REPUBLIC OF ZAMBIA

MINISTRY OF COMMUNITY DEVELOPMENT, MOTHER AND CHILD HEALTH

SOCIAL CASH TRANSFER PROGRAMME

IMPACT EVALUATION
(Randomized Control Trial)

24-Month Report for the Multiple Category Targeting Grant

DECEMBER 2014

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Contents

Contributors

The evaluation of the Multiple Category Targeting Grant is being conducted by American Institutes for Research (AIR) for the government of the Republic of Zambia, under contract to UNICEF and funded by UK aid from the UK government, Irish Aid, and the Government of Finland. The principal investigators for the overall evaluation are David Seidenfeld (AIR) and Sudhanshu Handa (University of North Carolina at Chapel Hill). The Zambia-based principal investigator is Gelson Tembo (Palm Associates and the University of Zambia). The overall team leaders for this report are David Seidenfeld (AIR) and Sudhanshu Handa (UNC), but many others made important contributions and are listed below (by institutional affiliation and in alphabetical order within each institution):

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David Seidenfeld, Ph.D.

Acronyms

ACC	Area Coordinating Committee
AIR	American Institutes for Research
ARI	Acute Respiratory Infection
CGP	Child Grant Program
CPI	Consumer Price Index
CWAC	Community Welfare Assistance Committee
DD	Differences-in-differences
DSWO	District Social Welfare Officers
FANTA	Food and Nutrition Technical Assistance Project
FAO	Food and Agricultural Organization of the United Nations
FGT	Foster-Greer-Thorbecke
MCTG	Multiple Category Targeting Grant
MCDMCH	Ministry of Community Development, Mother and Child Health
OVC	Orphans and Vulnerable Children
RCT	Randomized Controlled Trial
UNICEF	United Nations Children's Fund
ZDHS	Zambia Demographic and Health Survey
ZMW	Zambian Kwacha

Executive Summary

Background

This report provides the 24-month follow-up results for the Multiple Category Targeting Grant (MCTG) impact evaluation. In 2011, the government of the Republic of Zambia—through the Ministry of Community Development, Mother and Child Health (MCDMCH)—began implementing the MCTG in two districts: Luwingu and Serenje. American Institutes for Research (AIR) was contracted by UNICEF Zambia to design and implement a randomized controlled trial (RCT) for a three-year impact evaluation of the program, and to conduct the necessary data collection, analysis, and reporting.[1] This report presents findings from the 24-month follow-up study, including impacts on expenditures, poverty, food security, resilience, children, adolescents, and women's empowerment.

Study Design

We implemented a randomized controlled trial (RCT) to estimate program impacts after 24 months. This study includes 3,077 households in 92 Community Welfare Assistance Committees (CWACs) that were randomly assigned to treatment or control groups. As shown in the baseline report, randomization created equivalent groups. Although we lost 3 percent of households to attrition after 24 months, we maintained equivalent groups and found no differential attrition between treatment and control groups. By maintaining the integrity of the RCT design, we can attribute observed differences between treatment and control groups directly to the MCTG with confidence.

The 24-month follow-up data collection occurred in November and December 2013—the early stage of Zambia's lean season, when people start to run out of food from their previous harvest. The timing of this round of data collection fell exactly 24 months after the baseline study. Zambia has three seasons: a rainy season from December through March, a cold dry season from April through August, and a hot dry season from September through November. Crops are planted in the rainy season and harvested from the end of February until May. Food is least scarce toward the beginning of the cold dry season when crops are harvested.

Operational Performance

Overall, we found that the Ministry has been successfully implementing the cash transfer program. Beneficiaries have received the correct amount of money according to schedule, have been able to access the money without any cost and with relative ease, and have not experienced unethical solicitations. Less than 4 percent of recipients reported ever having to make multiple trips to receive a single payment. At the time of the 24-month survey, nearly all recipients (95 percent) at the 24-month survey walked to access payments, 97 percent reported that they generally felt safe collecting the transfers, and less than 1 percent of recipients reported that they paid any money for travel. Ninety-nine percent of payments to recipients had been paid within the last three months, and 96 percent of

[1] Palm Associates was contracted by AIR to assist with data collection.

recipients expected to receive the next payment within two months, indicating that the recipients received payments regularly and on time.

Consumption Expenditures, Food Security, and Poverty

We found that the MCTG has impacted consumption (ZMW 12.3 per capita increase per month), with most of the increase spent on additional food (ZMW 10.8 per capita increase per month). Smaller households have benefitted more than larger households (ZMW 17.1 compared to ZMW 8.0 total consumption per capita increase per month). The cash transfers have reduced poverty (headcount reduced by 4 percentage points) and the distribution of poverty, resulting in fewer households at the very poorest levels (the poverty gap and the squared-poverty gap have been reduced by 8 percentage points and 7 percentage points, respectively).

One of the goals of the MCTG is to improve the food security of beneficiary households and specifically increase the percentage of households eating two or more meals per day. The program has had large impacts on consumption, with most of the expenditures going towards increased food consumption. We found that these additional expenditures on food translated to greater food security. The MCTG has increased the percentage of households eating two or more meals per day by 11 percentage points, meaning that almost everyone is now eating two or more meals per day (95 percent). This impact is larger than the impact observed in the Child Grant Program (CGP) evaluation after 24 months (an 8 percentage point increase).

Resilience (Assets, Production, and Credit)

MCTG target households are demographically different from those in the CGP. In particular, MCTG households are much more likely to be labor constrained, with smaller families and older household heads. Given this additional vulnerability, we investigated the program's impact on recilience, which focuses on a household's ability to cope with and overcome stresses and shocks. In the absence of an internationally established way of measuring resilience, we looked for impacts across five domains that collectively contribute to resilience, and we found that the program has had positive impacts in each of these five domains. The MCTG has strengthened both agricultural and non-agricultural assets, especially household ownership of goats and chickens. The program has also strengthened existing sources of income (crop production and non-farm enterprise), made households more self-reliant by decreasing their dependence on friends and relatives and reducing debt, and reduced the need for excessive reliance on casual labor in the face of an emergency. The positive impact of the program on crop production is especially noteworthy among these labor-constrained households—an effect generated by an increase in the hiring of labor and increased purchasing of fertilizer.

Children

Children might benefit from living in a household that receives the cash transfer, depending on how the money is spent. The MCTG has had a large impact on children's material well-being, indicating that the recipients have used some of the transfer to purchase blankets, clothing, and shoes—items deemed necessary for supporting orphans and vulnerable children. The MCTG has increased children's material

well-being by 23 percentage points, with 58 percent of recipient children having all three items after 24 months. The number of children owning shoes had the biggest increase (23 percentage points), but there is a ceiling effect for having a second set of clothing since two years into the program almost every child in the treatment group meets this condition (97 percent).

Unlike the CGP, MCTG households have a large number of school-age children who might benefit from the transfer. We found large impacts on enrollment for both primary and secondary school-age children due to the MCTG, though impacts for each age group varied by gender. Conversely, we did not find any measureable impacts on school attendance. The MCTG generated a 9 percentage point increase in enrollment for primary school-age boys aged 7 to 14 years old, with the treatment group reaching 76 percent enrollment (compared to 72 percent enrollment in the control group) at the time of the 24-month follow-up. However, the program has not had an impact on enrollment outcomes for primary school-age girls. We also found that the program has had large impacts on secondary school-age children (15 to 17 years old), although the effect was reversed with the program only impacting girls' enrollment. The program has generated a 19 percentage point increase in enrollment among secondary school-age girls, with the treatment group reaching 62 percent enrollment (compared to 51 percent enrollment in the control group) at the time of the 24-month follow-up study.

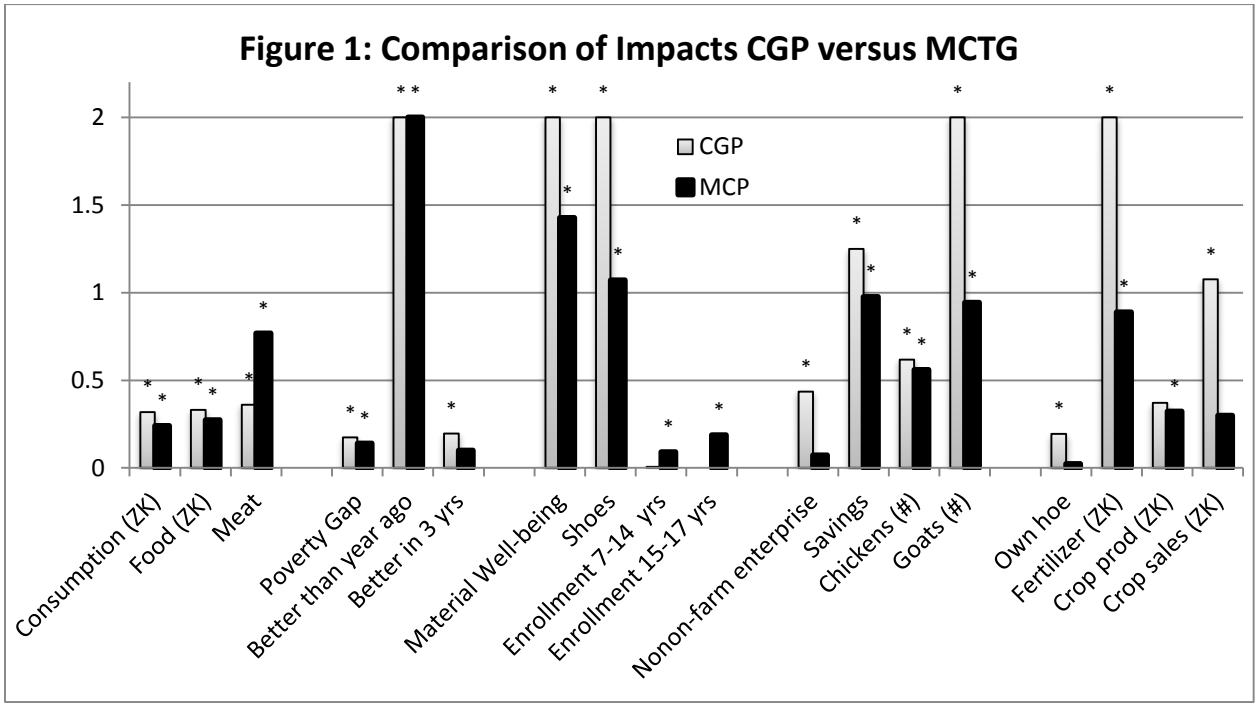
Adolescents

Beyond human capital, we investigated a set of indicators associated with the safe transition to adulthood among adolescents using a novel adolescent questionnaire administered directly to individuals aged 13 to 17 at baseline. We found that the program has had no impact on these outcomes (which included HIV risk factors, early pregnancy, early marriage, and mental health). However, these outcomes are difficult to influence in the short run and are determined by a complex interaction of factors, and it may be too soon to observe impacts of the MCTG on their levels.

In Conclusion

Overall, the MCTG has had an impact across an impressive range of indicators covering consumption and food security as well as livelihoods and schooling. In other words, the MCTG has achieved the twin objectives of mitigating food insecurity and consumption deficits in the present, and laying the base for breaking the inter-generational transmission of poverty by strengthening livelihoods and increasing human capital investment. Figure 1 compares the impacts of the MCTG with that of the CGP after two years across a range of indicators including current consumption, children's well-being, and future prosperity measured by livelihood strengthening. Impacts were measured as a proportion of the baseline mean for each individual indicator and are truncated at 2 (i.e. 200 percent impact). Overall, both programs have demonstrated impacts across a range of domains of interest to the Government of Zambia. The livelihood-related impacts appear stronger in the CGP, but it should be remembered that those households are in a better position to use the cash transfer for productive purposes because of their demographic make-up. The MCTG, meanwhile, has had larger impacts on schooling, again because of the demographic composition of MCTG households which contain more school-age children (see Table 1 for comparison of MCTG and CGP household characteristics). The consumption and food

security impacts are comparable—a finding that was expected given that these effects are driven by poverty and both target groups are extremely poor.



Notes: Significant results indicated by asterisk.

Table 1: Comparison of Mean Household Characteristics at Baseline, CGP versus MTCG

	MCP	CGP
Number of residents	5.00	5.69
Total expenditure per capita (ZMW)	51.36	46.40
Demographic composition		
Share 0–5 years	0.12	0.36
Share 6–12 years	0.22	0.19
Share 13–18 years	0.18	0.08
Share 19–35 years	0.15	0.26
Share 36–55 years	0.11	0.09
Share 56-69 years	0.10	0.01
Share 70+	0.12	0.00
Recipient's characteristics		
Age in years	56.55	29.85
Years of schooling	3.28	4.06
Married (%)	0.28	0.72
Never married (%)	0.03	0.11
Widowed (%)	0.56	0.06
Divorced (%)	0.09	0.07
N	3077	2519

Experiences from the MCTG and CGP evaluations together provide useful lessons for cash transfer programs across Africa. First and foremost, they demonstrate the undisputable conclusion that small, predictable sums of money placed in the hands of the poor are used effectively to achieve results that are in the best interest of society as a whole. Second, the range of domains where impacts have been found indicate that households spend money where they face the greatest constraints, and where it can best help them overcome their principal development challenges—a flexibility afforded to households because the programs are *unconditional.* Finally, the evaluations demonstrate that the magnitude of positive impacts across domains depends on the characteristics of the target group. While both programs impact livelihoods, the CGP has led to greater impacts in this domain, as well as to more diversification, because households are not labor constrained. The link between the characteristics of the target population, the conditionality of payments, and the subsequent impacts are therefore important to keep in mind when designing cash transfer programs.

I. Introduction

This report provides the 24-month follow-up results for the Multiple Category Targeting Grant (MCTG) cash transfer program impact evaluation. In 2011, the government of the Republic of Zambia—through the Ministry of Community Development, Mother and Child Health (MCDMCH)—began implementing the MCTG in two districts: Serenje and Luwingu. American Institutes for Research (AIR) was contracted by UNICEF Zambia in 2010 to design and implement a randomized controlled trial (RCT) for a three-year impact evaluation of the program and to conduct the necessary data collection, analysis, and reporting.[2] This paper presents findings from the 24-month follow-up study in 13 sections: Introduction, Conceptual Framework, Study Design, Attrition, Operational Performance, Consumption Expenditures, Poverty and Food Security, Resilience, Children, Adolescents, Women, Community Overview, Discussion, and Conclusion.

Background

In 2011, Zambia's MCDMCH started the rollout of the MCTG in two districts: Serenje and Luwingu. Zambia had been implementing cash transfer programs since 2004 in 12 other districts, trying different targeting models including community-based targeting, proxy means testing, and categorical targeting by age (over 60 years old and under five years old). The government decided to introduce a new model—the MCTG—in two new districts that had never received a cash transfer program. This categorical model targets any household that meets any of the following conditions:

- A female-headed household keeping orphans
- A household with a disabled member
- A household headed by an elderly person (over 60 years old) keeping orphans
- A special case: This category is for cases that are critical but do not qualify under the other categories (for example, a household of two elderly people who are unable to look after themselves)

Recipient households receive 60 kwacha (ZMW) a month (equivalent to U.S. $11)—an amount deemed sufficient to purchase one meal a day for everyone in the household for one month. The amount is the same regardless of household size. Payments are made every other month through a local paypoint manager, and there are no conditions that must be met in order to receive the money.

Locations

The MCDMCH chose to start the MCTG in the two districts within Zambia that have some of the highest rates of extreme poverty, thus introducing an element of geographical targeting to the program. The two districts are Luwingu (located in Northern Province) and Serenje (located in Central Province). These districts represent some of the most underprivileged communities in Zambia.

Objectives

According to the MCDMCH, the goal of the MCTG is to reduce extreme poverty and the intergenerational transfer of poverty. The objectives of the program relate to five primary areas: income, education, health, food security, and livelihoods. Therefore, the impact evaluation will focus

primarily on assessing change in these areas. According to the MCTG operations manual, the program has the following six objectives (listed in no particular order):

- To supplement and not replace household income
- To increase the number of children enrolled in and attending primary school
- To reduce the rate of mortality and morbidity among children under five
- To reduce stunting and wasting among children under five
- To increase the number of households having a second meal per day
- To increase the number of households owning assets such as livestock

II. Conceptual Framework

The MCTG provides an unconditional cash transfer to households that meet one of several demographic criteria. MCTG-eligible households are extremely poor: At baseline, 91 percent fell below the national extreme poverty line and had a median household per capita daily consumption of ZMW 1 (approximately 20 U.S. cents). Households with very low levels of consumption will spend almost all their income. We therefore expected that among the beneficiary population, virtually all of the cash transfer will be spent during the initial stages of the program, and that it will be spent on meeting basic needs such as food, clothing, and shelter. Once these immediate basic needs are met (and possibly after a period of time has elapsed), the influx of new cash may then trigger further responses within the household economy—for example, by providing room for investment, other productive activity, and the use of services, and by freeing up older children to attend school.

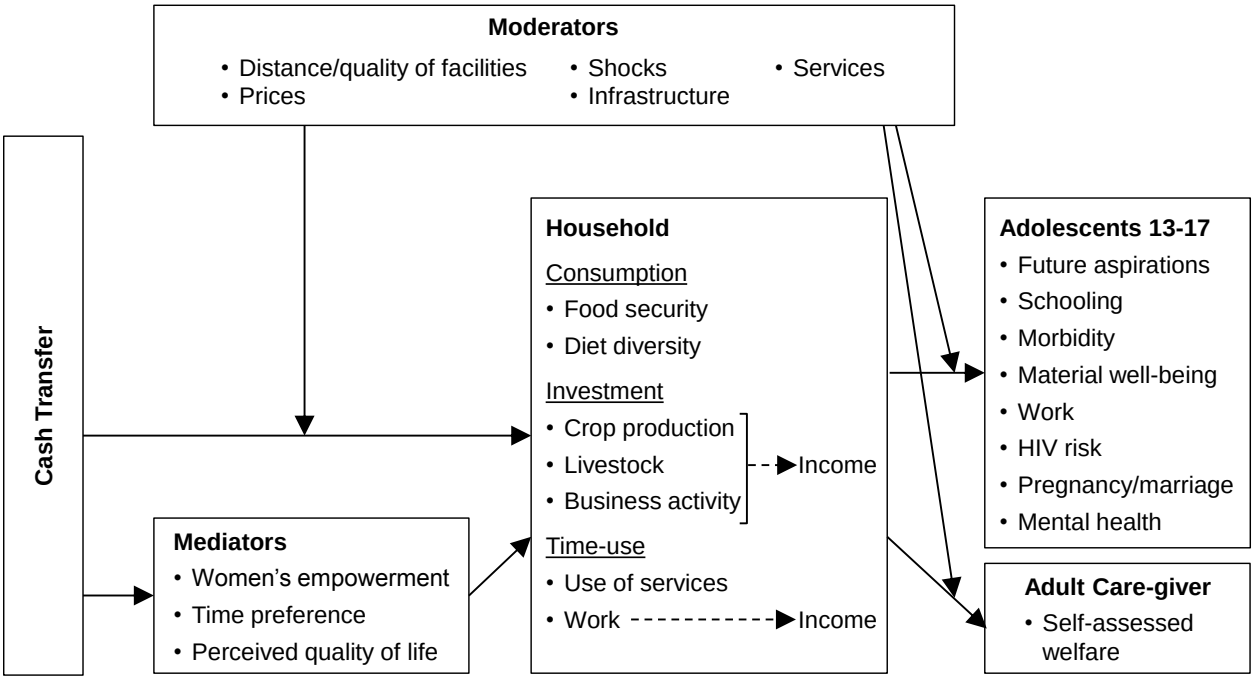
Figure 1 brings these ideas together into a conceptual framework that shows how the MCTG can affect household activity, the causal pathways involved, and the potential moderating and mediating factors (moderators and mediators). The diagram is read from left to right. We expected the cash transfer to have a direct effect on household consumption (food security, diet diversity), the use of services, and possibly even on productive activity after some time. Sociological and economic theories of human behavior suggest that the impact of the cash may be affected by several mediating factors, including bargaining power within the household, the degree to which the household is forward looking, and the expectations the household has about quality of life in the future (which could determine investment and other choices with longer term implications). Similarly, the impact of the cash transfer may be smaller or larger depending on local conditions in the community (moderators). These moderators include access to markets and other services, prices, and shocks. Moderating effects are shown with lines that intersect the direct causal pathways between the cash transfer and outcomes to indicate that they can influence the strength of the direct effect.

