**SMART nutrition assessment report**

# Report of Nutrition and Mortality in Kandahar City, Damaan and Spinboldak districts of Kandahar Province Afghanistan 29 June to 5 July 2014

**20 July 2014**




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# Contents

## ACRONYMS

| | |
|---|---|
| AHDS | Afghanistan Health and Development Services |
| AM | Acute malnutrition |
| AMS | Afghanistan Mortality Survey |
| BPHS | Basic Package of Health Services |
| C.I. | Confidence Interval |
| CMAM | Community Management of Acute malnutrition |
| CMR | Crude Mortality Rate |
| DEFF | Design Effect |
| DRC | Danish Refugee Council |
| DFATD | Department of Foreign Affairs, Trade and Development |
| ENA | Emergency Nutrition Assessment |
| EPI | Short name |
| FSL | Food Security and Livelihood |
| GAM | Global Acute Malnutrition |
| IYCF | Infant and Young Child Feeding |
| IDP | Internally Displaced people |
| HH | Household |
| LBW | Low Birth Weight |
| MoPH | Ministry of Public Health |
| MUAC | Middle Upper Arm Circumference |
| NCHS | National Center for Health Statistics |
| NRC | Norwegian Refugee Council |
| NRVA | National Risk and Vulnerability Assessment |
| OFDA | Office for Foreign Disaster Assistance |
| PPS | Probability Proportional to Size |
| RC | Reserve Cluster |
| SAM | Severe Acute malnutrition |
| SC | Save the Children |
| SD | Standard Deviation |
| SMART | Standardized Monitoring and Assessment of Relief and Transitions |
| U5MR | Under 5 Mortality Rate |
| UNOCHA | United Nations Office for the Coordination of Humanitarian Affairs |
| WASH | Water Sanitation and Hygiene |
| WFP | World Food Program |
| WHO | World Health Organisation |

## Executive summary


The survey was performed in Kandahar Province in Kandahar City, Damaan and Spinboldak districts. The target population were IDPs, being children 6-59 months of age the target for the anthropometry, children 0 – 23 months for IYCF, the whole population for the mortality and WASH parts. The main objectives of the survey were to estimate prevalence of GAM among children 6 to 59 and determine IYCF practices of children 0-23 months. This information was then to be used for expansion of nutrition services through ECHO funded Health and Nutrition project in IDP areas of Kandahar province.

The dates of data collection for the survey range from the 29th June to the 5th of July 2014.

The methodology used on this survey was the Random Cluster Survey approach. Sampling was done using PPS (probability proportional to size) in 2 stages. The sample size was calculated with the software ENA 2011 based in national population averages and HH size). It was 370 children for the Nutrition survey and 2970 people for the mortality component, which resulted in a total of 410 HH to be visited.

The major findings are summarized below:

GAM: 11.9 % (9.1 - 15.3 95% C.I.)
SAM: 3.3 % (1.8 - 6.2 95% C.I.)
MAM: 8.6% (6.2-11.6 95% CI)
Stunting 60.8% (53.6-67.6 95% CI)
Mortality rates (CMR and U5MR and 95% confidence intervals)
CMR: (total deaths/10,000 people / day): 0.15 (0.05-0.45) (95% CI)
U5MR: (deaths in children under five/10,000 children under five / day): 0.23 (0.03 - 1.75) (95% CI)
Early initiation of breast feeding 79%
Exclusive breastfeeding until 6 months 62%


**Brief interpretation of the results recommendations:**

The survey shown that acute malnutrition levels in IDP areas in Kandahar remain in a serious situation[1] but there is no direct correlation with mortality levels. Both the under five and crude mortality rates were within acceptable levels.

Chronic malnutrition is a very common problem among all age groups of children 6 to 59 months of age. This indicates a long-standing chronic nutrition problem among children 6 to 59 months.

IYCF practices are far from optimal. While it is encouraging that some of the key IYCF indicators are not as poor as one might have expected. Mothers require additional breastfeeding and complementary feeding support.

There is a general poor, water and sanitation and knowledge of key hygiene and sanitation practices.

Expand the coverage of therapeutic feeding program to reach all malnourished children with a special focus in hard to reach areas through community

[1] WHO (2000) nutrition emergency thresholds

mobilization, MUAC massive screening campaigns and active case finding.

Maternal nutrition – More than half of children 6 to 59 months are stunted. One of the risk factor of stunting is low birth weight, LBW could be one of the main reasons why prevalence of chronic malnutrition is very high. The adverse consequences of LBW continue to be manifested during childhood, and are passed on to the next generation when women, who are chronically undernourished, become pregnant. So, it is recommended to explore the feasibility of promoting programmes focusing on prevention interventions on the first 1000 special days (ie since onset of pregnancy to 2 years) of a child's live to reduce stunting.

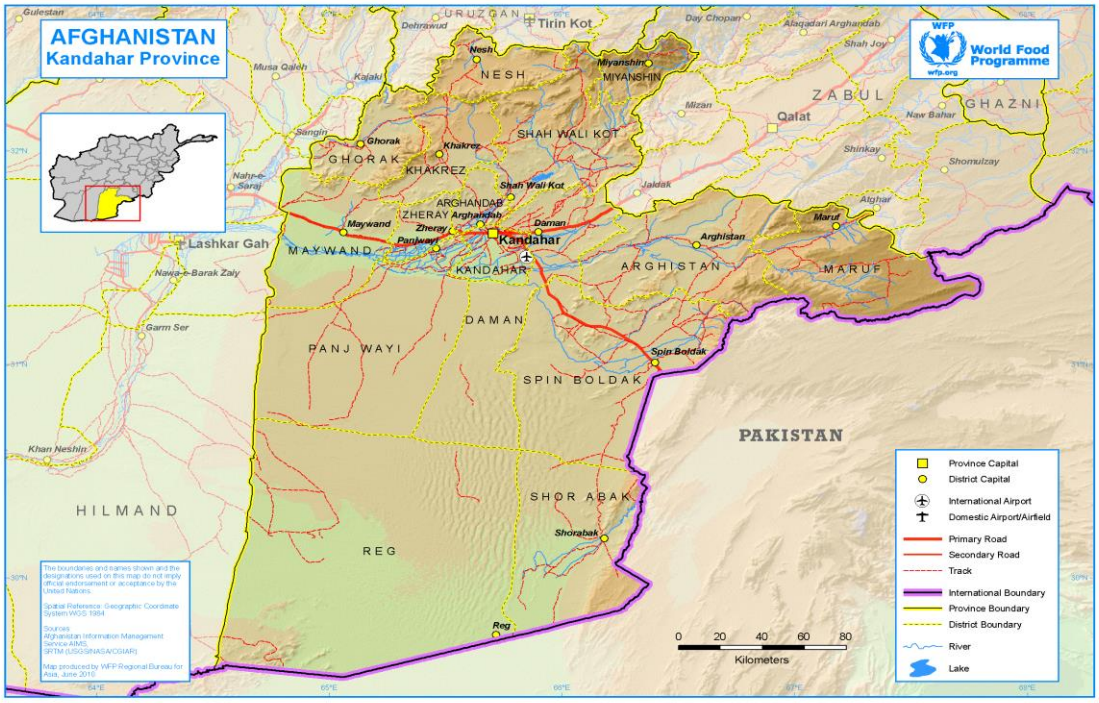
Breastfeeding practices and complementary feeding practices are far from optimal. Interventions should be prioritized to reduce stunting, including promotion of optimal IYCF, micronutrient-rich foods and appropriate supplementation and improving maternal health and nutrition.

Involve and train community members on the key infant and young child feeding practices, appropriate management of sick children, sanitation and personnel hygiene, and the dangers of poor nutrition on the health of children and the community as a whole.

Efforts have to be made to improve the water and sanitation situation of the communities through promotion of hygiene practices and provision of safe water supply.

# 1. Introduction

Kandahar province is located in the southern region of the country and has borders with Zabul in the East, Uruzgan in the North, Helmand in the West and an international border with the Balochistan Province of Pakistan in the South. The province covers an area of 47676 km$^2$ include 18 districts. More than four-fifths of the area is made up of flat land (84.5%) while nearly a tenth of the province is mountainous or semi mountainous terrain (7.6%).
Kandahar has a total population of 990100. There are approximately 14445 households in the province, and households on average have 7.4 members. Around 68% of the population of Kandahar lives in rural districts while 32% lives in urban areas. Around 51% of the population is male and 49% is female. The major ethnic group living in Khandahar province is Pashtoons. This includes major tribes such as Barakzai, Popalzai, Alkozai, Noorzai and Alezai. Pashtu is spoken by more than 98% of population and in more than 98% of villages. Dari is spoken in six villages by 4000 people and Balochi is spoken by 8000 people in two villages. 19000 people in nine villages speak some other unspecified language.[2]




The income for all wealth groups is dependent on agriculture – with the better-off depending on the sale of fruit, vegetable and staples, and the poor primarily depending on work on the farms of the better-off. Poor households sell a portion of the wheat, maize and vegetables they receive from in-kind payment immediately after harvest to cover pressing food and non-food needs. Livestock are sold throughout the year with peak sheep and goat sales happening from November to February.[3]
The Southern Region is largely considered chronically food insecure due to poor climatic conditions (drought), high tempo of military/insurgency activities (cut off from roads) restrictions on the type/quantity of crops cultivated and limited access

[2] Food security Atlas www.foodsecurityatlas.org. CSO/UNAMA
[3] FEWSNET Livelihoods Zoning in Afghanistan, 2011

to markets. In 2013 Kandahar province is the most vulnerable province in Afghanistan with the highest vulnerable index in Health, Nutrition, Conflict Displacement, Civilian Casualties and Security Incidents. Insecurity remains the biggest determinant of humanitarian need. Armed conflict and IEDs are everyday occurrence having a high toll on civilians. Protection of civilians is a main concern. Very low presence of humanitarian organizations in the province coupled with weak capacities of provincial authorities makes delivering humanitarian assistance difficult4. While the 2014 humanitarian needs overview document found that the humanitarian presence compared to need in Kandahar province considered have relatively fewer be further compounded by harsh terrain and extreme weather, and recurrent natural disasters. There are 40,257 internally displaced people 5,751 families they are currently living in Kandahar city, Daman and Spenboldak districts.
According to UNOCHA between 7300 to 8000 households and families have emmigrated from Helmand, Urozgan and some of relevant parts of Kandahar province and the number of migrants have been increasing day by day and they are really worried regarding instability and insecurity in 2014.

