NUTRITIONAL ANTHROPOMETRIC SURVEY
CHILDREN FROM 6 TO 59 MONTHS

KANCHANPUR DISTRICT, NEPAL

27/05/2008 - 06/06/2008

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EXECUTIVE SUMMARY

Kanchanpur district is situated in the Far West of the Terai, surrounded to the North by Dadeldhura district, to the East by Kailali district and to the South and West by India. The present survey covers 19 VDCs of Kanchanpur district, excluding the municipality of Mahendranagar.

OBJECTIVES

- To evaluate the nutritional status of children aged 6 to 59 months in the context of Kanchanpur district;
- To identify higher risk groups for malnutrition: gender and age;
- To assess health seeking behaviour for sick children in the visited households and the rationale for choices in health access;
- To serve as a baseline nutritional survey for the CMAM pilot project for Nepal;
- To make recommendations for nutritional interventions in regards to CMAM in Kanchanpur district as a component of the overall pilot project for CMAM in Nepal.

METHODOLOGY

The survey carried out in Kanchanpur district was based on a 2 stage cluster methodology, following the SMART guidelines. The first stage was the selection of 40 wards/clusters from an exhaustive list of wards in the studied area. The clusters, containing a minimum of 19 children, were selected randomly according to the wards' population size. The second sampling stage – the households' selection – was based on the EPI method.

All children from 6 to 59 months old or 60 to 110 cm when the age could not have been precisely defined, in the selected households were included in the survey.

A sample of 762 children was surveyed including 2 absences and 8 data out of range (according to the WHO standards from 2006).

The SMART methodology and ENA for SMART software (version October 2007) were used for the sample size determination, selection of the clusters and data analysis. Anthropometric data were analysed and compared to the new WHO standards.

MAIN FINDINGS

Prevalence of global and severe acute malnutrition in z-scores (n=752) – WHO reference
GAM: **17.0%** [CI 95%: 13.2 – 20.8]
SAM: **3.3%** [CI 95%: 2.2 – 4.5]

Prevalence of global and severe acute malnutrition in z-scores (n=755) – NCHS reference
GAM: **16.6%** [CI 95%: 13.4 – 19.8]
SAM: **1.5%** [CI 95%: 0.7 – 2.2]

Prevalence of chronic malnutrition in z-scores (n=742) – WHO reference
Global Stunting: **41.8%** [CI 95%: 37.5 – 46.1]
Severe Stunting: **14.0%** [CI 95%: 11.0 – 17.0]

Prevalence of illness, two weeks prior to the survey (n=762): **44.8 %**

Proportion of sick children who sought medical treatment (n=341): **83.9 %**

Locations where caretakers sought medical treatment for their sick child (n=286)

Pharmacy:	40.9 %
Private Health Facility:	27.3 %
Government Health Facility:	21.3 %
Female Community Health Volunteer:	3.5 %
Dhami (traditional healer):	2.4 %
Other, Specify:	3.5 %
No Answer:	1.1 %

Main reasons why the child was not sent to Government Health Facility (n=280)

Distance to treatment:	33.9 %
No drugs at health facility	18.6 %
Have to wait too long for treatment at the facility	10.4 %
Price of treatment	5.4 %
Facility was closed	4.6 %
Facility staff receive patients rudely	3.2 %
FCHV handled the treatment adequately	2.1 %
No staff at health facility	1.4 %

RECOMMENDATIONS

❖ To launch a monitoring system via a training of FCHVs to detect malnutrition during the growth monitoring sessions or EPI sessions in each VDC. This will allow to follow the nutritional status of children under 5 years old and be able to react on time if any deterioration happens due to food crisis or epidemic of diseases;

❖ To implement CMAM (Community based Management of Acute Malnutrition) pilot programme in Kanchanpur district including a community awareness programme about acute malnutrition issues;

❖ To open at least 10 Outreached Treatment Points (1 for 2 VDCs) for the treatment of severe acute malnutrition in the all district to minimize the distances between the caretaker and the health structure;

❖ To reinforce counseling activities on care practices, child stimulation and balanced diet in health posts and sub health posts;

❖ To conduct a nutritional survey at the end of the pilot programme to evaluate the efficacy of this approach and give some new recommendations on the best way to implement it;

❖ To conduct a mortality survey to serve as a baseline for future programmes and follow the trends in the district. A mortality survey cannot give information about a single programme but for all the health programme together.

INTRODUCTION

Nepal, a land locked country of 26 million nestles in the foothills of the Himalayas. The country is sandwiched between the two most populous countries of the world, India to the east, south and west and China to the north. Nepal is rectangular in shape and stretches 885 kilometers in length (east to west) and 193 kilometers in width (north to south). The total land area of the country is 147,181 square kilometers.

Geographically, Nepal is divided into three ecological zones (Mountains, Hills and Terai), five development regions (East, Central, West, Mid West and Far West) and seventy five districts. Districts are further divided into Village Development Committees (VDCs) and Municipalities. Each VDC is sub-divided into 9 wards.

In 2006, the MoHP, in coordination with UNICEF, started to discuss about the feasibility of implementing a CMAM programme in Nepal to tackle the high national malnutrition prevalence (GAM=13.4% and SAM=2.6%).
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 Regions as presented in the table below:

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	

Source: DHS 2006. Malnutrition rates are calculated based on the new WHO standards

UNICEF Nepal conducted a feasibility assessment in 2006 for CTC[1] in the Nepalese context. A number of challenges for the implementation were identified, including the following:
- Lack of identification and appreciation of malnutrition as a major health issue at the local level, both in the community and at many health facilities. Confusion about the different types of malnutrition, particularly the distinction between underweight and acute malnutrition.
- Securing staff availability, capacity, and supervision for community outreach, increasing access to adequate medical assessment, treatment, and referral.
- Access to referral stabilisation centres for SAM cases with complications, due to limited existing capacity, as well as socio-economic, geographical and infra-structure barriers.
- Perceived risk of over-emphasizing SAM treatment to the detriment of prevention, early identification and treatment of moderate malnutrition cases, although the CTC approach uses SAM treatment as one among other entry-points to address malnutrition.
- Cost-effectiveness requires correct targeting, but accurate data to identify communities with high rates of malnutrition is largely unavailable.
- Effectiveness and sustainability of the approach depends on training and supervision of both health staff at local health facilities and community volunteers and female community health volunteers (FCHVs), as well as community mobilisation on malnutrition awareness.

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[1] CTC: Community based Therapeutic Care. Now named CMAM: Community based Management of Acute Malnutrition

- Relatively challenging logistical arrangements and financial costs related to transportation and distribution of RUTF to local health facilities.
- Potential for local production of quality Ready to Use Therapeutic Food (RUTF), preferably based on locally available foods, to increase availability and sustainable access to treatment.

