

TITLE

The impact of the Social Cash Transfer Scheme on food security in Malawi

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ABSTRACT

The Malawi Social Cash Transfer Scheme (SCTS) was launched in 2006 to improve food security by directly providing cash transfers to the country's most destitute households. Although government implemented social transfer schemes have gained popularity throughout Latin America, these schemes are just emerging in Africa. Consequently, while there is evidence of the beneficial impact of cash transfers on food security from Latin American countries, there is a dearth of evidence from resource poor countries in Africa.

In order to fill this gap, we conducted a longitudinal, randomized community control study of the pilot SCTS in Mchinji, Malawi from March 2007 to April 2008 with a panel of intervention and comparison households. In this study, we describe the impact of approximately US\$14 per month on food security among recipient households compared to control households using indicators of food consumption and expenditures, dietary diversity, and food stores.

We present compelling evidence, whereby each of the tested outcomes yields large effect sizes that are highly statistically significant, demonstrating the impressive impact of cash transfers on food security in rural Malawi. The SCTS is an effective tool within the Government of Malawi's National Social Protection Policy for improving food security in the country's most destitute households.

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INTRODUCTION

A chronic lack of food security is one of the greatest challenges to households throughout Malawi, undermining efforts to improve health and development and fueling intergenerational poverty (Republic of Malawi, 2007). One goal of the Malawi Social Cash Transfer Scheme (SCTS) is to improve food security by directly providing cash transfers to the country's most destitute households (Schubert, 2006). The Social Cash Transfer Scheme is one tool within the Government of Malawi's National Social Protection Policy, which is an effort to respond to widespread poverty (National Social Protection Technical Committee, 2007). Government implemented social transfer schemes, which are popular throughout Latin America, are just emerging in Africa, and the Malawian scheme is one of the first of its kind in a resource poor country in Southern Africa.

Theoretically, cash transfers improve food security by improving food access, or providing households with income that can be used to purchase food (Reilly, Mock, Cogill et. al., 1999). An underlying assumption is that food is available in local markets for purchase and that by raising income in ultra poor households, families will choose to purchase food with a portion of their monthly income. For food security to improve throughout the household, a further assumption is that there will be some level of equity in the intra-household allocation of food. Consequently, in many Latin American schemes, in order to increase the likelihood of equitable intra-household allocation, only women or mothers may be the registered recipients. Furthermore, cash transfer programs

in Latin America are conditional, whereby recipients must meet specified obligations such as bringing children to growth monitoring check ups and attending nutrition seminars as in Brazil and Colombia respectively (Fiszbein, Schady, Ferreira, et.al., 2008). However, in Malawi, the cash scheme is not conditioned on any specified compulsory behavior and both men and women ‘head of households’ may be registered as recipients. Still, more women than men are enrolled in the scheme because Malawian women are more likely to meet the eligibility criteria due to their lower economic status and greater caregiving responsibilities. In addition, in Malawi, there are no programmatic accompaniments, such as nutritional supplements for children, which are given in Mexico and Nicaragua (Lagarde, Haines, Palmer, 2008). Malawian recipients are urged to use the transfer to purchase a variety of healthy foods, to purchase fertilizer and farm tools, and to direct a portion of their harvest to food stores.

Much of the literature on the impact of cash transfers on food security originates from Latin America, where cash schemes—accompanied by a strong evaluation culture—have been in operation for a number of years (Fiszbein, et.al, 2008). In Mexico, Gertler (2005) found that cash transfer households spent about 60% to 70% of the transfer on food. In Nicaragua, Maluccio and Flores (2005) used double difference estimates to show the scheme’s significant impact on annual per capita food expenditures and the percentage of total income spent on food between cash transfer and comparison households. They also examined individual food categories and found that the cash scheme had a significant impact on dietary diversity in intervention versus comparison households. Expenditures on nearly all food groups increased, along with expenditures on nutrient-dense foods, such as meats, fruits, and vegetables, which increased as a percentage of total food

expenditures. Maluccio and Flores, conclude that the scheme prevented deterioration in food security for the intervention group compared to the comparison group. In South Africa, Booysen and Van Der Berg (2005) examined the role of income grants on food expenditures and found that income grant recipients used the social grant to pay for food, but findings were only significant in the case of disability grants and at the $p < 0.10$ level.

Additionally, several studies provide evidence that cash transfers impact food security, as demonstrated by the positive affect they have on improved growth in children. These findings indicate that cash transfer households were consistently using income to purchase or grow high quality foods that were regularly consumed and shared with children in the household. In a recent review, Lagarde, Haines and Palmer (2008) reported positive impacts on child growth in Mexico and Nicaragua, but a negative impact on child growth in Brazil. In South Africa, Dufflo (2000) measured the impact of social pension grants on child health and nutrition. The effect of cash on anthropometric measures was largest for girls and occurred mostly when women received the cash grant. Furthermore, we present evidence from Malawi of greater gains in height, reduced stunting, and fewer illnesses among children from intervention versus comparison households (Miller, Tsoka, Reichert, 2007, and 2008).