**Services and humanitarian assistance**

Save the Children implements a DFATD-Canada funded nutrition programme in partnership with Afghanistan Health and Development Services (AHDS) who is providing a Basic package of health services (BPHS) implementing partner. There are 20 OTP and one SC sites already exist within host communities as part of this existing programme.
There are some other key actors in the area; Danish Refugee Council (DRC) implements FSL, Protection and WASH and Norvigion Refugee Council (NRC) provide cash support in the targeted areas, and WFP supports Food Aid.
In case of a significant new displacement, Save the Children can complement existing and planned responses from various actors with pre-positioned non-food items available via SC's Office for Foreign Disaster Assistance (OFDA)-funded project, as necessary, to support a comprehensive humanitarian response.

## 1.1 Survey Objectives

- To estimate the prevalence of acute and chronic malnutrition in children 6 to 59 months
- To obtain quantitative data on infant and young child feeding (IYCF) practices among 0-23 months old children
- Estimate retrospective crude and under five mortality rates over a 3 month period prior to the survey
- Make recommendations for health and nutrition ECHO funded project

[4] Humanitarian Overview (Jan 2013) - Kandahar Province

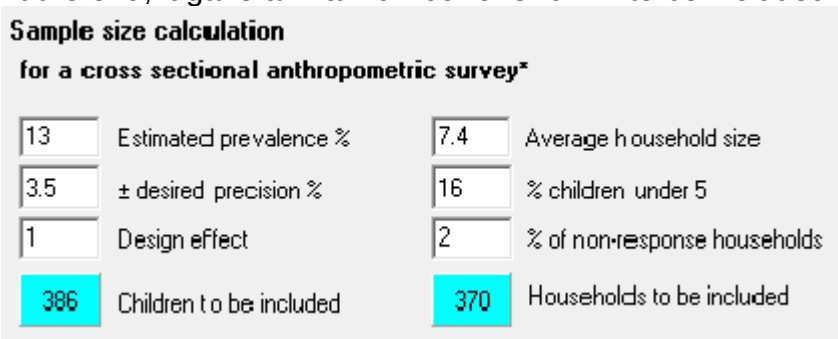
## 2. Methodology

### 2.1 Sample size

The chosen methodology was the Cluster sampling, as the target area was 16 IDP sites with different population sizes in each of the sites in Kandahar city, Daman and Spinboldak districts. The total population in these IDP sites were 17,269 people. Also, PPS was considered the fairest method to decide the populations to visit in a representative sample. The full list of IDP settlements is in annex

- *Calculation of the sample size for anthropometry*
  The estimated prevalence for the survey was set on a 13 % GAM[5].
  The DEFF was set on 1, because all the survey areas were homogenous with the same socio economic situation. Precision was set on +/-3.5 % (rule of thumb for the expected prevalence of 10 % to 15%)
  The final sample of children 6-59 months was therefore calculated on 386 children.
  In order to make the survey more simple and coherent with the mortality part, the sample was converted to number of HH's using the below criteria:
  National average household size in Afghanistan is officially set on 7.4[6] persons per HH, while also officially, the % of children under 5 years of age is 16 %.
  The percentage of non-response was set on 2 % as the Save the Children team in Kandahar was aware of having little empty HHs. (the final non response rate resulted on less than 2%).

  At the end, it gave a final number of 370 HH to be included in the survey.



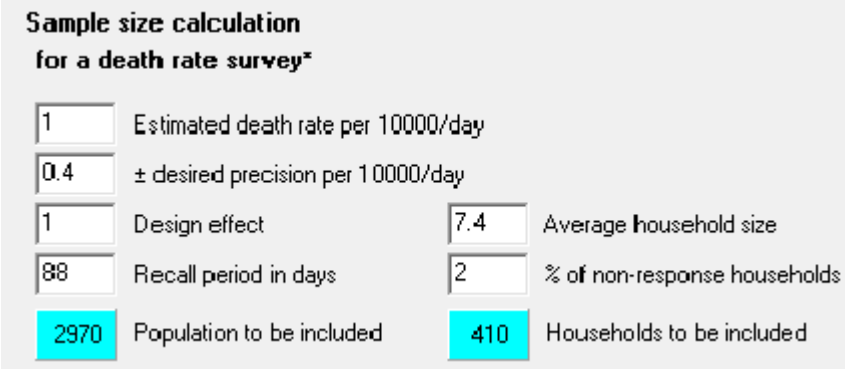

- *Calculation of the sample size for mortality.*

  The sample size for mortality was calculated based on the following criteria:
  The estimated death rate per 10000/day was set on 1 as it's the emergency threshold.
  Precision was set at 0.4 to have accurate enough data as recommended by ENA with the chosen estimate for CDR.

[5] National Nutrition Survey Afghanistan (2013)

[6] National Risk and vulnerability assessment 2011 and 2012

For the DEFF, 1 was chosen as ENA recommends in environments with low mortality associated with violence.
The recall period was set on 88 days. It was chosen based on a standard 90 days recall period, and set on 88 as the most memorable event in those dates was the presidential and provincial council elections on the 5th of April.
ENA gave a sample size of 2970 individuals for the mortality survey, which turned into 410 HH to be visited using the National HH size average and the same non response rate as for Mortality.




As the survey was a combined mortality and anthropometry study, the bigger HH sample was chosen. While there was not a high difference on the sample needed for either one of them, all the HH's were included in both surveys.

- *Calculation of the number of clusters for the survey*
  The number of clusters to include in the survey was calculated as a result of the number of HH's to be included divided by the number of HH's that an average team could visit in a regular work day. It was decided that teams would complete one cluster per day. The calculation was as follows:

| Event | Time to dedicate | Total time remaining |
|---|---|---|
| Time per day for field work | From 6:00 until 12:30 = 6 and half hours | 390 minutes |
| Travel time to cluster location | 30 min x 2 (go and return) = 60 min | 330' – 60'= 330' |
| Presentation to village leader and selection of the 1st HH | 1:00 h. | 330' – 60' = 270' |
| Two breaks of 15' plus 1 hour lunch break | 15' x 2 = 30' | 270' – 30' = 240' |
| Time to dedicate per HH, and reach the next | 13' for survey measurements and questionnaire + 3' walk to next HH= 16' | 240 / 16 = 15 |
| Total of HH's in one day | | 15 |

In order to reduce the data collection time, a total of 5 teams were recruited for the survey. The following calculation supported the final decision for the total number of clusters to include in the survey:

**410 HH's, divided by 15 HH in one day = 27 clusters**

Having 5 teams, the total time required for the data collection in the field was 6 days.

It is recognized that the optimal way of determining IYCF practices is to calculate the specific sample size for each indicator, however, the numbers and scale of such an assessment was beyond the scope or capabilities of this current survey. In all visited households with children 0-23 months, mothers were interviewed on key infant and young child feeding (IYCF) practices. The key IYCF practices assessed included exclusive breastfeeding in first 6 months, early initiation of breast milk within 1 hour of birth, supplementary feeding in children 6 months, and continued breastfeeding till the child is 2 years old.

## 2.2 Sampling procedure: selecting clusters

We have used each IDP settlement level population data from obtained from Directorate of refugees and repatriation and UNHCR.

- 27 Clusters were randomly selected using PPS through ENA software as it was considered the most fair in order to choose the sites to be surveyed. It was performed in a 2 stage cluster selection method:
- In **the first stage**, clusters were assigned to the settlements using their total size. A cluster assignment page was generated for each IDP site based in the number of clusters assigned. A final document was made with the final cluster number assigned.
- **The second stage** was the random selection of HH's at cluster level. Simple random sampling method was used as in all of the clusters. There was the list of HHs or the team developed the list of HHs with the IDP site leaders.

- *See annexes 2 for details*

## 2.3 Sampling procedure: selecting households and children

- Household selection was done using Simple random sampling method as it's described in the SMART methodology. The teams were intensely trained and followed on the performance of the method.
- Empty households and households with absent children were re-visited whenever it was known or fully unknown if they would be present later in the day. If neighbours or Village Heads could explain that they were long term absences or permanent emigration, the HH was not re-visited.
- Empty and non-responding HH's were not replaced, as the sample calculation already included 2 % of non-response that was actually enough.
- All eligible children in selected households were weighed and measured.

- The respondents for the questionnaires were selected based on their seniority. Household heads (In Afghanistan normally a male, but we found also some female headed households) were chosen first, and if absent, the second person (normally the first wife) was the most adequate one to respond. Nevertheless, in some household, the Household head would assign the role to another member that he considered better prepared to respond.

