Educate the Girls: Long run Effects of a Secondary School Program for Girls in Pakistan

Tareena Musaddiq[1] & Farah Said[2]

Abstract

Policymakers often advocate girls' education as an important policy tool for improving lives of women and children. There is, however, limited evidence from developing countries on the long run effects of such policies. This paper evaluates the long run effects of a conditional cash assistance program for girls attending secondary school in Punjab, Pakistan. We base our identification on differences in outcomes of women residing in treatment and comparison districts, and on their exposure to the program based on their age when the program was introduced. Results show that each year of exposure to the program increased the probability of beneficiaries completing secondary school by 0.6 pp., decreased the probability of marriage and pregnancy before the age of 16 (0.5 pp. and 0.2 pp.), and increased rates of maternal health care utilization. We also find evidence of inter-generational effects - children of beneficiaries have higher standardized scores for weight and height, are more likely to be vaccinated (0.7 pp.) and registered at birth (0.8 pp.) and are less likely to be stunted (-0.7 pp.), wasted (-0.4 pp.) or experience morbidity (0.5 pp.). These findings imply that programs aimed at promoting girls' education lead to beneficial long run gains in multiple dimensions, in addition to achieving the main goal of increasing education for girls.

[1] Department of Economics, Georgia State University, Tmusaddiq1@gsu.edu
[2] Centre for Research in Economics and Business, Lahore School of Economics, farahz3@gmail.com

1. Introduction

Improvements in health and education, especially for women and children, are universally accepted public policy goals in both developing and developed countries. Human development gaps are more glaring in the developing countries both in terms of the absolute numbers as well as the severity of the problem. Governments and international donor agencies have attempted to address these problems with a host of interventions ranging from free provision of health services to Conditional Cash Transfers (CCTs) for school attendance.

Programs focusing on educating girls are prominent, strategic initiatives. Investment in the education of young girls and women will yield not only additional private and social returns. More highly educated women may provide better health care and education for their children (Schultz 2004, Thomas1991). Most prior studies have been unable to identify the causal impact of women's education on long-run welfare outcomes, and the best evidence is only from the developed world (see Mensch et al. 2019 & Lochner et al. 2011 for a review). Given the disproportionate burden of disease, high fertility, maternal mortality and child mortality rates in developing countries, there is a need to understand better the role that programs for girl's education might play in improving these outcomes.

This paper estimates the long run effects of a *secondary* school program for girls in Pakistan on the health and well-being of beneficiaries and their children. In 2004, Government of Punjab, introduced a Female Secondary School Stipend Program (FSSP) to encourage households to send their girls to secondary schools and raise the overall literacy rates in the recipient districts. Under the FSSP, households in eligible districts with girls enrolled in grades 6-10 receive a monthly cash stipend conditional on achieving an 80% attendance rate. District eligibility is determined on literacy rates as per the 1998 Population Census. The program was implemented in districts with literacy rates of 40% or less. 15 out of the 36 districts qualified on the basis of literacy rates. As per official figures, cash transfers averaging USD14 million annually have been disbursed since to more than 411,000 girls from 2004 to 2013 (Alam et al. 2011).

We exploit the exogenous variation in the introduction of the FSSP to investigate long run effects of the program on the girls' education (primary and secondary school completion), teenage marriage and childbirth, and maternal health care utilization (pre and post natal care, medical assistance at time of birth). This is one of the few studies to examine the impact on the next generation's well-being (standardized weight and height measures for children under 5, incidence of disease, birth registration) in any country. Using three rounds of cross sectional data from Multiple Indicators Cluster Survey (MICS), we assign to each woman in our sample the number of years of exposure to the program based on district of residence (treatment vs. control) and her age at the initiation of the program. We estimate, the impact of each year of exposure on our outcomes of interest, controlling for district and cohort fixed effects. Identification of the FSSP effects comes from differential exposure to the program based on district of residence and year of birth.

We find *each* year of exposure to the program increases the probability of completing secondary schooling by 0.6 pp., reduces the likelihood of marriage and first birth before the age of 16 by 0.5 pp. and 0.2 pp., respectively; and improves maternal health care utilization across a host of measures. We also find important evidence of inter-generational effects. Specifically, children of women exposed to the program are healthier (in terms of weight and height for age) and are less likely to be underweight or stunted, are more likely to be vaccinated and to have an official birth registration record. These results are robust to excluding older cohorts or the highest and lowest literacy districts.

Our results are in line with the literature that finds positive relationships between schooling and own and children's health (see e.g. Currie et al. 2003, Grossman 2006). Conclusive evidence on a causal relationship in developing countries is relatively sparse[3], so this paper contributes to the existing literature in several important ways. First, we investigate the affects of a CCT program designed to encourage secondary schooling on primary and secondary schooling completion rates, fertility and maternal health outcomes. While secondary schooling programs are regularly evaluated for their impact on enrolment rates, evidence on the effects of secondary schooling on fertility and health is rare. The only other study, to the best of our knowledge, to do so is by Grepin et al. (2015) for a school reform in Zimbabwe. We add to the findings of this existing study in two main ways. The context in Pakistan is different and has larger global implications. Pakistan has an estimated 25 million children (between the age of 5 and 16) out of school (Ailaan 2014), ranking second only to Nigeria in the world ranking of Out of School Children. 55% of these children are female with the proportion rising with age. Pakistan bears a substantial proportion of global maternal deaths (Hogan et al. 2010) and ranks Pakistan ranks the worst in the world for infant mortality with almost one in 20 infants dying within a month of birth, accounting for 10% of global newborn deaths (Devine and

---

[3] See Grepin et al. 2015; Breierova and Duflo 2004; Akresh et al. 2018, Osili et al. 2008, Behrman 2015; Angeles et al. (2005); Mazumder et al. (2019)

Taylor 2018). The implications for the impact on these outcomes is much more important for countries like Pakistan and no such evidence exists at present. Moreover, we look at impact of mother's exposure to a schooling program on anthropometric child health measures for which there is no evidence for developing countries comparable to Pakistan.

Second, no study has looked at the long run impact of *secondary* schooling in Pakistan on fertility, age of marriage and child-birth, and health care utilization for women in Pakistan. Andrabi et al. (2012) is the only study that estimates the inter-generational transmission of human capital in Pakistan. Unlike their work, which looks at the impact of very low levels of education, our study looks at the impact that a secondary school program has on women's long run well being. Importantly, we estimate the impact on health outcomes of the children, as opposed to time allocation of mothers (e.g. time mothers spend on children's education related activities) or school enrollment of children.

Third, our work contributes to the growing literature on the long run impacts of CCT programs. Currently eighty countries have (had) some form of a CCT program and some recent studies have estimated the long run effects of earlier programs.[4] However, we present novel evidence on inter-generational impact of a CCT in terms of child health and well being for a developing country. Unlike other CCTs, the FSSP is unique in being a non-means tested program within treated areas.

The remainder of this paper is organized as follows: Section 2 reviews the literature. Section 3 provides program background and context. Section 4 discusses the data. Section 5 explains the estimation strategy. Section 6 presents the empirical results and Section 7 concludes.

---

[4] Barrera-Osorio et al. 2017; Parker and Vogl, 2018; Barham et al. 2013; Araujo et al. 2016

2. Literature Review

The positive correlation between schooling and one's own and children's health has been established widely in literature (See Grossman and Kaestner, 1997 and Grossman 2000, 2006 for a review). Educating girls is hence often used as a pathway to address a host of problems related to women and children's well-being in developing countries. Women who are more aware and knowledgeable are expected to make better and informed decisions about their own health and well-being, as well as their children's. Educated women may also benefit more from health initiatives and campaigns. More highly educated women are able to benefit from information disseminated through print since their ability to read and synthesize knowledge is superior. Moreover, we can expect educated women to be more open to seeking help and information related to health.

It is difficult, however, to disentangle the causal effect within this association observed between education and later life outcomes. Women who choose to get more education are likely different on other observable and unobservable characteristics that might lead to different decisions related to own health and investment in children's human capital in later life. Exogenous variation in education, introduced by compulsory schooling laws and college openings (among others), has been used to establish causal relationships between education and one's own and the next generations' outcomes in developed countries (see e.g. Currie and Moretti, 2003)[5]. Evidence on developing countries however is not as widespread. Grepin and Bharadwaj (2015) use changes in compulsory schooling laws and opening of new schools in Zimbabwe to establish that women reduce fertility and delay marriage and childbirth as a result of more education. In addition, parental education reduces infant morality. Likewise, Breierova and Duflo (2004) use a massive school construction program in Indonesia to show that female education impacts age of marriage and early fertility. In a more recent study Mazumder et al. (2019) use the same reform to show evidence of intergenerational gains; children whose mothers were exposed to the reform score higher on the national primary school examination. Interestingly, there is evidence of positive gains in terms of reducing fertility and improvements in health for the next generation even from increased schooling at the primary level (Osili and Long 2007; Behrman 2015). Evidence also exists that women with no education versus some education in Pakistan tend to spend more time on educational and enrichment activities with their children and their children are also more likely to be enrolled in school (Andrabi et al. 2012).

