

# Can more money get girls into school and keep them there? Effect of cash transfer increase on female education

Ayesha Khalid  
University of Oregon

June 5, 2019

## ABSTRACT

Conditional cash transfer programs have been implemented in many developing countries to improve human capital accumulation. Using novel monthly data on school enrollments and attendance in Punjab province in Pakistan, this paper examines the impact of an increase in the cash amount of a female-targeted conditional cash transfer program. In March 2017, the monthly cash transfer increased from \$1.31 to \$6.57. I find that the increase in cash transfer increased female enrollment by 4.45 percent in 6<sup>th</sup> grade, and by 3.86 percent in 9<sup>th</sup> grade. However, there is no effect of the higher cash transfer on the attendance of girls in grades 6–10. The increased cash transfer also had positive spillover effects on the enrollment of boys in middle and high schools in treated districts.

*Keywords:* Female educational attainment; developing countries; conditional cash transfers

*JEL Code:* I25, O15, O22

“Why don’t they let us study? They let the boys study, so they should let us study” —  
Bina, 15, forced to leave school after fifth grade, Karachi.

“Traveling to the nearest government middle school would cost Rs.3500 (\$24.70) monthly.”  
— Muskaan, left school during seventh grade, Lahore.

“My brothers don’t work, so I started working at age 10. I work (embroidery) from morning until 2 p.m., then I do housework until 4, then embroidery again until 8 or 9 p.m.”  
— Samika, 13, did not go to school, Lahore. <sup>1</sup>

## 1. Introduction

Education generates higher income levels and growth, both at the macro level (Lindahl & Krueger, 2001) and at the micro level (Angrist & Krueger, 1991; Duflo, 2001). Investment in schooling is critical to the development process (Lucas, 1989; Galor & Weil, 2000), and human capital accumulation is an important driver of economic growth (Mankiw et al., 1992; Jones, 2011). Educational outcomes have traditionally been poor in Pakistan. The adult literacy rate is only 58 percent, with 70 percent of men being literate compared to just 48 percent of women (Government of Pakistan, 2018). Public expenditure on education as a percentage of Gross Domestic Product (GDP) was merely 2.2 percent in 2017 (Government of Pakistan, 2018). In 2018, Pakistan ranked second lowest in the world in the global gender parity index. Specifically, the gender gap in educational attainment is about 20 percent in Pakistan, with only 10 of the 149 ranked countries ranked having a larger gap in educational attainment (World Economic Forum, 2018).

The gender parity index of school enrollment in Pakistan is 0.78, which means that across grades on average, 78 girls are enrolled for every 100 boys (Academy of Educational Planning and Management, 2015). There are 22.84 million children out of school in Pakistan, which is 44 percent of the total population of children aged 5-16 years (Academy of Educational Planning and Management, 2018). Amongst these out-of-school children, 32 percent are girls whereas 21 percent are boys (UNICEF, 2017). Currently, about five million children of primary school age are out of school, and 62 percent of these are females. This gender

---

<sup>1</sup>The interviews were conducted across Pakistan in 2017 by Human Rights Watch (reported in Human Rights Watch, 2018).

disparity persists even amongst middle school aged children (UNESCO). In 2016, 59 percent of middle school-aged girls were out of school compared to 49 percent of boys and by ninth grade only 13 percent of school-aged girls remain in school (Jamil, 2016).

In this paper, I study the impact of an increase in the cash amount of the female-targeted conditional cash transfer (CCT) program in the Punjab province in Pakistan. The female-targeted CCT program was first implemented in Punjab in 2004. Specifically, I examine the effect of monthly cash transfer increase, from \$1.31 to \$6.57 in 2017, on female school enrollment and attendance in middle and high school (grades 6 – 10). I use a novel monthly dataset on school attendance and enrollment for all public schools in Punjab over the period 2014–2018.

I also investigate whether there is any reallocation of resources amongst siblings due to this recent increase in the amount of monthly cash transfer. Specifically, I examine if the sibling gender composition of girls who are eligible for the stipend increase has any effect on their schooling status. It has been demonstrated in the child labor literature that a child’s education is influenced by the gender composition of their siblings, specifically, their number of female siblings (Garg et al., 1996; Sawada & Lokshin, 2009; Akresh & Edmonds, 2011; Akresh et al., 2012). There is evidence that girls are more involved in household work, due to their absolute and comparative advantage in household-based labor (Levison, 1998; Glick & Sahn, 2000; Edmonds, 2006; Dammert, 2010). If these girls, eligible for the cash transfer increase, have more female siblings, this may reduce the amount of their time demanded for household-based labor, thereby increasing their likelihood of attending school.

For girls in middle and high school, I find no effect of the increase in cash transfer on attendance. The increase in the monthly cash transfer (to \$6.57) is conditional on maintaining an average attendance of at least 80%. However, the earlier cash transfer, just \$1.31 per month, was also conditional on maintaining an average attendance of at least 80%. Therefore, girls who were already getting the stipend must maintain that attendance of 80%. The results indicate that the increase in the cash transfer increased enrollment by 1.6 and 3.7

female students in 6<sup>th</sup> grade and 9<sup>th</sup> grade, respectively, per female middle and high school in treated districts. This represents a 4.45 percent increase in female enrollment in 6<sup>th</sup> grade and a 3.86 percent increase in 9<sup>th</sup> grade, per month. Since 6<sup>th</sup> grade is a transition from primary to middle school and 9<sup>th</sup> grade is a transition from middle to high school, the results suggest that the increase in the cash transfer provided incentive to roughly one female student to transition from primary to middle school, and about three female students to transition from middle to high school. The increased cash transfer also had positive spillover effects on the enrollment of boys in middle and high schools in treated districts.

Rigorous evaluations of CCT programs have demonstrated their ability to improve schooling outcomes, such as increases in enrollment and attendance, and reductions in child work. Prior research on gender-targeted CCT programs in Bangladesh, Pakistan, Cambodia, and Malawi indicates that the CCT program increased enrollment and attendance of girls (Khandker et al., 2003; Chaudhury & Parajuli, 2006; Filmer & Schady, 2008; Baird et al.; 2010; Hasan, 2010). Chaudhury & Parajuli (2006) find an annual increase in female enrollment of six students, in response to the female-targeted CCT implemented in Punjab in 2004, which is a 9 percent annual increase in female enrollment in middle school (grades 6–8). Hasan (2010) finds that the CCT in 2004 led to an annual increase in female enrollment of about 1 to 4 students in grades 6–8, which is a 9–33 percent annual increase in female enrollment by grade. Alam et al. (2011) find that the CCT program increased annual female enrollment by 11 - 32 percent in the longer run, i.e. four years after the implementation in 2004. They also find the CCT increased the likelihood of girls transitioning into middle school and high school, by 3–6 percent and 4–6 percent, respectively.

