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The Cash for Nutrition Intervention in Yemen

Impact Evaluation Study

Sikandra Kurdi, Yashodhan Ghorpade, and Hosam Ibrahim

INTERNATIONAL
FOOD POLICY
RESEARCH
INSTITUTE

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EXECUTIVE SUMMARY

This report evaluates the impacts of the Cash for Nutrition intervention implemented by the Yemen Social Fund for Development and funded by the World Bank through the United Nations Development Programme as part of the Yemen Emergency Crisis Response Project. The evaluation focuses on the program impacts on child nutrition indicators and related intermediate variables. The decline in several indicators of welfare for the sample population that occurred after the beginning of the civil conflict in Yemen is also traced.

Cash for Nutrition intervention

The current Cash for Nutrition program is a resumption and expansion of a conditional cash transfer program which started as a pilot in Al Hodeidah governorate in January 2015 with the aim of reducing the high prevalence of child malnutrition. Prior to the current civil conflict, 46.5 percent of children under five years of age in Yemen were stunted and 16.3 percent were wasted, with the rate of wasting particularly high in Al Hodeidah governorate at 26.2 percent (MOPHP et al. 2015). The evaluation covers the period from January 2015 prior to the start of the conflict to July 2017. Transfers were suspended in early 2016 for nine months due to budgetary challenges during the civil conflict before being resumed at a higher level in the last quarter of 2016. The conditionality of the cash transfers is based on the attendance of the beneficiaries of the program – mothers of children under two years of age and pregnant women – at nutrition-focused trainings and compliance with child monitoring and treatment of malnutrition. The program impacts of improved nutritional outcomes are expected to result from a combination of increased household income and changes in behavior prompted by increased knowledge about healthy child feeding and sanitation practices.

Context and time trends

In addition to looking at the program impact, this report highlights changes in household welfare between the baseline round in January 2015 and the follow-up round in July 2017. For the most part, households were worse off due to the economic disruption and displacement caused by the civil conflict from March 2015. This is especially the case for communities not receiving additional external assistance. As the share of households in communities with other food distribution programs rose from 23 percent at baseline to 61 percent at follow-up, we control for access to food distribution to measure the change household welfare between baseline and follow-up to the conflict. We find that food distribution programs contributed significantly to combating the rise in food insecurity and strengthening food insecurity coping strategies.

The share of households reporting food insecurity increased by 22 percentage points between baseline and follow-up, with households coping by eating less preferred foods and reducing the amount of food consumed. There is also a significant positive trend between baseline and follow-up in consumption of calories from staple foods. Controlling for the increase in food distribution programs, we find an average increase of 152 calories per person in the consumption of staple foods between baseline and follow-up, a period of time during which prices of imported dry staples increased by about 23 percent. This increase in consumption of staple foods was accompanied by a decrease in consumption of other locally produced complementary food items, such as vegetables and dairy. We also find a strong negative time trend on spending on several food items, such as fresh fish and canned beans, while consumption of seasonal food items, such as limes, pomegranates, and dates, was higher due to the follow-up survey being implemented during the summer.

Indicators of dietary diversity for households, women, and children were calculated following FAO guidelines. While overall household dietary diversity only decreased slightly, women's

and children's dietary diversity decreased markedly between baseline and follow-up, with women on average consuming one fewer food group per day, and young children (ages 6 to 23 months) consuming between 1 and 1.5 fewer food groups per day.

Looking at infant and young children feeding practices, we observe a dramatic decrease in times fed per day between baseline and follow-up. This time trend of fewer milk feedings per day is accompanied by a 17-percentage point increase in women who report difficulty in producing sufficient amount of breastmilk and a 15 percentage point increase in the use of formula.

Controlling for the impact of food distribution, the rate of children being diagnosed with malnutrition increased by 13 percentage points. This may partly be attributable to adequate diagnoses, but more likely reflects overall worsening of conditions affecting the underlying determinants of nutritional status.

There is one notable positive time trend. Sanitation practices improved between baseline and follow-up, particularly regarding treatment of water for children under two years of age. This may be due to spillover effects from the community health educators on non-treated household, or to other informational campaigns unrelated to the conditional cash transfer (CCT) program.

Program impacts

We find significant positive impacts of the Cash for Nutrition intervention on a range of intermediate outcomes, suggesting that the program both improved knowledge and increased spending on food. Overall, the program decreased the share of children diagnosed with moderate or severe malnutrition and improved anthropometric indicators of nutritional status in children in the poorest third of households.

In terms of food consumption, we show that 63 percent of the cash transfer was spent on food purchases in cash, and approximately 80 percent of that cash spending (48 percent of the total transfer) was spent on one of the 33 key non-staple food items. The impacts are highest among the poorest tercile of households. In these poorest households, we find statistically significant increases in consumption of milk and a variety of fruits and vegetables and a marginally significant increase in consumption of eggs.

In line with these findings as well as with increased knowledge about the importance of nutrition and sanitation due to the training sessions under the program, we find large and significant impacts of the program across all households on the Child Dietary Diversity Score (CDDS). The average CDDS for program households rose by approximately 0.8 out of seven food groups, while the average CDDS declined in control households by about 1.3 food groups. We also find a significant program impact on household dietary diversity on Fridays (households are most likely at the Friday afternoon meal to include higher value food in their diets, especially meat) and significant impacts on individual measures of dietary diversity for every day for children ages 6 to 23 months and for women.

We do not find any significant impacts of the program on staple calorie consumption. This likely is related to substitution away from more nutritious but more costly food items as households prioritized maintaining calorie intake. Similarly, we do not find impacts on subjective statements above household or individual food security. However, we do find that the program's cash transfers helped significantly decrease the share of beneficiary households that sold gold (among the better off households) or borrowed from friends and neighbors (among the poorest).

For nutritional knowledge on topics covered in the training sessions, we find an overall positive impact on the number of correct answers to questions on nutritional knowledge asked in

the survey. In particular, we find positive impacts on knowledge about the importance of early initiation of breastfeeding, the problems of *qat* usage, and knowledge of how to feed children when they are sick. However, more work needs to be done on explaining the importance of iron-rich foods to avoid anemia, the importance of exclusive breastfeeding, and the timing of complementary feeding.

The nutritional training was effective in improving key practices related to child nutrition outcomes. The program increased the probability of early initiation of breastfeeding (in the first hour after birth) by 15 percentage points compared to an average rate of 74 percent in control communities at follow-up. The program also increased the probability of exclusive breastfeeding by 15 percentage points compared to an average rate of only 14 percent in control communities at follow-up. Finally, the program increased the probability of drinking treating water used by adults by 17 percentage point and the probability of drinking treating water used children under 2 years old by 10 percentage points.

In terms of women's empowerment, the program had a significant impact on the measure based on whether a woman is able to move freely outside of their residence: we find that treated households were 24 percentage points more likely to report that they can take their children if they are seriously ill to the health center on their own. This compares to a mean of 58 percent in control communities. This question was used previously as a measure of women's empowerment in other evaluations under Yemen's Social Fund for Development. In Yemen's conservative society, it is often the case that women rarely move outside the home. Consequently, variation in a woman's ability to move independently is only seen in response to questions about situations where there was more agreement that a woman might need to leave the home by herself. Additionally, we find significant impacts on both aspirations and expectations for daughters' education among program beneficiary respondents with daughters.

In terms of the final nutrition outcomes, the program had a significant impact on decreasing the number of children reported to have been diagnosed with malnutrition in the past two years by 10 percentage points, compared to a background increase of 13 percentage points in control households between baseline and follow-up. The program also decreased the share of these children who were found to be severely malnourished after evaluation at the health center by 9 percentage points. Among the poorest third of households, we find statistically significant program impacts of increases of 0.35 on height-for-age z-scores (HAZ), and 0.43 on weight-for-height-scores (WHZ).

The presence of food distribution programs in the study area was also associated with increased dietary diversity for young children as well as with increased consumption of staple foods, although not with changes in nutrition knowledge or improvements in anthropometric indicators, showing there are useful complementarities between the two types of food security interventions – nutrition-specific programs and food distribution programs – in a humanitarian context.

1 INTRODUCTION

1.1 Program description

The Cash for Nutrition intervention in Yemen is a resumption and expansion of a conditional cash transfer program which started as a pilot in Al Hodeidah in January 2015. The pilot program provided conditional cash transfers to mothers of children under two years of age and pregnant women to motivate attendance at nutritional training sessions and compliance with health center referrals. The program targeted the poorest and the most vulnerable households in the country by restricting recipients to Social Welfare Fund beneficiary households in three eligible districts in Al Hodeidah governorate: Marawi'ah, Bayt Al Faqiah, and Zabid. The pilot program was suspended in late 2015 due to financing challenges related to the civil conflict in Yemen, but in the last quarter of 2017 an expanded version of the pilot program was included in the World Bank funded Yemen Emergency Crisis Response Project. The Cash for Nutrition program now includes more than 40,000 beneficiaries in governorates across Yemen. The program is implemented by the Yemen Social Fund for Development in coordination with the Ministry of Public Health and Population.

Local women with at least a high school education were selected as community health volunteers and received basic training in health and nutrition education and malnutrition screening. The volunteers were employed by the program to provide monthly educational sessions and monitor the children of participating households. Cash for Nutrition program beneficiaries were required to attend these sessions and attendance was tracked, although the conditionality was not strictly enforced.

The monthly nutrition and health education sessions covered topics on infant and young child feeding practices, including exclusive breastfeeding, for children up until 6 months of age, complementary feeding for children from 6 to 24 months of age, the importance of balanced meals, use of iodized salt, proper hygiene and sanitation, appropriate treatment of drinking water, and treatment of diarrhea. Additional quarterly sessions targeted pregnant and lactating women and covered breastfeeding initiation, the importance of colostrum and no pre-lacteal feeds, as well as the consequences of consuming the stimulant qat (*Catha edulis*), smoking during pregnancy, hygiene and sanitation, and treatment of drinking water. Pregnant women were also referred to the nearest health center for antenatal care. In addition, under Yemen's Social Fund for Development, periodic screening sessions during home visits were carried out to detect and to refer cases of malnutrition to health centers for treatment.

Quarterly transfers under the pilot program were suspended after the first three rounds of transfers due to budgetary challenges that arose as a consequence of the civil conflict. With new funding provided by the World Bank, the pilot program was then expanded under the Yemen Emergency Crisis Response Project. Starting in the last quarter of 2016, transfers for beneficiaries were increased and provided on a monthly basis. The cash transfer program was rolled out in other governorates. In doing so, the age range for eligibility for the program was also expanded to include Social Welfare Fund beneficiary households with children up to under 5 years of age.

The program was originally intended to last for two years, with payments of 3,000 riyals per month. However, due to declines in the real value of the Yemeni Riyal, deterioration of the economic situation as a result of the conflict, and the suspension of basic Social Welfare Fund payments, the monthly transfer amount was increased to 10,000 riyals (about $30 per month at black market exchange rates). However, at the same time, for new beneficiaries the length of the program was decreased to one year.

The conditionality for the program when revised under the Yemen Emergency Crisis Response Project was substantially softened compared to the original plan of penalizing non-attendance at the nutritional trainings with reduced transfers. Instead, women who did not attend the trainings were contacted and educational volunteers worked with them to make sure they could attend.

The set of benefits (treatment) provided over the Cash for Nutrition program impact evaluation period differed in some details between the early period and what beneficiaries currently receive. However, we expect that any differential effects that could be attributed to these early differences will have faded out over time. Since the benefits provided over most of the impact evaluation period match those now provided under the expanded Cash for Nutrition program, our impact evaluation findings should be broadly applicable to the current program. To summarize, the treatment that treated households in our sample received consisted of:

- 2015: Cash transfers equivalent to 3,000 riyals per month for 9 months and nutritional training sessions every month
- January to September 2016: program suspended
- October 2016 to August 2017: 10,000 riyals per month and nutritional training sessions for 12 months

This evaluation measures the total impact of the first set of transfers and training sessions in 2015 plus the monthly transfers of 10,000 riyals and training sessions for the period from October 2016 to August 2017 for households in the districts in which the pilot implementation of the Cash for Nutrition program was carried out in Al Hodeidah governorate.

1.2   Evaluation questions

The primary research objectives for this evaluation are:

1) To measure the impact of the Cash for Nutrition program on eligible households;
2) To describe the degree to which household characteristics, details of program implementation, and the external environment increased or decreased program impact, and
3) To describe the functioning of the program and changes in household welfare in the current conflict environment.

The main outcome indicators for nutrition considered are child anthropometrics, specifically weight-for-height and height-for-age in children under five years of age, and whether a child was treated for malnutrition in past 2 years. Intermediate variables related to child undernutrition were also examined. As explained in the UNICEF's conceptual framework on the determinants of child malnutrition, the immediate causes of undernutrition are inadequate dietary intake and disease, while the underlying causes include household food insecurity, inadequate care and feeding practices, and lack of sanitation (UNICEF 1990). These underlying and immediate causes are assessed using the following intermediate variables:

- Household per capita calorie consumption from staple foods and household consumption of non-staple foods;
- Measures of dietary diversity, including Household Dietary Diversity Score (HDDS), Women's Dietary Diversity Score (WDDS), and Children's Dietary Diversity Score (CDDS);
- Practices such as exclusive breastfeeding and water treatment, which are important nutritional pathways to reduce the loss of nutrients due to disease;

- Knowledge and practices for a range of infant and young child feeding practices included in the program's nutritional training module, such as appropriate timing of complementary feeding, early initiation of breastfeeding, meal frequency, and knowledge about the importance of iron and vitamin A;
- Child illness in past 2 weeks; and
- Indicators of women's empowerment, as women's control of resources has been shown in other contexts to be correlated with better nutritional outcomes for children (Duflo 2012).

While looking at these indicators of program impact, we also measure the heterogeneity of impacts where relevant by:

- Baseline household wealth, which allows us to examine the degree to which the transfers have larger impacts in households where it represents a greater share of their total income;
- Baseline sources of information – the original sources of information caregivers of children use to make decisions about child feeding practices, for example, may impact the degree to which they are confident in the material presented in the nutritional training sessions;
- Women's position within the household, i.e., whether she is living independently with her husband, with her in-laws, or with her own parents – this may impact the degree to which the woman is able to influence decisions about child feeding practices; and
- Women's educational level, which may impact the degree to which they are able to understand the material presented in the nutritional training sessions.

Throughout the report we show both the program impacts and the change in outcomes for control households between the baseline data collection in December 2014 and January 2015 prior to the conflict and the follow-up data collection in July 2017.

1.3 Context

In addition to looking at the program impact, this report highlights changes in household welfare between the baseline and follow-up rounds. For the most part, households were worse off at the time of the follow-up survey due to the economic disruption caused by the civil conflict from March 2015 onwards. There may also be some differences due to seasonality. However, if anything, we expect that seasonal effects would results in an underestimation of the change in welfare over the time period. The follow-up survey was conducted in the period after Eid, when respondents had a higher probability of receiving private charity, and during the summer, when food prices are normally lower than they would be in the winter, when the baseline survey was conducted.

The report proceeds as follows. In section 2, we describe our sample and evaluation methodology in detail. In section 3, we present impact evaluation results and heterogeneity analysis for intermediate variables, and in section 4 we present results for the final outcomes of interest. Section 5 concludes.

2   SAMPLE AND METHODOLOGY

2.1   Randomization

Because the pilot program was limited to only 4,800 beneficiaries, Social Welfare Fund beneficiaries were divided into two separate priority groups. Women in the pilot districts who were direct family members of Social Welfare Fund beneficiaries were in the first priority group and were automatically included in the Cash for Nutrition program. Indirect family members, such as daughters-in-law, of Social Welfare Fund beneficiaries were added to a second priority list. Because the program was not large enough to include all of these second priority women, inclusion of these indirect family member beneficiaries was randomized at the community level.

Baseline data was collected on the pilot program in December 2014 and January 2015. The pilot program was suspended in mid-2015 due to the conflict situation in Yemen. An expanded program was launched in October 2016 which targeted the same women, while also enrolling all women related to a Social Welfare Fund beneficiary. Due to delays in the registration process, however, between January and August 2017, only the original pilot program beneficiaries received the new transfers, so the original randomization from the baseline was still in effect at the time of the follow-up data collection in July and August 2017.

2.2   Sample Size and Attrition

Table 2.2.1 Survey household sample distribution for Yemen Cash for Nutrition program evaluation survey rounds

	Control	Treatment	Total households
Baseline	999 households in 95 communities	1,001 households in 95 communities	2,000
Resurveyed at follow-up	915 households in 93 communities	935 households in 95 communities	1,850
Replacement households for those that could not be resurveyed at follow-up	58 households – reasons for not resurveyed: 40 no one at home; 1 refused; 2 moved away due to conflict; 15 other (not recorded)	37 households – reasons for not resurveyed: 24 no one at home; 1 moved away due to conflict; 12 other (not recorded)	95
Total survey sample			3,844
Total panel sample			3,700

Source: Yemen Cash for Nutrition program evaluation survey design.

Forty-nine households included in the baseline sample could not be identified for the follow-up survey based on the information on the household head of each available to the survey enumerators. In addition, 95 baseline survey households were identified but could not be resurveyed. For 6 of the survey households, there was an ID matching problem between baseline and follow-up, so both the baseline and follow-up observations for those households were dropped from the sample used for analysis. The total attrition rate was 7.5 percent, slightly higher among the treatment sample, but not significantly different between treatment and control.

The randomization of both control and treatment households for the survey sample was not fully successful, as a number of control households ended up receiving the transfers. Of the households assigned to the treatment sub-sample, 93 percent were currently receiving transfers at the time of the follow-up survey and 84 percent recall also receiving transfers in 2015. Of the households assigned to the control sub-sample, 24 percent were receiving transfers at the time of the follow-up survey and 23 percent recall receiving transfers in 2015. Because there is some

uncertainty about the accuracy of self-reporting of program participation, we report impact estimates using both a conservative ITT (intention to treat) approach based on the original randomization and, secondly, an impact of treatment on the treated approach by instrumenting self-reported actual treatment status by original assignment.