CCTs are widely used to improve health and education outcomes in developing countries. Currently eighty countries have (had) some form of a CCT program. There is evidence of short-term gains in health utilization and nutrition, but little is known about the long run, largely because CCTs started only in the late 1990s. Twenty years on, it is now possible to explore the longer run impacts. The existing literature shows positive impacts on long run educational achievement, labor force participation and mobility of early life beneficiaries (Barrera-Osorio et al. 2017 for Colombia; Parker and Vogl, 2018 for Mexico and Barham et al. 2013 for Nicaragua). On the other hand, Araujo et al. (2016) find only modest improvements in Ecuador, as estimated by increases in secondary school completion.

In this study we add to the literature by providing novel evidence on impact of a schooling program for girls in Pakistan. No such evidence exists on how exposure to education program alters (or not) the long run decisions such as age of marriage and child-birth and health care utilization for women in Pakistan. In fact, to the best of our knowledge Grepin et al. (2015) is the only study that answers this question for secondary schooling for a developing country.

We also make an important contribution in the literature on inter-generational effects of educational programs. While existing evidence shows intergenerational gains from school construction programs on child mortality (Grepin et al. (2015) in Zimbabwe) and, educational outcomes (Mazumder et al. 2019 in Indonesia; Andrabi et al. 2012 in Pakistan), unlike our study they do not speak on the quality of health and well-being of children.

Some recent studies discussed above have estimated the long run effects of earlier CCT programs but none have focused on the intergenerational effect in terms of child health. In addition, since the FSSP was a program that targeted girls, we are able to place our inter-generational findings within the broader context of direct or spillover impacts of maternal education. Moreover, unlike other CCTs the FSSP is unique in not being a means tested program in any of the treated areas. Existing evaluations of FSSP show increase in enrollment rates up to five years after the start of the program (Alam et al. 2011).

Our study provides first evidence on the long run and inter-generational effects of this program. While our study, like previous studies, cannot distinguish specifically which channel might be at play for the case of Pakistan (numeracy and literacy skills, exposure to the society, etc.), we are able to establish that women exposed to the FSSP delay marriage and child-birth and are more likely to seek better health care for themselves and their children. These results suggest that policy makers should consider the long run benefits when designing such policies and should factor in these gains in cost benefit analysis and future expansion of the program.

3. Background and Policy

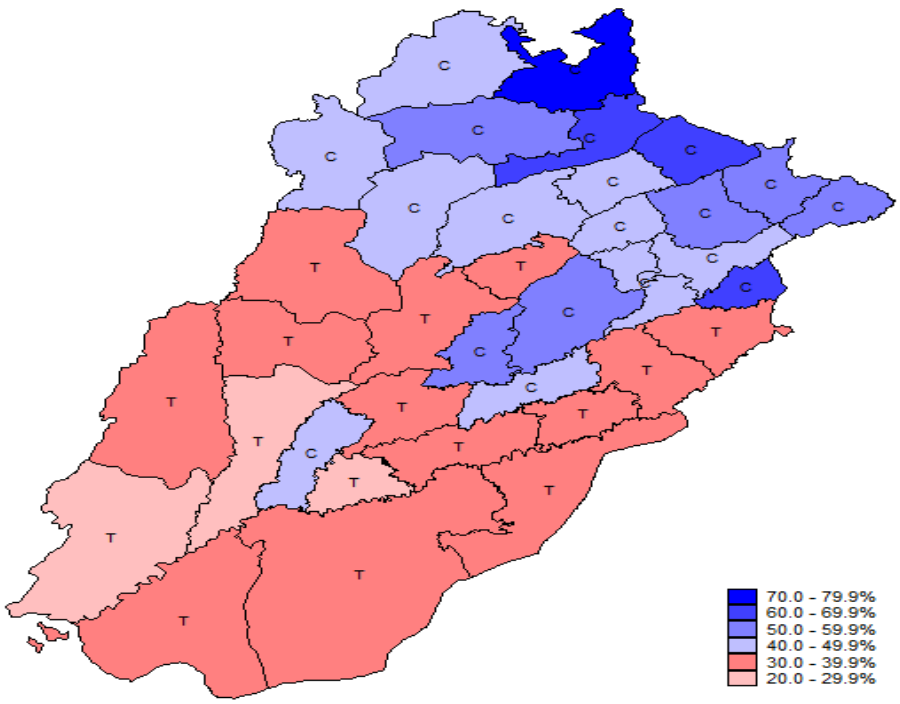
Pakistan is one of the three countries in the world with more than 1 million adolescent girls out of school (UNESCO 2015). The female gross enrollment rate for the primary level stands at 86% for Pakistan at present. This drops sharply to 42% for lower secondary (grades 6-8) and 24% for upper secondary (grades 9 and 10), despite no tuition fees in public schools. This is attributable to a host of subjective (e.g. cultural and psychological barriers) and objective barriers (e.g. costs of textbooks, transportation, street harassment, preference to the male child when resources are limited in the household, etc.).

FSSP was designed to curb some of the tangible barriers that households face in educating girls. It is an ongoing CCT program in the province of Punjab, the most populous province of Pakistan, housing more than half the population of the country. Historically, female enrollment in primary and secondary schools has been low in Punjab. This is true both in absolute terms and in comparison to boys (Behrman and Schneider 1993; Alderman et al. 2001; Holmes 2003; Lloyd et al. 2005). The low enrollment for girls in Pakistan is further compounded by low retention and completion rates (Sawada and Lokshin, 2009).

The Government of Punjab designed the FSSP to improve educational attainment among girls and decrease gender inequalities, specifically at the secondary level. In particular, the program seeks to target girls in districts with lagging literacy rates.

Districts with literacy rates below 40% (as per the 1998 Population Census) received the treatment (See Appendix Table A1 and Figure A1 for details). Figure 1 shows geography of the treatment and control districts. The treatment districts are located toward the south of the province and are spatially clustered close to each other.

Figure 1: Geography of Treatment and Control Districts in Punjab by Literacy Rates



Stipends worth Rs. 600 ($10) per female student were disbursed each quarter in recipient districts as long as the female students maintained 80% attendance (as reported by the school). 80% of the stipend was designed to cover the costs of schooling related to transport, uniform and textbooks; factors that are commonly cited as barriers to girls' attendance, leaving 20% left over for the family to use for other needs (Alam et al., 2011; Chaudhury and Parajuli 2010).

The stipend was directly disbursed to the household via a postal order from the District Education Office. The first stipends were disbursed to eligible students in grades 6-8 in the first quarter of 2004 (PERSP 2014). In 2006, the program was extended to include grades 9 and 10. By 2013, 411,000 girls in more than 6800 schools were enrolled in the program, at a cost of US$14.2 million on average each year (Fiszbein 2009; PESRP 2014).

At 3.4 percent of the median household expenditures of households in 2004, the monthly stipend is unlikely to have been a large income shock for households (Fiszbein and Schady 2009; Chaudhury et al. 2010). Stipend size has two important implications. First, it rules out large income shocks driving changes in outcomes. Second, given the costs associated with migration (including giving up housing, livestock and livelihood), the cash stipend on its own is likely insufficient to incentivize migration from non-recipient to recipient districts.

Enrolment rates reported in Multiple Indictors Cluster Survey (MICS) 2003 and 2014 for girls in relevant age group (11-15 years old) show that enrolment has increased overall in the decade since the FSSP was rolled out, but the recipient districts still lag behind the non-recipient districts (See Appendix Figure A2). Existing evaluations have shown that the FSSP has increased enrolment rates in recipient districts by 9 percentage points compared to the non-recipient districts and there is evidence that this effect lasted at least up to 5 years after the program was initiated (Chaudhry et al. 2010; Alam et al. 2011).