Therefore, the feasibility assessment recommended to conduct a pilot project in different implementation scenarios based on geographical and cultural specificities, including hills/mountains and Terai areas, in order to evaluate if and how the identified challenges can be overcome and to create lessons learned for nation wide implementation.

In this objective, two International NGOs have been selected to implement, monitor and evaluate the CMAM pilot project in different districts. A list of the potential districts was defined according different criteria, among them: the rates of malnutrition (wasting and stunting), presence of a NRH, accessibility, poverty incidence, CB-IMCI and security. 7 districts were selected as potential districts to implement a CMAM pilot project: Saptari, Parsa, Surkhet, Mugu, Kanchanpur and Bardiya

ACF agreed to take the lead for Mugu and Kanchanpur districts, Concern Worldwide for Bardiya district and UNICEF the rest.

Before starting the implementation of any programmes, a serie of assessments was needed to get a clear picture of the intervention zone as well as to have a baseline for the pilot project. In this purpose, it has been decided that each organization will carry out a nutrition survey, a causal analysis assessment and a health assessment.

To ensure that comparisons will be possible between the different districts of intervention in the aim to give final recommendations about CMAM and to draw a nation-wide protocol, a standardized methodology for the nutrition survey and the causal analysis assessment was defined between UNICEF, ACF and Concern Worldwide.

Kanchanpur district is situated in the Far West of the Terai, surrounded to the north by Dadeldhura district, to the east by Kailali district and to the south and west by India. Administratively speaking, Kanchanpur district is divided into 20 VDCs including the municipality of Mahendranagar. Its surface area is 1610 square kilometers with a population of 377,899 inhabitants spread over 60,158 households[2]. With a density of 235 inhabitants/km², Kanchanpur is ranked 23rd out of 75 districts, placing it among the most populated districts in Nepal (national average being 156 inhabitants/km²).

There are 21 health posts, sub health posts or Primary Health Care centres in the entire district. These health facilities have relatively good infrastructures and are sufficiently staffed. However, a problem of motivation of the health staff and drug supply appears to handicap the smooth running of these health facilities.

The Health Community is composed essentially of Female Community Health Volunteers (FCHV) who are quite active at the district level. Normally, there is one FCHV per VDC in all the country, but in the Terai, districts are so densely populated that there is one FCHV for 400 inhabitants, reaching more than 800 FCHVs for the sole district of Kanchanpur.

They play an important role in passing messages to the community and informing people about the date of the EPI sessions for vaccination and growth monitoring sessions, which happen twice a month.

This nutritional survey was carried out in Kanchanpur district, excluding the urban municipality of Mahendranagar, from the 27th of May to the 6th of June 2008. The survey will serve as a baseline for the pilot project aiming at implementing and testing the feasibility of CMAM (Community based Management of Acute Malnutrition) programme in different districts of Nepal. Three main actors are involved in this project: UNICEF, Concern and ACF. They all agree to implement and test the CMAM programme in 3 different agro-ecological

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[2] Data come from the census done in 2001 by CBS (Central Bureau of Statistics)

zones. ACF is taking the lead to implement CMAM in Mugu district (Mountainous area) and Kanchanpur district (Terai) while Concern will implement CMAM in Bardiya district (Terai) and UNICEF plan to launch CMAM in Parsa and Saptari districts (Terai) and in Surkhet district (Hills area).

After the pilot phase, recommendations regarding the best way of implementing such a programme in the 3 agro-ecological zones will be shared with the Ministry of Health and Population and all the stakeholders implicated in nutrition activities.

Therefore, the aim of this pilot project is to demonstrate that CMAM could be adapted to the Nepali context and be used nationwide as the major guidelines to treat acute malnutrition.

OBJECTIVES

- To evaluate the nutritional status of children aged 6 to 59 months in the context of Kanchanpur district

- To identify higher risk groups for malnutrition: gender and age

- To assess health seeking behaviour for sick children in the visited households and the rationale for choices in health access

- To serve as a baseline nutritional survey for the CMAM pilot project for Nepal

- To make recommendations for nutritional interventions in regards to CMAM in Kanchanpur district as a component of the overall pilot project for CMAM in Nepal

METHODOLOGY

1. SAMPLING METHODOLOGY

The survey carried out in Kanchanpur district included all VDCs of Kanchanpur except the municipality of Mahendranagar which was excluded for the following reasons:
- One of the objectives of this survey was to estimate the number of expected beneficiaries and to make recommendations for nutritional interventions with regard to CMAM programme. This programme will be set up in rural and remote areas to establish decentralisation of the treatment of acute malnutrition (currently these services are centralised in the hospital and NRU/NRH situated in the district head quarters (municipality area)). Therefore inclusion of data on the urban area was not really useful.
- Municipality wards are defined by urbanisation criteria like access to electricity, access to water, at least one road going up to the ward. These characteristics are determinants of relatively better nutritional status, thus the rate of malnutrition in these urban areas is likely to be lower than in the rural areas, confounding the findings for the rural areas.

A two stage cluster sampling methodology, following the SMART guidelines and using the supporting ENA[3] software was used, because no accurate population register is available for systematic sampling and households are not located in a way that they can be visited systematically.

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[3] ENA software for SMART, developed by Dr. Juergen Erhardt in cooperation with Prof. Michael Golden,

The under five population is estimated to be 39,212 individuals[4]. All children from 6 to 59 months old or 60 to 110 cm when the age could not be precisely defined, in the selected households were included in the survey.

For the anthropometry, a total of 750 children under 5 years old were needed to have statistically reliable results. This number was calculated with ENA software assuming 19.6% of estimated global acute malnutrition prevalence (19.6% of GAM using the new standards in the DHS 2006), a desired precision of $\pm$ 4%, a design effect of 2 considering that the population is quite heterogeneous and adding 5% to the sample to take into consideration aberrant and missing data.

It was estimated that each team could reasonably survey 19 children per day. Thus, 40 clusters with a minimum of 13 households each were needed for the survey.

The ward is the smallest administrative unit that can be found in Nepal with population figures and definite boundaries, and was therefore used as Primary Sampling Unit. The two stages of sampling are:
- the cluster (wards) are selected randomly proportionate to their population size from the total list of rural wards in the district;
- the required number of households within each cluster are selected randomly using the EPI methodology

Particular cases :

✓ Absent
- If the home was completely abandoned, a neighbour was asked why the home was abandoned. Then the team went to the nearest house following the methodology mentioned above.
- If the home was empty, a neighbour was asked of their whereabouts. If they were expected to return before the survey team left the village, the survey team returned to administer the questionnaires on the same day. If they were still absent, then the team asked the neighbours if they were able to fill in the mortality questionnaire, if not the family was recorded as absent.
- If in the visited house, the parents were present but the children were temporally absent, the team asked the parents when the children were supposed to return. Then the team returned at the end of the day. If the children were still absent, the team completed with the parents the questionnaire (age, sex) but the anthropometric part was left empty. These children were not replaced but mark as missing children.
- If any child of the family has been admitted in the centre/hospital the team went there and measured the child in the health centre.

