

Baseline Assessment Report of Nutrition at the Center Project

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Figure 1: Map of N@C Baseline Survey Intervention and Control Districts



Acronyms

ANC	Antenatal Care
BMI	Body Mass Index
EDHS	Ethiopian Demographic Health Survey
FHI	Food for the Hungry International
HDA	Health Development Army
HEP	Health Extension Program
HEW	Health Extension Worker
HSDP	Health Sector Development Plan
IFHP	Integrated Family Health Program (a national USAID program implemented by JSI and Path.
IYCF	Infant Young Child Feeding
MDD	Minimum Dietary Diversity
MDS	Minimum Dietary Diversity Score
MUAC	Mid Upper Arm Circumference
NNP	National Nutrition Program
ORDA	Organization for Rehabilitation and Development in Amhara
PADET	Professional Alliance for Development Ethiopia
PPC	Post Partum Care
PPS	Probability Proportional to Size
WDDS	Women Dietary Diversity Score

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First and foremost, we are grateful to the women of Simad, Ebinat and Tach Gaynt Woredas who readily consented to participate in this study and approved their young children's enrolment for anthropometry and anemia measurements. The women provided their valuable time and candidly shared their personal experiences on all issues covered in this study.

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Executive Summary

Introduction

Nutrition at the Center (N@C) is a multi-sectoral project of CARE Ethiopia designed to improve the nutritional status of women (15-49) and children less than 2 years of age in Ebinat and Simada Woredas of Amhara Regional State in the Federal Democratic Republic of Ethiopia. The project plans to impact nutrition-related behaviors, increase utilization of maternal and child health and nutrition services, increase household adaptation of appropriate hygienic and sanitation practices and increase availability and equitability of access to nutrient-dense food. This report is compiled based on the baseline study conducted in the three districts from 26 January to 19 February 2014, just after the crop harvesting season in the sample districts. The baseline survey covered the two intervention and one control (Tach Gaint) districts.

Methodology

The baseline study applied a cross-sectional observational method. The survey included interviewer-administered questions, on-site observation, anthropometry measure and haemoglobin level determination to generate benchmark information. The survey targets were women of reproductive age group (15-49 years of age) who gave birth in the last 36 months to their youngest babies. Besides, a woman should have resided in the area permanently (more than six months) and her youngest baby should have stayed during the survey time with her in order to be eligible for the survey. For a child to be approached for anthropometry measurement he/she must have been aged between 6 to 35 months during the survey period.

Results

A total of 2132 women were interviewed in the three districts. About 60% of the sample were from intervention sites and 40% were from control woredas. Nearly 30% of the mothers targeted by this study were from the age group 25-29 years, followed by 24% of women from 30-34 years and 20% from 20-24 years. Nearly about 4% of the women were 15-19 years old.

The overwhelming majority of households obtained food from own production and market purchase. About 11.6% of the households in the intervention and 17.3% in the control area reported to have preserved fruits or vegetables in the last 12 months. The widely applied vegetables and fruits methods of preservation in the intervention area had been solar drying (56%) and smoking (42%).

Based on the survey results, the percentage of households experiencing food deprivation scale ranging from moderate to severe hunger is 8.8% and 5.7% in the intervention and control woredas, respectively. About 4.3% of women in the intervention and 10.6% in control woredas met the minimum dietary diversity score, 5 or more food groups per day.

By applying WHO's cut-off points, the percentage of non-pregnant mothers who were experiencing severe anemia was nearly zero in both the N@C intervention and control districts. The mild and moderate anemia levels were 5% and 3% in the intervention area and 8% and 1.5% in the control district.¹ As this study demonstrated, the percentage of undernutrition in mothers (BMI below 18.5) in

¹ Pregnancy is self-reported by the mothers included in the sample survey.

the study sites were 28% and 24% in the intervention and control sites respectively with mean BMI 19.8 for both. This is slightly higher than the Amhara region-wide average obtained by EDHS 2011.

Among the women who had received ANC service, only 35% had it four or more times. About 41% of women in Simada, 30% of Ebnat women and 35% of Tach Gaynt had the four or more number of checks during their last pregnancy. About 81.3% of the women in the intervention and 77.1% in the control woredas delivered their last child at home.

About 72% of the women in the intervention area and 78% in the control district reported that they started breastfeeding their babies immediately or within an hour of delivery. About 75% of the infants in the intervention and 80% in the control district qualified to meet WHO's exclusive breastfeeding standard. Only 3% of the intervention district and 9% of the control district 6-23 months children met the requirements for the for minimum dietary diversity score. Among the intervention districts, 4% of Simada and 2% of Ebinat met the minimum score. About 6.2% of the intervention and 8% of the control children aged 6-23 months had received foods known to contain iron or commercially iron-fortified foods.

The level of moderate or severe stunting among the children in the intervention areas was 50.4% while the severe form was 27.1%. Likewise in the control district moderate or severe stunting prevalence was 51.5% and severe stunting was 26.3%. In general about 56% of the sample households in the intervention woredas reported to have access to protected water sources throughout the year in the project intervention woredas. This figure found to be higher in Simada % (67.3%) compared to Ebinat % (50.1%).

The majority of women (69.3%) in the intervention areas appear to have freedom to move anywhere on their own without company. As a result only nearly half of the women indicated that they can go to trainings, adult literacy and community meetings by their own. Women (63%) of Simada tend to enjoy less degree of freedom of mobility compared to the intervention district, Ebinat, (74.3%) in a number in most instances.

About 49.3% and 61.5% of women in the intervention and control sites, respectively, indicated that they agree or strongly agree that they can rely on people from the community to help when they face difficulty in breastfeeding their children. About 56% of women in the control and 44% of in the intervention have agreed that a man is justified to hit his wife or partner if she did not cook properly. Nearly 43% of the control women and 39% of the intervention agreed that they support if the woman is beaten when she neglects her children. This indicates that most of the women still view household work is their obligation and a husband is justifiable to beat them if they fail to fulfill these duties.

Conclusion

The majority of women enrolled into this study happened to be young rural women with no formal education. Most of them married off before the age of 18 years which exposed them to early age pregnancy that elevates risk of complications of pregnancy or childbirth.

A host of interlinked factors worked together to make women vulnerable to malnutrition and underweight. Cultural factors forced them to childhood marriage. Consumption of poor dietary diversity foods and low health service utilization further made them vulnerable to and deteriorated their malnutrition status.

Most of the household consumption comes from production of food from family owned plots of lands. A few own home gardens which are to a limited extent used for production of vegetables and fruits of non Vitamin A. Vegetable preservation practice is low and mostly relied on traditional techniques. Looking at the possible micronutrient access from vegetable sources, there appears to be an unreliable supply for low or no production months. This might point to the fact that the available garden not fully utilized to grow vegetables/fruits or the production is not sufficient enough to reserve for preservation.

The majority of the women in this study have initiated breastfeeding in less than one hour, exclusively breastfed till six months and continued breastfeeding their youngest child. Apart from this, some(15%) of mothers discard the colostrum and provide prelacteal feeds which potentially can be damaging for the health of newborns.

The bivariate and multivariate analysis has indicated that stunting is associated with child's sex, infant age, and maternal factors such as place of delivery, age of marriage and underweight status.

Recommendation

Prevention of child marriage is one of the key measures to prevent stunting in the study districts as early age child bearing have effect on placental development. The minimum age of marriage in Ethiopia is 18 and effort should be directed at increasing awareness at community level and educate children, youth and men groups to improve their understanding and reinforce the law. Working with faith-based organizations and men's groups is a strategic direction to enhance uptake of the message on harmful consequences of child marriage on continued multi generational malnutrition.

In order to relieve women from poorly spaced pregnancies which deplete the mother's body of essential nutrients and may pose a further risk on the feeding practice of the under two children in cases where mothers incorrectly believe that their nutritional status impacts their ability to produce breastmilk, promotion of long acting and permanent methods of contraceptives is a crucial intervention to promote in the study areas.

Integration of food security and WASH with Nutrition intervention should be N@C's key intervention strategy. Promotion of homestead gardens could be a focus to enhance nutrient-dense vegetable production by women in order to ensure availability of nutrients required for development of children and women.

1 Introduction

1.1 Study area Location

The baseline survey for Nutrition at the Center (N@C) Project is conducted in three woredas: two interventions (Ebinat and Simada) and one control (Tach Gaynt). The control woreda was included because of application of the quasi-experimental design in the evaluation system of the project. All the three woredas are located in South Gondar Zone, Amhara Regional State of Ethiopia. They are located in the northern highland part of Ethiopia known to be chronically food insecure. Hence targeted by national social transfer from Productive Safety Net Program (PSNP) since 2005.

Livelihood characteristics

Simada:

Simada woreda covers 2,281.72 square kilometer area. There are 40 kebele administrations in the woreda; 39 (rural) 1(urban). The total Population of the woreda is 251,751 among which 125,367 are male and 126,384 are female. Percentage of population under five is 13.5% and women 15-49 years are 23.8% (Source: District offices).

The woreda has two livelihood intervention zones: Guna Highland (GHL) and Abay Beshilo Basin. Crop production, livestock and petty trade are the main basis of livelihood and income source. Households mostly face food shortage for more than 6 months. All cereals except rice are available from the month of October, November, December, January and February. The usual staple food is with more cereals and less legumes. Households utilize haricot bean, 'nug (Niger seed), guaya (Litherism-legumes)' for sale and teff (*Eragrostis teff*), maize, chickpea, barley wheat, beans, pea for consumption. CARE, ORDA and FH are humanitarian organizations operating in the woreda on community health and nutrition.

Ebinat:

The total area of Ebinet Woreda is estimated to be about 2,498.38 square kilometer. The woreda has 36 kebeles of which one is urban and 35 are rural. Total population is estimated at 243,221 among which 51% are female. Percentage of population under five is 35,359 (15%) and from the female population the proportion of women of reproductive age between 15 to 49 years is about 46.5% (55,457).

Major livelihood activities in Ebinat Woreda include crop production, livestock, and petty trade. The most staple food is cereals. Principal agriculture products from poor rural households are combinations of cereal crops; barley, teff, maize, sorghum, millet which are also the common agricultural products for sell and consumption. The communities in the woreda experience chronic food shortage from year to year. There are quite a number of humanitarian organizations working in this target area including CARE, Concern, PADET, ORDA, IFHP and Red Cross. The following organizations CARE, PADET, IFHP and CHILD Health are working on nutrition and WASH interventions based on the discussion held with the district health offices.

1.2 Background on Nutrition at the Center Project

Nutrition at the Center (N@C) is a multi-sectoral project of CARE Ethiopia designed to improve the nutritional status of women (15-49) and children less than 2 years of age in Ebinat and Simada Woredas

of Amhara Regional State in Federal Democratic Republic of Ethiopia. The project plans to impact nutrition related behaviors, utilization of maternal and child health and nutrition services, increase household adaptation of appropriate hygienic and sanitation practices and increase availability and equitability of access to nutrient-dense food. Figure 1 depicts the results framework of the for N@C project. The project success is measured by the reduction of stunting among under 3, anemia among children under 2 years of age and under nutrition and anemia among women of reproductive age (15-49 years). See Annex 3 for the project results framework.

The purpose of the baseline survey is to collect benchmark quantitative information on malnutrition level and other immediate and distant factors impacting nutritional status of women and children in both intervention and control districts. The information obtained from the baseline survey is expected to help CARE to set targets for the program outcome and impact indicators which will be monitored and compared against during midterm and evaluation.

The baseline data collection was held in February 2014. Dadimos held series of discussions with CARE team in order to prepare ahead and to effectively coordinate the field work while keeping an eye on the quality of the data to be generated. In order to guide the preparations, the field travel and direct the field team to adhere to the agreed methodology, Dadimos in consultation with CARE Ethiopia, developed a comprehensive field manual which provided a road map from the preparation stage all the way to data collection and submission of the report to CARE Ethiopia.

2 Methodology

The baseline study applied a cross-sectional observational method. The survey included interviewer administered questions, on site observation, anthropometry measure and haemoglobin level determination to generate benchmark information. In addition, secondary data from DHS, other population-based surveys and health system reports are referred to enrich the primary data.

The survey targets were Women of reproductive age group (15-49 years of age) who gave birth in the last 36 months to their youngest babies. Besides, a woman should have resided in the area permanently (more than six months) and her youngest baby should have stayed during the survey time with her in order to be eligible for the survey. For a child to be approached for anthropometry measurement he/she must have been aged between 6 to 35 months during survey period and the child must have been 6-23 months to be included for anaemia testing.

2.1 Sampling

The survey has followed a two stage cluster sampling method whereby kebeles were the primary and households were the secondary sampling units. The sample size determination and sampling strategy was determined by CARE team. Probability proportional to size (PPS) which provides greater chance of selection for primary units having greater size of secondary unit, was applied in the selection of sample kebeles. In order to apply PPS procedure a sample frame of clusters with recent measures of size (number of households/individuals) made available by woreda offices in advance of sample selection.

2.1.1 Sample size determination

First, the size of the secondary sampling units, households/individuals, were calculated for three key indicators of N@C by applying the following statistical formula which is used to capture a difference in the prevalence of a condition between two episodes of time.

$$n = \frac{D * (Z_{1-a} + Z_{1-b})^2 * [p_1 (1 - p_1) + p_2 (1 - p_2)]}{(p_2 - p_1)^2}$$

Where

n = required sample size

D = design effect (assumed, D = 1.2);

p1 = estimated baseline prevalence rate of a condition

p2 = planned target prevalence rate of a condition

Z1-a = the z-score corresponding to the desired confidence level (typically, we set a = .05, thus Z0.95 = 1.645); and

Z1-b = the z-score corresponding to the desired power level (typically, we set b = 0.80

The sample size estimation was categorized into the following three clusters based on similarity of the data collection methods.

a) *Sample size for anthropometry measurement*

As per CARE's proposal exclusive breastfeeding and stunting were taken as key indicators to estimate sample size. 'Percentage of mothers who exclusively breastfed their children in the first six months' was used as the key indicator for sample size determination for children age groups (0-5), (6-17) months and their mothers. The prevailing baseline rate was set at P1 = 52% and expected rate of change at P2 = 65% (EDHS 2011). Using a significance level of 5%, power = 80%, difference between baseline and endline rates is at 13%, with a design effect of 1.2, the study required sample was estimated at 213 children in each age group of (0-5) and (6-17) months of age.

Stunting was chosen as indicator to estimate sample size for children of age 18-35 months. It was assumed stunting will be reduced by 9% at end of the program. The prevailing baseline rate was set at P1 = 41% and expected rate of change at P2 = 32% (EDHS 2011). Using a significance level of 5%, power = 80%, difference between baseline and endline rates is at 9%, with a design effect of 1.2, a sample size of 850 in (18-35) months of age group following an unbalanced design to capture stunting in the peak age group in the intervention area, and a sample of 425 in the comparison area were estimated.

In sum, a total of 1276 children in the intervention area were required for anthropometric study. From the comparison area 213 children are required in each age group of (0-5) and (6-17) and 425 in the (18-35) months of age. Thus, for both intervention and control, the needed total sample size for anthropometric measurement was estimated at 2,127.

b) *Sample size for iron deficiency anaemia*

In order to determine the sample size for determination of iron deficiency anemia, prevalence of anemia in children and mothers were used as key indicator. The N@C project aims to improve anemia in mothers from the baseline prevalence of 17% to the end line prevalence of 4% (13% reduction) in 15-49 years of age. Thus, for sample size estimation with P1 = 17%, P2 = 4%, significance level = 5%, power = 80% and the difference between baseline and endline = 13% with a design effect of 1.2, 157 mothers were required per woreda survey areas to test the assumption. Thus, the number of mothers required to test for anemia is 314 in each intervention and control area.

Anemia status in young children was expected to be improved from the baseline prevalence of 44% to the endline prevalence of 31% (13 percentage point reduction) among participating children (6-23) months of age. Thus, for sample size estimation with P1 = 44%, P2 = 31%, significance level = 5%, power = 80% and the difference between baseline and end line = 13% and considering a design effect of 1.2, 206 children are required in each woreda to test the assumption. Thus, the total number of young children required for assessing anemia in N@C was 412. Likewise, nearly 206 reproductive age women and the same 206 children 6-23 months old children were consider from both intervention and control areas for haemoglobin test to detect prevalence of anaemia within these population groups.

c) *Sample size for household food security, WASH, Women empowerment conditions*

In order to assess food security situation, access to WASH, gender related conditions and IYCF practices, a total of 1276 mothers in the intervention area were required based on the sample size calculated for anthropometric study. From the comparison area 213 women with children age of (0-17) and 425 women with children of age (18-35) months were taken into consideration. Thus, for both intervention and control the required sample size of women for this measurement was 2127 women (households).

Table 1: Summary of sample population distribution in intervention and control Woredas

Target	Intervention (two Woredas)			Control (one Woreda)		
	Interview	Anthropometry	Anemia	Interview	Anthropometry	Anemia
Children	No	1276	206	No	851	205
Women	1276	1276	206	851	851	205
	1276	2552	412	851	1702	410

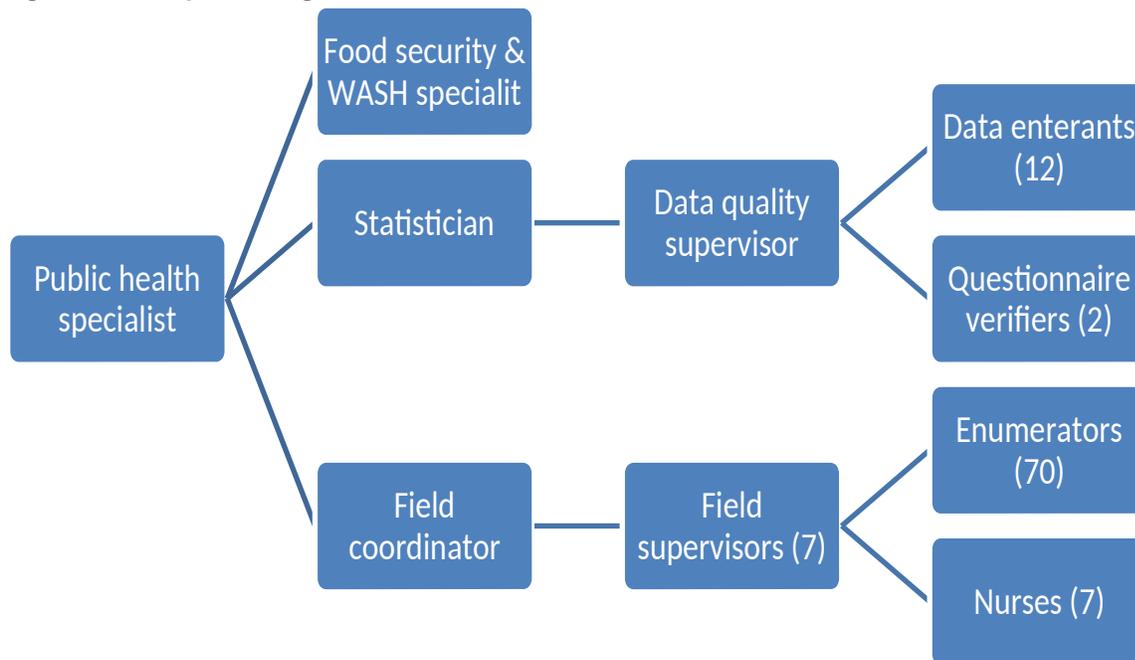
2.1.2 Selection of secondary sampling units

Selection of secondary sampling unit or households was done applying bottle spinning method. The bottle spinning was done in a central location of the kebele mostly in the kebele administration compound or near a health post assuming that it is the geographic and population centre as well. A levelled surface was spotted to run the bottle spinning. The line along the bottle determined the direction of the enumeration team movement. One team heads to the direction of the top of the bottle another one in the opposite direction to the bottom of the bottle. The team starts from the first house confirming for availability of women and children as per the inclusion criteria. If no eligible person, the team goes to the next household and checks again. When team found appropriate woman, sought for consent and completed the interview and then anthropometry. The enumerator team writes code on the door using a chalk to signal household completed the interview and adds additional coding if the child was eligible for anemia testing.

2.2 Study team organization

The staff involved in this study is grouped into core team and field team. The core team consisted of lead public health specialist, a food security and WASH specialist, and a statistician. The field team included field coordinator, enumeration team and data entry and quality assurance team. Field team was led by a field coordinator who was assisted by the public health specialist. The field coordinator in Overall the survey had seven field supervisors. A field supervisor oversaw 10 enumerators and one anemia testing nurse. The statistician travelled to the field to provide training and assist data entrants and data verifiers in the initial stages of data entry. The statistician was also supported by an assistant who oversaw the double data entry procedure and field level questionnaire verification. The following chart shows the study team organization

Figure 2: Survey team organization



2.3 Organization of the questionnaire

The survey questionnaire was originally designed by CARE and refined based on two rounds of field tests following enumeration teams training. It contained questions organized into 10 categories and 21 modules ranging from A to Z. Translation of the questions to Amharic was also dealt with by CARE Ethiopia team. Dadimos conducted a separate translation exercise which helped to compare with CARE's translated version. But it was CARE's version taken as a standard Amharic tool. The biggest module (Q) consists of 4 sub sections. The last two modules (S and Z) are not questionnaires per se rather they are meant to collect physical measurement and blood sample test results. The questionnaire consists of the coded letters on the left side and the skip pattern guides on the right side (see Annex 1).

The following are the distinct categories of the questionnaire:

1. Background Information : Household, youngest children, and mother (Module A, B, C, & D)
2. Food security (Module E to Module J)
3. Mothers 15-49 health (Module K),
4. Nutrition (Module L and M),
5. Child health (Module N)
6. WASH (Module O and P)
7. Women empowerment (Module Q with four sub clusters)
8. Safety net participation (Module R)
9. Mother anthropometry (ht, wt, MUAC) and anemia (Module S)

10. Child anthropometry (wt, ht, oedema) and anemia (Module Z)

The questionnaire part that relates to anemia test was split from the main questioner with its separate consent form. It was duplicated separately based on the sample size required for anemia.

2.4 Field team formation and training

The field supervisory, data collection, entry and quality control staff were recruited from the survey woredas, Debre Tabor area and Bahir Dar town. The recruitment and selection process was undertaken in consultation with CARE field office in Debre Tabor. An advertisement was posted for a week followed by screening and short listing using a standard developed by Dadimos.

A total of 80 persons were brought on board for training in Debre Tabor. From these 70 were enumerators, 7 supervisors and 3 were additional enumerators on waiting list who attended two weeks class room and field exercise supported training. To offset for drop outs, additional 6 individuals were brought on board in the middle of the training who were provided immediately with off working hour crash course to catch up with the large group. Four days prior to the end of the training course, seven blood sample collectors started their two days training separately and one day session as part of the main trainees.

A schedule for training of supervisors and enumerators was designed by CARE Ethiopia team and enriched with inputs from Dadimos. Due to the large size of participants, the training was conducted in two separate halls for most of the days except during the days when it was generally agreed that combined sessions would add value over separate sessions. The training started off with provision of background information on N@C program and objectives of the baseline survey, spent seven days discussing the questionnaire line-by-line, two days on anthropometry measurement, calibration of instruments (height board and weighing scale) and one day on field survey methodology. At the end of each training day, the trainers and note takers (supervisors) from both sessions convened a debriefing session to share points raised in their separate trainings and agree on action points needed to be taken forward collectively. Both sessions were jointly facilitated by CARE and Dadimos staff.

There was a separate half a day session for supervisors on details of field methodology focusing on bottle spinning method, data quality checks, instrument calibration, age disaggregated sample distribution per kebele, coordination between the enumeration and anemia team, and household coding plan. In order to enhance enumerator's interviewing skills and to get them conversant with the questions, each participant took part in roll play exercises and self and group reflections sessions to pick lessons for individual skill improvement. The participants spent two more days exercising on anthropometry measurement on one another first but on real children and mothers as well in a later stage at a place arranged by CARE within Debre Tabor town.

The final day of the training, field simulation exercise took place in a kebele close to Debre Tabor whereby participants were split to small groups under supervisors, to take part in anthropometry standardization session and field test of questionnaire. More over this particular session shed light on the unforeseen possible logistic challenges and helped to uncover some insights on best possible ways of making the field arrangement. Based on feedback from participants and plenary sessions, changes were agreed to be made on the questionnaire, inputs and arrangement for field work were made in order to successfully undertake the actual field work. The questionnaire printing was done after

collecting feedback from the field testing exercises. The standardization exercise helped to identify enumerators' individual differences in anthropometry measurement and this was used to include additional exercise sessions especially for the ones who needed extra skills and this feedback was also used as input in setting up field teams and pairing up individuals for field data collection.

Training for the blood sample collectors started when the enumerators were sent off for field for questionnaire field testing and standardization exercise. The training for blood sample collectors focused on how to ask for consent, how to take blood sample, sample size and sampling frame for anemia test targets, how to coordinate with the enumerators and age disaggregated targets per kebele, operate hemocue machine including fitting and disassembling the parts, calibration, cleaning and keep the machines and its parts safe.

2.5 Data collection

In accordance with the field data collection arrangement and team movement plan which was developed by Dadimos and adjusted per CARE's feedback, the entire field team moved to Simada district first and started the data collection on the 26th January 2014. The field team worked in Simada for the first two consecutive days. This was planned in order to pick the challenges on the logistic or other aspects early and provide feedback to the entire team together before they disperse to widely apart locations. The details of the team movement plan are shown in Annex 4.

The following points outline the steps applied by field team when they arrive to a kebele for the first time:

- They met or informed the kebele administration that the survey team is on the ground.
- Drew the map of the kebele boundary indicating the important institutions such as schools, health facilities, kebele office and other prominent social structures by consulting health extension workers and key informants or local guides in the kebeles. The household distribution was clearly seen in the maps showing where the villages and houses are densely populated and where the population is sparse.
- Collected information on the estimated number of households from the kebele or government office.
- Spotted a central location in the kebele to do bottle spinning. This has been done in most cases at the centre of the kebele usually next to the kebele office or health posts.

The data collection team was arranged in a way that one supervisor overseen 10 enumerators and one blood sample collector. There were 7 seven supervisors in total. The enumerators were organized to work in pairs accompanied by one field guide for a pair. The pairs were teamed up based on their performance in the standardization test and participation in the class room discussion on the questionnaire so they can complement one another. The pairs were guided to do interview and anthropometry measurement alternatively so they would share the work load fairly. The field guide role was to support the pair in locating households and assist in transporting the height boards and weighing balance. When the pair went into a house, they first checked if the women and children in the households met inclusion criteria, then requested for consent, began with interview of the mother, proceeded to anthropometry measurement of the mother and finally measure anthropometry of the baby (over six months).

Each pair was given one locally produced wooden height board of 2m tall usable for both the child and the mother as well, one digital weighing scales fitted with batteries to weigh both mothers and children, and MUAC tapes of adult size, pre-defined household IDs, questionnaire, and chalks to mark on the household door that will signal other enumerators that the household had completed the interview and alert the anaemia team that the household is eligible for anaemia test or not. Each blood sample collector was teamed up with five pair of enumerators. The blood collectors were dressed in white gown to give good impression in the community. They carried bag to keep their items, hemocue machine, calibration reagents and standard sample, supplies of lancet, alcohol detergent, gauze, bag to keep used gauze and lancets. Each blood sample collector was assigned with one field guide different from the ones assigned to enumerators. Communications between the field guides assigned for enumerators and blood sample collectors facilitated in locating anaemia eligible households.

Each morning supervisors have handed out questionnaire, child age groups distributed per kebele and pre-coded household IDs to enumerators and blood sample collectors. During the data collection supervisors moved from one pair to another to check for compliance of the enumerators to inclusion criteria, interview techniques, anthropometry measurement procedures and provided on spot feedback. At the end of the day, all enumerators and blood sample collectors met at a central place in a kebele mostly near where they will be picked up by a vehicle and handed over the completed questionnaire. Supervisor checks each and every questionnaire received and confirms compliance based on the quality checklist provided. The Household IDs and distribution of age of children per kebele is checked against the plan and the balance is discussed with enumerators. The supervisor passes the completed and checked questionnaire to the field supervisor who will hand over them to data entrants.

2.6 Data entry quality control protocol

A double entry protocol was followed in this survey. The data entry template was developed by CARE using CSPro 5.1. This template was adjusted by the Dadimos team based on the final questionnaire agreed upon after field test. A total 12 data entrants were recruited from Bahir Dar and Debre Tabor towns based on their experience and familiarity with the software planned to be used. They were trained for five days and carried out the data entry in Debre Tabor while the data collection was running.

To ensure quality of data, every questionnaire was entered twice and regularly checked for consistency between two entries. When deviations between two data entrants were identified the team had to go back to the paper questionnaire and spot the mistakes. Based on this data entry, mistakes were corrected by repeated comparison between two sets of entries on the same bunch of questionnaires. Before the data, entry data verification was made and real time feedbacks were given to enumeration team on any anomalous completion of questionnaires.

2.7 Data analysis

Dummy tables were designed by CARE initially basing on the study objectives, survey questions and possible sound relationships of the variables under study. Where there was no specific guidance or requirement stated from CARE, Dadimos opted for international standardized indicators by making reference to leading development agencies in the specific sector under consideration. Dadimos applied descriptive, bivariate and multivariate analysis and the team's analytical skills to objectively present the findings of this study. The data analysis is undertaken by IBM SPSS Statistics Version 20 and WHO Anthro v 3.2.2.

