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Can a Conditional Cash Transfer Reduce Teen Fertility? The Case of Brazil's Bolsa Familia

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Abstract

In 2008, Brazil's conditional cash transfer program expanded to cover a wider range of ages. Poor families are now given stipends for their children's school attendance up to age seventeen, whereas prior the maximum age was fifteen. Using a nationally representative household survey, we estimate the impact of this policy on teen fertility with a triple difference analysis on the fertility outcomes of treated cohorts vs. non-treated cohorts based on income eligibility, age eligibility, and timing of program implementation. We find a three percentage point drop in fertility among eligible teens within five years of program implementation. This offsets the difference in fertility between poor and non-poor teens. The impact is concentrated in urban areas, with no program effects found in rural areas. We are able to replicate these findings using National Birth Registry Data.

INTRODUCTION

Within the last decade, Brazil's teen pregnancy rates have been among the highest in the world. In 2015, the fertility rate was 67 births per 1000 adolescent girls ages 15–19 in Brazil. In the same year in the United States, which has a notoriously high teen birthrate among developed countries, the teen fertility rate was 30.6 per 1000 girls (World Bank, 2017; Kollodge, 2015). While Brazil's total fertility for the population as a whole has fallen below replacement (Dinez Alvez, 2007), teen birth rate is not much different than in previous decades, causing births to adolescents (nineteens and younger) as a percent of total births to rise from 12% in 1986 to nearly 20% between 2004 and 2009 (Gupta and da Costa Leite, 1999, SINASC 2004–2009). Adolescent girls who live in poverty are particularly affected. They are almost twice as likely as other adolescent girls to be teen mothers, and only 25% of 16 and 17 year-old girls with children remain in school compared to 80% of those without children (Brazil's household survey PNAD, 2004–2013). The timing of the

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[2]All authors contributed equally to this work. RG and SR originated the work in 2011 and developed the identification strategy and main statistical analyses. In 2016, ZO updated the work with more recent data and additional statistical analyses, with SR providing intellectual supervision. All authors shared equally in writing the paper.

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first pregnancy has impacts on children with higher order births, likely through lower income levels: earlier pregnancies are correlated with lower levels of education of mothers.[3] Ultimately, a large portion of children born to women who are or who have been adolescent mothers are born into disadvantage, which can hinder their development through the life course.

The correlation between increased education and reduced fertility is found not only in Brazil (Gupta and da Costa Leite, 1999), but is also well observed throughout Latin America (Flores and Nunez, 2001) and the world (Lam and Duryea, 1999; Cleland, 2002). However, there is debate about whether a conditional cash transfer for education could lower teen fertility. On the one hand, attending school may expand girls' social networks and allow them to meet more potential sexual partners. Further, cash transfer programs often include benefits based on the number of children in a family which could encourage women to start child bearing earlier or have more children over the course of their lifetime because the lifetime cash benefit of having a child has increased. This type of association between conditional cash transfers and pregnancy for women of all ages (not specifically adolescents) has been confirmed for only one conditional cash transfer in Latin America, Stecklov et. al. (2006) take advantage of the random implementation of three conditional cash transfer programs—in Mexico, Honduras, and Nicaragua—and find that women are more likely to have given birth in the past twelve months or be at least three months pregnant only in Honduras, where incentives to have more children were strongest due to additional transfers for pregnant women and families with children under the age of three.

On the other hand, it is possible that a conditional cash transfer designed to increase teen education may also result in a decrease in adolescent pregnancy. The adolescent conditional cash transfer increases the opportunity cost of getting pregnant if getting pregnant makes it more difficult to stay in school. An increased opportunity cost of pregnancy could affect fertility decisions either directly through the teen herself or through increased pressure from parents, who would cease to benefit from the teen CCT if their daughter were to stop attending school. The theory that CCTs targeted towards teens may reduce teen pregnancy finds some support from a study that examines the impact of a CCT on teen pregnancy in Mexico; the authors find an increase in contraceptive use, though there was no corresponding impact on pregnancy (Darney et. al, 2013). Cortés et al. (2016) find a reduction in teen pregnancy for a conditional cash transfer program in Bogota, Colombia that requires completion of the school year and enrollment in the subsequent year to receive a subsidy. These pathways can only be salient if the cash transfer is sufficiently large to have meaningful impacts on income or education. Depending on the size of the transfer, costs of schooling, and base enrollment rates, the transfer may or may not impact adolescent fertility behavior. Further, the condition must be sufficiently strong to alter behavior.

The strongest experimental evidence that conditional cash transfers for schooling reduce early pregnancy comes from Malawi. Using a randomized control trial, Baird et. al. (2010)

[3]Health is a concern as well. Pregnancy resulting from improper contraceptive implies that these young women are also be exposed to STIs. Birth weights are lower and mortality rates are higher for both children of adolescent mothers and the adolescents themselves (Klein et. al. 2005).

find a conditional cash transfer of $10 a month to stay in school reduced sexual behavior by 5.5 percentage points for girls who had dropped out but returned to school and 2.5 percentage points for girls who never dropped out. Yet Malawi, where secondary school is not free and pregnancy essentially requires dropping out of school, is a very different cultural setting than Brazil, where pregnant girls can continue receiving free education.

An increase in age eligibility from fifteen to seventeen years provides the opportunity to test the effect of Bolsa Familia eligibility on teen fertility in Brazil (Bolsa Familia, 2010). Our study complements previous work in several ways. First, it adds to the limited body of work able to directly measure impacts of CCTs on teen fertility rather than on sexual behavior likely to impact fertility. Second, it provides evidence of impacts at scale. While the Malawi study only included about 1,300 girls and the Bogota study is representative of about 25,000 girls within a capital city, Bolsa Familia is a nationwide program for the fifth largest nation in the world.

We exploit the exogeneity of a teen's age at the time of the Bolsa Familia expansion to compare outcomes across age and income-eligible cohorts before and after the policy change expanding benefits to 16 and 17-year olds. As we can only imperfectly measure Bolsa Familia eligibility and not take-up, our study approximates an intent-to-treat analysis. Previous work (Reynolds 2015) has already confirmed the salience of the conditional cash transfer in the year after programmatic change, finding a four to five percentage point increase in attendance for 16-year-olds. When looking at a longer time frame (5 years after program implementation) we find a drop in fertility, evident starting 3 years after implementation. These results suggest that a conditional cash transfer scheme can address teen pregnancy at a national level. However, effects may take time to materialize.

BOLSA FAMILIA BACKGROUND

Brazil is home to the first conditional cash transfer programs, implemented independently by two municipalities in 1995: Bolsa Escola (School Grant in Brasilia) and PGRFM (Guaranteed Minimum Family Income Program in Campinas, Sao Paulo). The popularity of such programs expanded, and by 2001 more than 200,000 families were covered by local or state programs, many of which were absorbed into the federal adoption of Bolsa Escola and Bolsa Alimentação in 2001. These precedents paved the way for Bolsa Familia to be established as a national project in October 2003, combining these and a few other programs into a single centralized system.

Under Bolsa Familia legislation, poor families (defined as below the poverty line) receive a stipend if they have pregnant mothers or children up to age fifteen in the household. Children must complete vaccine schedules, attend school 85% of the time, and pregnant women must complete prenatal appointments in order for families to receive the stipend. The value of the stipend was about US$9 per child with a maximum of US$27 in 2007. Money is deposited into mothers' accounts and withdrawn from ATMs using Bolsa Familia cards.[4] Bolsa Familia benefits are designated at the family level as determined during

[4]Only 2.2% of recipients do not use electronic withdrawal (Lindert et. al. 2007).

registration with the Unique Registry system. As such, an adolescent mother would not necessarily be able to qualify for full Bolsa Familia benefits if they were still part of an already enrolled family.

In addition to geographic expansion, there have been changes to both eligibility criteria and the value of benefits received under Bolsa Familia over time. Our study focuses on the single largest change in the program, implemented in January 2008. With the Pro-Jovem law aimed at meeting various educational goals for Brazil's youth, Bolsa Familia expanded benefits to add an additional R$30 (about US$10) per sixteen and seventeen-year-old for up to two adolescents per family. This transfer for teens was 40% larger than the transfer for children ages 0 to15. Adolescent beneficiaries must attend school at least 75% of school days, whereas child beneficiary required attendance is 85%. Further, unlike the child benefit, the adolescent benefit is conditional only on adolescents' school attendance. If adolescents fail to meet the attendance requirement, families lose only the variable benefits linked to that particular adolescent. A family's non-compliance first results in a government investigation to determine if the family truly has access to health and education or is in need of additional social services. Then a warning postponement of payment is followed by a two-month suspension of benefits and ultimately cancelation. Research has shown that this tiered enforcement scheme has been effective (Kaufmann et al 2012).