✓ Composition of the household
A household was defined as all the persons eating from the same cooking pot.
- If there was more than one household in the compound, the team included all the households living in the compound and hence all children under five years old.
- If there was more than one wife in the house, the team included all of the children below five year's old living in the house.
- If the team passed by a house where there was a child visiting the family (present for less than 1 month), he was not included in the survey (a child is classed as belonging to one family if he has been eating in the house since at least one month).
- If several children from different families were in the house, they were included if they were living permanently (for more than one month) in this house (see criteria above).

✓ Disabled Child
- The disabled children were included in the survey, even if the anthropometric data were not possible to take. The other data were collected.

December 2006: Available from www.nutrisurvey.de
[4] Data comes from the 2001 census of the Central Bureau of Statistics (CBS)

✓ If there not enough children in the ward

- If all the houses of the ward have been visited and some children are missing to obtain a full cluster, the team went to the nearest ward (Criteria: if there were more than one nearest ward, one was chosen randomly by writing the name of the wards on paper and a random selection was done. the same two stage methodology was used in this newly selected village and the teams continued until they obtained sufficient children for the survey.).

✓ If there were too many children in the last house to visit

- If the last house to be visited had more children aged 6-59months than the team needed to complete the cluster, all the children aged 6-59 months from the family were measured.

2. DATA COLLECTED

- *Sex:* The sex of each child was recorded (M/F).
- *Age* (in months): any document related to health such as the immunization card or road-to-health card was considered. If there was no document with a birth date available, then the date of birth of each child from 6 to 59 months was asked to the head of the family and the age was estimated by using the local seasonal and event calendar. If the age was still not sure, only children with height between 60 and 110 cm were included in the survey.
- *Weight* (in kg): Hanging scales 25 kg, type Salter, graduate by 100g, were used. The scales were checked for accuracy before and after each day measurements using the same known weights.
- *Height* (in cm): The measuring board was at least 130 cm long and made of hardwood. The board was marked out in 0.1cm steps. The height was recorded to the nearest 0.1cm. For children less than 85 cm, the height was taken in a lying position while for children measuring 85 cm up to 110 cm, the height was taken in standing position.
- *Oedema*: oedema was assessed with a moderate thumb pressure applied on both feet during three seconds (the time to count "one thousand and one, one thousand and two, one thousand and three"). If a depression was printed on both feet, oedemas were recorded. (Y/N).
- *MUAC* (in mm): the Middle Upper Arm Circumference was recorded to the nearest mm using MUAC measuring tapes graduated to 0.1cm. The MUAC of the left arm of all children 6-59 months old was taken.
- **Additional questions:** Health seeking behavior (see questionnaire annex 3).

3. INDEXES

Malnutrition rates:

Acute malnutrition or wasting is defined by the Weight-for-Height (WFH) index and the presence of bilateral oedema. The WFH index of a measured child is calculated by taking into consideration the median weight of the NCHS reference population, for the same height. Acute malnutrition is expressed either in Z-score or in percentage of the median. Z-score expression always yields a greater prevalence of malnutrition than that calculated with the percentage of median criteria since it takes into account variation in the standard deviation of weight at different heights, making it more statistically valid. Nevertheless, percentage of the median is commonly used to identify children eligible for feeding programs.

Z-scores
Global Acute Malnutrition (GAM) : < -2 Z-Scores and/or oedema
Severe Acute Malnutrition (SAM) : < -3 Z-Scores and/or oedema
Percent of median
Global Acute Malnutrition (GAM) : < 80% median and/or oedema
Severe Acute Malnutrition (SAM) : < 70% median and/or oedema

The WHO child growth standards (2006) are also used to define nutritional status of children. These new growth standards are expressed in z-scores.

MUAC is also considered as a pertinent indicator of malnutrition especially to identify under-5 children at risk of malnutrition related to mortality. There is no internationally recognised threshold for the classification of malnutrition according to MUAC. The cut-off points used in this survey are based on ACF recommendations, for all children under-five years old:

MUAC (mm)	Nutritional status
135 ≤ MUAC	No malnutrition
125 ≤ MUAC < 135	At risk of malnutrition
110 ≤ MUAC < 125	Moderate malnutrition
MUAC < 110	Severe malnutrition

ACF uses the cut-off of 110 ≤ MUAC < 125 mm to define moderate malnutrition and 125 ≤ MUAC < 135 to define the children 'at risk of malnutrition'.

4. TRAINING, SURVEY ORGANIZATION AND SUPERVISION

Four teams of three persons were in charge of the data collection. Each team was composed of one team leader, two measurers and one porter. Each team leader had to ensure the follow-up of the SMART methodology as well as the quality of the data collected for the entire time of the survey. One cluster per team was surveyed each day. The nutrition survey officer supervised all the four teams and ensured the quality of the overall survey (selection of household, measurements methodology, filling properly all questionnaires). Prior to the survey, a five days training on malnutrition, SMART methodology and anthropometric measurements was conducted. The fourth day, a standardization test was performed. The teams offered constructive criticism or positive feedback on measurement techniques for other teams during this session. In the last day of the training, a practical test was done nearby Gamgadhi (in one ward not included in the survey) to assess the good follow-up of the methodology and also the anthropometric measurements. The survey lasted from the 25th of May to the 14th of June 2008 (13 days of data collection + 5 walking days + 3 days off).

5. DATA ANALYSIS

Anthropometric data were analyzed using ENA for SMART software (last update October 2007).

RESULTS

The current international growth reference, the National Center for Health Statistics (NCHS) reference, is widely used to compare the nutritional status of populations and to assess the growth of individual children throughout the world. Recently, concerns were raised regarding the adequacy of this reference for assessing the growth of breast-fed infants. A study developed in Brazil shows that infants who were exclusively or predominantly breast-fed for the first 4-6 months and partially breast-fed thereafter, grew more rapidly than the NCHS reference in weight and length during the first 3 months, but appeared to falter thereafter. The average growth of all infants, regardless of feeding pattern, was faster than the NCHS reference until 6 months, after which their growth became slower than that of the NCHS sample. These findings suggest that the infancy portion of the NCHS reference does not adequately reflect the growth of either breast-fed or artificially fed infants. This probably results from characteristics of the original sample and from inadequate curve-fitting procedures. An improved international growth standard that reflects the normal infant growth pattern was developed by WHO and released in 2006.

