Summary Findings of Cross-sectional Nutrition Surveys in Northern Nigeria July 2010

1. INTRODUCTION

A cross-sectional anthropometric and mortality survey was undertaken in eight states of northern Nigeria from 13th July to 4th August 2010 with the main objective to determine nutritional status of children under five and women of reproductive age group (15 - 49 years). The survey was conducted in Borno, Jigawa, Kano, Katsina, Kebbi, Sokoto, Yobe and Zamfara states. This survey is the first of two carried out in northern states in 2010. Data were collected from a total of 3,575 households and 4,880 women of reproductive age and 5,518 children under the age of five. A Multi stage cluster sampling method was employed to undertake the survey.

2. RESULTS

2.1. Child Nutritional Status

The nutrition status results of children 6 to 59 months of age were analysed using the WHO growth reference standards of 2006. Flagged data which indicates outliers due to incorrect measurements was excluded from the analysis. The global acute malnutrition (WHZ and/or bilateral edema) results are ranked from the lowest to the highest prevalence by state as shown in figure 1 below.
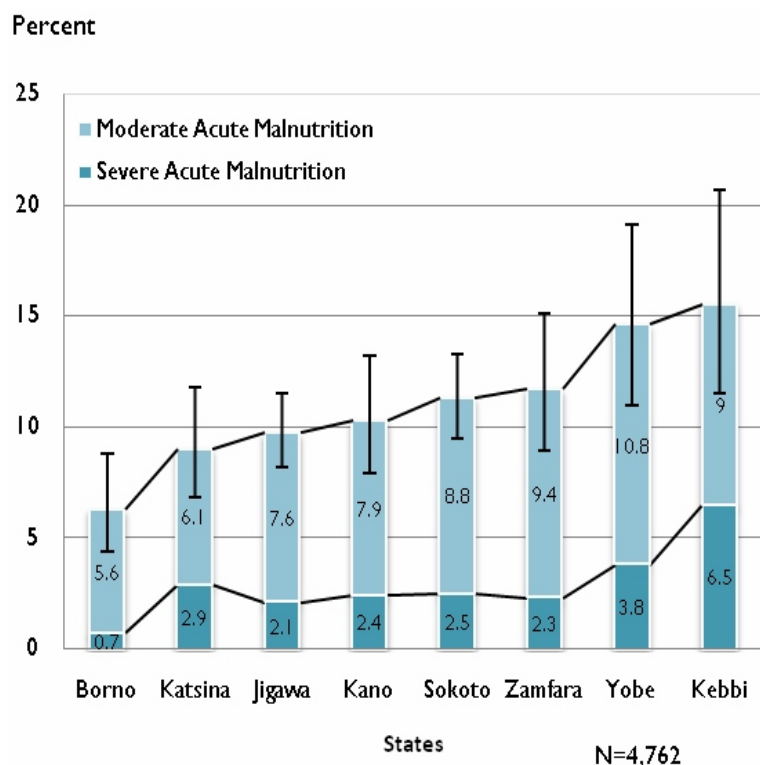

FIGURE 1: Global acute malnutrition (WHZ and/or bilateral edema) and confidence intervals by states.

Note: According to WHZ. Global acute malnutrition is <-2SD and severe acute malnutrition is <-3 SD. Note: Estimate of global and severe acute malnutrition included bilateral edema cases. Mid upper arm circumference (MUAC) used <125mm and <115mm as cut off for global and severe acute malnutrition

Five out of the eight states had global acute malnutrition above 10 percent. The highest levels and lowest levels of global acute malnutrition using weight for height Z-score (WHZ) were reported in Kebbi and Borno at 15.4% and 6.3% respectively as shown in table 1 below. A total of eight cases of bilateral edema were found during the survey. One case of bilateral edema was identified in Zamfara, four were in Jigawa and three cases in Kano states. There were no cases of both marasmus and kwashiorkor (children with severe acute malnutrition (SAM) and bilateral edema).