4. Data

We employ The Multiple Indicators Cluster Survey (MICS) for Punjab for this study. MICS is a cross sectional household survey specifically designed to monitor indicators related to well being of women and children. To date, over 300 rounds of surveys have been collected in more than 100 countries. This study uses data from MICS conducted in Punjab, Pakistan in 2003, 2011, 2014.

For Punjab, MICS is representative at the district level and contains detailed information regarding age, education, employment and health of all members of the households. More importantly for our study, MICS has two questionnaires designed for women and children that are aimed at capturing information about maternal and child health. In particular, for women of childbearing age (15-49 years) MICS has information pertaining to age of marriage and first birth, number of births, and maternal health care utilization (for births in the two years prior to the survey). For children under the age of five, MICS collects information about current weight and height (anthropometric measures administered by the survey team), immunization, incidence of disease, child registration. Detailed questions regarding knowledge about illness and treatment, as well as health care utilization are also available in the data.

We use the information about the roll out of the program from the Punjab Education Sector Reform Program (PESRP) to define our control and treatment districts. Table 1 below shows the summary statistics for women in the sample. Women in our sample have an average exposure of 1.6 years to the CCT program. However, conditional on any exposure, the average years of exposure is around 4. The average years of schooling for women in Punjab is around 4 years; 30% and 20% women in our sample

Table 1: Summary Statistics for Women in the Sample[6]

	Obs.	Mean	Std.	Minimum	Maximum
		Age>10			
Years of Exposure	287,270	1.6	2.9	0	10
Age	287,270	27.6	10.7	11	50
Completed Primary	287,270	0.3	0.46	0	1
		Age>16			
Completed	240,780	0.20	0.40	0	1
Years of Ed	240,095	4.06	4.7	0	23
Married before 16	209,131	0.12	0.33	0	1
First Birth before 16	209,131	0.042	0.20	0	1
	Women who gave birth in the last two years				
Prenatal Checkup	48,856	0.82	0.39	0	1
Delivery at medical	48,856	0.53	0.5	0	1
Skilled Birth Attendant	48,856	0.73	0.44	0	1
Post natal care	48,856	0.56	0.5	0	1
	Women who have ever given birth				
Child Died	128,885	0.36	0.5	0	1

report completing primary and secondary schooling respectively. Out of women who report ever being married or ever giving birth, twelve percent were married and four and half percent had their first child before the age of sixteen, respectively.[7] Roughly half of the women who gave birth in the two years prior to survey report delivering the child at a medical facility or getting a post natal check up. Twenty seven percent of these women were not attended by a skilled health professional at the time of giving birth. Out of all women in the sample who report ever having given birth, one in every three reports having a child who later died.

[6] See Appendix Table A2 and A3 for detailed summary statistics. Overall, we can expect these numbers to be less favorable in treatment than control districts since treatment districts have low literacy rates and are economically weaker than control districts. The number of observations for women's outcome related to maternal care is smaller because those questions were only administered to women who gave birth in the two years prior to the survey.

[7] These statistics rise to 26.6% and 10% respectively when we consider marriage and first birth before 18. The average age at marriage is 20.05 years for women and the average age at first birth is around 22.1.

The MICS survey conducts detailed information on health status of children under the age of five in the households sampled. Specifically, the survey team is trained to measure height and weight of children. In addition parents are surveyed about the incidence of disease and health care utilization for children, including vaccinations. Summary statistics for these children are reported in Table 2 below. The average age is two years with equal distribution of male and female children. The average child in Pakistan is more than one standard deviation below weight for age and height for age standards set by World Health Organization. One in every three children is underweight and twenty eight percent are stunted.[8] Diarrhea is considered to be one of the three leading causes of child death in Pakistan from curable and preventable diseases. 16% of children were reported to have diarrhea within two weeks prior to the survey. 83% of children were reported as ever having received a vaccination.

Table 2: Summary Statistics for Children Under the Age of 5

	Obs.	Mean	Std.	Minimum	Maximum
Weight for Age Z	88,478	-1.49	1.18	-5	5
Height for Age Z	87,548	-1.23	1.38	-5	5
Stunted	87,548	0.28	0.45	0	1
Underweight	88,478	0.33	0.47	0	1
Child had diarrhea	93,380	0.16	0.36	0	1
Vaccinated	93,380	0.83	0.38	0	1
Child registered	88,843	0.44	0.50	0	1
Age	93,380	2.00	1.42	0	4
Gender	93,380	0.51	0.50	0	1
Mother's Age	93,380	29.87	5.97	11	49

Birth registration is an important concern for child protection in developing countries across the world. Without a birth record, children are more vulnerable to child

[8] A child is categorized as underweight if the weight-for-age standardized score is two standard deviations below the average. A child is considered stunted if the height-for-age standardized score is two standard deviations below the average.

rights violations, such as child marriage, child labor and trafficking, and becoming child soldiers. In certain instances, specially emergencies, people without birth certificates can be excluded from health coverage, access to education, and social protection programs. International agencies like UNICEF are actively partnering with the local government in Pakistan to increase birth registration for child protection purposes in Pakistan. As can be seen in Table 2, less than half of the children in Pakistan have a birth record.

5. Methodology

We begin by estimating the effect of the CCT program on women's education in reduced form. The identification in this setting comes from exposure to the program, which is composed of two components. First, an individual needs to be a resident of the district eligible for treatment. This eligibility was based on district literacy rates from the 1998 Population Census. It is unlikely that households located in districts based on the availability of the program. As explained earlier, the stipend amount is not large enough to induce migration. Moreover, only 0.3% of families with girls report moving across districts for reasons related to education (DHS, 2012).[9]

For girls residing in the treatment districts, we assign exposure to the program in terms of the number of years. Years of exposure to the program is determined by two variables; timing of the intervention (starting in 2004) and the individuals' year of birth (or age at the time of the intervention). The stipend is offered for grades 6-10. Typically, we can expect girls in these grades to be aged 11 to 15 years.

We first estimate the effect of the program on years of education as follows:

$$Edu_{idk} = \alpha_o + \alpha_1(Years\ of\ exposure) + \delta_d + \sigma_k + \varepsilon_{idk} \quad (1)$$

[9] We do not have information about place of birth or place of residence during secondary school age. We therefore assume current place of residence as place of residence during school going years. This is a reasonable assumption given low migration rates especially for women.

where Edu_{idk} is an education outcome for individual i (years of education, completing primary school and completing secondary school), living in district d, from birth cohort k. *Years of exposure* is determined based on the age of the individual in 2004 (i.e. at the start of the program). Girls' aged 17 and older in 2004 were too old to benefit from the program and hence had no exposure to the program. For the more recent cohorts, years of exposure are calculated based on age in 2004. For example, girls aged 6 in 2004 were exposed to the program for 10 years, girls aged 7 in 2004 were exposed for 9 years, girls aged 14 in 2004 were exposed for 2 years and so on. Note that we also include the years that the younger cohorts of girls spend in primary school as being "exposed" to the program. The idea is that the option of receiving stipend in the future at the secondary level will be a factor in the decision making process of the households regarding enrolling (or dropping out) the girl child at each grade. This is substantiated by our result that girls exposed to the program are more likely to complete primary schooling.

We include district (δ_d) and cohort (σ_k) fixed effects to account for any differences across districts and cohorts other than the program that might be accounting for differences in educational attainment. This estimation helps establish the impact of the CCT program on educational attainment. A positive value for α_1 would indicate that exposure to the program increases education (e.g. if the outcome of interest is years of education one additional year of exposure to the program would increase years of education by α_1).

5.2 Long Run Effect on Women's outcomes

Next, we estimate the impact of the program on long run outcomes for women. We use exposure to the policy as the main variable of interest and estimate the following model:

$$Y_{idk} = \beta_o + \beta_1(Years\ of\ Exposure_{ijk}) + \delta'_d + \sigma'_k + \upsilon_{ijk} \quad (2)$$

Y_{idk} represents the outcome of interest for woman i, residing in district d, from birth cohort k. Our main outcomes of interest in Equation 2 are whether the woman is married before the age of 16, has her first child before the age of 16 and several indicators of maternal health care utilization (i.e. prenatal check up, delivery at a medical facility, skilled birth attendance and post natal check up). β_1 captures the impact of one additional year of exposure on the outcome of interest. *Apriori*, we expect woman exposed to the program to delay marriage and childbirth. This can be due to several reasons including staying in school longer, greater exposure to the society and awareness of rights and being more empowered. We cannot speak to the role of each of these channels, but our results will reflect whether women exposed to the program completed more years of schooling.

