

Determinants of Child Nutrition in Nigeria.

Odufuwa, Bolanle Aderemilekun

Nigeria

**49th International Course in Health Development
September 19, 2012 – September 6, 2013**

**KIT (ROYAL TROPICAL INSTITUTE)
Development, Policy & Practice/
Vrije Universiteit Amsterdam**

Determinants of Child Nutrition in Nigeria.

A thesis submitted in partial fulfillment of the requirement for the degree of
Masters in Public health

By

Odufuwa, Bolanle A

Nigeria

Declaration: Where other people's work has been used (either from a printed source, internet or any other source) this has been carefully acknowledged and referenced in accordance with departmental requirements.

The thesis titled, "**Determinants of Child Nutrition in Nigeria**", is my own work.

Signature:.....

49th International Course in Health Development (ICHHD)
September 19, 2012 - September 6, 2013
KIT (Royal Tropical Institute)/ Vrije Universiteit Amsterdam,
Amsterdam, The Netherlands
September 2013

Organised by:

KIT (Royal Tropical Institute), Development Policy & Practice
Amsterdam, The Netherlands

In co-operation with:

Vrije Universiteit Amsterdam/Free University of Amsterdam (VU)
Amsterdam, The Netherlands

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES	v
ACKNOWLEDGEMENT	vi
ABSTRACT	vii
LIST OF ABBREVIATIONS AND ACRONYMS	viii
GLOSSARY.....	ix
INTRODUCTION.....	xi
CHAPTER 1: BACKGROUND INFORMATON.....	1
1.1 Geographical Profile	1
1.2 Demographical Profile	1
1.3 Socio-economic situation	2
1.4 Education	2
1.5. Health care deliveries.....	2
1.6 Maternal Health and Nutrition	3
CHAPTER 2: STUDY OUTLINE	4
2.1 Problem statements.....	4
2.2 Justification	6
2.3 Objectives	8
2.3.1 General Objective:.....	8
2.3.2 Specific Objectives:.....	8
2.4 Methodology	8
2.4.1 Data Collection Techniques	8
2.4.2 Search strategies Key words and inclusion criteria	9
2.4.3 Grey Literature.....	9
2.4.4. Description of Conceptual Framework.....	9
2.5 Study Limitations	11
CHAPTER 3: STUDY RESULTS AND FINDINGS.	12
3.1. Immediate Causes.....	12
3.1.1 Adequate dietary intake.....	12

3.1.2 Complementary Feeding	14
3.1.3 Diseases	15
3.2 Underlying Causes	17
3.2.1 Household food security	17
3.2.2 Maternal and Child care	18
3.2.3 Access to Health Care Services and Healthy Environment	20
Access to health care services	20
Water and Sanitation.....	22
3.2.4 Women education and information	23
3.3 Basic Cause	25
3.3.1 Resources and control	25
Human resources for health	26
Poverty and Household income	27
Socio Cultural Organization	28
Food restrictions	28
Gender inequality.....	29
3.3.2 Political Environment.....	30
National Policy on Food and Nutrition& Plan of action.....	31
National Policy on Infant and Young Child feeding (IYCF) in Nigeria, 2005	31
Nutrition Programs in Nigeria.....	31
3.3.3. Economic structure	34
CHAPTER 4: LESSON LEARNED/ COUNTRY EXPERIENCES	35
4.1 Short route interventions to reduce child undernutrition.	35
Nutrition Education counseling and behavioral change	35
CHAPTER 5: DISCUSSION	37
5.1 Discussion	37

5.2 Trends and Determinants of stunting, wasting, and underweight.	37
5.3 Immediate causes of undernutrition.....	37
Inappropriate feeding practices.....	37
Morbidity	39
5.4 Underlying and basic causes of undernutrition.....	39
Lack of access to food and poverty.....	39
Inadequate health care and poor sanitary condition.....	40
Low level of women Education	41
5.5 Consideration in improving nutrition program.....	42
Reflection on conceptual framework	42
CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS	43
6.1 Conclusion.....	43
6.2 Recommendations	43
REFERENCES	47
ANNEXES	56
Annex 1: Countries with highest burden of malnutrition	56
Annex 2: Distribution of birth attendants	56

LIST OF TABLES AND FIGURES

Figure 1: Map of Nigeria	1
Figure 2: Trends in Nutritional Status of Children Under-five (2003-2008) ...	5
Figure 3: Percentage of Children under-five who are underweight, stunted and wasted, Nigeria, 2011	6
Figure 4: Percentage of Children under-five who are underweight by Geo- political zone Nigeria, 2011.	6
Figure 5: Conceptual Framework for Malnutrition.....	10
Table 1: Mean nutrient intake as percentage of RDA for the under-five children	14
Figure 6: Malnutrition and Infection	16
Figure 7: Trends in breastfeeding practices in Nigeria	19
Figure 8: a) % of household members using improved sources of drinking water	22
b) % of household members using improved sanitary facility in Nigeria	22
Figure 9: Literacy level among women young aged 15-24years, by wealth quintile, Nigeria 2011.	24
Table 2: Distribution of Health workers	26
Table 3: Food and nutrition program implementation	33

ACKNOWLEDGEMENT

My sincere gratitude goes to Almighty Allah for giving me the opportunity to travel abroad through a prestigious Netherlands Fellowship Award for an international degree and for providing me the strength to complete the programme at record time.

I thank The Netherlands Government for the Fellowship Award that gave me another opportunity to undertake a 12months Master's Programme in Public Health. This is indeed a great experience and promising opportunity to showcase importance of nutrition in health development, and particularly in academic platform.

I would like to express my sincere gratitude and appreciation to my lovely and ever caring husband Bashir Olufemi and my lovely children (Aminat, Awwal and Aliyat Odufuwa) for their perseverance and endurance during the course of my study abroad. If not for their support and encouragement, I would not have been able to complete the programme in record time.

I would also like to thank my thesis advisor and 'back stopper' for their highly appreciated support and guidance despite their busy schedules. They gave me positive comments and support that pushed me on to be the best I can.

My gratitude also goes to the entire Faculty Members most especially, KIT course Coordinators for their different support and contribution toward achieving this Master's Programme. Many thanks to my colleagues ICHD students 2012-2013 for making my stay and experience worthwhile. You guys are great!

ABSTRACT

Background: Under-nutrition is a public health issue in sub-Sahara Africa and is widespread in Nigeria. Under-nutrition in all its forms (wasting, stunting and underweight) is rampant in rural areas and more pronounced mostly in the Northern part of the country. The consequences of under-nutrition cannot be overemphasized. It increases the risk of infection, reduces immunity and serves as underlying causes of mortality in under-five. Also its impact on economic growth, productivity and intellectual is enormous.

Objectives: The aim of this study is to provide policy makers and stakeholders evidence based-recommendations to reduce levels of under-nutrition among children under-five years in Nigeria.

Methods: Literature review was done to identify and describe the determinants of child's undernutrition using the conceptual frame work for malnutrition as a guide.

Results: Inappropriate feeding practices and infections were identified as immediate causes of under-nutrition among children. Underlying causes are lack of access to food, poor access to health care and environment and low maternal education status. Socio-cultural factors, poor access to resources, lack of political will, and weak human and institutional capacity in implementing policies are the basic causes of under-nutrition among children under-five in Nigeria.

Conclusion and recommendations: Under-nutrition requires multi sectoral and integrated approach to address its causes. Nigerian government should be more committed financially in nutrition activities and the nutrition program implementing apparatus should be appropriately placed where due attention will be given preferably within the presidency. Lastly, regular research on nutrition and health should be encouraged and health care services should be strengthened.

Key words: Under-nutrition, determinants, under-five children, Nigeria.

Word count: 12, 642

LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune deficiency Syndrome
ANC	Antenatal Clinic
BMI	Body Mass Index
CHEWs	Community Health Extension Workers
EBF	Exclusive Breastfeeding
FAO	Food and Agriculture Organization
FMOH	Federal Ministry of Health
FOS	Federal Office of Statistics
GDP	Gross Domestic Product
GHE	Government Expenditure on Health
HIV	Human Immune Deficiency Virus
HRH	Human Resources for Health
IFPRI	International Food Policy Research Institute
IYCF	Infant and Young Child Feeding
LGA	Local Government Area
MDGs	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
NBS	National Bureau of Statistics
NCFN	National Committee on Food and Nutrition
NDHS	Nigeria Demographic and Health Survey
NFCNS	Nigeria Food Consumption and Nutrition Survey
NNPC	Nigerian National Planning Commission
NPC	National Population Commission
OOP	Out-of- pocket
PHC	Primary Health Care
PHE	Private Health Expenditure
TBA	Traditional Birth Attendant
UNICEF	United Nations Children’s Fund
WHO	World Health organization

GLOSSARY

Body mass index: “Is defined as an individual’s body weight (in kilograms) divided by height (in meters squared) (kg/m^2)” (UNICEF, 2012a). BMI above 25 (overweight) and lower than 18.5 (underweight) are considered inadequate.

Chronic malnutrition: “Chronic malnutrition, also known as ‘**stunting**’, is a form of growth failure which develops over a long period of time. Inadequate nutrition over long periods of time (including poor maternal nutrition and poor infant and young child feeding practices) and/or repeated infections can lead to stunting. In children, it can be measured using the height-for-age nutritional index” (UNICEF, 2012a).

Complementary feeding: “The use of age-appropriate, adequate and safe solid or semi- solid food in addition to breast milk or a breast milk substitute. The process starts when breast milk or infant formula alone is no longer sufficient to meet the nutritional requirements of infant. It is not recommended to provide any solid, semi- solid or soft foods to children less than 6 months of age. The target range for complementary feeding is generally considered to be 6-23months” (UNICEF, 2012a).

Early initiation of breast feeding: “Breastfeeding within one hour of birth” (UNICEF, 2012a).

Exclusive breastfeeding: “An infant receives only breast milk and no other liquids or, not even water, with the exception of oral rehydration salt (ORS) or drops or syrups consisting of vitamins, minerals supplements or medicines. UNICEF recommends exclusive breastfeeding for infants aged 0-6 months” (UNICEF, 2012).