Unlike earlier work, which evaluates the effectiveness of female-targeted CCT implemented in Punjab in 2004, I examine the effect of the intervention in 2017 that increased the cash transfer amount from \$1.31 to \$6.57. Prior research on the impact of the female-targeted CCT program in Punjab only examines changes in the annual female enrollment. Since, my data has monthly records of enrollment, I can examine the impact of increased

cash transfer on monthly, rather than annual, enrollment. The data also has information on monthly attendance, which allows me to study the effect of the increase in the cash amount on attendance along with enrollment.

The remainder of the paper is organized as follows. Section 2 outlines the relevant background information concerning gender inequality and the CCT program in Punjab. Section 3 reviews the existing literature. The data are discussed in Section 4, and the empirical model is detailed in Section 5. Section 6 presents the estimation results, and Section 7 concludes.

## **2. Background**

Many children across Pakistan, especially girls, are locked out of education and into poverty. Girls, in particular, face many barriers and constraints that limit their access to education and the benefits they derive from education. The public schools in Punjab are single-gendered. Many girls have no access to education at all due to a shortage of government schools especially for girls. Moreover, many girls are not allowed to attend school because they are employed as child laborer. Families also prioritize boys' education, sometime encourage child marriage, and are concerned about sexual harassment on the way to school and terror attacks on girls' schools (Human Rights Watch, 2018). Barriers to education for girls are a reflection of the broader problem of gender inequality in Pakistan. According to the World Bank, Pakistan has the highest global rate of maternal mortality. Moreover, violence against women—including domestic violence, forced marriages, child marriages, acid attacks and rape—is prevalent and tends to precipitate no adequate government action. It is estimated that 21 percent of females are married under the age of 18, and 3 percent of females are married before 15 (Ijaz, 2017).

Though literacy rates are higher in Punjab compared to other provinces of Pakistan, gender differences in education persist. The adult literacy rate in Punjab is 77 percent for urban areas and 55 percent for rural areas (Government of Pakistan, 2018). In Punjab, 74 percent of men have ever attended school, compared to 56 percent of women. Similar gender

disparities exist among those who completed primary school (grades 1–5) in Punjab, with 61 percent of men completing primary school compared to 47 percent of women (Government of Pakistan Statistics Division, 2016).

The government of Punjab has undertaken several education reform initiatives to improve education outcomes in the province. One such reform was the 2004 launch of a female-targeted conditional cash transfer (CCT) program, called the Female School Stipend Program (FSSP), to reduce the gender disparity in education. Under the FSSP, girls in middle school (grades 6–8) in 15 selected districts<sup>2</sup> received a monthly stipend of Rs. 200 (\$1.31) conditional on maintaining average attendance rate of at least 80%. The 15 (out of 36) districts selected for the intervention were those with literacy levels below 40 percent. In 2006, the FSSP was extended to include girls in 9th and 10th grades.

In March 2017, the government of Punjab replaced the existing FSSP by the Zewar-e-Taleem Programme. The monthly stipend for girls in secondary school was increased from Rs.200 (\$1.31) to Rs.1000 (\$6.57) in 16 districts<sup>3</sup>. Figure 2 shows the spatial locations of the districts in which the Zewar-e-Taleem Programme was implemented. The cost of this project was Rs.6 billion (\$42 million) (Punjab Social Protection Authority). The stipend is paid on quarterly basis conditional on the student maintaining an attendance rate of at least 80 percent. Given that the minimum wage in Punjab is Rs.15,000 (\$ 98.53) per month (Rahim, 2017), the new cash transfer amount is 6.67 percent of the monthly minimum wage, whereas the earlier stipend was only 1.33 percent of the monthly minimum wage.

The purpose of introducing a higher stipend is to improve enrollment and retention among female students. Under the FSSP, the stipend was transferred through government postal service, whereas now the stipend is delivered through an ATM card to ensure efficient delivery and transparency. For households whose daughters are already going to secondary school, the conditional cash transfer is simply an income transfer, whereas it is an incentive

---

<sup>2</sup>The districts were Bahawalnagar, Bahawalpur, Bhakkar, Dera Gazi Khan, Jhang, Kasur, Khanewal, Layyah, Lodhran, Muzaffargarh, Okara, Pakpattan, Rajanpur, Rahimyar Khan, and Vehari.

<sup>3</sup>The 15 districts were same as before. The new district is Chiniot, which became a separate district in 2009, whereas before it was merely a tehsil of Jhang district.

payment for households that have daughters out of school.

### **3. Literature Review**

Recent review studies of CCT evaluations (Fiszbein et al., 2009; Independent Evaluation Group, 2011) show that these programs improve schooling (enrollment, attendance, child work) and health (vaccinations, doctor visits) outcomes. Due to a rigorous evaluation of the Mexican Oportunidades program, which has been operating since 1997, CCT programs have been implemented in Latin America and many other developing countries. There were 29 countries that had some form of CCT program as of 2007 (Fiszbein et al., 2009).

CCT programs targeted to low-income households are becoming an important policy tool in developing countries to increase human capital investments and to reduce poverty (de Janvry et al., 2006). These programs provide cash transfers to poor households, conditional on documentation of a pre-specified investment in the human capital of their children. The premise of these conditional cash transfers is that investment in human capital of children can break the inter-generational transmission of poverty by increasing the productivity of the affected children as adults.

A vast empirical literature has demonstrated the effectiveness of CCT programs in a variety of contexts, where the cash transfer is conditioned on school attendance. Many of these programs have improved schooling outcomes in developing countries (Paul Schultz, 2004; de Janvry et al., 2006; Filmer & Schady, 2009). Rigorous evaluations of CCT programs in Mexico, Brazil, Honduras, Jamaica and Nicaragua have also demonstrated the ability of the programs to increase school enrollment rates (Rawlings & Rubio, 2005).

Young girls are an important demographic group to target in order to break the poverty cycle in developing countries (Levine et al., 2008). In many developing countries, households underinvest in female health and education, which necessitates gender-targeted interventions (Ezemenari et al., 2002). Currently, there are a few CCT programs that target only girls, including programs in Bangladesh, Pakistan, Cambodia, and Malawi. Khandker et al. (2003)

have studied the effect of the female secondary school stipend program (FSSP) introduced in rural Bangladesh in mid 1990s. They find that the program increased enrollment of girls in middle school by 8–12 percent. They did not find any spillover effect from girls’ participation on the enrollment of boys. Sayeed (2016) finds that the FSSP in Bangladesh not only increased completed schooling by 0.4 years, it also delayed the average age at first marriage by 0.4 years, and the age at first birth by 0.3 years.