2.8 Ethical considerations

The questionnaire was accompanied by a standard consent form which had separate versions for interview and anaemia testing. The interview was preceded with reading out the consent statement to and seeking verbal consent from the respondent mothers. Nevertheless the blood collectors secured written consent for each of the woman who have allowed their and/or child's bloods to be drawn. Prior to the survey, CARE Ethiopia was granted ethical clearance from Bureau of Health of Amara Regional state.

2.9 Challenges of the Study

Alike any other surveys conducted in rural areas characterized by poor road infrastructure, electric power supply access to competent field workers. For the sake of documenting lessons we have reported the key challenges we faced in the course of this study as follows.

- 1. Getting field workers:** At the beginning the survey was planned to have an enumeration team consisting of a lead interviewer and a blood sampler. Based on this it was planned to have 35 health professionals (such as nurses) to withdraw blood sample from and measure hemoglobin level of mothers and children. However, it was not possible to get this number of health professionals both from the study districts and region for employment. Therefore, finally we decided to have one health professional per supervision team which consists five enumerations team by replacing the intended health professional per enumeration team by individuals having experience in anthropometry measurement. In this way we added 35 anthropometry measurers and reduced health professionals from 35 to seven.
- 2. Field level data entrants:** Data entry at field level was the requirement defined by CARE. Thus, we recruited about 10 data entrants from the Town of Debretabor. These people were inexperienced in data entry except they were computer literate. This situation demanded the Dadimos team provision of an extended training and time of practice for the data entry team members. In addition, with the request of CARE, Dadimos recruited a statistician from a local university-college to supervise the day to day works of the data entry team.
- 3. Anthropometry measurement tools:** The height boards provided by CARE were locally made in Barhirdar Town. Initially a board was provided for each of the enumeration team. However, some of the boards warped and fail apart in a few days of the field work time. To correct this, CARE field team immediately replaced some of the warped boards and for the rest of the cases the enumeration teams jointly used a few boards together.
- 4. Incompetent enumerators:** Getting competent data collectors was also a challenge expected by Dadimos and CARE team before the start of the survey. To address this expected problem three additional enumerators were included in the survey training program. In the course of the training weak training participants were identified and excluded from participation in the field data collection at the same time without affecting the total number of enumerators required for the survey.
- 5. Power outage during data entry:** Repeated power interruption was also one of the challenges faced by the data entry team. Apart from this the power backup generator in CARE's compound

at Debreabor was not effective to run desktop PCs being used for data entry purpose. Thus this has extended the time of data entry work.

3 Findings and description

3.1 Demographics Characteristics of Mothers

Under this section of the report age, marital status, age of marriage, educational background, household head status, number of pregnancy and number of living children are described (Table 2). As the inclusion criteria limits, the women enrolled into this study had only been between 15-49 years of age with at least one child of their own within the age of 0 up to 36 months.

A total of 2132 women were interviewed in the three districts. About 26.4% (562) were from Simada, 33.5% (715) from Ebinat and 40% (855) were from Tach Gaynt woredas. In other words, 60% of the sample were from intervention sites and 40% were from control woreda.

The mean age of mothers in all the sample districts is between 28 and 30 years. Nearly 30% of the mothers surveyed in this study were from the age group 25-29 years followed by 24% of women from 30-34 years and 20% from 20-24 years. Nearly about 4% of the women were 15-19 years old.

Table 2: Percentage distribution of women age and marital status

Mothers' age (years)	Simada (N=558)	Ebinat (N=715)	Intervention (N=1273)	Control (N=854)
15-19	3.6	3.9	3.8	3.0
20-24	19.2	23.8	21.8	18.1
25-29	27.6	29.2	28.5	31.9
30-34	24.9	23.9	24.4	23.1
35-39	17.6	13.8	15.5	18.1
40-44	6.6	4.3	5.3	5.3
45-49	0.5	1.0	0.8	0.5
Mean age	29.8	28.3	29.0	29.5
Median age	29.50	28.0	28.0	29.0

Marital status is a milestone in reproductive health marking societal authorization to engage in marriage, sexual practices and child birth. In the intervention woredas, nearly 99% of the women had been in marital or cohabitating relationships indicating the rural community's strong support for marital relationships. Nearly 90% of the sampled women were in monogamous marital relations while 0.3 percent was just single. The women who identified themselves as single were female headed households and had been having 1-4 children. Polygamy was reported by only 3% of the women and was distributed fairly between the control and intervention sites. About 9.2% of women in the control district and 7.6% in the intervention sites reported of having been in cohabitating in a monogamous relationship.

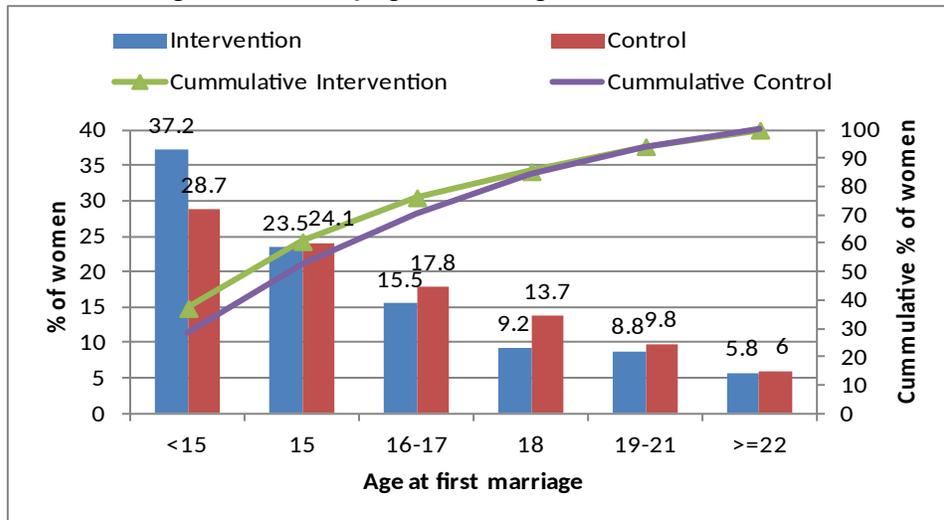
Nearly almost all women (98% in intervention woredas) live with men bound by. As Table 3 illustrates, in both the intervention (3.8%) and control (4.2%) woredas about a few women engaged in polygamous arrangements.

Table 3: Percentage of women by current marital status

	Simada (N=553)	Ebinat (N=715)	Intervention (N=1277)	Control (N=855)
Married (monogamous)	83.0	86.2	84.8	87.5
Married (polygamous)	6.1	0.6	3.0	3.1
Cohabiting with partner (monogamous)	8.7	9.6	9.2	7.6
Cohabiting with partner (polygamous)	0.7	0.8	0.8	1.1
Divorced or separated	0.4	1.3	0.9	0.4
Widowed	0.5	1.1	0.9	0.5
Single	0.5	0.4	0.5	0.0
Married or cohabited	98.5	97.2	97.8	99.3
Marriage or cohabited polygamous	6.8	1.4	3.8	4.2

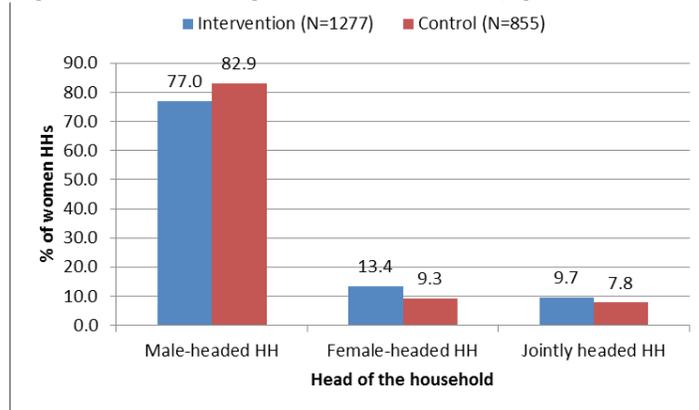
Age at first marriage in which a woman started to live with her partner is a critical time since it determines the duration of her reproductive period. Among all women interviewed in the intervention areas, over a third (37.2%) of them were married before the age of 15 years while 74% were married before they turned 18 years (Figure 3). This is an indication of high prevalence of child marriage in the study districts. In the intervention sites, the percentage of married women before 18 years of age was 76% while in the control district it was 70%. Among the 20-49 years of old women, the median age of marriage was found to be 15 years irrespective of the district they lived in. This is consistent with the Ethiopian Demographic and Health Survey (EDHS 2011) finding where the median age of marriage for the same age women was indicated to be 15.1 for entire Amhara Region. The current survey result indicates the higher chance for women to expose to early pregnancy before they get physiologically and emotionally ready for child bearing. This certainly will heighten the women risk of developing complications from pregnancy to childbirth.

Figure 3: Percentage of women by age of marriage



Women's decision making role in the household, i.e. whether she has the privilege to allocate sufficient household resources on items that matter to her so much or not, depends on her status in the household. Based on the survey results, about 77% and 82.9% of the interviewed women in the intervention and control woredas, respectively, reported that men were the heads of households.

Figure 4: Percentage of households by gender of household head status



Further analysis within the Female headed household showed, 62% were in cohabitating relations while 18% were in marital relationships. From the 9% who were jointly heading their households, 90% were in marital relations.

Women's educational status is known to have direct effect on the household nutrition and health status. About 40% of the women in the control district and 32%

in the intervention areas had attended some kind of schooling. Among the women who reported to have received education most were in primary school but it also includes adult education (5.7% in intervention) and vocational schools.

When their reading skill was tested by providing a text on a paper, 31% of women in the intervention and 39% of the control woreda were able to correctly read it. This is lower than the number reported as having had any schooling. However further analysis showed only 10% and 15% of sample women in the

intervention and control woredas respectively are able to read (Figure 5).

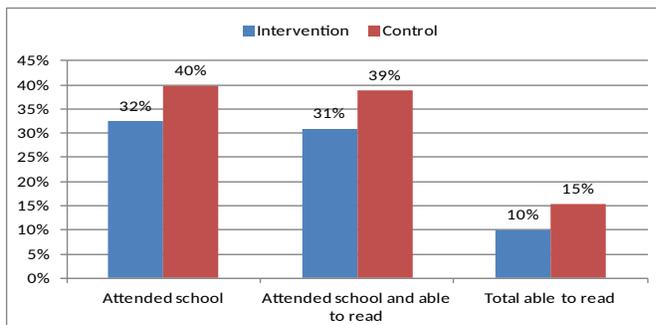


Figure 5: Percentage of women school attendance and ability read

History of pregnancy and number of living children a woman had signify the number of possible children she could have had if the pregnancy is not terminated or leads to live birth. Among the interviewed women of reproductive age, the mean number of pregnancies a woman had was 3.6 in intervention woredas and 3.5 in control woreda.

A woman's current fertility is partially reflected by her current pregnancy status. Among the women in both sites, 3.6% self-reported that they were pregnant during the survey. When seen across districts 4% of the women in the intervention area were pregnant while this was 3% in the control district. This should be taken with caution as self-reported pregnancy is prone to high degree of error. According to EDHS 2011 the high total fertility rate in Amhara region (4.2) signifies the potential of women in the region to bear high number children in the reproductive age group. This study has shown that mean number of living children a woman had was 3.2 in the three districts. The figure applies to each individual district with no major variation across.

Table 4: Percentage of women state of pregnancy and situation of living children

Number of times of pregnancy	Simada (N=562)	Ebinat (N=715)	Intervention (N=1277)	Control (N=855)
Number of times of pregnancies				
1	18.5	20.1	19.4	20.5
2-3	34.3	34.8	34.6	31.5
4-5	28.6	27.6	28.0	31.3
6+	18.5	17.5	17.9	16.7
Mean # of pregnancy	3.64 (562)	3.55 (715)		3.54 (853)
Percentage of women by number of living children				
1-2	39.7	41.4	40.6	37.4
3-4	36.3	33.8	34.9	40.2
5+	24.0	24.8	24.4	22.3
Mean # of living children			3.2	3.2
Percentage of women currently pregnant				
Yes	3.7	4.3	4.0	3.1
No	96.3	95.7	96.0	96.9

3.2 Access to Food and Extension Services

3.2.1 Access to Food

The overwhelming majority of households reported to obtain food from own production and market purchase. Based on this in the intervention areas about 77.5% of households access food from own production while 67.7% indicated market as the other means to obtain food. Likewise, in the control woreda, Tach Gaynt 93.9% and 84.4% reported own production and purchase as the main sources of food, respectively. Apart from this two sources about 9.00% households in the intervention and 42.6% in the control woredas access food from formal social transfer undertaken by NGOs and government through emergency or Productive Safety Net Program². Specially in Tach Gaynt Woreda PSNP beneficiaries are high obtaining both a predictable social transfer both in the form of cash and food. As a result of the cash transfer the proportion of households sourcing food from market is high in comparison with the intervention sites. Likewise nearly 1% to 2 % respondents access food for the family by begging from other. Borrowing food is also indicated as important sources of food for over 3% of households in both the intervention and control woredas.

Table 5: Percentage of households by main sources of food

	Simada	Ebinat	Interventio	Control
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² The formal social transfer includes food for work, government food aid and NGO food aid. These percentages were calculated from the households that received one or more of social transfers.

			n	
Produce Food	76.2%	78.6%	77.5%	93.9%
Purchase food	62.3%	72.0%	67.7%	84.4%
Food for work	6.0%	4.3%	5.1%	34.0%
Government food aid	6.9%	1.0%	3.6%	14.9%
NGO Food Aid	0.9%	0.3%	0.5%	0.2%
Trade Borrow	4.3%	2.2%	3.1%	3.4%
Beg	1.6%	0.3%	0.9%	1.8%
Other	2.1%	1.4%	1.7%	2.8%

Respondent women from the sample household accessing food from production were further asked as to who is mainly responsible for the production of consumption food in the household. Based on this about 67.5% in the intervention woredas and 81.6% in Tach Gaynt the women indicated that their husbands are mainly responsible for the production consumption food. Similarly 13.9% of respondent women indicated that they themselves are mainly responsible for the production of household food in the intervention woredas. Likewise, from Tach Gaynt 5% of women indicated the same. However, the survey did not have adequate information to explain this interesting variation in gender role between the two areas.

Figure 6: Percentage of households accessing food in the form of social transfer

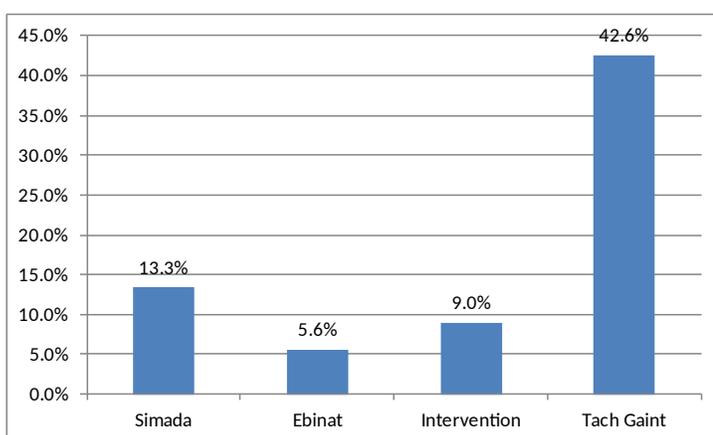


Table 6: Percentage of households by family members mainly responsible for the production of consumption food

	Simada	Ebinat	Intervention	Control
Respondent's husband	66.7%	68.1%	67.5%	81.6%
Respondent women	14.8%	13.3%	13.9%	5.0%
Other male family members	2.3%	1.7%	2.0%	3.7%
Other female family member	1.2%	0.6%	0.9%	1.8%
Other	3.0%	5.3%	4.3%	1.8%
Farm Collective	2.5%	1.1%	1.7%	1.1%
Neighbors	1.4%	0.3%	0.8%	0.4%

Home gardens are important sources of diversified food from plant sources and cash income usually managed by women in rural areas. To understand the extent of such a practice the N@C baseline survey asked household if they have and use home gardens to grow food for family consumption. Based on this about a quarter (20.8%) and 28.2% of households in the intervention and control woredas, respectively, reported a home gardening practice (Figure 7). Table 8 also indicates the distribution of ownership of

home gardens. Specifically, in the intervention woredas, about 43% of respondents reported co-ownership (husband and wife jointly own) while 28.8% of them indicated that their husbands own and decide on the home garden alone.

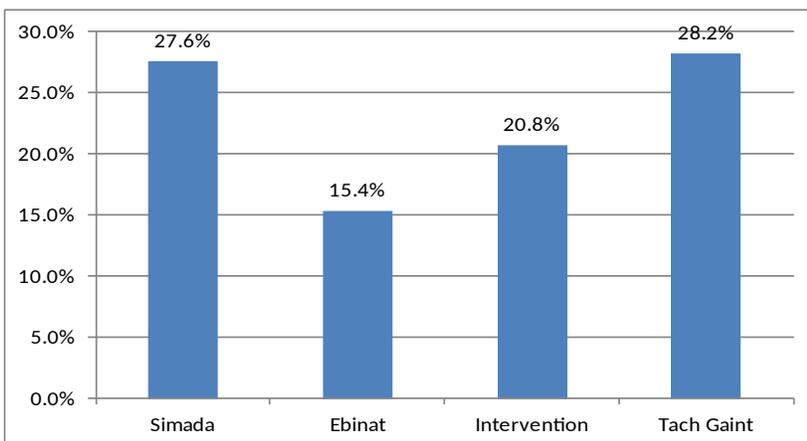


Figure 7: Percentage of households having home gardens

Table 7: Percentage distribution of ownership of home gardens

	Simada N=157	Ebinat N=111	Interventio n N=268	Control N=338
Both the women and her husband	38.3%	49.7%	43.0%	39.5%
Respondent women's husband	29.4%	28.0%	28.8%	34.8%
Respondent women	9.0%	3.7%	6.8%	8.2%
Other male relative	7.1%	8.2%	7.6%	7.0%
Other female relative	5.8%	1.9%	4.2%	3.1%
Land owner	6.4%	2.8%	4.9%	1.4%
Neighbor	0.7%	1.0%	0.8%	0.0
Other	3.3%	4.6%	3.8%	6.1%

3.2.2 Agriculture Extension Services

The agricultural extension system in Ethiopia largely focuses on three areas including crop, livestock and natural resources management. Woreda office of agriculture usually assigns three development agents, one per these streams to be led on additional coordinator. Accordingly woredas also assign addition irrigation development agent if a kebele has water resources potential and famers owned irrigation fields. With regard to access to agricultural extension service respondent women were asked if they have been personally met or being visited by crop and livestock extension workers in the past 12 months prior to the survey. The survey result shows that about 62.5% of women in intervention and 55.6% in control woredas were visited by crop extension workers during the 12 months prior to the survey. The same way 43.9% and 40% of women in the intervention and control woredas, respectively, have been visited by the livestock extension workers.

Table 8: Percentage of women visited by extension workers in the last 12 months

	Simada N=562	Ebinat N=715	Intervention N=855	Control N=855
Met crop extension worker	53.6%	49.1%	62.5%	55.6%
Met livestock extension worker	37.0%	37.8%	43.9%	40.0%

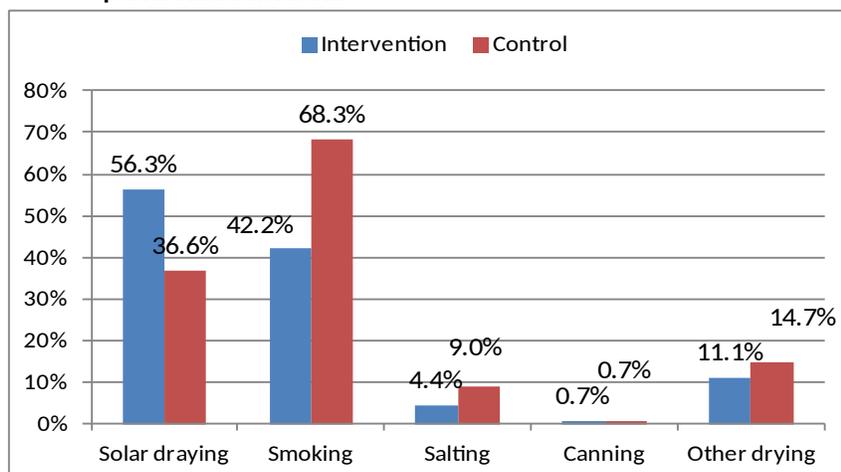
3.3 Food Preservation and Storage

One of the food-based approaches to improve dietary intake of micronutrients is to ensure a year-round availability of nutrient-dense foods. This can be promoted by developing household and community food preservation and processing techniques. The sample women in the three districts were asked on vegetable, fruits and food crop preservation practices at household level. Based on this, about 11.6% of the households in the intervention and 17.3% in the control area reported to have preserved fruits or vegetables in the last 12 months (Table 10). The widely applied vegetables and fruits methods of preservation in the intervention area had been solar drying (56%) and smoking (42%) while for the control site it was smoking (68%) and solar drying (37%). The prominent vegetables preserved in the intervention sites had been garlic (81%), onion (26%) and pumpkin (19%) while in the control pumpkin (89%), garlic (18%) and onion (8%) have been preserved during the reference period (Figure 9).

Table 9: Percentage of households reported preservation of vegetables or fruits in the last 12 months and food crops from the last harvest

	Simada N=562	Ebinat N=715	Intervention N=1277	Control N=855
Fruits or vegetables	16.2%	8.0%	11.6%	17.3%
Food crops	51.6%	66.9%	60.1%	86.9%

Figure 8: Percent of households by type of vegetable and fruit preservation methods



Preservation of staple food crops, mainly cereals and pulses, is crucial in order to ensure availability household food for a period until the next harvest season is secured. The practice of preservation food crops from the previous harvest appears to differ widely from one district to another. About 40% of the households from the intervention districts and 13%

from control district never preserved any crop in the last 12 months. This difference might be associated to size availability of food from own production per household.

Among the ones who preserved, in the intervention areas, the most commonly preserved crops had been 'Teff' (83%), wheat (65%), bean (44%), and barely (43%). About 90% of the Simada women and 80% of Tach Gaynt and Ebinat had preserved 'Teff'.

The prominent reasons for storing food crops were for household consumption (99%), to sell for higher prices (28%) and for planting (48%). The most commonly used food crops storage facility in the intervention districts had been traditional storage (82%) followed by improved locally made structure (8%). The traditional storage is known to result in loss of bioavailability of the nutrients as well as destruction of the food stored by rodents and pests. The average post- harvest losses (manly due to

poor storage system) of food crops such as Teff, Sorghum, Wheat and Maize are 12.9%, 14.8%, 13.6% and 10.9% respectively (Derege A. *etal* 1989). This level of food crop loss is high for Ethiopia experiencing food insecurity largely due to factors associated with food availability.

Table 10: Food crop preservation practices

	Simada (N=562)	Ebinat (N=715)	Intervention (N=1277)	Control (N=855)
Food crops storage practice	51.9%	66.9%	60.3%	87.3%
Types of crops preserved				
Teff	90.1%	79.5%	83.5%	82.6%
Wheat	54.8%	70.8%	64.7%	71.7%
Barley	26.4%	54.3%	43.7%	35.3%
Bean	29.1%	51.1%	42.8%	41.6%
Pea	15.1%	34.4%	27.1%	37.3%
Chickpea	21.2%	27.1%	24.9%	26.8%
Millet	1.7%	14.6%	9.7%	0.8%
Grass pea	41.1%	6.3%	19.5%	2.9%
Maize	7.9%	6.1%	6.7%	5.4%
Sorghum	5.1%	5.8%	5.6%	6.2%
Lentil	3.1%	4.2%	3.8%	9.1%
Flaxseed	3.1%	1.5%	2.1%	9.5%
Haricot bean	4.1%	0.6%	1.9%	16.0%
Oats	0.3%	0.2%	0.3%	0.1%
Red pea	2.1%	0.0%	0.8%	11.0%

3.4 Food Security (Household Hunger Scale)

3.4.1 Household Hunger Scale

Household Hunger Scale (HHS) is an important indicator of a food deprivation scale that measures proportion of households experiencing by three categories of food deprivation: little to no hunger, moderate hunger and severe hunger (FFP, 2011). These questions are posed to the respondents as follows:

- i) In the past [4 weeks/30 days] was there ever no food to eat of any kind in your house because of lack of resources to get food?
- ii) In the past [4 weeks/30 days] did you or any household member go to sleep at night hungry because there was no enough food?
- iii) In the past [4 weeks/30 days] did you or any household member go a whole day and night without eating anything at all because there was not enough food?

Usually, it is recommended to combine moderate and severe as an indicator to measure level of food insecurity at household level (FFP, 2011). Based on the survey results, the percentage of households

experiencing food deprivation scale ranging from moderate to severe hunger is 8.8% and 5.7% in the intervention and control woredas, respectively. These figures seem to be low for the recall period, because the survey was conducted immediately after the 2013 main harvesting season in the area.

Table 11: Percentage of households by food access scale (HHS)

Food deprivation scale in HHs	Simada N=562	Ebinat N=715	Intervention N=1277	Control N=855
Little to no hunger	92.5%	90.2%	91.2%	92.4%
Moderate hunger	7.1%	7.8%	7.5%	5.7%
Severe hunger	0.4%	2.0%	1.3%	.0%
Moderate to severe	7.5%	9.8%	8.8%	5.7%

3.4.2 Women’s Dietary Diversity Score

Women’s dietary diversity score (WDDS) reflects the consumption of variety of foods and food groups in the diet that helps to ensure adequate intake of micronutrients nutrients, and promotes good health among women of reproductive age (15-49 years of age). There is ample evidence from developed countries showing that dietary diversity is indeed strongly associated with nutrient adequacy, and thus is an essential element of diet quality.³ Recently, a study on WDDS tested the ability of simple dietary diversity scores to predict micronutrient adequacy of diets of women of reproductive age (Gina Kennedy *et al* 2013). Based on this study all dietary diversity scores were significantly correlated with micronutrient adequacy of the diet.

Following this, the women were asked if they have consumed from list of 20 food groups one by one in the previous day or in the last normal day (excluding feast day or fasting day), inside and outside the home. Based on the WDDS guideline (*ibid*) all these food groups were further regrouped into 9 food groups. The result of this analysis indicates that a widespread barely diversified food intake by reproductive age women⁴. About 4.3% of women in the intervention and 10.6% in control woredas meet the minimum dietary diversity score, 5 or more food groups per day (Arimond et al, 2008).

When we further examine the intake of individual diet groups, starchy staple (99.3%); legumes, nuts and seeds (77.0%); and other fruits mainly including tomatoes, onions and tubers (33.8%) are the most important sources of diets for women in the intervention woredas. Apart from these due to limited production system, consumption culture of the society in general and women in particular economic deprivation consumption of protein and micronutrients from animal sources are very limited. For instance in the intervention area about 11.4% reproductive age women reported consumption of meat and fish during the 24 hours recall while only less than 6% of women indicated vitamin A from plant sources and green leafy vegetable.

³ Randall, Nichaman and Contant, Jr. 1985; Krebs-Smith et al. 1987; Kant 1996; Drewnowski et al. 1997; Cox et al. 1997; Lowik, Hulshof and Brussaard 1999; Bernstein et al. 2002; Foote et al. 2004.

⁴ We analyzed WDDS using 9 food groups see Table 13.

Table 12: Women's dietary diversity score

Food groups / WDDS	Simada	Ebinat	Intervention	Control
1. Starchy staple	98.6%	99.9%	99.3%	100.0%
2. Legumes, nuts and seeds	59.3%	90.9%	77.0%	93.2%
3. Other fruits and vegetables	36.3%	31.9%	33.8%	48.9%
4. Meat and fish	11.2%	11.6%	11.4%	12.0%
5. Other vitamin A rich vegetables and fruits	5.7%	5.7%	5.7%	13.1%
6. Dark green leafy vegetables	4.6%	2.7%	3.5%	9.1%
7. Eggs	5.2%	2.8%	3.9%	9.0%
8. Milk and milk products	9.6%	6.2%	7.7%	8.3%
9. Organ meat	2.0%	1.1%	1.5%	2.8%
WDDS 5 or more food groups, during normal days	5.2%	3.6%	4.3%	10.6%
WDDS 4 or more food groups, during normal days	12.3%	11.5%	11.8%	24.9%
WDD: % of women who ate from 1 food group	22.8%	4.6%	12.6%	3.4%
WDD: % of women who ate from 2 food groups	40.7%	55.7%	49.1%	38.0%
WDD: % of women who ate from 3 food groups	23.3%	28.3%	26.1%	33.7%
WDD: % of women who ate from 4 food groups	7.1%	7.8%	7.5%	14.3%

The **mean WDDS** in the intervention area is 2.4 while it is 3.0 in the control woredas. Quartile means of women's dietary diversity score shows that except the women under the upper quartile the rest have not met the minimum WDDS, 4 food groups per day (Arimond et al, 2008). This also further explains the wide spread mono feeding culture of the population in the survey areas regardless of economic or social status of the population.

