Evidence from a Randomized Evaluation of the Household Welfare Impacts of Conditional and Unconditional Cash Transfers Given to Mothers or Fathers*

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December 19, 2019

Abstract

We conducted a randomized control trial in rural Burkina Faso to estimate the impact of alternative cash transfer delivery mechanisms on education, health, and household welfare outcomes. The two-year pilot program randomly distributed cash transfers that were either conditional or unconditional and were given to either mothers or fathers. Conditionality was linked to older children enrolling in school and attending regularly and younger children receiving preventive health check-ups. Compared to the control group, cash transfers improve children's education and health and household socioeconomic conditions. For school enrollment and most child health outcomes, conditional cash transfers outperform unconditional cash transfers. Giving cash to mothers lead to significantly better education outcomes. However, there is evidence that money given to fathers better improves young children's health, particularly during years of poor rainfall..

Keywords: Cash transfers; Conditionality; Intrahousehold Bargaining; Education; Health; Africa
JEL classification: I21; I12; I38; J12; J13; O15; C93

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* These data were collected for a project evaluating social protection strategies in Burkina Faso, which greatly benefited from the support of Marie-Claire Damiba, Seydou Kabré, and Victorine Yameogo from the Secrétariat Permanent du Comité National de Lutte contre le SIDA et les Infections Sexuellement Transmissibles in Burkina Faso and Nono Ayivi-Guedehoussou, Hans Binswanger, Ousmane Haidara, Timothy Johnston, Mead Over, and Tshiya Subayi-Cuppen at the World Bank. Data collection was supervised by Robert Ouedraogo, Jean-Pierre Sawadogo, Bambio Yiriyibin and Pam Zahonogo from the University of Ouagadougou. The project is funded by the NBER Africa Project and the following World Bank trust funds grants: Strategic Impact Evaluation Fund (SIEF), Bank-Netherlands Partnership Program (BNPP), Gender Action Plan (GAP), Knowledge for Change Program (KCP), WB-DFID Evaluation of the Community Response to HIV and AIDS, Trust Fund for Environmentally & Socially Sustainable Development (TFESSD), and Luxembourg Poverty Reduction Partnership (LPRP). The authors thank Emilie Bagby, German Caruso, Christine Jachetta, Marleen Marra, and Nga Thi Viet Nguyen for excellent research assistance. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the World Bank, its Executive Directors, or the countries they represent.

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1. Introduction

Conditional cash transfer (CCT) programs have become one of the most popular interventions in developing countries.[1] These programs give cash to poor households conditional on the household taking measures to increase their children's human capital (e.g., enrolling their children in school and maintaining their attendance, taking them for regular preventive health care visits). By making transfers conditional, this type of intervention tries to encourage the accumulation of human capital and stop the intergenerational transmission of poverty. A common alternative social sector protection program to CCTs is unconditional cash transfer (UCT) programs whereby cash is given to poor eligible households without any conditions. There is credible evidence that both types of transfer schemes (CCT and UCT) can substantially improve child education and health outcomes.[2] Understanding whether and how the conditions make a difference in the outcomes they seek to improve is critical for governments and organizations to properly develop these social safety net programs.

Numerous research papers studying intrahousehold bargaining indicate resources under the mother's control have a stronger positive impact on a child's health and schooling than when those resources are controlled by the father.[3] Presumably because of this, currently almost all cash transfer programs give the resources to the mother, so it is usually not possible to disentangle how much of any impact is due to the transfer recipient's gender, how much is due to the income effect, and how much is due to the change in relative prices associated with the conditionality. Several systematic reviews find that when focusing on well identified randomized evaluations the evidence base supporting this claim is not as strong as we generally believe (Duflo 2012; Yoong, Rabinovich, and Diepeveen 2012). Benhassine et al. (2015) find that

[1] A growing number of countries, in particular in Latin America, but also in Asia have implemented such programs. (Fiszbein and Schady 2009). In Africa, several CCT pilot programs have been implemented (South Africa, Kenya, Malawi, and Morocco) and several of them have been recently evaluated.

[2] For evidence of the impact of CCTs on education: in Mexico see Schultz 2004; Behrman, Sengupta and Todd 2005; de Janvry et al. 2006; Attanasio, Meghir and Santiago 2011; in Colombia see Attanasio et al. 2010; in Nicaragua see Maluccio and Flores 2005; Macours, Schady and Vakis 2008; in Honduras see Glewwe and Olinto 2004; in Brazil see Glewwe and Kassouf 2012; and in Cambodia see Filmer and Schady 2011; for evidence of the impact of UCTs on education: in Eduador see Schady and Araujo 2008; in South Africa see Case, Hosegood, and Lund 2005; Edmonds 2006;, and in the United States for the long-term impacts see Aizer et al. 2016. For evidence of the impact of CCTs on health: in Colombia see Attanasio et al. 2005; in Ecuador see Paxson and Schady 2008; in Nicaragua see Maluccio and Flores 2005; Macours, Schady, and Vakis 2008; and for evidence of the impact of UCTs on health: in South Africa see Case and Deaton 1998; Case, Hosegood, and Lund 2005; and Duflo 2003.

[3] Influential papers by Schultz (1990), Thomas (1990; 1993), and Lundberg, Pollak, and Wales (1997) provide empirical evidence supporting this finding. For an overview of the intrahousehold bargaining literature see Strauss and Thomas (1995); Haddad, Hoddinott, and Alderman (1997); and Strauss, Mwabu, and Beegle (2000).

having the mother as the transfer recipient made few differences in the context of a school related cash transfer in Morocco. Haushofer and Shapiro (2016) evaluate a large unconditional cash transfer in rural Kenya and observe few differences between female and male recipient households in consumption, production, and investment decisions. More recently, an experiment in the Republic of Macedonia randomized school linked conditional cash transfers at the municipality level to either household heads (generally a male) or mothers and showed that women who were offered the transfer on average have stronger measured empowerment (Almås et al. 2018, Armand et al. 2016).

Few studies have explicitly compared conditional and unconditional cash transfers in the same context. One experiment (Baird, McIntosh, and Özler 2011) examines the impact of conditional and unconditional cash transfers on adolescent girls' schooling and health outcomes in Malawi. That study concludes that for the schooling outcomes CCTs outperformed UCTs, while both CCTs and UCTs had various impacts in reducing HIV prevalence together with pregnancies and sexual relationships with men older than 25 (Baird et al. 2012). They further document that cash transfers improved the mental health of the recipient girls, unless they were given conditionally to the parents (Baird, de Hoop and Özler, 2013). Benhassine et al. (2015) use a randomized experiment in Morocco to estimate a "labeled cash transfer" program: a small cash transfer made to fathers of school-aged children in poor rural communities, not conditional on school attendance but explicitly labeled as an education support program. They document large gains in school participation and conclude that adding conditionality and targeting mothers made almost no difference in that context.

We present evidence of the impacts from a unique cash transfer pilot program in rural Burkina Faso, the Nahouri Cash Transfer Pilot Project (NCTPP). The NCTPP incorporated a random experimental design to evaluate the relative effectiveness of the following four social protection programs targeting poor households in the same setting in rural Burkina Faso: conditional cash transfers given to fathers, conditional cash transfers given to mothers, unconditional cash transfers given to fathers, and unconditional cash transfers given to mothers.

To our knowledge, our study is the only randomized experiment to investigate in the same context both the role of conditionality and the gender of the transfer recipient in a cash transfer program targeting all children, boys and girls, up to age 15 and to study the impact of

those different cash transfer modalities on a broad range of education, health, and household welfare outcomes.

Our results indicate that cash transfers improve children's education and health as well as household and adult socioeconomic conditions. They substantially increase school enrollment, unconditional attendance and grade progression, but they have only limited impact on learning outcomes as measured by standardized tests in math and French. The cash transfers also improve the health outcomes of children ages 0-5, leading to more routine preventive visits to health clinics, less illnesses (both as reported by parents and as measured by a biomarker for inflammations) and better nutritional outcomes as indicated by anthropometric measurements, particularly during a year with poor harvests.

However, the gender of the transfer's recipient as well as the conditionality lead to differentiated impacts. For school enrollment and most child health outcomes, conditional cash transfers outperform unconditional cash transfers. The gender of the transfer's recipient does not lead to such clear cut conclusions: While giving cash to mothers yields better results for most education outcomes, giving cash to fathers leads to significantly better nutritional outcomes during years with low rainfall.

The remainder of the paper is organized as follows. Section 2 describes the context of our experiment and the design of the cash transfer pilot program. In Section 3, we discuss our empirical identification strategy. Section 4 presents the main results, the robustness checks, and a discussion of the cost-effectiveness of the different cash transfers. Section 5 concludes.

2. Context and Experimental Design

2.1 Context

Burkina Faso offers an important setting for exploring the effects of cash transfers on rural households, focusing in particular on children's education and health outcomes. Even by African standards, child education and health in Burkina Faso are poor. The United Nations Human Development Index ranks Burkina Faso 181 out of 187 countries. In 2010, the net attendance ratio for primary school in rural Burkina Faso was 44.4 (45.5 for boys and 43.1 for girls) and the gross attendance ratio was 64.9 (66.2 for boys and 63.5 for girls) (Institut National de la Statistique et de la Démographie and ICF International, 2012).[4] Approximately 33 percent of

[4] The primary school net attendance ratio is the percentage of children attending primary school who are of the official school age. The primary school gross attendance ratio is the number of primary school students, irrespective

children in Burkina Faso under age 5 were considered stunted and 25 percent were considered underweight.[5]

Formal education in Burkina Faso consists of six years of primary school, four years of lower secondary school, and three years of upper secondary school, followed by tertiary education. A national law officially makes school mandatory until age 16. However, this law is not enforced because the government lacks the resources to provide education to all school age children. In principle, children can attend public primary schools free of charge. However, parents still have to pay for various fees and school supplies. These expenses must be paid in cash and in a timely manner, with most being paid at the start of the academic year, thus representing a significant constraint for cash-strapped households. Cash transfers reduce this cash-constraint in addition to compensating for the opportunity cost of child time.

The pilot cash transfer program was conducted in Nahouri province in southern Burkina Faso, located approximately 100 miles from the capital, Ouagadougou. Households in the province are predominantly subsistence farmers growing millet, sorghum, and peanuts. On average, there are 6.5 members in each household (Table 1) of whom 3.4 are children ages 0-15.

64.4 percent of the children aged 7 to 15 are reported by their parents to be enrolled in school, but when enrollment is measured using the information available in school rosters, the enrollment rate is lower at 53.2 percent. School attendance conditional on enrollment as measured from school rosters is higher at 98.9 percent, suggesting that, once enrolled children are very likely to attend classes. The attendance rates are consistent with other research in Africa using administrative school data (Miguel and Kremer, 2004 in Kenya; Benhassine et al., 2015 in Morocco; Kazianga, de Walque, and Alderman, 2012 in another region of Burkina Faso). Furthermore, at least for Burkina Faso where enrollment is low, they are suggestive of an environment where parents strategically choose which children they enroll and then make sure the children attend regularly. Focusing on attendance unconditional on enrollment, a broad measure of school participation that accounts for enrollment and attendance effects, we find that on an average school day, 51.1% of the age-eligible children are in class. Education expenses per

of age, as a percentage of the official primary school age population. If there are a significant number of underage or overage students in primary school, the gross attendance ratio will be higher than the net attendance ratio.

[5] Stunting is defined as children being below minus two standard deviations from the median height-for-age of a reference population. Underweight is defined as children being below minus two standard deviations the median weight-for-age of a reference population.

child are on average $9.76 per year and discretionary education expenditures (school supplies and parent association fees) are $4.72.

Among children younger than 5, 38.2 percent were stunted (2 standard deviations below the reference population for height-for-age), and 31.4 percent were underweight (2 standard deviations below the reference population for weight-for-age).

2.2 Experimental Design: Burkina Faso Nahouri Cash Transfer Pilot Project Overview

The 75 villages in Nahouri province that each have a primary school were randomly allocated to the following five groups as illustrated in panel A of Figure 1: (i) conditional cash transfers given to the father (CCTF), (ii) conditional cash transfers given to the mother (CCTM), (iii) unconditional cash transfers given to the father (UCTF), (iv) unconditional cash transfers given to the mother (UCTM), and (v) a control group.[6] There were 15 villages in each treatment arm and in the control group, and only poor households were eligible to receive a cash transfer.[7] Once villages were randomly assigned to the five groups defined above, poor households in the treatment villages were randomly assigned to receive that particular type of cash transfer.

On average, there are approximately 172 households per village. About 82 percent of households were eligible to receive transfers in each village. Mean household assets for poor households were 116,503 FCFA (around $280.7 USD). In each treatment village, 36 eligible households were randomly selected to receive the transfers. In our three survey rounds (baseline, one-year follow-up, two-year follow-up) conducted in June 2008, June 2009, and June 2010, we interviewed all poor households in each of the treatment villages who were randomly selected to receive the transfer.[8] In each of these four groups of 15 villages, we interviewed approximately

[6] Due to the low primary school enrollment rates in Burkina Faso, the program intervention focused exclusively on primary schooling as opposed to also covering secondary schools.

[7] Immediately prior to the baseline survey, we conducted an extended household census in every village to collect information from each household about household living structure (flooring, access to latrine), household asset ownership (plow, cart, draft animals, motorcycle, radio), whether the head of household ever attended school, whether the household grows cotton, and whether there was a weekly market in the village. This information was combined with a Burkina Faso nationally representative household survey to calculate a predicted poverty level for each household and compare that with the national poverty line to determine whether a household is considered poor or non-poor, and subsequently is eligible to receive the cash transfer. Compared to non-poor households, these poor households were less likely to have a head who ever attended school (63 versus 12%), less likely to grow cotton (45 versus 10%), less likely to live in a village with a weekly market (67 versus 40%), less likely to own draft animals (66 versus 36%), less likely to own a motorcycle (55 versus 7%), less likely to own a radio (83 versus 57%), less likely to own a plow or cart (51 versus 37%), and less likely to have access to a latrine (17 versus 2%), and less likely to have a house with mud walls (84 versus 40%).

[8] Our research protocol received IRB clearance from the Institutional Review Board at the University of Illinois at Urbana-Champaign (case #08334) and from the Burkina Faso National IRB ("Comité d'Ethique").

540 poor households randomly selected to receive transfers. The control group consisted of 615 randomly selected poor households that did not receive a cash transfer in the 15 control villages where no households received cash transfers.[9]

Parents were informed about the transfers by the staff of the Nahouri Cash Transfer Pilot Project and a project manager who was hired by the research team. This researcher manager participated in all activities related to the project's logistical organization, and she reported directly to the research team. The transfers were paid in each village at the place where each village usually meets for communal meetings, such as the market square or the village chief's residence. We avoided locations associated with specific public services such as schools or health centers because we did not want to send the false signal that unconditional transfers might have been tied to these services.

For households randomly assigned to a CCT scheme, for their children under age seven, receiving the transfer required quarterly visits to the local health clinic for preventive health care (growth monitoring), while for children age seven to fifteen, receiving the transfer required school enrollment with an attendance rate above 90 percent each quarter.[10] For families randomly assigned to a UCT program, the mother or father received a quarterly stipend for each child, and there were no requirements or conditions linked with receiving the stipend. Each child in the CCT households was given a program booklet in which school attendance or health clinic visits were recorded by the school principal or health clinic staff, respectively. In addition to recording attendance or clinic visits, the administrators also had to sign and stamp the booklet to verify its authenticity. The booklets were used by the project staff in charge of transfer payments, under the supervision of our project manager, to confirm a child's satisfaction of the conditionality requirements needed to receive CCTs. In addition, and again under the supervision of the project manager, 20 percent of these children were randomly selected and a village committee that had been specifically trained to do audits verified the information in the booklets against health clinic and school administrative registers. Based on the reports from our project manager and our discussions with these committees, it appears that conditionality was enforced.

