

# Pre-Analysis Plan: Working With Community Health Workers to Increase Use of ORS and Zinc to Treat Child Diarrhea In Uganda

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# 1 Introduction

## 1.1 Abstract

Oral rehydration salts (ORS) and zinc are highly effective at preventing child mortality from diarrhea yet they are widely underused throughout sub-Saharan Africa. This research aims to test the impact of a novel preemptive home-delivery intervention aimed at increasing the use of ORS and zinc for child diarrhea in Uganda. The intervention aims to increase availability of ORS and zinc and reduce barriers to access by having community health workers (CHWs) deliver the products directly to households for free prior to a diarrhea episode. Under this set-up, the products will be readily available for free immediately after a child comes down with diarrhea. Moreover, we will disentangle the mechanisms through which the intervention could change product use by using a multi-armed approach that tests for the impact of free distribution and preemptive home-delivery separately (i.e. preemptive delivery but not free and free but not preemptive delivery). Under certain assumptions, we will also be able to isolate for the effect of information. We will use a four-arm cluster randomized controlled trial designed to measure the impact of each of the three interventions on ORS and zinc use for treating child diarrhea relative to a control group. We will also test for differences between intervention groups. The results of the study will be used to inform how best to implement the program at scale-up and to provide insight into the remaining barriers to ORS and zinc use (price, distance/inconvenience, and information).

## 1.2 Motivation

Diarrheal diseases are the second leading cause of death globally for children under five years old with roughly 700,000 deaths annually [7]. In Uganda, 90 in every 1000 live births die before their 5th birthday (UDHS 2011) and diarrheal illnesses account for about 13% of these deaths [7]. Diarrheal mortality is particularly tragic since roughly 93% of deaths due to diarrheal illness are cheaply preventable through the use of oral rehydration salts (ORS) [3, 9, 11, 13, 16]. In 1978, ORS was lauded as one of the most important medical advances of the 20th century by the medical journal *The Lancet* and [5] since 1980, when ORS became widely available, there has been more than a two-thirds reduction in global diarrheal mortality for children under five-years-old [7, 18]. Due to its low cost and high effectiveness, ORS is recommended by the

WHO for all cases of child diarrhea regardless of illness severity [17]. More recently, zinc was also introduced as a recommended treatment for child diarrhea after it was demonstrated to reduce illness severity and provide short term preventive benefits [2].

Despite the effectiveness of ORS in preventing diarrheal mortality, usage rates remain dangerously low, particularly in sub-Saharan Africa (SSA) [4, 7, 10, 12, 14, 15]. In Uganda, the location of the proposed study, only about 46% of diarrheal cases are treated with ORS (UDHS 2011). Therefore, finding ways of increasing use of ORS is an essential step towards reducing child mortality in Uganda and throughout the region.

There are several potential explanations for why ORS use remains low. First, although ORS is free at public health clinics, many caretakers seek care in the private sector where they are required to pay for ORS. Moreover, many community health workers in Uganda sell ORS at a subsidized price. Since ORS does not provide an *observable* benefit to the child (no effect on volume or duration of diarrhea), caregivers may not be aware of the effectiveness of ORS at saving a child's life. Therefore, caregivers may undervalue ORS and not be willing to pay the small nominal price of ORS (USD \$0.20 per treatment course) (the *price barrier*). Several recent randomized controlled trials (RCTs) show that even highly subsidized prices can result in a substantial reduction in take-up of health products relative to free-distribution. Miguel and Kremer (2007) found that free distribution of deworming medication to Kenyan children increased take-up from 18-75% relative to a small fee. Cohen and Dupas (2010) found that take-up of bed nets in Kenya falls by 60 when the price increases from 0 to \$0.60. Ashraf (2010) found that take-up of point-of-use water treatment in Zambia falls by 30% when price increases from \$0.09 to \$0.25. Kremer et al. (2011) found that a majority of households use chlorine for water treatment in Kenya when provided for free, but only 10% use it at the market rate. Dupas et al. (2011) found that chlorine use increased nearly 3 fold when it was provided for free relative to a 50% discount. Spears (2010) found that take-up of hand washing soap in India falls from 84% to 13% when the price changes from 3-15 rupees. Taken together, these studies suggest that poor people in developing are very sensitive to prices of health products, and even highly subsidized prices can substantially reduce take-up.

Second, it can be an inconvenience to visit health facilities or drug shops to retrieve ORS, particularly since most children have diarrhea many times throughout the year. Many mothers are required to walk long distances or pay high transport costs to reach their nearest clinic. Time constraints may limit caregivers to only making the long journey when a case becomes "severe", at which point it could be too late (the *inconvenience/distance barrier*). Moreover, concepts from behavioral economics such time inconsistent preferences or inertia could be at play. For example, mothers may have a preference for retrieval of ORS in a future time period since they are informed of the best practice, but when their child becomes ill in the current period, their preferences are different and they choose not to travel to retrieve ORS or to wait and see how severe the case is until they make the trip. Several studies suggest that distance and inconvenience can be important barriers to take-up. Thornton (2008) finds that distance to HIV testing centers was a key barrier, an even larger barrier than price, to retrieval of HIV test results in Malawi. Kremer et al. (2011b) finds that individuals are only willing to walk 3.5 minutes further to collect water from a protected spring that produced clean water as opposed to retrieving contaminated water from an unprotected well. Banerjee et al. (2010b) found that small incentives (less than a days wage) resulted in much greater willingness to travel to immunization camps. Taken together, these studies demonstrate that distance and convenience are important factors in take-up of health services, and that making products more convenient or nudging people to overcoming inertia could increase utilization.

Third, even conditional on arriving at a clinic for care, many providers still fail to provide ORS

and zinc to caretakers to treat their child’s diarrhea [15]. In Uganda, only 50% of children who visit a health provider received ORS and under 10% received zinc (UDHS 2011). Providers, particularly in the private sector, often distribute antibiotics as substitutes for ORS and zinc, however antibiotics do not treat dehydration (the reason for nearly all deaths) and most cases of child diarrhea are viral and therefore unaffected by antibiotics. This suggests that making ORS and zinc the default treatment choice by bypassing providers (i.e. through direct distribution of ORS and zinc) could both increase use of ORS and zinc, and reduce unnecessary and potentially harmful use of antibiotic.

In this study, we aim to measure the impact of novel preemptive delivery intervention aimed at addressing these barriers to ORS and zinc use in Uganda. We will work with Community Health Promoters (CHPs), a program supported by BRAC, to carry out the interventions. The intervention will increase convenience of ORS and zinc by having community health workers (CHWs) deliver the products directly to households prior to a diarrhea episode for home storage. The intervention will address the price barrier by providing ORS and zinc for free. Under this set-up, the products will be readily available for free immediately after a child comes down with diarrhea. Moreover, we will disentangle the mechanisms through which the intervention could change product use (price and convenience) by using a multi-armed approach that tests for the impact of free distribution and preemptive home-delivery separately (i.e. preemptive delivery but not free and free but not preemptive delivery).

CHPs are community members who are hired by BRAC to sell essential health products (which are purchased from BRAC at a highly subsidized price) and provide very basic primary care through door-to-door household visits. We will carry out a village-cluster randomized controlled trial to measure the impact of each intervention on ORS and zinc use and their comparative effectiveness.

This work contributes to a limited body of literature assessing the barriers to ORS use and potential interventions to increase use. Although there is an extensive body of medical literature assessing the health gains from ORS [3, 9, 11, 13, 16] and identifying the problem of underuse [4, 7, 10, 12, 14, 15] there is little evidence on *why* ORS use remains low, what are the key barriers, and what potential interventions could be used to increase use. A recent systematic review by Lenters et al. found only 19 studies that assessed interventions to increase ORS use, and only 3 RCTs [6]. Nearly all interventions were some sort of social marketing campaign and were skewed geographically towards South Asia. The authors concluded that most of the studies reviewed were of low quality and as result much more evidence is needed on potential strategies for increasing ORS use, particularly in SSA. Although diarrhea is one of the biggest threats to children in the developing world, the issue of ORS use has so far been ignored by the field of development economics.

## 1.3 Research Question

### 1.3.1 Primary Research Questions

**Primary Question 1:** Do *preemptive home visits with free distribution* of ORS and zinc prior to the occurrence of a diarrhea episode coupled with information about the importance of proper treatment result in greater take-up and use of these products to treat child diarrhea relative to the status quo?

**Primary Question 2:** Do *Preemptive home visits with an offer to sell* ORS and zinc at the typical subsidized price currently charged (roughly USD\$0.40 per treatment course) coupled

with information about the importance of proper treatment result in greater take-up and use of the products to treat child diarrhea relative to the status quo?

**Primary Question 3:** Does *Free distribution* of ORS and zinc by CHWs upon *retrieval by caretakers* coupled with information result in greater take-up of these products to treat child diarrhea relative to the status quo?

**Primary Question 4:** Do preemptive home visits with *free distribution* of ORS and zinc result in greater take-up and use of the products to treat child diarrhea relative to preemptive home visits with *offers to sell* the products?

**Primary Question 5:** Does free distribution with *preemptive delivery* of ORS and zinc for household storage result in greater take-up of these products than free-distribution upon *retrieval* from the CHWs?

**Primary Question 6:** Does *Free distribution* of ORS and zinc by CHWs upon *retrieval by caretakers* result in greater take-up of ORS and zinc relative to *Preemptive home visits* with an *offer to sell* the products?

### 1.3.2 Secondary Research Questions (assessed for both interventions)

**Secondary Question 1:** Does information on the importance of ORS and zinc in treating child diarrhea result in greater use of these products?

**Secondary Question 2:** What is the impact of these interventions on take-up and use of *ORS and zinc (combined)* to treat child diarrhea?

**Secondary Question 3:** What is the impact of these interventions on *time between diarrhea initiation and ORS initiation*?

**Secondary Question 4:** What is the impact of these interventions on *time between diarrhea initiation and zinc initiation*?

**Secondary Question 5:** Are ORS and zinc substitutes to antibiotics? In other words, does the increased use of ORS and zinc produced by the interventions correspond with a *reduction in use of antibiotics*?

## 2 Research Strategy

This project will use a cluster randomized controlled trial design. We will work with BRAC to select 120 villages (see sample size calculations below) where their CHP program is active (CHPs are active in over 2000 villages in Uganda). CHPs are community members who are hired by BRAC to sell essential health products to households, which are purchased from BRAC at a subsidized price. CHPs are also trained to provide very basic primary care and health education. The interventions will take place at the village level since one CHP is dedicated to serve an entire village. Each village will be randomly assigned to one of three groups.

**Group 1 — Control:** No intervention will take place. Caretakers will have standard access to ORS and zinc at local health facilities and pharmacies. Some CHPs in control villages could make household visits, however offers to sell diarrhea treatment pre-emptively are rare and CHPs are generally not the source of diarrhea treatment.

**Group 2 — Household Visit + Free Distribution + Preemptive Delivery:** CHPs will be provided a small incentive to visit all of the households in their catchment area that contain a child under 5-years-old (roughly 100 households) at the beginning of the study. CHPs will train caretakers on the dangers of diarrhea and the importance of ORS and zinc use. CHPs will then offer to give ORS and zinc to caretakers for free to store in their homes.

**Group 3 — Household Visit + Cost Sharing + Preemptive Delivery:** CHPs will be provided a small incentive to visit all of the households in their catchment area that contain a child under 5-years-old at the beginning of the study. CHPs will train caretakers on the dangers of diarrhea and the importance of ORS and zinc use. CHPs will then offer to sell ORS and zinc to caretakers at their standard subsidized price (roughly USD\$0.40 in total per treatment course) to store in their homes.

**Group 4 – Household Visit + Free Distribution Upon Retrieval:** CHPs will be provided a small incentive to visit all of the households in their catchment area that contain a child under 5-years-old at the beginning of the study. CHPs will train caretakers on the dangers of diarrhea and the importance of ORS and zinc use. CHPs will then inform caretakers that they have ORS and zinc available for free that caretakers can retrieved from the CHPs home if needed. The average distance to the CHPs household is about 15 minutes.