Table 1: Prevalence of global and severe acute malnutrition in children 6 to 59 months of age by state (WHZ WHO 2006 & MUAC WHO/UNICEF 2009)

Survey Domain	Acute Malnutrition WHZ			Acute Malnutrition MUAC		
	N	Global Acute Malnutrition WHZ	Severe Acute Malnutrition WHZ	N	Global Acute Malnutrition MUAC	Severe Acute Malnutrition MUAC
Borno	504	6.3	0.7	506	5.1	0.7
		[4.4,8.8]	[0.3,1.7]		[3.1,8.1]	[0.3,1.8]
Jigawa	602	9.7	2.1	620	8.3	3
		[8.2,11.5]	[1.0,4.2]		[6.2,11.1]	[1.6,5.5]
Kano	692	10.4	2.4	718	7.2	2.1
		[8.0,13.3]	[1.5,3.9]		[5.1,10.0]	[1.1,3.9]
Katsina	697	9	2.9	723	7.7	2.8
		[6.8,11.8]	[1.9,4.2]		[5.4,10.9]	[1.8,4.5]
Kebbi	585	15.4	6.5	609	14.8	3.7
		[11.4,20.6]	[3.9,10.5]		[10.9,19.8]	[2.3,6.0]
Sokoto	569	11.3	2.5	591	9.7	2
		[9.5,13.3]	[1.5,4.2]		[7.2,12.9]	[1.0,4.0]
Yobe	508	14.6	3.8	519	12.2	2.8
		[11.0,19.1]	[2.5,5.6]		[8.8,16.8]	[1.6,5.0]
Zamfara	605	11.6	2.3	623	9.8	1.9
		[8.8,15.0]	[1.2,4.3]		[7.5,12.7]	[1.1,3.5]

Note: results in brackets are 95% confidence intervals

Stunting which measures height for age and underweight which measures weight for age were measured and the results are shown in table 2 below. Stunting reflects long term malnutrition. Underweight is a composite measure for stunting and wasting and is used globally to track progress with Millennium Development Goals (MDGs).

Note: Stunting is defined as HAZ <-2SD and severe stunting is HAZ<-3SD. Underweight is defined as WAZ <-2SD and severe underweight is WAZ <-3SD.

Table 2: Prevalence of overall and severe chronic malnutrition (Height-for-Age) and Underweight (Weight-for-Age) in children 6 to 59 months of age by states (WHO 2006)

Survey Domain	Chronic Malnutrition			Underweight		
	N	Stunting	Severe Stunting	N	Underweight	Severe Underweight
Borno	488	54.1	27.1	505	32.3	10.5
		[49.3,58.9]	[23.1,31.6]		[28.2,36.7]	[6.4,16.9]
Jigawa	580	66.4	44.5	609	43.3	21.5
		[61.3,71.1]	[38.7,50.4]		[39.2,47.5]	[18.1,25.2]
Kano	640	57.9	33.8	692	39.1	16
		[52.4,63.3]	[29.3,38.7]		[35.0,43.4]	[12.2,20.8]
Katsina	688	62.4	35.6	721	38.3	14.2
		[55.6,68.7]	[30.5,41.1]		[33.8,43.1]	[11.4,17.7]
Kebbi	553	52.8	30.9	605	38.5	17.4
		[46.2,59.2]	[25.3,37.0]		[31.6,45.9]	[13.0,22.8]
Sokoto	549	60.5	31.2	582	43.2	15.7
		[55.3,65.5]	[27.1,35.6]		[39.3,47.1]	[12.5,19.4]
Yobe	486	58.2	31	507	42.7	16.4
		[50.0,65.9]	[24.8,38.0]		[35.9,49.8]	[11.9,22.2]
Zamfara	587	60.9	33.4	608	38.7	15.6
		[54.0,67.3]	[27.4,39.9]		[34.8,42.8]	[13.0,18.7]

Note: results in brackets are 95% confidence intervals

Underweight was highest and lowest in Jigawa and Borno at 43.3% and 32.3% respectively. Stunting was found to be above 50 percent among under-five children in all states. The highest and lowest levels of stunting were recorded in Jigawa and Kebbi at 66.4% and 52.8% respectively, as shown in figure 2 below. The result reveals the existence of critical long term nutritional problems among surveyed communities.
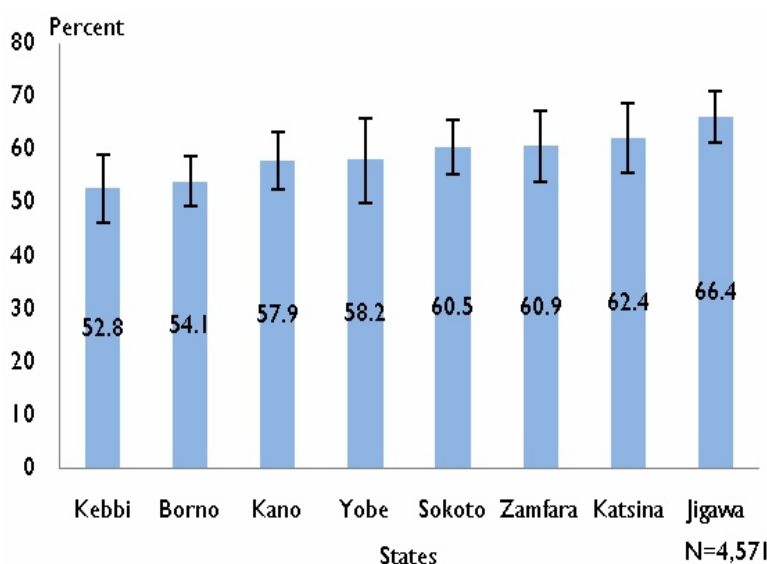