[9] To minimize child fostering in response to the program introduction and reduce any potential sample attrition (see Akresh 2009 for evidence on the relationship between income shocks and child fostering), eligibility for cash transfers was based only on the children who were present in the household at the time of the baseline survey.
[10] In the CCT villages, the first payment of the school year is conditional on school enrollment and not attendance, since attendance cannot be measured in the holiday period preceding the start of the school year.

Cash transfer take-up rates (the fraction of eligible households receiving transfers for at least some children) in the CCT villages declined as the school year progressed, which is also consistent with conditionality being enforced.[11]

For each child under age seven, in the CCT and UCT programs, the mother or father would receive 4,000 FCFA per year, distributed in four quarterly payments.[12] For each child age 7 to 10 (or in grades 1 to 4 in the CCT villages), the mother or father would receive 8,000 FCFA per year, while for each child age 11 to 15 (or in grades 5 or higher and younger than 15 in the CCT villages), the mother or father would receive 16,000 FCFA per year, distributed in four quarterly payments. Given the average number of children per household, each household expected to receive about CFA 28,141 per year or the equivalent of $68 USD using the exchange rate at baseline. This corresponds to about to 9.1 percent of total household expenditures at the baseline, which includes food and non-food expenditures. For comparison, Fiszbein and Schady (2009) note CCT program generosity levels of 1, 6, 17, 22, and 29 percent of household expenditures in Bangladesh, Brazil, Colombia, Mexico, and Nicaragua, respectively. Hence, the Burkina Faso transfer program is on the low end in terms of how generous the transfers were relative to the other programs described by Fiszbein and Shady (2009).

The program design assumes that each of the treatment groups would receive equal amounts of resources per capita over the two-year transfer program period, if households randomly allocated to the conditional cash transfers fully satisfied the conditionality. In practice, because there was not full compliance with conditionality, the households under the UCT programs, on average, received more resources per capita.

3. Empirical Identification Strategy

The key question we want to answer is whether cash transfers improve education, health, and other welfare outcomes in the recipient households. For educational outcomes, we focus on the impact of transfers on school enrollment, attendance, and achievement tests in math and French for children between the ages of 7 to 15. For enrollment and attendance, we can rely both on household self-reports and on administrative data collected from the school ledgers. For child

[11] The CCT take-up rates by quarter for school year 2008-2009 are 99.0, 91.0, 90.7, and 85.3 percent, respectively. In school year 2009-2010, the rates are 94.7, 91.6, 89.9, and 89.7 for each quarter, respectively. The take-up rates in the UCT villages are considerably higher. In school year 2008-2009, they are 99.4, 98.8, 98.6, and 94.5 percent for each quarter, respectively. In 2009-2010, they are 99.1, 98.8, 98.5, and 97.1 percent for each quarter, respectively.
[12] At baseline in 2008, the exchange rate was CFA 415 = $1 USD.

health outcomes, we focus on routine preventive health clinic visits, anthropometrics (weight, arm circumference, and height), self-reported illnesses, and biomarker blood tests that measured C-reactive protein, which is a marker of inflammation and infections. For household welfare, we focus on livestock, agricultural production, demographics, assets, self-perceptions of social status, housing, and entrepreneurship.

The randomized experimental design provides a strong identification strategy and allows us to attribute any differences in outcome indicators between the treatment and control groups to the impact of the program. We focus on the program effect on the treated households (ATE), and we estimate the following regressions:

$$(1) \quad y_{iht} = \beta_0 + y_{ih0} + \beta_1 treat_t + \beta_2 CTF_t + \beta_2 X_{iht} + \beta_3 Z_{h0} + \beta_4 V_0 + \varepsilon_{iht} \quad \forall t = 1,2$$

$$(2) \quad y_{iht} = \beta_0 + y_{ih0} + \beta_1 treat_t + \beta_2 UCT_t + \beta_2 X_{iht} + \beta_3 Z_{h0} + \beta_4 V_0 + \varepsilon_{iht} \quad \forall t = 1,2$$

where y_{iht} is the outcome of interest for individual i in household h in year t, $treat_t$ is a treatment indicator that takes the value one if a child lives in a household that was randomly selected to receive a treatment (i.e. any cash transfer) and zero otherwise, CTF_t is an indicator that takes the value one if a child lives in a household that was randomly selected to receive a cash transfer given to fathers and zero otherwise, UCT_t is an indicator that takes the value one if a child lives in a household that was randomly selected to receive an unconditional cash transfer and zero otherwise, X_{iht} is a vector of individual characteristics (gender and age), Z_{h0} is a vector of household characteristics at baseline[13], V_0 is a vector of village characteristics at baseline[14] and ε is an error term.[15] Because we have access to baseline and follow-up data and to control for any possible differences across individuals, households, and villages in the baseline, we use a value added specification controlling for baseline outcomes for the individual, y_{ih0}.

[13] All regressions include the following household characteristics: marital status of the head of the household (single, married monogamous or married polygamous) and the type of housing (metal roof, cement walls).

[14] In all regressions, we include the following village characteristics: distance to the provincial capital, source of water, rainfall, and presence of a village market. In addition in the education related regressions, we add the following school characteristics: number of classrooms, distance to the nearest secondary school, and presence of a school feeding program. In the health related regressions, we control for the following health facility characteristics: facility offers nutritional counseling/nutritional supplements/vaccinations, clinic funding sources, and recent village history of health epidemics.

[15] Correlation among the error terms of children in a given village experiencing the same shocks in the baseline or follow-up rounds, combined with the design effect of our village-level before and after treatment, might bias the ordinary least squares standard errors downward, so in all regressions we cluster the standard errors at the village level.

In order to obtain clear comparisons between the different modalities of transfers and to increase statistical power, in the empirical estimations, we pool the treatment arms. The specification in Equation 1 (see also Figure 1 Panel C) combines into one group the conditional and unconditional cash transfers given to fathers and into a second group the conditional and unconditional cash transfers given to mothers. With this specification, we focus on whether the gender of the transfer receipient matters and we ignore the conditionality aspects of the design. In Equation 2 (see also Figure 1 Panel B), we combine into one group the conditional cash transfers given to fathers or mothers and into a second group the unconditional cash transfers given to fathers or mothers. With this specification, we focus on whether the conditionality matters and we ignore the intra-household allocation dimension of the design.

The impact of the transfer program in period t (t=1, 2) is given by β_1, the differential impact of the gender of the recipient of the transfer is given by β_2 in Equation 1 while the differential impact of the conditionality is given by β_2 in Equation 2[16]. Since we randomized at the village level, the treatment indicators are exogenous in both regressions.

4. Empirical Results

4.1. Sample and Baseline Balance

The sample used for the education and health analyses is constructed as follows. For education outcomes, we focus on children who are 7 to 15 years old at endline in 2010 (after the two year cash transfer intervention). These children would have been 5 to 13 years old at baseline in 2008. For health outcomes, the sample includes children who are 24 to 60 months old at endline in 2010, i.e. who were 0 to 36 months old at baseline in 2008.

In Table 2, we use baseline data to test the balance of the randomization experiment. We present the mean of the specific variable measured at the baseline for the control group and each of the four pooled treatment arms described in Figure 1 Panels B and C, i.e. conditional cash transfers (CCT), unconditional cash transfers (UCT), cash transfers to fathers (CTF) and cash transfers to mothers (CTM). In the column next to each group mean, we present p-values from a test comparing each of those pooled treatment arms with the control group. Finally, in the last column, we present the p-value for an F-test of the joint test that the means of the five study groups (see Figure 1 Panel A) are equal.

[16] In appendix tables B1-B6, we include the results with a different specification where the different transfer modalities (CTM, CTF, CCT and UCT) are compared to the control group.

We can reject the null hypothesis that the treatment arm is equal to the control in 10% of the cases. However, two outcome variables, number of children and owns a business, appear to be driving most of that imbalance, so this analysis should be interpreted cautiously. The lottery assigning villages to treatment and control groups was conducted publicly with all villages having a representative present and one of the authors was also present to observe and supervise the lottery. We can confidently rule out the possibility that any villages were able to alter their assignment to treatment or control. Thus, we argue that the differences observed are due to chance, and conclude that there is a very good balance across the study arms at baseline, especially for the main outcomes of interest.

4.2. Attrition

Household attrition was very low between the baseline and one-year follow-up survey (1.38 percent), and increases slightly when comparing the baseline and two-year follow-up survey (4.62 percent). In Appendix Table 1, we explore the relative differences between attritor and non-attritor households. Column 1 presents means of individual and household-level characteristics from the baseline survey for the sample of households that were followed from the baseline to the two-year follow-up survey (non-attritors). Column 2 presents means for the sample of attritor households, and column 3 presents the average difference in characteristics between attritors and non-attritors, as well as a test of whether the difference is statistically significant. For the main child education and health outcomes, there are no significant differences between attritor and non-attritor households. Attritor households do appear to have less children, less likely to polygamous, more likely to be female-headed, and with a younger household head. To address any potential bias due to attrition, in Section 4.8 we conduct additional robustness checks related to attrition and sample selection. These include estimating inverse probability weighted regressions to determine if any of the results for the main outcomes are affected when explicating addressing the issue of attrition.

In the subsequent tables, we report the results of the impact evaluation. Our tables are structured in 4 horizontal panels. Panels A and B report results from round 3, 2 years after the start of the intervention while Panels C and D report results from round 2, one year into the experiment. Panels A and C focus on the comparison between cash transfers given to the mothers versus fathers. The results displayed are from Equation 1. In those panels, the coefficient on the variable treatment can be interpreted as the impact of cash transfers given to mothers. The

coefficient on CTF indicates whether giving the transfers to fathers yields a (statistically) different impact from giving them to mothers. Below the table, we present the p-value for "Treatment + CTF" indicating whether the impact of cash transfers given to fathers is statistically different from zero. Similarly, Panels B and D focus on the comparison between conditional and unconditional cash transfers. The results displayed are from Equation 2. In those panels, the coefficient on the variable treatment can be interpreted as the impact of conditional cash transfers. The coefficient on UCT indicates whether giving the transfers unconditionally yields a (statistically) different impact from imposing conditions on the transfers. The p-value for "Treatment + UCT" indicates whether unconditional cash transfers have an impact statistically different from zero.

We adopt two strategies to address the large number of outcomes that we examine to avoid overemphasizing any single significant result. First, as mentioned in the introduction, we create indexes for each family of outcomes following Kling, Liebman, and Katz (2007). These indexes combine all of the outcomes in each family of outcomes. To construct the indexes, we define each outcome so that higher values correspond with better outcomes. Then we standardize each outcome into a Z-score by subtracting the mean and dividing by the standard deviation of the older cohort born in low intensity regions. We then average all of the Z-scores and standardize the average relative to the control group. We then estimate the effect of the cash transfers on these standardized outcome indexes.

Second, we correct for the potential issue of simultaneous inference using multiple hypothesis testing. Following Benjamini and Hochberg (1995), we use the concept of a false discovery rate (FDR) to allow inference when conducting many tests. Intuitively, FDR allows a researcher to tolerate a certain number of tests to be incorrectly discovered. An FDR adjusted q value of 0.05 implies that 5 percent of significant tests result in false positives compared with an unadjusted p-value of 0.05 that implies 5 percent of all tests result in false positives. Those results are reported in appendix tables 7a – 12b.

4.3. Impacts on Education for Children Ages 7-15

The analysis of the educational and child labor outcomes is presented in Table 3. In particular, columns one to three analyze the effect on enrollment while columns four to seven examine the impact on unconditional attendance, grade progression, and learning.. The standard errors in this

table, as well as in all subsequent tables, are clustered at the unit of randomization, which is the village.

To analyze the impact of cash transfers on school enrollment, we use three measures of enrollment as dependent variables. The first comes from school administrative ledgers we collected at each school (column 1). The second comes from the household survey where we asked parents to provide evidence of school registration by either showing the student ID card/number or other evidence such as an official school receipt of registration documents (column 2). This additional evidence on school registration was only collected during round 3, the last survey round. The third measure comes from parental self-reports in the household survey (column 3) and is potentially prone to self-reporting bias as highlighted by Baird and Özler (2012). However, by using three measures, two collected at the household-level – including one asking for documents confirming actual registration - and one collected at the school-level, we reinforce the robustness of our analysis. At round 3, the correlation between the the school-based measure (column 1) and the parental self-report (column 3) is 0.82, it is 0.82 between the parental self-report and the registration evidence provided by the households (columns 2 and 3), and it is 0.69 between the school-based (column 1) and evidence-based (column 2) measures.

Focusing first on the results at the end of the two year experiment (round 3), we find that the cash transfers increase enrollment. In the comparison between the transfers made to the mothers and the fathers (panel A), the coefficient on "treatment" can be interpreted as the impact of cash transfers given to mothers. For example, with the school-based administrative measure in column 1, the coefficient estimates the impact of cash transfers to mothers as a 16.7 percentage point increase in enrollment. Compared to a mean of 40.2 percent of children enrolled in the control group, this corresponds to 41.5 percent improvement. The coefficients on the CTF indicator are negative and significant in columns 1 and 3, suggesting that giving to fathers led to a somewhat reduced impact on enrollment.. However, the p-values reported for "Treatment + CTF" also suggest a combined coefficient different from zero, implying that cash transfers given

to fathers nevertheless have a positive and significant impact in increasing enrollment, except when using parental self-reports (p-value: 0.208, column 3).[17]

In the comparison between conditional and unconditional transfers (Panel B), the coefficient on "treatment" can be interpreted as the impact of conditional cash transfers. Again, these coefficients are all positive and significant, indicating that conditional cash transfers increased school enrollment. The coefficient on the UCT indicator is negative and significant for the three measures indicating that unconditional cash transfers were less effective than conditional transfers in increasing enrollment. However when looking at the p-values reporting "Treatment + UCT", we find thatfor the school-based measure and the evidence-based parental report the p-value suggest a combined coefficient statistically different than zero, indicating a positive impact of the UCTs, albeit lower than with CCTs..[18]

The impact of the cash transfers on enrollment at round 2, one year into the experiment, is not as strong or significant. Only using the school-based measure (column 1), can we detect a significant impact of cash transfers (transfers given to mothers and unconditional cash transfers). One likely explanation of this more limited impact of cash transfers at round 2 is that due to logistical reasons, the cash transfer program was unexpectedly launched late by Burkina Faso's government in the 2008-2009 school year. The first cash payment was only made at the end of November/early December 2008, while the school year started October 1, 2008. This meant households did not receive the transfer in time to pay school fees due at the start of the academic year and this might have reduced their ability to enroll their children during the program's first year.

Column 4 reports the cash transfers' impact on unconditional school attendance. Given that attendance conditional on enrolment is very high (98.3%) since once enrolled children tend to attend classes, our approach consists of estimating the impact on average school attendance rates of all school age children, unconditional on their enrollment. This is a broad measure of school participation with direct policy relevance that accounts for the enrollment and attendance effects

[17] A recent cash transfer program aimed at improving secondary school enrollment in Macedonia randomly gave conditional cash transfers to mothers or fathers, and evaluation results also found that specifically targeting mothers did not significantly improve school enrollment (Armand 2014).