## 2.4 Case definitions and inclusion criteria

Case definition for GAM and SAM:
GAM is the result of the sum of both MAM and SAM cases

- The household definition in Afghanistan is a group of people living in the same house or compound, sharing the food coming from the same cooking pot. The last concept was used to decide whether we were talking about one or separate HH's in a compound. In case of finding a compound with more than one HH, a simple random selection method was used to choose one of them, using papers with as many numbers as separate HH's, and choosing one randomly.
- The age range of the children included in anthropometry survey is 6 to 59 months. In case of not knowing the age, children measuring between 65 and 110 cm. were decided to be eligible as per the National Protocol for treatment of Acute Malnutrition.
- The cut-off for deciding whether the height of the child should be measured standing up or lying down was 87 cm, again as per National Protocol for treatment of Acute Malnutrition. Less than 87 cm was lying down measurement, and above that, they would be measured standing up. The teams were provided with a measuring stick 87 cm. long to help on rapid decision making.
- The main standards used for reporting were the WHO 2006 standards, official in Afghanistan at the moment of the survey. However, the NCHS 1977 analysis is included at the end as an annex.
- The length or recall period in mortality survey was established in 88 days, to make the period be coincident with a well-known event that was the presidential and provincial counsel elections on 5th of April. The recall period was decided on a 3 month period as it's a standard for low emergency settings with not remarkable mortality related events.
- Whether the selected households had or not eligible children for the anthropometry survey, they were always included in the mortality component.

- IMPORTANT note: In Afghanistan, it's not culturally acceptable to weight the children naked. They must at least wear pants and a shirt. The weight of such clothes was measured with a precision scale, using the clothes of 2 children of 2 years of age to be **average for the sample**. The final weight of those clothes was calculated to be near 100 gr. That's the subtraction number used in the ENA software.

## 2.5 Questionnaire, training and supervision

Questionnaire

- The questionnaires were translated into Pashto language, the one widespread spoken in the area. Also the guidelines for the mortality questionnaire were translated. Interviews were conducted in Pashto language.
- The questionnaires were piloted in a field test[7] prior to the start of the survey, and then checked with the field teams in a focus group discussion at the end of the day with minimal changes done out of it.

Survey teams and supervision

- The teams were composed of at least 3 individuals, one team leader and 2 measurers. The team leader was in charge of the mortality, WASH and HH questionnaires. All the teams were composed of 2 females and one male. The reason for this was to ensure that at least 2 people would be allowed in the HH and so there would not be one person alone to perform the anthropometric measurements[8].
- In total, 17 persons were trained, in order to have enough people to have 5 teams of 3, (15), and also have reserve staff already prepared to take over in case of sickness or abandon of one of the survey team members, and to have a buffer in case of very bad performance during the standardization test. Out of the 17, 2 were placed as "reserves" due to their insufficient performance during the standardization test, only to be called in cased of abandon and to be given non anthropometric measurements related tasks.
- The selected enumerators, who had already participated in other Save the Children surveys, most of them were university students, as the universities were on vacations at the this time of the year, but a few of them were high school students and teachers with high literacy level and liaisons in the community. However, the specific concepts of a SMART survey took them high effort to apprehend, and intense commitment from the training team.
- The supervision team consisted ofed 3 people. All the supervisors had received the ToT on SMART methodology, and were medical doctors with program management positions in Save the Children CMAM programs. Also four staff from the nutrition team of Medair based in Kandahar participated in the data collection and supervision during data collection. The manager of the survey also took field supervision duties.
- Teams were supervised at all times by the supervision team for the whole duration of data collection.

**Training**

The training of the field teams was conducted in Pashto language by the Dr. Mohammad Naser Lamar hired as a consultant for translation of training materials and questionnaires in Pashto, training of enumerators and supervision during data collection in the field.

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[7]The field test is a "rehearsal" of a cluster data collection in which all the regular activities of a normal work day for the teams are performed. That test was performed in and IDP camp near to the town in Kandahar that were not selected for the survey, and the data was analyzed with the software ENA in a separate database. Results were shared with the teams and corrections based on their performance analysis were done.

[8]In the Afghan culture, men are not allowed into a HH if there's not a man from the HH or related, present, and in some cases, the man in the HH will not allow other men inside anyway. In the case of Kandahar IDP settlements, this is not a rule in most of the communities and access was granted most of the time.

The training covered the following topics:

- General survey objectives
- Overview of survey design
- Household selection procedures
- Anthropometric measurements and interpretation
- Signs and symptoms of malnutrition
- Data collection and interview skills
- Mortality, IYCF, WASH and HH interview
- Review of the questionnaires
- Preparation of an events calendar for the determination of the age of children in case of difficulties to have an exact date.
- Practice on Anthropometric measurements
- Role play on interview skills

The training lasted 4 days including the standardization test.

- As time was constrained a decision was made on providing continuous supervision to all five teams all the time in order to ensure a good quality in the measurements. Standardization test was performed using 10 children among 3 and 5 years of age. Those enumerators with the poorest performance were given other tasks as passing the mortality questionnaire. See annexes 3 standardization tests results

- A pre-test was conducted in a Sheen Ghazi Sahabi IDP settlement near Kandahar city that was not part of the survey, with the same conditions as the proper survey: One cluster per day, 15 HH to be visited conducting anthropometry, mortality, WASH, IYCF and HH components.

## 2.6 Data analysis

- The data was entered by two data entry clerks, in two different computers in order to perform double data entry control. They entered the data directly on ENA software and performed themselves the double entry check under supervision of one of the trainers. Extra checks were performed on the entered data to ensure that all possible errors related to data entry were avoided.
- Daily plausibility test were performed both in the daily data and the cumulative data during the data collection period. Mistakes and implausible results were rechecked in the field whenever possible, and data that could not be confirmed was removed from the final file. Most errors were related to the age of the children, which some had that data removed but anthropometric data was kept in order to be included in the WHZ component.
- Many SMART and WHO flags were checked and confirmed as real data, many of them witnessed and confirmed by the coordination team and double checked and certified with comments in the forms by the field enumerator teams. The final dataset used for this report is then the one with no exclusion of flags, more realistic than excluding the flags for report. See plausibility tests in annexes 1 for further information.

## 2.6 Limitations of the Survey

- Most of the mothers were unable to give correct age of the children even after probing using calendar of events. Chronic malnutrition and underweight estimation of children could be biased as some of them were not included in the calculation for these nutrition indicators.
- The cultural characteristics of Afghanistan made difficult the supervision of the field work, as the supervision team was composed of males, and those are rarely allowed into the Households. Females are required to be part of supervision teams.
- The survey was conducted during the month of Ramadan where the enumerators were unable to work full day and the weather was also hot during the month of July. We had less number of HHs per cluster to be visited per day.

- **3. Results**

## 3.1 Anthropometric results (based on WHO standards 2006):

Anthropometric data was obtained from a total of 421 children aged from 6 to 59 months of whom 49.6% and 50.4% percent were girls and boys respectively. The result shows that the overall ratio of boys to girls 6 to 59 months was 1 (male N=212 and female N=209) which indicates that both boys and girls are equally represented (a sex ratio of between 0.8 and 1.2 is believed to be acceptable)

The following exclusions were used to clean the data and z scores outside of these ranges were not included in analysis as they were unplausible and likely reflected a measurement error:  z-scores from Zero (reference mean) WHO flags: WHZ -5 to 5; HAZ -6 to 6; WAZ -6 to 5

Table 3.1: Distribution of age and sex of sample

| | Boys | | Girls | | Total | | Ratio |
|---|---|---|---|---|---|---|---|
| **AGE (mo)** | **no.** | **%** | **no.** | **%** | **no.** | **%** | **Boy:girl** |
| **6-17** | 64 | 50.4 | 63 | 49.6 | 127 | 30.2 | 1.0 |
| **18-29** | 57 | 46.7 | 65 | 53.3 | 122 | 29.0 | 0.9 |
| **30-41** | 46 | 51.1 | 44 | 48.9 | 90 | 21.4 | 1.0 |
| **42-53** | 40 | 52.6 | 36 | 47.4 | 76 | 18.1 | 1.1 |
| **54-59** | 5 | 83.3 | 1 | 16.7 | 6 | 1.4 | 5.0 |
| **Total** | 212 | 50.4 | 209 | 49.6 | 421 | 100.0 | 1.0 |