Nevertheless, some countries have already adopted the new WHO reference as the reference to be used to define prevalence of malnutrition and so for admission and discharge criteria in nutrition programmes. Nepal is one of these countries.

So for consistency purposes, analysis of the data is presented first with the WHO standards 2006 and then with the NCHS references.

1. CHARACTERISTICS OF THE SAMPLE

A sample of 762 children was surveyed including 2 absences and 8 data out of range (according to the WHO standards from 2006).

No malnourished children have been found with oedema. All the severe cases detected were according to the weight for height criteria.

Table 1 : *Distribution of age and sex of the sample, Kanchanpur district, Nepal, May-June 2008*

	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy: girl
6-17 months	100	52.4	91	47.6	191	25.1	1.1
18-29 months	81	47.1	91	52.9	172	22.6	0.9
30-41 months	84	50.6	82	49.4	166	21.8	1.0
42-53 months	96	60.0	64	40.0	160	21.0	1.5
54-59 months	43	58.9	30	41.1	73	9.6	1.4
Total	404	53.0	358	47.0	762	100.0	1.1

The sex ratio of the survey (1.1) is including in the interval 0.8 – 1.2, meaning that both sexes are equitably represented, there is also a very similar proportion of children in each of the age groups, which validates the representiveness of the sample.

Graph 1 : *Distribution of children per age, Kanchanpur district, Nepal, May-June 2008*
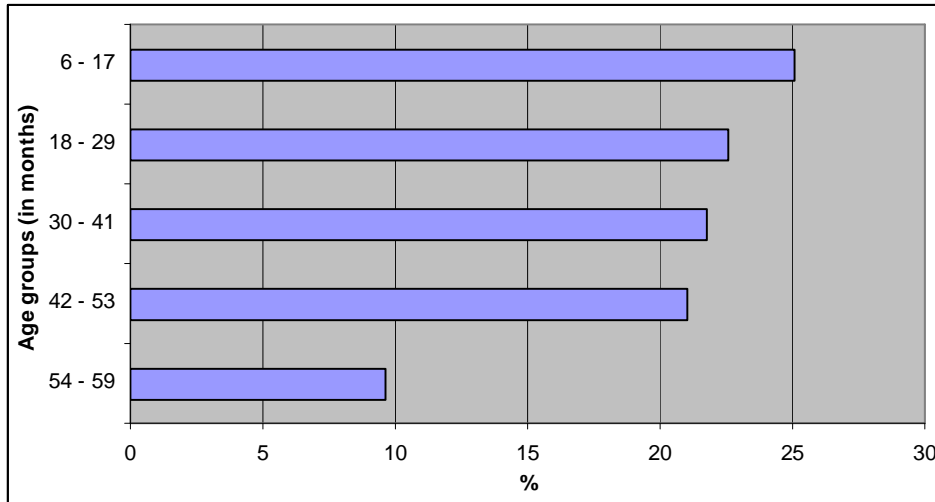
The graph above shows equitable repartition of children by age groups. The difference observed between the age group 54-59 months and the other ones is due to number of months covered by the age group. Indeed, the age group 54-59 months covers 6 months while the other age groups are covering a period of 12 months.

The real design effect of the survey is 2.01 which correspond to the assumption made for the sample calculation.

Children from 6 to 29 months represent 47.6% (n=363) of the total sample. However, analysis was done with a sample of 357 data, 6 data being out of range.

2. PREVALENCE OF ACUTE AND CHRONIC MALNUTRITION

2.1. Prevalence of acute malnutrition using WHO standards 2006

Table 2 : *Prevalence of global and severe acute malnutrition for children 6-59 months (WHO standards), in z-score, Kanchanpur district, Nepal, May-June 2008*

	6 - 59 months (n=752)
Global Acute Malnutrition	**17.0** % [CI 95%[5] : 13.2% - 20.8%]
Severe Acute Malnutrition	**3.3** % [CI 95% : 2.2% - 4.5%]

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[5] CI : 95%Confidence interval

Graph 2 : *Weight-for-Height distribution (in z-scores) according to the WHO standards, Kanchanpur district, Nepal, May-June 2008*
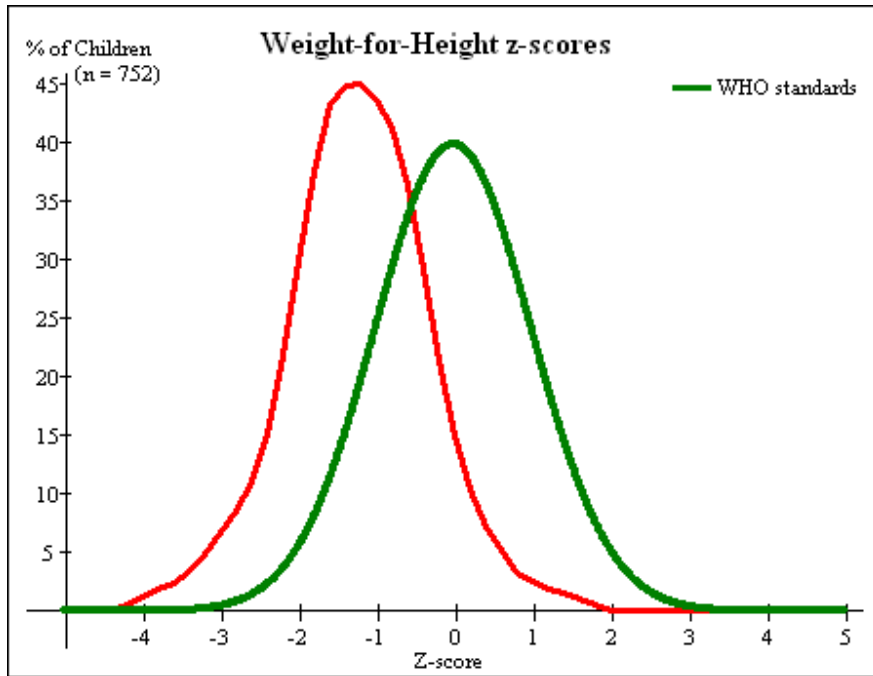
The mean weight-for-height is equal to -1.23 ± 0.90. The standard deviation (WHZ) of 1.0 z-score is within the accepted limits (0.85 to 1.10). The moment of skewness which is equal to 0.21 is within the interval range of -1 and 1. With a kurtosis of WHZ of 4.5, there is probably a kurtosis problem visualized in the curve by a relatively peaked distribution of the data.