5.3 Inter-generational Effects of the Program

We next estimate the impact on the children of the beneficiaries through Equation 3.

$$C_{cidk} = \beta_o + \beta_1(Years\ of\ Exposure_{ijk}) + \boldsymbol{\beta X_{cijk}} + \gamma'_s + \delta'_d + \sigma'_k + \upsilon_{ijk} \quad (3)$$

C_{cidk} is the outcome of interest for child c, born to mother i from cohort k, in district d. X_{cijk} is a set of child controls such as gender of the child (and birth-order). Outcomes of interest for children under the age of five include current weight and height z scores and corresponding indicators for stunting wasting and being underweight, whether the child is immunized, the incidence of diarrhea and whether the child's birth is officially registered. γ'_s are survey year fixed effects to account for weight and height measurements taken in different survey periods.

5.4 Threats to identification

One of the threats to identification is the concern regarding endogenous migration i.e. migration to the treatment district could possibly be induced by the program. There are couple of reasons why we can expect this to not be an issue in this setting. First, the size of the transfer ($2.5 per month) is small. Especially after accounting for costs associated with schooling (including transport, text books and uniforms), the amount leftover (if any) is minimal. The transfer is hence not large enough to encourage households to move given the costs associated with migration itself. In addition, the non-stipend districts are on average economically better than the stipend districts, reducing the incentive even further. Unfortunately MICS does not provide any information on migration. We use The Demographic Health Survey (DHS) of 2012 to estimate rate of migration from control to treatment district. [10] The migration rate is low; around 0.64%. Only 6% of those migrating report migration for economic opportunities or education.

The second concern, in terms of migration, is that of out migration after receiving the treatment. Girls who complete secondary schooling might be more likely to move out to districts that are economically more vibrant. This can be due to better marriage prospects and assortive matching i.e. finding better partners who work in other districts. It can also be induced by better employment opportunities available in other districts, which higher educated girls might want to seek out. This type of out-migration in unlikely in this setting. Most migration in Punjab is in the form of temporary out migration of a member of the household, most often working men or head of the household (Alam et al. 2011). Estimates from DHS 2012 show a migration rate of 1.84% from treatment to

[10] The MICS do not any information on migration. We calculate these migration rates from the Demographic Health Survey 2012 survey which follows a random sample design**.**

control districts for women. 93% out of those migrating report migrating for marriage or family reasons, ruling out the channel of migration for seeking better economic opportunities. Further, the World Bank in its' medium term evaluation of the program uses econometric models to show that migration is not an issue in the evaluation of FSSP (IEG, 2011).

6. Results

We begin by discussing the impact of the program on girl's education as modeled in Equation 1.[11] We use three outcomes of interest here; total years of education, completion of primary school, and secondary school completion. Table 3 below shows the results. As seen in Column 1, an additional year of exposure to the CCT program increases the probability of completing primary school by 1.2 percentage points, an increase of 4 percent relative to the average. This has important implications for policy. It

Table 3: Impact of the CCT program on Girls' Schooling

	(1) Completed Primary	(2) Completed Secondary	(3) Years of Ed.
Years of exposure	0.0122***	0.0055***	0.123***
	(0.00193)	(0.00165)	(0.0288)
Observations	287,270	240,780	240, 780
R-squared	0.213	0.151	0.212
Mean	0.30	0.20	4.06
% Change	4.07%	2.75%	3.03%

Clustered standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
All estimations control for district and cohort fixed effects. Column 1 is restricted to girls aged 10 and older. Column 2 and 3 are restricted to girls aged 16 and older.

indicates that the incentive of receiving a cash transfer in grades 6-10 induces girls to complete primary school. A program designed to increase secondary schooling can hence

[11] All of the analyses in Table 2-6 are robust to using a binary difference in difference indicator instead of years of exposure.

induce households to have girls complete primary schooling, in order to benefit from the program in secondary school.

Next, we estimate whether the FSSP leads to higher rate of secondary school completion, which was the main stated aim of the program. Column 2 shows that a year of exposure to the program increases the probability of girls completing secondary school by 0.6 percentage points. The average secondary school completion rate is 20% on average implying a 2.75 percent increase in completion for every year of exposure to the program. Finally, in Column 3 we see that each year of exposure to the program increases years of education by 0.123 years. It is important to note that the results in Table 3 estimate the impact of the program for *each* year of exposure. From a policy perspective such programs are designed for much longer time periods. In fact, the FSSP has been in place since 2004 and is still ongoing. If the program is in place when a girl joins grade 1 in school, she would be "exposed" (i.e. the program would exist) for a total of 10 school years for her, out of which she would receive stipend in 5 of them (grades 6-10). Assuming linear effects, estimates in Table 3 translate into much bigger impacts over the life of the program. Secondary school completion rates would in this case increase by 25%, from the average, when a girl is exposed to the program from grade 1 to grade 10. This indicates that exposure to the program throughout primary and secondary schooling can lead to large improvements in girls' secondary school completion. [12]

Next, we turn to the impact of the program on women's later life decisions. We first look at the impact on decisions related to marriage and childbirth. For this we look at the probability of being married before the age of 16 and of having a first child before the

[12] We also estimate non-linear models using two different approaches; indicator for each year of exposure and a hazard model to account for dropping out in earlier grades. Results for impact on education remain consistent with higher effects when exposure to the program starts in primary school. Results can be made available on request.

age of 16. We prefer using this measure over age at marriage and age at first birth since those measures by definition would only include married women or women who have given birth, excluding those who potentially delay marriage and childbirth due to the program (Results for these measures are in Appendix Table A4 and are consistent with our findings here). A year of exposure to the program reduces the likelihood of marriage before the age of 16 by 0.52 percentage points and the likelihood of having the first child before 16 by 0.2 percentage points. These correspond to more than 4% reduction on average for teenage marriage and pregnancy for each year of exposure. These results are robust to using age cutoffs at 17 and 18 years (See Table A5 in Appendix for details).

Table 4: Impact of FSSP on Marriage & Fertility

	(1) Married before 16	(2) First birth before 16
Years of Exposure	-0.00520***	-0.00197**
	(0.00159)	(0.000621)
Observations	209,131	209,131
R-squared	0.053	0.018
Mean	0.12	0.042
% Change	-4.33%	-4.69%

Clustered standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
All estimations control for district and cohort fixed effects.

Next, we look at whether the program impacts maternal health care utilization. The outcome variables are based on births occurring in the two years prior to the survey date. Table 5 shows the results. We begin by looking first at behavior during pregnancy and after giving birth. Each year of exposure to FSSP increases the probability of women seeking pre-natal (0.6 percentage points) and post-natal care (0.8 percentage points). Looking at utilization at the time of giving birth, there is a positive but statistically insignificant effect on probability of giving birth at a medical facility versus giving birth at home. However, we find that a woman exposed to a year of the program is, on average, 3.3% more likely to be attended by a medical professional when giving birth. It is important to note that lack of skilled attendance at time of birth is one of the leading reasons for high maternal mortality in Pakistan and exposure to FSSP induces women to seek out trained professionals.

Lastly, we see in Column 5 that women exposed to the program are also less likely to have had a child who later died. We cannot speak to the exact channel through which this might be working. It might be due to better maternal health care as we see in Columns 1-4. It could also be attributable to better nourishment and health seeking behavior for children after birth, leading to better health and reduced incidence of disease. We discuss these latter channels more in our next section on the inter-generational impact.

Table 5: Impact of FSSP Maternal Health Care

	(1) Prenatal Care	(2) Post Natal Check	(3) Delivered at Medical Facility	(4) Skilled Birth Attendance	(5) Child Died
Years of exposure	0.00640**	0.0083*	0.00600	0.0242***	-0.0085**
	(0.00345)	(0.00429)	(0.0041)	(0.0035)	(0.00323)
Observations	48,856	48,856	48,856	48,856	128,885
R-squared	0.066	0.188	0.112	0.339	0.047
Mean	0.82	0.56	0.53	0.73	0.36
% Change	0.8%	1.48%	1.13%	3.31%	-2.36%

Clustered standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
All estimations control for district and cohort fixed effects. Results are robust to including the birth order of the child.
The outcome in column five is administered by the survey team to all women in the sample who have ever given birth and not just those who gave birth in the last two years.

