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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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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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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 does not lead to significantly better child health or education outcomes, and there is evidence that money given to fathers improves young children's health, particularly during years of poor rainfall. Cash transfers to fathers also yields relatively more household investment in livestock, cash crops, and improved housing.

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

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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 recent 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).

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[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 2012; in Colombia see Attanasio et al. 2010; in Nicaragua see Maluccio and Flores 2005; Macours, Schady and Vakis 2012; 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 Ecuador 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 2010; in Nicaragua see Maluccio and Flores 2005; Macours, Schady, and Vakis 2012; 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).

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 no significant 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 years with poor harvests.

However, the gender of the transfer's recipient as well as the conditionality leads 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 strong contrasts, with cash given to mothers and fathers having similar impacts on child health and education. While giving cash to mothers seems slightly, but not significantly, better for education outcomes, giving cash to fathers leads to significantly better nutritional outcomes during years with low rainfall. Cash transfers given to fathers also lead to increased livestock ownership, higher agricultural production in cash crops, and relatively more investment in the household's equipment (electricity and metal roof).

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

[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 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.

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 (1.5 between 0 and 6 and 1.8 between 7 and 15).

61.3 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 49.1 percent. School attendance conditional on enrollment as measured from school rosters is higher at 98.3 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, 47.1% of the age-eligible children are in class. Education expenses per child are on average $9.54 per year and discretionary education expenditures (school supplies and parent association fees) are $4.71.

Among children younger than 5, 26.7 percent were stunted (2 standard deviations below the reference population for height-for-age), and 35.4 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 173 households per village. About 82 percent of households were eligible to receive transfers in each village. Mean household assets for poor households were 115,949 FCFA (around $279.4 USD), while for non-poor, non-eligible households it was 203,828 FCFA. 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 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]

[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 (20 versus 11%), less likely to own draft animals (64 versus 35%), less likely to own a motorcycle (55 versus 7%), less likely to own a radio (47 versus 33%), less likely to own a plow or cart (48 versus 35%), and less likely to have access to a latrine (10 versus 1%).

[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").

[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.

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. 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]

[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.

[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.

For each child under age seven, in the CCT and UCT programs, the mother or father would receive 4000 FCFA per year[12], distributed in four quarterly payments. For each child age 7 to 10 (or in grades 1 to 4 in the CCT villages), the mother or father would receive 8000 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 27,835 per year or the equivalent of $67 USD using the exchange rate at baseline. This corresponds to about to 7 percent of household total 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 transfer program is between the least and the most generous of the 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 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

[12] At baseline in 2008, the exchange rate was CFA 415 = $1 USD.

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}.

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 recipient 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

[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.

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. 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 2 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.

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 those regression results 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 (1.26 percent), and increases slightly when comparing the baseline and two-year follow-up survey (3.56 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 be smaller in size, 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.

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, learning and total hours of child labor. 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 official school receipt of registration documents (column 2). This additional evidence of school registration was only requested at our last survey round, round 3. 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 parental self-reports (column 3) and the school-based measure (column 1) is 0.80, it is 0.84 between the parental self-reports and the registration evidence provided by the households (columns 2 and 3) and 0.68 between columns 1 and 2.

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 measure in column 1, the coefficient estimates the impact of cash transfers to mothers as a 13.8 percentage point increase in enrollment. Compared to a mean of 38.3 percent of children enrolled in the control group, this corresponds to 36 percent improvement. The coefficients on the CTF indicator are negative but not significant, suggesting that the gender of the recipient did not matter much in terms of enrollment impacts. The p-values reported for "Treatment + CTF" also suggest a combined coefficient different from zero, implying that cash transfers given to father have a positive and

significant impact in increasing enrollment, except when using the measure asking parents to show evidence of enrollment (p-value: 0.135).[16]

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 encouraged school enrollment. The coefficient on the UCT indicator is negative for the 3 measures and significantly so for the first two, indicating than unconditional cash transfers were less effective than conditional transfers in increasing enrollment. This finding is confirmed when looking at the p-values reported got "Treatment + UCT": only for the school-based measure does the p-value suggest a combined coefficient statistically different than zero.

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 fathers and both conditional 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 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[17]: for each child, we compute the proportion of school days attended for the entire academic year. Children who are not enrolled

[16] 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).

[17] 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 be less reliable.

receive a zero value for attendance. The results are in line with the enrollment results: at round 3, all types of transfers increase school attendance and while the coefficients on CTF and UCT are negative, they are not significantly so. At round 2, transfers given to fathers and both conditional and unconditional cash transfers have an impact in improving attendance.

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 not statistically significant. However, the p-values on "treatment + CTF" and "treatment + UCT" suggest the impact of those transfers is not significantly different from zero.

In column 6 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 no effects of the cash transfers on learning. However, it is important to stress that even though there is no 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, 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 2011 and Benhassine et al. 2015 also find limited learning impacts in Cambodia and Morocco, respectively, but Baird, McIntosh, and Özler, 2011 document positive learning in Malawi).

Overall, we find positive impact of cash transfers on school enrollment, attendance and grade progression, but limited impacts on learning. Generally, we do not find significant differences according to the gender of the recipient, except for learning at round 2 where it seems better to give the transfers to mothers, even if there the impact is not significantly larger than zero. We find that the conditionality makes a significant difference in improving enrollment.

Finally, we test in column 7 the effect of the transfers on total hours of child labor. The survey collected information for each child about whether, during the two days preceding the survey when school was in session, the child engaged in different types of child labor activities in the household or on the farm, and if they participated in an activity, during what period of the day they did so. In this rural setting most people do not have watches, and we found during pre-testing of the survey instrument that asking about the period during the day for the activity, rather than the number of hours, was a more accurate way of understanding how a child's time is allocated. These time periods use the school schedule as a reference period and ask whether a child did a specific activity before school opened, during school hours, during school lunch break, after school closed, all day, or occasionally throughout the day. We use these periods to calculate the number of hours a child engaged in child labor activities.[18] The specific child labor activities we focus on in this paper include: household chores such as cooking, fetching water, sweeping, and doing dishes; tending to siblings or sick members; and engaging in farm labor.

We find few significant impacts of the cash transfers on child labor. At round 2, all coefficients are negative – pointing to a reduction in hours of child labor – but the coefficients are not statistically different from zero, except for unconditional cash transfers (p-value on treatment + UCT = 0.071). At round 3, similarly, there is no significant impact of the cash transfers on total hours of child labor (see the coefficients on "treatment" and the p-values reported), but the positive and significant coefficient on CTF implies that when given to fathers cash transfers leads to a larger number of hours worked than when given to mothers.