Food taboos: “Foods that are not eaten for cultural or religious reasons”.

Infant and young child feeding (IYCF): “Term used to describe the feeding of infants (less than 12 months old) and young children (12–23 months old). IYCF programmes focus on the protection, promotion and support of exclusive breastfeeding for the first six months, on timely introduction of complementary feeding and on continued breastfeeding for two years or beyond. Issues of policy and legislation around the regulation of the marketing of infant formula and other breast milk substitutes are also addressed by these programmes” (UNICEF, 2012a).

Macronutrients: "Fat, protein and carbohydrates that are needed for a wide range of body functions and processes" (UNICEF, 2012a).

Malnutrition:"A broad term commonly used as an alternative to 'under-nutrition' but which technically also refers to over-nutrition. People are malnourished if their diet does not provide adequate nutrients for growth and maintenance or if they are unable to utilize the food they eat due to illness (under-nutrition) or they are also malnourished if they consume too many calories (over-nutrition)" (UNICEF, 2012a).

Nutritional status: "Is defined as physiological condition of an individual that results from the balance between nutrient requirements and intake and the ability of the body to use these nutrients" (UNICEF, 2012a).

Prelacteal feeding: "Giving the infant other liquids during the period between the birth and when the mother's milk is flowing freely" (NPC, 2009a)

Undernutrition:"An insufficient intake and/or inadequate absorption of energy, protein or micronutrients that in turn leads to nutritional deficiency"(UNICEF, 2012a).

Underweight: "**Wasting** or **stunting** or a combination of both, measured through the weight-for-age nutritional index" (UNICEF, 2012a).

Recommended daily allowance: "The average daily dietary intake of nutrients that is sufficient to meet the nutrient requirements of nearly all (approximately 98 per cent of) healthy individuals in a given population. For calories, the recommended daily allowance is based on the mean for a given population"(UNICEF, 2012a).

Severe acute malnutrition: "A result of recent (short-term) deficiency of protein, energy, and minerals and vitamins leading to loss of body fats and muscle tissues. Acute malnutrition presents with **wasting** (low weight-for-height) and/or the presence of oedema (i.e., retention of water in body tissues).Defined for children aged 6–60 months, as a weight-for-height below – 3 standard deviations from the median weight-for-height for the standard reference population or a mid-upper arm circumference of less than 115 mm or the presence of nutritional oedema or marasmic-**kwashiorkor**" (UNICEF, 2012a).

INTRODUCTION

I am a Nutritionist working at Tai Solarin College of Education, Omu-Ijebu Ogun State, Nigeria. I have been teaching nutrition courses in the institution and I have published a few articles on nutrition and health issues. I am keenly interested in exploring peculiarities and correlations between nutrition and health. More importantly, to advocate for courses on Nutrition and Health in my Institution and other education institutions in Nigeria.

The importance of quality food cannot be ignored in human sustenance. In other words, it could be said that adequate and nutritious food intake at infancy and early childhood is a prerequisite for promoting adequate growth, healthy living and development of child. Adequate nutrition is described as the intake and utilization of enough energy and nutrients to maintain well-being, health and productivity (of a child) (Olusanya, 2008). Inability of individuals to meet necessary nutrition contents is a growing problem in Nigeria.

Malnutrition is a growing public health problem in developing countries, specifically Nigeria. The menace and its implications on life and economic development of the country requires attention. It is imperative to note that Nigeria is one of the 34 countries in the World that accounted for 90 percent of malnutrition (Black et al., 2008) (see annex 1). The rate of stunting is higher (41%) in Nigeria compared with other sub-Saharan Africa countries. Also Nigeria is one of the 10 countries in the World that accounted for the high burden of underweight and wasting (UNICEF, 2009). It is displeasing to note that malnutrition contributes about 50% to under-five mortality in Nigeria. Despite the high prevalence of stunting and underweight in Nigeria, efforts to ameliorate the situation have been insufficient, thus leaving millions of children at risk of lower chance of survival. If this negative trend continues; the reality of Nigeria to meet the Millennium Development Goals, and other health indicator may be jeopardized. Therefore, underlying issues of malnutrition needs to be addressed in Nigeria.

This motivated me to embark on an extensive literature review on determinants of nutritional status among vulnerable group (children under five years) in Nigeria. Examining the determinants and contributing factors to malnutrition; and assessing Nigerian nutrition and health development policies. The UNICEF, (1990) conceptual framework of malnutrition forms the basis of analysis, discussion and structure of the thesis. Findings from

this study will be instrumental to policy makers and other stakeholders on how to improve nutritional status of under-five children in Nigeria. It will equally facilitate effective and feasible policy that will enhance good nutrition intervention programs in the country.

The thesis is structured into six chapters. The first chapter provides the background information of Nigeria. Chapter two contains the methodology adopted; and this entails statement of problem, justification, objectives of the study and limitation of study. Chapter three reveals the results and findings of determinants of malnutrition. Findings are discussed under major headings: immediate causes, underlying causes and basic causes. Chapter four discusses the best practices from other countries. Discussion based on the findings and reviews of literatures are presented in chapter five. Conclusion and recommendations for improved under-five malnutrition is the focus of chapter six.

CHAPTER 1: BACKGROUND INFORMATION

1.1 Geographical Profile

Nigeria is an African Nation located in the sub-Saharan (West Africa) region. It is a country that operates a Federal system of Government. Nigeria's capital is Abuja; it is divided into six geo-political zones; with 36 states and 774 Local Governments Areas (LGA). Nigeria has a landmass of 923,768sq km². It is a country with humid sub-tropical climate (NPC, 2009a). It shares boundaries with Cameroon at the East, Niger Republic at the North, Atlantic Ocean at the South and Benin Republic at the East (see Fig. 1).

Figure 1: Map of Nigeria



Source: Wikipedia, The free encyclopedia. Map of Nigeria, 2013

1.2 Demographical Profile

Nigeria has an estimated population of 160 million, and it is the most populous nation in Africa and the 6th largest country in the World. It has three dominant ethnic groups (Hausa, Igbo and Yoruba); the nation has more than 200 sub-ethnic groups and above 500 languages with different cultures. Also, 48% of Nigeria population is urbanized; while 52% lives in rural areas. Islam and Christianity are the notable religions (UNICEF, 2007;

World Bank, 2013). About 50% are female and 50% males. Young and active population with median age of 19.4 characterized the country (NPC, 2009a).

1.3 Socio-economic situation

According to the World Bank (2013), Nigeria is a lower middle income country endowed with natural resources (tin, ore, coal lead and petroleum). Agriculture is the dominating rural activity in the country. Non-oil sector account for average growth rate of about 8%. Oil and gas contributes -0.35 percent. Nigeria exhibit both formal and informal economic activities. Nigeria relies on oil as the resource that drives the economics of the country. Oil and gas contribute 15% of gross domestic product (GDP) and 79% and 71% of federal government revenue and export revenue respectively (AEO, 2013). There is economic imbalance between rural and urban areas; this generally facilitates rural-urban migration.

1.4 Education

According to NBS, (2011) about 57% female were literate compared to 75% males. The NDHS, (2008) also reported that female literacy rate is 54%; with about 80% in the South East and South West compared to North West and North East zones which has 21% and 23% respectively. It was also noted that literacy levels differs between different income groups; with 40% of males in the poorest households being literate against 13% of females. There is gender inequality in education in Nigeria (NPC, 2009a).

1.5. Health care deliveries

Nigeria operates a decentralized health care delivery system. It is categorized into three levels namely Primary, Secondary and Tertiary levels. Each level of health care is managed by different tiers of Government. Federal government is responsible for the tertiary and overall policy; while State and Local Government is in-charge of secondary and primary level respectively (FMOH, 2011). In Nigeria, health services are provided by both public and private sector. Approximately 23,640 health facilities are available; close to 85% provides primary health care, while 14 and 0.2% offers secondary and tertiary health care respectively. Over 38% of these are owned by private sectors, and mostly located in urban areas (FMOH, 2005a).

PHC provides communities with preventive health services. They are the first point of call. It contains the health post, dispensaries, clinics, health centers. Secondary healthcare facilities serve as referral centers, and take care of referral cases from primary health centers; the tertiary healthcare level renders a range of services, particularly specialized health issues or complicated cases. They are also involved in training and research activities (Labiran, Mafe & Lambo, 2008). Out-of-pocket expenditure on health (OOP) is about 96% of the private health expenditure (PHE) which amount for 5.4% of the gross domestic product (GDP) (WHO, 2013). Nigerian Government allocates a relatively low percentage (6%) of budget to health. Apart from not meeting the Millennium Development Goals (MDGs); it falls below the agreement (15%) of the African Union declaration (AU, 2001).

1.6 Maternal Health and Nutrition

Dietary intake of mothers (either micro or macro nutrients) influences her health and their children at different stages in life cycle. Deficiency in iron and folic acid results in high infants and maternal deaths and increases the risk of premature delivery and low birth weight (UNICEF, 2006). Studies in Nigeria show that the dietary intake of mothers is adequate in macro nutrients but deficient in micronutrients.

Nigeria Demographic and Health Survey (NDHS) 2008 report shows that 70% of mother's consumed food that is adequate in protein and energy while less than half consume fruits and vegetables. This is similar with the finding of Bolajoko & Folahan (2013) on nutrient intake of pregnant women in Southern Nigeria which revealed that the pregnant women met their recommended dietary intake (RDI) of energy and protein while their diet is deficient in vitamins and minerals.

NDHS, (2008) report on nutritional status shows that 66% of women aged 15-49 had normal Body Mass Index (BMI) (18.5-25cm), 12% are underweight (< 18.5 cm), 16% are overweight; while 6% are obese (>25.0). Women from urban areas are more overweight than those from rural areas (31% and 17% respectively); and it increases with age, education and wealth (NPC, 2009b). Maternal mortality rate in Nigeria (545/100,000 live births) is among the highest in the World (USAID, 2012).