FIGURE 2: prevalence of stunting by confidence interval by state

The trends in acute malnutrition, underweight and stunting are shown in figure 3 below. The onset and peak of malnutrition by month is found within the first 24 months of life as shown in figure 3 below. The data from this survey confirms a widely confirmed pattern of onset and peak of malnutrition within the first 24 months of life. Malnutrition during the 24 months period is mainly a result of intra-uterine growth retardation, inadequate breastfeeding and poor quality and quantity of complementary foods.
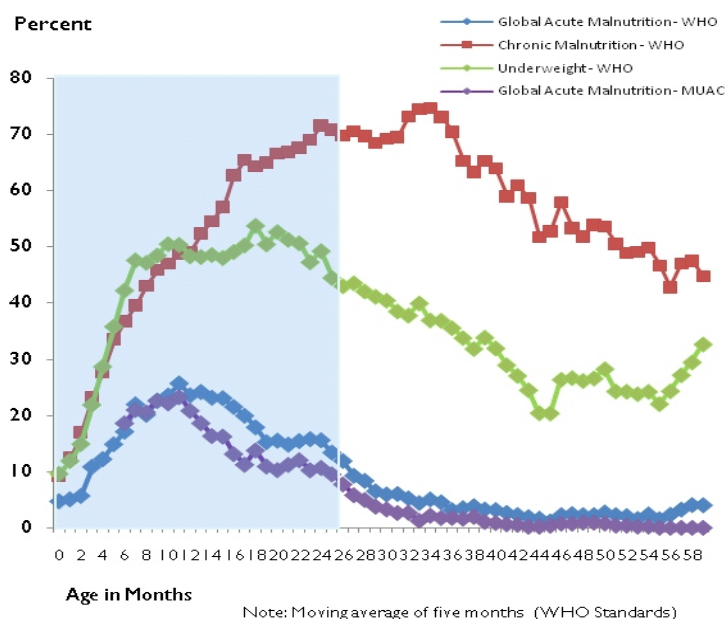

FIGURE 3: Trends of prevalence of GAM, Stunting, Underweight and MUAC<125mm by age in months

2.2. Vitamin A and Deworming Coverage

The survey assessed coverage of both vitamin A supplementation and deworming. Vitamin A supplementation reduces mortality among under five by about 23%. Deworming which removes intestinal worms is known to have impact on reduction of stunting and iron deficiency anemia. The government of Nigeria and partners provide vitamin A supplementation and deworming twice a year for children 6-59 months. The highest and lowest coverage of vitamin A supplementation were reported in Katsina and Sokoto at 93% and 32.4% respectively. The highest and lowest coverage of deworming were reported in Katsina and Yobe states at 93.2 and 2.7 percent respectively.

Table3. Vitamin A supplementation in children 6-59 and deworming coverage in children 12 59 months of age by survey domain

Survey Domain	N	Vitamin A	N	Deworming
Borno	510	75.7	469	8.5
		[64.0,84.5]		[3.5,19.0]
Jigawa	623	52.8	551	24
		[36.7,68.3]		[13.4,39.3]
Kano	716	48.8	640	27.7
		[33.2,64.6]		[13.9,47.7]
Katsina	740	93	652	93.2
		[89.6,95.3]		[89.0,95.9]
Kebbi	630	81	540	20.2
		[63.2,91.4]		[11.2,33.8]
Sokoto	584	32.4	533	3
		[23.0,43.5]		[0.9,9.8]
Yobe	517	52.5	449	2.7
		[38.2,66.4]		[1.1,6.7]
Zamfara	625	88.1	517	38.9
		[75.5,94.7]		[24.9,55.0]

Note: results in brackets are 95% confidence intervals

2.3 Mortality

A six months recall period was used to collect mortality data. The highest under-five death rate was found in Kano and kebbi state at 1.15/10,000/day. The highest crude mortality was reported in Kano at 0.55/10,000/day.