Table 13: The mean dietary distribution of women of reproductive age by quartile

Woredas	1 st Quartile	2 nd Quartile	3 rd Quartile	4 th Quartile	Total mean
Intervention	1.66 (504)	2.00 (244)	3.00 (705)	4.63 (151)	2.44 (1377)
Simada	1.61 (362)	0.00	3.00 (202)	4.74 (69)	2.32 (562)
Ebinat	1.77 (142)	2.00 (289)	3.00 (533)	4.54 (82)	2.53 (715)
Control	1.00 (29)	2.00 (231)	2.60 (200)	3.92 (382)	2.97 (855)

3.5 *Maternal Health*

3.5.1 Maternal anemia

Maternal anemia is strongly associated with increased risk of maternal sickness and death, reduced child cognitive development and compromised productivity extending into adulthood. Anemia is defined as blood hemoglobin concentration of less than 12g/dl in non-pregnant women and less than 11g/dl for pregnant women. EDHS 2011 has shown that 29.9% of pregnant women and 10.8 % non-pregnant women had anemia. The corresponding anemia levels for Amhara region were 9.6% for all women.

By applying WHO's cut-off points, the percentage of non-pregnant mothers who were experiencing anemia was 9.1% in intervention and 10% in control district.⁵

Table 14: Mothers' anemia (Non-pregnant)

	Not Anemic %	Any Anemia <12g/dl	Mild ^a %	Moderate ^b %	Severe ^c %
Intervention (N=187)	90.9	9.1	5.9	3.2	0
Simada (N=79)	94.9	5.1	5.1	0.0	0
Ebinat (N=108)	88.0	12.1	6.5	5.6	0
Control (N=191)	90.1	10	8.4	1.6	0

Note; a: (11-11.99 g/dl) ; b: (8-10.99 g/dl) ; c: < 8 g/dl

This study has indicated that anemia prevalence in women is lower (9.1%) in intervention districts compared to EDHS national average (10.8%) and Amhara regional average (9.6%). The degree of anemia prevalence ranges from mild to moderate forms in the study districts. (new national and amhara anemia prevalence is taken from UNFPA report which analysed successive EDHS results (2005 & 2011). The advantage of this document over EDHS report is that the anemia percentage for pregnant and non-pregnant is disaggregated by region).

EDHS 2011 data indicates that pregnancy is a significant predictor of anemia in women with three times more risk among pregnant compared to non-pregnant women. However in the N@C baseline study perhaps due to their very small proportion combined with degree of error inherent with self reporting of pregnancy, the pregnant women experience less risk of anemia compared to pregnant mothers.

3.5.2 Maternal undernutrition

Maternal undernutrition has a potential to result in poor outcomes of pregnancy. This study measures maternal under nutrition by BMI and MUAC targeting non-pregnant women only. While MUAC specifically checks mothers' acute malnutrition status, the BMI looks at both chronic and acute aspect of maternal malnutrition.

Body Mass Index

Underweight in mothers is measured by BMI (Body mass index) which is computed from body weight and height. BMI measures body fat stores and is used as proxy to determine nutritional status. BMI less than 18.5 is considered as underweight which has remained significantly high in women of reproductive age group in Ethiopia. According to the recent EDHS, the national percentage of maternal underweight was 23.2 and the mean BMI was 20. For Amhara region, underweight percentage was 19.6% in 2005 which slightly deteriorated to 21.3% in 2011.

As this study demonstrated, the percentage of undernutrition (BMI below 18.5) in the study sites was 28% and 24% in the intervention and control sites respectively with mean BMI of of 19.8 for both. This is slightly higher than the Amhara region-wide average obtained by EDHS 2011.

⁵ Pregnancy is self-reported by the mothers included in the sample survey.

Table 16: Mothers' BMI

Area	Mean BMI	< 18.5 ^a %	(18.5-24.9) ^b %	(> 25-29.9) ^c %	> 30.0 ^d %	N
Intervention	19.86 (1200)	27.5	70.1	1.8	0.7	1277
Simada	20.13 (516)	23.6	73.0	2.3	1.0	562
Ebinat	19.66 (684)	30.4	67.9	1.3	0.4	715
Control	19.89 (727)	23.9	74.8	1.2	0.1	855

*Does not include women who self-reported as pregnant at the time of the survey

a: Underweight; **b:** Normal; **c:** Overweight; **d:** Obese

Overall, close to a third of the women in the intervention area are underweight which is characterized by being too thin for their height. This condition has a potential to result in low birth weight infants leading to an intergenerational cycle of malnutrition.

Mid-upper arm circumference

Mid-upper arm circumference (MUAC) is the circumference of the left arm measured at the midpoint between the tip of the shoulder and the tip of the elbow. MUAC measurement in non-pregnant women is applied as a proxy indicator of maternal acute malnutrition due to its association with weight and weight for height. This study has only targeted non-pregnant women for the MUAC measurement. MUAC measurement below 21.5 cm is taken as severe malnutrition while 21.5 to 22.5 cm is considered as moderate malnutrition. The study has indicated that 15% of the women in the intervention and 14% of the women in the control district were severely malnourished. The moderate malnutrition rate was 18% in the control group and 16% in the intervention areas.

Table 17: Mother's Mid-Upper Arm Circumference

	N	Below 21.5 cm	21.5 to 22.5 cm	> 22.5 cm
Intervention	1276	15.2	16.2	68.6
Simada	562	13.3	13.5	73.1
Ebinat	715	16.7	18.3	65.0
Control	855	14.3	18.4	67.4

3.5.3 Maternal health service utilization

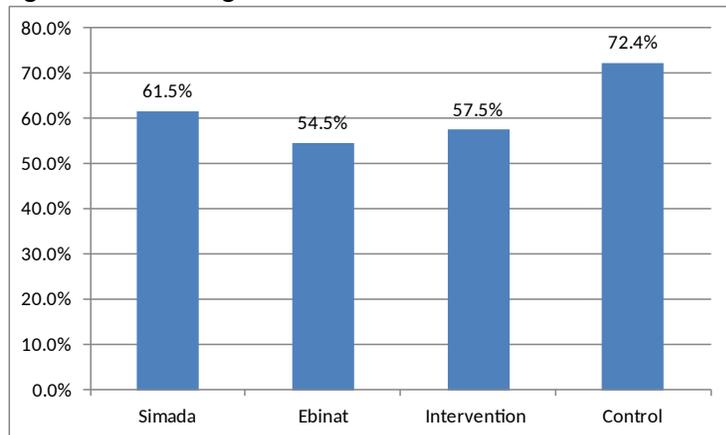
The marked improvement in accessibility of health facilities to rural population of Ethiopia is not readily translated to a corresponding rise in health service utilization as anticipated. Maternal health service utilization is low in the rural part of the country.

Antenatal care service use

ANC is an important entry point to determine and act on women's nutrition status. The earlier the pregnant woman comes to ANC service, the easier to identify and treat malnutrition and health

problems. According to EDHS 2011, utilization of focused four or more ANC services was 19% nationally and 12% for Amhara region.

Figure 9: Percentage of women who attended ANC service



Based on the results of the baseline, about 58% of the women in the intervention area and 72% in the control area had attended any ANC service during the last pregnancy. In other words 42% in the intervention, 27% in the control district did not receive any ANC service during the last pregnancy. Across individual woredas, 46% of women in Ebinat and 39% in Simada did not have a chance for ANC checkup for their last pregnancy (Figure 9).

Table 18: Percentage of mothers by provider of ANC services

	Simada (N=562)	Ebinat (N=715)	Intervention (N=732)	Control (N=619)
Health personnel doctor	3.2	1.3	2.2	1.0
Nurse Midwife	61.4	62.4	62.0	70.0
Auxiliary midwife	3.5	3.4	3.4	3.1
Traditional birth attendant	0.6	0.0	0.3	0.8
Health extension workers	31.3	33.0	32.0	24.9

Among the women who had received ANC service, only 35% had it four or more times. About 41% of women in Simada, 30% in Ebinat and 35% of Tach Gaynt had four or more number of checks during their last pregnancy. This is much higher than the regional EDHS 2011 figure. Mothers were also asked from whom they obtained the ANC service. Based on this, nurses/midwives (65%) were the most referred to providers of ANC service followed by health extension workers (29%). In relation with this, government health centers (69%) and government health posts (29%) are the commonest facilities the women received ANC services from.

Table 19: Place where ANC service received

	Simada (N=562)	Ebinat (N=715)	Intervention (N=1277)	Control (N=855)
At home	0.9	0.0	0.4	0.8
At other home	0.6	0.0	0.3	0.0

At government hospital	1.2	0.8	1.0	0.5
At government health center	68.5	66.9	67.7	71.6
At government health post	28.9	32.3	30.7	27.1

Contents of ANC service

The service components received during any ANC visit indicate the comprehensiveness of the package and missed opportunities. This study has asked for receipt of antimalarial drugs and iron tablets during the last ANC visit.

Over 90% of the women did not take antimalarial drugs during their last pregnancy. This is understandable since most of the kebeles in the three districts are not malaria prone.

Table 20: History of taking iron tablets

	Simada (N=562)	Ebinat (N=715)	Intervention (N=1277)	Control (N=855)
Yes	51.3	40.8	45.4	55.0
No	48.8	59.2	54.6	44.9

Nearly 53% of the women in the intervention areas and 43% in the control have not taken any iron tablets during the last pregnancy. Among the intervention districts, 59% of the Ebinat women and 46% of Simada women have not taken iron supplements (Table 23). Among those who have received ANC service, 16% in the intervention area and 21% in the control district have hardly taken iron tablets.

Cross tab analysis of ANC attendance by iron intake has shown that in the intervention and control districts, 28% of those in either group who attended ANC failed to take the recommended iron tablets. This is equivalent to the missed opportunity (Figure 10) since their ANC service attendance did not result in iron intake.

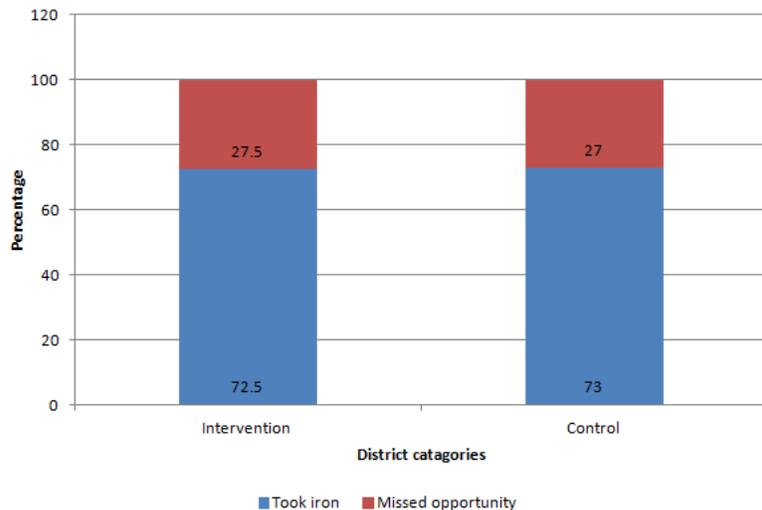


Figure 10: Percentage of ANC received women who took iron and missed opportunities

Institutional delivery

As per the EDHS 2011, only 10% of Ethiopian women deliver in a health facility assisted by trained health persons indicating that 90% deliveries take place at home. Access and use of health service delivery is very low even compared to other sub-Saharan African countries. For Amhara region, the percentage of skilled birth attendance was 11.5% in the five years preceding the last EDHS survey.

According to the baseline survey, about 81.3% of the women in the intervention and 77.1% in the control woredas delivered their last child at home. This means less than one fifth (19%) of women in the

intervention and 23% of the deliveries in the control attended their last delivery at a health facility with assistance of health professionals.

Table 21: Place of delivery of youngest baby

	Simada (N=562)	Ebinat (N=714)	Intervention (N=1272)	Control (N=851)
At home	83.2	79.8	81.3	77.1
At govt. hospital	2.0	1.0	1.4	1.6
At govt. health center	11.5	16.0	14.0	18.3
At govt. health post	1.1	1.8	1.5	2.1
At private hospital or clinic	2.2	0.0	0.0	0.1
At parents home	0.2	1.4	1.8	0.8

Regarding the birth attendants during last delivery, about 36% of women were helped by traditional birth attendant, 21% were supported by their neighbors, 19.6% by family member, and only 17% were assisted by trained health professionals (midwife, nurse or doctors). The percentage of women who were assisted by trained health professional is highest in Tach Gaynt (20%) followed by Ebinat (16.7%) and Simada (12.6%).

Overall, the skilled delivery rate for the study area has improved from the EDHS level most likely due to the concerted effort of government and partners across the country in the last two years to increase institutional delivery. The strengthening of HDA members, establishment of mothers' conference groups, one ambulance for one woreda modality and institutional modifications in mothers' delivery rooms to install home like setting for mothers must have started to pay off.

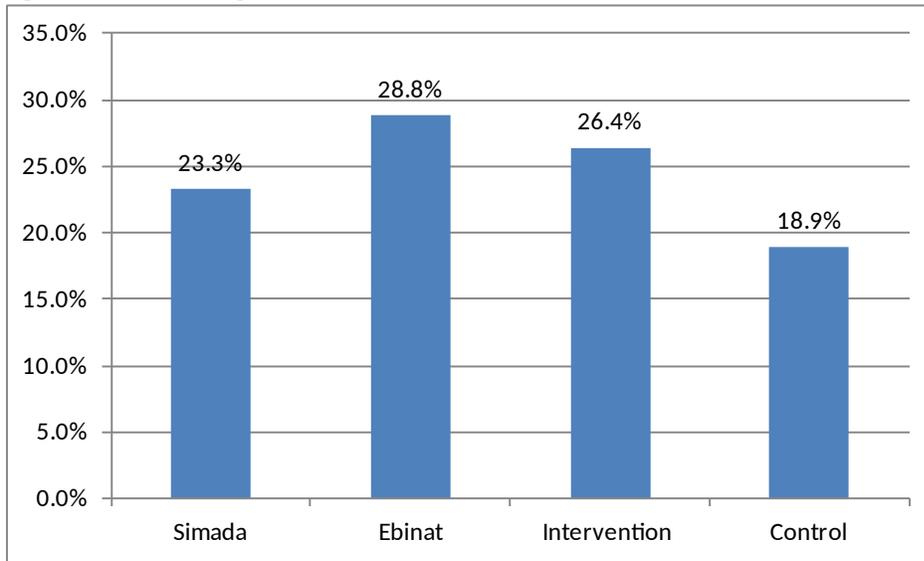
Post partum care service use

Receiving postpartum care (PPC) is instrumental for prevention of complications of delivery during post partum period and timely recognition of newborn problems. While the national level of PPC was 12.8%, the Amhara regional figure was 11.4% in EDHS 2011.

The percentage of women who did not attend PPC after their last pregnancy was 73.6% for intervention districts and 81% for the control. Among the women who received PPC service, 58% have gotten the service from government health post and 39% from private health facility. With regard to the time of use of PPC service most of the women received the services a week after delivery.

Overall, the reported PPC service utilization rate in the three districts is higher than the DHS figure for Amhara region. This and as to why significant number of women received the PPC service from private health facilities need further exploration to discover the causes that led to this situation.

Figure 11: Percentage who received PPC



3.6 Infant & Young Child Feeding Practices (IYCF)

The practice of infant and young child feeding (IYCF) in families has huge impact on child growth and development. Today, standard IYCF indicators are applied in public health to gauge presence and timing of good child feeding practices and quality of food consumed against the recommended standard from birth to two years of age.

The standard indicators computed for the N@C baseline study include: early initiation of breastfeeding, exclusive breastfeeding under 6 months, and continued breastfeeding at 1 year; introduction of solid, semi-solid or soft foods; timely complementary feeding; minimum dietary diversity; minimum meal frequency; minimum acceptable diet; consumption of iron-rich or iron-fortified foods; and bottle feeding. With the exception of the 'timely complementary feeding' indicator, these indicators are computed based on the indicator formulations and step-by-step guidance provided in a WHO document.⁶ The IYCF indicators are computed from data on child feeding practices in the 24 hours preceding the interview date.

The following table and subsequent sections of the report present the findings of the baseline survey in N@C intervention and control woredas on the IYCF indicators.

⁶ Indicators for assessing infant and young child feeding practices, part II measurement: USAID, AED, Fanta 2, UC Davis, IFPRI, Unicef, WHO, 2010

Table 22: IYCF Indicator Summary by Area

Indicators	Intervention				Control			
	N	n	%	CI	N	n	%	CI
IYCF1: Timely Initiation of Breast Feeding (0-23) months	744	536	72.0	69.1% - 75.5%	593	461	78.0	74.5% - 81.2%
IYCF2: Exclusive Breast Feeding (0-5)months	219	162	74.0	67.8% - 79.3%	191	149	78.0	71.6% - 83.3%
IYCF3: Introduction of Solid/Semi-solid or soft food (6-8) months	52	11	21.2	12.4% - 34.0%	50	31	62.0	48.2% - 74.1%
IYCF4: Continued Breast feeding at (12-15) months	68	68	100.0	94.6% - 100%	73	71	97.3	90.1% - 99.3%
IYCF5: Minimum Dietary Diversity (6-23) months	525	11	2.1	1.2% - 3.7%	402	34	8.5	6.1% - 11.6%
IYCF6: Minimum Meal Frequency (6-23) months	525	247	47.0	42.8% - 51.3%	402	244	60.7	55.8% - 65.4%
IYCF7: Minimum Acceptable Diet (6-23)months	525	12	2.3	1.3% - 4.0%	402	20	5.0	3.2% - 7.6%
IYCF8: Iron Rich or fortified Solid/Semi-solid Foods (6-23) months	525	32	6.1	4.4% - 8.5%	402	31	7.7	5.5% - 10.7%
IYCF9: Bottle Feeding (0-23) months	744	711	95.6	93.8% - 96.8%	593	557	93.9	91.7% - 95.6%

Note N = Sample size with the age range; n = Number of events within the sample frame; and CI = Intervals calculated at 95% confidence

3.6.1 Early initiation of breastfeeding

Timely initiation of breastfeeding refers to practice of beginning to feed the newborn with breast milk (i.e., putting the child to the mother's breast) within one hour after birth at most. As indicated in Table 24, about 72% of the women in the intervention area and 78% in the control district reported that they started breastfeeding their babies immediately or within an hour of delivery.

3.6.2 Colostrum feeding

Colostrum is the first thick, yellowish or clear colored first breastmilk produced in the first few days after birth. It contains higher proportion of protein due to concentrated antibody and anti-infective proteins compared to mature breast milk⁷. About 23% of women in Tach Gaynt, 36% in Simada and 38% in Ebinat districts discarded the colostrum rather than giving it to their babies. This perhaps is attributed to low education or misconceptions mothers held on the benefits of breast milk and infant feeding practices.

Table 23: Practice of feeding colostrums to the baby

⁷ Combined course on growth assessment and IYCF counseling: WHO, 2012

	Simada (N=562)%	Ebinat (N=715)%	Intervention (N=)%	Control (N=855)%
Fed it to the child	64.2	61.6	62.7	76.6
Discarded away	35.7	38.1	37.0	22.7
DK	0.2	0.3	0.2	0.7

3.6.3 Prelacteal feeds

Prelacteal feeds are foods other than breast milk provided to newborns during the first three days. Giving prelacteal foods interferes with early and effective suckling and the establishment of breastfeeding, and greatly increases the risk of infections.

Table 25: Practice of offering drink other than breast milk in the first 3 days

	Simada (N=562)	Ebinat (N=715)	Intervention (N=1277)	Control (N=855)
Yes	14.7	6.0	9.8	3.4
No	85.3	94.0	90.2	96.6

Nearly 9.8 % of women in the intervention

Table 24: Percentage of mothers who provided prelacteal feeds

	Intervention	Control
Local beer (tela)	77.9	71.0
Butter	14.5	6.5
Plain water	12.2	6.5
Sugar or glucose water	11.5	6.5
Infant formula	10.7	6.5
Tea	10.7	6.5
Honey	10.7	6.5
Gripe water	9.9	9.7
Sugar-salt-water-solution	9.9	12.9
Fruit Juice	9.9	6.5
Coffee	9.9	6.5
Herbal infusion	9.9	6.5
Others	9.9	6.5

woredas have fed their babies of less than three days with different liquids other than breast milk. This proportion is relatively higher in Simada woreda (15%) compared to either Ebinat (6%) or Tach Gaynt (3%). Interestingly, of those mothers who do provide prelacteal feeds, 77.8% and 71% in the intervention and control districts, respectively, have provided newborn babies with local beer or commonly called 'Tela'. Other drinks such as butter, plain water, sugar water, tea and honey are some of the liquids provided to newborns most commonly in the intervention woredas (Table 24 and 25).

Overall, provision of prelacteal feeds appear to shed further light on the poor newborn feeding practices prevailing in the districts under consideration. Nevertheless even more worrisome malpractice in this regard is feeding infants local beer which contains undertermined alcoholic content and unknown status from sanitation and hygiene perspective too. Clearly this, as well as the provision of honey - not recommended for infants under 1 year because of the risk of botulism-causing bacteria -- has potentially damaging consequences on the health of the babies.

3.6.4 Exclusive breastfeeding

Exclusive breast feeding of infants up to six months is essential to bring about optimal growth of the baby for his or her age. According to the WHO standard, exclusive breastfeeding is achieved when an infant of 0-5 months is given nothing other than breast milk in the last 24 hours before the survey; ORS or any drops, vitamin or mineral syrups, or medicines are allowed IF prescribed by a doctor. Nationally, 52% of the children 0-5 months are exclusively breastfed (EDHS 2011).

In this study 75% of the infants in the intervention and 80% in the control district qualified as per WHO's exclusive breastfeeding standard (Table 23). This level of exclusive breastfeeding can be rated as good in the intervention and control areas vis-à-vis WHO standard⁸ (50-89% rated as good).

3.6.5 Introduction of Solid/Semi-Solid Foods

Timely-initiation of solid/semi-solid foods with adequate calorie and micronutrients is critical to prevent any possible malnutrition among growing children. WHO recommends that as of six months, infants need additional food to satisfy their physiological needs. This can be provided in soft form with frequency and amount added incrementally as the age of the infant advances.

Introduction of solid/semi-solid or soft complementary food during 6-8 months was 21.2% in the intervention and 62% in the control area. This is much higher than the national level (49%) obtained from EDHS 2011 in the control area. The lower figure in intervention area underlines the need to encourage mothers to improve the practice of timely introduction of solid/semi-solid foods at the appropriate age to meet the child's growth requirements.

3.6.6 Continued breastfeeding at 1 year

Although breast milk's potential to meet fully the nutrient requirements of a healthy growing baby is reduced after six months, it will still continue to be irreplaceable source of a proportion of calories and nutrient needs of children beyond six months. About 100% the women in the intervention and 98% in control district reported that they were breastfeeding their infants aged 12-15 months in the 24 hrs preceding the survey (Table 22). Based on this, the mothers in the study districts appear to have good understanding on the continued energy provision capabilities of breast milk in the period beyond six months.

3.6.7 Minimum dietary diversity

Dietary diversity is an indicator of access to a variety of complementary foods. The indicator is used to discover the proportion of children who have consumed foods from at least four different food groups in the last 24 hours before the survey. The mothers were first asked if their children consumed from 20 food groups listed in the questionnaire at home or elsewhere. Using WHO guideline the 20 food groups were reduced to seven standard food groups. Then the children were categorized in to two groups:

⁸ Infant and young child feeding, A tool for assessing national practices, policies and programs: WHO & Linkages, 2003

those who consumed at least 1 food from four different groups and those who were fed on less than four food groups.

Only 2% of the intervention children and 8% of the control 6-23 months children had met the minimum requirements of the dietary diversity score. Among the intervention districts, 3.4% of Simada and 1% of Ebinat met the minimum score. These figures are somewhat similar to what EDHS 2011 found for Amhara region. The low minimum dietary diversity experienced by the children in the study area points mainly to poor access or understanding of what constitutes good complementary food for children.

3.6.8 Minimum meal frequency

Minimum complementary meal frequency of a growing child depends on whether the child is breast fed or not. This indicator aims to calculate among breastfed and non-breastfed children proportion who received solid, semi-solid or soft foods the minimum number of times in the last twenty four hours. According to WHO, the minimum frequency of solid, semi-solid or soft food intake yesterday is 2 times for breast fed infants 6-8 months and 3 times for children aged 9-23 months focusing on non-liquid foods only, and 4 times for non breast fed children including milk feeds and solid/semi solid foods. The minimum meal frequency gauges the energy intake from complementary foods.

The survey shows that among 6-23 months children, 47% of the intervention and 61% of the control children received the minimum meal frequency. This figure is significantly higher than the Amhara region figure (34%) obtained by EDHS 2011. Having 53% children who are not fed the minimum number of meals a day during the harvest period implies (when the survey was conducted), the poor child feeding practice is not about food availability rather it has to do with awareness and knowledge of IYCF good practices as well as access to diversified food either from own production or market.

3.6.9 Minimum acceptable diet

Minimum acceptable diet tells a combined story of the minimum dietary diversity and minimum meal frequency of a child of 6-23 months. The indicator provides information on the proportion of children who have obtained minimum acceptable diet excluding breast milk. This study has shown that only 2.3% of the intervention children and 5.0% of the control children have met the minimum recommended quality and quantity of diet required for their optimal development. This finding is well in line with what is revealed by EDHS 2011 for Amhara region which was 2.1%. This should not be a surprise as already the minimum dietary diversity and minimum meal frequency score is very low. Given that the survey is conducted during time of harvest, this again emphasizes the previous argument made whereby the low percentages are more likely attributed to low understanding in the community on good IYCF practices and access to limited food diversity rather than overall inaccessibility of food.

3.6.10 Iron-rich food intake

Due to complete depletion of the iron store a newborn inherited from its mother at the age of six months, an infant body resorts to continued breast milk and good mix of complementary food sources to meet its growing needs. Hence it is indispensable complementary foods that carry good quantity of iron provided to the infant in proper form.

Infant's iron rich nutrient intake adequacy is measured by consumption of iron rich foods. About 6.1% of the intervention and 7.7% of the control children aged 6-23 months had received foods known to contain iron specifically fresh organ meat, flesh meat, or fortified infant formula. This is explained by low availability and use of specially designed iron fortified food for infants and young children and poor animal food consumption practice among children in particular and the entire community in general. This assertion is supported by the Ethiopian food consumption pattern survey 2014 report where the top five iron sources for young children in Amhara region are identified as Teff mixed flour, raw eggs, raw Ethiopian Kale, white Teff and Milk.

3.6.11 Bottle feeding

Bottle feeding either for breast milk or for complementary food is prone to contamination and further to occurrence of infectious diseases unless proper care is consistently applied to maintain hygiene and sanitation at home. About 96% of the intervention and 94% of the control 0-23 children had been fed by bottle in the 24 hours before the surveys.

In general, the key challenge that emerges with bottle feeding is difficulty of cleaning the bottle, especially in a typical rural context where there is poor access to clean water and sanitation facilities, as well as very low understanding on hygienic practices. Despite the fact that the bottle feeding practice prevalent in the study districts is considered fair by international standards (5-29% is rated as fair), it is potentially risky child feeding practice putting infants vulnerable to diarrheal diseases.

3.7 *Child undernutrition*

Under nutrition in children continues to aggravate child morbidity and mortality despite the unprecedented reduction Ethiopia has registered in death of under five children¹. Malnutrition as a problem per se has shown very little progress in Ethiopia. For example stunting has declined by 14% only in 10 years period just from 2000 to 2011. The trend implies the need to hasten the nutrition interventions to gain significant advancement in this regard.

The baseline used anthropometric technique to measure malnutrition in under three years of children. This is based on measuring body size or physical characteristics (weight and height) and age and sex of the child. The data collected is used to compute anthropometric indices: wasting, stunting and underweight. The findings are generated in relation to the World Health Organization (WHO) child growth standard reference population in the form of standard deviations or Z-scores. Data entered was transferred to WHO Anthro software and analyzed deriving Z-scores from the difference between the individual value and median value of the reference population divided by standard deviation of the reference population. It is assumed the Z-score indicates how far a child's weight or height is from the median weight or height of a child at the same height or weight in the reference value.

Table 26: Child Anthropometrics for the control site

Age in month	Stunted Height-for-age			Wasted Weight-for-height				Underweight Weight-for-age				N(#)
	% < -3 Z	% < -2 Z	Mean Z	% < -3 Z	% < -2 Z	% above +2 Z	Mean Z	% < -3 Z	% < -2 Z	% above +2 Z	Mean Z	
6- 11	18.5	34.5	-1.4	5.0	13.4	5.9	-0.63	9.2	23.5	0	-1.36	107
12-23	29.0	54.8	-2.21	5.3	13.8	3.2	-0.65	10.2	32.5	0.7	-1.5	402
24-35	27.1	55.6	-2.09	3.0	10.5	2.3	-0.59	8.3	28.6	0	-1.55	554
6-35	26.3	51.5	-2.02	4.3	12.4	3.3	-0.63	9.3	29.3	0.3	-1.53	668
6-35 Male	26.2	45.1	-2.12	4.0	13.1	4.2	-0.67	9.8	26.4	0.7	-1.64	
6-35 Female	15.2	35.8	-1.55	3.3	7.0	1.2	-0.61	4.7	19.7	0.2	-1.36	

Table 27: Child Anthropometrics for the intervention sites

Age in month	Height-for-age			Weight-for-height				Weight-for-age				N(#)
	% < -3 Z	% < -2 Z	Mean Z	% < -3 Z	% < -2 Z	% above +2 Z	Mean Z	% < -3 Z	% < -2 Z	% above +2 Z	Mean Z	
6-35	27.1	50.4	-2.01	3.0	10.2	2.1	-.62	9.6	32.3	0.6	-1.5	1062
6- 11	5.6	24.3	-0.8	2.8	12.1	3.7	-0.4	1.9	20.6	1.9	-0.84	119
12-23	32.6	55.2	-0.75	3.5	12.4	1	-2.21	12.2	37.3	0.5	-1.6	283
24-35	27.3	51.8	-2.08	2.7	8.1	2.5	-0.57	9.2	31	0.4	-1.54	266
6-35 Male	26.7	44.3	-1.95	3	9.4	1.5	-0.68	9.4	30.9	0.6	-1.6	
6-35 Female	18.1	39.3	-1.49	2	7.5	2	-0.56	6.5	22.6	0.5	-1.4	

3.7.1 Stunting

Stunting which is commonly known as chronic malnutrition is explained as physical shortness for a specific age. It is known to be caused by long term exposure to poor nutrition or diseases or other distant factors and refers to past nutrition problems rather than the current status. Stunting is computed from the child's height and age variables.

The level of moderate and severe stunting among the children in the intervention areas was 50.4% while the severe form of was 27%. As per WHO's cut off point, over 40% stunting has alarming public health importance. No significant difference was observed in the prevalence of stunting between the control and intervention child population. The trend of stunting has shown an increasing pattern as the age of the child progressed but only up until 2 years then it begun to level off.

As seen in Figure 12, the green curve represents the distribution of the standard WHO population while the blue and pink signify the distribution among the survey male and female children respectively. The sample population curves are shifted to the left side and more flattened than the standard green curve implying a greater proportion and varying level of stunted children in the sample compared to the WHO standard population. This is more so for male children compared to the girls. This supports what is shown in the Table 26 & 27 where more number of boys are affected more so than girls in both the control and intervention districts.

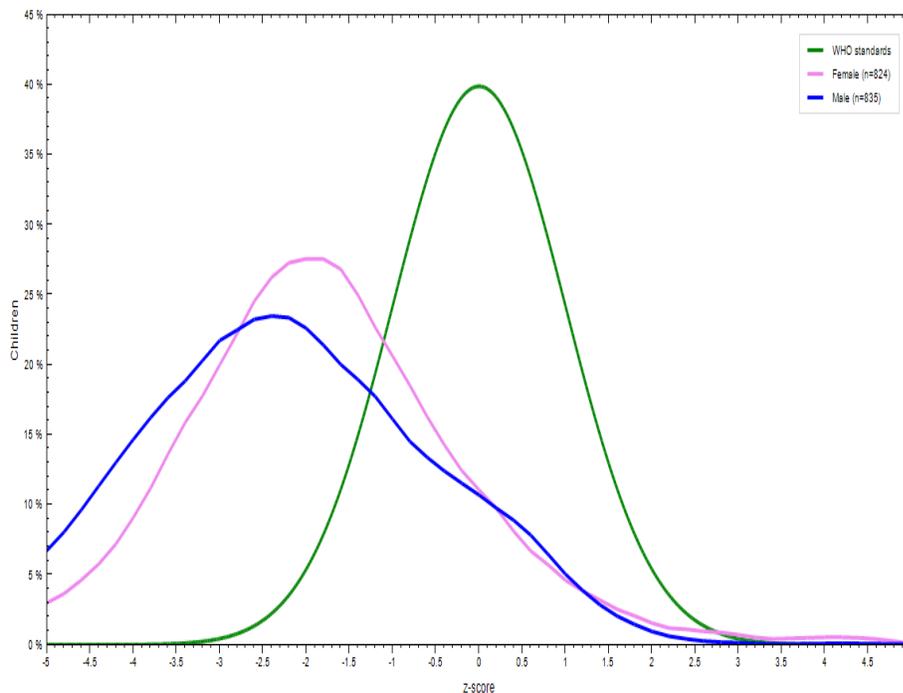


Figure 12: Gaussian curve for height for age index of the survey (blue & pink) against WHO's population Standard (Green)

3.7.2 Wasting

Weight for height is also commonly known as wasting or acute malnutrition. It is computed from weight and height of the child. This index is considered as indicator of current nutritional status of children. The prevalence of global acute malnutrition-GAM (Z score < -2) was 10% and the severe acute malnutrition-SAM (Z score < - 3) was 3.0 % among all under five children in the intervention area. There appears to be a slight increase in the number of affected children in the control area compared to the intervention districts. Male children have been slightly more affected by wasting than their female counterparts. In

addition, Figure 12 indicates that there is only a bit of deviation of prevalence of acute malnutrition among boys and girls compared to the WHO standard. This implies the proportion of wasting is just slightly higher than the standards WHO population.

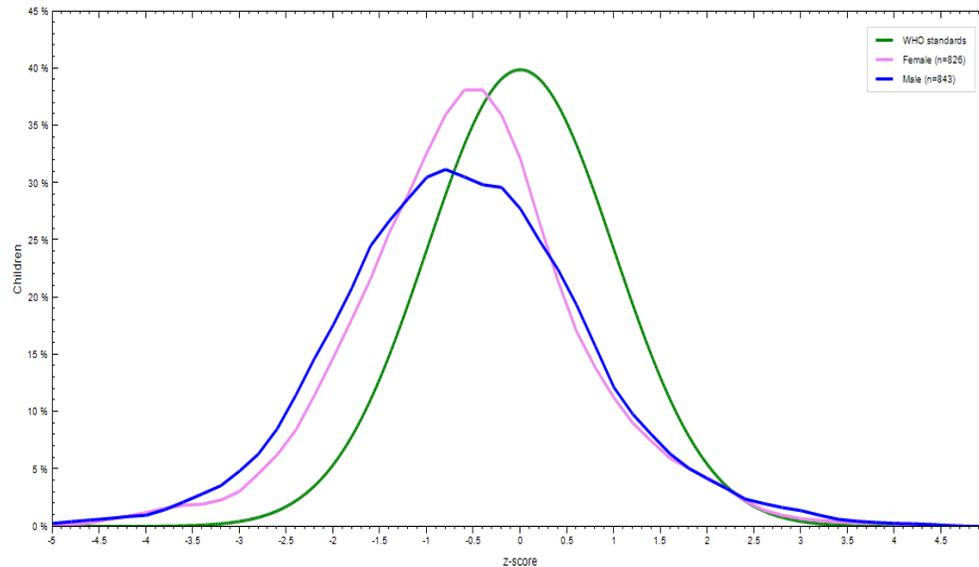


Figure 13: Gaussian curve for weight for height index of the survey (blue & pink) against WHO's population Standard (Green)

3.7.3 Underweight

Underweight is a composite index of both acute and chronic malnutrition. It is derived from weight and age data of a child. The level of global underweight in the intervention population was 32% while the severe form was 9.6% in the same population. Decreasing trend of underweight was observed as the age of the children increased. These rates appear slightly higher than the national situation whereby 29% of children were underweight of which 9% were severely affected.

Looking at Figure 13, the curves for both male and female appear to be shifted to left side indicating a higher level of underweight prevalence in the study population compared to the standard WHO population.

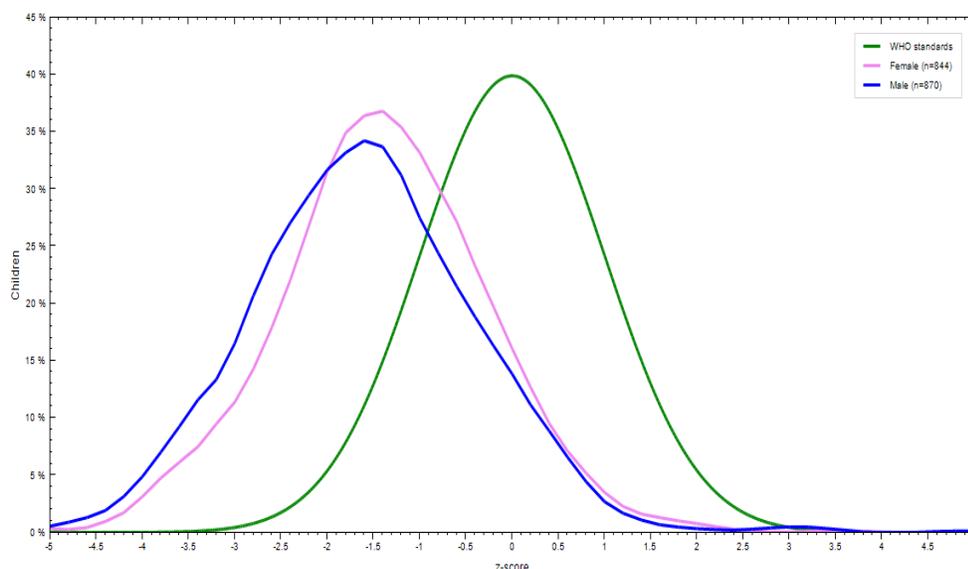


Figure 14: Gaussian curve for weight for age index of the survey (blue & pink) against WHO's population Standard (Green)

3.7.4 Childhood anemia

Anemia in children occurs when iron consumption is inadequate or absorption is sub optimal. Iron absorption from the intestine is further hampered by the accompanying types of foods eaten and diseases affecting the child. Anemia in children has grave consequences beyond the physical exhaustion. It could prevent children from attaining their full cognitive potential resulting in less productiveness in school and work life. Blood hemoglobin level measurement is widely used as a proxy indicator of anemia which in turn is attributed to Iron deficiency in most cases. There are different cut off levels to determine the anemia level in children and women.

In this baseline survey homocues were applied to draw blood samples from children and instantly measure hemoglobin level among sample children aged 6 to 23 months. The following tables present the result of this blood test using different cut-off standards. As per the WHO standard, 3% of the children in intervention district were experiencing severe form of anemia while in the control district it was slightly up to 4%.

Table 28: Anemia (CARE) - 6-23 months

Area	Anemic ^a % n	Not Anemic % n	N
Intervention	35.8	64.2	187
Control	38.0	62.0	187
Ebinat	33.3	66.7	108
Simada	39.2	60.8	79

a- refers to hemoglobin level of less than 10.5g/dl of blood

Not anemic column refers to blood hemoglobin level over 10.4g/dl of blood

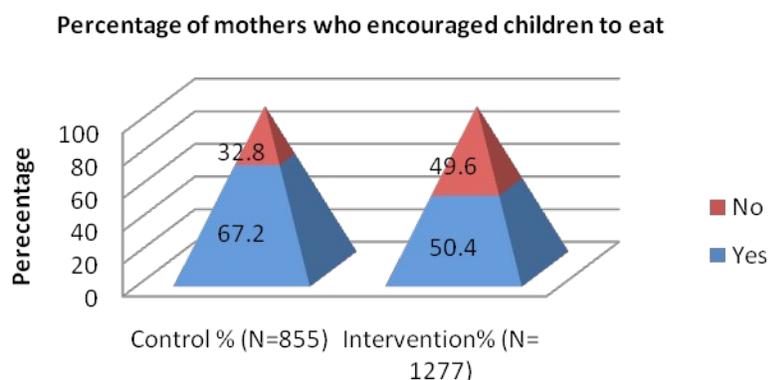
Table 29: Anemia (DHS) - 6-23 months

Area	Anemic ^a % n	Not Anemic % n	N
Intervention	44.4	55.6	187
Control	52.9	47.1	187
Ebinat	46.3	53.6	108
Simada	41.8	58.2	79

a- refers to blood hemoglobin level less than <11g/dl of blood
 Not anemic refers to blood hemoglobin level over 10.9 g/dl of blood

3.8 Responsive Feeding

Responsive feeding refers to being sensitive and responsive to a child's feeding cues. Feeding during and after illness is especially important to help the child to catch up in terms of growth and avoid malnutrition.. WHO recommends that when children are sick it is important to keep the child breastfeeding and encourage the baby to eat more and more.



About 67% and 50% of primary caregivers from control and intervention woredas respectively said that they used different techniques to encourage their children to eat such as playing/laughing and modeling. In this regard, about 95% of the mothers in the intervention districts and 98% in the control site reported that they were the primary caregivers for the children under consideration.

Figure 15: Percentage of mothers who encouraged the child to feed

Table 30: The primary feeding person for the child

	Intervention% (N= 1277)	Control % (N=855)
Mother	95.6	98.5
Father	.3	.2
Grandmother	.2	.3
Childs sibling		.3
HH help or maid	3.9	.8

Table 31: Techniques applied to encourage children eating

	Intervention%	Control %
Offered another food or drink	40.3%	34.2%
Talked/Encouraged verbally	16.8%	20.4%
Praised child for eating	8.0%	15.2%
Played /laughed	32.1%	48.0%
Modeled eating	40.2%	33.0%

3.9 Childhood Illness

Mother's report of children illness in the last 15 days prior to the interview is taken as a proxy indicator of child morbidity. An infant or child who falls sick may not suck breast milk or feed as often and as adequate as the other days. Prevention or early treatment of childhood sicknesses is a core IYCF practice for under two years of children.

About 56% of the women in the intervention and 51% of the control reported that their children experienced runny nose and cough. Fever was reported in the 45% of the intervention and 38% of the control children. Women of the intervention reported that 11% of their children were caught with malaria while the corresponding figure was 7% for the control group. When it comes to having two or more loose stools, 24% of the intervention and 23% of the control reported that they had seen the illness in their children. In regard to observing bloody stool in children, 8% of the intervention and 7% of the control women reported that they have seen bloody stool at least once a day. Observation of intestinal worms is reported by 4% of the women in the intervention area and 2% of the women in the control district.

Table 32: Children's history of malaria and loose stools ⁹

	Control% (N=855)	Intervention% (N=1277)
Has the child been diagnosed with malaria		
Yes	7.0	11.4
No	93.0	88.6
Has the child experienced runny nose and cough		
Yes	50.9	56.2
No	49.1	43.7
Did the child had difficulty of breathing symptoms		
Yes	27.6	38.5
No	72.4	61.4
Three or more loose stools		
Yes	23.9	24.8
No	76.1	75.2

⁹ This question was asked to households living in malaria prone zones

These figures signify common childhood illnesses such as pneumonia, diarrhea, dysentery and intestinal worm infections had been experienced by significant proportion of the children in the study area. Most of these infections may be caused or aggravated by malnutrition and can make the child less interested in eating and more vulnerable.

3.10 Water, Sanitation and Hygiene

Increasing access to improved drinking water is one of the Millennium Development Goals that Ethiopia and other nations worldwide have adopted (United Nations, 2002). Improvements in water, sanitation and hygiene are expected to reduce the burdens of disease and improve the overall health and nutrition of the people. A reduction in morbidity, such as diarrhea, as a result of improvements in hygiene and sanitation, improves nutritional status by reducing the impacts of dehydration, fever and mal-absorption of nutrients. Reductions in morbidity are expected to improve productivity and nutritional status of citizens by reducing the burdens of diseases. A reduction in morbidity, such as diarrhea, as a result of improvements in hygiene and sanitation, improves nutritional status by reducing the impacts of dehydration, fever and mal-absorption of nutrients.

3.10.1 Access to Water

In the N@C baseline survey households were asked the primary and secondary sources of drinking water. Based the results of these interviews presented in Table 34 about 71.2% and 74.0% of households in the project intervention and control woredas, respectively, obtain water from protected primary sources. Access to primary protected water sources is low in Ebinat (62.3%) compare to Simada (82.2%).

Table 33: Percentage of households by access to drinking water sources

		Simada	Ebinat	Intervention	Tach Gaynt
Primary drinking sources of water	N	562	715	1277	855
	Unprotected ^a	17.8%	37.1%	28.8%	26.0%
	Protected ^b	82.2%	62.9%	71.2%	74.0%
Secondary drinking sources of water	N	228	231	459	298
	Unprotected ^a	46.1%	62.8%	54.5%	51.0%
	Protected ^b	53.9%	37.2%	45.5%	49.0%
Protected drinking water source throughout the year		67.3%	50.1%	56.1%	64.7%

^a Unprotected dug well, Unprotected spring, Rainwater collection, Cart with small tank, Tanker truck, and Surface water

^b Protected: Piped water into dwelling, Piped water into yard, Public tap, Tubewell borehole, Bottled water, Protected dug well and Protected spring.

Slightly more than one-third (36.7%) of the sample households resort to secondary water sources in different times of the year to fetch drinking water. Based on the findings of the survey, majority (54.5%

intervention and 51,0% control) of households obtain drinking water from unprotected secondary water sources. Use of unprotected water sources is comparatively high in Ebanat % (52.8%) than in Simada % (46.1%). Nearly half of the sample households (48.7% in the intervention woredas and 47,4% in Tach Gaynt) use the secondary water sources for to three month a year. This is highly likely to be during rainy season which is difficult to cross to protected water sources on foot for women and young girls responsible to fetch water and in most of the cases unprotected surface water sources are plenty.

Table 34: Frequency of use of secondary unprotected water sources in the past 12 months

	Simada N=105	Ebinat N=145	Intervention N=250	Tach Gaynt N=152
Rarely % (Less than 2 months)	32.4%	29.9%	31.0%	31.2%
Sometimes % (2-3 months)	38.1%	56.4%	48.2%	47.8%
Often % (3-4 months)	19.0%	9.0%	13.2%	13.8%
Frequently % (4 to 6 months)	10.5%	4.8%	7.2%	7.2%

In general about 56% of the sample households in the intervention woredas reported to have access to protected water sources throughout the year in the project intervention woredas. This figure found to be higher in Simada (67.3%) compared to Ebinat (50.1%). This percentage is far lower than the proportion of households accessing water from protected primary sources because households would also go to unprotected secondary sources sometimes in the year for different reasons. Thus identifying reasons for the reasons households resorting to unprotected secondary water sources while they have protected primary sources can substantially improve access to protected drinking water sources throughout the year. This will certainly reduce inevitable disease burdens on household members, specially children which are highly susceptible to water born diseases.

Table 35: Percentage of households by primary drinking water sources

	Simada		Ebinat		Intervention		Tach Gaynt	
	N	%	N	%	N	%	N	%
Piped water into dwelling	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Piped water into yard	6	1.1%	1	0.1%	7	0.5%	1	0.1%
Public tap	315	56.0%	236	33.0%	551	43.1%	576	67.4%
Tubewell borehole	2	0.4%	2	0.3%	4	0.3%	1	0.1%
Protected dug well	28	5.0%	100	14.0%	128	10.0%	7	0.8%
Protected spring	110	19.6%	111	15.5%	221	17.3%	80	9.4%
Unprotected dug well	20	3.6%	14	2.0%	34	2.7%	5	0.6%
Unprotected spring	58	10.3%	175	24.5%	233	18.2%	120	14.0%
Rainwater collection	1	0.2%	0	0.0%	1	0.1%	0	0.0%
Bottled water	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Cart with small tank	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Tanker truck	0	0.0%	1	0.1%	1	0.1%	0	0.0%
Surface water	21	3.7%	75	10.5%	96	7.5%	62	7.3%
Other	1	0.2%	0	0.0%	1	0.1%	1	0.1%
Missing	0	0.0%	0	0.0%	0	0.0%	2	0.2%
Total	562	100.0%	715	100.0%	1277	100.0%	855	100.0%

Tables 35 and 36, show list of sources of household's drinking water. With special emphasis to unprotected primary sources about a quarter % (25.5%) households obtain drinking water from springs % (18.2%) and surface water % (7.5%). The same way the baseline survey result shows that about 11% and 6.7% of households reported to obtain from unprotected springs and surface water secondary sources. These results of the survey entail the necessity of employing interventions strategies of N@C focusing in improving or changing this two water sources would also significantly raise the proportion of households accessing improved water sources in the intervention villages.

Table 36: Percentage of households by secondary drinking water sources

	Simada		Ebinat		Intervention		Tach Gaynt	
	N	%	N	%	N	%	N	%
Piped water into dwelling	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Piped water into yard	2	0.4%	0	0.0%	2	0.2%	2	0.2%
Public tap	62	11.0%	25	3.5%	87	6.8%	83	9.7%
Tubewell borehole	6	1.1%	1	0.1%	7	0.5%	4	0.5%
Protected dug well	10	1.8%	17	2.4%	27	2.1%	5	0.6%
Protected spring	43	7.7%	43	6.0%	86	6.7%	52	6.1%
Rainwater collection	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Bottled water	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Unprotected dug well	19	3.4%	6	0.8%	25	2.0%	8	0.9%
Unprotected spring	53	9.4%	87	12.2%	140	11.0%	97	11.3%
Cart with small tank	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Tanker truck	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Surface water	33	5.9%	52	7.3%	85	6.7%	47	5.5%
No Secondary source	326	58.0%	483	67.6%	809	63.4%	554	64.8%
Other	4	0.7%	0	0.0%	4	0.3%	1	0.1%
Missing	4	0.7%	1	0.1%	5	0.4%	2	0.2%
Total	562	100.0%	715	100.0%	1277	100.0%	855	100.0%

At an average these households have to spend about 40 to 45 minutes to go to water sources, get water and come back to home. There is significant time variation between protected and unprotected water sources in both intervention and control areas (Table 38). Women were also asked if they usually use drinking water purification method. Tiny portion of the respondents indicate usual practice of water purification, 14.7% in intervention and 17.7% in control areas. Water bleaching or chlorination is the most common practice in 5.6% and 15% of households in intervention and control woredas respectively. While over a quarter of households are primarily using unprotected drinking water sources (Table 39) only a tiny proportion of households are applying at least one water purification method.

Table 15: Average time required to fetch water in minutes

	Unprotected	Protected
Simada	38.85	46.51
Ebinat	40.73	33.96
Intervention	40.21	40.28
Control	38.85	46.51

Table 37: Percentage of HHs usually use water purification method

Purification method	Simada	Ebinat	Intervention	Tach Gaynt
Add bleach/chlorine	4.30%	6.60%	5.6%	15.00%
Boil	3.60%	1.50%	2.4%	1.30%
Use purifying tablets	1.10%	0.10%	0.5%	0.40%
Solar disinfection	0.40%	0.30%	0.3%	0.00
Let it stand and settle	0.00%	0.00%	0.0	0.00%
Strain it through a cloth	0.70%	2.90%	2.0%	0.50%
Use water filter	0.00	0.40%	0.2%	0.00
Other	0.90%	3.90%	2.6%	0.80%
Use at least one method	10.1%	15.0%	14.7%	17.7%

Since direct tap water connection is not common drinking water storage is a common practice in rural areas of Ethiopia. As indicated in Table 40, 85% of household in intervention and 80% in control areas store drinking water at home. Majority (93.4% in intervention and 78.4% in control) of households in the intervention woredas apply narrow mouthed containers for water storage. This mainly because people are using plastic jars that are commonly used for carrying water from source to home.

Table 38: Percentage of HHs holds storing water

	Simada N=562	Ebinat N=715	Intervention n N=1277	Tach Gaynt N=855
Yes	78.8%	89.6%	84.9%	80.1%
No	21.2%	10.3%	15.1%	19.1%
Total	100.0%	100.0%	100.0%	100.0%

Table 39: Type of water storage container used

	Simada N=441	Ebinat N=639	Intervention n N=1080	Tach Gaynt N=683
Narrow mouthed	82.8%	59.5%	93.4%	78.4%
Wide mouthed	9.8%	17.5%	4.1%	10.4%
Both types	7.5%	23.0%	2.5%	11.2%

3.10.2 Sanitation

Momentous improvements in disease reduction; and hence, enhancement in nutritional status, can only be gained when safe drinking water, access to improved latrine, and hygienic behavior are integrated and utilized by the community. In developing countries like Ethiopia, where hygiene practices are grossly substandard and the exposure risk for diseases is multiple, the approach should be to seek multiple interventions. A study by Bergeron and Esrey indicates that when interventions include water,

sanitation, and hygiene (hand washing), the median reduction of diarrheal incidence would be up to 65%¹⁰.

A household is regarded as having an improved toilet if it is using only by members of the household without sharing with neighbors and if the facility used by the household separates the waste from human contact (WHO and UNICEF, 2010). Accordingly, facilities that are considered improved are: flush toilet, connection to a piped sewer system, connection to a septic system, flush / pour-flush to a pit latrine, ventilated improved pit (VIP) latrine, pit latrine with slab, and composting toilet. Sanitation facilities that are not considered as "improved" are: public or shared latrine, flush/pour flush to elsewhere (not into a pit, septic tank, or sewer), pit latrine without slab, open pit latrine, bucket latrines, hanging toilet / latrine, and use of no facilities / bush / field.

Based this definition and results of the survey the use of improved toilet by households is at suboptimal level in both intervention (30.7%) and control (28.9%) woredas (Figure &&). Pit latrines without slab are commonly employed unsafe structures in rural areas, 14.4% and 42.1% in intervention and control woredas respectively. In the intervention woredas pit latrine with slab % (16%) and composite % (21.4%) toilets are the common improved toilet facilities households are using. Nearly 28% of households share the improved facilities neighbors and this by itself reduced the effective access to safe sanitation facilities within the intervention communities. Over one-third (37.7%) sample households in the intervention woredas and one-fifth (20.3%) in TachGaynt have no any form of toilet and simply members are defecating in an open field or bush (Table &&). Therefore, project strategies that allow households to own and use private improved toilets and changing covering open pits with slab could be an immediate strategy to enhance access and utilization of improved sanitation facilities in the N@C intervention communities

Figure 16: Percentage of households having improved toilet facility

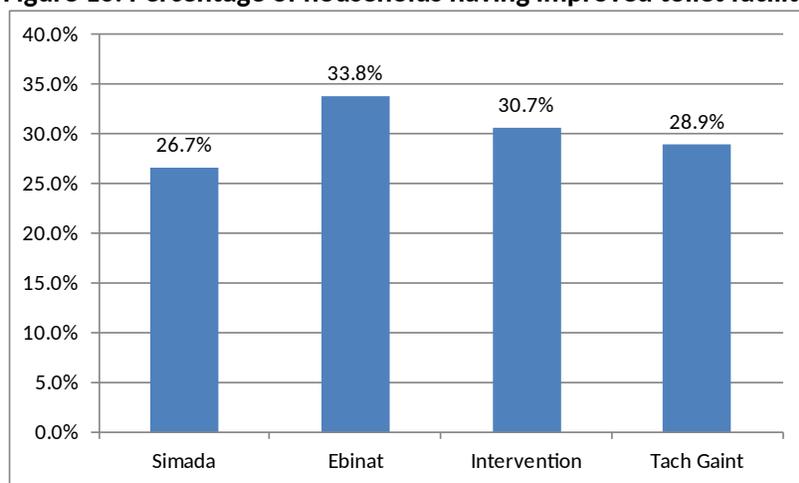


Table 40: Percentage of households by type of toilet facilities

	Simada	Ebinat	Intervention	Tach	Gaynt

¹⁰ Bergeron, G. and S. Esrey. 1993. Baseline Survey for the Guatemala Highlands Rural Water and Sanitation Project. WASH Field Report #403. WASH: Washington DC.

	N=562	N=715	N=1277	N=855
Flush or pour piped sewer	.2%	3.7%	2.2%	.2%
Flush or pour to septic tank	.6%	.3%	.4%	.2%
Flush or pour to pit latrine	.9%	.6%	.7%	0.0%
Flush or pour to elsewhere	.2%	0.0%	.1%	0.0%
Flush or pour to unknown	.4%	0.0%	.2%	.2%
Ventilated Imp pit latrine	4.3%	.2%	2.0%	.3%
Pit latrine with slab	14.1%	17.5%	16.0%	27.8%
Composting toilet	18.2%	23.9%	21.4%	7.6%
Pit latrine without slab	16.8%	12.6%	14.4%	42.1%
Bucket	0.1%	0.0%	0.0%	0.0%
Hanging toilet	0.1%	0.0%	0.0%	0.0%
No facilities, bush or field	38.3%	37.2%	37.7%	20.3%
Other	5.7%	3.9%	4.7%	1.3%
Total	100.0%	100.0%	100.0%	100.0%

Provision of improved toilet infrastructures and safe water would not be a guarantee for health family members. Removing or reducing internal and external body contaminating and disease causing agents such as bacteria by washing hands during critical times is an important aspect of hygienic behaviors to promote health. Specifically, focusing on this behavioral issue, the survey asked mothers how regularly they wash their hands during critical times. Nearly 96.1% and 97.3% of child mothers always wash their hands before they eat food in the intervention and control woredas, respectively. In both areas nearly 90% of them always apply hand washing before they always start food preparation. Likewise, 84.5% of mothers in the intervention and 67.6% in the control woredas wash their hands always before they feed children. However, regular hand washing habit of mothers after toilet (46.5%) and after changing baby's diaper or similar material to receive baby feces (21.7%) is relatively low in the intervention woredas. These habits are the same low in the control, Tach Gaynt Woreda.

Alongside with consistent behavior of hand washing, using safe water for hand washing by child caregivers has significant impact on child health and thereby nutritional status. Based on the survey findings, 67.1% and 70% of mothers in the intervention and control woredas, respectively, use safe water for hand washing available from protected primary sources (Table 41). Use of safe water during critical times for hand washing largely depends on availability of protected water sources as well as knowledge and attitudes of individuals. Thus, the practice of hand washing by child caregivers at critical times could be enhanced by increasing knowledge and promoting improved attitudes towards hand washing and implementation of activities that will guarantee water from protected sources.

Table 41: Percentage of respondents reported hand washing practices at critical times

		Woreda							
		Simada		Ebinat		Intervention		Tach Gaynt	
		N	%	N	%	N	%	N	%
Before eating	Never	2	0.4%	0	0.0%	2	0.2%	0	0.0%
	Always	540	96.1%	687	96.1%	1227	96.1%	832	97.3%
	Sometimes	18	3.2%	27	3.8%	45	3.5%	22	2.6%
	Missing	2	.4%	1	.1%	3	.2%	1	0.1%
	Total	562	100.0%	715	100.0%	1277	100.0%	855	100.0%
Before preparing food	Never	3	.5%	15	2.1%	18	1.4%	0	0.0%
	Always	508	90.4%	631	88.3%	1139	89.2%	769	89.9%
	Sometimes	37	6.6%	62	8.7%	99	7.8%	84	9.8%
	Missing	14	2.5%	7	1.0%	21	1.6%	2	.2%
	Total	562	100.0%	715	100.0%	1277	100.0%	855	100.0%
Before feeding child	Never	7	1.2%	33	4.6%	40	3.1%	1	.1%
	Always	485	86.3%	598	83.6%	1083	84.8%	578	67.6%
	Sometimes	46	8.2%	78	10.9%	124	9.7%	263	30.8%
	Missing	24	4.3%	6	.8%	30	2.3%	13	1.5%
	Total	562	100.0%	715	100.0%	1277	100.0%	855	100.0%
After toilet use	Never	27	4.8%	101	14.1%	128	10.0%	6	.7%
	Always	229	40.7%	365	51.0%	594	46.5%	265	31.0%
	Sometimes	237	42.2%	232	32.4%	469	36.7%	547	64.0%
	Missing	69	12.3%	17	2.4%	86	6.7%	37	4.3%
	Total	562	100.0%	715	100.0%	1277	100.0%	855	100.0%
After changing baby diaper	Never	25	4.4%	45	6.3%	70	5.5%	1	.1%
	Always	143	25.4%	134	18.7%	277	21.7%	151	17.7%
	Sometimes	38	6.8%	33	4.6%	71	5.6%	108	12.6%
	Missing	356	63.3%	503	70.3%	859	67.3%	595	69.6%
	Total	562	100.0%	715	100.0%	1277	100.0%	855	100.0%

Table 42: Hand washing water sources (% of HHs)

Woreda	Source of water	Protecte d	Unprotecte d
Simada	Primary, N=560	78.9	21.1
	Secondary, N=555	17.8	82.2
Ebinat	Primary, N=713	57.8	42.2
	Secondary, N=713	17.8	82.2
Interventio n	Primary, N=1273	67.1	32.9
	Secondary, N=1268	13.4	86.8
Tach Gaynt	Primary, N=713	70.3	29.7
	Secondary, N=713	14.8	85.2

To further verify the way hand washing is practiced interviewers kindly asked respondent mothers to observe the availability specific hand washing places together with detergents or other locally hand washing agents within the house. Based on this about 13.2% of households in the intervention woredas and 22.8% in Tach Gaynt % (control) woredas have put water at a specific place for hand washing. Likewise 36.3% and 49.2% of households in intervention and control woredas, respectively, have kept

detergents or local cleansing agents at a specific place for hand washing. In both places percentage of women physically having soaps and cleansing materials is a bit higher than the percentage of households reported to apply these materials.

Table 43: Percentage of mothers reported use of detergents of local cleansing agents during hand washing

	Simada N=562	Ebinat N=715	Intervention N=1277	Tach Gaynt N=855
Using either detergent or local cleansing agent	48.0%	27.1%	36.3%	49.2%
Soap	42.6%	25.2%	32.8%	41.2%
Detergent	1.3%	0.9%	1.0%	4.7%
Liquid soap % (incl. shampoo)	0.6%	0.8%	1.1%	0.1%
Ash	9.4%	2.5%	5.6%	9.2%

Note: the sums of percentages of detergents and cleansing agents across columns might be greater than 100% because more than one item of this type can be kept by households for hand washing.

Table 44: Percentage of households kept soap, local cleansing agents and water at a specific place (observed by the enumerators)

	Simada N=562	Ebinat N=715	Intervention n N=1277	Tach Gaynt N=855
Water present at a specific place	15.5%	11.4%	13.2%	22.8%
Soap, detergent or local cleansing agents present at a specific place	48.0%	27.1%	36.3%	49.2%

3.11 Women's Empowerment

In patriarchal society like Ethiopia the gender inequitable norms put a lot of limitations on women while providing relatively better freedom of doing something on their own for men in personal as well as social matters. Rural women in marital relationships are often perceived as needing to stay in their home and should they need to go outside of their home, they are supposed to secure their partners approval before going ahead with their decisions. In order to shed light on freedom of women to travel to personal interest places or social places, a set of questions were asked and the findings uncovered the following context in the three districts.

As per table 29, the majority of women (over 60%) appear to have freedom to move anywhere on their own without company. Perhaps this proportion is relatively lowered in case of when a woman wanted to go to a training course or adult literacy course as this requires regular attendance for an extended number of months. Women of Simada tend to enjoy less degree of freedom of mobility compared to the other districts in a number in most instances.

Table 45: Percentage of women who go alone or need company when going to the following places

To buy something on your own	Simada (N=562)	Ebinat (N=715)	Intervention (N=1277)	Control (N=855)
Not at all	7.8	2.8	5.0	3.2
If someone accompanies me	29.2	22.9	25.7	35.2
on my own	63.0	74.3	69.3	61.7
To fetch water on your own				
Not at all	3.3	1.0	2.0	.8
If someone accompanies me	14.7	7.6	10.7	17.6
on my own	82.0	91.4	87.3	81.6
To training course/adult literacy course				
Not at all	12.8	4.7	8.2	9.6
If someone accompanies me	35.2	26.9	30.5	41.0
on my own	52.1	68.4	61.3	49.4
To a health facility				
Not at all	2.2	.4	1.2	1.1
If someone accompanies me	36.0	24.1	29.3	36.8
on my own	61.8	75.5	69.5	62.1
To community meeting				
Not at all	6.9	3.7	5.1	4.8
If someone accompanies me	36.3	29.6	32.6	48.2
on my own	56.8	66.7	62.4	47.0
To homes of close-by friends				
Not at all	2.3	.7	1.4	.4
If someone accompanies me	10.8	4.8	7.4	13.4
on my own	86.9	94.5	91.1	86.3
To go outside of the village				
Not at all	2.7	.8	1.6	1.2
If someone accompanies me	30.8	30.3	30.5	45.7
on my own	66.5	68.9	67.8	53.1
To church or mosque				
Not at all	4.1	.3	2.0	.8
If someone accompanies me	20.3	13.0	16.2	20.3
on my own	75.6	86.7	81.8	78.9

3.12 Community Social Capital

Social capital means the set of norms, institutions and organizations that promote trust and cooperation among persons in communities and also in wider society (Durstun, 1999). Social capital may affect various attributes and attitudes of both parents/caregivers and children that ultimately affect the well-being of the child (Harpham, 2002). For instance, informational exchange through women's local networks can weigh heavily in the decision making process of parents/caregivers choice of type of healthcare to seek for their sick child. This in turn affects quality of treatment the child receives, which

will eventually have an effect on the growth and wellbeing of the child that goes up to the next descendants. For instance it can influence parents/caregivers decision on whether to take a sick child to a health facility or traditional healer through informational exchange and women's local networks. This in turn affects the child growth and future wellbeing that goes up to the next descendants.

In relation with the community social capital, this survey assessed women's participation in social groups and reliance on community supports during critical times. In the first place women were if they can rely on people with the community during the time they need supports for different reasons asked. Then they were asked about the form of their participation in different active community groups. The following sections present the findings on these two areas.

3.12.1 Women's Reliance on Community Supports

To understand the existence and the values community social capital factors affecting child wellbeing such as breast feeding, food provisioning, health and security when mothers pass through different circumstance, the N@C baseline survey asked mothers a set of questions. However, the study has a limitation of explaining the quality and method of supports.

The survey asked mothers if they rely on the community during five critical needs for support including:

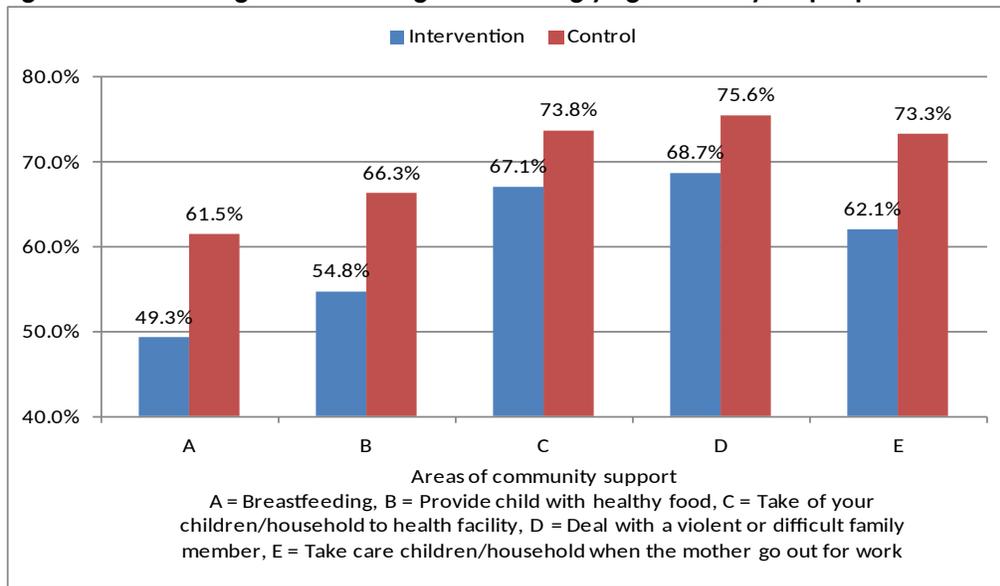
1. During difficulty in breastfeeding baby
2. During lack of enough healthy food to provide a child
3. Take care of children/household if there is a need to go to health facility
4. Deal with a violent or difficult family member
5. Take care of children/household if you need to go out to work

The responses of the mothers on this set of questions has been organized in Table 48 and Figure 17. Almost over half of the mothers in the intervention and control woredas agree or strongly agree that they can rely on community supports during critical needs through the social capital they have. Since the percentage of those who "strongly agree" are very low for all of the woredas surveyed, the percentage of those who "agree" and "strongly agree" have been merged together to come up with a figure for relying on social capital. As Figure 17 shows, generally, mothers in Tach Gaynt have better social capital than the intervention woredas (Simada and Ebinat); even though the communities in these woredas are considered to have similar cultural background. The study, unfortunately did not uncover the reasons for such variations in social capital between woredas at community level. However, it would be worthy to undertake a focused assessment to understand these differences and come up with possible lessons that can be promoted among communities in the intervention woredas.

Table 46: Percentage of women relaying community support during critical times of need

Community support during critical times of need.	Perception on the support reliability	Simada N=562	Ebinat N=715	Interventio n N=1277	Tach Gaynt N=855
If you have difficulty breastfeeding your baby	Strongly disagree	12.8%	20.7%	17.2%	7.1%
	Disagree	31.0%	32.3%	31.7%	25.3%
	Neither agree or disagree	3.0%	.7%	1.7%	6.1%
	Agree	46.6%	41.7%	43.9%	49.1%
	Strongly agree	6.4%	4.6%	5.4%	12.4%
If you can't provide your child with enough healthy food	Strongly disagree	8.4%	13.1%	11.0%	6.2%
	Disagree	34.9%	30.6%	32.5%	21.5%
	Neither agree or disagree	2.0%	.8%	1.3%	6.0%
	Agree	48.9%	50.2%	49.6%	54.6%
	Strongly agree	5.3%	5.2%	5.2%	11.7%
Take care of your children/household if you need to go to the health facility/institution	Strongly disagree	8.2%	7.1%	7.6%	5.7%
	Disagree	22.4%	24.8%	23.7%	14.7%
	Neither agree or disagree	1.8%	.6%	1.1%	5.4%
	Agree	59.6%	56.4%	57.5%	59.3%
	Strongly agree	8.0%	10.9%	9.6%	14.5%
You deal with a violent or difficult family member	Strongly disagree	5.9%	5.9%	5.9%	5.0%
	Disagree	26.7%	20.4%	23.2%	13.5%
	Neither agree or disagree	2.1%	1.4%	1.7%	5.8%
	Agree	54.4%	60.6%	57.9%	61.8%
	Strongly agree	10.5%	11.0%	10.8%	13.8%
Take care of your children/household if you need to go outside the home to do work	Strongly disagree	6.2%	6.6%	6.4%	5.3%
	Disagree	33.3%	27.6%	30.1%	16.1%
	Neither agree or disagree	2.3%	.7%	1.4%	5.1%
	Agree	52.3%	58.2%	55.6%	61.3%
	Strongly agree	5.9%	7.0%	6.5%	12.0%

Figure 17: Percentage of women agree or strongly agree to rely on people from the community



About 49.3% and 61.5% of women in the intervention and control sites, respectively, indicated that they agree or strongly agree that they can rely on people from the community to help when they face difficulty in breastfeeding their children. The percentage of women whom reported their confidence in the community support on breastfeeding children tend to be low as compared to other forms of supports because, it can mainly be carried out at a household level by the grandmothers of the child.

Mothers' assurance that they can rely on the community to provide their children with health food when they themselves are unable to do so is 54.8% in the intervention woreda and 66.3% in the control woreda. Likewise 68.7% and 62.1% of mothers in the intervention area have agreed or strongly agreed to get support from the community members during the time they need to go to health facility.

3.12.2 Women's Participation in Community Groups

Participation in community groups or organizations is an important part of day to day life for women. Their participation in community groups enhances their social capital. Like the case of reliance on social capital participation women in community groups is lower in the intervention woredas than Tach Gaynt, the control woreda. This might be due to a long existence of NGOs and high PSNP case long in Tach Gaynt.

According to the survey findings about 20.6% of women in the intervention woredas and 35% in the control woreda actively participate in community groups focused on agriculture. These groups include community water shade development association, community irrigation users' association, community seed multiplication cooperatives, irrigation administration committee (Simada), farmer innovation group (Ebinat), community research group (Ebinat) and Kebele PSNP food security task force. Similarly about the intervention and control woredas 41.2% and 36.6% women respectively indicated that there are agricultural groups in their localities but do not participate. High proportion of non-participant could be associated with the fact that men are commonly taking part in agricultural groups or community institutions in rural areas of Ethiopia. With regard in WASH groups, 18.7% and 29.6% of women in

intervention and control woredas, respectively, reported their participation. Considering WASH as common good of the community a few people can be involved in WASH committees which are the most common practice.

Table 47: Percentage of women reported participation in community groups and organization

	Simada		Ebinat		Intervention		Tach Gaynt	
Agriculture								
Groups, but NOT participant	18 6	33.2 %	33 9	47.4 %	52 5	41.2 %	31 1	36.6 %
No Program, not aware of groups	25 4	45.3 %	23 3	32.6 %	48 7	38.2 %	24 1	28.4 %
Yes program and participant	12 0	21.5 %	14 3	20.0 %	26 3	20.6 %	29 8	35.0 %
WASH								
Program, but NOT participant	16 3	29.1 %	25 2	35.2 %	41 5	32.5 %	28 2	33.2 %
No Program, not aware of program	30 8	54.9 %	31 4	43.9 %	62 2	48.7 %	31 7	37.3 %
Yes program and participant	90 5	16.1 %	14 9	20.8 %	23 9	18.7 %	25 1	29.6 %
Nutrition								
Program, but NOT participant	15 3	27.3 %	21 1	29.6 %	36 4	28.6 %	31 1	36.6 %
No Program, not aware of program	30 2	53.9 %	41 5	58.1 %	71 7	56.2 %	33 8	39.8 %
Yes program and participant	10 5	18.8 %	88 9	12.4 %	19 3	15.2 %	19 9	23.5 %
Maternal Health								
Program, but NOT participant	17 8	32.0 %	23 8	33.4 %	41 6	32.8 %	29 7	35.1 %
No Program, not aware of program	24 6	44.1 %	32 0	44.9 %	56 6	44.5 %	17 3	20.6 %
Yes program and participant	13 3	24.0 %	15 4	21.7 %	28 7	22.7 %	37 5	44.2 %
Child Health								
Program, but NOT participant	15 1	27.6 %	21 1	30.0 %	36 2	29.0 %	28 7	34.3 %
No Program, not aware of program	28 6	51.7 %	36 4	51.4 %	65 0	51.5 %	20 3	24.4 %
Yes program and participant	11 2	20.7 %	12 9	18.6 %	24 1	19.5 %	34 7	41.3 %
Education								
Program, but NOT participant	16 3	29.0 %	23 3	32.6 %	39 6	31.0 %	38 7	45.3 %
No Program, not aware of program	34 7	61.7 %	40 9	57.2 %	75 6	59.2 %	30 3	35.4 %
Yes program and participant	48 5	8.5% %	67 9	9.4% %	11 5	9.0% %	15 1	17.7 %

	Simada		Ebinat		Intervention		Tach Gaynt	
Economic Development								
Program, but NOT participant	16 4	29.4 %	24 3	34.0 %	40 7	32.0 %	28 2	33.3 %
No Program, not aware of program	33 2	59.3 %	32 8	45.9 %	66 0	51.8 %	24 2	28.6 %
Yes program and participant	62	11.3 %	14 4	20.1 %	20 6	16.2 %	32 3	38.1 %
Women's Empowerment								
Program, but NOT participant	15 0	26.7 %	25 3	35.4 %	40 3	31.6 %	26 8	31.4 %
No Program, not aware of program	33 1	59.0 %	36 7	51.3 %	69 8	54.7 %	31 2	36.5 %
Yes program and participant	80	14.3 %	95	13.3 %	17 5	13.7 %	27 4	32.1 %
Climate Change								
Program, but NOT participant	94	16.7 %	17 9	25.0 %	27 3	21.4 %	17 4	20.5 %
No Program, not aware of program	38 9	69.2 %	33 0	46.2 %	71 9	56.3 %	51 0	59.8 %
Yes program and participant	79	14.1 %	20 6	28.8 %	28 5	22.3 %	16 7	19.7 %

3.13 Gender Attitudes & Beliefs

Women's tolerance to their partners' violent behaviors is partially dependent on how they perceive violence and their role in the community. The women were asked the following set of questions to discover if their views on partners' violence reflect gender equitable attitudes or not. The questions concern a number of issues from freedom of mobility, child care, communications, responsibility for food cooking and refusal to have sex.

Table 48: Percentage of women who agree or do not agree with their partners' act of violence in the following contexts

If she goes out without telling him?				
	Simada (N=562)	Ebinat (N=715)	Intervention (N=1277)	Control (N=855)
No	59.4	59.3	59.4	61.4
Yes	40.6	40.7	40.6	38.6
If she neglects their children?				
No	52.5	66.0	60.1	56.8
Yes	47.5	34.0	39.9	43.2

If she argues with him?				
No	59.3	70.2	65.4	60.4
Yes	40.7	29.8	34.6	39.6
If she refuses to have sex with him?				
No	61.2	71.6	67	50.1
Yes	38.8	28.4	33	49.9
If she did not cook the food properly?				
No	47.2	62.5	55.8	43.9
Yes	52.8	37.5	44.2	56.1
Gender Attitude Index				
	Samida (562)	Ebinat (715)	Intervention (1277)	Control (855)
Don't Accept Hitting	32.6	44.8	39.4	26.2
Accepts Hitting	67.4	55.2	60.6	73.8

Interesting findings were seen in matters that relate to responsibility of cooking, neglect of children and leaving house without informing. About 56% of women in the control and 44% of in the intervention have agreed that a man is justified to hit his wife or partner if she did not cook properly. Nearly 43% of the control women and 39% of the intervention agreed that they support if the woman is beaten when she neglects her children. This indicates that most of the women still view household work is their obligation and a husband is justifiable to beat them if they fail to fulfill these duties.

3.14 Women's participation in community and government programs

Participation of women in community-based groups and government or NGO established schemes is an important aspect of women's social, economic and political empowerment. Women would have better roles to play, and access to information and skills to gain through participation in community development undertakings. Their participation brings positive and immense changes within the household and community that can bring structural changes at a wider scale by narrowing gender gaps in rural area. The N@C baseline survey assessed women's program participation in three areas:

- Community program participation,
- Government program participation, and
- Direct social transfer.

3.14.1 Community program participation

Community program participation is about involvement of women in community initiated local programs and community-based groups. In this regard, women of reproductive age were asked the existence of different programs and community groups in their villages and their active membership.

The agricultural community programs include labor and farm inputs sharing community driven schemes. Such schemes are tradition of Ethiopian farming households. In the intervention woredas, 36.4% of women indicated that they know about the existence of community groups and community development programs in the village but that they are not members. Likewise, an equivalent proportion of women (35.9%) are active members or participants of such groups. Interestingly about 27.8% of women in the intervention woredas have no or do not know about community-based group agricultural programs to participate in. Nearly half (49.6%) of the women from the control woreda reported that they are active members of the community-based agricultural groups.

Participation in economic development includes involvement of women savings and small business activities in group with other fellow community members. About 27% if women in both intervention and control woredas are not participating in such community-based schemes while the groups are there at a local level. In the intervention woredas over half (53.4%) the sample women reported that there are no or not aware of economic development groups or schemes for them to participate in. In contrast with this in Tach Gaynt, control woreda, about 45.3% of women are found to be active members of economic groups while 18.9% are the same in the two intervention woredas. This low rate of participation of women in economic development groups, in the intervention woredas, calls for the promotion of village saving and loan associations (VSAs) and small business groups to be one of N@C's strategies and inCARE Ethiopia is well experienced in it.

Participation of women in climate change adaptation groups and programs has significant role in sustainable local development in a fragile biophysical empowerment where agriculture is the main livelihood stay. Although the concept of climate change adaptation is not yet well understood at a lower level women were asked if they have roles in community groups and programs that are active in natural resource management and rehabilitation. The percentage of women reported active participation in climate change adaptation community-based initiatives was limited to 13% and 17.9% in the intervention and target woredas respectively. In the same line nearly 70% of women indicated that they are either unaware of or there are no community driven climate change adaptation groups to involve in.

Table 49: Percentage of women reported participation in community development groups

		Simada N=562	Ebinat N=715	Interventio n N=1277	Tach Gaynt N=855
Agriculture development	Group, but NOT member	35.5%	37.1%	36.4%	31.6%
	No group, not aware of group	27.6%	28.0%	27.8%	18.8%
	Yes group and active member	37.0%	35.0%	35.9%	49.6%
Economic Development	Group, but NOT member	26.0%	28.7%	27.5%	26.9%
	No group, not aware of group	54.4%	52.6%	53.4%	27.5%
	Yes group and active member	19.0%	18.7%	18.9%	45.3%
Climate Change adaptation	Group, but NOT member	11.9%	20.8%	17.0%	14.0%
	No group, not aware of group	81.9%	60.0%	70.0%	68.6%
	Yes group and active member	5.5%	18.9%	13.0%	17.4%
WASH	Group, but NOT member	23.2%	24.9%	24.3%	28.0%
	No group, not aware of group	58.8%	54.8%	56.6%	40.9%
	Yes group and active member	17.6%	20.3%	19.1%	31.3%
Education	Group, but NOT member	21.6%	26.0%	24.0%	40.0%
	No group, not aware of group	70.0%	65.0%	67.2%	39.8%
	Yes group and active member	8.4%	9.0%	8.8%	20.2%

		Simada N=562	Ebinat N=715	Interventio n N=1277	Tach Gaynt N=855
Nutrition	Group, but NOT member	22.3%	21.6%	21.9%	26.4%
	No group, not aware of group	69.6%	66.2%	67.7%	42.5%
	Yes group and active member	8.1%	12.2%	10.4%	31.1%
Maternal Health	Group, but NOT member	27.2%	24.1%	25.5%	26.9%
	No group, not aware of group	56.8%	60.7%	58.6%	28.3%
	Yes group and active member	16.7%	15.2%	15.9%	44.9%
Women's Empowermen t	Group, but NOT member	20.5%	25.7%	23.4%	26.5%
	No group, not aware of group	70.8%	64.8%	67.4%	52.9%
	Yes group and active member	8.5%	9.5%	9.1%	20.1%

Participation in WASH initiatives was also asked to the sample women. Women can participate in local WASH programs or schemes mainly through leadership and water users' associations. In most of the cases involvement of women in the leadership of WASH schemes management is an activity that is limited to individuals in the community. Since limited number of women can participate in the leadership, it is difficult to infer women's participation through population based survey like this one. Thus most important group participation of women in WASH schemes is by being WASH members. Based on this about 24% of women in the intervention and 28% in control woredas indicated their active membership in WASH groups. About 56.6% and 40.9% of them in intervention and control woredas, respectively, have indicated that there are no WASH groups that women can play an active role. Therefore, future WASH schemes that N@C planned about should find ways that promote active participation of women.

Women's group based participation in maternal and child health and nutritional security is found to be the best strategies that state and non-state development actors are pursuing this time. As part of this there are different mechanisms that promote women's participation and role in Ethiopia. In the intervention woredas about 10.4% and 15.9% of women reported to in nutrition and maternal health groups/programs, respectively. Large proportion of women in these woredas indicated unawareness about or absence of nutrition (67.7%) and maternal health (58.6%) groups.

3.14.2 Government program participation

Sample women included in the N@C survey indicated a range of programs supported by the government and they involved in organized groups in the course of implementation. These programs are usually implemented by woredas offices, kebele development agents or health extension workers. Agricultural development was one of the focuses of the survey in this regard. As per the local information government programs that involve local people in agriculture include community water shade development association, community seed multiplication, irrigation development, farmer research group (Ebinat) and PSNP committee.

Table 50: Percentage of women reported participation in government programs

		Simada N=562	Ebinat N=715	Intervention N=1277	Tach Gaynt N=855
Agriculture	Group, but NOT member	40.3%	58.2%	50.3%	42.7%
	No group, not aware of group	38.5%	25.6%	31.3%	19.0%

development	Yes group and active member	21.2%	16.2%	18.4%	38.3%
Economic Development	Group, but NOT member	33.5%	40.2%	37.2%	33.9%
	No group, not aware of group	50.2%	36.3%	42.4%	21.4%
	Yes group and active member	16.3%	23.5%	20.3%	44.7%
Climate Change adaptation	Group, but NOT member	26.4%	28.9%	27.8%	23.4%
	No group, not aware of group	54.0%	40.3%	46.3%	55.3%
	Yes group and active member	19.6%	30.8%	25.9%	21.3%
WASH	Group, but NOT member	26.9%	37.2%	32.7%	33.4%
	No group, not aware of group	55.9%	42.0%	48.1%	34.1%
	Yes group and active member	17.3%	20.7%	19.2%	32.6%
Education	Group, but NOT member	30.4%	37.1%	34.1%	48.4%
	No group, not aware of group	56.6%	52.7%	54.4%	30.3%
	Yes group and active member	13.0%	10.2%	11.4%	21.3%
Nutrition	Group, but NOT member	29.2%	36.0%	33.0%	39.8%
	No group, not aware of group	53.7%	50.7%	52.0%	27.5%
	Yes group and active member	17.1%	13.3%	15.0%	32.7%
Maternal Health	Group, but NOT member	35.9%	39.0%	37.6%	35.6%
	No group, not aware of group	39.3%	32.4%	35.4%	15.0%
	Yes group and active member	24.7%	28.6%	26.9%	49.4%
Women's Empowerment	Group, but NOT member	28.7%	38.4%	34.1%	36.6%
	No group, not aware of group	51.7%	47.5%	49.3%	30.0%
	Yes group and active member	19.6%	14.2%	16.6%	33.4%
Child Health Gov Programs	Program, but NOT participant	33.3%	36.3%	35.0%	35.7%
	No Program, not aware of program	44.5%	39.6%	41.8%	17.9%
	Yes program and participant	22.1%	24.1%	23.2%	46.4%

Based on the results of the survey about 18.4% and 28.3% of women in the intervention and control woredas reported their group participation in government led agricultural development programs. Nearly half of the respondents in the intervention areas also indicated that they do not participate in such undertakings while groups are active in their villages. This might be due to the fact that women's group membership in government agricultural programs is a bit low by mainly giving due focus to the participation of men.

Government is keen in promoting wider scale climate change adaption measures in rural areas. In the Ethiopian context labor based physical asset creation is the main activity that rural people are engaged in through PSNP and mass-based free labor mobilization. Following this promotion of improved fuel saving cooking stoves, woodlot plantation, farm plot soil and water conservation are programs rural people are involved on group or individual basis.

Despite these wide spread interventions, group-based active involvement of women in climate change adaptation is limited 25.9% in intervention and 21.4% in control woredas. Nearly half of the sample women (46.3% in intervention and 55.3% in control woredas) indicated that they are not members and ware of climate change adaptation groups that involve women. In addition over a quarter (25.9%) of women in intervention woredas and 23.4% in control woredas did not involve in the existing climate change adaptation groups within the locality. N@C could identify key areas of climate change adaptation that would provide economic opportunities and enhance health status of mothers and

children at the same time reducing climatologically stresses. One key activity could be promotion of group based production and household utilization of improved fuel efficient cooking stoves.