CHAPTER 2: STUDY OUTLINE

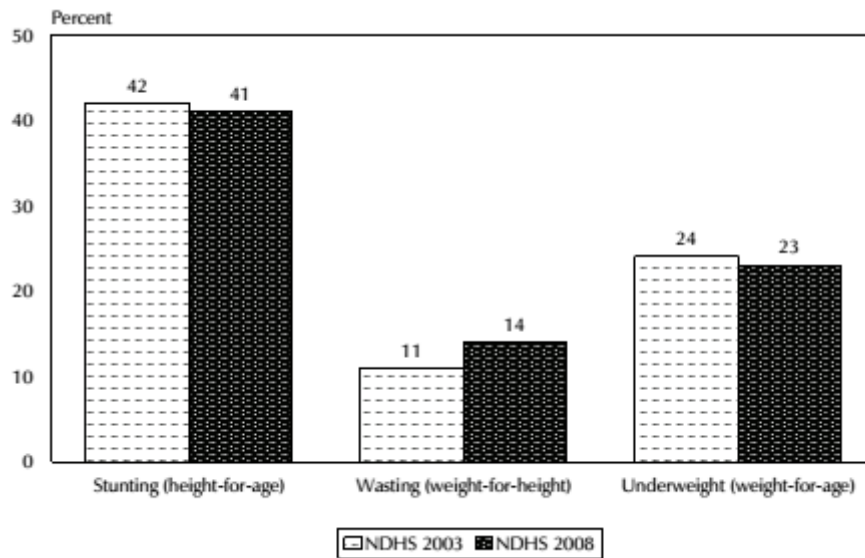
2.1 Problem statements

Malnutrition has been considered as a major public health problems facing developing countries like Nigeria. Globally, about 165million children under-five years of age are stunted and more than 90% of these children live in Africa and Asia, 101 million are underweight and 52million are wasted (UNICEF, 2012b). In developing countries, malnutrition accounts for more than one third of deaths among children under-five years (UNICEF, 2009).

Malnutrition is nutritional disorder associated with inadequate or excess intake of nutrients. Smith and Haddad, (1999); Olusanya, (2008); UNICEF, (2010) posit that malnutrition manifests in different forms such as: under-nutrition, over-nutrition and micronutrient malnutrition. There is increasing evidence that under-nutrition is the most common form of malnutrition in Nigeria. Wasting, underweight and stunting are the common indicators used to measure under-nutrition(UNICEF, 2010; UNICEF, 2009).Under-nutrition occurs as a result of insufficient food intake (quantity and quality), suboptimal feeding practices and repeated infectious diseases (UNICEF,2009).

Under-nutrition is an underlying cause of 2.2million child deaths and 21% of disability-adjusted life years lost in developing countries (Black et al., 2008).The prevalence of malnutrition among children under-five years of age in Nigeria has not shown any significant improvement, as revealed in figure 2; the prevalence of three forms malnutrition is high. NDHS 1990 shows that about 36%, 43%, and 9% of under-five in Nigeria were underweight, stunted, and wasted respectively (FOS, 1992). It was reported that underweight (weight-for-age) are 27.2%, stunting (height-for-age) and wasting (weight-for-height) were 43% and 11.2% respectively (NPC, 2004).In similar vein, the National Food consumption and Nutrition survey(NFCSN 2001-2003) explained that 42, 25, and 9% of under-five children were stunted, underweight and wasted respectively (Maziya – Dixon et al.,2004).In addition, NDHS 2008 report also shows that about 41% of underfive children in Nigeria are stunted, 14% wasted, and 23% underweight.

Figure 2: Trends in Nutritional Status of Children Under-five (2003-2008)

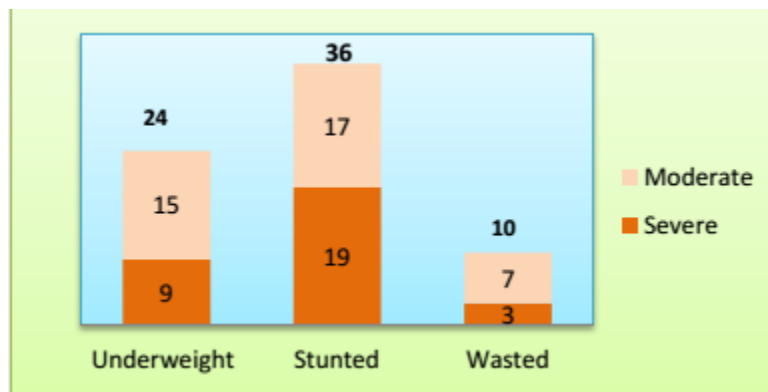


Source: NDHS 2008

Another point of note according to NDHS, (2008) is that there is geographical differentiation of under-nutrition in Nigeria. For instance, underweight and stunting is more pronounced in the North-West (10-35%) compared to South- East (53-22%) (NPC, 2009a).

Chronic malnutrition (stunting) is higher in males than females and more rampant in rural than urban areas (NPC, 2009a). Recent survey report expatiate that a slight decline in level of stunting, wasting, and underweight (36%, 24%, and 10% respectively) with the highest prevalence of underweight in the North West and East zone (38% and 35% respectively) as shown in figure 3 and 4 (NBC, 2011).

Figure 3: Percentage of Children under-five who are underweight, stunted and wasted, Nigeria, 2011



Source: MIC, 2011

Figure 4: Percentage of Children under-five who are underweight by Geo-political zone Nigeria, 2011.



Source: MIC, 2011

Although a lot of studies have been done on nutritional status of under-five in Nigeria but very few studies looked into the various determinants of malnutrition. More so, reflecting back on the indicators and trends of malnutrition in Nigeria the situation is not improving significantly. This research therefore seeks to identify the gaps or reasons for not making substantial improvement and proffer possible recommendations for policy makers in order to reduce under-nutrition among under-five children in Nigeria.

2.2 Justification

Evidence has shown that under-nutrition is a major public health issue in developing countries (UNICEF, 2012b). Children are recognized vulnerable

groups that require distinctive nutrition/food elements. It has been argued that adequate nutrition for children, particularly the under-five is inevitable for child growth and prevention from diseases. In sub-Sahara Africa, Nigeria specifically, malnutrition is one of the leading factors of mortality among under-five children. About one-third of under-five mortality in the World was traced to malnutrition, yet malnutrition did not receive the substantial attention compared with malaria and Human Immune Deficiency Virus/ Acquired Immune Deficiency Syndrome (HIV/AIDS) and other communicable diseases in developing countries, especially in Nigeria (Save Children, 2012).

Malnutrition among children is perceived to be dangerous as it reduces child immunity to infection; worsening illnesses and increases death associated diarrhea and respiratory tract infection. This was highlighted by Black et al., (2008) that a chronically malnourished child performs poorly in school, and is less productive in their adulthood stage. These have impacts on the country's overall productivity capacity. This stems on the fact that, socio-economic development and potential to reduce poverty in countries depend a lot on nutritional status of the citizens (UNICEF, 2009).

Therefore, to achieve the Millennium Development Goals (MDGs) particularly MDG 1, to eradicate poverty and hunger, MDG 4, to reduce child mortality, and MDGs 5, to reduce maternal mortality and improve other health indicators; government needs to give priority to nutrition of women and children. Sequel to these assertions, and the persistent stunting and underweight among children in Nigeria, the country is far behind in meeting the MDGs 1c which is to halve the 1990 rate of underweight by 2015.

Despite different policies on maternal and child nutrition in Nigeria, National Policy on Food and Nutrition (2001), the Plan of Action (2004) and the National Policy on Infant and young Children feeding (2005b), the level of malnutrition in Nigeria is still high (as demonstrated in figure 2) and as hardly improved comparing badly against the nutrition indicators of other countries in sub-Sahara Africa like Ghana, Senegal and Tanzania.

Several studies assessed the causes of malnutrition in under-five children (Ajao et al., 2010; Anigo et al., 2009; Sanusi et al., 2006) but the few ones that addressed malnutrition only looked at the underlying causes and immediate causes of malnutrition. Understanding the determinants of malnutrition at all levels is imperative if the current levels/trends are to be reduced.

This study therefore intends to critically assess the basic, immediate and underlying causes of malnutrition in Nigeria using the UNICEF conceptual framework of malnutrition as a guide. The study also looks at the various existing policies on food and nutrition to see how they have been implemented and why they have not resulted in substantial reduction of the level of malnutrition in Nigeria. It will proffer recommendations for policy makers and stakeholders on how to improve level of under-nutrition in children under-five years in Nigeria.

2.3 Objectives

2.3.1 General Objective: To provide policy makers and stakeholders evidence based-recommendations to improve under-five under-nutrition in Nigeria by describing and analyzing the factors which contribute to under-five nutrition in Nigeria.

2.3.2 Specific Objectives: The specific objectives are to:

1. Examine the scale and trends of malnutrition in children under-five years of age in Nigeria
2. Identify basic, underlying and immediate causes of malnutrition in children under-five years with the guide of the conceptual frame work of malnutrition.
3. Examine the existing Food and Nutrition policies and their implementation and compare them with potential resources and international best practices.
4. Make recommendations to key stakeholders to improve the nutritional status of under-fives in Nigeria.

2.4 Methodology

2.4.1 Data Collection Techniques

This thesis is a descriptive study based on literature review. To achieve the above stated-objectives data were collected from various studies and research related to child nutrition and determinants in published journals articles and unpublished works including country reports and guidelines where necessary.

2.4.2 Search strategies Key words and inclusion criteria

Pub Med and Google Scholar were all accessed to review published literature. Royal Tropical Institute and Vrije University libraries were used for easy access to published books and other relevant information.

Key words used: Various combinations of the following words were used to search the literature. Nigeria, nutrition, under-five, determinants, under-nutrition, stunting, wasting, underweight, developing country, Policies on nutrition, food security, disease and malnutrition, child care practices, weaning method, infant feeding practices, food taboos, breastfeeding, complementary feeding dietary intake, dietary diversity, politics and nutrition, nutrition intervention programs, maternal and child nutrition .

