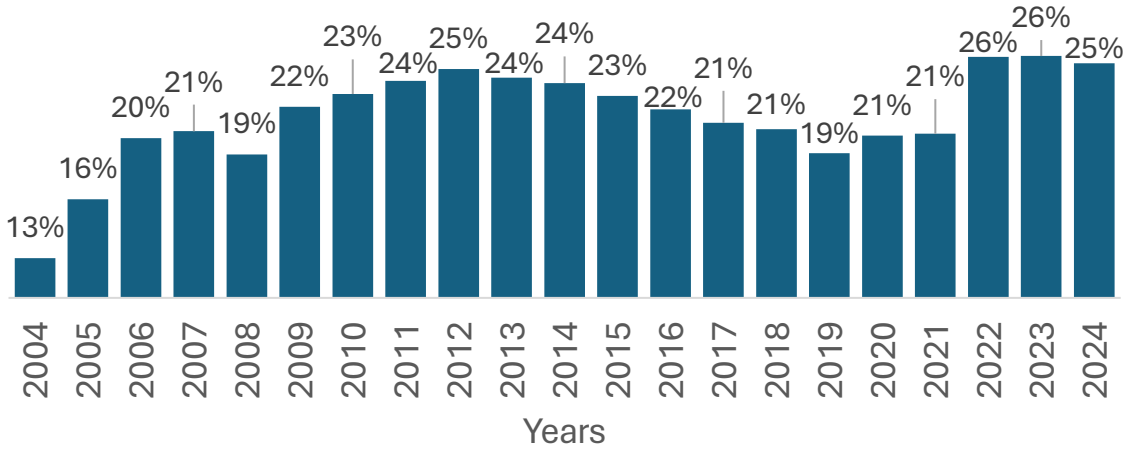
BFP OVER THE YEARS

Number of Beneficiary Families of the Bolsa Família Program (BFP) over the years. Brazil, 2004-2024

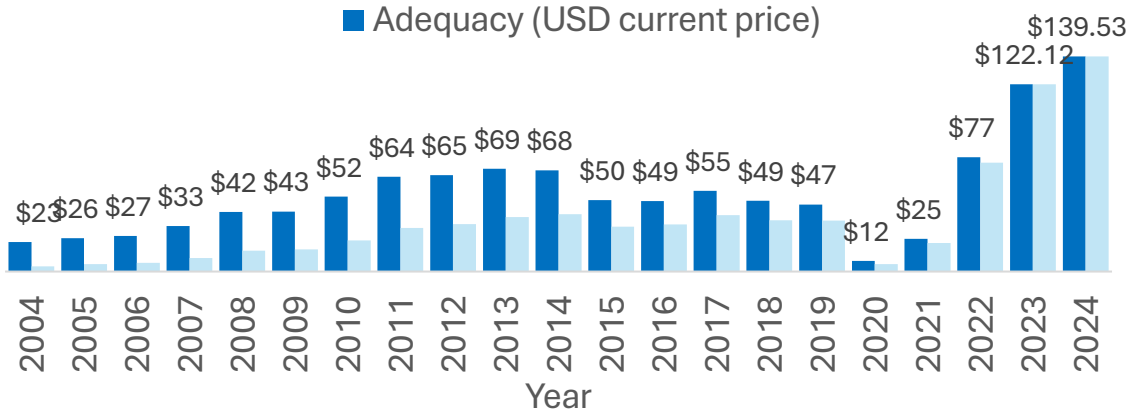
(values in millions of families).



