

The effect of conditional cash transfers on tuberculosis incidence and mortality: a cohort study of 54 million individuals in Brazil

Presenter: Dr Davide Rasella

Institute of Collective Health (ISC/UFBA), Salvador, Brazil

Authors: Gabriela S Jesus, MSc*; Priscila FPS Pinto, PhD*; Andrea F Silva, PhD; Daniella M Cavalcanti, PhD; Iracema Lua, PhD; Maria Yury Ichihara, PhD; Mauricio L Barreto, Prof; Delia Boccia, PhD; Mauro N Sanchez, Prof; Davide

*These authors equally contributed as first authors

WCE

WORLD CONGRESS OF EPIDEMIOLOGY 2024



INTRODUCTION

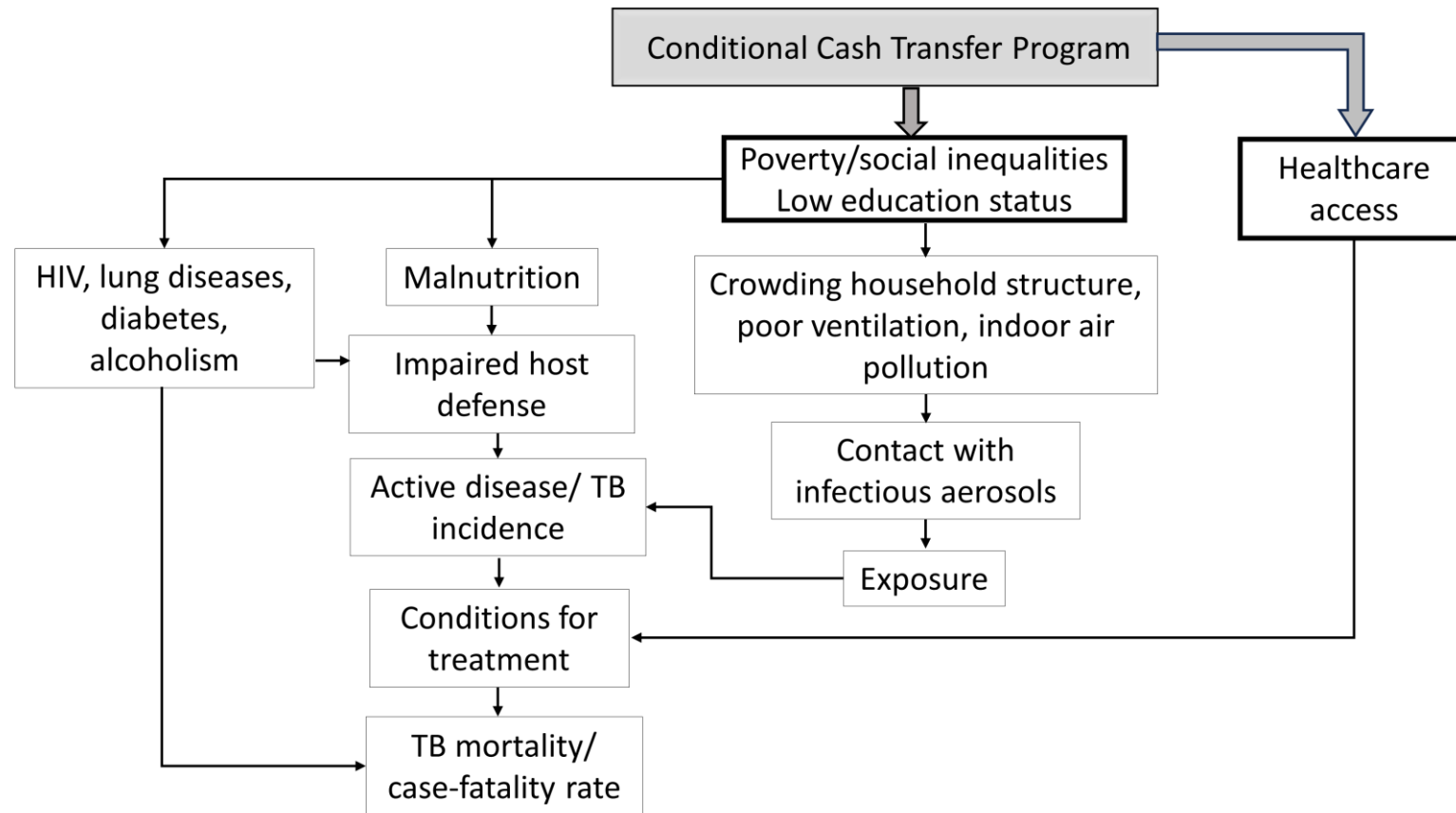


Figure 1. Conceptual framework about determinants and possible effects of the conditional cash transfers (CCT) on tuberculosis (TB) outcomes

INTRODUCTION

- Conditional Cash Transfers (CCT) are among the most effective interventions for poverty alleviation and reduction of socioeconomic inequalities implemented worldwide.
- OBJECTIVE = Evaluate the effect of the *Bolsa Família Program* (BFP), one of the largest CCT programs in the world, on Tuberculosis (TB) incidence, mortality, and case-fatality rates, estimating its heterogeneous effectiveness across the spectrum of ethnoracial factors and socioeconomic conditions.