The next step in the causal chain is the effect on adolescents, and here we focused on adolescents aged between 13 and 17—an important demographic group within the target households. At baseline, roughly 16 percent of all household members in the sample fell within this five-year age range. The key point here is that any potential impact of the program on children will work through the household, either through household spending or household time allocation decisions (including use of services). This link between the household and children can be moderated by environmental factors, such as distance to schools or health facilities (as indicated in the diagram), and by household-level characteristics themselves (such as the mother's literacy). Indeed, from a theoretical perspective, some factors cited as mediators may actually be moderators (such as women's bargaining power). We can test for moderation versus mediation through established statistical techniques,[3] and this information will be

[3] Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182.

important to help us understand the actual impact of the program on behavior.[4] In Figure 1, we list some of the key indicators along the causal chain that we analyze in the evaluation of the MCTG.

Figure 1. Conceptual Framework for Impact Evaluation of Zambia Multiple Categorical Grant



[4] A mediator is a factor that can be influenced by the program and so lies directly within the causal chain. A moderator, in contrast, is not influenced by the program. Thus, service availability is a moderator, whereas women's bargaining power may be either a moderator or a mediator, depending on whether it is itself changed by the program. Maternal literacy is a moderator and not a program outcome, unless the program inspires adult recipients to learn to read and write.

III. Study Design

The MCTG impact evaluation relied on a design that randomized communities to treatment and control groups to estimate the effects of the program on recipients. Communities identified by Community Welfare Assistance Committees (CWACs) were randomly assigned to either the treatment group (which started the program in November 2011) or to the control group. This study reports on the effects of the program after two years.

Benefits of Randomization

A randomized controlled trial (RCT) is the most powerful research design for drawing conclusions about the impacts of an intervention on specific outcomes. An RCT draws from a pool of comparable subjects and then randomly assigns some to a treatment group (which receives the intervention) and others to a control group (against which comparisons can be made). An RCT permits us to directly attribute any observed differences between treatment and control groups to the intervention. Without randomization, unobserved factors (such as motivation) could have influenced members of a group to move into the treatment or control group.[5] Randomization helps to ensure that both observed and unobserved characteristics that may affect the outcomes are similar between the treatment and control groups. In a randomized experiment, treatment and control groups are expected to be comparable (with possible chance variation between groups) so that the average differences in outcome between the two groups at the end of the study can be attributed to the intervention. Our analysis of the control and treatment groups found that randomization had created equivalent groups at baseline for the MCTG evaluation (see the baseline report for a complete description of the randomization process and results).

Timing and Process of Data Collection

To ensure high-quality and valid data, we paid special attention to the process and timing of data collection, making sure that it was culturally appropriate, sensitive to Zambia's economic cycle, and consistently implemented. AIR contracted with Palm Associates—a Zambian research firm with years of experience conducting household surveys throughout Zambia—to help implement the MCTG survey and enter the data. A team of Zambian enumerators experienced in household and community surveys and fluent in the local language where they worked were trained on the MCTG instrument and then tested in the field before moving into their assigned communities for data collection.

One enumerator collected data in each household, interviewing the identified potential female recipient and documenting her answers. This oral interview process was necessary because many of the recipients are illiterate. In addition to interviewing the female head of household, the enumerator interviewed up to two adolescents between the ages of 13 and 17 in each household. The adolescent interviews were held in private and enumerators could only interview adolescents of the same gender in order to be culturally sensitive given the private nature of the questions. In addition to the household survey, two senior enumerators administered a community questionnaire in every CWAC to a group of

[5] Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Hopewell, NJ: Houghton Mifflin.

community leaders, including CWAC committee members, teachers, village headmen, and local business owners.

The 24-month follow-up data collection occurred towards the beginning of Zambia's lean season, when people start to have the least amount of food left from the previous harvest and hunger worsens. The timing of this round of data collection fell exactly 24 months after the baseline study, ensuring that households were being compared during the same season as at baseline. Zambia's seasonality was also taken into account to ensure accessibility to households. Zambia has three seasons: a rainy season from December through March, a cold dry season from April through August, and a hot dry season from September through November. Data collection was timed early in the lean season (November through December, 2013) to avoid difficulties reaching households due to flooding. Crops are planted in the rainy season and harvested throughout the rainy season and into May. Food is most scarce toward the middle of the rainy season (February and March) because this is the longest period without a food harvest. The MCTG aims to support poor households during this period of hunger by providing enough money to purchase a meal a day. We believe that the biggest impacts of the program are likely to be observed during this lean season and the study was therefore designed with baseline and follow-up periods of data collection towards the beginning of this season.

Data Entry

Palm Associates entered the data as they came in from the field. Data were verified using double entry on separate computers. Inconsistent responses between the two entries were flagged, and the actual response was then identified by referring back to the original questionnaire.

Analysis Approach

This study is a longitudinal, randomized, controlled evaluation with repeated measures at the individual and household level. We estimated program impacts on individuals and households using a differences-in-differences (DD) statistical model that compares change in outcomes between baseline and follow-up data collection and between treatment and control groups (see Annex 1 for details on this method). The DD estimator is the most commonly used estimation technique for impacts of cash transfer models and has been used in Mexico's Progresa program[6] and Kenya's Cash Transfer for Orphans and Vulnerable Children, among others.[7] We used cluster-robust standard errors to account for the lack of independence across observations due to the clustering of households within CWACs.[8] We also used inverse probability weights to account for the 2 percent attrition in the follow-up sample.[9] The MCTG provides the same cash transfer amount, regardless of the household size. As such, we investigated differential impacts by household size for each outcome. We present impacts by household size only when they are different.

[6] http://wbro.oxfordjournals.org/cgi/reprint/20/1/29

[7] Kenya CT-OVC Evaluation Team. (2012). The impact of the Kenya CT-OVC Program on human capital. *Journal of Development Effectiveness*, *4*(1), 38–49.

[8] http://www2.sas.com/proceedings/sugi23/Posters/p205.pdf

[9] Woolridge, J. W. (2010). *Econometric analysis of cross section and panel data*. Cambridge, MA: MIT Press.

IV. Attrition

Attrition within a sample occurs when households from the baseline sample are missing in the follow-up sample. Mobility, the dissolution of households, death, and divorce can cause attrition and make it difficult to locate a household for a second data collection. Attrition causes problems when conducting an evaluation because it not only decreases the sample size (leading to less precise estimates of program impact) but also introduces selection bias to the sample, which may lead to incorrect program impact estimates or change the characteristics of the sample and affect its generalizability. There are two types of attrition: differential and overall. Differential attrition occurs when the treatment and control samples differ in terms of the types of individuals who leave the sample. Differential attrition can create biased samples by eliminating the balance between the treatment and control groups achieved through randomization at baseline. Overall attrition is the total share of observations missing at follow-up from the original sample. Overall attrition can change the characteristics of the remaining sample and affect the ability of the study's findings to be generalized to populations outside the study. Ideally, both types should be small.

We investigate attrition at the 24-month follow-up by testing similarities at baseline between (1) treatment and control groups for all non-missing households (differential attrition), and (2) all households at baseline and the remaining households in the 24-month follow-up sample (overall attrition). Testing these groups on baseline characteristics allowed us to assess whether the benefits of randomization had been preserved at the time of the follow-up data collection.

Differential Attrition

We found no difference in baseline characteristics between the treatment and control households that remained in the study at the time of the 24-month follow-up data collection, meaning that there was no differential attrition and that the benefits of randomization had been preserved. Table 4.1 shows the household response rate at 24 months by treatment status for each district. The response rates were balanced between the treatment and control groups. We tested the household control variables and outcome measures for statistical differences at baseline between the treatment and control groups that remained in the 24-month follow-up sample. None of the indicators were statistically different, which demonstrated that, on average, people missing from the 24-month follow-up sample looked the same at baseline, regardless of whether they were from the treatment or control group. The similarity of the characteristics of people missing from the follow-up sample between the treatment and control groups allayed any concern that attrition had introduced selection bias. As a result, the study maintained the strong internal validity created through randomization, allowing us to attribute estimated impacts to the cash transfer program (rather than to differences in the groups resulting from attrition). See Annex 2 for the results of the tests' mean differences on the indicators.

Table 4.1: Household Response Rate by Study Arm at 24-Month Follow-Up for MCTG (n =3,077)

District	Treatment	Control	n
Serenje	97.3	96.5	1,514
Luwingu	99.2	98.4	1,497
Overall	98.2	97.5	3,077

Overall Attrition

Nearly 98 percent of the households that were present at baseline were also present in the 24-month follow-up sample. Table 4.2 shows the overall attrition rate by district. There were no mean differences in the baseline characteristics for individuals or households between the sample at baseline and remaining 24-month follow-up sample. These results suggest that there was no significant overall attrition. See Annex 2 for all results comparing the baseline sample with the 24-month follow-up sample.

Table 4.2: Overall Attrition for MCTG 24-Month Follow-Up: Household Response Rate by District

District	Response Rate	Households at Baseline	Percent Total Missing Households (n=66)
Serenje	96.9	1,561	71.2
Luwingu	98.75	1,516	28.7
Overall	97.86	3077	100

Adolescent Attrition

Adolescents are a target group of the MCTG and a key study subgroup. High levels of adolescent attrition could mitigate the effects of randomization and reduce the study's ability to attribute adolescent outcomes to the program. Table 4.3 shows adolescent attrition by district. At 24 months, the adolescent attrition rate was 31 percent, which was higher than the overall attrition rate. There were no significant differences between the treatment and control groups in terms of why adolescents left their households. To preserve the number of adolescents in the sample, another member of the household was surveyed if the adolescent surveyed at baseline was unavailable. In total, 338 new adolescents were surveyed. Despite the higher rates of attrition for adolescents, there was no difference in the baseline characteristics of the treatment and control groups. See Annex 2 for all the results comparing the baseline sample with the 24-month follow-up sample.

Table 4.3: Adolescent Attrition for MCTG 24-Month Follow-Up: Adolescent Response Rate by District

District	Response Rate	Adolescents at Baseline	Percent Total of Missing Adolescents (n=632)
Serenje	62.2	1,153	68.8
Luwingu	78.8	930	31.1
Overall	69.6	2,083	100

V. Operational Performance

This section discusses the fidelity of program implementation from the beneficiaries' perspective. We focus on two primary areas: payments and program understanding. The first part investigates recipients' experience around four themes related to payments: access, notifications, unjust solicitations, and timeliness. Next, we examine recipients' knowledge of the program, specifically the perceived conditions associated with continuing to receive payments, funding sources, and resources for complaints.

Overall, the Ministry has successfully implemented the cash transfer program. Beneficiaries have received the right amount of money according to schedule, have been able to access the money without any cost and with relative ease, and have not experienced unethical solicitations. Although recipients understand the eligibility criteria that must be met to enter the program, there is some misunderstanding about the conditions required to remain in the program, with many believing that certain guidelines must be followed in order to continue participating. The analysis for this section only includes responses from beneficiaries of the program at the time of the two-year follow-up data collection. As such, the data presented here were gathered from people who have been receiving the cash transfers for two years. Data and analyses are presented through descriptive statistics due to the cross sectional nature of the data. There were 1,323 households in the sample, spread across 46 communities in the two MCTG districts (Serenje and Luwingu).

Payments

Monitoring payments provides insights into program efficiency. Ineffective payment distribution may result in underutilization of funds, missed payments, dissatisfaction in beneficiary households, and ultimately fewer positive program benefits. High private costs for the recipients (such as expenses to access payment, solicitations or mistreatment by program staff or other community members, and lack of timely payments) could negatively impact program effects. Potential problems associated with distributing the payments could also add upfront costs to the Ministry, making program expansion within Zambia challenging. This study investigates recipient experiences around four themes related to payments: access to payments, notifications of payments, unjust solicitations for payments, and timeliness.

Access: Findings from the study suggest that recipient households have incurred little to no cost and have been able to travel easily to access the cash transfer. Almost every recipient reported that they walk to the pay point (95 percent), with under one percent reporting that they paid money for travel. On average, recipients walk 30 minutes one way to the pay point and wait an average of 34 minutes to receive their payment. Less than 4 percent of recipients reported ever having to make multiple trips to receive a single payment. Furthermore, 97 percent of recipients reported that they generally felt safe collecting money from the pay point. As such, pay points appear to be appropriately located, easily accessible, and reliable.

Seventy-seven percent of beneficiary households had identified a representative (usually a family member or relative) to pick up payments if they were unable to. Fifty-six percent of recipients reported

that they had used their representative at least one time. This procedure is consistent with the instructions in the program's operations manual.

Solicitations: Solicitations were rarely reported, and nearly all recipients were happy with program staff. Less than 2 percent of recipients were solicited by either a pay point staff member or another community member. Ninety-nine percent of recipients expressed satisfaction with the pay point staff, as well as the MCTG representatives.

On-time payments: Overall, payments during the two-year period were consistently on time for both districts. Ninety-nine percent of payments to recipients had been paid within the last three months, and 96 percent of recipients expected to receive the next payment within two months.

Program Understanding

Recipients demonstrated a mixed understanding of the cash transfer program's policies. This knowledge is important because it affects recipients' expectations and behavior. Recipients were asked various questions regarding their understanding of the program with respect to conditionality, funding sources, and resources for complaints.

Perceptions of conditionality: Although continuing participation in the cash transfer program is unconditional, 65 percent of recipients believed that continuing to receive payments was conditional on a set of rules. Among these recipients, the rules cited as most important included maintaining adequate nutrition for children (cited by 39 percent), keeping children enrolled in primary school (cited by 30 percent), and providing clean and appropriate clothing to children (cited by 9.5 percent).

Funding sources: Recipients have a good understanding of where the funds originate. Eighty percent of recipients attributed the funding to the Government of Zambia, and an additional 12 percent attributed funding to the MCDMCH specifically.

Complaints: In the event of a payment problem, 67 percent of recipients reported that there was someone to contact. The reported payment problem contacts seem largely consistent with the MCTG's complaint and problem-reporting mechanism. A complaint is first reported to a CWAC grassroots organization, which then reports problems it cannot solve to the DSWO. Fifty-five percent of those recipients listed a CWAC member among their three points of contact for a payment problem, 31 percent listed a pay point staff member, and 9 percent listed a DSWO. However, among the less than 4 percent of recipients (29 households) that have contacted someone about a payment problem, 71 percent contacted a CWAC member.

VI. Consumption Expenditures

The conceptual framework suggests that the primary direct impact of the MCTG will be on the consumption spending behavior of recipient households, so we expected to find that the program's most important impacts were on spending levels, with relatively higher impacts on items that are more sensitive to income. Tables in this report follow a format that provides information about impacts 24 months as well as baseline statistics. Our explanation of the first table, Table 6.1, can be applied to all similar tables that follow. Table 6.1 reports results for total consumption as well as eight categories of consumption. Column (1) in this table shows the impact of the CGP between baseline and 24 months. Column (2) shows the baseline mean value of the indicator mentioned at the beginning of each row, and columns (3) and (4) show the mean values for the treatment and control groups at 24 months. These are important in assessing the absolute levels of consumption for the two groups, because the impact estimates in column (1) indicate differences in levels between baseline and 24 months. The t-statistic, shown in parentheses under the impact estimate, is used to help determine statistical significance[10]. Table 6.1 shows the impact estimates for total per capita expenditure (row 1) and impacts on per capita spending on other consumption items. The MCTG has increased total per capita consumption spending by ZMW 12.29 per month, which is approximately the same as the per capita value of the transfer. This means that among very poor households, almost all the income from the program is consumed.

The subsequent rows of Table 6.1 show the distribution of the increased spending by category. The majority of the increased spending goes to food (ZMW 10.75), which accounts for 87 percent of additional spending, followed by health and hygiene (ZMW 1.31) at 11 percent, and clothing at 4 percent. In contrast, there has been no program impact on education, domestic items, transportation/communication, or alcohol/tobacco. Note that consumption levels in the control group also improved during the two-year period, but that the treatment group improved much more (the impact estimate accounts for gains made by the control group). The control group's improvement during this period is consistent with a general trend in rural Zambia, which experienced bumper harvests, improving households' ability to consume.

Table 6.1: MCTG Impacts on Per Capita Expenditures (ZMW 2011=100)

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Total	**12.288**	51.356	77.086	65.963
	(3.492)			
Food	**10.750**	39.515	58.178	49.322
	(3.911)			
Clothing	**0.489**	1.025	2.226	1.741
	(2.599)			
Education	0.266	1.340	1.828	1.718

[10] Statistical significance means that the observed impact is unlikely to be 0. The t-statistic is a standardized version of the impact estimate. When the t-statist is greater than a specified number (based on the alpha level, or level of confidence to avoid false positive results), then the underlying impact estimate is called statistically significant.

	(1.208)			
Health	**1.313**	2.245	4.444	3.346
	(3.069)			
Domestic	0.107	5.683	8.215	7.287
	(0.155)			
Transport/Communication	-0.249	0.755	0.486	0.671
	(-0.958)			
Other	-0.222	0.158	1.393	1.560
	(-0.887)			
Alcohol, Tobacco	-0.165	0.634	0.318	0.317
	(-0.522)			
N	6,086	3,076	1,522	1,488

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

The overall increase in food spending was ZMW 10.75, as reported in Table 6.1. The largest share of this spending went to meats including poultry and fish (ZMW 3.77), followed by cereals (ZMW 3.12) and sugars (ZMW 1.19). There was a clear shift in spending towards protein (dairy, meats), indicating a possible improvement in diet diversity among MCTG recipients. Table 6.2 breaks down the program impacts by detailed food groups.