The federal government allocates funds to each municipality based on official poverty estimates. Within the municipality, however, poor families may remain on the waiting list if the municipality is not an efficient allocator. To minimize leakage to the non-poor, the "Decentralized Management Index" is used to reward municipalities for thorough administration while municipalities that do not pass randomized audits are punished. However, non-poor families may also be legitimately receiving Bolsa Familia because eligibility is re-evaluated only every two years. Since a poor family's income is often volatile, some families' income will be above the eligibility threshold at any point in time. We take this into account in our robustness checks but not as a critique; overall Bolsa Familia is regarded as a well-targeted endeavor (Lindert et. al. 2007).

DATA

The primary source of data used in our study is the Pesquisa Nacional por Amostra de Domicilios (PNAD). PNAD is Brazil's yearly national household survey of approximately 150,000 households and 390,000 individuals each year. PNAD is representative of households at the state and national level since 2004, with least populated regions left out in earlier years. PNAD is a self-weighted survey that is representative at the state and rural/urban level. The households are different each time, making it a repeated cross section. We use data from 2005 to2013, excluding 2010, when the national Census was used to collect national data instead.

The key outcome variable of interest is whether or not a teenager was ever pregnant. This is a dummy variable with a value of 1 if a woman has any children and 0 if she does not. Since 2001, fertility questions have been included for all girls aged 10 and older and include how many babies were born, both live and stillbirth. The PNAD reference date for each survey

year is chosen within the last week September so we know how many babies were born by September of a given year. As a result, the responses to the birth questions include children conceived nine months prior during the previous school year, which corresponds to the calendar year in Brazil. There are no questions on abortions or pregnancies that were not carried to term.

There are three eligibility aspects to the expansion of Bolsa Familia: income, age, and survey year. We create three indicator variables for each of these aspects. If their triple interaction is 1, it indicates an individual that would plausibly be treated.

Income

Bolsa Familia eligibility status is awarded if per-capita household income is below the poverty line. The PNAD calculates income per capita based on responses to income questions and family size, which would determine eligibility for Bolsa Familia. The income questions cover all members of the family age 10 and older and include both formal and informal employment over the previous month. This is not a perfect measure of Bolsa Familia eligibility as the family may report different income levels to municipal workers that determine Bolsa Familia eligibility and, as mentioned earlier, income may have fluctuated since the stipend was awarded. We consider an adolescent to be “income-eligible” if her family’s per capita household income is below that year’s particular eligibly threshold. There is no direct question about participation in Bolsa Familia. Since we cannot definitively say whether a family receives Bolsa Familia, this is considered an Intent to Treat analysis.

For each year, we calculate how far the family’s per capita income is from the poverty line. After examining the income distribution around the poverty line, we restrict our sample to those with less than 85 Reals (~45 US dollars) above the poverty line. This is the monetary “distance” at which there are close to an equal number of observations eligible and ineligible for Bolsa Familia.

To assess whether or not there may be misreporting and, therefore, bias in income, we examine the distribution of self-reported income around the poverty line in 2007 prior to the Bolsa Familia expansion. In Figure 1 we see a relatively smooth density of self-reported income per capita, aside from expected spikes near round numbers (100 and 200). However, we see an important spike in self-reported income at 120 Reals—the requisite cutoff for Bolsa Familia eligibility in 2007. Since the income thresholds for Bolsa Familia eligibility are well known and easily manipulated, we find that this indicates that individuals are reporting income that aligns with their Bolsa Familia eligibility. This mirrors their behavior with the Unique Registry questionnaire that is used for determining actual Bolsa Familia eligibility. Histograms for other years are provided in the Appendix. It is possible that families would have enrolled in Bolsa Familia to obtain the adolescent benefits after the program expansion. To assess this, we examine the rate of girls with income reported at the exact poverty line over time compared to those not at round numbers (ie., omitting individuals at R$100, R$200, etc. away from the poverty line). These results can be seen in Appendix Figure 2. They show likely manipulation decreased drastically after 2006 (when the poverty line was set at 100$R) and continued to decline afterward.

Age

To estimate whether an adolescent was age-eligible to receive benefits at the time of conception, we adjust age eligibility to account for gestation. Women who were age-eligible (age 16 or 17) would be 17 or 18 years of age 9 months later, when a child was (or was not) born and observed in the survey. Thus, we consider age 17 or 18 to be age-eligible. In the sample we include girls aged 15 to 18. Those aged 15 or 16 at the time of the survey are considered age-ineligible. We do not include older girls as the lifestyle changes associated with turning nineteen make them a bad comparator for the Bolsa Familia eligible cohorts. A figure showing the proportion of age-eligible girls in our sample, by year, can be seen in Appendix Figure 3.

Year

Though 2008 was the year the program began, we would not see impacts on childbirth until nine months later in 2009. Thus, we consider eligible years to be 2009 to 2013. We use data going back to 2005 to have a comparable number of intervention and non-intervention years.

Additional Control Variables

In our specifications with full controls we also include:

- Number of children under 5 years in the household excluding the adolescent mother's children
- Total number family members over 5 years in the household except for the adolescent mother's children
- Dummies for the highest level of education achieved by the head of household (primary, secondary, tertiary)
- A dummy for rural/urban
- We allow for a state-cohort cluster for standard errors in all specifications.

Baseline summary statistics for these variables are provided in Table 1. The statistics are for 2007 (the year before the Bolsa Familia expansion) and only include those individuals with no more than R$85 above the poverty line. School attendance declines rapidly from age sixteen to eighteen. Simultaneously, the number of adolescents with children nearly triples. While these statistics do not denote a causal relationship, they suggest an intervention that increases school attendance may reduce teen pregnancy. In Appendix Figure 5, we show trends in enrollment for poor adolescents over time and confirm an increasing trend in enrollment after 2008.

MODEL

We use a triple difference estimation strategy to identify an intent-to-treat estimate of the Bolsa Familia age-eligibility expansion. We compare the fertility outcomes of girls from families below the income-eligible threshold for Bolsa Familia who were ages 16 and 17 in 2008 and after (i.e. 17 and 18 in 2009 and after) to girls who were not eligible due to not being poor or not the right age at the appropriate time. Because our outcome is births, which

occur nine months after conception, we will consider age-eligible to be 17 and 18 and the treatment year to be 2009 for the remainder of this paper.

Our identifying equation is:

$$O_{ilt} = \beta_1(A_i T_t P_i) + \beta_2 A_i + \beta_3 P_i + \beta_4(A_i T_t) + \beta_5(A_i P_i) + \beta_6(T_t P_i) + \beta_7 C_i + \delta_t + \epsilon_{ilt} \quad (1)$$

P_i = 1 if the teen's family is below poverty line (Poor)

A_i = 1 if the teen is age-eligible, ages 17 and 18 (Age-eligible)

T_t = 1 if the policy is in place, if the year is 2009 or after (After)

C_i are household characteristics

δ_t are year fixed effects

ε_{ilt} is an error term

A girl's age (A_i) is clearly exogenous, as these girls were born before Bolsa Familia had begun as a national program. Furthermore, an individual pregnancy decision would not affect the year Bolsa Familia was extended, so T_t can also be considered exogenous. As we show above, it is likely that families manipulate their reported monthly per-capita income to ensure receipt of Bolsa Familia benefits. As such, P_i is likely to line up with beneficiary status in the Cadastro Unico. To ensure our results are robust to manipulation, we present results in Appendix A3 showing our primary specifications with individuals exactly at the poverty line removed. The number of individuals removed is illustrated in Appendix Figure 2.

Our model also assumes that there are no other national-level policies geared toward reducing teen pregnancy or increasing school enrollment enacted contemporaneously to the Bolsa Familia expansion and target specifically those who are eligible for Bolsa Familia. While we have identified isolated policies within municipalities and small-scale interventions such as improved sexual education in schools, we have been unable to identify any policies that would have taken effect across the country in this time period.