Filmer & Schady (2008) examine the impact of the Japan Fund for Poverty Reduction program that provides scholarships to girls transitioning from primary school to secondary school in Cambodia. The scholarship program led to an increase in enrollment and attendance at program schools by 30 to 43 percent. Baird et al. (2010) study the effect of the CCT program in the Malawi—Zomba Cash Transfer Program, which targets girls who are both currently in school or recent dropouts. The CCT program, which offers \$10 per month and payment of secondary school fees, led to an increase in school inflow by 35 percent.

Chaudhury & Parajuli (2006) use a provincial school census for 2003 and 2005 to evaluate the impact of a female secondary school stipend program (FSSP) in Punjab, Pakistan. They find a 9 percent increase in female enrollment in response to the FSSP. Hasan (2010) also examines the impact of the FSSP implemented in Punjab province of Pakistan in 2004. He finds that the FSSP not only increased the enrollment of girls in grades 6–8, but also had a positive spillover effect on boys’ enrollment.

Alam et al.(2011) study the longer run effects of the FSSP in Punjab. They find that the increase in enrollment of girls in middle school due to the stipend, persists for five years into the program, and eligible girls are more likely to complete middle school. The results suggest that girls who are eligible for the stipend work less, delay their marriages, and have fewer births prior to 19 years. They also find that high-school-aged girls, who were eligible for the stipend in 2006 have a higher rate of enrolling and completing high school. The results provide evidence of spillover effects on male siblings, specifically, families with daughters eligible for the stipend enroll their sons in private schools in response to the stipend program.



## 4. Data

The data on school attendance and test scores come from the Program Monitoring and Implementation Unit (PMIU) of the government of Punjab, a province covering about 80,000<sup>4</sup> *miles*<sup>2</sup> and a population of over 110 million in 2017<sup>5</sup>. The capital city alone (Lahore) has a population of over 11 million<sup>6</sup>. In 2014, PMIU initiated digital monthly monitoring all public schools in Punjab. The PMIU employs 950 field officers that randomly visit about 50,000 schools monthly in 36 districts of Punjab. They record student attendance, teacher attendance, and the condition of school facilities. They also administer a short test of English, Urdu and math to a sample of students in the third grade. The schools are not notified about the date of the monitoring visit. Moreover, PMIU shuffles the set of schools to be visited by field officers each month.<sup>7</sup>

The school attendance data run from September 2014 to March 2018. The dataset has information on the district, tehsil, name of school, school ID, the gender served by the school, school level: primary (grades 1–5), middle (grades 6–8), high (grades 9–10), number of teachers hired, number of teachers absent on the monitoring date, number of students enrolled in each grade, and the number of students present in each grade on the monitoring date.

The other school characteristics that I use in my analysis come from the annual school census data for all public schools in Punjab. The census data include information on many school characteristics. The characteristics that I use include the year school was built, school size ( $ft^2$ ), number of classrooms, number of open-air classrooms, the proportion of students and teachers who have furniture, and indicators for the presence of electricity, toilets, drinking water, school fenced wall and main gate.

During each monthly school visit, field officers record enrollment in each class. Though the school-year begins in April for public schools in Punjab, there is on-going enrollment

---

<sup>4</sup>Punjab is roughly the same size as the U.S. states of Nebraska, or Minnesota or Kansas.

<sup>5</sup>This is similar to the population of U.S. states of California, Texas, Florida and Ohio, put together.

<sup>6</sup>This is roughly the combined populations of New York City and Chicago.

<sup>7</sup>The school attendance and test score data were acquired directly from the Database Administrator at PMIU by petition. The school attendance data is available on the PMIU website but the data is not downloadable. The test score data is not publicly available.

through out the year. In the data, the enrollment levels recorded by field officers varies over the months. If a school does not have 80 percent attendance on the monitoring day, the school has to submit a formal report. To ensure that the monthly enrollment records are not manipulated sometimes by field officers or school administrators to increase attendance above 80 percent, I compare percentage attendance as recorded by field officers with the percentage attendance computed using official start of school year (April) enrollment, considering 80 percent attendance as threshold.

I find that for grades 1–5 grade, there are about 8 percent observations for which attendance with the start of the school year (April) enrollment is less than 80 percent but with monthly enrollment, it is more than 80 percent. For grades 6–9 , there are 3.3–5.7 percent observations for which attendance with April enrollment is less than 80 percent but with monthly enrollment, it is greater than 80 percent. For 10<sup>th</sup> grade, there are about 19 percent observations for which attendance with the start of the school year enrollment is less than 80 percent but with monthly enrollment, it is higher than 80 percent. Since the monthly enrollment records do not seem to be manipulated to increase attendance above 80 percent, I use monthly enrollment for estimation<sup>8</sup>.

To examine potential spillovers to siblings from the increased cash transfer as well as the effect of sibling composition on female schooling, I use data from ASER (The Annual Status of Education Report) Pakistan, for the years 2014 - 2018<sup>9</sup>. The survey is nation–wide, surveying more than 140 districts and about 600 households per district. The survey has information on household composition, household characteristics, age, gender, schooling status, and learning levels (i.e. basic reading and arithmetic levels) for children in the household.

Table 1 and Table 2 present the summary statistics for the attendance and enrollment of girls in grades 6–10. The mean female attendance for grades 6–8 is slightly higher in treated

---

<sup>8</sup>I have also estimated models with the start of the school year (April) enrollment. The results are not qualitatively different. Thees other results are available upon request.

<sup>9</sup>ASER is the largest citizen led initiative to provide reliable estimates on the schooling and learning status of children aged 3–16 years living in all rural and few urban districts of Pakistan.

districts than in control districts. For grades 6–8, mean female attendance is about 92% in control districts and about 93% in treated districts. For grades 9–10, the mean attendance for females is about 91% in both treated and control districts. The mean enrollment of girls in middle school (grades 6–8) varies from about 47–49 girls in control districts, whereas it varies from about 32 - 36 girls in treated districts. For 9<sup>th</sup> grade, the mean enrollment is about 104 and 95, in control and treated districts, respectively. The mean enrollment in 10<sup>th</sup> grade is 93 girls in control districts and about 84 girls in treated districts.