Table 6.2: MCTG Impacts on Per Capita Expenditures by Food Group (ZMW 2011=100) – Levels

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Cereals	**3.121**	7.223	8.281	6.802
	(4.116)			
Tubers	-0.163	8.955	8.641	8.453
	(-0.187)			
Pulses	1.436	3.300	5.544	4.407
	(1.614)			
Fruits, Vegetables	0.875	9.738	15.909	15.273
	(0.915)			
Meat	**3.769**	4.950	12.574	8.717
	(2.773)			
Dairy	0.099	0.280	0.453	0.356
	(0.986)			
Sugars	**1.189**	0.921	2.400	1.462
	(4.932)			
Fats, Oil, Other	0.424	4.148	4.379	3.852
	(0.674)			
N	6,086	3,076	1,522	1,488

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Impacts by Household Size

The MCTG provides the same cash transfer amount to all households, regardless of size. MCTG households vary in size: Approximately half of the households had four or fewer members at baseline, and the other half have five or more members at baseline. As such, the value of the transfer per capita within a household varies greatly, which could lead to differential program impacts. We investigated the possibility of differential program impacts by household size by comparing smaller households (four or fewer members) with larger households (five or more members). Throughout this report, we provide impacts by household size only when a difference existed. We begin by comparing the demographic profile of smaller and larger households in the study sample. Table 6.3 shows that larger households are poorer (in terms of total per capita expenditure). The demographic composition of larger households is also different, with a larger share of members aged between 0 and 18 (63 percent, compared to 39 percent in smaller households). In contrast, smaller households have a greater share of people over 56 years old (37 percent in smaller households and only 10 percent in larger households). Unsurprisingly, smaller households also have heads that are slightly older (by eight years) and more likely widowed. As a result, it appears that the smaller households in our sample are slightly further along in the life cycle relative to larger households.

Table 6.3: Mean Household Characteristics by Size of Household at Baseline

	All	Size <= 4	Size > 4
Number of residents	5.00	2.90	6.82
Total expenditure per capita (ZMW)	51.36	67.30	37.48
Luwingu	0.49	0.58	0.42
Serenje	0.51	0.42	0.58
Demographic composition			
Share 0–5 years	0.12	0.07	0.16
Share 6–12 years	0.22	0.17	0.27
Share 13–18 years	0.18	0.15	0.20
Share 19–35 years	0.15	0.13	0.16
Share 36–55 years	0.11	0.11	0.11
Share 56-69 years	0.10	0.16	0.05
Share 70+	0.12	0.21	0.05
Recipient's characteristics			
Age in years	56.55	60.69	52.94
Years of schooling	3.28	2.80	3.72
Married (%)	0.28	0.21	0.35
Never married (%)	0.03	0.04	0.02
Widowed (%)	0.56	0.63	0.49
Divorced (%)	0.09	0.10	0.09
N	3077	1431	1645

Given that the cash transfer did not vary depending on household size, it is unsurprising that program impacts on total per capita expenditure were double the size for small households than they were for larger households, and this pattern also held for program impacts on food (which were three times as large for smaller households) and health (which were twice as large for smaller households). There were significant impacts on education spending among large households (ZMW 0.65) but no impacts among

small households. This result is consistent with the demographic profile of larger households, which contain proportionately more school-age children relative to smaller households (see Table 6.3). Table 6.4 shows program impacts on total expenditure and broad groups by large and small households.

Table 6.4: MCTG Impacts on Per Capita Expenditures by Household Size (ZMW 2011=100)

	All HH		Small HH		Large HH	
	Program Impact (1)	Baseline Mean (2)	Program Impact (3)	Baseline Mean (4)	Program Impact (5)	Baseline Mean (6)
Total	**12.288**	51.356	**17.085**	67.302	**8.024**	37.484
	(3.492)		(2.779)		(3.422)	
Food	**10.750**	39.515	**16.428**	52.143	**5.786**	28.530
	(3.911)		(3.567)		(2.829)	
Clothing	**0.489**	1.025	**0.529**	1.240	**0.445**	0.838
	(2.599)		(2.029)		(2.575)	
Education	0.266	1.340	-0.152	1.160	0.653	1.497
	(1.208)		(-0.556)		(2.017)	
Health	**1.313**	2.245	**1.675**	2.866	**0.972**	1.706
	(3.069)		(2.004)		(4.088)	
Domestic	0.107	5.683	0.048	7.990	0.140	3.676
	(0.155)		(0.040)		(0.351)	
Transport/Communication	-0.249	0.755	-0.621	0.692	0.070	0.810
	(-0.958)		(-1.691)		(0.237)	
Other	-0.222	0.158	-0.344	0.149	-0.161	0.166
	(-0.887)		(-0.840)		(-1.114)	
Alcohol, Tobacco	-0.165	0.634	-0.476	1.062	0.118	0.261
	(-0.522)		(-0.710)		(1.113)	
N	6,086	3,076	2,833	1,431	3,253	1,645

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

We found similar differences in terms of the composition of food spending impacts in small and large households. In smaller households, the impact of the MCTG on food consumption was roughly twice as large for cereals and meat as it was in larger households. These distinct patterns are likely linked to the differences in the number of people in the household who have to share the benefits of the cash transfer. Table 6.5 presents program impacts on food spending by household size.

Table 6.5: MCT Impacts on Food Per Capita Expenditures (ZMW 2011=100) – Levels

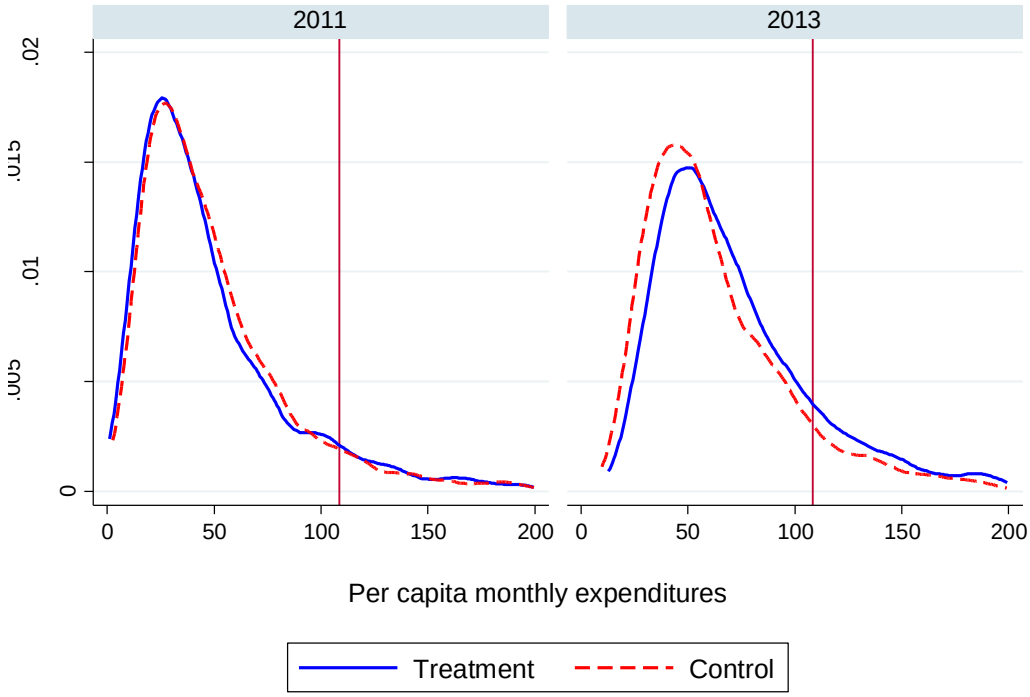
	All HH		Small HH		Large HH	
	Program Impact	Baseline Mean	Program Impact	Baseline Mean	Program Impact	Baseline Mean
	(1)	(2)	(3)	(4)	(5)	(6)
Cereals	**3.121**	7.223	**4.459**	8.843	**2.009**	5.814
	(4.116)		(3.816)		(3.113)	
Tubers	-0.163	8.955	0.186	12.260	-0.409	6.080
	(-0.187)		(0.131)		(-0.636)	
Pulses	1.436	3.300	2.395	4.645	0.616	2.130
	(1.614)		(1.816)		(0.742)	
Fruits, Vegetables	0.875	9.738	1.639	13.075	0.175	6.835
	(0.915)		(0.996)		(0.215)	
Meat	**3.769**	4.950	**5.500**	6.461	**2.148**	3.636
	(2.773)		(2.475)		(2.181)	
Dairy	0.099	0.280	-0.046	0.360	0.228	0.210
	(0.986)		(-0.280)		(2.726)	
Sugars	**1.189**	0.921	**1.700**	1.169	**0.728**	0.705
	(4.932)		(4.887)		(2.476)	
Fats, Oil, Other	0.424	4.148	0.595	5.329	0.290	3.121
	(0.674)		(0.620)		(0.484)	
N	6,086	3,076	2,833	1,431	3,253	1,645

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

VII. Poverty and Food Security

Earlier in this report, we demonstrated that the MCTG has had a significant impact in terms of raising households' average consumption levels. In this chapter, we provide estimates of the program's impact on measures of poverty and food security. Figure 7.1 compares the distribution of per capita monthly consumption expenditure between the treatment and control groups in each period. The vertical line is the severe poverty line, as defined by the Central Statistics Office in 2011 (ZMW 96.37), deflated to 2011 units (in these figures we drop the top 1 percentile for ease of exposition). Individuals to the left of the line are in extreme poverty. In 2011, the two distributions were almost identical, and more importantly (for the purposes of this study), the same proportion of households (92 percent) in the treatment and control samples were below the severe poverty line. By 2013, however, the distribution of per capita expenditure among treatment households had clearly shifted to the right relative to control households, and fewer households in the treatment group (83.5 percent) were below the severe poverty line (compared to 89 percent of households in the control group).

Figure 7.1: Distribution of Per Capita Expenditures by Wave and Treatment Status



The program has reduced the severe poverty headcount rate by 4.3 percentage points. However, the largest program impacts were on the poverty gap (which fell by 7.9 percentage points) and the squared poverty gap (which fell by 7.4 percentage points), which account for the distribution of individuals below the line rather than whether individuals moved above the line. For programs that target people at the very bottom of the income distribution, these last two indicators are better measures of changes in welfare because it is highly unlikely that a program will provide sufficient funds to lift people from the very bottom of the distribution to above the severe poverty line. However, a significant positive

movement below the line will show up in the poverty gap and squared poverty gap indicators. As such, this pattern of results provides evidence of both the MCTG's highly successful targeting approach and its impact on welfare. Table 7.1 provides more details on the impact of the MCTG on the three commonly used Foster-Greer-Thorbecke (FGT) poverty indicators—the headcount, poverty gap, and squared poverty gap—using both the severe and the moderate poverty lines.

Virtually all MCTG recipients are below the moderate poverty line (95 percent), and the impact of the program on the poverty headcount using the moderate poverty line, although statistically significant, was very small (1.5 percentage points). However, the impacts on the poverty gap and squared poverty gap were large simply because these indicators account for the distribution of individuals below the moderate poverty line. Note that among the control group, there was also a clear trend of improvement in terms of the poverty gap and squared poverty gap, although the gains in monetary welfare among the MCTG recipients was an order of magnitude larger in terms of the percentage change from baseline. These reductions in poverty among the control group reflect the general reductions in poverty that occurred in Zambia during the time period, in part due to the bumper harvest of 2012.

Table 7.1: MCTG Impacts on Poverty Indicators

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
<u>Severe Poverty Line</u>				
Headcount	**-0.043**	0.920	0.835	0.890
	(-2.804)			
Poverty Gap	**-0.079**	0.568	0.377	0.443
	(-3.641)			
Sq. Poverty Gap	**-0.074**	0.395	0.203	0.258
	(-3.518)			
<u>Moderate Poverty Line</u>				
Headcount	**-0.015**	0.973	0.947	0.970
	(-2.764)			
Poverty Gap	**-0.071**	0.688	0.533	0.595
	(-3.807)			
Sq. Poverty Gap	**-0.074**	0.533	0.354	0.414
	(-3.701)			
N	6,086	3,076	1,522	1,488

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Food Security

One of the goals of the MCTG is to improve the food security of MCTG households and specifically increase the percentage of households eating two or more meals per day. As stated earlier, the program has had large impacts on consumption, with over 87 percent of additional expenditures going toward food consumption. We found that these additional expenditures on food translated to greater food security—a finding consistent with our baseline predictions. The MCTG has increased the percentage of households eating two or more meals per day by 11 percentage points, meaning that almost everyone (95 percent) now eat two or more meals per day. Although the difference between the treatment and control groups was only 11 percentage points, a possible ceiling effect limits measurement of the program's impact on this indicator because the indicator has almost reached its limit. Only 5 percent of households in the treatment group now eat fewer than two meals per day. Table 7.2 shows the impacts of the program on several food security indicators.

Fortunately, other indicators—such as the Food and Nutrition Technical Assistance Project (FANTA) food security score[11] —provide more in-depth evidence of the program's impact. FANTA is a measure of a household's food insecurity, with greater values indicating more food insecurity. We found that the program reduced a household's food insecurity score by 1.8 points—a 15 percent decrease from the control group's score. The program also increased the number of households that are not severely food insecure[12] by 12 percentage points (46 percent in the treatment group versus 37 percent in the control group). The MCTG has also had a strong impact on perceptions of food security. Almost twice as many MCTG households (59 percent) as control households (37 percent) reported that they do not consider themselves very poor. Over five times more MCTG households (43 percent) than control households (8 percent) reported being better off now than they were 12 months ago. As such, it appears that the MCTG has improved household food security with strong impacts on one of the primary goals of the program—to increase the number of households eating two or more meals per day. (All of these impacts were virtually the same between small and large households and so are not reported by household size.)

[11] FANTA is a measure of a household's food insecurity, with greater values indicating more food insecurity. The score from 0-24 (higher indicating less food security), was created from adding the frequency which the household lacks access to food, in both quantity and type. Coates, J., Swindale, A., & Bilinsky, P. (2007). Household food insecurity access scale for measurement of food access. Washington DC: Food & Nutrition Technical Assistance Project (FANTA). Available at www.fantaproject.org

[12] Households that cut back on meal size or number of meals often, and/or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating), even as infrequently as rarely.

Table 7.2: MCTG Impacts on Food Security

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Eats more than one meal a day	**0.113** (4.144)	0.712	0.949	0.867
Ate meat/fish 5+ times last month	0.013 (0.447)	0.099	0.141	0.120
Ate vegetables 5+ times last week	0.020 (0.597)	0.888	0.924	0.907
Does not consider itself very poor	**0.255** (4.487)	0.333	0.594	0.371
Food security scale	**1.780** (3.765)	-14.671	-9.962	-11.712
Is not severely food insecure	**0.117** (2.069)	0.171	0.457	0.365
Better off than 12 months ago	**0.400** (10.279)	0.079	0.430	0.075
N	6,086	3,076	1,522	1,488

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

VIII. Resilience (Assets, Production, and Credit)

Resilience has become a key focus of the international development community in recent years due to the increasing disruption in food supplies and agricultural productivity caused by climate change, as well as the increasing incidence of civil unrest, war, and economic crises. Consequently, this section of the report presents some preliminary findings on the impact of the MCTG on resilience.

Due to its relative novelty in the development dialogue, the definition of resilience is still a matter of some discussion. The Resilience Alliance defines the concept as "The capacity of a system to absorb disturbance and reorganize while undergoing change." DFID defines it as "…the ability of countries, communities and households to manage change, by maintaining or transforming living standards in the face of shocks or stresses—such as earthquakes, drought or violent conflict—without compromising their long-term prospects," while the FAO's Resilience Measurement Technical Working Group defines it as "…the capacity that ensures adverse stressors and shocks do not have long-lasting adverse development consequences."[13] The common thread through these and other definitions is the notion that resilience reflects an ability to successfully manage or withstand a shock or stress. Efforts to measure resilience are still very much in their infancy, but Alinov et al.'s (2010) Resilience Index Measurement and Analysis Model (RIMA) is perhaps the most sophisticated measure currently available.[14] The dimensions of this index include income and food access, agricultural and non-agricultural assets, access to basic services and safety nets, as well as "adaptive capacity" dimensions such as human capital.

While the MCTG evaluation was not designed with the objective to measure resilience, our survey collected data on many of the indicators that are now commonly used to measure the concept. This has allowed us the opportunity to provide an initial assessment of the MCTG's impact on resilience. Additionally, the types of households targeted by the MCTG are those that grapple with conditions that necessitate resilience to succeed. MCTG households are extremely poor, headed by widows caring for orphans or seniors caring for orphans, and/or containing people with disabilities. Many households do not have sufficient able-bodied adults to generate sufficient resources to support children, especially when living in a subsistence farming community. For instance, at baseline 75 percent of all households in the survey were headed by women and 50 percent of household heads were elderly (over the age of 60). Informed by the notion that resilience involves being able to manage or withstand a shock, we investigated (using the RIMA) five domains that were covered by our survey instrument and capture resilience: 1) non-agricultural assets; 2) agricultural assets; 3) livelihood diversification and strengthening sources of income; 4) access to transfers and safety nets; and 5) exposure to shocks and

[13] Resilience Alliance. 2002. *Key concepts* (available at http://www.resalliance.org/index.php/key_concepts). DFID. 2011. *Defining disaster resilience: a DFID approach paper.* London (available at https://www.gov.uk/government/publications/defining-disaster-resilience-a-dfidapproach-paper). Food Security Information Network (FSIN) 2014 "Resilience Measurement Principles", FSIN Technical Series No.1, January 2014.

[14] Alinovi L., D'Errico M., Main E. and Romano D. (2010), *Livelihoods strategies and households resilience to food security: An empirical analysis to Kenya.*

use of non-detrimental coping strategies. We look at each of these in turn and then provide some concluding remarks at the end of this section.

Non-Agricultural Assets

We investigated the impact of the MCTG on owning 14 individual non-agricultural assets, and on an assets index calculated using principal components derived from these 14 assets. An asset index is a weighted index, where the weight for each individual asset is estimated using the statistical procedure of principal components analysis (PCA). Using PCA allows us to summarize a multitude of measurements (all assets) into a single indicator (asset index). Each individual asset index for a given household has no meaning on its own, but relative to other households' indexes can give a measure of the wealth of the individual household. A more negative index is poorer overall than a more positive index. We observed a significant increase in the proportion of households owning a mattress (12 percentage points) and a bed (13 percentage points). Most of the impact estimates were positive, and some were close to significance (such as owning a watch and owning a radio). As a result, the MCTG has had a large and significant impact on the overall asset index (shown in the first row of Table 8.1). Impacts were generally larger among smaller households and are shown in Annex 3.

Table 8.1: MCTG Impacts on Asset Ownership (Share)

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Assets Index	**0.292**	0.141	-0.057	-0.229
	(3.557)			
Bed	**0.132**	0.315	0.351	0.303
	(3.677)			
Mattress	**0.123**	0.268	0.435	0.331
	(3.173)			
Mosquito Net	0.052	0.744	0.748	0.704
	(1.179)			
Table	0.029	0.054	0.075	0.045
	(1.661)			
Sofa	0.013	0.027	0.034	0.019
	(1.421)			
Radio	0.032	0.075	0.082	0.067
	(1.939)			
TV	0.002	0.009	0.008	0.008
	(0.947)			
DVD	0.001	0.016	0.006	0.009
	(0.441)			
Cell	0.001	0.001	0.047	0.044
	(0.391)			
Watch	0.010	0.007	0.013	0.011
	(1.648)			
Clock	0.019	0.082	0.011	0.009
	(1.530)			
Electric Iron	0.014	0.903	0.003	0.003
	(0.217)			

Charcoal Iron	0.024	0.105	0.057	0.049
	(1.156)			
Pump	0.000	0.066	0.001	0.001
	(0.025)			
N	6,079	3,070	1,522	1,487

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

We also estimated the impact of the MCTG on seven dimensions of housing quality and found only one significant difference between treatment and control households—an increase of 19 percentage points in the share of treatment households purchasing some kind of fuel for lighting (Table 8.2), with larger impacts among smaller households (22 points, versus 16 points among larger households).

Table 8.2: MCTG Impacts on Housing Conditions

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Purchased Roof	-0.011	0.100	0.087	0.127
	(-0.848)			
Purchased Floor	-0.005	0.056	0.043	0.057
	(-0.450)			
Purchased Wall	0.035	0.849	0.940	0.911
	(1.580)			
Purchased Lighting	**0.189**	0.570	0.820	0.726
	(4.262)			
Purchased Cooking	0.013	0.030	0.032	0.021
	(1.406)			
Clean Water	0.059	0.229	0.190	0.200
	(1.776)			
Own Toilet	0.009	0.790	0.935	0.902
	(0.220)			
N	6,073	3,066	1,519	1,488

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Agricultural Assets

The MCTG has had a significant impact on livestock ownership, increasing the share of households with goats and chickens by 16 and 22 percentage points, respectively. There was also a smaller impact on the share of households with pigs (which increased by 3 percentage points) and ducks. Additionally, using PCA to calculate an livestock index, shows that, overall, the 'wealth' of households in regards to livestock was higher for beneficiary households at 24 months than for both the full sample at baseline and the control sample at 24 months, resulting in a large positive impact on the value of the livestock index of 0.55 (Table 8.3). The subsequent table shows impacts measured in numbers (rather than the proportion of households owning an asset). We see that the MCTG has increased the number of goats owned per household by 0.34, chickens by 1.47, and pigs by 0.07, on average, in treatment households. Unlike the non-agricultural assets, there were no differences in these effects by household size.

Table 8.3: MCTG Impacts on Livestock Ownership (Share)

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Livestock Index	**0.552**	-0.040	0.270	-0.193
	(7.821)			
Cattle	-0.000	0.007	0.005	0.009
	(-0.379)			
Goats	**0.155**	0.113	0.223	0.107
	(5.741)			
Chicken	**0.220**	0.475	0.524	0.358
	(5.458)			
Ducks	**0.008**	0.012	0.019	0.007
	(2.019)			
Pigs	**0.025**	0.014	0.021	0.002
	(3.659)			
N	6,085	3,076	1,522	1,487

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Table 8.4: MCT Impacts on Livestock Ownership (Number)

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Livestock Index	**0.552**	-0.040	0.270	-0.193
	(7.821)			
Cattle	-0.026	0.025	0.034	0.067
	(-0.822)			
Goats	**0.336**	0.363	0.598	0.373
	(3.642)			
Chicken	**1.466**	2.616	3.198	1.849
	(4.776)			
Ducks	0.036	0.048	0.099	0.029
	(1.036)			
Pigs	**0.070**	0.041	0.058	0.007
	(2.681)			
N	6,085	3,076	1,522	1,487

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

We now turn our attention to agricultural implements and assess the impacts of the MCTG on ownership. Table 8.5 shows that the program has had no impact on owning any implements nor on the overall index of implements, which was calculated using principal components of all five implements. These results are the same for small and large household alike.) Looking at the number of implements (Table 8.6) owned by households, there is some suggestion that the average number of hoes and axes increased by 0.23 and 0.15, respectively, but this was not sufficient to produce impacts on the overall index of agricultural implements. The results suggest that the MCTG tends to increase household ownership of livestock rather than tools used for agricultural implements.

Table 8.5: MCTG Impacts on Agricultural Implements (Share)

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Ag Implements Index	0.147	-0.027	0.079	-0.024
	(1.802)			
Axe	0.065	0.742	0.814	0.751
	(1.824)			
Pick	0.039	0.079	0.066	0.051
	(1.624)			
Hoe	0.021	0.903	0.971	0.947
	(1.508)			
Hammer	0.003	0.105	0.066	0.071
	(0.200)			
Shovel	-0.011	0.066	0.051	0.056
	(-0.846)			
N	6,078	3,070	1,520	1,488

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Table 8.6: MCT Impacts on Agricultural Implements (Number)

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Ag Implements Index	0.147	-0.027	0.079	-0.024
	(1.802)			
Axe	**0.149**	1.021	1.216	1.065
	(2.266)			
Pick	0.049	0.096	0.083	0.058
	(1.791)			
Hoe	**0.227**	1.933	2.506	2.370
	(2.259)			
Hammer	-0.002	0.133	0.074	0.091
	(-0.093)			
Shovel	-0.012	0.088	0.059	0.063
	(-0.469)			
Plough	0.034	0.018	0.003	0.007
	(1.404)			
N	6,083	3,073	1,522	1,488

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Livelihood Diversification and Income Strengthening

A key dimension of resilience is diversifying sources of income in order to reduce the risk associated with relying on a sole income source, as well as strengthening existing income-generating activities to allow for increased savings, which can be used when there is a negative shock to the primary source of income. The primary source of income for MCTG households is agriculture so we investigated whether the MCTG has stimulated a move to either a more diverse set of crops or more non-farm enterprise, and whether income from agriculture has increased.

The MCTG does appear to have strengthened existing flows of income, rather than supporting a more diverse income stream. The share of households producing maize and ground nuts increased by 12 and 14 percentage points, respectively, and the share of households cultivating beans also increased significantly (by 11 percentage points; see Table 8.7). However, these three products were the most common items produced at baseline, meaning that the results represent an increase in existing cropping patterns rather than a movement toward new crops. In terms of the overall kilograms produced, we found significant increases only in millet and beans (23 and 15 kilograms, respectively; see Table 8.8). As such, the MCTG's impact on bean cultivation is on both the extensive margin (cultivated by more households) and the intensive margin (cultivated in larger quantities per household).

Table 8.7: Crop Production (Share)

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Maize	**0.123**	0.555	0.606	0.600
	(2.793)			
Cassava	-0.080	0.612	0.572	0.527
	(-1.827)			
Millet	0.033	0.140	0.052	0.066
	(1.752)			
Groundnut	**0.139**	0.325	0.306	0.196
	(2.848)			
Sweet potatoes	0.016	0.078	0.032	0.040
	(0.911)			
Sorghum	-0.007	0.058	0.023	0.025
	(-1.300)			
Other beans	**0.114**	0.213	0.200	0.136
	(3.150)			
N	5,365	2,728	1,372	1,265

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold indicates are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Table 8.8: Crop Production (Kg)

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Maize	90.691	399.744	321.004	359.730
	(1.842)			
Cassava	53.755	358.034	372.314	290.304
	(0.908)			
Millet	**22.789**	31.990	11.685	13.858
	(2.361)			
Groundnut	23.635	63.766	55.579	42.601
	(1.746)			
Sweet potatoes	5.456	28.807	12.198	23.866
	(0.406)			
Sorghum	-2.974	8.419	4.089	4.447
	(-1.264)			
Other beans	**14.530**	23.820	23.395	13.976
	(2.289)			
N	5,365	2,728	1,372	1,265

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

As a result of the program's impacts on the amount of crops produced, there was a significant impact on the overall value of the harvest, which increased by 350 kilograms (see the first row of Table 8.9), and a greater proportion of households (5 percentage points) now sell some of their harvest. Table 8.10 shows overall impacts (Column 1) and baseline mean (Column 2), followed by impacts on small households (Column 3) and the baseline mean for small households (Column 4), and impacts on large households (Column 5) with the baseline mean for large households (Column 6). T-statistics are also included below the impact estimates in parentheses. Impacts on harvests, sales, and own crop production were mostly driven by smaller households (Table 8.10), although this seems counter-intuitive given that agriculture is labor intensive and these households are somewhat labor constrained. The explanation for this finding lies in households' use of agricultural inputs. The MCTG has had a significant impact on total operated land (by 0.15 hectares) and expenditure on inputs, primarily fertilizer, and hired labor, but the MCTG's impact on hired labor was almost 2.5 times greater in smaller households relative to large households (see Annex 3 Tables A3.9 and A3.10). Program impacts on expenditure on other crop inputs also tended to be bigger in smaller households, although not to the same extent as the difference in hired labor.

Table 8.9: Harvest, Sales, and Own Consumption

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Value of harvest (ZMW)	**349.427**	1,080.440	961.431	812.076
	(2.583)			
Value of sales (ZMW)	73.370	243.662	224.150	201.817
	(1.481)			
% of crops sold	**0.052**	0.148	0.180	0.145
	(2.019)			
Value of crops consumed at home (ZMW)	95.986	412.875	444.938	390.873
	(1.748)			
% of crops consumed at home	-0.040	0.492	0.584	0.623
	(-0.839)			
N	5,352	2,719	1,370	1,263

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Table 8.10: Harvest, Sales, and Own Consumption by Household Size

	All HH		Small HH		Large HH	
	Program Impact (1)	Baseline Mean (2)	Program Impact (3)	Baseline Mean (4)	Program Impact (5)	Baseline Mean (6)
Value of harvest	**349.427**	1,080.440	**437.060**	884.387	280.234	1,231.231
	(2.583)		(2.019)		(1.972)	
Value of sales (ZMW)	73.370	243.662	69.969	180.579	74.155	292.181
	(1.481)		(1.527)		(0.976)	
% of crops sold	**0.052**	0.148	**0.052**	0.143	0.053	0.152
	(2.019)		(2.110)		(1.424)	
Value of crops consumed at home (ZMW)	95.986 (1.748)	412.875	110.861 (1.444)	356.302	81.216 (1.617)	456.387
% of crops consumed at home	-0.040 (-0.839)	0.492	-0.050 (-0.882)	0.500	-0.031 (-0.643)	0.485
N	5,352	2,719	2,332	1,178	3,020	1,541

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Only 11 percent of the households in the sample were engaged in non-farm enterprises (NFE) at baseline, and the program has not had a significant impact on increasing the share of households engaged in NFE as seen in row 1 of Table 8.11.[15] However, among those engaged in NFE, the MCTG appears to have generated a significant increase in total revenues (37 percent) and profits (30 percent), demonstrating once again that the program has strengthened existing sources of income—an important component of resilience.[16]

Table 8.11: Impact of the MCTG on Non-Farm Enterprise

	All HH		Small HH		Large HH	
	Program Impact (1)	Control Stats (2)	Program Impact (3)	Control Stats (4)	Program Impact (5)	Control Stats (6)
HH operates NFE	0.008	0.114	-0.002	0.099	0.012	0.126
	(0.348)		(-0.093)		(0.417)	
	[3,076]	[1,515]	[1,431]	[690]	[1,645]	[825]
Months in operation since November 2012	0.064	6.529	0.792	6.303	-0.310	6.673
	(0.114)		(0.912)		(-0.526)	
	[329]	[170]	[123]	[66]	[206]	[104]
Own NFE assets	-0.063	0.485	-0.142	0.471	-0.038	0.495
	(-0.791)		(-1.245)		(-0.414)	
	[330]	[171]	[125]	[68]	[205]	[103]
Log total monthly revenue	**0.368**	116.1	**0.496**	96.4	0.374	131.2
	(2.712)		(2.409)		(1.838)	
	[331]	[172]	[125]	[68]	[206]	[104]
Log total monthly profit	**0.293**	60.4	0.372	54.0	0.374	65.2
	(2.307)		(1.686)		(1.993)	
	[331]	[172]	[125]	[68]	[206]	[104]
Log Value of owned assets	-0.083	4.2	-0.120	3.8	-0.076	4.5
	(-0.282)		(-0.287)		(-0.238)	
	[330]	[171]	[125]	[68]	[205]	[103]

Note: Estimations use single difference using data from 24-month wave. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices. Control statistics in the table refer to the average of each outcome considered for the control group.

[15] The estimates shown are single difference (comparison between treatment and control at follow-up only) because the information on NFE was only collected during the follow-up data collection.

[16] When the dependent value is measured in logarithms, as it is in these two cases, the regression coefficients (when multiplied by 100) are interpreted as percent changes.

Transfer and Safety Nets

A key component of resilience is having access to networks, whether formal or informal, in the event of an emergency. Our survey instrument gathered information on the receipt of cash transfers from both government and non-government sources (NGO as well as private individuals), while the consumption module asked about remittances sent to other individuals outside the household. Households in the treatment group were obviously significantly more likely to receive assistance from a government program (i.e. the MCTG), although this impact disappears when we do not include the MCTG program. Among smaller households, there was an indication that the program had led to a reduction in the receipt of transfers from private individuals (by 18 percentage points, Table 8.12), suggesting a possible crowding out of private support. However, as seen earlier, transfer and program households continued to have significantly higher consumption and diet diversity than non-program households.

Table 8.12: MCTG Impacts on Receiving and Sending Transfers

	All HH		Small HH		Large HH	
	Program Impact (1)	Baseline Mean (2)	Program Impact (3)	Baseline Mean (4)	Program Impact (5)	Baseline Mean (6)
Received gov. program	**0.573** (9.924)	0.555	**0.602** (8.569)	0.508	**0.548** (9.016)	0.596
Received gov. program (excluding MCTG)	0.003 (0.033)	0.555	0.007 (0.071)	0.508	-0.002 (-0.017)	0.596
Received NGO program	-0.069 (-1.762)	0.187	-0.086 (-1.713)	0.220	-0.056 (-1.651)	0.159
Received from individual	-0.116 (-1.779)	0.523	**-0.179** (-2.418)	0.526	-0.074 (-1.098)	0.521
Sent transfers	-0.002 (-0.311)	0.014	-0.003 (-0.381)	0.009	-0.004 (-0.398)	0.019
N	6,020	3,010	2,804	1,402	3,216	1,608

Notes: Estimations use single difference using data from 24-month wave. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices. Control statistics in the table refer to the average of each outcome considered for the control group.

Without a personal network of friends and relatives to turn to for assistance, poor rural households typically have to borrow money or seek purchases on credit in times of crisis, though this is the least preferred form of coping. During the follow-up data collection, we only gathered information on households' position in the credit market, but the results (presented in Table 8.13) show that the MCTG has significantly reduced the debt exposure among program households. There is a reduction (by 3 percentage points) in the proportion of MCTG households who owe long term debt (defined as debt taken out prior to December 2012) as well as a decline in the share of households (by 8 percentage points) that needed to take out a loan during the previous six months. (Note that 80 percent of loans taken are for consumption purposes, including 11 percent for education and 6 percent for health).

Table 8.13: Impact of MCTG on Credit Outcomes

	All HH		Small HH		Large HH	
	Program Impact (1)	Control Stats (2)	Program Impact (3)	Control Stats (4)	Program Impact (5)	Control Stats (6)
Owe money from before December 2012	**-0.026**	0.067	-0.016	0.050	**-0.035**	0.080
	(-2.296)		(-1.233)		(-2.716)	
	[3,008]	[1,488]	[1,402]	[679]	[1,606]	[809]
Log (Amount Owed)	0.019	4.343	0.328	3.973	-0.123	4.527
	(0.077)		(0.646)		(-0.362)	
	[152]	[96]	[57]	[32]	[95]	[64]
Borrowed money during the last 6 months	**-0.075**	0.179	**-0.079**	0.155	**-0.075**	0.199
	(-3.902)		(-3.537)		(-2.901)	
	[3,005]	[1,486]	[1,400]	[678]	[1,605]	[808]
Loan used for consumption	-0.054	0.632	-0.038	0.650	-0.063	0.620
	(-1.111)		(-0.525)		(-0.908)	
	[441]	[258]	[170]	[100]	[271]	[158]
Log (amount borrowed during the last 6 months)	-0.018	4.134	0.026	3.989	0.062	4.227
	(-0.157)		(0.165)		(0.355)	
	[448]	[263]	[173]	[103]	[275]	[160]

Note: Estimations use single difference using data from 24-month wave. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices. Control statistics in the table refer to the average of each outcome considered for the control group.

Shocks and Coping Mechanisms

Our final resilience domain was shocks and associated coping strategies. We asked the main respondent whether the household had experienced one of 25 specific shocks, whether the shock had a negative or positive effect on the household, and if negative, what coping mechanism the household employed to deal with the shock. At baseline, the most common shock—reported in 22 percent of households—was illness, an accident, or the death of a household member. The other main shocks were food price changes (16 percent) and livestock disease and drought (each of which was reported by 9 percent of households). Shocks are typically categorized as idiosyncratic or covariate. Covariate shocks are shocks that affect the entire community (such as drought, floods, or crop food price changes) and are typically considered exogenous. Idiosyncratic shocks, on the other hand, only affect the household and may have an endogenous component to them. The data indicated that very few shocks, if any, were covariate (i.e., affected all the households in a village). For example, the correlation in reporting a drought or food price change among households in the same village was only slightly higher (and not significantly so) than reporting an illness, though we must remember there may be substantial measurement errors in the

reporting of shocks.

With these caveats in mind, we estimated the impact of the MCTG on different measures of shocks (Table 8.14) and found that there was no indication that MCTG households were less likely to be exposed to a shock. Indeed, when we tried to classify shocks into idiosyncratic and covariate (a difficult task, as the discussion above suggests), we found an indication that MCTG households were more likely (by 15 percentage points) to have suffered some form of idiosyncratic shock—a result that was concentrated among larger households where there are more people who are likely to suffer a shock.

Table 8.14: MCTG Impacts on Shocks

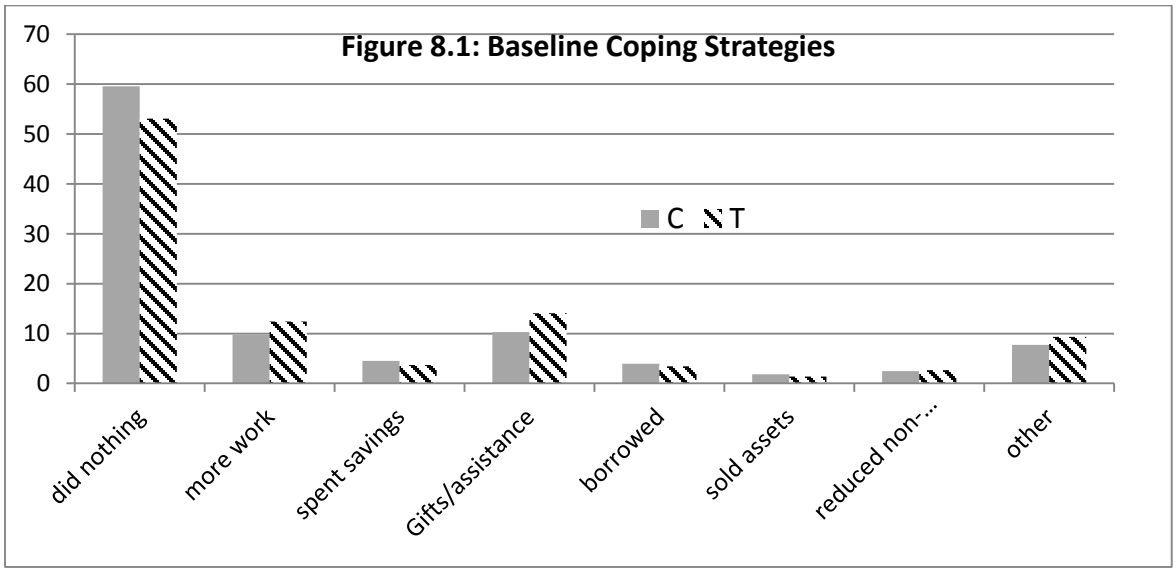
	All HH		Small HH		Large HH	
	Program Impact (1)	Baseline Mean (2)	Program Impact (3)	Baseline Mean (4)	Program Impact (5)	Baseline Mean (6)
Any negative shock	0.107	0.517	0.060	0.474	0.145	0.554
	(1.332)		(0.667)		(1.723)	
Any positive shock	0.025	0.074	0.015	0.073	0.034	0.075
	(0.763)		(0.385)		(0.985)	
Any covariate shock	0.066	0.284	0.002	0.256	0.123	0.309
	(0.753)		(0.021)		(1.279)	
Any idiosyncratic shock	**0.147**	0.433	0.122	0.383	**0.167**	0.476
	(2.372)		(1.685)		(2.484)	
Illness negative shock	0.061	0.311	0.044	0.278	0.075	0.340
	(1.440)		(0.895)		(1.461)	
N	6,020	3,010	2,804	1,402	3,216	1,608

Notes: Estimations use single difference using data from 24-month wave. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices. Control stats in the table refer to the average of each outcome considered for the control group.

Among those who suffer a negative shock, how did they cope and how has the MCTG affected their coping strategies? At baseline, the most common coping mechanism was to "do nothing," followed by receiving assistance from friends or relatives and working more (Table 8.15, columns 1 and 2). At the time of the follow-up data collection, the pattern of coping appeared to have changed significantly across the two groups of households. Both groups showed a significant reduction in "doing nothing." Among MCTG households, this decline was offset by increases in using the MCTG as a coping mechanism and the use of savings. Among control households, there was an increase in undertaking more work, and relying on friends and relatives for gifts and assistance and a reduction in non-food consumption, resulting in negative impacts for MCTG households on these two coping mechanisms (see Table 8.16). (Note that borrowing is one of the least common forms of coping.)

Table 8.15: Main Coping Strategy for Those Who Experienced Negative Shock

	Baseline		Follow-up	
	C	T	C	T
Did nothing	59.57	53.09	3.23	2.06
More work	9.73	12.42	34.06	13.89
Spent savings	4.49	3.68	13.44	19.94
Received gifts/assistance	10.3	14.09	17.85	10.39
Borrowed	3.92	3.4	2.44	2.28
Sold assets	1.83	1.39	3.23	3.06
Reduced non-food expenditures	2.46	2.64	11.99	6.5
Other	7.71	9.3	13.74	9.44
MCTG			0.00	32.44
Total	100	100	100	100
N	1,583	1,441	1,518	1,800



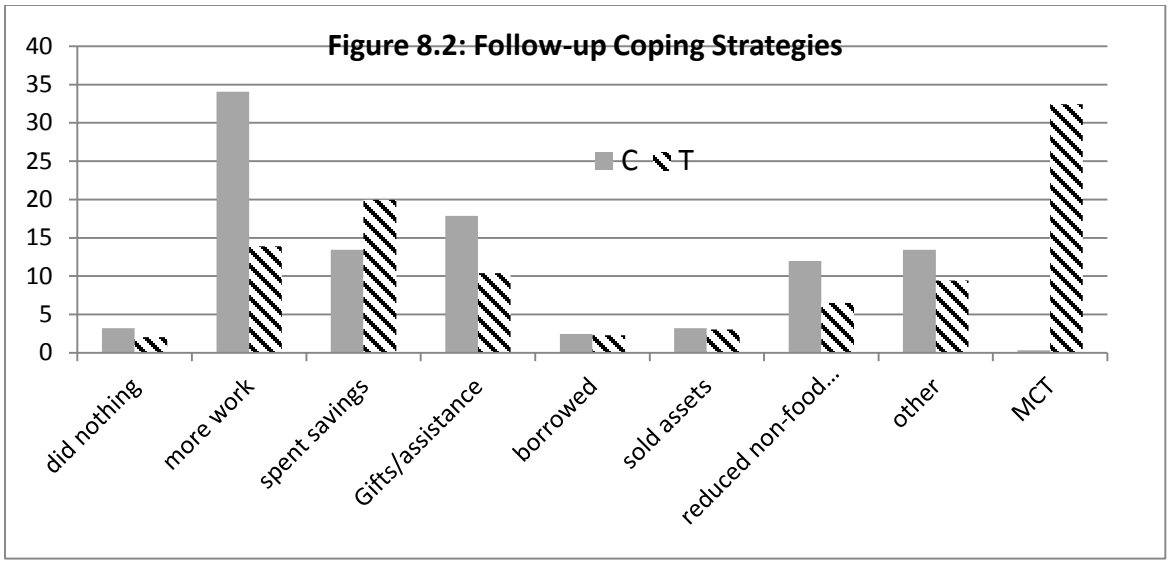


Table 8.16: MCTG Impacts on Coping Strategies

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Did nothing	-0.015	0.570	0.021	0.032
	(-0.335)			
More work	**-0.175**	0.107	0.139	0.341
	(-4.575)			
Spent savings	0.041	0.040	0.199	0.134
	(1.434)			
Received gifts/assistance	**-0.101**	0.125	0.104	0.179
	(-2.939)			
Borrowed	0.000	0.038	0.023	0.024
	(0.028)			
Sold assets	0.020	0.015	0.031	0.032
	(1.441)			
Reduced non-food expenditures	-0.034	0.028	0.065	0.120
	(-1.460)			
Other	-0.037	0.077	0.094	0.134
	(-1.312)			
N	5,375	2,057	1,800	1,518

Note: Estimations use difference-in-difference modeling among panel households. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for gender, age, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Summary of Effects on Resilience

The results above portray a clear picture of the positive impact the MCTG has had on household resilience. Specifically, the MCTG has led to improvements across a number of domains that are typically associated with strengthening resilience (see Table 8.17), including increased livestock holdings, strengthening of existing income generation sources, a reduction in debt (improvement in credit market position), and a shift in coping mechanisms towards more self-reliance. It is worth noting, however, that

the MCTG did not lead to a reduction in exposure to shocks, nor to the diversification of income sources.

Table 8.17: Summary of Impact of the MCT on Household Resilience

Domain	Impact
1 Non-agricultural assets	*
2 Agricultural assets	
Livestock	*
Tools	
3 Livelihoods	
NFE strengthening	*
NFE diversification	
Agricultural strengthening	*
Agricultural diversification	
4. Transfers, safety nets and debt	
Government	*
NGO	
Private individuals	
Less debt	*
5 Shocks and coping mechanisms	
Shocks	
Coping mechanisms	*

IX. Children

Children, especially those of school-going age, might benefit from living in a household that receives the cash transfer, depending on how the money is spent. The conceptual framework demonstrates how the cash transfer might have an impact on certain areas, such as children's material well-being, education, labor, and health. At baseline, we ran simulations to predict where we believed impacts were most likely to occur, based on the estimated elasticity of demand and spending patterns. We concluded that material well-being would likely improve, and that there could be a small change in school attendance among older children. We did not expect impacts for other indicators related to older children, however, because the transfers were not expected to be spent in ways that would affect these outcomes. After two years, we investigated the effects of the MCTG on a number of outcomes in these areas for children aged 5 to 17. As expected, we found large impacts on their material well-being. These results were supported by the spending patterns observed 24 months into the program: Recipient households spent 6 percent of their additional money on clothing but less than 1 percent of their additional money on education. As such, the minimal impact on education is not surprising.

Material Well-Being

The MCTG has had a large impact on children's material well-being, indicating that recipients used some of the transfer to purchase blankets, clothing, and shoes—items deemed necessary for supporting orphans and vulnerable children.[17] The material well-being indicator uses a scale from 0 to 3; a child gets one point for having a shared blanket, one point for having a second set of clothing, and one point for having a pair of shoes. At baseline, only 16 percent of the children aged 5 to 17 had all three items. Two years later, 58 percent of the children in MCTG households had a blanket, a change of clothing, and shoes, compared to only 38 percent of the children in control group households. The MCTG has increased children's material well-being by 23 percentage points. This impact is largely due to the increase in the number of children with shoes in MCTG households compared with those in control group households. Table 9.1 shows the impact of the program on each item on the material well-being scale. The program has had an impact on all three items separately, but it has had the biggest impact on the number of children with shoes, which increased by 23 percentage points (there was a 17 percentage point increase in the number of children with blankets and 5 percentage point increase in the number of children with a change of clothing). Children's material well-being improved in both the treatment group and the control group during the two-year period, but it improved more in the treatment group as a result of the MCTG. We suspect that the control group's growth results from the bumper harvests that occurred during the study period and the general economic improvement of the country. The program is now experiencing a ceiling effect in terms of its impact on clothing, because 97 percent of children in MCTG households and 96 percent of children in control group households own a second set of clothing two years into the program. As such, there is little room for MCTG households to improve more than control group households on this indicator, yet there is still an impact, though smaller relative to the

[17] The material well-being scale is a recommended indicator to measure care and support for orphaned and vulnerable children. See UNICEF. (2005). *Guide to monitoring and evaluation of the national response for children orphaned and made vulnerable by HIV/AIDS*. New York, NY: Author. Available at http://www.measuredhs.com/hivdata/guides/ovcguide.pdf

other two material needs. This study asks about a second set of clothing, but perhaps children in MCTG households own more clothing overall than children in control group households—an indicator not captured here.

Table 9.1: MCTG Impacts on Basic Needs Met, Ages 5–17

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
All needs met	**0.227**	0.159	0.575	0.384
	(4.525)			
Shoes	**0.226**	0.211	0.599	0.411
	(4.197)			
Blanket	**0.165**	0.610	0.927	0.827
	(4.680)			
Two sets of clothing	**0.048**	0.770	0.969	0.956
	(2.051)			
N	12,870	6,618	3,175	3,077

Note: Estimations use difference-in-difference modeling among panel households. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for gender, age, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Education

Unlike CGP households, MCTG households have a large number of school-age children who might benefit from the cash transfer. The conceptual framework shows the pathways by which the transfer could lead to impacts on education, specifically regarding enrollment and attendance. We investigated education outcomes related to enrollment and attendance for children of primary school age (7 to 14) and secondary school age (15 to 17). We also looked at differential impacts by gender for each of these age groups.

We found large impacts on enrollment for both primary- and secondary-age children due to the MCTG, though impacts for each age group varied by gender. We did not find any impacts on attendance. The MCTG has generated a 9 percentage point increase in enrollment for primary school-age boys aged 7 to 14 years old, with the treatment group reaching 76 percent enrollment and the control group reaching 72 percent enrollment. However, the program has not had an impact on educational outcomes for primary school-age girls. Table 9.2 shows the education results for primary school-age boys, while Table 9.3 shows the education results for primary school-age girls.

Table 9.2: MCTG Impacts on Education, Males Aged 7–14

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Currently enrolled (%)	**0.088**	0.702	0.758	0.722
	(3.493)			
Full attendance prior week (%)	-0.054	0.804	0.732	0.755
	(-1.163)			
Number of days in attendance prior week (0–5) if enrolled	-0.168	4.512	4.339	4.419
	(-0.867)			
N	4,404	2,258	1,090	1,056

Note: Estimations use difference-in-difference modeling among panel households. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for gender, age, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Table 9.3: MCTG Impacts on Education, Females Aged 7–14

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Currently enrolled (%)	0.043	0.732	0.758	0.749
	(1.355)			
Full attendance prior week (%)	-0.047	0.821	0.729	0.771
	(-1.079)			
Number of days in attendance prior week (0–5) if enrolled	-0.154	4.537	4.349	4.515
	(-0.849)			
N	4,074	2,070	1,047	957

NOTE: Estimations use difference-in-difference modeling among panel households. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for gender, age, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

The program has also had large impacts on secondary school-age children (15 to 17 years old), although the effect is reversed, with the program only impacting girls' enrollment. The program has resulted in a 19 percentage point impact in enrollment among secondary school-age girls, with the treatment group reaching 62 percent enrollment and the control group reaching 51 percent enrollment. It appears that while many of the girls in the control group stopped enrolling in school, the program helped girls in the treatment group maintain their enrollment in school. Female enrollment rates in the control group are consistent with the fact that many girls tend to drop out of school around this age due to early marriage or pregnancy. Table 9.4 shows the educational outcomes for girls aged 15 to 17 while Table 9.4 shows the impacts on boys aged 15 to 17 (no impacts).

Table 9.4: MCTG Impacts on Education, Females Aged 15–17

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Currently enrolled (%)	**0.185**	0.653	0.624	0.506
	(3.103)			
Full attendance prior week (%)	0.047	0.807	0.652	0.663
	(0.663)			
Number of days in attendance prior week (0–5) if enrolled	0.028	4.624	4.280	4.388
	(0.111)			
N	779	429	181	169

Note: Estimations use difference-in-difference modeling among panel households. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for gender, age, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Table 9.5: MCTG Impacts on Education, Males Aged 15–17

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Currently enrolled (%)	0.094	0.765	0.665	0.586
	(1.841)			
Full attendance prior week (%)	-0.055	0.804	0.715	0.749
	(0.836)			
Number of days in attendance prior week (0–5) if enrolled	-0.230	4.612	4.461	4.567
	(-1.084)			
N	1,507	761	364	382

Note: Estimations use difference-in-difference modeling among panel households. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for gender, age, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

There are several points to note about these analyses. First, there were no differences in impacts on enrollment between small and large households. Second, the estimated impacts on enrollment were larger than the observed mean differences in enrollment between the treatment and control groups at 24 months. Typically, we would expect the estimated impacts to closely resemble the observed mean differences between groups in an RCT, but randomization did not achieve equivalent groups in terms of enrollment at baseline, with the treatment groups reporting slightly lower enrollment than the control groups at baseline. The lack of equivalence at baseline for the enrollment indicator is not a serious concern for our impact estimates because we used a differences-in-differences approach to calculate impacts, which accounts for the differential baseline levels between the treatment and control group. Figures 9.1 and 9.2 show school enrollment by age at baseline and 24 months later for males and females. These figures show the difference between treatment and control groups at baseline and how the difference had changed 24 months into program implementation as a result of the program.

Figure 9.1:

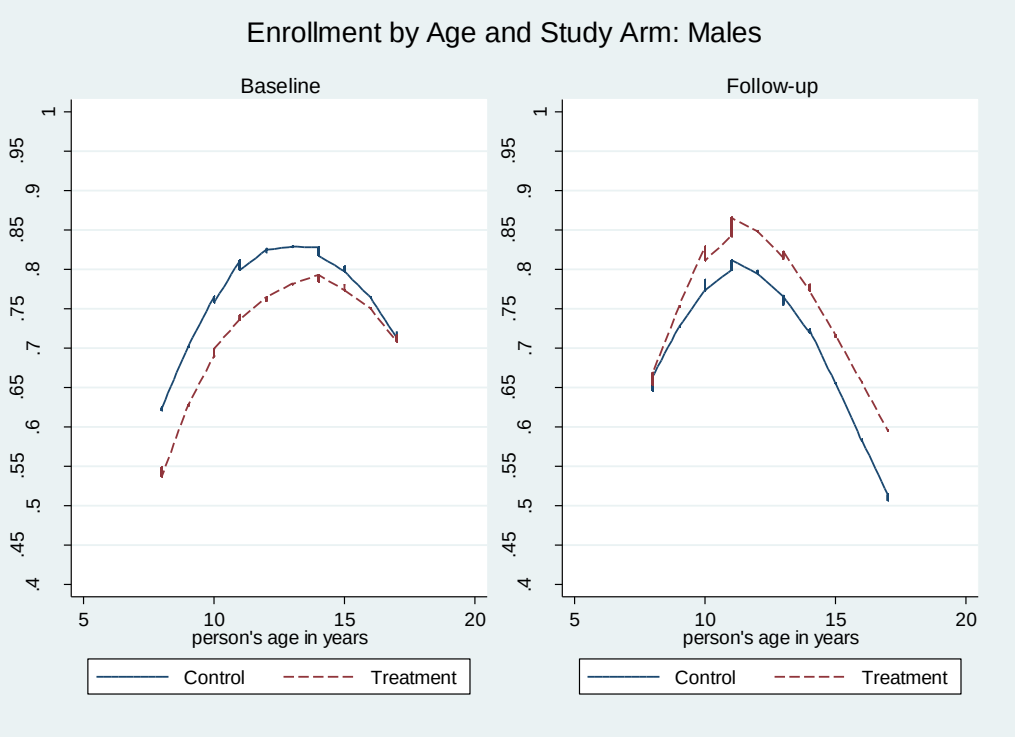


Figure 9.2:

Health and Labor

We investigated program impacts on health outcomes (morbidity, treatment seeking, and chronic illness) and labor outcomes (engagement in any work including domestic chores, paid work, and number of hours of work) for children. As predicted at baseline, we did not find any impacts on health outcomes for children under the age of five. Similarly, we found no impacts on child labor, either positive or negative.

X. Adolescents

The MCTG targets households caring for orphans and vulnerable children (OVCs) and the evaluation was particularly concerned with its potential impacts on the next generation of youth as they transition into adulthood. There is increasing evidence that cash transfers have the ability to influence a range of outcomes for adolescent populations, ranging from HIV risk behaviors to early marriage outcomes.[18] Despite these promising results, however, it is still unclear which causal pathways are responsible for impacts in the case of unconditional payments focused on underlying structural determinants, such as general poverty. In the case of the MCTG, the program's potential impact on children and adolescents must work through the household, either through household spending or household time allocation decisions (including use of services, such as attending school). These impacts can also be moderated by environmental factors (such as distance to schools or health facilities) and household-level characteristics (such as the mother's literacy). Data on outcomes for adolescents were gathered through a dedicated youth interview, which was administered to adolescents aged 13 to 17 at baseline and again during the 24-month follow-up data collection (when adolescents were aged approximately 15 to 19). The adolescent interviews were held in private and enumerators could only interview adolescents of the same gender in order to be culturally sensitive given the private nature of the questions. For this report, we analyzed three categories of outcomes: 1) HIV risk behaviors, 2) mental health indicators, and 3) pregnancy and early marriage outcomes.