Inclusion criteria: The inclusion criteria were studies conducted in Nigeria and other developing countries with similar socio economic background that are written in English language. Journal articles where only abstract could be accessed were excluded. The search was restricted to those articles/studies published from 1990 to 2013 except for some few key historical articles where no other literature was available. The 1990 limit was chosen to coincide with the development of the conceptual framework for malnutrition by UNICEF and the year for MDG baseline.

2.4.3 Grey Literature

Websites United Nations Children's Fund (UNICEF), Food and Agriculture Organization (FAO), World Bank and World Health Organization (WHO) were explored. The 2008 Nigeria demographic and health survey (NDHS) and relevant peer reviewed publications were explored to determine the trends of malnutrition in under-five children over a period of time. National Policy on Food and Nutrition, the National Policy on Infant and young Children feeding documents were also assessed and gaps were identified to inform policy makers.

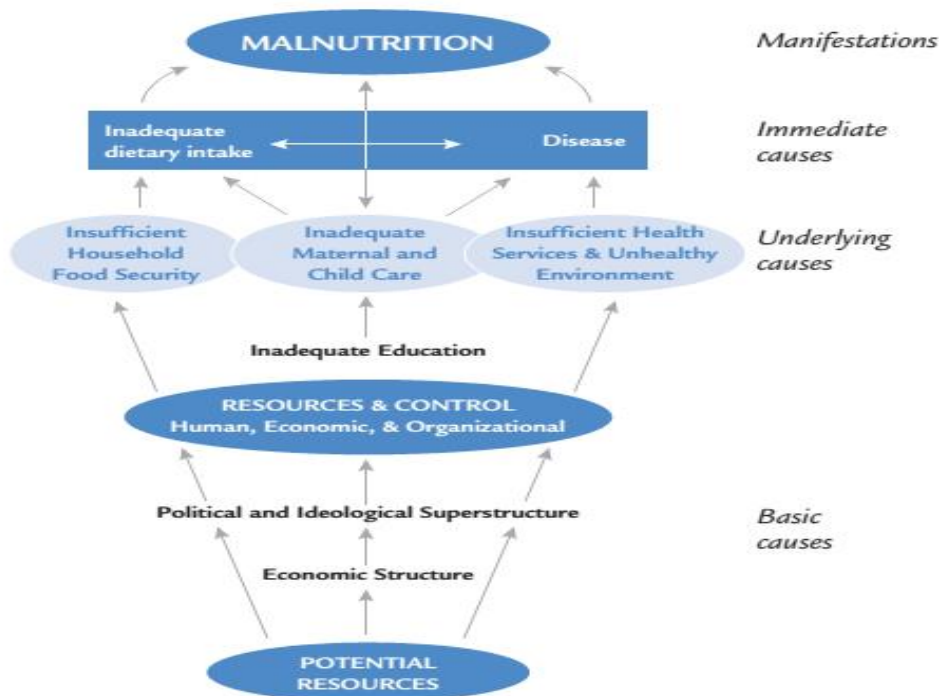
2.4.4. Description of Conceptual Framework

I adopted the conceptual framework of malnutrition developed by UNICEF, (1990) (see fig. 5). The framework forms the anchor of this thesis, and guided my discussion. It should be noted that, the framework is globally used in developed and developing countries literatures to analyze the causes and discuss under-nutrition issues among children. Based on the framework, food intake and diseases are not the only contributory factors to under-nutrition. It was explained that status and attributes of different institutions/

organizations cannot be ignored in under-nutrition discourse. In other words, basic causes are related to national and community status; underlying causes includes the families and household characteristics, and the immediate causes are the individuals. The framework therefore categories the causes of malnutrition into three namely: (i) Basic; (ii) Underlying and (iii) Immediate causes (see figure 5).

Inadequate dietary intake and infection are the two significant immediate causes of malnutrition. Lack of household food security, poor maternal and child care and poor sanitary condition and insufficient health services are identified leading underlying causes of malnutrition. Determinants of underlying causes are categorized as basic causes, which include resources made available by different levels such as household, community and the nation. Also political, economic, ideological, legal and cultural factors may debar people from attaining key resources necessary to attain good nutritional status.

Figure 5: Conceptual Framework for Malnutrition



Source: UNICEF, 1990

2.5 Study Limitations

This thesis was based on secondary data obtained from published materials (articles, reports etc).As a result, any error that occurred during data collection, processing, analysis, and interpretation may have affected the validity and reliability of my study. More so, there are limited studies on nutritional status of under-five children at national level. Therefore, studies conducted at regional and state levels were used; which might not be a true representative of the country. Most findings were obtained from the National Survey Reports.

CHAPTER 3: STUDY RESULTS AND FINDINGS.

3.1. Immediate Causes

The immediate causes of under-nutrition manifest themselves at individual level. These include inadequate diet (energy, fat, protein, vitamin, and mineral) and health status. Malnutrition occurs when dietary intake is inadequate in both quantity and quality to meet the nutritional requirement of individual and when health is unsatisfactory as a result of diseases or infection especially childhood illnesses which lead to body increase in requirement for nutrients and reduces appetite and mal absorption of nutrients from the gut.

3.1.1 Adequate dietary intake.

Adequate dietary intake for infants aged 0-6 month's old is Exclusive Breastfeeding (EBF). Breast Feeding (BF) is the best practice for feeding an infants and young children. Optimal BF practices promote healthy growth and development of newborns. Based on clinical and epidemiological evidence, EBF for six months, followed with a transitional introduction to complementary foods was recommended globally (Sellen, 2007).

Despite the numerous benefit of breast milk and the practice, EBF and timely introduction of children to complementary food is still poorly practiced among Nigerian women. The NDHS survey shows that the percentage of infants and children under six months that were exclusively breastfed reduced from 17% in 2003 to 13 percent in 2008 (NPC, 2009a). Another recent survey in 2011 reported 15% (NBC, 2011). Study on infant feeding practice in North West Nigeria found infants were not initiated to BF immediately after birth as recommended, more than 50% of mothers did not give colostrum to their infants due to tradition passed by on by elderly in the community while some belief that the milk is dirty thereby denying the infant essential nutrients and reducing their immunity (Anigo et al., 2009).

In 2008, the NDHS survey shows that about 36% of children within the age range of 6-8 months and 82% from age 24-35 months consumed food that is rich in Vitamin A. Children from the Southern zones consumed more compared to those ones from Northern zones (81%-88% and 54%-77% respectively).

Educational level of mothers and household wealth status are some of the factors that determine the food consumption pattern of children. Children

whose mother has more than secondary education consume more vitamin A rich food than those with no education (86% and 58% respectively). Likewise those from highest wealth quintile eat more vitamin A rich food 83% compared to 56% from lowest health quintile (NPC, 2009a).

Iron rich foods intake was reported to be high among children from South-South zones compared to North East zones. Also children from higher wealth quintile household and those born to literate mothers were fed more with iron rich food than their counterparts (NPC, 2009a).

A survey on inequality and welfare status of some households in rural Nigeria revealed that the dietary make up of food consumed by the households is largely of starchy foods with very little proteins and vitamins. Also on the frequency of food consumption, over half of the respondents (51.7%) ate twice a day; about one-third ate three times a day, while only 10% ate once a day (Oluwatayo, 2008).

A cross sectional studies conducted by Amosu et al (2011) in South-Western Nigeria revealed that the dietary intake of the children was below Recommended Dietary Allowance (RDA) for their age. The mean energy, protein, vitamin A, iron and calcium intake in male and female were below RDA 1291.84kcal, 10.24g, and 6.9mg (see table 1 for details of nutrient intake).

Similarly, Addo (2005) affirmed that approximately, 27% of Nigerian children under-five year old met their RDA while about 19% were severely deficient.

Table 1: Mean nutrient intake as percentage of RDA for the under-five children

Variable	RDA	Intake	%RDA
Energy (kcal)	1800	1291.84	71.77
Protein (g)	24	10.42	43.42
Fat (g)	-	35.7	-
Carbohydrate (g)	-	252.38	-
Iron (mg)	10	6.91	69.1
Calcium (mg)	400-800	328	54.70
Vitamin C (mg)	45	49.58	110.21
Vitamin A (ug)	500	308.15	61.63
Niacin (mg)	8	5.27	65.88

Source: Amosu et al, 2011.

3.1.2 Complementary Feeding

In line with the UNICEF and WHO recommendations from 6 months of life complementary food either solid or semi-solid should be introduced in order to meet the infant's increasing energy and nutrients needs in addition with continued breastfeeding to 24 months or more (UNICEF, 2012b). In addition, infants are expected to eat 2-3 times per day starting from 6-8 months and 3-4 times from 9-23 months with in-between meals being offered 1-2 times per day (PAHO/WHO, 2003).

A report from the Federal Ministry of Health (FMOH) 2005 revealed that more than half of Nigerian infants are given complementary foods earlier than the six months recommended by WHO/UNICEF. Studies have shown that complementary food was introduced to the children as early as 3 months old and often the food are of low quality to meet their RDA (Amosu et al., 2011; Ajao et al., 2010; Anigo et al., 2009). The percentage of children who receive complementary food earlier than six months rose from 18% in 2003 to 35% in 2008 (NPC, 2009a). Introducing the infants to complementary food at this tender age may displace breastfeeding and also exposes the infants to infection due to unhygienic handling of food during preparation and utensils.

According to the Infant and Young Children Feeding (IYCF) practice breastfed infants are expected to be fed with food from at least three food groups. Overall, only 30% of children within age 6-23 months were fed

following the IYCF practice. The NDHS (2008) shows that 35% of children who were breastfed met the minimum feeding practice standard in terms of food diversity compared to 16% of non-breastfed. More than half of the breastfed children were given food from at least three food groups and eat more than four times a day while 80% of non-breastfed were not fed according to IYCF guidelines (NPC, 2009a).