Inter-generational Effects

The literature documents a positive impact of mother's education on children's well being in multiple dimensions. Educated mothers, for example, tend to have healthier and more educated kids. We present the effects of the FSSP on children's health in Table

6, using data on children under the age of five in the household. Columns 1 and 2 show the impact of the mother being exposed to a year of the FSSP on the weight of the child, measured by weight for age z (WAZ) score and the incidence of underweight.[13] We find consistent results across both measures; a child whose mother is exposed to the FSSP for a year scores 0.014 standard deviations higher on the WAZ score and is 0.7% less likely to be underweight.

Likewise Column 3 and 4, show results for height-for-age standardized score (HAZ) and stunting.[14] We find that children whose mothers benefited from the program on average score higher on the HAZ score by 0.02 standard deviation and are 0.7 percentage points less likely to be stunted. Finally we also check for the impact of being wasted and find a reduction consistent with results in Columns 1-4.[15]

Table 6: Intergenerational effect- Impact on Child Health (for children under 5)

VARIABLES	(1) WAZ	(2) Underweight	(3) HAZ	(4) Stunted	(5) Wasted
Years of Exposure	0.0136*	-0.0067**	0.0194**	-0.00702***	-0.0042**
	(0.00757)	(0.00303)	(0.00832)	(0.00279)	(0.00244)
Observations	88,478	88,478	87,548	87,548	88,478
R-squared	0.044	0.030	0.06	0.043	0.025
Mean	-1.49	0.33	-1.23	0.28	0.16
% Change	0.9%	-2.03%	1.58%	-2.50%	-2.62%

Clustered standard errors in parentheses,*** p<0.01, ** p<0.05, * p<0.1
Regressions include control for gender of child, district, mother's birth cohort and year of survey fixed effects. Results are robust to including birth order (See Appendix Table A6).

We also explore the impact on other measures of well-being for children that are important for Pakistan and developing countries in general. Table 7 shows the impact on

[13] Children's weight and height are measured by the survey team. The Z score is calculated based on the WHO standards for weight and height for age. Underweight: weight for age < –2 standard deviations (SD) of the WHO Child Growth Standards median
[14] Stunting: height for age < –2 SD of the WHO Child Growth Standards median
[15] Wasting: weight for height < –2 SD of the WHO Child Growth Standards median

indicators for vaccination, incidence of disease (measured here by diarrhea in last 2 weeks) and child protection (measured here by whether a child has an official birth record). We find that children of mother's exposed to the program are more likely to be vaccinated. However, there we lose a large fraction of our sample due to lack of reporting on this variable. If missing values in this case are correlated to whether or not the child is vaccinated, this estimate will be biased.

Children with mothers exposed to FSSP are less likely to experience diarrhea (5% point reduction for 10 years of mother's exposure). As mentioned earlier, diarrhea is one of the top three leading causes of under five mortality in Pakistan from curable and preventable diseases. These results suggest that educated mothers are more likely to take actions to reduce incidence of diarrhea in children (e.g. better informed about hygiene, more open to seeking health care and information)

Table 7: Intergenerational Effect-Impact on Child Well Being

VARIABLES	(1) Ever Vaccinated	(2) Diarrhea in last 2 weeks	(3) Child's birth is Registered
Years of exposure	0.00731***	-0.00517*	0.00784**
	(0.00265)	(0.00246)	(0.00306)
Observations	54,638	93, 380	88,843
R-squared	0.097	0.022	0.192
Mean	0.83	0.16	0.44
% Change	0.8%	-3.23%	1.75%

Clustered standard errors in parentheses,*** p<0.01, ** p<0.05, * p<0.1
Regressions include controls for mother's year of birth, age and gender of child, district and year of survey fixed effects. Results are robust to including birth order (See Appendix Table A7)

Child protection is of particular concern for policy makers in Pakistan. Official recording of a child's birth by the government establishes the child's existence under law. This helps safeguard a host of rights for children. For example, exact age record of a child is central to protection from child labor, child marriage, trafficking and ensures adequate treatment in the criminal justice system. Yet, more than half the children in Pakistan do not have an official birth record. Column 3 in Table 7 shows that children's whose mothers were exposed to the FSSP were 0.8 percentage points more likely to have an official record of birth. This corresponds to 1.75% increase from the average for each year the mother is exposed to the program.

Results in Table 3-7 show that exposure to FSSP has large gains not only in terms of the immediate stated goal on improving education but on important policy goals related to women and children's well being. It is important to consider these long run gains when weighing the benefits of the program against the costs. Our study provides the first estimates of these long run benefits. This is timely information given the program is currently being piloted for expansion in terms of stipend amounts and regions covered. While there is no existing study that provides evidence on a similar program on comparable outcomes as ours, it is worth putting the estimates in perspective of existing studies that use other school reforms to look at long run outcomes. Back of the envelope calculations using our estimates in Table 3 and 4 show that women induced into one additional year of education by the program are 4% points less likely to get married before the age of 16 and 1.6% points less likely to have their first child before 16. These numbers are comparable to what Grepin et al. (2015) find (6.1% point and 2.3% point respectively) using Zimbabwe's compulsory schooling law and secondary school construction program. For the inter-generational effects, Gunes (2015) is the most relevant comparison available, with the caveat that Turkey is very different from Pakistan in terms of income per capita (more than 4 times that of Pakistan in 2017). Extrapolation of our results in Table 3 and Table 6 indicate that completing secondary school (or five additional years of education) for mothers, owing to the FSSP, would increase WAZ of children by 0.6 standard deviations and HAZ by 0.8 standard deviations. These estimates are lower but comparable to Gunes et al. (2015) who find a 1.1 and 1.0 standard deviation change in WAZ and HAZ respectively if mothers complete secondary school.

Robustness Checks

We run several checks on our results. First, we exclude from our analysis women born before 1980. We then estimate our main model with this sub-sample of women. Results are shown for all outcomes in Table A8 & Table A9 in the Appendix. Excluding older cohorts does not substantively change any of the main results discussed earlier.

Second, we exclude districts with very low (<20%) and very high literacy rates (>60%). This allows us to see if the effect is driven by districts at the lower of higher end of the distribution for pre-period literacy rates. Table A10 & Table A11 in the Appendix show that excluding these districts does not significantly change our estimates on women's outcomes related to education, marriage and childbirth compared to our main results. Some of the outcomes related to maternal health care utilization however do lose statistical significance due to lower statistical power in these smaller samples. However, the direction (and magnitude) changes little. On the other hand, it might indicate that the excluded districts were driving the results which in this case is encouraging from a policy perspective since those districts with very low literacy rates likely need the change the most. Results for the inter-generational impact also remain largely consistent with earlier results using the full sample.

Lastly, we run our main estimation models using a binary difference-in-differences approach, with indicators for treatment district and whether the women belonged to a cohort that was young enough to benefit from the program when it was introduced. Compared to our main model, where we estimate the impact of each year of exposure, in this estimation we estimate the impact of any exposure to the program versus none. We can therefore, by definition of the variable of interest, expect the magnitude of the effect to be different from the primary results. Table A12 (A-D) in the Appendix shows that the impact of the program using this approach. Results are largely consistent with our earlier results in Tables 3-7.

6. Conclusion

Pakistan faces serious challenges with respect to human capital. One of the strategic development priorities used as a tool to address these problems is increased education for girls, especially adolescent girls. However, little causal evidence is available on returns to such programs in developing countries (Mensch et al. 2019). This paper seeks to bridge that gap by using a CCT program in the province of Punjab to estimate the impact of secondary schooling on long run outcomes on the beneficiaries, as well as the impact on health and well-being of their children. Results show that the CCT program was effective in its goal of increasing schooling for girls. In the long run, as a result of exposure to the program, women delay marriage, are less likely to give birth before the age of 16 and are more likely to seek maternal health care. Further we find intergenerational effects in terms of child health and well-being.

From a cost perspective, the amount of stipend disbursed to a girl through grades 6-10 is $150 or $30 per year. In addition we can expect administrative overheads of managing the program. Nonetheless, the cost per student seems reasonably small compared to the gains we see not just in schooling but also in maternal health, child mortality, child health and protection for each year of exposure. From a cost-benefit perspective the program provides large gains in long run for outcomes that would otherwise be costly to improve.

There are important lessons for policy making for developing countries that can be derived from this study. Programs that target girl's education, specifically adolescent girls education, have long run beneficial effects beyond the aim of increasing schooling for girls. These benefits smust be accounted for when designing these policies since they can potentially make an important contribution in reducing a host of other problems.

References

Ailaan, A., 2014. 25 *Million broken promises: The crisis of Pakistan's out-of-school children*. Islamabad: Alif Ailaan.