Figure 3.1: Population age and sex pyramid

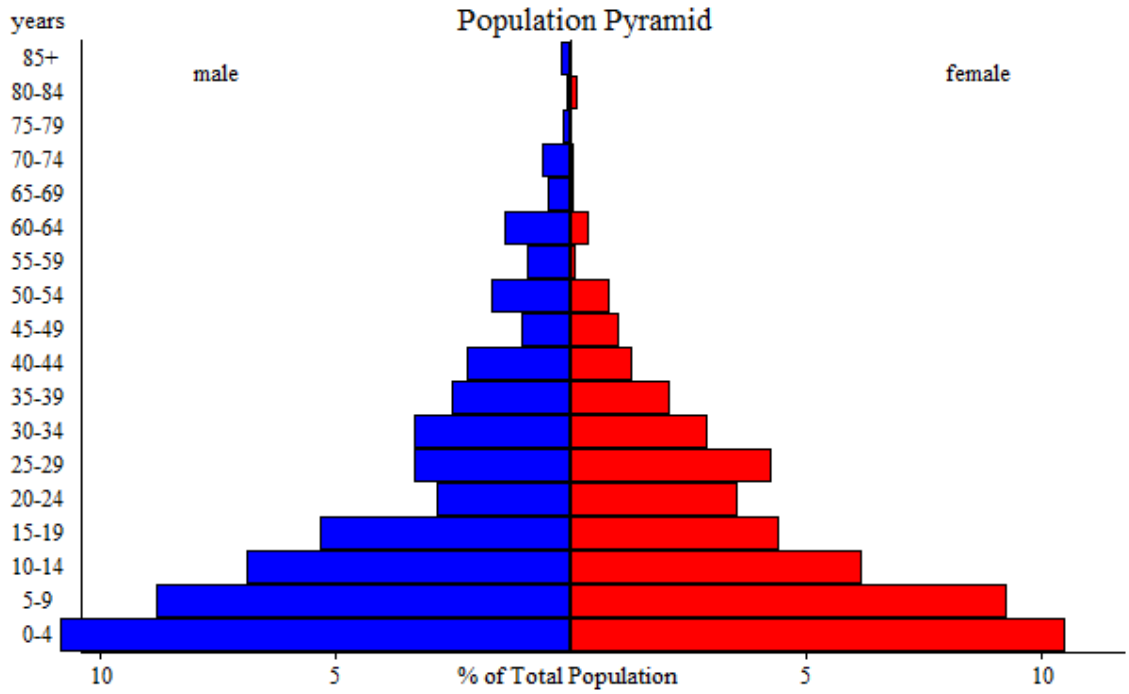

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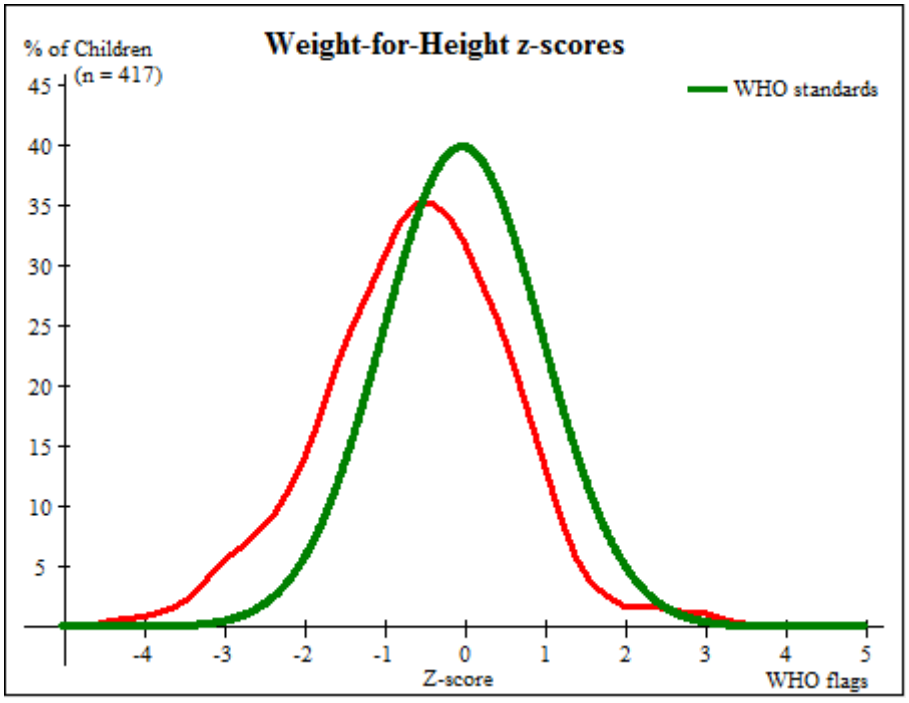
Table 3.2: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

| | **All** n = 421 | **Boys** n = 212 | **Girls** n = 209 |
|---|---|---|---|
| **Prevalence of global malnutrition (<-2 z-score and/or oedema)** | (50) 11.9 % (9.1 - 15.3 95% C.I.) | (22) 10.4 % (7.0 - 15.2 95% C.I.) | (28) 13.4 % (10.4 - 17.0 95% C.I.) |
| **Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)** | (36) 8.6 % (6.2 - 11.6 95% C.I.) | (15) 7.1 % (4.2 - 11.6 95% C.I.) | (21) 10.0 % (6.9 - 14.3 95% C.I.) |
| **Prevalence of severe malnutrition (<-3 z-score and/or oedema)** | (14) 3.3 % (1.8 - 6.2 95% C.I.) | (7) 3.3 % (1.7 - 6.5 95% C.I.) | (7) 3.3 % (1.2 - 8.7 95% C.I.) |

The prevalence of oedema is 1.0 %

Figure 4 Gaussian curve comparing the median of WHS standards with survey results (Red)




3.3: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

| | **Severe wasting (<-3 z-score)** | **Moderate wasting (>= -3 and <-2 z-score )** | **Normal (> = -2 z score)** | **Oedema** |
|---|---|---|---|---|

| Age (mo) | Total no. | No. | % | No. | % | No. | % | No. | % |
|---|---|---|---|---|---|---|---|---|---|
| **6-17** | 127 | 7 | 5.5 | 18 | 14.2 | 102 | 80.3 | 0 | 0.0 |
| **18-29** | 122 | 2 | 1.6 | 15 | 12.3 | 103 | 84.4 | 2 | 1.6 |
| **30-41** | 90 | 0 | 0.0 | 2 | 2.2 | 86 | 95.6 | 2 | 2.2 |
| **42-53** | 76 | 1 | 1.3 | 1 | 1.3 | 74 | 97.4 | 0 | 0.0 |
| **54-59** | 6 | 0 | 0.0 | 0 | 0.0 | 6 | 100.0 | 0 | 0.0 |
| **Total** | 421 | 10 | 2.4 | 36 | 8.6 | 371 | 88.1 | 4 | 1.0 |

This table shows that the prevalence of acute malnutrition is very high among children 6 – 17 months (SAM 5.5% and MAM 14.2%, GAM = 19.7%). This is mostly relevant to sub-optimal IYCF practices.

Table 3.4: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

| | **<-3 z-score** | **>=-3 z-score** |
|---|---|---|
| **Oedema present** | Marasmic kwashiorkor<br>No. 0<br>(0.0 %) | Kwashiorkor<br>No. 4<br>(1.0 %) |
| **Oedema absent** | Marasmic<br>No. 10<br>(2.4 %) | Not severely malnourished<br>No. 407<br>(96.7 %) |

Table 3.5: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

When MUAC criterion is taken into account, 17.1% (12.2 - 23.4 95% C.I.) of the children 6-59 months were acutely malnourished and 6.4 % (4.0 - 10.1 95% C.I.) of them were severe. Younger children 6-17 months were most affected, 36.2% had MUAC <125 mm. It is often observed in many nutrition surveys that the GAM rates are found to be higher than then the WFH rates. GAM rates based on MUAC are particularly worrying.

| | **All**<br>n = 421 | **Boys**<br>n = 212 | **Girls**<br>n = 209 |
|---|---|---|---|
| **Prevalence of global malnutrition (< 125 mm and/or oedema)** | (72) 17.1 %<br>(12.2 - 23.4<br>95% C.I.) | (24) 11.3 %<br>(6.4 - 19.2<br>95% C.I.) | (48) 23.0 %<br>(16.9 - 30.4<br>95% C.I.) |
| **Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)** | (45) 10.7 %<br>(7.1 - 15.9<br>95% C.I.) | (15) 7.1 %<br>(3.0 - 15.7<br>95% C.I.) | (30) 14.4 %<br>(9.8 - 20.5<br>95% C.I.) |
| **Prevalence of severe malnutrition (< 115 mm and/or oedema)** | (27) 6.4 %<br>(4.0 - 10.1<br>95% C.I.) | (9) 4.2 %<br>(2.3 - 7.7<br>95% C.I.) | (18) 8.6 %<br>(4.7 - 15.4<br>95% C.I.) |

Table 3.6: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

| | | Severe wasting (< 115 mm) | | Moderate wasting (>= 115 mm and < 125 mm) | | Normal (> = 125 mm ) | | Oedema | |
|---|---|---|---|---|---|---|---|---|---|
| **Age (mo)** | **Total no.** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| **6-17** | 127 | 15 | 11.8 | 31 | 24.4 | 81 | 63.8 | 0 | 0.0 |
| **18-29** | 122 | 9 | 7.4 | 9 | 7.4 | 104 | 85.2 | 2 | 1.6 |
| **30-41** | 90 | 0 | 0.0 | 5 | 5.6 | 85 | 94.4 | 2 | 2.2 |
| **42-53** | 76 | 0 | 0.0 | 1 | 1.3 | 75 | 98.7 | 0 | 0.0 |
| **54-59** | 6 | 0 | 0.0 | 0 | 0.0 | 6 | 100.0 | 0 | 0.0 |
| **Total** | 421 | 24 | 5.7 | 46 | 10.9 | 351 | 83.4 | 4 | 1.0 |

Table 3.7: Prevalence of underweight based on weight-for-age z-scores by sex

| | **All** n = 417 | **Boys** n = 211 | **Girls** n = 206 |
|---|---|---|---|
| **Prevalence of underweight (<-2 z-score)** | (156) 37.4 % (31.2 - 44.0 95% C.I.) | (76) 36.0 % (27.0 - 46.1 95% C.I.) | (80) 38.8 % (31.4 - 46.8 95% C.I.) |
| **Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)** | (95) 22.8 % (18.9 - 27.2 95% C.I.) | (45) 21.3 % (16.3 - 27.4 95% C.I.) | (50) 24.3 % (19.3 - 30.1 95% C.I.) |
| **Prevalence of severe underweight (<-3 z-score)** | (61) 14.6 % (10.1 - 20.6 95% C.I.) | (31) 14.7 % (8.7 - 23.7 95% C.I.) | (30) 14.6 % (9.4 - 21.9 95% C.I.) |

