

## **Assessment of childhood Nutritional Status: Findings from a Health and Demographic Surveillance System, Zamfara State.**

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### **Introduction**

Globally, malnutrition is a major Public Health problem, especially as it affects the health of the under-five children. Malnutrition, defined as a pathologic state resulting from a relative or absolute deficiency or excess of one or more essential nutrients sufficient to produce disease, is one of the highest contributing factors to the global under-five mortality burden. More than 10 million under-five children die annually worldwide and malnutrition accounts for about 60 percent of these deaths [1-3]. Childhood nutrition has received little attention in comparison to the magnitude of the problem [4]. For instance, the Food and Nutrition Policy, approved in 1998 was not launched until 2002, and thus infants that would have been captured and prevented from being malnourished were missed [4]. The issue is more worrisome in developing countries, Nigeria inclusive.

In 2012, Nigeria accounted for 11 million out of the world 60 million stunted children. This figure had been projected to increase to 13.4 million by the year 2020 if adequate and urgent interventions are not in place to address the issue of childhood malnutrition in Nigeria [5]. Although Nigeria recorded a decline in under-five stunting from 41 percent in 2008 to 37 percent in 2013, however increasing prevalence of wasting and underweight have been reported in the Nigeria Demographic and Health Survey in the same year. For example, the trend in nutritional status worsened from 24% in 2003 to 23% in 2008 and 29% in 2013 for underweight and 11% in 2003 to 14% in 2008 and 18% in 2013 for wasting [6].

### **Methods and Materials**

#### *Study Area*

The study was conducted within the Nahuche Health and Demographic Surveillance System (Nahuche HDSS) site located in Bungudu Local Government area of Zamfara State. The Nahuche HDSS was established by the Department for International Development (DFID) funded Partnership for Reviving Routine Immunization in Nigeria; Maternal Newborn and Child Health (PRRINN-MNCH) Programme and the Zamfara State government in 2009. There are six districts under the surveillance area (hitherto refer to as DSA). The baseline population of the DSA was 25,149 (62,389 males and 62,760 females) in 2010. The study area is a rural area with limited and deficient infrastructural development. Farming with primitive agricultural tools remains the most engaged economic activities. Details of Nahuche HDSS data collection has been documented elsewhere [7].

### ***Data Collection for the study***

Nahuche HDSS database provided the sampling frame for the study. Households with under-five children were identified from the database. Three of the six districts were randomly selected for the study. A total of 404 under-five children from a sampling frame of 11,436 under-five children were selected through a multistage sampling technique from the three districts. Semi structured interviewer administered questionnaires was used in data collection. Content validity of the questions was ensured by translating to Hausa language and back-translating from Hausa language to English language. Trained Hausa language speaking field workers were used for data collection. Anthropometric measurements were carried out using child's age, height and weight. Recumbent length (for children less than 24 months of age) and height (for children more than 24 months of age) were taken. Indices like height-for-age, weigh-for-age and weight-for-height were generated.

Participants were categorized using the indices that were compared with standard reference values of World Health Organization (WHO) standards recommendations to obtain the Z-scores. Children with height-for-age Z-score of below minus 2 and below minus 3 standard deviation from the median of the reference population were considered stunted and severely stunted while, children with weight-for-age Z-score less than minus 2 and less than minus 3 standard deviation from the median of the reference population were regarded as underweight and severely underweight. Lastly, children with Weight-for-height Z-score less than minus 2 and minus 3 standard deviation from the median of the reference population were classified as wasted and severely wasted. Data entry was done using EpiData version 3.1 software. The data was exported to the Emergency Nutrition Assessment (ENA) for SMART software to calculate height-for-age (HAZ), weight-for-height (WHZ) and weight-for-age (WAZ) for the anthropometric analysis (z-scores).

### **Preliminary Result:**

Tables 1 and 2 shows the level of malnutrition in the DSA. Generally, 70% of the children were stunted while 54% were severely stunted. Stunting is apparently high among children less than 12 months of age (85%). In terms of prevalence of wasting among the under-five children, 15% of them were generally wasted. Wasting varies greatly by age and peaks among children age 36-59 months (18%). Lastly, prevalence of under-weight among the under-five children in the DSA was 37%. Among the underweight children, 24% were severely underweight. The nutritional indicator reported that male children are less likely to be underweight and severely underweight (36% and 22%) than female children (38% and 26%).