Despite these findings, there is still a dearth of evidence on the impact of cash transfers on households in Africa. For example, how do cash transfers impact food expenditures throughout the year and what are the seasonal differences in the types of foods consumed based on intervention status? Should cash transfers be targeted only to female-headed-households in order for food expenditures to increase and food diversity to improve? In

order to begin to fill this gap, researchers from Boston University School of Public Health and the Centre for Social Research at the University of Malawi conducted a longitudinal study of the SCTS in Mchinji Malawi from March 2007 to April 2008. In this study, we describe the impact of approximately US\$14 per month on food security at the household level for cash transfer recipient and comparison households. To measure food security, we use indicators of food consumption and expenditures, dietary diversity, and food stores (Barrett, 2002; Ruel, 2003).

The Malawi Social Cash Transfer

The Social Cash Transfer Scheme is currently operational in seven districts in Malawi. The SCTS relies on community based targeting whereby elected or appointed Community Social Protection Committees (CSPCs) select the poorest 10% of households that are also labour constrained to receive the SCTS. Targeted households must meet the eligibility criteria of being ultra poor, or within the lowest economic quintile, and labor constrained, with a dependency ratio that is incalculable or worse than three. A high dependency ratio may be the result of households with many children under the age of 19, elderly dependents over the age of 65, or adults aged 19-64 with chronic illnesses or disabilities that make them unable to work. On average, beneficiaries receive MK2,000 (US\$14) per month depending on the size of the household and the number of school aged children in the household (a MK200 top-up is paid for primary school aged children and MK400 for secondary aged youth) (Table 1).

[Table 1 about here]

METHODS

The Boston University Institutional Review Board and the Malawian National Health Research Council at the Ministry of Health approved the study protocols submitted for the evaluation.

Study Design

This longitudinal study to examine the impact of the SCTS consisted of three rounds of a household survey with a panel of intervention and comparison households in cash transfer recipient and non-recipient villages. We collected a baseline survey in March 2007, a midpoint survey six months from when the intervention households received their first cash payment in September 2007, and an endline survey in April 2008, one year from when the study began. Data for the baseline and endline occurred towards the end of the rainy season when food insecurity is typically at its worst, while the midpoint assessment was conducted in September, when access to food is at an annual high point. Comparison households received their first transfers in May 2008.

It is important to report that in September 2007, UNICEF financed a one-time-only food bucket valued at MK1,230 (US\$8.80) containing oil, sugar, tea, salt, soap and beans for all comparison households. Given the poverty in these households, we concluded that the benefits of recognizing the situation of comparison households outweighed the minimal risk of biasing results. The bucket was given before the midpoint data collection and six months before endline data collection, so it is unlikely that it biased any findings.

Sample Selection

Mchinji District is divided into nine Traditional Authorities (TAs) which are further divided into groups that contain multiple villages creating clusters of about 1000 households. By March 2007, the SCTS reached approximately 29 village groups within four out of nine TAs in Mchinji District. However, the scheme had not yet reached all village groups, which provided an opportunity to conduct an evaluation where we could collect baseline data with both an unexposed intervention and comparison group.

With oversight from the district government, the CSPCs implemented the multi-stage, targeting process in eight village groups that would become the study population. This yielded approximately 100 households per village group to enroll as cash recipients or approximately 800 households in total. According to the CSPCs, each of these households met the criteria of being ultra poor and labour constrained. Using a flip of a coin, we assigned four village groups into the intervention arm and designated the remaining four as the comparison group. The sampling frame was thus a district-provided roster of all cash transfer approved households in the eight village groups. We observed that CSPCs from different village groups varied on their selection criteria with some committees prioritizing households with orphans while others prioritizing elderly-only households. Thus, even if intervention and comparison village groups were socio-demographically and economically identical, variations in the CSPC's selection criteria resulted in study groups with slightly different demographics.

Sample Size

RAs made every effort to interview all household heads, including setting up appointments, meeting respondents in their fields if necessary, and returning to households at least three times. In March 2007, the baseline sample size was 819 households with 411 comparison and 408 intervention households. In September, 789 households were interviewed. During the final round in April 2008, 766 households were interviewed. The reasons for loss to follow-up in each category were too small to analyze statistically, however deaths were the most common reason for loss to follow-up in comparison versus intervention households (16 versus 7 deaths). In the intervention group, the District removed 17 households from the scheme because they were not actually eligible. The final analysis is based on 752 households that were interviewed in all three data collection rounds, yielding a 90% response rate among intervention and 94% response rate among comparison households.

Quantitative Household Survey

We developed a structured quantitative questionnaire in English, which was translated into Chichewa and back-translated into English. The instrument was adapted from existing surveys used with similar populations throughout Malawi, such as the World Bank's Integrated Household Survey. We trained the team of research assistants (RAs) in Mchinji over one week prior to each round of data collection. After pilot testing, we revised the instruments and administered them to the household head or deputy in respondent households.

The 46-page survey included a household panel, and detailed questions on housing, durable assets, income, expenditures, and weekly food consumption. The food consumption and expenditure panel required respondents to recall seven days of household food intake and expenditures and contained questions on 112 different foods. The survey asked whether households consumed the item, where the item came from (e.g. purchased, home grown, gift, given as payment). We trained RAs to probe all answers and verify that answers were consistent and plausible. When necessary, such as when respondents were quite elderly or chronically ill, RAs confirmed responses with other household members.

Study supervisors checked completed surveys on a daily basis for consistency and completeness. If necessary, RAs returned to the household to fill in missing data or clarify responses. Data was entered into the Census and Survey Processing System (CSPRO Version 3.3) database. We examined the database in batches to check for missing or outlying data.