Table 3.8: Prevalence of underweight by age, based on weight-for-age z-scores

| | | Severe underweight (<-3 z-score) | | Moderate underweight (>= -3 and <-2 z-score ) | | Normal (> = -2 z score) | | Oedema | |
|---|---|---|---|---|---|---|---|---|---|
| **Age (mo)** | **Total no.** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| **6-17** | 127 | 22 | 17.3 | 33 | 26.0 | 72 | 56.7 | 0 | 0.0 |
| **18-29** | 120 | 23 | 19.2 | 30 | 25.0 | 67 | 55.8 | 2 | 1.7 |
| **30-41** | 88 | 11 | 12.5 | 15 | 17.0 | 62 | 70.5 | 2 | 2.3 |
| **42-53** | 76 | 5 | 6.6 | 15 | 19.7 | 56 | 73.7 | 0 | 0.0 |
| **54-59** | 6 | 0 | 0.0 | 2 | 33.3 | 4 | 66.7 | 0 | 0.0 |
| **Total** | 417 | 61 | 14.6 | 95 | 22.8 | 261 | 62.6 | 4 | 1.0 |

Table 3.9: Prevalence of stunting based on height-for-age z-scores and by sex

| | **All** n = 421 | **Boys** n = 212 | **Girls** n = 209 |
|---|---|---|---|
| **Prevalence of stunting (<-2 z-score)** | (256) 60.8 % (53.6 - 67.6 95% C.I.) | (130) 61.3 % (54.7 - 67.5 95% C.I.) | (126) 60.3 % (50.3 - 69.4 95% C.I.) |
| **Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)** | (133) 31.6 % (27.0 - 36.5 | (69) 32.5 % (25.4 - 40.5 | (64) 30.6 % (24.8 - 37.1 |

| | | | |
|---|---|---|---|
| | 95% C.I.) | 95% C.I.) | 95% C.I.) |
| **Prevalence of severe stunting (<-3 z-score)** | (123) 29.2 % (23.1 - 36.2 95% C.I.) | (61) 28.8 % (20.6 - 38.6 95% C.I.) | (62) 29.7 % (22.1 - 38.6 95% C.I.) |

Table 3.10: Prevalence of stunting by age based on height-for-age z-scores

| | | **Severe stunting (<-3 z-score)** | | **Moderate stunting (>= -3 and <-2 z-score )** | | **Normal (> = -2 z score)** | |
|---|---|---|---|---|---|---|---|
| **Age (mo)** | **Total no.** | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| **6-17** | 127 | 25 | 19.7 | 40 | 31.5 | 62 | 48.8 |
| **18-29** | 122 | 49 | 40.2 | 34 | 27.9 | 39 | 32.0 |
| **30-41** | 90 | 29 | 32.2 | 31 | 34.4 | 30 | 33.3 |
| **42-53** | 76 | 18 | 23.7 | 25 | 32.9 | 33 | 43.4 |
| **54-59** | 6 | 2 | 33.3 | 3 | 50.0 | 1 | 16.7 |
| **Total** | 421 | 123 | 29.2 | 133 | 31.6 | 165 | 39.2 |

Table 3.11: Mean z-scores, Design Effects and excluded subjects

| Indicator | n | Mean z-scores ± SD | Design Effect (z-score < -2) | z-scores not available* | z-scores out of range |
|---|---|---|---|---|---|
| Weight-for-Height | 417 | -0.58±1.17 | 1.00 | 4 | 0 |
| Weight-for-Age | 417 | -1.72±1.15 | 1.75 | 4 | 0 |
| Height-for-Age | 421 | -2.33±1.39 | 2.05 | 0 | 0 |

* contains for WHZ and WAZ the children with edema.

## 3.2 Mortality results (retrospective over 3 months/days prior to interview)

Table 3.12: Mortality rates

| |
|---|
| CMR (total deaths/10,000 people / day): 0.15 (0.05-0.45) (95% CI) |
| U5MR (deaths in children under five/10,000 children under five / day): 0.23 (0.03 - 1.75) (95% CI) |

## 3.3. Infant and young child feeding practices

Data was obtained about the feeding practices of 188 infants and young children 0-23.9 months of age. The results according to the indicator are divided into the following sections:

| Indicator | Explanation of indicator | Total Number | Result |
|---|---|---|---|
| **Children ever breastfed:** | **Proportion of children born in the last 23.9 months who were ever breastfed** | **187** | **99%** |
| **Timely (or early) initiation of breastfeeding** | **Proportion of children born in the last 23.9 months who were put to the breast within one hour of birth** | **148** | **79%** |
| **Pre-lacteal feeding** | **Proportion of children born in the last 23.9 months who were given a pre-lacteal fluid in the 3 days following delivery** | **99** | **53%** |
| **Exclusive breastfeeding under 6 months:** | **Proportion of infants 0-5.9 months of age who were fed exclusively with breast milk [Using information from the previous day (24 hours)]** | **117** | **62%** |
| **Continued breastfeeding at 1 year:** | **Proportion of children 12 – 15.9 months of age who are fed breast milk [Using information from the previous day (24 hours)]** | **96** | **51%** |
| **Continued breastfeeding at 2 years:** | **Proportion of children 20 – 23.9 months of age who are fed breast milk [Using information from the previous day (24 hours)]** | **21** | **11%** |

### 3.4. Water and Sanitation

| Main source of drinking water | Frequency N=365 | Percentage% |
|---|---|---|
| Hand-pump | 160 | 44% |
| uncovered shallow wells | 48 | 13% |
| Well (protected) | 53 | 15% |
| Public tap/water tank | 66 | 18% |
| Stream/spring/irrigation canal | 38 | 10% |
| **Grand Total** | **365** | 100% |

| Treatment of drinking water | Frequency N=365 | Percentage% |
|---|---|---|
| Yes | 167 | 46% |
| No | 112 | 31% |
| Don't Know | 86 | 24% |
| **Grand Total** | **365** | 100% |

| Methods of water treatment | Frequency N = 167 | Percentage % |
|---|---|---|
| Chloride | 0 | 0% |
| Boiled water | 13 | 8% |
| Filtered | 0 | 0% |
| stored water (to let water settle) | 142 | 85% |
| Salt | 12 | 7% |
| **Grand Total** | **167** | 100% |

| Having a latrine in the settlement | Frequency N=365 | Percentage % |
|---|---|---|
| Yes | 287 | 79% |
| No | 78 | 21% |
| **Grand Total** | **365** | **100%** |

| Type of latrine | Frequency N=365 | Percentage % |
|---|---|---|
| Pit Latrine | 12 | 3% |
| Surface latrine | 108 | 30% |
| Traditional Latrine | 135 | 37% |
| Outside/not in latrine | 110 | 30% |
| **Grand Total** | **365** | **100%** |

| When should one wash their hands | Frequency N= 365 | Percentage % |
|---|---|---|
| Don't Know | 1 | 0% |
| Before praying | 229 | 63% |
| After eating | 157 | 43% |
| Before feeding a baby or children | 75 | 21% |
| Before eating | 223 | 61% |
| After using the toilet | 263 | 72% |
| After touching an animal | 41 | 11% |

| What is used for hand washing | Frequency N=365 | Percentage % |
|---|---|---|
| Nothing | 246 | 67% |
| Soap | 103 | 28% |
| Ashꞏ | 19 | 5% |
| Hand washing liquid | 12 | 3% |
| Boiled water | 0 | 0% |

| How important it is to wash hands with water and soap? | Frequency N-= 365 | Percentage % |
|---|---|---|
| Very Important | 204 | 56% |
| Important | 147 | 40% |
| Not Important | 14 | 4% |
| **Grand Total** | **365** | **100%** |

## 3.5. Household Questionnaire:

The household questionnaires were focused on determining sources of staple foods, sources of cash income, coping strategies, and livestock condition.

A total of 365 households were visited. Of these, 4% were female headed households. The mean household size was 8.15 (range 2-15).

| Main occupation of the household head (Major economic activity) | Frequency N=365 | Percentage % |
|---|---|---|
| Farming (Agri./Agro ) | 102 | 28% |
| Trading | 28 | 8% |
| Salaried workers | 22 | 6% |
| CHW | 1 | 0% |
| DAILY WORKER | 168 | 46% |
| DRIVER | 11 | 3% |
| JOBLESS | 19 | 5% |
| SALE OF COW | 1 | 0% |
| SALE OF IRON | 1 | 0% |
| SHOPKEEPER | 12 | 3% |
| **Grand Total** | **365** | **100%** |

| Source of your main staple food in the past four weeks | Frequency N-365 | Percentage % |
|---|---|---|
| Purchase | 312 | 85% |
| Own product | 7 | 2% |
| Food loans | 32 | 9% |
| Food gift | 3 | 1% |
| Wild Food | 11 | 3% |
| **Grand Total** | **365** | **100%** |

| Normal source of cash income at this time of the year | Frequency N=365 | Percentage % |
|---|---|---|
| sale of fruits/vegetables | 32 | 9% |
| Sale of livestock | 24 | 7% |
| Sell of own cereal production | 9 | 2% |
| carpet weaving and handicrafts | 2 | 1% |

| | | |
|---|---|---|
| Petty/large trad | 29 | 8% |
| Credit | 102 | 28% |
| Remittance | 0 | 0% |
| Sell of labour | 71 | 19% |
| salaried workers | 16 | 4% |
| Beggary | 1 | 0% |
| DAILY WORK | 67 | 18% |
| DRIVING | 5 | 1% |
| SALE OF COW | 1 | 0% |
| SALE OF IRON | 3 | 1% |
| SALE OF PLASTIC | 1 | 0% |
| SALE OF WOOD | 1 | 0% |
| SELLER | 1 | 0% |
| **Grand Total** | **365** | **100%** |

| **Coping mechanism at stress time** | **Frequency N=365** | **Percentage %** |
|---|---|---|
| Sell of more livestock | 21 | 6% |
| Migration for labour | 16 | 4% |
| Sale fire wood | 1 | 0% |
| Sell of assets//tools | 3 | 1% |
| Reduce number of meals | 13 | 4% |
| Petty trade | 2 | 1% |
| Remittance | 1 | 0% |
| Migration for food | 3 | 1% |
| Borrowing | 304 | 83% |
| Beggary | 1 | 0% |
| **Grand Total** | **365** | 100% |