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 ill (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. While the comparison between transfers given to mothers and fathers does not yield any significant impact or difference, the comparison between

[18] Since the school day starts at 7:30am, ends at 5:00pm, and includes a lunch break of 2.5 hours during which children return home and another 30 minute break at school, we assign the following number of hours to correspond to each time period: 2 (before school opened), 6 (during school), 2 (during school lunch break), 2 (after school closed), 10 (all day), 0.5 (occasionally). To check the robustness of the correspondence between number of hours and time periods during the day, we also estimate several alternative variations, and results are consistent.

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 were directly 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 outcomes 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. Cash transfers to the mothers and conditional cash transfers decrease significantly the level of CRP indicating a reduction in infections. This effect is not present when the transfers are given to fathers and when they are unconditional and those differences across transfer types are 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 in 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 ill in the last 30 days as reported by the parents a measure of the general health of the children. The cash transfers appear to have an impact in reducing illness episodes. At round 2, that reduction does not vary according to the gender of the recipient, but CCTs have a statistically stronger impact than UCTs. At round 3, transfers to fathers are the only ones to reduce illness and the difference with transfers to mothers is statistically significant, while both CCTs and UCTs decrease children's illnesses.

Finally, we measure the effect of the cash transfers on anthropometrics in the last three columns 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, yields in 2010 are higher than the long run average yields, except peanuts with yield 0.05 standard deviations below the long run average.[19]

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 height-for-age and have an impact statistically greater than zero for arm circumference-for-age and height-for-age. 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[20]. 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 have a statistically stronger impact than UCTs on weight-for-age z-scores and they are improving arm circumference-for-age and height-for-age z-scores, while UCTs have no significant impacts on those measures.

[19] 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).

[20] 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.

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

In Table 5, we analyze the impact of the cash transfers on household livestock and agricultural outcomes, demographics, and various measures of household welfare. We measure livestock ownership in column 1 using tropical livestock units (TLU)[21] and in column 2 we investigate more specifically the ownership of chickens. In round 3, we find significant positive impacts of cash transfers to fathers on overall livestock holdings (Panel A, column 1) and specifically chickens (Panel A, column 2). The effects are significantly larger for cash given to fathers than mothers. Both conditional and unconditional cash transfers increase livestock holdings in round 3 (Panel B, column 1), and there is no statistical difference between the types of transfers. There is no impact of any transfer types on livestock in round 2.

Columns 3 and 4 focus on measures of household agricultural production. Column 3 analyzes the transfers' impact on the annual production of peanuts, while column 2 focuses on production of sorghum and millet. Peanuts are the main cash crop in the region, while sorghum and millet are staple crops that are more likely to be used for own consumption. Giving transfers to mothers reduces peanut production significantly in round 3 (results in round 2 are not statistically significant), while transfers given to fathers works in the opposite direction (the coefficient for CTF is statistically significant in both rounds). In round 3, UCT also leads to lower peanut production. For sorghum and millet production, unconditional cash transfers lead to higher production than conditional transfers in both rounds, and the impact is significantly greater than zero in round 2.

One emerging tendency from the Table 5 results is that when the transfers are given to fathers this leads to more investment in livestock and the cash crop peanuts. This might be one of the mechanisms explaining how giving cash to fathers rather than mothers seems to be more effective in improving children's nutritional status (at least in round 2) as reported in Table 4.

In column 5, we measure an individual's self-perception about their social position within society in Burkina Faso using the MacArthur Scale of Subjective Social Status. The indicator takes the value 1 if the respondent rates himself above the average social status in Burkina Faso.

[21] 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

We find a positive impact of cash transfers on self-reported perceptions of social status and the type of cash transfer does not seem to alter the results as there are no statistically significant differences between cash to mothers versus fathers or conditional versus unconditional.

Results in column 6 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 result appears to be driven by additional received child fostering and by a combination of increased fertility and reduced child mortality.[22]

In column 7, we measure the value of household assets defined as the purchased value of each asset owned by the household at the time of the survey.[23] We find a short-term effect in round 2 whereby cash transfers to mothers and conditional cash transfers led to an increase in asset values, although there is no significant difference with transfers to fathers or unconditional ones. There does not appear to be any beneficial longer-term effect as these increases in assets do not continue into round 3.

4.6. Impacts on Housing, Marriage, and Entrepreneurship

In an attempt to compare the impact of the Burkina Faso cash transfer pilot with results from other cash transfer projects, in Table 6, we analyze the effect of cash transfers on housing characteristics, marriage, and entrepreneurship. Despite other researchers finding impacts of cash transfer programs on similar outcomes (Blattman, Fiala, and Martinez 2014; Haushofer and Shapiro 2016), overall in this context of rural Burkina Faso, we do not find any consistent statistically significant impacts on these outcomes. Outcomes in columns 1-3 focus on characteristics about the household dwelling. 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. Cash transfers to fathers (as opposed to mothers) are more likely to increase access to household electricity, although the impact is significantly different from zero only in round 2. Results in column 2 show that there is no significant increase in the likelihood of households having a metal roof after receiving the transfers. Cash given to fathers does increase

[22] 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.

[23] These assets include typical items that rural households in Burkina Faso might own such as bicycles, mopeds, radios, beds, tables, chairs, pots and pans, and cell phones.

the likelihood relative to cash given to mothers, while unconditional transfers lowers the likelihood, but the overall impact is not statistically significant. Finally, unconditional transfers tend to do worse than conditional ones for improving whether the house walls are made of concrete (column 3).

In round 3, unconditional transfers lower the likelihood of the household head being divorced compared with conditional cash transfers, although the overall effect is not statistically different from zero at standard levels (p-value is 0.149). Column 5 investigates the impact on transfers received in the last year from other household members. We find no statistically significant impacts, but in round 3, recipients of UCTs were statistically less likely than CCT recipients to receive transfers from within their households.

Finally, in column 6, we measure entrepreneurship using the probability that someone in the household owns a business. In the context of rural Burkina Faso, these businesses are likely to still be small scale enterprises that could include tailors, masons, vendors, bakers, or hairdressers. Overall, we find no positive impact of any of the cash transfers on entrepreneurship, but we note that in round 2 the impact was significantly larger for UCTs than for CCTs.

4.7. Heterogeneous Effects by Child Gender

In Table 7, we revisit some of the main findings on children's outcomes and we investigate whether the impact varies according to the child's gender. We focus on the impacts on the school-based measure of enrollment, child labor, weight-for-age z-score, illness episodes in the last 30 days, and C-reactive protein, a biomarker of inflammation in the body. 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 enrollment measure (columns 1-2), at round 3 at which the strongest enrollment impacts were found for all children, we find that cash transfers given to mothers and conditional cash transfers increase enrollment for both boys and girls. Giving the cash transfers to fathers also increase significantly enrollment for both genders, but CTM outperforms CTF for boys, even though we cannot reject equality of the boys and girls coefficients for CTF (p-value 0.234). UCTs increase enrollment for boys, but not for girls: 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 et al., 2012a, 2012b; Akresh, de Walque, and Kazianga, 2013).