To be valid, this approach requires that outcome trends align during pre-intervention years. To confirm parallel trends, we conduct a placebo test on program implementation date to show no difference in fertility before actual program implementation. These results are found in the robustness section.

RESULTS

Our triple difference regressions show a consistent 3 percentage point drop in the teen births to those presumed eligible for Bolsa Familia after 2010 (Table 2). Our results are robust to a variety of specifications including: (1) no controls, (2) including only household controls, and (3) including household as well as rural-urban controls. Year fixed-effects are included

for all specifications to account for secular trends. Our results amount to a roughly 10 percent drop in number of births to teens prior to the intervention. To put these results in perspective, this is nearly enough to make up for the 2 to 4 percentage point gap in teen pregnancy between the poor and non-poor.

Given significant fertility and wealth differences between rural and urban Brazilians, we also look at impacts by whether a teen lives in a rural or urban area (Table 3). We find that the decrease in fertility associated with Bolsa Familia expansion to adolescents is concentrated almost entirely in urban areas. In particular, there is a 5 percentage point drop in fertility among urban teens and no significant drop among rural teens.

ROBUSTNESS

Table 4 contains the placebo trend checks for outcomes of fifteen to eighteen year olds supposing treatment began in 2007 or 2008.

To assess the impact of the policy based solely on Bolsa Familia eligibility and program implementation we conducted a double-difference analysis on just the 17 and 18 year old cohort. While we are unable to confirm parallel trends with this analysis and exclude it from the study, we do include a graph showing noise in fertility rates by year adolescent girls. For 17 year old girls we do see a steady drop between 2008 and 2011 (Appendix Figure 5). For 18 year old girls, we see a large drop between 2009 and 2011.

In an alternative robustness check using the full sample, we run a fully saturated model that includes interactions between age and poverty eligibility and every year of the program. This specification allows us to identify effects on a yearly basis as opposed to aggregating all treatment years together. This models an event study where we are able to assess exactly when effects of the program expansion began. These results are displayed in Table 5, with the year 2008 being omitted as the base comparison year. Given the number of interaction terms, we omit these from our tables for simplicity. While these results do not show highly statistically significant results for any singular year after the program expansion, the magnitudes display little evidence of changes in fertility trends prior to the program. After program implementation, on the other hand, we see drops in fertility similar in magnitude to those of our primary specification. We hypothesize that the effect for 2009 is smaller because it is the first year of implementation. Impacts in 2012 are also somewhat smaller but still more than twice the magnitude of those in preintervention years. However, while neither pre or post interactions grouped were jointly significant at traditional levels, the post intervention yearly trends were significant at 20% while the pre intervention trends were not even significant at 50%. For this reason, and because of the noise in the yearly trends, we prefer our main specification which combines all the years together.

To check the robustness of the main specification we conduct three sensitivity analyses, all of which confirm our results. First, we check to ensure that our triple-difference estimator is robust to variation of the poverty line. The PNAD data do not explicitly identify whether or not someone receives Bolsa Familia. We run our preferred specification with placebo poverty lines ranging from 50% to 200% of the actual poverty line. We find that

significantly underestimating the poverty line results in a null estimate, which provides confidence in our results because it suggests that including some treated in the control group removes the policy impact. On the other hand, overestimating the poverty line does not significantly change the estimate (Appendix Table A1). This may be due to the fact that in our dataset, we identify approximately 19% of individuals as being eligible for Bolsa Familia whereas the true percentage is closer to 22% (Hellman, 2015). Fourth, we conduct a sensitivity analysis on the income restriction used to select our sample. Our primary specification uses a restriction of those with no more than R$85 (~US$40) per capita income over the poverty line to balance the sample. However, when we expand the sample to include individuals up to R$210 (~US$100) per capita income from the poverty line, our results are consistent (Appendix Table A2). To ensure that our results are robust to manipulation of poverty reporting, we remove individuals at the poverty line with minimal impact on our results (Appendix Table A3). Lastly, we run our primary specifications including an age-poor interaction to ensure that trends within certain age groups are not the true cause of our results. Our results are robust to including these additional terms (Appendix Table A4).

Evidence using the National Birth Registry

To further verify the validity of our findings, we use data from the Brazilian birth registry combined with data from the Ministry of Social Development on Bolsa Familia coverage at the municipal level. Brazil's Information System on Live Births (Sistema de Informações sobre Nascidos Vivos – SINASC) publishes individual level data on live births, which includes both demographic and health-seeking behavior of the mother. The Ministry of Social Development database includes information on Bolsa Familia at the municipal level and is updated biannually.

While the birth registry data do not include indicators of whether or not families were Bolsa Familia beneficiaries, the Ministry of Social Development has information on what percentage of eligible individuals within a municipality are treated by Bolsa Familia. There is variation in these data as Bolsa Familia was not immediately available for every poor family in Brazil and was scaled up over time. We note that the coverage variable has a limitation because by 2013 on average municipalities had 95% coverage, whereas only 81% were covered in 2008 on average. This means that there is less variability in later years once coverage nears 100%. The largest jump in coverage occurred between 2008 and 2009 when it increased from 81% to 91%, on average. By 2011, coverage had stabilized at around 94% on average. The municipal coverage variables scaled from 0 to 1 to denote going from no eligible households in a municipality receiving Bolsa Familia to all eligible households in a municipality receiving Bolsa Familia.

We aggregate birth registry at the municipal level by residence and age of the mother.

We then combine these data with municipal level data on municipality size and Bolsa Familia coverage. Baseline characteristics of mothers can be seen in Appendix A7.

We use OLS to estimate how the Bolsa Familia expansion to adolescents impacts teen fertility by interacting the percent of the municipality covered by Bolsa Familia with a dummy indicating whether the year is 2009 or later. The primary equation is:

$$O_{lt} = \beta_1\left(\text{Coverage}_{lt} \times T_{t)}\right) + \beta_2\left(\text{Coverage}_{lt}\right) + \Sigma_t \ Year_t + \delta_{lt} + \epsilon_{lt} \quad (2)$$

O_{lt} is the log of births to ages 17 & 18 in locality l in year t. *Coverage* is the percentage of eligible households in a municipality that received Bolsa Familia, and T is a dummy variable denoting whether or not the program was in place (2009 & after to allow for a full-term pregnancy).

Results are presented in Table 6. We see a 6 to12 percent drop in births for those aged 17–18 in municipalities with higher Bolsa Familia coverage, which is consistent with our primary estimates of a 3 percentage point drop (approximately 10% drop). These coefficients are larger as they represent a municipality going from 0% to 100% coverage.

As with the primary results, we conduct a placebo test for implementation year. No effect was found with a 2007 placebo and a smaller but significant effect was found with a 2008 placebo (Appendix A5). For additional robustness, we also perform this analysis as an event study and find results analogous to the event study performed for the PNAD data including results that are larger in magnitude and significance after two years of program implementation (see appendix A6). However, these estimates are also somewhat noisy, which is why we again prefer the grouped analysis. For example, though the 15 and 16 year olds by 2013 were positive, while for the 17 and 18 year olds the estimates were much smaller or negative, so the contrast between the age groups still is as expected.

Discussion

This is one of the first studies of which we are aware to show the impact of an educationally targeted CCT on adolescent fertility at a national scale. We have examined the impacts on adolescent fertility of broadening the coverage of Brazil's conditional cash transfer program Bolsa Familia to include 16 and 17year olds. By 2013 a 3 percentage point reduction in teen fertility was found. This represents a 10% drop in pregnancy for impoverished 16 and 17 year olds compared to years before program expansion. With 24% of the population enrolled in Bolsa Familia in 2007, this delay in fertility amounts to approximately 7,000 delayed pregnancies for the 16 and 17 year olds enrolled in the program at the time it was enacted. These results demonstrate that programs that target education and income can have an impact on fertility.