# 4. Discussion

## *4.1 Nutritional status*

The findings of this survey indicate that the nutritional situation according to the WHO 2000 benchmarks was in a serious situation (GAM=11.9%), necessitating immediate action that addresses the immediate and underlying causes of malnutrition to avoid slipping into the critical situation and prevent increased morbidity and mortality. Though the current prevalence of GAM is not above the emergency threshold (GAM>15%) but our recommendation is to consider the context in Kandahar rather than waiting until a certain threshold has been reached, by which it could be too late to implement an effective response. The fact that acute malnutrition found in this survey showed that younger children (6 – 17 month) were more likely to be malnourished. A very high rate of acute malnutrition (SAM 5.5% and MAM 14.2%, GAM = 19.7%) has been found among this age catagory which is mostly relevant to sub-optimal IYCF practices during this peroid.

The prevalence of chronic malnutrition is very high, 60.8 %. The 2013 national survey and some other surveys in other provinces of Afghanistan also shows high rate of stunting. Looking to the consequences of chronic malnutrition, interventions should be prioritized to address it.

Stunting can have an intergenerational effect, as stunted mothers give birth to small children, as growth can be restricted in the womb. Children who are stunted will not grow to achieve their physical or academic potential. As well as affecting their height and physical stature, stunting has an impact on a child's brain development, which can affect their educational achievement. The first 1,000 days of a child's life – from conception through a mother's pregnancy and until two years age - are the most critical period in a child's development as damage done during this period is irreversible, even if a child's diet improves later in life.

The effects of stunting are not limited to individuals. A lack of physical and academic potential will have its toll on the country's future. Work capacity will be affected, and so, for example, agricultural productivity will be reduced, resulting in a lack of capacity to feed the family and so a reduced production of food countrywide, jeopardising the nation's self-sufficiency on food production and increasing the dependency in imports. All said, stunting is a threat for a whole nation's future.

As well as reducing stunting, optimal breastfeeding could prevent 13% of all child deaths – more than any other preventive intervention - and complementary feeding could prevent an additional 6%. Interventions to improve infant and young child feeding (IYCF) are of critical importance to saving lives and improving childhood wellbeing. Nutrition in early childhood and specifically IYCF must be highly prioritized in national policies and strategies to save children's lives.

Prevalence of underweight was also found to be high, and at 37.4% (31.2-44.0 95% CI) higher than to the NNS 2013 rate of 29 percent.

The findings of this survey are in conformity to national nutrition surveys conducted in 2013. The National nutrition Survey 2013 found that GAM rate among children 6 – 59 months was 13.5% (95% confidence interval: 8.51-20.72%) and about 43.6% (95% CI: 36.96-50.52%) were stunted.

The findings confirm the existing malnutrition situation in Kandahar as serious that should be tackled holistically to prevent its effects on the wellbeing of children. This is necessary because children with acute malnutrition become more susceptible to diseases and are at a greater risk of dying when they become ill (WHO, 2000), while chronic malnutrition can affect cognitive and social development.

## 4.2 Mortality

Mortality rates are low and under the emergency thresholds: 0.15 CDR and 0.32 for U5. There is a possibility that children deceases are underreported in the surveyed area as the results of under-five death compared to CDR is unlikely.

## 4.3 Causes of malnutrition

Major acute causes of malnutrition:

There is no any specific assessment to identify causes of malnutrition in Afghanistan.

Widespread poverty, lack of access to food and poor diet are major causes of wasting, stunting and micronutrient deficiencies in Afghanistan. The results of the

National Risk and Vulnerability Assessment (NRVA) 2011/2012 show that 30.1% of households do not meet their daily caloric needs (2,100 kcal/person/day), and 36.5% % of the Afghan population, live below the poverty line. Malnutrition is very commonly, a consequence as well as a contributing factor, of infectious diseases. Poor hygiene, sanitation and limited potable water supply are major causes of infections.

There will be higher rates of malnutrition during August and September as there would be more incidences of diarrheal disease among children during this period and other mentioned causes. Children under 5 will be more affected.

## 5. Conclusions

The survey has shown that acute and chronic malnutrition levels in IDP areas in Kandahar province remain in a critical situation but there is no direct correlation with mortality levels. Both the under five and crude mortality rates were within acceptable levels.

There is a general poor water and sanitation and knowledge of key infant and young child feeding practices.

## 6. Recommendations and priorities

Increase therapeutic feeding programme coverage to reach all malnourished children with a special focus in hard to reach areas through community mobilization, MUAC massive screening campaigns and active case finding.

Children (6 – 17 months) are more affected which need immediate response as younger children are more at risk of dying due to infectious disease and malnutrition.

Our recommendation is to consider the context in Kandahar rather than waiting until a certain threshold has been reached, by which it could be too late to implement an effective response.

Maternal nutrition – More than half of children 6 to 59 months are stunted. One of the risk factor of stunting is low birth weight, which starts in utero and becomes worse if the diet or health status is inadequate during postnatal development. LBW could be one of the main reasons why prevalence of chronic malnutrition is very high. The adverse consequences of LBW continue to be manifested during childhood, and are passed on to the next generation when women, who are chronically undernourished, become pregnant. So, it recommended to explore the feasibility of promoting programmes focusing on prevention interventions on the first 1000 special days (ie since onset of pregnancy to 2 years) of a child's live to reduce stunting.

Prioritization of interventions to reduce stunting including promotion of optimal IYCF, micronutrient-rich foods and appropriate supplementation and improving maternal health and nutrition

Conduct behavioural change interventions that addresses infant and young children feeding practices, appropriate complementary feeding after six months and continued breastfeeding up to 24 months.

Involve and train community members on the key infant and young child feeding practices, appropriate management of sick children, sanitation and personnel hygiene, and the dangers of poor nutrition on the health of children and the community as a whole

Improve food diversification during weaning and complementary period, increase of meal frequencies that are age-specific.

Efforts have to be made to improve the water and sanitation situation of the communities through promotion of hygiene practices and provision of safe water supply.

There is need to regularly monitor the nutrition situation especially with the increase of IDPs due to conflicts and displacements.

## 7. References


- 2013 Afghanistan National Nutrition Survey
- Afghanistan National Risk and Vulnerability Assessment 2011/12:
- Population data from Directorate of refugees and repatriation and UNHCR
- SMART Methodology Version 1, April 2006: http://www.smartmethodology.org/images/stories/SMART_Methodology_08-07-2006.pdf


## 8. Acknowledgements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2. Funded by ECHO
3. List the individuals involved in the survey

Manager of the survey: Dr. Mohammad Akbar Sabawoon, Senior Nutrition Advisor
Co-manager / Field trainer: Dr. Mohammad Naser Lamar and Dr. Aminullah Mahbobi, Senior Nutrition Officer based in Kandahar
Supervisors: Dr. Akbar, Dr. Naser, Dr. Aminullah Mahbobi and Dr. Ghani from Medair
Logistics/administration: Logistics and administration Kabul, Mr Raz Muhammad, Admin/Logistic, Kandahar office

Team members:

| | Team Leader | Team member | Team member |
|---|---|---|---|
| Team 1 | Nasrtullah | Fazilla | Arifa |
| Team 2 | Iqbal Ahmad | Jawahera | Fazilla |
| Team 3 | Rohullah | Saliha | Karima |

| | | | |
|---|---|---|---|
| Team 4 | M. Akbar | Farida | Fareeqa |
| Team 5 | Ihsanullah | Wazhma | Huma |

NB: Male / Female

4. The Provincial Governor of Kandahar province, for kindly acknowledging about the survey and granting access to the province.
The MoPH, for issuing a letter of presentation for our teams, making it official and a part of the Ministry of health activities and interests

## 9. Appendices:

**Appendix 1**

***Plausibility Report*** **(attached in separate documents)**

**Appendix 2**

***Assignment of Clusters***

| Geographical unit | Population size | Assigned cluster |
|---|---|---|
| Kochian | 150 | 1,RC |
| Haji Aziz | 400 | 2,3,4,5,6 |
| Naqiline | 300 | 7,8,9,10 |
| Jatan | 90 | 11 |
| Mala Raouf kalai | 129 | 12 |
| Bakht.M. kalai | 45 | 13 |
| Qomandani Manda | 220 | 14,15,16 |
| Saifulddin kalai | 120 | 17 |
| Juma khan chawk | 115 | 18,19 |
| Farsi Zabanan | 105 | 20 |
| Haji Asadullah Farahi kalai | 100 | 21 |
| Sultan zai kalai | 65 | 22 |
| Ishaqzai kalai | 30 | |
| Shaista pump kakozai | 68 | 23 |
| Shinghazai Ashabi | 250 | 24,25,26 |
| kariz Bazar | 280 | RC,27,RC |