## 2.1 Sampling

### 2.1.1 Population and Sampling Frame

We will use 6 of BRAC’s microfinance branches as our study sites (BRAC has 128 branches throughout the country). BRAC’s “branches” are local office’s which are used to administer their programs to the surrounding villages. Each branch corresponds to 20 CHPs resulting in 120 villages/CHPs in total to be included in our sample. All villages within selected branches will be enrolled in the study and randomized to one of the three groups described above. Branches were chosen based on 3 criteria: 1) high diarrhea prevalence, 2) branch managers are willing to participate and help with coordination, and 3) proximity to Kampala (due to budgetary constraints).

Once branches and villages are selected, the study team will enroll 80 households with a child under 5-years-old in each village. Although most villages have 100+ households, we don’t gain much power from including additional households in each cluster as power is driven mostly by the number of villages, and logistical constraints limit our ability to do a full census. Enumerators will start at the CHPs household (where her operations take place) and walk to the 80 nearest households with a child under-5 residing. Although our sample might not be representative of the entire village population, it will be representative of the households most likely to benefit from the intervention.

Although we will enroll 80 household per villages, only households with at least one child who was reported to have had a case of diarrhea in the past 4 weeks (during baseline or endline) will be included in the analysis (estimated sample size and power described below).

### 2.1.2 Assignment to Treatment

Within each branch 1/3 of villages will be assigned to each group using a random number generator (runiform in Stata 14).

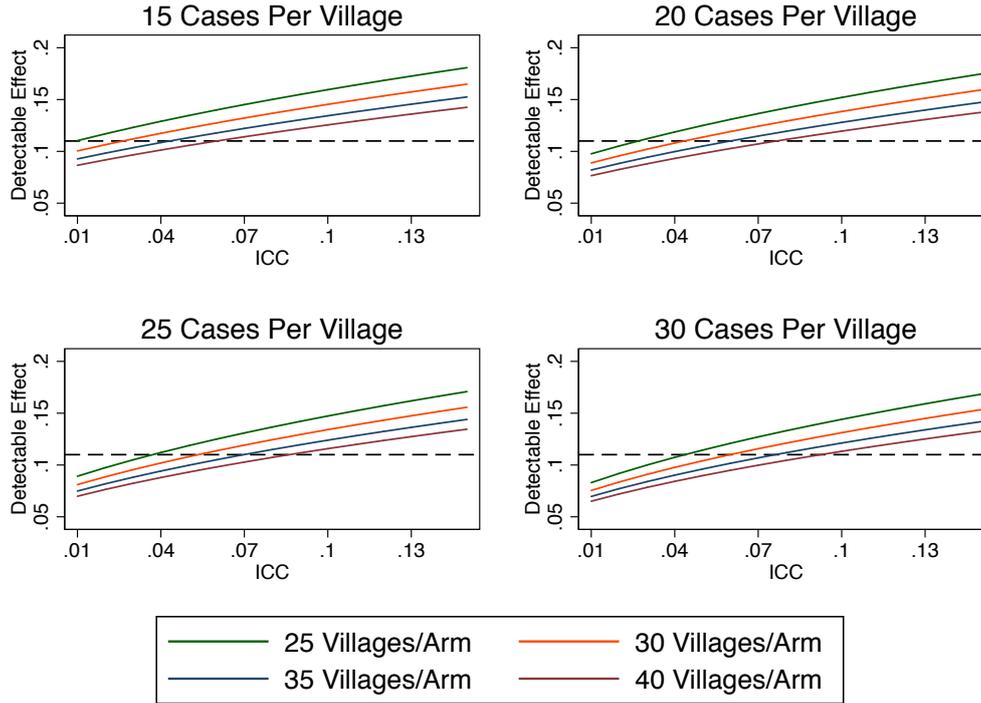


Figure 1: Detectable Effect Under Different Assumptions About Sample

### 2.1.3 Statistical Power

With 120 villages, 80 households enrolled in each village, and 25% of children having a case of diarrhea in the past month (UDHS 2011), we expect to have a final sample of 2400 cases of diarrhea (600 per group). Assuming an intra-class correlation (ICC) of .05, we will be able to detect a minimum of an 11-percentage point increase in ORS use between each group, with a comparison group mean of 50% (UDHS 2011). However, we were unable to find a good estimate of the ICC, and therefore we are uncertain of the validity of this assumption. Moreover, there is also some uncertainty in regard to some of our other assumptions as well (e.g. diarrhea prevalence, number of households with a child under-5 per village, number of villages due to budgetary restrictions etc.). We therefore also conduct a series of additional sample size calculations under different assumptions (Figure 1). This figure shows that the detectable effect is particularly sensitive to the ICC. However, even under the worst case scenario—if we are short on funding and can only enroll 25 villages per arm, if the ICC is 0.15, and there are only 15 cases of diarrhea per village—we will still be able to detect a difference of 18 percentage points. During our piloting of the Group 2 intervention we found that ORS use increase from 56% at baseline to 94% after the intervention. Therefore we expect that we will be sufficiently powered to detect important effects of these interventions.

## 2.2 Field Work

### 2.2.1 Instruments

Our survey instruments are attached as Appendix 1. Survey instruments were programmed into tablet devices which will be used for electronic data collection. We will use 3 survey instruments.

- 1) **Baseline Survey:** This instrument will be used to collect information on outcomes prior to the interventions, including whether a diarrhea episode occurred in the prior 4 weeks and which diarrhea treatments were used. The baseline survey will also collect information on ORS availability including price paid for diarrhea treatments (if used recently) and distance to nearest ORS distributor.
- 2) **Follow-up survey:** In addition to the outcome and access information collected at baseline, the follow-up survey will collect a variety of demographic information and other characteristics of the children, households, and caretakers enrolled in the study. This survey will also collect information on knowledge of diarrhea and proper treatment practices.
- 3) **CHP survey:** All 120 CHPs enrolled in the study will complete the CHP survey which will collect information on village characteristics and CHP practices.

### 2.2.2 Data Collection

**Phase 1 — Listing of households (2 days per village):** In the first phase of data collection, CHPs will create a list of all the households with a child under 5-years-old in their catchment area, that includes the name and nickname of the household head. Our enumerators will use this list to track households to enroll.

**Phase 2 — Baseline Survey (1 day per village):** Teams of 6 enumerators will use the list provided by the CHPs and travel to all listed households (with the CHPs guidance) to conduct a baseline survey. Questionnaires will be completed by primary caretakers and will be recorded in tablet devices (which have already been programmed with our survey instrument). Caretakers that reported a child to have had diarrhea in the past 4-weeks will be asked detailed questions about the diarrhea episode and caretaker treatment decisions. Enumerators will move on quickly from households with no recent diarrhea episode only recording that they did not have an episode (e.g. no demographic information). The CHP survey will also be conducted during Phase 2.

**Phase 3 — Endline Survey (1.5 days per village):** Four weeks after the intervention is implemented, all households will be re-visited and asked to complete a follow-up survey that will follow the same protocol as the baseline survey. Four weeks will be sufficient time for roughly 25% of children to have a diarrhea episode (Uganda DHS), but short enough for accurate recall.

### 2.2.3 Data Processing

Data will be collected on tablet devices and stored on a BRAC server. Each survey will be automatically sent to the server via Internet. Raw data will be kept in tact and additional cleaned data sets will be created in Stata. Wagner, Asiimwe, Levine, and Dow will have full ownership over the data.

## 3 Empirical Analysis

### 3.1 Variables

#### 3.1.1 Treatment Outcomes

**Primary Outcome:** The primary outcome for the study is self reported ORS use for a case of child diarrhea. This will be measured through a series of survey questions which ask caretakers who reported having a child who had a diarrhea episode in the past 4 weeks the following:

1. Did you give (CHILD NAME) anything to treat the Diarrhea?
2. If yes, can you tell me or show me what treatments you gave (CHILD NAME) (either home-prepared or from outside of home)
3. If yes, can you tell me if you gave [CHILD NAME] any of the following treatments [INTERVIEWER WILL READ LIST]

Responses for (2) will not be prompted by the interviewer. For (3), respondents will be read the following list and asked if they used each of the treatments.

1. ORS
2. Zinc
3. Home-prepared treatment
4. Antibiotic

Our main outcome variable will be a binary variable that is set to 1 if the respondent reports that they used ORS in (3) and to 0 if they reported that they did not use ORS in (3) or if they reported that they gave no treatment to the child in (1). We will conduct a robustness check where we use the unprompted response from (2) to create our ORS use variable.

We will conduct an identical process for creating secondary treatment outcomes; zinc and antibiotic variables. All treatment outcomes will be set to missing if 1) the child was not reported to have had diarrhea in the last 4 weeks, or 2) if the caretaker did not know whether the child was given the respective treatment.

#### 3.1.2 Time to Treatment Initiation Outcomes

For ORS and zinc treatments, we are also interested in the time between the diarrhea episode initiation and the treatment initiation. It is recommended by the WHO that both ORS and zinc are started immediately after the first symptoms of diarrhea. We will measure this using the following question, which will be asked to all caretakers that report giving the respective treatment to the child.

”How many days after the diarrhea began did you first give (CHILD NAME) [ORS/zinc]?”  
The enumerator will report '0' if treatment began on the same day as the diarrhea episode.

### 3.1.3 Controls/Balance Check Variables

**Caretaker Characteristics (measured at baseline and endline):** We will create variables for caretaker’s age (Question 101), education (none, primary, secondary+), (Question 102), marital status (Question 103), number of children (Question 104), and employment status (Question 115).

**Household Characteristics (measured at endline only):** We will create variables for type of latrine used (covered, uncovered, or bush) (Question 109), main source of drinking water (piped, protected well/borehole, open well, surface water (river, damn, lake, etc.)) (Question 110), main source of income (agriculture, private sector, public sector, self-employed, informal sector, or other ) (Question 113).

**Child Characteristics:** We will create variables for child gender (Question 202), age (Question 203), frequency of diarrhea (Question 206), and birth order (Question 205 and Question 104)

**Baseline Village Characteristics:** We will collapse the following information to the village level using the baseline survey wave only.

1. *Baseline ORS/Zinc/Antibiotic use:* The most important control variable is baseline treatment use, since this will adjust for potential preexisting differences in use that were not balanced as a result of randomization. Since we will have different children at baseline and endline, we will not be able to control for each child’s ORS use at baseline. Instead, we will control for village level ORS use. We will create this variable by taking the mean of our ORS variable for each village at baseline.
2. *Distance to closest distributor of ORS:* This will be created using questions 122 and 123 combined with 132-140. The first two questions ask “Is there anywhere in your village where you can go to get ORS to treat your child’s diarrhea?” and “Where can you go to get ORS to treat your child’s diarrhea?”. The second set of questions ask “How many minutes does it take to travel to the nearest [INSERT HEALTH PROVIDER TYPE]?”. We will set this variable to the minimum time reported across providers where at least 25% of respondents in a village reported that provider as a source of ORS in Q123.
3. *Availability of free ORS:* This will be created using question 124 “Is there anywhere in your village where you can go to get FREE oral rehydration salts (ORS)?”. We will set this variable to the mean of Q124 (i.e. the share of respondents that know of a place to get free ORS) for each village.
4. *Baseline awareness of ORS:* This variable will be created from question 120, which asks respondents “Have you heard of a treatment for child diarrhea called Oral Rehydration Salts (ORS)?”. We will set this variable to the mean of Q120 (i.e. the share of respondents that have ever heard of ORS) for each village.

All of the above variables relating to ORS will also be created for zinc.

## 3.2 Balance Checks

Among our endline sample (which will be different from our baseline sample) we will check for balance between the 4 groups on all the baseline characteristics mentioned in the previous section. We will report the mean of each variable and report the p-value of each group’s difference in means relative to the control group (using t-tests). Moreover, we will calculate

p-values of differences in means between each group, the rest of which will be reported in an appendix with significant differences (p<.05) acknowledged in the main text. We will fill the cells of Table 1 for our main balance table.

We will also fit a multinomial logit model with group type (Group 1-Group 4) as the dependent variable and report the  $\chi^2$  test statistic as the joint test for equality.

### 3.3 Process Evaluation

First, we will test for whether the intervention appeared to be carried out properly by measuring differences in CHP behavior in the past 4 weeks (home visits and delivery), home-storage of ORS (which will be measured for the entire sample), and receipt of free ORS and zinc. We will fill in Table 2.