Table 4: Crude mortality rate and under-five death rate by state

States	Crude mortality rate (10,000/day)	Under-five death rate (10,000/day)
Borno	0.08 (0.01-0.58)	0.19 (0.03-1.39)
Jigawa	0.31 (0.13-0.71)	0.85 (0.35-2.05)
Kano	0.55 (0.28-1.05)	1.15 (0.59-2.22)
Katsina	0.16 (0.06-0.43)	0.14 (0.02-1.05)
Kebbi	0.30 (0.14-0.61)	1.15 (0.48-2.74)
Sokoto	0.06 (0.02-0.25)	0.15 (0.02-1.17)
Yobe	0.36 (0.19-0.68)	0.86 (0.31-2.40)
Zamfara	0.06 (0.01-0.25)	0.14 (0.02-1.13)

Note: results in brackets are 95% confidence intervals

The mortality rate in most states was found to be below the average baseline for sub-Saharan Africa, which is0.44/10,000/day and 1.14/10.000/day for crude and under five death rates respectively. Emergency levels are experienced when mortality figures double the sub-Saharan Africa baseline.

2.4 Women Nutritional Status

The nutritional status of women of reproductive age is an important determinant of maternal mortality, intra-uterine growth retardation, malnutrition in children and a key component of the vicious cycle of poverty and poor health. Women's nutrition is used as a proxy indicator of household food insecurity. Malnutrition among women of reproductive age was assessed using Mid Upper Arm Circumference (MUAC) and Body Mass Index (BMI) and results are shown in table 5 below. The lowest and highest prevalence of under-nutrition (low BMI) were reported in Zamfara and Yobe state at 12.9% and 45.2% respectively.

Table 5: Stunting and low MUAC in all women and low BMI in non-pregnant women by state

States	All women				Non pregnant women	
	Stunted	N	Low MUAC	N	Low BMI	N
Borno	1.9 [0.7,5.6]	510	8.3 [5.1,13.2]	510	21.1 [16.4,26.7]	443
Jigawa	4.1 [2.5,6.6]	662	5.5 [4.1,7.2]	662	22.3 [17.9,27.5]	523
Kano	2.6 [1.7,4.1]	691	6.6 [5.0,8.6]	691	15.1 [12.2,18.6]	577
Katsina	0.6 [0.2,1.5]	661	7.0 [4.7,10.4]	662	19.5 [15.5,24.1]	551
Kebbi	1.2 [0.6,2.4]	616	4.9 [3.6,6.7]	616	17.3 [13.2,22.2]	487
Sokoto	2.8 [1.5,5.1]	555	7.0 [3.6,13.1]	555	27.1 [22.0,32.9]	452
Yobe	1.2 [0.5,3.2]	542	12.4 [9.3,16.5]	542	45.2 [36.5,54.3]	445
Zamfara	6.5 [4.0,10.6]	641	9.8 [7.7,12.5]	641	12.5 [9.4,16.5]	520
Overall		4,878		4,878		4,000

Note: results in brackets are 95% confidence intervals

The pooled data from all the eight states illustrated in figure 4 below indicates that the highest levels of undernutrition using MUAC, BMI and height among women of reproductive age is among adolescents as compared to the older women. This high undernutrition among adolescent could be highlighting a potential determinant of child malnutrition due to intra-uterine growth retardation. The difference noted among adolescent girls and older women is statistically significant.
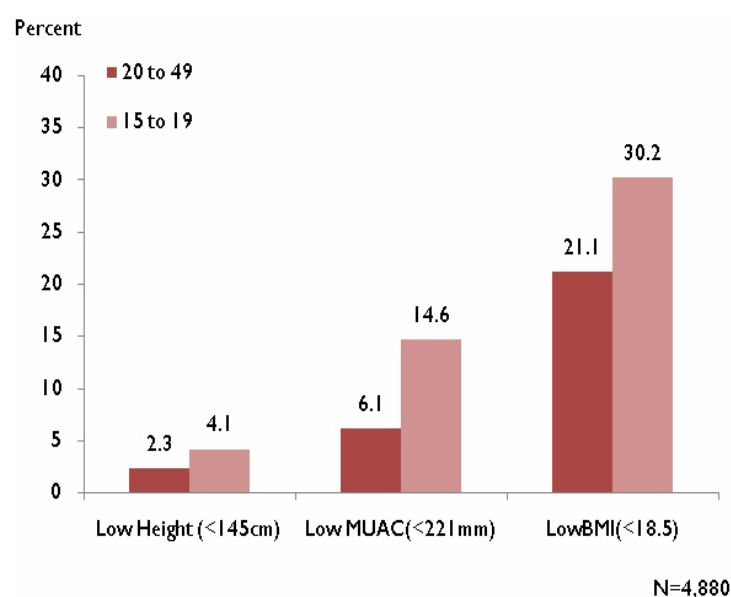