Alam, A., Baez, J.E. and Del Carpio, X.V., 2011. Does cash for school influence young women's behavior in the longer term? Evidence from Pakistan. IZA DP No. 5703, *Bonn: The Institute for the Study of Labor*

Alderman, H., Orazem, P.F. and Paterno, E.M., 2001. School quality, school cost, and the public/private school choices of low-income households in Pakistan. *Journal of Human Resources*, pp.304-326.

Andrabi, T., Das, J. and Khwaja, A.I., 2012. What did you do all day? Maternal education and child outcomes. *Journal of Human Resources*, *47*(4), pp.873-912.

Angeles, G., Guilkey, D.K. and Mroz, T.A., 2005. The effects of education and family planning programs on fertility in Indonesia. *Economic Development and Cultural Change*, *54*(1), pp.165-201.

Araujo, M.C., Bosch, M. and Schady, N., 2017. Can Cash Transfers Help Households Escape an Inter-Generational Poverty Trap? In *The Economics of Poverty Traps*. University of Chicago Press.

Barham, T., Macours, K. and Maluccio, J.A., 2013. More schooling and more learning? Effects of a three-year conditional cash transfer program in Nicaragua after 10 years(No. IDB-WP-432). *IDB Working Paper Series*.

Barrera-Osorio, F., Linden, L. L., & Saavedra, J. (2017). Medium-and Long-Term Educational Consequences of Alternative Conditional Cash Transfer Designs: Experimental Evidence from Colombia (No. w23275). *National Bureau of Economic Research.*

Behrman, J. A. (2015). Does schooling affect women's desired fertility? Evidence from Malawi, Uganda, and Ethiopia. *Demography*, *52*(3), 787-809.

Behrman, J.R. and Schneider, R., 1993. An international perspective on Pakistani human capital investments in the last quarter century. *The Pakistan Development Review*, pp.1-68.

Breierova, L. and Duflo, E., 2004. The impact of education on fertility and child mortality: Do fathers really matter less than mothers*?* (No. w10513). *National Bureau of Economic Research.*

Chaudhury, N. and Parajuli, D., 2010. Conditional cash transfers and female schooling: the impact of the female school stipend programme on public school enrolments in Punjab, Pakistan. *Applied Economics*, *42*(28), pp.3565-3583.

Currie, J. and Moretti, E., 2003. Mother's education and the intergenerational transmission of human capital: Evidence from college openings. *The Quarterly Journal of Economics*, *118*(4), pp.1495-1532.

Devine,S. and Taylor.G.,2018. *Every Child Alive: The Urgent Need to End Newborn Deaths*. Switzerland: UNICEF

Field,E. and Vyborny.K., 2016. *Female Labor Force Participation in Asia: Pakistan Country Study*, Manila: Asian Development Bank

Fiszbein, A. and Schady, N.R., 2009. *Conditional cash transfers: reducing present and future poverty*. Washington D.C. World Bank Publications.

Grépin, K.A. and Bharadwaj, P., 2015. Maternal education and child mortality in Zimbabwe. *Journal of Health Economics*, *44*, pp.97-117.

Grossman, M., 1972. On the concept of health capital and the demand for health. *Journal of Political Economy*, *80*(2), pp.223-255.

Grossman,M. & and Kaestner,R.1997. Effects of Education on Health. In *The Social Benefits of Education*, ed. by Behrman, J.R., and Stacey, N., Ann Arbor: University of Michigan Press.

Grossman, M., 2000. The Human Capital Model. In *Handbook of health economics*, 1, pp. 347-408.

Grossman, M., 2006. Education and nonmarket outcomes. *Handbook of the Economics of Education*, *1*, pp.577-633.

Hogan, M.C., Foreman, K.J., Naghavi, M., Ahn, S.Y., Wang, M., Makela, S.M., Lopez, A.D., Lozano, R. and Murray, C.J., 2010. Maternal mortality for 181 countries, 1980–2008: a systematic analysis of progress towards Millennium Development Goal 5. *The Lancet*, *375*(9726), pp.1609-1623.

Holmes, J., 2003. Measuring the determinants of school completion in Pakistan: analysis of censoring and selection bias. *Economics of Education Review*, *22*(3), pp.249-264.

IEG (Independent Evaluation Group). 2011. *Do Conditional Cash Transfers Lead to Medium-Term Impacts?: Evidence from a Female School Stipend Program in Pakistan.* Washington, DC: World Bank.

Lloyd, C.B., Mete, C. and Sathar, Z.A., 2005. The effect of gender differences in primary school access, type, and quality on the decision to enroll in rural Pakistan. *Economic Development and Cultural Change*, *53*(3), pp.685-710.

Mazumder, B., Rosales-Rueda, M. and Triyana, M., 2019, May. Intergenerational Human Capital Spillovers: Indonesia's School Construction and Its Effects on the Next Generation. In *AEA Papers and Proceedings* (Vol. 109, pp. 243-49).

Osili, U.O. and Long, B.T., 2008. Does female schooling reduce fertility? Evidence from Nigeria. *Journal of development Economics*, *87*(1), pp.57-75.

Parker, S.W. and Vogl, T., 2018. Do Conditional Cash Transfers Improve Economic Outcomes in the Next Generation? Evidence from Mexico (No. w24303). *National Bureau of Economic Research.*

Qureshi, J.A., 2018. Additional returns to investing in girls' education: Impact on younger sibling human capital. *The Economic Journal*.

Rosenzweig, M. R., & Schultz, T. P. (1983). Estimating a household production function: Heterogeneity, the demand for health inputs, and their effects on birth weight. *Journal of Political Economy*, *91*(5), 723-746.

Sawada, Y. and Lokshin, M., 2009. Obstacles to school progression in rural Pakistan: An analysis of gender and sibling rivalry using field survey data. *Journal of Development Economics*, *88*(2), pp.335-347.

UNESCO, 2015. Fixing the Broken Promise of Education for All. *Montreal: UNESCO Institute for Statistics*