[18] Additional robustness checks (not shown) indicate that the enrollment results are consistent if the regressions are estimated at the household level, instead of the child level, and use the fraction of children in the household who are enrolled as the outcome variable. Results are also consistent if the regressions control for the baseline number of siblings in the household as that could influence child labor decisions as well as the total amount of cash transfers received by the household.

and is not confounded by changes in the share of the sample enrolled. We rely on a measure taken from school ledgers collected at the school level[19]: for each child, we compute the proportion of school days attended for the entire academic year. Children who are not enrolled receive a zero value for attendance. At round 3, transfers to mothers and fathers significantly increase school attendance to a similar extent. While both CCTs and UCTs both have a significant positive impact, the effect with CCTsis significantly higher at the 10% level than with UCTs. No impacts on unconditional attendance are measured at round 2.

In column 5, we study the impact of the cash transfers on school progression using the current grade in school (controlling for age in the regression) as the dependent variable. While we find no impact at round 2, we find that transfer to mothers and conditional cash transfers significantly improve grade progression at round 3. The coefficients on CTF and UCT measuring the differences with CTM and UCT respectively are negative (but only statistically significant for CTF). The p-values on "treatment + CTF" and "treatment + UCT" suggest the impact of those transfers is not significantly different from zero. We report similar findings when analyzing whether the child is on track (column 6). The coefficients on CTF and UCT measuring the differences with CTM and UCT respectively are negative (but only statistically significant for UCT). However, the p-values on "treatment + CTF" and "treatment + UCT" suggest the impact of those transfers remain positive and significantly different from zero.

In column 7 we study the effect of the cash transfers on learning measured as the proportion of correct answers in mathematics and in French tests. The tests were designed with the help of education specialists in Burkina Faso and included in our household questionnaire. We find few effects of the cash transfers on learning: no impacts are measured at round 2 and at round 3, only cash transfers to mothers increase learning significantly However, it is important to stress that even though there is limited differential learning across treatment and control groups, this does not mean there is no learning going on for these children. For children in the treatment groups who get enrolled between baseline and round 3, their mean test scores increase and they improve at the same rate as for children in the control group who get enrolled across rounds. Our findings imply that transfers increase enrollment, and these children (who would not have enrolled absent the intervention) are learning as much as their peers in the control group. Overall,

[19] We also collected parental self-reports for attendance but the recall period was the last two weeks and since some villages were surveyed after the end of the school year, we consider this measure to not be reliable.

however, it is fair to conclude that the impacts on learning are limited, which is consistent with results for most other cash transfer programs (Filmer and Schady, 2009 and Benhassine et al., 2015 also find limited learning impacts in Cambodia and Morocco, respectively, but Baird, McIntosh, and Özler, 2011 and de Walque and Valente, 2018 document positive learning in Malawi and Mozambique respectively).

In column 8, we aggregate the seven previous measures of school enrollment, attendance and grade progression using the index suggested by Kling, Liebman and Katz (2007). We find no effects at round 2, but at round 3, we come to the following conclusions: all four types of transfers have significant positive impacts, but transfers to mothers have significantly stronger impacts than when given to fathers and, similarly, conditional transfers outperforms unconditional ones. .

4.4. Impacts on Health for Children Under 5

Table 4 reports the impact of the cash transfers on the health outcomes of young children, looking at preventive routine health clinic visits (column 1), C-reactive protein (CRP) levels as a biomarker for infections (column 2), the probability of being healthy in the last 30 days (column 3) and anthropometric indicators (columns 4 to 6).

The number of preventive routine health clinic visits per year for children was measured for children aged 0 to 5 in round 3 only. Transfers given to mothers and fathers both lead tosignificant increases in the likelihood of a preventive visit and there is no statistically significantdifference between both coefficients. The comparison between CCTs and UCTs indicates that conditional cash transfers increase the number of preventive visits, while UCTs do not and that difference is statistically significant. By linking the payment of the cash transfers to regular visits to the health center for children under age 6, the CCTs achieved their objective of increasing preventive health care. We describe these impacts in more detail in Akresh, de Walque, and Kazianga (2016).

Preventive routine visits are self-reported by the parents and in the CCT arms were directly conditioned upon. In the next columns, we investigate whether the cash transfers had further impacts on health outcomes which with the exception of self-reported health are also more objectively measured. In column 2, we use a biomarker collected only during round 3 that provides a more objective measure of child health. In particular, we measure the C-reactive protein (CRP) level on each child aged 0 to 5 which we collected using venous blood samples

(Zeba et al. 2013). The level of CRP rises when there is inflammation throughout the body, but for ease of interpretation and to facilitate the calculation of the index in column 7, we have flipped the sign in column 2. Cash transfers to the mothers and conditional cash transfers decrease significantly the level of CRP indicating a reduction in infections[20]. This effect is not present when the transfers are given to fathers and when they are unconditional but those differences across transfer types are not statistically significant.

While our dependent variables in columns 1 and 2 were only collected at the final follow-up (round 3), the remaining dependent variables (columns 3-6) have been collected at each round. Because we follow a value added specification requiring the children to be present at the baseline and follow-up rounds, our sample for those dependent variables for the round 2 analysis is limited to children aged 12-60 months and for round 3 to ages 24-60 months.

In column 3, we analyze the probability of being healthy in the last 30 days as reported by the parents a measure of the general health of the children. This is constructed by assigning a zero if the parent reported the child as ill in the last 30 days and a 1 otherwise. The cash transfers appear to have an impact in keeping children healthy and reducing illness episodes, but the transfer modality doesn't seem to matter since all four types have a statistically positive impacts and no significant differences appear between them.

We also measure the effect of the cash transfers on anthropometrics in the columns 4-6 of Table 4. Our dependent variables are weight-for-age z-scores, arm circumference for age z-scores and height-for-age z-scores. These three measures can, respectively, be interpreted as short-term, short to medium-term and medium to long-term indicators of children's nutrition and health status.

We find no effects on anthropometric measurements at round 3, while significant improvements are measured at round 2. A possible interpretation of that contrast is that 2010 (round 3) was a better year than 2009 in terms of rainfall and harvest. For the main crops relevant for the Nahouri region and analyzed later in table 6 (millet, sorghum and peanuts), yields in 2009 are lower than yields in 2010. Moreover, yields in 2009 are between 0.23 and 0.79 standard deviations below average yields of the 10 previous years (1998-2008). In contrast,

[20] Because we have flipped the sign of the outcome variable in column 2, this is however marked by a positive coefficient.

yields in 2010 are higher than the long run average yields, except peanuts with yield 0.05 standard deviations below the long run average.[21]

If cash transfers act as a safety net, they should have a larger impact when times are difficult. At round 2, giving the cash transfers to fathers rather than mothers seems to be more effective in improving the nutritional status of children: CTF outperforms CTM for weight-for-age and arm circumference-for-age and have an impact statistically greater than zero for all three anthropometric measures. These findings might seem surprising at first, given the general perception that mothers are more directly involved in taking care of children's health. In the context of Burkina Faso and West Africa more generally, it is important to note that culturally, fathers are seen as responsible for providing food on the family's table (see Kazianga and Wahhaj, 2013 and Duflo and Udry 2004). This social norm was confirmed in qualitative interviews and focus groups we conducted in the program villages after the intervention[22]. This strong cultural norm might lead them to devote additional resources such as cash transfers, in priority to more and better food, potentially explaining these findings.

Also at round 2, conditional cash transfers appear to outperform UCTs in improving anthropometric outcomes. They are significantly improving all three measures and have a statistically stronger impact than UCTs on weight-for-age and height for age z-scores while UCTs only significantly impacts arm circumference for age. Even at round 3, when no overall impacts are statistically significant, UCTs significantly underperform compared with CCTs for weight- and height-for-age.

In column 7, we aggregate the previous measures of child health (columns 1 to 6 for round 3 and columns 3-6 for round 2) using the index suggested by Kling, Liebman, and Katz (2007). .At round 2, we conclude that all transfer modalities have an overall positive impact on child health, but that transfer to fathers have a stronger impact than those given to mothers, while the difference between CCTs and UCTs is not statistically significant. At round 3, all transfer

[21] The average yields in kg/ha over the 1998-2008 were 838 for peanuts, 795 for millet and 955 for sorghum. In 2009, they were 722, 774 and 920 respectively, while in 2010 they were 830, 843 and 1004, respectively. Food and Agriculture Organization of the United Nations. 2014, FAOSTAT database, available at http://faostat3.fao.org/home/E (accessed on 10/30/2014).

[22] For the focus groups, we selected one village from each of the four treatment groups. In each village, we conducted a focus group discussion with 10 men from different recipient households and a separate focus group discussion with 10 women from different recipient households.

modalities have a positive impact, except UCTs which significantly underperform compared to CCTs (while the difference by gender of the recipient is not statistically significant).

4.5. Impacts on Housing, Livestock, Agriculture, Demographics, and Welfare

In Table 5, we analyze the impact of the cash transfers interventions on the housing quality experienced by the household. In particular, we investigate the availability of electricity and the presence of a metal roof or concrete walls. We detect few statistically significant impacts, but at round 3, after 2 years of intervention, we observe significant difference by transfer modalities: transfers to father outperform transfer to mothers for electricity and metal roofs (columns 1 and 2) and UCTs underperform compared to CCTs for metal roofs,concrete walls and improved water source (columns 2-4). These tendencies are confirmed when looking at the index aggregating the three measures in column 4.

In table 6, we focus on the impact of cash transfers on household livestock,agricultural outcomes and business ownership.

We measure livestock ownership in column 1 using tropical livestock units (TLU)[23] and in columns 2-4 we investigate more specifically the ownership of goats, chickens and cows, respectively. In round 3, we find significant positive impacts of all types of cash transfers on overall livestock holdings with no significant difference by transfer modality (Panel A, column 1). When looking at the type of livestock, we report positive impacts of transfers to the mother on goat and cow ownership at round 3, and also that, in comparison with CCTs, UCTs lead to higher chicken (round 3) and cow (round 2) ownership.

Columns 5 and 6 focus on measures of household agricultural production. Column 5 analyzes the transfers' impact on the annual value of red and white sorghum and millet produced while column 6 focuses on the production of peanuts, the main cash crop in the region. Giving transfers to mothers and UCT significantly increases the value of sorghum and millet produced at round 3, while UCT outperform CCTs on this metric at round 2 (column 5). Forpeanut production, at round 2, which corresponds to a difficult agricultural year, transfers to fathers

[23] The concept of tropical livestock units (TLU) provides a common metric for quantifying a wide range of different livestock types in a standardized manner. To do this, an "Exchange Ratio" was developed to convert different species into a common unit. Specifically, we used the following equation: TLU = #horses*0.80 + #cattle*0.70 + #camels*0.70 + #donkeys*0.50 + #pigs*0.20 + #sheep*0.10 + #goats*0.10 + #rabbits*0.05 + #guinea fowl*0.01 + #chickens*0.01. For more details, see: http://harvestchoice.org/maps/total-livestock-population-tlu-2005

significantly outperforms transfers to mothers (which, like CCTs lead to a significantly lower peanut output). Column 7 reports impact of the cash transfers on business ownership: at round 2, CCTs lead to a significant decrease in business ownership and that effect is also statistically different than the impact of UCTs. Column 8 presents a production index aggregating the results in the 7 previous columns. At round 3, transfers to mothers and UCTs led to overall improvements in production, while at round 2 UCTs outperforms CCTs.

Table 7 investigates the impact of the cash transfers on assets purchases, on transfers and on savings. Column 1 reports few impacts on the total value of assets purchased in the last year, except that at round 2 transfers given to fathers have led to less purchases than when given to mothers. Column 2 focuses on the purchase of bikes -a crucial asset in Burkina Faso – in the last year: at round 2, both transfers to mothers and CCTs significantly increase the value of bike purchases and UCTs significantly underperform compared to CCTs. Column 3 focuses on net inter-households transfers.. We observed limited impacts on inter -household transfers, except that at round 2, CTFs lead to a higher amount of net transfers received than transfers to mothers. Column 5 investigates the impact of the cash transfers on savings using whether the household has any savings as a binary dependent variable. In both years, we observe that CCTs tend to decrease the probability of any savings (only statistically significant at round 3), but that no such effect is found for UCTs with the difference between CCTs and UCTs being significant in both years. Column 5 includes a index aggregating the results in the 4 previous columns but shows no significant impacts.

Table 8 studies how the cash transfers might have impacted household demographics. Results in column 1 focus on the number of children 0-15 years old and finds that at the end of 2 years of cash transfers, there are significantly more children living in the household if the cash was given to mothers or was unconditional. This is also true after one year (round 2) for CTFs and UCTs. In columns 2 and 3, we investigate whether this result might be driven by additional received child fostering. This seems to be the case, at least to some extent, with transfers to mothers and UCTs more likely to lead to younger (0-2 years) children received in foster care (column 2, round 3). However the impacts on child fostering do not explain the full extent of the increase in the number of children which is likely also explained by a combination of increased

fertility and reduced child mortality.[24] In column 4, we investigate whether cash transfers might have led to an increase in the existence of polygamous households which in rural Burkina Faso can be perceived as a sign of relative wealth.,We find that transfers to mothers and UCTs are more likely to increase the likelihood to live in a polygamous household at both rounds 2 and 3, that the same is true for transfers to fathers at round 3, and that for UCTs this effect is significantly different than for CCTs at round 3. Column 5 includes a index aggregating the results in the 4 previous columns: there is no overall demographic impacts after round 2, but at round 3, we find that the transfers led to demographic impacts, especially when given to the mothers and unconditionally.

4.7. Heterogeneous Effects by Child Gender

In Table 9, we revisit some of the aggregate findings on children's outcomes and we investigate whether the impact varies according to the child's gender. We focus on the education and health index measures suggested by Kling, Liebman and Katz (2007) and already included for the overall sample in tables 3 and 4[25]. The structure of the tables is the same as previously except that we add at the bottom p-values testing whether we can reject equality between the coefficients for boys and girls.

For the education index (columns 1-2), at round 3 at which the strongest education impacts were found for all children, we find that cash transfers given to mothers and conditional cash transfers improve education outcomes for both boys and girls. Giving the cash transfers to fathers also significantly improves outcomes for both genders, but CTM outperforms CTF. . Both CCTs and UCTs improve education outcomes for boys and girls, but CCTs outperforms UCTs among girls, but not among boys. The CCT and UCT coefficients are not statistically different for boys, but they are for girls. This result suggests that while the conditionality does not play a big role in attracting boys in schools, it is crucial in increasing girls' school participation (Akresh, de Walque, and Kazianga, 2013).

[24] We do find positive impacts on the number of children recently born and reported in the next survey round. However, since the survey did not include a full birth history for mothers and because children who were born and then subsequently died before the next survey round were never included in the household roster, we cannot precisely estimate the separate impacts on fertility and mortality.

[25] The detailed education and health results by gender of the child are in appendix tables 4a and b and 5a and b, respectively.

At round 2, when overall education impacts were more muted because the cash transfers were introduced a few months late in the school year, we find no aggregate impacts on education impacts and no differences across transfer modalities or across gender.

For the health index (columns 3-4), for boys, giving the transfers to the father or the mother doesn't seem to make a difference: both lead to statistically significant improvement in health at rounds 2 and 3. No such positive impacts are found for girls, except for transfers given to the fathers at round 2. The differences between the coefficients for boys and girls are significant or close to significant at round 2 (p-value = 0.03 for rejecting that the coefficient on CTM is the same for boys and girls and p-value = 0.118 for the CTF coefficients), but not at round 3. These differences on how the recipient of the transfer affect outcomes for boys and girls are not as strong when we focus on conditionality: CCTs consistently leads to significant improvements and outperform UCTs for boys and girls, except at round 2 for boys when both CCTs and UCTs lead to similarly positive health outcomes.

