

MFI A RESEARCH

**Community-Based
Nutrition (CBN)
Intervention Evaluation
in Ethiopia**

**This study was sponsored by UNICEF
November 2011, Addis Ababa**

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Suggested citation:

Mela Research. 2011. Community-Based Nutrition intervention evaluation in Ethiopia. Addis Ababa, Ethiopia

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	4
1. BACKGROUND AND OBJECTIVES.....	9
2. METHDOLOGY.....	11
2.1. STUDY DESIGN.....	11
2.2. STUDY AREA AND DOMAIN.....	11
2.3. SAMPLING FRAME:.....	12
2.4. SAMPLE SIZE AND SAMPLING APPROACH.....	12
2.5. SURVEY QUESTIONNAIRES AND ANTHROPOMETRY.....	13
2.6. SURVEY TEAMS.....	13
2.7. TRAINING OF SURVEY TEAMS.....	14
2.8. FIELD DATA COLLECTION AND SUPERVISION.....	14
2.9. DATA PROCESSING AND CLEANING.....	15
2.10. ANTHROPOMETRIC DATA ANALYSIS.....	15
3. HOUSEHOLD POPULATION AND CHARACTERISTICS.....	17
3.1. INTERVIEWS AND SAMPLE SIZE ACHIEVED.....	17
3.2. AGE-SEX DISTRIBUTION OF HOUSEHOLD MEMBERS.....	18
3.3. MATERIALS USED TO CONSTRUCT HOUSES.....	18
4. AGRICULTURAL LAND POSSESSION AND FOOD SECURITY.....	20
4.1. AGRICULTURAL LAND AND FOOD SOURCE.....	20
4.2. HOUSEHOLD FOOD SECURITY.....	22
5. WATER AND SANITATION.....	25
5.1. HOUSEHOLD WATER SUPPLY.....	25
5.2. HOUSEHOLD LATRINE.....	25
6. MATERNAL HEALTH AND NUTRITION.....	27
6.1. RESPONDENTS AND CHILDREN CHARACTERISTICS.....	27
6.2. ANTENATAL CARE.....	29
6.3. HEALTH CARE AND NUTRITION SERVICES DURING PREGNANCY.....	31
6.4. DELIVERY CARE.....	33
7. CHILD HEALTH CARE SERVICE AND NUTRITION.....	34
7.1. CHILD VITAMIN A AND DE WORMING.....	34
7.2. CHILD GROWTH MONITORING.....	34
7.3. MOTHERS'/CARETAKERS' KNOWLEDGE OF CHILD MALNUTRITION.....	37
7.4. KNOWLEDGE OF BREASTFEEDING AND WEANING.....	38
7.5. ACCESS TO INFORMATION AND SERVICES FROM HEWS AND VCHWS.....	41
8. INFANT AND YOUNG CHILD FEEDING PRACTICES.....	43
8.1. BREASTFEEDING PRACTICES.....	43
8.2. BOTTLE FEEDING AND WEANING.....	44
8.3. COMPLEMENTARY FEEDING, FOOD DIVERSITY, AND MEAL FREQUENCY.....	45
9. CHILDHOOD ILLNESS AND TREATMENT PRACTICE.....	50

9.1. FEVER	50
9.2. DIARRHEA.....	50
10. TARGETED SUPPLEMENTARY FEEDING (TSF)	52
11. NUTRITIONAL STATUS OF CHILDREN	55
11.1. HEIGHT-FOR-AGE	55
11.2. WEIGHT-FOR-HEIGHT	55
11.3. WEIGHT-FOR-AGE	55
11.4. MID UPPER ARM CIRCUMFERENCE (MUAC)	56
12. SALT IODIZATION.....	59
13. CBN PROGRAM COVERAGE AND IMPLEMENTATION	60
13.1. TRAINING ON CBN AND RELATED ISSUES	60
13.2. CBN AND RELATED ACTIVITIES	61
13.3. KEBELE-LEVEL PROGRAM MONITORING AND INFORMATION BOARD.....	62
13.4. REVIEW MEETINGS AND COMMUNITY CONVERSATION:	63
14. TREND DATA ON SELECTED INDICATORS	64
14.1. TREND IN PREVALENCE OF STUNTING:	64
14.2. TREND IN PREVALENCE OF WASTING:	64
14.3. TREND IN PREVALENCE OF UNDERWEIGHT	64
14.4. TREND IN OTHER INDICATORS:	64
15. CONCLUSION	66
ANNEX 1. TREND ANALYSIS FOR SELECTED INDICATORS.....	67
ANNEX 2. SURVEY AREAS BY ROUND	70
ANNEX 3. STANDARDIZATION OF HEIGHT/LENGTH MEASUREMENT AND MUAC.....	75
ANNEX 4. LIST OF SURVEY TEAMS	77

EXECUTIVE SUMMARY

The Community-Based Nutrition (CBN) program, which is a sub-component of the National Nutrition Program (NPP), is being implemented through the GOE-UNICEF Country Program Action Plan 2007-2011 in selected Woredas of Amhara, Oromia, SNNP and Tigray Regions. Program implementation commenced in three phases. Phase one was initiated in 2008 (in 40 Woredas -Group 1) , phase two was initiated in 2009 (in 77 Woredas-Group 2) and phase three will kick off in 2011 (in 54 Woredas-Group 3). The CBN program aims to build up communities and families' capacity and ownership to make informed decisions on child care practices at family and community levels. It also provides simple tools to aide community mobilization, problem identification, analysis and problem solving. The NNP recognizes the importance of sound program evaluation, and had already conducted baseline surveys in the first and second group intervention Woredas. This report presents an end-line survey findings for Group 1 area, a mid-line for Group 2 and a baseline for Group 3 areas.

A two stage cluster sampling was implemented. In the first stage survey enumeration areas (EAs) were selected using probability proportion to size (PPS) from each group. At the second stage, equal probability, systematic sampling with a random start was employed to select households to be included in the survey from each of the selected EAs. In each group 65 EAs was the target sample size, giving a total of 195 EAs in the entire three groups. In each EA the target sample size was 15 households.

The survey primarily targeted children age 0-35 months and mothers/caretakers. The household head or a woman age 15-49 years residing in the selected household provided household level information. All mothers or caretakers who care for a child that lives with them and is under the age of 35 months were interviewed. Height, Weight and MUAC of children under the age of 35 months were also measured. In addition, salt samples were tested for their iodine content in each of the sampled households. A total of 3069 children age 0-35 months were included in the three groups.

Below presents a summary of the salient findings of the study:

Household Food security

- Household Food Insecurity Access Scale (HFIAS), a summary score that measures the degree of food insecurity (access) in the household in the previous 30 days, revealed that 15%-16% of the households across the three groups were categorized as being food secure. On the other hand, 37.4%-45% were moderately food insecure while 35% -43.4% of the households across the three groups were categorized as severely food insecure.

Water and sanitation

- Public tap/standpipe reported to be the leading source of water supply across the three groups - 33.7% in group 1, 26% in group 2 and 30.3% in group 3 areas. This was followed by unprotected springs ranging between 19.5% and 29.4% in the three groups. Protected spring, borehole and surface water, were also reported among the main sources of water supply across the three groups. On the whole,

49.3% of the households in group 1 area, 60% in group 2 and 54.4% in group 3 areas can be considered as having access to improved water source.

- Pit latrines without slabs or open pit was reported to be the predominant latrine facility in the study area - 57.5% in group 1, 52.7% in group 2 and 54.9% in group 3 areas. A notable portion of the of households in group 1 area (17.3%) reported to own pit latrine with slab. On the other hand, only 10.1% and 8.3% of the households in group 2 and 3 areas, respectively, reported to have pit latrine with slab. Overall, 17.4%, 10.1% and 8.3% of the households in group 1, 2 and 3 areas, respectively, can be considered as having improved latrines.

Maternal Health Care:

- About 64% of the women in group 1 area, 61.9% in group 2 and 64.1% in group 3 received ANC when they were pregnant with their most recent birth. Only 24.2%, 27% and 23.8% of the women in group 1, 2 and 3 areas, respectively, received at least four ANC visits during pregnancy. Most ANC users received care in health post at 60.8%, 56.7% and 71.8%, respectively.
- The proportion of women that received iron tablet during pregnancy was 31.9%, 23.6% and 20%, respectively, in group 1, 2 and 3 areas.
- The receipt of at least one TTI during pregnancy was reported at 66.6% in group 1, 65.8% in group 2 and 71.2%.
- Only 7.3%, 5% and 7.5% of the women in group 1, 2 and 3 areas, respectively, reported to have had food intake that was more than usual during their most recent pregnancy.

Child vitamin A and deworming:

- Across the three groups about two-third of the children age 6-35 months reported to have received Vitamin A in the last 12 months - 64.9% in group 1, 65.1% in group 2 and 65.1% in group 3 areas. A little bit over a third of the children across the three groups received vitamin A in the 3 months preceding the survey.
- The proportion of children age 0-35 months that received deworming tablet was 17.6%, 15.9% and 14.4%, respectively, in group 1, 2 and 3 areas.

Child growth monitoring

- About two-third of the children age 0-35 months across the three groups reported to possess either a family health card (FHC) or other growth card or both. FHC alone was reported to be owned by 23.7%, 22.6% and 22.0%, respectively, of the children in group 1, 2 and 3 areas.
- In the preceding 3 months of the survey, 32.2% and 30.7% of the children age 6-35 months in group 1 and 2 areas, respectively, had their weight measured. This was lower at 19.6% in round 3 areas. In the previous 1 month only 16% in group 1, 16.9% in group 2 and 7.8% in group 3 areas were reported to be weighted.
- Among those children weighted in the previous 3 months, 18.6% and 19.2% in group 1 and 2 areas, respectively, had their families participated during weighting. The corresponding percentage in group 3 was 12%. It appears that families have participated in a number of activities that included weighting the child, community conversation, individual counseling on child growth, discussion on growth chart and plotting on growth card.

Information from HEWs and vCHWs:

- Mothers were asked if they have ever received any message on nutrition from the HEWs and the vast majority (93.7%) in group 1, 89.5% in group 2 and 83.7% in

group 3 said so. Recent contact (i.e. within the past 6 months) with HEWs was reported at 44.3%, 46.1% and 47.4%, respectively.

- Three quarter of the mothers in group 1 area reported to have ever received information on nutrition from volunteer community health workers (vCHWs). This was relatively lower at 64.4% in group 2 while the lowest, 53%, being in group 3. Recent contact with vCHWs (within the previous 6 months) was reported at 30.6%, 25.2% and 24.8%, respectively, in group 1, 2 and 3 areas.

Breastfeeding practices:

- Among children age 0-11 months the proportions that started breastfeeding within an hour of birth was 55.2%, 61.4% and 60.8%, respectively, in group 1, 2 and 3 areas.
- Among children age 0-11 months, 16.9% in group 1, 16.2% in group 2 and 19.8% in group 3 areas were given something else other than breast milk within 3 days after birth.
- Colostrums was fed to 66.2%, 67% and 68.9% of the children in group 1, 2 and 3 areas, respectively.
- Breastfeeding status for children under 6 months is determined on the basis of a mother's recall of her child's intake over the previous 24-hour period (past day and night). Based on a 24-hour mother's recall, the proportion of children age 0-5 months that were given only breast milk (exclusively breastfed) were notably high across the three groups ranging between 80.3% and 83.8%.
- Among children age 12-23 months, the proportion that continued breastfeeding for one year or longer was 83.8% in group 1, 83.3% in group 2 and 82.5% in group 3.
- Among children age 0-35 months, 70.2% in group 1, 66.2% in group 2 and 71.3% in group 3 areas were reported to have breastfed for 8 or more times the previous 24 hours.

Bottle feeding and weaning:

- Among children age 0-35 months, the proportion that was fed with bottle the previous day was 31.6%, 24.1% and 28.1%, respectively, in group 1, 2 and 3 areas.
- Mothers were asked to report any type of foods/fluids the child had taken the previous day of the interview. Between 69.2% and 71.8% of the children across the three groups reported to have given plain water and this was followed by solid/semi-solid food (57%-61.3%), cow's milk (36.3%-41.6%) and fruit juice/tea/coffee (24.7%-27.7%).
- About a third of the children in group 1 area were fed 4 or more times yesterday. This was higher at 45.3% in group 2 area and 36% in group 3. Between 23% and 32.8% of the children age 6-35 months across the three groups reported to have been fed for 3 times the previous day.
- The proportion of children age 6-8 months who received solid, semi-solid or soft foods in the previous day was 73.1%, 81.9% and 78.9% in group 1, 2 and 3 areas, respectively.

Minimum Dietary Diversity:

- The proportion of children age 6-23 months who met the minimum dietary diversity was low at 14.8% in group 1, 12.3% in group 2 and 15% in group 3 areas. The lowest proportion who met the minimum dietary diversity was documented among children age 6-11 months in the three groups.

Minimum Meal Frequency:

- Based on the definition for minimum meal frequency for breastfed and non-breastfed children, 63.1%, 63.7% and 54.9% of the children age 6-23 months in group 1, 2 and 3 areas, respectively, have met the minimum meal frequency.

Minimum Acceptable Diet:

- Only 12.1%, 10.8% and 12.1% of the children in group 1, 2 and 3 areas, respectively, can be considered as having the minimum acceptable diet the previous day.

Prevalence of fever:

- About 23% of the children age 0-35 months in group 1, 20.7% in group 2 and 19.7% in group 3 areas reported to have had fever in the two weeks preceding the survey. Of these, between 37%-42% across the three groups were taken to health facility for treatment.

Prevalence of diarrhea and treatment:

- Between 20.6% and 23.4% of the children age 0-35 months in the three groups reported to have had diarrhea the previous 2 weeks.
- About 35% in group 1, 31% in group 2 and 29% in group 3 of the children with diarrhea received ORS in the previous two weeks. The corresponding percentage for RHF was 26.1%, 29.2% and 27.4%, respectively.
- Between 18.1%-19.8% of such children with diarrhea were given increased fluid.
- The proportion of children with diarrhea who received ORT (ORS or RHF or increased fluid) was 49.8%, 51.1% and 47.3%, respectively, in group 1, 2 and 3 areas.

Targeted Supplementary Feeding (TSF):

- Fifty-two percent of the children age 6-35 months in group 1, 34.9% in group 2 and 37% in group 3 had participated in the most recent TSF screening.
- During pregnancy, 26.6%, 14.1% and 15.8% of the mothers across the three groups, respectively, reported to have participated in the screening.
- Possession of ration card by the children was assessed and that 15% in group 1, 9.3% in group 2, and 6.5% in group 3 areas reported to own a ration card.
- Supplementary feeding was given to 17.1%, 15.3% and 14.1% of the children in group 1, 2 and 3 areas, respectively, following the most recent screening.
- It was also reported that some mothers were given supplementary feeding at different time from pregnancy to the time when the child was under 6 months and 6 months or older. On the whole, 13.2% of the mothers in group 1 area reported to have received supplementary feeding during pregnancy. This was reported lower at 4.9% and 5.3%, respectively, in group 2 and 3 areas.
- About 12%, 5.1% and 6.5% of the mothers, respectively, in group 1, 2 and 3 areas reported to have received supplementary feeding when their children were under 6 months. The corresponding percentages of mothers that received supplementary feeding when their children were 6 months or older was 10.2%, 4.3% and 4.9%, respectively.

Nutritional status of children:

- Data show children in the three groups are suffering from a high level of chronic malnutrition (stunting) at 37.5% in group 1, 36.4% in group 2 and 36.3% in group 3. The proportion of children who were severely stunted ($SD < -3$) was also found high at 16.1%, 15.8% and 15.8%, respectively.

- In group 1 area, 15.1% of the children were wasted (<-2SD); this was 10.6% and 13.6%, respectively, in group 2 and 3 areas. Severely wasted children comprised 4.6%, 2.5% and 4.6%, respectively, in group 1, 2 and 3 areas.
- Nearly comparable proportion of the children across the three groups were underweight (26.6%-27%). Severely underweight children (<-3SD) comprised 9.3% of the children in group 1, 7.8% in group 2 and 10% in group 3.
- This survey found 1.7% of the children age 6-35 months in group 1 area, 0.6% in group 2 and 1.6% in group 3 were suffering from severe acute malnutrition (MUAC<11cm). Moderate acute malnutrition rates appeared comparable across the three groups ranging between 5.8% and 6.1%.

Salt testing (iodine testing):

- Iodated (weak color) salt was found in 17.1%, 23%, and 20% of the households in group 1, 2 and 3 areas, respectively. Few households had strong colored iodated salt at 7.5%, 8.9% and 6.9%, respectively.

Trend analysis:

- A significant declining trend in the level of stunting from 44.5% to 37.5% ($z=-3.28$, $p=0.001$) was documented between the baseline (2009) and end-line (2011) in group 1 area. Likewise, the prevalence of stunting in group 2 area declined from 41% in 2010 to 36.4% in 2011 and this decline was statistically significant ($z=-2.19$, $p=0.028$).
- The prevalence of wasting has shown a significant reversal trend in group 1 area - from 10% to 15.1% ($z=3.55$, $p=0.000$). While there was no significant difference between baseline and mid-line wasting prevalence in group 2 area (11.4% and 10.6%).
- In group 1 area the prevalence of underweight estimated at 28.4% and 27%, respectively, in the baseline and end-line. The corresponding percentages in group 2 were 26.2% and 26.6%, respectively. There was no significant trend in underweight prevalence in both group 1 and 2 areas.
- Significant improvement/positive trends was documented in VA supplementation, possession of FHC, proportion of children weighted (last 3 months and last 1 month), Colostrums feeding, Prolactal feeding (within 3 days of birth), and the prevalence of Iodated (weak color) salt among others.
- These trend data are encouraging but should be interpreted with caution, as these cannot be conclusive in the absence of a good control group. Further analysis of the baseline and end-/mid-line data using advanced Statistical procedures may improve our understanding of the observed trend and also help to unravel the net effect of the CBN program intervention.

1. BACKGROUND AND OBJECTIVES

The magnitude of child malnutrition in Ethiopia is among the highest in the world. According to the Ethiopian DHS 2011¹, the prevalence of stunting among under-five children was 44%, wasting 9.7% and underweight 28.7%. These data suggest child malnutrition not only high in the country but also has remained unchanged over the past few years. Micronutrient deficiency diseases such as vitamin A, iron and iodine deficiencies, which often occur in association with protein-energy malnutrition, are also highly prevalent in the country. The national micronutrient survey conducted in 2005² indicated that almost 37% of preschool children were affected by sub-clinical Vitamin A Deficiency and 39% of the school age children were affected by Iodine deficiency disorders (IDD).

It is thus evident that Ethiopia is suffering from the consequences of malnutrition. A profile estimating the extent of health and economic burden associated with malnutrition in the country indicated that 58% of child deaths is attributable to malnutrition, 470 Ethiopian children die every day because of protein-energy malnutrition alone; over 4 million newborns suffer some form of intellectual disability due to IDD, productivity losses resulting from the intellectual impairment caused by iodine deficiency between 2000 and the year 2005 exceeds 936 US million dollars and productivity losses resulting from the stunting alone occurring between 2000 and the year 2005 exceeds 2,031 million US dollars³.

Analysis of the causes of malnutrition in Ethiopia based on the generic framework of the determinants of malnutrition developed by UNICEF in 1990⁴, show that **inadequate dietary intake** and **disease** (immediate causes of malnutrition) are quite common and widespread in Ethiopia. Food insecurity, inappropriate and suboptimal care and poor health services and unhealthy environments (underlying causes) are also quite common in the country.