At round 2, when overall enrollment impacts were more muted because the cash transfers were introduced a few months late in the school year, we find that impacts on boys' enrollment could already be measured: the four types of transfers already lead to increases in enrollment for boys. We cannot however reject equality between the coefficients for boys and girls.

For child labor (columns 3-4), we confirm a reduction in child labor for UCTs, which is present both for boys and girls. At round 3, cash given to fathers lead to more child labor than when the transfers are given to mothers for both boys and girls, but compared to the control group, the increase is only statistically different than zero among girls.

For weight-for-age (columns 5-6), as observed earlier, most of the impacts are concentrated at round 2 in 2009 which was a more difficult year for agricultural production. Strikingly, all impacts are concentrated among boys: CTFs significantly improve weight-for-age and outperforms CTMs. Similarly, for boys, CCTs also outperforms UCTs and improves weight-for-age. None of these impacts and differences are statistically significant in the sample of girls. It is difficult to determine whether this result might be due to a preference for boys or to the fact that anthropometric outcomes tend to be lower for boys at those ages (see the lower means in the control groups for boys) and therefore that there is more room for improvement in the presence of an intervention.[24]

Illness in the last 30 days as reported by the parents offers interesting contrasts by child gender (columns 7-8). At round 2, for boys, cash given to mothers decreases illness episodes and outperforms CTFs. For girls, while CTMs and CTFs are not statistically different from each other, only CTFs lead to a significant reduction. For boys, both CCTs and UCTs lead to significant reductions in morbidity, but for girls only CCTs achieve such impact and the difference between both types of transfers is significant. At round 3, for boys, CTMs and CTFs have a similar impact in reducing illnesses, while for girls only transfers given to fathers lead to a reduction. For males, only CCTs reduce illnesses episodes and they outperform UCTs, while for girls only UCTs lead to a significant reduction (but the difference with CCTs is not statistically

[24] For pre-school age children in sub-Saharan Africa, the empirical evidence indicates that while malnutrition is widespread, girls are on average better off than boys. See Svedberg (1990) for an earlier analysis and Wamani et al. (2007) for a more recent analysis using DHS data. A similar pattern was found in Burkina Faso in an impact evaluation of school feeding programs (Kazianga, de Walque and Alderman 2014).

significant). Finally, for C reactive protein (CRP) in columns 9-10, a biomarker whose values rise when there is inflammation throughout the body and that we only collected at the final round, we also find that the impacts and differences are concentrated among boys: transfer to mothers and CCTs reduce CRP and CCTs significantly outperform UCTs. Those results from C reactive protein, an objective biomarker, are consistent with illness episodes reported by the parents, at least for boys.

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 7-15 children in columns 1-3, we perform a similar analysis for 0-5 children in columns 4-6 to 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 table 3, 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.[25]

[25] 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

4.9 Cost-Effectiveness

Table 8 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 Table 5 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 0.40 years of student participation and 0.72 years to cumulated years of education completed. In contrast, $100 spent on transfers to fathers add only about 0.29 years of student participation but have no statistically significant effect on cumulated years of education. The effects on child labor are not statistically significant for transfers to mothers nor for transfers to fathers. Taken together, these estimates imply that transfers to mothers are more cost-effective than transfers to fathers in improving education outcomes.

The results on health outcomes and household level outcomes are rather mixed. Transfers to mothers are more cost effective in improving the C-reactive protein measure, whereas transfers to fathers are more cost-effective in reducing the probability of a child being ill in the 30 days preceding the survey. For household level outcomes, transfers to mothers and to fathers are equally cost-effective in improving perceived own social status, but estimates clearly show that transfers to fathers are more cost effective than transfers to mothers in increasing livestock ownership.

Columns 3 and 4 contrast conditional cash transfers with unconditional cash transfers. Overall, conditional cash transfers are shown to be more cost-effective than unconditional cash transfers for all outcomes for which the point estimates are statically significant at the 10 percent

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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.

level, except for the incidence of illness for which the two transfer schemes are equally cost-effective.

We report the cost-effectiveness analysis for the second round (after one year of treatment) in columns 5-8. Transfers to fathers (column 6) are more cost-effective than transfers to mothers (column 5) in raising school participation. For child health outcomes, $100 spent on transfers to fathers increase standardized height-for-age by 1.93 standard deviations and standardized arm circumference-for-age by 1.69 standard deviations, but transfers to mothers have no significant effect on any of these two anthropometric measures. Transfers to mothers are, however, more cost-effective in reducing the incidence of illness in the last 30 days preceding the survey. Transfers to mothers are just as cost-effective as transfers to fathers on raising self-perceived social status. Overall, transfers to fathers and to mothers are equally cost-effective after one year treatment. One should, however, notice the late rollout of the program in the first year that we discussed above.

The last two columns (7 and 8) show cost-effectiveness analysis for conditional cash transfers and unconditional cash transfers. The figures in the first row indicate that $100 spent increase school participation by 0.25 years for CCT and by 0.30 years for UCT, implying that UCT are slightly more cost effective than CCT for school participation. Furthermore, UCT are more cost-effective in reducing child labor than CCT.

Turning to child health outcomes, our estimates imply that $100 spent on CCT reduce the probability of a child being reported ill by 0.29 and increase standardized height-for-age by 1.57 standard deviations. Each $100 spent on UCT, on the other hand, reduce the probability of a child being reported ill by 0.20 but have no significant effect on standardized height-for-age nor on standardized arm circumference-for-age.