Data analysis

The CSPRO database was exported to Statistical Analysis Software (SAS 9.1) for data cleaning and analysis. For the expenditure data, we calculated monthly total expenditures, per capita total expenditures, total food expenditures, per capita total food expenditures, and food shares as a percentage of total expenditures. To examine food diversity, we created dummy variables by category to determine whether the household reportedly consumed food in the following food groups: roots and tubers, pulses, fruit, meat, dairy, sugars and an indicator of the mean number of vegetables per week (Table 2). Finally, we

created a composite to capture food diversity by summing the number of food groups that households consumed (Ruel, 2003). Food diversity scores ranged between one and eight depending on the variety of foods consumed in the past week, with each food group earning one point.

[Table 2 about here]

We systematically calculated univariate and bivariate statistics, including means and frequencies for all outcomes. Next, we computed difference-in-differences estimates using regression models to calculate the average difference between outcome values for the two randomly assigned intervention and comparison groups at baseline, at the six-month midpoint, and at endline (Ravallion, 2003). The double difference methodology accounts for any observable or unobservable between-group differences at baseline by subtracting out existing differences from the equation (Maluccio and Flores, 2005). This double difference is the estimate of the program impact (i.e. the difference-in-differences impact estimate, which is reported in percentage points or monetary values). These estimates provide insight into the difference between households over time and across seasons depending upon intervention status. To answer policy relevant questions (e.g. ‘*Should cash transfers only be given to women?*’) separate regression models were calculated to examine, for instance, the differential impact of the transfer depending upon the gender of the household head.

RESULTS

Household characteristics and demographics

Overall, intervention and comparison households are indeed demographically and economically vulnerable given the average age, gender, and level of schooling among

household heads, the proportion of households with high or incalculable dependency ratios, as well as the percentage of households with orphans, chronically ill or disabled members (Table 3). All families live in mud or grass housing, the majority without any sanitation facility, and less than 1% reported receiving any other safety net support within the previous year.

While each group was demonstrably vulnerable, there were some statistically significant differences between the two groups, which most likely resulted from differences in the prioritization of either elderly-only households or households with orphans during the targeting process (Miller, Tsoka, Reichert, 2008a). It is likely that in the comparison group, the larger percentage of household heads with no schooling is partly due to a higher proportion of elderly or older household heads. In fact, elderly-only-household-heads were on average 76-years-old, versus other household heads who were 58-years-old on average ($p < 0.0001$). In logistic regression models, (*not shown*) elderly-only-household-heads were 92% more likely to have no schooling than heads living with other family members ($p < 0.01$).

Despite the demographic differences, the outcome variables of interest (Tables 4-7) were statistically similar between intervention and comparison households so that these groups generally experienced the same level of food insecurity at baseline. Thus, comparison households are indeed useful in approximating a counterfactual to illustrate what intervention households would have experienced in the absence of the cash transfer. Even if the demographic differences influence outcomes, again, the double difference analysis

accounts for the differences that may influence estimates of the impact of the cash transfer.

[Table 3 about here]

Food availability and reported hunger

At baseline, intervention and comparison households were statistically similar on various indicators of food insecurity (Table 4). In both groups, a high percentage of households reported that they did not consume enough meals per day, that there was hunger in the household, and that the household had insufficient food for more than eight days per month. Between the baseline, conducted at the end of the rainy season, and midpoint surveys, collected when households were still enjoying their harvest, as expected there were improvements in intervention and comparison households for all of these indicators (Figures 1-4). However, intervention and comparison households had a 67 percentage point difference in the proportion reporting that food consumption over the past month was less than enough ($p < 0.0001$), indicating a tremendous gain in food security within intervention households. For each of these indicators, the percentage point difference between intervention and comparison groups was more than 40 points at midpoint and even higher at the endline assessment. While comparison households returned to a high level of insecurity by endline, intervention households maintained their gains, indicating a sustained improvement in food security.

[Table 4 about here]

[Figures 1-4 about here]

Food Expenditures

Between baseline, midpoint, and endline, a trend is apparent whereby households reported higher expenditures during the rainy season (baseline and endline), when stores were low and food must be purchased, than during the midpoint (September), when households consumed more homegrown rather than purchased food. At baseline, total monthly expenditures and monthly food expenditures were significantly higher in intervention households, although the differences disappeared when per capita total expenditure and per capita food expenditure variables accounted for household size (Table 5). By midpoint, the study groups had dramatic and statistically significant differences in all expenditure measures and in the share of expenditures dedicated to food (Figures 5-6) indicating a positive impact of cash on the economic access to food. Furthermore, higher expenditures in intervention households was sustained between September to April. Moreover, the size of the difference between intervention and comparison households represents a striking difference in the food purchasing power between groups. Monthly total expenditures increased, on average, by 25% in comparison households and 86% in intervention households between 2007 and 2008. Total food expenditures increased by 10% in comparison households and 87% in intervention households.

[Table 5 about here]

At baseline there is a gap in monthly food expenditures between households based on the gender of the household head whereby male-headed-households spend significantly more on food than female-headed-households in both intervention and comparison groups (Figure 7-8). This trend is reversed by endline, when female-headed-households have slightly higher food expenditures than males in intervention households, but still lower

than male-headed in comparison households, although this is not statistically significant. With regards to monthly per capita food expenditures, there are no statistical differences at baseline or endline based on the gender of the household head.