Table 3 : *Prevalence of global and severe acute malnutrition for children 6-29 months (WHO standards), in z-score, Kanchanpur district, Nepal, May-June 2008*

	6 - 29 months (n=357)
Global Acute Malnutrition	**17.9** % [CI 95% : 13.1% - 22.8%]
Severe Acute Malnutrition	**3.4** % [CI 95% : 1.3% - 5.4%]

By comparing the prevalence of global and severe acute malnutrition among the children from 6 to 29 months and from 30 to 59 months, no significant difference is found (p>0.05). Both age groups have a similar risk to be malnourished.

Table 4 : *Prevalence of global and severe acute malnutrition for girls and boys from 6 to 59 months old (WHO standards), in z-score, Kanchanpur district, Nepal, May-June 2008*

	Girls (n=354)	Boys (n=398)
Global Acute Malnutrition	**14.7** % [CI 95% : 10.4% - 19.0%]	**19.1** % [CI 95% : 14.1% - 24.1%]
Severe Acute Malnutrition	**2.8** % [CI 95% : 0.8% - 4.9%]	**3.8** % [CI 95% : 1.8% - 5.7%]

By comparing the prevalence of global and severe acute malnutrition among girls and boys from 6 to 59 months, no significant difference is found (p>0.05). Although the proportions presented in the table above appear quite large, both sexes have similar risks of being malnourished.

2.2. Prevalence of stunting (chronic malnutrition) using the WHO standards 2006

Table 5 : *Prevalence of stunting (chronic malnutrition), in z-score, Kanchanpur district, Nepal, May-June 2008*

	6 – 59 months (n=742)
Global stunting malnutrition <- 2 Z Score	**41.8** % [CI 95% : 37.5 – 46.1]
Severe stunting malnutrition <- 3 Z Score	**14.0** % [CI 95% : 11.0 – 17.0]

The difference of sample size compared to the sample used to calculate the wasting rates is due to error of age. Indeed, it is extremely difficult to collect the age of each child with a high precision knowing that in Kanchanpur few households possess a proof of age like a birth certificate or vaccination or growth card.

2.3. Prevalence of acute malnutrition using the NCHS reference 1978

Table 6 : *Prevalence of global acute malnutrition (NCHS reference), Kanchanpur district, Nepal, May-June 2008*

	6 - 59 months
Expressed in Z-score (n=755)	**16.6** % [CI 95% : 13.4% - 19.8%]
Expressed in % of median (n=760)	**9.2** % [CI 95% : 6.6% - 11.8%]

Table 7 : *Prevalence of severe acute malnutrition (NCHS reference), Kanchanpur district, Nepal, May-June 2008*

|	6 - 59 months
Expressed in Z-score (n=755)	**1.5** % [CI 95% : 0.7% - 2.2%]
Expressed in % of median (n=759)	**0.5** % [CI 95% : 0.0% - 1.0%]

2.4. Prevalence of acute malnutrition using MUAC criteria

Table 8 : *Prevalence of acute malnutrition according to MUAC criteria, Kanchanpur district, Nepal, May-June 2008*

MUAC (mm)	Length / Height (cm)		Total
	≥65 & < 90	≥90	
<110	8	-	8
≥ 110 & < 125	122	11	133
≥125	335	259	594
Total	465	270	735

Moderate and severe acute malnutrition according to MUAC criteria show that children with a height between 65 and 90 cm are more malnourished than children taller than 90 cm, meaning that children less than 30 months are more at risk of mortality than the others, MUAC being the best indicator to express this risk.

Graph 3 : *Prevalence of acute malnutrition using different standards: MUAC, NCHS, WHO, Kanchanpur district, Nepal, May-June 2008*
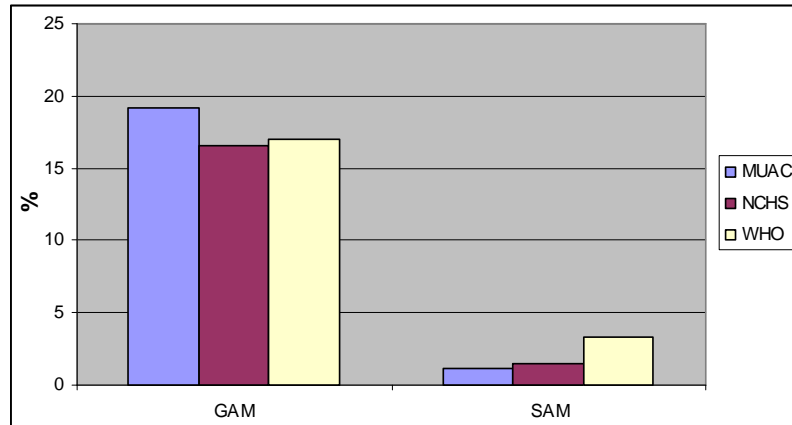
Comparing the prevalence of global and severe acute malnutrition calculated with MUAC, NCHS reference or WHO new standards, a difference is observed between the different malnutrition rates. This observation raised the question of detection, admission and discharge criteria (which reference/standard used?) in a future programme of treatment of severe acute malnutrition.

3. DOMESTIC HEALTH PRACTICES

3.1. Has this child (6 months – 59 months) in your household been sick in the last 2 weeks?

Table 9 : *Prevalence of reported illness 2 weeks prior the survey among 6-59 months children according to the caretaker, Kanchanpur district, Nepal, May-June 2008*

	Number of children	%
No	421	55.2
Yes	341	44.8
Total	**762**	**100**

44.8% of surveyed children from 6 to 59 months were reported to have been sick in the last 2 weeks (all causes).

3.2. Did the caretaker seek medical treatment for this illness episode?

This question was asked for those who had been sick in the last 2 weeks.

Table 10 : *Proportion of sick children who sought medical treatment according to caretaker, Kanchanpur district, Nepal, May-June 2008*

	Number of children	%
No	55	16.1
Yes	286	83.9
Total	**341**	**100**

Among the 44.8% of children who were sick in the last 2 weeks, 83.9% of the caretakers were seeking a treatment for the illness episode.

3.3. *Where did they seek treatment?*

This question was asked for those who sought medical treatment for the illness episode

Table 11 : *Locations where caretakers sought medical treatment for their sick child, Kanchanpur district, Nepal, May-June 2008*

|	Number of children	%
Government Health Facility	61	21.3
Female Community Health Volunteer	10	3.5
Pharmacy	117	40.9
Private Health Facility	78	27.3
Dhami (traditional healer)	7	2.4
Other, Specify	10	3.5
Don't Know / No Answer	3	1.1
Total	**286**	**100**

Among the 10 "other" answers, 4 were treated at home (1 with drugs, 3 traditionally) and 6 went to India.
Among the 83.9% of the caretakers who sought treatment for the illness episode, 40.9% of them went directly to the pharmacy, 27.3% went to a private health facility and 21.3% went to a government health facility.