**Appendix 3**

***Evaluation of Enumerators***

**Weight:**

| | Precision: Sum of Square [W2-W1] | Accuracy: Sum of Square [Superv.(W1+W2)-Enum.(W1+W2] | No. +/- Precision | No. +/- Accuracy |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Supervisor | 0.18 | | 0/9 | |
| Enumerator 1 | 0.64 POOR | 0.88 POOR | 0/8 | 2/5 |
| Enumerator 2 | 0.34 OK | 0.44 OK | 2/8 | 1/8 |
| Enumerator 3 | 0.28 OK | 0.18 OK | 0/8 | 3/1 |
| Enumerator 4 | 0.21 OK | 0.21 OK | 0/9 | 2/4 |
| Enumerator 5 | 0.29 OK | 0.27 OK | 0/9 | 4/2 |
| Enumerator 6 | 0.27 OK | 0.21 OK | 0/10 | 5/2 |
| Enumerator 7 | 0.38 POOR | 0.32 OK | 0/8 | 6/3 |
| Enumerator 8 | 0.26 OK | 0.98 POOR | 1/8 | 4/4 |
| Enumerator 9 | 0.23 OK | 0.29 OK | 0/8 | 2/3 |
| Enumerator 10 | 0.32 OK | 0.84 POOR | 1/7 | 4/6 |
| Enumerator 11 | 0.22 OK | 1.36 POOR | 0/7 | 3/7 |
| Enumerator 12 | 0.22 OK | 1.00 POOR | 0/7 | 1/4 |
| Enumerator 13 | 0.53 POOR | 1.51 POOR | 3/5 | 3/6 |
| Enumerator 14 | 0.20 OK | 0.66 POOR | 1/7 | 3/4 |
| Enumerator 15 | 0.27 OK | 0.61 POOR | 0/9 | 4/4 |
| Enumerator 16 | 0.17 OK | 0.13 OK | 1/7 | 2/2 |
| Enumerator 17 | 0.14 OK | 0.38 OK | 0/8 | 1/6 |

**Height:**

| | Precision: Sum of Square [H2-H1] | Accuracy: Sum of Square [Superv.(H1+H2)-Enum.(H1+H2] | No. +/- Precision | No. +/- Accuracy |
|---|---|---|---|---|
| Supervisor | 0.23 | | 5/4 | |
| Enumerator 1 | 17.92 POOR | 17.89 POOR | 2/7 | 5/4 |
| Enumerator 2 | 0.32 OK | 0.37 OK | 3/6 | 4/3 |
| Enumerator 3 | 0.24 OK | 0.53 OK | 2/5 | 4/3 |
| Enumerator 4 | 0.34 OK | 0.23 OK | 5/5 | 6/2 |
| Enumerator 5 | 0.40 OK | 0.47 OK | 2/8 | 3/3 |
| Enumerator 6 | 0.29 OK | 0.16 OK | 1/8 | 5/2 |
| Enumerator 7 | 0.22 OK | 0.33 OK | 1/7 | 5/3 |
| Enumerator 8 | 0.46 POOR | 0.57 OK | 2/3 | 3/5 |
| Enumerator 9 | 0.32 OK | 0.49 OK | 5/3 | 2/7 |
| Enumerator 10 | 0.24 OK | 0.33 OK | 4/2 | 2/4 |
| Enumerator 11 | 0.10 OK | 0.75 POOR | 4/3 | 1/5 |
| Enumerator 12 | 0.23 OK | 0.30 OK | 3/6 | 1/7 |
| Enumerator 13 | 0.41 OK | 0.82 POOR | 1/8 | 0/4 |
| Enumerator 14 | 0.17 OK | 0.24 OK | 3/5 | 3/3 |
| Enumerator 15 | 0.09 OK | 0.22 OK | 2/7 | 4/3 |
| Enumerator 16 | 0.14 OK | 0.43 OK | 4/4 | 3/4 |
| Enumerator 17 | 0.24 OK | 372.89 POOR | 2/7 | 1/6 |

**MUAC:**

| | Precision: Sum of Square [MUAC2-MUAC1] | Accuracy: Sum of Square [Superv.(MUAC1+MUAC2)-Enum.(MUAC1+MUAC2] | No. +/- Precision | No. +/- Accuracy |
|---|---|---|---|---|
| Supervisor | 9.00 | | 3/6 | |

| | | | | |
|---|---|---|---|---|
| Enumerator 1 | 15.00 OK | 70.00 POOR | 5/4 | 2/5 |
| Enumerator 2 | 19.00 POOR | 52.00 POOR | 5/5 | 6/2 |
| Enumerator 3 | 18.00 OK | 17.00 OK | 3/6 | 4/2 |
| Enumerator 4 | 18.00 OK | 13.00 OK | 3/6 | 4/3 |
| Enumerator 5 | 21.00 POOR | 38.00 POOR | 2/7 | 3/4 |
| Enumerator 6 | 10.00 OK | 33.00 POOR | 4/3 | 2/7 |
| Enumerator 7 | 0.00 OK | 21.00 OK | 0/0 | 3/7 |
| Enumerator 8 | 30.00 POOR | 249.00 POOR | 2/6 | 7/2 |
| Enumerator 9 | 6.00 OK | 17.00 OK | 4/2 | 3/3 |
| Enumerator 10 | 7.00 OK | 12.00 OK | 6/1 | 0/6 |
| Enumerator 11 | 9.00 OK | 46.00 POOR | 4/2 | 2/8 |
| Enumerator 12 | 19.00 POOR | 44.00 POOR | 3/5 | 3/5 |
| Enumerator 13 | 12.00 OK | 19.00 OK | 3/6 | 3/4 |
| Enumerator 14 | 9.00 OK | 70.00 POOR | 1/5 | 4/4 |
| Enumerator 15 | 11.00 OK | 16.00 OK | 2/6 | 1/6 |
| Enumerator 16 | 12.00 OK | 15.00 OK | 5/4 | 2/4 |
| Enumerator 17 | 12.00 OK | 27.00 OK | 0/9 | 2/4 |

For evaluating the enumerators the precision and the accuracy of their measurements is calculated.
For precision the sum of the square of the differences for the double measurements is calculated. This value should be less than two times the precision value of the supervisor.
For the accuracy the sum of the square of the differences between the enumerator values (weight1+weight2) and the supervisor values (weight1+weight2) is calculated. This value should be less than three times the precision value of the supervisor.
To check for systematic errors of the enumerators the number of positive and negative deviations can be used.

## Appendix 4; List of IDP settlements

| No | Province | District | Community/village Name | # of Family/house holds |
|---|---|---|---|---|
| 1 | Kandahar | Daman | Kochian | 150 |
| 2 | Kandahar | Daman | Haji Aziz | 400 |
| 3 | Kandahar | Daman | Naqiline | 300 |
| 4 | Kandahar | Daman | Jatan | 90 |
| 5 | Kandahar | Spinboldak | Mala Raouf kalai | 129 |
| 6 | Kandahar | Spinboldak | Bakht.M. kalai | 45 |
| 7 | Kandahar | Spinboldak | Qomandani Manda | 220 |
| 8 | Kandahar | Nawi kalai | Saifulddin kalai | 120 |
| 9 | Kandahar | Nawi kalai | Juma khan chawk | 115 |
| 10 | Kandahar | Nawi kalai | Farsi Zabanan | 105 |
| 11 | Kandahar | Nawi kalai | Haji Asadullah Farahi kalai | 100 |
| 12 | Kandahar | Nawi kalai | Sultan zai kalai | 65 |
| 13 | Kandahar | Nawi kalai | Ishaqzai kalai | 30 |
| 14 | Kandahar | Nawi kalai | Shaista pump kakozai | 68 |
| 15 | Kandahar | District#3 | Shinghazai Ashabi | 250 |
| 16 | Kandahar | District#2 | kariz Bazar | 280 |

**Appendix 5**

***Result Tables for NCHS growth reference 1977***

Table 3.2: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

| | **All**<br>n = 421 | **Boys**<br>n **=** 212 | **Girls**<br>n **=** 209 |
|---|---|---|---|
| **Prevalence of global malnutrition (<-2 z-score and/or oedema)** | (41) 9.7 %<br>(7.3 - 12.9<br>95% C.I.) | (17) 8.0 %<br>(5.3 - 12.0<br>95% C.I.) | (24) 11.5 %<br>(8.6 - 15.1<br>95% C.I.) |
| **Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)** | (35) 8.3 %<br>(6.0 - 11.3<br>95% C.I.) | (15) 7.1 %<br>(4.6 - 10.8<br>95% C.I.) | (20) 9.6 %<br>(6.7 - 13.6<br>95% C.I.) |
| **Prevalence of severe malnutrition (<-3 z-score and/or oedema)** | (6) 1.4 %<br>(0.6 - 3.5<br>95% C.I.) | (2) 0.9 %<br>(0.2 - 3.9<br>95% C.I.) | (4) 1.9 %<br>(0.7 - 4.9<br>95% C.I.) |