2.3 Survey

The survey data was collected using the Open Data Kit (https://opendatakit.org/) suite of tools for computer assisted personal interviewing (CAPI) on smart phones. The primary respondent was the woman identified as a second-priority potential beneficiary by the program, which means that all respondents were pregnant or mothers of children under 2 years of age at the time of the baseline survey.

Data collection for the baseline survey was done by an independent survey organization, Prodigy, while for the follow-up survey the data collection was managed directly by the Social Fund for Development due to the challenges of conducting survey fieldwork during the conflict. Following Yemeni cultural norms, all enumerators were female and were trained in the use of the CAPI-based survey instruments and in the anthropometric techniques for measuring children.

The baseline survey instrument included the following modules:

1) Household roster – information collected on the primary respondent, her children living at home, and the male head of household, if any
2) Child nutrition practices and health
    a. Antenatal care for pregnant women
    b. Breastfeeding and complementary feeding for children under 2, diarrhea, and diagnoses of malnutrition for children under 5, at the child level
    c. Water treatment practices and contraceptive use, at the household level
3) School enrollment, at the child level
4) Food consumption
    a. Recall of food groups (24-hour and last Friday) consumed, for all individuals in the household
    b. Meals outside the home and *qat* use
    c. Staple food consumption in past two days
5) Literacy and education level of the primary respondent, her mother and mother-in-law, and husband
6) Food access and food security
    a. Livestock ownership and garden production
    b. Food insecurity and coping strategies
    c. Purchases of key non-staple food items in past week
7) Household assets
8) Nutrition knowledge
9) Child births and deaths in past year
10) Anthropometrics for children aged 6 to 59 months

The follow-up survey omitted modules 3, 5, 6a, and 7 and added an additional module 11 containing questions about transfers received from the program, how the household coped with the conflict, on women's mobility, and on educational aspirations for her daughters.

Finally, in addition to the household survey, a community survey was collected in which the male survey team leader collected information from community members about the location of the nearest school and health center and the presence in the community of other nutrition related interventions. The team leader also visited a local market to collect data on food prices and availability. Community surveys are missing for 13 communities in the sample. In consequence, regressions that include controls on the presence of other food distribution programs have a smaller sample size, as households from the communities in which community surveys were not done are not included in those analyses.

2.4 Summary statistics

2.4.1 Household assets and education levels of women

Table 2.4.1 shows the characteristics of households in the sample at baseline. In spite of the randomization, there are some significant differences between the control and the treatment sub-samples. Treatment households reported lower levels of assets. The asset index is generated from a principal component analysis of floor type, roof type, sanitation type, and ownership by the household of items in a list of 24 household durables. The individual factors that differed significantly between treatment and control and had the highest weight in the index are ownership of washing machines and televisions. A higher percentage of women in treatment households are illiterate. Treatment and control households were similar in terms of mother's age currently and mother's age at marriage.

Table 2.4.1 Summary statistics on assets owned by households surveyed for the Yemen Cash for Nutrition program evaluation

Household Characteristics	Control	Treatment	p-value
Asset Index mean (SD)	0.1352 (1.930)	-0.1349 (1.768)	0.001 ***
Household owns TV, %	44.0	33.6	<0.001 ***
Household owns washing machine, %	9.2	5.9	0.007 ***
Husband in household, %	74.6	72.9	0.400
Mother age, years, mean (SD)	28.1 (6.81)	27.6 (6.86)	0.082
Mother age at marriage, years, mean (SD)	17.6 (2.86)	17.6 (2.94)	0.930
Mother is illiterate, %	73.4	79.7	<0.001 ***
Household receives income from employment, %	74.0	74.0	0.910
Household receives income from remittances, %	15.7	16.8	0.510
Household receives income from agriculture or fishing, %	9.9	8.7	0.350
Household receives income from rents or microenterprise, %	2.5	2.5	1.000
Household receives income from Social Welfare Fund or pension transfers, %	74.9	72.4	0.210
Household owns any livestock, %	52.7	52.3	0.860
People in house, mean (SD)	6.50 (3.26)	6.21 (3.54)	0.061 *
Rooms in house, mean (SD)	1.31 (0.636)	1.30 (0.581)	0.600
Observations	999	1001	

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Standard deviations in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

2.4.2 Transfers received

Most households recalled receiving between 80,000 and 110,000 riyals per year since the program payments were re-started. When asked a multiple response question about how the household had used the transfer, 74 percent of respondents mentioned using the transfers to buy more food, while 48 percent used them to repay store credit. About 30 percent of respondents mentioned using the transfers for healthcare costs, and the same share mentioned using them to repay debts to neighbors or relatives.

Table 2.4.2 Household use of transfers

How household used transfer (multiple responses allowed)	Households, %
Repaying debt to neighbors or relatives	29.3
Repaying debt to shopkeeper	48.2
Buying more food	74.3
Buying better quality food	14.4
Paying for healthcare	30.2
Other	17.3
Observations	1,090

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note that the number of households receiving transfers is higher than the number of households in the treatment sub-sample due to imperfect compliance with the randomization.

2.5 Methodology

The basic model we use to assess the impact of the Cash for Nutrition component of the Yemen Emergency Crisis Response is a difference-in-differences framework with household fixed effects and applying instrumental variables (IV) to the analysis. Community-level treatment assignment is used as an instrument for actual treatment status as reported in the follow-up survey. The estimating equation is:

$$y_{ict} = \beta_1 participatedXfollowup_{ict} + \beta_2 followup_t + \eta_i + \epsilon_{itc} \qquad (1)$$

where y_{ict} is the outcome variable of interest for individual *i*; *followup* identifies observations from the follow-up survey, $participatedXfollowup$ is defined as 1 if the household responded at follow-up that they had received cash transfers in 2016 and 2017 and had attended at least one nutritional training session, and 0 otherwise. $participatedXfollowup$ is instrumented by *treatXfollowup*, the community level indicator of being identified as a second-priority potential beneficiary of the Cash for Nutrition program. Except where otherwise stated, all standard errors for model coefficients are clustered at the community level.

When interpreting the coefficients, β_1 is the program impact, and β_2 captures changes between the baseline and follow-up survey.

While our preferred analysis of the intention to treat effects of the program is based on the instrumental variable approach, corresponding estimates for all tables using the following Ordinary Least Squares (OLS) specification are available in the Annex.

$$y_{ict} = \beta_1 treatXfollowup_{ct} + \beta_2 followup_t + \eta_i + \epsilon_{ic} \qquad (2)$$

For questions from module 11, which were only asked in the follow-up survey, we test only a direct comparison of households assigned to treatment versus control, controlling for the household characteristics that differed in the balance tests. The estimating equation here is:

$$y_{ic} = \alpha + participated_{ic} + assetindex_i + motherillit_i + peopleinhouse_i + \zeta_c + \epsilon_{ic} \quad (3)$$

where ζ_c indicates community level fixed effects and $participated_{ic}$ is instrumented by $treat_c$, an indicator of whether the community was assigned to include second-priority beneficiaries of the program.

For measures of food security, anthropometrics, and calorie consumption, we additionally control for the time-varying presence of other food distribution programs in the community as reported in the community questionnaire.

$$y_{ict} = \beta_1 participatedXfollowup_{ict} + \beta_2 followup_t + \eta_i + food_{ct} + \epsilon_{itc} \quad (4)$$

When exploring the degree to which the program impacted different groups, we split the sample based on baseline characteristics. The most important of these characteristics is a household welfare measure based on assets. We define a baseline assets index using principal component analysis on ownership by the household of 24 different durable goods, plus the type of sanitation used by the household, whether the house has floors made of materials other than earth or sand, and whether the house has a solid roof. Based on this index, we divide the sample into three groups. The lowest tercile represents the poorest households at baseline, while the highest tercile represents relatively better off households at baseline. Because the recipients of the cash transfers were relatives of Social Welfare Fund beneficiaries, there is considerable variation in terms of how poor the beneficiary households are.

Table 2.5.1 summarizes the characteristics of households by asset tercile. Households in the lowest tercile all have earth or sand floors, are unlikely to own means of transport, mobile phones, or televisions, and mostly use wood for cooking. Households in the highest tercile, on the other hand, often live in houses with stone or ceramic floor and solid roofs, mostly use bucket toilets for sanitation, sometimes own motorcycles, cars, and refrigerators, use gas for cooking, and almost all own televisions with satellite receivers.

Table 2.5.1 Asset ownership by household wealth tercile, percent of households in tercile

Asset	Lowest	Middle	Highest	Asset	Lowest	Middle	Highest
Concrete or wooden roof	2.2	16.0	30.0	Mobile phone	37.9	64.1	81.1
Earth or sand floor	98.8	85.9	56.6	Gas canister	0.7	11.3	36.8
Pit latrine	37.5	13.3	5.4	Gas oven	0.1	1.2	3.2
Bucket toilet	33.5	75.5	88.0	Wood oven	95.8	79.0	60.7
Flush toilet	0.0	0.2	3.3	Gas stove	13.8	48.6	55.4
Car	0.8	0.8	2.1	Refrigerator	0.0	0.2	10.1
Bus or taxi	0.4	0.7	1.5	Electric heater	0.1	0.5	0.0
Motorcycle	11.1	27.3	30.0	Music player	17.0	27.0	22.2
Bicycle	0.3	1.0	2.9	Gas lamp	15.7	8.2	3.8
Television	1.0	24.0	91.7	Weapon	0.1	0.3	0.6
Satellite dish	0.0	15.6	83.9	Generator	0.1	1.5	3.5
Washing machine	0.0	0.2	21.6	Pump	0.1	0.8	0.5
Sewing machine	0.1	0.8	3.6	Fishing boat	0.5	0.0	0.0
Land phone	0.3	0.8	1.2				
Observations	731	601	666				

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.

3 RESULTS FOR INTERMEDIATE VARIABLES

3.1 Consumption of staple foods

In this evaluation, we use a strategy for measuring average calorie consumption developed for the Social Fund for Development by Egel and Yeslam (2010). Households are asked specifically about the amount of staple grains and sugar consumed for the entire family for each of the past two days. The volume is recorded in terms of a household-defined unit (the scoop or cup used for measuring), which is then converted into milliliters by the enumerator. The volume amounts are then converted into calories and divided by the number of people sharing meals (converted into adult male equivalent units).[1] The resulting total then is inflated by 25 percent to estimate total per capita calorie consumption, since in Yemen on average 80 percent of calories come from staple grains and sugar consumption. In the impact evaluation of the Labor-Intensive Works Program (LIWP), this method of measurement was found to be sufficiently accurate to capture a significant impact of increased household income on staple calorie consumption (Christian, de Janvry, and Egel 2015). We also increased the accuracy of the measurement compared to the LIWP evaluation by asking respondents about the number of people in four categories – children under five years of age, children ages 5 to 12 years, males over 12 years, and females over 12 years – who shared each meal in the household over the past two days, rather than only asking about the total number of people sharing meals.

Table 3.1.1 shows the summary statistics for average calorie consumption. Compared to the average calorie consumption found in the LIWP evaluation, consumption levels recorded in both the baseline and the follow-up surveys for this evaluation are dramatically lower, with average consumption at baseline of around 1,800 calories per adult equivalent, compared to 2,700 calories in the LIWP survey. The same methods were used to collect the data on food consumption for the two evaluations, suggesting that Social Welfare Fund beneficiary households in Al Hodeidah are particularly vulnerable compared to average households in the communities targeted by LIWP. These low levels of average calorie consumption are also consistent with the high levels of food insecurity reported by respondents in the Cash for Nutrition evaluation surveys. Only 15 percent of respondents to the surveys for the LIWP evaluation mentioned food insecurity, while in the Cash for Nutrition baseline survey in Al Hodeidah, about 40 percent of households mentioned food insecurity.

Table 3.1.1 Average calorie consumption per male adult equivalent, by control or treatment category at baseline and follow-up

	(1) Treatment Baseline	(2) Treatment Follow-up	(3) Control Baseline	(4) Control Follow-up
Average calories, per adult male equivalent unit	1820.4	1954.8	1662.8	1992.8
	(1081.8)	(1026.5)	(888.9)	(3055.8)
Average calories, per adult male equivalent unit (2.5% trimmed)	1785.4	1930.1	1656.0	1862.4
	(911.3)	(901.4)	(851.3)	(954.3)
Observations	989	931	996	915

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Mean coefficients; standard deviation in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Because of measurement error resulting in some significant and unrealistic outlier values, the second row of statistics are averages computed after trimming the top and bottom 2.5 percent of observations.

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[1] Adult equivalent units are calculated by age and gender categories based on daily calorie requirements. Daily calorie requirements relative to adult men are taken from the FAO technical report "Human Energy Requirements" using moderate activity level (FAO 2004).

Table 3.1.2 shows the Cash for Nutrition conditional cash transfer impact on calorie consumption. We do not find any significant impacts of the program on staple calorie consumption with the IV specification. Notably, though, we see a positive and significant trend between baseline and follow-up in staple calorie consumption. Part of this increase can be explained by the increase in food distribution programs, which primarily focus on distributing staple foods. Even after controlling for the increase in food distribution programs (column 3), we find a significant increase of about 152 calories per person between baseline and follow-up. As will be seen below, this increase in staple food consumption is paralleled by a decrease in consumption of foods with higher nutritive values, indicating substitution away for more nutritious but more costly food items as households prioritize maintaining calorie intake.

Table 3.1.2 Overall impact of the Cash for Nutrition program on calorie consumption, IV estimation

	(1) Average Calories	(2) Trimmed Average Calories	(3)	(4) People Sharing Meals	(5)
ParticipatedXFollowup	-268.3	-72.8	-94.9	0.545**	0.564**
	(184.3)	(104.9)	(100.7)	(0.275)	(0.282)
Follow-up	386.6**	215.2***	174.6**	-0.509***	-0.627***
	(150.2)	(76.1)	(76.1)	(0.182)	(0.208)
Food Distribution			172.2***		0.299**
			(49.1)		(0.141)
Observations	3,676	3,354	3,354	3,700	3,376
Mean dependent variable	1,853.3	1,805.3	1,809.7	6.906	6.900

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Because of measurement error resulting in some significant and unrealistic outlier values, columns (2) and (3) are based on a sub-sample resulting from trimming the top and bottom 2.5 percent of observations

The fourth and fifth columns of Table 3.1.2 indicates another possible explanation for the lack of an impact on calorie consumption: the number of people reported sharing meals in the household decreased significantly between baseline and follow-up in control communities but increased significantly both in communities where there was food distribution and as a result of the Cash for Nutrition conditional cash transfer treatment. Because calorie consumption per adult equivalent is defined as total calorie consumption divided by the number of adult-equivalent persons sharing meals, an increase in the number of mouths to feed decreases average consumption. The number of people eating meals is not necessarily equal to the number of people living in the households, since there can be guests at meals or household members can eat some meals outside or skip meals. Unfortunately, the number of people living in the household was not collected at follow-up, but we do know that there was no significant difference between control and treatment in terms of the probability that they hosted Internally Displaced Persons, which suggests that the increase in people sharing meals has more to do with changes in consumption by household members rather than changes in household composition.

This argument is also supported by the fact that if we look at the age categories of people sharing meals (Table 3.1.3), the significant changes primarily involve children under 5 years old. There is a negative time trend on children under 5 (column 1), which may partly be explained by the aging cohort of young children in this sample. However, it is not fully offset by increases in the number of children aged 5 years and older (column 2), suggesting that children, like adult men and especially adult women, are sometimes skipping meals due to increased food insecurity. (See section 3.5 for discussion of increases in self-reported food insecurity since baseline.) We interpret the

positive treatment impact on number of children aged 5 years and older and eating meals as likely to indicate both a protective effect of the transfers on decreasing the probability that children are forced to skip meals, and a greater understanding of the importance of timely, adequate, and frequent complementary feeding due to the nutrition education training sessions. (Discussed further in section 3.7.)

Table 3.1.3 Impact of the Cash for Nutrition program on number of individuals sharing meals in the household, IV estimation

	Children under 5	Children Ages 5 to 12	Women	Men
ParticipatedXFollowup	0.313***	0.122	0.169	0.030
	(0.111)	(0.0980)	(0.137)	(0.122)
Follow-up	-0.257***	0.013	-0.313***	-0.125
	(0.082)	(0.073)	(0.102)	(0.087)
Food Distribution	0.004	0.065	0.083	0.157**
	(0.049)	(0.047)	(0.065)	(0.070)
Observations	3,376	3,376	3,376	3,376
Mean dependent variable	1.604	1.914	2.302	1.708

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3.2   Dietary diversity

Household, women's, and children's dietary diversity are calculated following FAO guidelines (Kennedy, Ballard, and Dop 2011). Household dietary diversity (HDDS) is defined as the number of food groups out of a maximum of 12 from which anyone in the household ate during the past 24 hours. The measure indicates the access of household members to nutritious food.

We propose an additional important related measure: the number of food groups eaten on the most recent Friday. The choice to also include the number of food groups eaten on Friday reflects that the degree to which households are able to include higher value food in their diets, especially meat, is most likely to be reflected in the make-up of their Friday afternoon meal. Collecting data specifically about Friday consumption allows us to have a better chance of measuring any increase in dietary diversity that is concentrated in the Friday afternoon meal.

As shown in table 3.2.1, the program impact on HDDS is positive but not statistically significant for days other than Friday, while for Friday, the impact on household dietary diversity score is both positive and marginally significant at the 10 percent level. The impact of the cash transfers in terms of dietary diversity is similar in magnitude to the coefficient associated with food distribution programs. If we look specifically at meat consumption on Fridays, which is where we expected to see the greatest impacts, there is a statistically significant impact of the cash transfers on increasing the probability of meat consumption by 13 percentage points after controlling for the impact of food distribution centers.