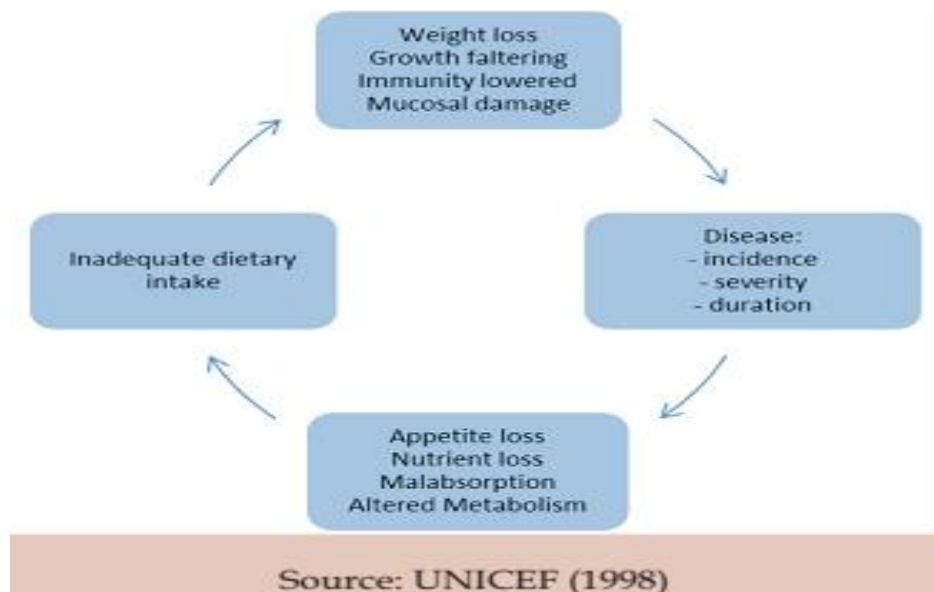
Ajao et al., (2010) study on influence of family size, household food security status, and child care practice on nutritional status of under-five children in Ile-Ife, Southern Nigeria shows that the energy food and body building food forms the bulk dietary intake (45% and 38% respectively) while protective and refined foods were consumed in small quantity (about 8% and 9%).

3.1.3 Diseases

Malnutrition is a major underlying cause of morbidity and mortality in children under-five years in developing countries, like Nigeria. In 1968, Scrimshaw & Taylor affirmed the synergistic relationship between malnutrition and infection. Study shows that a repeated episode of infection without adequate food intake causes growth faltering among children in developing countries and diarrhea accounted for 25-30% (Black et al., 2008). Other infection like measles, respiratory infection, HIV/AIDS, intestinal parasites also have significant impact of nutritional status.

It is pertinent to note that, poor nutrition coupled with infection in a vicious cycle accounted for high morbidity and mortality in under-five children in developing countries. For example, low dietary intake in children impairs and weakens the immune system defenses which make the child prone to disease condition and prolong the duration of the disease. More so, disease depletes nutrient and suppresses appetite so sick children tend not to eat as they should and the cycle continues (Figure 6 demonstrates the vicious cycle of malnutrition and infection).

Figure 6: Malnutrition and Infection



In Nigeria childhood illness like acute respiratory infection (16%) diarrhea (19%), and malaria (30%), are the most common cause of under-five mortality. These deaths would have been averted if the children are not undernourished (UNICEF, 2009). Diarrhea which is the second leading causes of death after malaria accounted for 19% of deaths in under-five children. In sub-Sahara Africa, Nigeria has high prevalence rate of diarrhea 18.8% when compared with average 16% worldwide (UNICEF, 2008).

Generally, childhood infection is associated with reduces dietary intake, however, this effect is more pronounced in children with diarrhea. Studies conducted in Eastern Guatemala, Bangladesh, Costa Rica, and Uganda reported reduction in dietary intake in children with diarrhea (Nel, 2010).

The symbiotic relationship between under-nutrition and diarrhea is in two ways: malnutrition leads to diarrhea and diarrhea also aggravates the course of malnutrition (Nel, 2010). A child who suffers from repeated episodes of diarrhea is more likely to be wasted and stunted. Literature have shown that poor feeding practices like discarding colostrum, using prelacteal feeds, suboptimal feeding practices, early introduction of formula, and early weaning is associated with higher risk of diarrhea infections and associated morbidity and mortality (Jones, 2003; Lambert, 2011).

3.2 Underlying Causes

The nutritional status of children is strongly related to health conditions and health services. Under-nutrition does not arise as a result of inadequate dietary intake and infection alone, inadequate health services, poor water and sanitation, household food insecurity can also increase incidence of the disease.

3.2.1 Household food security

The Food security as defined in the World Food Summit 1996 stated that "Food security exist when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 1996). Accessibility, availability, and utilization are the key determinants of food security. Household food security ensures that households at all-time have adequate access to nutritious food either through food purchases or home production. However, this is determined by factors such as household size, family income and educational level.

In 1986 and 1998, the percentage of food insecure household was estimated to be 18% and 40% respectively, this figure soared to 70% in 2006 (Sanusi et al., 2006). Globally, about 800 million people comprising of 300 million children go to bed without food. It is estimated that 40% percent of Nigerians lack access to adequate food (Babatope, 2013)

Sanusi et al., (2006) assessed of food security status of households managed by teachers in Lagos and Ibadan. They affirmed the influence of income and educational status on household food security. The study shows that teachers household in Lagos are more food secure than in Ibadan. Generally, household food security in both cities was low (26%).

Ajao et al., (2010) reported 65% household food insecurity occur in Ile-Ife. Less than 40% of the mothers reported that they have access to food all year round and nearly 50% did not have access to food all year round due to financial constraints. Also about 11% of the children have to skip meals or reduce quantity of meal. Omonana and Agoi (2007) study on analysis of food security situation among urban household in Lagos shows a decline in food insecurity; as household head income increases and educational status improves.

3.2.2 Maternal and Child care.

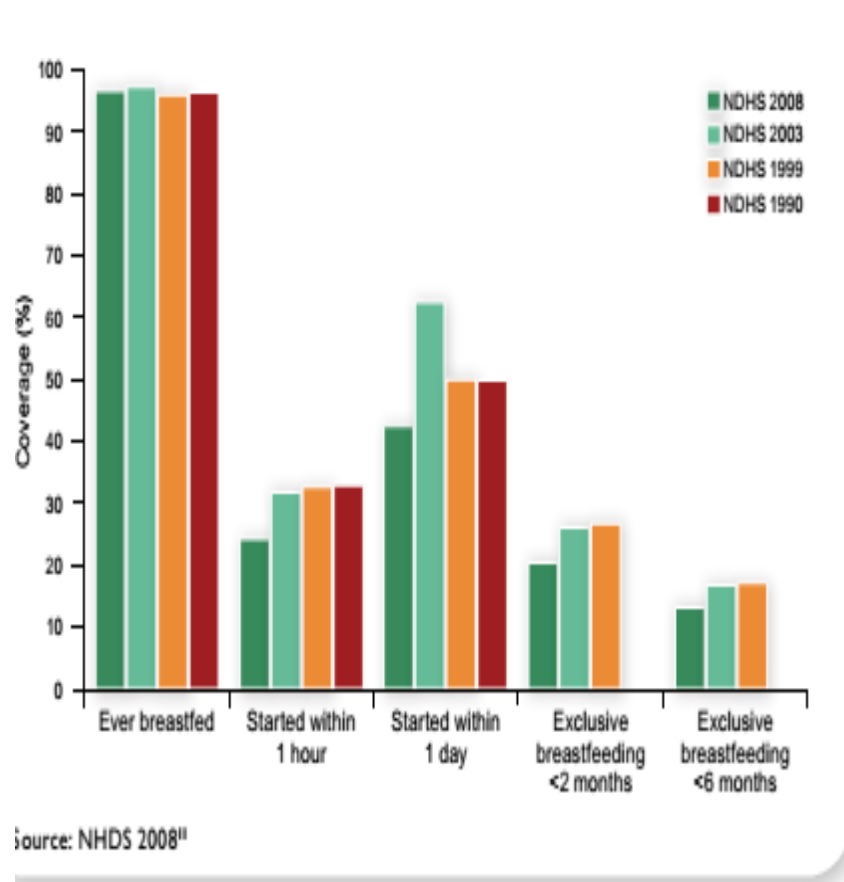
Adequate care is vital for the nutritional well-being of infants and young children. The quality of care mother rendered to the child right from the womb and especially during the first two years of life is essential for the survival, development and determines nutritional status of the child (Olayiwola, 2003). The adequacy of care rendered by caregivers and mother is determined by their control over resources, time, knowledge and cultural practices.

Traditionally, the primary context of care of young children is home. But due to urbanization and civilization most of the care practices has been eroded. The rapid urbanization and women engagement in labor force has led to an increase demand of early child care in Nigeria. For example, in Nigeria over 60% of women work in the labor force and most often out of home in search for income to feeding the family and meet their ends needs.

Only 38% mother's initiate breastfeeding within an hour of birth to their newborns and 68% commence breastfeeding thereafter (within the first day) (Figure 7 shows the trends of breastfeeding in Nigeria from 1990-2008).It worthy to note that all the indicators in 2008 are worse compared to 1990. A survey conducted in Daura and Zango the Northern Nigeria where malnutrition is more pronounced shows that none of the mothers of infants under six months was practicing exclusive breastfeeding and about 50% failed to initiate breastfeeding within one hour after birth (Save the Children,2010).

The detrimental effect of early mixed feeding on infants cannot be overemphasized. It increases and exposes infants to high risk infection like acute respiratory infection and diarrhea. Study revealed that 56% infants in Nigeria are given prelacteal feed (giving infants other liquids at birth before the mother begins to lactate fully) this practice undermines exclusive breastfeeding. Place of residence, assistances at delivery, place of delivery and maternal educational status contributed significantly to this practice (NPC, 2009a).

Figure 7: Trends in breastfeeding practices in Nigeria



Duration and frequency of breastfeeding as reported by mothers in Nigeria presented in 2008 NDHS indicated that rural women breastfeed longer than those in urban areas (19 to 16 months respectively). Likewise, women from the lower wealth quintile placed their children on breast milk longer than those in the highest quintile (17-21 months and 14.6 months respectively). Children were breastfed on demand with a minimum of 9 times during the day and 6 times at night. It is interesting to note that all the children are equally breastfed irrespective of their sex (NPC, 2009a).