N=4,880

FIGURE 4: Percent of women with low height, low MUAC and non-pregnant women with low BMI by age in groups

Note: Body mass index(BMI) is defined as weight in kg/height in meter square, Low BMI is <18.5, stunting is <145 cm in height and low MUAC is <221mm

The prevalence of pregnancy by age group of mothers is shown in figure 5 below. Pregnancy during adolescence was reported at 19.8% notwithstanding the risk of undernutrition in this same age group. Young mothers are at the highest risk of undernutrition.
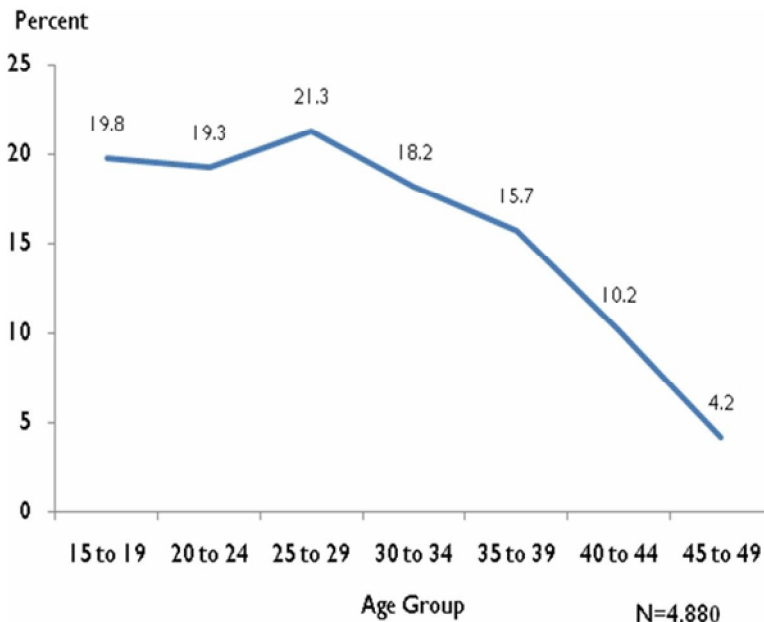

FIGURE 5: Percent of women pregnant by age in groups

3. Discussion

High prevalence of global acute malnutrition was observed in the surveyed areas. Five out of 8 states reported global acute malnutrition of above 10 percent. The survey population is estimated at 36 million which comprised of 17 percent under five populations, which gives a very high caseload.

The reported level of chronic malnutrition (>50%) were found to be beyond the critical point of 40% according to CDC/WFP measuring and interpreting malnutrition and mortality. This indicates the long term malnutrition problems that exist in the surveyed area.

Public health interventions like vitamin A supplementation and deworming coverage were found to be very low in most of the states, which is a missed opportunity to reduce child morbidity and mortality using maternal, newborn and child health week (MNCHW) held twice a year.

All forms of malnutrition reached the peak within the first two years, except chronic malnutrition. These findings are similar to patterns seen in similar nutrition studies.

Adolescent women were found more malnourished compare to their older counterparts. Adolescent nutritional status affects birth outcomes and perpetuates the inter-generational cycle of poverty and poor health.

4.   RECOMMENDATIONS

I. Community based management of acute malnutrition (CMAM) and inpatient management of acute malnutrition should carry on providing nutritional support for malnourished children. High emphasis should also be given to children under the age of two years.

II. At the moment CMAM is in 145 sites in all the states included under Sahel region, except Kano. It is recommended to include Kano state while expanding in all other states to reach more children.

III. Long term program to prevent malnutrition should be in place to curb the observed high chronic malnutrition in survey areas.

IV. Attention to be given to adolescent malnutrition which negatively impact and perpetuate inter-generational cycle of malnutrition.

V. Areas with low coverage of vitamin A supplementation and deworming should be supported.

Contact Details:
National Bureau of Statistics
Isiaka Olarewaju (Deputy Director) - iolarewaju@nigerianstat.gov.ng
                                     - ialarewaju@yahoo.com

Federal Ministry of Health, Department of Family Health (Nutrition Division)
Thompson Chmaykbata - tchmay@yahoo.com

UNICEF
Stanley Chitekwe (Nutrition Manager) - schitekew@unicef.org
Isiaka Alo (Nutriiton Specialist) - ialo@unicef.org
Bamidele Omotola (Nutrition Specialist) - bomotola@unicef.org
Robert Johnston (Nutrition Specialist-WCARO) rojohnston@unicef.org
Assaye Tolla (Consultant) – bulti.ta@gmail.com