4.8 Robustness Checks: Attrition and Selection

In Appendix Tables 2 and 3, we include robustness checks related to attrition and selection for the analyzed samples. In Appendix Table 2 we perform robustness checks to verify whether there was differential attrition and selection across treatment groups in our ability to collect data at follow-up rounds for a set of child related outcomes. We investigate with child-level regressions whether the child's enrollment or attendance (columns 1 and 2) was missing from the school roster, and whether the child did not take the mathematics and French achievement tests (column 3). While we perform this analysis for children age 7-15 in columns 1-3, we perform a similar analysis for children age 0-5 in column 4to investigate whether the child's anthropometric measures were missing. We do not find any evidence that the treatment groups are correlated with missing child information in the school rosters, missing achievement tests, or missing anthropometric measures.

While those results are reassuring and while attrition in our sample is low, to further confirm that attrition does not significantly impact our findings, in appendix tables 3a and 3b, we re-estimate regressions adjusted for attrition using an inverse probability weighting (IPW) approach suggested by Wooldridge (2002, 2010). IPW is based on the key assumption that sample attrition is ignorable with respect to the dependent variable, conditional on the observables in the attrition equation (Wooldridge, 2002). The IPW procedure consists of two

stages. First, data from the baseline round are used to estimate the probability a household remains in the survey in round 3. The inverse of the predicted probabilities are then used to weight the data, essentially giving more weight to households who are more likely to leave, conditional on observables. The results of the IPW regressions in appendix table 3 are very similar and consistent with the results in tables 3 and 4.[26]

4.9 Cost-Effectiveness

Table 10 compares the program's impact to its costs, including administrative costs. Columns 1-4 show the cost-effectiveness analysis for the third round, i.e. two years after treatment began and columns 5-8 show the cost effectiveness analysis for the second round, i.e. one year after treatment began. The estimates used in the cost-effectiveness calculations are taken from Table 3 for the education outcomes, from Table 4 for the health outcomes, and from Tables 6-8 for the household level outcomes. Given the costs of the program and the estimated program impacts, we estimate the benefits for spending $100 on each transfer scheme, and we limit the analysis to program impact estimates that are statistically significant at most at the 10 percent level.

The first two columns compare how cost-effective are transfers to mothers versus transfers to fathers in raising education and health outcomes and household level economic well-being indicators. Each $100 spent on transfers to mothers add about 0.70 years of student participation and 1.3 years to cumulated years of education completed. In contrast, $100 spent on transfers to fathers add only about 0.43 years of student participation but have no statistically significant effect on cumulated years of education. We confirm that cashs transfers to mothers are more cost-effective that cash transfers to farhers along other measures of educational outcomes, including different measures of enrollment, attendance, progression through the grades and learing.

The results on health outcomes and household level outcomes are rather mixed. Transfers to mothers are more cost effective in increasing the routine health clinic visits and improving the C-reactive protein measure, whereas transfers to fathers are more cost-effective in increasing the

[26] We have run robustness checks where the dependent variable is defined as the average enrollment rate at the household level. For each household, we divide the number of children 7-15 years old who are enrolled in school by the number of children 7-15 years old in the household. We find that the results are consistent: transfers to mothers have a greater effect on enrollment than transfers to fathers, and conditional cash transfers have a greater effect on enrollment than unconditional cash transfers.

probability of a child remaining healthy in the 30 days preceding the survey. After 2 years of intervention, we do not find any significant effects on any anthropometric measures.

The interventions had significant effects on several household level outcomes. Our estimates indicate that for every $100 transferred to mothers, livestock ownership increased by 0.61 tropical livestock units and production of sorghum and millet increased by CFA 11036.. For fathers, $100 received increased the probability of using an improved water source by 28.5 percentage points and livestock by 0.26 tropical livestock units, but did not any detectable effects on the remaining outcomes. On balance, transfers to mothers are most cost-effective along the household level outcomes we examined.

Columns 3 and 4 contrast conditional cash transfers with unconditional cash transfers.Each $100 spent as CCT added 0.9 years to student participation, 1.7 years to cumulated years of education, 1 year to attendance and increased grade progression by 68.6 percentage points. In comparison, spending $100 as unconditional cash transfers raised participation by 0.36 years, attendance by 0.40 years and grade progression by 24.8 percentage points but did not have any significant effects on the other measures of education outcomes. Conditional cash transfers are shown to be more cost-effective than unconditional cash transfers for health outcomes for which the point estimates are statically significant at the 10 percent level, except for the incidence of illness for which the two transfer schemes are roughly equally cost-effective. Unconditional cash transfers are, however, more cost-effective for household level outcomes, specifically for the sorghum and millet production.

We now turn to the cost-effectiveness analysis for the second round (after one year of treatment) in columns 5-8. As we discuss in section 4.3, the program had limited effects on education after one year of treatment. Nevertheless, we notice that transfers to fathers (column 6) are more cost-effective than transfers to mothers (column 5) in raising school participation. The two transfer schemes are similarly cost-effective at keeping children on track with their grades.

Transfers to fathers are clearly more cost-effective at improving child health outcomes. We find $100 spent on transfers to fathers increased standardized weight-for-age by 3.7 standard deviations, standardized arm circumference-for-age by 1.69 standard deviations and standardized height-for-age by 3.9 standard deviations buttransfers to mothers had no significant effect on any of these two anthropometric measures. Transfers to mothers are, however, are just as cost-

effective as transfers to fathers at keeping childrend healthy in the last 30 days preceding the survey.

Overall, one year into the experiment transfers to mothers are slightly more cost-effective for household level outcomes. Transfering $100 to mothers has increased livestock ownership by 0.83 tropical livestock unit, the value of bycicles by CFA 878.By comparison, the same amount given to fathers increased livestock by 0.11 tropical livestock unit.

The last two columns (7 and 8) show cost-effectiveness analysis for conditional cash transfers and unconditional cash transfers. The estimates indicate that CCT had no detectable effects on education. We find that $100 spent on UCT increased school participation by 0.25 years and the probability of a child staying on track by 16.1 percentage points, implying that UCT are slightly more cost effective than CCT for school participation.

Turning to child health outcomes, our estimates imply that $100 spent on CCT increased the probability of a child remaining healthy by 60.5 percentage points, standardized weight-for-age by 3.43 standard deviations, standardized arm cirmcumference-for-age by 2.62 standard deviations and height-for-age by 4.35 standard deviations. Each $100 spent on UCT, on the other hand, increased the probability of a child staying healthy by 45.7 percentage points and standardized arm circumference-for-age by 2.3 standard deviations, but had no significant effect on any other health outcomes. Hence, overall, CCT were more cost-effective at improving child health outcomes.

Lastly, we examine the cost-effectiveness on household level outcomes. Each $100 spent on CCT raised access to improved water by 17.5 percentage points and the value of bycicles by CFA 1626.6. Spending $100 on UCT increased livestock by 0.87 tropical livestock units (including 1.48 cowsHence, on balance UCT are more cost effective than CCT in raising overall household economic well-being in the first year of the program implementation.

We also compare our program's impact with other programs with similar objectives. Such a comparison is made difficult not only by the fact those programs took place in different contexts and countries, but also because programs often have multiple objectives and should not be judged solely on specific indicators such school enrollment impacts. With these caveats in mind, both our estimates have comparable enrollment impacts to the mid-range of cost-benefit estimates from other studies, including free school uniforms in Kenya school meals in Kenya at 0.71 years per $100 (Evans, Kremer and Ngatia, 2008) and merit scholarship for girls in Kenya

at 0.27 years (Kremer, Miguel and Thorton, 2001). However, the programs in Burkina Faso are less cost-effective than cheaper interventions such as information dissemination in Madagascar at 20.7 years per $100 (Nguyen, 2006) or deworming in Kenya at 13.9 years per $100 (Miguel and Kremer, 2004). On the other hand, transfers program in Burkina Faso are more cost-effective compared to other CCT programs. de Janvry and Sadoulet (2006) estimate the Mexican Progresa program cost-benefit at 0.03 additional years of students participation per $100. The CCT and UCT programs in Malawi (Baird, McIntosh, Özler. 2011) increased girl's participation by 0.07 and 0.02 years per each $100 spent.

5. Conclusion

Social safety nets are actively promoted in developing nations both as responses to financial crises and as mechanisms to alleviate poverty. Conditional cash transfers, which are now common in Latin America but remain relatively rare in other regions, are also seen as a way to reduce future poverty by investing in the next generation's human capital (Fiszbein and Schady, 2009). However, the roles of conditionality and of the recipient's gender in achieving this objective are unclear.

From a policy-making perspective, our study addresses the feasibility of conditional cash transfer schemes in Sub-Saharan Africa. Since CCT programs rely on a certain level of administrative capacity (the ability to target households, plan meetings to notify households of their obligations and rights, monitor household compliance and conditionality, and transfer funds to families), there is a debate on whether these programs, which have been successful in Latin America, can be successfully implemented by African central or local governments (Samson, 2006; Schubert and Slater, 2006; Szekely, 2006; Freelander, 2007). The cash transfer program we study relied on existing government structures and was implemented in an environment where there is no systematic population registration and where formal banking is almost non-existent. Even though our study was a two-year pilot limited to one province and its scalability remains to be confirmed, it nevertheless indicates that cash transfer, and in particular *conditional* cash transfers can be implemented and be effective in an environment with limited administrative capacity.

The role of conditionality and of the recipient's gender in achieving cash transfer program's objectives is actively debated by policy makers. In this paper, we explicitly compare

the impact of conditional and unconditional cash transfers as well as transfers given to fathers and to mothers in the same environment using a randomized experiment in rural Burkina Faso. In doing so, we investigate impacts on a broad range of child education and health as well as household welfare outcomes. Our results indicate that compared to the control group, cash transfers improve children's education and health as well as household and adult socioeconomic conditions.

However, the gender of the transfer's recipient as well as the conditionality play an important role and lead to different impacts. For school enrollment and several health outcomes conditional cash transfers outperform unconditional cash transfers. The policy implications of these results are clear. CCT programs are generally thought to be more costly and complex to administer per recipient than UCT programs due to the expenses associated with monitoring that the conditions are met. For this reason, many policy makers, especially in Africa, tend to favor UCTs which require less administrative capacity. However, our study suggests that administrative arrangements for CCTs can be manageable and not too costly and that the benefits of CCTs are, for many outcomes, significantly larger, so that they are more cost-effective.

In policy circles, it is often assumed that giving transfers to mothers rather than fathers will lead to better outcomes. Our results, however, probably somewhat surprisingly, suggest that this assumption should be questioned or at least nuanced. Giving to mothers is better better for some education outcomes, but the evidence is more mixed for health outcomes: giving the transfer to mothers leads to lower levels of C-reactive protein a biomarker whose values rise with inflammation in the body, however giving to fathers leads to better nutritional outcomes, especially during a difficult year when the transfers fully serve as a safety net. These results might be context specific given the strong cultural norm in West Africa prescribing that fathers are responsible for feeding their family, but they still suggest that policy makers should not automatically assume that it is always preferable to have mothers as the transfer's recipients.

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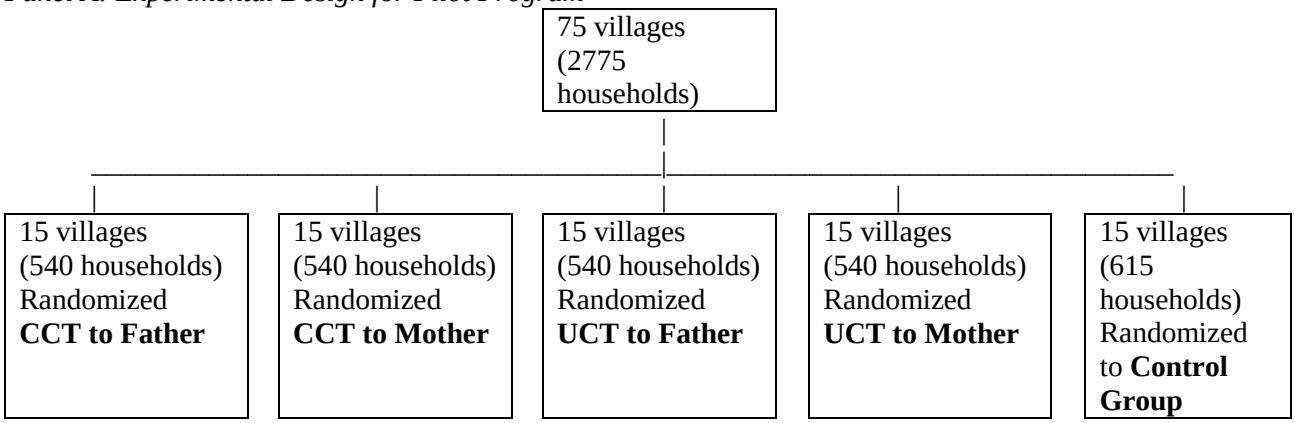
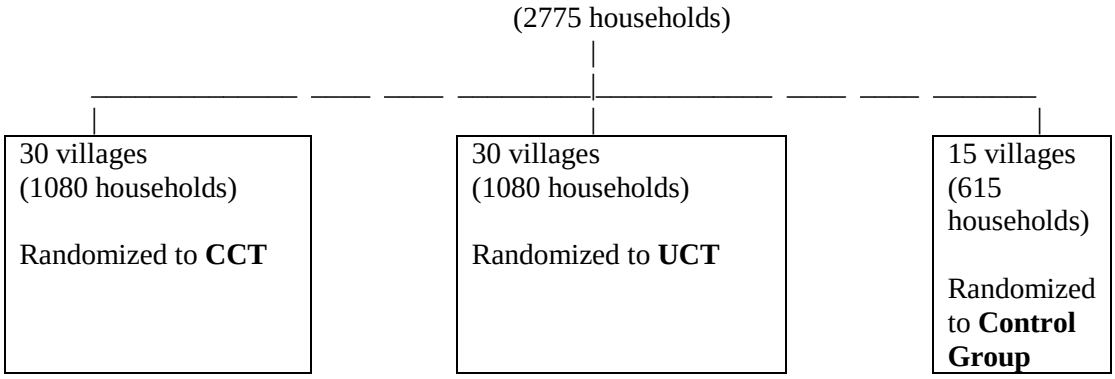
Figure 1: Summary of Treatment and Control Group Randomization Plan

Panel A: Experimental Design for Pilot Program



Panel B: Conditional Transfers versus Unconditional Transfers Comparison



Panel C: Transfers to the Mothers (CTM) versus Transfers to the Fathers (CTF) Comparison

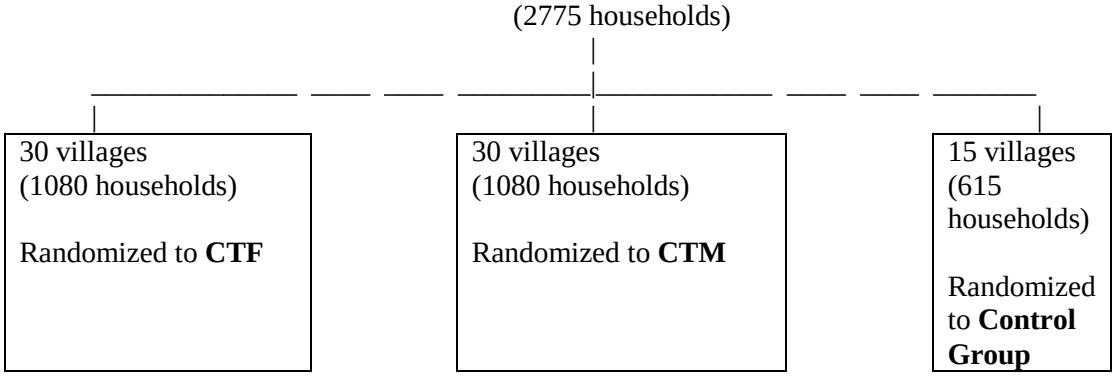


Table 1: Baseline Household Characteristics. Burkina Faso Nahouri Cash Transfers Pilot Project (NCTPP)

Variables	Mean	Standard Deviation
Household Size	6.487	3.075
Total Value Assets Purchased Last Year (FCFA)	16,350	58,626
Marital Status = Monogamous	0.595	0.491
Household Head is Male	0.860	0.347
Ethnic Group = Kassena	0.555	0.497
Ethnic Group = Nankana	0.331	0.471
Ethnic Group = Mossi	0.072	0.258
Caste = Noble	0.571	0.495
Religion = Muslim	0.232	0.422
Religion = Christian	0.277	0.448
Religion = Animist	0.479	0.500
Household Head Ever Enrolled in School	0.155	0.362
Household Head Age	45.1	14.6
Household Head's Father is Educated	0.035	0.183
Number of Wives of Household Head's Father	2.246	1.945
Number of Children of Household Head's Father	9.228	7.029

Notes: The sample includes all 2749 households at baseline. Marital status refers to the marital status of the household head. Data source: Nahouri Cash Transfers Pilot Project (NCTPP) Evaluation data.