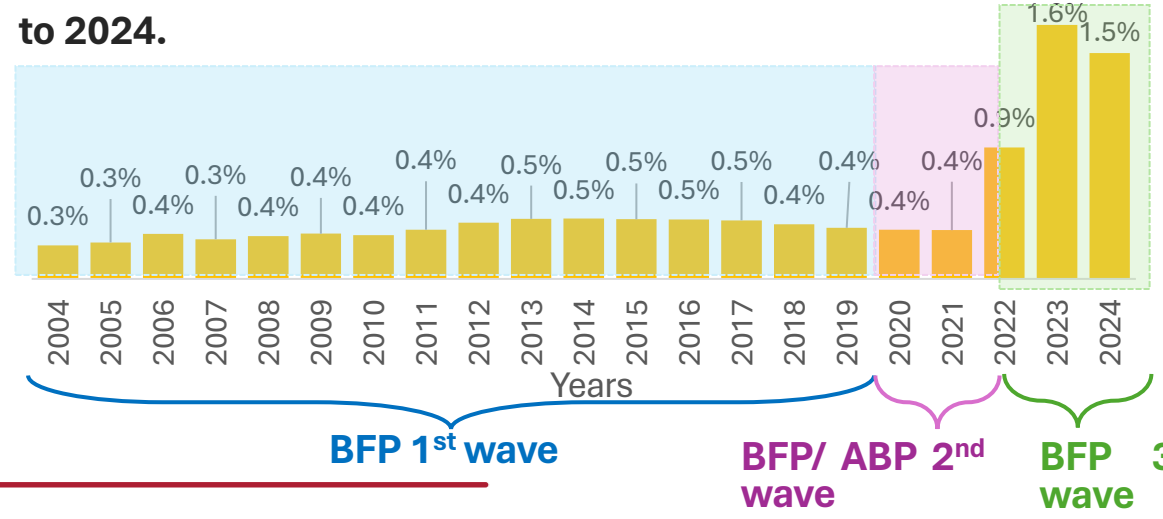
Coverage of BFP. Brazil, 2004-2024.



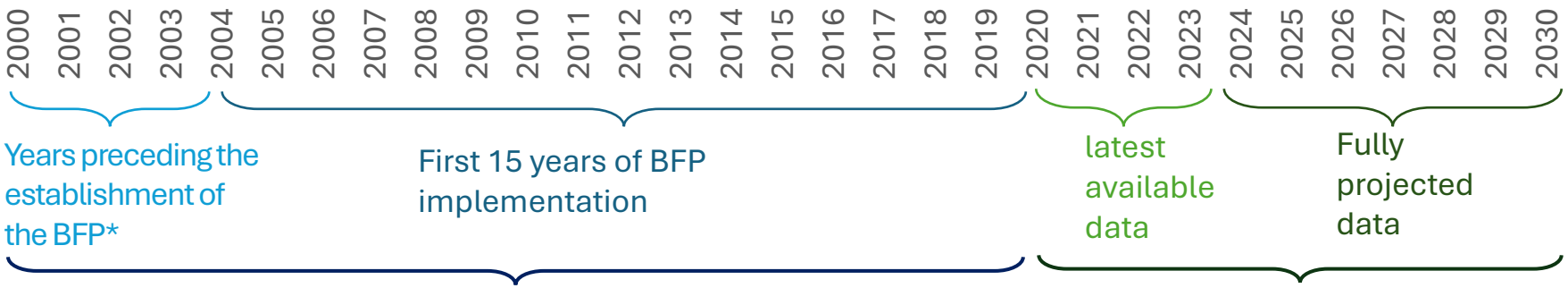
Average amount of money transferred monthly per family (adequacy). BFP, Brazil, 2004-2024.



BFP budget as a percentage of Brazilian GDP. Brazil, 2004 to 2024.



BFP OVER THE YEARS



Ex-post impact evaluation:

We measured the effect of BFP target coverage and BFP adequacy on overall mortality and hospitalization - during the years 2000-2019 - using **negative binomial multivariable regression** models with **fixed-effects** specifications.

$$Log\ Y_{it} = \alpha_i + \sum_{q=1}^{3} \beta_q CCT_{qit} + \sum_{s=4}^{9} \beta_s T_y + \sum_{k=10}^{16} \beta_k X_{kit} + u_{it}$$

Ex-ante impact evaluation:

We used validated municipal-level microsimulation models to forecast the impact of potential BFP **expansions** or **reductions** on health outcomes through 2030, and was conducted in **two steps**:

1. We created a synthetic cohort of all Brazilian municipalities for the years 2024–2030, extrapolating and modelling each municipal-level independent variable from the 2000-2023 dataset.
2. We predicted mortality and hospitalization rates using these independent variables as inputs in the same multivariate regression models employed in the retrospective analysis, including estimates of their effects.