Table 3.2.1 Impact of the Cash for Nutrition program on household dietary diversity (HDDS), IV estimation

	(1)	(2)	(3)	(4)	(5)	(6)
	Yesterday HDDS		Friday HDDS		Friday Meat	
ParticipatedXFollowup	0.270	0.374	0.403	0.435	0.154***	0.128***
	(0.250)	(0.262)	(0.258)	(0.270)	(0.046)	(0.046)
Follow-up	-0.061	-0.287	0.029	-0.155	-0.160***	-0.164***
	(0.185)	(0.212)	(0.184)	(0.215)	(0.033)	(0.038)
Food Distribution		0.389***		0.369***		0.059**
		(0.130)		(0.138)		(0.027)
Observations	3,698	3,374	3,698	3,374	3,698	3,374
Mean dependent variable	6.522	6.519	6.749	6.744	0.231	0.227

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We also asked specifically about which household members consumed food from each group, allowing us to construct individual dietary diversity indices for children and women. The child dietary diversity score (CDDS) is calculated out of seven food groups. On this scale, a minimum sufficient dietary diversity for a child is considered to be eating from at least four of the seven groups. The women's dietary diversity score (WDDS) emphasizes food groups that are sources of calcium and iron, as these are especially important for women, and is calculated out of nine food groups (WHO 2007).

We find significant program impacts on child dietary diversity in the age range of 6 to 23 months. Table 3.2.2 shows the program impacts on child dietary diversity. Note that as indicated by the mean value of around 2.6, most children in this population are well below the minimum dietary diversity standard of four food groups per day. The regression results show a very large and concerning negative time trend in dietary diversity for this age group, especially after controlling for the presence of food distribution programs. The results show a decrease between baseline and follow-up of between 1.0 and 1.5 food groups consumed each day. The program impact only partially reverses this negative time trend, but is large in magnitude and highly statistically significant, ranging from an increase of 0.726 food groups on a weekday to an increase of 0.519 food groups on Fridays (0.867 and 0.621 respectively using the IV specification) after controlling for the presence of food distribution programs.

Table 3.2.2 Impact of the Cash for Nutrition program on child dietary diversity score (CDDS), children aged 6 to 23 months, IV estimation

	(1)	(2)	(3)	(4)
	Yesterday CDDS		Friday CDDS	
ParticipatedXFollowup	0.753**	0.867***	0.507	0.621**
	(0.293)	(0.276)	(0.316)	(0.295)
Follow-up	-1.262***	-1.585***	-1.062***	-1.315***
	(0.180)	(0.174)	(0.187)	(0.192)
Food Distribution		0.498***		0.440**
		(0.156)		(0.193)
Observations	759	705	759	705
Mean dependent variable	2.669	2.651	2.802	2.785

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.2.3 shows the program impacts on women's dietary diversity. We find significant program impacts, with increases of 0.35 food groups on normal days and 0.30 food groups on Fridays (0.51 and 0.43 respectively using the IV specification).

Table 3.2.3 Impact of the Cash for Nutrition program on women's dietary diversity score (WDDS), IV estimation

	(1)	(2)	(3)	(4)
	Yesterday WDDS		Friday WDDS	
ParticipatedXFollowup	0.380*	0.510***	0.355*	0.427**
	(0.210)	(0.181)	(0.214)	(0.193)
Follow-up	-1.171***	-1.428***	-1.038***	-1.263***
	(0.148)	(0.128)	(0.140)	(0.133)
Food Distribution		0.401***		0.432***
		(0.086)		(0.097)
Observations	3,700	3,376	3,700	3,376
Mean dependent variable	3.834	3.840	4.072	4.076

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3.3 Consumption of key non-staple food items

In the food consumption module of the questionnaire, participants were asked about the value in Yemeni Riyal of their purchases of 33 types of food during the past week in order to get a measure of the impact of the cash transfers on consumption of non-staple foods.[2] Because of the significant depreciation in the value of the Yemeni Riyal between baseline and follow-up, we inflate the baseline reported consumption by 1.5 so that our findings are expressed in Yemeni Riyal at follow-up values. This is especially important as staple foods as primarily cheaper and less-preferred than other complementary foods, so to the extent that people were forced to shift into spending a greater share of their food budget on staples, as described earlier, the cash transfers were more likely to have a positive impact on conserving spending on non-staple foods. As seen in the regression tables, Table 3.3.1 and Table 3.3.2, there is a strong negative time trend on spending on many of these key items. This mirrors the positive time trend on staple food consumption. For fresh foods, however, the time trend is also likely to relate to seasonality of availability of the foods for consumption, which explain the positive coefficients at follow-up for items such as limes, pomegranate, and dates.

We find significant impacts of the cash transfers on consumption of leeks, peppers, bananas, grapes, apricots, pomegranates, and dates as well as on overall expenditure on non-staples in the OLS specification, and also on fresh milk and apples when using the IV specification.[3] Just as importantly, there are no significant negative impacts on consumption of any food types, and even where the coefficients are not statistically significant, they are positive for 27 out of the 33 food types, providing supportive evidence for the broad story interpretation that cash transfers were important in allowing households to maintain or even increase purchases of non-staple foods.

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[2] The 33 foods were selected based as the most commonly consumed in Al-Hodeidah in the Household Budget Survey.

[3] Because of the large number of dependent variables, we implement correction for multiple hypothesis testing following Anderson (2008), however the positive impacts that we find survive this correction

Table 3.3.1 Impact for all households of the Cash for Nutrition program on value of consumption of key food items, Yemeni Riyals, IV estimation

	Participated XFollowup	p-value	Adjusted p-value	SE*	Follow-up	SE*	Observations	Mean value, YER
Meat	-5.76	0.977	0.965	202.00	-181.90	133.70	3,696	334.8
Chicken	96.23	0.229	0.399	79.95	-176.90***	48.71	3,698	335.5
Fresh Fish	341.60	0.114	0.231	216.00	-854.70***	182.20	3,692	1073.5
Fresh Milk	89.35	0.032	0.102	41.63	-46.80*	27.00	3,698	73.3
Yogurt	25.65	0.438	0.499	33.03	-10.92	20.01	3,698	120.6
Cheese	16.33	0.435	0.499	20.94	-3.54	11.28	3,698	59.9
Eggs	-0.56	0.982	0.965	24.53	21.57*	11.40	3,698	52.3
Tomato	103.70	0.039	0.113	50.18	-230.50***	33.87	3,698	622.6
Potato	111.10	0.093	0.201	66.04	-198.20***	47.32	3,698	622.0
Onions	-1.39	0.964	0.965	30.64	-102.10***	17.10	3,696	264.4
Okra	-16.18	0.378	0.499	18.36	-53.76***	11.21	3,698	56.4
Squash	-15.45	0.414	0.499	18.91	-24.95**	11.94	3,698	32.6
Spinach	13.70	0.141	0.261	9.31	10.05*	5.28	3,698	9.1
Carrot	28.16	0.054	0.140	14.61	-49.88***	9.85	3,698	77.1
Leek	35.27*	0.014	0.085	14.30	-54.47***	9.59	3,698	71.3
Cucumber	7.31	0.693	0.832	18.50	-46.37***	10.77	3,698	82.1
Pepper	64.05*	0.006	0.069	23.38	36.01**	15.72	3,698	97.8
Coriander	2.30	0.477	0.506	3.23	2.07	2.20	3,698	5.6
Bananas	101.40*	0.020	0.085	43.59	-71.84**	33.02	3,694	221.1
Grapes	52.60***	0.000	0.001	14.31	18.53**	7.75	3,698	36.4
Papaya	4.00	0.460	0.506	5.41	5.519**	2.72	3,698	7.4
Apricot	6.464*	0.016	0.085	2.68	-0.35	1.00	3,698	2.1
Lemon/Lime	9.61	0.362	0.499	10.54	26.11***	5.83	3,692	20.5
Oranges	2.16	0.906	0.965	18.35	-60.84***	11.74	3,698	51.8
Apples	23.87	0.242	0.399	20.40	-23.55**	10.73	3,696	63.8
Pomegranate	27.87**	0.002	0.035	8.80	4.63	5.11	3,698	15.3
Watermelon	-7.15	0.338	0.499	7.46	-1.38	3.72	3,698	10.9
Qishta	-0.40	0.892	0.965	2.90	2.83*	1.51	3,698	2.6
Dates	59.54**	0.017	0.085	25.05	93.86***	15.18	3,698	83.8
Canned Beans	0.84	0.524	0.552	1.32	-3.00***	1.00	3,686	2.6
Canned Milk	-0.50	0.409	0.499	0.60	-0.20	0.29	3,696	0.8
Canned Fish	0.03	0.275	0.440	0.03	0.00	0.02	3,690	0.0
Canned Fruit	0.16*	0.073	0.171	0.09	0.03	0.05	3,696	0.1
Total Non-staples	1124.40**	0.018	0.085	476.80	-1974.20***	320.90	3,652	4495.7

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: p-values: * p < 0.10, ** p < 0.05, *** p < 0.01. * Clustered standard errors (village-level).

The total spending on all non-staple food items in our survey increased by 1124 Yemeni Riyal (YER) per week. This is equal to approximately 80 percent of the impact on self-reported total weekly food purchases in cash (see section 3.6), which shows both that these particular food-items comprise a large share of the household budget and suggests that one of the benefits of the cash transfers in contrast to relying on credit or food distribution services is being able to buy non-staple food items which allow for a more diverse diet as seen in section 3.2.

Table 3.3.2 Impact for lowest wealth tercile households of the Cash for Nutrition program on value of consumption of key food items, Yemeni Riyals, IV estimation

	Participated XFollowup	p-value	Adjusted p-value	SE*	Follow-up	SE*	Observ-ations	Mean value, YER
Meat	171.00	0.049	0.147	86.80	-108.80	71.24	1,334	144.2
Chicken	20.75	0.778	0.779	73.59	-63.24	38.85	1,334	193.6
Fresh Fish	387.30	0.368	0.514	430.50	-856.80**	392.70	1,330	909.6
Fresh Milk	105.30*	0.011	0.074	41.19	-64.42**	29.05	1,334	48.1
Yogurt	7.00	0.847	0.779	36.28	-8.24	21.47	1,334	76.1
Cheese	19.75	0.318	0.514	19.79	-9.51	11.27	1,334	31.4
Eggs	48.91	0.027	0.105	22.11	-8.77	13.16	1,334	31.1
Tomato	109.70	0.104	0.226	67.47	-209.40***	48.37	1,334	554.2
Potato	71.15	0.407	0.514	85.75	-131.20**	61.31	1,334	527.8
Onions	74.16	0.059	0.163	39.24	-135.30***	27.07	1,334	246.8
Okra	11.66	0.646	0.646	25.36	-61.46***	16.17	1,334	47.6
Squash	-8.94	0.610	0.624	17.53	-17.69	12.06	1,334	24.1
Spinach	17.17	0.121	0.249	11.08	5.37	6.10	1,334	7.6
Carrot	23.35	0.164	0.308	16.76	-36.39***	11.14	1,334	58.1
Leek	15.89	0.391	0.514	18.52	-26.67***	10.20	1,334	60.6
Cucumber	11.94	0.556	0.608	20.30	-32.26**	13.47	1,334	60.7
Pepper	93.07**	0.002	0.024	30.15	29.65*	16.40	1,334	86.1
Coriander	5.36	0.177	0.308	3.97	0.11	2.84	1,334	4.8
Bananas	237.30**	0.002	0.024	77.58	-156.10**	67.89	1,334	178.8
Grapes	58.37**	0.002	0.024	19.18	5.24	11.26	1,334	33.1
Papaya	8.65	0.382	0.514	9.89	2.48	3.62	1,334	9.5
Apricot	8.16	0.048	0.147	4.13	-1.12	1.68	1,334	2.5
Lemon/Lime	-1.92	0.888	0.799	13.65	15.20**	6.88	1,330	13.5
Oranges	22.06	0.337	0.514	22.96	-46.17***	17.79	1,334	36.2
Apples	52.90*	0.016	0.084	21.97	-12.13	14.62	1,334	51.6
Pomegranate	28.94*	0.021	0.096	12.54	1.14	7.85	1,334	13.5
Watermelon	-3.03	0.748	0.779	9.45	-1.92	4.76	1,334	11.0
Qishta	-1.17	0.815	0.779	5.01	2.67	2.04	1,334	3.1
Dates	57.29	0.083	0.200	33.04	68.57***	21.16	1,334	65.9
Canned Beans	2.00	0.341	0.514	2.10	-3.39*	1.74	1,330	2.0
Canned Milk	-0.23	0.603	0.624	0.45	0.08	0.21	1,332	0.5
Canned Fish	0.06	0.159	0.308	0.04	-0.01	0.03	1,332	0.0
Canned Fruit	0.03	0.850	0.779	0.14	0.13	0.11	1,334	0.1
Total Non-staples	1575.20*	0.009	0.074	599.20	-1852.60***	495.80	1,318	3,513.8

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: p-values: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. * Clustered standard errors (village-level).

Importantly, these impacts are also strongest among the poorest households in the program. As shown in Table 3.3.2, in the lowest tercile of households, there are significant positive impacts on consumption of six of the 33 food items including milk, an important animal-source protein for complementary feeding. In contrast, in the middle tercile and highest tercile of households there is only one significant positive impact (Tables 3.3.3 and 3.3.4).

Table 3.3.3 Impact for middle wealth tercile households of the Cash for Nutrition program on consumption of key food items, IV estimation

	Participated XFollowup	p-value	Adjusted p-value	SE*	Follow-up	SE*	Observations	Mean value, YER
Meat	-430.00	0.155	0.449	302.60	115.00	135.10	1,112	314.6
Chicken	128.30	0.233	0.491	107.70	-143.70**	70.13	1,114	323.8
Fresh Fish	475.30	0.049	0.376	241.90	-940.50***	183.70	1,114	1,031.1
Fresh Milk	86.91	0.187	0.449	65.89	-68.59	52.97	1,114	64.9
Yogurt	-32.94	0.590	0.710	61.17	2.92	27.66	1,114	126.0
Cheese	-6.26	0.873	0.860	39.29	-2.79	17.67	1,114	63.0
Eggs	15.62	0.592	0.710	29.14	8.80	13.35	1,114	47.7
Tomato	15.07	0.869	0.860	91.32	-165.90**	70.63	1,114	633.0
Potato	128.60	0.322	0.636	129.80	-214.10**	102.90	1,114	636.1
Onions	-22.43	0.731	0.766	65.30	-112.60***	36.00	1,114	274.5
Okra	-19.10	0.459	0.665	25.78	-45.21**	17.98	1,114	55.1
Squash	-21.95	0.602	0.710	42.10	-42.41	28.94	1,114	47.8
Spinach	14.41	0.387	0.636	16.67	16.09	10.24	1,114	12.6
Carrot	38.61	0.120	0.449	24.83	-50.21***	16.69	1,114	80.8
Leek	46.92	0.018	0.175	19.79	-57.71***	15.70	1,114	69.3
Cucumber	41.98	0.084	0.376	24.33	-55.04***	15.45	1,114	82.0
Pepper	98.53*	0.002	0.073	32.54	2.77	23.66	1,114	100.7
Coriander	5.43	0.250	0.500	4.72	-1.44	3.16	1,114	4.9
Bananas	87.40	0.142	0.449	59.49	-84.47**	36.57	1,112	237.5
Grapes	56.57	0.016	0.175	23.52	19.74*	10.85	1,114	42.3
Papaya	3.47	0.661	0.736	7.93	3.89	4.02	1,114	6.4
Apricot	10.00	0.011	0.175	3.93	-2.55**	1.12	1,114	1.8
Lemon/Lime	23.10	0.091	0.376	13.68	20.03**	7.98	1,114	19.2
Oranges	-56.04	0.080	0.376	32.06	-40.53**	18.92	1,114	61.1
Apples	-44.62	0.204	0.449	35.10	0.42	17.22	1,112	69.4
Pomegranate	19.87	0.160	0.449	14.14	12.42	7.74	1,114	19.0
Watermelon	-4.44	0.727	0.766	12.75	-9.13	8.79	1,114	10.8
Qishta	2.66	0.596	0.710	5.02	0.32	1.83	1,114	2.8
Dates	56.90	0.066	0.376	30.95	88.88***	19.81	1,114	86.9
Canned Beans	1.11	0.393	0.636	1.30	-2.25**	0.93	1,110	2.5
Canned Milk	-0.71	0.579	0.710	1.28	-0.17	0.42	1,114	0.8
Canned Fish	0.03	0.512	0.710	0.05	-0.02	0.04	1,110	0.0
Canned Fruit	0.25	0.065	0.376	0.13	0.00	0.06	1,112	0.1
Total Non-staples	632.50	0.392	0.636	738.20	-1731.08***	381.90	1,098	4,508.3

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: p-values: * p < 0.10, ** p < 0.05, *** p < 0.01. * Clustered standard errors (village-level).