In the focus group discussions done during the Causal Analysis Assessment, the most frequent response to the question: "What kind of treatment do you give to a malnourished child?", is "traditional treatments". It appears that people have great respect and faith in traditional healers, especially regarding malnutrition.

When asking health workers about this difference of responses collected between the nutrition survey and the CAA, they said that some of the diseases in Nepal are considered as the field of traditional medicine, which could lead us to think that malnutrition, for the majority of Nepali people living in Kanchanpur district, is more a "specialty" of traditional healers. According to these focus group discussions, the first treatment to cure malnutrition is a traditional home treatment. If the treatment is not effective, then the second attempt is to seek for a traditional healer. In the third place, the FCHVs will be solicited. The recourse to the health centre or hospital appears to come in case of failure of these three first attempts.

Graph 4 : *Locations where caretakers sought medical treatment for their sick child, Kanchanpur district, Nepal, May-June 2008*
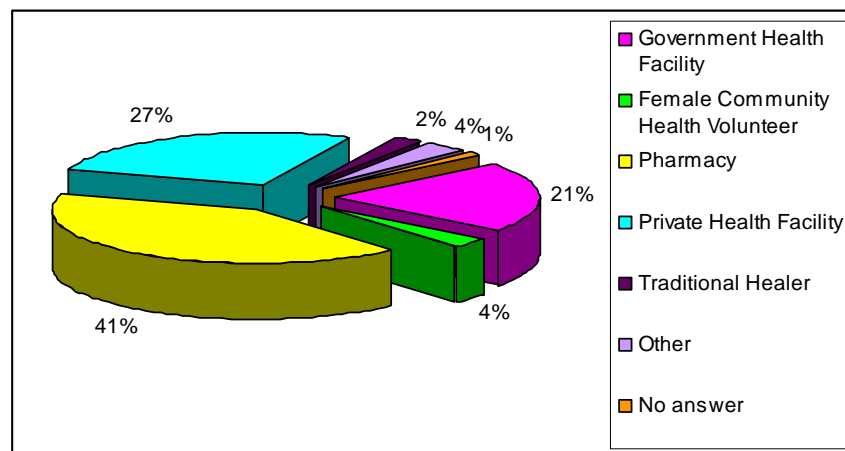
### 3.4. If they did not access a government health facility, what is the reason?

This question was asked for those who did not seek treatment and those who went to somewhere else than a government health facility

Table 12 : *Reasons why the child was not sent to Government Health Facility according to caretaker, Kanchanpur district, Nepal, May-June 2008*

	Number of children	%
Distance to treatment	95	33.9
No staff at health facility	4	1.4
No drugs at health facility	52	18.6
Facility staff refuse to treat some patients	0	0.0
Facility staff receive patients rudely	9	3.2
Facility was closed	13	4.6
Have to wait too long for treatment at the facility	29	10.4
FCHV handled the treatment adequately	6	2.1
Price of treatment	15	5.4
Other, specify	35	12.5
Don't know / No answer	22	7.9
Total	**280**	**100**

Among the 35 "other" answers, 8 were because of inefficiency of Government Health Facility, 5 because the sickness is considered as normal phenomena, 4 because of distrust in Government Health Facility, 3 because of lack of time, 3 because the child recovered himself, 2 because a person or family member from drugstore visited the household, 2 because the child was not very sick, 2 because the child was treated successfully by Dhami at home, 1 because of lack of money for transportation, 1 because all patients are given the same medicine in Government Health Facility, 1 because there was drug at home, 1 because the sickness was too recent, 1 because the family doesn't care about the child's sickness, and 1 because the caretaker didn't know any health centre.

Graph 5 : *Reasons why the child was not sent to a Governmental Health Facility according to the caretaker, Kanchanpur district, Nepal, May-June 2008*

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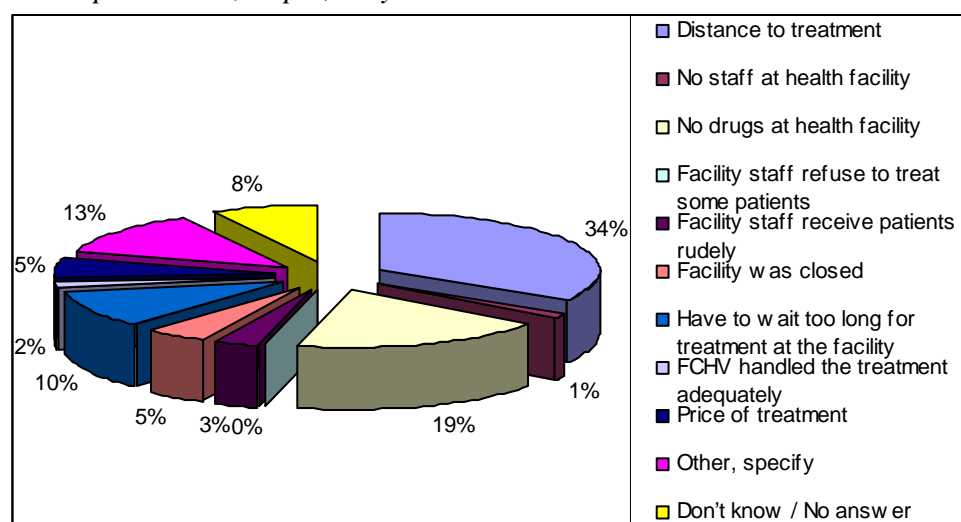
33.9% of caretakers did not seek a treatment or went to somewhere else than a government health facility when her child was sick, because of distance to treatment.
18.6% said that there is usually no drugs at governmental health facility
10.4% said that they have to wait too long for treatment at governmental health facility.

DISCUSSION

Nepali Technical Assistance Group (NTAG)[6], a national Nepali NGO funded by UNICEF conducted two nutritional surveys in Kanchanpur district in June 2005 and in March 2006, which showed respectively the following results:
- GAM[7]=17% and SAM[8]=2%, confidence interval not available, n=625
- GAM=21% and SAM=2%, confidence interval not available, n=613

These results are based on NCHS references from 1978. The methodology employed follows the UN Sub-Committee on Nutrition guideline on conducting anthropometric surveys.

May-June represents the period just before the rainy season which usually starts by the end of June. As these two nutritional surveys have been carried out at similar periods of the year than the one conducted by ACF in May-June 2008 (GAM=16.6% [13.4 – 19.8] and SAM= 1.5% [0.7 – 2.2]), comparison using the NCHS reference, can be made.

No significant difference between the survey conducted in 2005 and that conducted in 2006 were observed. Comparing the survey of 2005 and that done in 2008 led to the same conclusions. However, comparison of the prevalence of global acute malnutrition between 2006 and 2008, showed a significant difference (p=0.03). The Relative Risk is equal to 1.27 [1.02 – 1.59] and Khi² to 4.51, meaning that in 2006, children less than 5 years old were 1.27 times more at risk to become at least moderately malnourished compared to the children of 2008. This suggests an improved situation in terms of nutritional status since 2006.