### 3.4 Treatment Effects

#### 3.4.1 Reduced form

We will conduct several analyses to assess the impact of each treatment arm on ORS use. We will refer to our main estimates as reduced form estimates since it is possible some households in our treatment groups will not receive the treatment (e.g. if the CHP fails to make the delivery or does not comply with instructions to provide the products for free). All regressions will be linear probability models (LPMs), which should be similar to a logit or probit model since the mean of our dependent variables are likely to be between 0.2 and 0.8. For comparison, we will also estimate reduced form treatment effects using a logit model and report average marginal effects (using the delta method and Stata’s margins command ).

First, we will run an un-adjusted regression using the post data only. We present all analyses in terms of ORS use, but analogous analyses will be conducted for each outcome of interest.

$$ORS_{iv} = \beta_0 + \beta_1 Group2_{iv} + \beta_2 Group3_{iv} + \beta_3 Group4_{iv} + \epsilon_{iv} \quad (1)$$

$\beta_1$  will estimate the impact of combined effect of free distribution and preemptive delivery,  $\beta_2$  will estimate the impact of the preemptive home visits alone (i.e. with no free-distribution), and  $\beta_3$  will estimate impact of free-distribution alone (i.e. with no preemptive delivery). We will then use the lincom command in Stata 14 to estimate differences between each group. Specifically, we will estimate the following:

$\beta_1 - \beta_2$  (price-effect): The effect of free-distribution with preemptive delivery relative to payment with delivery.

$\beta_1 - \beta_3$  (distance/convenience effect): The effect of free-distribution with preemptive delivery relative to payment with preemptive delivery.

$\beta_2 - \beta_3$  (price effect vs. distance/convenience effect): The effect of preemptive delivery with payment relative free-distribution with no-preemptive delivery.

Under the assumption that the effects of each mechanisms on ORS use is additively separable (i.e.  $ORS(Price, Delivery) = ORS(Price) + ORS(Delivery)$  ), we can also test for the impact of increased information provided by the CHP on ORS use. We can do this by estimating the following differences-in-difference.

$$[Group3Control] - [Group2 - Group4] = \beta_4 - [\beta_2 - \beta_3]$$

The first term, is the effect of information combined with preemptive delivery and the second term is the effect of preemptive delivery. Therefore, this difference isolates for the effect of information assuming no interaction between free distribution and preemptive delivery.

However, these estimates do not account for potential baseline differences in ORS use between groups, nor do they account for differences in other characteristics that are not balanced between groups at baseline that could affect ORS use. We will account for differences in baseline ORS use using two different methods. First we will use a difference-in-differences (DiD) estimation strategy.

$$ORS_{ivt} = \beta_0 + \beta_1 Group2_{iv} + \beta_2 Group3_{iv} + \beta_3 Group4_{iv} + \beta_4 Post_t + \beta_5 PostXGroup2_{ivt} + \beta_6 PostXGroup3_{ivt} + \beta_7 PostXGroup4_{ivt} + \epsilon_{ivt} \quad (2)$$

Here,  $\beta_5 - 7$  estimate the impact the respective groups, taking into account pre-intervention differences in ORS use. Moreover, this accounts for any time-invariant unobserved heterogeneity between groups. However, since children with a diarrhea episode at baseline will mostly be different from children with a diarrhea episode at endline, it is possible that there is weak correlation between baseline ORS use and endline ORS use. However, the DiD model above imposes a potentially stronger relationship between baseline and endline outcomes than actually exists (i.e. assumes a coefficient of 1) which overcorrects for baseline outcomes. To account for this, we will use a more flexible method for controlling for baseline outcomes which produces substantial improvements in power when autocorrelation in the outcome is low [8].

$$ORS_{ivt} = \beta_0 + \beta_1 Group2_{iv} + \beta_2 Group3_{iv} + \beta_3 Group4_{iv} + \beta_3 ORS_{v(t-1)} + \epsilon_{ivt} \quad (3)$$

Here we include the average ORS use in the child's village at baseline on the right hand side of the equation  $ORS_{v(t-1)}$ , allowing for flexibility in how baseline ORS use in a child's village affects their ORS use at endline. As a result, this is our preferred model and the main model we will report in our paper. The DiD model will be included in an appendix for reference.

**[INTERNAL NOTE: SHOULD WE ADD A DiD MODEL WILL VILLAGE FIXED EFFECTS?]**

Next we will add a variety of control variables to equations 3 and 4 above to account for potential differences between treatment and control groups and to improve precision. We will control for the following characteristics.

**[INTERNAL NOTE: IS THIS THE WAY WE SHOULD PRE-SPECIFY CONTROLS OR IS THERE A BETTER WAY (E.G. CHOOSE THE 10 THAT PRODUCE THE SMALLEST SEs ON OUR TREATMENTS)?]**

*Caretaker Characteristics:* age, education, employed in last 7 days, number of children

*Child characteristics:* age, birth order, diarrhea frequency per month

*Household Characteristics:* water source, main source of income

*Baseline Village Characteristics:* % of households visited by CHP in past month, % of households ever visited by a CHP, % of household aware of free ORS in Village, distance to nearest

ORS distributor, average diarrhea frequency per month

We will also include indicators for each branch as covariates to improve power, since we stratified on this variable. Our preferred model is equation 3 with the controls listed above. Example tables for the analyses from this section are presented in tables 3 - 6.

### 3.4.2 Impact Of Home Storage: Instrumental Variables Analysis

Our reduced form estimates will help answer the question of whether the program and variation in how the program is designed effects diarrhea treatment practices. However, as mentioned above, some of the CHPs might not comply with group guidelines and therefore some households might not receive the program. A more fundamental question is whether having ORS and zinc stored in the household preemptively (i.e. prior to a diarrhea episode) results in higher use than having to go retrieve the product once a diarrhea episode begins. In order to answer this question, we will use an instrumental variables approach where we use random assignment as an instrument for preemptive home storage. For this analysis we will only use groups 2 and 4 since both groups have free distribution and information with only the group difference being that group 2 will have a higher probability of having the products stored in the household preemptively (since they will receive preemptive deliveries). We will use two-stage least squares to estimate the following equations.

First Stage:

$$Store_{ivt} = \beta_0 + \beta_1 Group2_{iv} + \beta_3 ORS_{v(t-1)} + X_{iv}\beta_4 + u_{ivt} \quad (4)$$

Second Stage:

$$ORS_{ivt} = \alpha_0 + \alpha_1 Store_{iv} + \alpha_3 ORS_{v(t-1)} + X_{iv}\alpha_4 + \epsilon_{ivt} \quad (5)$$

The key assumption that has to hold for random assignment to be a valid instrument is that random assignment into Group 2 relative to Group 4 only affects ORS use through increasing home storage (i.e.  $Group2 \perp \epsilon$ ). Since the only difference between groups is the timing and location at which ORS was provided for free, we expect this assumption to hold. We expect  $\beta_1$  to be positive and significant, implying that assignment to *Group2* indeed increases home-storage. We also expect  $\alpha_1$  to be positive implying that preemptive home-storage of ORS increases ORS use.

Table 7 presents an example table from equations 4 and 5.

## 3.5 Heterogeneous Treatment Effects: Price, Distance, and Knowledge

For targeting purposes it might be helpful to understand for what types of villages this program will be most effective. We expect this program will particularly effective for areas that 1) do not have easy access to free ORS and zinc, 2) are farther away from ORS and zinc distributors, and 3) have little awareness of ORS and zinc. Therefore, we will test heterogeneous treatment effect of each treatment arm by baseline levels of these 3 characteristics. We will measure Each characteristic in the following way (all at the village level):

**Price:** Share of respondents that are aware of a place to get free ORS/Zinc

**Distance:** Distance to nearest ORS/Zinc distributor (created as described in section 3).

**Knowledge:** Share of respondents that ever *used* ORS/Zinc and share of respondents that ever *heard of* ORS/Zinc.

In order to assess heterogeneous treatment effects by these 4 variables, we will create interaction terms, where each factor is interacted with each treatment group variable. We will then estimate the following equations.

$$\begin{aligned} ORS_{ivt} = & \beta_0 + \beta_1 Group2_{iv} + \beta_2 Group3_{iv} + \beta_3 Group4_{iv} + \beta_4 Free_v + \\ & \beta_5 FreeXGroup2_{iv} + \beta_6 FreeXGroup3_{iv} + \beta_7 FreeXGroup4_{iv} + \\ & \beta_8 ORS_{v(t-1)} + X_{iv}\beta_9 + \epsilon_{ivt} \end{aligned} \tag{6}$$

$$\begin{aligned} ORS_{ivt} = & \beta_0 + \beta_1 Group2_{iv} + \beta_2 Group3_{iv} + \beta_3 Group4_{iv} + \beta_4 Dist_v + \\ & \beta_5 DistXGroup2_{iv} + \beta_6 DistXGroup3_{iv} + \beta_7 DistXGroup4_{iv} + \\ & \beta_8 ORS_{v(t-1)} + X_{iv}\beta_9 + \epsilon_{ivt} \end{aligned} \tag{7}$$

$$\begin{aligned} ORS_{ivt} = & \beta_0 + \beta_1 Group2_{iv} + \beta_2 Group3_{iv} + \beta_3 Group4_{iv} + \beta_4 Know_v + \\ & \beta_5 KnowXGroup2_{iv} + \beta_6 KnowXGroup3_{iv} + \beta_7 KnowXGroup4_{iv} + \\ & \beta_8 ORS_{v(t-1)} + X_{iv}\beta_9 + \epsilon_{ivt} \end{aligned} \tag{8}$$

Equations 6, 7, and 8 test the how treatment effects vary by baseline access free treatment, baseline distance to the nearest distributors, and baseline knowledge/experience with these products. In equation 6, a negative and significant coefficient on the interaction terms will suggest that people that had less access to free ORS experienced a larger improvement from the interventions, suggesting price was an important barrier that the interventions helped overcome. We would expect this to be larger (more negative) for groups 2 and 4, since these groups provide access to free ORS.

In equation 7, a positive and significant coefficient on the interaction terms will suggest that people that had less access to ORS distributors (further away) experienced a larger improvement from the interventions that improving ORS suggesting that lack of access/availability was an important barrier that the interventions helped overcome.

Finally, a negative and significant coefficient on the interaction terms in equation 8 will suggest that people that had less knowledge or experience with ORS and zinc experienced a larger improvement from the interventions.

### 3.5.1 Pooled Group Analysis: Free Distribution

In addition to the above analyses we will also conduct an analysis where we pool Groups 2 and 4 (free distribution) and Groups 1 and 3 (cost-sharing). This will improve power since groups will double in size.

## 3.6 Standard Error Adjustment

All standard errors will be clustered at the village level, the level at which the randomization/intervention will occur. Multiple hypothesis testing adjustments will not be used for the primary outcome, ORS use, since there is only 1 primary outcome. We will use the free step-down resampling method to control the False Discovery Rate (FDR) to adjust standard errors for secondary outcomes since we are testing multiple hypothesis [1].

## 3.7 Outcomes

We assess the impact of the interventions on the following outcomes:

- **Primary Outcome**
  - Used ORS
- **Secondary Outcomes**
  - Time to ORS use
  - Used Zinc
  - Time to Zinc use
  - Used ORS+Zinc
  - Used antibiotic
  - Used antidiarrheal
- **Tertiary Outcomes**
  - Diarrhea Prevalence
  - ORS stored in the household currently
  - ORS Stored in household at any point in the last 4 weeks
  - ORS stored in the household when child developed diarrhea
  - Zinc stored in the household currently
  - Zinc Stored in household at any point in the last 4 weeks
  - Zinc stored in the household when child developed diarrhea
  - Purchased ORS in last Month
  - Price Paid for ORS
  - Price Paid for Zinc
  - Used properly prepared ORS (1 liter per pack + boiled)

- Visited Health Provider for Treatment
- Knowledge of ORS
- Knowledge of zinc

## 3.8 Robustness Checks

### 3.8.1 Measuring ORS and Zinc use with packet monitoring

It is possible that there is differential response bias in the treatment and control groups. For example, the treatment group may over-report use since it was provided to them for free (social desirability bias). In order to account for this, we will provide incentives to the pre-emptive free delivery group (Group 2) caretakers to keep the ORS and zinc packets we provide (used and/or unused). Caretakers will be given \$0.25 (USD) during the endline survey if they have any of the packets that were provided to them by the CHP as a result of the intervention. All packets delivered by in the intervention will have a black mark with permanent marker. Enumerators will record 1) if the packet was observed, 2) the number of used packets, and 3) the number of unused packets. We will then cross check the number of used packets with self-reported ORS use. As a robustness check, we will code ORS use in 2 different ways using these more objective observations.