HIV Risk Behaviors

Literature linking cash transfers to reproductive health and HIV has grown substantially in the last five years. Pettifor and colleagues (2012) review 10 completed studies and six ongoing studies of cash payments specifically for HIV prevention, the majority of which focused on structural factors, such as poverty among adolescents in developing countries. The review indicated that cash payments, primarily in Africa, have the potential to reduce risky sexual behavior among young women in particular, with 9 of the 10 completed studies finding positive impacts on behavioral outcomes, although much of this evidence comes from small-scale studies. Recent results from the four-year follow-up evaluation of a national social transfer program in Kenya showed that young people aged 16 to 20 in intervention households were six percentage points more likely to postpone sexual debut, and that young women had significantly fewer partners in the last 12 months and fewer unprotected sex acts in the last three months.[19]

[18] Handa, S., Halpern, C.T., Pettifor, A. & Thirumurthy, H. 2014a. The government of Kenya's cash transfer program reduces the risk of sexual debut among young people age 15–25. *PLoS ONE, 9*(1), e85473, doi:10.1371/journal.pone.0085473; Pettifor, A., MacPhail, C., Nguyen, N. & Rosenberg, M. 2012. Can money prevent the spread of HIV? A review of cash payments for HIV prevention. *Aids Behav*, Substantive Review, *16*(7), 1729-38; McQueston, K., Silverman, R., & Glassman, A. 2013. The efficacy of interventions to reduce adolescent childbearing in low- and middle-income countries: A systematic review. *Studies in Family Planning*, *44*(4), 369–388.

[19] Handa, S., Halpern, C.T., Pettifor, A. & Thirumurthy, H. 2014a. The government of Kenya's cash transfer program reduces the risk of sexual debut among young people age 15–25. *PLoS ONE, 9*(1), e85473. doi:10.1371/journal.pone.0085473;

We estimated program impacts on a set of HIV-related risk behaviors including sexual debut (whether a person has ever had sex) and, among those who have had sex, age when a person first has sex, condom use when a person first has sex, the incidence of transactional sex, and the number of partners a person had in the last 12 months. The percentage of youth aged 13 to 17 who reported that they had had sex increased from 13.6 percent at baseline to 36.9 percent and 36.7 percent in the treatment and control samples, respectively, at the time of the 24-month follow-up data collection. The average age at which youth first had sex was approximately 13.9 years old at baseline, and 22.6 percent indicated that they had used a condom when they first had sex. Approximately 27.6 percent of the sample reported that they had given or received favors for sex at baseline, and the average number of sexual partners in the last 12 months was 0.72 at baseline. We found that the program had not had a measureable impact on any of these behaviors over the 24-month period (Table 10.1). Results were the same when analyzing males and females separately, among OVC only, and among the sample of youth who were interviewed in both rounds of the study (panel youth). These results contrast with those reported by Handa et al. for the Kenya CT-OVC. However, their analysis was conducted over a four-year period and it may be that the two year window of this evaluation is not long enough for the program to impact these indicators.

Table 10.1: MCTG Impacts on Adolescent HIV Risk Behaviors Among Youth Aged 13–17 at Baseline

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Ever had sex	-0.026	0.136	0.369	0.367
	(-0.718)			
	[3,789]			
Age first sex	-0.076	13.886	14.790	14.941
	(-0.226)			
Condom used first sex	-0.016	0.226	0.197	0.165
	(-0.246)			
Ever given or received favors for sex	-0.036	0.276	0.254	0.240
	(-0.474)			
Number of sexual partners last 12 months	-0.087	0.721	1.199	1.179
	(-0.571)			
N	911	269	307	335

Notes: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for age in years of youth, sex of youth, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Mental Health

There is increasing evidence that poverty and mental health are interconnected, and that mental health has significant spillover effects on other health outcomes, particularly physical health and disease burden. We found that the MCTG has had no measureable impact on adolescent mental health, meaning that any potential effect working through household wellbeing or increases in education has not yet had an effect on youth psychological wellbeing. We measured mental health primarily through a shortened, 10-item version of the Center for Disease Control Depression Index (CESD-10), which has

been validated with high internal consistency and reliability in a range of contexts.[20] The questions asked how often certain feelings or behaviors have occurred (for example, having trouble sleeping or feeling lonely or fearful). The response options were: 1) rarely or none of the time, 2) some or a little of the time, 3) occasionally or a moderate amount of the time or 4) all the time. Answers to each of the 10 questions received a score from one to four and these scores were summed to create a scale where higher scores indicate more depressive symptoms. The scale is rebased to zero (with a range of 0 to 30) and a score of 10 or above indicates depressive symptoms (as in previous studies in South Africa and Kenya).[21] At baseline, the CESD index was 11.5, indicating that 68 percent of the sample exhibited depressive symptoms. At 24 months, the index had decreased to 6.8 and 6.5 among youth in the treatment and control groups, respectively, indicating that a smaller percentage of the sample (20–22 percent) were exhibiting depressive symptoms. In addition to these indicators, we assessed the future outlook of youth over the next one, three, and five years. At baseline, approximately 51.9 percent of the sample believed that life would be better within one year, 65.8 percent believed that life would be better within three years, and 79.4 percent believed life would be better within five years. At 24 months, the percentages trend slightly upward, and are similar for treatment and control groups. In the treatment sample, 55.6 percent believed that life will be better within one year, 65.8 percent believed that life would be better within three years and 80.0 percent believed life would be better within five years. Table 10.2 shows that there were no measureable program impacts on any of these indicators, both within the full sample and by gender (Tables 10.3. and 10.4). This lack of impact was consistent across a sample of exclusively OVC youth, those who remained in the sample at baseline and after 24 months, and a sample stratified by household size. It is possible that the program has not yet been implemented for long enough to have a measurable impact on these secondary order outcomes. Alternatively, it may be that other indicators of mental health are required to measure more nuanced outcomes.

[20] Andresen, E. M., Malmgren, J. A., Carter, W. B., & Patrick, D. L. (1994). Screening for depression in well older adults: Evaluation of a short form of the CES-D (Center for Epidemiologic Studies–Depression Scale). *American Journal of Preventive Medicine, 10*, 77–84. Radloff, Lenore. 1977. The CES-D scale: A self-report depression scale for research in the general population, *Applied Psychological Measurement, 1*(3), 385–401.

[21] Handa, S., Thirumurthy, H., Kilburn, K., Pettifor, A & Halpern, C.T. 2014b. Effects of a large-scale unconditional cash transfer program on mental health outcomes of young people in Kenya. Working paper; Ardington, C. & Case, A. 2008. *Health: Analysis of the NIDS wave 1 dataset* (no. 2). University of Cape Town: Southern Africa Labour and Development Research Unit.

Table 10.2: MCTG Impacts on Adolescent Mental Health Among Youth Aged 13–17 Years at Baseline

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
CESD	0.015	11.517	6.797	6.545
	(0.027)			
Depressive symptoms (>=1 on CESD index)	-0.012	0.680	0.221	0.203
	(-0.184)			
Believes life will be better in 1 year	0.026	0.519	0.556	0.544
	(0.405)			
Believes life will be better in 3 years	-0.001	0.658	0.682	0.691
	(-0.028)			
Believes life will be better in 5 years	-0.022	0.794	0.800	0.818
	(-0.597)			
N	3,783	2,017	844	922

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for age in years of youth, sex of youth, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices. CESD stands for Center for Disease Control Depression Index.

Table 10.3: MCTG Impacts on Adolescent Mental Health Among Female Youth Aged 13–17 at Baseline

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
CESD	-0.089	11.610	7.076	6.706
	(-0.151)			
Depressive symptoms (>=10 on CESD index)	0.005	0.682	0.243	0.199
	(0.071)			
Believes life will be better in 1 year	-0.052	0.525	0.534	0.533
	(-0.725)			
Believes life will be better in 3 years	-0.046	0.660	0.668	0.674
	(-0.750)			
Believes life will be better in 5 years	-0.045	0.796	0.803	0.823
	(-0.892)			
N	1,768	952	386	430

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for age in years of youth, household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices. CESD stands for Center for Disease Control Depression Index.

Table 10.4: MCTG Impacts on Adolescent Mental Health Among Males Aged 13–17 Years at Baseline

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
CESD	0.063	11.433	6.562	6.405
	(0.106)			
Depressive symptoms (>=10 on CESD index)	-0.031	0.678	0.203	0.208
	(-0.422)			
Believes life will be better in 1 year	0.093	0.514	0.575	0.555
	(1.297)			
Believes life will be better in 3 years	0.033	0.657	0.694	0.705
	(0.674)			
Believes life will be better in 5 years	-0.008	0.792	0.797	0.813
	(-0.205)			
N	2,015	1,065	458	492

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at p < .05. All estimations control for age in years of youth, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices. CESD stands for Center for Disease Control Depression Index.

Pregnancy and Early Marriage

Because of the multi-dimensional relationship between poverty, early marriage, and pregnancy, it is not surprising that McQueston and colleagues (2013)[22] included cash transfers—typically a poverty-targeted intervention—in their recent systematic review of successful strategies for reducing adolescent childbearing in low- and middle-income countries. The review screened over 720 abstracts published between 2000 and 2011 and reviewed 19 studies that met its inclusion criteria. Based on significant impacts documented in four rigorously designed evaluations, the review recommended cash transfer programs as one of three successful program types to reduce adolescent fertility. Despite this recommendation, the geographic spread and program design of the reviewed transfer programs are diverse, and there is a lack of literature around the impact pathways responsible for effects on adolescent reproductive health outcomes. Given that transfers are not designed to affect adolescent outcomes such as early marriage and pregnancy (leading to limitations around sample sizes and availability of indicators), it is difficult to know among what ages, in what contexts, and through which pathways we might replicate positive results.

Since information on pregnancy is collected through the special fertility module directed at all females aged 13 to 49 and marital status is recorded in the roster for all members over age 12, we analyzed marriage outcomes for all youth aged 13 to 24 and pregnancy for females age 13 to 24. At baseline, the percentage of youth who had ever been married among the full sample was 7.3 percent, and the percentage of females who had ever been pregnant was 18.7 percent. The MCTG has had no impact on either of these outcomes across the full sample aged 13 to 24 (Table 10.5), nor for the two sub-groups

[22] McQueston, K., Silverman, R., & Glassman, A. 2013. The Efficacy of Interventions to Reduce Adolescent Childbearing in Low- and Middle-Income Countries: A Systematic Review. *Studies in Family Planning*, *44*(4): 369–388.

of relatively younger youth aged 13 to 17 (Table 10.6) and relatively older youth aged 18 to 24 (Table 10.7). We also estimated impacts for OVC only and for individuals who were in both rounds of the survey, and we did not find any program impacts on these two indicators. When breaking down the sample by household size, there was some suggestive evidence that the proportion of females aged 13 to 24 who had ever been pregnant had increased among larger MCTG households—a result that merits additional scrutiny given that there was no increase in marriage within this group, nor were there positive effects on sexual debut among the younger age cohort in these households.

Table 10.5: MCTG Impacts on Early Marriage and Pregnancy Among Youth Aged 13–24 at Baseline

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Ever married	-0.004	0.073	0.064	0.063
	(-0.997)			
N	7,694	4,263	1,805	1,896
Ever been pregnant (female only)	0.039	0.187	0.230	0.203
	(1.299)			
N	3,527	1,872	777	878

Notes: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for age in years of youth, sex of youth, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Table 10.6: MCTG Impacts on Early Marriage and Pregnancy Among Youth Aged 13–17 at Baseline

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Ever married	0.000	0.009	0.006	0.004
	(0.005)			
N	3,679	2,336	646	697
Ever been pregnant (female only)	0.018	0.036	0.061	0.031
	(1.108)			
N	1,581	979	278	324

Notes: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for age in years of youth, sex of youth, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

Table 10.7: MCTG Impacts on Early Marriage and Pregnancy Among Youth Aged 18–24 Years at Baseline

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Ever married	-0.011	0.129	0.051	0.057
	(-1.061)			
N	3,843	1,812	1,004	1,027
Ever been pregnant (female only)	0.037	0.324	0.233	0.223
	(0.724)			
N	1,695	817	417	461

Notes: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for age in years of youth, sex of youth, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices.

XI. Women

The MCTG targets female-headed households and because in most cases, cash is given directly to women, there is the potential for specific impacts on women's empowerment outcomes. As demonstrated in the conceptual framework, these impacts depend on many factors, including the balance of power within households and women's individual characteristics (such as how forward looking they are when determining consumption patterns). The following section explores trends and the impact of the MCTG on bargaining power, as proxied by household decision making, savings, future outlook, and women's general health.

Bargaining Power

To explore bargaining power among sample households, we asked decision-making questions across nine domains: 1) children's health, 2) children's schooling, 3) spending their own income, 4) spending their partner's income, 5) major household purchases, 6) daily household purchases, 7) spending on children's clothes and shoes, 8) visits to family and relatives, and 9) their own health.[23] These questions were asked of one woman per household (typically the female head of household or caregiver of an OVC) and they allowed the respondent to answer whether a decision was typically made by herself, her partner, jointly, or by someone else in the household. The same woman was targeted for both the baseline and 24-month surveys, but she may have been replaced by another women in the household (who met the interviewing criteria) if she was no longer in the household or was unable to be interviewed. These types of decision-making questions are widely used as proxy measures for women's empowerment and are routinely collected in the Demographic and Health Survey (DHS) and other large-scale surveys.

To explore program impacts, we constructed two variations of indicators for each decision-making domain. First, we constructed a binary indicator to reflect whether a woman indicated sole decision-making power over the domain. Second, we constructed a binary indicator to reflect whether a woman indicated sole or joint decision-making power over the domain. In addition, we constructed a composite measure representing the count or summation of the decision making domains, giving 1 point to each time the woman indicates having sole or sole and joint decision making power (ranges from 0 to 9)[24].

Table 11.1 shows results for indicators of sole decision making by domain. Mean values at baseline for these indicators ranged from a low of 41 percent (the percentage of women who indicated that they had sole decision-making power for decisions on children's schooling) to a high of 83 percent (the percentage of women who indicated that they had sole decision-making power for decisions on a their own health). Results indicate that the program has had a significant impact on the percentage of women with sole decision-making power for decisions on their own income (which increased by five percentage

[23] Because some decisions are not applicable to all women, individual decision making domains may have different sample sizes. For example, not all women work for wages or income, and thus there is no decision made around spending of her own income. Variations in sample sizes are noted in tables.

[24] Results are robust to use of a more sophisticated composite measure constructed by factor analysis, which weights indicators differently on the basis of their variation within the sample and correlation between each other.

points), as well as decisions relating to major purchases and family visits (both of which increased by six percentage points).

Table 11.1: MCTG Impacts on Women's Sole Decision Making by Question

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Children's health	0.020	0.413	0.778	0.768
	(0.447)			
Children's schooling	0.028	0.411	0.741	0.736
	(0.604)			
Own income (N = 5,418)	**0.047**	0.795	0.745	0.731
	(2.026)			
Partner's income (N = 1,998)	0.075	0.484	0.111	0.123
	(1.059)			
Major purchases	**0.062**	0.765	0.724	0.708
	(2.527)			
Daily purchases	0.047	0.791	0.813	0.792
	(1.892)			
Children's clothes and shoes	0.076	0.445	0.766	0.752
	(1.641)			
Family visits	**0.064**	0.792	0.766	0.742
	(2.813)			
Own health	0.032	0.828	0.837	0.812
	(1.508)			
N	5,920	3,062	1,452	1,406

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices. One woman per household is asked questions on who in the household usually makes decisions across nine domains. The female head of household or primary caregiver of OVCs in baseline is targeted for questions throughout the panel. However, if this woman is not available, a substitute mother or primary caregiver may respond to questions.

Table 11.2 shows parallel results for women's indicators of sole or joint decision making. The means for these indicators ranged from lows of 47 percent (the percentage of women with sole or joint decision-making power for decisions on children's health and education) to highs of 91 percent (the percentage of women with sole or joint decision-making power for decisions on their own income and health). Results show that the significant impacts found among sole decision (Table 11.1)-making indicators carried over only to joint decisions about family visits (a three percentage point increase for women in beneficiary households). Encouragingly, nearly all indicators showed improved levels of decision making or similar levels of decision-making after 24 months, compared to the baseline.

Table 11.2: MCTG Impacts on Women's Sole or Joint Decision Making by Question

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Children's health	-0.004	0.471	0.897	0.902
	(-0.097)			
Children's schooling	-0.010	0.475	0.872	0.884
	(-0.263)			
Own income (N = 5,418)	0.010	0.908	0.919	0.922
	(0.555)			
Partner's income (N = 1,998)	0.042	0.745	0.713	0.714
	(0.746)			
Major purchases	0.025	0.875	0.880	0.879
	(1.168)			
Daily purchases	0.022	0.888	0.905	0.901
	(1.177)			
Children's clothes and shoes	0.067	0.518	0.908	0.894
	(1.841)			
Family visits	**0.033**	0.894	0.890	0.884
	(2.035)			
Own health	0.019	0.911	0.916	0.903
	(0.987)			
N	5,920	3,062	1,452	1,406

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices. One woman per household is asked questions on who in the household usually makes decisions across nine domains. The female head of household or primary caregiver of OVCs at baseline is targeted for questions throughout the panel. However, if this woman is not available, a substitute mother or primary caregiver may respond to questions.

Results from the average summations show that at baseline, women made approximately 5.2 sole decisions and approximately 5.9 sole or joint decisions out of eight possible decisions. Results show that the program has had measureable impacts on the summation indicator for sole decision making, but not for sole and joint decision making. This indicates that the program has shifted more decision making power to women alone, in domains where they originally did not take part in decision making. This result is noteworthy given that recent reviews of women's empowerment indicators have revealed that there are few rigorous evaluations showing large impacts on women's decision making or bargaining power, even in instances where programs were designed to explicitly empower women (Doss, 2013; van den Bold, Quisumbing and Gillespie, 2013). The significant program impacts may be due to the target sample, which includes a large percentage of female-headed and skipped-generation households. Table 11.3 shows results for the composite decision making indicator for both sole and sole and joint decision making. In these composite measures, the indicator for decisions on partner's income has been dropped because the sample size was restrictive.

Table 11.3: MCTG Impacts on Composite Measures of Women's Sole and/or Joint Decision Making

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Count of sole decision making	**0.315**	5.190	6.133	5.994
	(2.157)			
Count of sole or joint decision making	0.191	5.915	7.168	7.152
	(1.194)			
N	5,383	2,753	1,354	1,276

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices. One woman per household is asked questions on who in the household usually makes decisions across eight domains. The female head of household or primary caregiver of OVCs at baseline is targeted for questions throughout the panel. However, if this woman is not available, a substitute mother or primary caregiver may respond to questions. Summations represent totals across decision-making domains.

Savings and Future Outlook

We investigated indicators of savings and future outlook, as reported by the female respondents who answered decision-making questions for each household. Results indicate that at baseline, approximately 12.6 percent of households had accumulated savings in the previous three months. Two years later, MCTG households were 12 percentage points more likely to report any savings than households in the control group. In addition, MCTG households reported greater amounts of savings, as measured in logged kwacha. When we examined future outlook, we found upward trends in beliefs that life would be better in one, two, and three years, although program impacts were only weakly significant (less than p<0.5 percent) after 24 months. Table 11.4 shows the impacts of the program on women's savings and future expectations.