The prevalence of oedema is 1.0 %

Table 3.3: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

| | | Severe wasting (<-3 z-score) | | Moderate wasting (>= -3 and <-2 z-score ) | | Normal (> = -2 z score) | | Oedema | |
|---|---|---|---|---|---|---|---|---|---|
| **Age (mo)** | **Total no.** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| **6-17** | 127 | 1 | 0.8 | 19 | 15.0 | 107 | 84.3 | 0 | 0.0 |
| **18-29** | 122 | 1 | 0.8 | 14 | 11.5 | 105 | 86.1 | 2 | 1.6 |
| **30-41** | 90 | 0 | 0.0 | 1 | 1.1 | 87 | 96.7 | 2 | 2.2 |
| **42-53** | 76 | 0 | 0.0 | 1 | 1.3 | 75 | 98.7 | 0 | 0.0 |
| **54-59** | 6 | 0 | 0.0 | 0 | 0.0 | 6 | 100.0 | 0 | 0.0 |
| **Total** | 421 | 2 | 0.5 | 35 | 8.3 | 380 | 90.3 | 4 | 1.0 |

Table 3.4: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

| | **<-3 z-score** | **>=-3 z-score** |
|---|---|---|
| **Oedema present** | Marasmic kwashiorkor<br>No. 0<br>(0.0 %) | Kwashiorkor<br>No. 4<br>(1.0 %) |
| **Oedema absent** | Marasmic<br>No. 2<br>(0.5 %) | Not severely malnourished<br>No. 415<br>(98.6 %) |

Table 3.5: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

| | **All**<br>n = 421 | **Boys**<br>n = 212 | **Girls**<br>n = 209 |
|---|---|---|---|
| **Prevalence of global malnutrition (< 125 mm and/or oedema)** | (72) 17.1 %<br>(12.2 - 23.4<br>95% C.I.) | (24) 11.3 %<br>(6.4 - 19.2<br>95% C.I.) | (48) 23.0 %<br>(16.9 - 30.4<br>95% C.I.) |
| **Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)** | (45) 10.7 %<br>(7.1 - 15.9<br>95% C.I.) | (15) 7.1 %<br>(3.0 - 15.7<br>95% C.I.) | (30) 14.4 %<br>(9.8 - 20.5<br>95% C.I.) |
| **Prevalence of severe malnutrition (< 115 mm and/or oedema)** | (27) 6.4 %<br>(4.0 - 10.1<br>95% C.I.) | (9) 4.2 %<br>(2.3 - 7.7<br>95% C.I.) | (18) 8.6 %<br>(4.7 - 15.4<br>95% C.I.) |

Table 3.6: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

| | | Severe wasting (< 115 mm) | | Moderate wasting (>= 115 mm and < 125 mm) | | Normal (> = 125 mm ) | | Oedema | |
|---|---|---|---|---|---|---|---|---|---|
| **Age (mo)** | **Total no.** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| **6-17** | 127 | 15 | 11.8 | 31 | 24.4 | 81 | 63.8 | 0 | 0.0 |
| **18-29** | 122 | 9 | 7.4 | 9 | 7.4 | 104 | 85.2 | 2 | 1.6 |
| **30-41** | 90 | 0 | 0.0 | 5 | 5.6 | 85 | 94.4 | 2 | 2.2 |
| **42-53** | 76 | 0 | 0.0 | 1 | 1.3 | 75 | 98.7 | 0 | 0.0 |
| **54-59** | 6 | 0 | 0.0 | 0 | 0.0 | 6 | 100.0 | 0 | 0.0 |
| **Total** | 421 | 24 | 5.7 | 46 | 10.9 | 351 | 83.4 | 4 | 1.0 |

Table 3.5: Prevalence of acute malnutrition based on the percentage of the median and/or oedema

| | n = 421 |
|---|---|
| **Prevalence of global acute malnutrition (<80% and/or oedema)** | (35) 8.3 % (6.0 - 11.4 95% C.I.) |
| **Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)** | (29) 6.9 % (4.8 - 9.8 95% C.I.) |
| **Prevalence of severe acute malnutrition (<70% and/or oedema)** | (6) 1.4 % (0.6 - 3.5 95% C.I.) |

Table 3.6: Prevalence of malnutrition by age, based on weight-for-height percentage of the median and oedema

| | | Severe wasting (<70% median) | | Moderate wasting (>=70% and <80% median) | | Normal (> =80% median) | | Oedema | |
|---|---|---|---|---|---|---|---|---|---|
| **Age (mo)** | **Total no.** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| **6-17** | 127 | 1 | 0.8 | 14 | 11.0 | 112 | 88.2 | 0 | 0.0 |
| **18-29** | 122 | 1 | 0.8 | 14 | 11.5 | 105 | 86.1 | 2 | 1.6 |
| **30-41** | 90 | 0 | 0.0 | 0 | 0.0 | 88 | 97.8 | 2 | 2.2 |
| **42-53** | 76 | 0 | 0.0 | 1 | 1.3 | 75 | 98.7 | 0 | 0.0 |
| **54-59** | 6 | 0 | 0.0 | 0 | 0.0 | 6 | 100.0 | 0 | 0.0 |
| **Total** | 421 | 2 | 0.5 | 29 | 6.9 | 386 | 91.7 | 4 | 1.0 |

Table 3.7: Prevalence of underweight based on weight-for-age z-scores by sex

| | **All** n = 417 | **Boys** n = 211 | **Girls** n = 206 |
|---|---|---|---|
| **Prevalence of underweight** | (189) 45.3 % | (85) 40.3 % | (104) 50.5 % |

| | | | |
|---|---|---|---|
| **(<-2 z-score)** | (38.8 - 52.0 95% C.I.) | (31.5 - 49.7 95% C.I.) | (42.2 - 58.7 95% C.I.) |
| **Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)** | (126) 30.2 % (25.4 - 35.5 95% C.I.) | (56) 26.5 % (21.5 - 32.3 95% C.I.) | (70) 34.0 % (27.7 - 40.9 95% C.I.) |
| **Prevalence of severe underweight (<-3 z-score)** | (63) 15.1 % (10.8 - 20.8 95% C.I.) | (29) 13.7 % (8.7 - 21.1 95% C.I.) | (34) 16.5 % (10.8 - 24.3 95% C.I.) |

Table 3.8: Prevalence of underweight by age, based on weight-for-age z-scores

| | | **Severe underweight (<-3 z-score)** | | **Moderate underweight (>= -3 and <-2 z-score )** | | **Normal (> = -2 z score)** | | **Oedema** | |
|---|---|---|---|---|---|---|---|---|---|
| **Age (mo)** | **Total no.** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| **6-17** | 127 | 19 | 15.0 | 50 | 39.4 | 58 | 45.7 | 0 | 0.0 |
| **18-29** | 120 | 28 | 23.3 | 40 | 33.3 | 52 | 43.3 | 2 | 1.7 |
| **30-41** | 88 | 11 | 12.5 | 17 | 19.3 | 60 | 68.2 | 2 | 2.3 |
| **42-53** | 76 | 5 | 6.6 | 17 | 22.4 | 54 | 71.1 | 0 | 0.0 |
| **54-59** | 6 | 0 | 0.0 | 2 | 33.3 | 4 | 66.7 | 0 | 0.0 |
| **Total** | 417 | 63 | 15.1 | 126 | 30.2 | 228 | 54.7 | 4 | 1.0 |

Table 3.9: Prevalence of stunting based on height-for-age z-scores and by sex

| | **All** n = 421 | **Boys** n = 212 | **Girls** n = 209 |
|---|---|---|---|
| **Prevalence of stunting (<-2 z-score)** | (230) 54.6 % (46.2 - 62.8 95% C.I.) | (114) 53.8 % (44.8 - 62.6 95% C.I.) | (116) 55.5 % (44.8 - 65.7 95% C.I.) |
| **Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)** | (134) 31.8 % (26.7 - 37.4 95% C.I.) | (66) 31.1 % (23.7 - 39.6 95% C.I.) | (68) 32.5 % (25.9 - 39.9 95% C.I.) |
| **Prevalence of severe stunting (<-3 z-score)** | (96) 22.8 % (17.5 - 29.2 95% C.I.) | (48) 22.6 % (15.1 - 32.4 95% C.I.) | (48) 23.0 % (16.8 - 30.5 95% C.I.) |

Table 3.10: Prevalence of stunting by age based on height-for-age z-scores

| | | **Severe stunting (<-3 z-score)** | | **Moderate stunting (>= -3 and <-2 z-score )** | | **Normal (> = -2 z score)** | |
|---|---|---|---|---|---|---|---|
| **Age (mo)** | **Total no.** | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| **6-17** | 127 | 18 | 14.2 | 41 | 32.3 | 68 | 53.5 |
| **18-29** | 122 | 39 | 32.0 | 34 | 27.9 | 49 | 40.2 |
| **30-41** | 90 | 20 | 22.2 | 32 | 35.6 | 38 | 42.2 |
| **42-53** | 76 | 17 | 22.4 | 25 | 32.9 | 34 | 44.7 |
| **54-59** | 6 | 2 | 33.3 | 2 | 33.3 | 2 | 33.3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Total** | 421 | 96 | 22.8 | 134 | 31.8 | 191 | 45.4 |

Table 3.11: Mean z-scores, Design Effects and excluded subjects

| Indicator | n | Mean z-scores ± SD | Design Effect (z-score < -2) | z-scores not available* | z-scores out of range |
|---|---|---|---|---|---|
| Weight-for-Height | 417 | -0.75±0.97 | 1.00 | 4 | 0 |
| Weight-for-Age | 417 | -1.89±1.04 | 1.73 | 4 | 0 |
| Height-for-Age | 421 | -2.10±1.31 | 2.81 | 0 | 0 |

* contains for WHZ and WAZ the children with edema.