[Figures 5-8 about here]

Food Consumption

We found dramatic differences in reported consumption of various food groups in the past week between baseline and the endline surveys. For example, we observed gains in the consumption of complex proteins in intervention versus comparison households. This is evidenced by a 42 percentage point difference in the consumption of pulses ($p < 0.0001$); a 25 percentage point difference in the consumption of dairy ($p < 0.0001$); and a 62 percentage point difference in the consumption of meat or fish ($p < 0.0001$) between baseline and endline.

The difference-in-differences estimate show that most gains in various food consumption categories were sustained, such as those in pulses, meat, and dairy, but the size of the gains in the intake of fruit and vegetables declined somewhat from midpoint to endline. This is likely due to decreased availability of these foods at local markets.

[Table 6 about here]

At baseline, there is a significant gap between households based on gender in the consumption of meat. By endline, this disparity is eliminated so that the same percentage of male- and female-headed-respondents in intervention households reported consuming meat. The disparity persists in comparison households indicating that the cash transfer

decreases gender disparities in the consumption of high quality proteins and that male-headed-households ‘perform’ as well as female-headed-households in providing quality foods for their families. Likewise, while dairy consumption remains moderately low even at endline, similar proportions of male and female-headed intervention households reported consuming dairy items.

[Figures 9-16 about here]

Dietary Diversity

The food diversity composite score was also identical between groups at baseline (Table 7). By the midpoint however, intervention households were consuming food from 6.5 different groups per week versus no change in the comparison group. While food diversity declined in comparison households from baseline to endline, the gains in intervention households were sustained.

[Table 7 about here]

Finally, food diversity is significantly worse in female-headed-households compared to male-headed-households at baseline. By endline, female-headed-households experience a greater gain such that they report consuming 2.1 more food items per week versus 1.4 items in male-headed-households; however all intervention households report consuming on average 6.2 food groups per week.

[Figure 17 about here]

CONCLUSIONS AND IMPLICATIONS

Similar to findings from the Nicaraguan scheme, the Malawi SCTS provides the income necessary for households to increase food expenditures and increase the share of expenditures dedicated to food. Intervention households in Malawi allocated 62% of total

expenditures to food purchases, which is akin to households in Mexico that spent 60% to 70% of the transfer on food. The significant improvement in dietary diversity among intervention households is further evidence of the impact of the cash transfer on food security. Households experienced exciting improvements in the regular consumption of a wider variety of foods and complex proteins such as meat and fish.

Despite the lack of conditions on the cash transfer in Malawi, which is in contrast to the Latin American schemes, recipient households prioritized food purchases and chose to use cash for food without the need for conditions. Elsewhere, we document and quantify how much SCTS households spent on healthcare, child education, household goods, assets, savings and other items (Miller, Tsoka, Reichert, 2008b); but it is not surprising that the ultra poor and labor constrained households in Malawi, that clearly suffer from chronic hunger, seek to improve and maintain food security before making other purchases.

Although the evaluation was relatively short-term in length, conducted over the course of one year, recipients were able to reach what they reported as an acceptable level of food security. By endline, 13% of intervention versus 81% of comparison households reported that food consumption was less than enough ($p < 0.0001$). On average, cash recipients consumed a variety and adequate amount of foods per day, without experiencing many days of food shortages, which is in striking contrast to the comparison group. While we did find some seasonal differences in the consumption of food items among intervention households (i.e. roots and tubers), essentially, recipients were able to maintain similar

food expenditure and consumption levels throughout the year. Recipients reached a higher level of food security than comparison households by the midpoint assessment and maintained these gains, thus the SCTS smoothes food consumption, nearly eliminating hunger and food shortages throughout the rainy season. These outcomes also confirm that food is available for purchase in local markets.

In contrast to findings from Dasgupta (2001), where female-headed-households are more likely to use cash transfers to improve child health and development, we do not find strong evidence that the gender of the household head is an important factor in determining the impact of the cash on food expenditures or diversity over one year. Rather, in Malawi, cash transfers appear to reduce the baseline gender gap in expenditures and diversity, so that while female-headed-households may have greater gains in food security, they started at a lower level. Male and female-headed-households appear to ‘perform’ equally well in establishing food secure households, given this period of time. Longer-term follow up is needed to determine whether differences in food security emerge based on the household head.

Moreover, while we do not have specific data to determine how equitable food allocation is within households, we have reported elsewhere the greater gains in height, reduced stunting, and fewer illnesses among children from intervention versus comparison households (Miller, et. al. 2008, 2009). These findings suggest that households have reached a level of equity in the intra-household allocation of food that is necessary for the cash transfer to impact gains in child health and development.

This study was conducted with the specific purpose of evaluating the impact of the SCTS. Consequently, we were able to establish relationships with respondents and other villagers by visiting households repeatedly, returning to households to confirm data, and observing households and communities over multiple months, which yielded high quality data.

Finally, it is possible that the findings presented here are biased towards the null because of the food buckets given only to the comparison group due to resource limitations. Still, field staff felt strongly that the destitution found in comparison households warranted acknowledgement of their hunger. Nevertheless, we present compelling evidence, whereby each of the tested outcomes yields large effect sizes that are highly statistically significant, demonstrating the impressive impact of cash transfers on food security in rural Malawi. The Social Cash Transfer Scheme is an effective tool within the Government of Malawi's National Social Protection Policy, for improving food security in the country's most destitute households.