Table 1: Summary Statistics – Attendance (%)

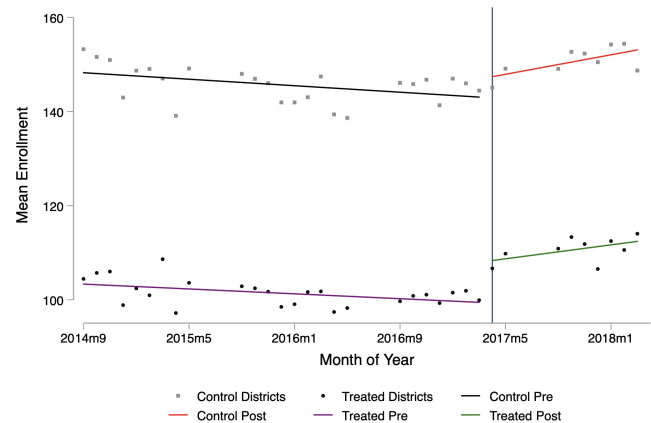
	(1)	(2)	(3)
VARIABLES	Control	Treated	Difference
Grade 6	92.21	93.07	-0.859***
Grade 7	92.27	93.15	-0.879***
Grade 8	93.43	94.37	-0.944***
Grade 9	91.75	91.96	-0.209**
Grade 10	91.06	91.18	-0.119

Table 2: Summary Statistics – Enrollment

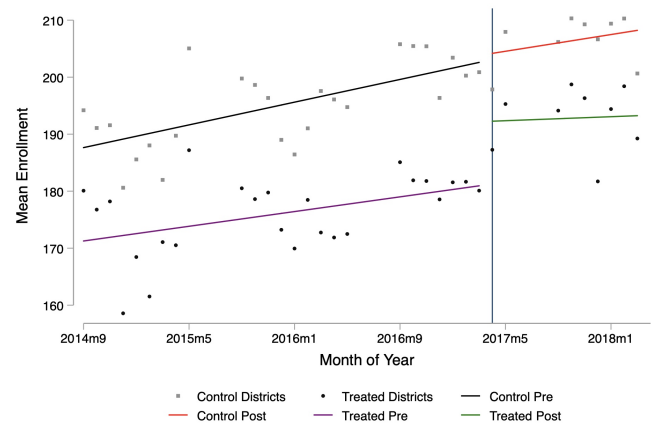
	(1)	(2)	(3)
VARIABLES	Control	Treated	Difference
Grade 6	49.55	36.21	13.34***
Grade 7	49.09	34.25	14.84***
Grade 8	47.33	32.14	15.19***
Grade 9	104.16	95.87	8.29***
Grade 10	93.66	83.98	9.68***

Figure 1 shows the mean enrollment of girls in middle and high school in treated and control districts pre- and post-treatment. The graphs suggest that the mean enrollment in both middle and high schools in treated districts increased post-treatment. The increase in mean enrollment post-treatment seems to be larger for high schools compared to middle schools in treated districts, but this could be due to noisier mean enrollment in high schools for both the treated and control districts.

Figure 1: Enrollment of Girls: Pre- and Post-Intervention



(a) Middle school (grades 6-8)



(b) High school (grades 9-10)

## 5. Methodology

I use a difference-in-difference (DD) and triple difference (DDD) design to estimate the impact of the cash increase intervention on the enrollment and attendance of female students in middle and high school. The equations I estimate for DD and DDD analysis are of the following forms, respectively

$$Y_{it} = \gamma_0 + \gamma_1 Post_t + \gamma_2 District_i + \gamma_3 Post_t * District_i + X_{it}\Pi + DOW_{it} + \alpha_m + \delta_y + \mu_i + \epsilon_{it} \quad (1)$$

$$Y_{it} = \beta_0 + \beta_1 Post_t + \beta_2 District_i + \beta_3 Female_i + \beta_4 Post_t * District_i + \beta_5 Post_t * Female_i + \beta_6 District_i * Female_i + \beta_7 Post_t * Female_i * District_i + X_{it}\Pi + DOW_{it} + \alpha_m + \delta_y + \mu_i + \epsilon_{it} \quad (2)$$

where  $Y_i$  is either the percentage attendance or the enrollment level in school  $i$  at time  $t$ .  $Post_t$  is an indicator which is 1 if the time  $t$  is after the intervention, and 0 before.  $District_i$  is an indicator that is 1 if school  $i$  is in a treated district and 0 if the school is in a non-treated district.  $Female_i$  is an indicator, which is 1 if the school  $i$  is for girls, and 0 if it is for boys.  $X_{it}$  is a vector of observable school characteristics possibly related to attendance and enrollment, which includes teacher attendance, student–teacher ratio, school age, school size, number of classrooms, number of open-air classrooms, proportion of students and teachers that have furniture, and indicators for electricity, toilets, drinking water, school fenced wall and main gate.  $DOW_{it}$ ,  $\alpha_m$ , and  $\delta_y$  are day of the week, month and school-year fixed effects, respectively. The school–year is from April to March.  $\mu_i$  is the fixed effect for schools, and  $\epsilon_{it}$  is an idiosyncratic error term.

The identifying assumption is that there is no change in school characteristics when the new CCT is launched. Thus, any change in student enrollment and attendance is due to the increase in the amount of the cash transfer. For the DD estimate, the parameter of interest is  $\gamma_3$ . For the DDD estimate, the treatment group is girls in middle and high school in the

CCT eligible districts, making  $\beta_7$  as the parameter of interest. Earlier studies of female CCT have sometimes shown a spillover effect on boys' school enrollment. If the increase in the amount of cash transfer has a spillover effect on enrollment and attendance of boys' schools, the parameter estimates for  $\beta_7$  in the DDD model would tend to be biased downwards.

To examine the effect of sibling composition on the schooling status of girls eligible for the increased cash transfer, I will estimate the following equation

$$S_{ihkt} = \alpha_0 + \omega_1 N_{ihkt} + \omega_2 F_{ihkt} + \pi X_{ihkt} + Z_{hkt}\Pi + \kappa C_{kt} + \alpha_m + \delta_y + \epsilon_{ihkt} \quad (3)$$

where  $S_{ihkt}$  is the educational outcome of girl  $i$ , eligible for the increased cash transfer, in household  $h$  in district  $k$  at time  $t$ .  $N_{ihkt}$  is the total number of siblings that the girl has, and  $F_{ihkt}$  is the count of female siblings that the girl has.  $X_{ihkt}$  is the age of the girl and  $Z_{hkt}$  is a vector of observable characteristics of households.  $C_{kt}$  is an indicator for increased cash transfer in district  $k$  at time  $t$ .  $\alpha_m$  and  $\delta_y$  are month and year fixed effects, respectively, to account for seasonal and long-term time trends.  $\epsilon_{ihkt}$  is an idiosyncratic error term. The parameter of interest are  $\omega_1$  and  $\omega_2$ , where  $\omega_1$  is the change in  $S_{ihkt}$  associated with a male sibling, and  $\omega_1 + \omega_2$  is the change in schooling outcomes of girl  $i$  associated with an additional female sibling.