For each outcome and each scenario, 10,000 Monte Carlo simulations were performed, allowing parameter values to vary in each simulation cycle according to their assumed underlying distribution

MAIN RESULTS

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TABLE 1. Means of the municipal mortality rates, conditional cash transfer coverage, demographic, socioeconomic and healthcare-related variables for selected municipalities of Brazil (N=3,669).

Variables	Years			Δ
	2000	2010	2019	(2019-2000)
Mortality rate for age group (per 1,000 population)				
Overall	7.57 (1.44)	6.29 (0.87)	5.65 (0.79)	-1.92
Under-5 (per 1,000 livebirth)	24.32 (15.10)	15.62 (6.82)	13.85 (5.78)	-10.47
5-69 years old	3.84 (0.89)	3.56 (0.61)	3.36 (0.57)	-0.48
70+ years old	68.03 (15.87)	56.47 (8.93)	52.34 (7.42)	-15.69
Hospitalization rate for age group (per 1,000 population)				
Overall	2.00 (6.03)	1.47 (2.31)	1.38 (3.58)	-0.62
Under-5 (per 1,000 livebirth)	799.30 (1,484)	705.38 (1,416)	644.14 (1,320)	-155.16
5-69 years old	4.12 (12.48)	2.69 (6.66)	2.90 (7.63)	-1.23
70+ years old	185.30 (276.42)	106.62 (149.83)	66.60 (95.12)	-118.70
Bolsa Família Program (BFP)				
Coverage of the all population (%)	7.86 (7.70)*	19.07 (14.63)	16.78 (14.14)	8.92
Coverage of the target population (%)	50.67 (19.49)*	98.75 (4.38)	99.25 (5.25)	48.58
Adequacy (BRL)	71.67 (6.57)*	126.85 (12.29)	408.05 (52.21)	336.38
Adequacy (USD PPP)				
Others Social Programs				
Benefício de Prestação Continuada (BPC) coverage (%)	1.02 (0.64)	1.74 (0.95)	2.23 (1.11)	1.21
Family Health Strategy coverage (%)	13.01 (21.76)	47.33 (31.20)	59.81 (27.71)	46.80
Other covariates				
Fertility rate (birth per woman)	3.33 (0.67)	2.89 (0.49)	2.55 (0.38)	-0.78
Poverty rate (%)	23.07 (17.85)	11.73 (11.79)	7.48 (9.23)	-15.59
Proportion of individuals older than 15 years who are illiterate (%)	10.89 (8.93)	7.60 (6.72)	4.73 (5.02)	-6.16
Gini Index	56.70 (5.83)	53.17 (6.88)	52.43 (9.70)	-4.27
Piped water (%)	80.39 (20.45)	84.97 (16.86)	87.44 (15.90)	7.06
Adequate sanitation (%)	11.97 (12.66)	22.50 (18.52)	27.28 (22.03)	15.31
Urbanization rate (%)	86.71 (18.00)	88.96 (16.20)	90.66 (14.96)	3.95
Hospital bed rate per 1,000 population (%)	2.93 (2.04)	2.56 (1.63)	2.24 (1.43)	-0.69
Rate of physicians per 1,000 population (%)	1.41 (0.93)	1.69 (1.13)	2.16 (1.46)	0.75

TABLE 2. Rate Ratios from the fixed effect negative binomial models for the association between age-standardized hospitalization and mortality rates with the Bolsa Família Program (BFP) coverage and adequacy.