Good child spacing is important in understanding health status of the mother and the quality of care in terms of time spent in caring for the child. Research have shown that short birth intervals (<24 months) are associated with poor health outcomes, especially during infancy. Good child spacing (2 years) thus, improve the health status of the mother and the child. NDHS 2008 report revealed that median birth interval of 31.4 months and this similar with the 2003 NDHS (31.2 months) (NPC, 2009a).

Less than 10% percent of children were given additional fluid with continued breastfeeding and about 25-28% was placed on oral rehydration therapy (ORT), increased fluids and continued breastfeeding. However, children from urban areas were reported to be better catered for than those from rural areas (NPC, 2009a; NBC, 2011).

3.2.3 Access to Health Care Services and Healthy Environment

Accessing health care services is determined by several factors such as geographical location, affordability, people perception about quality, literacy level, access to information and attitudes regarding gender.

Access to health care services

In Nigeria about 70% of households have access to Primary Health Care facility (PHC) within 5km from their home (FMOH, 2011). Yet, these services are not equitably distributed across regions with the Southern zones having more facilities than the Northern zones and people in urban areas have more access (80%) in relative to those in rural areas (66%) (Akinyele, 2009). The PHC was adopted in Nigeria in the mid-eighties, and offers the eight basic health component as declared by the Alma Ata.

The PHC offers clinic-based services given minimal or no attention to outreach, home and community-based services. In most cases, the PHC are not functional due lack of political will, lack of accountability and lack of capacity at the LGA level all these result in shortage of qualified staff, obsolete and inadequate equipment, and usually running out of stocks for drugs and essential supplies (FMOH, 2007; World Bank, 2011). This low coverage and poor quality of health care services has contributed to deteriorating state of health: high maternal and child mortality and high prevalence of malnutrition in Nigeria.

Nutrition counseling services for mothers and children are rarely offered at primary, secondary and tertiary levels. Poor financing, shortage of staff, lack of training and support among others are the reasons given (FMOH, 2011). For example, the routine macronutrients supplementation, deworming and growth monitoring and promotion were neglected in most of the health facilities (FMOH, 2011). A study conducted by Akinyele (2001) also revealed that the six essential nutrition actions were irregularly implemented at PHC. Treatments for severe acute malnutrition (SAM) are offered in tertiary hospital which is not accessible to the vulnerable group at the grassroots.

Preventive care which supposed to form the bedrock of PHC is not adequately funded. In 2006-2008 about 70% of public spending in health goes to curative care (World Bank, 2011a).

Globally, a greater proportion of deaths in children under five years of age are caused by communicable and vaccines preventable diseases. Most of these deaths and burden of illness can be averted by high vaccination coverage. In Nigeria, immunization services are provided routinely and through outreach centers and during the national immunization day (FMOH, 2011). Report from the 2008 NDHS shows a fair improvement in the number of children that are fully immunized compared to 2003 report. Overall, 23% of children between 1 to 2 years old were fully immunized in 2008 as against 13% in 2003. Twenty eight percent of children receive fully immunization by 12 months of age in 2011 (MICS) compared to 19% reported in 2008 (NPC, 2009a; NBC, 2011). Although, there is a slight improvement but this is not significant enough.

It is worth noting that, 29% of children in Nigeria did not receive any immunization at all. According to the survey children from urban areas, high wealth quintile and educated mothers were fully vaccinated compared to their counterparts. And the proportion of children that is fully immunized in South West and South East is as high as 43% compared to 6% in North East and North West (NPC, 2009a; NBC, 2011). Some of the reasons given for not receiving immunization are: lack of information (27%), fear of side effects (26%) and distance of the health post (13%).

Micronutrient deficiencies have been proven to increase the vulnerability of child to diarrhea and Vitamin A and zinc supplementation also slow down the severity and improve the prognosis of the child to diarrhea diseases (Bahman et al., 2007). However, reports from national surveys shows that most children under five years old in Nigeria are deficient of these vital micronutrients (NPC, 2004; NPC, 2009a; Maxiyo- Dixon et al., 2004; NBC, 2011).

Antenatal Care (ANC) is important at early stage of the pregnancy. Thus pregnant women at this stage benefit from interventions that require early or repeat visits. ANC attendance among pregnant women in Nigeria is very poor, less than 20% of pregnant women make their first ANC before the first trimester and about 45% receive the recommended two or more doses of tetanus. Likewise, less than 5% receive the recommended doses of two or

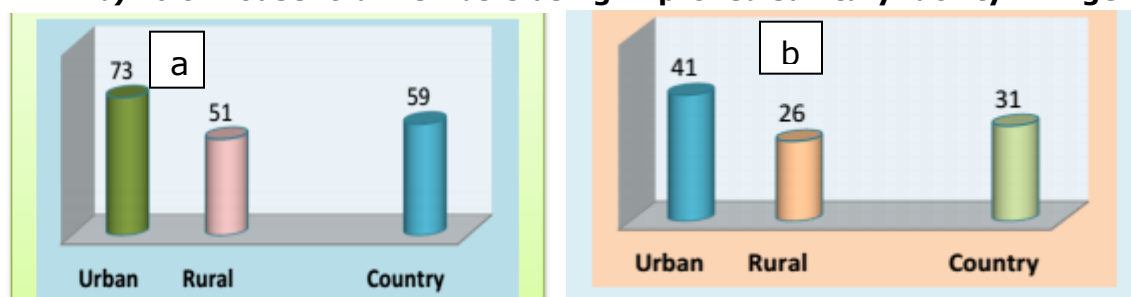
more Intermittent preventive treatment for malaria and about one- fifth sleep under insecticide treated bed nets (ITNs) during pregnancy (NPC, 2009a). Approximately 40% of deliveries in Nigeria are being attended to by skilled birth attendant less than 20% are done at home by relatives, while 22% are with traditional birth attendant (NPC, 2009a; NBC, 2011). (see annex 2)

Reports on health seeking behavior of mother’s and care givers during episode of diarrhea and acute respiratory diseases indicated that less than 50% of the mothers reported to have taken their child to health facility (NPC, 2009a; NBC, 2011).

Water and Sanitation

Access to portable drinking water in Nigeria is poor, 59% of Nigerian households have access to improved water supply (NBS, 2011). Urban areas have better access than rural areas; about 71% and 53% respectively (See Figure. 8a). Greater percentage of Nigerians relies for supply of water mainly from boreholes, tap water and wells (NPC, 2009a). Contamination of water due to poor source and treatment services is high in the country. In other words, treatment of water is not done by the majority (85%) of households. Despite the monthly environmental sanitation in Nigeria, the sanitation situation is poor. An indicator of note is the toilet facilities, waste disposal methods and management, flooding etc. About 31% Nigerian households use improved toilet facilities with the urban households having better access than rural households 42% and 24% respectively (See Fig. 8b) (NBS, 2011).

**Figure 8: a) % of household members using improved sources of drinking water
b) % of household members using improved sanitary facility in Nigeria**



Source: MICs, 2011

Inadequate access to this basic needs make the children prone to diseases and aggravate malnutrition. Diarrhea accounted for an estimated 150,000

deaths mainly among under-fives in Nigeria annually and is associated poor sanitary hygiene (UNICEF, 2008). Recently, hand washing with soapy water has been proved to reduce diarrhea episodes by 30% and so far an approximate of 47% reduction has been reported in some cases. This has not been well practiced in Nigeria due to poor access to this facility (UNICEF, 2008). A study conducted in Ondo State respondents was asked on how they dispose the stool of young children within the family. Approximately 30% reported using toilet, 7% were thrown outside while less than 10% were rinsed away in water. This practice is not the proper method of sewage disposal (Quadri & Ojure, 2013). A study conducted in the Northern Nigeria shows that about 34 and 22% of the household did not have access to safe water and improved sanitary disposal (Save the children, 2010). Poor accessibility to portable water source increases the workload of mothers (time taken in fetching water) and decreases the time allocated for caring for the child.

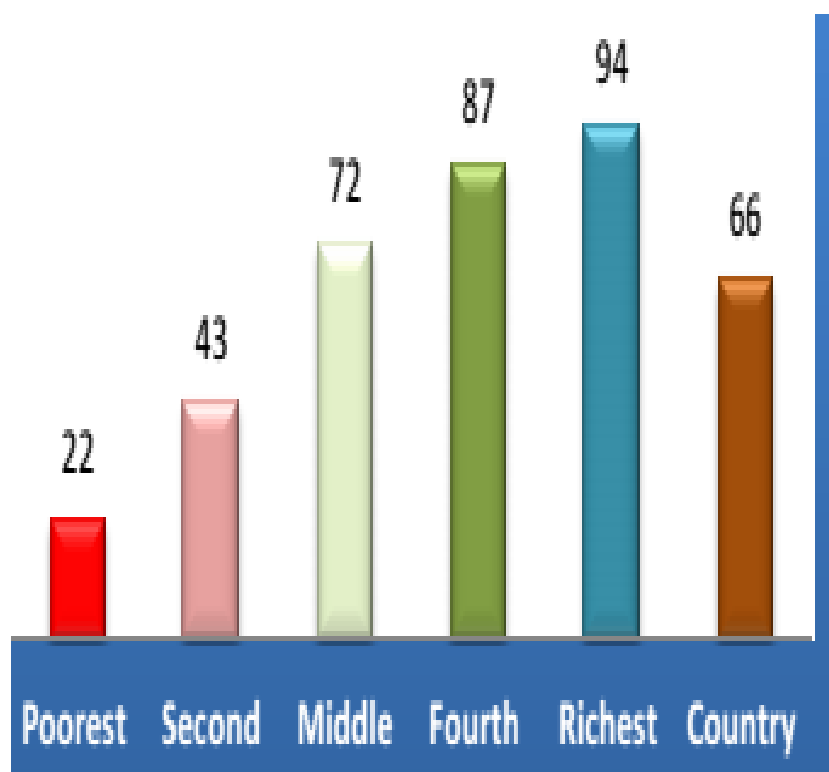
Infants and young children are more prone to food borne disease between the age of 6-23 months when complementary food is introduced, often because the food is handled or been prepared in an unhygienic environment (UNICEF, 2010). Inadequate food preservation is another cause of food contamination and food borne diseases. Study has shown that most often food is kept in a warm cupboard while some are left uncovered in an open place which makes it to be susceptible to contamination (Quadri & Ojure, 2013).