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Tables 1-7

Table 1. Size of Cash Transfer

Number of household members	MK per month	US\$ per month
1	600	\$4.30
2	1000	\$7.14
3	1400	\$10.00
4	1800	\$12.85

Table 2. Food groups

Food Group	Selected foods within each category
Roots and tubers	Cassava tubers, cassava flour, sweet potato, Irish potato, plantain
Pulses	Beans, cowpea, groundnut, groundnut flour, soybean flour
Vegetables	Onion, cabbage, rape, Chinese cabbage, tomato, cucumber, pumpkin, okra
Fruit	Mango, banana, citrus, papaya, guava, wild fruit, apple, other fruits
Meat	Eggs, dried fish, fresh fish, beef, goat, pork, chicken, other poultry, small animals
Dairy	Fresh milk, powdered milk, margarine, butter, soured milk, yoghurt, cheese
Sugar/Oil	Sugarcane, cooking oil

Table 3. Baseline Characteristics

	C n=386	I n=366	
Characteristics of household head			
Age of household head	63	61	
Gender: Female headed	66%	63%	
Level of education of HH			
No schooling	65%	44%	
Some primary schooling	35%	45%	
Some secondary schooling	0%	1%	***
Marital status of household head			
Single	2%	2%	
Married	26%	27%	
Divorced	15%	17%	
Widowed	57%	54%	
Characteristics of the household			
Dependency ratio incalculable (no healthy adult 19-64)	62	55	~
Dependency ratio greater than 3 (one adult provides for more than 3 dependents)	16	23	*
Household size	3.5	4.7	***
Households with at least one chronically ill member	35%	42%	
Households with at least one disabled member	28%	30%	
Households with one or more orphans	68%	74%	~
Elderly only households (no HH member <65 years)	22%	12%	**
Had a death in the household in the past five years	26%	35%	~
Housing characteristics			
Outer walls			
Grass	2%	4%	
Mud	41%	71%	
Mud or burnt brick	56%	26%	***
Type of toilet			
Pit latrine with no ventilation	35%	35%	
None	64%	65%	
Access to safety nets			
Fee food maize distribution	<1%	<1%	
Food for work program or inputs for work	0%	0%	
Supplementary inputs for malnourished children	<1%	1%	
Agricultural inputs (seed fertilizer for rainy season) or other	<1%	1%	

C=Comparison, I= Intervention

~p<0.05, * p<0.01, **p<0.001, ***p<0.0001

Table 4. Self-reported assessment of food security and well being

	C n=386	I n=366	
HHH report that food consumption over past month is less than enough			
Baseline	89%	92%	
After 6 months	67%	6%	***
After 1 year	81%	13%	***
Difference between baseline and midpoint	67***		
Difference between baseline and endline	71***		
HHH report that members are somewhat or very hungry after meals			
Baseline	77%	81%	
After 6 months	59%	8%	***
After 1 year	66%	7%	***
Difference between baseline and midpoint	56***		
Difference between baseline and endline	63***		
Percent taking at least 2 meals per day			
Baseline	50%	45%	
After 6 months	58%	96%	***
After 1 year	51%	93%	***
Difference between baseline and midpoint	43***		
Difference between baseline and endline	46***		
Percent reporting going 8 or more days per month without enough food			
Baseline	68%	75%	~
After 6 months	38%	2%	***
After 1 year	46%	4%	***
Difference between baseline and midpoint	42***		
Difference between baseline and endline	49***		

C=Comparison, I= Intervention

~p<0.05,* p<0.01,**p<0.001,***p<0.0001

Table 5. Household expenditures

	Main models		
	C n=386	I n=366	
Monthly total expenditures (MK)			
Baseline	574.2	759.5	**
After 6 months	610.8	5096.3	***
After 1 year	770.4	5575.7	***
Difference between baseline and midpoint	4301.0***		
Difference between baseline and endline	4620.1***		
Monthly per capita total expenditures (MK)			
Baseline	196.1	189.1	
After 6 months	188.6	1302.9	***
After 1 year	252.6	1441.3	***
Difference between baseline and midpoint	1121.3***		
Difference between baseline and endline	1195.7***		
Monthly food expenditures (MK)			
Baseline	401.1	503.7	~
After 6 months	311.9	3573.9	***
After 1 year	445.4	3803.0	***
Difference between baseline and midpoint	3159.4***		
Difference between baseline and endline	3255.0***		
Monthly per capita food expenditures (MK)			
Baseline	142.1	131.7	
After 6 months	99.8	952.4	***
After 1 year	153.9	1018.2	***
Difference between baseline and midpoint	863.1***		
Difference between baseline and endline	874.7***		
Percent of total expenditures spent on food			
Baseline	47%	47%	
After 6 months	35%	66%	***
After 1 year	38%	62%	***
Difference between baseline and midpoint	32***		
Difference between baseline and endline	24***		

