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IMPROVING NUTRITION IN ETHIOPIA – A MULTI-SECTORAL CHALLENGE

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July 2006

[1] Study conducted by Jesper Kuhl (consultant) under supervision of a World Bank team consisting of Luc Christiaensen (Senior Economist), Harold Alderman (Lead Human Development Economist), and Meera Shekar (Senior Nutrition Specialist) and Iqbal Kabir (UNICEF). The findings, interpretations, and conclusions expressed are entirely those of the author, and they do not necessarily represent the view of the World Bank or UNICEF, its Executive Directors, or the countries they represent.

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Abstract

Child malnutrition follows from a host of factors, including food insecurity, disease, limited maternal education and poor nutritional knowledge and practices. Using the baseline survey for the evaluation of the Child Growth Promotion Component (CGPC), this paper describes malnutrition outcomes, determinants of malnutrition at the individual, household and community level for 5700 children in southern Ethiopia, as well as program indicators for the CGPC.

Malnutrition rates are in general similar to findings from national surveys, and expected signs of causation are found with respect to gender and illnesses. The survey shows varying quality of the caregivers' knowledge and practices on child nutrition and health, and only 58% of the caregivers correctly assess their child's true nutritional status. The surveyed households have a low resource base, with a high prevalence of shocks. The communities have very low levels of basic health, transport and communication services, and child-related relief programs are only available for a minority of the households. Even though the health personnel of the CGPC shows better knowledge and practices on child malnutrition than the surveyed households in general, two-third of them think that their training for the program had not been sufficient for their job.

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Acronyms

BMI	-	Body-Mass Index
CGPC	-	Child Growth Promotion Component
DID-approach	-	difference-in-difference approach
EDHS 2005	-	Ethiopian Demographic and Health Survey 2005
ETB	-	Ethiopian birr
FDRE	-	Federal Democratic Republic of Ethiopia
FFSCB	-	Federal Food Security Coordination Bureau
FSP	-	Food Security Program
HEP	-	Health Extension Program of the Government of Ethiopia
HP	-	Community health promoter of the CGPC
HW	-	Community health worker of the CGPC
HWP	-	Community health workers and promoters of the CGPC
MUAC	-	Mid-Upper Arm Circumference
NCHS	-	US National Center for Health Statistics
NGO	-	Non-governmental organization
SNNPR	-	Southern Nations, Nationalities and People's Region of Ethiopia
UNICEF	-	United Nations Children's Fund
WHO	-	World Health Organization

EXECUTIVE SUMMARY

Malnutrition in the first years of life impairs the physical and mental abilities and can permanently reduce an individual's capacity and well-being. Child malnutrition follows from a host of factors, including lack of income and food insecurity, disease, limited maternal education and poor nutritional knowledge and practices. The Government of Ethiopia in 2005 initiated the Child Growth Promotion Component (CGPC) as part of the broader Food Security Project (FSP). The CGPC seeks to improve the nutritional status of children below 2 years of age through growth monitoring and advice to the caregivers. As the first step towards an evaluation of the CGPC, a team of researchers supported by the World Bank and UNICEF in July and August 2005 conducted a baseline survey of 5706 children in 7 woredas/70 kebeles of SNNPR.

The survey finds 19% of the children below 2 wasted, 33% stunted and 34% underweight, with substantial differences between the 7 woredas. The stunting and underweight-figures are similar to the EDHS 2005-findings, while wasting is higher, possibly due to the implementation of the survey during the hunger season. Boys are found to have a steeper increase in stunting as they get older than girls. The measurements of Mid-Upper Arm Circumference (MUAC) are found to be poor predictors of child malnutrition, with many false negatives. The MUAC measures detected only 42% of the wasted children, while they correctly assessed 77% of the not wasted children.

Approximately one-third of the 0 to 2 year old children have had diarrhea, malaria and/or pneumonia/cold during the 2 weeks prior to the survey interviews. Cross-tabulations with the wasting index show effects of the illnesses on malnutrition, while correlations with stunting suggest the existence of reverse causality going from malnutrition to a larger incidence of illnesses.

Only 57.9% of the caregivers correctly assessed their child's true nutritional status as expressed by the height-for-age index. This finding is robust to alternative malnutrition indicators and cut-off values, and quite closely matches other results from Ethiopia.

The quality of the caregivers' knowledge on child nutrition and health is also mixed. The dietary recommendations for infants on e.g. exclusive breastfeeding the first 6 month and the introduction of complementary foods at the age of 6 month, are largely not followed. Less than 50% of the 0 to 3 month old infants are exclusively breastfed, and between 7 and 15% of the children in the different age groups are bottle-fed.

More caregivers seem to know the recommendations on the introduction of complementary foods than the analysis of their practices indicate. Asked about the causes of malaria and diarrhea a majority knows the right answers, but many also state wrong and misleading causes. Older family members and other relatives are by far the mostly used general source of information on child health, nutrition and care, while health institutions and

personnel are seen as important sources of information on specific illnesses such as diarrhea and malaria. Schools are in general not stated as sources of information, but 62% of the household members older than 5 years have not completed any level of schooling. This figure even increases to 79% for the mothers of the 0 to 2 year old children.

The effectiveness of the CGPC hinges on the work of the local health workers and promoters. Two-third of them think that their training for the program had not been sufficient for their job. The health workers and promoters however do show a better knowledge and health behavior than the surveyed households in general, and can act as role models for the surrounding community.

Only 3% of the surveyed households state that they do not own any land, which is in line with the large share of the Ethiopian population linked to agriculture and the implementation of the survey in rural areas. The share of asset-owning households has increased in the 3 years prior to the survey for most asset categories. A high share of households are hit by ecological, price and health shocks, with for instance 95% of the household experiencing a drought in the 3 years prior to the survey.

The opportunity set of households to improve their livelihood is also shaped by the external society. Woreda and kebele profiles document long distances to various institutions in the rural areas. While most of the surveyed kebeles have basic health facilities, only about half of the kebeles have a bore hole for water and the access to transport and communication infrastructure is in general low.

The overall Food Security Project aims to increase the resource base of poor households and provides the initiation capital for local rotating credit schemes. These credits are seemingly very needed and popular, since over half of all interviewed households had applied for a loan. 32% of the surveyed households (in the treatment kebeles) have received a credit and 75% of all credits are used for the purchase of an ox or other livestock.

Only 17 of the 70 kebeles had active child-related NGO/CBO-programs in the community, with a large part being supplementary feeding programs. The Enhanced Outreach Strategy-program by UNICEF and WFP was implemented in all the woredas in which the CGPC baseline survey was undertaken, but only 9% of the surveyed households stated that they had participated in the most recent EOS campaign.

67% of the surveyed households had participated in public works in the 6 month prior to the survey, and had mainly been paid through food handouts. Free food handouts are intended for households that are not able to participate in public works, but the survey finds a strong correlation between public work participation and the receipt of free cash or food. There is a very small targeting of public works towards households with a higher dependency ratio, while no such distinction is found for free handouts.

The CGPC baseline survey was for the purpose of the overall CGPC evaluation divided into a treatment and a control group, where the CGPC is only introduced in the former. A comparison of the two groups across the various topics addressed in the questionnaire and this report shows that the control group areas have lower malnutrition rates and are in general more affluent with larger asset and land holdings, while health parameters and coverage are similar.

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The CGPC spans two lines of administration. At the woreda level the health office administers the CGPC, but the funding is channeled through the food security coordination bureau (at the federal, regional and woreda level), together with the overall funding for the FSP. The regional Food Security Coordination Office embraces a Food Security Program Coordinator.

The CGPC complements the household-level approach to child nutrition and care with a community-wide problem analysis and action initiated by the health worker. The communities are supposed to discuss the overall growth data and decide on actions at the community and program level to support and enhance child nutrition, for which the program can provide grants.

3. EVALUATION OF THE CHILD GROWTH PROMOTION COMPONENT

The objectives of the evaluation of the CGPC are fourfold:

1) Assess quantitatively the net impact of the CGPC on the nutritional outcomes of children, i.e. the impact of better caring practices imparted through improved nutritional knowledge;
2) Investigate empirically the additional impact that accrues from key exogenous factors, e.g. increased household income, maternal education, better health service delivery, physical isolation and sanitation;
3) Explore the conditions under which a child growth promotion program is most effective; in particular, examine through primary data analysis if income and nutritional knowledge act as substitutes or complements and if this relation holds across different income levels;
4) In realizing objectives 1)-3) generate Ethiopia specific empirical evidence to:
    a) Provide feedback to the project during its implementation (especially based on the analysis of the baseline);
    b) Contribute to the overall discussions and fine tuning of the national nutrition strategy, in particular regarding the scope for child growth promotion and maternal education programs as a timely and potentially cost effective intervention to reduce child malnutrition;
    c) Inform the broader ongoing debate on nutrition in Ethiopia.

It is important to note that this evaluation does not seek to identify what the impact of a ‘perfect’ child growth promotion project would be on nutritional outcomes. Rather, it specifically seeks to identify the impact of an actual program, with all the inherent capacity constraints and difficulties that go with it. Such feedback from experience on the ground is especially useful to inform discussions about extending and scaling up of the CGPC. The

government is currently considering including child growth promotion as one of the key activities of the Health Extension Program (HEP). Their experience as captured during the evaluation would also provide useful feedback as the HEP is rolled out over the coming years.