These findings diverge somewhat from results found by Cortés et al (2016), though we find a similar effect size. While their study found that educational achievement conditions (not just enrollment conditions) were necessary for an impact on fertility, we find that attendance conditions are sufficient to produce an impact on fertility, at least in the Brazilian context. Considering the Bolsa Familia benefits, families receive more for having an adolescent in school than for having a pregnant adolescent not attending school. This suggests that the transfer amount for adolescents is sufficiently large to not just incentivize increased enrollment as has been shown previously by Reynolds (2015). As Reynolds (2015) identified the impact on enrollment to be concentrated within adolescent boys, it is likely

that effects we find is also due to reduced risky sexual behavior that may result in pregnancy. Our results differ from the study in Malawi, which finds only short-term impacts because the program concluded after a short time. We do not see short term impacts in Brazil when looking at either the PNAD or SINASC event study data. One possibility for this lack of short term impact in Brazil could be that in the first year of the program, the 17-year-olds most at risk had already dropped out of school since they did not receive the conditional cash transfer at age 16. Since it is harder to re-enroll drop-outs than to retain already-enrolled students, these students were likely not impacted by the initial offering of the Bolsa Familia expansion. As continuously enrolled children became older, the cash transfer became salient. Support for this theory is found with respect to enrollment compliance for boys (Reynolds, 2015) as well as in the enrollment figures in Appendix Figure 4.

Our analysis is an intent-to-treat analysis and is limited in that we only approximate income eligibility. The Bolsa Familia program was also not as closely monitored as the Malawi study's program, suggesting there may have been leakage or oversight. We may not have captured all the treated and some of the untreated may have contaminated the treatment group. These inaccuracies suggest that our estimates may be lower bounds.

Additional research will be needed to better understand why impacts are concentrated exclusively in urban areas, but the salience of the stipend for education may be related; Reynolds (2015) also found education impacts concentrated in urban areas. This may be because there are higher returns to completing high school in urban areas compared to rural areas as urban areas have more varied employment opportunities. We do not see differences in urban and rural marriage rates among Bolsa Familia eligible teens, in spite of differences in wage rates.

Overall, our findings confirm that conditional cash transfers can have positive secondary impacts on teen fertility. This study shows that Bolsa Família's CCT targeted at teens reduced teen fertility among the urban poor by 10% within 5 years in Brazil, bringing fertility rates for adolescents living in poverty down to nearly the same rates as other adolescents in Brazil. This drop in adolescent fertility could have long term impacts on social welfare, with delayed pregnancy allowing for high school completion, higher income, and a more economically secure childhood for children who are born to these women later.

APPENDIX

A1.

Sensitivity to Poverty Line

Triple Difference Pregnancy to Term: Girls Aged 15 to 18 (Varying Poverty Line)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	50% Poverty Line	75% Poverty Line	Poverty Line	125% Poverty Line	150% Poverty Line	175% Poverty Line	200% Poverty Line
Treated (Age-Eligible *Poor *After)	**0.022**	**0.004**	**−0.030***	**−0.028***	**−0.039*****	**−0.025***	**−0.022***
	(0.021)	**(0.016)**	**(0.015)**	**(0.015)**	**(0.014)**	**(0.013)**	**(0.012)**
Age-Eligible *After	−0.027*	−0.017	0.006	0.010	0.025**	0.016	0.017*
	(0.014)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)
Age-eligible *Poor	0.014	0.013	0.027***	0.039***	0.047***	0.051***	0.060***
	(0.011)	(0.010)	(0.010)	(0.008)	(0.008)	(0.008)	(0.009)
After *Poor	−0.037***	−0.023***	−0.027***	−0.033***	−0.024***	−0.018***	−0.012*
	(0.011)	(0.009)	(0.008)	(0.007)	(0.007)	(0.006)	(0.006)
After	−0.009	0.002	0.013	0.023**	0.026***	0.023***	0.017**
	(0.014)	(0.011)	(0.010)	(0.010)	(0.009)	(0.009)	(0.008)
Poor	0.032***	0.037***	0.039***	0.044***	0.047***	0.049***	0.053***
	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)
Age eligible	0.160***	0.154***	0.139***	0.124***	0.109***	0.100***	0.086***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)
Constant	0.188***	0.198***	0.184***	0.160***	0.147***	0.137***	0.124***
	(0.025)	(0.023)	(0.019)	(0.017)	(0.014)	(0.013)	(0.011)
HH Controls	YES	YES	YES	YES	YES	YES	YES
Urban Controls	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Observations	26,031	33,451	40,877	47,573	53,415	58,761	63,605
R-squared	0.101	0.097	0.093	0.090	0.086	0.083	0.081

Robust standard errors in parentheses, clustered at the state-birth cohort level

* significant at 10%;

** significant at 5%;

*** significant at 1%

(1) “Treated” teens are ages 17 & 18 in 2009 (age 16 & 17 in 2008)

(2) “Pregnant” refers only to pregnancies brought to term (still or live birth)

Poverty line is per capita income requirement for Bolsa Familia Eligibility

PNAD 2005–2009, 2011–2013

A2.

Sensitivity to Income Cutoff

Triple Difference Pregnancy to Term: Girls Aged 15 to 18 (Varying Income Cutoff Range)							
	Fert kids: age15–18	**Fert kids: age15–18**	**Fert kids: age15–18**	**Fert kids: age15–18**	**Fert kids: age15–18**	**Fert kids: age15–18**	**Fert kids: age15–18**
VARIABLES	**55 Reals**	**85 Reals**	**120 Reals**	**150 Reals**	**180 Reals**	**210 Reals**	**No Cutoff**
Treated (Age-Eligible *Poor *After)	−0.015	−0.030*	−0.032**	−0.035**	−0.035**	−0.036***	−0.019
	(0.018)	(0.015)	(0.015)	(0.014)	(0.014)	(0.014)	(0.013)
Age-Eligible *After	−0.008	0.006	0.009	0.012	0.012	0.013*	−0.003
	(0.014)	(0.011)	(0.010)	(0.009)	(0.008)	(0.008)	(0.005)
Age-eligible *Poor	0.018*	0.027***	0.037***	0.042***	0.048***	0.053***	0.091***
	(0.010)	(0.010)	(0.009)	(0.009)	(0.009)	(0.008)	(0.008)
After *Poor	−0.018**	−0.027***	−0.029***	−0.030***	−0.027***	−0.028***	−0.017***
	(0.009)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)
After	0.007	0.013	0.019**	0.024***	0.023***	0.022***	−0.001
	(0.012)	(0.010)	(0.009)	(0.009)	(0.008)	(0.008)	(0.005)
Poor	0.029***	0.039***	0.044***	0.049***	0.051***	0.054***	0.055***
	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)
Age eligible	0.148***	0.139***	0.130***	0.125***	0.120***	0.114***	0.079***
	(0.008)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)
Urban	−0.008	−0.006	−0.006	−0.005	−0.006	−0.006*	−0.015***
	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)
Constant	0.192***	0.184***	0.161***	0.154***	0.148***	0.143***	0.096***
	(0.022)	(0.019)	(0.016)	(0.015)	(0.013)	(0.012)	(0.006)
HH Controls	YES	YES	YES	YES	YES	YES	YES
Rural/Urban Controls	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Observations	33,716	40,877	48,184	53,768	58,775	63,342	107,581
R-squared	0.097	0.093	0.089	0.086	0.083	0.081	0.069

Robust standard errors in parentheses, clustered at the state-birth cohort level

*significant at 10%;

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(2)"Pregnant" refers only to pregnancies brought to term (still or live birth)

(1)"Treated" teens are ages 17 & 18 in 2009 (age 16 & 17 in 2008)

*** significant at 1%

significant at 5%;

A3.

Omitting Individuals at the Poverty Line

Triple Difference Pregnancy to Term: Girls Aged 15 to 18 (Omitting Individuals on Poverty Line)			
	(1)	(2)	(3)
	Fert kids: age15–18	Fert kids: age15–18	Fert kids: age15–18
VARIABLES	no controls	HH controls	HH & Urban Controls
Treated (Age-Eligible *Poor *After)	−0.030 *	−0.029 *	−0.029 *
	(0.016)	(0.015)	(0.015)
Age-Eligible *After	0.007	0.006	0.006
	(0.011)	(0.011)	(0.011)
Age-eligible *Poor	0.030 ***	0.026 ***	0.026 ***
	(0.010)	(0.010)	(0.010)
After *Poor	−0.014 *	−0.027 ***	−0.027 ***
	(0.007)	(0.008)	(0.008)
After	0.017 *	0.016	0.015
	(0.010)	(0.010)	(0.010)
Poor	0.019 ***	0.039 ***	0.039 ***
	(0.005)	(0.005)	(0.005)
Age eligible	0.147 ***	0.139 ***	0.139 ***
	(0.007)	(0.007)	(0.007)
Urban			−0.005
			(0.004)
Constant	0.062 ***	0.172 ***	0.178 ***

Triple Difference Pregnancy to Term: Girls Aged 15 to 18 (Omitting Individuals on Poverty Line)			
	(1)	(2)	(3)
	Fert kids: age15–18	Fert kids: age15–18	Fert kids: age15–18
VARIABLES	no controls	HH controls	HH & Urban Controls
	(0.006)	(0.018)	(0.019)
HH Controls	NO	YES	YES
Rural/Urban Controls	NO	NO	YES
Year Fixed Effects	YES	YES	YES
Observations	40,135	40,135	40,135
R-squared	0.053	0.091	0.092

Robust standard errors in parentheses, clustered at the state-birth cohort level

*significant at 10%;

**significant at 5%;

***significant at 1%

(1)"Treated" teens are ages 17 & 18 in 2009 (age 16 & 17 in 2008)

(2)"Pregnant" refers only to pregnancies brought to term (still or live birth)

PNAD 2005–2009, 2011–2013

A4.