Risk factors related to **food security** encompasses all constraints preventing access to adequate, optimal and sustainable food sources. This is most likely due to inadequate own production (lack of resource, knowledge, poor environmental conditions etc), lack of income (poverty) to purchase foods among others.

Factors related to **care** encompasses all limitations and constraints to appropriate infant and young child feeding (breastfeeding, complementary feeding and feeding during illness), health seeking behaviors capacity to diagnose illnesses and seeking prompt and effective treatments as well as maintaining the sanitation and hygiene of the food, environment and the children. Additionally, care includes the provision of time, attention and support to meet the physical, mental and social needs of nutritionally vulnerable groups. Many studies

¹ Central Statistics Agency, ORC Macro. 2011 Ethiopian demographic and health survey - Preliminary Report. 2011. CSA. Addis Ababa, Ethiopia.

² Demissie T, Ali A, Mekonen Y, Haider J and Umeta M. Magnitude and distribution of vitamin A deficiency in Ethiopia: 2010. Food and Nutrition Bulletin of UNU. In press

³ Linkages. Counselors guide, using the essential nutrition actions to improve the nutrition of women and children in Ethiopia. 2004. Linkages

⁴ UNICEF. Policy review: strategy for improved nutrition of children and women in developing countries. 1990. UNICEF. New York USA

suggest that the overall care in general and infant and young child feeding practices in particular are sub-optimal in the country⁵.

Factors related to **health services and a healthy environment** includes absence of adequate health facilities and services, lack of access to clean and potable water as well as absence of sanitation facilities. Preventive and curative health service delivery and the extent to which the services are utilized are the most important determinants of health status of children.

Cognizant of the extent of the problem and the impacts of malnutrition on health, survival and economic productivity and in attempt to achieve the target 1 and target 2 of the Millennium Development Goal (MDG), the Government of Ethiopia (GOE) with partner organizations developed and begun implementing the National Nutrition Program (NNP) in 2008. Among the various components of the program, NNP places a significant emphasis on the Community-Based Nutrition (CBN) sub-component implemented through the GOE-UNICEF Country Program Action Plan 2007-2011 in selected Woredas of Amhara, Oromia, SNNP and Tigray Regions. Program implementation commences in three phases. Phase one was initiated in 2008, phase two in 2009 and phase three will kick off in 2011. The CBN program aims to build up communities and families' capacity and ownership to make informed decisions on child care practices at family and community levels. It also provides simple tools to aide community mobilization, problem identification, analysis and problem solving. The major implementation approaches include Growth Monitoring and Promotion, supported by Community Conversation, where community members ASSESS the situation of their children, ANALYZE causes of malnutrition and other problems, and take appropriate ACTIONS (Triple A approach). Community Dialogue provides a forum to bring about appropriate and feasible solutions/actions by learning from each other and helping each other.

The NNP recognizes the importance of sound program evaluation, and had already conducted baseline surveys in the first and second group intervention Woredas. This report presents findings from a household survey that was conducted in September 2011 covering a total of 3069 children age 0-35 months in a randomly selected CBN program implementation Woredas in Amhara, Oromia, SNNP and Tigray regions. The survey presents an end-line data for Group 1 area, a mid-line for Group 2 and a baseline data for Group 3 areas.

⁵ Linkages. Counselors guide, using the essential nutrition actions to improve the nutrition of women and children in Ethiopia. 2004. Linkages

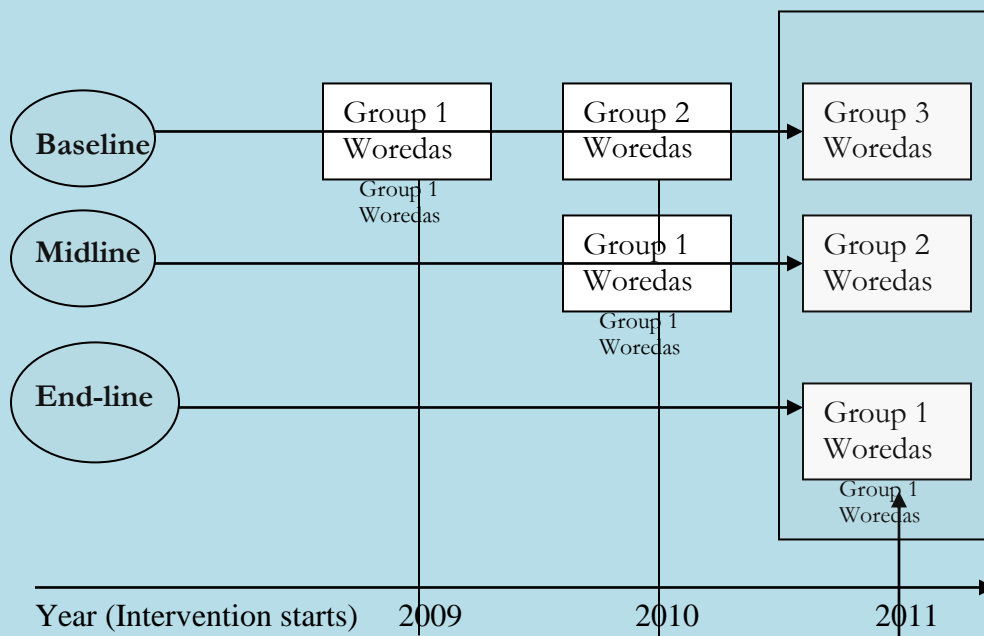
2. METHDOLOGY

2.1. Study design

The CBN evaluation design primarily lends itself to a *Staggered Implementation Design*. This is a type of quasi-experimental design in which the intervention is introduced to different groups at different times. For this type of study design, there are no real “control groups”, that is, each group receives the intervention. A retrospective control will be used because the intervention was introduced at different time intervals in each group. The illustration below explains the application of this design to this survey (**Figure 1**).

For each of the three groups outlined in the illustration, it can be seen that the intervention was introduced at different times – for the Group 1, the intervention was introduced in 2009, for the Group 2 the intervention was introduced in 2010, which is about a year after the intervention has already been introduced in Group 1, and for Group 3, the intervention has yet to be introduced.

Figure 1. Illustration of the Staggered Implementation Design for the CBN evaluation



2.2. Study area and domain

The CBN program implementation areas - i.e. 54 Woredas in group 3, 77 in group 2 and 40 group 1 were the focus of the survey, which served as sampling frames for each domain. These Woredas are located in Amhara, Oromia, Tigray and SNNP regions. The survey was intended to provide separate estimates for three domains- i.e. for Group1, Group 2 and Group 3 areas.

2.3. Sampling frame:

The sampling frame for this survey was obtained from the list of enumeration areas (EAs) that is available from the most recent (2007) census of Ethiopia. The Central Statistically Agency (CSA) provided the sampling frame. An EA contained between 100 and 200 households depending on the population settlement pattern and the terrain. The list of EAs for the CBN implementation Woredas served as the primary sampling units (PSU) for this survey.

2.4. Sample size and sampling approach

A two-stage cluster sampling:

A two stage cluster sampling was implemented. In the first stage EAs were selected using probability proportion to size (PPS) from each group. Whilst the baseline survey demanded us to do a fresh EA selection, the mid-and end-line surveys used the same EAs that were sampled in the baseline survey. At the second stage, equal probability, systematic sampling with a random start was employed to select households to be included in the survey from each of the selected EAs. The CSA in close consultation with the Mela Research PLC core survey team selected the survey EAs.

Number of households per EA

In each group 65 EAs was the target sample size, giving a total of 195 EAs in the entire three groups (see Annex 2 for the sample EAs). In each EA the target sample size was 15 households.

Household listing and selection:

Once the EAs for the survey were identified, household listing was done in each of the selected EAs. The CSA provided maps and number of households for each EA. The listing involved EA delineation, visiting each of the households in the selected EAs and recording the names of the heads of the households. The listing also provide information on whether there was any child 0-35 months in the household. Only those households with children age 0-35 months were included in the sampling frame for the second stage selection. At the second stage, equal probability, systematic sampling with a random start was employed to select 15-18 households (with children 0-35 months) to be included in the survey in each of the selected EAs.

Survey respondents:

The survey primarily targeted children age 0-35 months and mothers/caretakers. The household head or a woman age 15-49 years residing in the selected household provided household level information. All mothers or caretakers who care for a child that lives with them and is under the age of 35 months were interviewed. Height, Weight and MUAC of children under the age of 35 months were also measured. In addition, salt samples were tested for their iodine content in each of the sampled households.

2.5. Survey questionnaires and anthropometry

- **Household Module:** This was administered to a household head or a woman age 15-49 years residing in the selected household. Only one questionnaire was completed per household. The household roster/listing form was the key for identifying mothers/caretakers and children 0-35 months. The household questionnaire also gathered general household information, household assets, water, and sanitation and, household food security level, etc.
- **Women's Module:** This was administered to mother/caretakers of children 0-35 months. It collected information on maternal health, assessed knowledge about nutrition and related issues, including antenatal care, vitamin A supplementation, deworming, delivery conditions, food consumptions and nutritional knowledge, among others.
- **Child Module:** All mothers or caretakers who care for a child age 0-35 months responded to this module. It gathered information on basic child information, breastfeeding and nutrition, food consumption the previous 24 hours, child immunization, vitamin A supplementation, the incidence of illnesses such as fever and diarrhea and treatment seeking, whether a child has benefited from TSF, among others.
- **Anthropometric Module:** Height, weight and MUAC measurements of children 0-35 months were taken from all children age 0-35 months residing in the selected household. Weight of children was measured with minimum clothing and without any ornaments on a digital scale to the nearest 0.1 kg. Children and infants (who can not stand by themselves were weighed on the arms of adults. Scales were regularly checked using a standard weights. Laying length of under 2 children and standing heights of children above two years was measured on a wooden board to the nearest 0.1 cm. MUAC was measured using non stretchable tapes to the nearest 0.1cm. All anthropometric measurements strictly adhered to the WHO guideline on how to weigh and measure children. Only one measurer in each team with the assistance of locally hired guide took anthropometric measurements.
- **EA Module:** This module is brief and intended to collect data at the EA/Kebele level. It concerns on the CBN and related program implementation at the sampled Kebele/EA level. The respondents to this module were the Health Extension Workers (HEWs). One EA module was completed per EA.

2.6. Survey teams

A total of 18 survey teams and 4 regional survey coordinators conducted the fieldwork. Each survey team composed of 3 interviewers, 1 anthropometry measurer and 1 supervisor. By region, we deployed 6 teams in Amhara, 5 in Oromia, 4 in SNNP and 3 in Tigray. This allocation of teams was based on the sample size in the regions. Language proficiency was used to assign teams to regions. All survey teams members speak Amharic. On top of that those deployed in Tigray and Oromia speak the local languages. For SNNPR the interviewers were all recruited from the region and almost all speak one local language in addition to Amharic. Nevertheless, due to diverse language groups in the region, translators were used in several EAs of SNNP.

2.7. Training of survey teams

The training to survey teams was conducted during August 29-September 4, 2011 in Addis Ababa. The training encompassed class room training, role play, mock interview, on-hand practice on the field. The last day of the training was dedicated to survey team formation and finalization, route determination, and survey logistics organizations. The class room training (August 29-Sept 2, 2011) focused on introduction about the survey, survey methodology, item-by-item training of the questionnaires, role play (in three languages - *Amharic, Oromofa and Tigrigna*), mock interview and other details about the survey. A total of 100 interviewers /supervisors and the four survey regional coordinators attended the training. The training was facilitated by the study investigators of Mela Research PLC, a Nutritionist, survey methodologist (Epidemiologist), an experienced DHS trainer (recruited from the Central Statistically Agency) and the four survey coordinators.

The field practice was key for anthropometric standardization as well as for the interviewers/ supervisors to get a hand-on experience in the actual field set up. It was conducted in one of the CBN implementation Woredas near Addis Ababa (*Bereh Woreda*, Oromia region). Those Kebeles that were not part of the actual survey were the sites for the field practice.

Details about the way the anthropometric standardization (for height and MUAC) was done can be found in Annex 3.

As part of the training, 3 consecutive tests were given to the interviewers and supervisors to screen the best 72 interviewers/measurers and 18 supervisors to be deployed. Two teams (8 interviewers, 2 measurers & 2 supervisors) who participated in the training were not deployed to the field due to their low performance in the training.

2.8. Field data collection and supervision

The coordinators/supervisors map out the EAs and the survey routes before traveling to the field. The survey routes were thoroughly discussed with each team. The survey areas were divided into 18 survey zones, each team assigned to one survey zone. In terms of the number EAs, each team was assigned to survey between 10-13 EAs. As much as possible the topography and accessibility of the EAs were taken in to consideration while assigning the teams. All teams traveled to the field on September 5, 2011 and started field data collection on September 6, 2011. The data from the first 3-4 days of the fieldwork simultaneously computerized at Mela head office in Addis Ababa and prompt feedback was given to each team based on preliminary data quality checking. The fieldwork was completed on October 7, 2011.

Field supervision had three layers by the survey supervisors, coordinators and core survey team at Mela Research PLC. In addition to this, UNICEF/CBN regional experts closely supervised the fieldwork progress. On spot checking, re-interview of some households, carefully checking the quality of the anthropometric data, editing of the completed questionnaires were the day-to-day duties of the survey supervisors. Coordinators spent about 5 days with each team to assure data quality and provide instruction. They also checked each and every questionnaire before submitting to Mela head office in Addis Ababa.

In the whole the fieldwork can be considered a success. Nevertheless, the rainy season, difficult topography, absence of all weather road to access, and extreme inaccessible of EAs were among the challenges of the fieldwork. In most instances, teams had to travel 3-4 hours to reach to the EAs. There were some EAs in Amhara and Oromia regions that couldn't easily be accessed and requiring over 8 hrs travel on foot. We had to drop these EAs after confirming the situation from respective Woreda offices. On the whole, we dropped 13 EAs (7 in Amhara, 5 in Oromia, 1 in SNNP) out of the target 195 EAs. In order to achieve the desired sample size, the data for these EAs were compensated by increasing the sample size in the surveyed EAs from 15 to 18 households per EA.

2.9. Data processing and cleaning

The data-management system is divided into three phases: preparation, primary data processing and secondary data processing. Each of these phases is summarized in the sections below.

Preparation:

This is the phase of preparing the database template, pre-testing the template and designing a system for editing questionnaires. A double-data entry program that includes logical consistency checks, legal values and skip patterns was developed in Epi-Info 6.04, and pre-tested before the data entry. Four highly experienced data entry clerks were recruited to work in two pairs. One-day training was given about the data entry template and about the structure of the questionnaire, followed by a practical session of entering data. Additionally, four office editors were recruited for checking the consistency of questionnaires in each EA, assigning for each household a unique office ID and translating open ended question responses to facilitate the data entry.

Primary Data Processing

The goal of primary data processing was to produce clean, edited data files. Primary data processing involved entering all questionnaires, comparison of double-entered questionnaires, verifying hard copies and correcting the data for inconsistency and backing up the edited, or final, data file. The structure checking, the verification of data entry and secondary editing were iterative procedures that were repeated until all problems were resolved or determined to be acceptable.

A 100% data reconciliation of the double entry by each team was done and all inconsistent entries were referred back to the hard copies and corrections were made accordingly. In addition to the double data entry, we also implemented 100% hard-soft copy verification for the anthropometric data.

Secondary Data Processing

This was the stage of producing analysis data files and to create standard tabulations. Secondary data processing involved the steps of concatenating all data files into one data file, recoding and labeling variables, and exporting the data to STATA format.

Data analysis primarily restricted to descriptive and univariate analysis. STATA 10 was used for data analysis.

2.10. Anthropometric data analysis

The data on weight and height of children age 0-35 months were used to calculate three summary indices of nutritional status according to the WHO child growth standard. The World Health Organization (WHO) reference for child nutritional status z-score values were computed using *WHO Anthro V 3.1.0*⁶. Details about each indices can be found in Chapter 11 of this report.

⁶ <http://www.who.int/childgrowth/en>

3. HOUSEHOLD POPULATION AND CHARACTERISTICS

3.1. Interviews and Sample Size achieved

Table 1 presents information on the target and achieved sample size as well as the response rates. The survey interviewed 975, 976 and 975 households in group 1, 2 and 3 areas, respectively. These are almost exactly the sample size initially intended. In these households we identified 1023, 1035 and 1011 children age 0-35 months, respectively. The mothers/caretakers of these children were the primary respondents to the various questions concerning these children and the women themselves. Nearly 99% of these children's heights and weights were measured. Mid-upper arm circumference measurements were taken from children age 6-35 months and over 98% of the children had their arm-circumference measured.

Table 1. Results of household, women interviews and anthropometric measurements by intervention group, CBN evaluation survey, September 2011

Result of Interview	CBN Intervention area		
	Group 1	Group 2	Group 3
Number of target Enumeration areas (EAs)	65	65	65
Number of Enumeration areas (EAs) completed	60	61	61
% EAs achieved*	92.3	93.8	93.8
Target number of households (n)	975	976	975
Interviewed households (n)	975	976	975
Household response rate (%)	100.0	100.1	100.0
Number of children 0-35 months (n)	1023	1035	1011
Average number of children 0-35 months per HH	1.05	1.06	1.04
Children 0-35 months height/length measured (n)	1013	1025	996
% eligible children height/length measured	99.0	99.0	98.5
Children 0-35 months weight measured (n)	1018	1028	1005
% eligible children weight measured	99.5	99.3	99.4
Children age 6-35 months	826	857	811
Children age 6-35 months MUAC measured (n)	816	847	800
% eligible children MUAC measured	98.8	98.8	98.6

* sample size for those EAs that were dropped due to inaccessibility were compensated by increasing the number of HHs to be interviewed per EA in the included EAs

3.2. Age-sex distribution of household members

In the 2926 households of the three groups, there were 16,378 household members - 5606 in group 1, 5431 group 2 and 5341 in group 3 areas. About 25% of the household population were under five years of age and women age 15-49 years comprised 39% of the population. There is no significant difference in the age distribution of household population among the three groups (Table 2). The proportion of children under the age of 5 years in this present survey is higher than the estimates from the DHS and other similar surveys that documented in the range of 16-18%. This is due to the fact that this present survey, by design, sampled households with children under 3 years of age while excluded those households without any children under 3 years of age.

The mean household size was a little bit higher than 5 persons - 5.7 in group 1, 5.6 in group 2 and 5.6 in group 3 areas.

Table 2. Distribution of de-jure household population age group and sex by intervention group, CBN evaluation survey, September 2011

Age	CBN intervention areas								
	Group 1			Group 2			Group 3		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-4	25.0	23.9	24.5	25.7	26.1	25.9	25.6	25.1	25.4
5-9	18.1	18.7	18.4	17.9	19.4	18.6	18.3	17.4	17.8
10-14	13.5	12.8	13.2	12.2	10.0	11.1	12.1	11.5	11.8
15-19	7.2	7.1	7.1	5.9	7.3	6.6	6.2	6.7	6.4
20-24	2.8	9.7	6.2	3.8	10.1	7.0	3.6	9.4	6.4
25-29	5.9	10.2	8.0	7.5	10.6	9.1	6.5	12.3	9.3
30-34	6.9	7.0	7.0	8.5	7.4	7.9	8.4	6.9	7.6
35-39	7.7	5.9	6.8	7.5	4.8	6.2	7.4	5.8	6.6
40-44	5.8	1.9	3.8	4.8	1.4	3.1	5.0	2.5	3.8
45-49	3.2	0.7	2.0	2.5	0.7	1.6	2.8	0.9	1.8
50-54	1.4	0.4	0.9	1.6	0.7	1.1	2.1	0.4	1.2
55-59	0.8	0.4	0.6	0.5	0.4	0.5	0.6	0.2	0.4
60-64	0.5	0.3	0.4	0.4	0.4	0.4	0.6	0.4	0.5
65+	1.0	1.0	1.0	1.1	0.5	0.8	0.7	0.5	0.6
Missing	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3
Mean HH size	5.2	6.4	5.7	5.6	5.5	5.6	5.5	5.4	5.5
Number	2833	2764	5606	2723	2700	5431	2720	2569	5314

3.3. Materials used to construct houses

On the whole, limited types of materials were used for the construction of floor, walls and roofs across the three study groups (Table 3). Nevertheless, group 1 and 2 areas appeared relatively better than group 3 areas in terms of the type of materials for the construction of wall and roof. The vast majority of the floor was earth - 74.5%, 79.5% and 75.8%, respectively, in group 1, 2 and 3 areas. (52%) and dung (46%). This was followed by animal dung at 24.4%, 19.5% and 21.9%, respectively.

The vast majority of the houses (77%-94%) had their wall made of wood with mud. This was recorded to be the highest in group 3 area while the list in group 1. In group 1 area, next to wood and mud, 21.7% of the houses had their wall made out of stone and cement.

Two materials were predominantly used for the construction of roofs -thatch/leaf/grass (44.7%-66.2%) and corrugated iron (31.8%-43.6%). In terms of the presence of roofs made of corrugated iron, houses in group 1 and 2 areas appeared to be comparable and also are significantly more likely than group 3 areas to have roofs made of corrugated iron.

About half of the houses in group 1 area reported to have a window(s), this was followed by 45.3% in group 2 and the least at 36.4% in group 3 areas.

Table 3. Percent distribution of households according to materials used for the construction of houses by intervention group, CBN evaluation survey, September 2011

Household characteristics	CBN intervention areas		
	Group 1	Group 2	Group 3
Main material of the floor			
Earth, sand	74.5	79.5	75.8
Dung	24.4	19.5	21.9
Wood planks	0.1	0.0	0.1
Cement	0.6	0.8	1.0
Missing	0.2	0.2	1.2
Main material of the wall			
Wood and mud	77.0	83.2	94.0
Stone and mud	0.6	14.9	3.3
Stone and cement	21.7	0.2	0.0
Bricks	0.1	0.5	0.0
Reed and bamboo	0.6	0.5	1.8
Missing	0.0	0.7	0.9
Main material of the roof			
Corrugated iron/metal	43.6	44.8	31.8
Thatch, leaf, grass	44.7	51.6	66.2
Wood and mud	8.1	2.7	0.9
Mud and stone	3.3	0.1	0.0
Reed and bamboo	0.1	0.3	0.4
Missing	0.2	0.5	0.7
Widow (s) in the house			
Yes	49.0	45.3	36.4
No	51.0	45.3	63.6
N	975	976	975

4. AGRICULTURAL LAND POSSESSION AND FOOD SECURITY

4.1. Agricultural land and food source

As shown in Table 4 , ownership of agricultural land is nearly universal (93%-94%) across the three groups. Most households reported to own a cultivated land size in the range of 0.5-2 hectares (60.8%-68.8%). Some households reported to own land exceeding 2 hectares - 7.9% in group 1, 2% in group 2 and 14.8% in group 3.

Data on frequency of cultivation suggest that the vast majority of the household reported to cultivate only once a year (77.8% - 81.4%). Relatively more households in group 1 area than either in group 2 or 3 reported to cultivate twice a year (21.1% vs. 17.7%).

Ownership of vegetable garden by the study households compares across the three groups, ranging between 42% and 44.8%. It is however unknown whether the families grow vegetable and fruit in the reported garden areas, as this was not asked to the respondents.

Given the vast majority of the households own agricultural lands, it is not unexpected to find most families produce their own food. Indeed, about three-quarter of the households in group 1 and 2 areas, respectively, reported to produce their own food while this was significantly lower at 64.9% in group 3 area. About a fifth of the households in group 1 area reported purchasing their food while this was the highest at 24.3% in group 3 area. The lowest reporting of food purchase, 16%, came from group 2 area (Table 4). For those who reported purchasing their foods, the main income sources revolved around livestock sale, agricultural products sale and own business.

Table 4. Distribution of households according to presence of agricultural land, land size, frequency of cultivation, and ownership of vegetable garden by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1	Group 2	Group 3
Presence of agricultural land	N=975	N=976	N=975
Yes	94.1	93.1	93.0
No	5.9	6.9	7.0
Size of cultivated land (in Hectare)	N=917	N=909	N=907
No land	5.9	6.9	7.0
<0.5 ha	13.8	11.3	14.6
0.5-1 ha	36.7	28.2	28.8
1-2 ha	32.1	32.7	32.0
>2 ha	7.9	18.9	14.8
Missing	3.5	2.0	2.9
Frequency of cultivation	N=917	N=909	N=907
Once a year	77.8	81.4	80.5
two times a year	21.1	17.7	17.1
Three times a year	0.3	0.2	0.4
Four times a year	0.0	0.0	0.2
Missing	0.8	0.8	0.8
Ownership of garden	N=975	N=976	N=975
Yes	44.8	42.0	45.1
No	53.7	57.5	54.1
Missing	1.5	0.5	0.8
Main food source	N=975	N=976	N=975
Own production	73.5	75.9	64.9
Purchase	20.8	16.6	24.3
Food aid/donation	3.2	1.7	5.0
Shared production	0.7	3.0	0.5
Missing	1.8	2.8	5.3
If Purchase, source of income	N=203	N=162	N=237
Salary/wedge	9.4	8.6	8.0
Own business	27.1	43.8	32.5
Sale of livestock	36.9	23.5	41.8
Remittance	1.0	0.6	0.8
Sale of agricultural products	21.2	9.3	11.0
Renting land	1.0	0.0	0.4
Other sources	17.2	21.0	18.6

4.2. Household Food security

Food security is defined as a state in which “all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life”⁷. Because it is a complex, multidimensional concept, measuring food insecurity has been an ongoing challenge to researchers and practitioners alike. Until very recently, most household-level measures of food access, such as income and caloric adequacy, have been technically difficult, data-intensive, and costly to collect. A household Food Insecurity Access Scale (HFIAS) was developed by Food and Nutrition Technical Assistance Project (FANTA) and Academy for Educational Development with funding from USAID⁸ that yields information on food insecurity (access) at the household level. Different types of indicators can be calculated to help understand the characteristics of and changes in household food insecurity (access) in the surveyed population. These indicators provide summary information on: (1) Household Food Insecurity Access-related **Conditions** (2) Household Food Insecurity Access-related **Domains** and (3) Household Food Insecurity Access **Scale** (HFIAS)

Household Food Insecurity Access-related Conditions: Two key indicators are presented. As shown in Table 5, the indicators measure the percent of households experiencing food shortage in the previous 30 days and the frequency of occurrence of the problem. Data show that 15.7%, 20.7% and 25.4%, respectively, of the households in group 1, 2 and 3 areas reported that there was ever a day in the previous 30 days where there was no food at all in the household because there were no resources to get food. The proportion that reported that there was no food at all in the household for 10 or more days because there were no resources to get food was 2.3%, 3.3% and 3.5%, respectively.

Household Food Insecurity Access-related Domains: These indicators provide summary information on the prevalence of households experiencing one or more food related problems such as insufficient quality and insufficient food intake. Three key indicators were presented in this section. On the whole, our findings suggest that the prevalence of these indicators is relatively high in the study areas. The proportion of households who were ever not able to eat the kinds of foods they preferred because of a lack of resources (in the last 30 days) were notably high at 73.6%, 73.5% and 73.1%, respectively, in the group 1, 2 and 3 areas. Likewise, 77.7%, 74% and 75% the households in group 1, 2 and 3 areas, respectively, said household members ever ate a few kinds of food day after day because of a lack of resources in the last 30 days. Food quality also appeared among the major concerns of these households as 49.4%, 50% and 54.5% of the households in group 1, 2 and 3 areas, respectively, reported that household members ever eat food that they did not want to eat because of a lack of resources to obtain other types of food during the last 30 days.

Household Food Insecurity Access Scale (HFIAS) Score: This summary score is a categorical measure of the degree of food insecurity (access) in the household in the

⁷ United States Agency for International Development (USAID). “Policy Determination 19, Definition of Food Security, April 13, 1992.” Washington, DC, 1992.

⁸ Coates, Jennifer, Anne Swindale and Paula Bilinsky. *Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access: Indicator Guide (v. 3)*. Washington, D.C.: Food and Nutrition Technical Assistance Project, Academy for Educational Development, August 2007.

previous 30 days. This score was computed based on 9 items/questions⁹. The responses to all nine frequency-of-occurrence questions was coded as 1 if it occurs once or twice (rarely), 2 if occurs 3-10 times (sometimes) and 3 if occurs more than 10 times (often). The higher the score, the more food insecurity (access) the household experienced. The lower the score, the less food insecurity (access) a household experienced.

The HFIAS data in Table 5 revealed that 15%-16% of the households across the three groups were categorized as being food secure. On the other hand 37.4%-45% were moderately food insecure while 35% -43.4% of the households across the three groups were severely food insecure. These data taken together suggest that the study households across the three groups are exposed to notably high level of food insecurity.

⁹ Items/questions used for the computation of HFIAS: (1) In the past 30 days were you or any household members not able to eat the kinds of foods you preferred because of a lack of resources? If "Yes", how often did this happen in the last 30 days?; (2) In the past 30 days did you or any household member eat just a few kinds of food day after day because of a lack of resources? If "Yes", how often did this happen in the last 30 days? (3) In the past 30 days did you or any household member eat food that you did not want to eat because of a lack of resources to obtain other types of food? If "Yes", how often did this happen in the last 30 days?; (4) In the past 30 days did you or any household member eat a smaller meal than you felt you needed because there was not enough food? If "Yes", how often did this happen in the last 30 days? (5); In the past 30 days did you or any household member eat fewer meals in a day because there was not enough food? If "Yes", how often did this happen in the last 30 days?; (6) In the past 30 days was there ever no food at all in your household because there were no resources to get more? If "Yes", how often did this happen in the last 30 days?; (7) In the past 30 days did you or any household member go to sleep at night hungry because there was not enough food? If "Yes", how often did this happen in the last 30 days? (8); In the past 30 days did you or any household member go a whole day without eating anything because there was not enough food? If "Yes", how often did this happen in the last 30 days? (9) In the past 4 weeks, did you or any household member go a whole day and night without eating anything at all because there was not enough food? If "Yes", how often did this happen in the last 30 days?

Table 5. Household food security level by intervention group, CBN evaluation survey, September 2011

	CBN intervention areas		
	Group 1	Group 2	Group 3
<u>Household food insecurity access-related Conditions:</u>			
% households that reported there was ever a day where there was no food at all in the household because there were no resources to get food (in the last 30 days)	15.5	20.7	25.4
% households that reported there was no food at all in the household for <u>10 or more days</u> because there were no resources to get food (in the last 30 days)	2.3	3.3	3.5
<u>Household food insecurity access-related Domains:</u>			
% households who were ever not able to eat the kinds of foods they preferred because of a lack of resources (last 30 days)	73.6	73.5	73.1
% households whose members ever ate a few kinds of food day after day because of a lack of resources (last 30 days)	77.3	74.0	75.0
% households whose members ever eat food that they did not want to eat because of a lack of resources to obtain other types of food (last 30 days)	49.4	50.0	54.5
<u>Household food insecurity access scale score (HFIAS score):</u>			
Food secure	15.1	16.9	16.0
Mildly food insecure	4.9	4.8	3.1
Moderately food insecure	45.0	37.8	37.4
Severely food insecure	35.0	40.4	43.4
Number of households	975	976	975

5. WATER AND SANITATION

5.1. Household water supply

Public tap/standpipe reported to be the leading source of water supply across the three groups - 33.7% in group 1, 26% in group 2 and 30.3% in group 3 areas. This was followed by unprotected springs ranging between 19.5% and 29.4% in the three groups. Protected spring, borehole and surface water were also reported among the main sources water supply across the three groups. On the whole, 49.3% of the households in group 1 area, 60% in group 2 and 54.4% in group 3 areas can be considered as having access to improved water source (Table 6). Although about half of the households didn't have improved water supply, water treatment is rarely practiced (3.8%-5.5%).

Table 6. Percentage distribution of households according to water source by intervention group, CBN evaluation survey, September 2011

Household water source	CBN intervention area		
	Group 1	Group 2	Group 3
Public tap/standpipe	33.7	26.0	30.3
Borehole	14.0	11.6	13.4
Protected well	1.4	1.8	1.2
Unprotected well	1.2	4.4	0.7
Protected spring	16.4	14.2	14.8
Unprotected spring	21.8	29.4	19.5
Surface water	10.4	11.5	16.7
Other sources	1.1	1.1	3.4
"Improved" water source@	49.3	60.0	54.4
Water treatment practice			
Nothing	96.1	94.5	96.2
Boil	3.9	5.5	3.8
Number of households	975	976	975

@Piped into household, public standpipes, boreholes, protected wells or springs or rainwater collection

5.2. Household latrine

The data on latrine facilities indicate that pit latrines without slabs or open pit was reported to be the predominant latrine facility in the study area - 57.5% in group 1, 52.7% in group 2 and 54.9% in group 3 areas (Table 7). A notable portion of the of households in group 1 area (17.3%) reported to own pit latrine with slab. On the other hand only 10.1% and 8.3% of the households in group 2 and 3 areas, respectively, reported to have pit latrine with slab. Other types of latrines were rarely reported across the three groups. About a quarter of the households in group 2 area did not have any type of toilet facility and this was 23% in group 3 and relatively the lowest at 15.8% in group 1 areas. Taken together, 17.4%, 10.1% and

8.3% of the households in group 1, 2 and 3 areas, respectively, can be considered as having improved latrines.

Table 7. Percentage distribution of households according to latrine facility by intervention group, CBN evaluation survey, September 2011

Household latrine	CBN intervention area		
	Group 1	Group 2	Group 3
Ventilated improved pit latrine (VIP)	2.0	0.5	0.4
Pit latrine with slab	17.3	10.1	8.3
Pit latrine without slab/open pit	57.5	52.7	54.9
Composting toilet	2.3	7.6	6.6
No facilities or bush or field	15.8	24.9	23.0
Disposing on farm	0.6	2.2	0.9
Missing	4.5	2.0	5.9
"Improved" latrine@	17.4	10.1	8.3
Number of households	975	976	975

@connection to sewer or septic system, pour-flush latrine, pit latrine and VIP

6. MATERNAL HEALTH AND NUTRITION

6.1. Respondents and children characteristics

As shown in Table 8 the mean age of respondent mothers/caretakers compares well across the three groups and was around 28.5 years. The majority of respondents in the three groups (45.2%-47%) were in the age group 25-34 years. Younger women (age 15-24 years) represents about a quarter of the women. Marriage appears universal for these women with over 93% across the three groups reported to be currently married.

Respondents' educational level can be considered quite low in the study areas with 70.4% in group 1, 63.8% in group 2 and 64.6% in group 3 did not have any education or cannot read or write. The proportions that have elementary education (i.e. grade 1-6) were 20.9%, 22.9% and 24.8%, respectively, in groups 1, 2 and 3. Few women (5.3%-8.1%) had achieved at least 7 years of schooling.

The majority of the respondents in group 1 (54%) and 2 areas (53.3%) were followers of Orthodox Christian. In round 3 areas respondents nearly equally split between Muslim (36.4%) and Orthodox Christian (32.2%) followers.

The study included 1023, 1025 and 1011 children age 0-35 months in group 1, 2 and 3 areas, respectively. Similar age distribution of these children can be noted across the three groups with mean age of 16, 16.4 and 15.5 months, respectively, in group 1, 2 and 3 areas. They are also nearly equally split by sex.

Table 8. Distribution of mothers/caretakers and children (age 0-35 months) according to selected characteristics by intervention group, CBN evaluation survey, September 2011

	CBN Intervention area		
	Group 1	Group 2	Group 3
Mother/caretakers (n)	975	976	975
Age			
15-24	25.9	29.4	25.4
25-34	45.2	46.9	46.9
35-49	22.6	18.1	21.9
Missing	6.4	5.7	5.8
Mean age	28.4	28.7	28.5
Marital status			
Married	94.5	94.1	92.9
Divorced/separated	3.1	3.0	2.3
Widowed	0.9	1.6	2.2
Single	1.6	1.3	2.6
Education			
No schooling	70.4	63.8	64.6
Informal education	2.5	3.3	2.5
Pre-school	0.8	1.9	0.7
1-6 grade	20.9	22.9	24.8
7+ grade	5.3	8.1	7.6
Religion			
Orthodox	54.0	53.3	32.2
Muslim	31.0	27.0	36.4
Protestant	14.6	17.1	27.2
Others	0.4	2.6	4.2
Children (0-35 months) (n)	N=1023	N=1025	N=1011
Child's age			
0-5 months	19.3	17.2	19.8
6-11 months	19.0	17.4	18.1
12-23 months	32.6	35.4	32.7
24-35 month	29.1	30.0	29.4
Mean age (months)	16.0	16.4	15.5
Child's sex			
Male	51.7	48.4	50.8
Female	48.3	51.6	49.2

6.2. Antenatal care

In this survey, each woman who has a child aged 0-35 months was initially asked whether she had gone for antenatal care (ANC) check-up to a health institution when she was pregnant with her youngest child. She was also asked how many such visits she made and the services she received during antenatal visit. Table 9 shows that 63.5% of the women in group 1, 61.9% in group 2 and 64.1% in group 3 received ANC for their most recent birth. The numbers of antenatal care visits are important for the health and outcome of the pregnancy. However, in this study only 24.2%, 27% and 23.8% of the women in group 1, 2 and 3 areas, respectively, received at least four ANC visits during pregnancy.

Most ANC users received care in health post at 60.8%, 56.7% and 71.8%, respectively, in group 1, 2 and 3 areas. This was followed by health center in the range of 25.9%-37.4%.

The content of antenatal care is vital in evaluating its value. In order to identify and prevent possible complications during pregnancy and childbirth, testing for complications should be routinely included in all antenatal care visits. The provision of iron tablets and anti-malarial drugs during pregnancy as deemed necessary is highly recommended. ANC visit also creates opportunity to provide counseling to the mothers on HIV/AIDS, maternal nutrition, among others. To help assess the contents of the ANC services, respondents were asked about whether they had had certain screening tests and also given some of the treatments and counseling during at least one of the antenatal visits. As shown in Table 10, among those women who received ANC, different information and services were reported to be given to the women. Of particular interest to the present study, 82.9% of the women who attended ANC in group 1 area reported to have received information on maternal nutrition. The receipt of this information was reported at 73% and 68.5%, respectively, in group 2 and 3 areas. About 80% of the women reported to have received information on breastfeeding in group 1 area while this was reported to be relatively lower at 66.1% and 66.4%, respectively, in group 2 and 3 areas. Between 68%-77.1% of the women across the three groups reported to have their weight measured.

Table 9. Among women with children age 0-35 months, the proportion who had antenatal care in health facilities for their most recent pregnancy, the number of visits and places where service received and type of provider by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1 N=1023	Group 2 N=1035	Group 3 N=1011
Received at least one ANC	63.5	61.9	64.1
Number of ANC visits			
None	36.5	38.1	35.9
1	4.1	3.6	4.1
2	8.2	7.0	11.0
3	26.0	23.8	24.9
4+	24.2	27.0	23.8
Missing	1.0	0.5	0.3
Place of ANC (more than one place possible)	N=650	N=641	N=648
Government Hospital	1.2	0.8	0.3
Health Center	33.4	37.4	25.9
Health Post	60.8	56.7	71.8
Other facilities	4.6	5.1	2.0
Type of ANC provider	N=650	N=641	N=648
Doctor	0.1	0.3	0.0
Nurse/midwife	24.1	33.2	21.4
HEWs	71.7	64.6	74.2
Other Health workers	4.1	1.9	4.4

Table 10. Contents of antenatal care services among antenatal care users by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1 N=650	Group 2 N=641	Group 3 N=648
Weight measurement	68.0	77.1	70.9
Blood pressure measurement	68.0	70.1	68.9
Urine test	34.8	32.2	25.3
Blood test	50.5	42.4	39.7
Drugs for malaria	32.3	22.6	22.3
Breast feeding information	79.8	66.1	66.4
Family planning information	87.7	78.2	77.0
HIV/AIDS information	83.8	78.3	72.9
Maternal nutrition information	82.9	73.0	68.5

6.3. Health care and nutrition services during pregnancy

This survey also assessed women's receipt of iron tablet, tetanus injection (TTI), de-worming tablet during pregnancy of their most recent live birth. In addition, they were also asked to report their food intake behavior during pregnancy. Table 11 details data on these indicators. It appears that women in group 1 area were more likely than those in group 2 and 3 to receive iron tablet during pregnancy at 31.9%, 23.6% and 20%, respectively. Most reported to have had iron for at most 30 days.

The receipt of at least one TTI was reported at 66.6% in group 1, 65.8% in group 2 and 71.2% in group 3 areas. Most of the women who received TTI reported to have received it for 2-3 times - 45.6%, 43.1% and 50.8%, respectively. Only about a tenth of the women across the three groups reported to have received deworming tablets during pregnancy.

Healthy nutrition intake is critical for the health of the mothers, the foetus and also the infant. In this survey, women were asked their food intake behaviour during pregnancy of their most recent birth. Contrary to the recommendation by the health and nutrition experts, a good portion (over 45%) of the women across the three groups reported to have had food intake that was less than usual while about 40% reported same as usual. Only 7.3%, 5% and 7.5% of the women in group 1, 2 and 3 areas, respectively, reported to have had food intake that was more than usual.

Table 11. Among women with children age 0-35 months, the proportion who received iron, TT injection, de-worming and food intake during pregnancy by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1 N=1023	Group 2 N=1035	Group 3 N=1011
Iron intake during pregnancy	31.9	23.6	20
Number of days Iron taken			
None	68.1	76.4	80.0
1-30 days	23.8	21.4	16.8
31-60 days	3.2	1.0	0.7
>60 days	1.8	0.6	0.3
Do not know	3.1	0.6	2.2
Tetanus injection during pregnancy			
No	33.3	34.2	28.9
Once	12.2	13.5	12.9
2-3 times	45.6	43.1	50.8
Do not know	0.5	0.8	0.2
Missing	8.4	8.4	7.2
De-worming tablet taken			
No	81.4	82.6	83.1
Yes	11.8	9.8	11.0
Missing	6.8	7.6	5.9
Food intake during pregnancy			
Less than the usual	44.1	51.3	45.8
Same as usual	41.8	36.6	41.0
More than usual	7.3	5.0	7.5
Missing	6.8	7.1	5.7
Reason for eating more	N=75	N=52	N=76
Fetus competes	5.3	5.8	2.6
Development of fetus	14.7	5.8	18.4
Health of fetus and mother	22.7	44.2	18.4
Being hungry	45.3	25.0	55.3
Others	12.0	19.2	5.3

6.4. Delivery care

A woman who has a child age 0-35 months was asked where she delivered and who assisted her during the delivery of her most recent birth. Across the study groups, the vast majority of the deliveries (over 93%) took place at home (Table 12). This data confirms other studies, suggesting the fact that most rural women in the country do not have easy access to delivery and new born care services. Only between 5.8% and 6.9% of the women across the three groups reported to have delivered in health institution.

Table 12 also presents information on assistance during delivery. Professionally assisted delivery can be considered so low across the three groups at around 5%-6%. The HEWs reported to have attended only 3.5% of the deliveries in group 1 area. While less than 2% of the deliveries in group 2 and 3 areas were assisted by the HEWs. As expected the vast majority of the deliveries reported to be attended by families/friends as well as traditional birth attendants.

Table 12. Among women with children 0-35 months, the proportion that were assisted by professionals and others during delivery, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1 N=1023	Group 2 N=1035	Group 3 N=1011
% home delivery	93.2	93.1	94.2
% institutional delivery	6.8	6.9	5.8
Assistance during delivery			
Health professional	5.1	6.1	5.1
Health Extension Workers	3.5	1.6	1.2
Traditional birth attendant	21.0	21.8	21.3
VCHW	1.6	0.4	2.4
Families/friends/neighbors	59.7	62.4	61.8
No one	1.8	0.8	2.6
Missing	7.3	6.9	5.6

7. CHILD HEALTH CARE SERVICE AND NUTRITION

7.1. Child vitamin A and de worming

Survey respondents were shown vitamin A capsule and asked if their child age 6-35 months received a supplement during the last twelve months. For those who have received a vitamin A supplement, the number of months since they receive the supplement was collected. Across the three groups about two-third of the children reported to have received Vitamin A in the last 12 months - 64.9% in group 1, 65.1% in group 2 and 65.1% in group 3 areas. A little bit over a third of the children across the three groups received vitamin A in the 3 months preceding the survey.

In order to assess whether the child has received deworming tablet, mothers/caretakers were shown a sample tablet and asked if the child had received it in the preceding 6 months. As shown in Table 13, 17.6%, 15.9% and 14.4% of the children age 0-35 months in group 1, 2 and 3 areas, respectively, reported to have received deworming tablet in the previous 6 months.

Table 13. Distribution of children according to receipt of vitamin A and de worming tables by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1	Group 2	Group 3
Children age 6-35 months	N=826	N=857	N=811
Child received Vitamin A (last 12 months)	64.9	65.1	65.1
Timing of last vitamin A (last 12 months)			
No vitamin A	33.2	35.2	35.3
Less than 4 months	35.1	34.9	34.9
4-5 months ago	10.5	12.6	8.3
6+ months ago	17.8	14.7	10.0
Do not know	3.4	2.6	1.5
Children age 0-35 months	N=1023	N=1035	N=1011
De worming tablet given to child (last 6 months)	17.6	15.9	14.4

7.2. Child growth monitoring

About two-third of the children age 0-35 months across the three groups reported to possess either a family health card (FHC) or other growth card or both (Table 14). FHC alone was reported to be owned by 23.7%, 22.6% and 22.0%, respectively, of the children in group 1, 2 and 3 areas. The corresponding proportion of children that owned other growth card were 20.5%, 21.5% and 21.3%, respectively.

In the preceding 3 months of the survey, 32.2% and 30.7% of the children age 6-35 months in group 1 and 2 areas, respectively, had their weight measured (Table 14). This was lower at

19.6% in group 3 areas. On the other hand, in the previous 1 month only 16% of the children in group 1, 16.9% in group 2 and 7.8% in group 3 areas were reported to be weighted.

Among those children weighted in the previous 3 months, mothers/caretakers were asked to report the place(s) where these children were weighted. In group 1 area, 49.2% of the children were reported to be weighted in community weighting sessions; this was higher at 64.2% in group 2. Likewise, about 45% of the children in group 3 area were weighted in community weighting sessions. About half of children in group 1 (45.9%) and group 3 (50%) areas were weighted in health facilities while this was relatively lower at 32.3% in group 2 area.

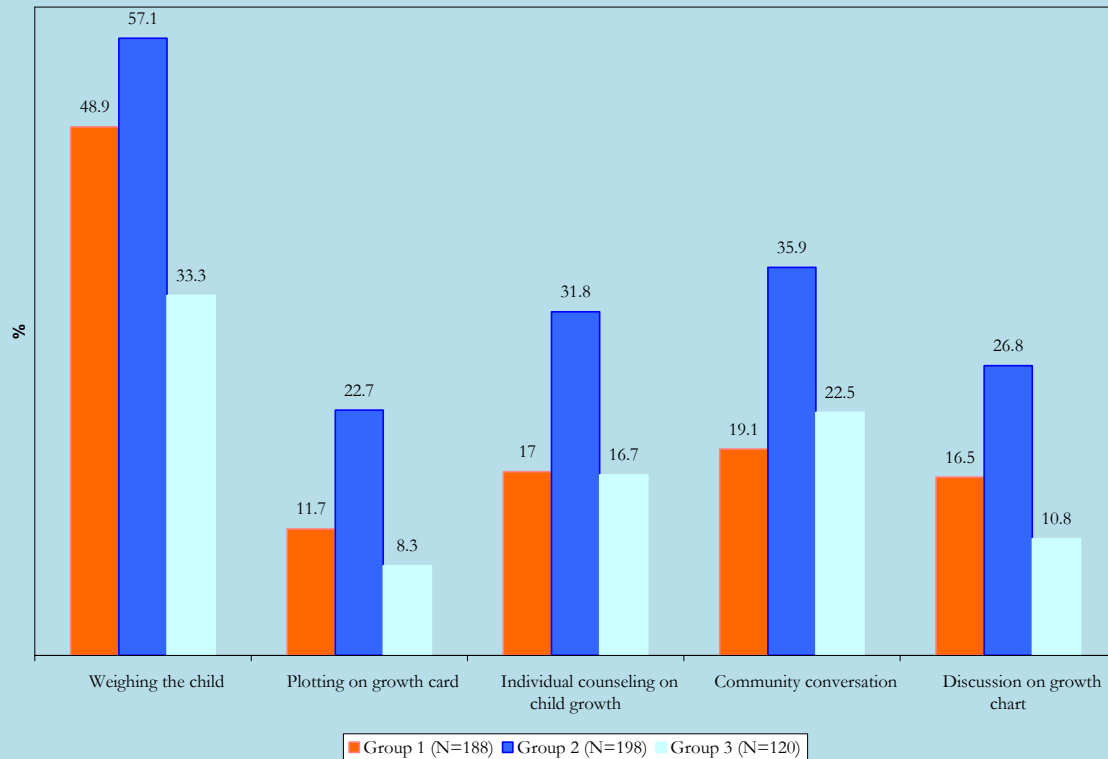
Data on frequency of weighting in the previous 3 months suggest that most children that were weighted the last 3 months were weighted only once (61.1%-63.9%). Whereas a little bit over a third of those in group 1 (36.6%) and group 2 (36.1%) were reported to be weighted for 2-3 times. Few children (2.3%) reported to have their weight measured 3 or more time the previous three months in group 1 areas. This was less than 2% in group 2 and 3 areas.

Among those children weighted in the previous 3 months, information was collected on participation of family members during the weighting sessions. As shown in Table 14, 18.6% and 19.2% of the children that were weighted in the previous 3 months in group 1 and 2 areas, respectively, had their families participated during weighting. The corresponding percentage in group 3 was 12%. The type of family participation is shown in Figure 2. It appears that families have participated in a number of activities that included weighting the child, community conversation, individual counseling on child growth, discussion on growth chart and plotting on growth card. In order of magnitude, families in group 1 area reported to have participated in weighting the child (48.9%), community conversation (19.1%), individual counseling on child growth (17%), community conversation (16.5%) and plotting on growth card (11.7%). It can be noted that families in group 2 areas have better participation in different activities during the weighting sessions including weighting the child (57.1%), community conversation (35.9%), individual counseling on child growth (31.8%), discussion on growth chart (26.8%) and plotting on growth card (22.7%). Of note, family participation is not only lower in group 3 area but also was more limited to some activities.

Table 14. Distribution of children age 0-35 months according to possession of growth card, prevalence of weighting in the previous 3 months, frequency of weighting and family participation during child weighing by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1	Group 2	Group 3
	N=1023	N=1035	N=1011
Child Growth Card and/or FHC			
No card at all	36.0	38.5	49.6
FHC only	23.7	22.6	22.0
Other growth card	20.5	21.5	21.3
Both	18.7	15.7	5.8
Missing	1.1	1.7	1.3
Child weighted in the previous 3 months	32.2	30.7	19.6
Child weighted in the previous 1 month	16.0	16.9	7.8
Place child weighted (last 3 months)	N=329	N=318	N=198
Health facility	45.9	32.3	50.0
Community weighing sessions	49.8	64.2	44.9
Both	1.8	1.6	1.5
Missing	2.5	1.9	3.6
Frequency of weighting (last 3 months)			
Once	61.1	62.9	63.9
2-3 times	36.6	36.1	32.9
More than 3 times	2.3	1.0	1.9
Missing	0.0	0.0	1.3
	N=329	N=318	N=198
Family participated during weighting (last 3 months)	18.6	19.2	12.0

Figure 2. Among children Distribution of children age 0-35 months who were weighted in the previous 3 months, the distribution of children according to the type of family participation during weighting by intervention group, CBN evaluation survey, September 2011



7.3. Mothers'/caretakers' knowledge of child malnutrition

Mothers/caretakers were asked to spontaneously mention (unprompted) the signs of a malnourished child. Taken together, it appears that mothers/caretakers in the study areas can be considered as having incomplete knowledge about the signs of a malnourished child (Table 15). Being thin was by far the most frequently mentioned sign of a malnourished child, as reported by over 80% of the mothers across the three groups. This was followed by being short (30.9%-33.5%), being irritable (28.9%-32%), leg edema (14.9%-18.5%) and old man face (11.2%-12.1%). Other signs such as change of hair color and sunken eye were rarely reported. About 10%, 6% and 10.3% of the mothers in group 1, 2 and 3 areas, respectively, didn't know any sign of a malnourished child. Of note, there was no significant difference in mothers' knowledge about the signs of a malnourished child across the three groups.

When asked to respond to the question "What are some ways that you can help a malnourished child get better?" 66.9% in group 1, 70% in group 2 and 68.2% in groups responded that they knew at least one way (Table 15). The vast majority of these mothers (89.2%-92.4%) across the three groups said increasing the amount of food at each meal

helps a malnourished child get better. This was followed by increasing meal frequency (43%-44.3%), feeding the child food that she/he prefers (22.2%-23.8%), take the child to a health center (17.5%-28%), take the child to the HEW (17.1%-18.7%), encourage the child to eat more (11.6%-12.9%) and give the child a more balanced diet (11.5%-19.2%), among few others. On the whole, this suggests that mothers across the study areas saw increasing food intake and meal frequency as the two most important ways to help a malnourished child. While they appeared to have limited knowledge on other important ways of dealing with such children.

Table 15. Mothers'/caretakers' knowledge of a malnourished child by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1 N=1023	Group 2 N=1035	Group 3 N=1011
Signs of a malnourished child			
Thin	80.7	85.1	83.0
Short	30.9	33.5	31.3
Old man face (monkey face)	11.2	12.1	15.3
Irritable	32.0	28.9	33.0
Change of hair color	9.5	9.9	14.0
Sunken eye ball	7.8	6.9	8.4
Leg edema	14.9	15.1	18.5
Do not know	9.5	5.9	10.3
Ways to help a malnourished child			
Knows at least one way	66.9	70.0	68.2
Reported ways to a malnourished child			
	N=684	N=724	N=689
Increase the amount fed at each meal	89.2	92.4	91.1
Feed the child more frequently	43.0	43.1	44.3
Feed the child foods he/she likes	23.8	22.5	22.2
Encourage the child to eat more	12.6	11.6	12.9
Take the child to see the VCHW	2.2	2.8	1.7
Take the child to see the HEW	18.7	17.7	17.1
Take the child to the health centre	17.5	20.6	28.0
Give the child a more balanced diet	11.5	11.2	19.2
Give the child plumpynut [use local name]	3.1	4.4	2.9

7.4. Knowledge of breastfeeding and weaning

Women's knowledge of selected child feeding practices including breastfeeding practices, complementary feeding, age at weaning, and method of feeding was assessed (Table 17).

Accurate knowledge of some key breastfeeding and complementary feeding practices is a necessary condition for actual practice. However, knowledge doesn't necessarily translate in to actual practice due to several intervening factors such as attitude, culture, resources, among others.

When asked to mention the correct timing to initiate breastfeeding, 56% of the mothers in group 1, 58.4% in group 2 and 62.9% in group 3 reported immediately after birth (within an hour of birth).

A notably high percentage of women across the three groups (76.6%-77.5%) said children should be given only breast milk up to age 6 months. Women in the study areas saw three major benefits of breastfeeding including for child growth, for child health and food for the child. The other important benefit, i.e. pregnancy prevention, was rarely reported.

Most mothers across the three groups (81.4%-83.1%) report to know about colostrums. Only 22.1% and 27.9% of the women in group 1 and 2 areas, respectively, saw colostrums as a first immunization to the newborn. This was reported at 26.2% in group 3 area. A relatively higher portion of these women (45.4%-51.3%) said colostrums is beneficial for child growth. On the other hand 38.5%-43.5% of the women who knew about colostrums across the three groups didn't report any benefit of colostrums (Table 16).

Women were asked the age of a child to introduce liquid (including water) and solid foods in addition to breast milk. Table 16 shows that 56.7%, 60.9% and 60.7% of the mothers said a child should start liquids (including water) in addition to breast milk at the exact age of 6 months. Three types of food predominantly reported by the mothers as babies' additional first food across the groups including gruel (58.4%-62.2%), soft porridge (47.2%-57.6%) and cow's milk (52.1%-56.9%).

Method of child feeding that mothers should adapt was assessed by asking the mother respondents. Spoon feeding was reported by 42.3%, 40.0% and 40.7% of the mothers in group 1, 2 and 3 areas, respectively. Similar percentage of mothers also reported bottle feeding in the range of 39.3% to 46.1% across the three groups. About a third said hand feeding as one method of child feeding.

Table 16. Mothers'/caretakers' knowledge of a breastfeeding and addition food by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1 N=1023	Group 2 N=1035	Group 3 N=1011
% who said breastfeeding should be initiated immediately after birth	56.0	58.4	62.9
% who said children should be given only breast milk up to age 6 months	77.1	77.5	76.6
Benefits of breastfeeding			
Child growth	69.6	68.8	73.1
Child health	59.5	56.7	64.4
Child food	49.2	49.9	51.9
Comfort (for not crying	6.1	7.7	8.1
Mother health	3.8	6.5	6.8
Preventing pregnancy	1.9	1.2	1.6
Other benefits	6.5	6.6	5.9
% who know about colostrums (first yellow milk)	82.8	83.1	81.4
Benefits of feeding colostrums to the newborn	N=847	N=860	N=823
First immunization only	22.1	27.9	26.2
Child growth only	45.4	50.2	51.3
First immunization OR child growth	56.5	61.5	59.5
Do not know any benefit	43.5	38.5	40.5
% who said weaning should be introduced at the exact age of 6 months	56.7	60.9	60.7
Babies' additional first foods	N=1023	N=1035	N=1011
Gruel	62.2	58.4	60.0
Soft porridge	57.0	47.2	57.6
Cow's milk	52.1	54.7	56.9
Formula milk	1.7	1.6	0.9
Do not know	0.6	0.2	1.0
Method feeding mother should adapt			
Spoon	42.3	40.0	40.7
Cup	30.1	31.5	37.1
Hand	39.3	40.0	46.2
Bottle	0.0	0.0	0.0
Do not know	0.1	0.3	0.3

7.5. Access to information and services from HEWs and vCHWs

Information from HEWs:

Mothers were asked if they have ever received any message on nutrition from the HEWs and the vast majority (93.7%) in group 1, 89.5% in group 2 and 83.7% in group 3 said so (Table 17). Recent contact (i.e. over the past 6 months) with HEWs was reported at 44.3%, 46.1% and 47.4%, respectively.

Respondent mothers were further asked the type of nutrition information they received from HEWs. It appears that most women across the three groups reported to have received some important information from HEWs that include, in order of priority, information on exclusive breastfeeding (66.4%-80.2%), complementary feeding (62%-79.4%), child/weight/growth (45.4%-65.5%) and on giving plumpynut to their child (32.4%-45%). On the whole, mothers in group 1 area are more likely than those in group 2 and 3 to have received such information from the HEWs.

Mothers reported to met HEWs in varying places which include health post, house visit, community outreaches, community conversation, growth monitoring and family visit. Access to HEWs by the mothers appears comparable across the three groups.

Table 17. Distribution of mothers/caretakers according to receipt of information on nutrition from HEWs by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1 N=1023	Group 2 N=1035	Group 3 N=1011
Ever received information on nutrition from HEWs	93.7	89.5	83.7
Type of nutrition information from HEWs	N=959	N=926	N=846
Child weight/growth	65.5	57.5	45.4
Exclusive breast feeding	80.2	67.2	66.4
Complementary feeding	79.4	68.6	62.0
On giving plumpynut to your child	45.0	35.7	32.4
Place of meeting with HEWs (last 6 months)	N=959	N=926	N=846
Health post	75.9	70.1	78.5
Community outreaches	63.4	55.5	49.3
House visit	67.0	61.2	58.0
Community conversation	59.4	54.1	50.1
Growth monitoring	47.6	40.7	32.0
Family training	29.5	29.0	22.6
	N=1023	N=1035	N=1011
Contacted by HEWs (last 6 months)	44.3	46.1	47.4

Information from vCHWs:

Three quarter of the mothers in group 1 area reported to have ever received information on nutrition from volunteer community health workers (vCHWs). This was relatively lower at 64.4% in group 2 while the lowest, 53%, being in group 3 (Table 18). Recent contact with vCHWs (within the previous 6 months) was reported at 30.6%, 25.2% and 24.8%, respectively, in group 1, 2 and 3 areas.

vCHWs in group 1 area were more likely than those in group 2 and 3 to provide different nutrition related information to the mothers (Table 18). In addition it was reported that a little over three-quarter of the vCHWs in group 1 area advised mothers to take sick child to the HEWs. The reporting for the same was 73% and 64.2% in group 1 and 2 areas, respectively.

In group 1 and 2 areas, it was reported that house visit (52.5%-61.9%), community conversation (43.9%-54.5%), community outreach (39.1%-52.2%) and growth monitoring (32%-39%), in order of priority, as the places where vCHWs meet mothers.

Table 18. Distribution of mothers/caretakers according to receipt of information on nutrition from HEWs by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1	Group 2	Group 3
Ever received information on nutrition from vCHWs	75.5	64.4	53.0
Type of nutrition information from vCHWs	N=772	N=667	N=536
Child weight/growth	67.6	61.8	45.7
Exclusive breast feeding	71.2	61.9	64.5
Complementary feeding	71.2	67.5	61.2
on taking sick child to see the HEW	76.2	73.0	64.2
Place of meeting with VCHWs	N=772	N=667	N=536
Community outreaches	52.2	39.1	29.4
House visit	61.9	52.5	40.8
Community conversation	54.5	43.9	32.9
Growth monitoring	39.0	32.0	18.1
	N=1023	N=1035	N=1011
Contacted by vCHWs (last 6 months)	30.6	25.2	24.8

S. INFANT AND YOUNG CHILD FEEDING PRACTICES

8.1. Breastfeeding practices

Table 19 presents key breastfeeding related indicators including timely initiation of breastfeeding, pre-lacteal feeding, colostrums feeding, exclusive breastfeeding, and continuation of breastfeeding for children 0-23 months. It also presents data on frequency of breastfeeding.

Timely Initiation of breastfeeding:

It is recommended that children be put to the breast immediately or within one hour after birth. Among children 0-11 months the proportion that started breastfeeding within an hour of birth was 55.2%, 61.4% and 60.8%, respectively, in group 1, 2 and 3 areas.

Pre-lacteal feeding:

Pre-lacteal feeding is giving liquids or foods other than breast milk prior to the establishment of regular breastfeeding. In this survey we asked respondents whether they gave liquids or foods to their children immediately after birth (within 3 days). Of all children age 0-11 months, 16.9% in group 1, 16.2% in group 2 and 19.8% in group 3 areas were given something else other than breast milk within 3 days after birth.

Colostrums feeding:

During the first few days after delivery, colostrums, an important source of nutrition and antibody protection for the newborn, is produced and should be fed to the newborn while awaiting the production of regular breast milk. Among children 0-11 months, 66.2%, 67% and 68.9% reported to have received colostrums in group 1, 2 and 3 areas, respectively.

Exclusive breastfeeding among children 0-5 months:

WHO¹⁰ recommends that children be exclusively breastfed—fed only breast milk with no other liquids (including water) or food—on demand for the first 6 months of life. Breastfeeding status for children under 6 months is determined on the basis of a mother's recall of her child's intake over the previous 24-hour period (past day and night). Based on a 24-hour mother's recall, the proportion of children age 0-5 months that were given only breast milk (exclusively breastfed) were notably high across the three groups (80.3%-83.8%).

Continued breastfeeding:

Continued breastfeeding is important for older infants and young children, contributing significantly to overall nutrient intake. Among children age 12-23 months, the proportion that continued breastfeeding for one year or longer is computed as shown in Table 19. In general, continued breastfeeding for one year and beyond can be considered high at 83.8% in group 1, 83.3% in group 2 and 82.5% in group 3.

Frequency of breastfeeding:

Mothers of children 0-35 months were asked to report the number of times they breastfed their child in the 24 hrs preceding the interview. The question was asked separately for the

¹⁰ WHO. The optimal duration of exclusive breastfeeding: a systematic review. Geneva: World Health Organization. WHO/NHD/01.08;WHO/FCH/CAH/01.23, 2001

number of time the child breastfed during the day and night time. On the whole over 80% of the children reported to breastfed the previous 24 hrs across the three groups. When asked to report the frequency of breastfeeding, 70.2% of the children in group 1, 66.2% in group 2 and 71.3% in group 3 areas were reported to have breastfed for 8 or more times the previous 24 hours. While less than 15% of the children cross the three groups breastfed for 4-7 times the previous 24 hours.

Table 19. Prevalence of key breastfeeding practices by age and intervention round CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1	Group 2	Group 3
Children age 0-11 months (n)	N=391	N=358	N=383
% initiated breastfeeding within one hour after birth (0-11 months)	55.2	61.4	60.8
% with pre-lacteal feeding (0-11 months)	16.9	16.2	19.8
% who received colostrums (0-11 months)	66.2	67.0	68.9
Children 0-5 months (n)	N=197	N=178	N=165
% exclusively breastfeeding (0-5 month)	83.8	80.3	82.5
Children 12-23 months (n)	N=334	N=366	N=331
% continued breastfeeding at 1 year	88.3	83.3	84.9
Children 0-35 months (n)	N=1023	N=1035	N=1011
Child breastfed the previous 24 hrs	83.3	81.1	84.3
Frequency of BF in the previous 24 hrs			
None	16.7	18.9	15.7
1-3 times	0.5	0.2	0.2
4-7 times	12.6	14.7	12.8
8 or more times	70.2	66.2	71.3

8.2. Bottle feeding and weaning

Among children age 0-35 months, the proportion that was fed with bottle the previous day was 31.6%, 24.1% and 28.1%, respectively, in group 1, 2 and 3 areas (Table 20).

Mothers were asked to report any type of foods/fluids the child had taken the previous day of the interview. In order of frequency of occurrence, mother reported that the child had received plain water, solid/semi-solid food, cow's milk and fruit juice/coffee/tea (Table 21). Between 69.2% and 71.8% of the children across the three groups reported to have given plain water and this was followed by solid/semi-solid food (57%-61.3%), cow's milk (36.3%-41.6%) and fruit juice/tea/coffee (24.7%-27.7%).

Mothers of children age 6-35 months were asked the number of times the child was fed in the previous day. Only 33.4% of the children in group 1 area were fed for 4 or more times yesterday. This was higher at 45.3% in group 2 area and 36% in group 3. Between 23% and 32.8% of the children age 6-35 months across the three groups reported to have been fed for 3 times. On the other hand 12.4%, 8.8% and 10.8% of the children age 6-35 months in group 1, 2 and 3 areas, respectively, didn't eat any solid/semi-solid food the previous day.

Table 20. Prevalence of bottle feeding and weaning by intervention round CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1	Group 2	Group 3
Children fed with bottle in the previous night	N=1023 31.6	N=1035 24.1	N=1011 28.1
Type of foods/fluids child took in the previous day	N=1023	N=1035	N=1011
Vitamins, minerals, supplements, medicines	3.0	2.4	1.9
Plain water	71.8	72.7	69.2
Fruit juice, coffee, tea	24.7	27.7	27.4
ORS/ <i>Lemlem</i>	1.8	1.3	2.4
Infant formula	2.5	4.5	2.2
Powdered milk	2.1	1.3	1.3
Cow's milk	36.3	41.6	38.3
Solid or semi solid food	57.0	61.3	56.8
Others	3.6	3.8	7.4
Frequency of feeding in previous day (children age 6-35 months)	N=824	N=852	N=809
Didn't eat	12.4	8.8	10.8
Once	3.2	3.0	3.8
2 times	14.4	14.7	21.3
3 times	32.8	23.0	25.6
4-6 times	33.4	45.3	36.0
More than 6 times	3.9	5.3	2.6

8.3. Complementary feeding, food diversity, and meal frequency

Introduction of solid, semi-solid or soft foods:

Here we report the proportion of children age 6-8 months who received solid, semi-solid or soft foods in the previous day. As shown in Table 21, 73.1%, 81.9% and 78.9% of the children in group 1, 2 and 3 areas, respectively, had received solid, semi-solid or soft foods in the previous day.

Minimum Dietary Diversity:

Proportion of children 6-23 months who received foods from 4 or more food groups in the previous day is considered meeting the minimum dietary diversity. To compute a value for

this indicator, a 7 food group¹¹ score variable was created. To create the seven food groups categories we asked mothers of the type of food the child had the previous day and the different food items were grouped into the 7 food groups. The list of the food items is detailed in Box 1. A score, based on the food groups, was categorized into two as (1) 4 or more food groups and (2) less than 4 food groups. This indicator was also presented separately in three age categories as age 6-11, 12-23 and 6-23 months.

Box 1. List of food items reported to receive by the child in the previous day and the food groups

<i>Food group</i>	<i>List of food items</i>
Group 1: Grains, roots and tubers	<ul style="list-style-type: none"> ○ Any porridge or gruel (Made from grain other than Teff) ○ Bread, pasta, rice, noodles, biscuits, cookies, or any other foods made from oats, maize, barley, wheat, sorghum, millet or other grain. ○ Any food made from teff, like injera, kita or porridge ○ Any white potatoes, white yams, bulla, Kocho, Cassava /boye or any other food made from roots
Group 2: Legumes and nuts	<ul style="list-style-type: none"> ○ Any food made from beans, peas, lentil or pulses ○ Any nuts or seeds such as peanuts, sesame, sunflower
Group 3: Dairy products (milk, yogurt and cheese)	<ul style="list-style-type: none"> ○ Any milk product like cheese, yogurt ○ Milk (non-human milk – cow, goat or powder)
Group 4: Flesh foods (meat, fish, poultry and liver/organ meats)	<ul style="list-style-type: none"> ○ Any liver, kidney, heart or organ meats ○ Any beef, pork, lamb, goat, camel, rabbit or wide game meat such as antelope or deer ○ Any chicken ducks or other birds ○ Any fresh or dried fish or shell fish
Group 5: Eggs	<ul style="list-style-type: none"> ○ Any eggs
Group 6: Vitamin-A rich fruits and vegetables	<ul style="list-style-type: none"> ○ Any pumpkin, carrot, squash or sweet potato that are yellow or orange inside ○ Dark green leafy vegetables (example: Kale, spinach or Amaranth leaves)
Group 7: Other fruits and vegetables	<ul style="list-style-type: none"> ○ Any other vegetables (any starchy vegetables)

Figure 3 presents the distribution of children age 6-23 months who received from the different food groups in the previous day. Data show that most children across the three groups reported to receive food made of grains the previous day (80.0%-82.9%). Next to grains, children reported to eat dairy products (46%-55.3%), legumes (25.3%-38.1%), VA rich foods (15.7%-16.3%), among others. Other food groups received by small proportion of children include flesh, eggs and other fruits and vegetables. On the whole, the data suggest the presence of very limited food diversity for children age 6-23 in the entire study area with most receiving grains, followed by dairy and legumes. There also appears no significant variation in the level of food diversity across the three groups.

The proportion of children age 6-23 months who met the minimum dietary diversity was low at 14.8% in group 1, 12.3% in group 2 and 15% in group 3 areas (Table 21). The lowest proportion who met the minimum dietary diversity was documented among children age 6-11 months in the three groups.

Minimum Meal Frequency:

Minimum meal frequency is defined as the proportion of breastfed and non-breastfed children 6-23 months who received solid, semi-solid or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more the previous day. Minimum is defined as - 2 times for breastfed children age 6-8 months, 3 times for breastfed children 9-23 months, and 4 times for non-breastfed children 6-23 months¹². ‘Meals’ include

¹¹ The 7 food groups used for calculation of this indicator are: (1)Grains, roots and tubers, (2)Legumes and nuts, (3)Dairy products (milk, yogurt and cheese), (4)Flesh foods (meat, fish, poultry and liver/organ meats), (5)Eggs, (6)Vitamin-A rich fruits and vegetables, and (7)Other fruits and vegetables

¹² CARE. Infant and Young Child Feeding Practices: Collecting and Using Data: A Step-by-Step Guide. Cooperative for Assistance and Relief Everywhere, Inc. 2010.

both meals and snacks (other than trivial amounts), and frequency is based on mothers/caregiver report.

Based on the definition for minimum frequency for breastfed and non-breastfed children, 63.1%, 63.7% and 54.9% of the children age 6-23 months in group 1, 2 and 3 areas, respectively, have met the minimum meal frequency (Table 22). There was an increasing trend in the proportion who met the minimum meal frequency by age.

The minimum meal frequency was also computed separately by breastfeeding status. Among currently breastfeeding children age 6-23 months, between 59.7% and 68.6% across the three groups have met the minimum meal frequency the previous day. Of note, the number of children who were not breastfeeding in the three groups was low for any meaningful interpretation of this indicator.

Minimum Acceptable Diet:

The Minimum acceptable diet indicator is computed for children age 6-23 months, first separately by child's breastfeeding status¹³ and, then by combining breastfeeding and non-breastfeeding children to yield a single indicator. The minimum dietary diversity and minimum meal frequency scores computed above were combined to form the minimum acceptable diet indicator. However, for non-breastfed children, the dietary diversity component of this indicator is different from the individual practice indicator calculated earlier (which did not distinguish between breastfed and non-breastfed children). A dietary diversity for non-breastfeeding children was computed using a 6 food group score (instead of the 7 food group score above) in order to exclude the dairy group from the calculation. The number of milk feeds was counted separately for non-breastfed children to determine if the child received at least 2 milk feeds, the minimum number required for this indicator. Details about how to compute these and the other IYCF indicators can be consulted from "*CARE. Infant and Young Child Feeding Practices: Collecting and Using Data: A Step-by-Step Guide - Cooperative for Assistance and Relief Everywhere, Inc. 2010.*"

Table 21 also provides data on the minimum acceptable diet for children 6-23 months, stratified by age of child and breastfeeding status. On the whole, data suggest that the vast majority (over 87%) of children across the three groups did not receive the minimum acceptable diet the previous day. Only 12.1%, 10.8% and 12.1% of the children in group 1, 2 and 3 areas, respectively, can be considered as having the minimum acceptable diet the previous day. There appears some positive trend in the proportion having the minimum acceptable diet by age.

¹³ **For breastfeeding children:** [Breastfed children 6-23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day / breastfed children 6-23 months]

For non-breastfed children: [Non-breastfed children 6-23 months of age who had at least the 2 milk feedings and had at least the minimum dietary diversity and the minimum meal frequency during the previous day / non-breastfed children 6-23 months]

Figure 3. Distribution of children age 6-23 months who received food from the different food groups in the previous 24 hours of the survey by intervention round, CBN evaluation survey, September 2011

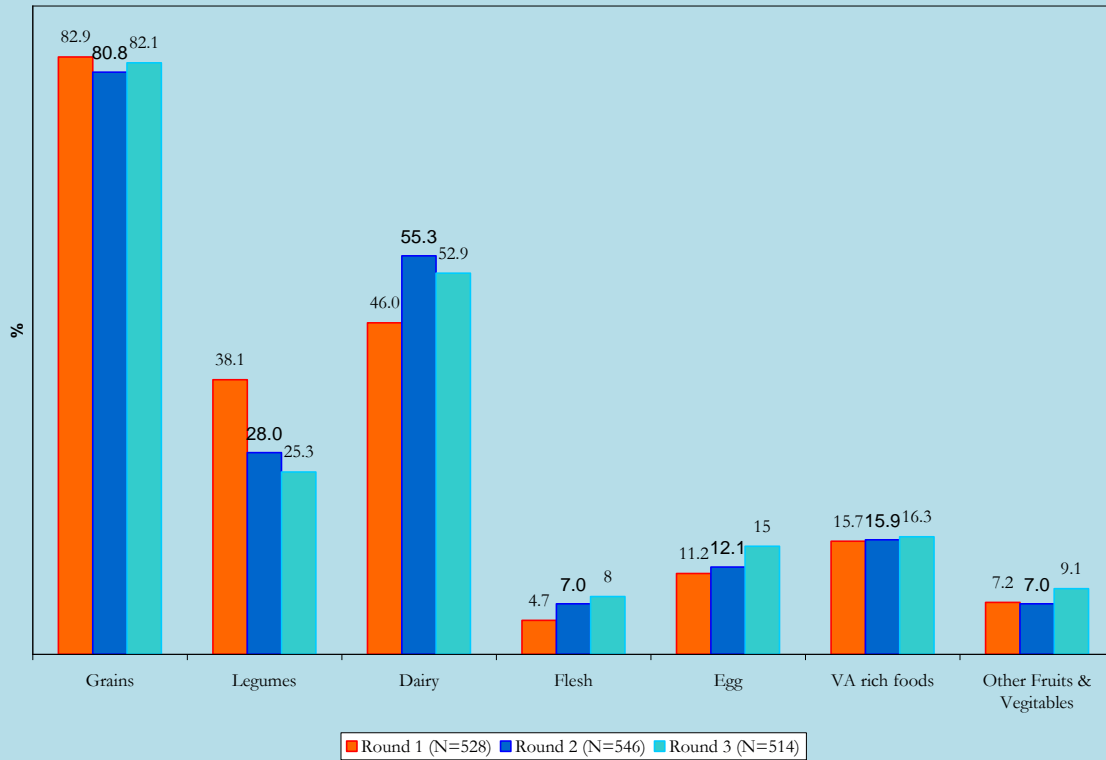


Table 21. Complementary feeding practices, Minimum dietary diversity, Minimum meal frequency and Minimum acceptable diet by age and intervention round CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1	Group 2	Group 3
6-8 months old, n	N=108	N=105	N=109
Introduction of solid, semi-solid or soft foods among children 6–8 months of age	73.1	81.9	78.9
Minimum dietary diversity, by age of child			
6-11 months old, n	N=194	N=180	N=183
% Minimum dietary diversity (6-11)	11.9	7.2	11.5
12-23 months old, n	N=334	N=366	N=331
% Minimum dietary diversity (12-23)	16.5	14.7	16.9
6-23 months old, n	N=528	N=546	N=514
% Minimum dietary diversity (6-23)	14.8	12.3	15.0
Minimum meal frequency, by age of child			
6-11 months old, n	N=194	N=180	N=183
% Minimum meal frequency (6-11)	52.1	55.6	53.5
12-23 months old, n	N=334	N=366	N=331
% Minimum meal frequency (12-23)	69.5	67.8	55.6
6-23 months old, n	N=528	N=546	N=514
% Minimum meal frequency (6-23)	63.1	63.7	54.9
By breastfeeding status			
Currently breastfed, n	N=496	N=507	N=472
% Minimum meal frequency (6-23)	67.1	68.6	59.7
Not currently breastfed, n	N=32	N=39	N=42
% Minimum meal frequency (6-23)	50.0	71.8	52.4
Minimum acceptable diet			
By age of child			
6-11 months old, n	N=194	N=180	N=183
% Minimum acceptable diet (6-11)	9.3	7.2	10.9
12-23 months old, n	N=334	N=366	N=331
% Minimum acceptable diet (12-23)	13.8	12.6	12.7
6-23 months old, n	N=528	N=546	N=514
% Minimum acceptable diet (6-23)	12.1	10.8	12.1

9. CHILDHOOD ILLNESS AND TREATMENT PRACTICE

9.1. Fever

In this survey the mothers or caretakers of children age 0-35 months were asked a series of questions on the prevalence of fever and diarrhea during the two weeks preceding the survey. Table 22 revealed that 21.9% in group 1, 20.7% in group 2 and 19.7% in group 3 areas reported to have had fever in the two weeks preceding the survey. Only 38.7%, 42.1% and 37.7% of these children with fever in group 1, 2 and 3 areas, respectively, were taken to health facility for treatment. A little bit over a fifth of these children across the three groups were taken to health center while a little bit over a tenth to health post.

9.2. Diarrhea

A nearly similar portion of the children age 0-35 months (20.6%-23.4%) in the three groups reported to have diarrhea the previous 2 weeks. Oral Rehydration Salt (ORS) is highly recommended for children with diarrhea. The use of a home made solution prepared from sugar, salt and water, which is referred to here as Recommended Home Fluid (RHF) and the continuous supply of fluids for children with diarrhea is crucial. Oral Rehydration Therapy (ORT) encompasses all increases in fluid, RHF and ORS. Thus, a child with diarrhea is defined as receiving ORT if he/she received either ORS, or RHF or increased fluids. In order to gauge the extent of use of oral rehydration, the survey asked mothers regarding the use of ORS and RHF for children sick with diarrhea in the two weeks prior to the survey. As shown in Table 22, 35.1% in group 1, 31% in group 2 and 28.7% in group 3 of the children with diarrhea received ORS in the previous two weeks. The corresponding percentage for RHF was 26.1%, 29.2% and 27.4%, respectively. It is recommended to continue feeding and increase the amount of fluid to children during illness with diarrhea. Mothers/caretakers were asked about changes in feeding practices for those children ill during the two-week prior to the interview. Between 18.1%-19.8% of such children with diarrhea were given increased fluid.

Taken together, the proportion of children with diarrhea who received ORT was 49.8%, 51.1% and 47.3%, respectively, in group 1, 2 and 3 areas.

Table 22. Two-week prevalence of childhood illnesses and treatment practice by intervention round
 CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1	Group 2	Group 3
	N=1023	N=1035	N=1011
% children 0-35 months with fever	21.9	20.7	19.7
Among children 0-35 with fever :	N=225	N=214	N=199
Taken to health facility/provider (any)	38.7	42.1	37.7
Taken to Health post	10.7	13.5	13.1
Taken to Health center	23.6	20.6	22.6
Taken to Hospital	0.9	0.0	0.0
taken to other facilities/providers	3.6	7.9	2.0
	N=1023	N=1035	N=1011
% children age 0-35 months who had diarrhea	20.6	21.2	23.4
Among children 0-35 with diarrhea	N=211	N=219	N=237
Given Oral Rehydration Salt (ORS)	35.1	31	28.7
Given Recommended Home Fluids (RHF)	26.1	29.2	27.4
Increased Fluid	19.1	19.8	18.1
ORS or RHF or increased fluid (ORT)	49.8	51.1	47.3

10. TARGETED SUPPLEMENTARY FEEDING (TSF)

Targeted Supplementary Feeding (TSF) is one of the components of the CBN program. Those children who are found to have a Mid-upper arm circumference (MUAC) below the cut-off point of 21.0 cm and 12.0 cm, respectively, are given a ration card and referred to the TSF program and, (where available) those with a MUAC below 11.0 cm and/or with edema, for treatment of severe malnutrition. The TSF beneficiaries receive two monthly food supplements.

In this survey mothers/caretakers of children 6-35 months were asked if their child had participated in the most recent TSF screening and, as shown in Table 23, 52.3% in group 1, 34.9% in group 2 and 37% in group 3 of the children had participated in the recent screening. The reason for not participating in the recent screening was assessed among those who didn't participate in the recent screening (Figure 4). Three major reasons have emerged including mother didn't know the date/time of the screening, the program was not present in the Kebele and didn't know at all about the program.

During pregnancy, 26.6%, 14.1% and 15.8% of the mothers across the three groups, respectively, reported to have participated in the screening.

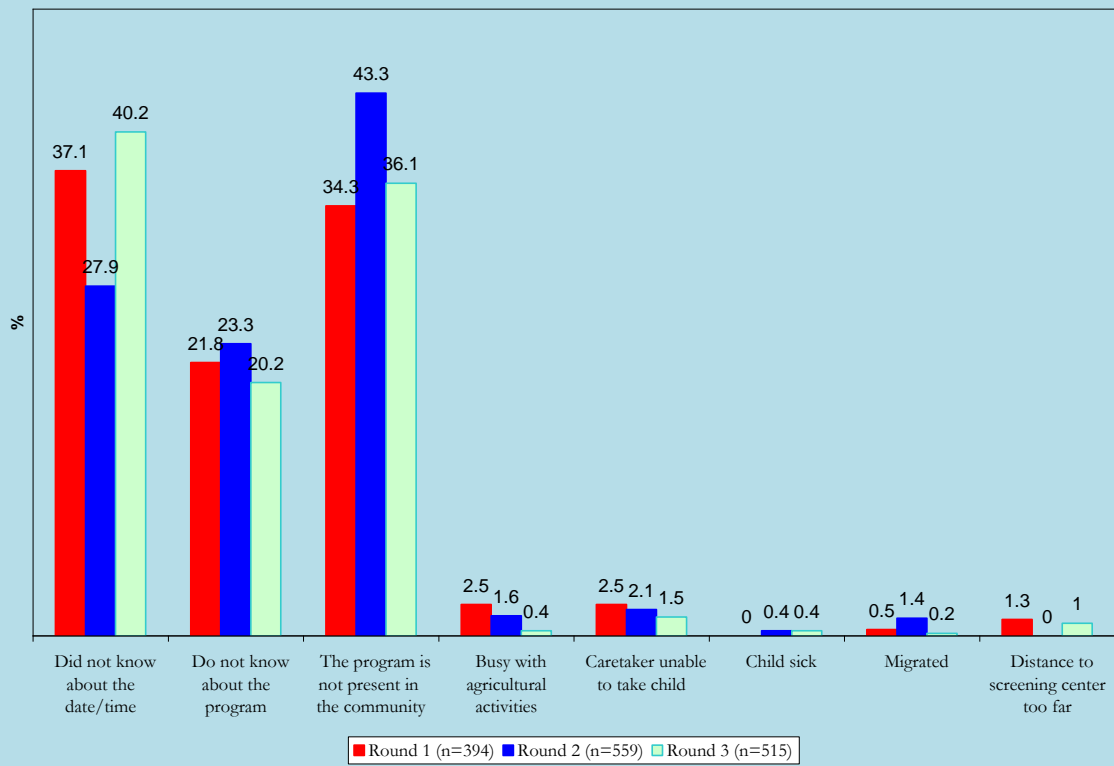
Possession of ration card by the children was assessed and that 15% in group 1, 9.3% in group 2, and 6.5% in group 3 areas reported to own a ration card. While most of the ration cards were seen by the data collectors, some were not seen.

Supplementary feeding was given to 17.1%, 15.3% and 14.1% of the children in group 1, 2 and 3 areas, respectively, following the most recent screening. It was also reported that some mothers were given supplementary feeding at different time from pregnancy to the time when the child was under 6 months and 6 months or older. As shown in Table 23, 13.2% of the mothers in group 1 area reported to have received supplementary feeding during pregnancy. This was reported lower at 4.9% and 5.3%, respectively, in group 2 and 3 areas. About 12%, 5.1% and 6.5% of the mothers, respectively, in group 1, 2 and 3 areas reported to have received supplementary feeding when their children were under 6 months. The corresponding percentages of mothers that received supplementary feeding when their children were 6 months or older was reported at 10.2%, 4.3% and 4.9%, respectively.

Table 23. Participation in targeted supplementary feeding among children age 6-35 months by intervention round CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1	Group 2	Group 3
Children age 6-35 months	N=826	N=857	N=811
% children participated in recent screening	52.3	34.9	37.0
Mother participate on screening during pregnancy (%)	26.6	14.1	15.8
Ration card ownership (age 6-35 months)	N=826	N=857	N=811
No ration card	84.0	89.4	90.3
Yes, card not seen	8.6	6.6	3.9
Yes, card seen	6.4	2.7	2.6
Missing	1.0	1.3	3.2
	N=826	N=857	N=811
% who received supplementary feeding after last screening	17.1	15.3	14.1
Frequency of supplementary feeding	N=87	N=60	N=56
Once	49.4	26.7	37.5
2 times	24.1	30.0	25.0
3 or more times	17.1	23.3	23.2
Missing	9.2	20.0	14.3
Children age 6-35 months	N=826	N=857	N=811
Mother received supplementary food during pregnancy	13.2	4.9	5.3
Mother received supplementary food during breastfeeding when child was less than 6 months	11.6	5.1	6.5
Mother received supplementary food when child was above 6 months	10.2	4.3	4.9

Figure 4. Reasons for not participating in the recent screening by intervention round, CBN evaluation survey, September 2011



11. NUTRITIONAL STATUS OF CHILDREN

The data on weight and height of children age 0-35 months were used to calculate three summary indices of nutritional status (according to WHO child growth standard), which affects susceptibility to disease and their chance of survival. These indices are height-for-age, weight-for-height, and weight-for-age. The three nutritional status indices are expressed in standard deviation (SD) unit (z-score) from the median for the international population. Children, who fall more than 2 standard deviations below the reference median are considered to be malnourished, while those who fall more than 3 standard deviations units below the reference median are considered to be severely malnourished.

Each of the indices provides somewhat different information about the nutritional status of children. The height-for-age index measures linear growth retardation among children. Children who are more than 2 SD below the median of the reference population in terms of height-for-age are considered short for their age or *stunted* (chronically malnourished). The weight-for-height index measures body mass in relation to body length. Children who are more than 2 SD below the median of the reference population in terms of their weight-for-height are considered to be thin or *wasted* (acutely malnourished). Weight-for-age is a composite measure which takes into account both chronic and acute under-nutrition. Children who are more than 2 SD below the reference median on this index are considered *underweight*.

11.1. Height-for-age

Table 24 presents results for height-for-age for children age 0-35 months. Data show children in the three groups are suffering from a high level of chronic malnutrition (stunting) at 37.5% in group 1, 36.4% in group 2 and 36.3% in group 3. The proportion of children who were severely stunted ($SD < -3$) was also found high at 16.1%, 15.8% and 15.8%, respectively. Of note, there was no significant statistical difference in the level of stunting across the three groups. A linear increase in stunting can be noted by age the lowest being in the age group 0-5 months while the highest among children 24-35 months. This pattern holds across the three groups.

11.2. Weight-for-Height

The proportion of children wasted was markedly high, especially in group 1 and 3 areas while it was relatively lower in the group 2. In group 1 area, 15.1% of the children were wasted ($< -2SD$); this was 10.6% and 13.6%, respectively, in group 2 and 3 areas. Severely wasted children comprised 4.6%, 2.5% and 4.6%, respectively, in group 1, 2 and 3 areas. The peak prevalence of wasting was noted among children age 6-11 months especially in group 1 and 3 areas (Table 25).

11.3. Weight-for-age

Nearly comparable proportion of the children across the three groups were underweight (26.6%-27%). Severely underweight children ($< -3SD$) comprised 9.3% of the children in group 1, 7.8% in group 2 and 10% in group 3. As noted in stunting, the rate of underweight

linearly increases with age, the lowest being among children age 0-11 months, the highest among children age 24-35 months (Table 26).

11.4. Mid upper arm circumference (MUAC)

MUAC has been endorsed by the World Health Organization (WHO) as a suitable tool to diagnose severe acute undernutrition and the most appropriate indicator for use in admission into emergency feeding programs. MUAC less than 11.0 cm indicates severe acute malnutrition (SAM). This is recommended as a criterion of admission to therapeutic feeding programs. MUAC is also used to detect moderately malnourished children and as a criterion of admission to supplementary feeding centre. MUAC of between 11-12 cm indicates moderate acute malnutrition (MAM). Such children should be immediately referred for supplementation (Table 27).

This survey found 1.7% of the children age 6-35 months in group 1 area, 0.6% in group 2 and 1.6% in group 3 were suffering from severe acute malnutrition (MUAC<11cm). Moderate acute malnutrition rates appeared comparable across the three groups ranging between 5.8%-6.1%. Across the three groups the highest rates of acute malnutrition was recorded among children age 6-11 months while the lowest among older children age 24-35 months.

Table 24. Distribution of children 0-35 months according to height-for-age by intervention group, CBN evaluation survey, September 2011

	HEIGHT-FOR-AGE								
	Group 1			Group 2			Group 3		
	% below -2 SD	% below - 3SD	N	% below -2 SD	% below - 3SD	N	% below -2 SD	% below - 3SD	N
Children 0-35 months	37.5	16.1	1002	36.4	15.8	1019	36.3	15.8	980
Age of child									
0-5 months	11.1	2.6	189	11.6	3.5	172	13.0	3.2	185
6-11 months	27.9	9.5	190	24.7	6.2	178	28.0	11.0	182
12-23 months	43.0	18.2	330	42.9	17.9	363	39.6	19.2	323
24-35 months	54.6	26.6	293	49.3	25.8	306	52.8	23.1	290

Table 25. Distribution of children 0-35 months according to weight-for-height by intervention group, CBN evaluation survey, September 2011

	WEIGHT-FOR-HEIGHT								
	Group 1			Group 2			Group 3		
	% below -2 SD	% below - 3SD	N	% below -2 SD	% below - 3SD	N	% below -2 SD	% below - 3SD	N
Children 0-35 months	15.1	4.6	1009	10.6	2.5	1011	13.6	4.6	986
Age of child									
0-5 months	14.2	3.7	190	8.9	3.0	169	15.0	8.3	193
6-11 months	19.1	7.2	194	12.1	2.3	174	18.2	5.7	176
12-23 months	16.0	4.2	331	12.7	3.0	362	12.0	4.0	325
24-35 months	11.9	3.7	294	8.2	1.6	306	11.6	2.0	292

Table 26. Distribution of children 0-35 months according to weight-for-age by intervention group, CBN evaluation survey, September 2011

	WEIGHT-FOR-AGE								
	Group 1			Group 2			Group 3		
	% below -2 SD	% below - 3SD	N	% below -2 SD	% below - 3SD	N	% below -2 SD	% below - 3SD	N
Children 0-35 months	27	9.3	1000	26.6	7.8	1016	26.9	10.0	973
Age of child									
0-5 months	9.0	2.7	188	12.2	5.2	172	11.5	5.5	182
6-11 months	29.5	6.8	190	23.6	5.1	178	28.5	9.5	179
12-23 months	28.9	9.7	329	29.6	9.7	361	27.9	9.3	322
24-35 months	34.8	14.7	293	32.8	8.5	305	34.5	13.8	290

Table 27. Distribution of children 6-35 months according to MUAC by intervention group, CBN evaluation survey, September 2011

	MUAC								
	Group 1			Group 2			Group 3		
	<11 cm	11-12 cm	N	<11 cm	11-12 cm	N	<11 cm	11-12 cm	N
Children 0-35 months	1.7	6.0	822	0.6	6.1	855	1.6	5.8	807
Age of child									
6-11 months	4.7	10.9	192	1.1	8.4	178	3.9	11.0	181
12-23 months	1.2	5.7	333	0.5	7.9	335	1.5	4.8	330
24-35 months	0.3	3.0	297	0.3	2.6	302	0.3	3.7	296

12. SALT IODIZATION

The survey tested salt in each of the sampled households for iodine. In over 97.5% of the households in the three groups salt was tested. Findings show, the vast majority of the households (73%) in group 1 area did not have iodated salt, while this was relatively lower at 69.1% in group 3 and the lowest at 64.3% in group 2 (Table 28). Iodated (weak color) was found in 17.1%, 23%, and 20% of the households in group 1, 2 and 3 areas, respectively. Few households had strong colored iodated salt at 7.5%, 8.9% and 6.9%, respectively.

Table 28. Salt iodization status by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1 N=975	Group 2 n=976	Group 3 N=975
Non iodated (No color change), 0 PPM	73.0	64.3	69.1
Iodated (weak color), 1-15 PPM	17.1	23.0	20.3
Iodated (Strong color), 16-30 PPM	7.5	8.9	6.9
Difficult to judge	0.1	1.2	1.5
Salt was not available	1.5	1.0	1.2
Not tested	0.7	1.5	0.9

13. CBN PROGRAM COVERAGE AND IMPLEMENTATION

We collected information from the HEWs in the Kebeles/EAs sampled for this survey concerning a number of issues relevant to the CBN program implementation at the Kebele/EA level using a structured questionnaire. The areas of focus mainly revolve around CBN and related trainings given to the HEWs and vCHWs, whether CBN and all related activities have started in the Kebele, and community participation in committees, and community conversation, among others.

13.1. Training on CBN and related issues

As shown in Table 29, HEWs in group 1 and 2 areas were reported to have received training in a number of issues including on CBN (94.8% and 98.3%), essential nutrition action (50% and 38.3%), extended outreach service (69% and 70%), therapeutic feeding (62.1% and 60%), and safety net (31% and 13%). Of note, though in a much lower coverage, such trainings were also reported to have been given to the HEWs in non-CBN areas (group 3). For instance in 42% of the 59 group 3 Kebeles (i.e. in 25 of 59 Kebeles) HEWs claimed that they were trained on CBN.

In over three-quarter of the Kebeles of group 1 and 2 areas, two of the HEWs were reported to be trained on CBN while in less than a fifth only one HEW. There were few Kebeles (5.2% in group 1 and 1.7% in group 2) where the HEWs allegedly reported that they did not receive any training on CBN.

On average about two years (23.4 months) has elapsed since the HEWs in group 1 areas received the first training on CBN. This was reported at an average close to 16 months in group 2 areas. Refresher training was reported to be given to the HEWs in over three-quarter of the Kebeles of group 1 (77.6%) and 2 areas (78.3%).

In over 98% of the group 1 Kebeles and 93.2% of the group 2 the vCHWs were reported to be given training on CBN. As the number of vCHWs varies across Kebele, the number trained on CBN may also vary accordingly. An average of 24 vCHWs were reported to have received training on CBN in group 1 area; this was almost same at 23 in group 2.

Table 29. Distribution of Kebeles/EAs according to the training provided to HEWs and vCHWs on CBN and related issues by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Group 1 ^a N=58	Group 2 ^b N=60	Group 3 ^c N=59
HEWs trained on the following			
Community Based Nutrition (CBN)	94.8	98.3	42.4
Essential Nutrition Action (ENA)	50.0	38.3	33.9
Extended Outreach Service (EOS)	69.0	70.0	40.7
Therapeutic Feeding (TF)	62.1	60.0	30.5
Safety Net (SN)	31.0	13.3	15.3
Number of HEWs trained on CBN	N=58	N=60	N=59
0	5.2	1.7	57.6
1	19.0	15.0	13.6
2	75.8	83.3	28.8
	N=56	N=59	N=27
No. of moths since the initial CBN training (mean & 95% CI)	23.4 (20.0-26.8)	15.8(13.9-17.7)	10.3 (6.4-14.2)
	N=58	N=60	N=59
HEWs received refresher training on CBN	77.6	78.3	17
	N=58	N=60	N=59
Number of vCHWs trained on CBN			
None	1.7	6.8	59.3
<10	1.7	10.2	22
10-19	29.3	25.4	2.4
20-29	44.8	28.8	6.8
30 or more	22.4	28.8	8.5
Mean (95% CI)	24 (21-27)	23 (19-26)	7 (3-11)

HEWs were not interviewed in ^a2 (group 1), ^b1 (group 2) and ^c2 (group 3) Kebeles due to their long absence from duty during the data collection period despite repeated attempts by the data collection teams

13.2. CBN and related activities

In over 98% of the Kebeles in group 1 and 2 areas CBN activities were reported to be started (Table 30). While about 30% of the group 3 Kebeles reported that they had already started CBN activities. Initially when this survey was designed it was anticipated that CBN activities had not started in group 3 Woredas and this survey was intended to provide baseline data for the entire group 3 areas. It may well be that this assumption may not hold in about 30% of the Kebeles, which reported that CBN activities have already started in these Kebeles. It however deserves further investigation, as this may be subjected to information bias from the side of the HEWs.

In most Kebeles where CBN activities have initiated, both EOS/TSF activities were reported to present - 72.4% in group 1 area and 67.8% in group 2. Safety net program was

present in about 7% and 5.1% of the group 1 and 2 areas, respectively. About a fifth of the Kebeles in group 1 and 2 areas have to date implemented only EOS related activities without any TSF (Table 30).

Growth monitoring program reported to present in the vast majority of the Kebeles in group 1 and 2 (94.8% and 91.7%, respectively) and in 87.9% of group 3 Kebeles.

13.3. Kebele-level program monitoring and information board

Keeping of records of program monitoring data/information for key CBN related activities was also assessed at the Kebele level. Monitoring systems such as village register, use of community GMP data, community pregnancy weight gain register and community information board were reported to be implemented in most of the sampled Kebeles in group 1 and 2 areas (Table 30). Over three-quarter of the Kebeles in group 1 (77.6%) and 2 (76.7%) areas reported to have village register in the Kebele. Between 78.3% and 81% of the Kebeles in group 1 and 2 areas reported to use community GMP data. Community pregnancy weight gain register was present in 63.8% and 58.3%, respectively, of the Kebeles in group 1 and 2 areas. Though lower than group 1 and 2 areas, these data monitoring systems were also reported to present in group 3 areas. A little bit over a third of the Kebeles in group 1 area (35.1%) and 21.7% in group 2 area said to have community information board.

Table 30. Distribution of Kebeles/EAs according to the presence of CBN related activities by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Round 1 ^a	Round 2 ^b	Round 3 ^c
	N=58	N=60	N=59
CBN activities started in the Kebele/EA	98.3	98.3	29.8
Types of CBN activities in the Kebele/EA	N=57	N=59	N=17
EOS/TSF	72.4	67.8	50.9
EOS only	19	20.3	29.1
Safety Net	6.9	5.1	12.7
Do not know	1.7	6.8	7.3
Growth monitoring (GM) in the Kebele/EA	N=58	N=60	N=59
	94.8	91.7	87.9
How long ago since GM started in the Kebele/EA (Mean & 95% CI)	N=55	N=55	N=51
	24.0(19.4-28.6)	14.4(11.2-17.7)	22.6(18.4-26.9)
Village register in the Kebele/EA	N=58	N=60	N=59
	77.6	76.7	47.5
Kebele use community GMP data	81.0	78.3	54.2
Community pregnancy weight gain register	63.8	58.3	52.6
Community information board	35.1	21.7	23.7

HEW's were not interviewed in ^a2 (group 1), ^b1 (group 2) and ^c2 (group 3) Kebeles due to their long absence from duty during the data collection period despite repeated attempts by the data collection teams

13.4. Review meetings and community conversation:

The average number of review meetings conducted in the Kebeles ever since GM started was 10 and about 8 in group 1 and 2 areas, respectively (Table 31). This was averaged at 9 in group 3. It was also reported that various community members have attended the last review meetings in the Kebeles. These include Kebele leaders (58.6% in group 1 and 53.3% in group 2), women's affairs representatives (58.6% in group 1 and 41.7% in group 2), development agents (36.2% in group 1 and 38.3% in group 2), about a fifth in the two groups comprises members of food security task force and youth affairs. Participation of religious leaders in the review meetings was reported low. Of note, in about 7% of group 1 Kebeles and 13.3% of group 2 it was reported that Kebeles haven't conducted any review meeting hitherto.

Most Kebeles, 86.2% in group 1 and 83.3% in group 2 areas, reported to have ever had community conversation meetings; and in the last month alone these Kebeles have conducted, on average, 4 and 2.7 meetings, respectively. The corresponding average number of conversation meeting (last month) in group 3 area was 2.5 (Table 31).

Table 31. Distribution of Kebeles/EAs according to the presence of CBN related review meetings and community conversations by intervention group, CBN evaluation survey, September 2011

	CBN intervention area		
	Round 1 ^a	Round 2 ^b	Round 3 ^c
	N=55	N=55	N=51
No. of review meetings since GM started (mean & 95% CI)	10.4 (7.9-12.7)	7.7(5.1-10.4)	9.1(4.5-13.6)
Community members who attended the last review meeting	N=58	N=60	N=59
Kebele Leader	58.6	53.3	50.8
Women's Affairs	58.6	41.7	35.6
Members Of Food Security Task Force	22.4	21.7	20.3
Development Agents	36.2	38.3	44.1
Youth Affairs	32.7	26.7	28.8
Religious Leaders	19	25	30.5
No review meeting conducted	6.9	13.3	23.7
	N=58	N=60	N=59
Community conversation meeting in the Kebele/EA	86.2	83.3	67.8
	N=50	N=50	N=40
Number of community conversation in the Kebele, last month (mean & 95% CI)	4.0(1.7-5.8)	2.7(1.8-3.6)	2.5(1.0-4.1)

HEWs were not interviewed in ^a2 (group 1), ^b1 (group 2) and ^c2 (group 3) Kebeles due to their long absence from duty during the data collection period despite repeated attempts by the data collection teams

14. TREND DATA ON SELECTED INDICATORS

14.1. Trend in prevalence of Stunting:

Baseline (2009) vs. end-line (2011) comparison of stunting in group 1 area is shown in Figure 5A. There was a statistical significant declining trend in the level of stunting during the period from 44.5% to 37.5% ($z=-3.28$, $p=0.001$). During the 2 years period there was a 7% absolute decline in group 1 area, which can be translated to an annual average decline of 3.5%. Likewise, similar declining trend in stunting can be noted in group 2 area between the baseline (2010) and mid-line (2011), as shown in Figure 5A. Data show the prevalence of stunting in group 2 area declined from 41% to 36.4% in one year (4.6 % decline per annum) and this decline was statistically significant ($z=-2.19$, $p=0.028$).

14.2. Trend in prevalence of Wasting:

The prevalence of wasting has shown a significant reversal trend in group 1 area - from 10% to 15.1% ($z=3.55$, $p=0.000$) (Figure 5B). While there was no significant difference between baseline and mid-line wasting prevalence in group 2 area (11.4% and 10.6%). It should be emphasized that wasting is a less stable indicator to track trend over time as it can be influenced by current situation such as disease outbreaks and food shortage.

14.3. Trend in prevalence of Underweight

This summary indicators appears stable over the past few years both in group 1 and 2 areas (Figure 5C). In group 1 area it was estimated at 28.4% and 27% during the baseline and end-line, respectively. The corresponding percentages in group 2 were 26.2% and 26.6%, respectively.

14.4. Trend in other indicators:

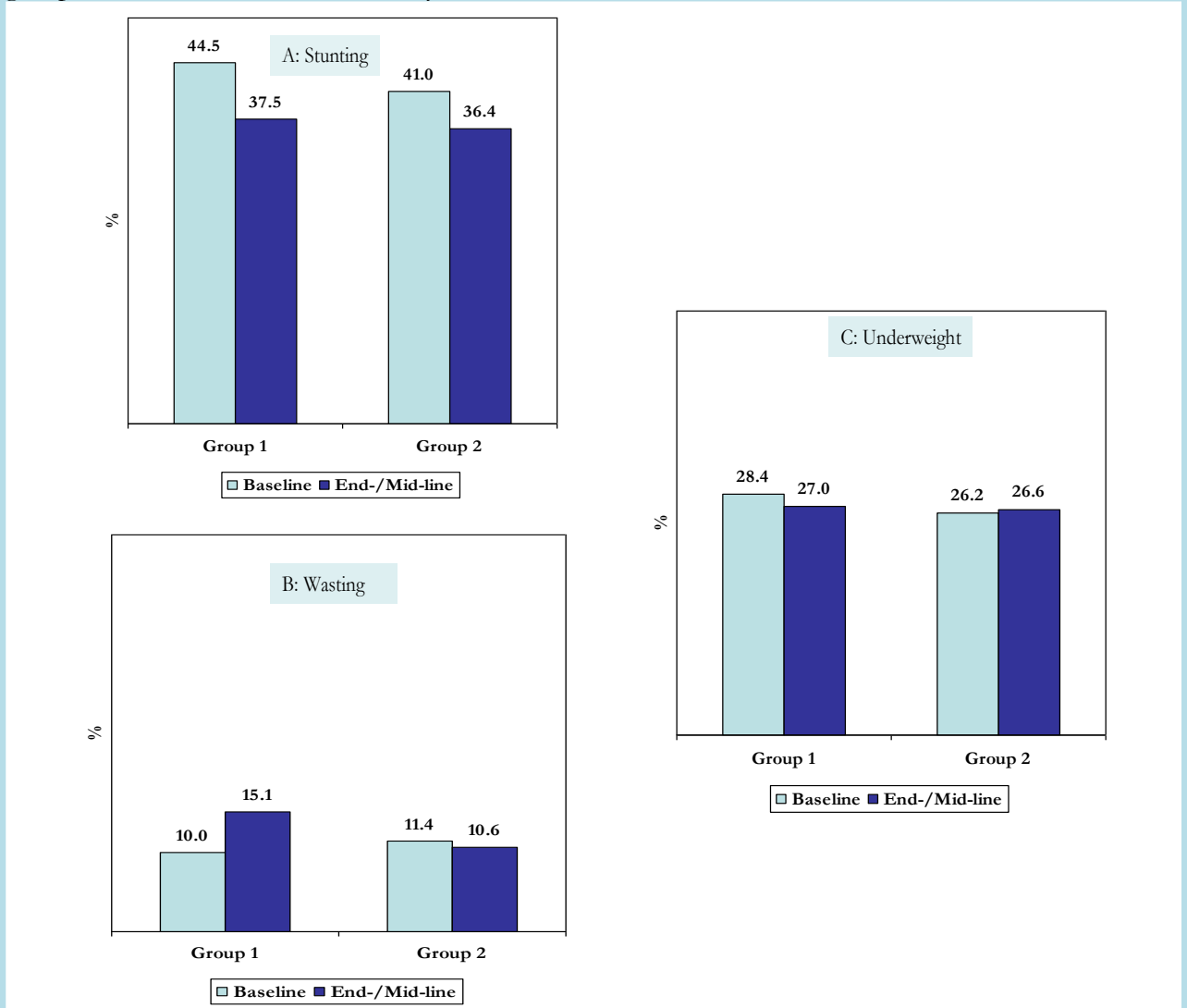
In Annex 1 we present trend data for several selected key indicators including VA supplementation, deworming, growth monitoring, breastfeeding practices, IYCF indicators, childhood illness and TSF related indicators. Whereas some of these indicators have shown notable improvement in both group 1 and 2 areas since the baseline, others remained unchanged.

In summary, significant improvement/positive trends was documented in the following indicators:

- VA supplementation
- Possession of FHC
- Child weighted (last 3 months and last 1 month)
- Colostrums feeding
- Prelactal feeding
- Iodated (weak color) salt
- Stunting prevalence

Interpretation of these interesting positive trends can be challenging due to methodological concerns. The lack of control group prevents us from making firm conclusion based on these observations. Further investigation warrants to clarify these interesting findings.

Figure 5. Trend in nutritional status of children age 0-35 months between baseline (2009) and end-line (2011) for group 1 areas and between baseline (2010) and mid-line (2011) for group 2 areas, CBN evaluation survey.



15. CONCLUSION

This survey was set out to evaluate the CBN program in group 1 and 2 areas while to provide benchmarks for group 3 areas. The survey findings taken together suggest that children across the three groups are characterized by high level of malnutrition and high incidence of morbidity, which in turn are important determinants of child mortality.

Findings provide some evidence of reduction in the prevalence of stunting both in group 1 and 2 areas since the baselines. In group 1 area stunting significantly declined from 44.5% to 37.5% between 2009 and 2011; in group 2 from 41% to 36.4%. Other indicators that have shown notable improvements during the period include VA supplementation for children, possession of FHC, the proportion of children weighted (last 3 months and last 1 month), colostrums feeding, prelactal feeding and the presence of Iodated (weak color) salt. These findings are encouraging but should be interpreted with caution, as these cannot be conclusive in the absence of a good control group. Further analysis of the baseline and end-/mid-line data using advanced Statistical procedures may improve our understanding of the observed trend and also help to unravel the net effect of the CBN program intervention.

This study confirmed that CBN program interventions activities, especially critical program inputs such as training to HEWs and vCHWs, review meetings, Kebele-level data capturing and program monitoring systems, among others have been in place in almost all the Kebeles/EAs sampled for this survey in group 1 and 2 areas. Nevertheless, we cannot ascertain the breadth and depth of implementation of program activities in these Kebeles. There is also some indication from the household data that the actual program implementation may not be as intensive and variation is also apparent across Kebeles. This supposition emerges from the documented low coverage of some of the key program output indicators by this survey, including growth monitoring, family participation in growth monitoring activities, TSF screening, among others. For instance, only 32.2% and 30.7% of the children in group 1 and 2 areas, respectively, had their weight measured in the previous 3 months. Likewise, less than 20% of the families participated during weighting of children in the previous 3 months. A little bit over half of the children (52.3%) in group 1 area and 35% in group 2 had participated in the recent TSF screening. These findings signal the limited coverage of the program intervention activities and may warrant a process evaluation of the CBN program target Woredas.

Annex 1. Trend Analysis For Selected Indicators

Trend data - Baseline vs. end-line (Group 1) & baseline vs. mid-line (Group 2) for selected indicators

	Group 1			Group 2		
	Baseline	End-line	Absolute Difference	Baseline	Mid-line	Absolute Difference
Food security level						
Food secure	14.2	15.1	+0.9	25.1	16.9	-8.2
Mildly food insecure	3.6	4.9	+1.3	6.4	4.8	-1.6
Moderately food insecure	34.4	45.0	+10.6	34.8	37.8	+3.0
Severely food insecure	47.8	35.0	-12.8	33.7	40.4	+6.7
VA and de-worming						
Child received VA (last 12 months)	52.5	64.9	+12.4	52.5	65.1	+12.6
De-worming tablet (last 6 months)	21.1	17.6	-3.5	21.1	15.9	-5.2
Growth monitoring						
FHC only	10.2	23.7	+13.5	13.0	22.6	+9.6
Other growth card	32.1	20.5	-11.6	23.2	21.5	-1.7
Both	5.7	18.7	+13.0	8.0	15.7	+7.7
Child weighted (last 3 months)	13.8	32.2	+18.4	7.6	30.7	+23.1
Child weighted (last 1 month)	8.2	16.0	+7.8	1.6	16.9	+15.3
Family participated during weighting (last 3 months)	Not calculated	18.6		Not calculated	19.2	
Breastfeeding practice						
Initiated BF within 1 hr	50.4	55.2	+4.8	56.7	61.4	+4.7
Prelactal feeding (within 3 days of birth)	26.0	16.9	-9.1	22.7	16.2	-6.5
Colostrums feeding	58.6	66.2	+7.6	55.2	67.0	+11.8
Exclusive BF	Not calculated	83.8		Not calculated	80.3	
Continued BF at 1 year	Not calculated	88.3		Not calculated	83.3	

Table 33 (cont.)

	Group 1			Group 2		
	Baseline	End-line	Absolute Difference	Baseline	Mid-line	Absolute Difference
Food diversity (last 24 hrs)						
Grain	42.0	82.9	+40.9	73.1	80.8	+7.7
Legumes	20.0	38.1	+18.1	24.7	28.0	+3.3
Dairy	24.0	46.0	+22.0	46.7	55.3	+8.6
Flesh	1.0	4.7	+3.7	3.4	7.0	+3.6
Eggs	3.0	11.2	+8.2	7.2	12.1	+4.9
VA rich foods	2.0	15.7	+13.7	6.1	15.9	+9.8
Others fruits & vegetables	8.0	7.2	-0.8	11.6	7.0	-4.6
Infant and Young child feeding (IYCF) (age 6-23 months)						
Minimum Meal Frequency	Not calculated	63.1		60.6	63.7	+3.1
Minimum Dietary Diversity		14.8		9.1	12.3	+3.2
Minimum Acceptable Diet		12.1		7.9	10.8	+2.9
Childhood illness and treatment						
Fever (previous 2 weeks)	40.7	21.9	-18.8	36.3	20.7	-15.6
Diarrhea (previous 2 weeks)	30.8	20.6	-10.2	26.6	21.2	-5.4
ORS (for children with diarrhea)	17.2	35.1	+17.9	26.3	31.0	+4.7
RHF (for children with diarrhea)	18	26.1	+8.1	23.7	29.2	+5.5
Increased fluid (for children with diarrhea)	24.9	19.1	-5.8	19.1	19.8	+0.7
Targeted Supplementary Feeding (TSF)						
% children (age 6-35 months) participated in recent screening	53.3	52.3	-1.0	31.9	34.9	+3.0
Ration card - Yes, card not seen	9.2	8.6	-0.6	14.8	6.6	-8.2
Ration card- Yes, card seen	16.3	6.4	-9.9	6.8	2.7	-4.1
Supplementary feeding after last screening (among screened)	16.1	17.1	+1.0	21.2	15.3	-5.9
Mother participate on screening during pregnancy	Not calc.	26.6		Not cal.	14.1	
Mother received supplementary food during pregnancy		13.2			4.9	
Mother received supplementary food during breastfeeding when child was less than 6 months	14.9	11.6	-3.3	18.4	5.1	-13.3
Mother received supplementary food when child was above 6 months	14.8	10.2	-4.6	15	4.3	-10.7

Annex 1 (cont.)

	Group 1			Group 2		
	Baseline	End-line	Absolute Difference	Baseline	Mid-line	Absolute Difference
Children Nutritional Status						
Stunting (Z<-2 SD)	44.5	37.5	-7.0	41.0	36.4	-4.6
Wasting (Z<-2 SD)	10.0	15.1	+5.1	11.4	10.6	-0.8
Underweight (Z<-2 SD)	28.4	27.0	-1.4	26.2	26.6	+0.4
MUAC (<11 CM)	1.8	1.7	+0.1	0.5	0.6	-0.1
Salt iodization testing						
Non iodated (No color change), 0 PPM	90.2	73.0	-17.2	90.2	64.3	-25.9
Iodated (weak color), 1-15 PPM	3.9	17.1	+13.2	3.9	23.0	+19.1
Iodated (Strong color), 16-30 PPM	3.5	7.5	+4.0	3.5	8.9	+5.4

Annex 2. Survey areas by round

Round 1 - Survey areas

Region	Zone	Woreda	Kebele
Amhara	East Gojam	Enbse	Mekane genet
Amhara	East Gojam	Gero Getu	Adis Alem
Amhara	East Gojam	Gonchi siso ense	Gonideweyin baza
Amhara	East Gojam	Machekel	Minichina yekesit
Amhara	North Gonder	Adiarkaye	Ziwa
Amhara	North Gonder	Dabat	Dafeya
Amhara	North Gonder	Dabat	Sebentara
Amhara	North Gonder	Debark	Kirar zibizab
Amhara	North Gonder	East belessa	Akite iyesus
Amhara	North Gonder	Tach gaint	Kebele 16
Amhara	North Gonder	W/belessa	Menti
Amhara	North Wollo	Debresina	Holagosh
Amhara	North Wollo	Gubalafto	Lasite gerado
Amhara	South Gondar	Lay gaint	Akabit
Amhara	South Gondar	Lay gaint	Barozibana titaro
Amhara	South Wollo	Ambasel	Hamusit
Amhara	South Wollo	Ambasel	Milewa
Amhara	South Wollo	Desie zuria	Tid Gebeya
Amhara	South Wollo	Desie zuria	Abaso kotu
Amhara	South Wollo	Desie zuria	Dajole
Amhara	South Wollo	Jamma	Faji
Amhara	South Wollo	Jamma	Yedo
Amhara	South Wollo	Wereleilu	Kuyu
Amhara	South Wollo	Worebabu	Gedero
Amhara	Waghemra	Sekota	Tsata
Amhara	Waghemra	Sekota	Wal
Oromia	Addis Ababa Zuria Liyu Zone	Sebeta	Roge atebela
Oromia	Chiro	Habru/Bona	Weroni guda
Oromia	East Hararghe	Gero Getu	Biftu diremu
Oromia	East Hararghe	Melkabal	Burka Negeya
Oromia	East Hararghe	Melkabal	Tokuman kane
Oromia	South Shewa	Goro	Chanicho Soyema
Oromia	West Hararghe	Gemechis	Homecho sogido
Oromia	West Hararghe	Gemechis	Rukele agemti
Oromia	West Hararghe	Habru	Gerbi teka
Oromia	West Hararghe	Kuni	Adamuda
Oromia	West Hararghe	Mieso	Welitane
Oromia	West Hararghe	Tulo	Gara kufa
SNNP	Dawro	Maraka	Chilish

SNNP	Gamo gofa	Kucha	Kasike zulo
SNNP	Gamo gofa	Kucha	Koy lade
SNNP	Gamo gofa	Zala Uba Male	Deboch Bena
SNNP	Hadiya	Soro	Ile
SNNP	Hadiya	Soro	Sunidusa
SNNP	Sidama	Bona	Wetiko wedimo
SNNP	Sidama	Loka Abaya	Sodosemita
SNNP	Wolayita	Boloso Sore	Dache Gofera
SNNP	Wolayita	Boloso Sore	Dubo
SNNP	Wolayita	Offa	Weshe Alidado
Tigray	Central	Ahfom	Tahitay Deiriha
Tigray	Central	Ahfom	Zibenigus
Tigray	Central	Enderata	Shibita
Tigray	Central	Mereb leki	Asayime
Tigray	Central	Tanqua abergele	Simiret
Tigray	Central	Were lakhe	Mayikuhili
Tigray	East Tigray	Atsbi Wenberta	Barika adi sibiha
Tigray	East Tigray	Erob	Enidemosa
Tigray	East Tigray	Ganta Afeshum	Bahira seheta
Tigray	East Tigray	Hawzen	Digum
Tigray	East Tigray	Saesi Tsaedaemba	Senikata
Tigray	Southern Tigray	Alagie	Sesat
Tigray	Southern Tigray	Alamata	Merewa
Tigray	Southern Tigray	Ofa	Rada bekedda
Tigray	Southern Tigray	Raya Azobo	Bale ulaga
Tigray	Southern Tigray	Raya Azobo	Mechare

Round 2- survey areas

Region	Zone	Woreda	Kebele
Amhara	East Gojam	Shebel Berenta	Lidena akababiw
Amhara	East Gojam	Sinan	Debirezeyit
Amhara	North Gonder	Beyeda	Adi Lemilem
Amhara	North Gonder	Chiliga	Mirit Amiba
Amhara	North Gonder	Gondor Zuria	Abunesemirana mariam wiha
Amhara	North Gonder	Gondor Zuria	Sohor sarwiha
Amhara	North Gonder	Lay Armacho	Abegina Muna
Amhara	North Gonder	Tach Armacho	Jiniger
Amhara	North Shewa	Menz Gera Midir	Talit
Amhara	North Shewa	Menz Keya Gebreal	Nidi
Amhara	North Wollo	Gidan	Gesita
Amhara	North Wollo	Lasta	Degosech
Amhara	North Wollo	Wadla	Beteyohannis
Amhara	Oromia	Artuma Fursi	Chereti Debiso

Amhara	South Gonder	Dera	Belabo Tejmerer
Amhara	South Gonder	Dera	Huletu Wegedeme
Amhara	South Gonder	Farta	Limado debiresina
Amhara	South Gonder	Farta	Mesikel Tsion
Amhara	South Gonder	Mirab Esite	Genete mariam
Amhara	South Wollo	Legahida	Biribirite
Oromia	Arsi	Merti	Ashi Egersa
Oromia	Bale	Ginir	Aridatere
Oromia	Bale	Goro	Glincho
Oromia	Bale	Seweyna	Chopi
Oromia	Borena	Bule Hora	Kilinso mokonisa
Oromia	East Hararghe	Fedis	Dinhaka
Oromia	East Shewa	Adami tulu Jido kombolcha	Hurufa lole
Oromia	Guji	Odo Shakiso	Koricha dalecha
Oromia	Guji	Odo Shakiso (Seba boro)	Buri ejerisa
Oromia	North Shewa	Alelitu	Koke neseber
Oromia	North Shewa	Degem	Lelesa Aledoro
Oromia	North Shewa	Kuyu	Doro birbirsu
Oromia	North Shewa	Were Jarso	Werimi goba
Oromia	North Shewa	Wuchale	Adere goridema
Oromia	S/West Shewa	Ameya	Bero salen
Oromia	S/West Shewa	Wonchi	Dulelo Bilecha
Oromia	West Arsi	Arsi Negele	Godeduro
Oromia	West Arsi	Shala	Ropi
Oromia	West Arsi	Shashemene Zuria	Bute fulicha
Oromia	West Arsi	Shashemene Zuria	Hurisa sinbo
Oromia	West Hararghe	Chiro Zuria	Wachu limay
Oromia	West Shewa	Ada'a Berga	Horoboro
Oromia	West Shewa	Bako Tibe	Tulusenigota
Oromia	West Shewa	Chelia	Alewereilu
Oromia	West Shewa	Meta Robi	Menide Ela
SNNP	Guragie	Meskan	Mirab mesikan
SNNP	Hadiya	Mirab Badawocho	Tikot
SNNP	K. Tembaro	Hadaro Tunito	Mugunja
SNNP	K. Tembaro	Kacha Bira	Hobichka
SNNP	Silte	Lanifaro	Girinizila gogalo
SNNP	Silte	Silite	Anishebeso
SNNP	Special Woreda	Koniso Special	Arifayide
SNNP	Special Woreda	Koniso Special	Kaleshe
SNNP	Wolayita	Bolossa Bonibe	Mole menias
SNNP	Wolayita	Damot Gale	Bela koyisha
SNNP	Wolayita	Damot Pulasa	Lera
SNNP	Wolayita	Sodo Zuria	Tome gerera

Tigray	Central	Degua Temben	Debre Nazareth
Tigray	Central	Lailay Adiabo	Adi Abagi
Tigray	Central	Lailay Maichew	Hatsebo
Tigray	Central	Medebay Zana	Tikule
Tigray	Central	Nader Adet	Adikebakili
Tigray	Western Tigray	Tahitay Adiyabo	Lemlem
Tigray	Western Tigray	Tsegede	Shahigine
Tigray	Western Tigray	Welikayit	Wef Arigif

Round 3- Survey areas

Region	Zone	Woreda	Kebele
Amhara	North Gondar	Gondar Zuriya Woreda	Chihiramanterno
Amhara	North Gondar	Gondar Zuriya Woreda	Gebriel
Amhara	North Gondar	Gondar Zuriya Woreda	Hamsafej wana
Amhara	North Shewa	Antsokiyana Genza Woreda	Geshoge
Amhara	North Shewa	Menz Lalo Midir Woreda	Genbot Haya
Amhara	North Wollo	Meket Woreda	Berekeze
Amhara	North Wollo	Meket Woreda	Dbko
Amhara	North Wollo	Meket Woreda	Kila
Amhara	North Wollo	Meket Woreda	Weketa
Amhara	Oromia	Bati Woreda	Bira
Amhara	South Gondar	Simada Woreda	Kebele 02
Amhara	South Gondar	Simada Woreda	Kebele 23
Amhara	South Gondar	Simada Woreda	Kebele 33
Amhara	South Gondar	Simada Woreda	Kinde Meda
Amhara	South Wollo	Mekdela Woreda	DEDERE
Amhara	South Wollo	Mekdela Woreda	GOBADIN
Amhara	South Wollo	Mekdela Woreda	TEBI
Amhara	South Wollo	Tehuledere Woreda	Jari
Amhara	South Wollo	Tehuledere Woreda	Welide Lulu
Amhara	Waghemra	Dehena Woreda	KETEMA ZURIA
Amhara	Waghemra	Dehena Woreda	SERAMRE
Oromia	Arsi	Aseko Woreda	Ifetu Bulala
Oromia	Arsi	Aseko Woreda	Kara Dibu
Oromia	Arsi	Bele Gasgar Woreda	Jidego Barbar
Oromia	Arsi	Sire Woreda	Amolachancho
Oromia	Borena	Arero Woreda	Web
Oromia	Borena	Dire Woreda	Soda
Oromia	Borena	Meyo Woreda	Cheriliche
Oromia	East Hararghe	Gole Oda Woreda	Garakefa
Oromia	East Hararghe	Gole Oda Woreda	Telemimo
Oromia	East Hararghe	Gursum Woreda	Day Feres

Oromia	East Hararghe	Gursum Woreda	Gara Wadaja
Oromia	East Hararghe	Midega Tola Woreda	Liben
Oromia	North Shewa	Kimbibit Woreda	Dalota Qorke
Oromia	West Hararghe	Boke Woreda	Burka Oda
Oromia	West Hararghe	Guba Qoricha Woreda	Goro Meta
Oromia	West Hararghe	Guba Qoricha Woreda	Kurkura Eya
SNNP	Dawro	Gena Bosa Woreda	Alani Ayisha
SNNP	Gamo gofa	DENIBU GOFA Woreda	Ubabere
SNNP	Gamo gofa	DENIBU GOFA Woreda	Weyde Yalo Tsala
SNNP	Gedeo Zone	Wenago Woreda	Dodoro
SNNP	Gedeo Zone	Wenago Woreda	Wetiko
SNNP	Gurage	Gumer Woreda	Burdana Denber
SNNP	Hadiya	MISRAK BADAWOCHO Woreda	2nd CHEFAO
SNNP	Hadiya	MISRAK BADAWOCHO Woreda	WELIDEYA
SNNP	K. Tembaro	Doyo Gena Woreda	Murasa Weramo
SNNP	Sidama Zone	Chuko Woreda	Gure
SNNP	Sidama Zone	Chuko Woreda	Lelahoncho
SNNP	Sidama Zone	Chuko Woreda	Qorke
SNNP	Sidama Zone	Dara Woreda	Aleme koricha
SNNP	Sidama Zone	Dara Woreda	Haro Komolcha
SNNP	Sidama Zone	Dara Woreda	Shilcho
SNNP	Sidama Zone	Shebedino Woreda	Abela Lida
SNNP	Sidama Zone	Shebedino Woreda	Alawo Ano
SNNP	Sidama Zone	Shebedino Woreda	Morochi Shonidola
SNNP	Siliti Zone	Wilbareg Woreda	Angamo Yode
SNNP	Wolayita	Deguna Fanigo woreda	Dununa Weraza lasho
SNNP	Gedeo Zone	Wenago Woreda	Bele Bukisa
SNNP	Sidama Zone	Shebedino Woreda	Delelcha Teberka
SNNP	Sidama Zone	Shebedino Woreda	Abela Lida
Oromia	Arsi	Sire Woreda	Lodi Banben
Oromia	North Shewa	Kimbibit Woreda	Basona Serabi
Amhara	North Shewa	Antsokiyana Genza Woreda	Getem Gojo Weha
Amhara	Oromia	Bati Woreda	Kopafu
Amhara	South Wollo	Tehuledere Woreda	Muti Belig

Annex 3. Standardization of height/length measurement and MUAC

Below is the steps/activities we followed for the standardization exercise and assuring anthropometric data quality:

- One day classroom theoretical training with demonstration in the training venue was done. We brought a child with his mother for the class room training.
- One full day was dedicated to the field practice, demonstrations, hands-on practice and standardization.
- Adequate discussions and demonstrations by experts/coordinators on how to take weight, height and MAUC measurements using several children aged 0-35 months was done on the field, as part of the field practice.
- Sufficient time for hand-on practice, with close supervision of experts done in pairs (9 pairs alternating as measurer and assistance). About 150 children were brought from a rural village on the site (this is a CBN implementation rural Woreda near Addis Ababa, which is not selected for the actual survey). The measurers had ample opportunity to practice on as much children as they can.
- After the measurers had sufficient hands on practice on the filed, we resorted to the standardization exercise that was conducted right on an elementary school in the field. Ten children (*6 children 2-3 years old, 2 children under 2 years and 2 children 3-4 years old*) were placed in ten separate classrooms, along with height board and MUAC tape. The experts first measured the ten children followed by all 9 pairs of measurers. Once the first session was over and the records collected, the measurers took MUAC and height measurements on same ten children for the second time. Data was entered into SPSS on the site. Simple analysis was also done right on the site that look into intra-observer variation (precision) and inter-observer variation (reliability).
- Then the differences between the 10 pairs of measurements of each pair of measurers (intra-measurers variation) were examined for precision using a simple analysis. Precision for both MUAC and height was found to be quite satisfactory.
- The variation between the measurers and supervisor's measurements (inter-measurers variation) was examined for reliability/accuracy. There were two blunders (difference of 19mm and above) as a result of carelessness in recording/reading. The measurers who committed such big errors were advised to be vigilant and not to repeat such mistakes. In fact, that was used as a good example to strengthen the purpose of the standardization and for the measurers to become more vigilant on this despite their previous experiences.
- There were some mild/moderate differences that ranged between 6 mm-14.5mm. Observations by the experts during the standardization exercise revealed that assistants tend to forget holding the legs tightly in the right position. Examination

of the direction of the deviation (positive-negative deviations) indicated that most of the measurers were consistently measuring a little bit below experts' measurements (more positive variations) confirming the observation by the experts. Re-training through repeated demonstrations was done to rectify this problem, especially in few of the measurers who committed the errors.

- In our assessment, the measurers are well trained and grasped the techniques very well. In the whole, they also performed well in the standardization process except with some errors. Moreover, most trainers have Nursing and Public Health background with previous experience in similar surveys. Some of our interviewers/supervisors and also measurers worked in the CBN baseline survey.

Challenges with standardization:

- Since each child was measured 20 times that created discomfort and most kids kept on crying despite some candy/biscuit incentives. Mothers were also uncomfortable about this whole process. Despite this challenge we were able to achieve our goals concerning standardization.

Annex 4. List of survey teams

Lead consultants (Mela Research PLC):

Yared Mekonnen, MSc, PhD [Epidemiologist/Demographer]

Tsegaye Demissie, PhD [Nutritionist/Biologist]

Biruk Tensou, MSc [Demographer/Statistician]

Survey coordinators, supervisors and interviewers

No	Name	Task assigned
	Amhara	
	Daniel Hailemariam	Amhara - Regional survey coordinator
	Amhara Team 1	
1	Aynalem Netsere	Supervisor
2	Endeshaw Brhane	Interviewer
3	Muluken Teshome	Interviewer
4	Tariku Feyisa	Interviewer
5	Bereket Yohanse	Interviewer
	Amhara Team 2	
1	Alemayehu Abebe	Supervisor
2	Ermias Samuel	Interviewer
3	Awoke Hunegnaw	Interviewer
4	Solomon Hailaile	Interviewer
5	Yihene Mola	Interviewer
	Amhara Team 3	
1	Temesgen Darico	Supervisor
2	Leelena Alebachew	Interviewer
3	Leyualem Bekele	Interviewer
4	Habtamu Demelash	Interviewer
5	Melekam Berhanu	Interviewer
	Amhara Team 4	
1	Minal Getahun	Supervisor
2	Webeshet Alelachew	Interviewer
3	Fentabil Getnet	Interviewer
4	Getachew birru	Interviewer
5	Abu Zenebe	Interviewer

	Amhara Team 5	
1	Tefera Semachew	Supervisor
2	Amare Yazachew	Interviewer
3	Wondim Melkam	Interviewer
4	Mintaychu Hussien	Interviewer
5	Zewdnesh Zehara	Interviewer
	Amhara Team 6	
1	Mulate Tarekegn	Supervisor
2	Tsegaye Alem w/Senbet	Interviewer
3	Tsehaye Diriba	Interviewer
4	Yohanes Negatu	Interviewer
5	Tesefu Chane	Interviewer
	Tigray	
	Bizuayehu Desta	Tigray - regional survey coordinator
	Tigray Team 1	
1	Mekonnen Tadesse	Supervisor
2	Helen Abrham	Interviewer
3	Rodase Mered	Interviewer
4	Leul Kifle	Interviewer
5	Mulay Gush	Interviewer
	Tigray Team 2	
1	G/Medin G/Meskel	Supervisor
2	Brikte G/selassie	Interviewer
3	Tagose T/Mariam	Interviewer
4	Abreham Iyasu	Interviewer
5	Haftai G/Rufael	Interviewer
	Tigray Team 3	
1	Bahita Tadesa	Supervisor
2	Elsa Zewdu	Interviewer
3	Andom G/Selassie	Interviewer
4	Tesfamariyam TilahuN	Interviewer
5	Yosef W/mariam	Interviewer

	SNNP	
	Mulualem Tefera	SNNP - Regional survey coordinator
	SNNP Team 1	
1	Getahun Demssie,	Supervisor
2	Asefa Bekele	Interviewer
3	Fikre Demsseie	Interviewer
4	Demissie Engeno	Interviewer
5	Efrem Kassahun	Interviewer
	SNNP Team 2	
1	Bereket Yohanse	Supervisor
2	Terefe Gelibo	Interviewer
3	Abrushie Yohans	Interviewer
4	Hiywot Fana	Interviewer
5	Tefera Gebreyes	Interviewer
	SNNP Team 3	
1	Sinedu Matewos	Supervisor
2	Kelil Mohammed	Interviewer
3	Yemsrach Beyene	Interviewer
4	Rediet Fikadu	Interviewer
5	Tateke Webe	Interviewer