DESIGN OF CGPC EVALUATION

The design of the overall evaluation and baseline survey is determined by the aim to estimate the net effect of the CGPC on pre-school children's nutritional status over and above the effect of other factors. Differences in malnutrition rates between a treatment group where the CGPC is implemented and a control group without the CGPC can result from three factors:

1. Differences attributable to the program itself,
2. Initial differences between the kebeles/households in the two groups,
3. Differential changes over time across the two groups unrelated to the program.

The focus of the CGPC evaluation is on estimating the first effect. It is unlikely that the treatment and control groups will be the same (point 2) and it is also unlikely that the evolution in their characteristics over time will be the same (point 3). One would optimally randomize the treatment across persons or households in order to average out all initial differences between the treated and non-treated groups and consequently also the likelihood of differential changes over time among these groups. Yet, in our case, such an experimental evaluation design would require that the kebeles that will receive the CGP component as well as the control kebeles should be randomly selected across the different regions. This is not the case. As a result, it is unlikely that the treatment and control groups will be the same (point 2) and it is also unlikely that the evolution in their characteristics will be the same over time (point 3).

However, under a few plausible assumptions a difference in difference (DID)-approach complemented with data collection on key observable determinants of child malnutrition can substitute for the randomization of treatment across communities.

Under the DID-approach, the change in malnutrition rates before and after the CGP program in the control group is subtracted from the change in malnutrition rates before and after the CGP program in the treatment group to control for changes over time unrelated to the CGP program, assuming they are identical across both groups. This may not be the case, because the CGP and FSP woredas and kebeles have been selected following particular criteria. By collecting additional data on key individual, household and community determinants of child malnutrition (e.g. gender, household income, paternal education, sanitary environment) as well as some of the selection criteria and using a regression framework one can further control for initial differences between the treatment and control groups as well as differential changes in the characteristics over time. This would reduce the potential contamination of the estimate of the net treatment effect[3]. Under plausible assumptions, DID can also remove the influence of *unobservable* community factors if these are constant over time since their net influence on the outcome measures is part of the observed information at the baseline. By differencing the changes in the project period, this effect is removed.

[3]See Appendix A1 for a more detailed and technical exposition.

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Table 2: Survey sample size

Woreda	Number of kebele	Designed number of households	Surveyed number of households	Attrition rate (%)
Treatment group				
Boloso Sore	10	750	770	-2.7
Damot Woyde	10	750	625	16.7
Kucha	10	750	705	6.0
Konso	10	750	752	-0.3
Treatment group total	*40*	*3000*	*2852*	*4.9*
Control group				
Kedida Gamela	10	1000	992	0.8
Uba Debre-Tsehay	10	1000	922	7.8
Burji	10	1000	940	6.0
Control group total	*30*	*3000*	*2854*	*4.9*
TOTAL	***70***	***6000***	***5,706***	***4.9***

The surveyed households in each kebele were selected by systematic random sampling, surveying only households with children below 2 years of age. See Appendix A2 for a detailed description of the household sampling approach at the kebele level.

Questionnaires

The household questionnaire had an emphasis on the nutritional status of children below 2 years of age and the knowledge, attitudes and practices related to their care. It however also covers household composition, the income generating activities of the households, household assets and housing, participation in the FSP, and shocks to the households' livelihood. The questionnaire allowed for the recording of up to two children below the age of 2 in the child-specific modules on health and nutrition. The majority (99%) of the households however only had 1 child below 2 years of age.

Besides the household survey a kebele questionnaire on community characteristics, infrastructure and institutions was administered to a group of kebele leaders. Also the health workers were surveyed in a separate health personnel questionnaire on their personal characteristics, training and knowledge, if there is a health station in the kebele. In the treatment group the same questionnaire was also administered to 3 to 4 community health promoters in each kebele.

4. NUTRITIONAL FINDINGS

Anthropometrics is used to assess and predict performance, health and survival of individuals. The measurement of various body dimensions and their combinations can assist in the diagnosis of (the type of) malnutrition and its consequences. Using the age, height and weight of the children, three indices can be calculated that express specific characteristics of malnutrition (Cogill, 2003; WHO, 1997). We use the nutrition indices to characterize the malnutrition for children and their parents in the CGPC baseline survey. The following

paragraphs offer short descriptions of these indices. Box 1 gives the concise definitions provided by the World Health Organization (WHO, 1997).

Weight-for-height helps to identify children suffering from current or acute malnutrition, and a low weight-for-height index is termed wasting. Wasting stems from (combinations of) inadequate food intake, incorrect feeding practices, diseases and infections and is a short-term measure from which children can recover if fed and cared for appropriately. Wasting in individuals or population groups can change rapidly, and is therefore highly susceptible to seasonal variations in food availability or disease prevalence.

A low **height-for-age** reflects reduced skeleton growth resulting from repeated or chronic malnutrition and is referred to as stunting. This dependence on past malnutrition means that stunting is accumulating in the sense that repeated incidences of undernutrition add to the degree of stunting. The long-term effects of stunting include lower energy intake, a lower immune response, and poorer mental and physical capabilities (Grantham-McGregor et al., 1999a). For children under 2 years of age the long-term consequences are still reversible, but become permanent disabilities thereafter. This permanence of stunting explains the targeting of the CGPC at children between 0 and 2 years of age, since actions to preempt and reverse stunting have to be taken in this age bracket.

The third anthropometric index **weight-for-age** is a composite of the two other indices. A low weight-for-age (usually referred to as underweight) can derive both from an insufficient height-for-age of the child or from a low weight-for-height of the child, and therefore reflects both chronic malnutrition and present (acute) malnutrition.

BOX 1: WHO definitions of nutrition indicators

The three most commonly used anthropometric measures to assess the growth status of children are weight-for-height, height-for-age and weight-for-age. These anthropometric indices can be interpreted as follows:

Low weight-for-height: Wasting or thinness indicates in most cases a recent and severe process of weight loss, which is often associated with acute starvation and/or severe disease. However, wasting may also be the result of a chronic unfavourable condition. Provided there is no severe food shortage, the prevalence of wasting is usually below 5%, even in poor countries. The Indian subcontinent, where higher prevalences are found, is an important exception. A prevalence exceeding 5% is alarming given a parallel increase in mortality that soon becomes apparent (Toole and Malkki, 1992). On the severity index, prevalences between 10-14% are regarded as serious, and above or equal 15% as critical. Typically, the prevalence of low weight-for-height shows a peak in the second year of life. Lack of evidence of wasting in a population does not imply the absence of current nutritional problems: stunting and other deficits may be present (Victora, 1992).

Low height-for-age: Stunted growth reflects a process of failure to reach linear growth potential as a result of suboptimal health and/or nutritional conditions. On a population basis, high levels of stunting are associated with poor socioeconomic conditions and increased risk of frequent and early exposure to adverse conditions such as illness and/or inappropriate feeding practices. Similarly, a decrease in the national stunting rate is usually indicative of improvements in overall socioeconomic conditions of a country. The worldwide variation of the prevalence of low height-for-age is considerable, ranging from 5% to 65% among the less developed countries (de Onis et al., 1993). In many such settings, prevalence starts to rise at the age of about three months; the process of stunting slows down at around three years of age, after which mean heights run parallel to the reference. Therefore, the age of the child modifies the interpretation of the findings: for children in the age group below 2-3 years, low height-for-age probably reflects a continuing process of "failing to grow" or "stunting"; for older children, it reflects a state of "having failed to grow" or "being stunted".

It is important to distinguish between the two related terms, length and stature: length refers to the measurement in recumbent position, the recommended way to measure children below 2 years of age or less than 85 cm; whereas stature refers to standing height measurement. For simplification, the term height is used all throughout the database to cover both measurements.

Low weight-for-age: Weight-for-age reflects body mass relative to chronological age. It is influenced by both the height of the child (height-for-age) and his or her weight (weight-for-height), and its composite nature makes interpretation complex. For example, weight-for-age fails to distinguish between short children of adequate body weight and tall, thin children. However, in the absence of significant wasting in a community, similar information is provided by weight-for-age and height-for-age, in that both reflect the long-term health and nutritional experience of the individual or population. Short-term change, especially reduction in weight-for-age, reveals change in weight-for-height. In general terms, the worldwide variation of low weight-forage and its age distribution are similar to those of low height-for-age.

Source: WHO (1997, p.46/47)

Z-SCORES

For the comparison of the anthropometry of children across population groups and countries the weight-for-height, height-for-age and weight-for-age indices are usually interpreted using Z-scores. A Z-score is a statistical concept that describes an outcome in

terms of its number of standard deviations (SD) or Z-scores from the median of its distribution (WHO, 1997). Z-scores thereby become independent of the measurement unit of the specific measure.

To compare the nutritional outcomes, they are related to a reference population of children. In this report the most commonly used reference standards developed by the US National Center for Health Statistics (NCHS), and recommended by the World Health Organization[5] are applied.

A Z-score is written as

$$\textbf{Z-score} = \frac{[\text{observed value} - \text{median of reference population}]}{[\text{standard deviation of reference population}]}$$

The following discussion of the nutritional status of children in the CGPC baseline survey will use Z-scores, or measures derived from these. Critical values for malnutrition expressed in Z-scores are –2 SD (standard deviations) and –3 SD. Percentages of children wasted, stunted or underweight describe the percentage of children with the respective Z-scores below –2 SD.

DATA HANDLING

The assessment of nutritional status requires a number of composite background data. Body stature is captured by length, weight and Mid-Upper-Arm Circumference (MUAC). Length is recorded instead of height, since children below 2 years of age are the target group of the CGPC and therefore of the evaluation baseline survey. For any child, the recumbent length measurement is always greater than the standing height measurement. Children below 2 years of age cannot always stand well, and to ensure consistency length was measured for all children. This corresponds to the general practice for the anthropometric measurement of children (Cogill, 2003; Dibley et al., 1987; WHO, 1997).

In a first stage of data cleaning these anthropometric variables are cleaned for outliers by applying the bounds detailed in table 3. This looses a minor number of observations on length and MUAC.

Table 3: Range control for anthropometric variables

Measure	Range	Comment	Total number of recorded obs.	Set to missing
Length	Between 37cm and 105cm	-6/+6 standard deviations from the NCHS/WHO reference tables.	5405	21 (0.39%)
Weight	Between 0.3kg and 23kg	-6/+6 standard deviations from the NCHS/WHO reference tables.	5666	0
MUAC	0cm and 25cm	Maximum measure on UNICEF MUAC-tape for children	5548	37 (0.67%)

[5] See http://www.who.int/nutgrowthdb/reference/en/ and WHO (1997) for further information on the reference standard data.

The exact age of the child is crucial for two of the nutritional indicators. The age of the surveyed children is calculated after transforming the interview date and the recorded birth date from the Ethiopian calendar[6] to the Gregorian (European, US) calendar. 320 (5.5%) observations on the age of the children are missing (due to invalid interview or birth date) and 160 (2.8%) are outside the 0 to 24 month range.

Beyond the cleaning of the underlying variables, the anthropometric Z-scores exceeding +/-6 standard deviations are set to missing. Table 4 provides a full overview over the sources of missing anthropometric Z-scores. The full cleaning of the anthropometric data looses approximately 9% of the observations for each of the three anthropometric measures, and leaves approximately 4900 valid observations for each of the three anthropometric indices.

Table 4: Sources for missing anthropometric Z-scores

	Weight-for-Height		**Height-for-Age**		**Weight-for-Age**	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Valid entry[a]	4,892	91.23	4,781	89.16	4,911	91.59
Weight is missing	13	0.24	-	-	38	0.71
Length is missing	157	2.93	172	3.21	-	-
Age is missing	-	-	175	3.26	179	3.34
Both var.s are missing	35	0.65	17	0.32	10	0.19
Z-score outside range[b]	265	4.94	217	4.05	224	4.18
Total[c]	*5,362*	*100*	*5,362*	*100*	*5,362*	*100*

[b] if both underlying variables are not missing and in the valid range, see table 3.
[a] The range is set to +/-6.
[c] The total number of observations on the anthropometric data is lower than the total number of households sampled, since the combination of several data modules incurs losses through unclear identifications.

NUTRITIONAL STATUS

The malnutrition indicators for the full survey are reported in the first row of table 5. 19% of the children between 0 and 2 years are found to be wasted, i.e. have Z-scores of the height-for-age index below –2. This share of wasted children is higher than generally observed, and the Ethiopian Demographic and Health Survey 2005 (reproduced in the last row of table 5) found 13.7% of the children between 0 and 24 month to be wasted. The timing of the CGP baseline survey in July can be contributory to the divergence, as the time period before the main rains is in general considered a lean period in Ethiopian agriculture.

The CGPC survey found 33% of the children to be chronically undernourished, or stunted, while 34.2% were underweight, i.e. fell below –2SD for the weight-for-age index. The stunting and underweight indices include the accumulating effect of earlier malnutrition spells, and are therefore less influenced by current or acute malnutrition. The CGPC baseline survey results on these indicators are similar to the EDHS 2005 findings.

[6] The Ethiopian calendar consists of 13 months where the first 12 months have 30 days each, and the last (thirteenth) month has 5 days (6 days in a leap year). The Ethiopian New Year falls on September 11 (September 12 in the leap year).

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Table 5: Aggregated

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Table 6: Malnutritio

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Table 7: Malnutritio

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3 - 6	20
6 - 9	14

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Table 12: Illness and treatment

	%	Diarrhea (1)	Malaria (2)	Pneumonia/ Cold (3)	Total (4)
CHILD ILL LAST 2 WEEKS	**Total**	16	16	13	36
	By gender				
	Male	17	17	14	37
	Female	16	15	13	35
	By age group				
	0 - 3	9	8	11	22
	3 - 6	16	9	17	34
	6 - 9	19	15	16	41
	9 - 12	18	16	14	38
	12 - 15	18	18	13	37
	15 - 18	15	24	14	39
	18 - 21	16	18	11	37
	21 - 24	16	18	12	38
	Treatment/Control				
	Treatment	18	16	13	35
	Control	15	15	14	37
TREATMENT	**Seek treatment if sick?**	60	59	59	
	Where treatment?				
	Traditional healer	12	8	8	
	Family member	1	1	2	
	Drug shop	4	7	7	
	Health post	33	40	31	
	Health center	39	29	37	
	Hospital	1	1	1	
	Private Clinic	6	10	6	
	Other	1	0	1	
	Missing obs.	4	4	7	
	Kind of treatment				
	ORT/ORS	57	5	13	
	Medication	30	85	68	
	Medicine/herbal drugs	6	5	8	
	Other	2	1	4	
	Missing obs.	5	4	7	
	Why no treatment?				
	Don't know where to go	5	3	4	
	Not permitted to go	3	1	4	
	No money for treatment	69	73	63	
	No health facility nearby	15	17	15	
	No transport	2	2	3	
	Other	2	1	3	
	Missing obs.	4	4	8	

ILLNESS AND MALNUTRITION

Illness contributes to malnutrition, but malnourished children are also more likely to fall sick. For both diarrhea and pneumonia we can detect a (two-way) correlation between malnutrition and illness in the CGPC baseline survey.

The upper left quadrant of table 13 shows the tabulation of wasting against diarrhea. A slightly higher share of the wasted children had had diarrhea over the previous 2 weeks than the not acutely malnourished children, and the correlation is significant at the 2%-level. We can however not conclude on the direction, since diarrhea can cause the loss of weight, possibly resulting in wasting, but the weakness of the wasted body also can increase the probability of incurring diarrhea.

We find a stronger correlation if we in lower left quadrant tabulate diarrhea against stunting, where there is a difference of 4%-points between the malnourished and not malnourished children. From the correlation of stunting with diarrhea we can conclude that stunting increases the incidence of diarrhea, since stunting is the result of long-term, cumulative malnutrition and a spell of diarrhea cannot directly affect the rate of stunting of the child.

For pneumonia in the rightmost quadrants of table 13, we find similar correlations with malnutrition, albeit with a lower correlation coefficient and lower level of significance for stunting.

Table 13: Malnutrition and illness

		Diarrhea		Pneumonia/Cold	
	%	**No**	**Yes**	**No**	**Yes**
Wasted	**No**	68	12	70	10
	Yes	16	4	16	3
		0.033 (0.020)		*0.035 (0.014)*	
Stunted	**No**	57	10	58	9
	Yes	27	6	29	5
		0.056 (0.000)		*0.025 (0.080)*	

Note: Numbers denote cell percentages. Correlation coefficients below subtables (p-value in parenthesis).

HEALTH SEEKING BEHAVIOR

Illnesses and nutrient deficiencies can be prevented through vaccinations, medicines and the intake of supplementary nutrients. We will here describe the coverage for the 0 to 2 year old children for various vaccines, deworming medicines and supplementary vitamin A.

A vaccination against tuberculosis through the injection of BCG typically causes a visible scar in the shoulder, and 83% of the surveyed children had received such a vaccination, see column 1 of table 15. If the children hadn't received any BCG-vaccination, the caregiver mainly gave the young age as the reason (47%), while 21% didn't know about the vaccination (see table 14). However, in 4% of the non-vaccination cases the caregiver

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Table 14: Reason for

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Too young
Too far to go
Drug not available

than 6 month. 70% of all surveyed households in the CGPC baseline had given their child(ren) older than 6 month vitamin A during the last 6 months (see column 5 of table 15). This percentage is quite stable across the gender of the child and the 7 woredas, where the fraction varies between 54 and 70%. 88% of these households had received their vitamin A capsules from public clinics or institutions or an NGO, while a further 10% had received it through the EOS campaign.

A comparison of the treatment of the children across the treatment and the control group in the last block of table 15 shows only minor differences in coverage levels.

Table 15: Medical treatments

Percentage of children with treatment	**BCG**	**Polio**	**Measles**	**Deworming**	**Vitamin A**
	(1)	(2)	(3)	(4)	(5)
Gender					
Male	83	94	77	56	71
Female	83	93	75	54	69
Woredas					
Boloso Sore	79	95	84	46	69
Damot Woyde	81	92	73	63	72
Kucha	85	94	70	57	71
Konso	90	95	83	49	68
Kedida Gamela	85	93	83	72	72
Uba-Debre Tsehay	79	92	62	51	73
Burji	83	93	74	49	64
Age group (month)					
0 - 3	55	69			
3 - 6	75	90			
6 - 9	88	97			54
9 - 12	88	98	72		71
12 - 15	87	97	77	57	73
15 - 18	90	98	77	58	71
18 - 21	88	97	76	50	67
21 - 24	90	98	82	55	75
Treatment/Control group					
Treatment	84	94	78	53	70
Control	82	93	73	57	70
TOTAL	**83**	**94**	**76**	**55**	**70**

6. ATTITUDES AND PRACTICES

Sufficient and correct knowledge on nutrition, health and care of children is a prerequisite for proper action by the caregivers. A number of questions in the CGPC baseline survey therefore examine the attitudes and practices of the caregivers with respect to childcare, health and nutrition. In 93% of the cases the mother of the youngest child in the household answered these questions.

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CHILD FEEDING PRACTICES

The assessment for child feeding practices of the 0 to 2 year old children of the CGPC baseline survey includes breastfeeding, bottle use, the frequency of feeding solids or semi-solids, and the food group frequency over the last 7 days. This section discussed these issues one by one.

Breastfeeding

Breastfeeding has been found to be one of the most effective strategies to improve nutrition and prevent and reduce illnesses in children, see Huffman and Steel (1995) for a discussion. The benefits derive both from exclusive breastfeeding over the first months of life and from continued breastfeeding with supplementary foods later on. The reduction in fertility from breastfeeding and the resulting longer birth intervals also ensure better nutrition and childcare. In an overview over a number of studies examining the effect of breastfeeding on the mental development of children 24 month and younger, Grantham-McGregor et al. (1999b) conclude that breastfed infants appear to have a small but consistent advantage over non-breastfed infants at all time points up to 24 month.

In the CGPC baseline survey 88% of all children covered have been breastfed sometime since their birth[12]. If they were not breastfed, over half of the cases were related to the mother in terms of illness, nipple problems, insufficient milk or work, see table 18.

Table 18: Why was child never breastfed?

Reason	Percent
Mother ill/weak	21.8
Child ill/weak	8.6
Child died	0.8
Nipple/breast problem	3.7
Insufficient milk	21.8
Mother working	4.1
Child refused	12.8
Other	26.3
Total	*100*

An immediate start of breastfeeding after birth is crucial. However, only 53% of the children in the CGPC baseline survey had been given the breast during the first hour after birth. The first breast milk/colostrum provides unique nutrients and protection against infectious disease, but only 56% of the children received it, while in the remaining cases it was pumped out and thrown away.

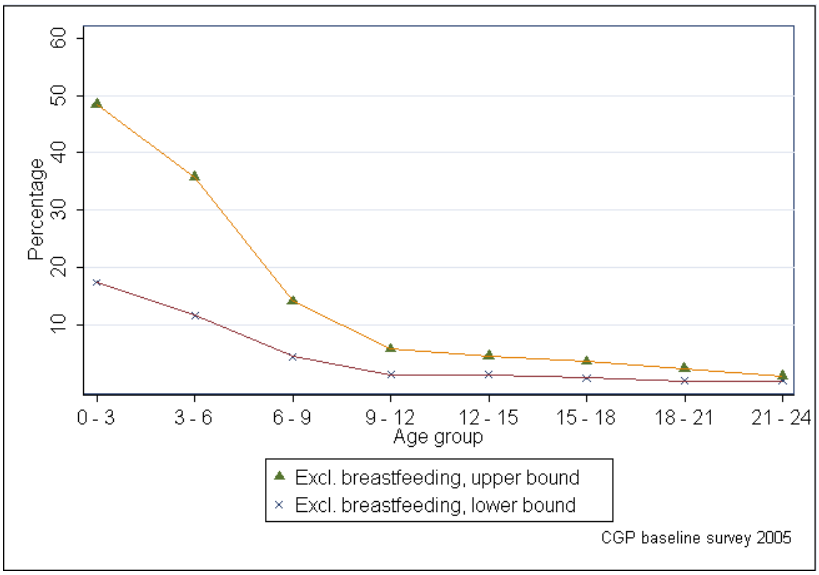
For the first 6 month the only dietary recommendation for children is to be exclusively breastfed, where children do not receive fluids, had been fed mashed, pureed or solid food during the last 24 hours, nor were bottle-fed. Figure 3 illustrates the percentage of exclusive breastfeeding for 3-month age groups for the CGPC baseline survey. We derive a lower and

[12] If only non-missing observations on breastfeeding are included, this percentage increases to 94%.

an upper bound for exclusive breastfeeding. For the lower bound missing observations for food, fluids or bottle-fed are treated as "Yes" (thus marking the child as non-exclusively breastfed), and as "No" for the upper bound. The missing observations can both confirm or refute exclusive breastfeeding, and the true percentage will therefore be between the two bounds.

There is a decreasing trend in the percentage of exclusively breastfed children as the children grown older. For the 0 to 3 month olds between 17 and 48% only receive breast milk, while the rate falls to between 12 and 36% for the 3 to 6 month old children. Even some the 6-12 month old infants, who should be receiving complementary foods by that age, are still exclusively breastfed.

Figure 3: Exclusive breastfeeding, by age groups



It is recommended to breastfeed the infants and children beyond the age of 6 month alongside other foods at least up to 2 years of age. Figure 4 graphs the percentage of children still breastfed by age groups, allowing for an upper and a lower bound, where missing observations have been interpreted as "Yes" and "No" respectively. The figure shows a declining but high rate of breastfeeding, where the rate of breastfeeding falls from around 90% for the 0-6 months old infants to approximately 70% for the 18 to 24 months old children.

Figure 4 Percentage

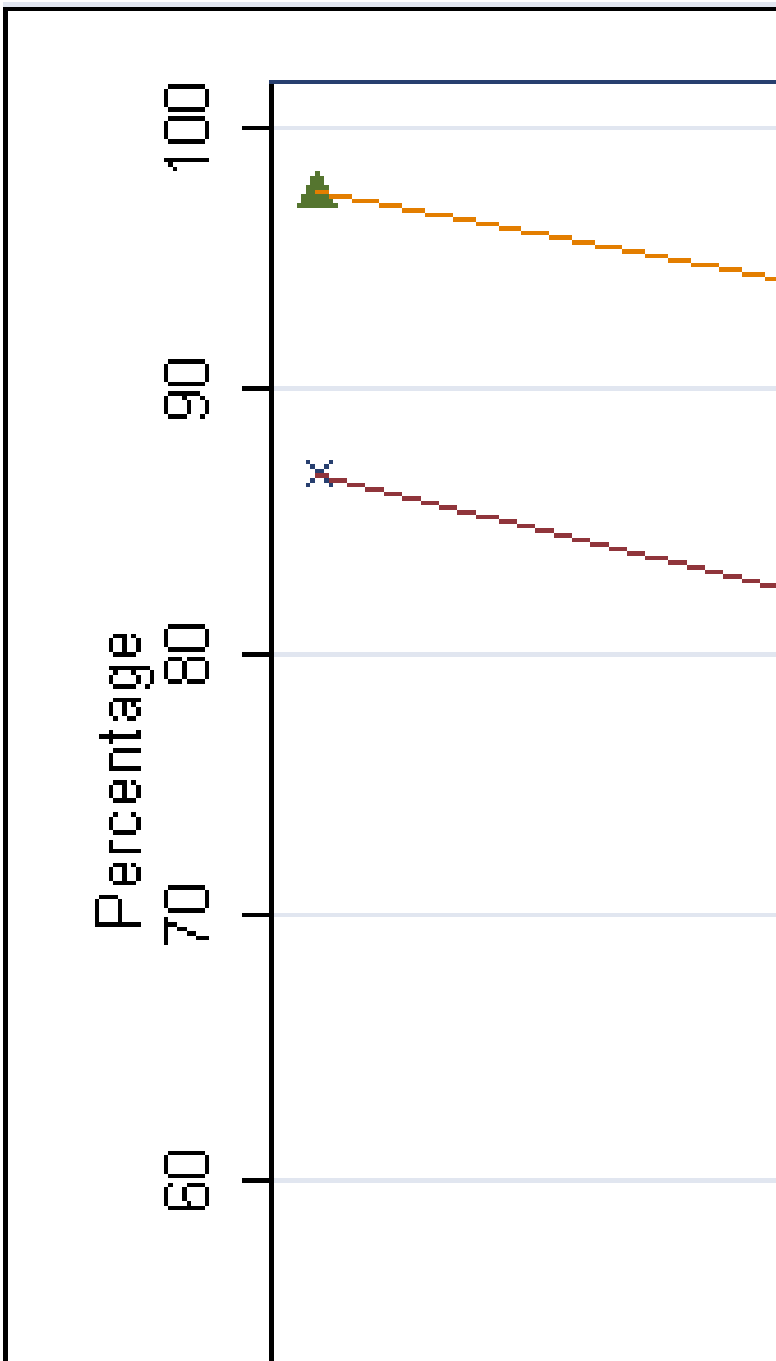


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Table 19 shows summary statistics for the food groups. All groups have a mean significantly different from 0 at least at the 1%-level, but there are clear differences between the food groups. While milk, other liquids, and food made of grains are given comparably often, the other food groups are very rarely fed to the children. Milk and food made of grains had on average been fed to the children 3 of the previous 7 days, and more than 10% of the children had had food from these groups or from the other liquids groups on each of the last 7 days. For the other groups less than 10% had received the food more than 3 days (groups e, f and i), more than 2 days (group g), more than 1 day (group j) and less than 10% of the children had had any meat at all over the last 7 days.

The comparison of the treatment and control group in the last columns shows a mixed picture. For all but group g there is a significant difference in the mean number of times food from these groups had been given to the children, but the difference goes either way. There does not seem to be any qualitative trend in the difference, since the children of treatment group for instance receive food rich in vitamin A more often, while the children in the control group receive foods with oil, fat or butter more often. This last comparison however fits into the earlier discussed trend that the control group areas are slightly more affluent than the treatment group areas.

Table 19: Food Group Frequencies

	Type of food	All households			Treatment	Control	T & C different?	
		Mean (Std. dev)	Median	q_{90}	Mean (Std. Dev)	Mean (Std. dev)	F-stat (sign.) of H_o: T=C	H_1
a	Milk	3.17 (3.03)	3	7	3.52 (3.14)	2.82 (2.88)	8.713 (0.000)	T > C
b	Fruit juice	0.28 (1.05)	0	0	0.3 (1.12)	0.25 (0.97)	1.864 (0.031)	T > C
c	Other liquids	1.67 (2.42)	0	7	1.58 (2.38)	1.77 (2.45)	3.049 (0.001)	C > T
d	Food made of grains	2.86 (2.99)	2	7	2.74 (2.97)	2.98 (3.01)	2.960 (0.002)	C > T
e	Food rich in vitamin A	0.7 (1.48)	0	3	0.76 (1.55)	0.64 (1.41)	3.169 (0.001)	T > C
f	Food made from roots/tubers	0.68 (1.55)	0	3	0.79 (1.7)	0.56 (1.37)	5.641 (0.000)	T > C
g	Other fruits & vegetables	0.54 (1.17)	0	2	0.53 (1.11)	0.55 (1.23)	0.571 (n.s.)	C > T
h	Meat	0.14 (0.64)	0	0	0.16 (0.74)	0.11 (0.52)	3.006 (0.001)	T > C
i	Food made from legumes	0.8 (1.88)	0	3	0.71 (1.81)	0.89 (1.95)	3.445 (0.000)	C > T
j	Food with oil, fat or butter	0.3 (1.08)	0	1	0.24 (1.01)	0.35 (1.15)	3.635 (0.000)	C > T

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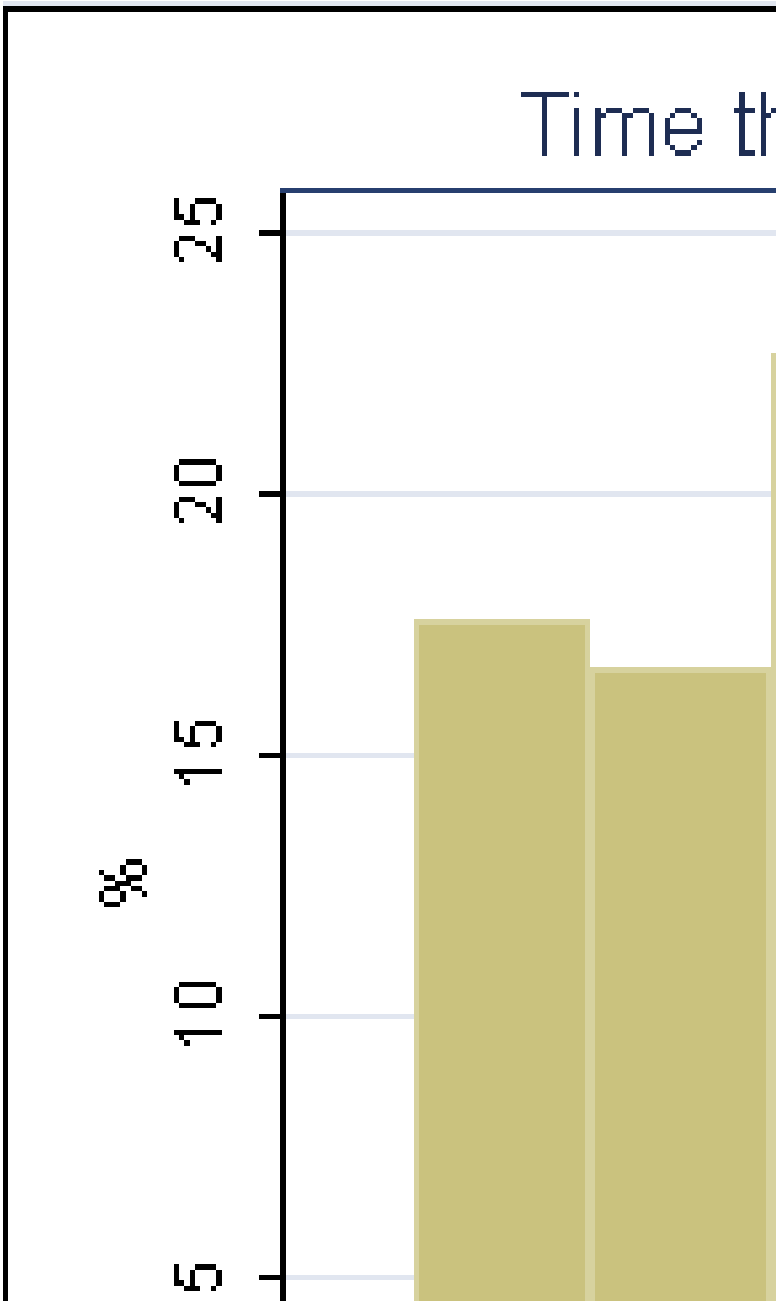

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Table 23: Diverge in knowledge and practice for complementary foods

Age group	Exclusively breastfed (%)		Not excl. breastfed/ Given compl. foods (%)		When best to start complementary food?	
	Low	High	Low	High	Pct.	reverse cum pct.[a]
(1)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
0 - 3	17.4	48.4	51.6	82.6	2.7	100.0
3 - 6	11.7	35.7	64.3	88.3	21.5	97.3
6 - 9	4.4	14.1	85.9	95.6	68.5	75.8
9 - 12	1.3	5.8	94.2	98.7	3.7	7.3
12 - 15	1.3	4.6	95.4	98.7	3.3	3.6
15 - 18	0.7	3.6	96.4	99.3	0.2	0.3
18 - 21	0.2	2.4	97.6	99.8	0.0	0.1
21 - 24	0.2	1.0	99.0	99.8	0.1	0.1

[a] Percentage who advice the introduction of complementary food at this age or later.

Malaria and diarrhea are two typical illnesses affecting children and their growth and development negatively. A first step towards reducing the incidence of illness is to ensure a sufficient knowledge about the specific causes of malaria and diarrhea. Table 24 reports the causes stated by the caregivers in the CGPC baseline survey.

Table 24: Stated causes of illnesses

Percentage of caregivers who stated the following causes[a]*:* **for diarrhea**		**for malaria**	
1) Dirty water & food	58.1	1) Mosquito bites	67.6
2) Food left outside	15.3	2) Impure food or water	16.2
3) Dirty dishes for eating	10.9	3) Spiritual or evil eye	1.7
4) Evil eye	5.4	4) Teething	1.8
5) Teething	15.2	5) Lack of food	16.4
6) Lack of hygiene	17.3	6) Other	2.5
7) Exposure to sun light	1.7	7) Don't know	19.4
8) Lack of food	17.5		
9) Other	0.6		
10) Don't Know	24.1		

[a] The caregivers could state several causes.

The majority of caregivers/households – 58% – do know that dirty water and food can contribute to the emergence and persistence of diarrhea. Smaller percentages also give other unhygienic or unclean practices as causes. However, the second largest share of households – 24% – do not know the causes of diarrhea at all, and considerable shares of households believe that the evil eye, teething, the lack of food or even the exposure to sunlight contribute to diarrhea.

A similar picture emerges from the answers given on the cause of malaria. Two-third of the households do state mosquito bites as the cause of malaria, but 19% are ignorant, and 16% think that impure water or food or the lack of food are contributory to malaria incidences.

Caregivers could state several causes and the shares given in table 24 are therefore not unambiguous. We can instead count the number of right answers for the causes of diarrhea (causes 1-3 and 6) and wrong answers (causes 4, 5, 7 and 9), and find the percentages given in table 25. This shows us that 43.8% of the respondents were fully right in the sense that they only stated right causes for diarrhea, while only 7.4% of the respondents were fully wrong and only gave wrong causes. The remaining caregivers either do not know at all (23.5%) or give mixtures of right and wrong causes.

Table 25: Right and wrong answers for diarrhea

		Number of wrong answers			
	%	**0**	**1**	**2**	**3**
	0	23.5	5.2	1.4	0.8
Number of right answers	**1**	27.9	7.8	5.9	0.0
	2	9.9	7.0	0.2	0.0
	3	5.8	0.4	0.1	0.0
	4	0.2	1.4	0.1	0.0

Legend: Fully right Fully wrong

The same analysis of right and wrong answers for the causes of malaria (where only cause 1 is right) shows that 45.5% of the caregivers are fully right, 8.6% are fully wrong, 22% mention mosquito bites as the cause for malaria alongside other (wrong) causes, and 19.4% do not know at all. This result is in so far encouraging as even people who state mosquitoes alongside other causes know the importance of mosquito nets, and therefore can be counted into the share of people aware to the cause of malaria.

SOURCES OF KNOWLEDGE

A first clue to sources of misleading information as well as an indication of ways to change false perceptions on illness causes is the examination of where the households and caregivers obtain their knowledge.

General sources

Over 70% of the caregivers gave older family members or other relatives as their most important source of information on child health and nutrition (table 26). The small 3%-share of media (newspaper, radio, TV) as a source of information is clearly a result of the low penetration of the rural areas by printed or electronic media. In the present survey 95% and 90% of the caregivers answered that they never read a newspaper or listen to the radio, respectively. This is however slightly at odds with the finding that 12% of the households state that they own a radio and 1.5% a TV (table 27), in particular since a wider audience than only the owner often listens to the radio or watches TV. The ownership data also show an increase in the frequency of these media receivers in the 3 years preceding the survey.

Table 26 : Most important source of knowledge on child nutrition

Source	Percent
Older family members	56.39
Other relatives, friends and neighbors	15.71
Community bulletin board	1.09
Community or local newspaper	2.42
National newspaper	0.07
Radio	0.60
Television	0.05
Groups or associations	4.29
Community leaders	7.15
Health post	9.99
Clinic	1.94
Hospital	0.07
NGOs	0.24
Total	*100*

Table 27: Radio & TV ownership (% of hhd.s)

	Now	3 years ago
Radio	12	8.8
TV	1.5	1.3

Knowledge sources for specific topics

Along with the knowledge on the causes of malaria and diarrhea the caregivers were asked on the source(s) of their knowledge, and table 28 reports the results. About one-third of the caregivers had their knowledge from a health institution or a nurse or doctor. The next biggest source of information – one-quarter – is the previous generation, which can possibly reproduce outdated or false knowledge. Only 4% had received their knowledge from school, which both points at the low rate of schooling and at a low transmission of knowledge on child health and nutrition in school. Below we will show that only 21% of the mothers of the 0 to 2 year old children have completed any schooling grade, but even of these a high proportion did not consider or recall school as a source of knowledge. However, even though 21% of mothers went to school, an even smaller percentage made it beyond the first few grades.

Table 28: Sources of

Pct. of caregivers wh **Diarrhea**
Mother/grandmother
School
Health institution
NGO/CBO
Written information
Experience
Don't know

The share of boys and girls is approximately equal in each of the age groups, and a χ^2-test cannot be rejected. In both the treatment and control areas the distribution of children in the age groups follows the overall overrepresentation of children in the 9-18 months range, but children in the treatment group are on average 22 days older[15].

Table 30: Age profile for children under 2 years of age

		Age group (months)								
	All	**0 – 3**	**3 - 6**	**6 - 9**	**9 - 12**	**12 - 15**	**15 - 18**	**18 - 21**	**21 - 24**	**Total**
%										
Total	100	10.7	10.8	10.3	14.1	20.9	13.8	9.8	9.6	100
Male	51.9	11.0	10.7	10.0	13.7	21.0	13.6	10.3	9.6	100
Female	48.1	10.2	10.8	10.7	14.5	20.8	14.0	9.2	9.7	100
Treatment	49.7	9.4	10.0	10.6	13.5	23.5	13.2	10.2	9.7	100
Control	50.3	11.9	11.5	10.0	14.7	18.5	14.4	9.5	9.6	100

SCHOOLING

A basic transfer mechanism for knowledge and awareness is general schooling. However, of all household members older than 5 years of age, 62% had not completed any level of schooling, see table 31. After an increase in the percentage from grade 1 to grade 2 the percentage of children having completed subsequent grades falls steadily. Only 0.1% (or 13 persons) of all surveyed household members finished their schooling with a university degree. Small percentages have completed adult education, religious school or other education.

Table 31: School achievements

FORMAL SCHOOLING	Percent	Cum. percent	OTHER SCHOOLING	Percent
No level completed	62.4	62.4	Adult education	0.9
Grade 1	4.5	66.9	Religious school	0.1
Grade 2	5.9	72.8	Other	0.04
Grade 3	5.3	78.0	Missing	1.1
Grade 4	4.6	82.6	Don't know	0.3
Grade 5	3.7	86.3		
Grade 6	3.6	89.9		
Grade 7	2.7	92.6		
Grade 8	2.0	94.6		
Grade 9	1.3	95.9		
Grade 10	0.9	96.8		
Grade 11	0.2	96.9		
Grade 12	0.5	97.4		
Certificate	0.1	97.5		
College/University	0.1	97.6		

[15] This age difference is significant different from 0 at the 0.1% level.

Basic schooling is expected to pass on both general abilities in terms of reading, writing and calculus and more specific knowledge on for instance child-related issues. For the transmissions of knowledge on child health and nutrition both kinds of transfers are relevant, for different reasons. The specific teaching on the one hand can have a direct impact on the knowledge on child nutrition if it includes topics on e.g. (child) health, hygiene and nutrition. The general abilities, in particular reading, on the other hand enable people and their households to absorb information at later points in time. Their usefulness is however conditional on the maintenance of the skills and the availability of written materials. The latter is an issue for policy programs and outside the scope of this study, but we can examine the maintenance of the general skills using specific questions in the CGPC baseline survey on the reading and writing skills of the household members. Table 32 presents the shares of household members (5 years of age or older) by educational level, who state that they can read a letter[16]. Overall are 30% of the household members able to read a letter, a slightly lower share than the 38% who have at least 1 year of schooling (table 31). This disparity seems to stem mainly from the household members who have only completed between 1 and 3 years of schooling. In this group only one-third has acquired reading skills in their (few) years of schooling.

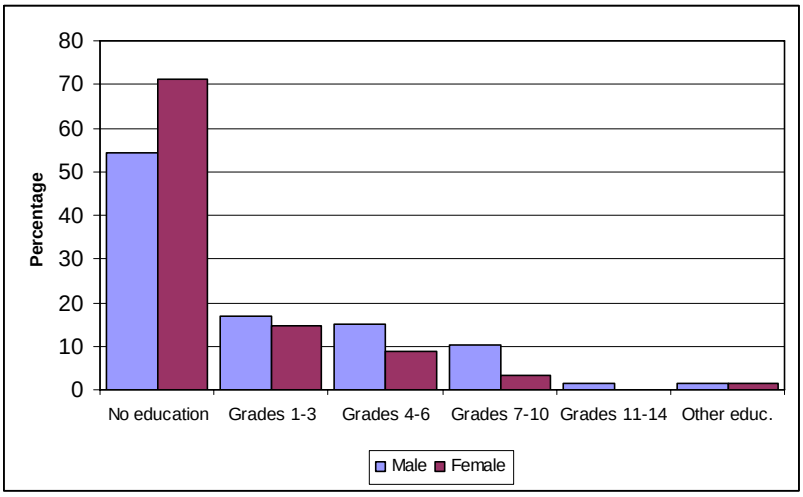
Table 32: Reading abilities

	Reading ability (%)		
Educational level	**Yes**	**No**	**Missing**
No education	1	82	17
Grades 1-3	63	34	4
Grades 4-6	96	3	2
Grades 7-10	97	2	1
Grades 11-14	99	0	1
Other education	12	84	5
Missing	5	17	78
Total	*30*	*58*	*12*

Distinguishing schooling by gender shows a clear difference among men and women, or boys and girls. Figure 9 shows the percentages of household members (over 5 years of age) that have achieved certain levels of schooling. 55% of the surveyed men/boys have no education, against 72% of the women/girls. The percentage of persons who have completed higher levels of schooling is correspondingly higher for men/boys than for women/girls.

[16] The ability is not fully self-reported, but stated by the respondent for the household, in most cases the household head.

Figure 9: Schooling by gender



When we look at the mothers of the surveyed 0 to 2 year old children, the picture is even gloomier. Of these 79% have not had any schooling and correspondingly fewer have made it to any (higher) grades.

The school attendance rate is also determined by the distance and transport time to school. Table 33 reports the existence of a primary-secondary school in the kebele and the average distance in terms of kilometers and travel by usual mode of transport to the schools. Primary schools are often found nearby. 80% of all kebeles have a primary school, and the average distance is correspondingly small. Secondary schools on the other hand are more dispersed, with on average 20 km or 2.5 hours of transport from the kebeles to the school.

Table 33: Distance to primary and secondary school

Primary school	in kebele	km	hours	**Secondary school**	in kebele	km	hours
Boloso Sore	90%	0.6	0	Boloso Sore	0%	13.0	0.7
Damot Woyde	78%	2.1	0.3	Damot Woyde	0%	16.0	2.6
Kucha	70%	4.3	0.2	Kucha	0%	36.0	3.9
Konso	88%	0.3	0.2	Konso	13%	14.0	0.8
Kedida Gamela	80%	1.1	0.2	Kedida Gamela	0%	19.0	2.8
Uba-Debre Tsehay	100%	0	0	Uba-Debre Tsehay	22%	21.0	4.4
Burji	56%	1.4	0.3	Burji	11%	17.0	1.3
Total	***80%***	***1.4***	***0.2***	***Total***	***7%***	***20.0***	***2.5***

ASSET OWNERSHIP

The income generation of agricultural households is – beyond the availability of land to be discussed in the next section – based on its movable assets. In this section we will therefore discuss the ownership of assets that are important of the households earning capacity.

Table 34 lists the surveyed assets and the 2nd and 3rd columns report the percentage of households who owned the specific asset at the time of the survey and 3 years prior to the

survey. The general picture is that an increasing share of households owned the various assets. The share of oxen-owning households had for instance increased from 48% 3 years ago to 54% at the time of the survey[17]. Similar increases are observed for most other assets. A high-flyer among the assets are bed-nets, for which the share of owners among the households has increased fourfold. This is most likely the result of national malaria campaigns that have distributed mosquito nets or sold them cheaply.

The comparison of asset ownership in the treatment and control groups in columns 4 and 5 reveals the same pattern as observed in other contexts; a larger share of the households in the control group own the larger and more valuable assets, such as cattle and other livestock. A difference that may turn out to be important for the level of information and knowledge is the far higher share of households in the control group who own a radio or a TV.

[17] The difference is significant at the 0.1%-level.

Table 34: Asset ownership now and before

Asset	Pct. of households who own asset			
	At time of survey	3 years earlier	Treatment group at time of survey	Control group at time of survey
(1)	(2)	(3)	(4)	(5)
Oxen	54	48	46	61
Milk cow	56	48	54	58
Other cattle	43	31	43	43
Horses,donkeys,etc.	17	16	12	22
Sheep/goat	44	33	43	45
Chicken/poultry	38	33	33	43
Scythe	49	43	50	47
Sickle	79	71	74	85
Axe	73	64	75	71
Pick axe	36	33	42	31
Plough	49	43	44	53
Wheelbarrow	3.7	3.4	3.1	4.4
Sewing machine	1.4	1.4	0.7	2.1
Loom	2.2	2.1	2.2	2.2
Sprayer	1	0.9	0.4	1.6
Tractor	0.9	0.9	0.3	1.5
Pump	1.1	1	0.4	1.8
Radio	12	8.8	6.5	18
TV	1.5	1.3	0.8	2.1
Video	1.1	1	0.5	1.6
Refrigerator	1.2	1	0.5	1.9
Bed nets	6.8	1.6	0.6	13
Bicycle	1.5	0.9	0.6	2.4
Car/Truck	1	0.8	0.4	1.6
Motorcycle/Moped	1	0.8	0.4	1.7
Other (specify)	2.3	1.7	1.8	2.8

LAND OWNERSHIP

85% of the Ethiopian population is linked to the agricultural sector, and land access is thus a major determinant of their livelihood. The sample of the present survey is taken from rural areas, and the majority of households rely on farming for their income.

Only 0.3% of the households state that they do not own any land[18]. Figure 10 illustrates the distribution of land holdings, where a high frequency of plot sizes between 0 and 1 ha is obvious. 62% of the households only own 0.5ha or less, and 78% own 1 ha or less[19].

[18] Land ownership is here not in a literal sense, as the Ethiopia state owns all land, and only assigns user rights that in principle can be revoked on short notice.

[19] There are 7.6% missing observations on land ownership, which may also indicate that the respective households do not own land.

Figure 10: Land hold

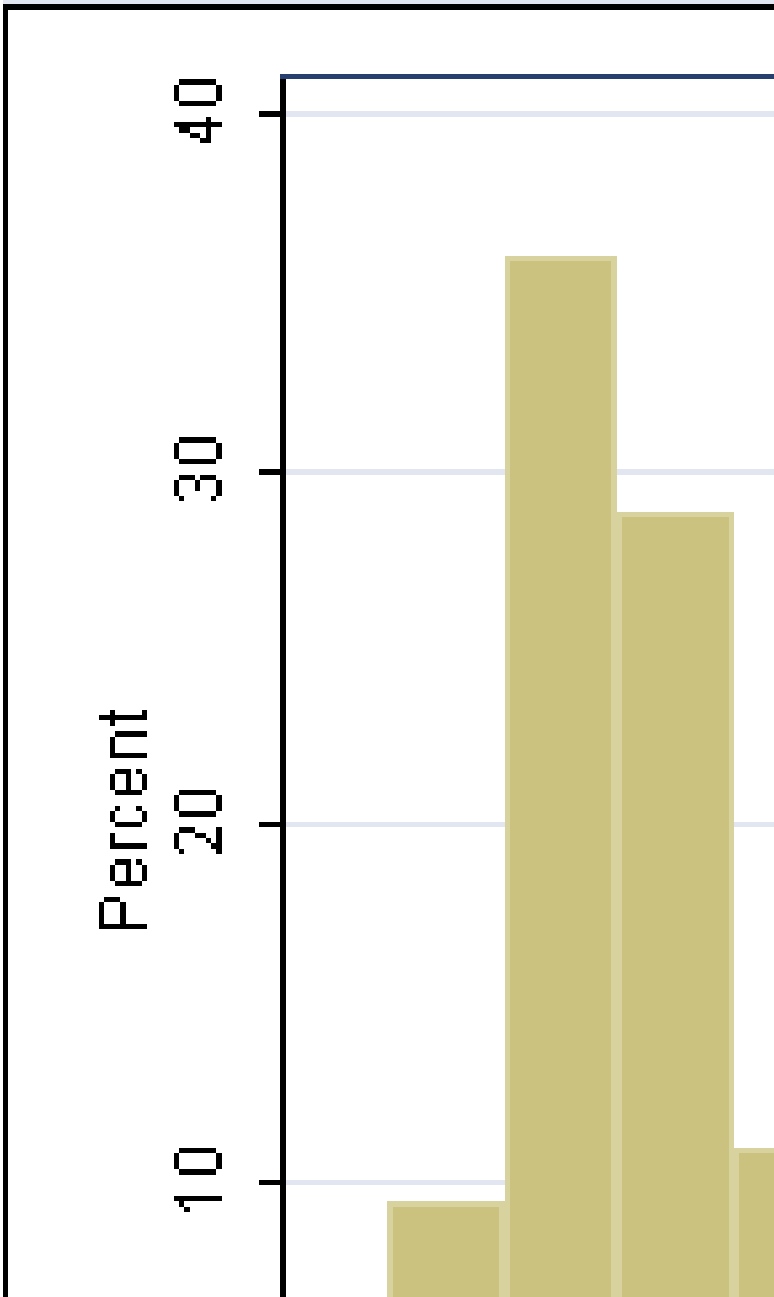


Table 36: Comparison of land ownership and cultivation

		Land ownership (ha)	
	Pct. of hhd.s	Mean	Median
Cultivated = owned	76	0.53	0.5
Cultivated < Now owned	3	0,76	0.5
Cultivated > Now owned	6	0.40	0.25
Missing	15	-	-
Total	*100*	*0.53*	*0.5*

A comparison of land holdings across the two evaluation groups (table 37) shows that the households in the control group on average own plots twice as large as the households in the treatment group. This confirms the earlier discussion of the differences between the two groups, where the treatment areas have *a priori* been selected from the food-insecure, i.e. poor, areas. A t-test on the equality of means is also soundly rejected in favor of larger land holdings in the control group.

Table 37: Land ownership in treatment and control group

	Land ownership (ha)				
Evaluation group	Mean	Std.dev.	Min	Max	Median
Treatment	0.37	0.29	0	4.5	0.25
Control	0.65	0.46	0	3.75	0.5
Total	0.53	0.42	0	4.5	0.5
H_o: T = C	t = 24.78				
H_1: C > T	P=0.000***				

SHOCKS TO HOUSEHOLD CONSUMPTION

The surveyed households are prone to shocks, both from their natural environment and illness and death, given the low level of health services in the remote areas. With a lack of insurance markets shocks to the farming or property of the household are easily translated into consumption downturns. And shocks can in line with their overall effect on the household have a high impact on child nutrition.

Table 38 (column 2) shows that a high share of households has been hit by one or more of the shocks in the 3 years prior to the CGPC survey. Especially droughts and rainfall-related shocks have been frequent with respectively 95% and 67% of the household experiencing at least one drought or rainfall-related shock over the previous 3 years. And considerable shares of the households have also been hit by a major harvest loss, a loss of livestock, and (at least) one major illness in the household that has not resulted in death.

The remaining columns of table 38 report on the spread of the shocks in the community, as stated by the households. The answers show some clear tendencies. The ecological shocks (drought, rainfall-related shocks, harvest losses) and price changes on the

one hand affect almost all households[21]. Theft, loss of livestock and not least illness and death on the other hand to a higher degree only hit the specific household.

Table 38: Shocks in the previous 3 years

Shock	Pct. of hhd.s affected	Affected households			
		Only this hhd	Few hhd.s	Many hhd.s	Almost all hhd.s
(1)	(2)	(3)	(4)	(5)	(6)
Drought	95	2	3	17	79
Heavy rainfall, flooding, untimely rains	67	1	10	33	55
Unexpected decline in prices	12	4	8	21	67
Major harvest loss	53	3	11	29	57
Theft of household assets	4	30	9	27	34
Unemployment from paid job	2	10	8	22	59
Loss of livestock (death, theft, illness)	43	37	11	20	32
Loss of land (reallocation, transfer)	6	35	8	13	44
Substantial storage loss	2	13	18	43	27
Major illness not resulting in death	54	57	7	19	17
Death	14	86	9	5	1

The households were asked on how the shocks affected their consumption (see table 39), and across all shocks a high percentage of the household reports a very negative effect on their consumption level.

Table 39: Effect of most recent shock on household consumption

Shock	Effect on household consumption (row-percentage of households)			
	Very negatively	Somewhat negatively	Not much	Not at all
Drought	87	11	1	1
Heavy rainfall, flooding, untimely rains	69	27	4	1
Unexpected decline in prices	65	30	4	0
Major harvest loss	73	22	5	1
Theft of household assets	62	31	5	2
Unemployment from paid job	66	28	3	2
Loss of livestock (death, theft, illness)	76	21	3	0
Loss of land (reallocation, transfer)	73	25	1	1
Substantial storage loss	44	54	2	0
Major illness not resulting in death	68	28	3	0
Death	83	16	1	0
Total	77	20	3	1

[21] Unemployment also seems to affect many households, but we disregard it here, since it has only affected 2% of all households.

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Table 42: Access to utilities

A. Bore hole for water	in kebele	hours [a]
Boloso Sore	56%	0.4
Damot Woyde	33%	1
Kucha	67%	0.1
Konso	50%	0.0
Kedida Gamela	30%	1.6
Uba-Debre Tsehay	90%	0
Burji	56%	0.1
Total	***55%***	***0.5***

B. Public water tap	in kebele	hours [a]
Boloso Sore	50%	0.3
Damot Woyde	38%	1.6
Kucha	11%	2.5
Konso	25%	.
Kedida Gamela	10%	3.2
Uba-Debre Tsehay	10%	3
Burji	11%	3.3
Total	***21%***	***2.2***

C. Village well	in kebele	hours [a]
Boloso Sore	78%	0
Damot Woyde	50%	0.7
Kucha	50%	0.2
Konso	75%	0.1
Kedida Gamela	0%	3.5
Uba-Debre Tsehay	50%	3.1
Burji	44%	0.2
Total	***48%***	***1***

D. Electricity	in kebele	hours [a]
Boloso Sore	10%	0.5
Damot Woyde	0%	3.1
Kucha	0%	5.9
Konso	13%	0.3
Kedida Gamela	20%	1.8
Uba-Debre Tsehay	0%	4.6
Burji	0%	3.6
Total	***6%***	***3.1***

[a] Travel distance by usual mode of transport.

BUSINESS INSTITUTIONS

Sustainable improvements in peoples' living standard require improvements of their basis of living. In the surveyed rural communities most if not all households are engaged in agriculture, and improvements therefore require the transmission of agricultural knowledge, better input and output markets and better access to capital.

For the day-to-day agricultural business the households need to buy inputs for their farming such as seeds or fertilizer. Sales points where the households can obtain inputs are on average 13 km or 2 hours transport[22] away from the kebeles (table 43A). This is considerably far, even though most households will use donkeys to transport e.g. fertilizer.

New knowledge on agricultural practices is disseminated through a network of agricultural extension agents. These are in general quite accessible, as table 43B shows. If the farmers want to realize new ideas or simply extend their present farming, they will often need some capital to for instance buy additional livestock. Formal credit sources are on average 3 hours away, as table 43C shows.

[22] The majority (97%) accesses these business institutions by foot.

Table 43: Business in

A. Sales point for agr
Boloso Sore
Damot Woyde
Kucha
Konso
Kedida Gamela
Uba-Debre Tsehay
Burji
Total

C. Village bank / credit source

for 2 or 3 years[23] (
funding for schem

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households intervi
need for credit in
loans, as over half
32% (out of the
investments. The
the households, a
households, but als

Table 44: Use of cred

Use of credit
Oxen
Other livestock
Tools
Inputs (fertilizer, etc
Petty trade
Operate business
Pay other loan
Consumption
Social activity
Construction
Other

source of credit. A
households, where

Table 45: Alternative

Credit source
Credit association
Private lender
Neighbor/Friend
Cooperative
Micro-finance institut
NGO/CBO
Other
Total

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provincial or regio

42% of th
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mainly independen
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the advocacy and c

Table 46: Perso

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Table 47: Formal edu

Education

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Table 48: Training o

Training topic

Table 49: Was the tr

Training topic
(A) Ante and postnata
(B) Child food & nutr
(C) Child growth mon
(D) Child Care
(E) Hygiene
(F) Family planning a

Table 50: Sufficiency

Number of topics, f training was insufficient	
0	
1	
2	
3	
4	
5	
6	
7	
Total	

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Figure 13. The go
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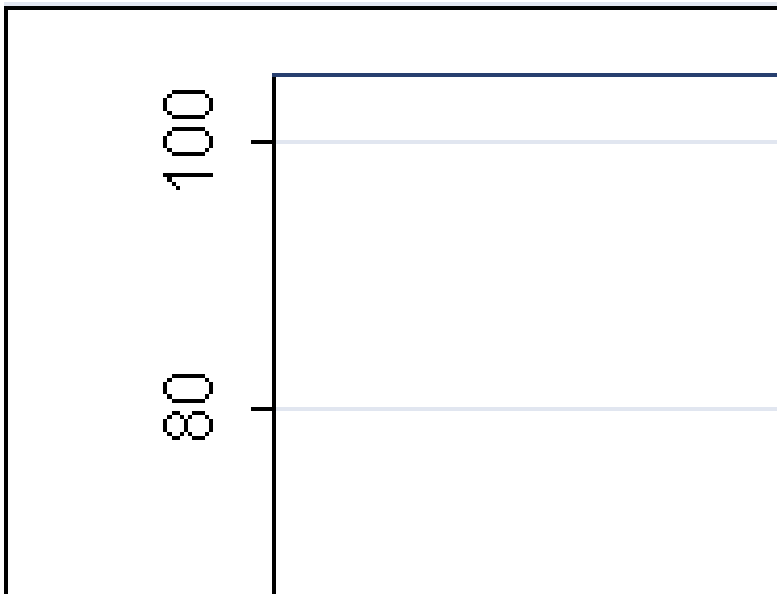
Figure 13: Introduct



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28% and 14%, th
significant at the 5

Table 55: Free hando

		%
Household received free food/cash	Yes	
	No	
	Missi	
	Total	

Table 57: Dependenc

	Total
Mean	1.61
St. dev.	0.931
Min	0
Max	10

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Security Project (F
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AP

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APPE

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child younger
years ago, for

To be filled later
The questionnaire

MODULE 2: HOUSEHOLD ROST

1	*2*	*3*
	Name (start with household head)	**Sex**

14	*15*	16	*17*
	Name (copy from module 2**)**	**How long have you lived in this kebele?** (adults only)	**If moved into … did [NAME] liv…** (adults only)
		Always……1	**Where**

Part A: CHIL

1
Name of ch

MODULE 4: I

1	
PART A: ASSET	
Item no.	**Asset**
1	Oxen
2	Milk cow
3	Other cattle

9
CROP
Teff
Maize
Barley
Wheat
Sorghum
Pulses (beans, fenugreek)

Please translate an

Used measurement unit

MODULE 5: S

MODULE 6: I

1	**What is the** *(circle)*
2	**What is th** *(circle)*

11	**What do (circle)**
12	**What do you use** ***(circle)***
13	**Is cooking done**

9	**Have you received year?**
10	**What were the sou** *(Circle one or more*
11	**Has any household last 6 month?** *(circl*
12	**If so, did he/she re**
13	**Has the HH recei**

	during pregnancy
12	**Did the mother of food during pregna**
13	**Does [NAME] hav see it)** *(circle one)*
14	**Is the growth card the household or health worker/clini**
15	*How many times in weight or height bee*
16	**Has [NAME] ha tuberculosis, that shoulder that usua**

	you seek treatmen
d	**What treatment received?**
e	**If no, why did y seek treatment?**
	During the illne

	once a week or no
33	**If a child is sick, the household whether to take t for diagnosis treatment at the post, clinic, etc.?**
34	**If you earn mo receive in kind p or gift, who decides how it used?**

13	***Do you believe that***
On how many days D each of the following?	
14a	**Milk**, other than
14b	**Fruit juice**?
14c	Any **other liquic** or soup broth?
14d	Any food made wheat, barely, te

MODULE 10:

Ask about **child cl**

1a	**Child's name**
1b	**Child's ID-nu**
2	**Who is caregiver of [NAME]?**
3	**How long wa house yesterd**

14	**When do you food to childr**

15	**What causes** *(Do not probe given.)*

AP

To be a
for instance th
school or clini

MODULE 1: I

MODULE 2: C

1	**How many H**
2	**How many H**
3	**How many years?** *(Circ*
4	**How many l**

MODULE 3: I

Facility-no.	*1A.* **FACILITY**
1	Primary school

MODULE 4: I

1	**Is there a heal**
2	**When was the**
3	***Has the im*** *(Health worke*
4	**Are there any**

APPEN

MODULE 1: I

5	**Do you ha**
6	**If so, how**
7	**How old is**
8	**How old is**
9	**What activities currently** *(Note one*

MODULE 3: I

1	**What substa** **baby?** *(Do not probe*
2	**When do y** **complementa** **breastmilk)?**

	do not read ans *If a general an* *specific answer*

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ARWPS 2	Towar Devel Repub

Africa Region Working P	
Series #	**Title**
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ARWPS 14	Reform Role Africa
ARWPS 15	The Enviro

Africa Region Working P	
Series #	**Title**
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ARWPS 27	Free T Econo

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Series #	**Title**
	Indust
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ARWPS 39	The In Reduc the Co Macro

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AWPS 71	An Ar 1998 a *Policy*

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AWPS 84	

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