VARIABLES	HOSPITALIZATION			MORTALITY		
	Coverage	Adequacy	Adequacy x Coverage	Coverage	Adequacy	Adequacy x Coverage
CCT target population coverage	1	-	-	1	-	-
Low (0 – 29.9%)	[1.000,1.000]	-	-	[1.000,1.000]	-	-
Intermediate (30 – 69.9%)	0.885***	-	-	0.924***	-	-
	[0.879,0.892]	-	-	[0.920,0.927]	-	-
High (70 – 99.9%)	0.851***	-	-	0.889***	-	-
	[0.845,0.857]	-	-	[0.885,0.892]	-	-
Consolidated (100%)	0.768***	-	-	0.824***	-	-
	[0.764,0.771]	-	-	[0.822,0.826]	-	-
CCT adequacy	-	1	-	-	1	-
Low (< R$ 61.44)	-	[1.000,1.000]	-	-	[1.000,1.000]	-
Intermediate (≥ R$ 61.44 to < R$ 99.13)	-	0.882***	-	-	0.900***	-
	-	[0.878,0.886]	-	-	[0.898,0.902]	-
High (≥ R$ 99.13 to < R$ 151.23)	-	0.842***	-	-	0.853***	-
	-	[0.837,0.847]	-	-	[0.851,0.855]	-
Consolidated (≥ R$ 151.23)	-	0.835***	-	-	0.849***	-
	-	[0.831,0.840]	-	-	[0.847,0.851]	-
CCT Adequacy x Target coverage	-	-	1	-	-	1
Low Adequacy x Low Coverage	-	-	[1.000,1.000]	-	-	[1.000,1.000]
Low Adequacy x High Coverage	-	-	0.923***	-	-	0.950***
	-	-	[0.917,0.929]	-	-	[0.947,0.954]
High Adequacy x Low Coverage	-	-	0.814***	-	-	0.866***
	-	-	[0.810,0.817]	-	-	[0.864,0.868]
High Adequacy x High Coverage	-	-	0.702***	-	-	0.775***
	-	-	[0.698,0.706]	-	-	[0.773,0.777]

High coverages and adequacy of BFP were associated with a statistically significant reduction of:

- 23.2% on overall age-standardized hospitalization rates (ASHR):
- 16.5% ASHR
- 17,6% on overall age-standardized mortality rates (ASMR),
- 15,1% on ASMR.

Based on these models, the Bolsa Família Program prevented the following during the period from 2004 to 2019:

- **Over 8 million hospitalizations** (8,176,047, 95% CI: 4,336,139 – 12,280,661) and
- **More than 710,000 deaths** (715,069, 95% CI: 289,813 – 1,151,145).

FIGURE 1. Rate Ratios from the fixed effect negative binomial models by age-groups for the association between hospitalization and mortality rates with the Bolsa Família Program (BFP) coverage and adequacy