Table 3.3.4 Impact for highest wealth tercile households of the Cash for Nutrition program on consumption of key food items, IV estimation

	Participated XFollowup	p-value	Adjusted p-value	SE*	Follow-up	SE*	Observ- ations	Mean value, YER
Meat	61.60	0.903	1.000	504.40	-439.20	314.50	1,246	556.7
Chicken	77.05	0.66	1.000	175.20	-283.10***	104.20	1,246	498.9
Fresh Fish	184.10	0.598	1.000	348.70	-806.90***	265.40	1,244	1,282.4
Fresh Milk	91.62	0.325	1.000	93.04	-18.89	39.81	1,246	108.4
Yogurt	116.00*	0.058	0.973	61.26	-28.79	42.30	1,246	164.1
Cheese	41.95	0.292	1.000	39.81	-0.81	20.50	1,246	87.9
Eggs	-66.53	0.245	1.000	57.17	57.96**	24.11	1,246	79.3
Tomato	164.00	0.046	0.973	82.11	-299.40***	51.88	1,246	687.7
Potato	121.10	0.226	1.000	99.96	-245.10***	66.61	1,246	710.3
Onions	-60.14	0.153	1.000	42.12	-64.09**	26.67	1,244	273.9
Okra	-52.10	0.096	0.973	31.28	-51.36***	16.86	1,246	67.1
Squash	-11.76	0.667	1.000	27.28	-19.29	13.90	1,246	28.0
Spinach	6.94	0.514	1.000	10.62	10.55*	6.10	1,246	7.7
Carrot	16.03	0.532	1.000	25.63	-60.65***	16.68	1,246	94.5
Leek	36.00	0.182	1.000	27.00	-75.57***	14.27	1,246	85.0
Cucumber	-43.53	0.249	1.000	37.80	-49.91***	17.86	1,246	105.5
Pepper	2.25	0.948	1.000	34.58	66.54***	24.43	1,246	107.9
Coriander	-2.92	0.65	1.000	6.44	6.25*	3.64	1,246	7.1
Bananas	-20.92	0.734	1.000	61.52	11.18	35.88	1,244	251.0
Grapes	45.68	0.037	0.973	21.96	29.33**	13.82	1,246	34.9
Papaya	0.52	0.95	1.000	8.27	9.28*	5.53	1,246	6.0
Apricot	1.37	0.703	1.000	3.60	2.01	1.64	1,246	2.0
Lemon/Lime	17.15	0.361	1.000	18.76	39.75***	9.53	1,244	29.0
Oranges	27.99	0.403	1.000	33.48	-89.35***	19.61	1,246	60.4
Apples	48.10	0.236	1.000	40.59	-50.82***	18.76	1,246	72.2
Pomegranate	33.62	0.024	0.973	14.87	2.18	7.47	1,246	14.2
Watermelon	-11.67	0.445	1.000	15.30	4.26	5.11	1,246	10.9
Qishta	-1.59	0.687	1.000	3.96	4.68	3.05	1,246	1.9
Dates	81.88	0.083	0.973	47.29	116.70***	25.18	1,246	100.4
Canned Beans	-1.22	0.612	1.000	2.42	-3.12**	1.45	1,242	3.3
Canned Milk	-0.76	0.521	1.000	1.19	-0.44	0.65	1,246	1.0
Canned Fish	0.01	0.809	1.000	0.06	0.013	0.03	1,244	0.1
Canned Fruit	0.21	0.134	1.000	0.14	-0.045	0.07	1,246	0.1
Total Non-staples	927.60	0.288	1.000	872.30	-2249.50***	571.30	1,232	5,536.9

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: p-values: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. * Clustered standard errors (village-level).

3.4 Food availability and prices in the community

Prices for the 33 food items mentioned in section 3.3 were also collected at the community level. Due to the higher inflow of cash to treated communities, it is possible that local prices in these communities could rise if markets are not sufficiently integrated. This potential for inflation is sometimes cited as a reason for preferring in-kind transfers over cash. On the other hand, it is also possible that by increasing demand, local stores would have greater incentive to stock higher value foods.

We did not find evidence of either effect in our analysis of the survey data. This may be because the difference in cash inflow was not that great between treated and control communities,

due to the program selection criteria and the fact that randomization was only among indirect beneficiaries, while control communities still have direct beneficiaries. As in the previous section, we adjust for known depreciation in the Yemeni Riyal between baseline and follow-up.

Table 3.4.1 shows that there was no significant impact on food availability at the community level. Food availability generally increased between baseline and follow-up, but this is likely to be mostly due to seasonality in the case of fruits and vegetables, as more such foods are available in the summer, when the follow-up survey was administered, than in the winter, when the baseline was done.

Table 3.4.1 Impact of the Cash for Nutrition program on community-level food type availability

	Vegetable availability	Fruit availability	Dry Staples availability	Canned Food availability	Fresh Meat, Dairy, Eggs availability
TreatXfollowup	0.032	0.045	0.039	0.010	0.072
	(0.048)	(0.061)	(0.029)	(0.007)	(0.055)
Follow-up	0.089**	0.169***	-0.004	-0.001	0.062
	(0.035)	(0.044)	(0.021)	(0.005)	(0.040)
Observations	349	349	349	349	349
Mean dependent variable	0.649	0.515	0.886	0.222	0.722

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 3.4.2 shows that there was no significant impact on prices, although the impact on the price of fruit is marginally statistically significant. After adjusting for the change in value of Yemeni Riyal, prices were lower in the follow-up rounds for fresh vegetables and meat, dairy, and eggs due again to the fact that the baseline was collected in winter and follow-up was collected in summer.

Table 3.4.2 Impact of the Cash for Nutrition program on community-level prices

	Vegetable prices	Fruit prices	Dry Staples prices	Canned Food prices	Fresh Meat, Dairy, Eggs prices
TreatXfollowup	16.71	42.80	31.65	-15.20	73.23
	(32.33)	(30.14)	(29.56)	(18.11)	(84.84)
Follow-up	-125.90***	21.93	-63.11***	27.40**	-276.30***
	(23.41)	(21.83)	(21.41)	(13.12)	(61.44)
Observations	349	349	349	349	349
Mean dependent variable	260.5	209.7	314.1	162.3	1174.5

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

3.5 Food security and coping strategies

Households were asked a standard food security question: "In the past seven days, were there times when you did not have enough food to eat?", and as a follow-up, the number of days within the past seven days when they had employed any of several different coping strategies due to not having enough food.

Table 3.5.1 shows summary statistics for the food security questions. Notably, the share of food insecure households is very high, especially for the follow-up survey, with more than half of households reporting that there were times during the past seven days when they did not have enough to eat. Table 3.5.2 shows the results of estimating the impact of the Cash for Nutrition program on food security, using an IV specification. We noted that the share of households in

communities that reported other food distribution programs rose from 23 percent at baseline to 61 percent at follow-up.

Table 3.5.1 Food insecure households, as a share of all households by survey round and treatment

	Treatment		Control	
	Baseline	**Follow-up**	**Baseline**	**Follow-up**
In the past 7 days, were there times when your household did not have enough food?	0.358	0.528	0.407	0.545
Observations	997	931	996	912

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.

Table 3.5.2 Impact of the Cash for Nutrition program on food insecurity, IV estimation

	Food Insecure	**Days Less Preferred Food**	**Days Borrowing**	**Days Limiting Portions**	**Days Limiting Adult Intake**	**Days Reduced Meals Per Day**
ParticipatedXFollowup	0.038	0.073	0.371	0.023	-0.029	0.032
	(0.069)	(0.332)	(0.285)	(0.298)	(0.237)	(0.262)
Follow-up	0.211***	2.157***	0.427**	1.579***	1.119***	1.044***
	(0.051)	(0.256)	(0.190)	(0.232)	(0.173)	(0.211)
Food Distribution	-0.189***	-1.027***	-0.661***	-0.813***	-0.686***	-0.779***
	(0.034)	(0.198)	(0.150)	(0.182)	(0.138)	(0.160)
Observations	3,360	3,360	3,360	3,360	3,360	3,360
Mean dependent variable	0.457	1.461	1.316	1.122	0.774	0.881

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In the first column of Table 3.5.2, we can see a significant and large increase of 21 percentage points between baseline and follow-up in the number of households experiencing food insecurity, after controlling for the presence of food distribution programs. The significant negative coefficient on the presence of food distribution, this indicates that food distribution programs contributed significantly to combatting the rise in food insecurity during the conflict period. Because food distribution programs are more likely to be located in areas of greater need, the coefficient estimate of -19 percentage points is likely to be an underestimate of the true impact of those food distribution programs.

The remaining columns in Table 3.5.2 show the impacts on average number of days each coping strategy was employed. Households with no food insecurity are considered as spending zero days for each coping strategy. There are significant increases between baseline and follow-up in the use of all coping strategies, with the average number of days in the past week doubling for eating less preferred food, reducing meal size, reducing adult intake, and reducing the number of meals per day. Again, there is evidence that the food distribution programs reduced the use of these coping strategies.

The fact that none of the coefficients on the Cash for Nutrition program treatment are significant implies that we do not find an impact of the program on food insecurity. This may be related to the fact that the subjective nature of the question led treatment households to over-report food insecurity or coping strategies because of concerns that the program would be ending soon.

Food distribution programs, on the other hand, were significantly associated with lower food insecurity for households in treated communities.

In the follow-up survey, households were asked about the ways in which they had coped with the civil conflict in Yemen. Households could select multiple responses from among the following:

- increased borrowing from shopkeeper;
- increased borrowing from relatives and friends;
- selling off livestock or assets;
- finding new work for men/ women/ or children; and
- selling off gold.

All of these coping strategies have limitations, and many have negative consequence in the long-term. For example, only so many assets can be sold off before the household is destitute. To the extent that the cash transfers decrease reliance on such coping strategies currently, cash transfers reduce the future vulnerability of the household.

Table 3.5.3 shows the share of households in the follow-up survey that reported using each coping strategy. The most common forms of coping were increased borrowing from shopkeepers (59 percent of control households) and friends and relatives (48 percent). Twenty nine percent of control households sold livestock or assets, 13 percent reported increased work for men in the household, and 19 percent reported selling gold. Very few households reported women or children going to work.

Table 3.5.3 Share of households reporting in the follow-up survey as having adopted economic coping strategies during the conflict, by treatment

	Treatment Follow-up	Control Follow-up
Have you done any of the following as to cope with the economic situation during the conflict?		
Increased borrowing from shopkeeper	0.616	0.590
	(0.487)	(0.492)
Increased borrowing from friends and relatives	0.471	0.483
	(0.499)	(0.500)
Sold livestock or household goods	0.289	0.287
	(0.453)	(0.453)
New work for men in the household	0.138	0.130
	(0.345)	(0.337)
New work for women in the household	0.022	0.031
	(0.145)	(0.173)
New work for children in the household	0.013	0.019
	(0.115)	(0.138)
Selling gold	0.129	0.188
	(0.336)	(0.391)
Other	0.138	0.113
	(0.345)	(0.317)
Observations	973	975

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds. Standard deviations in parentheses.

Table 3.5.4 show the impact of the conditional cash transfers on these coping mechanisms. Because the randomization was not perfectly balanced, we control for characteristics that differed between the control and treatment groups. The treatment accounted for a significant decrease in the share of households who reported selling gold by 7.8 percentage points. This is a large difference

relative to the 19 percent of control households that reported selling gold. For other coping strategies, there was no significant difference between treatment and control households.

Table 3.5.4 Overall impact of cash transfers of the Cash for Nutrition program on economic coping mechanisms, IV estimation

	Increased borrowing from shop-keeper	Increased borrowing from friends, relatives	Sold livestock or house-hold goods	New work for men in house-hold	New work for women in house-hold	New work for children in house-hold	Selling gold	Other
ParticipatedXFollowup	0.016	-0.046	-0.015	0.014	-0.014	-0.009	-0.078**	0.030
	(0.059)	(0.051)	(0.052)	(0.031)	(0.015)	(0.009)	(0.035)	(0.037)
Asset Index	0.007	-0.013*	-0.016**	0.006	-0.003	0.000	0.034***	0.000
	(0.008)	(0.008)	(0.008)	(0.005)	(0.002)	(0.002)	(0.007)	(0.007)
Mother is illiterate	0.033	-0.000	0.018	-0.019	-0.021*	0.005	-0.045*	0.031
	(0.033)	(0.029)	(0.026)	(0.023)	(0.012)	(0.006)	(0.023)	(0.023)
People in house	-0.003	0.002	0.010***	-0.000	0.002	0.004***	-0.003	-0.001
	(0.004)	(0.003)	(0.004)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
Observations	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In Table 3.5.5, we separate the sample into three groups based on the baseline assets index as described in the methodology section above. These tables show that the decrease in selling gold is limited to the two higher terciles. Table 3.5.6 show that the impact of the cash transfers on decreasing borrowing from friends and relatives is concentrated in the poorest asset tercile.

Table 3.5.5 Impact of cash transfers of the Cash for Nutrition program on selling gold for different asset terciles, IV estimation

	Lowest tercile	Middle tercile	Highest tercile	Total
ParticipatedXFollowup	0.056	-0.160**	-0.149**	-0.078**
	(0.037)	(0.063)	(0.065)	(0.035)
Asset Index	0.047**	0.068**	0.037**	0.034***
	(0.021)	(0.032)	(0.015)	(0.007)
Mother is illiterate	-0.080	-0.041	-0.033	-0.045*
	(0.051)	(0.046)	(0.031)	(0.023)
People in house	-0.006	0.005	-0.003	-0.003
	(0.004)	(0.006)	(0.004)	(0.002)
Observations	667	558	623	1,848

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.5.6 Impact of cash transfers of the Cash for Nutrition program on borrowing for different asset terciles, IV estimation

	Lowest tercile	Middle tercile	Highest tercile	Total
ParticipatedXFollowup	-0.164**	-0.018	0.054	-0.046
	(0.070)	(0.080)	(0.073)	(0.051)
Asset Index	0.044	-0.018	-0.040***	-0.013*
	(0.040)	(0.044)	(0.012)	(0.008)
Mother is illiterate	0.015	-0.001	-0.011	-0.000
	(0.070)	(0.053)	(0.044)	(0.029)
People in house	0.003	0.002	0.001	0.002
	(0.007)	(0.008)	(0.005)	(0.003)
Observations	667	558	623	1,848

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.5.7 summarizes the rate of internally displaced persons in our sample. Less than 2 percent of the households in our sample were displaced due to the conflict. (We are only able capture households that had been displaced in the past and have since returned to their houses, so this may underestimate the degree to which households in these districts of Al Hodeidah have been displaced). Due to the small sample of Internally Displaced Persons, we are unable to show impacts of the program on these individuals, in particular.

Table 3.5.7 Share of households reporting being internally displaced in the follow-up survey, by treatment

	Treatment Follow-up	Control Follow-up
Were you forced to leave your home at any time in the past two years due to conflict?	0.016	0.015
How many months since you left your home?	9.400	13.210
	(10.250)	(12.600)
How many months were you away from your home?	5.667	10.360
	(8.287)	(14.680)
Are you hosting other relatives in your house who were displaced due to the conflict?	0.068	0.064
Observations	938	918

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds. Standard deviations in parentheses.

6.6 percent of households are hosting other relatives who were displaced due to the conflict. However, there was no significant impact of the program on the probability of hosting displaced relatives (Table 3.5.8).

Table 3.5.8 Impact of the Cash for Nutrition program on hosting of internally displaced persons, IV estimation

	Hosting other relatives who were displaced due to conflict
ParticipatedXFollowup	0.015
	(0.027)
Asset Index	0.012*
	(0.006)
Mother is illiterate	-0.048**
	(0.020)
People in house	0.000
	(0.002)
Observations	1,848

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

3.6 Total food spending

An additional measure of household consumption that was collected in the survey was total average food spending each month and, in the follow-up survey only, a recall question asking about total food spending in the past week for cash and credit separately.

Tables 3.6.1 shows no impact of the Cash for Nutrition program on household consumption using the measure of estimated average food spending per month. This may be because the question was too imprecise. As in the previous sections, spending is converted to January 2017 Yemeni Riyal values. While nominal food budgets increased, in real terms food spending declined due to both lower prices for fresh foods during the summer, when the follow-up survey was done, and declines in the amount of food consumed.

Table 3.6.1 Overall impact of the Cash for Nutrition program on monthly household food spending per capita, IV estimation

	Monthly household food budget	Monthly household food budget per capita
ParticipatedXFollowup	-1929.5	-1300.5
	(5957.0)	(1046.0)
Follow-up	-9208.9**	-1051.9*
	(4149.7)	(619.9)
Observations	3,700	3,692
Mean dependent variable	43,737.7	7,279.3

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 3.6.2 shows the impact of the program on purchases in cash and credit using the weekly recall question in the follow-up survey. This distinction between cash and credit is important because store credit is heavily used by households in rural Yemen as a strategy for coping with economic hardship (see Table 3.5.4). However, purchasing on credit is limited by the shopkeepers' willingness to accept the promise of future payment from a particular household. We find that, while purchases on credit did not change as a result of the transfers, households that received cash transfers made significantly more cash purchases, by 1480 YER per week. Since the transfer

magnitude at time of the follow-up survey was 10,000 YER per month, this suggests 63 percent of the transfers were spent on immediate food purchases.

Table 3.6.2 Overall impact of the Cash for Nutrition program on weekly total food spending on credit and in cash, IV estimation

	Last week food purchases on Credit	Last week food purchases in Cash
ParticipatedXFollowup	195.5	1478.6***
	(680.8)	(448.3)
Asset Index	-1.3	300.2***
	(159.2)	(72.6)
Mother is illiterate	839.6	-548.4*
	(547.3)	(317.8)
People in house	189.7***	104.4***
	(57.3)	(32.5)
Observations	1,848	1,848
Mean dependent variable	4155.8	5788.8

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

While not directly related to food spending, we also checked whether there was any impact of the cash on *qat* consumption as this is often a concern. Table 3.6.3 confirms that the transfers did not increase spending on *qat*.

Table 3.6.3 Impact of Cash for Nutrition program on qat usage, IV estimation

	Male weekly qat usage	Female weekly qat usage	Household qat usage	Weekly qat expenditure
ParticipatedXFollowup	-0.270	-0.212	-0.313	-54.6
	(0.260)	(0.232)	(0.402)	(458.8)
Follow-up	0.208	-0.192	-0.293	-535.6*
	(0.162)	(0.158)	(0.259)	(296.8)
N	3,274	3,652	3,696	3,700
Mean dependent variable	2.861	1.739	4.432	1662.2

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

3.7 Knowledge and practices related to child nutrition

The Cash for Nutrition program included a nutritional training component. Initially it was intended as the object of the conditionality for the conditional cash transfer of the program, but in actual practice there was not strict enforcement of this conditionality. Instead, the program works with women who have not attended the trainings to find ways for them to attend.

Table 3.7.1 shows the number of training sessions attended by control and treatment households. Notably, while only 24 percent of control households reported receiving transfers, a much larger share reported attending the nutritional training sessions – 34 percent in 2015 and 35 percent in 2016/17. Among treated households, attendance was high and increased closer to the follow-up survey. Also notable is that the share of control households who reported learning from the community health education was even higher than the share that reported attending nutritional training sessions. This shows that the impact of the community health educator is not limited to households that were officially enrolled in the program.

Table 3.7.1 Attendance at nutrition knowledge training sessions under the Cash for Nutrition program, by treatment, share of respondents

	Treatment	Control
Nutritional training attendance in 2015	0.912	0.338
	(0.283)	(0.473)
Nutritional training attendance in 2016-2017	0.958	0.354
	(0.200)	(0.479)
Number of nutritional training sessions attended in 2016/17	8.234	2.524
	(2.130)	(3.824)
Did you learn new information from the community health educator this year?	0.934	0.440
	(0.249)	(0.497)
Observations	935	915

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Standard deviations in parentheses.

In our household survey, we asked the mothers a series of questions about nutrition and child feeding which were related to the content of the nutritional training sessions. Because there is a high degree of spillover effects in control communities, these estimates likely understate the true impact of the program on average nutritional knowledge.

A. General knowledge on nutrition

Table 3.7.2 shows the program impacts on correct responses to questions about knowledge on nutrition. Among the series of questions asked, we find impact only on a few specific topics: "Should child be given more food when sick?"; "Is qat harmful to health?"; and "When should babies start breastfeeding after birth?" Because of the large number of different questions asked in this section, we only consider findings to be potentially significant if they have a very high degree of statistical significance.

For the most part, the questions were already common knowledge, which may explain the lack of impact of the program. On a few topics, however, there was no impact, but also low levels of knowledge: "Are sweets healthy for children?", two questions about anemia and iron sources, and the question "Should babies under 6 months old be given anything except breastmilk?"

These results suggest that the training is doing well at addressing knowledge on the treatment of malnutrition, breastfeeding initiation, and the health issues of qat usage. Yet, more work needs to be done on explaining the importance of iron-rich foods to avoid anemia, the importance of exclusive breastfeeding, and the timing of complementary feeding. For complementary feeding, women were split between thinking that it should be greater than 6 months or less than 6 months.

Table 3.7.2 Overall impact of the Cash for Nutrition program on nutrition knowledge, IV estimation

	Participated XFollowup	SE*	Follow-up	SE*	Observ-ations	Mean value
Total knowledge score	0.913***	0.327	0.000	0.221	3,700	9.359
Knows location of nearest health center	0.076	0.066	0.198***	0.049	3,700	0.752
Knows should eat more during pregnancy/ breastfeeding	0.078	0.059	-0.012	0.037	3,700	0.773
Knows should not use *qat* during pregnancy/ breastfeeding	0.026	0.046	0.005	0.031	3,700	0.761
Knows should drink more during pregnancy/ breastfeeding	0.079	0.054	-0.057*	0.033	3,700	0.802
Knows should give child more to drink when sick	0.109*	0.058	-0.013	0.035	3,700	0.799
Knows should give child more food when sick	0.195***	0.059	-0.179***	0.036	3,700	0.796
Knows sweets not healthy for children	-0.016	0.065	0.007	0.042	3,700	0.554
Knows *qat* not healthy for children	0.036	0.036	0.039	0.024	3,700	0.855
Knows malnutrition can lead to anemia	0.047	0.049	0.026	0.033	3,700	0.835
Can mention correctly at least one source of iron	0.073	0.051	0.052	0.036	3,700	0.719
Knows malnutrition can lead to stunting	0.039	0.054	0.044	0.034	3,700	0.792
Knows babies should be breastfed within the first 6 hours after birth	0.064**	0.029	-0.012	0.019	3,700	0.933
Knows babies should be breastfed within the first 1 hour after birth	0.177***	0.049	-0.064*	0.034	3,700	0.807
Knows 6 months as age for complementary feeding	-0.037	0.046	-0.095***	0.033	3,700	0.252
Believes complementary feeding should start at less than 6 months	-0.037	0.046	-0.095***	0.033	3,700	0.252
Believes complementary feeding should start at more than 6 months	0.108*	0.063	0.072*	0.041	3,700	0.317
Knows babies under 6 months should not be given anything but breastmilk	0.068	0.054	0.093***	0.035	3,700	0.652

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01. * Clustered standard errors (village-level).

B. Infant and young child feeding practices

Information on infant and young child feeding practices was collected at the child level for children who were under 2 years old at the time of the survey – 1,580 children at baseline and 898 children at follow-up. Because many mothers only had a child of the given age at either the baseline or the follow-up, the regressions in this section include village-level fixed effects rather than mother fixed effects.

Table 3.7.3 shows that, in line with the increase in knowledge about breastfeeding initiation observed above, there is a significant increase of 8.0 percentage points in the probability that babies are breastfed during the first six hours after birth, compared to average rate of only 87.3 percent and a 15.4 percentage point increase in mothers breastfeeding their babies within the first hour after birth. Both breastfeeding within one hour after birth (optimal) and between one and six hours after birth (less optimal) are associated with lower rates of child mortality (Edmond 2006).

Table 3.7.3 Overall impact of the Cash for Nutrition program on infant and young child feeding, IV estimation

	Participated XFollowup	SE*	Follow-up	SE*	Observ-ations	Mean value
Baby breastfed during the first six hours after birth	0.081**	0.041	0.045	0.028	2,424	0.873
Baby breastfed during the first hour after birth	0.154***	0.057	0.049	0.041	2,424	0.709
How many times was baby fed breastmilk or formula yesterday?	1.523**	0.680	-1.161***	0.428	2,289	6.821
Do you have any difficulty producing enough milk?	-0.143**	0.071	0.191***	0.051	2,240	0.470
Do you give formula to your child?	0.068	0.055	0.145***	0.035	2,366	0.204
Continued breastfeeding between 7 and 24 months	0.041	0.064	-0.026	0.044	1,648	0.744
Gave solid food between 7 and 24 months	-0.010	0.038	-0.003	0.027	1,706	0.926
Times given solid food between 7 and 24 months	-0.028	0.196	-0.037	0.131	1,701	2.747

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

There is also an increase in number of times that children under 2 years of age are given breastmilk or formula per day which compensates for a dramatic decrease in times fed per day between baseline and follow-up. This time trend of fewer milk feedings per day is accompanied by a 17 percentage point increase in women who report that they have difficulty producing sufficient amount of milk and a 15 percentage point increase in the use of formula. Both of these negative time trends are likely related to the decreasing nutritional level of mothers. The program impact more than fully compensated for the decline in feeding times and mostly compensated for the decline in mothers reporting inability to produce sufficient milk.

For practices related to the timing and adequacy of complementary feeding, there is no impact of the program. There was no increase in knowledge on this topic between baseline and follow-up.

Finally, we find a significant impact of the program in the range of a 13 to 15 percentage point increase on the probability of exclusive breastfeeding compared with the average rate of only 14 percent in control communities at follow-up. Exclusive breastfeeding is measured for babies under 6 months based on a recall over the previous 24 hours of whether the mother gave the child any of a range of liquids or solids, including water and sugar water. The very low rate of exclusive breastfeeding in this context is mostly a result of high probability of giving water or sugar water to babies, based on a traditional understanding that the baby needs water to drink in hot weather, or because it will help the baby learn to speak.

Our regression results on exclusive breastfeeding in Table 3.7.4 are consistent across a variety of specifications. This includes analyses based only on the follow-up survey data or those that include data from a follow-up correction to the baseline survey in which we revisited mothers with children under 6 months old to re-collect exclusive breastfeeding data after a problem with the question in the baseline questionnaire. This strong positive impact finding, while representing almost a doubling compared to baseline rates, appears reasonable in magnitude considering the challenges of implementation in Yemen.

Table 3.7.4 Impact of the Cash for Nutrition program on exclusive breastfeeding, IV estimation

	Follow-up only	Panel	Panel
ParticipatedXFollowup	0.149**	0.133*	0.129*
	(0.074)	(0.073)	(0.071)
Follow-up		-0.014	0.012
		(0.056)	(0.059)
Food distribution			-0.065
			(0.049)
Asset Index	-0.012	-0.005	-0.008
	(0.018)	(0.016)	(0.015)
Mother is illiterate	-0.089	-0.072	-0.093
	(0.089)	(0.069)	(0.069)
People in house	-0.007	-0.009	-0.010
	(0.009)	(0.007)	(0.006)
Observations	184	258	255
Mean dependent variable	0.196	0.178	0.173
District fixed-effects?	No	Yes	Yes

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Much stronger impacts were found in other randomized control trial studies of behavior change communication interventions in similar developing country settings with low levels of maternal education. For example, in Bangladesh a randomized control trial study found a 64 percent increase in exclusive breastfeeding after 5 months from 40 hours of training by peer educators in an urban population with a 6 percent rate of exclusive breastfeeding without the intervention (Haider et al. 2000). In India a randomized control trial study found a 31 percent increase in exclusive breastfeeding after 3 months from breastfeeding promotion based on monthly home health visits in a population with a 48 percent rate of exclusive breastfeeding without the intervention (Bhandari et al. 2003).

C. Heterogeneity of impacts on breastfeeding initiation

We explore the impacts of knowledge and practices about breastfeeding initiation by literacy level and the location of the mother. Table 3.7.5 concerns knowledge about breastfeeding initiation, while Table 3.7.6 concerns actual breastfeeding initiation practice.

We find that the impacts for both knowledge and practice are stronger for illiterate women and for women living with their mother-in-law rather than their own mother. The heterogeneity result for literacy shows that the training disproportionately benefited women who have the fewest other sources of information. It also shows that the nutritional training sessions by community health educators works well with the population which is primarily illiterate.

Because many traditional practices about child feeding are passed down from mothers to daughters, we were curious as to whether it would be easier or harder for women to change their behavior in response to training if living with their own mother compared to living in an in-law's household or independently. Our findings suggest that women living with their own mother were significantly less likely to increase their knowledge as a result of training. There are similar differences for reported behavior, although in this case the difference between the two groups is not statistically significant due to the smaller sample size.

Table 3.7.5 Heterogeneity analysis: impact of the Cash for Nutrition program on knowledge about breastfeeding initiation within one hour, IV estimation

	Illiterate	Literate	Living with mother	Not living with mother
ParticipatedXFollowup	0.189***	0.148*	0.092*	0.389***
	(0.058)	(0.080)	(0.052)	(0.080)
Follow-up	-0.073*	-0.045	-0.021	-0.191***
	(0.039)	(0.062)	(0.035)	(0.057)
Observations	2,854	846	2,532	1,168
Mean dependent variable	0.788	0.872	0.808	0.805
Wald test	0.658		0.000	

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.7.6 Heterogeneity analysis: impact of the Cash for Nutrition program on breastfeeding initiation within one hour, IV estimation

	Illiterate	Literate	Living with mother	Not living with mother
ParticipatedXFollowup	0.167**	0.084	0.101*	0.293**
	(0.073)	(0.100)	(0.058)	(0.117)
Follow-up	0.027	0.134**	0.065	0.003
	(0.051)	(0.061)	(0.041)	(0.089)
Observations	1,832	560	1,700	688
Mean dependent variable	0.699	0.741	0.724	0.675
Wald test	0.310		0.553	

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

D. Water treatment practices and heterogeneity of impact

Sanitation is an important component of avoiding child malnutrition, as well as taking on particular urgency in Yemen due to outbreaks of cholera. The topic was covered as part of the nutritional training content.

Table 3.7.7 shows that there were significant impacts of the program on practices regarding treating water. Overall, only 11 percent of the sample treated water used for drinking by adults, while 23 percent treated water given to children under 2 years of age. The program impact on treating water for adults of 17 is therefore quite large. The impact on treating water for children was smaller, 10 percentage points in the IV specification, but still statistically significant. We also observe a very strong positive time trend, particularly in treated water for adults. This is likely due to spillover effects from the community health educators on non-treated households.

Table 3.7.7 Overall impact of the Cash for Nutrition program on water treatment, IV estimation

	Treating water for adults	Treating water for child under 2
ParticipatedXFollowup	0.167***	0.103*
	(0.042)	(0.059)
Follow-up	0.047*	0.164***
	(0.025)	(0.035)
Observations	3,700	3,700
Mean dependent variable	0.114	0.233

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In Table 3.7.8, we show the heterogeneity in impact by literacy status. The program impact on treating water for children under two years of age is higher among literate women, possibly because water treatment is somewhat costly and literate women tend to come from better-off households, or possibly because literate women were better able to accept the idea of the dangers of drinking untreated water. Unfortunately, there was no corresponding knowledge question in the survey, so it is difficult to distinguish between these two potential explanations.

Table 3.7.8 Impact of the Cash for Nutrition program on water treatment, by literacy status of the woman, IV estimation

	Treating water for adults		Treating water for child under two years of age	
	Literate	Illiterate	Literate	Illiterate
ParticipatedXFollowup	0.275***	0.132***	0.266***	0.052
	(0.062)	(0.046)	(0.070)	(0.068)
Follow-up	0.016	0.063**	0.134***	0.181***
	(0.040)	(0.028)	(0.042)	(0.042)
Observations	846	2,854	846	2,854
Mean dependent variable	0.144	0.105	0.316	0.208
Wald test	0.025		0.006	

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In terms of the way that water is being treated in this population, the most common methods are boiling or filtering with a cloth. Table 3.7.9 shows that there are program impacts on boiling water used for adults. For water for children under 2 years of age, the program impact on boiling water is not significant, likely due to the very strong positive time trend in boiling water used for children.

Table 3.7.9 Impact of the Cash for Nutrition program on water treatment by water treatment type, IV estimation

	Participated X Followup	SE*	Follow-up	SE*	Observ-ations	Mean value
Filter water for adults	0.006	0.012	-0.010	0.008	3,890	0.008
Boil water for adults	0.103***	0.024	0.007	0.012	3,890	0.040
Straining with cloth water for adults	0.028	0.030	0.031**	0.014	3,890	0.036
Adults drink bottled water	0.015	0.015	-0.010	0.011	3,890	0.013
Filter water for under-twos	-0.003	0.011	-0.003	0.007	3,890	0.008
Boil water for under-twos	0.039	0.051	0.127***	0.034	3,890	0.138
Straining with cloth water for under-twos	0.045*	0.024	0.006	0.012	3,890	0.028
Under-twos drink bottled water	-0.005	0.030	0.034*	0.020	3,890	0.059

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: *Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

3.8   Diarrhea

The main pathway by which water treatment practices affect child nutrition is through the reduction of the disease burden from enteric infections. We test whether children under 5 in our treatment sub-sample had fewer episodes of diarrhea in the past two weeks. Table 3.8.1 does not show any impact on the incidence of diarrhea. The lack of a measurable result may be due to measurement error or to the fact that improvements in sanitation practices were not confined to the treatment group.

Table 3.8.1 shows that there was an overall positive and significant reduction in the average length of the diarrhea episodes between baseline and follow-up. This positive time trend may be related to the improvements in sanitation found above, however, the average age of children in our sample also increased between baseline and follow-up, so it is also possible that the change is an artefact of the aging of the cohort.

Table 3.8.1 Overall impact of the Cash for Nutrition program on diarrhea, IV estimation

	Episodes of diarrhea	Length of diarrhea episodes
ParticipatedXFollowup	-0.061	-0.372
	(0.045)	(0.428)
Follow-up	0.030	-1.036***
	(0.033)	(0.270)
Observations	5,566	1,671
Mean dependent variable	0.397	4.629

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

3.9   Women's empowerment

In the follow-up interviewees' program participation module, the interviewees were asked three questions that determine the empowerment impact of the training program on women. Women were asked if they could take their child to the health center alone in case of illness. In addition, the participants were asked about the ideal level of education they would like their daughters to achieve and what level of education they expect their daughters to achieve.

The results in Table 3.9.1 show a significant impact of 24 percentage points on the share of women that can take their child to the health center if he/she is seriously ill compared to a mean of 66 percent in the sample as a whole.

We also find significant impacts on both aspirations and expectations for daughters' education among respondents with daughters. The program increased by 7 percentage points the share of mothers who would like their daughters to achieve secondary education increased and by 10 percentage points the share of mothers who would like their daughters to go beyond secondary education. We also find a significant increase of 16 percentage points in the share of mothers who expect their daughter to achieve post-secondary education.

Table 3.9.1 Overall impact of the Cash for Nutrition program on women's empowerment, IV estimation

	Ability to take your child alone to the health center	Would like daughter to achieve secondary education	Expect your daughter to achieve secondary education	Would like daughter to achieve post-secondary education	Expect daughter to achieve post-secondary education
ParticipatedXFollowup	0.236***	0.070**	0.053	0.105*	0.162***
	(0.051)	(0.034)	(0.056)	(0.054)	(0.062)
Asset Index	0.025***	0.026***	0.048***	0.048***	0.043***
	(0.007)	(0.005)	(0.007)	(0.007)	(0.008)
Mother is illiterate	-0.035	-0.073***	-0.112***	-0.148***	-0.159***
	(0.031)	(0.016)	(0.029)	(0.03)	(0.037)
People in house	0.003	-0.006**	-0.000	-0.006*	0.001
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Constant	0.525***	0.945***	0.741***	0.773***	0.469***
	(0.040)	(0.024)	(0.040)	(0.039)	(0.049)
Observations	1,847	1,540	1,542	1,540	1,542
Mean dependent variable	0.656	0.890	0.683	0.681	0.448

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4 IMPACTS ON CHILD MALNUTRITION

4.1 Treatment of malnutrition

Because part of the conditionality was regular screening for malnutrition and the program supported women with transportation to the health center, an expected impact was that a higher share of malnourished children in treated households would receive a full course of treatment. Children suffering from moderate acute malnutrition who pass a feeding test were to receive ready to use therapeutic foods (RUTF) and be monitored until they recovered, while children suffering from severe acute malnutrition were to be taken to a stabilization center.

Table 4.1.1 shows that there was an impact of negative 10 percentage points on the share of children diagnosed with malnutrition as a result of the Cash for Nutrition conditional cash transfer program, while the rate of children being diagnosed with malnutrition overall between baseline and follow-up increased by 13 percentage points (after controlling for the impact of food distribution). While the meaning of this impact coefficient is somewhat ambiguous, as a decrease in diagnoses is not necessarily a decrease in the underlying rate of malnutrition, when paired with the positive anthropometric findings below, we interpret it as positive sign about the program's impact on child health. Similarly, we see the impact of negative 9 percentage points on the share of children diagnosed who were found to be severely malnourished after evaluation at the health center.

Table 4.1.1 Overall impact of the Cash for Nutrition program on malnutrition, IV estimation

	Particip atedXFo llowup	SE*	Follow-up	SE*	Food distri-bution	SE*	Observ-ations	Mean value
Diagnosed with malnutrition and referred to health center	-0.096**	0.047	0.138***	0.032			4,514	0.354
	-0.102**	0.047	0.157***	0.037	-0.019	0.027	4,258	0.352
Diagnosed with severe acute malnutrition at health center	-0.054	0.038	0.049*	0.029			1,005	0.021
	-0.088*	0.045	0.080**	0.041	0.006	0.026	934	0.021
Visited health center after referral	0.006	0.063	-0.042	0.058			1,164	0.952
Received appropriate treatment at health center	0.115	0.085	-0.077	0.051			1,073	0.908
Follow-up every 2 weeks	-0.087	0.137	0.259**	0.101			966	0.708
Did not share RUTF with other children	0.128	0.134	0.015	0.084			839	0.447

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: *Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

95 percent of women visited the health center after they were referred. However, it was common for the follow-up care to be less than ideal, with only 71 percent of the sample reporting that they took the child back to the health center every two weeks until the child was found to be recovered. We do not see any positive impact of the program on follow-up every two weeks. The most common reason reported for not following up every two weeks at the health center, as seen in Table 4.1.2, was that it was not easy for mothers to leave home due to other responsibilities. It is possible that cost is not the major constraining factor prevent the follow-up visits to the health center.

Another remaining problem is the frequency with which RUTF were shared with other children instead of being consumed only be the malnourished child for which the RUTF was provided (see last row in Table 4.1.1). Here also, we do not see any program impact.

Table 4.1.2 Reasons given for not following up every two weeks at the health center, percent of respondents

	Baseline	Follow-up	Difference
Not easy to leave home because of other responsibilities	40.3	44.5	4.2
Not easy to leave home because need male to accompany	5.2	8.1	2.9
Did not think that visiting health center is important for child	5.2	4.3	-0.9
Forgot to do so	29.9	27.7	-2.2
Don't remember	6.5	5.3	-1.2
Other	13.0	10.0	-3.0
Observations	77	209	

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.

Finally, we were curious whether the increased screenings and nutritional counseling associated with the Cash for Nutrition program would improve mother's perception of whether her child was malnourished. In communities where malnutrition is endemic, it is difficult to recognize that a child who is active but very small needs a health intervention. As seen in the baseline report (Christian 2015), for more than half of children classified as wasted and a large share of children classified as severely wasted, the mother responded that she did not think her child was malnourished.

In Table 4.1.3 we show that the program has no impact on mothers' ability to perceive that children are malnourished. The three columns respectively show the impact on subjective perception of malnutrition conditional on the child being stunted, wasted, or severely wasted. As seen in the mean dependent variable row, only 25 percent of mothers in the sample realized there was a problem conditional on the child being actually stunted, 40 percent of mothers realized there was a problem conditional on the child being wasted, and 62 percent of their mothers recognized that there was a problem, conditional on the child being severely wasted. The analysis does not show any significant change in this indicator as a result of the program or between baseline and follow-up. This points to the importance of continued regular screening to identify children who are acutely malnourished in order that they receive treatment.

Table 4.1.3 Impact of Cash for Nutrition program on subjective perception of malnutrition in young children by mothers, IV estimation

	Stunted child	Wasted child	Severely wasted child
ParticipatedXFollowup	0.027	-0.013	0.140
	(0.049)	(0.114)	(0.548)
Follow-up	0.012	-0.066	-0.077
	(0.030)	(0.080)	(0.346)
Observations	2,683	776	80
Mean dependent variable	0.245	0.399	0.626

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.2   Anthropometrics

For the 1,048 children in the sample who were between the ages of 6 months and 30 months at the time of the baseline survey collection, we have panel data on anthropometric status. The individual children were matched across the survey rounds by name. Height-for-age z-score (HAZ) is an indicator of long-term chronic nutritional deficits, while weight-for-height z-score (WHZ) is an

indicator of short-term acute malnutrition. For both HAZ and WHZ, the coefficient on treatment is positive but not statistically significant when including the entire sample (Tables 4.2.1 to 4.2.4).

When we separate the sample by baseline asset quintile, however, we see that impacts are visible in the poorest third of households. Among these households, we find statistically significant program impacts of 0.35 on HAZ and 0.43 on WHZ before controlling for the impact of food distribution. Controlling for the impact of food distribution reduces the significance of the coefficients due to some observations being dropped due to missing information in the community survey but has little effect on the magnitudes. These impacts are meaningful in magnitude and similar to those found in other successful nutrition focused cash transfer interventions.

The positive coefficient on the follow-up variable here should not be interpreted as an overall improvement for health status of all children, as the cohort included in the panel regression has aged by 30 months and it is known that measures of nutritional status increase after the age of around 2 years (Lundeen et al. 2014).

Table 4.2.1 Impact of Cash for Nutrition program on height-for-age z-score (HAZ) for panel children, by baseline asset terciles, IV estimation

	All	Lowest Tercile	Middle Tercile	Highest Tercile
ParticipatedXFollowup	0.141	0.349*	-0.103	0.065
	(0.139)	(0.207)	(0.230)	(0.187)
Follow-up	0.317***	0.344**	0.340**	0.308**
	(0.087)	(0.155)	(0.135)	(0.130)
Observations	2,042	762	590	684
Mean dependent variable	-2.10	-2.15	-2.16	-1.99

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 4.2.2 Impact of Cash for Nutrition program on height-for-age z-score (HAZ) for panel children, by baseline asset terciles controlling for food distribution, IV estimation

	All	Lowest Tercile	Middle Tercile	Highest Tercile
ParticipatedXFollowup	0.109	0.314	-0.210	0.086
	(0.146)	(0.202)	(0.223)	(0.199)
Follow-up	0.353***	0.376**	0.432***	0.303**
	(0.100)	(0.161)	(0.137)	(0.149)
Food distribution	0.001	0.048	0.032	-0.069
	(0.068)	(0.094)	(0.121)	(0.099)
Observations	1,862	702	536	618
Mean dependent variable	-2.10	-2.16	-2.15	-2.00

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 4.2.3 Impact of Cash for Nutrition program on weight-for-height z-score (WHZ) for panel children, by baseline asset terciles, IV estimation

	All	Lowest Tercile	Middle Tercile	Highest Tercile
ParticipatedXFollowup	0.213	0.425*	-0.015	0.103
	(0.142)	(0.223)	(0.214)	(0.189)
Follow-up	0.306***	0.317**	0.353***	0.300**
	(0.086)	(0.157)	(0.127)	(0.126)
Observations	2,044	760	594	684
Mean dependent variable	-2.10	-2.13	-2.19	-2.00

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 4.2.4 Impact of Cash for Nutrition program on weight-for-height z-score (WHZ) for panel children, by baseline asset terciles controlling for food distribution, IV estimation

	All	Lowest Tercile	Middle Tercile	Highest Tercile
ParticipatedXFollowup	0.190	0.393*	-0.113	0.140
	(0.148)	(0.220)	(0.212)	(0.199)
Follow-up	0.311***	0.337**	0.353**	0.282*
	(0.101)	(0.166)	(0.143)	(0.145)
Food distribution	0.027	0.077	0.112	-0.081
	(0.069)	(0.103)	(0.111)	(0.100)
Observations	1,862	700	540	616
Mean dependent variable	-2.10	-2.15	-2.18	-2.00

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

5   CONCLUSION

5.1   Review of results

The aim of the evaluation was to look at both the overall impacts on child nutrition of the Yemen Cash for Nutrition intervention as well as intermediate variables related to this outcome. Most nutrition outcome variables worsened across the period for all households. However, the Cash for Nutrition intervention improved outcomes relative to untreated households, for consumption of non-staple food items, dietary diversity (particularly for women and children), knowledge and practices related to child nutrition, rate of malnutrition diagnoses, and child anthropometrics.

In terms of food consumption, we find significant positive program impacts on women's and children's dietary diversity and on household dietary diversity on Fridays. We also find significant beneficial impacts on consumption of non-staple foods such as milk, fruits, and vegetables.

In terms of knowledge and practices related to child nutrition, we find a number of positive indicators. We find a significant increase in the number of knowledge questions answered correctly by mothers, particularly questions concerning qat usage, breastfeeding initiation, and how to feed sick children. We find significant improvement in infant feeding practices in terms of early initiation of breastfeeding, exclusive breastfeeding, and frequency of breastfeeding. We also find significant increases in the share of households who treat water used for drinking. Finally, we find that women in treatment households expressed greater aspirations for their daughters' education and increases in their own mobility outside the house in the case of necessity for treating children at the health center.

Intermediate variables for which we did not find significant program impacts include self-reported food security, staple calorie consumption, and diarrhea incidence. In the case of staple calorie consumption, we believe this is because non-treated households were more likely to substitute away from non-staple complementary food towards staple foods in an attempt to maximize calorie consumption. In the case of self-reported food security and diarrhea incidence, we believe that the most likely explanation for the lack of measurable impact is difficulty in getting accurate and objective recollections.

In terms of final outcomes variables, we show that overall child health also improved, likely as a result of both the cash transfers and increased nutritional knowledge. Anthropometric indicators showed improvements for the poorest tercile of households and the rate of children diagnosed with both moderate and severe malnutrition decreased significantly.

5.2   Complementarities with food distribution

The Yemen Cash for Nutrition program took place within the context of a humanitarian crisis where the predominant mode of response was food distribution programs. While we are not able to directly measure the impacts of food distribution, we do record the presence of food distribution programs at the community level in each round of surveys, and the coefficient on the variable that we use to control for their presence indicates changes in outcome variables that are correlated at least with food distribution. Comparing the changes correlated with food distribution to the impacts we find from the Cash for Nutrition program, we see that there are important complementarities between the cash and knowledge provided by the Cash for Nutrition conditional cash transfer (CCT) intervention and the food provided by other interventions. One reason for this is that, as shown in Figure 5.2.1, households did not only use the cash for buying food, but also for other purposes, especially repaying debts and paying for healthcare.

Figure 5.2.1 How households used the conditional cash transfers from the Cash for Nutrition program
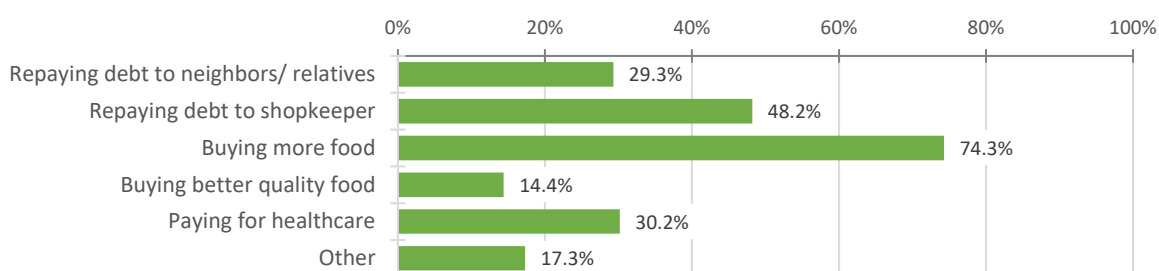
Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.

As summarized in Table 5.2.1, food distribution, unlike the cash transfers, was associated with improvements in food security and staple calorie consumption. Food distribution, however, was not associated with improvements in nutrition knowledge and practices or improvements in the anthropometric outcome indicators, which were impacted by the CCT program. Both types of program were associated with increases in dietary diversity, but the effect sizes were modest: Only in households reached by both types of program did children attain minimum levels of acceptable dietary diversity.

Table 5.2.1 Summary of complementarities between food distribution programs and the Cash for Nutrition conditional cash transfer program

Outcome	Communities with food distribution program	Conditional cash transfer program	Notes
Reported household food insecurity	Decreases	Decreases, but may have been under-reported	
Staple calorie consumption	Increases	*No change*	
Number of men eating meals in household	Increases	*No change*	
Number of children eating meals in household	*No change*	Increases	
Household dietary diversity	Increases	Smaller increase	
Young child dietary diversity	Increases	Increases in similar fashion	Need combined impacts of food distribution and cash transfers to reach minimum acceptable level
Women's dietary diversity	Increases	Increases in similar fashion	
Nutrition knowledge and practices	*No change*	Improved	
Women's empowerment	*No change*	Enhanced	
Rate of children diagnosed with malnutrition	*No change*	Decreased	

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.

5.3 Spillover effects

The program targets households that are already part of the Social Welfare Fund,. However, there is evidence of strong spillover impacts onto non-treated households in the same communities. Thirteen percent of control households in our sample who did not self-report as part of the CCT program still attended nutritional training sessions. An even larger share of control households who did not self-report as part of the Cash for Nutrition conditional cash transfer program, 26 percent, reported learning something new from the community health educator. Indirect evidence of the

impacts of this positive knowledge spillover to control households is seen in the significant increases between baseline and follow-up among non-conditional cash transfer program participants in water treatment and knowledge about health center locations, iron-rich foods for preventing anemia, and exclusive breastfeeding

5.4   Effectiveness of soft conditionality and nutritional training

A final lesson from the impact evaluation is that the use of soft conditionality has been sufficient to motivate high attendance at nutritional training sessions and that the training sessions themselves have been successful in improving nutritional knowledge and practice levels. The specific details in the report can be used to more finely tune the messages shared in the training sessions, with greater emphasis given on subjects where the evaluation found low levels of knowledge or smaller impacts. However, the overall conclusion is that the program design and use of community health volunteers was effective. Notably, improvements in knowledge and practices were found among both literate and illiterate women, showing that the model of training sessions is well adapted to reaching a largely illiterate population.

6   ANNEX – ORDINARY LEAST SQUARES (OLS) ESTIMATIONS

6.1   Consumption of staple foods

Table 6.1.1 Overall impact of the Cash for Nutrition program on calorie consumption, OLS estimation

	(1)	(2)	(3)	(4)	(5)
	Average Calories	Trimmed Average Calories		People Sharing Meals	
TreatXFollowup	-183.1	-49.7	-65.9	0.372**	0.393**
	(124.5)	(71.7)	(70.0)	(0.188)	(0.197)
Follow-up	322.0***	197.6***	152.0***	-0.378***	-0.494***
	(107.9)	(54.8)	(55.7)	(0.131)	(0.156)
Food Distribution			172.8***		0.296**
			(49.0)		(0.143)
Observations	3,831	3,831	3,605	3,844	3,616
Mean dependent variable	1,853.3	1,805.3	1,809.7	6.906	6.900

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01
Because of measurement error resulting in some significant and unrealistic outlier values, the statistics in columns (2) and (3) are computed from a sub-sample created by trimming the top and bottom 2.5 percent of observations.

Table 6.1.2 Impact of the Cash for Nutrition program on number of individuals sharing meals in the household, OLS estimation

	Children under 5	Children Ages 5 to 12	Women	Men
TreatXFollowup	0.218***	0.084	0.117	0.021
	(0.077)	(0.068)	(0.097)	(0.085)
Follow-up	-0.183***	0.041	-0.273***	-0.118*
	(0.060)	(0.053)	(0.077)	(0.067)
Food Distribution	0.002	0.064	0.082	0.157**
	(0.049)	(0.047)	(0.066)	(0.070)
Observations	3,616	3,616	3,616	3,616
Mean dependent variable	1.604	1.914	2.302	1.708

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

6.2   Dietary diversity

Table 6.2.1 Impact of the Cash for Nutrition program on household dietary diversity (HDDS), OLS estimation

	(1)	(2)	(3)	(4)	(5)	(6)
	Yesterday HDDS		Friday HDDS		Friday Meat	
TreatXFollowup	0.184	0.260	0.275	0.302	0.105***	0.089***
	(0.172)	(0.183)	(0.177)	(0.189)	(0.031)	(0.0318)
Follow-up	0.004	-0.199	0.126	-0.052	-0.123***	-0.134***
	(0.136)	(0.165)	(0.135)	(0.167)	(0.024)	(0.029)
Food Distribution		0.387***		0.366***		0.0581**
		(0.131)		(0.139)		(0.027)
Observations	3,843	3,650	3,842	3,650	3,842	3,650
Mean dependent variable	6.522	6.519	6.749	6.744	0.231	0.227

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.2.2 Impact of the Cash for Nutrition program on child dietary diversity score (CDDS), children aged 6 to 23 months, OLS estimation

	(1)	(2)	(3)	(4)
	Yesterday CDDS		Friday CDDS	
TreatXFollowup	0.616**	0.726***	0.415	0.519**
	(0.240)	(0.230)	(0.260)	(0.247)
Follow-up	-1.158***	-1.482***	-0.992***	-1.242***
	(0.151)	(0.150)	(0.158)	(0.170)
Food Distribution		0.518***		0.455**
		(0.157)		(0.194)
Observations	1,613	1,529	1,613	1,529
Mean dependent variable	2.669	2.651	2.802	2.785

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.2.3 Impact of the Cash for Nutrition program on women's dietary diversity score (WDDS), OLS estimation

	(1)	(2)	(3)	(4)
	Yesterday WDDS		Friday WDDS	
TreatXFollowup	0.260*	0.355***	0.242*	0.297**
	(0.143)	(0.126)	(0.146)	(0.135)
Follow-up	-1.080***	-1.307***	-0.953***	-1.162***
	(0.107)	(0.096)	(0.100)	(0.100)
Food Distribution		0.399***		0.430***
		(0.087)		(0.098)
Observations	3,795	3,617	3,795	3,617
Mean dependent variable	3.834	3.840	4.072	4.076

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

6.3 Consumption of key non-staple food items

Table 6.3.1 Impact for all households of the Cash for Nutrition program on consumption of key food items, OLS estimation

	TreatXFollowup	p-value	Adjusted p-value	SE*	Follow-up	SE*	Observ- ations	Mean value, YER
Meat	-3.94	0.977	0.965	138.70	-183.30*	95.87	3,842	334.8
Chicken	65.78	0.231	0.412	54.77	-153.80***	34.59	3,843	335.5
Fresh Fish	233.30	0.120	0.246	149.40	-772.80***	135.60	3,840	1,073.5
Fresh Milk	61.08	0.034	0.109	28.66	-25.42	19.39	3,843	73.3
Yogurt	17.53	0.437	0.499	22.50	-4.78	13.93	3,843	120.6
Cheese	11.17	0.438	0.499	14.37	0.37	7.83	3,843	59.9
Eggs	-0.38	0.982	0.965	16.82	21.44***	7.51	3,843	52.3
Tomato	70.91	0.043	0.126	34.75	-205.70***	24.69	3,843	622.6
Potato	75.92	0.097	0.208	45.54	-171.60***	34.65	3,843	622.0
Onions	-0.95	0.964	0.965	21.00	-102.40***	11.88	3,842	264.4
Okra	-11.06	0.382	0.499	12.62	-57.63***	8.00	3,843	56.4
Squash	-10.56	0.417	0.499	12.98	-28.64***	8.53	3,843	32.6
Spinach	9.37	0.144	0.268	6.39	13.33***	3.66	3,843	9.1
Carrot	19.25	0.055	0.148	9.96	-43.14***	7.01	3,843	77.1
Leek	24.11*	0.015	0.098	9.86	-46.03***	6.98	3,843	71.3
Cucumber	5.00	0.694	0.834	12.70	-44.62***	7.54	3,843	82.1
Pepper	43.78*	0.006	0.069	15.90	51.34***	11.07	3,843	97.8
Coriander	1.57	0.478	0.507	2.21	2.62*	1.58	3,843	5.6
Bananas	69.24*	0.023	0.098	30.14	-47.53*	24.40	3,841	221.1
Grapes	35.96***	0.000	0.001	9.69	31.12***	5.28	3,843	36.4
Papaya	2.73	0.461	0.507	3.70	6.47***	1.82	3,843	7.4
Apricot	4.42*	0.016	0.098	1.82	1.20**	0.55	3,843	2.1
Lemon/Lime	6.57	0.365	0.499	7.24	28.41***	4.07	3,840	20.5
Oranges	1.48	0.907	0.965	12.58	-60.33***	8.32	3,843	51.8
Apples	16.34	0.243	0.412	13.96	-17.84**	7.18	3,841	63.8
Pomegranate	19.05**	0.002	0.035	6.01	11.30***	3.50	3,843	15.3
Watermelon	-4.89	0.343	0.499	5.14	-3.09	2.51	3,843	10.9
Qishta	-0.27	0.892	0.965	1.99	2.73***	1.03	3,843	2.6
Dates	40.70*	0.018	0.098	17.05	108.10***	10.81	3,843	83.8
Canned Beans	0.58	0.525	0.554	0.90	-2.80***	0.73	3,837	2.6
Canned Milk	-0.34	0.411	0.499	0.41	-0.32	0.20	3,842	0.8
Canned Fish	0.02	0.275	0.440	0.02	0.00	0.01	3,838	0.0
Canned Fruit	0.11	0.074	0.174	0.06	0.07*	0.04	3,842	0.1
Total Non-staples	767.10*	0.021	0.098	329.10	-1702.40***	234.30	3,818	4,495.7

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: p-values: * p < 0.10, ** p < 0.05, *** p < 0.01. * Clustered standard errors (village-level).

Table 6.2 Impact for lowest wealth tercile households of the Cash for Nutrition program on consumption of key food items, OLS estimation

	TreatXFollowup	p-value	Adjusted p-value	SE*	Follow-up	SE*	Observ-ations	Mean value, YER
Meat	117.50	0.054	0.150	60.45	-65.51	52.58	1,396	144.2
Chicken	14.26	0.779	0.781	50.76	-57.99**	26.00	1,396	193.6
Fresh Fish	265.70	0.373	0.518	297.50	-758.40***	288.20	1,394	909.6
Fresh Milk	72.31*	0.011	0.074	27.98	-37.77*	19.88	1,396	48.1
Yogurt	4.81	0.848	0.781	25.01	-6.47	14.73	1,396	76.1
Cheese	13.57	0.322	0.518	13.66	-4.51	7.73	1,396	31.4
Eggs	33.60	0.029	0.114	15.22	3.61	9.00	1,396	31.1
Tomato	75.34	0.100	0.215	45.50	-181.60***	33.01	1,396	554.2
Potato	48.88	0.409	0.518	59.02	-113.20**	43.52	1,396	527.8
Onions	50.95	0.055	0.150	26.36	-116.50***	18.11	1,396	246.8
Okra	8.01	0.646	0.646	17.42	-58.51***	11.14	1,396	47.6
Squash	-6.14	0.613	0.629	12.12	-19.95**	8.60	1,396	24.1
Spinach	11.79	0.126	0.262	7.67	9.71**	4.20	1,396	7.6
Carrot	16.04	0.164	0.309	11.47	-30.47***	7.68	1,396	58.1
Leek	10.91	0.392	0.518	12.72	-22.65***	6.83	1,396	60.6
Cucumber	8.20	0.558	0.612	13.98	-29.24***	9.45	1,396	60.7
Pepper	63.94**	0.003	0.036	20.84	53.21***	10.83	1,396	86.1
Coriander	3.69	0.177	0.315	2.72	1.47	2.00	1,396	4.8
Bananas	163.00**	0.003	0.036	54.86	-96.06*	50.76	1,396	178.8
Grapes	40.10**	0.003	0.036	13.06	20.02***	7.47	1,396	33.1
Papaya	5.95	0.382	0.518	6.78	4.67**	1.88	1,396	9.5
Apricot	5.60	0.049	0.150	2.82	0.95	0.960	1,396	2.5
Lemon/Lime	-1.32	0.889	0.801	9.41	14.72***	4.54	1,394	13.5
Oranges	15.16	0.335	0.518	15.67	-40.59***	12.54	1,396	36.2
Apples	36.34*	0.018	0.096	15.20	1.27	10.33	1,395	51.6
Pomegranate	19.88	0.022	0.101	8.58	8.47	5.37	1,396	13.5
Watermelon	-2.08	0.750	0.781	6.53	-2.69	3.14	1,396	11.0
Qishta	-0.81	0.816	0.781	3.46	2.37*	1.23	1,396	3.1
Dates	39.36	0.086	0.205	22.81	83.08***	15.01	1,396	65.9
Canned Beans	1.37	0.341	0.518	1.43	-2.88**	1.26	1,394	2.0
Canned Milk	-0.16	0.604	0.629	0.31	0.02	0.14	1,395	0.5
Canned Fish	0.04	0.157	0.309	0.03	0.00	0.02	1,395	0.0
Canned Fruit	0.02	0.851	0.781	0.10	0.13	0.08	1,396	0.1
Total Non-staples	1077.00*	0.010	0.074	411.10	-1450.00***	357.60	1,387	3,513.8

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: p-values: * p < 0.10, ** p < 0.05, *** p < 0.01. * Clustered standard errors (village-level).

Table 6.3.3 Impact for middle wealth tercile households of the Cash for Nutrition program on consumption of key food items, OLS estimation

	TreatXFollowup	p-value	Adjusted p-value	SE*	Follow-up	SE*	Observ-ations	Mean value, YER
Meat	-289.30	0.159	0.456	204.30	5.38	82.32	1,154	314.6
Chicken	85.96	0.230	0.481	71.28	-111.00**	47.36	1,155	323.8
Fresh Fish	318.40	0.056	0.382	165.30	-819.30***	134.30	1,155	1,031.1
Fresh Milk	58.22	0.194	0.456	44.65	-46.43	38.42	1,155	64.9
Yogurt	-22.06	0.593	0.719	41.22	-5.48	17.44	1,155	126.0
Cheese	-4.19	0.874	0.852	26.40	-4.39	10.99	1,155	63.0
Eggs	10.46	0.593	0.719	19.55	12.78	8.33	1,155	47.7
Tomato	10.09	0.870	0.852	61.43	-162.00***	50.71	1,155	633.0
Potato	86.17	0.333	0.636	88.68	-181.30**	75.17	1,155	636.1
Onions	-15.02	0.732	0.772	43.86	-118.30***	24.17	1,155	274.5
Okra	-12.80	0.463	0.674	17.39	-50.08***	12.67	1,155	55.1
Squash	-14.70	0.606	0.719	28.42	-48.01**	20.47	1,155	47.8
Spinach	9.65	0.390	0.636	11.19	19.76***	6.98	1,155	12.6
Carrot	25.86	0.119	0.456	16.51	-40.37***	11.50	1,155	80.8
Leek	31.43	0.022	0.222	13.56	-45.75***	11.54	1,155	69.3
Cucumber	28.12	0.088	0.382	16.37	-44.33***	10.88	1,155	82.0
Pepper	66.00	0.003	0.114	21.75	27.89*	16.79	1,155	100.7
Coriander	3.64	0.251	0.504	3.16	-0.06	2.20	1,155	4.9
Bananas	58.46	0.145	0.456	39.92	-62.10**	25.28	1,154	237.5
Grapes	37.90	0.018	0.222	15.86	34.16***	7.13	1,155	42.3
Papaya	2.33	0.662	0.772	5.32	4.78*	2.62	1,155	6.4
Apricot	6.70	0.011	0.222	2.62	-0.00***	0.00	1,155	1.8
Lemon/Lime	15.47	0.092	0.382	9.12	25.92***	5.39	1,155	19.2
Oranges	-37.54	0.080	0.382	21.29	-54.82***	12.26	1,155	61.1
Apples	-30.03	0.205	0.456	23.58	-10.96	10.46	1,154	69.4
Pomegranate	13.31	0.160	0.456	9.43	17.49***	5.06	1,155	19.0
Watermelon	-2.98	0.729	0.772	8.56	-10.26*	6.16	1,155	10.8
Qishta	1.78	0.598	0.719	3.38	1.00	0.99	1,155	2.8
Dates	38.11	0.069	0.382	20.85	103.40***	13.79	1,155	86.9
Canned Beans	0.75	0.394	0.636	0.87	-1.97***	0.65	1,153	2.5
Canned Milk	-0.47	0.582	0.719	0.86	-0.35*	0.20	1,155	0.8
Canned Fish	0.02	0.514	0.719	0.03	-0.016	0.02	1,153	0.0
Canned Fruit	0.17	0.066	0.382	0.09	0.068*	0.04	1,154	0.1
Total Non-staples	426.20	0.396	0.636	501.10	-1569.90***	255	1,147	4,508.3

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: p-values: * p < 0.10, ** p < 0.05, *** p < 0.01. * Clustered standard errors (village-level).

Table 6.3.4 Impact for highest wealth tercile households of the Cash for Nutrition program on consumption of key food items, OLS estimation

	TreatXFollowup	p-value	Adjusted p-value	SE*	Follow-up	SE*	Observations	Mean value, YER
Meat	42.02	0.903	1.000	345.70	-425.90*	232.00	1,288	556.7
Chicken	52.56	0.663	1.000	120.20	-266.40***	76.89	1,288	498.9
Fresh Fish	125.50	0.603	1.000	240.50	-766.90***	201.30	1,287	1,282.4
Fresh Milk	62.50	0.331	1.000	64.01	0.97	27.20	1,288	108.4
Yogurt	79.14	0.049	0.878	39.92	-3.64	29.10	1,288	164.1
Cheese	28.61	0.293	1.000	27.12	8.28	14.63	1,288	87.9
Eggs	-45.38	0.256	1.000	39.81	43.54**	16.70	1,288	79.3
Tomato	111.80	0.055	0.878	57.86	-263.80***	39.92	1,288	687.7
Potato	82.63	0.231	1.000	68.63	-218.80***	50.07	1,288	710.3
Onions	-40.99	0.154	1.000	28.61	-77.17***	19.14	1,287	273.9
Okra	-35.54	0.100	1.000	21.43	-62.65***	12.01	1,288	67.1
Squash	-8.02	0.668	1.000	18.67	-21.84**	9.79	1,288	28.0
Spinach	4.73	0.518	1.000	7.31	12.05***	4.44	1,288	7.7
Carrot	10.93	0.532	1.000	17.46	-57.17***	12.26	1,288	94.5
Leek	24.56	0.186	1.000	18.48	-67.76***	10.38	1,288	85.0
Cucumber	-29.70	0.254	1.000	25.91	-59.34***	12.26	1,288	105.5
Pepper	1.53	0.948	1.000	23.66	67.03***	18.22	1,288	107.9
Coriander	-1.99	0.652	1.000	4.42	5.62**	2.65	1,288	7.1
Bananas	-14.26	0.736	1.000	42.16	6.63	26.16	1,287	251.0
Grapes	31.16	0.035	0.878	14.66	39.23***	9.71	1,288	34.9
Papaya	0.35	0.950	1.000	5.67	9.39**	4.11	1,288	6.0
Apricot	0.94	0.704	1.000	2.46	2.31**	1.12	1,288	2.0
Lemon/Lime	11.69	0.366	1.000	12.88	43.47***	6.89	1,287	29.0
Oranges	19.09	0.408	1.000	23.00	-83.28***	14.49	1,288	60.4
Apples	32.81	0.237	1.000	27.59	-40.39***	12.83	1,288	72.2
Pomegranate	22.94	0.027	0.878	10.26	9.46*	5.17	1,288	14.2
Watermelon	-7.96	0.453	1.000	10.57	1.73	3.08	1,288	10.9
Qishta	-1.09	0.690	1.000	2.72	4.33*	2.31	1,288	1.9
Dates	55.85	0.078	0.880	31.40	134.40***	17.69	1,288	100.4
Canned Beans	-0.83	0.616	1.000	1.66	-3.39***	1.06	1,286	3.3
Canned Milk	-0.52	0.525	1.000	0.82	-0.61	0.46	1,288	1.0
Canned Fish	0.01	0.810	1.000	0.04	0.02	0.02	1,286	0.1
Canned Fruit	0.15	0.137	1.000	0.10	0.00	0.05	1,288	0.1
Total Non-staples	629.10	0.294	1.000	597.30	-2045.50***	428.70	1,280	5,536.9

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: p-values: * p < 0.10, ** p < 0.05, *** p < 0.01. * Clustered standard errors (village-level).

6.4 Food security and coping strategies

Table 6.4.1 Overall impact of the Cash for Nutrition program on food insecurity, controlling for food distribution, OLS estimation

	Food Insecure	Days Less Preferred Food	Days Borrowing	Days Limiting Portions	Days Limiting Adult Intake	Days Reduced Meals Per Day
TreatXFollowup	0.026	0.050	0.258	0.016	-0.020	0.022
	(0.048)	(0.232)	(0.198)	(0.208)	(0.165)	(0.183)
Follow-up	0.220***	2.174***	0.515***	1.585***	1.112***	1.051***
	(0.038)	(0.200)	(0.139)	(0.182)	(0.135)	(0.165)
Food Distribution	-0.189***	-1.028***	-0.663***	-0.813***	-0.686***	-0.780***
	(0.034)	(0.199)	(0.151)	(0.182)	(0.139)	(0.160)
Observations	3,643	3,643	3,643	3,643	3,643	3,643
Mean dependent variable	0.457	1.461	1.316	1.122	0.774	0.881

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.4.2 Overall impact of cash transfers of the Cash for Nutrition program on economic coping mechanisms, OLS estimation

	Increased borrowing from shop-keeper	Increased borrowing from friends, relatives	Sold livestock or house-hold goods	New work for men in house-hold	New work for women in house-hold	New work for children in house-hold	Selling gold	Other
Treatment	0.011	-0.032	-0.010	0.009	-0.010	-0.006	-0.053**	0.020
	(0.040)	(0.035)	(0.036)	(0.021)	(0.010)	(0.006)	(0.024)	(0.025)
Asset Index	0.007	-0.013*	-0.016**	0.006	-0.003	0.000	0.034***	0.000
	(0.008)	(0.008)	(0.008)	(0.005)	(0.002)	(0.002)	(0.007)	(0.007)
Mother is illiterate	0.033	-0.003	0.017	-0.018	-0.022*	0.004	-0.048**	0.032
	(0.033)	(0.029)	(0.025)	(0.022)	(0.012)	(0.006)	(0.023)	(0.023)
People in house	-0.002	0.001	0.0097***	-0.000	0.001	0.004***	-0.004	-0.001
	(0.004)	(0.003)	(0.003)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
Observations	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.4.3 Impact of cash transfers of the Cash for Nutrition program on selling gold for different asset terciles, OLS estimation

	Lowest tercile	Middle tercile	Highest tercile	Total
Treatment	0.038	-0.108**	-0.102**	-0.053**
	(0.025)	(0.042)	(0.043)	(0.024)
Asset Index	0.049**	0.070**	0.036**	0.034***
	(0.020)	(0.032)	(0.016)	(0.007)
Mother is illiterate	-0.076	-0.052	-0.035	-0.048**
	(0.051)	(0.047)	(0.030)	(0.023)
People in house	-0.005	0.001	-0.005	-0.004
	(0.004)	(0.006)	(0.004)	(0.002)
Observations	667	558	623	1,848

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.4.4 Impact of cash transfers of the Cash for Nutrition program on borrowing for different asset terciles, OLS estimation

	Lowest tercile	Middle tercile	Highest tercile	Total
Treatment	-0.112**	-0.012	0.036	-0.032
	(0.049)	(0.054)	(0.050)	(0.035)
Asset Index	0.039	-0.018	-0.040***	-0.013*
	(0.042)	(0.045)	(0.012)	(0.008)
Mother is illiterate	0.003	-0.002	-0.010	-0.003
	(0.070)	(0.054)	(0.043	(0.029)
People in house	0.001	0.002	0.001	0.001
	(0.007)	(0.008)	(0.005)	(0.003)
Observations	667	558	623	1,848

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.4.5 Impact of the Cash for Nutrition program on hosting of internally displaced persons, OLS estimation

	Hosting other relatives who were displaced due to conflict
Treatment	0.010
	(0.018)
Asset Index	0.011*
	(0.006)
Mother is illiterate	-0.047**
	(0.020)
People in house	0.000
	(0.002)
Observations	1,848

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

6.5   Total food spending

Table 6.5.1 Overall impact of the Cash for Nutrition program on monthly household food spending per capita, OLS estimation

	Monthly household food budget	Monthly household food budget per capita
TreatXFollowup	-1319.1	-888.4
	(4080.3)	(714.4)
Follow-up	-9670.7***	-1363.5***
	(2994.9)	(433.8)
Observations	3,844	3,840
Mean dependent variable	43737.7	7279.3

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.5.2 Overall impact of the Cash for Nutrition program on weekly total food spending on credit and in cash, OLS estimation