Appendix

Figure A1: Literacy Rates in Punjab based on 1998 Population Census

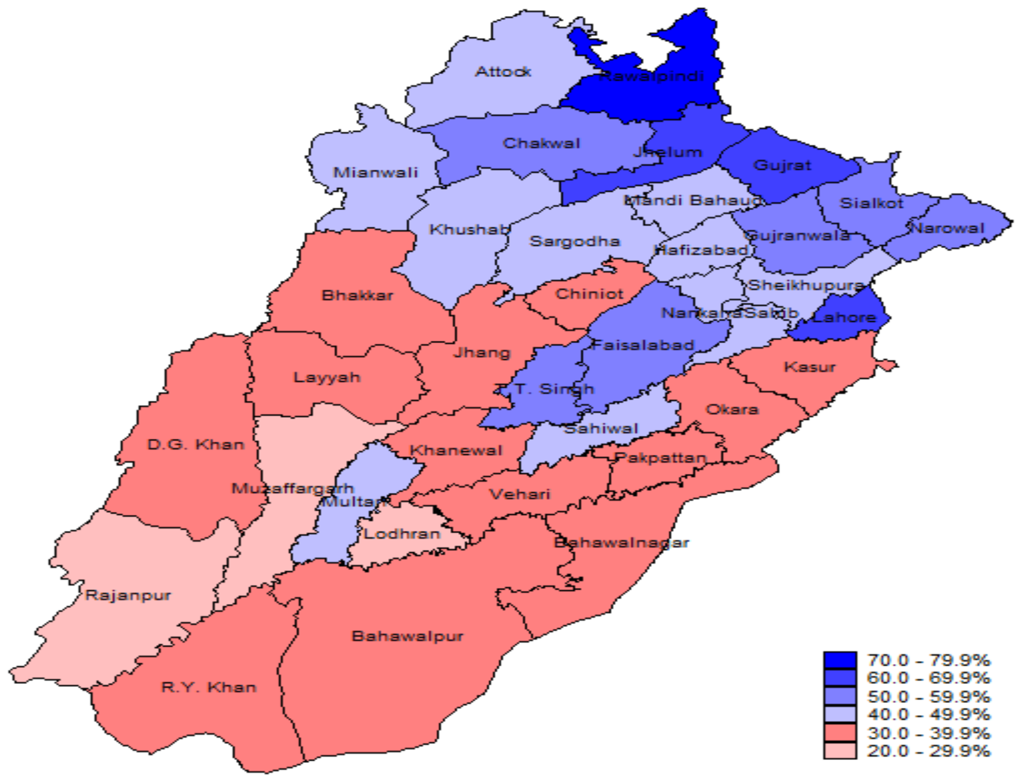
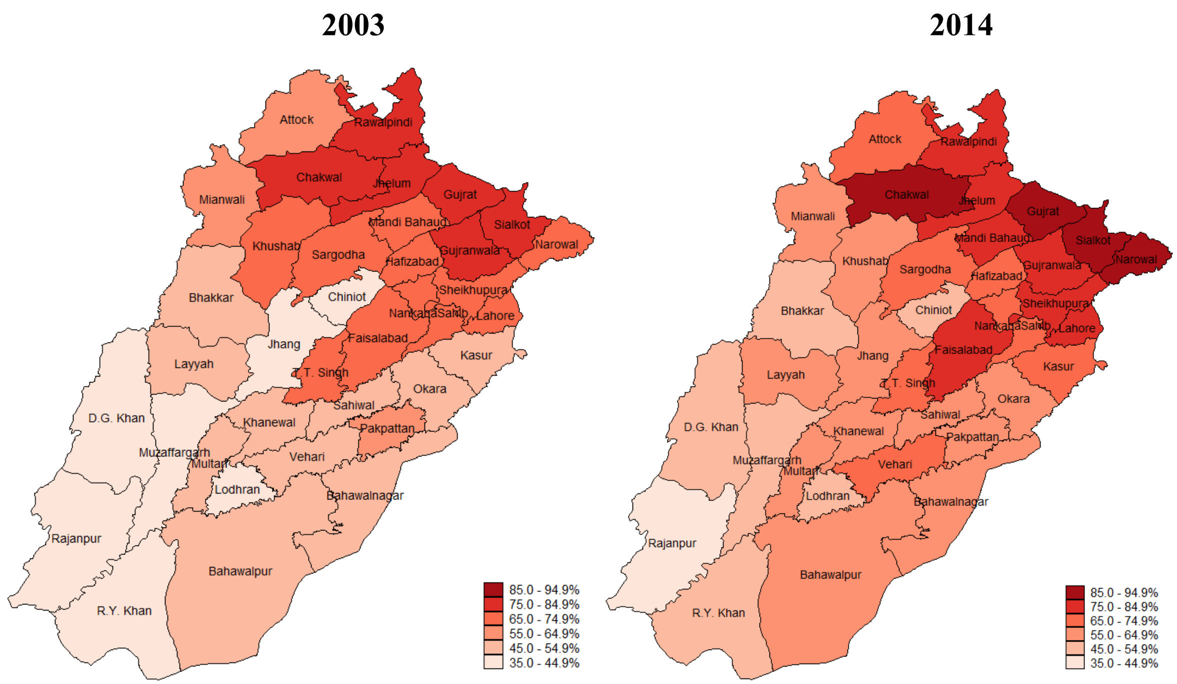


Figure A2: Female School Enrollment Rates in Punjab (2003 and 2014)[16]



[16] Note that enrollment rates in Punjab are on average higher than average enrollment rates in Pakistan. The enrollment rates calculated here are from cross sectional data in 2003 and 2014. These enrollment rates appear higher than primary and secondary school completion rates we observe in our data. This is because our data looks at women in their adulthood and completion rates historically have been much lower.

Table A1: District Literacy Rates for Punjab based on 1998 Population Census

Treatment	Literacy Rate	Control	Literacy Rate
Rajanpur	20.7	Khushab	40.5
Muzaffargarh	28.5	Hafizabad	40.7
Lodhran	29.9	Mianwali	42.8
D.G.Khan	30.6	Multan	43.4
Rahmiyar Khan	33.1	Shiekhupura	43.8
Bhakkar	34.2	Sahiwal	43.9
Pakpattan	34.7	Sargodha	46.3
Bahwalpur	35.0	Mandi Bahuddin	47.4
Bahawalnagar	35.1	Attock	49.3
Kasur	36.2	T.T.Sing	50.5
Vehari	36.8	Faisalabad	51.9
Jhang	37.1	Narowal	52.7
Okara	37.8	Gujranwala	56.6
Layyah	38.7	Chakwal	56.7
Khanewal	39.9	Sialkot	58.9
		Gujrat	62.2
		Jhelum	63.9
		Lahore	64.7
		Rawalpindi	70.5

Table A2: Summary Statistics by Control and Treatment Districts

Variable	Total Sample			Treatment Districts		Control Districts		Difference
	N	Mean	SD	Mean	SD	Mean	SD	
Age	287,270	27.00	.0207	26.98	0.0327	27.02	0.0269	-0.039
Completed Primary	287,270	0.3	0.46	0.22	0.416	0.35	0.48	-0.123 ***
Completed Secondary	240,780	0.20	0.40	0.149	0.356	0.238	0.426	-0.089 ***
Years of Ed.	240,780	4.06	4.7	3.18	4.44	4.68	4.77	-1.497***
Age at marriage	128,835	20.07	4.38	19.68	4.42	20.38	4.32	-0.692 ***
Married before 18	230,127	0.266	0.44	0.260	0.439	0.192	0.39	0.077 ***
Age at first birth	128,269	22.12	4.34	21.85	4.39	22.32	4.29	-0.464 ***
First Birth before 18	230,127	0.10	0.30	0.121	0.326	0.089	0.29	0.037 ***
Prenatal Checkup	48,856	0.82	0.39	0.735	0.441	0.880	0.32	-0.146 ***
Delivery at medical facility	48,856	0.53	0.5	0.403	0.491	0.622	0.49	-0.219 ***
Skilled Birth Attendant	48,856	0.73	0.44	0.626	0.483	0.801	0.40	-0.175 ***
Post-natal care	48,856	0.56	0.5	0.512	0.50	0.595	0.49	-0.082 ***
Child Died	75,664	0.36	0.48	0.38	0.49	0.35	0.48	0.02***
Age of Child	88,542	2.00	1.42	2.03	1.426	1.98	1.41	0.049***
Gender	88,542	0.51	0.50	0.512	0.50	0.509	0.50	0.003
Weight-for-Age-Z	88,542	-1.49	1.18	-1.643	1.190	-1.365	1.170	-0.277***
Height-for-Age-Z	88,542	-1.23	1.38	-1.374	1.412	-1.126	1.350	-0.247 ***
Stunted	88,542	0.28	0.45	0.326	0.469	0.246	0.430	0.080***
Underweight	88,542	0.33	0.47	0.378	0.485	0.286	0.452	0.090 ***
Child registered	88,843	0.44	0.5	0.286	0.452	0.565	0.496	0.276 ***
Had diarrhea	89,104	0.16	0.36	0.179	0.384	0.144	0.352	0.035***
Ever Vaccinated	52,190	0.83	0.38	0.734	0.442	0.897	0.304	-0.162***

Table A3: Summary Statistics by Age Specific Exposure

Variable	Total Sample			Exposed		Not exposed		Difference
	N	Mean	SD	Mean	SD	Mean	SD	
Years of exposure	287,270	1.70	2.89	5.32	2.62	0	0	-
Age	287,270	27.00	.0207	18.06	3.3	31.9	9.84	13.8***
Completed Primary	287,270	0.3	0.46	0.293	0.46	0.30	0.46	0.0023
Completed Secondary	240,780	0.20	0.40	0.22	0.41	0.19	0.40	-0.029***
Years of Ed	240,780	4.06	4.7	4.67	4.54	3.86	4.73	-0.814***
Age at marriage	128,835	20.07	4.38	17.96	2.64	20.34	4.48	2.37***
Married before 18	230,127	0.266	0.44	0.12	0.322	0.27	0.44	0.148***
Age at first birth	128,269	22.12	4.34	19.2	2.34	22.34	4.37	3.15***
First Birth before 18	230,127	0.10	0.30	0.05	0.21	0.13	0.33	0.08***
Any Prenatal Checkup	48,856	0.82	0.39	0.84	0.31	0.81	0.39	-0.03***
Delivery at medical facility	48,856	0.53	0.5	0.57	0.5	0.51	0.5	-0.05***
Skilled Birth Attendant	48,856	0.73	0.44	0.90	0.3	0.70	0.46	-0.20***
Any Post natal care	48,856	0.56	0.5	0.69	0.46	0.54	0.5	-0.15***
Child Died	75,664	0.36	0.48	0.38	0.48	0.27	0.44	0.11***
Age of Child	88,542	2.00	1.42	1.39	0.109	1.32	0.109	0.710***
Gender	88,542	0.51	0.50	0.511	0.0041	0.510	0.0017	-0.0011
Weight-for-Age-Z	88,542	-1.49	1.18	-1.58	1.19	-1.47	1.19	0.107***
Height-for-Age-Z	87,548	-1.23	1.38	-1.29	1.4	-1.23	1.39	0.054***
Stunted	87,548	0.28	0.45	0.29	0.45	0.28	0.45	-0.008**
Underweight	88,542	0.33	0.47	0.36	0.48	0.32	0.46	-0.035***
Child registered	88,843	0.44	0.5	0.38	0.49	0.44	0.5	0.064***
Had diarrhea	89,104	0.16	0.36	0.21	0.41	0.15	0.36	-0.049**
Vaccinated	52,212	0.83	0.38	0.20	0.40	0.82	0.38	-0.02***