Table 2: Baseline Means Burkina Faso Nahouri Cash Transfers Pilot Project (NCTPP)

	CCT Mean (1)	CCT= Control (2)	UCT Mean (3)	UCT= Control (4)	CTF Mean (5)	CTF= Control (6)	CTM Mean (7)	CTM= Control (8)	Control Mean (9)	All Equal (10)	Full Sample Mean (11)
Child Characteristics:											
Enrollment (School-based)	0.557	0.160	0.531	0.346	0.523	0.434	0.563	0.122	0.479	0.484	0.532
Enrollment (Parent Report)	0.671	0.346	0.631	0.788	0.626	0.871	0.675	0.292	0.616	0.541	0.644
Unconditional Attendance	0.536	0.198	0.509	0.411	0.498	0.544	0.546	0.139	0.463	0.383	0.511
Current Grade in School	2.157	0.372	2.099	0.570	2.084	0.691	2.170	0.238	2.017	0.814	2.107
On Track	0.230	0.210	0.236	0.109	0.232	0.164	0.234	0.140	0.195	0.598	0.227
Learning (Math/French)	0.381	0.168	0.377	0.186	0.383	0.173	0.376	0.173	0.347	0.499	0.373
Healthy Last 30 Days	0.927	0.754	0.938	0.346	0.937	0.398	0.929	0.670	0.920	0.560	0.930
Weight-for-Age Z-score	-1.097	0.629	-0.789	0.474	-0.884	0.704	-0.980	0.946	-0.995	0.539	-0.945
Arm circumference-for-Age Z-score	-0.842	0.257	-0.175	0.163	-0.242	0.297	-0.723	0.447	-0.521	0.322	-0.492
Height-for-Age Z-score	-1.351	0.709	-0.297	0.124	-0.574	0.311	-0.989	0.149	-1.278	0.014	-0.884
Household Characteristics:											
Energy Source	0.071	0.533	0.117	0.908	0.151	0.581	0.037	0.182	0.109	0.155	0.097
House with Metal Roof	0.613	0.775	0.505	0.252	0.567	0.730	0.551	0.590	0.592	0.354	0.566
House with Concrete Walls	0.015	0.945	0.015	0.972	0.014	0.924	0.016	0.836	0.015	0.996	0.015
Improved Water Source	-0.063	0.469	-0.104	0.588	-0.158	0.762	-0.008	0.332	-0.227	0.857	-0.116

Notes: The pooled treatment arms are abbreviated as CCT (conditional cash transfers), UCT (unconditional cash transfers), CTF (cash transfers to fathers), and CTM (cash transfers to mothers). Enrollment (school-based) comes from the school roster administrative data. Unconditional attendance is the proportion attending school, unconditional on enrollment. Learning measures the proportion of correct answers on the French and Math tests administered by the project enumerators. Ill last 30 days indicates if the child has been ill during the past 30 days. Social status is measured using the MacArthur Scale of Subjective Social Status and takes the value 1 if the respondent rates himself above the average social status in Burkina Faso. Total Value Assets is the value of all assets owned by the household. Energy source is a dummy variable defined as having any source of electricity in the house, such as solar, batteries, or access to the electric utility network. In column 10, we estimate regressions of each characteristic on dummies for the 5 groups and then calculate an F-test of the joint test that the means of the 5 groups are equal. Data source: Nahouri Cash Transfers Pilot Project (NCTPP) Evaluation data from 2008.

Table 2 (Continued): Baseline Means Burkina Faso Nahouri Cash Transfers Pilot Project (NCTPP)

	CCT Mean	CCT= Control	UCT Mean	UCT= Control	CTF Mean	CTF= Control	CTM Mean	CTM= Control	Control Mean	All Equal	Full Sample Mean
Household Characteristics											
Tropical Livestock Units	1.224	0.217	1.364	0.042	1.223	0.168	1.376	0.057	1.035	0.151	1.241
Number of Goats Owned	1.628	0.230	1.718	0.082	1.643	0.173	1.710	0.108	1.444	0.368	1.625
Number of Chickens Owned	5.408	0.683	5.283	0.832	5.196	0.960	5.487	0.562	5.167	0.861	5.303
Number of Cows Owned	0.637	0.283	0.763	0.106	0.605	0.309	0.805	0.099	0.452	0.204	0.648
Sorghum/Millet Value Produced	19 311	0.919	24 833	0.150	23 984	0.218	20 217	0.688	19 016	0.626	21,447
Peanut Value Produced	21 706	0.861	27 534	0.310	23 524	0.539	25 928	0.465	20 947	0.589	23,861
Owns a Business	0.629	0.019	0.622	0.010	0.643	0.028	0.608	0.007	0.776	0.073	0.659
Total Value Assets (FCFA)	7 450	0.179	6 215	0.535	6 528	0.370	7 123	0.266	5 527	0.484	6,537
Value of Bicycles (FCFA)	2 307	0.245	1 630	0.428	2 084	0.575	1 825	0.855	1 888	0.255	1,943
Interhousehold Net Transfers	-7 685	0.774	-4 190	0.425	-6 698	0.981	-4 572	0.559	-6 764	0.568	-5,990
Number of Children (ages 0-15)	3.359	0.181	3.590	0.010	3.501	0.036	3.449	0.072	3.106	0.102	3.393
Number non HH kids (0-2)	0.102	0.966	0.110	0.749	0.125	0.410	0.087	0.616	0.101	0.120	0.105
Number non HH kids (7-15)	0.385	0.299	0.423	0.068	0.386	0.249	0.422	0.091	0.337	0.438	0.389
Marital Status = Polygamous	0.211	0.351	0.233	0.091	0.223	0.170	0.220	0.211	0.184	0.547	0.213
Marital Status = Monogamous	0.585	0.507	0.601	0.887	0.586	0.542	0.600	0.848	0.605	0.509	0.595
Household Size	6.483	0.157	6.740	0.026	6.722	0.031	6.501	0.139	6.052	0.183	6.487
Household Head Is Male	0.844	0.992	0.883	0.162	0.862	0.520	0.865	0.451	0.844	0.324	0.859
Ethnic Group = Kassena	0.472	0.506	0.633	0.606	0.562	0.986	0.544	0.881	0.564	0.209	0.555
Ethnic Group = Nankana	0.435	0.627	0.209	0.246	0.328	0.790	0.314	0.714	0.366	0.143	0.331
Ethnic Group = Mossi	0.050	0.882	0.101	0.421	0.071	0.798	0.081	0.616	0.057	0.393	0.072
Caste = Noble	0.543	0.751	0.598	0.802	0.593	0.836	0.548	0.792	0.574	0.932	0.571
Religion = Muslim	0.238	0.657	0.239	0.666	0.218	0.921	0.260	0.425	0.211	0.917	0.232
Religion = Christian	0.294	0.880	0.247	0.276	0.250	0.352	0.291	0.825	0.302	0.454	0.278
Religion = Animist	0.457	0.805	0.501	0.786	0.522	0.627	0.436	0.603	0.478	0.691	0.479
Household Head Ever Enrolled	0.171	0.189	0.159	0.323	0.157	0.344	0.173	0.175	0.122	0.179	0.155
Household Head Age	45.415	0.980	44.737	0.568	45.777	0.723	44.359	0.396	45.386	0.161	45.143

HH Head’s Father is Educated	0.037	0.151	0.038	0.136	0.042	0.071	0.033	0.284	0.024	0.253	0.035
# Wives of HH Head’s Father	2.194	0.804	2.340	0.214	2.343	0.194	2.191	0.837	2.171	0.568	2.246
# Children of HH Head’s Father	9.151	0.874	9.390	0.583	9.456	0.499	9.083	0.987	9.075	0.877	9.227

Table 3: Impact of Cash Transfers on Education

	Enrollment (school based)	Enrollment (evidence)	Enrollment (parent report)	Unconditional Attendance	Current Grade	On track	Learning (Math/French)	Education index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Round 3 (Mothers vs Fathers)								
Treatment	0.167***	0.107***	0.100***	0.179***	0.311***	0.107***	0.074**	0.246***
	(0.049)	(0.041)	(0.038)	(0.050)	(0.120)	(0.029)	(0.033)	(0.059)
CTF	-0.064**	-0.016	-0.043*	-0.060	-0.142*	-0.018	-0.053***	-0.092**
	(0.032)	(0.031)	(0.024)	(0.037)	(0.085)	(0.023)	(0.017)	(0.043)
Panel B: Round 3 (Conditional vs Unconditional)								
Treatment	0.167***	0.131***	0.109***	0.183***	0.301**	0.123***	0.047	0.255***
	(0.048)	(0.042)	(0.040)	(0.049)	(0.126)	(0.029)	(0.033)	(0.062)
UCT	-0.060**	-0.060**	-0.058**	-0.065*	-0.115	-0.050**	0.004	-0.104**
	(0.030)	(0.029)	(0.025)	(0.035)	(0.084)	(0.024)	(0.021)	(0.044)
Observations	3,382	3,382	3,382	3,141	3,382	3,382	2,152	3,382
Mean Control Group	0.402	0.455	0.543	0.357	1.888	0.132	0.377	-0.007
P-value Treatment + CTF	0.028	0.043	0.186	0.015	0.164	0.001	0.500	0.016
P-value Treatment + UCT	0.022	0.097	0.208	0.014	0.110	0.004	0.127	0.013
Panel C: Round 2 (Mothers vs Fathers)								
Treatment	0.056*		0.024	-0.002	0.047	0.039*	0.008	0.045
	(0.033)		(0.031)	(0.038)	(0.090)	(0.021)	(0.021)	(0.048)
CTF	-0.014		-0.024	0.030	-0.069	-0.001	-0.015	-0.017
	(0.027)		(0.021)	(0.036)	(0.060)	(0.017)	(0.018)	(0.038)
Panel D: Round 2 (Conditional vs Unconditional)								
Treatment	0.034		-0.002	-0.012	0.029	0.036	0.001	0.021
	(0.037)		(0.033)	(0.040)	(0.097)	(0.023)	(0.021)	(0.051)
UCT	0.029		0.027	0.048	-0.031	0.005	-0.002	0.029
	(0.031)		(0.022)	(0.036)	(0.063)	(0.020)	(0.020)	(0.042)
Observations	3,233		3,233	3,002	3,233	3,233	2,344	3,233
Mean Control Group	0.449		0.556	0.435	1.926	0.165	0.368	-0.006
P-value Treatment + CTF	0.223		0.994	0.440	0.817	0.090	0.676	0.549
P-value Treatment + UCT	0.053		0.396	0.319	0.990	0.056	0.967	0.267

Notes: Robust standard errors in parentheses, clustered at the village level. *significant at 10%; **significant at 5%; ***significant at 1%. All regressions include child age and gender fixed effects, controls for household head marital status, type of housing, village characteristics (distance to province capital, source of water, rainfall, presence of a village market), and school characteristics (number of classrooms, distance to nearest secondary school, presence of school feeding program). Panels A and C estimate Equation 1; panels B and D estimate Equation 2. See Table 2 notes for variable definitions. Enrollment (evidence) comes from the household survey (only collected in round 3) where parents were asked to show evidence of school registration (student ID number, school receipt of registration, or a homework notebook). The treatment variable in Panels A and C measures the impact of cash transfers to mothers; in Panels B and D it measures the impact of conditional cash transfers. Below the table are p-values testing whether treatment + CTF or treatment + UCT are significantly different from 0. Data source: Nahouri Cash Transfers Pilot Project 2008-2010 evaluation data.

Table 4: Impact of Cash Transfers on Health

	Routine Health Clinique Visits	C-reactive Protein (CRP)	Healthy last 30 days	Weight for Age Z-score	Arm Circumference for Age Z-score	Height for Age Z-score	Health index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Round 3 (Mothers vs Fathers)							
Treatment	0.470***	0.093**	0.056*	-0.182	0.062	-0.027	0.093*
	(0.170)	(0.041)	(0.033)	(0.146)	(0.098)	(0.154)	(0.054)
CTF	-0.132	-0.040	0.015	0.150	0.064	0.106	0.023
	(0.165)	(0.039)	(0.020)	(0.098)	(0.102)	(0.113)	(0.051)
Panel B: Round 3 (Conditional vs Unconditional)							
Treatment	0.597***	0.081**	0.062*	-0.021	0.157	0.164	0.173***
	(0.187)	(0.041)	(0.033)	(0.151)	(0.101)	(0.148)	(0.054)
UCT	-0.383**	-0.014	0.003	-0.182*	-0.130	-0.280***	-0.138***
	(0.169)	(0.038)	(0.023)	(0.109)	(0.092)	(0.098)	(0.043)
Observations	1,720	1,164	1,640	1,135	1,078	1,065	1,640
Mean Control Group	0.466	0.469	0.824	-1.105	-0.872	-1.465	0.028
P-value Treatment + CTF	0.069	0.255	0.028	0.840	0.326	0.646	0.056
P-value Treatment + UCT	0.174	0.151	0.051	0.191	0.823	0.503	0.522
Panel C: Round 2 (Mothers vs Fathers)							
Treatment			0.054**	0.129	0.118	0.287	0.104*
			(0.024)	(0.127)	(0.111)	(0.198)	(0.054)
CTF			-0.000	0.246**	0.274***	0.050	0.099**
			(0.018)	(0.108)	(0.089)	(0.122)	(0.044)
Panel D: Round 2 (Conditional vs Unconditional)							
Treatment			0.060***	0.340**	0.260**	0.431**	0.186***
			(0.022)	(0.138)	(0.127)	(0.194)	(0.058)
UCT			-0.013	-0.189*	-0.020	-0.241**	-0.067
			(0.017)	(0.111)	(0.106)	(0.114)	(0.047)
Observations			2,324	1,678	1,609	1,569	2,324
Mean Control Group			0.847	-1.193	-0.712	-1.674	0.017
P-value Treatment + CTF			0.030	0.006	0.001	0.084	0.001
P-value Treatment + UCT			0.070	0.207	0.029	0.320	0.038

Notes: Robust standard errors in parentheses, clustered at the village level. * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions include child age and gender fixed effects, controls for household head marital status, type of housing, village characteristics (distance to province capital, source of water, rainfall, presence of a village market), and health facility characteristics (facility offers nutritional counseling/nutritional supplements/vaccinations, clinic funding sources, and recent village history of health epidemics).Panels A and C use the specification in Equation 1, panels B and D estimate Equation 2. See Table 2 notes for variable definitions. Outcomes in columns 1 and 2 were only measured in round 3, so it is not possible to control for baseline outcomes in those estimations. Column 1 measures the number of routine preventive health clinic visits for each child during the past year. Column 2 reports the level of C-reactive protein, a biomarker that increases with inflammation in the body. The treatment variable in Panels A and C measures the impact of cash transfers to mothers; in Panels B and D it measures

the impact of conditional cash transfers. Below the table are p-values testing whether treatment + CTF or treatment + UCT are significantly different from 0. Regressions include children aged 12-59 months in round 2 and 24-59 months in round 3. Data source: Nahouri Cash Transfers Pilot Project (NCTPP) Evaluation data from 2008-2010.

