Association of the Brazilian conditional cash transfer programme with preterm births using the CIDACS Birth Cohort

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BF mothers experienced a **6%** and **18%** ***reduction in severe-to-extreme*** and ***extreme PTB***, respectively, compared to non-BF mothers. A ***greater reduction*** in both outcomes was observed among ***white*** **(7%** and **21%)** and ***black*** **(13%** and **21%) BF mothers**, particularly those living in the ***South*** **(11%** and **28%)** and ***Northeast*** **(9%** and **19%)**.

BACKGROUND

Preterm births (PTBs) increase morbity and mortality during childhood and later life, being associated with poverty-related risk factors. We evaluated whether receipt of the Brazilian conditional cash transfer (CCT) programme (Bolsa Familia, BF) during pregnancy reduces the occurrence of PTBs and explored how this association differs by geographical region, maternal race, and Municipal Human Development Index (MHDI).

METHODS

Longitudinal study using linked data from Brazilian Live Birth System (SINASC). Singleton births from 2012 onward were included. The exposed group consisted of newborns to mothers who received BF from conception to delivery. Our outcomes were infants born with a gestational age <37 weeks - overall, severe-to-extreme (22-31 weeks), and extreme (<28 weeks) PTBs - compared to at-term newborns (37-42 gestational weeks). Propensity score kernel weighting was applied to control for sociodemographic confounders in the association between BF receipt and PTB, overall and stratified by different subgroups (geographical region, maternal race, and MHDI).

RESULTS

5,478,036 infants were analyzed; 69.3% of the mothers were beneficiaries. BF was associated with reductions in severe-to-extreme and extreme PTBs, particularly among subgroups (Table). A lower risk of both severe-to-extreme and extreme PTB, was observed among BF mothers living in the South, Northeast, and Southeast compared to non-beneficiaries. White, black, and mixed-brown BF mothers living in higher-income municipalities also had lower risks of severe and extreme PTBs.

Table. Coefficients of adjusted kernel-weighted logistic regressions of Bolsa Familia (BF) Programme participation during pregnancy on preterm births in Brazil (2012-2015) and within subgroups of geographical region, maternal race/skin colour, and municipal tertiles of per capita income (Municipal Human Development Index, MHDI).

Models	All preterm birth (PTB, 22 to <37 weeks)		Severe to extreme PTB (22 to <32 weeks)		Extreme PTB (22 to <28 weeks)	
	Weighted OR[1] (95% CI)	N*	Weighted OR[1] (95% CI)	N*	Weighted OR[1] (95% CI)	N*
Brazil (Model 1)	1.01 (1.00-1.02)	4,099,933	**0.94 (0.91-0.96)**	3,715,424	**0.82 (0.78-0.86)**	3,679,133
Geographical region (Model 2)						
Model 2a - South	1.02 (1.00-1.05)	475,058	**0.89 (0.83-0.96)**	432,952	**0.72 (0.64-0.80)**	429,111
Model 2b - North	1.03 (1.00-1.06)	473,670	0.95 (0.87-1.04)	423,686	0.93 (0.79-1.09)	419,339
Model 2c - Northeast	0.99 (0.97-1.01)	1,455,493	**0.91 (0.87-0.96)**	1,316,776	**0.81 (0.74-0.88)**	1,303,466
Model 2d - Southeast	**1.03 (1.02-1.04)**	1,355,534	**0.96 (0.92-0.99)**	1,232,201	**0.84 (0.78-0.89)**	1,219,915
Model 2e - Midwest	0.97 (0.94-1.00)	329,415	0.93 (0.85-1.02)	299,638	**0.72 (0.62-0.85)**	297,125
Maternal race or skin colour (Model 3)						
Model 3a - White	1.02 (1.00-1.04)	1,246,368	**0.93 (0.89-0.98)**	1,134,187	**0.79 (0.73-0.86)**	1,123,999
Model 3b - Black	1.01 (0.97-1.04)	318,752	**0.87 (0.79-0.95)**	287,579	**0.79 (0.67-0.93)**	284,400
Model 3c - Mixed/brown	1.00 (0.99-1.01)	2,477,473	**0.94 (0.90-0.97)**	2,242,846	**0.82 (0.77-0.87)**	2,220,526
Model 3d - Indigenous	1.03 (0.89-1.21)	33,135	0.92 (0.59-1.45)	28,443	0.86 (0.35-2.11)	28,052
MHDI (Model 4)						
Model 4a - 1st tertile (lowest income)	0.99 (0.96-1.02)	681,874	0.93 (0.85-1.02)	614,892	0.87 (0.74-1.03)	608,835
Model 4b - 2nd tertile (medium income)	1.00 (0.99-1.02)	1,134,540	**0.93 (0.88-0.98)**	1,026,230	**0.83 (0.75-0.91)**	1,016,017
Model 4c - 3rd tertile (highest income)	**1.02 (1.01-1.03)**	2,262,933	**0.94 (0.91-0.97)**	2,054,662	**0.82 (0.77-0.86)**	2,034,675

All the analytical steps (propensity score (PS) estimation, kernel matching, and weighted logistic regression) were conducted separately considering each outcome within each level of geographical region, maternal race/skin colour, and MHDI tertiles. [1]Beneficiary status (BF participation = 1). * Sample size following kernel matching.
Model 1: Covariables used to estimate PS: maternal schooling, maternal race/skin colour, month that started prenatal care, number of prenatal visits, number of previous pregnancies, geographical region, household location, overcrowding, household conditions (refers to: household building material, sewage, water supply, garbage disposal, and electricity). Model adjusted for maternal age and mode of delivery. Model 2: Covariables used to estimate PS: maternal schooling, maternal race/skin colour, month that started prenatal care, number of prenatal visits, number of previous pregnancies, household location, overcrowding, household conditions. Model adjusted for maternal age and mode of delivery. Model 3: Covariables used to estimate PS: maternal schooling, month that started prenatal care, number of prenatal visits, number of previous pregnancies, geographical region, household location, overcrowding, household conditions. Model adjusted for maternal age and mode of delivery. Model 4: Covariables used to estimate PS: maternal schooling, maternal race/skin colour, maternal age, month that started prenatal care, number of prenatal visits, number of previous pregnancies, geographical region, household location, overcrowding, household conditions. Model adjusted for maternal age and mode of delivery.

CONCLUSIONS

An income transfer programme for pregnant women of low-socioeconomic status has been associated with reductions in severe and extreme PTBs, particularly among certain subgroups. BF did not affect overall PTB occurrence, may be due to the potential prevention of this outcome through a national expansion of prenatal care. Severe and extreme PTB remained a less preventable outcome, requiring the provision of antenatal care and timely referrals for high-risk pregnancies. The income transfer may improve nutrition, reduce stress, and enhance access to health services, thus decreasing PTBs. Maternal race and socioeconomic status are significant determinants of child health, with black and mixed-brown mothers being historically disadvantaged in Brazil. CCT have shown to increase maternal and child health service utilization and educational attainment. Public health and social inclusion policies are crucial for improving the well-being of poor families and achieving SDGs.

ADDITIONAL KEY INFORMATION

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