3.2.4 Women education and information

Maternal education is very crucial for better caring practices for infant and young children feeding. It is now widely recognized as a determinant of the health of a nation. The relationship between undernutrition and maternal and caregiver's knowledge on appropriate care during illness and their health seeking behavior cannot be underestimated. Most often, mothers and caregivers could not recognize or identify early signs of diseases due to ignorance or lack of access to information (FMOH, 2011).

In Nigeria nearly 60% of the population is literate. The literacy rate varies significantly among male and female (NPC, 2009a). The recent national survey MICS 2011 shows that about 66% of woman aged 15-24 years are literate. Wealth, geopolitical zones and place of residence all respectively show strong association with literacy level (see Fig. 9).

Figure 9: Literacy level among women young aged 15-24years, by wealth quintile, Nigeria 2011.



Source: MIC, 2011

According to the report women living in urban areas are more educated than those in living in rural areas; 86% and 54% respectively. More so, there is a great disparity in literacy level from geopolitical zone, women from South zones are twice literate 89% compare to those from North West and North East (32 and 37% respectively) (NBS, 2011).

The more educated a woman is the more chances of getting employed, earning good income and less likely to have a malnourished child. A mother with no education, no employment and poor is 2-5 time more likely to have a malnourished child than those that are educated and gainfully employed (Amosu et al., 2011; Ajao et al., 2010).The prevalence of malnutrition was reported to be higher in children whose mother are not literate at all than those with secondary education (NPC, 2009a; NBC, 2011).

There is also a strong correlation between women literacy level and their health seeking behavior. Findings have shown that 90% of mother who attained more than secondary school education delivers their baby in health

facility and more likely to immunize their children and use modern contraceptives. More so they are less likely to give their infants prelacteal feeding than those with no education (NPC, 2009a; NBC, 2011)

3.3 Basic Cause

Basic causes of malnutrition occur as a result of variety of complex social, political and economic factors. These factors may hinder households in attaining good nutritional outcomes.

3.3.1 Resources and control

Availability and use of resources facilitates healthy living in the households and society at large. Access to and control of resources either at household or society level are determined by various factors. Mostly in Africa men have control over resources either at household or the society at large; thus given woman low voice in resource use and control. This has a negative effect on the family ability in achieving adequate food, care, and health especially for the children. Effective household resource utilization impact on food security, health and care for children. This however depends on educational status of women (Akinyele, 2009).

Marginalization of women in household use and control over resources is more pronounced in Nigeria. For instance access to and ownership of land, access to credit facilities, decision on household properties and use of health facilities are taken mainly by men.

Globally women contribute immensely to food production (Akinyele, 2009). In sub-Saharan Africa women produce over 80% of basic food stuff for household consumption and to generate income for the family upkeep (FAO/ ILO/ IUF, 2005). Similarly in Nigeria about 70% of women were engaged in farm work totaling 60% of the farming population (Mijindadi, 1993). Despite the huge involvement of women in agriculture, access to land, credit, improved technology, fertilizers, seedlings and training is undermined (Ajani, 2008).

Adebayo (2011) study on small scale farmers in Oyo State found that more than 50% of the farmers are food insecure. Reasons attributed to this are: inadequate storage facilities, poor infrastructure, poor access to credit facilities and lack of adequate food processing and preservation for excess agricultural produce during harvest session. At household level inadequate

access to storage and preservation facilities increase food insecurity especially in rural areas where majority are predominately farmers.

Human resources for health

In Africa, Nigeria is one of the countries with the highest numbers of human resources for health (HRH) like South Africa and Egypt. As illustrated in table 2 there are 39,210 registered doctors, 124,629 nurses and 88,796 midwives in Nigeria operating both public and private sectors (FMOH, 2006). This figure is equivalent to 20 doctors, nurses per 100,000 populations (Labitan, 2008) and close to WHO standard of 25 doctors nurses per 100,000 populations that is required to offer minimum service for maternal neonatal and child health (WHO 2006).

Table 2: Distribution of Health workers

Staff Type	Number of staff	No. per 10,000 population
Doctors	39,210	3
Nurses	124,629	10
Midwives	88,796	7
Community health practitioners	117,568	20
Dentists	2,773	0.2
Pharmacists	12,072	1
Medical lab scientists	12,860	1
Health record officers	820	0.06
Physiotherapists	769	0.06
Environmental health officers	3441	0.3

Source: FMOH 2006

Despite the large stock of HRH, health system in Nigeria still faces some challenges due to unequal distribution of Health workers and poor remuneration across the country. Report from Reproductive health resources and services survey shows that more than half of health facilities offering ANC and delivery service are short of midwives. It revealed further that 77% of PHC offering the ANC services are been staffed with incompetent health personnel. Most often, the health facility are manned by Community Health Extension Workers (CHEWs) who are deemed to provide 80% community based- care (FMOH, 2002).This partly responsible for the neglect of primary health prevention and promotion activities at community level.

Poverty and Household income

Despite the economic growth in Nigeria over a period of time this has not translated better and equitable outcomes for individuals and community. The increasing unemployment rate in Nigeria is forcing many people to shackle of poverty. Indeed, an estimate of 60% of Nigerian lives below poverty line; and majority of these people lives in rural areas. About 30% and 47% of urbanites falls within fourth and highest quintiles while a higher proportion of the rural dwellers were within the lowest and second quintile (NPC, 2009a). Interregional disparities are high and incidence of poverty is extremely high in Northern part of Nigeria. For example, the North East, North West, North South has the highest poverty rate (67.3%, 62.9%, and 62.3% respectively) compared to 42% and 34% in the South South and South West zone (NPC, 2007).

Agriculture is the most prominent occupation among male and female in Nigeria. This group of citizens lack access to basic facilities, resources and equipment that can improve the sector. Majority of the poor women live in rural area where they have limited access to portable water, good sanitation, basic affordable health care, land and other live sustaining elements.

In Nigeria studies have shown that under-five mortality and under-nutrition in all its forms are higher among people in the lower wealth quintile when compared to richest quintile (FMOH, 2011). According to the NDHS survey about 56% of the women could not seek health care due to financial constraints (NPC, 2009a).

It is estimated that three quarters of Nigerian households spend 70% of their income on food. Women contribute greatly to household food and nutrition security as they spend their income on food more than their male counterpart, thus improving the nutritional status of their children (World Bank, 2008). This fact was corroborated by the finding of Obayelu (2008) on study of determinants of food security and food demand in Northern Nigeria which shows that women tend to attach more importance to food consumption, prepared nutritious meal in the house rather than buying food from vendors.

Socio Cultural Organization

Numerous traditional and religious values and practices hinder women ability to make decision on issues affecting their health and that of their children. Most often these beliefs affect their health seeking behaviour, food habit, child caring and also prevent them from practicing appropriate feeding practices. However, these practices vary among ethnic groups. This has resulted in widespread malnutrition especially among the vulnerable groups (the pregnant women, lactating mothers and children) especially in the rural and semi-urban settings.

Food restrictions

Food consumption pattern of women (during pregnancy and lactation), infants and young children are usually surrounded with lots of folklore and beliefs in Africa. Cultural believes and practices are one of the underlying factors leading to high morbidity and mortality among under-five children, pregnant and lactating mothers (Ogunjuyigbe & Ojofeitimi, 2006). It should be mentioned that cultural factors and practices also determines the nutritional status of family; and thus can be taken to be an underlying causes of undernourishment.

In Nigeria the three major ethnic groups (Yoruba, Hausa and Igbo) have different tradition and belief in terms of health seeking behaviour, child caring and feeding practices. Weaning period is a critical period and the type of food given to the children is too monotonous. For example, in Nigeria the first common weaning food that cut across all the three ethnic groups is Pap (a gruel made from maize) thereafter the child is introduced into the family food. However, study have shown that legumes and fruits which contains essential nutrients are sparingly added to the diet owing to the fact that it is not easily digestible, causes flatulence and diarrhea (Ogunjuyigbe & Ojofeitimi, 2006).

Another cultural practice that affects the nutritional status of children is the feeding practices during childhood diseases like diarrhea. Ogunbiyi and Akinyele (2010) in their study revealed that most mothers discontinued feeding during episodes of diarrhea owing to the belief that it's prolong the duration of the diarrhea and induces vomiting (86% and 14% respectively). They explained further that about 44% of those that discontinued feeding also reduce breastfeeding intake because of traditional belief that diarrhea is a normal disease during infancy and that excessive feeding causes diarrhea.

All these practices hamper the well-being of the child. It results in weight loss, growth faltering and aggravates any existing malnutrition in the children.

In Nigeria, Muslims do not eat pork meat also some Christians are restricted from eating okra, palm oil and some other nutritious food which nourishes the body. Additionally, it is a taboo to eat certain foods during pregnancy. For example, eating snails during pregnancy is a taboo because of the belief that the baby drools excessively (**Olusanya, 2008**). Other foods like plantain and beverages were also discouraged during pregnancy. It is believed that when this is eaten it causes pre-eclampsia and increases to the size of the growing fetus.

Gender inequality

Gender inequality is a re-occurring issue in all sectors in Nigeria. The disparity varies from regions to regions; but is more pronounced in Northern part of Nigeria. In 2012 Nigeria rated 79 out of 86 countries in the OECD'S social institutions and Gender index and 120 out of 135 countries in the World economic forum's 2011 Global Gender Gap index (AEO, 2013). Drives towards improved gender empowerment in Nigeria are low. Poor gender empowerment impacts women access to physical and natural capital. This invariably affects women's health, their families and the society as a whole, especially children under-five years (Akinsanmi et al., 2005).