Access to safe and reliable WASH services and facilities are key to the well being of rural households and more specifically to women and children. In the case of N@C baseline, women were asked if they participate in WASH committees in programs run by the government. Based on the result of this survey 19.2% and 32.6% of women indicated their participation in local level WASH management bodies. Rather, the interesting side of this data is that the majority of women reported that they were either unaware of or aware but not members of WASH groups within their villages. Hence this might be one of the reasons for high population in the survey area accessing during water from unprotected water sources and having poor sanitary practices.

Community, maternal and child nutrition is one of the intentions of health extension systems in rural areas of Ethiopia. The government promotes both nutritious food production and consumption through these systems. Women also participate in nutrition related initiatives of the government in group basis such as one-to-five women's groups, wealth extension education and health development army. In this regard only 15% and 32.7% of sample women in intervention and control woredas, respectively, reported that they actively involved in women's group dealing on nutritional issues. In both intervention and control sample areas about one-third of the women are not participating in the existing nutrition groups. More interestingly over half (52.0%) of the women in the intervention woredas do not know the presence women groups dealing on nutrition to bring sizable changes in the family nutritional well being. This indicates an important area of work for N@C to promote nutritional status of children and mothers which are the most vulnerable groups of the population.

Regarding maternal health, the Government of Ethiopia has started grassroots level initiatives since 2011. This is to reduce maternal mortality through improving skilled delivery to meet MDG-5 by 2015. To attain this goal, one-to-five women's network and pregnant mothers conferences are the most common forums involving women. Based on the results of this survey, almost a quarter (26.0%) of mothers from the intervention and nearly half (49.4%) from the control woredas reported to involve in groups promoting maternal health. Whereas nearly 35% of mothers in both areas do not participate in such groups while they know their existences. Interestingly over one-third (35.4%) of women in the intervention and 15% in the control woredas are neither members nor aware of women groups formation to address maternal health issues.

The Ethiopian health extension program rolled out in the rural parts of the country since 2005 by considering maternal and child health as one of its main objectives. Child health is promoted through health education, treatment and vaccination. Mothers participate in community conversation, child vaccination, growth monitoring events and house to house visits facilitated by health extension workers together with health development army groups from the community side. In the intervention woredas about 23.2% and in control areas 46.4% of mothers reported their participation in the child health program. About 35% of interviewed mothers in both control and intervention areas reported their absences of participation while they know the presence of child health program in their locality. Complete absence as well as women's unawareness and lack of participation in the programs indicates the need for further work by all stakeholders including pivotal support from N@C.

The third aspect of community support and development program covered in the N@C baseline survey is vertical social transfer and direct support to women. As far as the vertical social transfer is concerned in Ethiopia, cash and food transfer for chronically food insecure and people affected by transitory food

insecurity are done at household level. Apart from this school feeding in pocket of areas to promote school attendance and well being of school attending children as well as supplementary and therapeutic feeding for children affected by acute malnutrition are other forms of individuals targeting social protection services. Due to its multicounty nature of the baseline the survey questionnaire treated household level food transfer as “food for work” without segregating the transitory and chronic causes of the assistance. In this case about 21.4% of households in the intervention and 46.3% in the control woredas indicate food transfer to their households. Similarly 8.1% and 10.4% of women in the intervention and control woredas, respectively, reported provision of school feeding support to their children in the last 12 months.

Table 51: Percentage of women received direct assistance in the last 12 months

	Simada N=562	Ebinat N=715	Intervention N=1277	Tach Gaynt N=855
Food for work	29.4%	15.1%	21.4%	46.3%
School feeding program	11.0%	5.9%	8.1%	10.4%
Plot or land for household consumption	11.0%	3.1%	6.6%	13.5%
Seeds	12.6%	6.4%	9.2%	18.4%
Ag tools/implements	3.9%	1.5%	2.6%	5.1%
Livestock	4.6%	2.0%	3.1%	7.1%
Poultry	3.6%	1.1%	2.2%	6.8%
Fisheries	0.2%	0.3%	0.2%	0.2%
Vehicle	0.2%	0.3%	0.2%	0.0%
Sewing machine	0.4%	0.3%	0.3%	0.2%
Latrine (new or renovated)	15.8%	2.7%	8.5%	21.1%
Water pump (new or renovated for irrigation)	2.8%	1.1%	1.9%	4.0%

Apart from this about in both the intervention (8.5%) and control (21.1%) woredas some households reported enjoying accesses promoting sanitation facilities. This is mainly expected to be prefab concrete slab for improved pit latrines which the most common technology being promoted in rural part of Ethiopia.

A few women also reported direct assistance in different forms to enhance agricultural production and productivity. Interestingly, nearly 8.1% households indicated to access plot of land in the form of assistance in the last harvesting season. This form of assistance is usually horizontally attained support from friends and relatives with the community. Similarly direct assistances in the form of seeds (9.2%), agricultural tools (2.6%), livestock (3.1%) and poultry (2.2%) were reported by a few respondent households.

4 Multi and bi-variate analysis on factors influencing undernutrition and anemia

In order to look for factors that influenced child and maternal undernutrition and anemia, a bivariate and multivariate analysis was conducted using binary logistic regression and cross tab.

The key dependent variables taken are stunting, maternal underweight, childhood anemia and maternal anemia and they were checked for any possible association with a host of independent variables: baby's sex, baby's age, mother's age, age of marriage, marital status, head of household, women MDDs, PSNP enrollment, Household hunger scale, access to unshared improved water, access to protected water throughout the year, ANC, Institutional delivery, post partum care, maternal MUAC, mothers' BMI, and IYCF- minimum dietary diversity. As can be seen in table 55, stunting is associated with baby sex, baby age, mothers' age of marriage. Maternal underweight correlated with maternal MUAC.

Table 52: Multivariate analysis showing the effect of independent factors on childhood stunting and maternal underweight

Independent variables	Outcome	Sig	OR	95% CI for EXP (B)	
				Lower	Upper
Male (ref female)	Stunting	0.026	1.412	1.041	1.913
Age of marriage (ref >18rs)	Stunting	0.011	1.605	1.112	2.317
Maternal Underweight (ref normal BMI)	Stunting	0.039	1.422	1.018	1.987
Severe MUAC (ref normal MUAC level)	Maternal underweight	0.000	10.469	7.747	14.146
Moderate MUAC (ref normal MUAC level)	Maternal underweight	0.000	3.579	2.703	4.740

Being a boy is 1.4X risk factor for stunting compared to being a girl. Women who married when they were younger than 18yrs of age are 1.6 times more likely to have a stunted child compared to women who married after 18yrs of age. Women who are underweight are 1.4 times more likely to have stunted children compared to normal BMI women. Another important finding is the relationship of home delivery with stunting. The study has shown that mothers who have their delivery at home are 2 times more likely to have stunted child compared to mothers who have had skilled delivery (OR=2.03, 95%CI (1.047-3.952)).

In regard to mothers' underweight status, women with severe MUAC level are 10 times at risk of being underweight compared to women with normal MUAC range. Women with moderate MUAC level are 4 times at risk of being underweight compared to women with MUAC level

Bivariate analysis to see for correlation of IYCF indicators with stunting has not shown any significant association. However looking at childhood anemia against the individual IYCF indicators, children with below minimum dietary diversity level are found to experience almost four times more risk to anemia

compared to children at least meeting the minimum dietary diversity score. (OR = 3.9, 95% CI (1.238 - 12.39)).

Maternal anemia and baby anemia were not significantly *associated* with any of the independent variables that are compared against (age, ANC, improved water source, improved toilet, women dietary diversity score, number of pregnancies, institutional delivery, age of marriage, household head and family size).

5 Conclusion and Recommendations

5.1 Conclusion

The majority of women enrolled into this study happened to be young rural women with no formal education. Most of them married off before the age of 18 years which exposed them to early age pregnancy that elevates risk of complications of pregnancy or childbirth.

A host of interlinked factors worked together to get the women vulnerable to high malnutrition and underweight. Cultural factors forced them to childhood marriage, consumption of poor dietary diversity foods and low health service utilization further made them vulnerable to and deteriorated their malnutrition status.

Most of the household consumption comes from production of food on family owned plots of lands as indicated in Table 6. A few own gardens which are to a limited extent used for production of vegetables and fruits of low nutrient content how do we know this? This is confirmed by the response of women on the type of crops they grew in their homegardens. Very few of them reported growing vegetable and fruits in their backyard garden (Questions E8). Vegetable preservation practice is low and mostly relied on traditional techniques. Looking at the possible micronutrient access from vegetable sources, there appears to be an unreliable supply for low or no production months. This might point to the fact that the available garden not fully utilized to grow vegetables/fruits or the production is not sufficient enough to reserve for preservation.

Majority of households indicated that they both produce and purchase as the main source of food. In the about 77.5% intervention and 93.9% in the control areas obtain household food from production. At the same time 67.7% and 84.4% of households in intervention and control areas respectively access food from market purchase. From the intervention areas about a quarter of households (20.8%) practice home gardening that could serve for production of fruits and vegetables for household consumption and local market supply. Home gardening is relatively low in Ebinat woreda (15.4%) as compared to Simada (27.6%).

Regardless of quality of support extension workers provide to families, about 62.5% and 55.6% of women in the intervention and control woredas respectively met crop extension workers at least once in the last 12 months. The same way 43.9% of women in intervention and 40% in control woredas met livestock extension workers. In general the contact between women and agricultural extension workers seem to have gaps given the agricultural based rural economy and role of women in agriculture.

The households widely practice food crop preservation, mostly focusing on Teff, wheat and barley for subsequent non-harvesting seasons. Traditional storage methods that subject the crop to wastage and deterioration of its nutrient contents further reduce the nutrient value of the food consumed.

The overwhelming majority of the households appear to have adequate supply of food for household consumption in the last month preceding the survey.

Utilization of maternal child health service is on the rise as signaled by mounting skilled delivery rate to 22% from 10% and lower anemia prevalence among women compared to the EDHS 2011 result. However looking at women's history of multiple pregnancies, high parity, low coverage of toilet, high consumption of legumes and cereals which have inhibiting effect on iron absorption such as phytates (Source: World Vision publication cited in reference section) poor history of intake of iron tablets during pregnancy, poor access to protected water sources, low dietary diversity score, the risk of vulnerability of women in the study districts to anemia is still high.

The majority of the women in this study have initiated breastfeeding in less than one hour, exclusively breastfed their children till six months and continued breastfeeding their youngest child up until 15 months. However significant proportion (15%) of them discarded the colostrums and provided prelacteal feeds which potentially can be damaging to newborn health.

Almost all the women have introduced soft, semi-solid or solid food timely however the minimum dietary diversity, meal frequency, acceptable diet and iron-fortified complementary food intake is extremely low for children. This is further compromised and put to additional risk of introduction of infection due to significant level of bottle feeding practice. Looking at all these factors, it should not come as surprise that over a third of the children were anemic since the iron-fortified complementary food intake is very low. This assertion is confirmed by the bivariate analysis which uncovered the fact that those children who consumed below minimum dietary diversity level are almost four times more likely to have anemia compared to children who consumed at least the minimum dietary diversity level. (OR = 3.9, 95% CI (1.238 - 12.39). This points to the fact that the childhood anemia in the sample population is more likely associated with low intake of iron rich diet rather than other possible causes.

Only about half of the households appear to have access to protected water source all year round and just one third own unshared and improved toilet facility. This justifies why common childhood illnesses such as diarrhea, dysentery and intestinal worm infections had been experienced by significant proportion of children in the study area. Most of these infections can either be attributed to malnutrition or aggravate the malnutrition status of the affected children. Poor knowledge and low practice of responsive feeding pose risk for these children to be at risk of malnutrition.

Prevalence of stunting in the intervention districts is still comparable to the regional figure obtained from EDHS 2011. As per WHO's grading system, stunting level of over 40% is a marker of high public health concern demanding urgent need for intervention.

The bivariate and multivariate analysis has indicated that stunting is associated with child's sex and maternal factors such as place of delivery, age of marriage and underweight status. Being a boy is a risk factor for stunting by 1.4X compared to being a girl child. This may be related to biological differences since cultural factors have little influence before the age of three years.

The finding that home delivery is 2 times more likely to risk stunting compared to mothers who delivered in health institutions. (OR=2.03, 95%CI (1.047-3.952). This is probably due to the strong counseling and education women receive in the health facilities that will help them to stick to good IYCF practices.

The bivariate analysis has indicated that women who are married when they were younger than 18yrs of age are 1.6 times more likely to have a stunted child compared to women who married after 18yrs of age. This supports the fact that

Women who are underweight are 1.4 times more likely to have stunted children compared to women with normal BMI. This is perhaps due to the fact that depleted nutrient content of an underweight mother is likely to result in underweight baby who at high risk of developing stunting.

In a patriarchal society like Ethiopia, most of the household work is usually left for women to take care of. In the study population, child feeding is primarily done by women (96%) and participation of men in child care appears to be very low (<3%) as shown in Table 31. Significant proportion of the women in this study still hold the traditional gender inequitable attitudes whereby they still think it is their obligation to take care of children, they cannot argue with their husbands, or cannot refuse to have sex with him and the like. These views reflect community-imposed limit on women not to exercise their capacity to take initiatives to improve child care practices or household situations.

As the Ethiopian society is dominated by patriarchal at household and community level participation women in community groups and government program found to be passive. Apart from this general reality, in both cases, the active participation of women is low in the project intervention areas compared to the control sites. Based on the survey findings about 19.2%, 15% and 26.9% of women in the intervention woredas reported to be active participants in government initiated WASH, nutrition and maternal health programs respectively. Such initiatives which will be the major focuses of N@C program women's participation are relatively high, 33% for both WASH and nutrition and 49% for maternal health, in the case of control woreda.

5.2 Recommendations

Prevention of child marriage should be considered as one of the measures to prevent stunting in the study districts. The minimum age of marriage in Ethiopia is 18 and effort should be directed at increasing awareness at community level and educate children, youth and men groups to improve their understanding and reinforce the law. Working with faith-based organizations and men's groups is a strategic direction to enhance uptake of the message on harmful consequences of child marriage on continued inheritance of stunting across generations. The experience from North Showa of Amhara Region shows that using '*idirs*' (*traditional community-based social organizations*) by incorporating an article on abolishing child marriage and abduction in their by-laws has brought unprecedented changes in the society (Eva and *atal*, 2013). CARE Ethiopia can explore and apply this approach by working with the *idir* leaders; churches, as well as kebele and woreda level judiciary system to eliminate early marriage and other nutrition related risk behaviors identified in this research.

In order to relieve women from poorly spaced pregnancies which deplete the mother's body of essential nutrients and pause further risk on the feeding practice of the under two children, promotion of long acting and permanent methods of contraceptives is a crucial intervention in the study areas. Health development army, women groups, men's development groups and farmers' training centers are potentially important avenues to improve awareness on contraceptive methods. To this effect, it will be essential to use health communication strategies and strengthen counseling sessions toward mothers to improve awareness and uptake of services.

This study has demonstrated that malnutrition has statistically significant sex inequality. This disadvantage is affecting more boys than girls. Substantial number of literature provide various

explanations including systemic sex differences in values of the reference standard population, family favoritism toward daughters, biological differences, etc. This result is intriguing and should be explored further by qualitative means to uncover the local reasons for this inequality.

A core area where the IYCF practice is failing children is on complementary feeding. Timely introduction and quality of complementary food appear to be less common in the study kebeles. It is indispensable to intensify the existing nutrition services by demonstrating preparation and cooking of complementary foods combined with education to improve mothers understanding of quality of complementary feeding practices. This education could be better conveyed through the health development army who are already engaged in counseling of pregnant and lactating mothers. Another opportunity CARE could explore is setting up nutrition demonstration centers in community centers, schools and health facilities whereby trained health staff could provide practical demonstration on how to cook and serve complementary food using locally available foods.

Integration of food security and WASH with Nutrition intervention should be N@C's key intervention strategy. Focus should be provided to promote homestead gardens to enhance nutrient-dense vegetable production by families in order to ensure availability of nutrients required for development of children and women. By leveraging from WASH programs, N@C should redirect its WASH interventions to benefit the households growing vegetables in homestead gardens. It is also highly desirable to increase practice of rearing small ruminant animals such as chicken for the sake of household consumption. Agricultural extension workers can be brought together with health extension workers during home visits and community meeting to teach households with appropriate vegetable or fruit production, preservation techniques and encourage consumption in order to ensure availability and access to essential nutrients throughout the year.

Women's active participation in economic and social development arenas was found to be low in the project area. This may be largely associated with low of women's involvement in community and government initiatives, low representation in leadership positions of community groups such as WASH committees managing local development activities and limited capacity of women to lead community initiatives. Therefore, in the course its program implementation, generally, N@C should ensure addressing these constraints by applying CARE's strategies empowering women. Specifically N@C should facilitate community members (men and women) to agree and take actions that would favor the active participation of women in its social and economic development initiatives by putting compulsory rules on adequate representation of women in development committees and leadership trainings.

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Annexes

Annex 1: Sample size by age and woreda

Tables A-1: Sample size by age

Age in months	Control (#)	Intervention (#)
0-5 months	187	214
6-11 months	119	107
12-17 months	124	112
18-23 months	159	290
24-36 months	266	554
Total (0-35)	855	1277

Table A-2: Actual sample from baseline evaluation

Intervention woreda & Kebele	# of mothers	# of children (6-23 months)	
Ebinat	Abajalie	52	20
	Ahkoha	52	20
	Bale Arb	76	29
	Giman	79	30
	Gunaguna	76	28
	Likuara	55	22
	Mechena	45	18
	Selamaya	77	31
	Shulugie	76	30
	Tarsemba	53	20
	Achi Kidanemihret	59	26
	Total	700	274
	Simada	Aje	74
Asefa Med		49	20
Dagala agodana		55	22
Geda Eyesus		40	15
Kindo Meda		46	20
Kok Ber		38	16
Sengola		60	23
Sergawit		48	19
Shasho Mariam		52	20
Yekuas		71	30
Yeshnfo		44	21
Total		577	235
Total intervention districts	1277	235	

Control Woreda		# of mothers	# of children (6-23 months)
Tach Gaynt	Agat	138	61
	Akieto	74	35
	Anjet	62	32
	Ansita	85	37
	Bete Yo.	79	36
	Betelhem	100	49
	Dajit	75	34
	Ephrata	86	41
	Gedoda	79	42
	Gomengie	77	35
	Total control district	855	402

Annex 2: Definition of anthropometric measurements and hemoglobin cut-off points

- a) WHZ: weight-for-height z-score measures body weight relative to height. It is normally used to indicate current nutritional status. Low WHZ helps identify “wasting” in children, an indicator of moderate to severe malnutrition resulting from actual weight loss or failure to gain weight. WHZ is also useful as a measure when ages are difficult to determine¹.
- b) HAZ: height-for-age z-score measures height relative to age. Low HAZ relative to a child of the same sex and age in the reference population is referred to as “stunting”¹.
- c) WAZ: weight-for-age z-score measures body weight relative to age. It is commonly used for growth monitoring and assessment of change in magnitude of malnutrition over time. Low WAZ relative to a child of the same sex and age in the reference population is referred to as “underweight”¹.

1. Z-score

We used ANTHRO software from WHO to calculate Z-score for each individual. Computed Z-scores express an anthropometric value as a number of standard deviation (SD) below or above the reference median value (see the formula below²).

$$Z - score (\text{SD} - score) = \frac{\text{observed value} - \text{median value of the reference population}}{\text{standard deviation value of reference population}}$$

2. Cut-off points

To assess anthropometric characteristics of the population, we need to set cut-off points for reported Z-scores. WHO 2006 standard provides Z-score cut-off points. Z-score <-2sd is used to classify low weight-for-height (W/Z), low height-for-age (H/A), and low weight-for-age (W/A) as moderate to severe undernutrition². Similarly, the cut-off point of <-3sd is used to classify severe or chronic malnutrition.

State	Cut-off Points
Wasting	<-2sd WHZ
Stunting	<-2sd HAZ
Underweight	<-2sd WAZ

3. Hemoglobin

According to the WHO, the cut-off value for anemia among pregnant women is 110 g/L (11.0 g/dl). Among non-pregnant women over 15 years of age, the cutoff value is 120 g/L³(12.0 g/dl).

	Mild	Moderate	Severe
Pregnant	10-10.9	7-9.9	< 7.0
Non-Pregnant	11-11.9	8-10.9	< 8.0

*The level of anemia termed “Mild” is still a serious conditions given iron deficiency is already advanced by the time anemia is detected and deficiency have functional consequences even when anemia is not clinically apparent (WHO 2000)

There is no WHO cut-off value for anemia among children younger than 6 months of age. For children between 6 and 59 months, children who have hemoglobin levels less than 110 g/L or (11.0 g/dl) are considered anemic⁴. This value is based on data from older children and therefore may not accurately reflect appropriate hemoglobin levels in infants⁵. Cut-off values of <105 g/L or (10.5 g/dl) at 4 and 6 months of age were used by a study of iron-replete breastfed infants³.

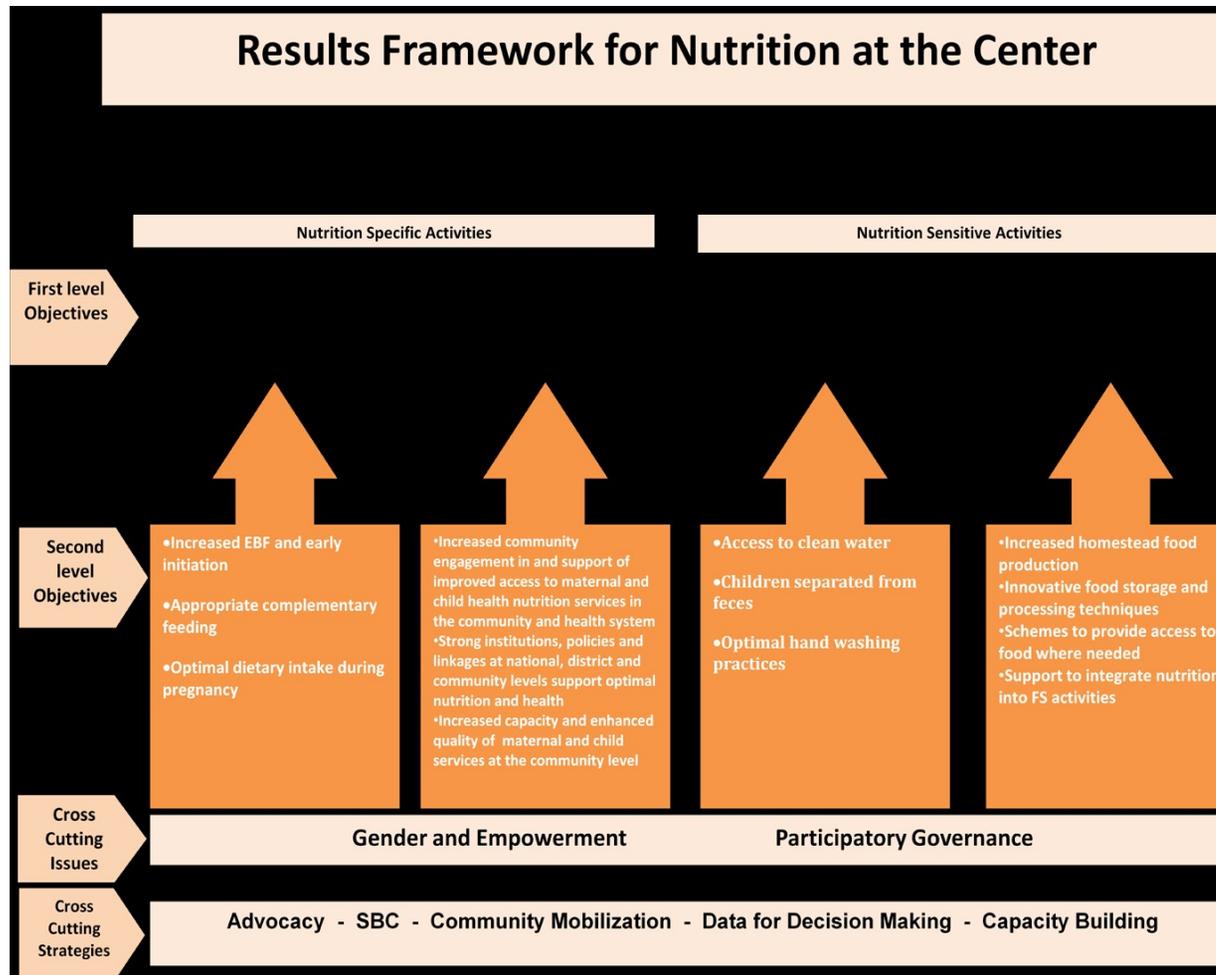
4. Body Mass Index (BMI)

BMI is an index computed through a ratio of weight-for-height, and is often used to classify underweight, normal, and overweight.

$$BMI = \frac{mass(kg)}{height(m)^2}$$

Underweight is defined as a BMI <18.50; normal is defined as a BMI of 18.50 - 24.99. BMI of 25-29.99 or above is classified as overweight, while BMI of 30 or higher is defined as obese.

Annex 3: Nutrition at the Center, Results Framework



Annex 4: N@C

baseline survey work schedule

S/ No	Activities	Date	Remark	Person / Organization responsible
1	Verify survey questionnaire translated by CARE	16-26 December		Mulugeta/ Etsub

S/ No	Activities	Date	Remark	Person / Organization responsible
2	Review and submit propose changes on the survey tool	16-26 December		Mulugeta/ Etsub
3	Receive feedback on questionnaire from CARE	3 January	Based on feedback from CARE on # 1 & 2	Nina
4	Submit first inception report with final tools (English and Amharic), field manual and final logistic plan	7 January		Mulugeta
5	Recruitment of supervisors, enumerators, health professionals (for anaemia testing) and data entrants	9-11 January	Dadimos advertised and recruited these staff from Bahir Dar and woreda towns	Dadimos
6	Training enumerators on questionnaires, anthropometry measurement and sampling methodology	14-23 January	19 th of Jan (Monday) was Ethiopian Epiphany. This day was a rest day and compensated by working on the preceding Sunday. Pre-test was done on 21 st of Jan. Depending on the understanding level of the enumerators another round of piloting can be done on 23 rd piloting.	Dadimos and CARE
7	Health professionals training on blood sample collection and anaemia testing	January 23		Etsub
8	Duplication of questionnaire	22-23 January	Duplication was done in Bahir Dar. Corrected questionnaire based on feedbacks from the pre-test and training was be ready by 21 th of January.	Biniyam
9	Data collection	24 January -18		Dadimos

S/ No	Activities	Date	Remark	Person / Organization responsible
		February		
10	Submit data collection and entry updates on daily basis for first week	26-31 January	Ongoing weekly update was continue after the first week	Estub and Biniayam
11	Update CSPro data entry template	22-23 January		Dadimos and CARE
12	Training of data entry team	25-31 January		Dadimos
13	Data entry	1 - 28 February	Assuming 510 questionnaires per day, 20 working days, double entry it required to employ 10 enumerators.	Dadimos
14	Submission of second interim report with reporting outline and analysis plan	10 February	Tentative reporting outline and dummy tables was prepared by CARE and reviewed by Dadimos.	Dadimos
15	Submit cleaned dataset exported to SPSS format	21 February		Mulugeta
16	Data analysis and report writing	25 February - 12 March	Data analysis on gender empowerment was done by Allison	Mulugeta/Estub
17	Draft 1 st report submission	27 April		Mulugeta
18	Commenting 1 st draft report	3 June	Nina provided consolidated feedbacks from CARE	Nina
19	Draft 2 nd report submission	July 16	Tania provided consolidated feedbacks from CARE	Mulugeta
20	Commenting 2 nd draft report	August 6		CARE team
21	Final report submission	August 28		Mulugeta

Annex 5: Survey Questionnaire

CARE Ethiopia

NUTRITION AT THE CENTER PROGRAM BASELINE HOUSEHOLD SURVEY 2014

A. Household identification and summary

Household Identification

	AREA	CODE	RESPONSE
A1	Country	01=Benin 02=Ethiopia 03=Bangladesh 04=Zambia	_ _
A2	Region _____ name:		CODE: _ _
A3	District _____ name:		CODE: _ _
A4	Subdistrict _____ name:		CODE: _ _
A6	Village _____ name:		CODE: _ _
A7	Household number (1-XX)		_ _

Interview Information

A8	Date of interview	_ _ dd	_ _ mm	20 _ _ yy
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		INITIALS	STAFF CODE OR DATE
A9	Name of lead interviewer (3 Initials & code)		_ _
A10	Field supervisor review (3 initials & code)		_ _
A11	Survey Completed	01 = Yes 02 = No	

FOR DATA ENTRY USE ONLY	INITIALS	CLERK CODE	DATE ENTRY/CHECK	OF
First Data Entry Write data clerk 3 initials and date)				
Second Data Entry Write data clerk 3 initials and date)				
Supervisor Check Write supervisor check and date)				

SCREENING QUESTION AND CONSENT

CONSENT	<p>Hello. My name is ___ and I work with LOCAL FIRM and a non-government organization. What is your name? Nice to meet you.</p> <p>Our team is in your village today and we would like to ask you questions from our survey. The information we collect will be used for planning, implementation and evaluation of a program. We are interviewing the mothers who have children less than 3 years of age. Do you have any children 3 years of age or less?</p>	
	Child 1	<input type="radio"/> 0 to <6 <input type="radio"/> 6 to <12 <input type="radio"/> 12 to <18 <input type="radio"/> 18 to <24 <input type="radio"/> 24 to <36
	Child 2	<input type="radio"/> 0 to <6 <input type="radio"/> 6 to <12 <input type="radio"/> 12 to <18 <input type="radio"/> 18 to <24 <input type="radio"/> 24 to <36
	Child 3	<input type="radio"/> 0 to <6 <input type="radio"/> 6 to <12 <input type="radio"/> 12 to <18 <input type="radio"/> 18 to <24 <input type="radio"/> 24 to <36
	SELECTED CHILD AGE	<input type="radio"/> 0 to <6 <input type="radio"/> 6 to <12 <input type="radio"/> 12 to <18 <input type="radio"/> 18 to <24 <input type="radio"/> 24 to <36

Record time the interview started in 24 hour format	HOUR	_ _
	MINUTES	_ _

CONSENT	<p>You have been selected at random to participate in this survey. We will be working with the Federal Ministry of Health to improve your health and well-being of as well as the health and well-being of your children and household. To do so, we would like to ask you questions about your household, agricultural practices, the types of food you have, food diversity, gender and group participation. We would like to take height, weight and upper arm measurements from you; and length and weight measurement of one of the selected child (NAME THE CHILD) less than --+three years of age. [IF ANEMIA TESTING: We will also test you and children less than three years of age for anemia, or low iron in the blood by taking a small sample of blood (prick from finger or heel) and will conduct the test immediately in front of you and share the results. I will describe</p>
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	calendar)	98= Don't know	
B7	What was (child's name) weight at birth	Write _____ in kilograms 98.8 = Don't know	_ _ _ . _ _
B8	Enumerator: VERIFY DO NOT READ Was (child's name) weight verified:	01= Yes, Health passport 02= Yes, Mother's recall 03= N/A, Not verified, not applicable	

C. Mother's Information

INSTRUCTIONS: Ensure that this is administered to the biological mother of the target child identified (less than 36 months of age). If this mother was not the respondent to a previous module, re-introduce the survey and obtain verbal consent.

Read: I would like to start by asking you a couple questions about you and your children.

NO.	QUESTIONS AND FILTERS	RESPONSE CODE	SKIP TO
C0	What is your date of birth? Respondent is not eligible if birthdate is before current date 1964 or after 1998	Write birthdate 98 98 98 = don't know	_ _ _ _ _ _ 19 _ _ _ dd mm yy
C1	How old are you? ENUMERATOR: Verify the age at last birthday. Verify with C0	Write age in years	If age <15 or >49 END SURVEY
C2	What is your current marital status?	01 = Married (monogamous) 02= Married (polygamous) 03= Divorced or separated 04= Widowed 05= Single (Never married) 06= Cohabiting with partner (monogamous) 07= Cohabiting with partner (polygamous)	If 05, 06 or 07 → C4
C3	How old were you at the time of	Write age in years	_ _ _

	your first marriage?	98 for DK		
C4	Who is the head of your household?	01 = Male-headed household 02 = Female-headed household 03 = Joint (male and female) headed household		
C5	What is your relationship to the head of the household?	01 = Self (Female headed) 02 = Spouse of HHH 03 = Sibling of HHH 04 = Child of HHH 05 = Parent of HHH 06 = Grandchild of HHH 07 = Grandparent of HHH 08 = Other		
C6	Have you ever received formal education (attend school)?	01= Yes 02= No		If 02→ C8
C7	What is the highest level of education that you have completed?	01= Some primary (grade 1-4) 02= Completed primary (grade 5-8) 03= Some secondary (grade 9-11) 04= Completed secondary (completed grade 12) 05 = Some higher education 06= Completed higher education 07 = Adult education 08= Vocational school 98 = Don't know		
C8	Can you read this sentence to me? Enumerator: Show respondent card with sentence on it. "I like to go to the market." Circle response describing their reading ability	01= Cannot read at all 02= Able to read only parts of sentence 03= Able to read whole sentence 04= Not available in language (specify) _____ 05= Blind/visually impaired		
C9	How many times have you been pregnant?	Write in response 98= Don't know	_ _	
C10	Are you currently pregnant?	01= Yes 02= No 08 = Don't know		
C11	How many living children do you have?	Write in response 98= Don't know	_ _	

D. Basic information of household characteristics

Read: Now I would like to ask you a few questions about your household and the type of things your household owns.

NO.	QUESTIONS AND FILTERS	RESPONSE CODE		SKIP TO
D1	How many people stay in this household? How many people (all ages) share food from the same pot?	Write number	_ _	
D1a	Is your household currently participating in the productive safety net program (PSNP)?	01=Yes 02= No		
D2	Does your household own any agricultural land?	01 = Yes 02 = No		
D3	Do you own your house?	01 = Yes 02 = No		
D4	I'm going to ask you about farm animals. How many... does your household own? a. Cattle/ (may be left as it is) b. Goat c. Sheep d. Chickens e. Pigs f. Horse g. Donkey h. Mule i. Other	Write number of animals 00= None 95= 95+ 98= Don't know	a. _ _ b. _ _ c. _ _ d. _ _ e. _ _ f. _ _ g. _ _ _ h. _ _ _ i. _ _ _	If all '00' →D 6a
D5	At night, are there any farm animals kept inside the house where you/your family members sleep?	01= Yes 02= No		If 02 →D 6a

D6	What type of farm animals are kept inside the house at night when you/your family members sleep?	a. Cattle/cow b. Goat c. Sheep d. Chickens e. Pigs f. Horse g. Donkey h. Mule i. Other	
D6a	Do you keep any other animals inside the house at night where you sleep (including pets)?	01= Yes 02=No	

Instructions: If you are not inside the household; ask the mother to visit the house (and see the interior and exterior).

D7	Main material of the floor. Enumerator: Observe and record one response	01= Earth/Sand/Animal dung 02= Bamboo 03= Stone/Brick 04= Cement 05= Tile 06= Vinyl strip 07= Other (specify)_____	
D8	Main material of the roof. Enumerator: Observe and record one response	01= Grass roof 02= Metal roof 03= Stone or tile roof 04= Plastic alone 05= Plastic plus grass 06= Asbestos 07= Other (specify)_____	
D9	Main material of the exterior walls. Enumerator: Observe and record one response	01= Earth/Sand/Mud/Clay 02= Bamboo, corn stalks 03= Stone/ Fired Brick 04= Cement 05= Tile 06= Vinyl strip 07= Mud brick or wattle 08= Other (specify)_____	
D11	Does your household have any mosquito nets that can be used while sleeping?	01= Yes 02=No	If 02→ D15

D12	How many insecticide treated mosquito nets (ITN) does your household have?	Write number of ITN 00 = None in household	_ _	
D13	Did you sleep under the mosquito net last night?	01=Yes 02= No		
D14	Did your [CHILD'S NAME]sleep under the mosquito net last night?	01=Yes 02= No		
D15	Where is cooking usually done?	01= In a room used for living or sleeping 02 = In a separate room in the same building used as a kitchen 03= In a separate building used as kitchen 04 = Outdoors 05= Other (specify): _____		
D16	Do you have electricity, solar power or generator in your home?	01 = Yes 02 = No		
D17	Does your household own any of the following: Read all responses, circle all that apply	a. Bicycle b. Radio c. Bed d. Mobile/other Telephone e. Television f. Refrigerator g. Cart pulled by animal h. Watch/Clock i. Sewing Machine j. Motorcycle k. Car/Truck l. Tractor m. Small generator (for irrigation) n . Other (specify)_____		

E. Agriculture production, access to food

Read: This section asks about the household's production of food, access to land, and where you get the food you eat.

NO.	QUESTIONS AND FILTERS	RESPONSE CODES	SKIP TO
-----	-----------------------	----------------	---------

E1	<p>What are the main sources of household food that you consume?</p> <p>Read all responses, circle all that apply</p>	<p>a. Produce food b. Purchase food c. Food for work d. Government food aid e. NGO food aid f. Trade/Borrowfood g. Charity h. Other (specify):_____</p>	<p>If "a" is not circled → E3</p>
E2	<p>Who usually grows the food you produce for consumption?</p> <p>Read all answers, circle all that apply</p>	<p>a. Self (respondent) b. Husband c. Other female family members/clan d. Other male family members/clan e. Neighbors f. Farm collective g. Don't know h. Other (specify):_____</p>	

READ: Now I am going to ask you a series of questions about the land your household lives on, uses for productive purposes -- that is leases or sharecrops, owns or rents out. I would like you consider not only the land your household uses now, but also the land your household may have used over the last six months. By piece of land, I mean one continuous piece, which is used predominantly for the same purposes and managed by the same person or group of people. I will first ask about the homestead, followed by any home/kitchen garden production.

E3	<p>Do you have any plot (or plots) of land that you use to grow food for family or personal consumption?</p>	<p>01 = Yes 02 = No</p>	<p>If 02 → E13</p>
E4	<p>Who owns the plot of land?</p>	<p>01= You (Respondent) 02= Your husband 03= Both you and your husband 04= Other Male relative 05= Other Female relative 06= Land owner 07= Neighbor 08= Company 09= Other (specify):_____</p>	<p>If 01 or 03 → E6</p>
E5	<p>How did you get access to grow on the plot of land that you use to grow food for personal or family</p>	<p>01= Rented in (cash) 02= Sharecropped in 03= Borrowed (no payment)</p>	

	consumption? Read all answers, circle ONE	04= _____ Other (specify) _____ 08= Don't know	
E6	Do/Did you have to obtain resources from someone (i.e., money, seeds, tools, animals) to grow food for personal or family consumption?	01= Yes 02= No	If 02 → E8
E7	Who provides you with the resources (i.e., money, seeds, tools, animals) to grow food for personal or family consumption? Read all answers, circle all that apply	b. Your Husband c. Other Male relative d. Other Female relative e. Land owner f. Neighbor g. Private company h. Government program i. Non-government organization j. Religious organization k. _____ Other (specify): _____	
E8	What types of food do you PRODUCE on this plot(s) of land Read all answers, circle all that apply	a. Grains: wheat, corn, oats, rice, sorghum millet b. Roots or tubers: White potatoes, manioc, cassava, sweet potato c. Pulses/legumes/nuts e.g. chicken peas, peas, beans, groundnuts etc d. Meat, poultry, fish, e. Eggs f. Milk and milk products g. Vitamin A-rich plant foods (Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside, mangoes, papayas, or other locally grown food that is rich in Vitamin A) h. Dark green, leafy vegetables i. Other fruits or vegetables j. Coffee, tea, k. Other (specify) _____	
E9	What are the main uses of foods you PRODUCE on this plot of land? Read all answers, circle all that apply	a. Personal/Family Consumption b. Sale c. Barter trade d. Other (specify): _____	

E10	Who usually decides which foods you PRODUCE on this plot of land?	<p>01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other Family 07= _____ Other (specify)_____</p>	
E11	<p>Which foods do you SELL from your plot of land?</p> <p>Read all answers, circle all that apply</p>	<p>a. Grains: wheat, corn, oats, rice, sorghum millet b. Roots or tubers: White potatoes, manioc, cassava, sweet potato c. Pulses/legumes/nuts e.g. chicken peas, peas, beans, groundnuts etc d. Meat, poultry, fish e. Eggs f. Milk and milk products g. Vitamin A-rich plant foods (Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside, mangoes, papayas, or other locally grown food that is rich in Vitamin A) h. Dark green, leafy vegetables i. Other fruits or vegetables j. Coffee, tea, k. None l. Other (specify): _____</p>	If "k" → E13
E12	Who usually decides which foods you SELL on this plot of land?	<p>01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other Family 07= _____ Other (specify)_____</p>	
E13	Do you have a home/kitchen garden that you use to grow food	<p>01 = Yes 02 = No</p>	If 02 →

	for family or personal consumption?		E23
E14	Who owns the home/kitchen garden?	01= You (Respondent) 02= Husband 03= Both you and your husband 04= Other Male relative 05= Other Female relative 06= Land owner 07= Neighbor 08= Company 09= Other (specify): _____ 98 = Don't know	If 01 or 02 → E16
E15	How did you get access to the home/kitchen garden that you use to grow food for personal or family consumption? Read all answers, circle ONE	01= Rented in (cash) 02= Sharecropped in 03= Borrowed (no payment) 04= Other (specify)_____ 05= Don't know	
E16	Do/Did you have to obtain resources from someone (i.e., money, seeds, tools, animals) to grow food on your home/kitchen garden for personal or family consumption?	01= Yes 02= No	If 02 → E18
E17	Who provides you with the resources (i.e., money, seeds, tools, animals) to grow food on your home/kitchen garden for personal or family consumption? Read all answers, circle all that apply	b. Husband c. Male relative d. Female relative e. Land owner f. Neighbor g. Private company h. Government program i. Non-government organization j. Religious organization k. Other (specify): _____	
E18	What types of food do you PRODUCE on this home/kitchen garden? Read all answers, circle all that	a. Grains: wheat, corn, oats, rice, sorghum millet b. Roots or tubers: White potatoes, manioc, cassava, sweet potato c. Pulses/legumes/nuts e.g. chicken peas, peas, beans, groundnuts etc	

	apply	<ul style="list-style-type: none"> d. Meat, poultry, fish e. Eggs f. Milk and milk products g. Vitamin A-rich plant foods (Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside, mangoes, papayas, or other locally grown food that is rich in Vitamin A) h. Dark green, leafy vegetables i. Other fruits or vegetables j. Coffee, tea k. Other (specify) 	
E19	<p>What are the main uses of foods you PRODUCE on your home/kitchen garden?</p> <p>Read all answers, circle all that apply</p>	<ul style="list-style-type: none"> a. Personal/Family Consumption b. Sale c. Barter trade d. Other (specify): 	
E20	<p>Who usually decides which foods you PRODUCE on this home/kitchen garden?</p>	<ul style="list-style-type: none"> 01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other Family 07= Other (specify) 	
E21	<p>Which foods do you SELL from your home/kitchen garden?</p> <p>Read all answers, circle all that apply</p>	<ul style="list-style-type: none"> a. Grains: wheat, corn, oats, rice, sorghum millet b. Roots or tubers: White potatoes, manioc, cassava, sweet potato c. Pulses/legumes/nuts e.g. chicken peas, peas, beans, groundnuts etc d. Meat, poultry, fish e. Eggs f. Milk and milk products g. Vitamin A-rich plant foods (Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside, mangoes, papayas, or other locally grown food that is rich in Vitamin A) h. Dark green, leafy vegetables i. Other fruits or vegetables j. Coffee, tea 	<p>If circle "k" → E23</p>

		k. None l. Other (specify):	
E22	Who usually decides which foods you SELL from this home/kitchen garden?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other Family 07= Other (specify)	

E23	What types of food do you have to buy Read all answers, circle all that apply	a. Grains: wheat, corn, oats, rice, sorghum millet b. Roots or tubers: White potatoes, white yams, manioc, cassava, sweet potato c. Pulses/legumes/nuts e.g. chicken peas, peas, beans, groundnuts etc d. Meat, poultry, fish e. Eggs f. Milk and milk products g. Vitamin A-rich plant foods (Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside, mangoes, papayas, or other locally grown food that is rich in Vitamin A) h. Dark green, leafy vegetables i. Other fruits or vegetables j. Coffee, tea k. Cooking related items (sugar, oil, salt, flour) l. Snacks (sugar, junk foods) m. Other (specify):	
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F. Food preservation and storage

NO.	QUESTIONS AND FILTERS	RESPONSE CODES	SKIP TO
F1	In the last 12 months, did the household preserve any fruits and/or vegetables for use later in the year?	01= Yes 02= No	If 02 → F5
F2	If yes, what methods of food	a. Solar drying	

	<p>preservation did you use?</p> <p>Read all answers, circle all that apply</p>	<p>b. Other drying</p> <p>c. Canning</p> <p>d. Salting</p> <p>e. Pickling</p> <p>f. Smoking</p> <p>g. Other (specify): _____</p>	
F3	<p>What varieties of fruits and vegetables did you preserve?</p> <p>Read all answers, circle all that apply</p>	<p>Pumpkin</p> <p>Citron</p> <p>Banana</p> <p>Kale</p> <p>Cabbage</p> <p>Lettuce</p> <p>Carrot</p> <p>Tomato</p> <p>Citrus</p> <p>Red pepper</p> <p>Garlic</p> <p>Onion</p> <p>Mango</p> <p>Papaya</p> <p>Lemon</p> <p>Orange</p> <p>Other (specify)-----</p>	
F4	<p>What amount (kilos) did you preserve of these varieties in the last 12 months</p>	<p>Write response in kilograms</p> <p>95.0 = 95 kilos or more</p> <p>98.8 = Don't know</p>	<p> _ _ . _ </p>
F5	<p>During the last post-harvest period, did you store any food crops (cereals, legumes) that you grew?</p>	<p>01= Yes</p> <p>02= No</p>	<p>If 02→ Mod ule G</p>
F6	<p>What variety of crops did you store?</p> <p>Read all answers, circle all that apply</p>	<p>Chicken pea</p> <p>Pea</p> <p>Teff</p> <p>Sorghum</p> <p>Flaxseed</p> <p>Maize</p> <p>Millet</p> <p>Wheat</p> <p>Barely</p> <p>Bean</p> <p>Haricot bean</p> <p>Oats</p>	

		Lentil Grass pea Red pea Other (specify)-----	
F7	What was the main method(s) of storage that the household used for this crop over the last 12 months? Read all answers, circle all that apply	a. Improved locally made structure/granary b. Modern storage structure like cribs or silos c. Sealed/tight containers d. Improved cereal banks e. Improved community storing facilities f. Traditional storage g. Other (specify): _____	
F8	What is the purpose of the crop(s) being stored? Read all answers, circle all that apply	a. Food for household consumption b. To sell for higher price c. Seed for planting d. Other (specify): _____	

G. Agriculture Extension

NO.	QUESTIONS AND FILTERS	RESPONSE CODES	SKI P TO
G1	In the past 12 months, have you ever met, or been visited by an agricultural extension worker	01= Yes 02= No	
G2	In the past 12 months, have ever met, or been visited by a livestock/fisheries extension worker	01= Yes 02= No	

H. Coping Strategy Index [not applicable for Ethiopia Baseline]

I. Household Hunger Scale

NO.	QUESTION	RESPONSE CODES	SKIP TO
I1	In the past 4 weeks/30 days was there ever no food to eat of any kind in your house because of lack of resources to get food?	01 =Yes 02= No	If 02→I3
I2	How often did this happen in the past [4 weeks/30 days]?	01= Rarely (1-2 times) 02= Sometimes (3-10 times) 03= Often (more than 10 times)	
I3	In the past [4 weeks/30 days]did you or any household member (including children) go to sleep at night hungry	01 =Yes 02= No	If 02→I5

	because there was not enough food?		
I4	How often did this happen in the past [4 weeks/30 days]?	01= Rarely (1-2 times) 02= Sometimes (3-10 times) 03= Often (more than 10 times)	
I5	In the past [4 weeks/30 days] did you or any household member (including children) go a whole day without eating anything at all because there was not enough food?	01 =Yes 02= No	If 02→ Module J
I6	How often did this happen in the past [4 weeks/30 days]?	01= Rarely (1-2 times) 02= Sometimes (3-10 times) 03= Often (more than 10 times)	

J. Women's Diet Diversity Score

READ: Now I would like to know about the kind of food you consume during a normal/typical day.

NO.	QUESTIONS AND FILTERS	RESPONSE CODES	SKIP
J1	Was yesterday a special day of celebration or fasting? Clarification special day includes: celebration, or feast day where you ate special foods or more food than normal. It also includes fasting day where you ate less than usual	01 = Yes 02 = No	If 02→J3
J2	How many days ago was a "normal" day where special kinds of foods were not eaten, or no one in the household ate more or less than usual or did not eat because of fasting?	Write number of days	_ _

READ: Please describe the foods (meals and snacks) and drinks that you took yesterday (or last "normal" day), both during the day and night, whether at home or outside the home. Let's begin with the first thing you took in the morning and continue up to the late evening..

Enumerator instructions: When composite dishes (soup, stew) are mentioned, asked for the list of ingredients. When the respondent has finished, probe for meals and snacks not mentioned.

NO.	FOOD GROUP	EXAMPLES	RESPONSE CODES Yes No
J3	a. CEREALS	Corn/maize, wheat, sorghum, millet or any other grains or foods made from these (e.g. bread, noodles, porridge or other grain products...) (Injera (flat bread), Kolo (roasted cereals), bread	1 2
	b. VITAMIN	Red or orange sweet pepper, pumpkin, carrot, squash	1

A	RICH VEGETABLES AND TUBERS	or sweet potatoes that are orange inside. Removed kale, cabbage, etc here (is listed in 'd' below.	2
c.	WHITE ROOTS AND TUBERS	White potatoes, white cassava, other foods made from roots (e.g. other options)	1 2
d.	DARK GREEN LEAFY VEGETABLES	Dark green/leafy vegetables including wild ones + locally available vitamin A rich leaves such as cassava leaves, local cabbage, kale, spinach	1 2
e.	OTHER VEGETABLES	Other vegetables (e.g. tomato, onion), including wild vegetables	1 2
f.	VITAMIN A RICH FRUITS	Ripe mangoes, apricots (fresh or dried), ripe papaya, dried peaches, other locally available vitamin A rich fruits	1 2
g.	OTHER FRUITS	Other fruits, including wild fruits	1 2
h.	ORGAN MEAT	Liver, kidney, heart or other organ meats or blood-based foods	1 2
i.	FLESH MEATS	Beef, pork, lamb, goat, wild game, chicken, or other birds	1 2
j.	EGGS	Chicken, duck, guinea fowl or any other egg	1 2
k.	FISH	Fresh, dried fish, shellfish or small, dried fish	1 2
l.	LEGUMES, NUTS AND SEEDS	Beans, peas, chicken peas, lentils, nuts, seeds or foods made from these	1 2
m.	MILK AND MILK PRODUCTS	Milk, cheese, yogurt, skimmed milk or other milk products	1 2
n.	OILS AND FATS	Oil, fats or butter added to food or used for cooking	1 2
o.	OTHER OILS	Foods made from palm oil	1 2
p.	OTHER	Specially fortified foods (e.g. Corn soya blend (CSB) foods fortified with micronutrient powder, plumpy'nut, other Ready-to-Use Therapeutic Foods or lipid-based nutrient supplement?	1 2
r.	OTHER SPICES, CONDIMENTS	Spices (black pepper, salt), condiments (soy sauce, hot sauce), fish powder	1 2
s.	OTHER	Sugar, honey, sweetened soda, sweetened juice or	1

	SWEETS	sugary foods such as chocolates, candies, cookies, pastries and cakes (including biscuits)	2
	t. OTHER SALTY READY-MADE SNACKS	High fat, salty, pre-packaged foods, typically eaten between meals as convenience	1 2
	u. OTHER BEVERAGES	Coffee, tea	1 2
	v. OTHER (Write in)	Alcohol beverages, local alcohol (areke), local beer (Tela or Korefe) or any other local examples	1 2

K. Maternal health/pregnancy

Read: Now, I have several questions about your last (most recent) pregnancy.

NO.	QUESTIONS AND FILTERS	RESPONSE CODES	SKIP TO
K1	During your last pregnancy, did you attend antenatal care (ANC) or pre-baby care?	01= Yes 02= No	If 02→K5
K2	How many times did you attend ANC?	01= One time 02= Two times 03= Three times 04= Four times (or more) 08= Don't know, don't remember	
K3	Whom did you see for ANC service?	01= Health personnel doctor 02= Nurse/midwife 03= Auxiliary midwife 04= Other person traditional birth attendant 05= Health extension workers 06= Other (specify)_____	
K4	Where did you receive ANC?	01= Your home 02= Other home 03= At government hospital 04= At government health center 05= At government health post 06= Other government sectors (specify) 07= At private hospital/clinic 08= Other private medical sector (specify) -- 09= Other (specify)_____	
K5	During your last pregnancy, did you take any intermittent preventive treatment (IPT) or any medicine to prevent malaria? (list the local brand name, show example)	01= Yes 02= No 08 = Don't know/remember	
K6	During your last pregnancy, did you take any iron tablets?(list the local brand name, show example of iron tablet)	01= Yes 02= No 08= Don't Know	If 02→K8
K7	During your last pregnancy, how long did you take iron tablets? (describe local name, show example of iron tablet)	01= Less than 30 Days 02= 30 to 59 Days 03= 60 to 89 04= 90 Days or more 08= Don't know	

K8	During your last pregnancy, where did you deliver your child?	01= At home 02= At government hospital 03= At government health center 04= At government health post 05= At private hospital/clinic 06= At parent's home 07= Other (specify) _____	
K9	During your last pregnancy, who assisted you in the delivery of your child?	01= Traditional Birth Attendant 02= Skilled Birth Attendant 04= Traditional Healer 05= Midwife 06= Medical Nurse 07= Medical Doctor 08= Family Member 09= Health extension worker 10= Neighbor 11= Other (specify) _____	
K10	After your last delivery, did you attend post-natal care (PNC)(after baby care)?	01= Yes 02= No	If 02 → Module L
K11	How many days after your last delivery did you attend PNC care?	Write number of days 98= Don't know	_ _
K12	Where do/did you attend PNC care?	01= Your home 02= Other home 03= At government hospital 04= At government health center 05= At government health post 06= Other government sectors (specify) 07= At private hospital/clinic 08= Other private medical sector (specify) -- 09= Other (specify) _____	

L. Infant and Young Child Feeding Practices (IYCF)

Instructions and verification: Copy the child's name. Verify the date of birth from Module B.		
NO.	QUESTIONS AND FILTERS	RESPONSE CODES
	Copy the name of child from Module B	
L2	Age of child in months (copy from B4)	_ _

Read: I would like to ask you some questions about how you have been feeding CHILD'S NAME from birth until now.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	RESPONSE	SKI P TO
L3	Did you ever breastfeed CHILD'S NAME?	01= Yes 02= No		If 02 →L 5
L4	How soon after birth did you first put (CHILD'S NAME) to your breast?	01= Immediately 02= In less than one hour 03= One hour to less than 24 hours 04= One day (24 hours or more) 08= Don't know		
L5	After CHILD'S NAME was born, what did you do with your first milk (colostrum)?	01= Gave it to your child 02= Threw it away 08= Don't know		
L6	In the first 3 days after birth, did you give (CHILD'S NAME) anything in addition to breast milk?	01= Yes 02= No		If 02 →L 8
L L7	What else did you give CHILD'S NAME in the first 3 days after birth? DO NOT read all answers, circle all that apply		One time	Mo re tha n on e tim e

	Ask about every liquid. If the mother responds 'yes' circle '1'. If the child did not take the item, circle '2'. For questions b, c or g; if the mother says 'yes' write number of times the infant was given the liquid in the last 24 hours	No	If 01=Yes, write number of times 98= Don't know	
a.	Plain water	1 2		
b.	Infant formula (NIDO, S26, NAN (WRITE LOCAL BRAND NAME)(if yes, write number of times)	1 2	_ _	
c.	Cow's/goat's/sheep's milk, tinned, or powdered milk , fresh milk, ultra high temperature (UHT)(WRITE LOCAL BRAND NAME - like mama, family)	1 2	_ _	
d.	Fruit juice or juice drinks	1 2		
e.	Broth (chicken soup, vegetable soup bean soup etc)	1 2		

	f. Other water-based liquids (e.g. Soft drinks like Pepsi, Coca Cola, Sprite, Fanta)	1		
		2		
	g. Sour milk or yogurt or skimmed milk, curd	1	_ _	
		2		
	h. Thin porridge (cannot pick with hands)	1		
		2		
	i. Tea or coffee	1		
		2		
	j. Vitamin syrup, cough syrup, other medicines	1		
		2		
	k. Oral Rehydration Salt	1		
		2		
	l. Any other liquid (write liquid below)	1		

		2		
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L11:Read: Now I would like to ask you about any foods CHILD'S NAME had yesterday (24 hours). I am interested in whether your child had the item even if it was combined with other foods, any snacks whether at home or outside the home. Please begin when (CHILD NAME) first woke up yesterday. Did (CHILD NAME) eat anything at that time?

Interviewer instructions: This is free recall from the first food item. Please underline the food name that has been consumed, and tally after the mother has finished listing the food. If there are columns with no underlines check question L12

a. Think about when (CHILD NAME) first woke up yesterday. Did (CHILD NAME) eat anything at that time?

⌘ If yes: Please tell me everything (CHILD NAME) ate at that time. Underline each food groupProbe: anything else? Until respondent says nothing else

⌘ If no: continue to Question b).

b. What did (CHILD NAME)do after that? Did (CHILD NAME) eat anything at that time?

⌘ If yes: Please tell me everything (CHILD NAME) ate at that time. Probe: Anything else? Until respondent says nothing else.

⌘ Repeat Question b) above until respondent says the child went to sleep until the next day

⌘ If respondent mentions mixed dishes (e.g. porridge, sauce or stew) Probe: What ingredients were in that (Mixed dish)? Probe: anything else? until respondent says nothing else.

As the respondent recalls foods, underline the corresponding food and write "1" in the column next to the food group. If the food is not listed in any of the food groups below, write the food in the box labeled 'other foods'. If foods are used in small amounts for seasoning or as a condiment, include them under the condiments food group.

When the mother has completed recalling what the child ate yesterday, review the food groups listed below. If there is a food group with no food underlined, say to the mother: 'I know you have told me everything that [NAME] ate yesterday, but just to be certain we haven't missed anything, I'd like to read you a list of foods. Please tell me if [NAME] had any of the foods I'll mention ...'.

L11	Food Group	Example	Ye s	N o	DK
	a. CEREALS (GRAINS)	bread, rice, biscuits, or other foods made from millet, sorghum, maize, rice, wheat or grain (Injera (flat bread), Kolo (roasted cereals),	1	2	8
.	b. VITAMIN A RICH VEG & TUBERS	pumpkin, carrots, sweet potatoes, squash and other locally available vitamin-A rich vegetables that are yellow or orange inside	1	2	8
	c. WHITE TUBERS & ROOTS	White potatoes, cassava or foods made from roots	1	2	8
	d. DARK GREEN	dark green/leafy vegetables locally available	1	2	8

	LEAFYVEG	vitamin-A rich leaves, for example pumpkin leaves	
	e. OTHER VEGETABLES	other vegetables (e.g. tomatoes, cabbage, kale)	1 2 8
	f. VITAMIN A RICH FRUITS	fruits rich in vitamin A (e.g. ripe mangoes, papaya)	1 2 8
	g. OTHER FRUITS	other fruits including guava, pineapple, watermelon, melon, orange, apple, grape, banana, jackfruit or other local fruits	1 2 8
	h. ORGAN MEAT (IRON-RICH)	liver, kidney, heart or other organ meats	1 2 8
	i. FLESH MEATS	Beef, pork, lamb (mutton), goat, wild game, chicken, or other birds	1 2 8
	j. EGGS	Egg	1 2 8
	k. FISH	fresh or dried fish or shellfish	1 2 8
	l. LEGUMES, NUTS AND SEEDS	beans, peas, lentils, nuts, seeds or foods made from these	1 2 8
	m. MILK AND MILK PRODUCTS	Milk (animal milk, tinned or powdered milk), cheese, yogurt or skimmed milk or other milk products	1 2 8
	n. OILS AND FATS	Oil, fats or butter or foods made with any of these	1 2 8
	o. OTHER OILS	Foods made from palm oil	1 2 8
	p. OTHER FORTIFIED FOODS	Specially fortified foods (e.g. Corn soya blend (CSB) foods fortified with micronutrient powder, plumpy'nut, other Ready-to-Use Therapeutic Foods or lipid-based nutrient supplement?	1 2 8
	r. OTHER SPICES, CONDIMENTS,	Spices (black pepper, salt), condiments (soy sauce, hot sauce) fish powder or any other local examples	1 2 8
	s. OTHER SUGARY FOODS	Cookies (cake, biscuit,), sweets, chocolates, candies, pastries	1 2 8
	t. OTHER SALTY READY-MADE SNACKS	High fat, salty, pre-packaged foods, typically eaten between meals as convenience	1 2 8
	u. OTHER (Write in)		1 2 8
	Check categories a-u		IF ALL 'NO' → L12 IF AT LEAST ONE 'YES' or ALL 'DK' → L13

NO.	QUESTION	CODING CATEGORY	RESPONSE	SKIP TO
L12	CHECKER FOR L11, if MOTHER SAID ALL '02' = NO Did CHILD'S NAME eat any solid, semi-solid, or soft foods yesterday during the day or night? By that I mean were any of these foods thick enough that you could have picked them up with your fingers and fed them by hand?	01= Yes If yes repeat L11 and underline food groups in L11. Continue to L13. 02= No 08 = Don't know		If 02 or 08 → L14
L13	How many times did CHILD'S NAME eat solid, semi-solid or soft foods other than liquids yesterday during the day or night? How many times did this happen?	Write number of times 98 = Don't know	 — — 	
L14	Did CHILD'S NAME drink anything from a bottle or nipple yesterday during the day or night?	01= Yes 02= No 08= Don't know		
L15	Yesterday, during the day or night, did CHILD'S NAME eat any iron fortified formula? (example: locally available fortified formula)	01= Yes 02= No 08= Don't know		
L16	Yesterday, during the day or night, did CHILD'S NAME eat any iron fortified food baby foods (example local baby foods)	01= Yes 02= No 08= Don't know		
L16a L16a	At what age did you first introduce solid/semi-solid food to CHILD'S NAME?	Write age in months 98= Don't know	 — — 	

	QUESTION	CODING CATEGORY	RESPONSE	SKIP TO
L17	Have you ever seen (CHILD'S NAME) eat soil?	01= Yes 02= No		If 02 → L21
L18	At what age was this behavior first observed?	Write age in months 98 = Don't Know	_ _	

L19	Have you ever observed this behavior in the past 30 days?	01= Yes 02= No	If 02→ L21
L20	How often have you ever observed this behavior in the past 30 days?	01= Everyday 02= Once per week 03= Couple times	
L21	Have you ever seen (CHILD'S NAME) eat chicken poop?	01= Yes 02= No	If 02→ Mod ule M
L22	At what age was this behavior first observed?	Write age in months - 98 = Don't Know - - - 	
L23	Have you ever observed this behavior in the past 30 days?	01= Yes 02= No	If 02→ Mod ule M
L24	How often have you observed this behavior in the past 30 days?	01= Everyday 02= Once per week 03= Couple times	

M. Responsive Feeding

NO.	QUESTION	CODING CATEGORIES	RESPONSE	SKIP TO
M0	ENUMERATOR: VERIFY L2 Is (CHILD NAME) 6 months or older?	01= Yes 02= No		If 02→ Module N
M1	Who is the primary person responsible for feeding (CHILD NAME) the main meal?	01= Mother 02= Father 03= Grandmother 04= Aunt (Mother sister-in-law) 05= CHILD NAME'S sister/brother 06= Other (specify): _____ 08= Don't know		If 08→ Module N
M2	Most of the time do they/you do anything to encourage (CHILD NAME) to eat?	01= Yes 02= No 08= Don't know		If 02or 08→ Module N
M3	What did they/you do? What did	a. Offered another food or drink		

	<p>they/you say?</p> <p>Probe: Did they/you say anything else?</p> <p>Do not read all answers, circle all that apply</p>	<p>b. Talked/Encouraged verbally</p> <p>c. Praised child for eating</p> <p>d. Played /laughed</p> <p>e. Modeled eating</p> <p>f. Refocused the child's attention (Show cartoon, animal)</p> <p>g. Ordered strongly/forced child to eat</p> <p>h. Threatened</p> <p>i. Another person helps child</p> <p>j. Had child sitting close to me</p> <p>k. Let the child feed him/herself</p> <p>l. Let child touch the plate</p> <p>m. Singing, dancing, music</p> <p>n. Told story</p> <p>o.</p> <p>Other(specify)_____</p> <p>—</p> <p>p. Don't know</p>	
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N. Childhood illness

Read: Think back over the last two weeks. Has (CHILD NAME) experienced any of the following symptoms?

No.	QUESTIONS AND FILTERS	RESPONSE CODES		SKI P
		Yes	No	
N1	Has (CHILD NAME) experienced runny nose and cough in the past two weeks?	1	2	
N2	Has (CHILD NAME) experienced rapid or difficulty in breathing in the past two weeks?	1	2	
N3	Has(CHILD NAME)experienced a fever in the past two weeks?	1	2	If 2→ N5
N4	Has(CHILD NAME)been diagnosed with malaria from a health care provider in the past two weeks?	1	2	
N5	In the last two weeks, has (CHILD NAME) experiencedthreeor more loose stoolsin a single day (within 24 hours)	1	2	
N6	Has(CHILD NAME)experienced at least one stool with blood in the past two weeks?	1	2	
N6	Has(CHILD NAME)been diagnosed with intestinal worms in the past two weeks?	1	2	

O. Drinking water

Read: Great, thank you. I have some questions about your household water sources and sanitation.

NO.	QUESTIONS AND FILTERS	CODE	RESPONSE	SKIP
O1	What is the primary source of drinking water for members of your household?	01= Piped water into dwelling 02= Piped water into yard/plot 03= Public tap/standpipe 04= Tubewell/borehole 05= Protected dug well 06= Unprotected dug well 07= Protected spring 08= Unprotected spring 09= Rainwater collection 10= Bottled water 11= Cart with small tank/drum 12= Tanker truck 13= Surface water (river, dam, lake, pond, stream, canal, irrigation channels) 14= Other (specify)_____		If 01 or 02→03
O2	How long does it take to go there, get water and come back? Enumerator instructions: Only include time to get to water source and back. Do not include socializing or other errands	Write number of minutes 480= 480 minutes or more (8+ hours) 988= Don't know	_ _ _	

O3	What is the secondary source of drinking water for members of your household?	01= Piped water into dwelling 02= Piped water into yard/plot 03= Public tap/standpipe 04= Tubewell/borehole 05= Protected dug well 06= Unprotected dug well 07= Protected spring 08= Unprotected spring 09= Rainwater collection 10=Bottled water 11= Cart with small tank/drum 12= Tanker truck 13= Surface water (river, dam, lake, pond, stream, canal, irrigation channels) 14= No secondary source 15= Other (specify)_____	If 14→O5
O4	Over the past 12 months, approximately how many months do you use your secondary water source?	01= Rarely (Less than 2 months) 02= Sometimes (2+ to 3 months of the year) 03= Often (3+ to 4 months of the year) 04= Frequently (4+ to 6 months of the year)	
O5	Who usually goes to the water source to fetch the water for your household?	01= Adult woman 02= Adult male 03= Female child (less than 15 years of age) 04= Male child (less than 15 years of age) 08 = Don't know	
O6	Do you treat your water in any way to make it safer to drink?	01= Yes 02= No 08= Don't know	If 02 or 08 → skip to O8

O7	<p>What do you usually do to the water to make it safer to drink?</p> <p>Do not read, but circle all that apply</p>	<p>a. Boil water</p> <p>b. Add bleach/chlorine</p> <p>c. Strain it through a cloth</p> <p>d. Use water filter (ceramic/sand/composite/etc)</p> <p>e. Solar disinfection</p> <p>f. Let it stand and settle</p> <p>g. Use purifying tablets</p> <p>h. Other (Specify) _____</p> <p>i. Don't know</p>	
O8	Do you store water for drinking in the household?	<p>01= Yes</p> <p>02= No</p> <p>08 = Don't know</p>	If 02 or 08 → Module P
O9	<p>If Yes, what kind of containers are they, may I please see them?</p> <p>(Enumerator, observe. Narrow mouthed: opening is 3 cm or less).</p>	<p>01= Narrow mouthed</p> <p>02= Wide mouthed</p> <p>03= Both types</p>	
O11	<p>Who takes water from these containers?</p> <p>Read all answers, circle all that apply</p>	<p>a. Adult woman</p> <p>b. Adult male</p> <p>c. Female child (between ages 5 and 15)</p> <p>d. Male child (between age 5 and 15)</p> <p>e. Female child (less than 5 years of age)</p> <p>f. Male child (less than 5 years of age)</p>	
O12	How do you remove water from the drinking water container?	<p>01= Pouring</p> <p>02= Dipping</p> <p>03= Both Pouring and Dipping</p> <p>04= Container has a spigot or tap</p> <p>05= Other (Specify) _____</p>	If 01 or 04, skip to O14

		08= Don't Know	
O13	What do you use to remove water?	01= Same receptacle/cup used to drink from 02= Receptacle reserved for retrieving water	
O14	When were the containers cleaned last?	01= Today or Yesterday 02= Less than one week ago 03= Several Weeks ago 04= Never 05= Other (Specify) _____ 08= Don't Know/Remember	

P. Hand washing, sanitation and disposal of child's feces
Water for other purposes, such as cooking and hand washing

NO.	QUESTIONS AND FILTERS	CODE	RESPONSE	SKIP
P1	What is the primary source of water used by your household for other purposes, such as cooking and hand washing?	01= Piped water into dwelling 02= Piped water into yard/plot 03= Public tap/standpipe 04= Tubewell/borehole 05= Protected dug well 06= Unprotected dug well 07= Protected spring 08= Unprotected spring 09= Rainwater collection 10=Cart with small tank/drum 11= Tanker truck 12= Surface water (river, dam, lake, pond, stream, canal, irrigation channels) 13= Other		If 01 or 02 →P3

Hand Washing

NO.	QUESTIONS AND FILTERS	CODE RESPONSE	SKIP
P5	When do you usually wash your hands? (Do not read responses. Allow respondent to answer first, and then ask how often by probing, with never, always or sometimes. If respondent does not mention an activity, such as “before eating”, circle 01 for Never.)		
	a. before eating	01= Never 02= Always 03= Sometimes	
	b. before preparing food	01= Never 02= Always 03= Sometimes	
	c. Before feeding the child	01= Never 02= Always 03= Sometimes	
	d. after toilet use	01= Never 02= Always 03= Sometimes	
	e. after changing a baby	01= Never 02= Always 03= Sometimes	
	f. Other	01= Never 02= Always 03= Sometimes	

Observation

section:

Read: I'd like you to please show me where you store your drinking water, and also where you most often wash your hands.

NO.	QUESTIONS AND FILTERS	CODE/RESPONSE	SKIP TO
P6	Can you please show me where you store your drinking water? Observe: Are the containers covered?	01= All are covered 02= Some are covered 03= None are covered 04= No permission to see	
P7	Thanks, can you show me where you most often wash your hands? (Ask to see and observe. Record only one hand washing place. This is the hand washing place	01 =Inside/within 10 paces of the toilet facility 02= Inside/within 10 paces of the	If 6 → P12

	that is used most often by the respondent or household.)	kitchen/cooking place 03= Elsewhere in home or yard 04= Outside yard 05= No specific place 06= No permission to see	
P8	OBSERVE: Is water present at the specific place for hand washing? Enumerator: If there is a tap or pump present at the specific place for hand washing, open the tap or operate the pump to see if water is coming out. If there is a bucket, basin, or other type of water container, examine it to see whether water is present in the container. Record observation.	01= Yes (Water is available) 02= No (Water is not available)	
P9	OBSERVE: Is soap or detergent present at the specific place for hand washing? Enumerator: record observation. Circle all that apply.	a. Bar soap b. Detergent (powder/liquid/paste) c. Liquid soap (including shampoo) d. None	If 'a, b, c' for P9 and 'a, b, c' P10 → P12
P10	OBSERVE: Is locally sourced cleansing agent present at the specific place for hand washing? Enumerator: Record observation. Circle all that apply.	a. Ash b. Mud/sand c. None d. Other (specify) _____	
P11	Do you have soap/local sourced cleansing agent in your house?	01= Yes 02= No 08= Don't know; N/A	If 02 or 08 → P12
P11a	Can I please see your soap/locally sourced cleansing agent? Circle all that apply.	a. Soap present b. Ash present c. None available	
P12	What kind of toilet facility do members of your household usually use?	01 = Flush/pour flush to piped sewer system 02= Flush/pour flush to septic tank 03= Flush/pour flush to pit latrine 04= Flush/pour flush to elsewhere	If 12 → P15

		<p>05= Flush/pour flush unknown place/not sure DK where</p> <p>06= Ventilated improved pit latrine (VIP)</p> <p>07= Pit latrine with slab</p> <p>08= Pit latrine without slab/open pit</p> <p>09= Composting toilet</p> <p>10= Bucket</p> <p>11= Hanging toilet/hanging latrine</p> <p>12= No facilities/bush/field</p> <p>13= Other (specify)</p>	
P13	Do you share this facility with other households?	<p>01= Yes</p> <p>02= No</p>	if 2=No → P15
P14	How many households use this facility?	<p>Write number of households</p> <p>98 = Don't know</p>	<p> </p> <p>—</p> <p>—</p> <p> </p> <p>—</p> <p>—</p> <p> </p>
P14a	<p>Whose household members of your immediate family use this toilet?</p> <p>Do not read, circle all that apply.</p>	<p>a. Male adults</p> <p>b. Female adults</p> <p>c. Male children</p> <p>d. Female children</p> <p>e. Others</p>	
P15	The last time (child name) passed stool, where did he/she defecate?	<p>01= Used potty</p> <p>02= Used washable diaper</p> <p>03= Used disposable diaper</p> <p>04= Went in his/her clothes</p> <p>05= Went in house</p> <p>06= Went outside of house/yard</p> <p>07= Used latrine</p> <p>08 =Don't know</p>	<p>If 07= →Module Q</p>

P16	The last time (child name) passed stool, what was done to dispose of the stools?	01= Dropped into toilet facility/latrine 02= Buried 03= Put into container for trash 04= In yard 05= In sink or tub 06= Thrown into waterway 07= Washed or rinsed away 08= Don't know	If 1-6, →P18
P17	If "washed or rinsed away", probe where the waste water was disposed?	01= Dropped into toilet facility 02= Put into container for trash 03= In yard 04= Outside of yard 05= Into sink or tub 06= Thrown into waterway 08= Don't know	
P18	What sanitary item do you usually use when you are menstruating? Do not read answers	01 = Nothing (not menstruating) 02 = Old cloth 03 = Reusable pads 04 = Disposable pads 05= Tampons 06= Other (specify) _____ 08= Don't know	

Q. Women's Empowerment

Mobility

Read: Now I would like to ask you about going places. Please tell me whether you can to go to the following places on your own, only if someone accompanies you, or not at all?

NO.	QUESTIONS AND FILTERS	RESPONSE CODES	SKIP TO
Q1	Can you go to the market to buy or sell things, on your own, only if someone accompanies you, or not at all?	01= Not at all 02= If someone accompanies me 03= On my own	
Q2	Can you go fetch water?	01= Not at all 02= If someone accompanies me 03= On my own	
Q3	Can you go to training courses, including adult literacy classes?	01= Not at all 02= If someone accompanies me 03= On my own	
Q4	Can you go to the health facility (when you are sick)?	01= Not at all 02= If someone accompanies me 03= On my own	
Q5	Can you go to a community meeting?	01= Not at all 02= If someone accompanies me 03= On my own	
Q6	Can you go to homes of close-by friends on your own, only if someone accompanies you, or not at all?	01= Not at all 02= If someone accompanies me 03= On my own	
Q7	Can you go to outside the village?	01= Not at all 02= If someone accompanies me 03= On my own	
Q8	Can you go to church or mosque?	01= Not at all 02= If someone accompanies me 03= On my own	

Community Social Capital

Read: I would now like to ask you some questions about your community. For each of the following statements do you: STRONGLY DISAGREE, DISAGREE, ARE UNDECIDED, AGREE, OR STRONGLY AGREE?

NO.	QUESTIONS AND FILTERS	RESPONSE CODES	SKIP TO
Q9	You can rely on people in your community to help you	01= Strongly	

	if you have difficulty breastfeeding your baby.	disagree 02= Disagree 03= Neither agree or disagree 04= Agree 05= Strongly agree	
Q10	You can rely on people in your community to help you if you can't provide your child with enough healthy food.	01= Strongly disagree 02= Disagree 03= Neither agree or disagree 04= Agree 05= Strongly agree	
Q11	You can rely on people in your community to help take care of your children/household if you need to go to health facility/institution.	01= Strongly disagree 02= Disagree 03= Neither agree or disagree 04= Agree 05= Strongly agree	
Q12	You can rely on people in your community to help deal with a violent or difficult family member.	01= Strongly disagree 02= Disagree 03= Neither agree or disagree 04= Agree 05= Strongly agree	
Q13	You can rely on people in your community to help take care of your children/household if you need to go outside the home to work.	01= Strongly disagree 02= Disagree 03= Neither agree or disagree 04= Agree 05= Strongly agree	

Household Decision-making

Read: Now, I would now like to ask you about who usually makes decisions in your household.

NO.	QUESTIONS AND FILTERS	RESPONSE CODES	SKIP TO
Q14	In your household who usually makes decisions about own health care?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	

Q15	In your household who usually makes decisions about your child's health?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	
Q16	In your household who usually makes decisions about large household purchases? Probe: (give local examples of large purchases)	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	
Q17	In your household who usually makes decisions about household purchases for daily needs?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	
Q18	In your household who usually decides when you visit family/relatives or friends?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	
Q19	In your household who usually decides when your whole household will visit family/relatives/friends	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	
Q20	In your household who usually decides how to use money that you bring into the household?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	
Q21	In your household who usually decides how to use the money your husband brings into the household?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	

Q22	In your household who usually decides when your family will sell a large asset (like a cow, sheep, goat)?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	
Q23	In your household who usually decides when your family will sell a small asset (like a chicken)?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	
Q24	In your household, who usually decides whether you can work to earn money?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	

Read: The next two questions ask about the relationship with your husband/spouse.

Q25	In your household, who usually decides when you and your husband have sex?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	If 7 → Skip to Q27
Q26	In your household, who usually decides whether you and your husband use family planning?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	
Q27	In your household, who usually decides whether to give the baby something other than breast milk during the first 3 days after birth?	01= You (respondent) 02= Your husband 03= Both you and your husband	

		04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	
Q28	In your household, who usually decides when to first introduce soft or solid food to your child?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	
Q29	If there is not enough food in the household, who decides how food is shared among family members?	01= You (respondent) 02= Your husband 03= Both you and your husband 04= Mother/Father In-law 05= Mother/Father 06= Other (specify)_____	

Gender Attitude and Belief: Tolerance of Intimate Partner Violence

Read: Sometimes a husband is angry with his wife. In your opinion, is a husband justified in hitting his wife in the following situations

No.	QUESTIONS AND FILTERS	RESPONSE CODES		SKIP
		Yes	No	
Q30	Is he justified in hitting his wife, if she goes out without telling him?	1	2	
Q31	Is he justified in hitting his wife, if she neglects their children?	1	2	
Q32	Is he justified in hitting his wife, if she argues with him?	1	2	
Q33	Is he justified in hitting his wife, if she refuses to have sex with him?	1	2	
Q34	Is he justified in hitting his wife, if she did not cook the food properly?	1	2	

R. Community group and Government safety net participation

NO.	QUESTION	RESPONSE CODES			S KI
		YES,	NO	YES there	

		there is program but NOT participant	program or don't know	is program AND active participant	P T O
R1	Are any active community programs in your village?				
a	Agriculture (example: local program name)	1	2	3	
b	WASH (example: local program name)	1	2	3	
c	Nutrition (example: local program name)	1	2	3	
d	Maternal Health (example: local program name)	1	2	3	
e	Child Health (example: local program name)	1	2	3	
f	Education (example: local program name)	1	2	3	
g	Economic Development [Equb (local saving)]	1	2	3	
h	Women's Empowerment (example: local program name)	1	2	3	
i	Climate Change (example: local program name)	1	2	3	
j	Other ((example: local program name) ldir	1	2	3	

NO.	QUESTION	RESPONSE CODES			SKIP TO
		YES, there is group but NOT member	NO group don't know	YES there is group AND active member	
R2	Are any active community groups in your village?				
a	Agriculture [community water shade development association, community irrigation users' association, community seed multiplication cooperative, Irrigation administration committee (Simada), farmer innovation group (Ebinat), community research group (Ebinat), Kebele PSNP committee]	1	2	3	
b	WASH [Kebele water asset administration committee, village level water users committee (for maintenance, labor cost and	1	2	3	

	money contribution), WASHCO (water and sanitation committee)]				
c	Nutrition [mothers support group (Simada), women self help saving group for seed purchase and fruit and vegetable production (Simada), development army (1-5)]	1	2	3	
d	Maternal Health [development army (1-5)]	1	2	3	
e	Child Health [development army (1-5)]	1	2	3	
f	Education [Kebele education and training board, parent-teacher integrity, school clubs, village development army]	1	2	3	
g	Economic Development [Equb (local saving), rural saving and credit cooperative (RUSACCO) at village level, women self help saving groups, youth self help saving groups, women IGA groups, youth IGA groups, development army (Kebele and village), animal fattening cooperative (Ebinat), bee product market cooperative (Ebinat), essence and gum producing cooperative (Ebinat)]	1	2	3	
h	Women's Empowerment [village level women self help saving groups, village level youth self help saving groups, females IGA groups, youth IGA groups, women development team (1- 5), youth development team (1- 5), women, youth and community forum, women, youth and parents forum (both forum work to create enabling environment for women and youth economic empowerment), gender based community conversation group at village level (Tach Gaynt)]	1	2	3	
i	Climate Change [village level natural resource conservation committee, Kebele development team (1-5 at village), energy-saving stove production association (Woreda level), landless youth association (engaged on mountain forestry - Simada), Kebele level energy-saving stove production association (to be established - Ebinat and Simada)]	1	2	3	
j	Other ((example: local program name)	1	2	3	

NO.	QUESTION	RESPONSE	SKIP TO
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		CODES		
		YES, there is program but NOT participant	NO group or don't know	Y E S t h e r e i s p r o g r a m A N D a c t i v e p a r t i c i p a n t

R3	Are any government programs (social safety net) in your village?			
a	Agriculture [water shade development, small scale irrigation, seed multiplication, innovation and research (Ebinat), PSNP]	1	2	3
b	WASH [Kebele and village WASH]	1	2	3
c	Nutrition [health extension program, fruits and vegetable production, development army]	1	2	3
d	Maternal Health [health extension program and development army]	1	2	3
e	Child Health [health extension program and development army]	1	2	3
f	Education [village development army]	1	2	3
g	Economic Development [rural saving and credit, self help and IGAs, development army (Kebele and village)]	1	2	3
h	Women's Empowerment [village self help and IGA, women development team (1- 5), youth development team (1- 5) and gender based community conversation group at village level (Tach Gaynt)]	1	2	3
i	Climate Change [natural resource conservation, development team (1-5 at village), energy-saving stove production (Woreda level), forestry, energy-saving stove production (planned - Ebinat and Simada)]	1	2	3
j	Other (example: local program name)	1	2	3

NO.	QUESTION	RESPONSE CODES	
		Yes	No
R4	Please tell me whether, in the last 12 months you or other members of your household has received any of the following inputs or direct assistance? Instructions: Read all options		
a	Food for work	1	2
b	School feeding program	1	2
c	Plot or land for household consumption	1	2
d	Seeds	1	2
e	Ag tools/implements	1	2
f	Livestock	1	2

g	Poultry	1	2
h	Fisheries	1	2
i	Vehicle	1	2
j	Sewing machine	1	2
k	Latrine (new or renovated)	1	2
l	Water pump (new or renovated for irrigation)	1	2
m	Agricultural inputs (fertilizers or seedling)	1	2
o	Other (Specify)	1	2

Record time the interview ended in 24 hour format	HOUR	_ _
	MINUTES	_ _

READ: Thank you for your time and participation. This concludes the household survey part. Next, we will take the height, weight and arm measurements of you and your child under three.

S. Mother's Anthropometry (Part I)

Read: Now I would like to take your height and weight measurements.

MEASUREMENTS FOR MOTHER				
NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	RESPONSE	SKIP TO
S1	Mother's Age	Copy from Page 5 C1	_ _	
S2	Pregnancy status	01=Pregnant 02= Not pregnant but lactating 03= Not Pregnant and not lactating		If 01 → S5
S3	Mother's height in centimeters	Write in measurement (centimeters) 988.8 = Don't know	_ _ _ . _ cm	
S4	Weight of Mother	Write in measurement (kilograms) 988.8 = Don't know	_ _ _ _ . _ kg	
S5	MUAC Measurement	Write in measurement (centimeters) 98.8 = Don't know	_ _ _ . cm	

Consent for Mother. As part of this survey, we are asking people to take an anemia test. Anemia is a serious health problem that usually results from poor nutrition, infection or chronic disease. This survey will assist the program to develop programs to prevent and treat anemia. We ask that all women ages 15 to 49 years take part in anemia testing and give a few drops of blood from a finger. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after each test. The blood will be tested for anemia immediately. The result will be kept strictly confidential [no names will be taken] and will not be shared with anyone other than members of our survey team.

You can say yes to the test or you can say no. It's up to you to decide. Do you have any questions? If you agree, please sign below.

Participant signature confirming consent for self _____

S6	Do you agree to participate in the anemia test?	01=Granted 02= Refused	Anemia tester (blood sample collector) sign name _____ _____	If 02→ Module Z
S7	Mother's Hemoglobin (Fingerprick sample)	Write in response 98.8 = Machine Error	_ _ . _ g/dL	

Z. Child's Anemia (Hemoglobin) Part II (Child Name: _____ Child Age: _____)

Consent for Child. We also ask that all children ages 6 months to less than 24 months take part in anemia testing and give a few drops of blood from a finger. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after each test.

The blood will be tested for anemia immediately. The result will be kept strictly confidential and will not be shared with anyone other than members of our survey team.

You can say yes to the test or you can say no. It's up to you to decide. Do you have any questions? If you agree, please sign below.

Participant signature confirming consent for child _____

NO.	QUESTIONS	CODING CATEGORIES	RESPONSE	SKIP TO
Z7	Will you allow (CHILD NAME) to participate in the anemia test?	01=Granted 02= Refused	Anemia tester sign name _____ _____ _	If 02→Z9
Z8	Hemoglobin (Fingerprick sample)	Record reading 98.8= DK/Test	_ _ . _ g/dL	

		error	
Z9	<p>DO NOT READ: Write down which measurement was taken of child</p> <p>Result of Measurements</p> <p>Circle one option</p>	<p>01=Measured weight only 02= Measured height only 03= Measured anemia only 04= Measured weight and height only 05= Measured weight and anemia only 06= Measured height and anemia only 07= Measured weight, height and anemia 08=Child not present 09=Refused all 10=Other(Specify)_____</p>	
<p>READ: Thank you for participation. Do you have any final questions? Have a good day.</p>			