**Table 1:** Height-for-Age, Weight-for-Height and Weight-for-Age of Index Children by background characteristics

Background Characteristics	Height-for-Age			Weight-for-Height			Weight-for-Age		
	Severe Stunting	Moderate Stunting	Mean Z-score (SD)	Severe Wasting	Moderate wasting	Mean Z-score (SD)	Severe Underweight	Moderate Underweight	Mean Z-score (SD)
Age in months									
6-11	10 (79.9)	1 (7.7)	-4.51	2 (15.4)	0 (0.0)	1.08	7 (53.8)	1 (7.7)	-2.45
12-23	79 (63.7)	10 (8.1)	-3.58	12 (9.8)	5 (4.9)	0.96	29 (23.0)	19 (15.1)	-1.5
24-35	51 (52.6)	20 (20.6)	-3.06	12 (11.3)	1 (0.9)	1.1	22 (22.2)	13 (13.9)	-0.99
36-59	75 (46.0)	31 (19.0)	-3.06	22 (13.8)	6 (3.8)	0.24	38 (23.3)	19 (11.7)	-1.68
Child's Gender									
Male	109 (56.5)	30 (15.5)	-3.61	18 (9.5)	4 (2.1)	0.76	43 (22.3)	27 (14.0)	-1.59
Female	106 (52.0)	32 (15.6)	-2.95	29 (14.4)	8 (3.9)	0.66	52 (25.5)	25 (12.2)	-1.38
All	215 (54.2)	62 (15.6)	-3.27	47 (12.0)	12 (3.1)	0.71	95 (23.9)	52 (13.1)	-1.48

Note: Absolute figures for wasting does not add up to 397 due to flagging (outliers) figures.

**Table 2:** Prevalence of Stunting, Wasting and Underweight by sex.

Nutritional Status	Boy	Girls	Total N=397	Statistical indices
	n=193	n=204		
	F (%)	F (%)	F (%)	
<b>Stunting</b>				
Severe stunting	109 (56.5%)	106 (52.0%)	215 (54.2%)	$\chi^2 = 1.0024$
Moderate stunting	30 (15.5%)	32 (15.6%)	62 (15.6%)	p-value=0.606
Normal	54 (28.0%)	66 (32.4%)	120 (30.2%)	df = 2
<b>Wasting</b>				
Severe Wasting	18 (9.5%)	29 (14.4%)	47 (12.0%)	$\chi^2 = 3.4915$
Moderate wasting	4 (2.1%)	8 (4.0%)	12 (3.1%)	p-value=0.175
Normal	167 (88.4%)	165 (81.7%)	332(84.9%)	df = 2
<b>Underweight</b>				
Severe underweight	43 (22.9%)	52 (25.5%)	95 (23.9%)	$\chi^2 = 0.6893$
Moderate underweight	27 (14.0%)	25(12.3%)	52 (13.1%)	p-value=0.708
Normal	123(63.7%)	127(62.3%)	250 (63.0%)	df = 2

## Conclusion

The findings from this study suggests the under-five children in the DSA are living in appalling conditions which underscore the great need for nutritional intervention. Efforts at reorienting caregivers and parents on the importance of adequate nutrient intake especially during the first five years of life will probably have great impact in reversing the trend in under-five malnutrition.

## References:

- [1] Ahmad, O. B., Lopez, A. D., Inoue M., (2000): The decline in child mortality: A reappraisal. Bull World Health Organization; 78(10): 1175-1191
- [2] World Health Organization (WHO). (2003a). *The World Health Report 2003: Shaping the Future*. Geneva. Retrieved from [http://www.who.int/whr/2003/en/whr03\\_en.pdf](http://www.who.int/whr/2003/en/whr03_en.pdf). Last accessed on 2 May 2012
- [3] World Health Organisation (WHO) (2003b). Global Strategy for Infant and Young Child Feeding. World Health Organization.
- [4] UNICEF. (2006, May 2). The State of the World's Children. New York Times. Retrieved from <http://www.unicef.org/sow06>. Last accessed on 13 June 2014
- [5] Ehikioya, A., Adanikin, O., (2012). The report, '11 million Nigerian children are malnourished' .Accessed on July 2012. Retrieved from A life free from hunger website: [http://www.A life free from hungerinternational.org/url.cfm](http://www.Alife free from hungerinternational.org/url.cfm)
- [6] National Population Commission (NPC) [Nigeria] and ICF International. 2014. *Nigeria Demographic and Health Survey 2013*. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF International
- [7] Alabi, O., Doctor, H.V., AbdulAzeez Jumare, Nasiru Sahabi, Ahmad Abdulwahab, Sally E. Findley and Sani D. Abubakar. 2014 "Profile: The Nahucho Health and Demographic Surveillance System- Northern Nigeria [Nahucho HDSS]". *International Journal of Epidemiology*. doi:10.1093/ije/dyu197