Table 11.4: MCTG Impacts on Women's Savings and Future Expectations

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Any savings (last three months)	**0.123**	0.126	0.334	0.196
	(2.837)			
Log amount saved last month (kwacha)	**0.626**	1.261	1.397	0.795
	(2.976)			
Believes life will be better 1 year	0.032	0.574	0.676	0.597
	(0.640)			
Believes life will be better 2 years	0.081	0.664	0.813	0.729
	(1.905)			
Believes life will be better 3 years	0.072	0.701	0.866	0.791
	(1.826)			
N	5,910	3,054	1,450	1,406

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices. The female head of household or primary caregiver of OVCs at baseline is targeted for questions throughout the panel. However, if this woman is not available, a substitute mother or primary caregiver may respond to questions.

Women's Health

We investigated health outcomes for the same women who answered the empowerment module questions with respect to morbidity in the previous two weeks, chronic illness in the previous year months, self-reported health status (self-rated "good health or better" and "very good health or better") and self-reported improved health over the previous year. Although self-reported measures of health are subject to bias, this may be an indicator that women are more optimistic about their health and economic situation. In addition, we investigated five individual measures of activities of daily living (ADLs) and one summary measure. ADLs are routinely used to measure the functional status of an individual, especially among disabled or elderly populations. These measures typically utilize questions about tasks such as feeding, bathing, dressing, the ability to perform housework tasks, and others within varying environments. In the MCTG questionnaire, we asked a number of ADL questions to individuals aged 18 and older (for example, *"How would you rate yourself when engaging in vigorous activities [such as run, lift a heavy load, lift a bucket of water]?")* The response categories were: 1) easily, 2) with difficulty, and 3) not at all. We analyzed each indicator independently and created a composite equal to one if the individual reported being able to perform all activities easily.

At baseline, 18 percent of women reported being sick in the last two weeks and approximately 61 percent had sought care of some type for the sickness. Only 6.5 percent of women reported being chronically ill for three of the last 12 months, and approximately 40 percent rated their own health as good or excellent. The percentage of women who reported that they could easily complete ADLs ranged from 47.5 percent to 55.2 percent at baseline. Despite positive trends over the 24-month period, there were no program impacts on any of the general health outcomes, including measurements of ADLs.

Table 11.5: MCTG Impacts on Women's General Health, Among Women Answering the Empowerment Module

Dependent variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Sick in the last 2 weeks	0.028	0.222	0.160	0.151
	(1.033)			
Sought care	0.018	0.609	0.625	0.612
	(0.286)			
Chronically ill (3 of the last 12 months)	0.029	0.083	0.036	0.024
	(1.745)			
Self-rated good or excellent health	0.009	0.349	0.406	0.415
	(0.193)			
Health rated better (compared to last year)	0.000	0.222	0.223	0.214
	(0.011)			
Activities of Daily Living (ADLs)				
Easily engages in vigorous activities	0.015	0.475	0.528	0.544
	(0.406)			
Easily engages in moderate activities	0.060	0.494	0.543	0.556
	(1.509)			
Can carry 10 kg bag for 500 meters	0.039	0.529	0.574	0.595
	(1.072)			
Easily bends, squats, or kneels	0.036	0.524	0.601	0.615
	(0.936)			
Easily walks 2 km or more	0.028	0.552	0.618	0.631
	(0.760)			
Can easily complete all activities of daily living (ADLs)	0.024	0.426	0.487	0.499
	(0.547)			
N	5,379	2,607	1,405	1,367

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Numbers in bold are significant at $p < .05$. All estimations control for age of individual, household size, recipient age, education and marital status, districts, household demographic composition, and a vector of cluster-level prices. The female head of household or primary caregiver of OVCs in baseline is targeted for questions throughout the panel. However, if this woman is not available, a substitute mother or primary caregiver may respond to questions.

XII. Community Overview

To better understand the culture, economic reality, and infrastructure of the communities that are part of the study, we conducted a community-level survey. We administered 92 community surveys in two districts: Serenje and Luwingu. The survey was administered by a team of Zambian enumerators experienced in household surveys and fluent in the local language. The enumerators interviewed key informants, which included the village head, Area Coordinating Committee/CWAC members, government officials, and teachers. This section includes two types of information: We begin by reporting on community-level indicators that might be affected by the program (prices and community empowerment), and we then present descriptive information about each community. Some of these measures (such as shocks and facilities) might affect the program's ability to impact outcomes of interest, thus it is important to understand their occurrence within each community.

Prices

There is a concern that in the villages of Zambia where the MCTG operates, a large influx of cash to the community may lead to inflation if supply cannot adequately respond to the new increase in demand for goods and services. We tracked 12 key consumption items to investigate this hypothesis. We deflated the reported values from the 24-month data to 2011 units using the all-Zambia consumber price index (CPI). Reported values from the baseline 2011 data were rebased to ZMW.

We found no evidence that the program affects prices. The only statically significant difference between mean prices in the treatment and control communities at the time of the 24-month follow-up data collection concerned the price of toilet soap. (A 0.42 Kwacha increase in price was observed in program CWACs, meaning that treatment communities now pay an average of 0.16 Kwacha more than households in control communities.) Though this price has increased, it is not a major concern because soap is not a staple food and the increase in price was small. Table 15.1 reports difference-in-difference estimates that effectively compare the changes in price over this period between treatment and control households in a manner similar to program impact estimates.

Table 12.1: MCTG Impacts on Prices

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Maize grain price	-1.51	18.51	22.05	22.53
	(-1.02)			
Rice price	6.09	5.19	17.10	10.61
	(1.27)			
Bean price	-0.25	4.17	4.36	4.51
	(-0.55)			
Dry fish price	-0.22	4.33	3.16	2.70
	(-0.25)			
Chicken price	-0.78	22.79	24.82	25.60
	(-0.40)			
Cooking oil price	-0.39	10.92	10.69	10.55
	(-0.67)			
Sugar price	-0.09	7.60	8.06	7.86
	(-0.30)			
Table salt price	0.16	3.34	3.63	3.60
	(0.46)			
Toilet soap price	**0.42**	4.49	4.57	4.41
	(2.08)			
Laundry soap price	-0.01	4.79	4.66	4.60
	(-0.02)			
Panadol price	-0.76	3.18	2.76	3.18
	(-1.60)			
Secondary school fee	-23.92	524.93	888.86	830.56
	(-0.21)			
N	184	92	46	46

Note: Estimations use difference-in-difference modeling among panel households. Robust *t*-statistics are in parentheses. Numbers in bold are significant at $p < .05$.

Community Empowerment

The program has created better representation for the communities in the local Area Coordinating Committee (ACC) and Community Development Committees, which is important because these committees are the primary methods of communicating with the Ministry about the program. The program has generated a 25.7 percentage point increase in the number of communities with representation in the local ACC or Community Development Committee. After 24 months, 74 percent of treatment communities had representation, compared to 57 percent of control communities. Most of the community executive committees are elected (93 percent), which empowers the community to make inclusive decisions.

The program has not had an impact on female participation in these committees. The community committees themselves, on average, consist of 10 community members, four of whom are female (on average). Seven percent of community committee chairpersons are female. Regular meetings are important in establishing committee effectiveness. Roughly 64 percent of committees meet on a quarterly basis. Quarterly meetings of committees' executives have decreased on average, from an average of 90 percent of community committees at baseline to 39 percent after 24 months.

Shocks

The community survey included questions on external shocks, which may affect the program's ability to impact outcomes. Beneficial shocks include the building of a school, road, or health facility in the last five years, and a new employment or development project that began in the last five years. Detrimental shocks include the loss of key social services, massive job lay-offs, a sharp price change, human disease, livestock disease, or crop disease, and flood or drought in the last two years.

Communities experienced few beneficial shocks, but detrimental shocks were common. Just under half of all the communities (44 percent) experienced at least one beneficial external shock, while almost all the communities (98 percent) experienced at least one detrimental external shock. There were no statically significant differences between treatment and control communities' experiences with shocks.

Table 12.2: Shocks Reported in the Community

Shocks	Pooled mean
Beneficial shocks	
School constructed in last 5 years	0.22
Road constructed in last 5 years	0.11
Health facility constructed in last 5 years	0.1
New employment available in last 5 years	0.1
Development project started in last 5 years	0.28
Any beneficial external shock (from above)	0.39
Detrimental shocks	
Loss of key social services in last 2 years	0.15
Massive job lay-offs in last 2 years	0.05
Sharp price changes in last 2 years	0.75
Human disease or epidemic in last 2 years	0.64
Livestock disease in last 2 years	0.71
Crop disease in last 2 years	0.57
Flood in last 2 years	0.13
Drought in last 2 years	0.52
Any detrimental external shock (from above)	0.98

Health and School Facilities

Most communities do not have local health facilities. Despite the overall low prevalence of health facilities, they are more common in control communities (37 percent of which have at least one facility) than in treatment communities (24 percent of which have at least one facility). This difference is not statistically significant. Of the existing health facilities, 29 percent are government hospitals, 36 percent are health centers or clinics, and 36 percent are health posts.

Schools are more common, although the types of school are limited. Eighty-eight percent of communities have at least one school in the community. In the communities that have schools, eight percent only serve children through grade four, 44 percent serve children through grade seven, and 46 percent serve children through grade nine. Just over two percent (two of the 89 schools) are secondary schools.

Cultural Norms

In order to better understand the communities in the study, we added new topics to the 24-month survey (language, religion, marriage, child care, and inheritance cultural norms).

Language

The communities are generally linguistically homogenous. Lala and Bemba are the primary household languages in three quarters of the communities in Serenje and Luwingu, respectively. Bemba is reported as the secondary language in 78 percent of Serenje households. Of the communities reporting a secondary language in Luwingu, English is the most commonly reported, spoken in 88 percent of households in the district.

Religion

Christian religious practices are most common among the communities. The primary religions in Serenje are Protestant and other Christian, at 43 and 41 percent respectively. In Luwingu, 91 percent of households report Catholicism as their primary religion, and 57 percent of households report Protestantism as the secondary religion.

Marriage

Marriage traditions involving a dowry are common and polygamy is rare. Sixty-five percent of communities in both districts practice customary marriage with a dowry at the first marriage. Polygamy is practiced in 8 percent of households per community, on average, across both districts (almost 13 percent in Luwingu but only 4 percent in Serenje).

Child Care

Communities have mixed approaches to child care. The survey asked how the community would respond to a child aged 10 who was healthy but did not attend school or had been absent for large stretches of time. Fifty-three percent of the communities said there would be disapproval from the community but no action would be taken, 24 percent said local elders or the community leader would take action, and 21 percent said nothing would be done. In the event of parental death, family and community members often become the primary caregivers for children. When the mother of a child

passes away, or both parents pass away, the maternal grandmother of a child becomes the primary female caregiver in 85 percent of communities.

Inheritance

Across communities, women have varying abilities to inherit property from their partners and family. If a woman's parents die, she can inherit their land in 86 percent of the communities overall, with some differences between districts. Serenje has a lower reported rate (74 percent of women could inherit land from their parents), while 98 percent of women in Luwingu report that women can inherit their parents' land. The percentages of women who can inherit land or a house when a their husband dies are very similar. The brother or another male relative of a deceased husband can inherit his widow as a wife in 42 percent of communities in Serenje and 54 percent of communities in Luwingu.

XIII. Discussion and Conclusion

The design of the impact evaluation of Zambia's MCTG represents the gold standard in evaluation research in that it involves a large, multisite sample with an experimental control group, a baseline measurement, and repeated post-intervention measures. Attrition at the time of the first follow-up data collection was very low (3 percent) with no differential attrition, meaning that the experimental balance created at baseline has been preserved. Consequently, the results presented in this report can be interpreted as causal effects of the MCTG, rather than confounding factors that have not been accounted for.

It is important to investigate program implementation in order to understand what exactly is being evaluated, and because deviations in program implementation can help explain impacts (or the lack thereof). Results from the data on program operations collected after 24 months indicate that the program is running as planned: Recipients are, by and large, satisfied with the operation of the program, transfers are being delivered in a timely manner, and any out-of-pocket costs associated with collecting payments are small. The timely, predictable delivery of the cash transfers and the low costs associated with collecting the money are essential preconditions for ensuring positive program impacts. These preconditions appear to have been met in the MCTG to date.

The challenge with evaluating the impact of an unconditional cash transfer program is that households are free to use the money as they see fit. Because cash is fungible, impacts might be found anywhere, depending on the preferences and constraints of each individual household. We have addressed this challenge by laying out a theoretical framework for the behavioral responses of households, and by using pre-program data to estimate income effects for different indicators to give us an idea of household preferences and how they are likely to use the cash transfer. We use our theory to guide our analysis.

The conceptual framework suggests that the primary direct impact of the MCTG will be on the consumption spending behavior of recipient households, so we expected that the program's biggest impacts would be on levels of spending, with relatively higher impacts on items more sensitive to income. The MCTG has increased total per capita consumption spending by ZMW 12.29 per month, which is approximately the same as the per capita value of the transfer. As expected among very poor households, almost all the income from the program was consumed. Most of the additional income was spent food (87 percent), leading to an increase in beneficiary households' food security (the number of households eating more than one meal a day increased by 11 percentages points, meaning that 95 percent of households now eat more than one meal a day) and diet diversity (specifically more meat and protein). The MCTG has also resulted in a decrease in severe poverty—not only in the poverty headcount, but especially in the poverty gap and squared poverty gap (which look at the distribution of poverty below the severe poverty line). These results on consumption, poverty, and food security are similar to the results from the Child Grant (CGP) cash transfer study, which makes sense given that the transfer size is the same.

However, the demographics of MCTG households are very different from those of the CGP households because MCTG households are older, with more adolescents, fewer children under the age of five, many more orphans and elderly, and more widow-headed households. The demographics of MCTG households resemble the households participating in many cash transfer programs in sub-Saharan Africa that reach severely poor and labor-constrained households (e.g., Malawi, Zimbabwe, Ghana, Mozambique, and Kenya). These households tend to have a missing generation with lots of adolescents and elderly people but few people in their thirties and forties, many of whom had children but then died, leaving them to be cared for by a single parent or grandparents. These households face different challenges than CGP beneficiaries, who tend to be young parents. As such, we would not expect MCTG households to be productive in the same way as CGP households because they have fewer able-bodied people who can farm (the primary source of income in these subsistence farming communities).

Given the different challenges and circumstances that MCTG households face (compared to CGP households), we investigated the program's impact on resiliency-a relatively new concept that highlights people's ability to cope with and overcome stresses and shocks. As there is no internationally established way of measuring resilience, we looked for impacts across five domains that collectively contribute to resilience among households. We found that the program has had positive impacts on components of each of these five domains. For example, the MCTG has strengthened both agricultural and non-agricultural assets, especially ownership of goats and chickens. The program has also strengthened existing sources of income (crop production and non-farm enterprise) and made households more self-reliant, decreasing dependence on friends and relatives and reducing debt and the need to work significantly more in the face of an emergency. The positive impacts of the program on crop production are somewhat surprising given that MCTG households are labor constrained households, but they are generated by an increase in the hiring of labor and increased purchasing of fertilizer. The strong increase in livestock holdings (larger than those found in the CGP) is likely due to the fact that this is a less labor intensive activity.

At the individual level, the MCTG has improved the lives of children by increasing their access to material needs (shoes, a blanket, and a change of clothing) and their enrollment in school. We found that the program increased school enrollment for primary school-age boys (aged 7 to 14) and for secondary school age-girls (aged 15 to 17) (see Table 13.1 for summary of impacts). These impacts were quite large, particularly for secondary school-age girls, many of whom typically drop out of school at this age. It is unclear why these impacts varied by age and gender. On the other hand, we did not observe any impacts on adolescents' HIV-related risky behavior (such as sexual debut or the age at which they first had sex), early marriage, pregnancy, or mental health. Of course, these are difficult indicators to move in the short term, and poverty is just one of a myriad complex factors that influence them.

Table 13.1: Summary of MCP Impacts on Enrolment by Age & Child Gender

Dependent Variable	Male		Female	
	Program Impact (1)	Baseline Mean (2)	Program Impact (3)	Baseline Mean (4)
Aged 7-14				
Currently enrolled (%)	**0.088** (3.493)	0.702	0.043 (1.355)	0.732
N	4,404	2,258	4,074	2,070
Aged 15-18				
Currently enrolled (%)	0.094 (1.841)	0.765	**0.185** (3.103)	0.653
N	1,507	761	779	429

Overall, our results show that the MCTG has had an impact across an impressive range of domains. In particular, the MCTG appears to be both protecting (and increasing) current consumption and leading households to invest in the future by strengthening livelihoods and increasing the human capital of children. In this sense, the MCTG may in fact be more successful than the CGP as a win-win policy for Zambia.

Annex 1: Difference-in-Differences Estimation

The statistical approach we take to derive average treatment effects of the MCTG is the difference-in-differences (DD) estimator. This entails calculating the change in an indicator (Y), such as food consumption, between baseline and follow-up period for treatment and comparison group units and comparing the magnitude of these changes. Figure A2.1 illustrates how the estimate of differences in differences between treatment (T) and control (C) groups is computed. The top row shows the baseline and postintervention values of the indicator (Y), and the last cell in that row depicts the change or difference in the value of the outcome for T units. The second row shows the value of the indicator at baseline and postintervention for comparison group units, and the last cell illustrates the change or difference in the value of this indicator over time. The difference between these two differences (treatment vs. control), shown in the shaded cell in Figure A1.1, is the difference-in-differences or double-difference estimator.

Figure A1.1: The Difference-in-Differences (DD) Estimator

	Baseline (2011)	Post (2013)	1st difference

Treatment (T)	Y^{T}_{2011}	Y^{T}_{2013}	$\Delta Y^{T}=(Y^{T}_{2013}-Y^{T}_{2011})$
Comparison (C)	Y^{C}_{2011}	Y^{C}_{2013}	$\Delta Y^{C}=(Y^{C}_{2013}-Y^{C}_{2011})$
			Difference in differences DD = $(\Delta Y^{T} - \Delta Y^{C})$

The DD is one of the strongest estimators available in the evaluation literature (Shadish et al., 2002). Two key features of this design are particularly attractive for deriving unbiased program impacts. First, using pre- and posttreatment measures allows us to "difference" out unmeasured fixed (i.e., time-invariant) family or individual characteristics that may affect outcomes, such as motivation, health endowment, mental capacity, and unobserved productivity. It also allows us to benchmark the change in the indicator against its value in the absence of treatment. Second, using the change in a control group as a comparison allows us to account for general trends in the value of the outcome. For example, if there is a general increase in school enrollment owing to expansion of school access, deriving treatment effects based only on the treatment group will confound program impacts on schooling with the general trend increase in schooling.

The key assumption underpinning the DD is that there is no systematic unobserved time-varying difference between the T and C groups. For example, if the T group changes its preference for schooling over time but the C group does not, then we would attribute a greater increase in schooling in T to the program rather than to this unobserved time-varying change in characteristic. In practice, the random assignment to T and C, the geographical proximity of the samples, and the rather short duration between pre- and postintervention measurements will make this assumption quite reasonable.