## 6. Results

### 6.1 Triple Difference

This section presents the results for triple difference estimation<sup>10</sup>. Table 3 reports the attendance (percentage) results by school level. The variables *District*, *Female*, *District#Female* drop out since school fixed effects are included. The majority of the public schools are primary level, which is why the sample size for primary level is larger than middle and high level. The increase in the cash amount of the conditional cash transfer is intended to improve enrollment and attendance of girls in middle school and high school. However, the additional

---

<sup>10</sup>I will be able to report the marginal effects for gender and treatment in triple difference specification.

cash transfer does not appear to have been discernibly effective for attendance of girls in middle and high school in treated districts.

Table 3: Attendance: Effect of Cash Transfer Increase by School Level

VARIABLES	(1) Primary	(2) Middle	(3) High
<i>Post</i>		1.540*** (0.211)	
<i>Post#District</i>	-0.868*** (0.295)	-0.608*** (0.223)	-0.454* (0.237)
<i>Post#Female</i>	0.276** (0.122)	0.491*** (0.0892)	0.551*** (0.121)
<i>Post#Fem#District</i>	0.213 (0.195)	0.128 (0.160)	0.0395 (0.218)
<i>Constant</i>	85.77*** (0.804)	82.57*** (1.996)	84.92*** (3.192)
Month FE	Y	Y	Y
Year FE	Y	Y	Y
School FE	Y	Y	Y
School Controls	Y	Y	Y
Observations	1,328,690	394,441	176,242
R-squared	0.061	0.046	0.052
No. of schools	49,583	13,888	6,519

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
Robust standard errors in parentheses

Table 4 reports the attendance results by grade. Models 1–5 are results for grades 6–10. The cash transfer is conditional on maintaining average attendance of at least 80%. The new cash transfer (Rs. 1000) does not seem to influence the attendance of girls in grades 6–10 in treated districts. However, the earlier cash transfer (Rs. 200) was also conditional on maintaining average attendance of at least 80%. Therefore, girls who were already getting the stipend, must be maintaining an attendance of 80%.

Table 4: Attendance: Effect of Cash Transfer Increase by Grade

VARIABLES	(1) Grade 6	(2) Grade 7	(3) Grade 8	(4) Grade 9	(5) Grade 10
<i>Post</i>	1.366*** (0.148)	0.779*** (0.155)	0.163 (0.139)		
<i>Post#District</i>	-0.150 (0.185)	-0.248 (0.191)	-0.309* (0.162)	0.231 (0.207)	-0.323 (0.277)
<i>Post#Female</i>	0.305*** (0.107)	0.637*** (0.0999)	0.602*** (0.0881)	0.494*** (0.110)	0.750*** (0.130)
<i>Post#Fem#District</i>	-0.0169 (0.177)	0.103 (0.195)	0.248 (0.152)	-0.0577 (0.225)	-0.0104 (0.275)
<i>Constant</i>	84.84*** (2.573)	83.47*** (2.339)	89.05*** (1.588)	84.42*** (2.937)	88.88*** (4.476)
Day of the week FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y
School Controls	Y	Y	Y	Y	Y
Observations	393,448	392,331	379,502	176,011	173,124
R-squared	0.040	0.043	0.074	0.037	0.106
No. of schools	13,887	13,880	13,870	6,519	6,379

Notes: \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Robust standard errors in parentheses

Table 5 reports the enrollment results by school level. The estimates indicate that the increase in the cash amount by Rs. 800 (\$5.25) increased the enrollment of girls in high school by about 3 student per female school in treated districts, but it had no effect on the enrollment of girls in middle school. Table 6 presents the enrollment results by grade. The results show that the increase in cash transfer increased enrollment of girls in 6<sup>th</sup> grade by 1.6, and in 9<sup>th</sup> grade by 3.7 students, per female middle and high school in treated districts. The higher cash amount does not seem to have an effect on the enrollments in 7<sup>th</sup>, 8<sup>th</sup> and 10<sup>th</sup> grade.



Table 5: Enrollment: Effect of Cash Transfer Increase by School Level

VARIABLES	(1) Primary	(2) Middle	(3) High
<i>Post</i>		2.419*** (0.890)	
<i>Post#District</i>	7.394*** (1.267)	3.617*** (0.952)	1.578 (1.578)
<i>Post#Female</i>	4.300*** (0.775)	5.611*** (0.581)	2.616*** (0.962)
<i>Post#Fem#District</i>	-1.584 (1.147)	0.715 (1.045)	3.183** (1.580)
<i>Constant</i>	98.56*** (1.533)	103.7*** (4.123)	129.9*** (8.493)
Month FE	Y	Y	Y
Year FE	Y	Y	Y
School FE	Y	Y	Y
School Controls	Y	Y	Y
Observations	1,332,803	396,384	178,292
R-squared	0.236	0.119	0.171
No. of schools	49,600	13,888	6,520

Notes: \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Robust standard errors in parentheses

Using the mean female enrollment in treated districts in Table 2, the results indicate that the increased cash transfer led to an increase in female enrollment of 4.45 percent in 6<sup>th</sup> grade and 3.86 percent in 9<sup>th</sup> grade, per month. Since 6<sup>th</sup> grade is a transition from primary to middle school and 9<sup>th</sup> grade is a transition from middle to high school, the results suggest that the increase in cash transfer provided incentive to about 1 female student to transition from primary to middle school, and to about 3 female students to transition from middle to high school.