Table 5: Impact of Cash Transfers on Housing

	Energy Source	Metal Roof	Concrete Walls	Improved water source	Housing Index
	(1)	(2)	(3)	(4)	(5)
Panel A: Round 3 (Mothers vs Fathers)					
Treat	-0.091	-0.039	0.003	-0.106	-0.075
	(0.070)	(0.046)	(0.011)	(0.132)	(0.068)
CTF	0.127**	0.058*	-0.016	0.229*	0.092
	(0.055)	(0.033)	(0.014)	(0.123)	(0.064)
Panel B: Round 3 (Conditional vs Unconditional)					
Treat	0.002	0.025	0.015	0.146	0.067
	(0.071)	(0.045)	(0.014)	(0.114)	(0.068)
UCT	-0.062	-0.074**	-0.041***	-0.287**	-0.199***
	(0.057)	(0.035)	(0.015)	(0.124)	(0.064)
Observations	2,612	2,612	2,612	2,612	2,612
Mean Control	0.295	0.641	0.032	0.011	0.001
P-value Treatment+CTF	0.595	0.682	0.299	0.316	0.787
P-value Treatment+UCT	0.392	0.288	0.003	0.329	0.045
Panel C: Round 2 (Mothers vs Fathers)					
Treat	-0.007	-0.011	-0.009	-0.067	-0.048
	(0.025)	(0.026)	(0.007)	(0.076)	(0.041)
CTF	0.050**	-0.012	0.006	0.066	0.071**
	(0.020)	(0.026)	(0.006)	(0.075)	(0.032)
Panel D: Round 2 (Conditional vs Unconditional)					
Treat	0.009	-0.005	-0.003	0.083	0.015
	(0.027)	(0.028)	(0.007)	(0.075)	(0.040)
UCT	0.019	-0.024	-0.008	-0.246***	-0.057
	(0.026)	(0.025)	(0.006)	(0.076)	(0.035)
Observations	2,701	2,701	2,701	2,701	2,701
Mean Control	0.087	0.610	0.021	-0.016	0.001
P-value Treatment+CTF	0.234	0.399	0.571	0.986	0.614
P-value Treatment+UCT	0.446	0.233	0.129	0.059	0.397

Notes: Robust standard errors in parentheses, clustered at the village level. * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions control for village characteristics (distance to the province capital, source of water, rainfall, presence of a village market). Panels A and C use the specification in Equation 1, panels B and D estimate Equation 2. See Table 2 notes for variable definitions. The treatment variable in Panels A and C measures the impact of cash transfers to mothers; in Panels B and D it measures the impact of conditional cash transfers. Below the table are p-values testing whether treatment + CTF or treatment + UCT are significantly different from 0. Data source: Nahouri Cash Transfers Pilot Project (NCTPP) Evaluation data from 2008-2010.

Table 6: Impacts of Cash Transfers on Productive Activities

	Tropical Livestock Units	Number of Goats	Number of Chickens	Number of Cows	Value of red sorghum, white sorghum, millet produced	Value of peanuts produced	Owns business	Production Index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Round 3 (Mothers vs Fathers)								
Treatment	0.333**	0.275**	0.364	0.340*	6,046*	-4,971	-0.001	0.128**
	(0.153)	(0.125)	(0.522)	(0.181)	(3 619)	(7,419)	(0.047)	(0.059)
CTF	-0.181	-0.163	-0.119	-0.277	-1 554	1,686	-0.036	-0.080
	(0.161)	(0.123)	(0.565)	(0.194)	(4 588)	(6,808)	(0.045)	(0.052)
Panel B: Round 3 (Conditional vs Unconditional)								
Treatment	0.176*	0.184	-0.191	0.115	1,803	345	0.007	0.066
	(0.095)	(0.125)	(0.504)	(0.106)	(4 336)	(7,362)	(0.044)	(0.052)
UCT	0.130	0.016	0.981*	0.169	7 114	-9,177	-0.055	0.043
	(0.174)	(0.133)	(0.541)	(0.211)	(4 947)	(7,091)	(0.043)	(0.056)
Observations	5,208	5,208	5,208	5,208	5,251	5,251	2,612	7,180
Mean Control Group	1.092	1.527	5.246	0.423	36,042	58,803	0.650	-0.055
P-value Treatment +CTF	0.046	0.362	0.682	0.479	0.336	0.668	0.441	0.262
P-value Treatment +UCT	0.046	0.128	0.188	0.128	0.032	0.256	0.333	0.049
Panel C: Round 2 (Mothers vs Fathers)								
Treatment	0.321	-0.015	-0.153	0.470	-772	-22,437***	-0.041	0.028
	(0.229)	(0.164)	(0.519)	(0.304)	(4 536)	(8,210)	(0.044)	(0.068)
CTF	-0.281	-0.071	-0.469	-0.335	3 698	16,345***	-0.011	-0.017
	(0.246)	(0.149)	(0.489)	(0.326)	(4 329)	(6,291)	(0.033)	(0.059)
Panel D: Round 2 (Conditional vs Unconditional)								
Treatment	-0.015	-0.117	-0.645	-0.028	-3,652	-16,073*	-0.076*	-0.044
	(0.143)	(0.167)	(0.526)	(0.172)	(4 893)	(8,663)	(0.042)	(0.051)
UCT	0.383	0.132	0.504	0.652*	9 921**	4,180	0.063*	0.130**
	(0.247)	(0.156)	(0.534)	(0.339)	(4 700)	(7,195)	(0.034)	(0.061)
Observations	5,381	5,381	5,381	5,381	5,373	5,373	2,701	7,402
Mean Control Group	1.145	1.747	6.058	0.388	40,578	66,384	0.764	-0.054
P-value Treatment +CTF	0.759	0.569	0.203	0.397	0.540	0.480	0.224	0.806
P-value Treatment +UCT	0.102	0.924	0.781	0.043	0.182	0.165	0.769	0.198

Notes: Robust standard errors in parentheses, clustered at the village level. *significant at 10%; **significant at 5%; ***significant at 1%. All regressions control for village characteristics (distance to the province capital, source of water, rainfall, presence of a village market). Panels A and C estimate Equation 1, panels B and D estimate Equation 2. See Table 2 notes for variable definitions. The treatment variable in Panels A and C measures the impact of cash transfers to mothers; in Panels B and D it measures the impact of conditional cash transfers. Below the table are p-values testing whether treatment + CTF or treatment + UCT are significantly different from 0. Data source: Nahouri Cash Transfers Pilot Project Evaluation data from 2008-2010.

Table 7: Impact of Cash Transfers on Assets, Transfers, and Savings

	Total Assets	**Bikes**	**Inter-HH Transfers Net**	**Any Savings**	**Wealth Index**
	(1)	(2)	(3)	(4)	(5)
Panel A: Round 3 (Mothers vs Fathers)					
Treat	1051	-180	731	-0.077	-0.029
	(1332)	(552)	(2957)	(0.057)	(0.034)
CTF	-287	-87	799	0.016	-0.007
	(1665)	(398)	(2530)	(0.049)	(0.026)
Panel B: Round 3 (Conditional vs Unconditional)					
Treat	1 458	-90	2 311	-0.118**	-0.043
	(1340)	(503)	(2770)	(0.056)	(0.033)
UCT	-1 151	-279	-2 431	0.105**	0.020
	(1593)	(391)	(2726)	(0.045)	(0.026)
Observations	6,568	6,568	3,633	6,417	6,926
Mean Control	7,910	2,516	-11,262	0.558	-0.031
P-value Treatment+CTF	0.603	0.597	0.581	0.315	0.287
P-value Treatment+UCT	0.831	0.501	0.969	0.826	0.527
Panel C: Round 2 (Mothers vs Fathers)					
Treat	1 248	511**	-2 664	-0.036	0.016
	(1231)	(244.43)	(6033)	(0.052)	(0.024)
CTF	-1528*	-151	9556*	0.008	-0.016
	(898)	(321)	(5258)	(0.039)	(0.022)
Panel D: Round 2 (Conditional vs Unconditional)					
Treat	870	773**	2 207	-0.071	0.004
	(1174)	(311)	(5204)	(0.051)	(0.024)
UCT	-838	-709**	-277	0.082**	0.008
	(950)	(303)	(6425)	(0.037)	(0.022)
Observations	6,762	6,762	2,515	6,417	6,926
Mean Control	5,484	1,376	-13,643	0.409	-0.034
P-value Treatment+CTF	0.821	0.285	0.186	0.591	0.995
P-value Treatment+UCT	0.981	0.791	0.774	0.826	0.604

Notes: Robust standard errors in parentheses, clustered at the village level. * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions control for village characteristics (distance to the province capital, source of water, rainfall, presence of a village market). Panels A and C use the specification in Equation 1, panels B and D estimate Equation 2. See Table 2 notes for variable definitions. The treatment variable in Panels A and C measures the impact of cash transfers to mothers; in Panels B and D it measures the impact of conditional cash transfers. Below the table are p-values testing whether treatment + CTF or treatment + UCT are significantly different from 0. Data source: Nahouri Cash Transfers Pilot Project (NCTPP) Evaluation data from 2008-2010.

Table 8: Impact of Cash Transfers on Demographics

	Number of Children	**Number of non-biological children ages 0-2**	**Number of non-biological children ages 7-15**	**Polygamous**	**Demographic Index**
	(1)	(2)	(3)	(4)	(5)
Panel A: Round 3 (Mothers vs Fathers)					
Treat	0.239***	0.055***	-0.004	0.017*	0.094***
	(0.084)	(0.019)	(0.041)	(0.009)	(0.031)
CTF	-0.108	-0.027	-0.017	-0.005	-0.052
	(0.080)	(0.020)	(0.035)	(0.008)	(0.034)
Panel B: Round 3 (Conditional vs Unconditional)					
Treat	0.065	0.029	-0.054	0.005	0.025
	(0.081)	(0.019)	(0.041)	(0.010)	(0.030)
UCT	0.250***	0.026	0.085**	0.020**	0.090***
	(0.072)	(0.018)	(0.034)	(0.009)	(0.031)
Observations	2,612	2,612	2,612	2,612	2,612
Mean Control	3.318	0.076	0.495	0.187	-0.003
P-value Treatment+CTF	0.135	0.138	0.597	0.195	0.193
P-value Treatment+UCT	0.000	0.002	0.426	0.007	0.000
Panel C: Round 2 (Mothers vs Fathers)					
Treat	0.071	-0.006	-0.033	0.014**	0.008
	(0.048)	(0.012)	(0.032)	(0.007)	(0.020)
CTF	0.045	-0.004	0.033	0.000	0.007
	(0.047)	(0.011)	(0.025)	(0.007)	(0.018)
Panel D: Round 2 (Conditional vs Unconditional)					
Treat	0.072	-0.014	-0.019	0.009	-0.000
	(0.053)	(0.011)	(0.033)	(0.007)	(0.020)
UCT	0.046	0.013	0.005	0.010	0.024
	(0.049)	(0.011)	(0.026)	(0.007)	(0.018)
Observations	2,701	2,701	2,701	2,701	2,701
Mean Control	3.222	0.092	0.437	0.181	-0.002
P-value Treatment+CTF	0.035	0.351	0.988	0.050	0.467
P-value Treatment+UCT	0.024	0.907	0.689	0.006	0.232

Notes: Robust standard errors in parentheses, clustered at the village level. * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions control for village characteristics (distance to the province capital, source of water, rainfall, presence of a village market). Panels A and C use the specification in Equation 1, panels B and D estimate Equation 2. See Table 2 notes for variable definitions. The treatment variable in Panels A and C measures the impact of cash transfers to mothers; in Panels B and D it measures the impact of conditional cash transfers. Below the table are p-values testing whether treatment + CTF or treatment + UCT are significantly different from 0. Data source: Nahouri Cash Transfers Pilot Project (NCTPP) Evaluation data from 2008-2010.

Table 10: Cost-Effectiveness Analysis, Overall Benefits per $100 Spent

	Round 3 (after 2 years of cash transfers)				Round 2 (after 1 year of cash transfers)			
	Mother	**Father**	**CCT**	**UCT**	**Mother**	**Father**	**CCT**	**UCT**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Education								
Enrollment (school based)	0.702	0.429	0.932	0.363	0.226	-	-	0.247
Enrollment (evidence)	0.450	0.379	0.731	0.241	NA	NA	NA	NA
Enrollment (parent report)	0.420	-	0.608	-	-	-	-	-
Unconditional Attendance	0.752	0.496	1.021	0.401	-	-	-	-
Current Grade	1.307	-	1.679	-	-	-	-	-
On Track	0.450	0.371	0.686	0.248	0.157	0.168	-	0.161
Learning	0.311	-	-	-	-	-	-	-
Health								
Routine Health Clinic Visits	5.308	3.729	6.273	-	NA	NA	NA	NA
C-Reactive Protein	1.050	-	0.851	-	NA	NA	NA	NA
Healthy last 30 days	0.632	0.783	0.651	0.770	0.536	0.491	0.605	0.457
Weight-for-age Z-score	-	-	-	-	-	3.685	3.428	-
Arm circumference-for-age Z-score	-	-	-	-	-	3.852	2.621	2.333
Height-for-age Z-score	-	-	-	-	-	3.312	4.345	-
Housing								
Concrete Walls	-	-	-	-	-	-	-	-
Improved Water Source	-	0.285	0.338	-	-	-	0.175	-
Livestock/Crops/Business								
Tropical Livestock Units	0.608	0.264	0.401	0.446	0.828	0.107	-	0.872
Number of Goats	0.502	-	-	-	-	-	-	-
Number of Cows	0.621	-	-	-	-	-	-	1.478
Value Sorghum/millet[a]	11.036	-	-	13.039	-	-	-	-
Value Peanut[a]	-	-	-	-	-	-	-	-
Own a Business	-	-	-	-	-	-	-	-
Assets/Transfers/Savings								
Bikes	-	-	-	-	878.385	-	1629.618	-
Any Savings	-	-	-	-	-	-	-	-
Demographics								
All kids	0.436	-	-	0.366	0.122	-	-	0.186
Non HH kids (0-2)	0.100	-	-	0.080	-	-	-	-
Polygamous	0.031	-	-	0.037	0.024	0.025	-	0.030

Notes: All calculations of program costs include program-related administrative expenses as well. N/A indicates that survey data was not collected for that outcome in that survey round. See Table 2 notes for variable definitions. a: 1,000 of CFA. Data source: Nahouri Cash Transfers Pilot Project (NCTPP) evaluation data from 2008-2010.