Including Age-Poor Interactions

Triple Difference Pregnancy to Term: Girls Aged 15 to 18 Including Age-Poor Interaction			
	(1)	(2)	(3)
	Fert kids: age15–18	Fert kids: age15–18	Fert kids: age15–18
VARIABLES	no controls	HH controls	HH & Urban Controls
Treated (Age-Eligible *Poor *After)	−0.032**	−0.030**	−0.030**
	(0.015)	(0.015)	(0.015)
Age-Eligible *After	0.008	0.007	0.007
	(0.010)	(0.010)	(0.010)
Age-eligible *Poor	0.042***	0.035***	0.035***
	(0.012)	(0.012)	(0.012)
After *Poor	−0.016**	−0.027***	−0.027***
	(0.007)	(0.007)	(0.007)
After	0.013	0.014	0.013
	(0.009)	(0.009)	(0.009)
Poor	0.020***	0.038***	0.038***
	(0.005)	(0.005)	(0.005)
Age eligible		0.212***	0.212***
		(0.009)	(0.009)
Urban			−0.006
			(0.004)
Constant	0.039***	0.148***	0.155***

Triple Difference Pregnancy to Term: Girls Aged 15 to 18 Including Age-Poor Interaction			
	(1)	(2)	(3)
	Fert kids: age15–18	Fert kids: age15–18	Fert kids: age15–18
VARIABLES	no controls	HH controls	HH & Urban Controls
	(0.005)	(0.018)	(0.019)
HH Controls	NO	YES	YES
Rural/Urban Controls	NO	NO	YES
Year Fixed Effects	YES	YES	YES
Age-Poor Interaction	YES	YES	YES
Observations	40,877	40,877	40,877
R-squared	0.067	0.105	0.105

Robust standard errors in parentheses, clustered at the state-birth cohort level

* significant at 10%;

** significant at 5%;

*** significant at 1%

(1)"Treated" teens are ages 17 & 18 in 2009 (age 16 & 17 in 2008)

(2)"Pregnant" refers only to pregnancies brought to term (still or live birth)

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A5.

Birth Registry Placebo Test

	Birth Registry Pacebo Test				
		(1)	(2)	(3)	(4)
	VARIABLES	Log Births: Age15	Log Births: Age16	Log Births: Age17	Log Births: Age18
2007 Placebo	Coverage *Treated	0.0045	−0.0377	−0.0336	−0.0478*
		(0.0319)	(0.0281)	(0.0266)	(0.0258)
	PBF Coverage	0.0373*	0.0287	0.0295	0.0335*
		(0.0221)	(0.0202)	(0.0193)	(0.0187)
	Constant	1.5218***	1.9395***	2.1694***	2.3325***
		(0.0223)	(0.0193)	(0.0183)	(0.0188)
	Municipal Fixed Effects	YES	YES	YES	YES
	Year Dummies	YES	YES	YES	YES
	Observations	45,986	50,271	52,185	52,907
	R-squared	0.0058	0.0225	0.0422	0.0640
	Number of ibge	5,539	5,570	5,577	5,582
2008 Placebo	Coverage *Treated	−0.0111	−0.0566**	−0.0431	−0.0895***
		(0.0313)	(0.0282)	(0.0265)	(0.0252)
	PBF Coverage	0.0430**	0.0316*	0.0296*	0.0436**
		(0.0201)	(0.0184)	(0.0177)	(0.0172)
	Constant	1.5312***	1.9390***	2.1444***	2.3275***
		(0.0229)	(0.0205)	(0.0190)	(0.0193)

	Birth Registry Pacebo Test				
		(1)	(2)	(3)	(4)
	VARIABLES	**Log Births: Age15**	**Log Births: Age16**	**Log Births: Age17**	**Log Births: Age18**
	Municipal Fixed Effects	YES	YES	YES	YES
	Year Dummies	YES	YES	YES	YES
	Observations	45,986	50,271	52,185	52,907
	R-squared	0.0058	0.0225	0.0423	0.0642
	Number of ibge	5,539	5,570	5,577	5,582

Robust standard errors in parentheses

*significant at 10%;

**significant at 5%;

***significant at 1%

(1)"Treated" are those who gave conceived after the program was implemented

(2)"Coverage" denotes a change from 0–100% coverage of the Bolsa Familia Program

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A6.

Birth Registry Event Study

Birth Registry Data (Event Study)				
	(1)	(2)	(3)	(4)
VARIABLES	**Log Births: Age15**	**Log Births: Age16**	**Log Births: Age17**	**Log Births: Age18**
BF Coverage × 2004	0.1212**	0.0645	0.0640	0.0867*
	(0.0579)	(0.0544)	(0.0482)	(0.0472)
BF Coverage × 2005	0.0165	0.0238	0.0050	0.0685
	(0.0583)	(0.0531)	(0.0481)	*V*(0.0469)
BF Coverage × 2006	−0.0135	0.0621	0.0498	0.0665
	(0.0612)	(0.0566)	(0.0521)	(0.0492)
BF Coverage × 2007	0.0738	0.0642	0.0388	0.1243**
	(0.0606)	(0.0558)	(0.0509)	(0.0494)
BF Coverage × 2008	0.0766	0.0231	0.0465	0.0723
	(0.0593)	(0.0542)	(0.0490)	(0.0471)
BF Coverage × 2010	0.0398	−0.1202*	−0.0263	−0.0515
	(0.0719)	(0.0709)	(0.0602)	(0.0601)
BF Coverage × 2011	−0.0713	−0.0602	−0.1080*	−0.0464
	(0.0827)	(0.0719)	(0.0636)	(0.0644)
BF Coverage × 2012	0.1084	0.0156	−0.0561	−0.1316**
	(0.0831)	(0.0711)	(0.0632)	(0.0650)
BF Coverage × 2013	0.0366	0.0654	−0.0282	−0.0689
	(0.0796)	(0.0726)	(0.0654)	(0.0605)
Constant	1.5591***	1.8966***	2.1258***	2.2626***
	(0.0444)	(0.0418)	(0.0362)	(0.0366)

Birth Registry Data (Event Study)				
	(1)	(2)	(3)	(4)
VARIABLES	**Log Births: Age15**	**Log Births: Age16**	**Log Births: Age17**	**Log Births: Age18**
Municipal Fixed Effects	YES	YES	YES	YES
Fully Saturated Interactions	YES	YES	YES	YES
Joint Significance pre-Intervention (p-value)	0.05	0.68	0.57	0.23
Joint Significance post-intervention (p-value)	0.39	0.22	0.55	0.38
Observations	45,986	50,271	52,185	52,907
R-squared	0.0061	0.0227	0.0425	0.0645
Number of ibge	5,539	5,570	5,577	5,582

Robust standard errors in parentheses

*significant at 10%;

**significant at 5%;

***significant at 1%

(1)"Treated" are those who gave conceived after the program was implemented

(2)"Coverage" denotes a change from 0–100% coverage of the Bolsa Familia Program

PNAD 2005–2009, 2011–2013

A7.