Table 6: Enrollment: Effect of Cash Transfer Increase by Grade

VARIABLES	(1) Grade 6	(2) Grade 7	(3) Grade 8	(4) Grade 9	(5) Grade 10
<i>Post</i>	0.215 (0.443)	-3.799*** (0.438)	1.346*** (0.367)		
<i>Post#District</i>	1.805*** (0.518)	2.034*** (0.479)	1.050** (0.426)	4.149*** (0.995)	1.122 (1.101)
<i>Post#Female</i>	2.377*** (0.284)	2.973*** (0.290)	2.138*** (0.286)	5.288*** (0.533)	1.629** (0.647)
<i>Post#Fem#District</i>	1.613*** (0.568)	-0.451 (0.465)	-0.478 (0.425)	3.705*** (1.083)	-0.105 (1.009)
<i>Constant</i>	45.23*** (1.321)	44.81*** (1.805)	42.39*** (1.678)	89.32*** (6.184)	97.44*** (4.718)
Day of the week FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y
School Controls	Y	Y	Y	Y	Y
Observations	397,185	396,082	389,560	178,645	177,103
R-squared	0.054	0.027	0.019	0.105	0.130
No. of schools	13,892	13,885	13,875	6,521	6,381

Notes: \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Robust standard errors in parentheses

## 6.2 Difference-in-Difference

The results for difference-in-difference estimation are presented in this section, to examine if the increase in cash transfer had an effect on the attendance and enrollment of both girls and boys school in treated districts. The variable *District* drops out since school fixed effects are included. Table 7 and Table 8 report the percentage attendance results for grades 6–10, for girls and boys, respectively. There is no effect of the increase in cash transfer on the attendance of girls in grades 6–10 in treated districts. The increased cash transfer did not effect the attendance of boys, except in 8<sup>th</sup> grade. The attendance of boys decreased by 0.3 percent in 8<sup>th</sup> grade in treated districts.

Table 7: Attendance: Effect of Cash Transfer Increase on Girls

VARIABLES	(1) Grade 6	(2) Grade 7	(3) Grade 8	(4) Grade 9	(5) Grade 10
<i>Post</i>				1.285*** (0.243)	1.988*** (0.251)
<i>Post#District</i>	-0.165 (0.187)	-0.138 (0.185)	-0.0534 (0.176)	0.150 (0.225)	-0.360 (0.286)
<i>Constant</i>	92.82*** (1.741)	89.89*** (1.771)	89.52*** (2.705)	79.09*** (3.927)	81.35*** (3.376)
Day of the week FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y
School Controls	Y	Y	Y	Y	Y
Observations	202,577	201,986	195,164	79,153	77,780
R-squared	0.045	0.044	0.067	0.043	0.106
No. of schools	7,068	7,066	7,061	2,909	2,832

Notes: \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Robust standard errors in parentheses

Table 8: Attendance: Effect of Cash Transfer Increase on Boys

VARIABLES	(1) Grade 6	(2) Grade 7	(3) Grade 8	(4) Grade 9	(5) Grade 10
<i>Post</i>				0.314 (0.208)	
<i>Post#District</i>	-0.132 (0.186)	-0.244 (0.192)	-0.302* (0.163)	0.281 (0.208)	-0.268 (0.276)
<i>Constant</i>	82.42*** (2.904)	81.18*** (3.260)	89.35*** (1.961)	87.78*** (3.504)	91.38*** (4.768)
Day of the week FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y
School Controls	Y	Y	Y	Y	Y
Observations	190,871	190,345	184,338	96,858	95,344
R-squared	0.038	0.043	0.083	0.034	0.111
No. of schools	6,819	6,814	6,809	3,610	3,547

Notes: \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Robust standard errors in parentheses

Table 9 presents the results for the enrollment of girls by grade. The increase in the cash transfer increased the enrollment of girls by 3.44 students in 6<sup>th</sup> grade per female middle school in treated districts. This represents a 9.49 percent increase in female enrollment in 6<sup>th</sup> grade. The higher cash amount increased 7<sup>th</sup> grade enrollment by 1.58 students, which is a 4.62 percent increase in female enrollment in 7<sup>th</sup> grade. The enrollment in 9<sup>th</sup> grade increased by 7.83 female students per female high school in treated districts, which is a 8.16 percent increase in female enrollment in 9<sup>th</sup> grade.

Table 9: Enrollment: Effect of Cash Transfer Increase on Girls					
VARIABLES	(1) Grade 6	(2) Grade 7	(3) Grade 8	(4) Grade 9	(5) Grade 10
<i>Post</i>				1.041 (0.847)	18.66*** (1.138)
<i>Post#District</i>	3.438*** (0.433)	1.582*** (0.359)	0.566 (0.392)	7.826*** (1.136)	1.001 (1.026)
<i>Constant</i>	44.63*** (2.540)	42.07*** (2.572)	42.41*** (2.269)	100.1*** (9.292)	77.70*** (8.440)
Day of the week FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y
School Controls	Y	Y	Y	Y	Y
Observations	204,352	203,743	200,272	80,352	79,592
R-squared	0.055	0.032	0.030	0.078	0.120
No. of schools	7,068	7,066	7,062	2,909	2,833

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Robust standard errors in parentheses

Table 10 presents the enrollment results for boys. The higher cash transfer increased the enrollment of boys by 1.82, 2.04, 1.06 and 4.24 students in grades 6–9, respectively, per male middle and high school in treated districts. The increase in cash transfer increased male enrollment by 3.68 percent in 6<sup>th</sup> grade, 4.28 percent in 7<sup>th</sup> grade, 2.36 percent in 8<sup>th</sup> and 4.32 percent in 9<sup>th</sup> grade. This suggests that the increased cash transfer had positive spillover effects on the enrollment of boys in both middle and high schools in treated districts.

Table 10: Enrollment: Effect of Cash Transfer Increase on Boys

VARIABLES	(1) Grade 6	(2) Grade 7	(3) Grade 8	(4) Grade 9	(5) Grade 10
<i>Post</i>				-12.44*** (0.894)	16.53*** (1.145)
<i>Post#District</i>	1.815*** (0.518)	2.036*** (0.479)	1.060** (0.426)	4.239*** (0.992)	1.120 (1.111)
<i>Constant</i>	47.61*** (2.421)	42.06*** (2.776)	46.96*** (2.583)	97.49*** (7.271)	78.26*** (4.542)
Day of the week FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y
School Controls	Y	Y	Y	Y	Y
Observations	192,833	192,339	189,288	98,293	97,511
R-squared	0.062	0.025	0.012	0.139	0.146
No. of schools	6,824	6,819	6,813	3,612	3,548

Notes: \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Robust standard errors in parentheses

## 7. Conclusion

Gender inequality has been persistent in Pakistan. This research explores the effectiveness of an increase in the cash amount of the female-targeted conditional cash transfer on schooling outcomes for girls. Specifically, I examine the impact of an increase in the monthly cash transfer from Rs.200 (\$1.31) to Rs.1000 (\$6.57) in 2017. The outcome variables are enrollment and attendance in middle and high schools, using a novel monthly data on student enrollment and attendance at all public schools in Punjab.

The increase in the cash amount of the conditional cash transfer was intended to improve enrollment and attendance of girls in middle school and high school. The increase in the cash transfer increased female enrollment by 1.6 students in 6<sup>th</sup> grade and 3.7 students in 9<sup>th</sup> grade, per female middle and high school in treated districts. This is a 4.45 percent increase in female enrollment in 6<sup>th</sup> grade and a 3.86 percent increase in 9<sup>th</sup> grade. However, I find

no effect of the increased cash transfer on the attendance of girls in middle and high school in the treated districts. The increase in cash transfer also had positive spillover effects on the enrollment of boys in middle and high schools in treated districts.

Education is a critical component of human capital acquisition, and effective human capital accumulation contributes to sustainable economic development and economic prosperity. In many developing countries, households underinvest in female education, often because they prioritize boys' education, depend upon the earnings from child labor, and encourage child marriage. This gender differential argues for gender-targeted interventions. By improving educational outcomes, in particular by increasing school enrollment, attendance and retention, developing countries can contribute considerably to their future income growth.

## References

- Academy of Educational Planning and Management (2015). Pakistan education statistics 2014-15.
- Academy of Educational Planning and Management (2018). Pakistan education statistics 2016-17.
- Akresh, R., Bagby, E., De Walque, D., & Kazianga, H. (2012). Child ability and household human capital investment decisions in burkina faso. *Economic Development and Cultural Change*, 61(1), 157–186.
- Akresh, R., & Edmonds, E. V. (2011). Residential rivalry and constraints on the availability of child labor. Tech. rep., National Bureau of Economic Research.
- Alam, A., Baez, J. E., & V. Del Carpio, X. (2011). Does cash for school influence young women’s behavior in the longer term ? evidence from pakistan. Policy Research working paper ; no. WPS 5669. Washington, DC: World Bank.
- Angrist, J. D., & Krueger, A. B. (1991). Does compulsory school attendance affect schooling and earnings? *The Quarterly Journal of Economics*, 106(4), 979–1014.
- Baird, S., Chirwa, E., McIntosh, C., & Ozler, B. (2010). The short-term impacts of a schooling conditional cash transfer program on the sexual behavior of young women. *Health economics*, 19 Suppl, 55–68.
- Chaudhury, N., & Parajuli, D. (2006). Conditional cash transfers and female schooling : the impact of the female school stipend program on public school enrollments in Punjab, Pakistan. Policy Research Working Paper Series 4102, The World Bank.  
URL <https://ideas.repec.org/p/wbk/wbrwps/4102.html>
- Dammert, A. C. (2010). Siblings, child labor, and schooling in nicaragua and guatemala. *Journal of Population Economics*, 23(1), 199–224.
- de Janvry, A., Finan, F., & Sadoulet, E. (2006). Evaluating brazil’s bolsa escola program: Impact on schooling and municipal roles. University of California at Berkeley.

- Duflo, E. (2001). Schooling and labor market consequences of school construction in indonesia: Evidence from an unusual policy experiment. *American Economic Review*, 91(4), 795–813.
- URL <http://www.aeaweb.org/articles?id=10.1257/aer.91.4.795>
- Edmonds, E. V. (2006). Understanding sibling differences in child labor. *Journal of Population Economics*, 19(4), 795–821.
- Ezemenari, K., Chaudhury, N., & Owens, J. (2002). Gender and risk in the design of social protection interventions.
- Filmer, D., & Schady, N. (2008). Getting Girls into School: Evidence from a Scholarship Program in Cambodia. *Economic Development and Cultural Change*, 56(3), 581–617.
- URL <https://ideas.repec.org/a/ucp/ecdecc/v56y2008p581-617.html>
- Filmer, D., & Schady, N. (2009). School enrollment, selection and test scores. *The World Bank, Policy Research Working Paper Series*.
- Fiszbein, A., Schady, N., Ferreira, F., Grosh, M., Keleher, N., Olinto, P., & Skoufias, E. (2009). *Conditional Cash Transfers: Reducing Present and Future Poverty*. The World Bank.
- URL <https://EconPapers.repec.org/RePEc:wbk:wbpubs:2597>
- Galor, O., & Weil, D. N. (2000). Population, technology, and growth: From malthusian stagnation to the demographic transition and beyond. *American Economic Review*, 90(4), 806–828.
- URL <http://www.aeaweb.org/articles?id=10.1257/aer.90.4.806>
- Garg, A., Morduch, J., et al. (1996). *Sibling rivalry, resource constraints, and the health of children*. Harvard Institute of Economic Research.
- Glick, P., & Sahn, D. E. (2000). Schooling of girls and boys in a west african country: the effects of parental education, income, and household structure. *Economics of education review*, 19(1), 63–87.
- Government of Pakistan (2018). Pakistan economic survey 2017-2018.



- URL [http://www.finance.gov.pk/survey/chapters\\_18/Economic\\_Survey\\_2017\\_18.pdf](http://www.finance.gov.pk/survey/chapters_18/Economic_Survey_2017_18.pdf)
- Government of Pakistan Statistics Division (2016). Pakistan social and living standards measurement survey 2014-15.
- URL [http://www.pbs.gov.pk/sites/default/files//pslm/publications/PSLM\\_2014-15\\_National-Provincial-District\\_report.pdf](http://www.pbs.gov.pk/sites/default/files//pslm/publications/PSLM_2014-15_National-Provincial-District_report.pdf)
- Hasan, A. (2010). *Gender-Targeted Conditional Cash Transfers : Enrollment, Spillover Effects And Instructional Quality*. The World Bank.
- URL <https://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-5257>
- Human Rights Watch (2018). Shall i feed my daughter, or educate her? barriers to girls' education in pakistan.
- Ijaz, S. (2017). Honor' killings continue in pakistan despite new law. Human Rights Watch.
- URL [https://www.hrw.org/news/2017/09/25/honor-killings-continue-pakistan-despite-new-](https://www.hrw.org/news/2017/09/25/honor-killings-continue-pakistan-despite-new-law)
- Independent Evaluation Group (2011). Evidence and lessons learned from impact evaluations on social safety nets. Washington D.C.: Independent Evaluation Group, World Bank.
- Jamil, B. R. (2016). Pakistan: all girls and boys in school for 12 years – a critical pathway to progress.
- URL <https://gemreportunesco.wordpress.com/2016/02/15/pakistan-all-girls-and-boys-in-school-for-12-years-a-critical-pathway-to-progress/>
- Jones, B. F. (2011). The human capital stock: a generalized approach. NBER Working Paper No. w17487.
- Khandker, S., Pitt, M., & Fuwa, N. (2003). Subsidy to Promote Girls' Secondary Education: The Female Stipend Program in Bangladesh. MPRA Paper 23688, University Library of Munich, Germany.
- URL <https://ideas.repec.org/p/pramprapa/23688.html>
- Levine, R., Lloyd, C. B., Greene, M., & Grown, C. (2008). Girls count: A global investment and action agenda. Washington, D.C.: Center for Global Development.