C=Comparison, I= Intervention

~p<0.05, * p<0.01, **p<0.001, ***p<0.0001

Table 6. Double difference impact estimates

	C n=386	I n=366	
Percent eating roots/tubers			
Baseline	43%	36%	~
After 6 months	55%	81%	***
After 1 year	34%	57%	***
Difference between baseline and midpoint	33***		
Difference between baseline and endline	30***		
Percent eating pulses			
Baseline	67%	66%	
After 6 months	69%	89%	***
After 1 year	51%	92%	***
Difference between baseline and midpoint	22***		
Difference between baseline and endline	42***		
Percent eating fruit			
Baseline	72%	70%	
After 6 months	36%	76%	***
After 1 year	49%	82%	***
Difference between baseline and midpoint	41***		
Difference between baseline and endline	34***		
Percent eating dairy			
Baseline	2%	2%	
After 6 months	4%	29%	***
After 1 year	18%	29%	***
Difference between baseline and midpoint	24***		
Difference between baseline and endline	25***		
Percent eating meat/fish			
Baseline	20%	25%	
After 6 months	19%	87%	***
After 1 year	18%	85%	***
Difference between baseline and midpoint	63***		
Difference between baseline and endline	62***		
Mean number of vegetables per week			
Baseline	3.1	3.3	
After 6 months	3.0	4.2	***
After 1 year	3.6	4.7	***
Difference between baseline and midpoint	1.0***		
Difference between baseline and endline	0.9***		
Percent eating sugar			
Baseline	42%	43%	
After 6 months	52%	86%	***
After 1 year	33%	85%	***
Difference between baseline and midpoint	33***		
Difference between baseline and endline	50***		

C=Comparison, I= Intervention

~p<0.05,* p<0.01,**p<0.001,***p<0.0001

Table 7. Double difference impact estimates of food diversity composite score

		C	I	
		n=386	n=366	
		Non-adjusted models		
Food diversity score				
	Baseline	4.4	4.4	
	After 6 months	4.4	6.5	***
	After 1 year	3.9	6.3	***
	Difference between baseline and midpoint	2.2***		
	Difference between baseline and endline	2.4***		

C=Comparison, I= Intervention

~p<0.05,* p<0.01,**p<0.001,***p<0.0001

Figures 1-17

Figure 1. HH food consumption is less than enough

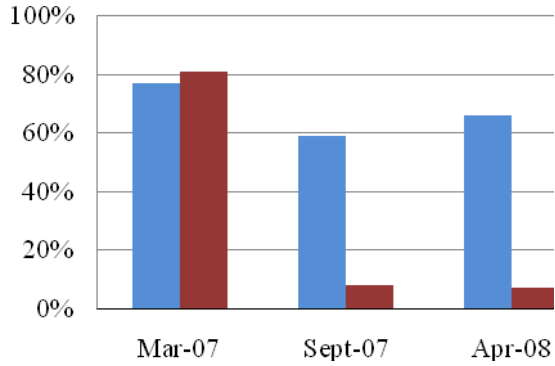


Figure 2. HH members are still hungry after meals

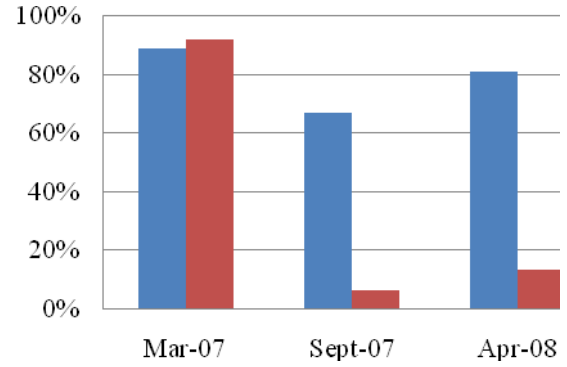


Figure 3. HH members go more than 8 days per month without adequate food

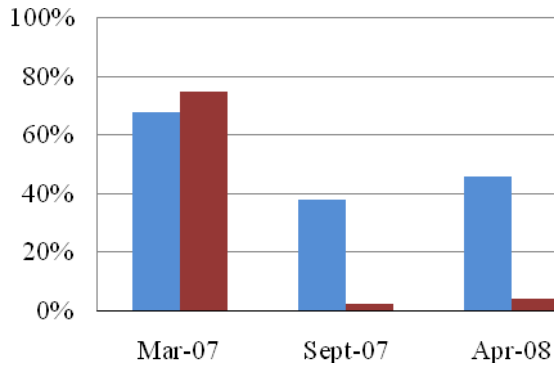
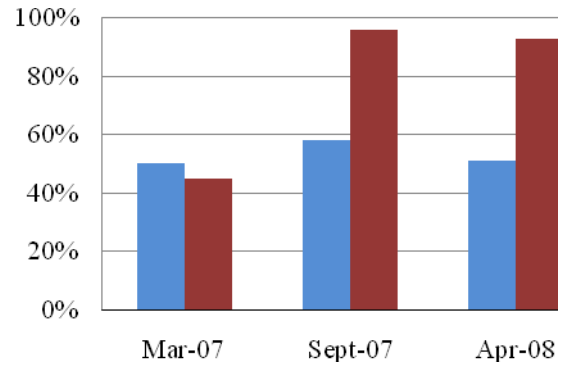