Table A4: Impact of the CCT program on Age at Marriage and First Birth

	(1) Age at marriage	(2) Age at First Birth
Years of Exposure	0.0454	0.0193
	(0.0294)	(0.0284)
Observations	128,835	128,302
R-squared	0.063	0.085

Clustered standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

All estimations control for district and cohort fixed effects. Column 1 is restricted to girls aged 10 and younger. Column 2 and 3 are restricted to girls aged 16 and older

Table A5: Impact of the CCT program on Teenage Marriage & First Birth at Different Ages

	(1) Married before 17	(2) Married before 18	(3) FB before 17	(2) FB before 18
Years of Exposure	-0.00353**	-0.00110	-0.00227**	-0.00220
	(0.00171)	(0.00208)	(0.000904)	(0.00136)
Observations	197,161	187,813	214,964	205,558
R-squared	0.055	0.059	0.022	0.027

Clustered standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

All estimations control for district and cohort fixed effects.

Table A6: Inter-generational effect: Impact on Child Health (with birth order control)

	(1) WAZ	(2) Underweight	(3) HAZ	(4) Stunted
Mother's Yrs. Of Exposure	0.0136*	-0.00657**	0.0190**	-0.00683**
	(0.00760)	(0.00303)	(0.00845)	(0.00285)
Observations	88,478	88,478	87,548	87,548
R-squared	0.040	0.028	0.028	0.025

Clustered standard errors in parentheses,*** p<0.01, ** p<0.05, * p<0.1
Regressions include control for gender of child, district, mother's birth cohort, birth order and year of survey fixed effects.

Table A7: Inter-generational effect: Impact on Child Well Being (with birth order controlled for)

	(1) Birth Registration	(2) Incidence of Diarrhea	(3) Ever Vaccinated
Mother's Yrs. Of Exposure	0.00668**	-0.00360	0.00645**
	(0.00312)	(0.00252)	(0.00268)
Observations	88,194	88,451	52,212
R-squared	0.197	0.024	0.106

Clustered standard errors in parentheses,*** p<0.01, ** p<0.05, * p<0.1
Regressions include control for gender of child, district, mother's birth cohort, birth order and year of survey fixed effects.

Table A8: Robustness Check: Impact of CCT Program on Women's Outcomes (Excluding Older Cohorts)

	(1)	(2)	(3)	(4)	(5)
Panel A	Completing Primary	Completing Secondary	Yrs. Of Ed.	Married before 16	FB before 16
Years of Exposure	0.0159***	0.0147***	0.200***	-0.00444***	-0.00164***
	(0.00219)	(0.00223)	(0.0307)	(0.00116)	(0.000458)
Observations	216,722	216,722	216,251	181,907	181,907
R-squared	0.224	0.152	0.207	0.055	0.019

	(6)	(7)	(8)	(9)	(10)
Panel B	Prenatal	Postnatal	Birth at Med. Facility	Skilled Attendant	Child died
Years of Exposure	0.00615*	0.00573	0.00365	0.0182***	-0.00789**
	(0.00305)	(0.00394)	(0.00401)	(0.00276)	(0.00296)
Observations	39,413	38,989	37,996	27,408	72,936
R-squared	0.059	0.161	0.088	0.270	0.031

Clustered standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A9: Robustness Check: Impact of CCT on Children's Outcomes (Excluding Mother's from Older Cohorts)

	(1) WAZ	(2) HAZ	(3) Underweight	(4) Stunted
Years of Exposure	0.0185**	0.0246***	-0.00915***	-0.00890***
	(0.00792)	(0.00839)	(0.00306)	(0.00284)
Observations	77,904	76,685	77,904	76,685
R-squared	0.031	0.040	0.021	0.029

	(5) Birth registration	(6) Diarrhea	(7) Vaccination
Years of Exposure	0.00772**	-0.00459*	0.00683**
	(0.00309)	(0.00245)	(0.00266)
Observations	81,734	81,734	49,540
R-squared	0.191	0.042	0.104

Clustered standard errors in parentheses,*** p<0.01, ** p<0.05, * p<0.1
Regressions include control for gender of child, district, mother's birth cohort, and year of survey fixed effects.

Table A10: Robustness Check: Impact of CCT on Women's Outcomes (Excluding Districts with High and Low Literacy Rates)

	(1) Completing primary	(2) Completing Secondary	(3) Yrs. Of Ed.	(4) Married before 16	(5) FB before 16
Years of Exposure	0.00925***	0.00265***	0.0772***	-0.00351***	-0.00122**
	(0.00139)	(0.000899)	(0.0240)	(0.00123)	(0.000584)
Observations	233,641	196,022	195,442	188,520	202,147
R-squared	0.202	0.140	0.204	0.055	0.019

	(6) Prenatal	(7) Postnatal	(8) Birth at Med. Facility	(9) Skilled Attendant	(10) Child died
Years of Exposure	0.00360	0.00146	0.0178***	0.00391	-0.00421
	(0.00373)	(0.00398)	(0.00251)	(0.00405)	(0.00294)
Observations	39,668	37,342	27,758	39,222	104,775
R-squared	0.053	0.091	0.355	0.191	0.042

Clustered standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A11: Robustness Check: Impact of CCT on Children's Outcomes (Excluding Districts with High and Low Literacy Rates)

	(1) WAZ	(2) HAZ	(3) Underweight	(4) Stunted
Mother's Years of Exposure	0.0117	0.0138	-0.00567*	-0.00672**
	(0.00838)	(0.00918)	(0.00336)	(0.00310)
Observations	73,028	72,322	73,028	72,322
R-squared	0.026	0.034	0.019	0.025

	(5) Birth registration	(6) Diarrhea	(7) Vaccination
Mother's Years of Exposure	0.00785**	-0.00456*	0.00658**
	(0.00341)	(0.00269)	(0.00283)
Observations	76,553	76,769	44,871
R-squared	0.174	0.044	0.098

Clustered standard errors in parentheses,*** p<0.01, ** p<0.05, * p<0.1
Regressions include control for gender of child, district, mother's birth cohort, and year of survey fixed effects.

Table A12 (A-D): Results from a Binary DID Estimation

A12 (A): Women's Outcomes

	(1) Completing Primary	(2) Completing Secondary	(3) Years of Ed.
Treatment*Exposed	0.0514***	0.0155	0.451***
	(0.0142)	(0.0120)	(0.153)
Observations	313,001	240,780	240,095
R-squared	0.098	0.070	0.130

A12 (B): Women's Outcomes

	(1) Prenatal	(2) Deliver Medical	(3) SBA	(4) Post Natal	(5) Child Died
Treatment*Exposed	0.0222	0.0358**	0.108***	0.00443	-0.0391***
	(0.0136)	(0.0166)	(0.0167)	(0.0163)	(0.0114)
Observations	48,856	48,856	48,856	48,856	128,885
R-squared	0.066	0.100	0.211	0.090	0.042

A12 (C): Children's Outcomes

	(1) WAZ	(2) Underweight	(3) HAZ	(4) Stunted
Treatment*Exposed	0.0532**	-0.0280***	0.0534*	-0.0141
	(0.0260)	(0.0102)	(0.0294)	(0.00963)
Observations	88,495	88,248	87,565	87,565
R-squared	0.029	0.021	0.021	0.018

A12 (D): Children's Outcomes

	(1) Birth Registration	(2) Diarrhea	(3) Ever Vaccinated
Treatment*Exposed	0.0195*	-0.0170**	0.0240**
	(0.0108)	(0.00824)	(0.00948)
Observations	88,211	88,468	52,219
R-squared	0.191	0.022	0.097

Clustered standard errors in parentheses,*** p<0.01, ** p<0.05, * p<0.1