However, the prevalence of global acute malnutrition (calculated with the NCHS standards) remains relatively high and the situation is still worrying. Indeed, WHO stated that a GAM prevalence higher than 15% shows an alarming situation. Moreover, with the worldwide food crisis not sparing Nepal and particularly the Terai region, where people used to do business with India and the advent of the rainy season with a probable increase of diarrhea cases and acute respiratory infections, the situation could deteriorate quite rapidly.

Looking at the prevalence of severe acute malnutrition calculated with the WHO standards 2006 (Nepali government advises using this new reference for admission and discharge criteria) and the high population density in Kanchanpur district, the estimated number of severely malnourished children being at high risk of death in the district at the time of the survey amounted to approximately 1300 which is a huge number.

The rate of underweight children found in May-June 2008 is still very high (52.2 % [95% CI: 48.1- 56.2 95%]) compared to the Millennium Development Goal, (MDG): by 2015 underweight rate should be 29%[9]. Many factors can contribute to this high underweight rate; among them micronutrient deficiencies are likely to have a certain impact on nutritional status as food intake is poorly diversified. The main meal for lunch and dinner is composed of rice (Bat), a lentils sauce (Dal) and a small portion of green vegetables (Sak) or mix of vegetables which are often potatoes (Tarkari).

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[6] NTAG
[7] GAM : Global acute malnutrition
[8] SAM : Severe Acute Malnutrition
[9] MDG 2015: Reduce by half the proportion of people who suffer from hunger

The workload of women can also have a non negligible impact on the nutritional status of children. Indeed, women are in charge of all the domestic tasks (cooking, washing clothes, cleaning the house, collecting water and wood, etc…) but they also play a big role in all the tasks related to the agricultural activities in the fields and care of the animals (buffalo, goats, chickens). This leaves a very small place for child care, including breastfeeding, bath, play sessions, massage, interaction with the child, active feeding (etc…), activities which have been proven as having a big impact on nutritional status of a child and its cognitive development.
Moreover, the food price crisis from 2006 to date has a certain impact on the quantity and quality of food people can afford to purchase or to grow. According to WFP[10], in spite of an increase in summer rice paddy production by 17% this year, rice prices are likely to increase by over 20%. Between December 2007 and April 2008, the price of staple food as coarse rice has increased by 26% and cooking oil by 22% in the Terai region.

This will for sure have an impact of the nutritional status of children less than 5 years, which are in growing stage and so need specific quantity of nutrients to assure their growth and development, as prices increase, household decision makers usually compromise on quality to maintain adequate quantities of food.

Regarding the health seeking behaviour, among the 44.8% of children who were reportedly sick in the last 2 weeks, 83.9% received a medical treatment, which proves that most of the caretakers still believe in the health system (public or private) and do not hesitate to go to a health structure to seek treatment. However, it appears that caretakers trust more easily the private health sector than the public one as 68.2% of them went to seek treatment either directly to a pharmacy (40.9%) or to a private health facility (27.3%). Only 21.3% of the caretakers with a sick child went to a governmental health facility. Traditional healers attracted only 2.4% of the interviewed caretakers. The main reported reasons of not using a governmental health facility are first the distance to reach the facility (33.9%), then the fact that drugs are not available in the governmental health facility (18.6%) and the third main reason is the waiting time to get a consultation that is estimated to be too long by the caretakers (10.4%).
It is important to mention that since January 2008, consultations and drugs in health posts and sub health posts are free. Only specific or non available medicines have to be purchased in a pharmacy or private health facility.

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[10] For a detailed analysis of the development of the price of coarse rice, please refer to *Market Watch – 3* published by WFP in February 2008.

RECOMMENDATIONS

❖ To launch a monitoring system via a training of FCHVs to detect malnutrition during the growth monitoring sessions or EPI sessions in each VDC. This will allow to follow the nutritional status of children under 5 years old and be able to react on time if any deterioration happens due to food crisis or epidemic of diseases;

❖ To implement CMAM (Community based Management of Acute Malnutrition) pilot programme in Kanchanpur district including a community awareness programme about acute malnutrition issues;

❖ To open at least 10 Outreached Treatment Points (1 for 2 VDCs) for the treatment of severe acute malnutrition in the all district to minimize the distances between the caretaker and the health structure;

❖ To reinforce counseling activities on care practices, child stimulation and balanced diet in health posts and sub health posts;

❖ To conduct a nutritional survey at the end of the pilot programme to evaluate the efficacy of this approach and give some new recommendations on the best way to implement it;

❖ To conduct a mortality survey to serve as a baseline for future programmes and follow the trends in the district. A mortality survey cannot give information about a single programme but for all the health programme together;

ANNEXES

ANNEX 1 : Map of Kanchanpur with the selected VDCs for the additional WASH and Food security assessment
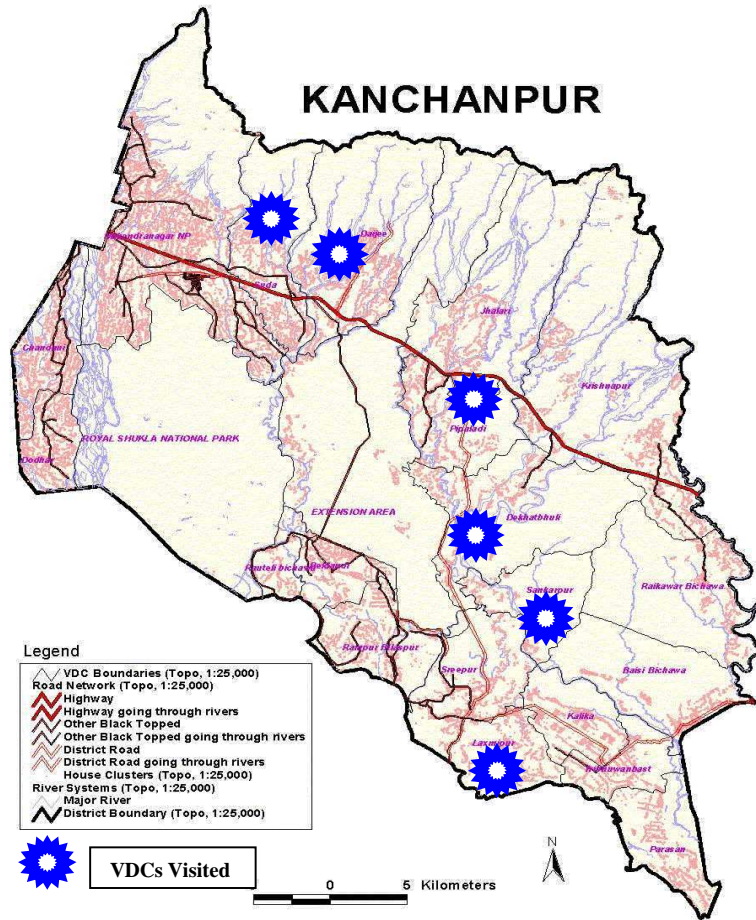
ANNEX 2 : Clusters selection, Kanchanpur district, Nepal, May-June 2008 (clusters coloured in grey are part of the buffer clusters. There were not assessed as all the selected clusters were accessible)