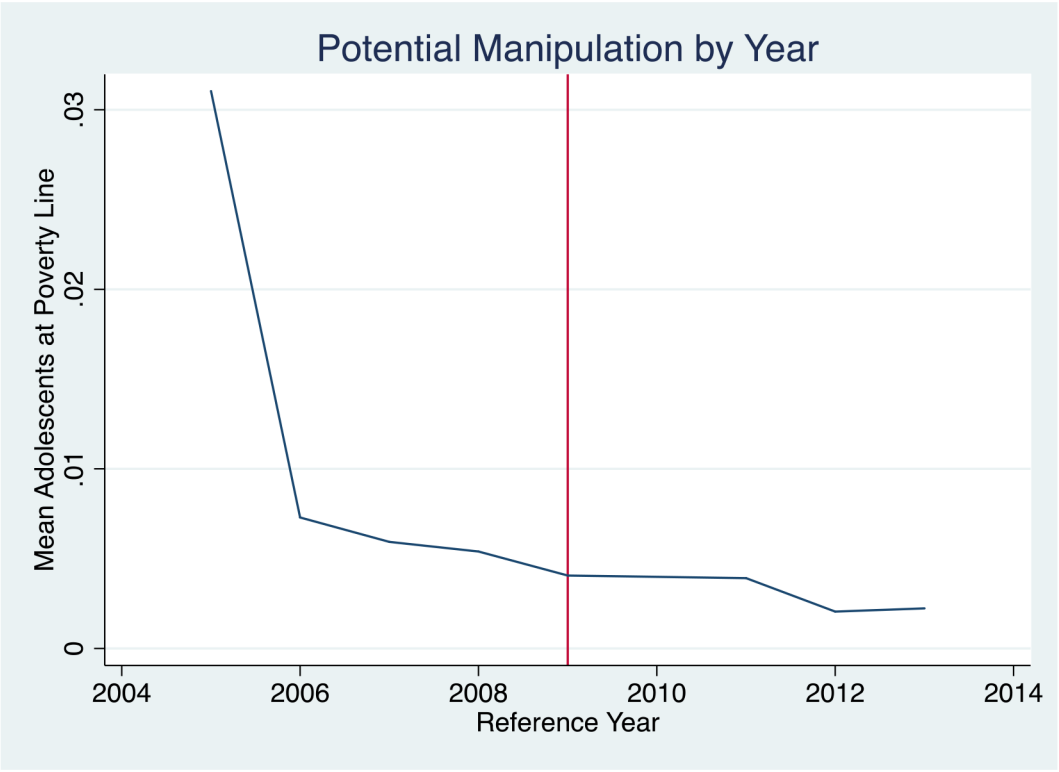
Baseline Characteristics for Birth Registry Data

Age	**16**	**17**	**18**	**19**
Percentage of Births to Age Group	3.1%	4.2%	5.2%	5.8%
Race				
White	39%	40%	41%	42%
Black	2%	2%	2%	2%
Yellow	0%	0%	0%	0%
Brown	56%	55%	54%	53%
Indigenous	1%	1%	1%	1%
Years of Schooling				
1 to 3	8%	7%	7%	7%
4 to 7	53%	44%	38%	35%
8 to 11	37%	42%	47%	48%
12 or more	0%	4%	6%	8%
Marital Status				
Single	87%	83%	79%	76%
Married	8%	13%	16%	20%
Pre-Natal Exams				
None	2%	2%	2%	2%
1–3	12%	11%	11%	10%
4–6	42%	40%	40%	39%

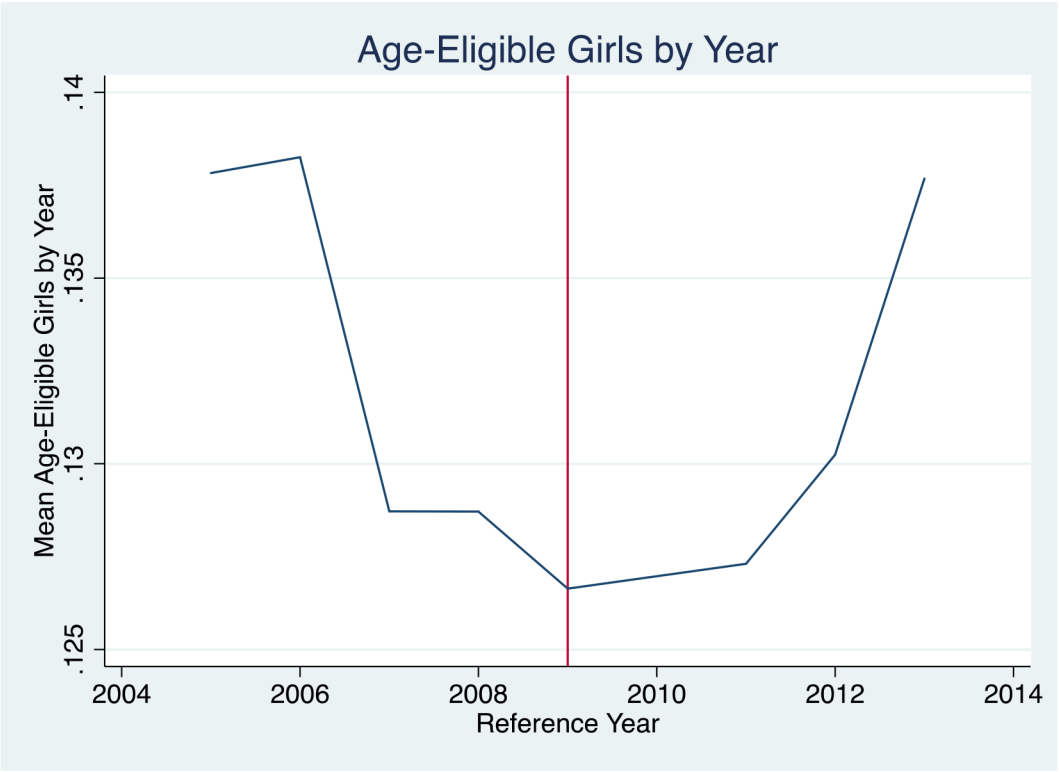
Age	16	17	18	19
7 or more	43%	45%	46%	47%
Sample Size	88,223	120,910	148,737	165,111

Appendix Figure 1*.

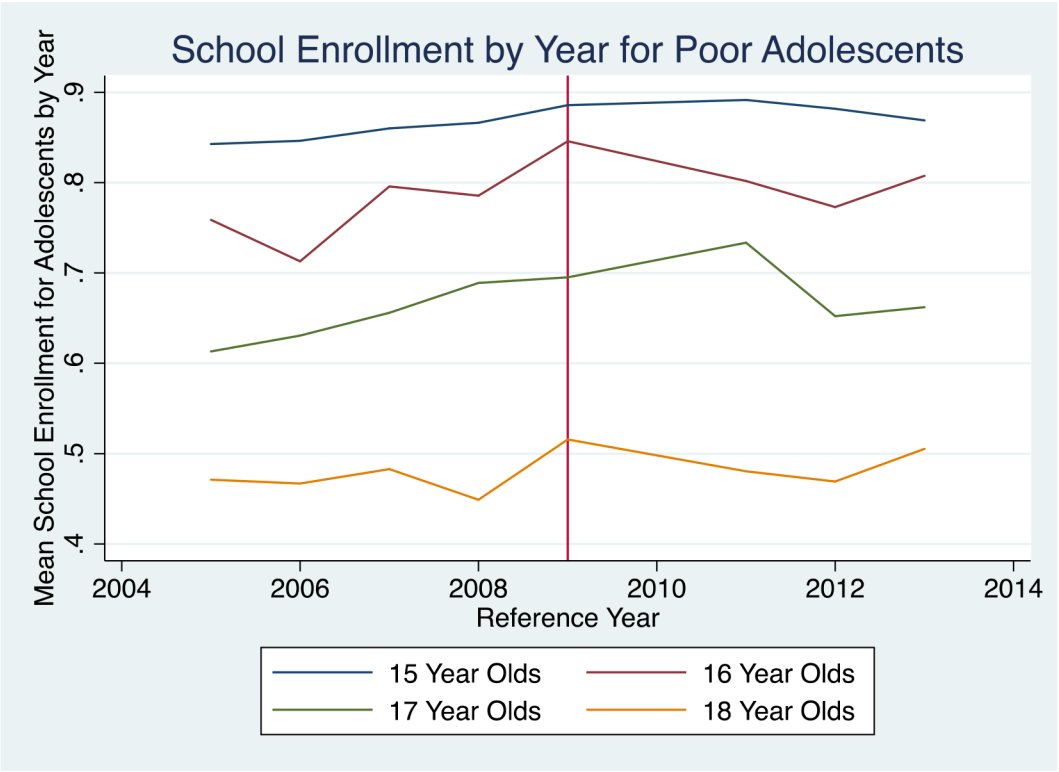
* Low variation in actual number of zero-income households. The density change is likely due to a larger number of households with per-capita incomes that put them outside of our analysis. Regression coefficients robust to removing zero-income households from analyses.