The last three rows examine the cost-effectiveness on household level outcomes. CCT and UCT are equally cost-effective in improving perceived own social status. Moreover, each $100 spent on UCT increase household sorghum production by 85 kg. None of the two transfer schemes has a significant effect on livestock ownership. Hence, 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 (Caldes, Coady, and Maluccio 2006). 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 (2005) estimate the Mexican Progresa program cost-benefit at 0.03 additional years of student's 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 seems marginally 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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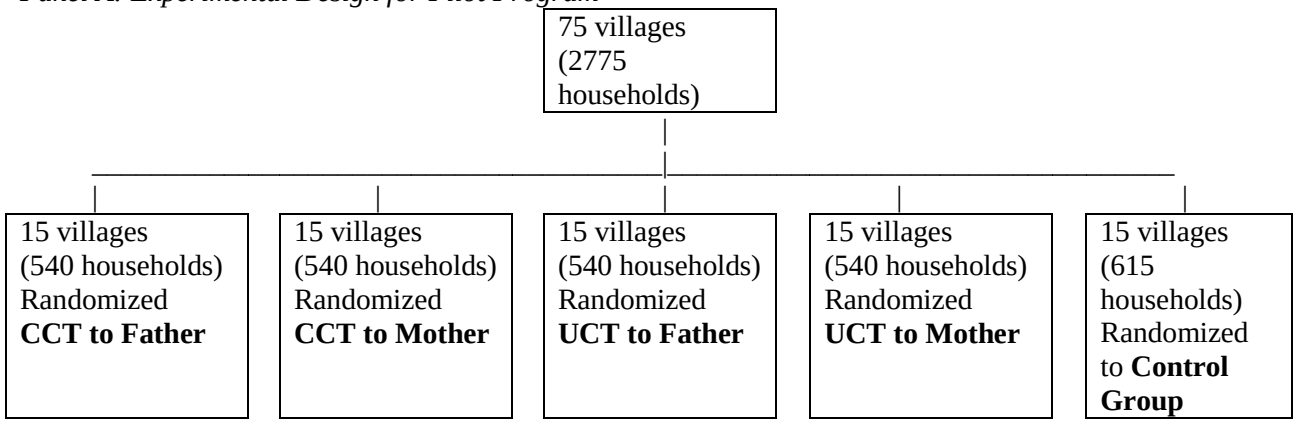
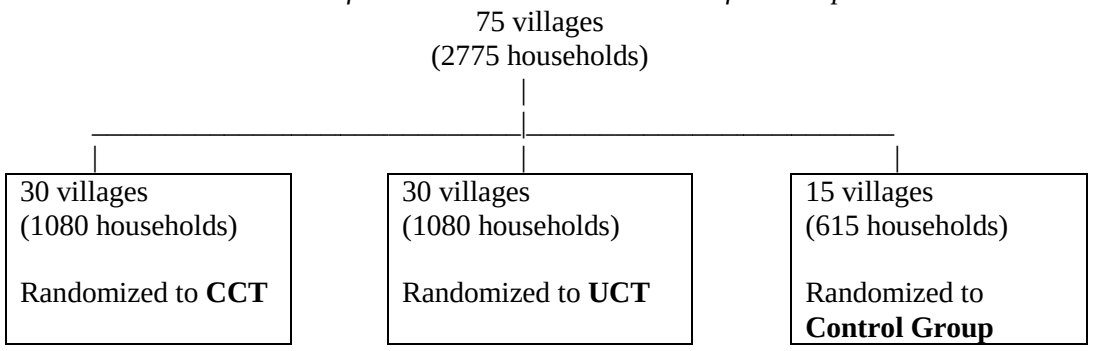
Figure 1: Summary of Treatment and Control Group Randomization Plan

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

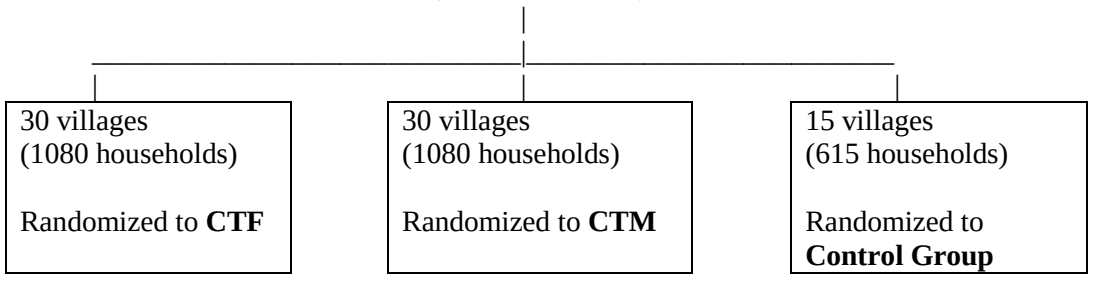


Table 1: Baseline Household Characteristics. Burkina Faso Nahouri Cash Transfers Pilot Project (NCTPP)

Variables	Mean	Standard Deviation
Household Size	6.482	3.073
Total Value Assets (FCFA)	115,949	271,689
Marital Status = Monogamous	0.595	0.491
Household Head is Male	0.858	0.349
Ethnic Group = Kassena	0.555	0.497
Ethnic Group = Nankana	0.330	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	0.156	0.363
Household Head Age	45.107	14.642
Household Head's Father is Educated	0.059	0.423
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)
Child Characteristics:										
Enrollment (School-based)	0.518	0.114	0.489	0.279	0.495	0.256	0.510	0.130	0.433	0.490
Enrollment (Parent Report)	0.643	0.200	0.600	0.620	0.602	0.609	0.641	0.196	0.574	0.518
Unconditional Attendance	0.486	0.257	0.477	0.291	0.471	0.371	0.492	0.192	0.421	0.736
Current Grade in School	1.871	0.392	1.882	0.305	1.809	0.645	1.948	0.099	1.728	0.574
Learning (Math/French)	0.382	0.133	0.384	0.096	0.380	0.161	0.380	0.067	0.345	0.364
Child Labor Hours	6.309	0.132	5.666	0.015	5.761	0.022	6.212	0.109	8.190	0.153
Weight-for-Age Z-score	-1.420	0.128	-1.328	0.313	-1.444	0.102	-1.302	0.376	-1.143	0.326
Arm circumference-for-Age Z-score	-0.523	0.364	-0.281	0.514	-0.383	0.970	-0.402	0.867	-0.377	0.392
Height-for-Age Z-score	-1.469	0.048	-1.309	0.280	-1.452	0.059	-1.318	0.251	-1.164	0.278
Ill Last 30 Days	0.097	0.718	0.078	0.724	0.094	0.785	0.080	0.792	0.087	0.594
Household Characteristics:										
Tropical Livestock Units	0.376	0.843	0.325	0.468	0.319	0.416	0.381	0.789	0.362	0.678
Number of Chickens Owned	2.757	0.714	2.261	0.408	2.283	0.454	2.724	0.751	2.544	0.790
Peanut Production (kg/year)	71.633	0.798	93.672	0.247	77.468	0.496	88.514	0.377	67.992	0.476
Sorghum/Millet Production (kg/year)	123.788	0.657	162.998	0.054	150.73	0.143	135.747	0.288	116.102	0.399
Social Status (MacArthur Scale)	0.111	0.546	0.105	0.477	0.100	0.384	0.117	0.659	0.135	0.482
Number of Children (ages 0-15)	3.345	0.188	3.570	0.011	3.483	0.039	3.434	0.076	3.098	0.116
Total Value Assets (FCFA)	114969	0.372	125799	0.077	125768	0.116	114800	0.319	100722	0.389

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
Household Characteristics										
Energy Source	0.071	0.539	0.118	0.900	0.152	0.574	0.037	0.183	0.109	0.157
House with Metal Roof	0.626	0.709	0.516	0.285	0.577	0.770	0.565	0.664	0.599	0.385
House with Concrete Walls	0.015	0.933	0.015	0.963	0.014	0.930	0.016	0.822	0.015	0.996
Marital Status = Divorce	0.029	0.862	0.028	0.724	0.032	0.927	0.026	0.536	0.031	0.929
Intrahousehold Transfers	5662	0.899	6209	0.750	6019	0.870	5878	0.963	5819	0.844
Owns a Business	0.629	0.019	0.622	0.010	0.643	0.029	0.608	0.007	0.776	0.073
Household Size	6.480	0.158	6.732	0.027	6.715	0.032	6.497	0.141	6.049	0.189
Marital Status = Monogamous	0.585	0.507	0.601	0.887	0.586	0.542	0.600	0.849	0.605	0.509
Household Head Is Male	0.843	0.982	0.882	0.174	0.861	0.545	0.864	0.472	0.844	0.366
Ethnic Group = Kassena	0.472	0.506	0.633	0.606	0.562	0.986	0.544	0.881	0.564	0.209
Ethnic Group = Nankana	0.434	0.632	0.207	0.239	0.327	0.784	0.313	0.704	0.366	0.134
Ethnic Group = Mossi	0.050	0.882	0.101	0.421	0.071	0.798	0.081	0.616	0.057	0.393
Caste = Noble	0.542	0.743	0.597	0.809	0.593	0.836	0.546	0.777	0.574	0.927
Religion = Muslim	0.238	0.657	0.239	0.666	0.218	0.921	0.260	0.425	0.211	0.917
Religion = Christian	0.293	0.867	0.247	0.269	0.250	0.352	0.289	0.797	0.302	0.469
Religion = Animist	0.457	0.805	0.501	0.786	0.521	0.634	0.437	0.611	0.478	0.701
Household Head Ever Enrolled	0.171	0.189	0.160	0.313	0.157	0.344	0.174	0.169	0.122	0.173
Household Head Age	45.441	0.951	44.628	0.519	45.738	0.740	44.315	0.387	45.367	0.184
Household Head's Father is Educated	0.058	0.565	0.067	0.379	0.079	0.191	0.047	0.975	0.047	0.617
# Wives of Household Head's Father	2.194	0.805	2.340	0.214	2.343	0.195	2.191	0.837	2.171	0.568
# Children of HH Head's Father	9.151	0.874	9.392	0.580	9.458	0.497	9.083	0.987	9.075	0.875

Table 3: Impact of Cash Transfers on Educational Outcomes

	Enrollment (school based)	Enrollment (evidence)	Enrollment (parent report)	Unconditional Attendance	Current Grade	Learning (Math/French)	Child Labor (Hours)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Round 3 (Mothers vs Fathers)							
Treatment	0.138***	0.079*	0.084**	0.143***	0.245**	0.040	-0.397
	(0.046)	(0.043)	(0.035)	(0.051)	(0.124)	(0.030)	(0.857)
CTF	-0.040	-0.012	-0.022	-0.037	-0.117	-0.030	1.667***
	(0.032)	(0.031)	(0.026)	(0.036)	(0.094)	(0.019)	(0.601)
Panel B: Round 3 (Conditional vs Unconditional)							
Treatment	0.147***	0.108**	0.090**	0.156***	0.245**	0.033	0.746
	(0.047)	(0.044)	(0.037)	(0.051)	(0.121)	(0.027)	(1.086)
UCT	-0.059*	-0.068**	-0.034	-0.062	-0.123	-0.017	-0.441
	(0.033)	(0.033)	(0.028)	(0.040)	(0.085)	(0.022)	(0.728)
Observations	3,060	3,060	3,060	2,902	3,060	2,663	3,060
Mean Control Group	0.383	0.444	0.616	0.338	1.856	0.431	5.144
P-value Treatment + CTF	0.030	0.135	0.085	0.028	0.265	0.443	0.202
P-value Treatment + UCT	0.041	0.336	0.107	0.048	0.275	0.104	0.730
Panel C: Round 2 (Mothers vs Fathers)							
Treatment	0.083		0.033	0.073	0.053	0.038	-1.682
	(0.052)		(0.032)	(0.050)	(0.080)	(0.024)	(1.160)
CTF	0.015		-0.034	0.049	-0.049	-0.044**	-0.119
	(0.045)		(0.022)	(0.048)	(0.055)	(0.020)	(0.740)
Panel D: Round 2 (Conditional vs Unconditional)							
Treatment	0.077*		-0.003	0.079*	0.032	0.013	-1.506
	(0.044)		(0.034)	(0.044)	(0.083)	(0.023)	(1.198)
UCT	0.028		0.037*	0.039	-0.009	0.004	-0.225
	(0.040)		(0.020)	(0.045)	(0.063)	(0.023)	(0.718)
Observations	2,919		2,919	2,744	2,919	2,842	2,919
Mean Control Group	0.352		0.595	0.306	1.799	0.392	7.282
P-value Treatment + CTF	0.018		0.986	0.002	0.956	0.569	0.157
P-value Treatment + UCT	0.030		0.326	0.008	0.783	0.750	0.103

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 Outcomes

	Routine Health Clinic Visits	C-reactive Protein (CRP)	Ill Last 30 Days	Weight for Age Z-score	Arm Circumference for Age Z-score	Height for Age Z-score
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Round 3 (Mothers vs Fathers)						
Treatment	0.365	-3.693*	-0.036	-0.027	0.087	0.002
	(0.254)	(1.912)	(0.031)	(0.135)	(0.115)	(0.136)
CTF	-0.220	2.095	-0.040*	-0.045	0.091	0.089
	(0.195)	(1.639)	(0.024)	(0.121)	(0.099)	(0.115)
Panel B: Round 3 (Conditional vs Unconditional)						
Treatment	0.550**	-4.723**	-0.060*	-0.016	0.158	0.116
	(0.245)	(1.866)	(0.036)	(0.156)	(0.119)	(0.131)
UCT	-0.628***	4.254**	0.006	-0.075	-0.061	-0.157
	(0.204)	(1.982)	(0.037)	(0.150)	(0.091)	(0.130)
Observations	2,167	1,440	1,506	1,002	943	959
Mean Control	0.879	16.102	0.195	-1.119	-0.872	-1.434
P-value Treatment +CTF	0.550	0.439	0.012	0.641	0.189	0.522
P-value Treatment +UCT	0.737	0.831	0.087	0.545	0.457	0.777
Panel C: Round 2 (Mothers vs Fathers)						
Treatment			-0.059**	0.027	0.160	0.178
			(0.023)	(0.152)	(0.169)	(0.182)
CTF			0.004	0.229**	0.205	0.215*
			(0.017)	(0.116)	(0.143)	(0.119)
Panel D: Round 2 (Conditional vs Unconditional)						
Treatment			-0.073***	0.248	0.315*	0.334*
			(0.022)	(0.171)	(0.172)	(0.179)
UCT			0.034**	-0.230*	-0.108	-0.101
			(0.016)	(0.134)	(0.146)	(0.139)
Observations			2,067	1,441	1,364	1,368
Mean Control			0.160	-1.172	-0.730	-1.710
P-value Treatment +CTF			0.107	0.136	0.024	0.033
P-value Treatment +UCT			0.089	0.905	0.185	0.204

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. Data source: Nahouri Cash Transfers Pilot Project (NCTPP) Evaluation data from 2008-2010.

Table 5: Impacts of Cash Transfers on Livestock, Agriculture, Demographics, and Welfare

	Tropical Livestock Units	Chickens	Peanuts (kg/year)	Sorghum/millet (kg/year)	Social Status (MacArthur Scale)	Number of Children	Assets (FCFA)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Round 3 (Mothers vs Fathers)							
Treatment	0.009	-0.081	-21.220*	4.261	0.026	0.275***	-1,374.29
	(0.023)	(0.220)	(12.009)	(19.492)	(0.023)	(0.098)	(3,033.20)
CTF	0.075***	0.521**	32.483**	9.814	0.028	-0.175*	1,016.29
	(0.029)	(0.212)	(15.915)	(21.701)	(0.025)	(0.101)	(3,644.29)
Panel B: Round 3 (Conditional vs Unconditional)							
Treatment	0.047*	0.149	12.886	-13.165	0.047**	0.022	-2,283.62
	(0.028)	(0.251)	(16.296)	(21.297)	(0.022)	(0.092)	(3,312.30)
UCT	0.000	0.062	-34.301**	43.546*	-0.015	0.342***	2,949.29
	(0.032)	(0.222)	(17.445)	(24.265)	(0.024)	(0.084)	(3,780.63)
Observations	2,994	2,994	2,994	2,994	4,985	2,294	2,257
Mean Control Group	0.225	1.702	110.677	184.220	0.052	3.343	124,360.60
P-value Treatment +CTF	0.001	0.049	0.476	0.504	0.024	0.268	0.928
P-value Treatment +UCT	0.060	0.316	0.098	0.127	0.171	0.000	0.593
Panel C: Round 2 (Mothers vs Fathers)							
Treatment	0.005	0.014	-17.624	7.493	0.047**	0.050	4,818.08**
	(0.022)	(0.210)	(17.584)	(21.197)	(0.019)	(0.057)	(2,063.65)
CTF	-0.008	-0.079	34.556**	17.401	-0.001	0.066	-78.43
	(0.024)	(0.207)	(14.124)	(23.675)	(0.021)	(0.043)	(2,654.69)
Panel D: Round 2 (Conditional vs Unconditional)							
Treatment	-0.018	-0.108	-5.966	-20.991	0.042**	0.050	5,233.73**
	(0.021)	(0.203)	(17.389)	(19.250)	(0.020)	(0.060)	(2,154.99)
UCT	0.038*	0.164	13.543	77.362***	0.011	0.069	-949.57
	(0.023)	(0.197)	(14.577)	(20.509)	(0.023)	(0.048)	(2,794.81)
Observations	3,042	3,042	3,042	3,042	5,132	2,362	2,308
Mean Control Group	0.190	1.469	122.039	190.561	0.031	3.259	113,234.50
P-value Treatment +CTF	0.902	0.761	0.293	0.801	0.037	0.268	0.110
P-value Treatment +UCT	0.330	0.790	0.632	0.014	0.015	0.068	0.534

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 6: Impact of Cash Transfers on Housing, Marriage, and Entrepreneurship

	Energy Source	**Metal Roof**	**Concrete Walls**	**Divorce**	**Intra-HH Transfers Received**	**Owns a Business**
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Round 3 (Mothers vs Fathers)						
Treat	-0.099	-0.039	0.012	-0.005	-391.79	-0.008
	(0.082)	(0.058)	(0.013)	(0.007)	(1,366.55)	(0.051)
CTF	0.110*	0.065*	-0.022	0.003	1,556.54	-0.050
	(0.058)	(0.036)	(0.015)	(0.006)	(1,219.50)	(0.044)
Panel B: Round 3 (Conditional vs Unconditional)						
Treat	-0.023	0.028	0.018	0.004	1,474.58	-0.002
	(0.082)	(0.054)	(0.014)	(0.008)	(1,707.19)	(0.050)
UCT	-0.044	-0.069**	-0.035**	-0.015***	-2,438.20**	-0.065
	(0.058)	(0.035)	(0.015)	(0.005)	(1,198.048)	(0.046)
Observations	2,270	2,256	2,261	2,295	5,005	2,295
Mean Control	0.333	0.627	0.025	0.029	7,559	0.664
P-value Treatment+CTF	0.896	0.621	0.355	0.839	0.508	0.267
P-value Treatment+UCT	0.412	0.457	0.077	0.149	0.483	0.215
Panel C: Round 2 (Mothers vs Fathers)						
Treat	-0.017	-0.015	-0.004	-0.004	152.02	-0.030
	(0.016)	(0.033)	(0.008)	(0.005)	(536.76)	(0.057)
CTF	0.053***	0.022	0.006	-0.000	-518.30	-0.025
	(0.020)	(0.028)	(0.007)	(0.004)	(322.69)	(0.036)
Panel D: Round 2 (Conditional vs Unconditional)						
Treat	0.002	0.011	0.004	-0.002	21.13	-0.079
	(0.018)	(0.036)	(0.008)	(0.005)	(525.99)	(0.056)
UCT	0.016	-0.033	-0.011*	-0.003	-307.23	0.076**
	(0.024)	(0.027)	(0.006)	(0.004)	(383.97)	(0.035)
Observations	2,349	2,305	2,319	2,362	4,746	2,362
Mean Control	0.027	0.589	0.017	0.027	4,497	0.752
P-value Treatment+CTF	0.068	0.858	0.823	0.457	0.476	0.327
P-value Treatment+UCT	0.370	0.498	0.397	0.301	0.604	0.946

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 7: Impact of Cash Transfers, By Child Gender (Round 3)

	Enrollment (school based)		Child Labor (Hours)		Weight-for-Age Z-score		Ill Last 30 Days		C-Reactive Protein	
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Round 3 (Mothers vs Fathers)										
Treatment	0.153***	0.118**	-0.354	0.322	0.247	-0.182	-0.082**	0.007	-6.757***	-0.243
	(0.043)	(0.058)	(0.868)	(1.134)	(0.157)	(0.181)	(0.035)	(0.049)	(2.325)	(2.238)
CTF	-0.061*	-0.016	1.485**	1.702**	-0.196	0.156	0.014	-0.092***	2.778	1.302
	(0.034)	(0.037)	(0.647)	(0.839)	(0.128)	(0.139)	(0.028)	(0.036)	(2.151)	(2.080)
Panel B: Round 3 (Conditional vs Unconditional)										
Treatment	0.131***	0.165***	0.333	1.569	0.230	-0.118	-0.117***	-0.006	-8.040***	-1.226
	(0.045)	(0.059)	(1.102)	(1.242)	(0.161)	(0.188)	(0.034)	(0.051)	(2.427)	(2.144)
UCT	-0.022	-0.102***	0.093	-0.686	-0.173	0.027	0.084**	-0.076	5.240**	3.521
	(0.037)	(0.039)	(0.776)	(0.933)	(0.147)	(0.191)	(0.035)	(0.047)	(2.177)	(2.625)
Observations	1,567	1,493	1,687	1,558	518	484	761	745	745	695
Mean Control	0.403	0.366	3.862	6.364	-1.295	-0.911	0.230	0.156	17.311	14.834
P-value Treatment+CTF	0.026	0.076	0.268	0.089	0.747	0.891	0.073	0.040	0.176	0.725
P-value Treatment+UCT	0.008	0.239	0.640	0.459	0.742	0.649	0.395	0.055	0.301	0.322
P-value Treatment (Boys vs Girls)	0.444		0.444		0.074		0.121		0.025	
P-value Treatment + CTF (Boys vs Girls)	0.234		0.120		0.431		0.516		0.169	
P-value Treatment (Boys vs Girls)	0.469		0.143		0.186		0.024		0.024	
P-value Treatment + UCT (Boys vs Girls)	0.851		0.497		0.186		0.827		0.107	

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, as well as the controls described under Table 3 for the education outcomes and under Table 4 for the health outcomes. 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. We also present p-values testing whether treatment is equal across the boys and girls regressions and whether treatment + CTF or treatment + UCT are equal across the boys and girls regressions. Data source: Nahouri Cash Transfers Pilot Project (NCTPP) Evaluation data from 2008-2010.

Table 7 (continued): Impact of Cash Transfers, By Child Gender (Round 2)

	Enrollment (school based)		Child Labor (hours)		Weight-for-Age Z-score		Ill last 30 days	
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel C: Round 2 (Mothers vs Fathers)								
Treatment	0.098*	0.061	-1.376	-1.977	0.143	-0.106	-0.095***	-0.021
	(0.053)	(0.059)	(0.979)	(1.489)	(0.166)	(0.191)	(0.036)	(0.022)
CTF	0.012	0.018	-0.116	-0.152	0.325***	0.134	0.037*	-0.026
	(0.044)	(0.049)	(0.647)	(0.990)	(0.123)	(0.160)	(0.022)	(0.024)
Panel D: Round 2 (Conditional vs Unconditional)								
Treatment	0.081*	0.069	-1.301	-1.932	0.421**	0.051	-0.084**	-0.060***
	(0.046)	(0.050)	(1.017)	(1.575)	(0.167)	(0.206)	(0.036)	(0.020)
UCT	0.048	0.004	-0.279	-0.258	-0.260*	-0.190	0.019	0.053**
	(0.039)	(0.046)	(0.591)	(1.023)	(0.150)	(0.171)	(0.019)	(0.023)
Observations	1,519	1,400	1,720	1,500	740	701	1,041	1,026
Mean Control	0.394	0.313	5.558	9.090	-1.485	-0.836	0.186	0.135
P-value Treatment+CTF	0.012	0.091	0.135	0.134	0.010	0.887	0.107	0.031
P-value Treatment+UCT	0.010	0.176	0.091	0.094	0.379	0.459	0.063	0.754
P-value Treatment (Boys vs Girls)	0.365		0.550		0.237		0.052	
P-value Treatment + CTF (Boys vs Girls)	0.964		0.238		0.266		0.339	
P-value Treatment (Boys vs Girls)	0.740		0.555		0.061		0.518	
P-value Treatment + UCT (Boys vs Girls)	0.829		0.202		0.252		0.079	

Table 8: 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 (1)	**Father** (2)	**CCT** (3)	**UCT** (4)	**Mother** (5)	**Father** (6)	**CCT** (7)	**UCT** (8)
Education								
Enrollment	0.40	0.29	0.51	0.23		0.30	0.25	0.30
Current Grade	0.72		0.85					
Health								
Routine Health Clinic Visits			2.62		N/A	N/A	N/A	N/A
C-Reactive Protein	-19.04		-22.50		N/A	N/A	N/A	N/A
Illness		-0.39	-0.29	-0.30	-0.29		-0.34	-0.20
Height-for-age Z-score						1.93	1.57	
Arm circumference-for-age Z-score						1.69	1.48	
Household								
Tropical Livestock Units		0.13	0.09	0.07				
Social Status (MacArthur scale)		0.16	0.14		0.14	0.14	0.13	0.15
Sorghum/millet								85.23

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. Data source: Nahouri Cash Transfers Pilot Project (NCTPP) evaluation data from 2008-2010.

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

	Non-Attritors (N=2749)	Attritors (N=127)	Mean Difference
Child Characteristics			
Enrollment (School-based)	0.492	0.443	0.049
	(0.008)	(0.053)	(0.054)
Enrollment (Parent Report)	0.615	0.540	0.075
	(0.007)	(0.047)	(0.046)
Unconditional Attendance	0.472	0.430	0.042
	(0.008)	(0.053)	(0.053)
Current Grade in School	1.849	1.954	-0.105
	(0.033)	(0.209)	(0.214)
Learning (Math/French)	0.376	0.396	-0.020
	(0.004)	(0.027)	(0.028)
Child Labor Hours	6.379	5.378	1.001
	(0.174)	(0.848)	(1.142)
Weight-for-Age Z-score	-1.342	-1.235	-0.107
	(0.030)	(0.118)	(0.134)
Arm Circumference-for-Age Z-score	-0.622	-0.651	0.030
	(0.025)	(0.112)	(0.115)
Height-for-Age Z-score	-1.621	-1.419	-0.202
	(0.037)	(0.161)	(0.172)
Ill Last 30 Days	0.069	0.096	-0.028
	(0.005)	(0.028)	(0.024)
Household Characteristics:			
Tropical Livestock Units	0.354	0.324	0.030
	(0.017)	(0.041)	(0.081)
Number of Chickens Owned	2.529	2.128	0.401
	(0.158)	(0.292)	(0.753)
Peanut Production (kg/year)	76.968	133.378	-56.410
	(8.336)	(73.721)	(42.566)
Sorghum/Millet Production (kg/year)	138.147	116.890	21.258
	(4.282)	(14.199)	(20.588)
Social Status (MacArthur Scale)	0.114	0.096	0.018
	(0.004)	(0.018)	(0.020)
Number of Children (0-15)	3.408	2.738	0.670***
	(0.039)	(0.146)	(0.181)
Total Value Assets (FCFA)	118272.9	66736.1	51536.8**
	(5,457.1)	(6,364.4)	(25,156.7)