1. Less conservative: Restrict Group 2 sample to households that received a delivery from the CHP. Code ORS to 1 if household was observed to have an empty packet and to zero otherwise they have no empty ORS packet (and received the delivery).
2. More conservative (lower bound): Use full Group 2 sample. Code ORS to 1 if household was observed to have an empty packet and to zero otherwise.

We will conduct a similar process for zinc use.

This will eliminate any upward bias of our estimates that result from differential self-report bias. However, it is important to note that this will account for any over-reporting of ORS/zinc use in Group 2, but will not account for over-reporting in the other groups since we cannot verify packet use in the control group, it would complicate the design too much in the treatment groups. Therefore, these estimates will represent a lower bound of the true effect.

### 3.8.2 Using unprompted ORS responses

We will conduct an additional robustness check where we will only code ORS/zinc as being used if caretakers report have used ORS without prompting from the enumerator.

### 3.8.3 Placebo Tests

We will conduct a series of placebo tests to test for differences between treatment and control groups on self reported healthy behaviors that should not be affected by the interventions. No effect on these outcomes will provide confidence that our effects on diarrhea treatment outcomes are a result of the interventions and not differential over-reported on healthy behaviors. We will use the following outcomes as placebo dependent variables in equation 3 with controls.

1. Gave child malaria treatment (conditional on symptoms)

2. Gave child food or liquid that was unclean
3. Frequency of child sleeping under bed net
4. Frequency of hand washing

### 3.8.4 Attrition and Changes in Group Composition

**Attrition:** We will have a panel of households in our sample. Since the duration of the study is relatively short (roughly 4 weeks) we don't expect attrition to be a huge issue. Most, if not all, attrition will be due to refusal to participate in the survey at follow-up among household who agreed to participate at baseline. It is possible that refusal to participate occurs differentially in the treatment and control groups, which could bias our estimates. For example, if the control group is more likely to refuse to participate at follow-up because they do not receive and gift (i.e. free treatment products), whereas all households in the treatment group are happy to participate since they received free ORS and zinc, this could result in groups no longer being comparable. To test for how sensitive our results are to potential changes in group composition due to attrition, we will run additional analyses where we assume that:

- 1) Everyone in the control group that attrites had a diarrhea episode and used ORS and everyone in the treatment groups that attrite had diarrhea and did not use ORS (lower bound) .
- 2) Everyone in the control group that attrites had a diarrhea episode and did not use ORS and everyone in the treatment groups that attrite had diarrhea and used ORS (upper bound).

This will provide upper and lower bounds for the potential bias introduced by attrition.

**Reporting of Diarrhea Episodes:** Another more concerning channel through which the composition of the treatment and control groups could shift differentially from baseline to follow-up is through differential reporting of diarrhea episodes. Since the main outcome of interest (ORS use) is contingent on a child having had a recent case of diarrhea, we will only collect outcome information for children that had a recent diarrhea episode. Therefore, the children whom we collect outcome information on at baseline will mostly be different than the children we collect outcome information on at endline (since most children will not have two episodes during our study period). It is possible that caretakers in the treatment groups will be more likely to report a diarrhea episode at endline than caretakers in the control group for two reason: 1) treatment group caretakers could have the expectation that they will be provided additional free products if a child had an episode and 2) treatment group caretakers might be more likely to accurately recall a recent case of diarrhea as result of the intervention (since they will have products in their homes). If this occurs, the children we have outcome information for in the treatment group might not be exchangeable for the children we have outcome information on for in the control group. We will test for this by estimating the following difference-in-differences equation:

$$Diarr_{ivt} = \beta_0 + \beta_1 Group2_{iv} + \beta_2 Group3_{iv} + \beta_3 Group4_{iv} + \beta_4 Post_t + \beta_5 PostXGroup2_{ivt} + \beta_6 PostXGroup3_{ivt} + \beta_7 PostXGroup4_{ivt} + \epsilon_{ivt} \quad (9)$$

Where  $Diarr_{it}$  represents whether child  $i$  in village  $v$  at time  $t$  had a diarrhea episode reported. The coefficients  $\beta_4$  and  $\beta_5$  (the DiD estimates) will indicate whether the treatment groups experienced a larger (or smaller) increase in reported cases of diarrhea relative to the control group. If any of these coefficients are positive and statistically significant we will go through a similar process as for sample attrition and provide bounds of the bias. We will do this in the following steps:

1. Assume that the control villages had the same change in diarrhea prevalence as treatment villages by randomly assigning observations to have had a diarrhea episode among the sample in the control group that did not report an episode.
2. Assume everyone in the control group that gets randomly assigned an episode used ORS (lower bound).
3. Assume everyone in the control group that gets randomly assigned an episode did not use ORS (upper bound).

## 4 Research Team

This project is led by Zachary Wagner and John Bosco Asimwe under the supervision of William H. Dow and David I. Levine. The research team works closely with Munshi Sulaiman and Robert Mpiira at BRAC and BRAC's community health promoters.

## 5 Deliverables

We will produce the following deliverables from this project.

- Job market paper for Zachary Wagner that includes everything outlined above (Authors ZW and JBA)
- Article aimed at medical journal audience that assesses the impact the interventions on ORS and zinc use (Authors ZW JBA DIL WHD)
- Article aimed a health economics journal audience that assess mechanisms through which the intervention worked and highlights barriers to ORS use using empirics (Authors ZW JBA DIL WHD)
- Cost-effectiveness analysis of the various interventions
- Report on the findings for BRAC

## 6 Calender

- June-July 2016: Baseline Surveys
- August 2016: Role out of interventions
- September-October 2016: Endline Surveys
- November 2016: Job Market Paper

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## 7 Tables

**Table 1.** Baseline Balance Between Treatment and Control

	Control	Group 2	Group 3	Group 4
<b>Caretaker Characteristics</b>				
Caretaker Age				
Caretaker Education: None				
Caretaker Education: Primary				
Caretaker Education: Secondary+				
Caretaker Employed in Last 7 Days				
Number of Children				
Heard of ORS				
Ever used ORS				
Heard of Zinc				
Ever used Zinc				
<b>Child Characteristics</b>				
Age (months)				
Birth order				
Diarrhea Frequency				
Diarrhea Last 4 Weeks				
ORS use				
Zinc use				
<b>Household Characteristics</b>				
Water Source: Pipe				
Water Source: Protected Well/Borehole				
Water Source: Unprotected Well				
Water Source: Surface Water				
Main Income: Agriculture				
Main Income: Public Sector				
Main Income: Private Sector				
Main Income: Self-employed/informal				
Visited by CHP in past month				
Ever visited by CHP				
Free ORS in Village				
Free Zinc in Village				
Distance to nearest ORS distributor				
Distance to nearest zinc distributor				
p-values relative to control reported in brackets				

**Table 2.** Process Evaluation

	Control	Group 2	Group 3	Group 4
CHP visit last 4 weeks				
CHP provided ORS for free last 4 weeks				
CHP provided zinc for free last 4 weeks				
Any ORS for free last 4 weeks				
Any zinc for free last 4 weeks				
CHP delivered ORS last 4 weeks				
CHP delivered zinc last 4 weeks				
ORS stored: currently				
ORS stored: last 4 weeks				
ORS stored: diarrhea initiation				
Zinc stored: currently				
Zinc Stored: last 4 weeks				
Zinc stored: diarrhea initiation				
Purchased ORS from CHP in last 4 weeks				
Price Paid for ORS				
Price Paid for Zinc				
Visited Health Provider for treatment				

p-values are relative to control with SE clustered at the village level

**Table 3.** Post-intervention treatment outcomes (means)

	Control	Group 2	Group 3	Group 4
Used ORS*				
Time to ORS use**				
Used Zinc**				
Time to Zinc use**				
Used ORS+Zinc**				
Used antibiotic**				
Used antidiarrheal**				
Diarrhea Prevalence				
Used properly prepared ORS				

\*primary outcome

\*\*secondary outcome

**Note:** Estimates are from equation 1

p-values are relative to control with SE clustered at the village level

**Table 4.** Impact on ORS and Zinc use

	ORS Use				
	Unadjusted	DiD	DiD	ANCOVA	ANCOVA
Group 2-Control					
Group 3-Control					
Group 4-Control					
Group 2-Group 3					
Group 2-Group 4					
Group 3-Group 4					
Controls	No	No	Yes	No	Yes
Obs					
	Zinc Use				
	Unadjusted	DiD	DiD	ANCOVA	ANCOVA
Group 2-Control					
Group 3-Control					
Group 4-Control					
Group 2-Group 3					
Group 2-Group 4					
Group 3-Group 4					
Controls	No	No	Yes	No	Yes
Obs					

\*\*\* $p < .01$ , \*\* $p < .05$ , \* $p < .1$

Village Clustered SEs in parentheses

Unadjusted = Equation 1; DiD = Equation 2; and ANCOVA = Equation 3

**Table 5.** Impact on Days to ORS and Zinc use

	Days to ORS Use				
	Unadjusted	DiD	DiD	ANCOVA	ANCOVA
Group 2-Control					
Group 3-Control					
Group 4-Control					
Group 2-Group 3					
Group 2-Group 4					
Group 3-Group 4					
Controls	No	No	Yes	No	Yes
Obs					
	Days to Zinc Use				
	Unadjusted	DiD	DiD	ANCOVA	ANCOVA
Group 2-Control					
Group 3-Control					
Group 4-Control					
Group 2-Group 3					
Group 2-Group 4					
Group 3-Group 4					
Controls	No	No	Yes	No	Yes
Obs					

\*\*\* $p < .01$ , \*\* $p < .05$ , \* $p < .1$

Village Clustered SEs in parentheses

Unadjusted = Equation 1; DiD = Equation 2; and ANCOVA = Equation 3

**Table 6.** Impact on Antibiotic Use

	Unadjusted	DiD	DiD	ANCOVA	ANCOVA
Group 2-Control					
Group 3-Control					
Group 4-Control					
Group 2-Group 3					
Group 2-Group 4					
Group 3-Group 4					
Controls	No	No	Yes	No	Yes
Obs					

\*\*\* $p < .01$ , \*\* $p < .05$ , \* $p < .1$

Village Clustered SEs in parentheses

Unadjusted = Equation 1; DiD = Equation 2; and ANCOVA = Equation 3

**Table 7.** Impact of Home Storage: IV

	ORS Use			
	First Stage	Second Stage	First Stage	Second Stage
Group 2-Control				
Group 3-Control				
Group 4-Control				
Group 2-Group 3				
Group 2-Group 4				
Group 3-Group 4				
Controls	No	No	Yes	Yes
Obs				
	Zinc Use			
	First Stage	Second Stage	First Stage	Second Stage
Delivery				
Recipe				
Delivery-Recipe				
Controls	No	No	Yes	Yes
Obs				

Columns 1 and 3=Equation 4, Columns 2 and 4=Equation 5

## 8 Appendix

### 8.1 Appendix 1: Survey Instrument



**FORM A.**  
**CAREGIVER SELECTION TOOL FOR USE WITHIN**  
**HOUSEHOLDS SELECTED FOR DIARRHEA MODULE**

1. **What is the total number of MAIN caregivers of children aged 0-59 months that are presently home? A MAIN caregiver is the person that makes decisions about how to care for the children in your household. \_\_\_\_\_**
2. Please provide the First name and Last initial of all these MAIN caregivers (*Interviewer: list in second column below*):

Serial no.	First name, Last initial (all MAIN caregivers of children 0-59 months and with diarrhea in past 4 weeks)
1	
2	
3	
4	
5	

**RANDOM SELECTION (if 2 MAIN caregivers or more are listed in table above):**

*Interviewer: Take out your phone and use the random number generator application. Set the Min to 1 and the Max to the number of caretakers in the household. Press 'generate' and select the caretaker that corresponds to the number that is generated.*

3. The person I need to speak to is \_\_\_\_\_ (*insert the first name and last initial*). May I please talk to this person now?