Figure 4. HH members consume at least 2 meals daily



■ Comparison
 ■ Intervention

Figure 5. Total monthly food expenditures

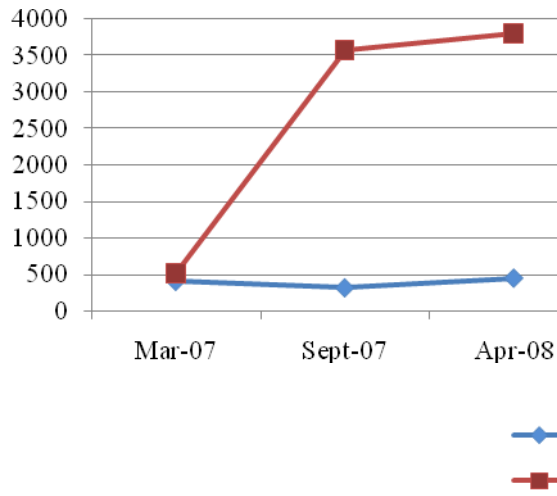


Figure 6. Per capita monthly food expenditures

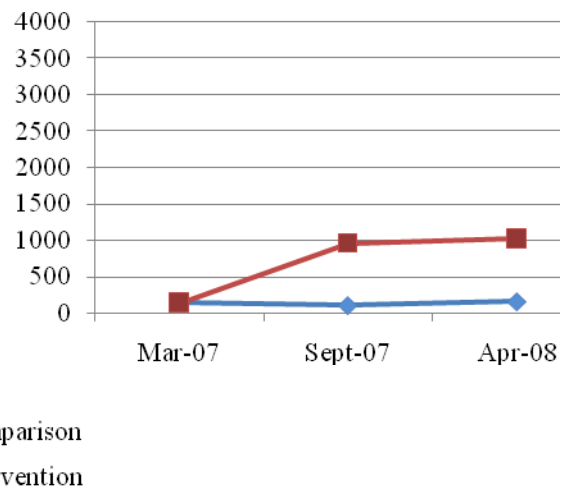


Figure 7. Monthly food expenditures by gender

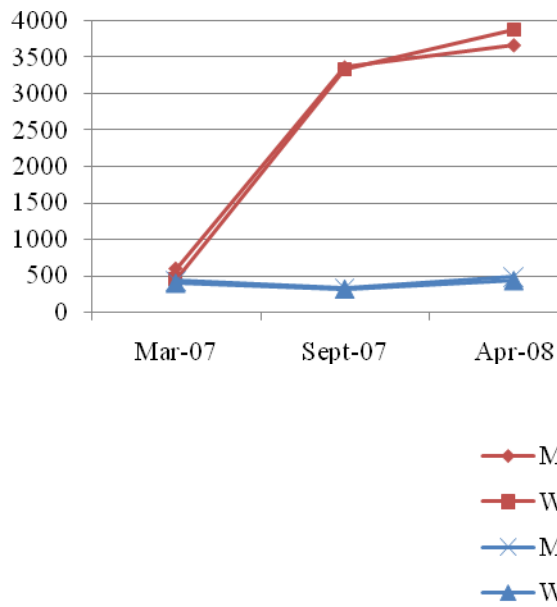


Figure 8. Monthly per capita food expenditures by gender

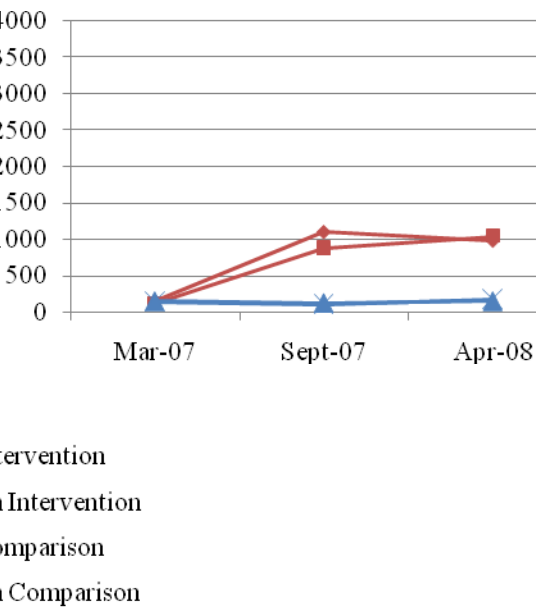


Figure 9. Percent eating roots and tubers

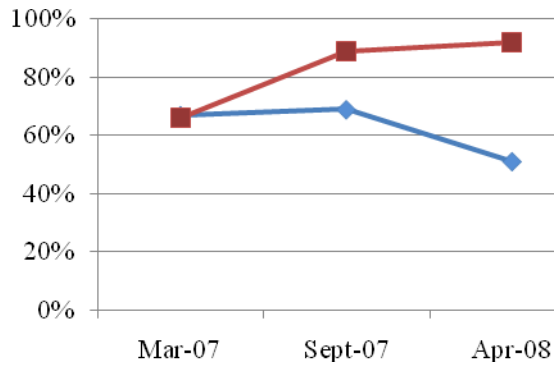


Figure 10. Percent eating pulses

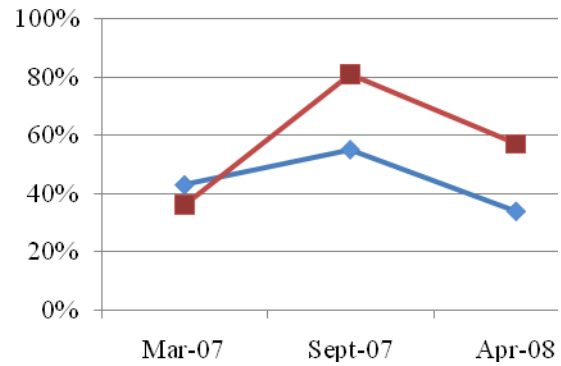


Figure 11. Percent eating fruit

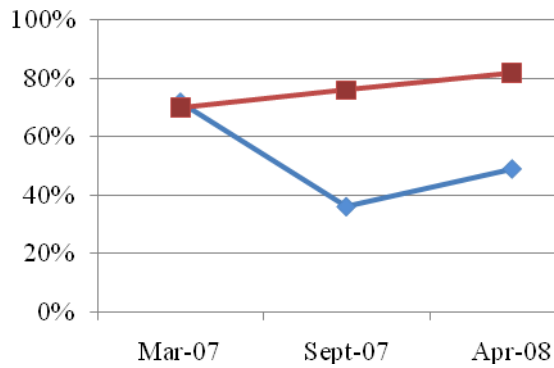


Figure 12. Percent eating dairy

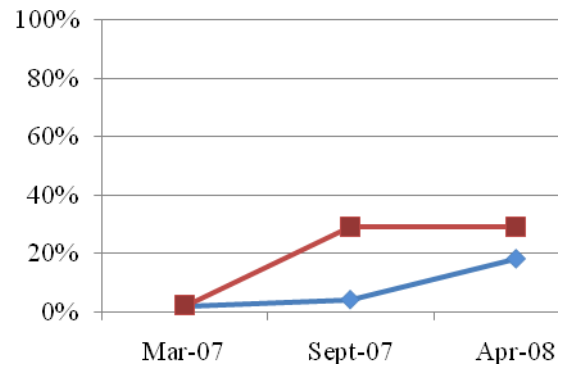


Figure 13. Percent eating meat/fish

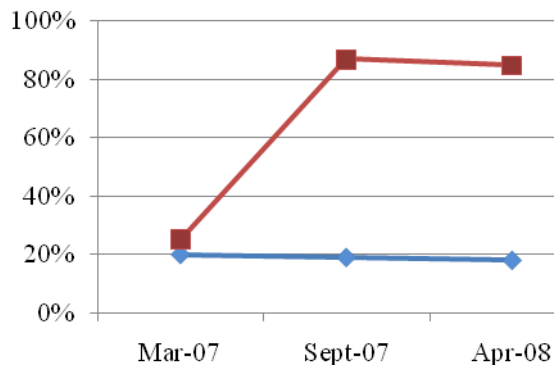
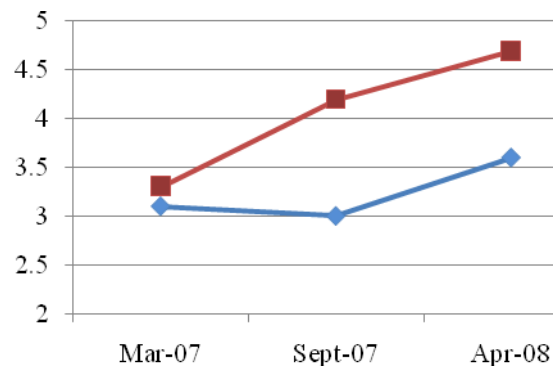


Figure 14. Mean number of vegetables per week



◆ Comparison
■ Intervention

Figure 15. Percent eating meat/fish by gender

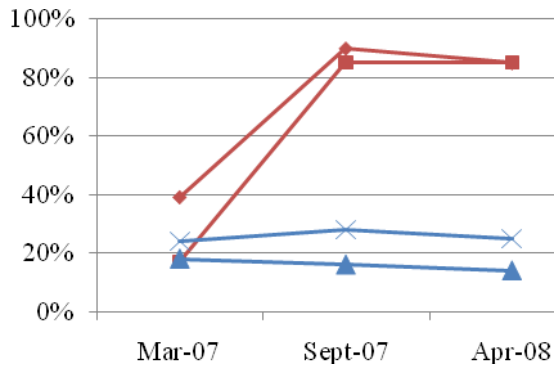
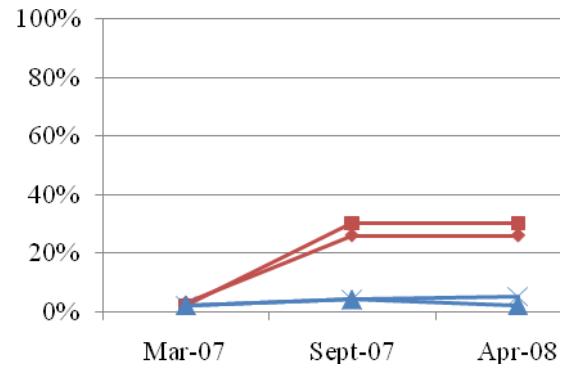
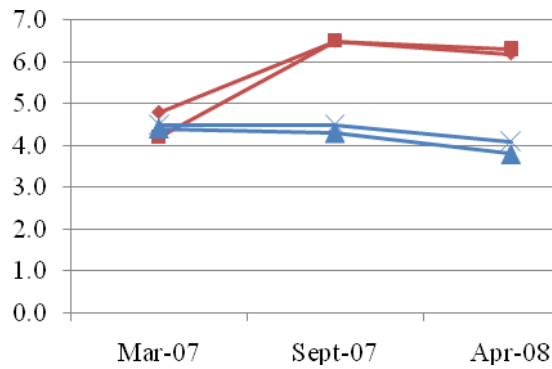


Figure 16. Percent eating dairy by gender



- ◆ Men Intervention
- Women Intervention
- × Men Comparison
- ▲ Women Comparison

Figure 17. Food diversity score by gender



- ◆ Men Intervention
- Women Intervention
- × Men Comparison
- ▲ Women Comparison