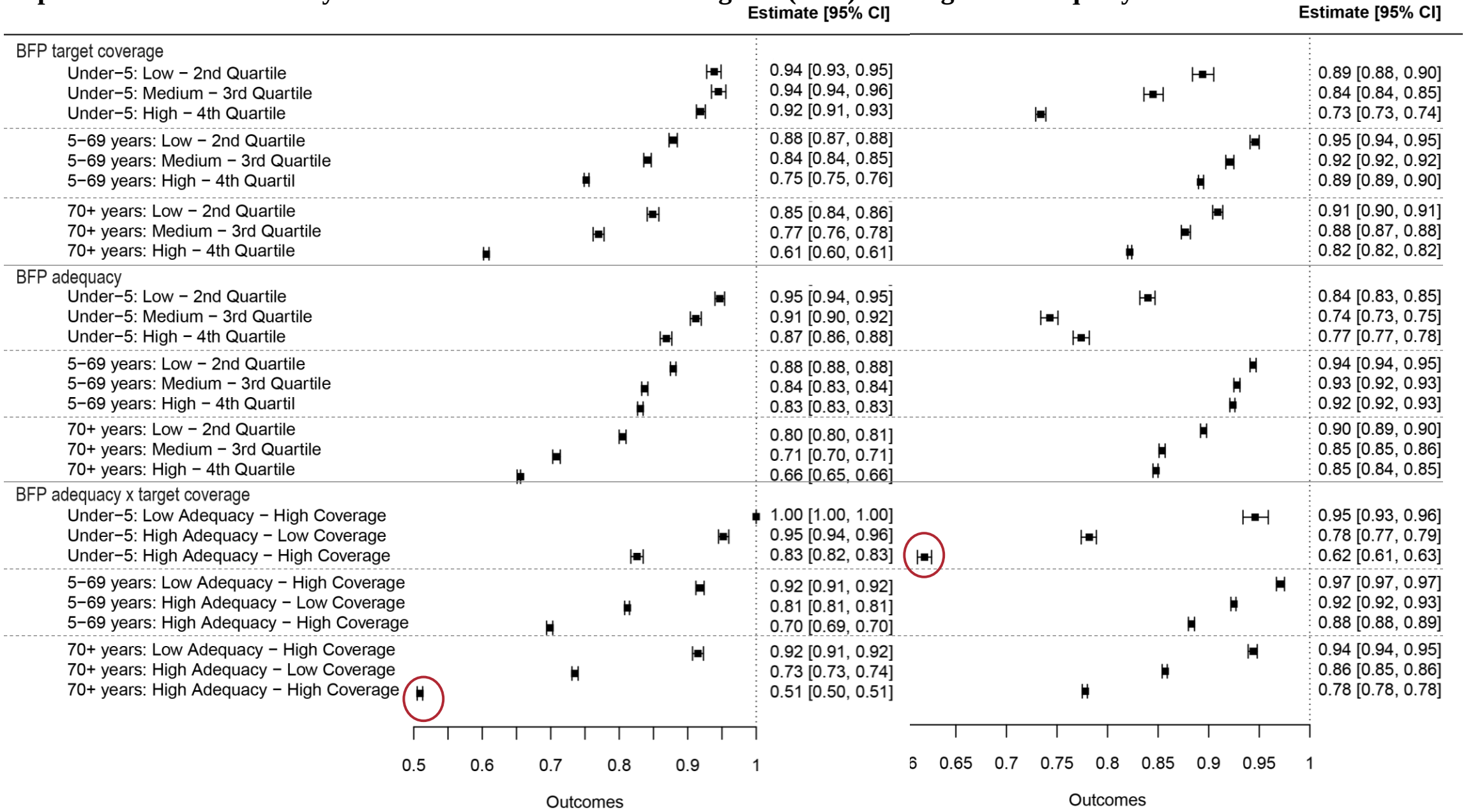