Yes.....1 [**Interviewer: move to informed consent**]

Refuse.....2 [**Interviewer: Thank the respondent and move to next eligible household**]

4. Were you or someone from your household asked to complete a questionnaire about your children's health about 4 weeks ago?

## **INTRODUCTION AND ORAL CONSENT**

Good morning/afternoon. My name is \_\_\_\_\_. I am a researcher working for Makerere University and the University of California, Berkeley in the United States. We are conducting a survey on child health and treatment practices among the residents of Uganda. We are inviting you to participate in this study because you have at least one child under 5-years-old living in your household. This information will be used to inform programming efforts by the Uganda Ministry of Health and other organizations that focus on diarrhea treatment in the country.

### **PROCEDURES**

If you agree to take part, some of the questions that we ask will be about health practices and diarrhea treatment. We will interview you in a private place. The interview will take no more than 30 minutes to complete. To further protect your privacy, your name will not appear on any questionnaire. The answers we collect from you will not be shown to anyone outside of the study team.

### **RISKS/DISCOMFORTS**

It is possible that some of the research questions may make you uncomfortable or upset. You are free to decline to answer any questions you don't wish to, or to stop the interview at any time. As with all research, there is a chance that confidentiality could be compromised; however, we will do everything we can to make sure that this does not happen. Whatever information you provide will be kept strictly confidential and will not be shown to other persons. The answers you give will not be shared with anyone outside of the study team.

### **BENEFITS**

There is no direct benefit to you from being in this study. However, the information we collect will help develop better programs and health services for people in Uganda.

### **CONFIDENTIALITY**

Your study data will be handled as confidentially as possible. If results of this study are published or presented, individual names and other personally identifiable information will not be used.

To minimize the risks to confidentiality, we will do the following:

- The data will be collected anonymously. We will not maintain a link between your identity and the research data. Personal identifiers will be removed as soon as data is entered into our computers.
- Your research records will be stored on a password-protected computer
- Only I/the researcher(s) will have access to your study records.

### **FUTURE USE OF STUDY DATA**

The research data will be maintained for possible use in future research by the study team.

### **COMPENSATION/PAYMENT**

You will receive a bar of soap for your participation in this study.

### **VOLUNTARY PARTICIPATION**

You do not have to agree to be in this study, and you may change your mind at any time without penalty or loss of benefits to which you are otherwise entitled.

### **QUESTIONS**

If you have any questions about this study, you may call Dr. John Bosco Asiimwe at Makerere University at 772-428-489. He will answer any questions or address any concerns you may have. If you have any questions about your rights as a study participant, or if you think you have not been treated fairly, you may call the National Council for Science and Technology, telephone 0-414 250 499.

**PERMISSION TO PROCEED**

You have been given a copy of this consent form to keep.

Do you have any questions about the survey? Yes/No

Do I have permission to interview you now? Yes / No

***Interviewer: If no, thank the respondent and end the questionnaire. Indicate Result in identification table.***

\_\_\_\_\_  
Print name of Person Obtaining  
Consent

\_\_\_\_\_  
Signature of Person Obtaining Consent

\_\_\_\_\_  
Date

**FORM B.**  
**CHILD SELECTION TOOL FOR USE WITHIN HOUSEHOLDS**  
**SELECTED FOR DIARRHEA MODULE**

1. Interviewer, ask respondent: “Do you have ORS stored in your household?”

Yes.....1  
 No.....2

2. Interviewer, ask respondent: “Have any of your children under 5 years old had diarrhea in the past 4 weeks?”

Yes.....1            (Continue to 3)  
 No.....2            (Skip to Form C.)

3. **What is the total number of children under 5 years old with diarrhea in the last 4 weeks for whom you are responsible: \_\_\_\_\_**

4. Please provide the First name of all these children (*Interviewer: list in second column below*)

Serial no.	First name (children 0-59 months with diarrhea in the past 4 weeks)
1	
2	
3	
4	
5	

5. We will be discussing the health of these children in the interview today.

## HOUSEHOLD QUESTIONNAIRE: SOCIOECONOMIC MODULE

Section I: Socioeconomic Module				
No	Questions and Filters	Responses	Codes	Skip To
101	How old are you?		<input type="text"/> <input type="text"/>	
102	What is the <b>highest</b> level of school you attended?	None/ Nursery Primary Vocational Secondary Tertiary/College (Middle level) University	1 2 3 4 5 6	
103	What is your marital status?	Never married Married/Living together Widowed Divorced Separated	1 2 3 4 5	
104	a. How many children do you have?  b. How many of these children are under 5-years-old?	<input type="text"/> <input type="text"/> Children  <input type="text"/> <input type="text"/> Children		
105	Which of the following items are available in this household?  <i>Interviewer: Read list. Multiple responses allowed.</i>	Electricity Radio Television Refrigerator Cell phone/Mobile Landline phone Gas/electric cooker Bicycle Sofa set Water tank NONE OF THE ABOVE	1 2 3 4 5 6 7 8 9 10 11	
106	MAIN MATERIAL OF FLOOR  <i>(Interviewer: Record observation. If interview is not inside house, ask to see inside)</i>	NATURAL FLOOR Earth/Sand Earth and Dung FINISHED FLOOR Stones Bricks Parquet or Polished Wood Mosaic or tiles Cement Other (Specify): _____	1 2 3 4 5 6 7 99	

## HOUSEHOLD QUESTIONNAIRE: SOCIOECONOMIC MODULE

107	<p>MAIN MATERIAL OF WALL</p> <p><i>(Interviewer: Record observation)</i></p>	<p>NATURAL WALLS</p> <p style="padding-left: 40px;">Thatched/Straw</p> <p>RUDIMENTARY WALLS</p> <p style="padding-left: 40px;">Mud and poles</p> <p style="padding-left: 40px;">Un-burnt bricks</p> <p style="padding-left: 40px;">Un-burnt bricks with plaster</p> <p style="padding-left: 40px;">Burnt bricks with mud</p> <p>FINISHED WALLS</p> <p style="padding-left: 40px;">Cement blocks</p> <p style="padding-left: 40px;">Stone</p> <p style="padding-left: 40px;">Timber</p> <p style="padding-left: 40px;">Burnt bricks with cement</p> <p style="padding-left: 40px;">Other (Specify):</p> <p>_____</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>99</p>	
108	<p>MAIN MATERIAL OF ROOF</p> <p><i>(Interviewer: Record observation)</i></p>	<p>NATURAL ROOFING</p> <p style="padding-left: 40px;">Thatched</p> <p style="padding-left: 40px;">Mud</p> <p>FINISHED ROOFING</p> <p style="padding-left: 40px;">Wood/planks</p> <p style="padding-left: 40px;">Iron sheets</p> <p style="padding-left: 40px;">Asbestos</p> <p style="padding-left: 40px;">Tiles</p> <p style="padding-left: 40px;">Tin</p> <p style="padding-left: 40px;">Cement</p> <p style="padding-left: 40px;">Other (specify):</p> <p>_____</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>99</p>	
109	<p>What type of toilet does your household use <b>most</b> of the time?</p>	<p style="padding-left: 40px;">Flush toilet</p> <p style="padding-left: 40px;">VIP latrine</p> <p style="padding-left: 40px;">Covered pit latrine no slab</p> <p style="padding-left: 40px;">Covered pit latrine w/ slab</p> <p style="padding-left: 40px;">Uncovered pit latrine no slab</p> <p style="padding-left: 40px;">Uncovered pit latrine w/slab</p> <p style="padding-left: 40px;">Composting toilet</p> <p style="padding-left: 40px;">Bush</p> <p style="padding-left: 40px;">Other (Specify):</p> <p>_____</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>99</p>	

## HOUSEHOLD QUESTIONNAIRE: SOCIOECONOMIC MODULE

110	What is the main source of drinking water for the members of your household?	<p style="text-align: center;">PIPED WATER</p> <p style="text-align: center;">Piped - into house 1</p> <p style="text-align: center;">Piped to yard/plot 2</p> <p style="text-align: center;">Public tap/standpipe 3</p> <p style="text-align: center;">WATER FROM OPEN WELL/SPRING</p> <p style="text-align: center;">Open well/spring in yard/plot 4</p> <p style="text-align: center;">Open public well/spring 5</p> <p style="text-align: center;">WATER FROM PROTECTED WELL/SPRING</p> <p style="text-align: center;">Protected well/spring in yard/plot 6</p> <p style="text-align: center;">Protected public well/spring 7</p> <p style="text-align: center;">WATER FROM BOREHOLE</p> <p style="text-align: center;">Borehole in yard/plot 8</p> <p style="text-align: center;">Public borehole 9</p> <p style="text-align: center;">SURFACE WATER (RIVER/DAM ETC)</p> <p style="text-align: center;">River/stream 10</p> <p style="text-align: center;">Pond/lake 11</p> <p style="text-align: center;">Dam 12</p> <p style="text-align: center;">Rain water 13</p> <p style="text-align: center;">Tanker truck 14</p> <p style="text-align: center;">Vendor 15</p> <p style="text-align: center;">Other (Specify): 99</p> <hr/>		
111	How much time does it take you to obtain drinking water (round trip)?	<p style="text-align: center;">Water on premises 1</p> <p style="text-align: center;">Less than 30 minutes 2</p> <p style="text-align: center;">30 minutes or longer 3</p> <p style="text-align: center;">Don't know 88</p>		
112	What type of cooking fuel does your household use <b>most</b> of the time?	<p style="text-align: center;">Fire wood 1</p> <p style="text-align: center;">Charcoal 2</p> <p style="text-align: center;">Kerosene/paraffin 3</p> <p style="text-align: center;">Gas/Biogas/LPG 4</p> <p style="text-align: center;">Electricity 5</p> <p style="text-align: center;">Straw/shrubs/grass 6</p> <p style="text-align: center;">No food cooked in the household 7</p> <p style="text-align: center;">Other (Specify): 99</p> <hr/>		
113	What is the <b>main</b> source of income for the household?	<p style="text-align: center;">Farming 1</p> <p style="text-align: center;">Employment: private sector/NGO 2</p> <p style="text-align: center;">Employment: Civil service 3</p> <p style="text-align: center;">Self employed/own business 4</p> <p style="text-align: center;">Jua kali/informal 5</p> <p style="text-align: center;">Casual/contract jobs 6</p> <p style="text-align: center;">Spousal support 7</p> <p style="text-align: center;">Parental support 8</p> <p style="text-align: center;">Domestic work 9</p> <p style="text-align: center;">Pension 10</p> <p style="text-align: center;">Other (Specify): 99</p> <hr/>		
114	Does your household own any agricultural land?	<p style="text-align: center;">Yes 1</p> <p style="text-align: center;">No 2</p> <p style="text-align: center;">Don't know 88</p>		

## HOUSEHOLD QUESTIONNAIRE: SOCIOECONOMIC MODULE

115	Have you worked to earn income in the last <b>7 days</b> ?  <i>(Interviewer: include both wage and self employment work)</i>	Yes No	1 2	
116	Have you worked to earn income in the last <b>12 months</b> ?  <i>(Interviewer: include both wage and self employment work)</i>	Yes No	1 2	
117	How often do you read the newspaper?	Daily Several times a week Once a week Occasionally Never Don't know	1 2 3 4 5 88	→Q119 →Q119
118	In the <b>past 1 month</b> , have you read a newspaper?	Yes No Don't know	1 2 88	
119	Do you have access to and/or do you use the Internet?	Yes No Don't know	1 2 88	