When treatment and comparison units are selected randomly and their characteristics are perfectly balanced, the simple mean differences as shown in Figure A1.1 are usually sufficient to derive unbiased estimates of program impact. However in large-scale social experiments, it is typical to estimate the DD in a multivariate framework, controlling for other potential intervening factors that might not be perfectly balanced across T and C units and/or are strong predictors of the outcome (Y). Not only does this allow us to control for possible confounders, it also increases the efficiency of our estimates by reducing the residual variance in the model. Of course, there is an important weakness to the multivariate approach, which is that overfitting the statistical model can wash-away program effects that work through the control variables. For example, if we control for the number of young children in the household when estimating treatment effects on nutrition, and if the program improves nutrition through decreases in fertility (through the well-known child quantity-quality trade-off), then we may not estimate a positive treatment effect when controlling for the number of young children, even though the program actually has an impact on nutrition.

Cross-Section Analysis of Selected Indicators

One data issue distinguishes the nonagricultural enterprise and labor analysis from the analysis used in the rest of the report. Both a detailed labor module and a nonagricultural enterprise model were included in the 2012 follow-up questionnaire but not in 2010. Consequently, we have only one

observation per household and per individual for most of the labor and nonagricultural enterprise outcomes of interest. Impact estimates for these indicators are derived using multivariate cross-section analyses. We also experimented with inverse probability weight estimators but these yielded similar results given the excellent balancing properties at baseline.

Annex 2: Mean Differences at Baseline for Attrition Analysis

Table A2.1: Household Level Control Comparisons (Full Sample Versus Remaining Sample at 24-month Follow-up)

Variables	Full Sample Mean	Full Sample N1	Remaining Sample Mean	Remaining Sample N2	Mean Diff	Diff SE	p-value	Effect Size
Household size	4.997	3,076	4.997	3,010	0.000	0.007	0.971	0.000
Number of children ages 0 - 5	0.184	3,076	0.182	3,010	-0.002	0.002	0.198	-0.005
Distance to food market	30.821	2,153	30.912	2,104	0.091	0.111	0.415	0.003
Distance to health facility	12.442	2,828	12.505	2,764	0.063	0.039	0.112	0.004
Yes/no whether household was affected by drought	0.095	3,077	0.097	3,011	0.002	0.000	0.000	0.006
Yes/no whether household was affected by flood	0.034	3,077	0.035	3,011	0.000	0.000	0.271	0.002
Yes/no whether household was affected by any shocks	0.553	3,077	0.555	3,011	0.002	0.001	0.199	0.004

Notes: Diff is the average difference between full and the remaining samples, and SE is the standard error of this difference clustered at the CWAC level.

Table A2.2: Household Level Outcome Comparisons (Full Sample Versus Remaining Sample at 24-month Follow-up)

Variables	Full Sample Mean	Full Sample N1	Remaining Sample Mean	Remaining Sample N2	Mean Diff	Diff SE	p-value	Effect Size
Cereal share	0.180	3,071	0.179	3,005	-0.001	0.000	0.010	-0.007
Root-tubers share	0.241	3,071	0.243	3,005	0.002	0.001	0.002	0.008
Pulses-legumes share	0.069	3,071	0.069	3,005	-0.000	0.000	0.198	-0.005
Fruits-vegetable share	0.275	3,071	0.275	3,005	-0.000	0.000	0.771	-0.001
Meal-poultry-fish share	0.099	3,071	0.099	3,005	-0.000	0.000	0.518	-0.002
Total household Expenditure per person in the household	51,355.563	3,076	51,000.944	3,010	-354.619	191.098	0.067	-0.008
Food security	14.671	3,004	14.682	2,940	0.011	0.014	0.451	0.002

Notes: Diff is the average difference between full and the remaining samples, and SE is the standard error of this difference clustered at the CWAC level.

Table A2.3: Household Level Control Comparisons (Control Versus Treatment for Respondent Households)

Variables	Control Mean	Control N1	Treatment Mean	Treatment N2	T-C Diff	Diff SE	p-value	Effect Size
Household size	5.010	1,488	4.984	1,522	-0.026	0.206	0.900	-0.010
Number of children ages 0 - 5	0.682	1,488	0.726	1,522	0.044	0.062	0.478	0.045
Distance to food market	27.501	1,050	34.310	1,054	6.809	6.974	0.332	0.217
Distance to health facility	11.970	1,365	13.027	1,399	1.056	1.873	0.574	0.064
Yes/no whether household was affected by drought	0.111	1,489	0.083	1,522	-0.027	0.023	0.236	-0.092
Yes/no whether household was affected by flood	0.031	1,489	0.039	1,522	0.008	0.021	0.710	0.043
Yes/no whether household was affected by any shocks	0.597	1,489	0.513	1,522	-0.084	0.051	0.102	-0.169

Notes: Diff is the average difference between Treatment and Control, and SE is the standard error of this difference clustered at the CWAC

level.

Table A2.4: Household Level Outcome Comparisons (Control Versus Treatment for Respondent Households)

	Control		Treatment		T-C	Diff	p-value	Effect
Variables	Mean	N1	Mean	N2	Diff	SE		Size
Cereal share	0.191	1,488	0.166	1,517	-0.025	0.024	0.291	-0.145
Root-tubers share	0.234	1,488	0.251	1,517	0.018	0.037	0.633	0.076
Pulses-legumes share	0.072	1,488	0.065	1,517	-0.007	0.008	0.358	-0.068
Fruits-vegetable share	0.268	1,488	0.283	1,517	0.015	0.012	0.213	0.091
Meal-poultry-fish share	0.100	1,488	0.098	1,517	-0.002	0.010	0.806	-0.019
Total household Expenditure per person in the household	51,774.742	1,488	50,244.432	1,522	-1,530.309	2,905.205	0.600	-0.034
Food security	14.645	1,460	14.718	1,480	0.073	0.451	0.872	0.013

Notes: Diff is the average difference between Treatment and Control, and SE is the standard error of this difference clustered at the CWAC level.

Table A2.5: Individual Level Control Comparisons: Adolescents at Risk (Control Versus Treatment for Respondent Individuals

	Control		Treatment		T-C	Diff	p-value	Effect
Variables	Mean	N1	Mean	N2	Diff	SE		Size
Married	0.006	891	0.004	830	-0.002	0.004	0.602	-0.029
Orphan or vulnerable child	0.428	869	0.400	795	-0.028	0.031	0.370	-0.057
Orphan-vulnerable child scale	1.695	879	1.571	820	-0.124	0.085	0.145	-0.132
Psychosocial score	17.767	755	17.929	663	0.162	0.545	0.766	0.034
Age	14.762	891	14.755	830	-0.007	0.143	0.963	-0.002
Ever had sexual intercourse 1=yes 0=no	0.118	770	0.126	691	0.008	0.019	0.690	0.024
Age first sexual intercourse	13.659	91	13.782	87	0.122	0.443	0.783	0.042
Used condom during first sexual intercourse	0.207	87	0.259	85	0.052	0.060	0.387	0.123

Notes: Diff is the average difference between Treatment and Control, and SE is the standard error of this difference clustered at the CWAC level.

Annex 3: Resilience

Table A3.1: MCTG Impacts on Asset Ownership (Share)

	All HH		Small HH		Large HH	
	Program Impact	Baseline Mean	Program Impact	Baseline Mean	Program Impact	Baseline Mean
	(1)	(2)	(3)	(4)	(5)	(6)
Assets Index	**0.292**	0.141	**0.307**	-0.050	**0.274**	0.308
	(3.557)		(3.052)		(3.256)	
Bed	**0.132**	0.315	**0.187**	0.288	**0.082**	0.338
	(3.677)		(4.048)		(2.163)	
Mattress	**0.123**	0.268	**0.188**	0.235	0.063	0.297
	(3.173)		(3.755)		(1.517)	
Mosquito Net	0.052	0.744	0.076	0.719	0.032	0.765
	(1.179)		(1.158)		(0.822)	
Table	0.029	0.054	0.012	0.036	0.043	0.070
	(1.661)		(0.849)		(1.800)	
Sofa	0.013	0.027	0.001	0.016	0.026	0.036
	(1.421)		(0.130)		(1.975)	
Radio	0.032	0.075	**0.042**	0.047	0.022	0.099
	(1.939)		(2.219)		(0.963)	
TV	0.002	0.009	0.000	0.001	0.000	0.016
	(0.947)		(1.399)		(0.120)	
DVD	0.001	0.016	-0.000	0.006	0.002	0.024
	(0.441)		(-0.089)		(0.299)	
Watch	0.010	0.007	0.004	0.006	0.014	0.008
	(1.648)		(0.877)		(1.765)	
Clock	0.019	0.082	**0.033**	0.058	0.012	0.103
	(1.530)		(2.154)		(0.603)	
Electric Iron	0.014	0.903	0.002	0.871	0.010	0.931
	(0.217)		(0.025)		(0.105)	
Charcoal Iron	0.024	0.105	0.028	0.083	0.020	0.125
	(1.156)		(1.483)		(0.740)	
N	6,082	3,072	2,831	1,429	3,251	1,643

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices.

Table A3.2: MCT Impacts on Housing Conditions

	All HH		Small HH		Large HH	
	Program Impact	Baseline Mean	Program Impact	Baseline Mean	Program Impact	Baseline Mean
	(1)	(2)	(3)	(4)	(5)	(6)
Purchased Roof	-0.011	0.100	-0.006	0.096	-0.011	0.104
	(-0.848)		(-0.327)		(-0.639)	
Purchased Floor	-0.005	0.056	0.003	0.043	-0.012	0.068
	(-0.450)		(0.222)		(-0.780)	
Purchased Wall	0.035	0.849	0.047	0.819	0.024	0.874
	(1.580)		(1.331)		(1.180)	
Purchased Lighting	**0.189**	0.570	**0.223**	0.483	**0.157**	0.646
	(4.262)		(3.687)		(3.912)	
Purchased Cooking	0.013	0.030	0.007	0.028	0.016	0.032
	(1.406)		(0.606)		(1.913)	
Clean Water	0.059	0.229	0.023	0.210	**0.092**	0.245
	(1.776)		(0.663)		(2.200)	
Own Toilet	0.009	0.790	0.030	0.771	-0.008	0.807
	(0.220)		(0.739)		(-0.154)	
N	6,073	3,066	2,827	1,426	3,246	1,640

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices.

Table A3.3: MCT Impacts on Livestock Ownership (Share)

	All HH		Small HH		Large HH	
	Program Impact	Baseline Mean	Program Impact	Baseline Mean	Program Impact	Baseline Mean
	(1)	(2)	(3)	(4)	(5)	(6)
Livestock Index	**0.552**	-0.040	**0.569**	-0.168	**0.536**	0.071
	(7.821)		(6.979)		(6.393)	
Cattle	-0.000	0.007	0.000	0.009	-0.001	0.007
	(-0.379)		(1.039)		(-0.673)	
Goats	**0.155**	0.113	**0.159**	0.092	**0.148**	0.131
	(5.741)		(4.857)		(4.452)	
Chicken	**0.220**	0.475	**0.247**	0.414	**0.194**	0.529
	(5.458)		(4.868)		(4.312)	
Ducks	**0.008**	0.012	0.007	0.010	0.006	0.014
	(2.019)		(1.469)		(1.403)	
Pigs	**0.025**	0.014	0.005	0.013	**0.049**	0.016
	(3.659)		(1.604)		(3.381)	
N	6,085	3,076	2,833	1,431	3,173	1,605

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices.

Table A3.4: MCT Impacts on Livestock Ownership (Number)

	All HH		Small HH		Large HH	
	Program Impact	Baseline Mean	Program Impact	Baseline Mean	Program Impact	Baseline Mean
	(1)	(2)	(3)	(4)	(5)	(6)
Livestock Index	**0.552**	-0.040	**0.569**	-0.168	**0.536**	0.071
	(7.821)		(6.979)		(6.393)	
Cattle	-0.026	0.025	0.028	0.034	-0.071	0.018
	(-0.822)		(1.106)		(-1.367)	
Goats	**0.336**	0.363	**0.357**	0.235	**0.319**	0.475
	(3.642)		(3.930)		(2.388)	
Chicken	**1.466**	2.616	**1.747**	2.096	**1.212**	3.069
	(4.776)		(4.655)		(3.106)	
Ducks	0.036	0.048	0.094	0.027	-0.015	0.066
	(1.036)		(1.892)		(-0.387)	
Pigs	**0.070**	0.041	0.017	0.033	**0.117**	0.048
	(2.681)		(0.727)		(3.013)	
N	6,085	3,076	2,833	1,431	3,252	1,645

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices.

Table A3.5: MCT Impacts on Agricultural Implements (Share)

	All HH		Small HH		Large HH	
	Program Impact	Baseline Mean	Program Impact	Baseline Mean	Program Impact	Baseline Mean
	(1)	(2)	(3)	(4)	(5)	(6)
Ag Implements Index	0.147	-0.027	0.143	-0.214	0.149	0.135
	(1.802)		(1.372)		(1.831)	
Axe	0.065	0.742	0.054	0.695	0.072	0.784
	(1.824)		(1.123)		(1.983)	
Hoe	0.021	0.903	0.030	0.871	0.014	0.931
	(1.508)		(1.285)		(1.144)	
Hammer	0.003	0.105	0.013	0.083	-0.006	0.125
	(0.200)		(0.692)		(-0.276)	
Shovel	-0.011	0.066	-0.008	0.055	-0.010	0.076
	(-0.846)		(-0.656)		(-0.545)	
N	6,078	3,070	2,830	1,429	3,248	1,641

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices.

Table A3.6: MCT Impacts on Agricultural Implements (Number)

	All HH		Small HH		Large HH	
	Program Impact	Baseline Mean	Program Impact	Baseline Mean	Program Impact	Baseline Mean
	(1)	(2)	(3)	(4)	(5)	(6)
Ag Implements Index	0.147	-0.027	0.143	-0.214	0.149	0.135
	(1.802)		(1.372)		(1.831)	
Axe	0.065	0.742	0.054	0.695	0.072	0.784
	(1.824)		(1.123)		(1.983)	
Pick	0.049	0.096	0.046	0.087	0.052	0.104
	(1.791)		(1.372)		(1.566)	
Hoe	**0.227**	1.933	0.091	1.493	**0.351**	2.315
	(2.259)		(0.941)		(2.418)	
Hammer	-0.002	0.133	0.004	0.094	-0.010	0.167
	(-0.093)		(0.140)		(-0.278)	
Shovel	-0.012	0.088	0.027	0.076	-0.046	0.098
	(-0.469)		(0.720)		(-1.340)	
Plough	0.034	0.018	0.048	0.017	0.022	0.019
	(1.404)		(1.127)		(0.802)	
N	6,083	3,073	2,831	1,429	3,252	1,644

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices.

Table A3.7: Crop Production (share)

	All HH		Small HH		Large HH	
	Program Impact	Baseline Mean	Program Impact	Baseline Mean	Program Impact	Baseline Mean
	(1)	(2)	(3)	(4)	(5)	(6)
Maize	**0.123**	0.555	**0.199**	0.480	0.074	0.613
	(2.793)		(3.661)		(1.524)	
Cassava	-0.080	0.612	**-0.107**	0.612	-0.062	0.612
	(-1.827)		(-2.068)		(-1.290)	
Millet	0.033	0.140	0.017	0.106	0.045	0.165
	(1.752)		(0.939)		(1.566)	
Groundnut	**0.139**	0.325	0.099	0.347	**0.175**	0.309
	(2.848)		(1.741)		(2.998)	
Sweet potatoes	0.016	0.078	-0.004	0.062	0.033	0.091
	(0.911)		(-0.237)		(1.377)	
Sorghum	-0.007	0.058	-0.005	0.047	-0.005	0.067
	(-1.300)		(-1.187)		(-0.664)	
Other beans	**0.114**	0.213	**0.112**	0.202	**0.115**	0.221
	(3.150)		(2.725)		(2.471)	
N	5,365	2,728	2,343	1,186	3,022	1,542

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices.

Table A3.8: Crop Production (Kg)

	All HH		Small HH		Large HH	
	Program Impact	Baseline Mean	Program Impact	Baseline Mean	Program Impact	Baseline Mean
	(1)	(2)	(3)	(4)	(5)	(6)
Maize	90.691	399.744	**95.952**	299.199	86.114	477.077
	(1.842)		(2.287)		(1.247)	
Cassava	53.755	358.034	78.077	325.000	29.944	383.441
	(0.908)		(0.945)		(0.522)	
Millet	**22.789**	31.990	5.000	25.691	**36.001**	36.835
	(2.361)		(0.518)		(2.740)	
Groundnut	23.635	63.766	9.671	61.783	34.823	65.292
	(1.746)		(0.724)		(1.911)	
Sweet potatoes	5.456	28.807	-6.532	21.824	14.031	34.178
	(0.406)		(-0.326)		(1.122)	
Sorghum	-2.974	8.419	**-5.844**	5.999	-0.849	10.280
	(-1.264)		(-2.169)		(-0.265)	
Other beans	**14.530**	23.820	16.523	20.124	13.124	26.662
	(2.289)		(1.712)		(1.720)	
N	5,365	2,728	2,343	1,186	3,022	1,542

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices.

Table A3.9: Crop Input Use and Land Use

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Operated land (has)	**0.148**	0.684	0.573	0.507
	(3.470)			
Total crop exp	**48.301**	53.900	77.487	59.894
	(3.292)			
Exp seed	3.434	13.925	12.217	13.026
	(1.162)			
Exp hired labor	**17.695**	4.628	27.415	10.024
	(4.091)			
Exp pesticides	1.159	0.846	1.475	1.059
	(1.234)			
Exp fertilizer	**24.530**	27.845	31.873	30.362
	(2.537)			
Other crop exp	**20.337**	12.130	33.396	16.505
	(3.027)			
N	5,367	2,729	1,373	1,265

Note: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices.

Table A3.10: Crop Input Use and Land Use

	All HH		Small HH		Large HH	
	Program Impact	Baseline Mean	Program Impact	Baseline Mean	Program Impact	Baseline Mean
	(1)	(2)	(3)	(4)	(5)	(6)
Operated land (has)	**0.148**	0.684	**0.100**	0.579	**0.183**	0.765
	(3.470)		(2.185)		(3.387)	
Total crop exp	**48.301**	53.900	**54.369**	36.948	**42.842**	66.950
	(3.292)		(2.894)		(2.298)	
Exp seed	3.434	13.925	3.310	8.532	3.306	18.077
	(1.162)		(1.131)		(0.710)	
Exp hired labor	**17.695**	4.628	**24.882**	2.966	**11.630**	5.907
	(4.091)		(5.040)		(2.002)	
Exp pesticides	1.159	0.846	0.100	0.263	1.926	1.294
	(1.234)		(0.077)		(1.005)	
Exp fertilizer	**24.530**	27.845	28.718	20.596	21.416	33.426
	(2.537)		(1.662)		(1.758)	
Other crop exp	**20.337**	12.130	**22.340**	7.821	**18.120**	15.447
	(3.027)		(2.508)		(2.166)	
N	5,367	2,729	2,345	1,187	3,022	1,542

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at $p < .05$. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices.