CONCERN worldwide

NUTRITIONAL SURVEY REPORT

Bardiya District
Nepal

May - June 2008

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List of Acronyms

ACF	Action Contre la Faim
CBO	Community-Based Organization
CDR	Crude Birth Rate
CBS	Central Bureau of Statistics
CI	Confidence Interval
Cm	centimeter
CMAM	Community Based Management of Acute Malnutrition
DHS	Demographic and Health Survey
DPHO	District Public Health Office/Officer
ENA	Emergency Nutrition Assessment
FCHV	Female Community Health Volunteer
FGD	Focus Group Discussion
GAM	Global Acute Malnutrition
HFA	Height for Age
HP	Health Post
INGO	International Non-governmental Organization
KG	Kilogram
MUAC	Mid-Upper Arm Circumference
NGO	Non Governmental Organizations
MoHP	Ministry of Health and Population
Mm	Millimeter
NRU	Nutrition Rehabilitation Unit
NRH	Nutrition Rehabilitation Home
PHC	Primary Healthcare Center
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SHP	Sub-Health Post
UN	United Nations
UNICEF	United Nations Children's Fund
VDC	Village Development Committee
WFH	Weight for Height
WHZ	Weight for Height z-score
WHO	World Health Organization

EXECUTIVE SUMMARY

In May 2008 Concern Worldwide conducted a nutrition survey in Bardiya district in the Terai area of the mid western region of Nepal. The Bardiya nutrition survey serves as a baseline survey carried out for the Community Based Management of Acute Malnutrition (CMAM) pilot project. UNICEF, ACF and Concern Worldwide have all agreed to pilot the CMAM approach in three different agro-ecological zones: Mugu (mountains), Surkhet and Jajarkot (hills) Kanchanpur, Bardiya, Saptari and Parsa (terai). The nutrition survey methodology was prior agreed by the different organisations to ensure findings and impact can be compared between the different CMAM pilot districts.

This survey was conducted using 30x30 cluster methodology with two stage random sampling; Gulariya municipality was excluded as the focus lied on Village District Committees (VDC) with reduced access to health services. For data analysis ENA SMART and EPI Info software was used.

Children 6-59 months were measured in weight, height, MUAC and age was recorded using a local calendar. In addition detailed household, water/sanitation, food consumption and child health and nutrition information was also collected by interviewing mothers/ caretakers of all children aged 6 – 30 months within the segment. This questionnaire attempts to identify causal factors and feeding and care practices behaviour that might contribute to good nutrition or malnutrition within Bardiya District.

The nutrition situation found in Bardiya district is shown in the table below:

Table 1 Bardiya District Acute Malnutrition Results (WHO 2005, z-score)

	% WHO z-score (n = 961)
Prevalence of global acute malnutrition (GAM) (<-2 Weight-for-Height z-score and/or oedema)	(156) **16.2 %** (12.6 - 19.9 95% C.I.)
Prevalence of moderate acute malnutrition (MAM) (>=-3 to <-2 Weight-for-Height z-score, no oedema)	(129) **13.4 %** (10.3 - 16.5 95% C.I.)
Prevalence of severe acute malnutrition (SAM) (<-3 Weight-for-Height z-score and/or oedema)	(27) **2.8 %** (1.5 - 4.2 95% C.I.)

The GAM prevalence of 16.2% (CI 95%: 12.6 – 19.9%, in Z-scores, WHO growth standards) and the SAM prevalence of 2.8% (CI 95%: 1.4 – 4.2, in Z-scores, WHO growth standards) shows that the nutrition situation in Bardiya District is critical (as per WHO classification) but better off than in the other CMAM pilot districts Kanchanpur (terai), Humla (mountains) and Mugu (mountains). A nutrition intervention to address severe acute malnutrition is recommended.

The CMAM pilot project should aim improving nutrition related behavior such as exclusive breastfeeding, hand washing practice, health seeking behavior and detecting danger signs of childhood illnesses. The community part of the CMAM approach needs to reflect the reality that child care is seen as a responsibility off all women in the community (mothers, grand mothers, mothers in law) as well as fathers. The community should play an active role in improving and monitoring quality of government health services provided.

The private sector is playing a major role in providing medical treatment to children. Therefore case finding and referral has to include private practitioners and pharmacists.

Recommendations given

1. An intervention to prevent and treat acute malnutrition in Bardiya district is justifiable. GAM levels are relatively low in comparison to other CMAM pilot districts. However total number of children affected is expected to be higher in Bardiya due to high population density.
2. As part of the CMAM pilot project discussions with FCHV could bring more clarity into the issue of possible under-reporting of diarrhoea. Through FCHVs CMAM should include activities to improve mother's skills in detecting possible illnesses of their children in need for medical treatment specifically danger signs of diarrhoea and dehydration as already covered by CB-IMCI.
3. The CMAM pilot project is designed to provide nutritional treatment to severe malnourished children only through government institutions such as FCHV, SHP, HP and the regional hospital. It therefore is crucial to improve quality of government health services and perception of the population to ensure severe malnourished children are brought to the available services.
4. The inclusion of private health service providers and pharmacies into the CMAM pilot project should be considered at least for the MUAC assessment and referral to the nearest OTP or NRH
5. A participatory quality monitoring scheme could help to improve quality of services provided, to increase community's ownership of government services and motivate health facility staff through received feedback and acknowledgement.
6. The nutrition education package of CMAM should pay special attention to reduce the practice of providing water during periods of exclusive breast feeding and FCHV, TBAs and midwives should focus at changing care taker's behavior in this regard. In addition definition and importance of providing colostrum to the newborn should be highlighted during counseling of mothers.
7. The reasons behind providing water to the child during periods where exclusive breastfeeding should be practiced should be further explored in an anthropological assessment. Believes and knowledge around colostrum should also be included in such an in-depth study.
8. The CMAM pilot project therefore needs to include not only all women in the village into nutrition activities but also should provide guidance to fathers to enable them giving improved advice to their wives particularly important in male dominated societies/ castes.
9. During the CMAM pilot a ready-to-eat snack able to produce at household level using local ingredients should be developed suitable for feeding children during outside house activities.
10. Hygiene messages designed and used by the CMAM pilot project should pay attention to hand washing practices after attending children who defecated and before cooking.
11. Special attention to Rajapur Delta might be necessary during planning and implementing any health and nutrition intervention to make sure that it is not excluded from planned services, as it may be the most vulnerable section of Bardiya district.

1. INTRODUCTION

1.1. Background

Nepal is a landlocked country in the Himalayas that consists of three distinct ecological zones. Topographically, Nepal is divided into three distinct ecological zones. These are the mountain, hill, and terai (or plains). The mountain zone has only about 7 percent of the total population. In contrast, the hill ecological zone is densely populated with about 44 percent of the total population lives in the hill zone. This zone includes the Kathmandu Valley, the country's most fertile and urbanized area. Although the terrain is also rugged in this zone, because of the higher concentration of people, transportation and communication facilities are much more developed here than in the mountains. Unlike the mountain and hill, the terai zone in the southern part of the country can be regarded as an extension of the relatively flat Gangetic plains of alluvial soil. The terai consists of dense forest area, national parks, wildlife reserves, and conservation areas. This area, which covers 34,019 square kilometres, is the most fertile part of the country. While it constitutes only 23 percent of the total land area in Nepal, 48 percent of the population lives here. Because of its relatively flat terrain, transportation and communication facilities are more developed in this zone than in the other two zones of the country and this has attracted newly emerging industries1. Over 90% of the population in Nepal lives in rural areas2.

Seasonal migration is quite common among the population of the terai. Especially, male members of poor families travel to India for about 4 - 6 months of every year for casual labour opportunities. Migration starts prior to winter/dry season (corresponds with October or November) with persons usually returning back for cultivation at their home gardens/land immediately before the monsoon season (corresponds with May or June). Those who do not return for cultivation on their own land, will usually always return for one month during the Dashain Festival during the month of October. The main reasons for seasonal migration are food deficits, poverty, absence of rural employment and lack of a regular source of income.3

1.2 Health and Nutrition situation In Nepal

With a population of 26.6 million and a per capita GDP of 1,490 US$ for 2004 (PPP) Nepal is ranked 138 on the 2006 Human Development Index (HDI). Life expectancy is about 61 years and adult literacy rate is 48.6. Nepal's women have a total fertility rate of 3.7 with over half of the births attended by relatives and only 15% by trained personnel. This fact leads to a high number of maternal deaths (a Maternal Mortality Ratio of over 500 per hundred thousand live births) with 21% of the infants having a low birth weight. The 2006 HDI states a national Infant Mortality Rate of 59 per thousand live births. For the 20% of the poorest population an Infant Mortality Rate of 86 is indicated. The same discrepancy is visible for the Under-five Mortality rate. While the average national Under-five Mortality is indicated with 76, for the 20% of the poorest population this rate is as high as 130. Access to and quality of health care services available to the Nepalese population depends strongly on the economic status of the service seekers and whether living in an urban or rural setting. The reasons for this include limited expenditure on

[1] Central Bureau of Statistics (2006).
[2] Nepal Micronutrient Status Survey (1998), Kathmandu, Nepal: Ministry of Health, Child Health Division, HMG/N, New ERA, Micronutrient Initiative, UNICEF Nepal, and WHO
[3] Gill, G. (2003). Season Labour Migration in Rural Nepal: A Preliminary Overview, Overseas Development Institute, London

public health, poor quality of care, a high turnover of service providers, a lack of drugs and supplies and a lack of ownership of health programmes by communities4.

Malnutrition has a detrimental impact on health, physical development, brain development, and intellect especially during pregnancy and the first two years of life. The consequence of malnutrition are higher child mortality and morbidity, hence higher burden to the health system, lower cognitive development hence, lower returns from investments in education, and lower productivity. Malnutrition accounts for an economic loss of about 3 percent of Gross Domestic Product in developing countries5.

According to the DHS 20066 data, the national prevalence of acute malnutrition in children under the age of five in Nepal is 13.4 percent, with prevalence of severe acute malnutrition at 2.6 percent. Prevalence varies across the ecological and geographic regions, and the highest prevalence of severe acute malnutrition is found in the Terai, and in the Mid and Far-Western Region (see table below). With an estimated under five child population of 3.5 million, this results in more than 90,000 children in Nepal severely acutely malnourished at any point in time. Moreover, though stunting or chronic malnutrition has decreased nationally in the past five years from 57 percent to 49.3 percent, the prevalence of stunting remains very high in the mountainous areas and the hilly areas of the Mid and Far west. These high figures of malnutrition prevalence indicate a prolonged tragedy that needs to be addressed.

Table 2 Prevalence of Acute Malnutrition (Weight for Height Z-score, wasting) in Nepal (DHS 2006) (WHO 2005 Standards)

Ecological zone	**Mountain**		**Hill**		**Terai**		Average for Region
Sub-region	Percentage below -2 SD	Percentage below -3 SD	Percentage below -2 SD	Percentage below -3 SD	Percentage below -2 SD	Percentage below -3 SD	Percentage below -2 SD
Eastern	8.0	0.9	8.6	1.2	11.2	0.7	10.1
Central	6.1	0.0	4.9	1.0	20.7	4.6	13.8
Western	11.2	4.7	9.1	1.0	13.8	4.2	10.9
Mid Western	N/A	N/A	9.1	2.4	**15.7**	**3.7**	11.6
Far Western	N/A	N/A	15.7	4.4	19.6	4.8	16.7
Average for Zone	9.4	2.9	8.4	1.6	16.6	3.4	

[4] Human Development Report 2006, UNDP
[5] Repositioning Nutrition as Central to Development, as strategy for large scale action, The World Bank, March, 2006.
[6] Nepal Demographic and Health Survey 2006 (DHS), Population Division MOHP, May 2007

Table 3 Prevalence of Chronic Malnutrition (Height for Age Z-score, stunting) in Nepal (DHS 2006) (WHO 2005 Standards)

Ecological zone	**Mountain**		**Hill**		**Terai**		Average for Region
Sub-region	Percentage below -2 SD	Percentage below -3 SD	Percentage below -2 SD	Percentage below -3 SD	Percentage below -2 SD	Percentage below -3 SD	Percentage below -2 SD
Eastern	55.5	25.4	42.4	19.4	37.0	12.5	40.3
Central	57.3	23.6	44.9	15.9	52.8	22.5	50.0
Western	66.8	32.2	48.9	20.4	52.2	24.9	50.4
Mid Western	N/A	N/A	65.5	32.9	**42.1**	**15.2**	57.9
Far Western	N/A	N/A	58.3	21.7	43.1	11.2	52.5
Average for Zone	62.3	28.9	50.3	21.0	46.3	18.0	

Bardiya District does not have any specific district level nutritional statistics. The results presented in this report from Concern's nutritional survey can not be directly compared with the above DHS results due to differences in methodology, surveyed population area and analysis.

1.3 Bardiya District – Demographic

Bardiya District is located in the terai of the Mid-Western Development Region, Bheri Zone. It is one of the seventy-five districts of Nepal. It's district headquarters are in the city of Gulariya. The district covers an area of 2,025 km² and according to the Central Bureau of Statistics CBS 2001, the total population of Bardiya is 382,649, out of which 189,994 are female and 192,665 are male that are distributed in 59,569 households. It lies south of Surkhet District, west of Banke District and east of Kailali Distirct. To the south lies Uttar Pradesh State of India. Bardiya is accessible by an asphalt road connected to Nepalgunj and also linked with seasonal and gravel motor roads to many other parts of the district.

It is fertile plain land covered with agricultural land and forest. The majority of the people living in this district are farmers and migrants from all over the country. Gulariya, the district headquarter, lies in the mid-southern part of the district. The Karnali, one of the largest and longest river systems of Nepal, divides into many branches when it reaches the terai and flows through Bardiya. The western branch of the Karnali forms the boundary between Bardiya and Kailali districts. The eastern branch of the Karnali is called the Geruwa River which divides the Rajapur delta from the mainland of Bardiya District.

Administratively Nepal is divided into five development regions, further divided into fourteen zones and 75 districts. Each district is further divided into village development committee (VDC) areas which always consists of nine smaller units called wards. The ward is the smallest administrative unit that can be found with official recorded population and definite boundaries. There are a few villages or smaller settlements within a ward. Bardiya District has 31 VDCs and one municipality.

Figure 1 Map of Nepal

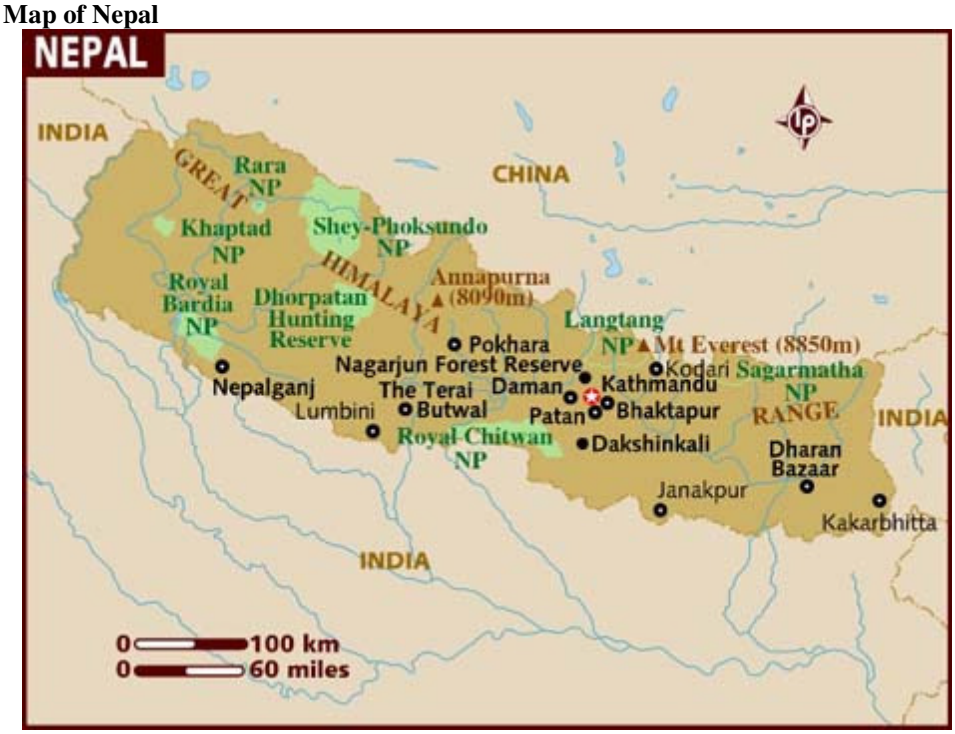
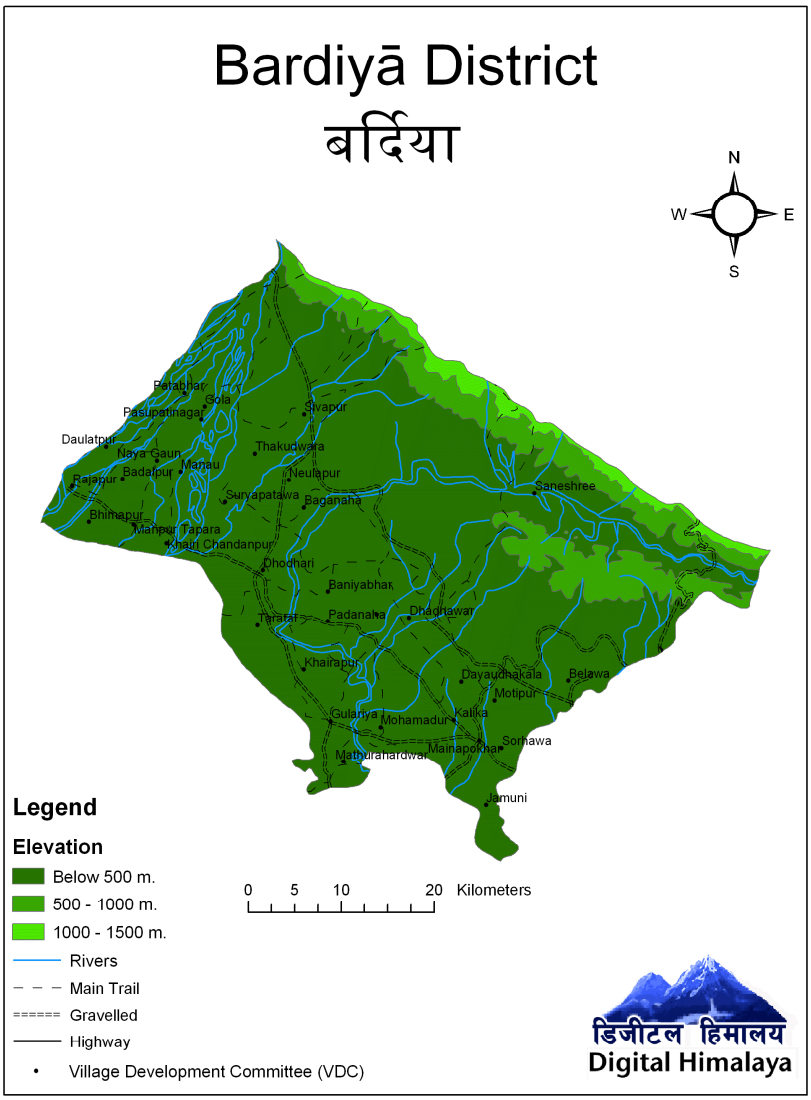


Figure 2 Map of Bardiya District



Bardiya District is a unique district being split into two distinct sections: the mainland of Bardiya and the Rajapur Delta (which consists of about 1/3 of the land area of Bardiya District). Rajapur Delta is 37 kilometers west of Gulariya and has historically been an area of frequent flooding due to the extensive network of branches from the Karnali River. The Karnali River has to be crossed in order to access Rajapur Delta and it can be done by a floating pontoon bridge during the dry season, but during the monsoon season it can only crossed by an engine steamer boat. The monsoon season usually leaves Rajapur Delta isolated for 3 to 4 months of the year.

Bardiya was part of Nepal before the Sugauli Treaty7 was signed in March 4, 1816 between the then government of East India Company and Nepal at which point Nepal lost territory

[7] Shrestha B.N. (2000). "What is Sugauli Treaty?", Boundary of Nepal. Bhumichitra Co. P. Ltd, Kathmandu Accessed on June 6, 2008 at: www.geocities.com/sugaulitreaty/nepal

including Bardiya. It was returned to Nepal along with Banke, Kailali and Kanchanpur Districts at the time of Jang Bahadur Rana.
In the early twentieth century, Bardiya was covered with forest and was sparsely populated with indigenous tribal people of primarily of Tharu ethnicity. Dang and Deukhuri valleys of Dang district also had a very large Tharu population at that time. However, as the Nepali-speaking peoples from the hills started migrating towards Dang valley for agricultural opportunities, Tharus were displaced and moved westward into Banke, Bardiya, Kailali and Kanchanpur. Later on, Nepali-speaking hill people also migrated into Bardiya. At present, the majority of people living in Bardiya are Dangora Tharus. They have their own Tharu language and specific culture distinct from other Nepalis. Another ethnic group, the Sonaha, live near the Karnali River, and traditionally maintain their livelihood by extracting gold from the sands of the river. Other ethnicities residing in Bardiya are Brahmin, Chhetri, Thakuri and these are followed by Dalits and Janajatis such as Gurung and Tamang, Newar and Magar.

2. SURVEY OBJECTIVES

The following were the objectives set for the nutritional survey

- To evaluate the nutritional status of children aged 6 to 59 months in the context of Bardiya District, Mid-western Nepal
- To identify higher risk groups for malnutrition: gender, age, wealth (data analysis not included into this report, will be analyzed separate)
- To assess health seeking behaviour for sick persons in the visited households and the rationale for choices in health access.
- To serve as a baseline nutritional survey for the Community Based Management of Acute Malnutrition (CMAM) pilot project for Nepal
- To make recommendations for nutritional interventions in regards to CMAM in Bardiya District as a component of the overall pilot project for CMAM in Nepal.
- Identification of causal factors and their correlation with nutritional status (data analysis not included into this report, will be analyzed separate)

3. METHODOLOGY

The Bardiya nutrition survey serves as a baseline survey carried out for the CMAM pilot project. UNICEF, ACF and Concern Worldwide have all agreed to pilot the CMAM approach in three different agro-ecological zones. ACF will pilot the approach in Mugu (mountains) and Kanchanpur (terai) districts, Concern will implement CMAM in Bardiya (terai) district and is also preparing for Jajarkot (hill) district. UNICEF has agreed to launch CMAM in Parsa and Saptari districts (terai) and in the hill district of Surkhet. The methodology for the four nutrition surveys carried out by Concern and ACF in May/June 2008 was prior discussed and agreed by the three agencies to ensure findings can be compared between the CMAM pilot districts. The harmonized survey methodology will also be used for the Concern Jajarkot survey scheduled for November 2008 and for the CMAM evaluation surveys end of 2009.

3.1 Selection of Survey Area within the Districts

All areas of Bardiya District were included in the random cluster sampling methodology except the wards of Gulariya municipality. These wards have easy access to the largest food market in the district and to the district hospital. One of the objectives of this survey is to make recommendations for nutritional interventions in regards to the CMAM

programme. This program is specifically trying to increase coverage of nutrition services to communities with limited access to health care structures programme and will be initially implemented in rural areas to allow for decentralisation of treatment for malnutrition. Therefore, data on the municipality wards was not considered useful for this survey and would have required a different methodology. An assessment in the municipality wards can be done if deemed necessary at a future point in time.

3.2 Sample size and sampling procedure

The population figures for Bardiya District in 2001 were obtained from the last official census of 2001 completed by the Central Bureau of Statistics.

Table 4 Estimated Population Size in Bardiya District

Geographical Unit	Population Size for children under 5 years old (2001)
Bardiya District	47789

The sampling size was determined using ENA software8. The variables used to calculate the sampling size are shown below in table 5. By using an estimated 15.7% GAM rate for the mid-western terai (DHS, 2006 figures), a 3.34 % desired precision with a 5% errant data or refusal to participate, the actual number of children needing to be measured equals 948.

Table 5 Estimation of numbers of children needing to be measured

District	Bardiya
Estimated Pop < 5 years old	47789
Estimated GAM (- 2 SD) (DHS 2006)	15.7
± Desired Precision %	3.34
Design Effect	2
Total Population to be surveyed	903
Calculation of errant data or refusal to participate	5 %
Total < 5 population to be surveyed	**948**

3.3 Selection of Clusters

A two stage cluster sampling methodology was used because no accurate population registers were available at household level and households could not be visited systematically for the whole district. With the ward as the smallest administrative unit in Nepal these available population figures and definite boundaries were considered as the primary sampling unit for this survey. The first stage is as follows:

- Clusters (wards) were selected randomly by the proportional population size methodology completed with ENA software.

[8] ENA software for SMART, developed by Dr. Juergen Erhardt in cooperation with Prof. Michael Golden, December 2006: Available from www.nutrisurvey.de

Approximately 30 children could be measured per day by the anthropometric teams. With 4 teams measuring 30 children per day for 8 days, the Bardiya Nutritional Survey needs 32 clusters to measure at least 948 children. A total of 36 clusters were selected by the ENA software and additional 4 clusters were randomly selected to be held in reserve in case one of the 32 clusters could not be reached for logistical or security reasons. A copy of the cluster assignment is included in Annex A.

3.4 Selection of Households and Children

3.4.1 Selection of Households and Children for Anthropometric Measurements and Health Seeking Behaviour questionnaire

The second stage of the cluster sampling methodology includes the actual selection of households within the chosen clusters (wards). A household was termed as all persons who eat from the same pot and share the same living space.

- The segmentation methodology was utilized for selection of households from each cluster.

Each day the team arrived at the cluster (ward) and found the ward leaders, village chief 'Bad Ghar' and/or Female Community Health Volunteer (FCHV) within the selected cluster. Detailed maps of the VDCs of Bardiya[9] with the selected cluster (ward) demarcated was reviewed and updated with these local key community informants.

The survey team and key informants confirmed that approximately 40% of the households in Bardiya had children under the age of 5 years of age. Therefore, the survey team together with the key informants divided the cluster into segments with approximately 70 – 80 households per segment, to give an approximate total of 30 children under the age of five within each segment. These segments were numbered and then the numbers were placed in a hat and a key community informant randomly chose a number corresponding to the segment that would be surveyed for that day. The same segmentation methodology was used for all the clusters.

Once the team arrived in the segment they randomly chose the area of the segment where they would begin and proceeded to measure all of the children aged 6 – 59 months in the segment and ask four questions to the caretaker of each child measured regarding illness in the last 2 weeks and health seeking behaviours for this illness.

If for any reason, a child could not be measured (i.e. refusal of the house occupants) then the team leader recorded this child as "refused".

If a child was temporarily absent (should return within one day), the team takes note and then returns to the household before the end of the day to measure the child. If the child could not be measured during the same day then the team leader keeps this as a record of "temporary absence".

If a child is permanently absent (absent longer than one day), this should be noted by the

[9] These VDC maps were obtained by the Nepal Government Department of Topography, Kathmandu

team leader as such.

Disabled children that would otherwise be eligible were included where possible. If it was not possible to measure the height and weight due to deformity or other abnormality, the child was noted as "disabled" in the records kept by the team leader.

If a child was absent from the household because he/she had been admitted to a hospital or health centre, the team had to go to this structure and measure the child. If it was not possible to visit the centre, the child was noted as such by the team leader.

Each household was asked before measurement began whether they would like to participate in the survey and they were then read an informed consent stating that participation in this survey was by voluntary basis only.

3.4.2 Selection of Children for Detailed Nutrition Causal Analysis Questionnaire

In addition to the anthropometric measurements, detailed household, water/sanitation, food consumption and child health and nutrition information were also collected by interviewing a mother or caretaker of all children aged 6 – 30 months within the segment. This questionnaire attempts to identify causal factors and feeding and care practices behaviour that might contribute to good nutrition or malnutrition within Bardiya District. This questionnaire is a complement to the anthropometric measurements and health seeking behaviour questionnaire.

Each nutritional survey team had one member trained and assigned for conducting a 45 question interview to a smaller sample of the chosen households for the anthropometric measurements. This interviewer followed the same randomized two stage cluster methodology for household selection as the anthropometric survey team, but only selected households for interviews with children aged 6 – 30 months within. The anthropometric survey team members left a signed sheet at every household with a child aged 6 – 30 months and informed the caretaker of this child that a more detailed interview would follow within the same day. This interviewer always followed behind the anthropometric measurement team and conducted interviews afterwards in order not to interfere with the quality of the data collected by the anthropometric survey team.

In principle, the mother and/or main caretaker of the child was the primary respondent for the questionnaire. If this person was not available, then the head of household could be interviewed. Only if these were not present another person within the household over the age of 15 was asked to answer the questionnaire. There was not a minimum or maximum number of interviews to be conducted per cluster. The interviewer attempted to interview all caretakers of children within the segment aged 6 – 30 months. If the time of day was between 4pm and 5pm and the interviewer had not completed all households with children aged 6 – 30 months, then he/she finished for the day without completing anymore interviews.

The questionnaire was translated and back translated and field tested before the survey began. An example of the detailed questionnaire is included in the Annex D.

3.5 Data collection and measurement techniques

3.5.1 Anthropometric data

The following anthropometric data was collected for children 6 months of age to 59 months of age: the respective team leaders were solely responsible for recording the anthropometric data in an appropriate order clearly and submitted every evening to Managers when they finish the field work. The form and code book can be found in Annex B

Age was recorded by birth date (dd/mm/yyyy) according to the Gregorian calendar. This birth date was confirmed by vaccination card and/or birth registration certificate provided by the local administration/VDC. If it was confirmed then a "Y" was marked on the anthropometric form in the appropriate column. If the age was not verified, then the date of birth or age in months was recorded as stated by mother or caretaker and an "N" was marked on the anthropometric form in the column for confirmation of date of birth.

A **"Calendar of Events"** specific to Bardiya district was developed and provided to each team. Each team used this calendar for assisting the mother or caretaker with identification of birth date if no verification of date of birth was found in the household. It was found very useful when the mother or caretaker was not able to tell the exact month and the day of the birth of the child. See Annex C for a copy of the calendar of events specific for Bardiya District.

The team leader was responsible to calculate the age in months of the child and converting it into the Gregorian calendar before performing the anthropometric measurements. If the age was not confirmed and the mother was unclear of the age of the child, the team included all children with a height of 60 cm – 110 cm. This was the last resort for inclusion or exclusion to the survey.

Sex of the child was recorded as "M" for male or "F" for female without any problems.

Weight was measured using 25 kg hanging Salter scales and recorded in kilograms to the nearest 100 grams. The Salter scales were calibrated each morning by the team leader using a known weight of 2kg. The scale was hung from a stick held by two measurers, and recalibrated to zero again with the hanging pants attached to the scale before the child was put into weighing pants. The teams attempted to weigh all children without clothing, but in some households if mothers refused to take off the clothes of the children, this was recorded on the data form.

Height was measured in centimetres using a 1.30 meter height board graduated to 0.1 cm with a movable block. Children were measured recumbent if their height was below 85 cm. The children were measured standing if they measure 85 cm or above. The height was recorded to the nearest 0.1 cm. All children were measured barefoot, and without caps or hairdo. For children measured standing up, the measurers were trained to ensure that the child's head, shoulder blades, buttocks, calves and heels were touching the boards and they were looking straight ahead. Children measured lying down were also supposed to be placed in the middle of the board with the head touching the fixed end, the knees pressed down and the heels touching the movable block.

Oedema was measured for every child by applying normal thumb pressure to the anterior surface of both feet for three seconds by one of the measurers. If an indentation remained

after the pressure was removed, presence of oedema was considered positive and a "Y" entered on the data collection form. If the thumb imprint was not persisting, or if the oedema was not bilateral, the child was recorded as not having oedema and an "N" was entered on the data collection form.

Mid upper arm circumference (MUAC) was also measured in centimetres, to the nearest 0.1 cm, using standard UNICEF MUAC measuring tape. The measurers were trained to locate the mid-point between the shoulder and the tip of the elbow on the left arm with the arm bent at a right angle and to note the mid-point. The measurement was taken at this mid-point with the arm extended and relaxed.

For malnutrition cases found - each child that was found with severe acute malnutrition (MUAC < 110 mm and/or oedema) was immediately referred to the closest nutritional rehabilitation home or hospital with nutritional rehabilitation facilities. If the mothers refused to go to the NRU and the child had medical complications that could be addressed at the closest health facility or the FCHV, then they were encouraged to take the child to that health facility. Each child found with moderate acute malnutrition (MUAC < 125 mm) and medical complications were also referred to the closest health facility or FCHV. Applicable medical complications were reviewed during the training session before beginning the nutritional survey.

.

Healthcare Seeking Behaviour Questions - Four questions regarding illness in the last two weeks of each measured child for anthropometry and the related health seeking behaviour of the caretaker was asked of the caretakers of the measured children. The answers to these questions were recorded by the team leader as per the appropriate codes. No spaces should have been left blank. The coded responses can be found with the actual questionnaire in Annex B.

The first question asked whether the child was sick "Yes" or "No" with a recall period of 2 weeks. If the child was sick, the caretaker was asked whether they sought treatment for that sickness, in which they could have also responded "Yes" or "No". If the response was 'Yes' then, a further probing question was asked to learn where they sought treatment with possible answers such as government health facility, FCHV, pharmacy (stores where they can go and buy medicines without having to see a medical professional), private health facility, Dhami/traditional healers or unknown. The next question was to know if they didn't seek treatment from a government health facility, then what was the reason. Answers were the distance, unavailability of staff, no drugs available, refusal and rude behaviour of the staff the cost and any others that led them to decide not to go the health facility nearby. A government health facility was defined as any level of facility such as the sub-health post (SHP), Health Post (HP), Primary Healthcare Canter (PHC) at the VDC level and/or the District Hospital at Gulariya and beyond.

3.4.2 Causal Analysis Questionnaire

In addition to the anthropometrical survey, in Bardiya district, a detailed household survey was conducted to assess causal factors influencing the nutritional status of children. A questionnaire was developed covering topics around water and sanitation, food consumption, child health and nutrition related behaviour. The questionnaire is included in the Annex D.

Household Information

This section covered the general socio-economic background of the household, such as family size, number of children under 5 years of age, educational level of the parent, principle means of livelihood, ownership of land and domesticated animals. As proxy indicators for the economic status of the household the general status of the house was observed including construction materials of the floor, walls and roof.

Water and Sanitation

Questions regarding source of drinking water, possible water treatment methodologies and hygiene practices were enquired e.g. hand washing practices, usage of soap and latrine utilisation.

Food Consumption and Security

The food consumption patterns of the surveyed households were investigated. The household head was asked about food groups eaten the day before, number of meals and additional snacks consumed and which animal products are usually eaten from own livestock. In case the household experienced a food shortage within the last year the exact months of that food shortage was investigated.
General information on the caste/ethnicity and religion of the household was also collected, however difficulties were experienced when to differentiate and categorize some of the sub-groups/ castes.

Child Health and Nutrition

In the regard to child health and nutrition related behaviour information was collected on breastfeeding practices e.g. time of first attachment to the breast after birth, provision of colostrum, time and reason of weaning and type of weaning foods given. Another focus lied on feeding practices during periods of illness and prevalence of diarrhoea within the last two weeks.

4. TRAINING AND SUPERVISION

Teams were trained for the survey and each team consisted of at least 4 members – two measurers, one interviewer and a team leader. One FCHV from the respective ward (of the cluster selected) accompanied most of the teams, but this was not mandatory. The FCHV was briefed on sampling methodology by the survey team on the morning of the survey in her ward. There was at least one male and one female on each team and all of the interviewers were female.

The nutritional team members attended a three day training conducted in the DHO Training Hall, Gulariya. The training sessions focused on anthropometric measurement and enabled each trainee to practice in the classroom and also in the community. Attention was given in training on standardization of instruments and data recording. The anthropometric team members were also trained for completing the four health seeking behaviour questions and the interviewer was given specific training on the additional causal analysis questionnaire. The team leaders were specifically trained on quality assurance techniques. The training also covered a basic introduction to Concern Worldwide, introduction to the community based management of acute malnutrition program proposed for Bardiya, explanation of the rationale for the survey and methodology, basic interview skills and sign and symptoms of malnutrition.

A practical classroom anthropometric measurement training session (standardization test) took place and the survey teams were able to measure at least five children each and compare their results with the measurements of a trainer expert. An error rate calculation was performed. The teams offered constructive criticism or positive feedback on measurement techniques for other teams during this session.

A practice survey day took place on the 3rd day of the training, in an area outside of the chosen clusters after the theoretical and practical classroom sessions were completed. The teams were accompanied and supervised by the Trainers/Managers during the test day and data collection forms were slightly modified for proper understanding in the context of Bardiya.

During the actual survey, each team checked their data collection sheets before leaving from the area on completeness and errors. Each day a debriefing session was conducted between the managers and team leaders and all data collected that day was reviewed for legibility, mistakes and the necessary clarifications made immediately.

5. DATA ANALYSIS

Nutrition teams returned data collections forms for one cluster daily during debriefing sessions with the nutrition supervisor. Data entry into the ENA database and EPI Info (additional causal analysis questionnaire) was entered by only the two nutritional survey managers.

5.1 Indicators and Formulae

5.1.1 Acute Malnutrition

The main indicator of nutritional status used throughout this report is weight-for-height, which assesses how thin the sample population is relative to their height, compared with a reference population (in this case the World Health Organization 2005 standards are used and in addition NCHS references were used for reasons of comparability)10. Weight-for-height is expressed either in Z-score or percentage of the median. The Z-score index is usually used to measure prevalence of malnutrition at population level, while percentage of the median is used to assess the nutrition status of individuals. The classification of GAM (Global Acute Malnutrition), moderate acute malnutrition and SAM (Severe Acute Malnutrition) using Z-score and percentage of the median are as follows:11

[10] There will be additional analysis based on the NCHS 1977 references but only for informational purposes and it will be included in a separate section. The recommendations from the survey are based on the WHO standards.

[11] Any children with oedema, regardless of their weight-for-height are classified as severely malnourished.

Table 6 Classification of the Nutritional Status using Z-score and % Median

	% of the median (using NCHS references only)	Z-scores (using WHO standards and NCHS references)
Global Acute Malnutrition	<80% and/or edema	<-2 and/or edema
Moderate Acute Malnutrition	<80% to ≥70%, no edema	<-2 and ≥-3, no edema
Severe Acute Malnutrition	<70% and/or edema	<-3 Z-score and/or edema

The weight for height index is the most appropriate index to quantify wasting in a population in situations where acute forms of malnutrition are the predominant pattern. However the mid-upper arm circumference (MUAC) is a useful tool for rapid screening of children at a higher risk of mortality. As well, MUAC will be used as the primary screening tool and admission criteria for the CMAM program. MUAC measurements should are presented and analyzed for all children included in the survey from 6 to 59 months.

Table 7 Classification of the Nutritional Status using MUAC

Adequate nutritional status	MUAC ≥ 13.5 cm
Risk of malnutrition	MUAC 12.5 to 13.4 cm
Moderate acute malnutrition	MUAC ≥11.0 to < 12.5 cm
Severe acute malnutrition	MUAC <11.0 cm

5.1.2 Chronic Malnutrition

Children who have a low height-for-age (HFA) are considered stunted. Measuring the height of a child in relation to a standard child of the same age gives an indication of the growth of a child. HFA is usually used as an indicator for chronic malnutrition. Age is difficult to obtain accurately and errors in age strongly influence the results for HFA/chronic malnutrition. HFA analysis is reported on a smaller sample of children than the WFH as only children with confirmed age were included.

7. RESULTS

7.1 Anthropometric results

The anthropometric nutritional survey was conducted in Bardiya District over 8 days from May 19-27 and included a three days training in Gulariya from 16-18 May, 2008. No substitutions of clusters needed to happen due to security restraints and/or any other adverse events.

Data was analyzed from a total of 961 children. 8 children were not measured in chosen households due to temporary absence. In each of these cases the survey team attempted to revisit the household within the same day, but the child was not available. 33 children were not measured in chosen households due to permanent absence. Only one caretaker refused to permit the survey team to measure a child within the selected household. The caretaker reported that the child had sustained an injury earlier in the day leaving the child

traumatized. No children were absent from the household due to attendance or admission to a hospital or health center. Nine records were excluded from all children measured due to errant data.

The following analyses are based on data from 961 children aged 6-59 months.

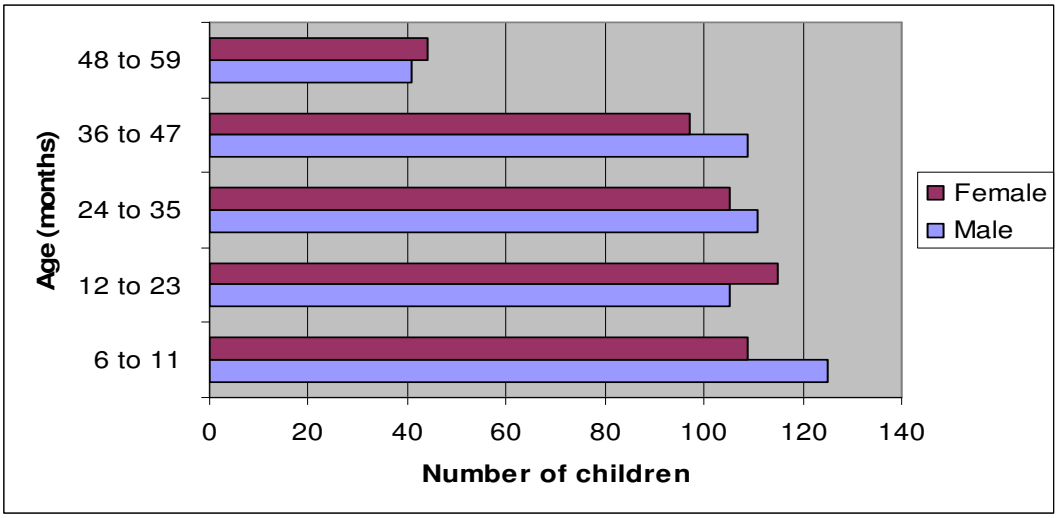
7.1.1 Age and sex distribution of the sample population

The age and sex distribution of the sample population is illustrated in Table 8 and Figure **3**
The sex-ratio (males/females) is well balanced.

Table 8 Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy: Girl
6-17 months	125	53.4	109	46.6	234	24.3	1.1
18-29 months	105	47.7	115	52.3	220	22.9	0.9
30-41 months	111	51.4	105	48.6	216	22.5	1.1
42-53 months	109	52.9	97	47.1	206	21.4	1.1
54-59 months	41	48.2	44	51.8	85	8.8	0.9
Total	491	51.1	470	48.9	961	100.0	1.0

Figure 3 Age and sex distribution of the sample population



7.1.2 Anthropometric analysis: WHO standard, Z-score

Table 9 Prevalence of acute malnutrition by sex, based on w/h z-scores and/or oedema (WHO)

	All n = 961	Boys N = 491	Girls n = 470
	(95%CI)	(95%CI)	(95%CI)
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(156) **16.2 %** (12.6 - 19.9)	(89) 18.1 % (13.1 - 23.2)	(67) 14.3 % (10.3 - 18.2)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(129) **13.4 %** (10.3 - 16.5)	(69) 14.1 % (9.8 - 18.3)	(60) 12.8 % (9.1 - 16.5)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(27) **2.8 %** (1.5 - 4.2)	(20) 4.1 % (2.1 - 6.1)	(7) 1.5 % (0.6 - 2.4)

The prevalence of oedema is 0.1 %

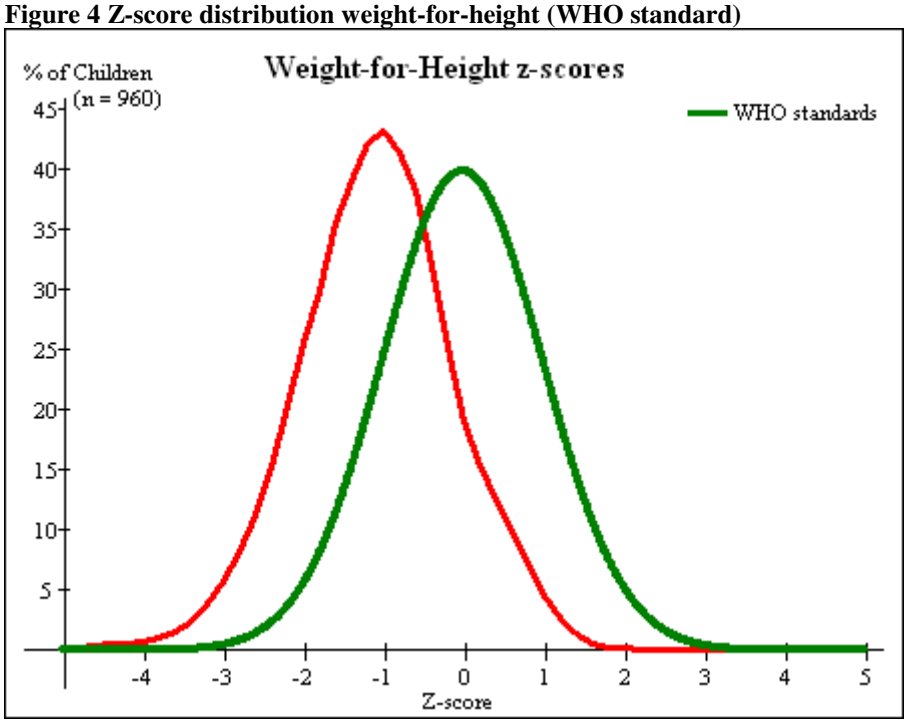
Table 10 Prevalence of acute malnutrition by age, based on w/h z-scores and/or oedema (WHO)

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mths)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	234	11	4.7	39	16.7	183	78.2	1	0.4
18-29	220	8	3.6	29	13.2	183	83.2	0	0.0
30-41	216	3	1.4	26	12.0	187	86.6	0	0.0
42-53	206	2	1.0	27	13.1	177	85.9	0	0.0
54-59	85	2	2.4	9	10.6	74	87.1	0	0.0
Total	961	26	2.7	130	13.5	804	83.7	1	0.1

Table 11 Distribution of acute malnutrition and oedema based on w/h z-scores (WHO)

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 1 (0.1 %)
Oedema absent	Marasmic No. 26 (2.7 %)	Normal No. 934 (97.2 %)

Figure 4 Z-score distribution weight-for-height (WHO standard)



The displacement of the WHZ sample curve to the left side of the reference curve indicates a less than average nutritional situation in the surveyed population. The mean of the sample is at -0.65 Z-scores, and the Standard Deviation (SD) is 0.974. The SD is within the interval of 0.85 and 1.10, which shows a normal distributed population.

7.1.3 Anthropometric Analysis: NCHS Reference

Table 12 Prevalence of acute malnutrition z-score, NCHS Reference

		Z-score
Prevalence of global malnutrition (<-2 z-score and/or oedema)	95%CI	(n=162) 16.9 % (13.1 - 20.6)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	95%CI	(n=152) 15.8 % (12.3 - 19.4)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	95%CI	(n=10) 1.0 % (0.3 - 1.8)

Table 13 Prevalence of acute malnutrition % median, NCHS Reference

	% median
Prevalence of global acute malnutrition (<80% and/or edema)	(n=75) 7.8 % (5.6 - 10.0 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(n=71) 7.4 % (5.3 - 9.5 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or edema)	(n=4) 0.4 % (-0.1 - 0.9 95% C.I.)

7.1.4 Anthropometric Analysis: Mid Upper Arm Circumference (MUAC)

According to MUAC criteria, 0.62% of the children surveyed are severely malnourished, 10.2% are moderately malnourished, 27.89% are at risk of malnutrition and 61.29% have adequate nutritional status.

Table 14 MUAC distribution of surveyed population

	MUAC (cm)	Number of Children	
Severe Acute Malnutrition	<11.0	6	0.62%
Moderate Acute Malnutrition	≥ 11.0 to < 12.5	98	10.2%
Risk of Malnutrition	12.5 to 13.4	268	27.89%
Adequate Nutritional Status	≥ 13.5	589	61.29%
	TOTAL	961	100%

7.2 Results of health seeking behavior questionnaire

Four health seeking behavior questions were asked by the anthropometric team to each caretaker of children included in the anthropometric data collection portion of the survey. Data on health seeking behaviour for sickness during the two weeks before the interview was collected by asking caretakers of all 961 children included in the sample (see Annex (B) for actual questionnaire and codebook).

Table 15 Prevalence of illness in the two weeks preceding the interview

	Number of children	Percent
No	807	84%
Yes	154	16%
Total	961	100.0%

Did the caretaker seek medical treatment for this illness episode?

Table 16 Proportion and number of children receiving medical treatment during illness in two weeks preceding the interview

	Number of children	Percent
Child was sick and did seek medical treatment	133	86.4%
Child was sick and did not seek medical treatment	21	13.6%
Total children sick in the last 2 weeks	154	100%

Of those children who were sick (n=154) 21 or 13.6% of caretakers did not seek medical treatment.

If the caretaker did seek medical treatment for the sick child, where did they seek treatment?

Table 17 Medical Facility used during last illness

	Number of children	Percent
Government Health Facility	22	16.5%
Female Community Health Volunteer	2	1.5%
Pharmacy	48	36.1%
Private Health Facility	58	43.6%
Dhami (traditional healer)	1	0.8%
Other, Specify	1	0.8%
No Answer	1	0.8%
Total	133	100%

The one child included in the "Other" category was of a caretaker who specifically mentioned that he/she took their sick child to India for treatment.

If the caretaker did not seek treatment for the child at a government health facility, then what was the reason?

Table 18 Reason for not going to a government health facility

	Number of children	Percent
Distance to the treatment	32	28.8%
No staff available at the Government HF	2	1.8%
No drugs available at the Government HF	65	58.6%
Government HF staff refuse to treat some patients	0	0%
Government HF staff receive patients in a rude manner	0	0%
Government HF was closed	4	3.6%
Must wait too long for treatment at the Government HF	1	0.9%
FCHV handled the treatment of the child adequately	2	1.8%
Price of treatment at the Government HF	0	0%
Other, Specify	1	0.9%
Caretaker does not know	3	2.7%
No answer	1	0.9%
Total	111	100%

As 22 caretakers did seek treatment for their child at the government health facility the total number accessing other facilities were 111. The caretaker of the one child included in the "Other" category stated that he/she believed private care to be better than the government health facility, but did not give a specific reason however; the caretaker did not seek treatment for the child in the government health facility because of two major reasons such as distance and the unavailability of the drugs.

28 children were identified as severely acute malnourished according to WHZ, MUAC or oedema criteria. 8 of these children were sick in the past two weeks. Only 6 caretakers sought treatment for their sick children. All of them were brought to private health facilities or pharmacies.

Table 19 Health seeking behavior of severely acute malnourished children

Child #	SAM according to what criteria	Did the caretaker seek treatment?	Where did the caretaker seek treatment?	Why did the caretaker not take the child to a Gov HF?
1	MUAC and WHZ	No		
2	WHZ	Yes	Private HF	No drugs at Gov HF
3	MUAC and WHZ	Yes	Private HF	No drugs at Gov HF
4	WHZ	Yes	Pharmacy	Does not know
5	WHZ	No		
6	WHZ	Yes	Private HF	Must wait too long at the Gov HF
7	WHZ	Yes	Pharmacy	Distance to Gov HF
8	Oedema	Yes	Private HF	No drugs at Gov HF

7. 3 Contextual Analysis of Nutrition Status

A total of 280 questionnaires were collected during the survey period with an average of 9 questionnaires completed per cluster. The questionnaire has four major components with few questions as follows;

Household size was asked of all households selected for the additional causal analysis interview. Overall household size ranged from 3 to 29 with an average (mean) household number of 8.7 and the median was 8 persons.

Children under the age of five in the households selected for additional causal analysis questionnaire had a mean of 1.5 and a median of 1.

7.3.1 Water and Sanitation

The sample population was asked about the location where they obtained their drinking water during the dry season and the rainy season. The information for all respondents did not change according to the season. Piped drinking water (tap stand) systems (whether private or public) were not found in Bardiya in the areas surveyed (note: municipality wards were excluded from the survey).

Table 20 Proportion of households using water from a certain source during the dry and rainy season

	Number of Respondents	Percent
Tube well/ borehole/ treadle pump - Public	31	11.1%
Tube well/ borehole/ treadle pump - Private (in own household or compound)	209	74.6%
Tube well/ borehole/ treadle pump - Private (outside of household or compound / neighbour)	39	13.9%
Unprotected well	1	0.4%
Total	280	100.0%

The respondents were then asked whether they did anything to the water to make it safer to drink (i.e. filter, water purification). Only 5 out of 280 respondents actually do something to the water to make it safer to drink, one household uses a ceramic filter before drinking the water and the other 4 respondents use chlorine treatment before drinking. Out of these five respondents who treated the water, four persons took their drinking water from a tube well/ borehole/ treadle pump - private (in own household or compound) and one person took their water from an unprotected well (this person used chlorine treatment on the water).

Table 21 Proportion of household making water safer to drink before consumption

	Number of Respondents	Percent
No, nothing is done to make the water safer to drink	275	98.2%
Yes, something is done to the water to make it safer to drink	5	1.8%
Total	280	100.0%

Selected households were then asked where members over the age of 5 and under the age of 5 defecate. The majority of households (57.1%) had persons over the age of five using

the open field/jungle/house yard, roadsides and very few (2.1%) used a closed latrine within their own household or compound. As well, most respondents (96.1%) reported that the children under the age of five within their households used the open field/jungle/house yard or roadsides. Very few respondents stated that persons over or under the age of five used a pond, lake, river or stream for the purposes of defecation, but it should be noted that during the course of the survey it was found that many persons within the communities do use the area close by or within 10 -20 meters of a body of water for purposes of defecation, but the respondents considered this open field because they did not defecate "in" the pond, lake, river or stream.

Table 22 Proportion of households using a certain location for defecation for household members over the age of five

	Number of Respondents	Percent
Closed latrine in own household or compound	6	2.1%
Closed latrine outside of household or compound	53	18.9%
Open latrine/toilet	54	19.3%
Open field/jungle/house yard, roadsides	160	57.1%
Pond, lake, river, stream	6	2.1%
No answer	1	0.4%
Total	280	100.0%

Table 23 Proportion of households using certain location for defecation for household members under the age of five

	Number of Respondents	Percent
Closed latrine in own household or compound	0	0.0%
Closed latrine outside of household or compound	5	1.8%
Open latrine/toilet	3	1.1%
Open field/jungle/house yard, roadsides	269	96.1%
Pond, lake, river, stream	2	0.7%
No answer	1	0.4%
Total	280	100%

Respondents were then asked when they washed their hands. All households (n=280) responded to this question. The survey team only asked the respondents an open ended question and did not prompt them to respond to the different listed categories. The respondents usually stated that they washed their hands before eating (95.7%), after using the latrine (98.9%) and before cooking (68.2%). The respondents had a much lower frequency of washing their hands after attending to a child who had defecated (13.9%) and before breastfeeding their child (11.8%).

Table 24 Occasions when hand washing is practiced

	Yes, hands were washed	%	No, hands were not washed	%	Does not know	Percent
Before cooking	191	68.2%	88	31.4%	1	0.4%
Before eating	268	95.7%	11	3.9%	1	0.4%
After using Latrine	277	98.9%	2	0.7%	1	0.4%
After attending to a child who defecated	39	13.9%	240	85.7%	1	0.4%
Before breastfeeding	33	11.8%	246	87.9%	1	0.4%

Table 25 Cleaning material used for hand washing at surveyed households

	Number of Respondents	Percent
Soap	147	52.5%
Plain Water	48	17.1%
Ash	75	26.8%
Soil/Clay	8	2.9%
No answer	2	0.7%
Total	280	100.0%

7.3.2 Child Health and Nutrition

The interviewers from the Concern Worldwide team interviewed respondents in households that had already been selected for anthropometric measurements and having children aged 6 months – 30 months. In total, caretakers of 280 children were interviewed about child health and nutrition practices.

Table 26 Distribution of sex of sampled children 6 months – 30 months

Sex of Child	Number of children	Percent
Male	140	50.0%
Female	140	50.0%
Total	280	100.0%

Out of these 280 children (aged 6 months – 30 months) 94.3% of them were still being breastfeed to some degree. Only 5.4% (n=15) were not breastfeed. Of these 15 children 9 of them were under the age of 24 months and 6 of these children were 24 months to 30 months.

Table 27 Proportion of children aged 6 – 30 months breastfed at the time of the interview

	Frequency	Percent
NO	15	5.4%
YES	264	94.3%
No answer	1	0.4%
Total	280	100.0%

Of those children who were not breastfed at the time of the interview the respondents reported that the breastfeeding discontinued because of new pregnancy (9), death of the mother (4), mother went to live abroad (1) and mother stated that she had "bad milk- not lactating well" (1).

The next question asked how long after birth did the mother first put the child to breast. 40.7% of the mothers put the baby to the breast within one hour of birth. 12.1% (n=34) of the mothers waited at least 24 hours to offer the child breast milk.

Figure 5 Time elapsed from time of birth until child was given breast milk

13.9% of respondents stated that they did not give the baby the colostrum or first milk. Of these 39 "No" responses majority of women put the child to the breast within two days making provision of colostrum likely without mothers being aware. In the questionnaire it was not further investigated whether the colostrum was expressed prior the child's first attachment to the breast.

Table 28 Number of children who were given colostrum (first milk)

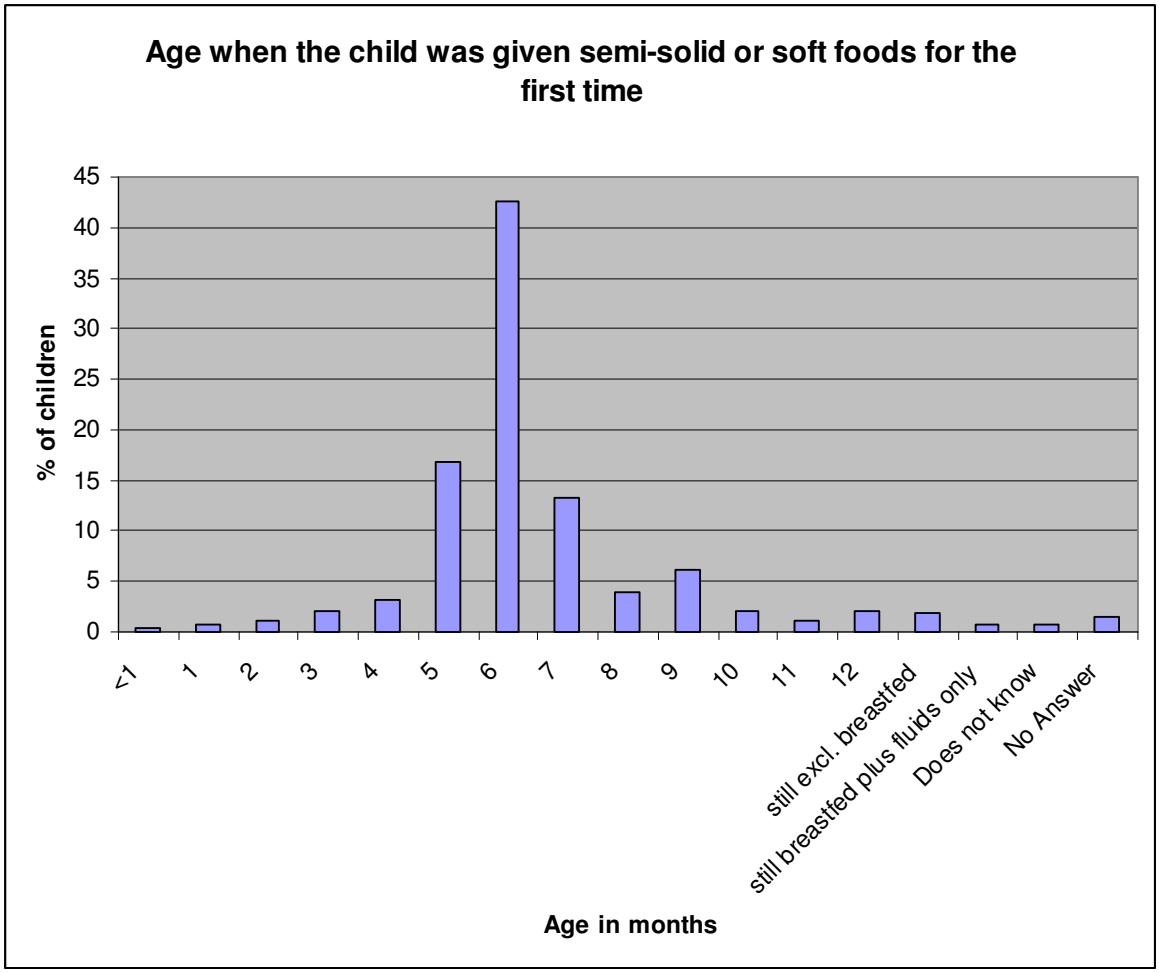
	# of children	Percent
No	39	13.9%
Yes	240	85.7%
No Answer	1	0.4%
Total	280	100.0%

Respondents were then asked for how long they exclusively breastfed the child. 13.2% (n=37) babies were only exclusively breastfed until one month of age. 26.8% (n=75) of the children were breastfed exclusively, as stated by respondents, until the age of 6 months.

These following exclusive breastfeeding results should be read with caution. Before asking this question, the interviewers explained to the respondents the exact definition of "duration of exclusive breastfeeding": the time that the baby ingested only breast milk - no other liquid (including water) or food. Many respondents were confused about this definition as they believed that as long as they did not introduce food or liquid (not including water) the child could be considered exclusively breastfed. So, for example, they would report that their child was breastfed for six months even if they began giving water to the child at 2 months of age. In conclusion, there is a misconception about the meaning of exclusive breastfeeding in relation to the introduction of water.

Figure 6 Age when the child was stopped being exclusively breastfed

Figure 7 Age when the child was given semi-solid or soft foods for the first time



24.3% (n=68) respondents stated that they gave semi-solid or soft foods to the child in question before 6 months of age. Majority of children (42.5%, n=119) were introduced to semi-solid or soft foods at the right age of 6 months.

The next group of questions addresses the care activities of the caretakers in the households surveyed.
When you leave your home to take care of daily activities (work, market, water, etc.) what do you usually do with the child?

Table 29 Alternate Care Taker when Mother leaves home

	# of responses	Percent
Child comes with the respondent every time	60	21.4%
Child stays at home alone	2	0.7%
Child stays with mother-in-law/grand mother of the baby	155	55.4%
Child stays at home with siblings older than 15	14	5.0%
Child stays at home with siblings younger than 15	23	8.2%
Child stays at home with father	4	1.4%
Other, specify	22	7.9%
Total	280	100.0%

Table 30 Person looking after the child most of the time

	# of Responses	Percent
Mother	188	67.1%
Mother-in-law/Grandmother of the baby	79	28.2%
Grandfather	3	1.1%
Siblings older than 15	3	1.1%
Siblings younger than 15	4	1.4%
Other women in the village (i.e. FCHV)	1	0.4%
Other, Specify	2	0.7%
Total	280	100.0%

Table 31 Person normally feeding the child

	# of Responses	Percent
Mother	145	51.8%
Mother-in-law/Grandmother of the baby	44	15.7%
Father	2	0.7%
Grandfather	2	0.7%
Siblings older than 15	2	0.7%
Siblings younger than 15	6	2.1%
Child eats by itself	73	26.1%
Other, Specify	3	1.1%
No Answer	3	1.1%
Total	280	100.0%

Table 32 Person providing advice to the caretaker on child caring practices

	# of Respondents	Percent
Mother	81	28.9%
Mother-in-law/Grandmother of the baby	74	26.4%
Father	53	18.9%
Grandfather	4	1.4%
Other women in the village	57	20.4%
Does not know	3	1.1%
Other, Specify	7	2.5%
No answer	1	0.4%
Total	280	100.0%

The below responses were included to investigate the pattern of feeding during an illness episode. The questions specifically focused on diarrhoea instead of asking the respondent to give responses on any illness experienced by the child during the last 2 weeks.

Table 33 Diarrhoea Prevalence among children within last two weeks

	# of children	Percent
No	167	59.6%
Yes	113	40.4%
Total	280	100.0%

Table 34 Provision of foods during the last illness period (diarrhoea)

	Frequency	Percent
More than usual	12	10.6%
Same as usual	15	13.3%
Less than usual	66	58.4%
Not at all	16	14.2%
Does not know	1	0.9%
No Answer	3	2.7%
Total	113	100.0%

Two of the respondents who did not give any food during the illness period (diarrhoea) were still exclusively breastfeeding their children.

Table 35 Provision of drinks during the last illness period (diarrhoea)

	Frequency	Percent
More than usual	15	13.3%
Same as usual	11	9.7%
Less than usual	47	41.6%
Not at all	36	31.9%
Does not know	1	0.9%
No Answer	3	2.7%
Total	113	100.0%

Table 36 Provision of breast milk during the last illness period (diarrhoea)

	Frequency	Percent
More than usual	42	37.2%
Same as usual	22	19.5%
Less than usual	35	31.0%
Not at all	7	6.2%
Does not know	1	0.9%
No Answer	6	5.3%
Total	113	100.0%

Out of the seven respondents who responded "Not at all" four are currently not breastfeeding their child regardless of illness or not and two of the respondents who responded "No Answer" are currently not breastfeeding their child regardless of illness or not.

8. DISCUSSION AND RECOMMENDATIONS

Anthropometric Analysis:

In comparison to the nutrition surveys conducted by ACF in preparation of their CMAM pilot projects the nutritional situation in Bardiya district is critical (as per WHO classification) but better off than in Kanchanpur (terai), Humla (mountains) and Mugu (mountains) districts.

Table 37 Malnutrition prevalence of the CMAM pilot districts in comparison (WHO, z-score)

	Kanchanpur Survey ACF May 08	Humla/Mugu Survey ACF May 08	Mugu Survey ACF May 08	Bardiya Survey Concern May 08
GAM	17.0%	19.6%	26.6%	16.2%
SAM	3.3%	3.6%	7.1%	2.8%

Recommendation 1: An intervention to prevent and treat acute malnutrition in Bardiya district is justifiable. GAM levels are relatively low in comparison to other CMAM pilot districts. However total number of children affected is expected to be higher in Bardiya due to high population density.

Anthropometric Analysis: WHO Standards versus NCHS References

The 2006 released WHO growth standards relate to how a child worldwide develops under optimal conditions. These new standards are supposed to replace the NCHS references developed 1978 by the National Centre for Health Services, Centre for Disease Control and WHO. The implication of introducing the new 2006 WHO standards to the practical implementation and monitoring of nutrition programmes in development and emergency context is highly discussed among nutrition practitioners.

Secondary data analysis12 of conducted nutrition surveys show that WHO standards using z-score increase the number of children (>67.5 cm) diagnosed with global acute and severe acute malnutrition and decrease the GAM and SAM prevalence of children (>67.5 cm) if % median is used.

At the moment, the NCHS references and the WHO standards are used to describe the nutritional situation of a surveyed area with four prevalences of huge differences (WHO: z-score, % median and NCHS: z-score, % median). This has led to difficulties in comparing nutrition survey results, its interpretation and in project planning.

The z-score is usually used for surveys to describe a population's nutritional status whereby the % median is in use for admission of children into nutritional programmes, for discharge and for calculating the overall caseload of programmes during planning phase.
With the WHO standards (z-score) higher GAM and SAM prevalence is detected during

[12] Andrew Seal, Marko Kerac: Operational implications of using 2006 World Health Organization growth standards in nutrition programmes: secondary data analysis; BMJ,doi.10.1136/bmj.39101.664109.AE, published 23.02.2007; http://bmj.com/cgi/content/full/334/7596/733

surveys but when % median is used for admissions actually fewer children are admitted into the programme, with shorter treatment time in comparison to when NCHS references are used.

Table 38 Differences in malnutrition prevalence using different standards/references

	Surveyed Prevalence using **WHO** Standard, **z-score**	Surveyed Prevalence using **NCHS** Reference, **z-score**	Expected Admission using **NCHS** Reference, **% median**	Expected Admission using **MUAC**
GAM	(n=156) 16.2 %	(n=162)16.9 %	(n=75) 7.8 %	(n=104) 10.8%
SAM	(n=27) 2.8 %	(n=10) 1.0 %	(n=4) 0.4 %	(n=6) 0.6%

When using the above SAM prevalences and linking them with the total expected population of under five year olds in Bardiya district the following case loads could be expected for CMAM using the different standards/references (expected number of children in Bardiya district below 5 years of age is 47,789):

Table 39 Differences in number of children classified as malnourished using different standards/references

	Surveyed Prevalence using **WHO** Standard, **z-score**	Surveyed Prevalence using **NCHS** Reference, **z-score**	Expected Admission using **NCHS** Reference, **% median**	Expected Admission using **MUAC**
GAM	7,741	8,076	3,728	5,161
SAM	1,338	478	191	287

The differences in malnutrition prevalence found in the Bardiya nutrition survey using WHO standards and NCHS standards are in line with the findings of Seal and Kerac when doing secondary data analysis. For the CMAM project the findings influenced the planning process at different stages:

- The selection of the pilot district was done based on the WHO GAM and SAM prevalence found using z-score. With a GAM prevalence of 16.2% Bardiya district is classified as in a critical stage[13]. The GAM prevalence using the NCHS reference is even higher with 16.9%. However the CMAM project is focusing on the treatment of severe malnourished children and therefore the SAM prevalence was considered to be most important for the selection of the pilot district. Whereby the SAM prevalence using WHO z-score is high with 2.8%, the NCHS reference indicates a rather low SAM prevalence with 1.0%.
- The expected case load for the Bardiya CMAM pilot using % median lies between 143 (WHO standard) and 191 (NCHS reference). However CMAM guidelines recommend using MUAC for active case finding and referral indicating an expected case load of 287.
- Calculation of required financial resources and quantities of plumpy nut needed for treatment are based on the high SAM prevalence found during the survey using

[13] WHO classification of wasting: weight for height z-score <-2 of 5% is acceptable, 5-9.9% is poor, 10-14.9% is serious and >=15% is classified as critical

WHO z-score (1,338 children). However admission will take place using MUAC and therefore actual children admitted into the CMAM programme for treatment are most likely to be much lower leaving resources unutilized and/or unavailable for other districts in greater need.

- The number of OTP sites required for treatment of uncomplicated severe malnourished children is based on WHO z-score SAM prevalence found during the survey. The much higher numbers might have led to an overestimation of the number of OTP sites required for the actual number of severe cases.
- The required in-patient treatment capacity for complicated severe malnourished children is influenced by the same.
- The CMAM is a pilot project and performance indicators are therefore crucial to develop recommendations for a possible national role out of the programme. The high SAM prevalence rate using WHO z-scores might negatively impact the actual coverage of the CMAM pilot achieved.

Health Seeking Behavior and Definition of Illness:

16% of the respondents to the health seeking behavior question "Has your child been sick in the past 2 weeks?" stated "yes" whereby 40% of the respondents to the detailed causal analysis question "Has your child had diarrhoea in the past 2 weeks?" stated "yes". It is possible that mothers do not consider diarrhoea as a reportable illness in need for treatment but rather a normal condition. Also the methodology could have led to biased results. Asking a leading question such as "has your child had diarrhoea in the last 2 weeks" may lead the respondent to answer "yes" more often than asking about general illness as it triggers their recall.

However the majority of children considered to be sick within the last two weeks were brought for medical treatment. It would be interesting to know for what illnesses the children were actually treated and how many had diarrhoea.

Recommendation 2: As part of the CMAM pilot project discussions with FCHV could bring more clarity into the issue of possible under-reporting of diarrhoea. Through FCHVs CMAM should include activities to improve mother's skills in detecting possible illnesses of their children in need for medical treatment specifically danger signs of diarrhoea and dehydration as already covered by CB-IMCI.

The majority of children brought for medical treatment were seen by a private health practitioner or by a pharmacist due to the opinion that at governmental health facilities drugs are not available or due to distances. The same health seeking behavior was found among the sick severe malnourished children brought for medical treatment. Not one of the severe malnourished sick children was brought to a government health facility for treatment.

Recommendation 3: The CMAM pilot project is designed to provide nutritional treatment to severe malnourished children only through government institutions such as FCHV, SHP, HP and the regional hospital. It therefore is crucial to improve quality of government health services and perception of the population to ensure severe malnourished children are brought to the available services.

Recommendation 4: The inclusion of private health service providers and pharmacies into the CMAM pilot project should be considered at least for the MUAC assessment and referral to the nearest OTP or NRH.

The community's perception of the quality provided at the government health facilities is very low. As part of the CMAM pilot project general health service performance improvement has to be looked at. The pilot project period will most likely not be sufficient to rebuild people's trust into government services but could set off a positive development.

Recommendation 5: A participatory quality monitoring scheme could help to improve quality of services provided, to increase community's ownership of government services and motivate health facility staff through received feedback and acknowledgement.

Child health and nutrition

According to the survey results the assessed breastfeeding and weaning behavior indicates quite good practices. However there seems to be a clear misunderstanding of what "exclusive breastfeeding" stands for and what colostrum actually is. In the Nepal context water is normally not considered as fluid and therefore a child receiving only water in addition to breast milk is still considered as being exclusively breastfed. The survey did not sufficient detail behavior around provision of colostrum. Nearly all mothers who stated they did not provide colostrum to the child started breastfeeding within 48 hours and therefore it can be assumed that the child actually received colostrum if the first milk was not expressed by hand prior to the child's first attachment. However this information was not collected.

Recommendation 6: The nutrition education package of CMAM should pay special attention to reduce the practice of providing water during periods of exclusive breast feeding and FCHV, TBAs and midwives should focus at changing care taker's behavior in this regard. In addition definition and importance of providing colostrum to the newborn should be highlighted during counseling of mothers.

Recommendation 7: The reasons behind providing water to the child during periods where exclusive breastfeeding should be practiced should be further explored in an anthropological assessment. Believes and knowledge around colostrum should also be included in such an in-depth study.

The nutrition survey revealed the important role mothers-in-law, grand mothers and other women in the village play when it comes to child care. They are mainly involved when the mother is out of the house and is not taking the child with her, when it comes to replace the mother during feeding and general caring time. Even though fathers are not much involved in direct caring activities in 18.9% they are providing advice to the mother on caring practices.

Recommendation 8: The CMAM pilot project therefore needs to include not only all women in the village into nutrition activities but also should provide guidance to fathers to enable them giving improved advice to their wives particularly important in male dominated societies/ castes.

In 21.4% of the time mothers carry their children when going for outside activities e.g. market, field work. During this time child appropriate feeding is most likely difficult to

achieve. More information is required to understand better the level of risky behavior in this practice. For children once admitted to the OTP the ready-to-use character of the plumpy nut will be an asset and mothers most likely will appreciate exactly this.

Recommendation 9: During the CMAM pilot a ready-to-eat snack able to produce at household level using local ingredients should be developed suitable for feeding children during outside house activities.

Water and Sanitation;

A majority of the respondents to this survey stated that they used either private or public tube well, borehole or treadle pumps with the majority of them having this save water source in their own compound.

Only 5 out of 280 respondents actually treated the water to make it safer to drink, 1 household uses a ceramic filter before drinking the water and the other 4 respondents use chlorine treatment before drinking. Out of these five respondents who treated the water, 4 of the persons took their drinking water from a tube well/borehole/treadle pump - private (in own household or compound) and one person took their water from an unprotected well (this person used chlorine treatment on the water).

As most of the people using drinking water from a save water source the low number of them treating the water seems an acceptable practice. More worrying is the hand washing behaviour. Hand washing is commonly practiced before eating (95.7%) and after latrine use (98.9%) and 82% of them are using soap, ash or soil however only 13.9% of them wash their hands after attending a child who defecated. Linking this with the fact that only 68.2% of them practice hand washing before cooking there might be a high chance of having bacteria transmitted from children's stool to the food chain via mothers hands.

Recommendation 10: Hygiene messages designed and used by the CMAM pilot project should pay special attention to hand washing practices after attending children who defecated and before cooking without loosing attention to the already correct and common practices.

Geopolitical:

Rajapur Delta seems to be an isolated segment of the district, which is difficult to access at all times and sometimes completely inaccessible during the monsoon season.

There were no security incidences during the course of the survey and the teams were welcomed by each and every key community leader and all household members in each cluster (ward) visited. There seems to be no hindrance to working in Bardiya at this time for international and Nepali staff. No one from the survey team expressed fear of travelling to any of the selected clusters, even along the Indian border.

Recommendation 11: Special attention to Rajapur Delta might be necessary during planning and implementing any health and nutrition intervention to make sure that it is not excluded from planned services, as it may be the most vulnerable section of Bardiya district.

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ANNEX

Annex A: Assignment of Clusters for Bardiya District Nutritional Survey 2008

Geographical unit	Population size	Assigned cluster	
Badalpur Ward 1	162	1	
Baganaha Ward 3	177	2	
Baniyabhar Ward 1	200	3	
Baniyabhar Ward 6	109	4	
Belawa Ward 5	143	5	
Bhimapur Ward 2	179	6	Randomly held in reserve
Daulatpur Ward 2	143	7	Randomly held in reserve
Deudakala Ward 3	712	8	
Deudakala Ward 7	289	9	
Dhadhawar Ward 4	325	10	
Dhadhawar Ward 8	366	11	
Dhodhari Ward 6	125	12	
Gola Ward 8	146	13	
Jamuni Ward 8	162	14	
Kalika Ward 5	178	15	
KhairiChandanpur Ward 9	174	16	
Magaragadi Ward 4	502	17	
Magaragadi Ward 9	442	18	
Mahamadpur Ward 8	372	19	
Manau Ward 9	72	20	
Manpur Tapara Ward 1	170	21	
Motipur Ward 1	151	22	
Motipur Ward 6	415	23	
Motipur Ward 9	117	24	
Neulapur Ward 3	143	25	Randomly held in reserve
Padanaha Ward 2	206	26	
Pasupatinagar Ward 2	145	27	
Patabhar Ward 4	253	28	
Patabhar Ward 9	459	29	Randomly held in reserve
Rajapur Ward 6	441	30	
Sanashree Ward 3	482	31	
Sanashree Ward 9	161	32	
Sorhawa Ward 2	280	33	
Sorhawa Ward 8	225	34	
Suryapatawa Ward 8	70	35	
Taratal Ward 9	250	36	

Annex B: Anthropometric Data Form and Code Book[14]

1. CHILD #	2. HH #	3. Name	4. Sex F or M	5. Date of Birth dd/mm/yyyy	6. Date of Birth Confirmed Y or N	7. Age in months	8. Weight (kg) ± 0.1 kg	9. Clothes on while weighing	10. Height (cm) ±0.1cm	11. Oedema (Y or N)	12. MUAC ±0.1cm	13. Sick in the last 2 weeks?	14. Seek medical treatment for this illness episode?	15. Where did they seek treatment?	16. If they did not access a gov HF, what is the reason?

[14] This form was translated into Nepalese for the actual survey.

CODEBOOK FOR THE ANTHROPOMETRIC FORM AND HEALTH SEEKING BEHAVIOR QUESTIONS

1. CHILD # jRrf ;+Vof Place the child number in this column

2. HH # 3/w'/L ;+Vof Place the household number in this column

3. Name gfd Place the name of the child to be measured here

4. Sex ln+u
Place either an 'F' for Female or a 'M' for Male in this column

5. Date of Birth hGd ldlt -ut], dlxgf, jif{_
Please convert the Date of Birth to the English Calendar

6. Date of Birth Confirmed hGd ldlt lglZrt eof] <
hGdbtf{ jf vf]ksf8{ x]/L lglZrt ug]{ .
Place a 'Y' if you visualized the vaccination or birth card or other official document. Place 'N' if you did not officially verify the date of birth

7. Age in Months jRrfsf] xfnsf] pd]/ -dlxgfdf_
If the date of birth is not confirmed, the team leader should try to estimate the age in months with the caretaker and the "Calendar of Events"

8. Weight aRrfsf] tf}n Record the weight to the closest 0.1kg.

9. Clothes on while weighing tf}n ln+bf sk8f
Codes are
'1' = ;6{ jf KofG6 shirt OR pants on while weighing
'2' = ;6{ / KofG6 shirt AND pants on while weighing
'0' = ljgf sk8f no clothes on child while weighing

10. Height jRrfsf] prfO{
Record height in centimetre to the closes 0.1cm

11. Oedema v'66f ;'lgPsf] lyof]<
(Y or N)

12.
MUAC kfv'/fsf] uf]nfO{
± 0.1cm

13. jRrf -^ b]lv %(dlxgf pd]/sf]_ ljut 2 xKtfdf s'g} lj/fdL k/]s]f lyof]<
Has this child (6 months – 59 months) in your household been sick in the last 2 weeks?
0= lyPg No 1=lyof] Yes 88=yfxf 5}g don't know

14. Did the caretaker seek medical treatment for this illness episode? Of] of] a]nfdf jRrfnfO{ s'g} pkrf/ ul/of]<
0=No ul/of]
1=Yes ul/Pg
88=don't know yfxf 5}g
99=no answer pQ/ lbGg
If Yes, then go to next question. If No, then go to the last question
99= pQ/ lbGg no answer
If Yes, then go to next question. If No, then thank the participant for their time. olb pkrf/ u/]sf]

eP o; kl5sf] s'/f ;f]Wg] gq ;xefuL ePsf]df wGojfb lbg]

15. Where did they seek treatment? pkrf/sf nflu sxfF nluof]<
1= Govt. HF ;/sf/L :jf:Yo ;+:yf
2= FCHV :jf:Yo :jod;]ljsf
3 = Pharmacy cf};wL k;n
4= Private HF gLlh :jf:Yo lgsfo
5 = Dhami (traditional healer) wfdL emf+s|L
9= Other – specify cGo eP pNn]v ug]{
88= don't know yfxf 5}g
99= no answer pQ/ lbGg
If the answer is "1" then you have completed the survey and thank the participant for their time olb pQ/ ! ePdf ;e]{If0fsf] sfd ;lsof] . ;do lbPsf]df wGojfb lbP/ ljbf x'g'xf]; tf/ afFls cGo s'g} eP clGtd k|Zgdf hfg'xf]; .

If the answer is any other code then go to last question

16. If they did not access a Govt. HF, what is the reason? olb ;/sf/L :jf:Yo ;+:yfdf gnu]sf] eP sf/0f s] xf] <
1 = distance to treatment 6f9f jf ef}uf]lns b'/tf
2 = No staff at HF sd{rf/L gx'g'
3 = No drugs at HF cf};lwsf] cefj
4 = Facility staff refuse to treat some patients sd{rf/Ln] pkrf/ ug{ gdfGg'
5=Facility staff receive patients rudely sd{rf/Lsf] ?vf] Aoaxf/ x'g'
6= Facility was closed :jf:Yo ;+:yf aGb x'g'
7= Have to wait too long for treatment at the facility w]/} nfdf] ;do;Dd kv{g' kg]{
8=FCHV handled the treatment adequately ;]ljsfn] g} /fd|;+u pkrf/. ug{'
9= Price of treatment vr{ w]/} nfUg'
10=Other (specify in the space) cGo eP pNn]v ug]{
88=don't know yfxf 5}g
99=no answer pQ/ lbGg

Appendix C: Calendar of Events for Bardiya District

Month	Events	Year									
		2003 / 2060		2004 / 2061		2005 / 2062		2006 / 2063		2007 / 2064		2008 / 2065	
January	Khar Katne/Park Maghi Festival ThakurDwara Mela				52		40		28		16		4
February	Winter				51		39		27		15		3
March	Holi Festival				50		38		26		14		2
April	Ram nawami Chaite Dashain				49		37	Cease-fire by political parties/Maoists	25		13		1
May	Start harvest wheat/barley Bedding/ Rice Nnursery				48		36		24	1st adjournment of elections Major Flood in Bardiya	12		0-1
June	Start cropping rice Rainy season		59		47		35		23		11		
July	Rice Planting Rainy season		58		46		34	FLOODING	22	Flooding Boat Accident	10		
August	Nag Panchami/Guriya Rainy season		57		45		33		21		9		
September	Hareri Puja Krishna Astami		56		44		32		20		8		
October	Ghatasthapana Dasami festival		55		43		31		19		7		
November	Start Harvesting Rice Tihar/Dipawali		54		42		30	Peace agreement	18	2nd adjournment of elections	6		
December	Khar Katne		53		41		29		17		5		

Annex D: Additional Questionnaire for the Causal Analysis of Nutrition Status[15]

Nepal CMAM Additional Health and Nutrition Survey Questionnaire				A
One sheet per selected household				
District:…… VDC: …… Village: …… Ward: ……				
Cluster # …… Team #: …….. HH #: …….				
Name of interviewer: …… Date: ……/……/……..				
	हरेक प्रश्नको उत्तर एक मात्र र उपयुक्त कोड अनुसार दिनुपर्नेछ ।			
Q #	**घरधुरी विवरण/HOUSEHOLD INFORMATION**	**Answers**	**Questions answers**	
1	यो घरको घरमुली को हो ? Who is heading the household?		1= आमा/mother; 2 = बुवा/father 3 = हजुरआमा/grandmother; 4=हजुरबुवा/grandfather 9 = अन्य/Other (specify) 99 = जवाफ दिन्न/no answer	
2	घरको कसले अन्तर्वार्तामा जवाफ दिइरहेको हो ? Who in the household is answering the questionnaire?		1= आमा /mother; 2 = बुवा/father 3 = हजुरआमा/grandmother; 4=हजुरबुवा/grandfather 9 = अन्य/Other (specify) 99 = जवाफ दिन्न/no answer	
3	घरमा कति जना बस्छन र एउटै भान्सामा खान्छन ? How many people live in this household and eat from the same kitchen?		1-50 for number of HH members परिवारका जम्मा सदस्यहरुको संख्या 99 = no answer जवाफ दिन्न	
4	घरमा ५ वर्ष मुनिका कति वटा वच्चाहरु छन ? How many of these are children under the age of five?		0-25 for # of children under five in HH ५ वर्षमुनिका सबै वालवालिकाहरुको संख्या 99 = no answerजव	
5	वच्चाको आमा र बुबाले कति पढेका छन ? How many years of schooling have the mother and father of the household completed ?		Exact number of COMPLETED year(s)/ विद्यालयमा अध्ययन पुरा गरेको वर्ष 0 = illiterate/ निरक्षर 1 = primary / प्राथमिक 2 = secondary/ माध्यमिक 3 = Intermediary level/प्रमाण पत्र तह 4 = Bachelor level and more/स्नातक वा सो माथि 9 = Non-Formal/Literateअनौपचारिक वा साक्षरता 88 = Do not know/ थाहा छैन 99 = No answer/जवाफ दिन्न	
	आमा 5A: Mother			
	बुवा 5B: Father			

[15] This form was translated into Nepalese for the actual survey.

6	घर परिवारको जिविकाको मुख्य साधन (यस मौसमको) के हो ? What is the household's principle means of livelihood (during this season)?		1= Crop farming/खेतिपाती 2= Livestock farming/Poultryपशु र पंक्षीपालन 3= Casual wage labour / Portering/ज्याला मजदुरी 4= Remittances/वैदेशिक रोजगार 5= Own business or salaried job नीजि व्यापार वा जागिर 6= Firewood / natural resources collection/sale दाउरा वा प्राकृतिक श्रोत संकलन र विकी 7= Fishing माछा मारेर बेच्ने 8 = Assistance programmes (pensions, NGO, disability allowance)/सहयोग (पेन्सन, संस्थागत, अपांगता) 99 = No answer/जवाफ दिन्न
	जिविकाको मुख्य उपाय Most important means of livelihood		
7	घरको छाना के ले बनेको छ? (अवलोकन गर्ने) Construction material of ROOF (observation)		1= Mud/माटो 2 = Thatched / bamboo/vखर वा बाँस 3 = Slate / local tiles/ढुँगा वा स्थानिय टाइल 4= CGI sheet/ग्याल्भानाइज्ड सीट कर्कट पाता 5 = Concrete/कन्क्रिट 6= Timber/काठ 8 = Do not knowथाहा छैन 99 = No answer /जवाफ दिन्न
8	घरको भुइ के ले बनेको छ? Construction material of FLOOR (observation)		1= Mud / earth / dung गोवर माटो 2 = Wooden planks / bamboकाठको फलेक वा बाँस 3 = Concrete / cementसिमेन्ट कन्क्रीट 4= Ceramic tilesसेरामिक टाइल 5 = Carpet चट्टाइ 8 = Do not knowथाहा छैन 99 = No answer उत्तर दिन्न
9	घरको दिवाल वा भित्ता के ले बनेको छ? (अवलोकन गर्ने) Construction material of WALL (observation)		1= Cement and brickसिमेन्ट र इँटा 2 = Stone and mudढुंगा र माटो 3 = Bambo and cementबाँस र सिमेन्ट 4= Woodकाठ 5 = Mudमाटो 6 = Plastic / tarpaulin प्लास्टिक 7 = Bamboo strawबाँसको झिंजा 8 = Do not know

			99 = No answer
10	घरको कुनै सदस्यको आफनो नाममा जग्गा छ ? Do any members of this household own any agricultural land?		0 = NO/छैन 1 = YES/छ 88 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न
11	घरको सदस्यहरुको नाममा कति जग्गा जमिन छ ? How much agricultural land do members of this household own?		Q11A fill in number /उत्तर अंकमा लेख्नुहोस 1-19 = number of Dhur/धुर Q11B fill in number /उत्तर अंकमा लेख्नुहोस 1-19=number of Katha/कट्ठा Q11C 1-98= number of Bighas/विगाहा 995= 99 or more Bighas/सो भन्दा बढि 996 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न
	धुर 11A: Number of DHUR:		
	कटठा 11B: Number of KATHA:		
	विगाहा 11C: Number of BIGHAS:		
12	घरमा कुनै पशु चौपाया वा पछी छन ? Does the household own any livestock, herds, farm animals or poultry?		0 = NO/छैनन 1 = YES/छन 88 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न
	खानेपानी तथा सरसफाई / WATER & SANITATION		
13	खानेपानी कहाँबाट ल्याउनुहुन्छ ? Where does your household get drinking water?		1= Public tap/सार्वजनिक धारा 2= Private tap/नीजि धारा 3 = Tubewell / borehole/treadle pump हातेकल, नक्ली, बम्बा वा ढिकी पम्प 4 = Protected dug well / spring/सुरक्षित कुँवा, इनार वा मुल 5 = Unprotected well /असुरक्षित कुवा वा इनार 6 = Rainwater/वर्सादको पानी 7 = Pond, lake, river, stream/पोखरी, ताल वा खोला 8 = Vendor / buy from shop/किनेर 9 =Private but neighboursनीजि तर छिमेकी 99 = No answer /उत्तर दिन्न
	13A: During the monsoon/वर्षादको मौसममा		
	13B: During the dry season/हिउँद वा सुख्खा मौसममा		
14	पानी सफा र सुरक्षित बनाउन के उपाय गर्ने गरेको छ ? Does the household do anything to the water to make it safer to drink? If No, go to Q16.		0 = NO/छैन 1 = YES/ छ 88 = Does not know/थाहा छैन

			99 = No answer उत्तर दिन्न
15	यदि भए धेरैजसो के उपाय गर्ने गरेको छ ? If Q14=YES, what do you usually do to make the water safer to drink?		1 = Boil/उमाल्ने 2 = Ceramic filter/फिल्टर 3 = Chlorine treatment/क्लोरिन हालेर उपचार गर्ने 4 = Solar disinfection/घाममा राख्ने 5 = Let it settle//राखेर 6= Filter with a cloth/कपडाले छानेर 99 = No answer/उत्तर दिन्न
16	घरको सदस्यहरुले कहाँ दिशापिसाब गर्छन ? Where do members of your household usually defecate?		1= Closed latrine in own homestead/घरभित्रको बन्द चर्पी 2 = Closed latrine outside of homestead/घर बाहिरको बन्द चर्पी 3 = Open latrine/toilet/खुला चर्पी 4 = Open field / jungle/house yard, roadsides घरआंगन, बाटो छेउ, खुला खेत वा जंगल 5 = Pond, lake, river, stream/पोखरी, ताल, नदि वा खोला 99 = No answer/उत्तर दिन्न
	पाँच वर्ष भन्दा माथिका सदस्यहरु 16A: HH members over 5 years old		
	पाँच वर्ष भन्दा मुनिका वच्चाहरु 16B: HH members under 5 years old		
17	तपाई कहिले हात धुनुहुन्छ ? When do you wash your hands?		0 = NO/ हैन 1 = YES/ हो 88 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न
	खाना पकाउनु अघि 17A: Before cooking		
	खाना खानु अघि 17B: Before eating		
	दिशा गरिसकेपछि 17C: After using latrine		
	विरामी वच्चा हेरे पछि 17D: After attending a child who defecated		
	वच्चालाई स्तनपान गराउनु अघि 17E: Before breastfeeding		
18	हात धुनको लागि के प्रयोग गर्नु हन्छ ? What do you use to wash your hands?		1 = Soap or oil cake/ साबुन वा पिना 2 = Plain water/सादा पानी 3 = Ash/खरानी 4=Soil/Clay/माटो 99 = No answer/ उत्तर दिन्न
	खाधान्न उपभोग/Food Consumption		
19	हिजो दिउसो र राती के के खानेकुराहरु खानुभयो ? Which type of food did you or anyone in your household eat yesterday during the day and night?		0 = If nobody in the household ate the food yesterday यदि कसैले खाना नखाएको भए 1 = if anyone in the household ate the food at least once the previous day यदि कमसेकम एक पटक खाना खाएको भए *NOTE: the previous day should be a NORMAL day (not a fasting or a feast day)* (तर अघिल्लो दिनमा
	अन्न चामल वा रोटी 19 A: CEREALS (bread, rice, noodle, roti, maize)		
	आलु, तरुल वा गन्जी वा सखरखण्डा 19B: Root/tuber (potatoes, yams, sweet potatoes)		
	कुनै सब्जी वा तरकारी 19C: Any vegetables		
	कुनै फलफुल 19D: Any fruit		

	मासु (कुखुरा, हाँस वा खसी) 19E: Meat (goat, chicken, duck, etc)		कुनै भोज वा व्रत परेको भए सो भन्दा पनि अघिको दिनको बारेमा सोध्नुहोस)
	अण्डा 19F: Egg		
	माछा, गंगटो वा घुंगी 19G: Fish, crab or shellfish		
	दाल वा गेडागेडी 19H: Lentils/pulses/legumes/nuts		
	दुध, दहि, चिज 19I: Milk/curd/cheese/milk products		
	तेल, ध्यु वा नौनी 19J: Oil/butter/ghee		
	चिनी, मह वा मिठाइ 19K: Sugar/honey/sweets		
	अन्य (चिया कफि वा जडिबुटीयुक्त पानी) 19L: Any other foods (coffee, tea, herbal water, etc)		
20	हिजो तपाईको परिवारले कति पटक खाना खानुभयो? How major many meals did your family eat yesterday?		Enter EXACT number of meals अंकमा लेख्नुहोस
21	हिजो तपाईको परिवारले कति पटक खाजा खानुभयो? How many tiffins/snacks did you family have yesterday?		Enter EXACT number of meals अंकमा लेख्नुहोस
22	यदि घरमा पशुपन्छी भए नियमित रुपमा के के खानुहुन्छ? If the household owns animals (Q12 above), which of their products are regularly consumed by the household?		0 = NO/खाँदिन 1 = YES/खान्छु 88 = Does not knowथाहा छैन 99 = No answer/उत्तर दिन्न
	अण्डा 22 A: Egg		
	दुध 22 B: Milk		
	माछा वा मासु 22 C: Meat or fish		
23	विगत बाह महिनामा तपाइको घरपरिवारमा खाधान्नको अभाव भयो ? Did your household experience any food shortage in the past 12 months?		0 = NO/भएन 1 = YES/भयो 88 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न
24	यदि खाधन्न अभाव भएको भए त्यसको खास कारण के थियो ? If food shortages were experienced, what was the primary reason for this shortage?		1= own production/food stocks depleted/ आफनो उत्पादन वा भण्डारको अन्न सकिएर 2= Lack of labour opportunities/lack of income श्रमको अवशर घटेर वा आम्दानीको अभाव भएर 3 = Increase in food prices खानेकुराको भाउ बढेर 4 = Remittances did not comeविदेशबाट खर्च नआएर 5 = HH members migrated out परिवारको सदस्य बसाइ सरी आएर 6 = HH members migrated in परिवारको सदस्य बसाइ सरी गएर 7 = Food not available in the market बजारमा खाधन्नको अभाव भएर 8 = No nearby marketबजार नजिक नभएर 9 = Other specifyअन्य भए उल्लेख गर्ने 77 = Not applicable नमिल्ने उत्तर 88 = Does not know थाहा छैन
	असार 24 A: Asad (Jun-Jul)		
	साउन 24B: Shrawan (Jul-Aug)		
	भदौ 24C: Bhadau (Aug-Sep)		
	असोज 24D: Asoj (Sep-Oct)		
	कार्तिक 24E: Kaartik (Oct-Nov)		
	मंसीर 24F: Mangsir (Nov-Dec)		
	पुस 24G: Push (Dec-Jan)		
	माघ 24H: Magh (Jan-Feb)		
	फागुन 24I: Phagun (Feb-Mar)		
	चैत्र 24J: Chait (Mar-Apr)		
	बैसाख 24K: Baisakh (Apr-May)		
	जेठ 24L: Jyesth (May-Jun)		

			99 = No answer उत्तर दिन्न
25	जातिगत विवरण के हो ? What is the caste and ethnic group of the household?		आवश्यक भए थप व्याख्या गर्नुहोस ।
	जात वा जनजातिय समुह 25A Caste/Ethnicity		
	धर्म 25B: Religion		

Nepal CMAM Additional Health and Nutrition Survey Questionnaire						
One sheet per selected household						
District:…….. VDC: …… Village: …… Ward: ……						
Cluster # …… Team #: …….. HH #: ……						
Name of interviewer: …… Date: ……/……/……..						

Q #	वाल स्वास्थ्य र पोषण/CHILD HEALTH & NUTRITION	Child 1 पहिलो वच्चा	Child 2 दोस्रो वच्चा	Child 3 तेस्रो वच्चा	Coded Answers
26	Birth date/जन्म मिति	…/…/…	…/…/…	…/…/…	Format should be dd/mm/yyyy अंग्रजी पात्रो
27	Sex of child/लिंग				1= छोरा male 2 = छोरी female
28	Is the child currently breastfed?/ वच्चाले हाल दुध पिइरहेको (स्तनपान गरिहेको छ ?				0 = NO/छैन 1 = YES/छ 77 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न
29	वच्चा जन्मेको कति समयपछि तपाइले स्तनपान गराउनु भयो ? How long after birth did you first put the child to the breast?				0 = within 1 hour एक घण्टा भित्र 1-24 = the exact number of hours कति समय पछि खुवाएको If more than 24 hours: write number of DAYS 77 = Not applicable (FOR CHILD ABOVE 24 MONTHS) यदि 24 घण्टा भन्दा बढि भए दिनमा लेख्नुहोस 88 = Does not know 99 = If the HH does not want to answer
	घण्टा Hours				
	दिन Days				
30	वच्चालाई शुरुको बिगौती दुध खुवाउनुभयो ? Was the child given the colostrum (first milk)				0 = NO/खुवाइन 1 = YES/खुवाएँ 77 = Not Applicable नमिल्ने उत्तर 99 = No answer/उत्तर दिन्न
31	वच्चा जन्मिएको तीन दिन भित्रमा दुध बाहेक कुनै अरु खानेकुरा पनि दिनुभयो? In the first three days after delivery, was the child given anything other than breastmilk?				0 = NO/दिइन 1 = YES/दिएँ 77 = Not Applicable नमिल्ने 88= Does not know थाहा छैन 99 = No answer/उत्तर दिन्न
32	यो वच्चालाई तपाइले कति महिना सम्म दुध मात्र (अरु खानेकुरा दिनु अघि) खुवाउनुभयो? For how long did you EXCLUSIVELY breastfeed this child (no other food or liquid given)?				0 = एक महिनाभन्दा सानो Less than 1 month 1-24 = कति महिना Corresponds to number of months 66 = हाल पनि दुध मात्र खुवाउने Still exclusively breastfeeding 77 = नमिल्ने उत्तर Not applicable (child above 24 months) 88 = थाहा छैन Does not know 99 = उत्तर दिन्न No answer

33	कति महिनाको उमेरमा वच्चालाई पहिलो चोटी अरु नरम र गिलो खानेकुरा खान दिनुभयो? At what AGE was the child given semi-solid or soft foods for the FIRST time?				0 = एक महिनाभन्दा कम Less than 1 month 1-24 = कति महिना Corresponds to number of months 66 = हाल पनि दुध मात्र खुवाउने Still exclusively breastfeeding 77 = नमिल्ने उत्तर Not applicable (child above 24 months) 88 = थाहा छैन Does not know 99 = उत्तर दिन्न No answer
34	विगत 24 घण्टाभित्र तपाईले वच्चालाई के खुवाउनुभयो ? What did you feed the child in the last 24 hours?				0 = NO खुवाइन 1 = YES खुवाए 66 = Still exclusively breastfed हाल पनि स्तनपान गराइरहेको 99 = No answerउत्तर दिन्न
	खाधान्न (रोटी, लिटो, हलुवा, जाउलो) 34 A: CEREALS (bread, rice, noodle, roti, maize, etc)				
	भिटामिनयुक्त खानेकुरा (पहेला फलफुल, आँप, मेवा, गाँजर, फर्सि, हाियो सागसब्जी र रस) 34 B: food rich in vitamin A (yellow color vegetables-carrot, pumpkin- or fruits -mango, papaya-, green leaves)				
	अन्य फलफुल तथा सब्जी34 C: Other fruits and vegetables				
	मासु, माछा वा अन्य सि फुड 34 D : Meat, poultry, fish, seafood				
	अण्डा 34 E: Egg				
	दाल, गेडागुडी र बदाम 34 F: Pulses/legumes/nuts				
	34 G: Milk/milk products				
	घ्यु वा तेलमा पकाएको कुरा 34 H: Foods cooked in fat or ghee				
	चिया तथा अन्य 34 I: Flavoured water (tea or herbal water)				
	चिनी, मह वा मिठाई 34 J: Sugar, honey, sweet				
35	यदि हाल स्तनपान गराउनुहुन्न भने कति महिनासम्म वच्चालाई स्तनपान गराउनुभयो ? If NOT breastfeeding, for how many months did you breastfeed this child?				0 = Less than 1 month एक महिनाभन्दा सानो 1-24 = Corresponds to number of months महिना अंकमा लेख्नुहोस 77 = Not applicable (child still breastfed) नमिल्ने उत्तर 88 = Does not knowथाहा छैन 99 = No answerउत्तर दिन्न
36	यदि हाल स्तनपान गराउनुहुन्न भने किन वच्चलाई स्तनपान गराउन छाडनुभयो ? If NOT breastfeeding, why did you stop breastfeeding this child?				1= Child above 24 months वच्चा 24 महिना भन्दा माथि 2 = Workloadकामको चाप 3 = New pregnancyनयाँ गर्भ 4 = Not enough breastmilk प्रसस्त दुध नआउने 9 = Other, specify अन्य भए उल्लेख गर्नुहोस 77 = Not applicable (child still breastfed) 88 = Does not know 99 = No answer
	यदि अन्य उत्तर भए उल्लेख गर्नुहोस If answer is OTHER, please specify				

37	दैनिक रुपमा घर छाडेर बाहिर काममा जाँनु पर्दा आफनो वच्चालाई के गर्नुहुन्छ ?When you leave your home to take care of daily activities (work, market, water, etc) what do you usually do with this child?				1= Child comes with me every timeवच्चा सधै म संगै आउछ 2 = Child stays at home alone वच्चा संधै घरमा बस्छ 3 = Child stays with mother-in-law / grandmother वच्चा हजुरआमा संग बस्छ 4 = Child stays at home with sibling older than 15 वर्ष भन्दा ठुला वच्चाहरु संग बस्छ 5 = Child stays at home with sibling younger than 15 भन्दा साना वच्चाहरुसंग बस्छ 6 = Child stays at home with father वच्चा बुवासंग घरमा बस्छ 9 = Other, specify अन्य भए उललेख गर्नुहोस 99 = No answerउत्तर दिन्न
	यदि अन्य उत्तर भए उल्लेख गर्नुहोस If answer is OTHER, please specify				
38	हाल वच्चाको देखभाल वा हेरविचार कसले गर्छ ? Who is looking after this child most of the time?				1= Motherआमा 2 = Mother-in-law /Grandmother of the baby सासु हजुरआमा 3= Fatherबुवा; 4 = Grandfatherहजुरबुवा 5 = siblings older than 15; 15 माथिका अन्य वच्चा 6 = siblings younger than 15 15 मुनिका अन्य वच्चा 7= Other women in the village/FCH गाउँका अन्य महिला वा सेविका 9 = Other, specify अन्य भए उल्लेख गर्नुहोस 99 = No answerउत्तर दिन्न
	यदि अन्य उत्तर भए उल्लेख गर्नुहोस If answer is OTHER, please specify				
39	सामान्यत वच्चालाई कसले खाना खुवाउँदछ ? Who is normally feeding the child?				1= Mother आमा 2 = Mother-in-law /Grandmother of the baby सासु हजुरआमा 3= Father बुवा 4 = Grandfatherहजुरबुवा 5 = siblings older than 15 15 वर्षभन्दा ठुला अन्य वच्चा 6 = siblings younger than 15 15 बर्ष भन्दा साना अन्य वच्चा 7 = Child eats by itself वच्चा आफैले खान सक्ने 9 = Other, specify अन्य भए उल्लेख गर्नुहोस 99 = No answerउत्तर दिन्न
	यदि अन्य उत्तर भए उल्लेख गर्नुहोस If answer is OTHER, please specify				
40	धेरैजसो कसले वच्चाको स्याहार बारे सल्लाह दिन्छ ? Who usually give advice to the caretaker on caring for this child?				1= Mother आमा 2 = Mother-in-law Grandmother सासु rहजुरआमा 3= Fatherबुवा द्ध = Grandfatherहजुरबुवा 5 = siblings older than 15 भन्दा माथिका वच्चा

	यदि अन्य उत्तर भए उल्लेख गर्नुहोस If answer is OTHER, please specify				6 = siblings younger than 15 भन्दा साना वच्चा 7 = Other women in the village गाउँका अन्य महिला वा स्यमंसेविका 9 = Other, specify अन्य भए उल्लेख गर्नुहोस 88 = Does not know थाहा छैन 99 = No answer उत्तर दिनन	
41	तपाईको वच्चाले आफै खान सक्छ भन्ने कुरा तपाइले वच्चाको कुन उमेरदेखि थाहा पाउनु भयो ? When do you consider this child can eat <u>alone</u>, without the presence of a caretaker?				0 = Less than 1 month एक महिनाभन्दा कम 1-24 = Corresponds to number of months जति महिना हो अंकमा लेख्नुहोस 77 = Not applicable (child still breastfed) नमिल्ने उत्तर 88 = Does not know थाहा छैन 99 = No answer उत्तर दिन्न	
42	विगत दुइ हप्तामा वच्चालाई पाखाला लागेको थियो ? Did this child have diarrhoea in the last 2 weeks?				0 = NO/थिएन 1 = YES/थियो 99 = No answer/उत्तर दिन्न	
43	विरामी भएको वेलामा त्यो वच्चालाई कुनै खानेकुरा दिनुभयो ? Was the child given FOOD during the illness period?				1 = संधै भन्दा धेरै More than usual; 2 = संधैको जस्तो Same as usual 3 = संधै भन्दा कम Less than usual; 4 = खुवाइन Not at all 77 = नमिल्ने Not applicable (Q42 = NO) 88 = थाहा छैन Does not know 99 = उत्तर दिन्न No answer	
44	विरामी भएको वेलामा त्यो वच्चालाई कुनै झोल खानेकुरा दिनुभयो ? Was the child given DRINKS during the illness period?				1 = संधै भन्दा धेरै More than usual; 2 = संधैको जस्तो Same as usual 3 = संधै भन्दा कम Less than usual; 4 = खुवाइन Not at all 77 = नमिल्ने Not applicable (Q42 = NO) 88 = थाहा छैन Does not know 99 = उत्तर दिन्न No answer	
45	यदि हाल स्तनपान गराइराखेको भए वच्चा विरामी हुँदा पनि दुध खुवाउनु भयो? If currently breastfeeding, was breastfeeding continued during the illness period?				1 = संधै भन्दा धेरै More than usual; 2 = संधैको जस्तो Same as usual 3 = संधै भन्दा कम Less than usual; 4 = खुवाइन Not at all 77 = नमिल्ने Not applicable (Q42 = NO) 88 = थाहा छैन Does not know 99 = उत्तर दिन्न No answer	
Thank you very much for your participation and time!!						