METHODS

Study design

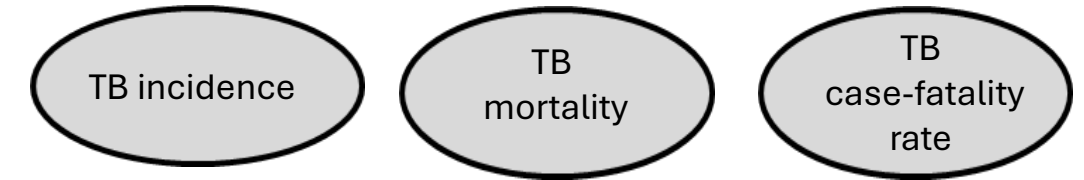
Impact evaluation study based on longitudinal data from a cohort of 54.5 million low-income Brazilians over 12 years (2004-2015)

Data Sources



Statistical analysis

Outcomes



Exposure



- Inverse probability of treatment weighting (IPTW) Poisson multivariable regression models
- According to: **ethnoracial factors, wealth levels**
- Wide range of Sensitivity and Triangulation analysis

RESULTS

- 54,571,434 individuals=23,907,958 BFP beneficiaries (43.8%), and 30,663,476 non-BFP beneficiaries (56.2%).
- 159,777 new TB diagnoses and 7,993 TB deaths.

Table 1. Estimates of the average effect of the *Bolsa Família* Program (PBF) IPTW multivariable Poisson model (with robust standard errors) on Tuberculosis incidence, mortality and the case-fatality rate in Brazil, 2004-

	Incidence	Mortality	Case-Fatality
	RR (95%CI)	RR (95%CI)	RR (95%CI)
Adjusted Model	0.59 (0.58-0.60)	0.69 (0.65-0.73)	0.90 (0.76-1.05)

RESULTS

Table 2. Estimates of the average effect of the *Bolsa Família* Program (BFP) adjusted Poisson model (with robust standard errors) on Tuberculosis incidence, mortality and the case-fatality rate in Brazil, 2004-2015.

Adjusted Models	Incidence	Mortality
Wealth	RR (95% CI)	RR (95% CI)
Lower wealth	0.49 (0.49-0.50)	0.60 (0.55-0.65)
Medium wealth	0.55 (0.54-0.57)	0.69 (0.63-0.77)
Higher wealth	0.95 (0.93-0.98)	1.00 (0.85-1.17)
Race or ethnicity		
White	0.67 (0.66-0.69)	0.83 (0.73-0.94)
Black/Pardo	0.58 (0.57-0.59)	0.69 (0.64-0.73)
Indigenous	0.37 (0.32-0.42)	0.35 (0.20-0.62)

DISCUSSION

- BFP effectiveness: a marked gradient based on ethnoracial and socioeconomic conditions with stronger effects among Indigenous, Black/pardo, and extremely poor populations;
- The magnitude of BFP effectiveness in the most vulnerable populations is extremely high (>50% reduction TB incidence), comparable with an effective biomedical intervention.
- Plausible results, considering that receipt of the BFP could alleviate extreme poverty and socioeconomic vulnerability; reducing food insecurity and malnutrition, and improving access to health care, among others.



Photo by Robson Gomes – Manguinhos RJ
Source: <https://www.anf.org.br/favelas-recebem-minidoors-com-campanha-de-combate-a-tuberculose/>

CONCLUSIONS

- The expansion of CCT programs in Low and Middle-Income Countries = strengthen the global response to TB, reducing social inequalities in the TB burden, and contributing to the achievement of the End TB Strategy and the TB-related Sustainable Development Goals.



Favela da Rocinha - Rio de Janeiro

Source: <https://m.folha.uol.com.br/equilibrioesaude/2016/11/1833657-na-rocinha-uma-mesma-rua-vive-diferentes-extremos-da-tuberculose.shtml>

REFERENCES

- Neves JA, Vasconcelos F de AG de, Machado ML, Recine E, Garcia GS, Medeiros MAT de. The Brazilian cash transfer program (Bolsa Família): A tool for reducing inequalities and achieving social rights in Brazil. *Glob Public Health* 2022; **17**: 26–42.
- Rasella D, Aquino R, Santos CA, Paes-Sousa R, Barreto ML. Effect of a conditional cash transfer programme on childhood mortality: a nationwide analysis of Brazilian municipalities. *The Lancet* 2013; **382**: 57–64.
- Pescarini JM, Campbell D, Amorim LD, *et al.* Impact of Brazil's Bolsa Família Programme on cardiovascular and all-cause mortality: a natural experiment study using the 100 Million Brazilian Cohort. *Int J Epidemiol* 2022; **51**: 1847–61.
- Torrens AW, Rasella D, Boccia D, *et al.* Effectiveness of a conditional cash transfer programme on TB cure rate: a retrospective cohort study in Brazil. *Trans R Soc Trop Med Hyg* 2016; **110**: 199–206.
- Olios JGN, Reis-Santos B, Locatelli RL, *et al.* Effect of the Bolsa Familia Programme on the outcome of tuberculosis treatment: a prospective cohort study. *Lancet Glob Health* 2019; **7**: e219–26.
- Carter DJ, Glaziou P, Lönnroth K, *et al.* The impact of social protection and poverty elimination on global tuberculosis incidence: a statistical modelling analysis of Sustainable Development Goal 1. *Lancet Glob Health* 2018; **6**: e514–22.





Thank you

davide.rasella@gmail.com



R01AI152938

welcome trust

WCE

WORLD CONGRESS OF EPIDEMIOLOGY 2024