**END OF SOCIOECONOMIC MODULE**

## HOUSEHOLD QUESTIONNAIRE: ACCESS MODULE

120	Have you heard of a treatment for child diarrhea called Oral Rehydration Salts (ORS)	Yes No	1 2 → Q126
121	Have you ever used ORS to treat a child's diarrhea	Yes No	1 2
122	Is there anywhere in your village where you can go to get oral rehydration salts (ORS) to treat your child's diarrhea?	Yes No	1 2 → Q126
123	Where can you go to get oral rehydration salts (ORS) to treat your child's diarrhea?  <b>Circle all that apply</b>	Government Health Center Private Health Center Pharmacy/Drug Shop Village Health Team Community Health Promoter Other _____ Don't Know	1 2 3 4 5 88 99
124	Is there anywhere in your village where you can go to get <b>FREE</b> oral rehydration salts (ORS)?	Yes No	1 2 → Q126
125	Where can you go to get <b>FREE</b> oral rehydration salts (ORS)?  <b>Circle all that apply</b>	Government Health Center Private Health Center Pharmacy/Drug Shop Village Health Team Community Health Promoter Other _____ Don't Know	1 2 3 4 5 88 99
126	Have you heard of a treatment for child diarrhea called Zinc	Yes No	1 2 → 132
127	Have you ever used Zinc to treat a child's diarrhea	Yes No	1 2
128	Is there anywhere in your village where you can go to get Zinc to treat your child's diarrhea?	Yes No	1 2 → 132
129	Where can you go to get Zinc to treat your child's diarrhea?  <b>Circle all that apply</b>	Government Health Center Private Health Center Pharmacy/Drug Shop Village Health Team Community Health Promoter Other _____ Don't Know	1 2 3 4 5 88 99
130	Is there anywhere in your village where you can go to get <b>FREE</b> Zinc?	Yes No	1 2 → 132
131	Where can you go to get <b>FREE</b> Zinc?  <b>Circle all that apply</b>	Government Health Center Private Health Center Pharmacy/Drug Shop Village Health Team Community Health Promoter Other _____ Don't Know	1 2 3 4 5 88 99

## HOUSEHOLD QUESTIONNAIRE: ACCESS MODULE

132	a. How many minutes does it take to travel to the nearest <b>government health center</b> ?	<input type="text"/> <input type="text"/> <b>minutes</b>	
	b. Have you visited the <b>government health center</b> in the past 4 weeks?	Yes No	1 2
133	a. How many minutes does it take to travel to the nearest <b>private health center</b> ?	<input type="text"/> <input type="text"/> <b>minutes</b>	
	b. Have you visited the <b>private health center</b> in the past 4 weeks?	Yes No	1 2
134	a. How many minutes does it take to travel to the nearest <b>pharmacy/Drug Shop</b> ?	<input type="text"/> <input type="text"/> <b>minutes</b>	
	b. Have you visited the <b>Pharmacy/Drug Shop</b> in the past 4 weeks?	Yes No	1 2
135	Is there a <b>Village Health Team (VHT)</b> in your village?	Yes No DK	1 2 → Q138 99 → Q138
136	Do you know where the VHT's household is located?	Yes No	1 2 → Q137b
137	a. How many minutes does it take to travel to the house of the <b>Village Health Team (VHT)</b> ?	<input type="text"/> <input type="text"/> <b>minutes</b>	
	b. Have you had a visit with the <b>Village Health Team (VHT)</b> in the past 4 weeks?	Yes No	1 2
138	Is there a <b>Community Health Promoter (CHP)</b> in your village?	Yes No DK	1 2 → Section 2 99 → Section 2
139	Do you know where the CHP's household is located?	Yes No	1 2 → Q140b
140	a. How many minutes does it take to travel to the house of the <b>Community Health Promoter (CHP)</b> ?	<input type="text"/> <input type="text"/> <b>minutes</b>	
	b. Have you had a visit with the <b>Community Health Promoter (CHP)</b> in the past 4 weeks?	Yes No	1 2

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

<b>SECTION 2 – DIARRHEA TREATMENT</b>				
<i>Interviewer: Aks Q201-279 for all children 0-59 months who had diarrhea in the past 4 weeks</i>				
No	Questions and Filters	Responses	Codes	Skip To
201	First name of selected child <b>Interviewer: check Form B</b>	First name: _____		
202	What is the sex of the child?	Male Female	1 2	
203	How old is the child?  <b>Interviewer: record age in months</b>	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> months		
204	What is your relationship with the child?	Mother Grandmother Aunt Sister Other (specify): _____	1 2 3 4 99	
205	How many older siblings does (NAME) have?	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> Siblings		
206	How frequently does (NAME) come down with diarrhea?	At least once per month Once every 2 months Once every 3 months Once every 4 months Less than once every 4 months	1 2 3 4 5	
207	Can you confirm that (NAME) had diarrhea in the last 4 weeks?	Yes No	1 2	<b>→See instructions in footnote<sup>1</sup></b>
208	Does the child currently have diarrhea?	Yes No	1 2	
209	For how many days has/did the child had diarrhea?	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> days		
210	Has (NAME) also had a fever during this diarrhea episode?	Yes No Don't know	1 2 88	
211	Did (NAME) have any blood in the stools when he or she had diarrhea in the last 4 weeks?	Yes No Don't know	1 2 88	
212	How much was (NAME) given to drink during the recent episode of diarrhea?  <b>Interviewer: Read list. Mark only one answer</b>	Much less than usual Somewhat less than usual About the same Somewhat more than usual Much more than usual Nothing to drink Don't know/Don't remember	1 2 3 4 5 6 88	
213	Is (NAME) usually breastfed?	Yes No	1 2	<b>→Q215</b>

<sup>1</sup> This question is a second check to make sure that we did the screening/selection correctly. If the child did have diarrhea according to the screening information, but they say NO diarrhea here, then stop the interview. First, check if the same caregiver has another child 0-59 months with diarrhea in the past 4 weeks and select that child (or randomly select if more than one). If that selected caregiver doesn't have another child in the same age range w/diarrhea, then check if another caregiver in the household has a child w/diarrhea and re-do the child selection with that different caregiver. If there are no more caregivers in the household with a child with diarrhea in past 4 weeks, then stop and move to next household.

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

214	<p>How much was (NAME) breastfed during the recent episode of diarrhea?</p> <p><b>Interviewer: Read list. Mark only one answer</b></p>	<p style="text-align: right;">Breastfed less 1 Breastfed about the same 2 Breastfed more 3 Not breastfed at all 4 Too old for breastfeeding 5 Don't know/Don't remember 88</p>			
215	<p>How much was (NAME) given to eat during the recent episode of diarrhea? Less than usual to eat, about the same amount, more than usual to eat, or nothing to eat?</p> <p><b>Interviewer: Read list. Mark only one answer</b></p>	<p style="text-align: right;">Much less than usual 1 Somewhat less than usual 2 About the same 3 Somewhat more than usual 4 Much more than usual 5 Nothing to eat 6 Don't know/Don't remember 88</p>			
216	<p>Did you seek <b>advice</b> from someone outside the home for the diarrhea?</p>	<p style="text-align: right;">Yes 1 No 2 Don't know 88</p>	<p>→Q220 →Q220</p>		
217	<p>How many days after the diarrhea began did you first seek advice?</p> <p><b>Interviewer: If the same day, record '00.'</b></p>	<table border="1" style="display: inline-table; margin-right: 5px;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table> days			
218	<p>Indicate the place where you received the <u>main</u> advice for (NAME)?</p> <p><b>Interviewer: Do not read list. Mark only one answer.</b></p>	<p style="text-align: center;"><b>Public Sector</b></p> <p style="text-align: right;">Health center 1 Community distributor (VHT or CHP) 2 Other public sector 3</p> <p style="text-align: center;"><b>Private Sector</b></p> <p style="text-align: right;">Private Clinic/provider 4 Private pharmacy/drug store 5 Faith-based, NGO/CBO 6 Friends/Relatives 7 Traditional healer 8 Don't know 88 Other (specify): _____ 99</p>			
219	<p>What advice did you receive from this place?</p> <p><b>Interviewer: Multiple responses allowed. Do not read list. Probe: Any other advice?</b></p> <p><b>*Note:</b></p> <ul style="list-style-type: none"> <li>• <b>Antidiarrheals include products to slow frequency of stools (i.e. Imodium, Lomotil), and bismuth subsalicylate (i.e. Pepto-Bismol)</b></li> </ul>	<p style="text-align: right;">Give fluids 1 Give ORS 2 Give zinc 3 Give antibiotic 4 Give antidiarrheal* 5 Give fever medicine 6 Give anti-nausea (vomitting) medicine 7 Give more than usual amount of fluid 8 Give more than usual to eat 9 Continue breastfeeding 10 Take to clinic or hospital 11 Don't know 88 Other (specify): _____ 99</p>			

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

220	<p>Did you <b>seek treatment</b> from someone <b>outside</b> the home for the diarrhea?</p> <p><b>Interviewer: make sure respondent understands that “treatment” includes medicine, ORS, zinc, etc.</b></p>	Yes No Don't know	1 2 88	→Q226 →Q226
221	<p>How many days after the diarrhea began did you first seek treatment?</p> <p><b>Interviewer: If the same day, record '00.'</b></p>	<input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/> days		
222	<p>Indicate the <b>first place</b> where you first sought treatment for (NAME)?</p> <p><b>Interviewer: Mark only one answer.</b></p>	<p><b>Public Sector</b></p> Health center Community distributor (VHT or CHP) Other public sector	1 2 3  4 5 6 7 8 88 99	
223	<p>Did <b>request</b> a specific type of treatment or did you let the provider determine the treatment?</p>	Requested Treatment Let Provider Decide Don't know	1 2 88	→Q226 →Q226
224	<p>What treatment(s) did you ask for?</p> <p><b>Interviewer: Do not prompt. Multiple responses allowed</b></p>	ORS Restors Zinc Zinkid Antibiotic Antidiarrheal Don't know Other (specify): _____	1 2 3 4 5 6 88 99	
225	<p>Why did you ask for this treatment?</p> <p><b>Interviewer: Read list. Multiple responses allowed.</b></p>	I always use it Most effective Saw it advertised Other (specify): _____	1 2 3 99	
226	<p>Now, I would like to ask you some questions regarding diarrhea treatment.</p> <p>Did you give (NAME) anything to treat the Diarrhea?</p> <p><b>Interviewer: make sure respondent understands that “treatment” includes medicine, ORS, zinc, solutions, pills, etc...</b></p>	Yes No Don't know	1 2 88	→Q228 →Q228

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

227	<p>a. If yes, can you tell me or show me what treatments you gave (NAME) (either home-prepared or from outside of home)</p> <p>Interviewer: DO NOT PROMPT. RECORD ALL THAT APPLY.</p> <p>b. If yes, can you tell me if you gave your child any of the following treatments</p> <p><b>Interviewer: READ LIST.</b></p> <p><b>Multiple responses allowed; circle all that apply. If respondent still has medicine package, ask to show.</b></p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• <b>Home-prepared treatment include: Sugar Salt Solution, Maize/millet Porridge, Herbal remedies, Passion fruit juice</b></li> <li>• <b>Antidiarrheals include products to slow frequency of stools (i.e. Imodium, Lomotil), and bismuth subsalicylate (i.e. Pepto-Bismol)</b></li> </ul>	<p style="text-align: right;">ORS 1 Zinc 2 Home-prepared treatment 3 Antibiotic 4 Anti-diarrheal* 5 Intravenous fluid 6 Injection 7 Fever medicine 8 Anti-nausea (vomiting) medicine 9 Other pill/syrup 10 Vitamins 11 Don't know 88 Other (specify): _____ 99</p>		
228	Did you have ORS stored in your home when (NAME) started having diarrhea?	<p style="text-align: right;">Yes 1 No 2 Don't Know 88</p>		
229	Did you have Zinc stored in your home when (NAME) started having diarrhea?	<p style="text-align: right;">Yes 1 No 2 Don't Know 88</p>		
230	<b>Interviewer: check if q227=1: ORS was given to the child.</b>	<p style="text-align: right;"><b>Yes 1</b> <b>No 2</b></p>		<b>→Q241</b>
231	<p>You mentioned that you have given (NAME) an ORS. Is that correct?</p> <p><b>Interviewer: If did not give ORS, correct q226 and q227.</b></p>	<p style="text-align: right;">Yes 1 No 2 Don't know 88</p>		<b>→Q241</b> <b>→Q241</b>
232	<p>How many days after the diarrhea began did you first give (NAME) ORS?</p> <p><b>Interviewer: If the same day, record '00.'</b></p>	<p style="text-align: center;"> <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/>             days         </p>		

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

233	From where was the ORS obtained?	<p style="text-align: center;"><b>Public Sector</b></p> <p style="text-align: center;">Health center 1 Community distributor (VHT or CHP) 2 Other public sector 3</p> <p style="text-align: center;"><b>Private Sector</b></p> <p style="text-align: center;">Private Clinic/provider 4 Private pharmacy/drug store 5 Faith-based, NGO/CBO 6 Friends/Relatives 7 Traditional healer 8 Don't know 88 Other (specify): _____ 99</p>		
234	How often did you give the ORS treatment to (NAME)?  <i>Interviewer: Read the list and ask the respondent to select one response.</i>	<p style="text-align: center;">After each liquid stool 1 Morning, mid-day, and night 2 Whenever the child wanted it 3 Once per day 4 Don't know 88 Other (specify): _____ 99</p>		
235	How many packets of ORS did you give to (NAME) during the episode of diarrhea?	<p style="text-align: center;">Less than 1 packet 1 1 packet 2 2 packets 3 3 packets 4 More than 3 packets 5</p>		
236	How many days did you give the child the ORS?	<input type="text"/> <input type="text"/> days		
237	Did you use ordinary water or did you use treated or boiled water when you prepared the ORS?	<p style="text-align: center;">Ordinary (Non Purified) Water 1 Treated Water 2 Boiled Water 3 Other (specify): _____ 99</p>		
238	About how much water did you use for each packet of ORS?	<p style="text-align: center;">Less than half a liters 1 half a liter 2 1 liter 3 2 liters 4 more than 2 liters 5 Don't know 88</p>		
239	Did you purchase the ORS or obtain it free?	<p style="text-align: center;">Purchased 1 Free 2 Don't know 88</p>	→ →	
240	What price did you pay for each packet of ORS?	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> UGX Don't know 88		
241	<b>Interviewer: check if q227=2: Zinc was given to the child.</b>	<b>Yes 1</b> <b>No 2</b>		→Q252
242	You mentioned that you have given (NAME) Zinc. Is that correct?  <i>Interviewer: If did not give Zinc, correct q226 and q226.</i>	<p style="text-align: center;">Yes 1 No 2 Don't know 88</p>		→Q252 →Q252
243	How many days after the diarrhea began did you first give (NAME) Zinc?  <i>Interviewer: If the same day, record '00.'</i>	<input type="text"/> <input type="text"/> days		

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

244	From where was the Zinc obtained?	<p style="text-align: center;"><b>Public Sector</b></p> <p style="text-align: center;">Health center 1 Community distributor (VHT or CHP) 2 Other public sector 3</p> <p style="text-align: center;"><b>Private Sector</b></p> <p style="text-align: center;">Private Clinic/provider 4 Private pharmacy/drug store 5 Faith-based, NGO/CBO 6 Friends/Relatives 7 Traditional healer 8 Don't know 88 Other (specify): _____ 99</p>		
245	How often did you give the Zinc treatment to (NAME)?  <i>Interviewer: Read the list and ask the respondent to select one response.</i>	<p style="text-align: center;">After each liquid stool 1 Once per day 2 Morning, mid-day, and night 3 Every other day 4 Whenever the child wanted it 5 Don't know 88 Other (specify): _____ 99</p>		
246	How many tablets were you given/or did you purchase in total?  <i>Interviewer: Clarify that this tablet NOT packets and includes tablets received from all sources including neighbors.</i>	<p style="text-align: center;">Number <input type="text"/><input type="text"/> Don't know 88</p>		
247	How many Zinc tablets did you give the child in total?	<input type="text"/> <input type="text"/> tablets		
248	<b>INTERVIEWER:</b> If respondent did not give all the tablets to the child ask to see remaining tablets.  <b>RECORD NUMBER OF REMAINING TABLETS</b>	number of remaining tablet _____		
249	How many days did you give the child the Zinc?	<input type="text"/> <input type="text"/> days		
250	Did you purchase the zinc or obtain it free?	<p style="text-align: center;">Purchased 1 Free 2 Don't know 88</p>		
251	What price did you pay for each package of zinc (10 tablets)?	<p style="text-align: center;"><input type="text"/><input type="text"/><input type="text"/><input type="text"/> UGX Don't know 88</p>		→253 For all responses
252	Can you tell me why you did not give your child zinc to treat the diarrhea?	<p style="text-align: center;">Did not know where to buy 1 Zinc is too expensive 2 Used a product I had confidence in 3 Other (specify): _____ 99</p>		
253	<b>Interviewer: check if q227=3: Home prepared solution was given to the child.</b>	<p style="text-align: center;"><b>Yes 1</b> <b>No 2</b></p>		→Q259
254	You mentioned that you have given (NAME) a home-prepared solution. Is that correct?  <i>Interviewer: If did not give home-prepared solution, correct q226 and q227.</i>	<p style="text-align: center;">Yes 1 No 2 Don't know 88</p>		→Q259 →Q259

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

255	Was (NAME) given a Sugar Salt Solution (SSS) during the episode of diarrhea?	Yes No Don't know	1 2 88	
256	What was recipe you used for the SSS	<b>RECORD VERBATIM</b>		
257	How often did you give the home-prepared solution to (NAME)?  <i>Interviewer: Read the list and ask the respondent to select one response.</i>	Frequently After each liquid stool Morning, mid-day, and night Whenever the child wanted it Don't know Other (specify): _____	1 2 3 4 88 99	
258	Did you use ordinary water or did you use treated water when you prepared the home-based treatment?	Ordinary (Non Purified) Water Treated Water Other (specify): _____	1 2 99	
259	<i>Interviewer: check Q227 for whether EITHER 1 or 3 are selected: ORS/SSS was given to the child.</i>	<b>ORS/SSS was given No ORS/SSS was given</b>	1 2	→Q261
260	Why did you not give (NAME) any ORS or SSS solutions?  <i>Interviewer: Do not read list. Multiple responses allowed.</i>	Child not seriously ill Could not find anywhere to get ORS Did not know how to prepare SSS Products too costly Child does not like the taste Didn't know about ORS/SSS It is not a real treatment Not very effective treatment Too far to go to retrieve Other (specify): _____	1 2 3 4 5 6 7 8 9 99	
261	<i>Interviewer: check if q227=4: Antibiotic was given to the child.</i>	<b>Yes No</b>	1 2	→Q265
262	You mentioned that you have given (NAME) an antibiotic. Is that correct?  <i>Interviewer: If did not give antibiotic, correct q226 and q227.</i>	Yes No Don't know	1 2 88	→Q265 →Q265
263	Where did you obtain this antibiotic?  <i>Interviewer: Mark only one answer.</i>	<b>Public Sector</b> Health center Community distributor (VHT or CHP) Other public sector  <b>Private Sector</b> Private Clinic/provider Private pharmacy/drug store Faith-based, NGO/CBO Friends/Relatives Traditional healer Don't know Other (specify): _____	1 2 3  4 5 6 7 8 88 99	
264	Why did you give (NAME) an antibiotic to treat diarrhea?  <i>Interviewer: Do not read list. Multiple responses allowed.</i>	Child had blood in stool Child had fever with diarrhea Health provider said it is more effective I asked for an antibiotic Other (specify): _____	1 2 3 4 99	

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

265	<b>Interviewer: check if q227=5: Antidiarrheal was given to the child.</b>	<b>Yes</b> <b>No</b>	1 2	→Q269
266	You mentioned that you have given (NAME) an Antidiarrheal. Is that correct?  <b>Interviewer: If did not give Antidiarrheal, correct q226 and q227.</b>	Yes No Don't know	1 2 88	→Q269 →Q269
267	Where did you obtain the antidiarrheal?  <b>Interviewer: Mark only one answer.</b>	<b>Public Sector</b> Health center Community distributor (VHT or CHP) Other public sector  <b>Private Sector</b> Private Clinic/provider Private pharmacy/drug store Faith-based, NGO/CBO Friends/Relatives Traditional healer Don't know Other (specify): _____	1 2 3  4 5 6 7 8 88 99	
268	Why did you give (NAME) an antidiarrheal to treat diarrhea?  <b>Interviewer: Do not read list. Multiple answers allowed</b>	Health provider said it is more effective I think it is most effective I asked for an antidiarrheal This treatment has worked well for me in the past Only treatment available in shop Other (specify): _____ _____ _____	1 2 3 4 5 99	
269	<b>Interviewer: check if q227=6: Intravenous fluid was given to the child.</b>	<b>Yes</b> <b>No</b>	1 2	→Q272
270	You mentioned that you gave (NAME) an intravenous fluid treatment. Is that correct?  <b>Interviewer: If did not give an Intravenous fluid, correct q226 and q227.</b>	Yes No Don't know	1 2 88	→Q272 →Q272
271	Where did you obtain this intravenous treatment?  <b>Interviewer: Mark only one answer.</b>	<b>Public Sector</b> Health center Community health worker Other public sector  <b>Private Sector</b> Private Clinic/provider Private pharmacy/drug store Community distributor Faith-based, NGO/CBO Friends/Relatives Traditional healer Don't know Other (specify): _____	1 2 3  4 5 6 7 8 9 88 99	

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

272	<b>Interviewer: check if q227=7: Injection was given to the child.</b>	<b>Yes</b> <b>No</b>	<b>1</b> <b>2</b>	<b>→Q275</b>
273	You mentioned that you gave (NAME) an injection. Is that correct?  <b>Interviewer: If did not give an injection, correct q223 and q251.</b>	Yes No Don't know	1 2 88	<b>→Q275</b> <b>→Q275</b>
274	Where did you obtain this injection?  <b>Interviewer: Mark only one answer.</b>	<b>Public Sector</b> Health center Community health worker Other public sector  <b>Private Sector</b> Private Clinic/provider Private pharmacy/drug store Community distributor Faith-based, NGO/CBO Friends/Relatives Traditional healer Don't know Other (specify): _____	1 2 3  4 5 6 7 8 9 88 99	
275	<b>Interviewer: Check if Q226=1: Child received treatment for their diarrhea.</b>	<b>Yes</b> <b>No</b>	<b>1</b> <b>2</b>	<b>→279</b>
276	Can you tell me why you did not provide any treatment to (NAME) during this recent episode of diarrhea?	Child not very sick Could not afford Did not know where to purchase treatment Child too young for drugs No treatment available in my area Don't know Other (specify): _____	1 2 3 4 5 88 99	
277	Did (NAME) have <b>symptoms of malaria</b> in the last 4 weeks?	Yes No Don't know	1 2 88	<b>→279</b>
278	Did you give (NAME) any treatment for his/her malaria symptoms?	Yes No Don't know	1 2 88	

### ORS use of other household members

**Interviewer:** Ask once all children with diarrhea in the past 4 weeks have been inquired about (Q201-Q278)

279	Did anyone else in your household aside from the children we discussed use ORS for any reason in the past 4 weeks?	Yes No Don't Know	1 2 88	<b>→282</b>
280	Was this ORS stored in the household?	Yes No Don't Know	1 2 88	
281	Who used the ORS?	Child older than 5 Sibling Husband Other		

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

282	Do you have any salt stored in your household?	Yes No Don't Know	1 2 88	
283	Do you have any sugar stored in your household?	Yes No Don't Know	1 2 88	

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

### Use of Other Health Products

284	In the past 4 weeks did you use any chlorine tablets to make your water clean and safe for your child/children to drink?	Yes No  Don't know	1 2 88	<b>→286</b>
285	How often did you use chlorine tablets to clean the water you gave to your child?	Rarely Some of the time Most of the time Always	1 2 3 4	
286	In the past 4 weeks did your children sleep under a bed net?	Yes No  Don't know	1 2 88	<b>→288</b>
287	How often did your children sleep under a bed net?	Rarely Some of the time Most of the time Always	1 2 3 4	

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

### Contact with Community Health Promoter

“Now I am going to ask you some questions about the community health promoter (CHP) in your village. A CHP is someone in your village that visits households and sells health products and other household goods.”