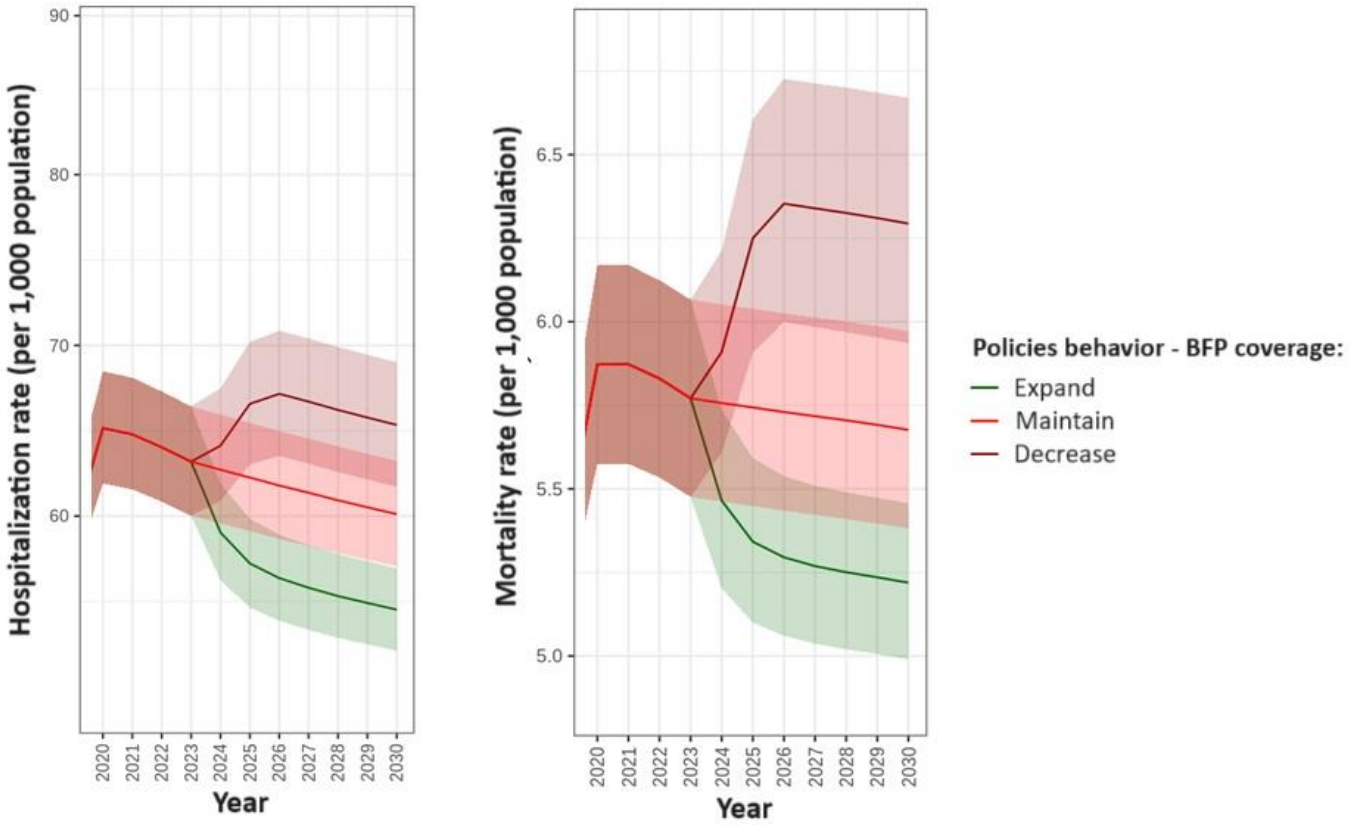