Online Appendix for

Evidence from a Randomized Evaluation of the Household Welfare Impacts of Conditional and Unconditional Cash Transfers Given to Mothers or Fathers

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November 25, 2019

Appendix Table 1: Relative Differences Between Attriting and Non-Attriting Households

	Non-Attritors (N=2622)	Attritors (N=127)	Mean Difference
Child Characteristics			
Enrollment (School-based)	0.388	0.383	0.005
	(0.487)	(0.488)	(0.048)
Enrollment (Parent-Report)	0.492	0.441	0.051
	(0.500)	(0.499)	(0.047)
Unconditional Attendance	0.371	0.366	0.005
	(0.477)	(0.478)	(0.047)
Current grade in school	1.606	1.686	-0.080
	(2.031)	(2.045)	(0.189)
On track	0.411	0.345	0.066
	(0.492)	(0.477)	(0.046)
Learning (Math/French)	0.318	0.337	-0.019
	(0.269)	(0.260)	(0.028)
Healthy last 30 days	0.932	0.912	0.020
	(0.251)	(0.285)	(0.022)
Weight for Age Z-score	-0.923	-1.301	0.377
	(3.869)	(1.153)	(0.322)
Arm Circumpherence for Age Z-score	-0.483	-0.659	0.176
	(3.547)	(1.394)	(0.301)
Height-for-Age Z-score	-0.852	-1.404	0.552
	(12.389)	(1.618)	(1.048)
Household Characteristics:			
Energy Source	0.094	0.165	-0.071***
	(0.292)	(0.373)	(0.027)
House with Metal Roof	0.566	0.559	0.007
	(0.496)	(0.498)	(0.045)
House with Concrete Walls	0.016	0.000	0.016
	(0.124)	(0.000)	(0.011)
Improved Water Source	-0.117	-0.087	-0.030
	(1.425)	(1.414)	(0.129)
TLU	1.236	1.370	-0.135
	(3.932)	(4.774)	(0.288)

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Column 1 presents means and standard deviations of household-level characteristics from the baseline survey for the sample of households that were followed from the baseline to the two-year follow-up survey (non-attritors). Column 2 presents means and standard deviations for the sample of attritor households. Column 3 presents the average difference in characteristics between attritors and non-attritors and tests if that difference is statistically significant. See Table 2 notes for variable definitions. Data source: Nahouri Cash Transfers Pilot Project (NCTPP) Evaluation data from 2008.

Appendix Table 1: Relative Differences Between Attriting and Non-Attriting Households (continued)

	Non-Attritors (N=2622)	Attritors (N=127)	Mean Difference
Number of goats owned	1.620	1.761	-0.142
	(3.118)	(3.235)	(0.227)
Number of chickens owned	5.287	5.736	-0.449
	(8.414)	(8.552)	(0.611)
Number of cows owned	0.635	0.995	-0.360
	(4.705)	(6.341)	(0.346)
Value of red sorghum, white sorghum,	21041	21074	-33
millet produced	(50865)	(37114)	(3606)
Total value of peanuts produced	22609	44323	-21714*
	(172735)	(344003)	(13009)
Owns a business	0.658	0.693	-0.035
	(0.475)	(0.463)	(0.043)
Total value of Assets purchased last year	6589	5161	1429
	(36621)	(17377)	(2321)
Total value of Bikes purchased last year	1943	1954	-11
	(8589)	(7037)	(549)
Inter HH Transfers Net	-5844	-8901	3057
	(121291)	(84061)	(10124)
Number of Children (0-15)	3.424	2.738	0.686***
	(2.011)	(1.640)	(0.182)
Number of Non-HH kids (0-2)	0.106	0.071	0.035
	(0.360)	(0.314)	(0.033)
Number of Non-HH kids (7-15)	0.393	0.310	0.083
	(0.806)	(0.710)	(0.073)
Marital Status = Polygamous	0.219	0.102	0.116***
	(0.413)	(0.304)	(0.037)
Marital Status = Monogamous	0.592	0.661	-0.069
	(0.492)	(0.475)	(0.045)
Household Size	6.543	5.323	1.221
	(3.093)	(2.410)	(0.279)
Household Head is Male	0.862	0.803	0.059*
	(0.345)	(0.399)	(0.032)
Ethnic Group = Kassena	0.554	0.591	-0.037
	(0.497)	(0.494)	(0.045)
Ethnic Group = Nankana	0.335	0.260	0.075*
	(0.472)	(0.440)	(0.043)
Ethnic Group = Mossi	0.071	0.087	-0.016
	(0.257)	(0.282)	(0.023)
Caste=Noble	0.571	0.575	-0.003
	(0.495)	(0.496)	(0.045)
Religion=Muslim	0.231	0.260	-0.029
	(0.422)	(0.440)	(0.038)
Religion=Christian	0.273	0.378	-0.105***
	(0.445)	(0.487)	(0.041)
Religion=Animist	0.485	0.354	0.131***
	(0.500)	(0.480)	(0.045)
Household Head is Educated	0.156	0.142	0.014
	(0.363)	(0.350)	(0.033)

Household Head Age	45.284	42.227	3.058**
	(14.524)	(14.975)	(1.322)
Household Head's Father is Educated	0.034	0.039	-0.005
	(0.182)	(0.195)	(0.017)
# Wives of Household Head's Father	2.247	2.214	0.033
	(1.950)	(1.849)	(0.177)
Household Head is Male	9.252	8.714	0.537
	(7.076)	(5.964)	(0.641)

Appendix Table 2: Sample Selection

	Education			Health
	Child Missing School Based Enrollment	Child Missing Attendance	Child Missing Achievement Test	Child Missing Anthropometrics
	(1)	(2)	(3)	(4)
Panel A: Round 3 (Mothers vs Fathers)				
Treatment	-0.002	-0.019	-0.072	-0.064
	(0.043)	(0.061)	(0.060)	(0.051)
CTF	-0.057	-0.051	0.018	0.053
	(0.038)	(0.048)	(0.036)	(0.047)
Panel B: Round 3 (Conditional vs Unconditional)				
Treatment	-0.003	-0.015	-0.071	-0.033
	(0.045)	(0.062)	(0.058)	(0.049)
UCT	-0.052	-0.054	0.016	-0.010
	(0.042)	(0.054)	(0.031)	(0.045)
Observations	4,525	4,525	4,525	1,640
Panel C: Round 3 (Mothers vs Fathers)				
Treatment	-0.052	0.012	0.005	-0.018
	(0.066)	(0.072)	(0.030)	(0.056)
CTF	-0.018	-0.061	0.019	0.067
	(0.026)	(0.039)	(0.025)	(0.042)
Panel D: Round 3 (Conditional vs Unconditional)				
Treatment	-0.048	0.007	0.019	0.026
	(0.065)	(0.072)	(0.031)	(0.055)
UCT	-0.025	-0.048	-0.010	-0.024
	(0.034)	(0.043)	(0.026)	(0.042)
Observations	4,358	4,358	4,358	2,324

Notes: Robust standard errors in brackets, clustered at the village level. * significant at 10%; ** significant at 5%; *** significant at 1%. The regressions use a modified specification from Equations 1 and 2 with the following dependent variables: column 1: a binary variable indicating whether a child is missing from the school administrative enrollment data; column 2: a binary variable indicating whether a child is missing from the school attendance records; column 3: a binary variable indicating whether a child did not take the Math and French achievement tests and columns 4-6 binary variable indicating whether the specific anthropometric measure was missing for a child. The treatment variable in Panels A and C measures the impact of cash transfers to mothers; in Panels B and D it measures the impact of conditional cash transfers. Data source: Nahouri Cash Transfers Pilot Project (NCTPP) Evaluation data from 2008-2010.

Appendix Table 3a: Inverse Probability Weighted Estimates of the Impact of Cash Transfers on Education

	Enrollment (school based)	**Enrollment (evidence)**	**Enrollment (parent report)**	**Unconditional Attendance**	**Current Grade**	**On track**	**Learning (Math/French)**	**Education index**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Round 3 (Mothers vs Fathers)								
Treatment	0.167***	0.107***	0.100***	0.178***	0.311***	0.106***	0.074**	0.246***
	(0.049)	(0.041)	(0.038)	(0.050)	(0.120)	(0.029)	(0.033)	(0.059)
CTF	-0.064**	-0.016	-0.043*	-0.061	-0.142*	-0.019	-0.053***	-0.093**
	(0.032)	(0.031)	(0.024)	(0.037)	(0.085)	(0.023)	(0.017)	(0.043)
Panel B: Round 3 (Conditional vs Unconditional)								
Treatment	0.167***	0.131***	0.109***	0.183***	0.301**	0.123***	0.047	0.255***
	(0.048)	(0.042)	(0.040)	(0.049)	(0.126)	(0.029)	(0.033)	(0.062)
UCT	-0.060**	-0.061**	-0.058**	-0.065*	-0.115	-0.049**	0.004	-0.105**
	(0.030)	(0.029)	(0.025)	(0.035)	(0.084)	(0.024)	(0.021)	(0.044)
Observations	3,382	3,382	3,382	3,141	3,382	3,382	2,152	3,382
Panel C: Round 2 (Mothers vs Fathers)								
Treatment	0.056*		0.025	-0.002	0.049	0.040*	0.007	0.046
	(0.033)		(0.031)	(0.038)	(0.090)	(0.021)	(0.021)	(0.048)
CTF	-0.014		-0.024	0.030	-0.069	-0.001	-0.015	-0.017
	(0.027)		(0.021)	(0.036)	(0.060)	(0.017)	(0.019)	(0.038)
Panel D: Round 2 (Conditional vs Unconditional)								
Treatment	0.034		-0.001	-0.012	0.031	0.036	0.001	0.021
	(0.037)		(0.033)	(0.040)	(0.097)	(0.023)	(0.021)	(0.051)
UCT	0.029		0.027	0.048	-0.029	0.005	-0.002	0.030
	(0.031)		(0.022)	(0.036)	(0.063)	(0.020)	(0.020)	(0.042)
Observations	3,233		3,233	3,002	3,233	3,233	2,344	3,233

Notes: Inverse probability weighted (IPW) estimates. Robust standard errors in brackets, clustered at the village level. * significant at 10%; ** significant at 5%; *** significant at 1%.

Appendix Table 3b: Inverse Probability Weighted Estimates of the Impact of Cash Transfers on Health

	Routine Health Clinique Visits	**C-reactive Protein (CRP)**	**Healthy last 30 days**	**Weight for Age Z-score**	**Arm Circumference for Age Z-score**	**Height for Age Z-score**	**Health index**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Round 3 (Mothers vs Fathers)							
Treatment	0.471***	0.096**	0.057*	-0.179	0.066	-0.029	0.094*
	(0.168)	(0.041)	(0.033)	(0.147)	(0.098)	(0.154)	(0.054)
CTF	-0.136	-0.041	0.015	0.151	0.064	0.106	0.023
	(0.163)	(0.039)	(0.020)	(0.099)	(0.102)	(0.113)	(0.051)
Panel B: Round 3 (Conditional vs Unconditional)							
Treatment	0.595***	0.085**	0.063*	-0.017	0.162	0.162	0.174***
	(0.184)	(0.040)	(0.033)	(0.151)	(0.101)	(0.148)	(0.054)
UCT	-0.380**	-0.016	0.003	-0.183*	-0.131	-0.282***	-0.138***
	(0.168)	(0.039)	(0.023)	(0.110)	(0.092)	(0.099)	(0.043)
Observations	1,720	1,164	1,640	1,135	1,078	1,065	1,640
Panel C: Round 2 (Mothers vs Fathers)							
Treatment			0.054**	0.126	0.113	0.285	0.103*
			(0.023)	(0.126)	(0.111)	(0.197)	(0.054)
CTF			0.000	0.244**	0.275***	0.049	0.099**
			(0.018)	(0.108)	(0.089)	(0.123)	(0.044)
Panel D: Round 2 (Conditional vs Unconditional)							
Treatment			0.060***	0.338**	0.256**	0.430**	0.185***
			(0.022)	(0.137)	(0.127)	(0.192)	(0.057)
UCT			-0.013	-0.192*	-0.023	-0.245**	-0.068
			(0.017)	(0.111)	(0.107)	(0.115)	(0.047)
Observations			2,324	1,678	1,609	1,569	2,324

Notes: Inverse probability weighted (IPW) estimates. Robust standard errors in brackets, clustered at the village level. * significant at 10%; ** significant at 5%; *** significant at 1%. Column 1 measures the number of routine preventive health clinic visits for each child during the past year. Column 2 reports the level of C-reactive protein, a biomarker that increases with inflammation in the body.

Appendix Table 4: Vaccinations. All kids 0-23 months

	Number of Vaccines	**All vaccines**	**BCG**	**TDP 1**	**TDP 2**	**TDP 3**
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Round 3 (Mothers vs Fathers)						
Treatment	1.444***	0.131***	0.132**	0.154***	0.120*	0.124**
	(0.472)	(0.042)	(0.064)	(0.060)	(0.062)	(0.051)
CTF	-0.807**	-0.067**	-0.071	-0.078*	-0.085*	-0.086**
	(0.342)	(0.033)	(0.044)	(0.047)	(0.047)	(0.043)
Panel B: Round 3 (Conditional vs Unconditional)						
Treatment	1.336***	0.119***	0.117*	0.155**	0.127**	0.114**
	(0.460)	(0.041)	(0.064)	(0.060)	(0.064)	(0.050)
UCT	-0.525	-0.039	-0.039	-0.072	-0.093**	-0.059
	(0.345)	(0.034)	(0.044)	(0.047)	(0.046)	(0.045)
Observations	917	917	660	733	756	787
Mean Control	5.528	0.352	0.696	0.562	0.552	0.515
P-value Treatment+CTF	0.220	0.162	0.376	0.229	0.613	0.484
P-value Treatment+UCT	0.125	0.080	0.250	0.190	0.602	0.323
Panel C: Round 2 (Mothers vs Fathers)						
Treatment	0.352	0.011	0.084	0.008	-0.002	-0.003
	(0.528)	(0.052)	(0.064)	(0.063)	(0.065)	(0.062)
CTF	-1.129***	-0.134***	-0.148***	-0.114**	-0.093*	-0.101*
	(0.409)	(0.046)	(0.054)	(0.054)	(0.055)	(0.053)
Panel D: Round 2 (Conditional vs Unconditional)						
Treatment	-0.369	-0.039	-0.029	-0.074	-0.079	-0.065
	(0.518)	(0.047)	(0.066)	(0.066)	(0.068)	(0.061)
UCT	0.359	-0.026	0.075	0.050	0.057	0.022
	(0.399)	(0.045)	(0.055)	(0.053)	(0.052)	(0.051)
Observations	992	992	660	755	788	830
Mean Control	5.736	0.338	0.646	0.573	0.538	0.491
P-value Treatment+CTF	0.154	0.020	0.334	0.118	0.193	0.129
P-value Treatment+UCT	0.987	0.261	0.492	0.715	0.759	0.536

Notes:

Appendix Table 4: Vaccinations. All kids 0-23 months (Continued)