Geographical unit		Population size (U5)	Cluster number
VDC	Ward number		
Baisi Bichawa	1	1530	1
Baisi Bichawa	6	1311	2
Beldandi	2	1743	3
Beldandi	7	2495	4
Chandani	1	1252	5
Chandani	4	2337	6
Chandani	7	4109	7
Daijee	3	2801	8
Daijee	5	2204	9
Daijee	7	1390	10
Dekhatbhuli	1	2578	11
Dekhatbhuli	5	1051	12
Dekhatbhuli	9	3081	13
Dodhara	3	1661	14
Dodhara	6	1274	15
Jhalari	1	3234	16
Jhalari	4	3177	17
Jhalari	9	3417	18
Kalika	5	1980	19
Kalika	8	1609	20
Krishnapur	1	4853	21
Krishnapur	3	1958	22
Krishnapur	6	3385	23
Krishnapur	9	1333	24
Laxmipur	7	1498	25
Parasan	1	1492	26
Parasan	6	998	27
Pipaladi	1	4580	28
Pipaladi	3	3484	29
Pipaladi	8	1472	30
Raikawar Bichawa	2	823	31
Raikawar Bichawa	6	1114	32
Rampur Bilaspur	1	2542	33
Rampur Bilaspur	5	1327	34
Rampur Bilaspur	9	2945	35
Rauteli Bichawa	6	398	36
Sankarpur	4	903	37
Sreepur	1	2201	38
Sreepur	4	2673	39
Sreepur	7	3174	40
Suda	3	1261	41
Suda	6	2511	42
Suda	9	1690	43
Tribhuwanbasti	5	1670	44

ANNEX 3 : Nutrition survey questionnaire

District_____Village: _____ VDC: _____Ward: _____ Date: _____ Cluster number: _____ Team number: _____

Child #	HH #	Name	Sex (F/M)	Date of Birth mm/dd/yyyy	Confirmed (Y/N)	Age in months	Weight (kg) ± 0.1 kg	Height (cm) ±0.1cm	Oedema (Y or N)	MUAC ±0.1cm	Has this child (6 months – 59 months) in your household been sick in the last 2 weeks? Y or N If Y, then go to next question If N, then you are finished.	Did the caretaker seek medical treatment for this illness episode? Y or N If Y, then go to next question If N, then go to the last question	Where did they seek treatment? 1= Gov HF 2= FCHV 3 = Pharmacy 4= Private HF 5 = Dhami (traditional healer) 10 = Other - specify 0= Don't know/ no answer If the answer is "1" then you are finished If the answer is any other code then go to last question	If they **did not** access a g HF, what is the reason? 1 = distance to treatment 2 = No staff at HF 3 = No drugs at HF 4 = Facility staff refuse to some patients 5=Facility staff receive pa rudely 6= Facility was closed 7= Have to wait too long treatment at the facility 8=FCHV handled the trea adequately 9= Price of treatment 10=Other (specify in the s 0=don't know/ no answer
1														
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ANNEX 4 : EPI method of household's selection

1. With the help of the local chairman/imam, going to somewhere near the centre of the selected cluster area.

2. Choosing randomly a direction by spinning pencil or pen on the ground and noting the direction in which it points when it stops.
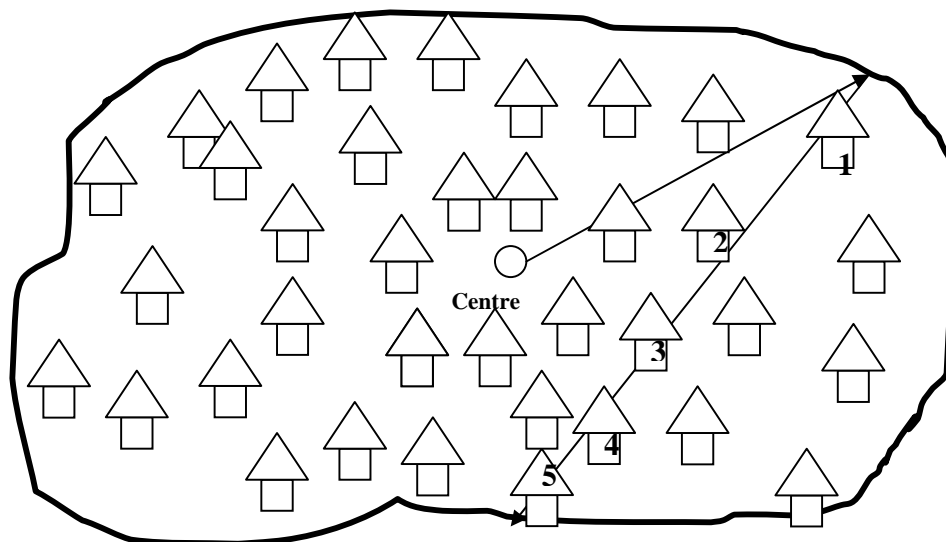
3. Walking in the direction indicated, to the edge of the village (as shown in the figure above).

4. At the edge of the village, the team spin the pen again until it points into the body of the village and walk along this second line counting each house on the way, to the edge of the village. If the houses are closely packed together, the teams count only the houses on their right side.

5. Using a random number list, selecting the first house to be visited by drawing a random number between one and the number of households counted when walking. For example, if the number of households counted is 5, as shown, the team leader selects a random number between one and 5. (Each team leader has a list of random numbers). If the number five is chosen, then the team go to the fifth household counted along the walking line. This is the first house to be visited by the team.

6. Going to the first household: based on the number of children aged from 6-59 months living in the household, the team examine and complete the child questionnaire for *all* of them for the nutritional survey and complete the family questionnaire regarding the mortality survey.

7. The subsequent households are chosen by proximity. In a village where the houses are closely packed together, the next house is chosen on the right: by standing in the entrance of the compound, the ones on the right arm.
The team continue to go following this method until the required number of children to be measured and the number of household to be visited is reached.

8. If the border of the village is reached and if the required number of children is not achieved, another direction should be determined using the procedure mentioned above (from step 4.) The team leader has to be careful to not include twice the same household.

9. The same method is used for all the cluster