288	Is there a community health promoter in your village?	Yes No Don't know	1 2 88	→Q301 →Q301
289	How often does the CHP visit your household?	Every Week Every Month Every 3 Months Less Than Every 3 Months Never Visited My Household	1 2 3 4 5	→Q301
290	What does the CHP do when they visit your household?  <b>Do Not Prompt. Circle all that apply.</b>	Hygiene Training Diarrhea Treatment Training Child Health Training Product Sales Other (Record Verbatim) _____	1 2 3 4 5	
291	Does the CHP ever talk to you about how to treat your child's diarrhea?	Yes No Don't know	1 2 88	
292	Has the CHP Visited Your Household in the <b>past 4 weeks</b> ?	Yes No Don't know	1 2 88	→Q301 →Q301
293	What did the CHP do when they visit your household?  <b>Do Not Prompt. Circle all that apply.</b>	Hygiene Training Diarrhea Treatment Training Child Health Training Product Sales Deliver ORS+Zinc Other (Record Verbatim) _____	1 2 3 4 5	
294	Did the CHP talk to you about how to treat your child's diarrhea?	Yes No Don't know	1 2 88	

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

### SECTION 3 – BELIEFS ABOUT DIARRHEA AND TREATMENT

301	<p>If your child becomes sick with diarrhea, what do you think the best way to treat the child is?</p> <p><b>Instructions to enumerators: Do not prompt. Record all that apply.</b></p>	<p style="text-align: right;">No treatment 1                  Increased Fluids 2                  Increased Food 3                  Herbal remedies 4                  Antibiotics 5                  Antidiarrheals 6                  Zinc 7                  ORS 8                  Home-made sugar salt solution 9                  Others specify _____ 99                  Don't know 88</p>		
<p><b>Interviewer: Check if 301=8 (Respondent chose ORS as best way to treat diarrhea). Ask 302 and 303 if 301=8. Otherwise skip to 304.</b></p>				
302	<p>How soon after the child's diarrhea symptoms begin should you begin giving the child ORS?</p> <p><b>Interviewer: Do not read responses. Probe to classify as one of the response options</b></p>	<p style="text-align: right;">Immediately (after 1<sup>st</sup> loose stool) 1                  After child has multiple loose stools 2                  After 1 day if diarrhea persists 3                  After 2 days if diarrhea persists 4                  Other specify _____ 99</p>		
303	<p>How frequently should the child be given ORS?</p> <p><b>Interviewer: Do not read responses. Probe to classify as one of the response options</b></p>	<p style="text-align: right;">Once per day 1                  Twice per day 2                  Three times per day 3                  Four times per day 4                  After each loose stool 5                  Other specify _____ 99</p>		
<p><b>Interviewer: Check if 301=9 (Respondent chose Zinc as best way to treat diarrhea). Ask 304-306 if 301=9. Otherwise skip to 307.</b></p>				
304	<p>How soon after the child's diarrhea symptoms begin should you begin giving the child Zinc?</p> <p><b>Interviewer: Do not read responses. Probe to classify as one of the response options</b></p>	<p style="text-align: right;">Immediately (after 1<sup>st</sup> loose stool) 1                  After child has multiple loose stools 2                  After 1 day if diarrhea persists 3                  After 2 days if diarrhea persists 4                  Other specify _____ 99</p>		
305	<p>How frequently should the child be given Zinc?</p> <p><b>Interviewer: Do not read responses. Probe to classify as one of the response options</b></p>	<p style="text-align: right;">Only one time per episode 1                  Every other day 2                  Once per day 3                  Twice per day 4                  Three times per day 5                  Four times per day 6                  After each loose stool 7                  Other specify _____ 99</p>		
306	<p>For how many days should the child continue to receive Zinc.</p> <p><b>Interviewer: Record number of days. Record 99 if respondents reports "until 10 tablets used" or "until packet it empty".</b></p>	<p style="text-align: center;"> <input style="width: 20px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black;" type="text"/> <b>days</b> </p> <p style="text-align: center;">Until 10 tablets used 99</p>		

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

This section asks your opinion on certain issues. Please tell me if you **believe that** the following statements **are true or false**.

1. Ability: Knowledge				
		True	False	Don't know
307	Diarrhea can be caused by lack of cleanliness	1	0	88
308	Diarrhea can be associated with lack of cleanliness, such as not washing hands with water and soap before eating	1	0	88
309	Diarrhea can be caused by drinking unsafe water	1	0	88
310	Diarrhea can be caused by eating unclean food	1	0	88
311	Antibiotics should only be used for certain kinds of diarrhea	1	0	88
312	Most diarrhea can be managed at home without any treatment	1	0	88
313	Giving food-based fluids is equally as effective as giving ORS	1	0	88
314	Diarrhea can be caused by growing teeth	1	0	88

Please tell me if you **“agree strongly,” “agree somewhat,” “disagree strongly,”** or **“disagree somewhat”** with the following statements.

2. Motivation: Threat Severity					
		Strongly Agree	Agree Somewhat	Disagree Somewhat	Strongly Disagree
315	Children can die from diarrhea	4	3	2	1
316	Your family will have a problem if one of the members has diarrhea	4	3	2	1
317	It does not seem like anyone around here has a problem because of diarrhea	4	3	2	1
318	Diarrhea is a major health problem in your community	4	3	2	1
319	Diarrhea is a problem in the poorer segment of the community only	4	3	2	1

3. Motivation: Threat Susceptibility (Children Under Five)					
		Strongly Agree	Agree Somewhat	Disagree Somewhat	Strongly Disagree
320	If your child gets diarrhea it is best just to do nothing and it will pass in time	4	3	2	1
321	The children under five in your household are healthy so their bodies can fight off diarrhea without doing anything	4	3	2	1
322	Children under five are too young to experience serious medical problems from getting diarrhea	4	3	2	1
323	You are not worried about the children (child) under five in your household getting diarrhea	4	3	2	1
324	Children are more likely to get diarrhea than adults	4	3	2	1

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

**Interviewer: Skip the following questions if respondent has not heard about ORS in Q120.**

<b>4. Opportunity: Availability</b>						
		<b>Strongly Agree</b>	<b>Agree Somewhat</b>	<b>Disagree Somewhat</b>	<b>Strongly Disagree</b>	<b>Don't know</b>
325	Drug stores nearby always have ORS for sale	4	3	2	1	88
326	ORS treatments are difficult to get around here	4	3	2	1	88
327	There is a place nearby where you can get ORS when your child needs it	4	3	2	1	88
328	You don't know where to get ORS	4	3	2	1	88
329	ORS treatments are too expensive	4	3	2	1	88
330	You are willing to pay the current price for ORS (UGX 400-500 per sachet)	4	3	2	1	88
331	ORS treatment products are available within walking distance from your home	4	3	2	1	88
<b>5. Motivation: Outcome Expectations</b>						
		<b>Strongly Agree</b>	<b>Agree Somewhat</b>	<b>Disagree Somewhat</b>	<b>Strongly Disagree</b>	<b>Don't know</b>
332	ORS is effective for treatment of diarrhea	4	3	2	1	88
333	ORS reduces the duration of a diarrheal episode	4	3	2	1	88
334	ORS does not help in reducing the severity of a diarrheal episode	4	3	2	1	88
335	Use of ORS reduces the risk of dehydration in children	4	3	2	1	88
336	ORS reduces the risk of a new diarrheal episode in the following 2 to 3 months	4	3	2	1	88
337	ORS helps to strengthen the immune system of children	4	3	2	1	88
<b>6. Capacity/Ability: Use of Products</b>						
		<b>Strongly Agree</b>	<b>Agree Somewhat</b>	<b>Disagree Somewhat</b>	<b>Strongly Disagree</b>	<b>Don't know</b>
338	ORS should be used for every type of child diarrhea	4	3	2	1	88
339	All child diarrhea should be treated with an antibiotic	4	3	2	1	88
340	ORS has too many side effects, so you don't feel safe giving ORS to your small child	4	3	2	1	88
341	ORS tastes bad so your child won't take it.	4	3	2	1	88
342	You would use ORS the next time your child has diarrhea if you had to pay a small fee for it.	4	3	2	1	88
343	You would use ORS the next time your child has diarrhea if it were free.	4	3	2	1	88

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

**Interviewer: Skip the following questions if respondent has not heard about zinc in Q126.**

<b>4. Opportunity: Availability</b>						
		<b>Strongly Agree</b>	<b>Agree Somewhat</b>	<b>Disagree Somewhat</b>	<b>Strongly Disagree</b>	<b>Don't know</b>
344	Drug stores nearby always have zinc for sale	4	3	2	1	88
345	Zinc treatments are difficult to get around here	4	3	2	1	88
346	There is a place nearby where you can get zinc when your child needs it	4	3	2	1	88
347	You don't know where to get zinc	4	3	2	1	88
348	Zinc treatments are too expensive	4	3	2	1	88
349	You are willing to pay the current price for zinc (UGX 1000 per 10 tablets)	4	3	2	1	88
350	Zinc treatment products are available within walking distance from your home	4	3	2	1	88
<b>5. Motivation: Outcome Expectations</b>						
		<b>Strongly Agree</b>	<b>Agree Somewhat</b>	<b>Disagree Somewhat</b>	<b>Strongly Disagree</b>	<b>Don't know</b>
351	Zinc is effective for treatment of diarrhea	4	3	2	1	88
352	The child should stop receiving Zinc once the diarrhea stops	4	3	2	1	88
353	Zinc reduces the duration of a diarrheal episode	4	3	2	1	88
354	Zinc does not help in reducing the severity of a diarrheal episode	4	3	2	1	88
355	Use of zinc reduces the risk of dehydration in children	4	3	2	1	88
356	Zinc reduces the risk of a new diarrheal episode in the following 2 to 3 months	4	3	2	1	88
357	Zinc helps with the ability of my child to stay healthy	4	3	2	1	88
<b>6. Capacity/Ability: Use of Products</b>						
		<b>Strongly Agree</b>	<b>Agree Somewhat</b>	<b>Disagree Somewhat</b>	<b>Strongly Disagree</b>	<b>Don't know</b>
358	Zinc should be used for every type of child diarrhea	4	3	2	1	88
359	Child diarrhea should be treated with an antibiotic	4	3	2	1	88
360	Zinc has too many side effects, so you don't feel safe giving zinc to your small child	4	3	2	1	88
361	Zinc tastes bad so your child won't take it.	4	3	2	1	88
362	Zinc is only a nutritional supplement, not an effective treatment for pediatric diarrhea.	4	3	2	1	88
363	Zinc should be given along with	4	3	2	1	88

## HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE

	ORS to be most effective.					
364	It is difficult to remember to give a child zinc when the diarrhea has stopped	4	3	2	1	88
365	You would use zinc the next time your child has diarrhea if you had to purchase it	4	3	2	1	88
366	You would use zinc the next time your child has diarrhea if it were free	4	3	2	1	88

### END OF DIARRHEA MODULE

### FORM C.

#### Checking Packaging and Incentive Payment

1. **Did the community health promoter in your village provide you with any ORS and zinc packets about 4 weeks ago?**

Yes.....1

No.....2 →[End Interview]

2. **Do you still have any of the packaging, used or unused, from the ORS and zinc you were provided?**

Yes.....1

No.....2 →[End Interview]

3. **Can I please see the packaging you still have?**

Yes.....1

No.....2 →[End Interview]

4. **Interviewer: record observation of packets**

a. **Total number of ORS packets (full and empty)**\_\_\_\_\_

b. **Total number of empty ORS packets**\_\_\_\_\_

c. **Total number of full ORS packets**\_\_\_\_\_

d. **Total number of zinc packets (full and empty)**\_\_\_\_\_

e. **Total number of zinc tablets used**\_\_\_\_\_

f. **Total number of zinc tablets remaining**\_\_\_\_\_

**Interviewer: provide respondents who had at least one ORS or zinc packet with incentive payment**

**HOUSEHOLD QUESTIONNAIRE: DIARRHEA MODULE**

**THANK YOU FOR PARTICIPATING IN THIS STUDY!**

**END TIME /\_\_/\_\_/\_\_/\_\_/**

**INTERVIEWER: PLEASE MAKE SURE HOUSEHOLD UNIQUE ID IS INDICATED ON  
TOP OF THE IDENTIFICATION TABLE**