	Polio 0	**Polio 1**	**Polio 2**	**Polio 3**	**Measles**	**Yellow**
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Round 3 (Mothers vs Fathers)						
Treatment	0.134**	0.177***	0.123**	0.146***	0.133***	0.133***
	(0.067)	(0.058)	(0.062)	(0.053)	(0.041)	(0.041)
CTF	-0.069	-0.110**	-0.104**	-0.097**	-0.083**	-0.078**
	(0.043)	(0.048)	(0.046)	(0.042)	(0.033)	(0.034)
Panel B: Round 3 (Conditional vs Unconditional)						
Treatment	0.123*	0.175***	0.127**	0.128**	0.117***	0.124***
	(0.067)	(0.059)	(0.064)	(0.052)	(0.040)	(0.040)
UCT	-0.044	-0.098**	-0.101**	-0.051	-0.044	-0.053
	(0.043)	(0.047)	(0.047)	(0.045)	(0.033)	(0.034)
Observations	657	701	739	776	901	902
Mean Control	0.688	0.598	0.579	0.508	0.365	0.365
P-value Treatment+CTF	0.358	0.297	0.780	0.384	0.280	0.241
P-value Treatment+UCT	0.264	0.213	0.692	0.192	0.115	0.131
Panel C: Round 2 (Mothers vs Fathers)						
Treatment	0.087	0.054	0.005	0.000	0.014	0.018
	(0.063)	(0.058)	(0.060)	(0.063)	(0.051)	(0.051)
CTF	-0.140***	-0.096*	-0.050	-0.063	-0.092**	-0.098**
	(0.053)	(0.050)	(0.053)	(0.050)	(0.044)	(0.044)
Panel D: Round 2 (Conditional vs Unconditional)						
Treatment	-0.010	-0.007	-0.043	-0.051	-0.016	-0.018
	(0.063)	(0.061)	(0.062)	(0.061)	(0.046)	(0.047)
UCT	0.054	0.027	0.044	0.037	-0.028	-0.021
	(0.053)	(0.051)	(0.048)	(0.045)	(0.041)	(0.041)
Observations	675	720	767	808	977	981
Mean Control	0.646	0.585	0.551	0.491	0.368	0.363
P-value Treatment+CTF	0.403	0.487	0.502	0.341	0.133	0.125
P-value Treatment+UCT	0.503	0.741	0.982	0.831	0.432	0.487

Appendix Table 5: Impact of Cash Transfers on Education and Health Outcomes, by Gender

	Education		Health	
	Education Index Boys	**Education Index Girls**	**Health Index Boys**	**Health Index Girls**
	(1)	(2)	(3)	(4)
Panel A: Round 3 (Mothers vs Fathers)				
Treatment	0.243***	0.245***	0.143**	0.045
	(0.067)	(0.068)	(0.065)	(0.063)
CTF	-0.101**	-0.088*	0.008	0.036
	(0.050)	(0.051)	(0.054)	(0.061)
Panel B: Round 3 (Conditional vs Unconditional)				
Treatment	0.224***	0.281***	0.209***	0.139**
	(0.068)	(0.073)	(0.069)	(0.062)
UCT	-0.062	-0.149***	-0.120**	-0.159***
	(0.054)	(0.048)	(0.051)	(0.052)
Observations	1,735	1,647	848	792
Mean Control	0.030	-0.041	-0.022	0.082
P-value Treatment+CTF	0.032	0.041	0.031	0.268
P-value Treatment+UCT	0.016	0.056	0.175	0.750
P-value CTM (Boys vs Girls)	0.9804		0.1487	
P-value CTF (Boys vs Girls)	0.8209		0.3317	
P-value CCT (Boys vs Girls)	0.3705		0.3269	
P-value UCT (Boys vs Girls)	0.6175		0.1105	
Panel C: Round 2 (Mothers vs Fathers)				
Treatment	0.063	0.025	0.180**	0.021
	(0.056)	(0.052)	(0.074)	(0.056)
CTF	-0.019	-0.020	0.076	0.115**
	(0.042)	(0.041)	(0.057)	(0.046)
Panel D: Round 2 (Conditional vs Unconditional)				
Treatment	0.034	0.005	0.234***	0.128**
	(0.060)	(0.055)	(0.076)	(0.059)
UCT	0.037	0.020	-0.036	-0.105**
	(0.047)	(0.044)	(0.057)	(0.050)
Observations	1,683	1,550	1,192	1,132
Mean Control	0.088	-0.097	-0.078	0.112
P-value Treatment+CTF	0.405	0.913	0.001	0.029
P-value Treatment+UCT	0.182	0.608	0.011	0.693
P-value CTM (Boys vs Girls)	0.4524		0.0296	
P-value CTF (Boys vs Girls)	0.4155		0.1187	
P-value CCT (Boys vs Girls)	0.5822		0.1457	
P-value UCT (Boys vs Girls)	0.3392		0.0248	

Notes:

Appendix Table 5a: P-values for Randomization Inference for Table 3 Education

	Enrollment (school based)	**Enrollment (evidence)**	**Enrollment (parent report)**	**Unconditional Attendance**	**Current Grade**	**On track**	**Learning (Math/French)**	**KLK Index**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Round 3 (main outcomes without education indeces)								
Treatment	0.000	0.010	0.006	0.000	0.009	0.000	0.042	0.001
CTF	0.054	0.628	0.073	0.100	0.093	0.425	0.002	0.036
Treatment	0.000	0.006	0.011	0.000	0.021	0.000	0.166	0.000
UCT	0.052	0.044	0.028	0.075	0.185	0.041	0.860	0.023
Panel B: Round 2 (main outcomes without education indeces)								
Treatment	0.104		0.437	0.967	0.610	0.069	0.733	0.346
CTF	0.592		0.231	0.433	0.259	0.932	0.426	0.646
Treatment	0.368		0.945	0.749	0.771	0.124	0.954	0.685
UCT	0.347		0.196	0.195	0.628	0.797	0.925	0.475

Notes:

Appendix Table 5b: P-values for Randomization Inference for Table 3 Education

	Enrollment (school based)	**Enrollment (evidence)**	**Enrollment (parent report)**	**Unconditional Attendance**	**Current Grade**	**On track**	**Learning (Math/French)**	**KLK Index**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Round 3								
			Father vs Mother					
CTF	0.025	0.05138	0.18525	0.010	0.162	0.000	0.490	0.013
CTM	0.001	0.01094	0.00694	0.001	0.010	0.001	0.043	0.002
			Unconditional vs Conditional					
CCT	0.000	0.00643	0.011	0.000	0.021	0.000	0.166	0.00044
UCT	0.023	0.10684	0.208	0.010	0.108	0.005	0.127	0.00794
Panel B: Round 2								
			Father vs Mother					
CTF	0.230		0.993	0.444	0.816	0.095	0.686	0.527
CTM	0.105		0.437	0.968	0.610	0.070	0.733	0.346
			Unconditional vs Conditional					
CCT	0.368		0.945	0.749	0.771	0.1242	0.954	0.685
UCT	0.064		0.386	0.335	0.990	0.062	0.970	0.266

Notes:

Appendix Table 6a: P-values for Randomization Inference for Table 4 Health

	Routine Health Clinique Visits	**C-reactive Protein (CRP)**	**Healthy last 30 days**	**Weight for Age Z-score**	**Arm Circumference for Age Z-score**	**Height for Age Z-score**	**KLK Index**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Round 3 (main outcomes without health indeces)							
Treatment	0.008	0.031	0.100	0.210	0.525	0.879	0.092
CTF	0.435	0.305	0.475	0.132	0.542	0.329	0.639
Treatment	0.003	0.053	0.081	0.888	0.127	0.266	0.003
UCT	0.025	0.680	0.895	0.086	0.134	0.005	0.000
Panel B: Round 2 (main outcomes without health indeces)							
Treatment			0.026	0.325	0.328	0.155	0.066
CTF			0.992	0.022	0.002	0.694	0.028
Treatment			0.006	0.023	0.047	0.029	0.006
UCT			0.439	0.095	0.841	0.043	0.157

Notes:

Appendix Table 6b: P-values for Randomization Inference for Table 4 Health

	Routine Health Clinique Visits	C-reactive Protein (CRP)	Healthy last 30 days	Weight for Age Z-score	Arm Circumference for Age Z-score	Height for Age Z-score	KLK Index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Round 3							
			Father vs Mother				
CTF	0.072	0.277	0.026	0.827	0.326	0.645	0.048
CTM	0.007	0.030	0.100	0.210	0.524	0.878	0.092
			Unconditional vs Conditional				
CCT	0.003	0.053	0.081	0.888	0.127	0.266	0.003
UCT	0.177	0.159	0.059	0.197	0.812	0.508	0.525
Panel B: Round 2							
			Father vs Mother				
CTF			0.028	0.005	0.001	0.079	0.004
CTM			0.025	0.325	0.328	0.155	0.065
			Unconditional vs Conditional				
CCT			0.006	0.023	0.047	0.029	0.006
UCT			0.056	0.219	0.024	0.294	0.036

Notes:

Appendix Table 7a: P-values for Randomization Inference for Table 5 Outcomes

	Energy Source	**Metal Roof**	**Concrete Walls**	**Improved Water Source**	**KLK Index**
	(1)	(2)	(3)	(4)	(5)
Panel A: Round 3					
Treatment	0.212	0.382	0.815	0.448	0.283
CTF	0.028	0.074	0.240	0.072	0.154
Treatment	0.981	0.575	0.325	0.217	0.323
UCT	0.297	0.038	0.009	0.024	0.004
Panel B: Round 2					
Treatment	0.794	0.671	0.205	0.409	0.254
CTF	0.008	0.665	0.307	0.385	0.022
Treatment	0.727	0.847	0.722	0.295	0.712
UCT	0.480	0.344	0.161	0.001	0.112

Notes:

Appendix Table 7b: P-values for Randomization Inference for Table 5 Outcomes

	Energy Source	**Metal Roof**	**Concrete Walls**	**Improved Water Source**	**KLK Index**
	(1)	(2)	(3)	(4)	(5)
Panel A: Round 3					
		Father vs Mother			
CTF	0.611	0.675	0.283	0.331	0.789
CTM	0.213	0.383	0.815	0.448	0.284
		Unconditional vs Conditional			
CCT	0.981	0.575	0.325	0.217	0.323
UCT	0.415	0.303	0.004	0.347	0.050
Panel B: Round 2					
		Father vs Mother			
CTF	0.233	0.415	0.566	0.988	0.599
CTM	0.793	0.670	0.204	0.408	0.253
		Unconditional vs Conditional			
CCT	0.727	0.847	0.722	0.295	0.712
UCT	0.464	0.254	0.135	0.066	0.397

Notes:

Appendix Table 8a: P-values for Randomization Inference for Table 6 Outcomes

	Tropical Livestock Units	**Number of Goats**	**Number of Chickens**	**Number of Cows**	**Value of red sorghum, white sorghum, millet produced**	**Value of peanuts produced**	**Owns business**	**KLK Index**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Round 3								
Treatment	0.033	0.035	0.501	0.055	0.104	0.497	0.976	0.038
CTF	0.312	0.180	0.820	0.180	0.733	0.800	0.450	0.147
Treatment	0.058	0.149	0.736	0.355	0.674	0.956	0.858	0.214
UCT	0.506	0.907	0.071	0.501	0.136	0.195	0.212	0.477
Panel B: Round 2								
Treatment	0.133	0.933	0.756	0.075	0.870	0.004	0.359	0.765
CTF	0.331	0.642	0.357	0.423	0.402	0.011	0.755	0.826
Treatment	0.944	0.487	0.255	0.939	0.479	0.068	0.084	0.438
UCT	0.081	0.406	0.371	0.014	0.037	0.560	0.059	0.026

Notes:

Appendix Table 8b: P-values for Randomization Inference for Table 6 Outcomes

	Tropical Livestock Units	**Number of Goats**	**Number of Chickens**	**Number of Cows**	**Value of red sorghum, white sorghum, millet produced**	**Value of peanuts produced**	**Owns business**	**KLK Index**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Round 3								
			Father vs Mother					
CTF	0.042	0.372	0.700	0.535	0.370	0.667	0.440	0.286
CTM	0.032	0.034	0.501	0.054	0.103	0.497	0.975	0.037
			Unconditional vs Conditional					
CCT	0.058	0.149	0.736	0.355	0.674	0.956	0.85779	0.214
UCT	0.044	0.159	0.211	0.126	0.036	0.238	0.32975	0.056
Panel B: Round 2								
			Father vs Mother					
CTF	0.856	0.545	0.210	0.510	0.560	0.489	0.257	0.825
CTM	0.133	0.933	0.756	0.075	0.870	0.004	0.359	0.765
			Unconditional vs Conditional					
CCT	0.944	0.487	0.255	0.939	0.479	0.068	0.084	0.438
UCT	0.057	0.915	0.795	0.017	0.206	0.183	0.769	0.211

Notes:

Appendix Table 9a: P-values for Randomization Inference for Table 7 Outcomes

	Total Assets	**Bikes**	**Inter-HH Transfers Net**	**Any Savings**	**KLK Index**
	(1)	(2)	(3)	(4)	(5)
Panel A: Round 3					
Treatment	0.470	0.759	0.803	0.413	0.168
CTF	0.853	0.827	0.753	0.791	0.753
Treatment	0.308	0.865	0.387	0.220	0.033
UCT	0.455	0.455	0.355	0.452	0.012
Panel B: Round 2					
Treatment	0.370	0.040	0.673	0.540	0.494
CTF	0.096	0.653	0.071	0.436	0.824
Treatment	0.488	0.008	0.671	0.874	0.174
UCT	0.389	0.010	0.947	0.693	0.024

Notes:

Appendix Table 9b: P-values for Randomization Inference for Table 7 Outcomes

	Total Assets	**Bikes**	**Inter-HH Transfers Net**	**Any Savings**	**KLK Index**
	(1)	(2)	(3)	(4)	(5)
Panel A: Round 3					
	Father vs Mother				
CTF	0.614	0.618	0.585	0.295	0.296
CTM	0.470	0.758	0.802	0.413	0.168
	Unconditional vs Conditional				
CCT	0.308	0.865	0.387	0.220	0.033
UCT	0.844	0.523	0.956	0.542	0.822
Panel B: Round 2					
	Father vs Mother				
CTF	0.807	0.299	0.189	0.996	0.599
CTM	0.370	0.040	0.673	0.540	0.494
	Unconditional vs Conditional				
CCT	0.488	0.008	0.671	0.874	0.174
UCT	0.977	0.816	0.795	0.615	0.824

Notes:

Appendix Table 10a: P-values for Randomization Inference for Table 8 Outcomes

	Number of Children	**Number of non-biological children ages 0-2**	**Number of non-biological children ages 7-15**	**Polygamous**	**Demographic Index**
	(1)	(2)	(3)	(4)	(5)
Panel A: Round 3					
Treatment	0.004	0.009	0.920	0.092	0.005
CTF	0.167	0.168	0.641	0.569	0.114
Treatment	0.430	0.144	0.192	0.624	0.432
UCT	0.003	0.144	0.018	0.028	0.003
Panel B: Round 2					
Treatment	0.133	0.626	0.307	0.036	0.715
CTF	0.328	0.672	0.195	0.978	0.700
Treatment	0.177	0.205	0.576	0.195	0.992
UCT	0.370	0.242	0.836	0.180	0.178

Notes:

Appendix Table 10b: P-values for Randomization Inference for Table 8 Outcomes

	Number of Children	**Number of non-biological children ages 0-2**	**Number of non-biological children ages 7-15**	**Polygamous**	**Demographic Index**
	(1)	(2)	(3)	(4)	(5)
Panel A: Round 3					
CTF	0.127	0.145	0.617	0.196	0.178
CTM	0.005	0.010	0.921	0.093	0.006
CCT	0.430	0.144	0.192	0.624	0.432
UCT	0.001	0.004	0.414	0.010	0.001
Panel B: Round 2					
CTF	0.033	0.346	0.987	0.053	0.459
CTM	0.132	0.625	0.306	0.035	0.714
CCT	0.177	0.205	0.576	0.195	0.992
UCT	0.024	0.912	0.698	0.006	0.225

Notes: