Impact of Conditional Cash Transfers on Health and Nutrition

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Abstract

This study examines the impact of conditional cash transfers (CCTs) for on sex ratios, health and nutrition of children. The main hypothesis is that CCTs may alter the perceived economic value of girls relative to boys, leading to more favorable sex ratios and better nutrition. Several studies have tried to explain the puzzling persistence of malnutrition inspite of rapid increases in economic growth and the reasons range from decreases in physical activity (Deaton and Dreze 2009) to the "South Asian Enigma" (Ramalingaswami, et al, 1997). The "South Asian enigma" underscores gender disparities as the main reason for the poor nutritional status despite high growth (Smith et al, 2003). We use data from the National Family Health Surveys (NFHS 2005-06 and 2015-16) to explore if cash transfer schemes for education make a positive and significant difference to sex ratios, nutrition and health seeking behavior. Our results suggest that cash transfer schemes have a positive but moderate impact on nutrition among eligible and non-eligible households, a positive impact on health seeking behaviors and that there are regional variations related to the implementation of the scheme

Introduction

Malnutrition among children is a persistent problem in India despite the country's economic growth of 6-7 percent over 1995-2013[1]. Although stunting has declined, the decline has been less than one percentage point per year and wasting among children under five has increased from 19.8 percent in 2005-06 to 21 percent in 2015-16. Several studies have argued that the reasons for the decline in nutritional status could be a decrease in physical activity (Deaton and Dreze 2009), increases in the relative price of food (Gaiha, Jha and Kulkarni. 2010), to the "Asian Engima" that focuses on gender disparities (Ramalingaswami, Jonsson, & Rohde 1997). The nutritional status of children particularly those under- five seems to be closely correlated to the Asian Engima since persistent forms of gender based discrimination often affect caregiving abilities.

A key role in addressing gender disparities is played by education and universal primary education is an objective of the Government of India. It is estimated that annually the government incurred a fiscal burden of Rs. 39622 crores on primary education in 2013 (GOI). In addition, state governments in India incurred fiscal burdens ranging from Rs. 1622 crores to Rs. 18126 crores on elementary education and different state funded schemes for education of the girl child (Dongre et al, 2013; Sekher, 2012).

Conditional cash transfer (CCT) schemes introduced by various Indian states provide financial incentives to families of girls if the birth of the girl is registered. These may offer different monetary benefits but have similarities such payments for immunizations and enrollment in Anganwadis (local village centers), payments for school enrollment and completion and payments at the time of marriage of the daughter or until she is 18 years old. The schemes make it mandatory for the families to visit the local centers which concurrently run education and health programs for women. It is estimated that approximately, 36,770 girls were enrolled into Dhanlakshmi scheme, during 2008 to 2013 in 7 states (Sekher and Ram, 2015).

We examine the impact of conditional cash transfers (CCTs) on sex ratios, health care and nutrition of children. The main hypothesis is that CCTs may alter the perceived economic value of girls relative to boys, leading to better nutrition and health care.

[1] https://community.data.gov.in/gdp-growth-rate-of-india-constant-prices-during-2001-02-to-2013-14/

We use data from the National Family Health Surveys (NFHS 2005-06 and 2015-16) to examine the impact of the CCT on nutritional outcomes for girls using both anthropometric measurements and a diet diversity index. Second, we examine health seeking behavior which comprises immunizations, breastfeeding, treatment for Diarrhea and visits to the local health center, and test for differences among eligible and non-eligible households. Finally we aim to explore if the cash transfer was associated in differences in age at marriage and fertility decisions.

Our results suggest that cash transfer schemes for education have a moderate impact on nutrition among eligible and non-eligible households and that there are regional variations related to the conditionality and implementation of the scheme.

I. Overview of the literature

Unitary household models are often contrasted with collective decision making wherein household members jointly influence the consumption and production decisions. An important implication of this literature is that transfers can act as a mechanism for changing the relative bargaining power of recipients and, also have differential impacts on the household members based on the identity of the recipient.

Conditional cash transfers are a preferred instrument to equalize outcomes for male and female children if gender bias exists. They also minimize wastage of resources and overcome problems of asymmetric information. We focus on CCTs for education primarily because they change the perceived economic value of girls to boys, by meeting a part of the expenditure on girls. The time lag associated with the complete payment also serves to delay the age at marriage and also affecting fertility choices.

Evidence on the impact of CCTs on education, health, nutrition, and poverty is mixed. Schemes in Latin America notably *Progresa Oportunidades* in Mexico, *Bolsa Familia* in Brazil, and *Bono de Desarrollo Humano* in Ecuador have had a positive impact on enrolment, improved nutritional status, reduced mortality and morbidity among young children and reduced rates of poverty (Leroy et al., 2009; Macours et al, 2012; Maluccio & Flores, 2005). In Ghana and Tanzania, cash transfers resulted in a higher utilization of health insurance schemes (Davis et al., 2013).

On the other hand, there are programs like the Family Allowance program (PRAF) in Honduras (Moore, 2008), and Programa Bolsa Alimentação (PBA) in Brazil where recipients gained less weight compared to those who were not part of the program (Martins et al, 2013).

A disadvantage of CCTs could be that households might prefer to send children to work to supplement family income but are instead forced to send them to school. Furthermore, participation in a CCT may well be a function of household income. The poorest households may not be able to participate if the costs involved in participating such as transport, loss of income, lack of information on benefits are too high (Bassett, 2008)

In India, state level CCTs for education are a relatively recent development and the impact of the cash transfers schemes in India has been confined to individual schemes and state level analysis on educational outcomes. The spillover benefit of transfers for education on health especially the behavior of caregiver, has not been documented in the literature. Given the conditions imposed by the schemes in terms of visiting the local anganwadis and payments till the child turns 18 years of age, it is useful to examine if the cash transfer induces a change in the behavior of parents who view girls as an economic burden.

II. Conceptual framework

II.1 How do CCTs work?

CCTs can work to affect health and education outcomes for girls in four ways. First, they provide extra resources to the household for investment in girls, thereby relaxing the budget constraint. This would assume that girls are treated as luxury goods. Second, they might change the perceived economic value of females relative to males. Third, CCTs for education of girls can encourage delays in marriages having an impact not only on fertility but also conferring intergenerational nutritional and health benefits. Finally, based on the identity of recipients, CCTs can alter the intrahousehold dynamics giving a greater weight to the recipient and influence their health seeking behavior for girls (Leroy et al, 2009).

While the exact mechanism by which the CCTs work may not be ascertainable, a successful CCT program, can help achieve a level of investment in human capital that is higher than what a cash constrained household will choose based on their private costs and benefits. The efficacy of the transfer could however be a function of various factors related to the design, identification and implementation of the program. The size and duration of the cash transfer should cover the direct

and indirect costs of participation, compensating households such that there is an incentive to avail of the grant; yet at the same time it should discourage households from becoming completely dependent.

II.2 Conditional Cash Transfers in India

The Government of India as well as different state governments have introduced schemes that transfer cash to recipients either for health, natal services or education. CCTs known as Ladli or Lakshmi schemes in India offer monetary transfers to families, rewarding them on the birth of a girl. While eligibility criteria differ, common features are payment at birth, cash for immunizations and visits to Anganwadis (health centers), school enrollment and at the time of marriage of the daughter or until she is 18 years old. The schemes are conditional on the woman visiting the local health centers which concurrently run education and health programs for adult women.

Table 1 illustrates some of these schemes. Our analyses are restricted to those states that introduce schemes for the girl child's education. These include Delhi, Haryana, Karnataka, Goa, Madhya Pradesh. We restrict the analyses to these states because most national level schemes were introduced prior or 2006, with the exception of the Dhanlakshmi scheme and the Janani Suraksha Yojana. The Janani Suraksha Yojana however is focused on reducing maternal and neo-natal mortality but not education. A cash benefit of Rs.500 is provided for every live birth to a woman from poor households and Rs.100 in rural areas and Rs. 200 in urban areas if the woman delivers in a institution.

The Dhanlakshmi scheme provides a cash transfer of Rs 100,000 at the age of 18 years to the family of unmarried girls, if they register the birth of a girl child and provide information on immunization, enrollment in school. The scheme was implemented in eleven blocks in the states of Bihar, Jharkhand, Chattisgarh, Orissa, Andhra Pradesh, Punjab and Uttar Pradesh (UNDP, 2009).

III. Data and Methodology

We use data from the National Family Health Survey 2005 and 2015, focusing on demographic information (age, sex, caste, education), an index of economic status and information on mother and child characteristics especially health seeking behavior, breastfeeding and nutrition. We treat the introduction of a cash transfer schemes as a natural experiment thus exploiting regional and

temporal variation across households. To identify households that benefit from the scheme we use a dummy to indicate state of residence, the wealth quintile and the number of daughters alive which would make the household eligible for receiving financial assistance on the birth of a daughter. These households are then compared with those in the control group.

Since the CCT programs were launched state wise, we estimate the impact on children or girls who were eligible in the state with those households within the sample that were not eligible for the assistance. Our identification strategy uses an interaction term of year with eligibility for the program, to obtain DID estimates. We also assume that prior to the program, all other cash transfer programs had a national coverage, therefore the trends in our dependent variables would be similar.

The eligibility criteria of most schemes states that the families have incomes below a threshold level and have two girls. The NFHS does not provide data on incomes but an asset index. We use this asset index to compute wealth quintiles to identify households below a threshold of income. Women with less than two children and girls with two siblings or less and born after a certain date are considered eligible. Thus our eligibility criteria is based on the wealth quintile, presence of two or less girls in the household and the state of residence.

We use a standard approach to regress the dependent variable on community/district or state level fixed effects, cohort fixed effects, and the interaction of the program with an indicator for exposure to the program. Our specification is

$$y_{ijt} = \beta + \beta_0 \, (eligibility_j \, x \, year_t) + \delta_j + \eta_t + \varepsilon_{ijk}$$

Where y_{ijt} is the outcome of interest for the ith child, jth household, at year t

$eligibility_j$ is a dummy for whether the household was eligible for the CCT scheme. It takes a value of 1 if the household is eligible based on the wealth index, and had less than two girls, and 0 otherwise

$year_t$ is a dummy taking a value 1 for observations from 2015, and 0 otherwise

$\delta_j \; and \; \eta_t$ are community/state and cohort fixed effects respectively

We focus on two indicators of nutritional status – anthropometric measures and diet diversity index.

For health seeking behavior we use vaccinations, breast feeding, treatment for Diarrhea and a check up for the baby within two months of birth, immunization).

IV. Results

Table 2 shows the sex ratios in selected states based on the Population Cenuses of 2001 and 2011 and also Calculations for the NFHS data. Computed as the ratio of sons to daughters within a household, the data indicate that with the exception of Madhya Pradesh, eligible households in other states saw an increase in the number of daughters.

Table 3 shows the summary statistics of the sample for eligible households. The Height-for-age and Weight-for-age zscores and weight-for-height zscores improved slightly over time. The percentage of children who are stunted and underweight declined from 2005 to 2015. The prevalence of Diarrhea decreased in both males and females and there is a notable increase in the number of post-natal check-ups within two months of birth for both girls and boys, although the vaccinations declined slightly. Both the mother's and father's education increased marginally, and this was also accompanied with an increase in the age of the mother. Most of the households are in rural areas and belong to the cultivator, agricultural laborer and labor not elsewhere classified categories (results not reported in table 3).

Table 4 shows the results of regressing the health outcome on the treatment viz the program. Stunting, wasting and underweight declined following the scheme, although the decline was modest. The diet diversity index showed an increase although it is not statistically significant. Exploring the health seeking behavior we find that breastfeeding decreased for the entire sample but immunizations, treatment for diarrhea and a check-up for the baby within two months of birth increased (Table 5). The result on breastfeeding probably implies a reallocation of time since to access the benefits of the scheme, mothers could well be queuing up at centers to register the birth of the child and at anganwadis to avail the benefits.

Anthropometric outcomes improved for boys more relative to girls, but only marginally. The diet diversity index increased more for girls but it is not statistically significant. The most noticeable change is in health seeking behavior especially vaccinations and treatment for Diarrhea increased more for girls. This is significant since Diarrhea is widely prevalent in India and is a cause of impaired growth (Table 6 and Table 7)

V. Conclusions:

This study contributes to the literature on unitary and collective models of household decision by exploring if conditional cash transfer schemes for education of females have any effect on nutritional status of, health seeking behavior for female children. Sex ratios in India are on average 919 (Census, 2011) and the north agricultural region is particularly known for its strong son preference since women are perceived to a be a liability because of huge transfers of assets made to them at the time of marriage. Against this background, cash transfer schemes not only help meet educational costs but by a system of delayed payments, aim to encourage parents to invest in the health and education of daughters.

The use of cross sectional data that does not specifically include data on cash transfers poses substantial challenges for assessing their effectiveness. We use two rounds of the data as before and after introduction of the program and compare the effects with those households within the state that were not eligible for the transfer. Our identification is based not on actual participation in the scheme but the assumption that all eligible households were covered by the scheme which can be subject to errors of exclusion, if eligible households chose not to participate.

An empirical problem is that if there are changes in underlying attitudes or preferences towards investing in girls then the estimate will capture the effect of both the introduction of the CCT and the preference change.

This paper is an ongoing study that does not claim to establish a causal relationship between cash transfer schemes and health and education outcomes. It intends to highlight the spillover benefits of cash transfers, suggesting that schemes designed for improving investments in one development indicator may be correlated strongly with other forms of investment in human capital.

Although the anthropometric outcomes show a very modest improvement, health seeking behavior, particularly treatment for Diarrhea, post-natal check-ups and vaccinations showed an improvement for both boys and girls. However, these results cannot be and should not be interpreted as evidence of a causal relationship especially given the severe limitations of a lack of data on household participation in the scheme and the actual benefits received. Further analysis required to isolate the effects of any scheme on households.

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Table 1: Conditional Cash transfer schemes in India

National Coverage	State Coverage
Dhanlakshmi (2008)	Ladli Scheme, 2008 (Delhi)
Janani SurakshaYojana (2005)	Ladli Scheme, Haryana
Balika Samridhi Yojana (1997)	Ladli Scheme, Goa, 2011-12 (Tamil Nadu)
National Program for Education of Girls at elementary –level under the Sarva Shiksha Abhiyaan (2003)	Bhagyalakshmi scheme (2011), (Karnataka)
Kasturba Gandhi Balika Vidyalaya Scheme, (2004)	Ladli Lakshmi Scheme, Madhya Pradesh, 2011

Source: Department of Women and Child Development http://www.wcddel.in/streesakti_3Ladli.html 2. https://govinfo.me/ladli-scheme-haryana/ 3 http://www.newincept.com/madhyapradesh/ladli-lakshmi-yojana-madhya-pradesh.html 4. http://www.mp.gov.in/en/web/wcd/we-lly

Table 2: Sex ratios in India

No.	State	2011 Census		2001 Census		2015[1]	2005[1]
		Sex ratio	Child sex ratio (0-6)	Sex ratio	Child sex ratio (0-6)	Ratio of Males to females	Ratio of Males to females
	India	943	919	933	927	-	-
1	Goa	973	942	961	938	0.91	0.97
2	Karnataka	973	948	965	946	0.91	0.97
3	Madhya Pradesh	931	918	919	932	1.01	0.92
4	Haryana	879	834	861	819	0.68	0.99
5	Delhi	868	871	821	868	0.90	1.02

Source: Census of India, 2011, https://www.census2011.co.in/sexratio.php

[1] Author's calculations based on NFHS data

Table 3: Descriptive statistics for eligible households, NFHS 2005, 2015

	Male	Female	Male	Female
	2005		2015	
Child age in years	2.20	1.93	2.21	1.92
HAZ	-2.20	-1.97	-1.77	-1.62
WAZ	-2.32	-2.14	-1.86	-1.75
WHZ	-1.60	-1.38	-1.22	-1.09
% Stunting	0.57	0.50	0.46	0.42
% Underweight	0.63	0.56	0.45	0.41
% Wasting	0.36	0.31	0.27	0.24
Had Diarrhea recently	0.20	0.21	0.13	0.16
Postnatal check up within 2 months of birth	0.08	0.10	0.35	0.37
Ever had vaccination	0.88	0.91	0.85	0.88
Years of mothers education	3.36	3.33	3.55	3.67
Age of mother	26.55	24.31	28.00	25.84
Age at marriage	14.94	15.68	14.43	14.47
Age of household head	39.74	40.39	40.03	41.04
Year of education of Partner/husband	2.00	2.52	2.66	3.09
Rural	0.88	0.86	0.93	0.93
Poorest	0.52	0.47	0.52	0.49
Poorer	0.48	0.53	0.48	0.51
Middle	0.00	0.00	0.00	0.00
Richer	0.00	0.00	0.00	0.00
Richest	0.00	0.00	0.00	0.00
Total Living Children	3.23	2.28	2.97	2.19
Sons Alive	1.90	0.84	1.65	0.77
Daughters alive	1.34	1.44	1.31	1.43
N	629	831	3394	4959

Source: Author's calculations

Table 4: Regression of Nutritional Status on Eligibility for cash transfer, NFHS, 2005, 2015

	(1) Stunting	(2) Underweight	(3) Wasting	(4) DDI
Eligibility*time	-0.04**	-0.07+	-0.05+	0.21
	(0.02)	(0.02)	(0.02)	(0.33)
Constant	-0.70+	-1.14+	-0.87+	4.45+
	(0.09)	(0.09)	(0.11)	(0.12)
N	35153.00	35153.00	35153.00	38096.00

Standard errors in parentheses
* *p < 0.10,* ** *p < 0.05,* + *p < 0.01*

Table 5: Regression of health seeking behavior on eligibility for cash transfer, NFHS, 2005, 2015

	(1) Breast feeding	(2) Vaccinations	(3) Post natal check	(4) Treatment for Diarrhea
Eligibility* Time	-0.07+	0.72+	0.05+	0.10**
	(0.01)	(0.17)	(0.02)	(0.04)
Constant	0.59+	10.14+	0.14+	0.84+
	(0.01)	(0.06)	(0.01)	(0.01)
N	38096.00	38096.00	24193.00	2963.00

Standard errors in parentheses
* *p < 0.10,* ** *p < 0.05,* + *p < 0.01*

Table 6: Regression of Health variables for boys, NFHS, 2005, 2015

	(1) Stunting	(2) Underweight	(3) Wasting	(4) DDI	(5) Breast Feeding	(6) Vaccinations	(7) Post Natal Check	(8) Treatment for Diarrhea
Time* eligibility	-0.07^{+}	-0.10^{+}	-0.06^{+}	0.09	-0.09^{+}	0.58**	0.07^{+}	-0.07^{+}
	(0.03)	(0.02)	(0.02)	(0.48)	(0.02)	(0.25)	(0.02)	(0.03)
Constant	0.41^{+}	0.40^{+}	0.24^{+}	3.93^{+}	0.58^{+}	10.18^{+}	0.16^{+}	0.41^{+}
	(0.01)	(0.01)	(0.01)	(0.15)	(0.01)	(0.08)	(0.01)	(0.01)
N	18269.00	18269.00	18269.00	19935.00	19935.00	19935.00	13128.00	18269.00

Table 7: Regression of Health variables for Girls, NFHS, 2005, 2015

	(1) Stunting	(2) Underweight	(3) Wasting	(4) DDI	(5) Breast Feeding	(6) Vaccinations	(7) Post Natal Check	(8) Treatment for Diarrhea
Time* eligibility	0.01	-0.03	-0.04**	0.38	-0.06^{+}	0.82^{+}	0.02	0.14**
	(0.02)	(0.02)	(0.02)	(0.46)	(0.02)	(0.23)	(0.02)	(0.06)
Constant	0.41^{+}	0.40^{+}	0.20^{+}	4.46^{+}	0.60^{+}	10.10^{+}	0.11^{+}	0.85^{+}
	(0.01)	(0.01)	(0.01)	(0.21)	(0.01)	(0.09)	(0.01)	(0.02)
N	16884.00	16884.00	16884.00	18161.00	18161.00	18161.00	11065.00	1344.00