- Levison, D. (1998). Household work as a deterrent to schooling: An analysis of adolescent girls in peru. *The Journal of Developing Areas*, 32(3), 339–356.
- Lindahl, M., & Krueger, A. B. (2001). Education for Growth: Why and for Whom? *Journal of Economic Literature*, 39(4), 1101–1136.  
URL <https://ideas.repec.org/a/aea/jeclit/v39y2001i4p1101-1136.html>
- Lucas, R. (1989). On the mechanics of economic development. *Journal of Monetary Economics*, 22, 3–42.
- Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A Contribution to the Empirics of Economic Growth. *The Quarterly Journal of Economics*, 107(2), 407–437.  
URL <https://ideas.repec.org/a/oup/qjecon/v107y1992i2p407-437..html>
- Paul Schultz, T. (2004). School subsidies for the poor: evaluating the Mexican Progresa poverty program. *Journal of Development Economics*, 74(1), 199–250.  
URL <https://ideas.repec.org/a/eee/deveco/v74y2004i1p199-250.html>
- Punjab Social Protection Authority (????).  
URL <http://www.pspa.punjab.gov.pk/ccts>
- Rahim, P. (2017). Minimum wages.  
URL <https://www.dawn.com/news/1358632>
- Rawlings, L. B., & Rubio, G. M. (2005). Evaluating the impact of conditional cash transfer programs. *The World Bank Research Observer*, 20(1), 29–55.
- Sawada, Y., & 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), 335–347.
- Sayeed, Y. (2016). Effect of girls’ secondary school stipend on completed schooling, age at marriage, and age at first birth. WIDER Working Paper Series 110, World Institute for Development Economic Research (UNU-WIDER).  
URL <https://ideas.repec.org/p/unu/wpaper/wp2016-110.html>
- UNESCO (????). Pakistan. United Nations Educational, Scientific and Cultural Organiza-

tion.

URL <http://uis.unesco.org/country/PK>

UNICEF (2017). State of the world's children data. United Nations Children's Fund.

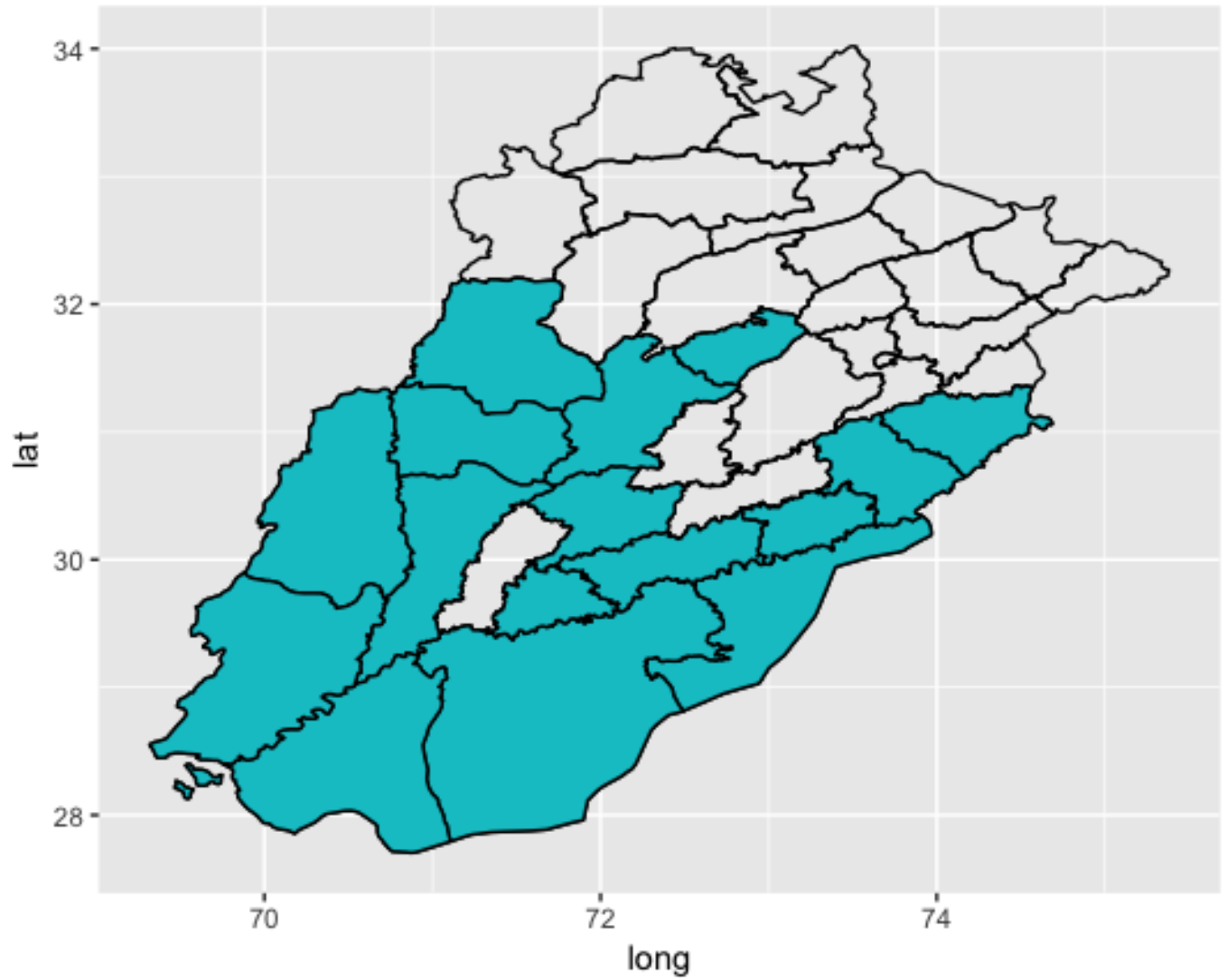
URL <https://data.unicef.org/wp-content/uploads/2018/03/SOWC-2017-statistical-tables.pdf>

World Economic Forum (2018). The global gender gap report.

URL [http://www3.weforum.org/docs/WEF\\_GGGR\\_2018.pdf](http://www3.weforum.org/docs/WEF_GGGR_2018.pdf)

## Appendix

Figure 2: Districts in Punjab with CCT



**Notes:** The CCT program is implemented in the colored districts. These include the districts of Bahawalnagar, Bahawalpur, Bhakkar, Chiniot, Dera Gazi Khan, Jhang, Kasur, Khanewal, Layyah, Lodhran, Muzaffargarh, Okara, Pakpattan, Rajanpur, Rahimyar Khan, and Vehari.