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=2749)	Attritors (N=127)	Mean Difference
Energy Source	0.095	0.168	-0.073***
	(0.006)	(0.034)	(0.027)
House with Metal Roof	0.578	0.568	0.010
	(0.010)	(0.044)	(0.045)
House with Concrete Walls	0.016	0.000	0.016
	(0.002)	(0.000)	(0.011)
Marital Status = Divorce	0.027	0.063	-0.036**
	(0.003)	(0.022)	(0.015)
Intrahousehold Transfers	5904.020	6636.000	-731.980
	(179.856)	(895.194)	(913.196)
Owns a Business	0.658	0.693	-0.035
	(0.009)	(0.041)	(0.043)
Household Size	6.538	5.323	1.215***
	(0.060)	(0.214)	(0.278)
Marital Status = Monogamous	0.592	0.661	-0.069
	(0.010)	(0.042)	(0.045)
Household Head is Male	0.862	0.795	0.066**
	(0.007)	(0.036)	(0.032)
Ethnic Group = Kassena	0.554	0.591	-0.037
	(0.010)	(0.044)	(0.045)
Ethnic Group = Nankana	0.334	0.260	0.260*
	(0.009)	(0.039)	(0.043)
Ethnic Group = Mossi	0.071	0.087	-0.016
	(0.005)	(0.025)	(0.023)
Caste = Noble	0.571	0.575	-0.004
	(0.010)	(0.044)	(0.045)
Religion = Muslim	0.231	0.260	-0.029
	(0.008)	(0.039)	(0.038)
Religion = Christian	0.272	0.378	-0.106***
	(0.009)	(0.043)	(0.041)
Religion = Animist	0.485	0.354	0.131***
	(0.010)	(0.426)	(0.045)
Household Head Ever Enrolled	0.156	0.142	0.015
	(0.007)	(0.031)	(0.033)
Household Head Age	45.249	42.181	3.068**
	(0.285)	(1.332)	(1.329)
Household Head's Father is Educated	0.058	0.079	-0.021
	(0.008)	(0.047)	(0.039)
# Wives of Household Head's Father	2.247	2.214	0.033
	(0.038)	(0.165)	(0.177)
# Children of Household Head's Father	9.252	8.714	0.538
	(0.139)	(0.531)	(0.641)

Appendix Table 2: Sample Selection

	Education			Health		
	Child Missing School Based Enrollment	Child Missing Attendance	Child Missing Achievement Test	Child Missing Height-for-Age Z-score	Child Missing Weight-for-Age Z-score	Child Missing Arm Circumference-for-Age Z-score
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Round 3 (Mothers vs Fathers)						
Treatment	0.023	-0.001	-0.057	0.027	0.011	0.025
	(0.045)	(0.060)	(0.057)	(0.066)	(0.064)	(0.063)
CTF	-0.070	-0.059	0.017	0.026	0.032	0.033
	(0.043)	(0.052)	(0.033)	(0.042)	(0.041)	(0.042)
Panel B: Round 3 (Conditional vs Unconditional)						
Treatment	0.014	-0.005	-0.056	0.024	0.004	0.016
	(0.045)	(0.060)	(0.057)	(0.068)	(0.064)	(0.064)
UCT	-0.055	-0.053	0.016	0.032	0.044	0.048
	(0.042)	(0.052)	(0.033)	(0.042)	(0.041)	(0.043)
Observations	4,126	4,126	4,126	1,506	1,506	1,506
Panel C: Round 2 (Mothers vs Fathers)						
Treatment	-0.070	-0.059	0.010	0.045	0.061	0.055
	(0.060)	(0.080)	(0.039)	(0.065)	(0.058)	(0.064)
CTF	-0.023	-0.057	-0.011	0.005	0.006	0.006
	(0.029)	(0.041)	(0.030)	(0.042)	(0.040)	(0.038)
Panel D: Round 2 (Conditional vs Unconditional)						
Treatment	-0.068	-0.057	0.008	0.022	0.034	0.038
	(0.060)	(0.079)	(0.036)	(0.065)	(0.056)	(0.063)
UCT	-0.027	-0.063	-0.007	0.044	0.053	0.035
	(0.029)	(0.040)	(0.029)	(0.040)	(0.038)	(0.037)
Observations	4,131	4,131	4,131	2,067	2,067	2,067

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. All regressions include child age fixed effects and child gender as well as the controls described under Table 3 for the education outcomes and under Table 4 for the health outcomes. 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 3: Inverse Probability Weighted Estimates of the Impact of Cash Transfers on Education and Health

	Education		Health	
	Enrollment (school based)	**Enrollment (parental report)**	**Weight-for-Age Z-score**	**Height-for - Age Z-score**
	(1)	(2)	(3)	(4)
Panel A: Round 3 (Mothers vs Fathers)				
Treatment	0.138***	0.085**	-0.030	0.003
	(0.046)	(0.035)	(0.136)	(0.136)
CTF	-0.041	-0.022	-0.041	0.091
	(0.032)	(0.026)	(0.122)	(0.116)
Panel B: Round 3 (Conditional vs Unconditional)				
Treatment	0.147***	0.090**	-0.015	0.119
	(0.047)	(0.037)	(0.157)	(0.131)
UCT	-0.060*	-0.034	-0.077	-0.158
	(0.033)	(0.028)	(0.150)	(0.130)
Observations	3,060	3,060	1,002	959
Panel C: Round 2 (Mothers vs Fathers)				
Treatment	0.084	0.034	0.030	0.181
	(0.052)	(0.032)	(0.151)	(0.181)
CTF	0.014	-0.034	0.225*	0.215*
	(0.044)	(0.022)	(0.116)	(0.120)
Panel D: Round 2 (Conditional vs Unconditional)				
Treatment	0.077*	-0.003	0.249	0.338*
	(0.044)	(0.034)	(0.169)	(0.178)
UCT	0.028	0.037*	-0.231*	-0.103
	(0.040)	(0.020)	(0.134)	(0.140)
Observations	2,919	2,919	1,441	1,368

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 enrollment from the school administrative rosters, column 2 from the parent report. Column 3 reports weight-for-age z-scores and column 4 height-for-age z-scores. All regressions include child age fixed effects and child gender as well as the controls described under Table 3 for the education outcomes and under Table 4 for the health outcomes. Panels A and C use the specification in Equation 1, panels B and D estimate Equation 2. 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.