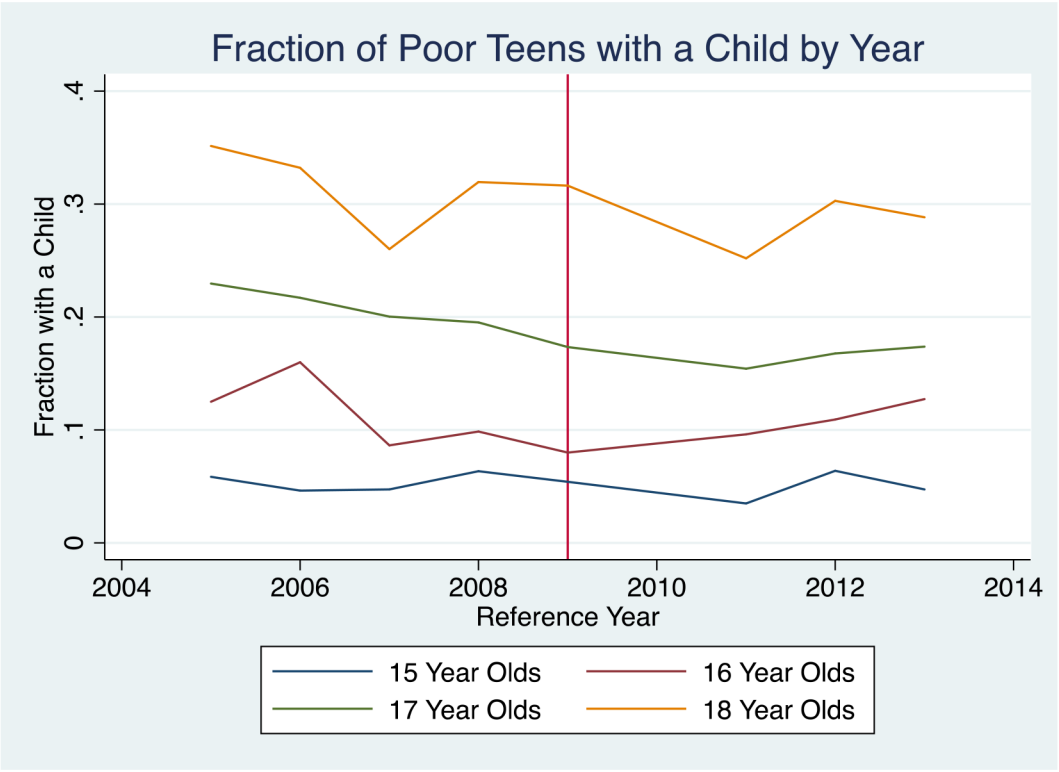
Appendix Figure 2.
Proportion of Adolescents at Poverty Line
Source: PNAD



Appendix Figure 3.
Eligible Girls by Year
Source: PNAD



Appendix Figure 4.
School Enrollment by Year for Poor Adolescents
Source: PNAD



Appendix Figure 5.
Fertility by Year for Poor Adolescents
Source: PNAD

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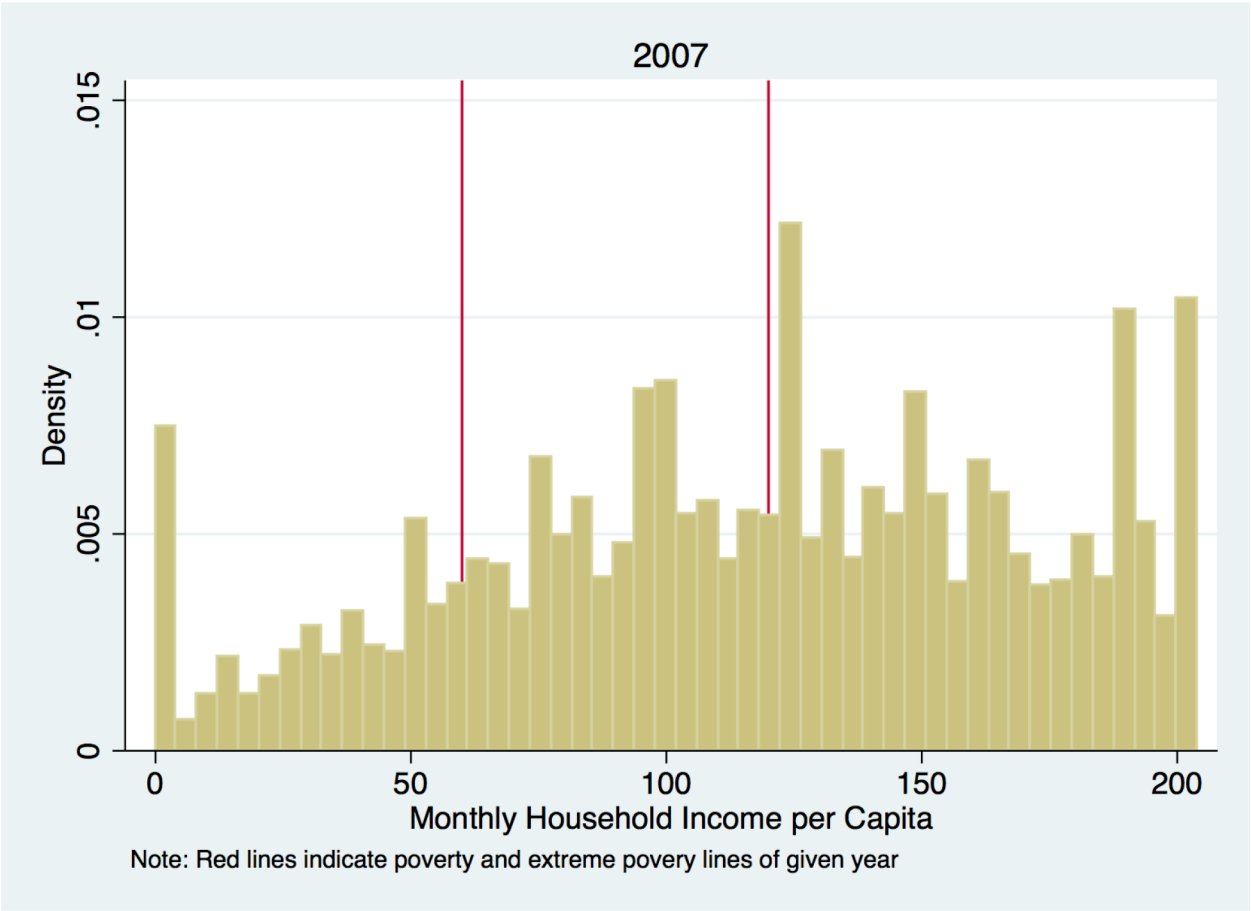

Figure 1.
Density of Monthly Household per Capita Income (2007)

Table 1:

Summary Statistics for those Eligible for Bolsa Familia

Age	**16**	**17**	**18**	**19**
Attends School	80%	66%	48%	37%
Gave birth in past year	5%	9%	9%	13%
Has Kids	9%	20%	26%	41%
Income per capita *	R$ 72.32	R$ 71.24	R$ 69.36	R$ 70.05
% with incomes in BF “extreme poor” range	34%	34%	37%	33%
# HH members <5y (excluding girl’s own children)	5.56	5.54	5.26	4.93
# HH members >5y (excluding girl’s own children)	0.34	0.34	0.30	0.23
% of HHs where head w/ primary incomplete	32%	30%	31%	30%
% of HHs where head w/ primary complete	47%	49%	46%	48%
% of HHs where head w/ secondary complete	10%	10%	12%	10%
% of HHs where head w/>secondary education	10%	11%	10%	10%
% whose moms live in HH with them	84%	78%	71%	64%
% living in urban areas	68%	69%	71%	66%
Sample Size	764	724	696	633

Source: PNAD 2007

* R$-USD Exhange =1 R$ - 0.32USD

Table 2:

Main results

Triple Difference Pregnancy to Term: Girls Aged 15 to 18			
	(1)	**(2)**	**(3)**
	Fert kids: age15–18	**Fert kids: age15–18**	**Fert kids: age15–18**
VARIABLES	**no controls**	**HH controls**	**HH & Urban Controls**
Treated (Age-Eligible *Poor *After)	−0.031**	−0.029*	−0.030*
	(0.016)	(0.015)	(0.015)
Age-Eligible *After	0.007	0.006	0.006
	(0.011)	(0.011)	(0.011)
Age-eligible *Poor	0.031***	0.027***	0.027***
	(0.010)	(0.010)	(0.010)
After *Poor	−0.016**	−0.027***	−0.027***
	(0.007)	(0.008)	(0.008)
After	0.012 *A*	0.013	0.013
	(0.010)	(0.010)	(0.010)
Poor	0.021***	0.040***	0.039***
	(0.005)	(0.005)	(0.005)
Age eligible	0.147***	0.139***	0.139***
	(0.007)	(0.007)	(0.007)
Urban			−0.006
			(0.004)
Constant	0.066***	0.178***	0.184***
	(0.006)	(0.018)	(0.019)
HH Controls	NO	YES	YES
Rural/Urban Controls	NO	NO	YES
Year Fixed Effects	YES	YES	YES
Observations	40,877	40,877	40,877
R-squared	0.053	0.093	0.093

Robust standard errors in parentheses, clustered at the state-birth cohort level

* significant at 10%;

** significant at 5%;

*** significant at 1%

(1) "Treated" teens are ages 17 & 18 in 2009 (age 16 & 17 in 2008)

(2) "Pregnant" refers only to pregnancies brought to term (still or live birth)

PNAD 2005–2009, 2011–2013

Table 3:

Heterogeneous Effects Urban Rural – Triple Difference

Triple Difference Pregnancy to Term: Girls Aged 15 to 18 Rural vs Urban		
	(1)	**(2)**
	Fert kids: age15–18	**Fert kids: age15–18**
VARIABLES	**Urban Only**	**Rural Only**
Treated (Age-Eligible *Poor *After)	−0.048***	0.024
	(0.017)	(0.027)
Age-Eligible *After	0.017	−0.029
	(0.012)	(0.022)
Age-eligible *Poor	0.033***	0.013
	(0.011)	(0.017)
After *Poor	−0.028***	−0.024*
	(0.009)	(0.013)
After	0.024**	−0.016
	(0.012)	(0.017)
Poor	0.037***	0.042***
	(0.006)	(0.010)
Age eligible	0.140***	0.135***
	(0.007)	(0.014)
Constant	0.159***	0.199***
	(0.020)	(0.029)
HH Controls	YES	YES
Rural/Urban Controls	N/A	N/A
Year Fixed Effects	YES	YES
Observations	29,632	11,245
R-squared	0.082	0.133

Robust standard errors in parentheses, clustered at the state-birth cohort level

* significant at 10%;

** significant at 5%;

*** significant at 1%

(1) "Treated" teens are ages 17 & 18 in 2009 (age 16 & 17 in 2008)

(2) "Pregnant" refers only to pregnancies brought to term (still or live birth)

PNAD 2005–2009, 2011–2013

Table 4:

Placebo Trends Check

Placebo Test - Triple Difference			
Pregnancy to Term: Girls Aged 15 to 18			
	(1)	(2)	(3)
VARIABLES	**True Treatment**	**1 Year Before Treatment**	**2 Years Before Treatment**
Treated (Age-Eligible *Poor *After)	−0.030 *	−0.024	−0.025
	(0.015)	(0.015)	(0.016)
Age-Eligible *After	0.007	0.004	0.003
	(0.011)	(0.011)	(0.012)
Age-eligible *Poor	0.027 ***	0.028 **	0.032 **
	(0.010)	(0.011)	(0.013)
After *Poor	−0.027 ***	−0.031 ***	−0.038 ***
	(0.008)	(0.007)	(0.007)
After	0.005	0.011 **	0.007
	(0.005)	(0.005)	(0.006)
Poor	0.040 ***	0.045 ***	0.054 ***
	(0.005)	(0.006)	(0.006)
Age eligible	0.139 ***	0.140 ***	0.140 ***
	(0.007)	(0.008)	(0.010)
Constant	0.171 ***	0.167 ***	0.169 ***
	(0.017)	(0.018)	(0.017)
HH Controls	YES	YES	YES
Rural/Urban Controls	YES	YES	YES
Year Fixed Effects	YES	YES	YES
Observations	40,877	40,877	40,877
R-squared	0.093	0.093	0.093

Robust standard errors in parentheses, clustered at the state-birth cohort level

* significant at 10%;

** significant at 5%;

*** significant at 1%

(1) "Treated" teens are ages 17 & 18 in 2009 (age 16 & 17 in 2008)

(2) "Pregnant" refers only to pregnancies brought to term (still or live birth)

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Table 5.

Event Study Treatment-Year Interaction

Event Study Pregnancy to Term: Girls Aged 15 to 18				
	(1)	(2)	(3)	(5)
	Fert kids: age15–18	Fert kids: age15–18	Fert kids: age15–18	Fert kids: age15–18
VARIABLES	no controls	HH controls	HH & Urban Controls	Urban
Age-eligible*poor*2005	0.031	0.026	0.026	0.026
	(0.028)	(0.027)	(0.027)	(0.030)
Age-eligible*poor*2006	−0.000	−0.006	−0.007	−0.011
	(0.031)	(0.031)	(0.031)	(0.032)
Age-eligible*poor*2007	−0.007	−0.006	−0.006	−0.020
	(0.029)	(0.029)	(0.029)	(0.030)
Age-eligible*poor*2009	−0.016	−0.020	−0.020	−0.051
	(0.029)	(0.028)	(0.028)	(0.031)
Age-eligible*poor*2011	−0.038	−0.040	−0.040	−0.070*
	(0.033)	(0.032)	(0.032)	(0.037)
Age-eligible*poor*2012	−0.019	−0.017	−0.017	−0.040
	(0.032)	(0.031)	(0.031)	(0.033)
Age-eligible*poor*2013	−0.030	−0.026	−0.026	−0.026
	(0.034)	(0.033)	(0.033)	(0.038)
Constant	0.074***	0.186***	0.193***	0.165***
	(0.009)	(0.019)	(0.020)	(0.021)
HH Controls	NO	YES	YES	YES
Rural/Urban Controls	NO	NO	YES	NO
Saturated Interactions (Year, Poor, Age-eligible)	YES	YES	YES	YES
Joint Significance pre-Intervention (p-value)	0.41	0.49	0.49	0.41
Joint Significance post-intervention (p-value)	0.81	0.81	0.8	0.33
Observations	40,877	40,877	40,877	29,632
R-squared	0.054	0.094	0.094	0.083

Robust standard errors in parentheses, clustered at the state-birth cohort level

* significant at 10%;

** significant at 5%;

*** significant at 1%

(1) "Treated" teens are ages 17 & 18 in 2009 (age 16 & 17 in 2008)

(2) "Pregnant" refers only to pregnancies brought to term (still or live birth)

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Table 6:

Birth Registry Data

Birth Registry Data Log Births by Age				
	(1)	(2)	(3)	(4)
VARIABLES	**Log Births: Age15**	**Log Births: Age16**	**Log Births: Age17**	**Log Births: Age18**
Coverage *Treated	−0.0395	−0.0642**	−0.0734**	−0.1293***
	(0.0361)	(0.0316)	(0.0294)	(0.0282)
PBF Coverage	0.0476***	0.0262	0.0310*	0.0415***
	(0.0185)	(0.0168)	(0.0163)	(0.0161)
Constant	1.5395***	1.9135***	2.1572***	2.3067***
	(0.0322)	(0.0281)	(0.0256)	(0.0255)
Municipal Fixed Effects	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES
Observations	45,986	50,271	52,185	52,907
R-squared	0.0058	0.0225	0.0423	0.0644
Number of ibge	5,539	5,570	5,577	5,582

Robust standard errors in parentheses

* significant at 10%;

** significant at 5%;

*** significant at 1%

(1) "Treated" are those who gave conceived after the program was implemented

(2) "Coverage" denotes a change from 0–100% coverage of the Bolsa Familia Program

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