	Last week food purchases on Credit	Last week food purchases in Cash
TreatXFollowup	133.3	1008.4***
	(465.1)	(301.7)
Asset Index	-2.239	292.7***
	(160.4)	(73.40)
Mother is illiterate	848.4	-481.4
	(539.9)	(325.5)
People in house	192.8***	127.8***
	(57.39)	(31.71)
Observations	1,848	1,848
Mean dependent variable	4155.8	5788.8

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.5.3 Impact of Cash for Nutrition program on qat usage, OLS estimation

	Male weekly qat usage	Female weekly qat usage	Household qat usage	Weekly qat expenditure
TreatXFollowup	-0.184	-0.146	-0.214	-37.33
	(0.179)	(0.160)	(0.276)	(314.40)
Follow-up	0.140	-0.243**	-0.368**	-548.60**
	(0.114)	(0.114)	(0.186)	(212.10)
N	3,631	3,819	3,842	3,844
Mean dependent variable	2.861	1.739	4.432	1,662.2

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

6.6   Knowledge and practices related to child nutrition

Table 6.6.1 Overall impact of the Cash for Nutrition program on nutrition knowledge, OLS estimation

	Treat-follow-up	SE*	Follow-up	SE*	Observ-ations	Mean value
Total knowledge score	0.624***	0.222	0.219	0.159	3,844	9.359
Knows location of nearest health center	0.052	0.045	0.216***	0.036	3,844	0.752
Knows should eat more during pregnancy/ breastfeeding	0.053	0.040	0.007	0.027	3,844	0.773
Knows should not use *qat* during pregnancy/ breastfeeding	0.018	0.032	0.011	0.023	3,844	0.761
Knows should drink more during pregnancy/ breastfeeding	0.054	0.037	-0.038	0.023	3,844	0.802
Knows should give child more to drink when sick	0.075*	0.040	0.013	0.025	3,844	0.799
Knows should give child more food when sick	0.133***	0.040	-0.132***	0.026	3,844	0.796
Knows sweets not healthy for children	-0.011	0.044	0.003	0.030	3,844	0.554
Knows *qat* not healthy for children	0.025	0.025	0.048***	0.017	3,844	0.855
Knows malnutrition can lead to anemia	0.032	0.034	0.037	0.024	3,844	0.835
Can mention correctly at least one source of iron	0.050	0.035	0.070***	0.026	3,844	0.719
Knows malnutrition can lead to stunting	0.027	0.037	0.054**	0.024	3,844	0.792
Knows babies should be breastfed within the first 6 hours after birth	0.044**	0.020	0.003	0.014	3,844	0.933
Knows babies should be breastfed within the first 1 hour after birth	0.121***	0.034	-0.022	0.024	3,844	0.807
Knows 6 months as age for complementary feeding	-0.026	0.032	-0.104***	0.025	3,844	0.252
Believes complementary feeding should start at less than 6 months	-0.026	0.032	-0.104***	0.025	3,844	0.252
Believes complementary feeding should start at more than 6 months	0.074*	0.043	0.098***	0.029	3,844	0.317
Knows babies under 6 months should not be given anything but breastmilk	0.047	0.037	0.109***	0.026	3,844	0.652

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: p-values: * p < 0.10, ** p < 0.05, *** p < 0.01. * Clustered standard errors (village-level).

Table 6.6.2 Overall impact of the Cash for Nutrition program on infant and young child feeding practices, OLS estimation

	TreatXF ollowup	SE*	Follow-up	SE*	Observ- ations	Mean value
Baby breastfed during the first six hours after birth	0.063**	0.032	0.058**	0.024	2,425	0.873
Baby breastfed during the first hour after birth	0.119***	0.044	0.073**	0.034	2,425	0.709
How many times was baby fed breastmilk or formula yesterday?	1.172**	0.525	-0.911**	0.351	2,290	6.821
Do you have any difficulty producing enough milk?	-0.110**	0.055	0.169***	0.042	2,242	0.470
Do you give formula to your child?	0.052	0.043	0.156***	0.029	2,367	0.204
Continued breastfeeding between 7 and 24 months	0.032	0.049	-0.019	0.036	1,651	0.744
Gave solid food between 7 and 24 months	-0.008	0.029	-0.005	0.022	1,708	0.926
Times per day given solid food between 7 and 24 months	-0.022	0.151	-0.042	0.107	1,704	2.747

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01. * Clustered standard errors (village-level).

Table 6.6.3 Impact of the Cash for Nutrition program on exclusive breastfeeding, OLS estimation

	Follow-up only	Panel	Panel
TreatXFollowup	0.121**	0.108*	0.106*
	(0.059)	(0.058)	(0.057)
Follow-up		0.007	0.030
		(0.051)	(0.054)
Food distribution			-0.064
			(0.049)
Asset Index	-0.015	-0.006	-0.010
	(0.018)	(0.016)	(0.015)
Mother is illiterate	-0.081	-0.067	-0.090
	(0.088)	(0.069)	(0.068)
People in house	-0.005	-0.008	-0.008
	(0.009)	(0.007)	(0.007)
Observations	184	258	255
Mean dependent variable	0.196	0.178	0.173
District fixed-effects?	No	Yes	Yes

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.6.4 Heterogeneity analysis: impact of the Cash for Nutrition program on knowledge about breastfeeding initiation within one hour, OLS estimation

	Illiterate	Literate	Living with mother	Not living with mother
TreatXFollowup	0.122***	0.118*	0.066*	0.239***
	(0.038)	(0.060)	(0.037)	(0.049)
Follow-up	-0.021	-0.025	-0.002	-0.074**
	(0.026)	(0.049)	(0.026)	(0.036)
Observations	2,954	890	2,625	1,219
Mean dependent variable	0.788	0.872	0.808	0.805
Wald test	0.955		0.000	

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.6.5 Heterogeneity analysis: impact of the Cash for Nutrition program on breastfeeding initiation within one hour, OLS estimation

	Illiterate	Literate	Living with mother	Not living with mother
TreatXFollowup	0.125**	0.071	0.082*	0.209**
	(0.054)	(0.085)	(0.047)	(0.083)
Follow-up	0.059	0.140**	0.079**	0.065
	(0.040)	(0.055)	(0.035)	(0.067)
Observations	1,834	591	1,703	722
Mean dependent variable	0.699	0.741	0.724	0.675
Wald test	0.599		0.142	

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.6.6 Overall impact of the Cash for Nutrition program on water treatment, OLS estimation

	Treating water for adults	Treating water for child under 2
TreatXFollowup	0.114***	0.070*
	(0.028)	(0.040)
Follow-up	0.087***	0.189***
	(0.018)	(0.025)
Observations	3,844	3,844
Mean dependent variable	0.114	0.233

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.6.7 Impact of the Cash for Nutrition program on water treatment, by literacy status of the woman, OLS estimation

	Treating water for adults		Treating water for child under 2	
	Literate	Illiterate	Literate	Illiterate
TreatXFollowup	0.219***	0.085***	0.212***	0.034
	(0.047)	(0.030)	(0.054)	(0.045)
Follow-up	0.054*	0.099***	0.171***	0.195***
	(0.029)	(0.019)	(0.031)	(0.028)
Observations	890	2,954	890	2,954
Mean dependent variable	0.144	0.105	0.316	0.208
Wald test	0.005		0.002	

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.6.8 Impact of the Cash for Nutrition program on water treatment by water treatment type, OLS estimation

	TreatXFollowup	SE*	Follow-up	SE*	Observations	Mean value
Filter water for adults	0.004	0.008	-0.009	0.006	3,939	0.008
Boil water for adults	0.068***	0.016	0.030***	0.008	3,939	0.040
Straining with cloth water for adults	0.019	0.020	0.037***	0.010	3,939	0.036
Adults drink bottled water	0.010	0.010	-0.006	0.008	3,939	0.013
Filter water for under-twos	-0.002	0.008	-0.004	0.005	3,939	0.008
Boil water for under-twos	0.026	0.016	0.136***	0.025	3,939	0.138
Straining with cloth water for under-twos	0.030*	0.020	0.016**	0.008	3,939	0.028
Under-twos drink bottled water	-0.003	0.010	0.033**	0.015	3,939	0.059

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

6.7 Diarrhea

Table 6.7.1 Overall impact of the Cash for Nutrition program on diarrhea, OLS estimation

	Episodes of diarrhea	Length of diarrhea episodes
TreatXFollowup	-0.044	-0.287
	(0.033)	(0.333)
Follow-up	0.017	-1.100***
	(0.026)	(0.218)
Observations	5,814	2,310
Mean dependent variable	0.397	4.629

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

6.8 Women's empowerment

Table 6.8.1 Overall impact of the Cash for Nutrition program on women empowerment, OLS estimation

	Ability to take your child alone to the health center	Would like daughter to achieve secondary education	Expect your daughter to achieve secondary education	Would like daughter to achieve post-secondary education	Expect daughter to achieve post-secondary education
TreatXFollowup	0.161***	0.045**	0.034	0.068*	0.105**
	(0.035)	(0.022)	(0.036)	(0.036)	(0.041)
Asset Index	0.024***	0.026***	0.048***	0.048***	0.043***
	(0.008)	(0.005)	(0.007)	(0.007)	(0.008)
Mother is illiterate	-0.025	-0.069***	-0.109***	-0.142***	-0.150***
	(0.031)	(0.016)	(0.029)	(0.029)	(0.036)
People in house	0.007**	-0.005**	0.001	-0.004	0.004
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
Constant	0.549***	0.954***	0.747***	0.786***	0.489***
	(0.038)	(0.021)	(0.037)	(0.035)	(0.045)
Observations	1,847	1,540	1,542	1,540	1,542
Mean dependent variable	0.656	0.890	0.683	0.681	0.448

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

6.9 Treatment of malnutrition

Table 6.9.1 Overall impact of the Cash for Nutrition program on malnutrition, OLS estimation

	TreatX Followup	SE*	Follow-up	SE*	Food distri-bution	SE*	Observ-ations	Mean value
Diagnosed with malnutrition and referred to health center	-0.073**	0.035	0.118***	0.024			4,793	0.355
	-0.075**	0.035	0.135***	0.030	-0.019	0.027	4,538	0.352
Diagnosed with severe acute malnutrition at health center	-0.035	0.024	0.032*	0.018			1,549	0.021
	-0.055**	0.027	0.048*	0.027	0.011	0.026	1,455	0.021
Visited health center after referral	0.004	0.043	-0.040	0.041			1,703	0.952
Received appropriate treatment at health center	0.066	0.056	-0.033	0.030			1,618	0.908
Follow-up every 2 weeks	-0.051	0.092	0.229***	0.065			1,510	0.709
Did not share RUTF with other children	0.073	0.095	0.051	0.061			1,367	0.447

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: *Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.9.2 Cash for Nutrition program impact on receiving assistance with transportation costs to the health center, OLS estimation

	All	Household in walking distance to health center	Household not in walking distance to health center
TreatXFollowup	0.116***	0.128***	0.116*
	(0.044)	(0.043)	(0.059)
Asset Index	0.006	0.014	-0.023*
	(0.008)	(0.009)	(0.012)
Mother is illiterate	-0.023	0.023	-0.138
	(0.022)	(0.023)	(0.083)
People in house	0.005	0.006	0.006
	(0.004)	(0.004)	(0.005)
Observations	804	466	289
Mean dependent variable	0.108	0.122	0.0900

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.9.3 Impact of Cash for Nutrition program on subjective perception of malnutrition in young children by mothers, OLS estimation

	Stunted child	Wasted child	Severely wasted child
TreatXFollowup	0.020	-0.009	0.074
	(0.037)	(0.077)	(0.285)
Follow-up	0.018	-0.070	-0.025
	(0.024)	(0.057)	(0.177)
Observations	2,683	1,294	278
Mean dependent variable	0.245	0.399	0.626

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

6.10 Anthropometrics

Table 6.10.1 Impact of Cash for Nutrition program on height-for-age z-score (HAZ) for panel children, by baseline asset terciles, OLS estimation

	All	Lowest Tercile	Middle Tercile	Highest Tercile
TreatXFollowup	0.099	0.240*	-0.075	0.045
	(0.099)	(0.142)	(0.169)	(0.131)
Follow-up	0.351***	0.439***	0.316***	0.323***
	(0.062)	(0.107)	(0.097)	(0.096)
Observations	2,069	773	600	690
Mean dependent variable	-2.096	-2.147	-2.160	-1.988

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.10.2 Impact of Cash for Nutrition program on height-for-age z-score (HAZ) for panel children, by baseline asset terciles controlling for food distribution, OLS estimation

	All	Lowest Tercile	Middle Tercile	Highest Tercile
TreatXFollowup	0.078	0.230	-0.156	0.058
	(0.106)	(0.149)	(0.167)	(0.138)
Follow-up	0.379***	0.449***	0.382***	0.325***
	(0.072)	(0.123)	(0.097)	(0.110)
Food distribution	0.001	0.060	0.038	-0.072
	(0.068)	(0.095)	(0.120)	(0.100)
Observations	1,974	740	572	656
Mean dependent variable	-2.10	-2.16	-2.15	-2.00

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.10.3 Impact of Cash for Nutrition program on weight-for-height z-score (WHZ) for panel children, by baseline asset terciles, OLS estimation

	All	Lowest Tercile	Middle Tercile	Highest Tercile
TreatXFollowup	0.152	0.296*	-0.011	0.071
	(0.102)	(0.155)	(0.158)	(0.133)
Follow-up	0.357***	0.429***	0.350***	0.324***
	(0.062)	(0.108)	(0.092)	(0.094)
Observations	2,070	772	602	690
Mean dependent variable	-2.10	-2.13	-2.19	-2.00

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.10.4 Impact of Cash for Nutrition program on weight-for-height z-score (WHZ) for panel children, by baseline asset terciles controlling for food distribution, OLS estimation

	All	Lowest Tercile	Middle Tercile	Highest Tercile
TreatXFollowup	0.138	0.292*	-0.084	0.096
	(0.108)	(0.164)	(0.157)	(0.139)
Follow-up	0.356***	0.425***	0.325***	0.318***
	(0.074)	(0.126)	(0.106)	(0.108)
Food distribution	0.027	0.090	0.114	-0.085
	(0.069)	(0.106)	(0.111)	(0.101)
Observations	1,974	739	574	655
Mean dependent variable	-2.10	-2.15	-2.18	-2.00

Source: Analysis of Yemen Cash for Nutrition program evaluation survey rounds.
Note: Clustered standard errors (village-level) in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

REFERENCES

Anderson, Michael L. 2008. "Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects." *Journal of the American Statistical Association* 103 (484): 1481–95.

Bhandari, Nita, Rajiv Bahl, Sarmila Mazumdar, Jose Martines, Robert E. Black, and Maharaj K. Bhan. 2003. "Effect of Community-Based Promotion of Exclusive Breastfeeding on Diarrhoeal Illness and Growth: A Cluster Randomised Controlled Trial." *Lancet* 361 (9367): 1418–23.

Christian, Sikandra. 2015. "Baseline Report on Child Malnutrition in Al Hodeida." Unpublished manuscript. Cairo: International Food Policy Research Institute.

Christian, Sikandra, Alain De Janvry, and Daniel Egel. 2015. "Quantitative Evaluation of the Social Fund for Development Labor Intensive Works Program (LIWP) CUDARE Working Paper, Department of Agricultural and Resource Economics. Berkeley, CA, USA: University of California, Berkeley.

Duflo, Esther. 2012. "Women Empowerment and Economic Development." *Journal of Economic Literature* 50 (4): 1051-1079.

Edmond, K.M. 2006. "Delayed Breastfeeding Initiation Increases Risk of Neonatal Mortality." *Pediatrics* 117 (3): e380–86.

Egel, Daniel, and Tareq Al-Bass Yeslam. 2010. "Conditions in Rural Yemen: Findings from the RALP Baseline Survey." Working Paper. Yemen Social Fund for Development and University of California Institute on Global Conflict and Cooperation.

FAO (Food and Agriculture Organization of the United Nations). 2004. *Human Energy Requirements*. Report of a Joint FAO/WHO/UNU Expert Consultation, Rome, 17-24 October 2001. FAO Food and Nutrition Technical Report Series 1. Rome: United Nations University, World Health Organization, and FAO.

Haider, R, A. Ashworth, I. Kabir, and S.R. Huttly. 2000. "Effect of Community-Based Peer Counsellors on EBF Practices in Dhaka, Bangladesh: A Randomised Controlled Trial." *Lancet* 356: 1643–47.

Kennedy, Gina, Terri Ballard, and MarieClaude Dop. 2011. *Guidelines for Measuring Household and Individual Dietary Diversity*. Rome: Food and Agriculture Organization of the United Nations.

Lundeen, Elizabeth A, Aryeh D Stein, Linda S Adair, Jere R Behrman, A Dearden, Denise Gigante, Shane A Norris, Linda M Richter, and Caroline H D Fall. 2014. "Height-For-Age Z Scores Increase Despite Increasing Height Deficits among Children in 5 Developing Countries." *The American Journal for Clinical Nutrition* 100 (3): 821-825.

MOPHP, CSO, PAPFAM, and ICF International (Ministry of Public Health and Population, Central Statistical Organization [Yemen], Pan Arab Program for Family Health, and ICF International. 2015. *Yemen National Health and Demographic Survey 2013*. Rockville, MD, USA: MOPHP, CSO, PAPFAM, and ICF International.

UNICEF (United Nations Children's Fund). 1990. *Strategy for Improved Nutrition of Children and Women in Developing Countries*. A UNICEF policy review. New York: UNICEF.

WHO (World Health Organization). 2008. *Indicators for Assessing Infant and Young Child Feeding Practices*. Geneva: WHO.

About the Author(s)

Sikandra Kurdi is an Associate Research Fellow in the Egypt Strategy Support Program (ESSP) of the International Food Policy Research Institute (IFPRI), based in Cairo. **Yashodhan Ghorpade** is an economist in the Social Protection and Jobs Unit of the World Bank, based in Washington, DC. **Hosam Ibrahim** is a Senior Research Assistant in ESSP of IFPRI, based in Cairo.