Figure 2. Scenarios of BFP behavior, and overall hospitalizations and mortality predictions, 2020-2030.



HOSPITALIZATION		
Year	Rate Ratio (Number)	[95% Prediction Intervals]
2020	0.925	0.886 – 0.929
2025	0.856	0.821 – 0.857
2030	0.830	0.796 – 0.857
Avoidable hospitalization	7,275,003	[3,459,039 – 11,462,638]
DEATHS		
Year	Rate Ratio (Number)	[95% Prediction Intervals]
2020	0.928	0.892 – 0.945
2025	0.901	0.865 – 0.916
2030	0.835	0.801 – 0.858
Avoidable deaths	636,411	[247,888 – 971,950]

Expanding BFP coverage could avert an additional 7,275,003(95%CI:3,459,039–10,343,240) hospitalizations and 696,875(95%CI:418,786–959,560) deaths by 2030 compared to scenarios without increasing this coverage

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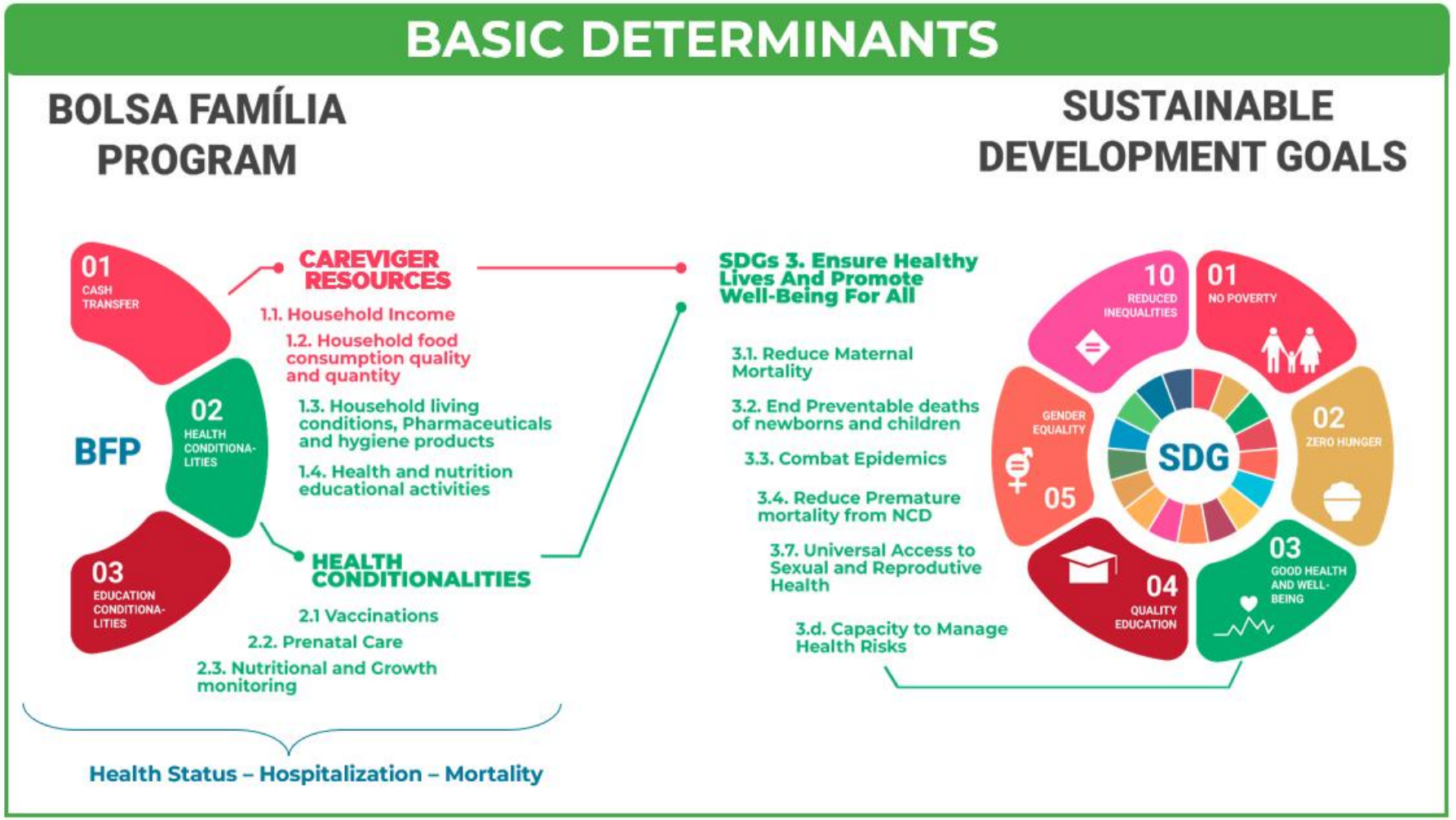
DISCUSSION



The Bolsa Família Program can affect overall mortality and morbidity through the "income-effect" and "conditionality-effect.

This design of mechanisms, which connects the BFP structure to health outcomes, aligns this public policy closely with the UN Sustainable Development Goals, particularly SDG 3: *Ensure Healthy Lives and Promote Well-Being for All at All Ages*.

CONCLUSION

- The success of the Bolsa Família Program in reducing morbidity and mortality in Brazil can be attributed to the multisectoral design of BFP, which integrates direct cash transfers with specific conditionalities. This approach aligns with the Health in All Policies (HiAP) framework and supports the achievement of the Sustainable Development Goals (SDGs). By emphasizing conditionalities, the program effectively addresses the root causes of health disparities, leading to significant improvements in population health outcomes and advancing progress toward SDG 3 (*Ensure Healthy Lives and Promote Well-Being for All at All Ages*) and its related targets.

- Indeed, the findings suggest that increased coverage and adequacy of the BFP program are linked to reductions in morbidity and mortality across *all age groups*, with particularly significant impacts on children under 5 and the elderly.

- **Our study shows that the Bolsa Família Program (BFP) strongly reduced morbimortality in Brazil, preventing millions of hospitalizations and deaths in the last two decades, particularly among children under-5 and older people. Expanding BFP coverage by 2030 is projected to avert numerous hospitalizations and deaths further and should be considered crucial for achieving the SDGs.**

THANK YOU!

Brazil's Conditional Cash Transfer: the effects of the first 20 years on health and projections for the SDGs in 2030.

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