Women are vulnerable groups, and thus face challenges of production, reproductive and social roles. In other words, increased workload reduces the time for child care. They dominate World's poor and work mostly in informal sectors; where they are poorly remunerated (Spielloch, 2007). Women are rarely employed in formal setting like men and when they do they are less paid than their male counterpart doing the same task/job. Also, in Nigeria gender differential in access to and control of assets affects health seeking behavior, food, sanitation and societal well-being (Ajani, 2008).

Girl's enrollment in primary school in Nigeria has increased over a period of time yet the proportion of boys to girl's enrollment across all level of education is still incomparable. For instance, in Northern Nigeria a male child is more likely to be educated than female (50% and 10% respectively). Women rights to movement and autonomy are often restricted due to religious, culture and social norms leading to a negative impact on their health and their children nutritional status because they have been deprived

of access to information and health services and lower self-esteem (Smith et al/ IFPRI, 2003).

Women are often marginalized in terms of employment, education, land, information, credit, technology and decision-making forum. A survey conducted in Northern Nigeria on women involvement of small scale farmers in agricultural cooperatives showed that 70% of women were deprived from participating due to the low literacy level and lack of access to credit (Amaza et al, 1999). Politically women's voice is not heard in Nigeria. They are not represented at the helms of affairs. Not until recently when they have been represented in the cabinet. For example women constitute 13% of the federal cabinet and about 30% of the high court judges (AEO, 2013).

3.3.2 Political Environment

Nigeria has been experiencing a fairly stable political environment. Although some parts of the country has been experiencing violent conflict in recent time (World Bank, 2013).

Recently, Nigeria was classified among the 34 countries contributing to 90% of high burden of malnutrition globally (Bhutta, 2013) (See annex 1) and coupled with the fact that malnutrition is widespread across the country nutrition activities in Nigeria has not received the priority it deserves. Despite various commitments of Nigerian government in various world summits in reducing hunger and improving maternal and child health, the financial commitments of Nigeria government is still very low. The recent summit on Global Nutrition Compact, Nigeria Government committed itself to spend 20million dollars on nutrition in 2014 while maintaining the current 10million been spend annually. This financial commitment is quite low and not impressive and sufficient in addressing the current level of stunting (41%) in the country (Save the Children, 2013). The budgetary allocation for health in Nigeria is still as low as 6% and far below Abuja declaration of 15% (AU, 2001). Also, the money allocated to social protection programs in Nigeria is minimal 0.6% of GDP and comparing badly with other sub-Sahara Africa (Hagen & Zanker, 2012).

In 1990 the National Committee on Food and Nutrition (NCFN) was established and was attached to Ministry of Science and technology. The committee was given the mandate of formulating Food and Nutrition Policy and National Food and Nutrition Plan of Action. The NCFN is saddled with the responsibility of coordinating, mobilizing resources, and implementing

nutrition intervention programs. Presently the NCFN and its policy body is under National Population Commission (NPC). However, there is lack of government will and commitment in implementing nutrition programs in Nigeria (World Bank, 2011).

More importantly, the NPC which anchors the nutrition body is given little or no budget for nutrition programmes. It should be mentioned that most staff are economists with only one nutritionist. Federal Ministry of Health (FMOH) and State Ministry of Health (SMOH) has a division for Nutrition but this section has not been fully funded neither at the Federal nor State level (World Bank, 2011).

National Policy on Food and Nutrition & Plan of action

The National Policy on Food and Nutrition in Nigeria was launched in 2002. The policy serves as a yardstick for the identification and formulation of nutrition programs in Nigeria and has a set "goal of improving the nutritional status of all Nigerians, with particular interest on the vulnerable groups, i.e. children, women and the elderly. It aims to reduce household food insecurity, improve feeding practices, increase human resources providing nutrition services, and improve understanding of nutrition problems and capacity to address them, through promotion of coordinated activities and appropriate resources allocation. The policy had a set of targets which include reduction of severe and moderate malnutrition among children under five by 30% and micronutrient deficiencies (vitamin A, iodine and iron) by 50% by 2010" (NNPC, 2001).

National Policy on Infant and Young Child feeding (IYCF) in Nigeria, 2005

The goal of this policy is "to ensure optimal growth, protection and development of the Nigerian child from birth to the first five years of life". It addresses issues related to breastfeeding, complementary feeding, IYCF in the context of HIV, use of milk substitutes, improved counseling, awareness raising and the capacity building of health staff" (FMOH, 2005b).

Nutrition Programs in Nigeria

Nigerian government has made various efforts in reducing the prevalence and incidence of under-nutrition, however all these efforts have not been successful in reducing level of stunting, wasting and underweight in children under-five years over decades. Several policies and nutrition programs had been embarked on such as food fortification and bio-fortification, (salt iodization,

vitamin A and iron fortification) home grown school feeding and health program, vitamin A supplementation among others (Akinyele, 2009). It is pertinent to note that some of these programs have yielded good result and good coverage for example Nigeria ranked first and the only country in sub-Saharan to be certified as universal salt iodization complacent in 2005.

Similarly some commonly consumed food stuffs like wheat and maize flour, vegetable oil, sugar, among others have been fortified with vitamin A and iron. This is been monitored by National Agency for Food and Drugs Administrative and Control (NAFDAC) and Standard Organization of Nigeria (SON) to ensure compliance by the manufacturer (Olayiwola, 2003). However, commonly consumed staple foods like cassava, maize, guinea corn which form the basis of diet of an average Nigerian especially in rural area were not fortified.

Yet, this has not made any substantial impact in reducing under-nutrition in Nigeria. Overall, some of the weaknesses in implementing most of the nutrition programs are: most programs are donor funded, grossly under funded by the federal government, lack institutional arrangement and effective capacity among others (World Bank, 2011). Table 2 below shows some of food and nutrition programs strength and weakness.

Table 3: Food and nutrition program implementation

S/No	Program	Strengths	Weaknesses
1	Primary Health Care Approach	<ul style="list-style-type: none"> Seeks to promote the integration of nutrition activities into the health care system 	<ul style="list-style-type: none"> Weak health system and poor implementation of PHC as vertical program
2	Accelerated Child Survival and Development	<ul style="list-style-type: none"> Seeks to integrate the components of child survival and development. 	<ul style="list-style-type: none"> Too early to evaluate effectiveness Implementation process slow now that it is merged with IMNCH
3	Catchments Area Planning and Action	<ul style="list-style-type: none"> Approach is community driven and interactive, offering greater flexibility and innovation 	<ul style="list-style-type: none"> Health system support is weak, no strong sustainability since donor support ended.
4	Gender Informed Nutrition and Agriculture	<ul style="list-style-type: none"> Existence of multiple partners working together including FBF1, COMPASS, BASICS III and USAID Presence of facilities for dry season farming and suitable crops to guarantee household food security. 	<ul style="list-style-type: none"> Inadequate stakeholders' understanding of aims, roles, and responsibilities Sociocultural barriers among the poor. Illiteracy and lack of basic numeric skills.
5	Home Grown School Feeding and Health Program	<ul style="list-style-type: none"> Increase enrollment in schools and improved performance of children. 	<ul style="list-style-type: none"> Design not adequate, state government buy-in is slow and no impact assessment indicators exist.
6	Vitamin A Supplementation	<ul style="list-style-type: none"> The National Food and Nutrition Policy is in place and provides a reference point for vitamin A supplementation. Trained vaccinators also visit the markets, places of worship, and day care centers for young children; each round is over a period of 3 – 7 days 	<ul style="list-style-type: none"> The National Food and Nutrition policy talks about MNDC emphasizing food fortification and dietary diversification but makes no mention of the role of vitamin A supplementation to control vitamin A deficiency and improve child survival. There is no provision for vitamin A supplementation in emergency situations.
7	Food Fortification and Biofortification	<ul style="list-style-type: none"> Increasing population coverage for vitamin and mineral consumption. 	<ul style="list-style-type: none"> Acceptability of products in rural areas not ascertained.
8	Salt Iodization	<ul style="list-style-type: none"> Coverage of all households (97percent) 	<ul style="list-style-type: none"> Inability to determine the amount of iodine consumed at the household level.
9.	Vitamin A Food Fortification	<ul style="list-style-type: none"> Makes vitamin A available to all members of the population. 	<ul style="list-style-type: none"> No guaranteed protection for consumers from over-consumption of vitamin A from the many products fortified.
10.	National Special Program on Food Security	<ul style="list-style-type: none"> Activities in many communities to assure food security. 	<ul style="list-style-type: none"> Difficult to document the level of production and impact.

Source: World Bank, 2011.

3.3.3. Economic structure

Nigeria is categorized as a middle- income country. It is endowed with physical and natural resources. The economic activity of the country is dominated by the agriculture and the oil and gas sector. The country has been experiencing robust economic growth for over 6 years with an estimate of 6.6% in 2012. Yet this does not translate into good livelihood of the citizens. Unemployment rate as at 2010 was 21% this has increased to 24% in 2011 (AEO, 2013) leading to high poverty rate.

Between 1996 and 2010 the percentage of Nigerians living below national poverty line soared from 65.5 to 69%. About 73.2% of these are rural dwellers and 61.8% resides in urban areas. Overall approximately 66% of rural dwellers live below USD 1 per day (AEO, 2013).Nigeria ranked 153 out of 187 countries on human development index with a value of 0.471(UNDP, 2013).

CHAPTER 4: LESSON LEARNED/ COUNTRY EXPERIENCES

This chapter explores the best practices from around the world highlighting different approaches in addressing malnutrition. This becomes relevant so that Nigerian government can learn lesson from other country that have made remarkable progress in reducing the level of malnutrition through a feasible ,effective and evidence based approach. It is important to note that, most of the interventions are single while some adopted a multiple approach.

4.1 Short route interventions to reduce child undernutrition.

Nutrition Education counseling and behavioral change

A study conducted in Malawi shows that children whose parents adhere to WHO feeding recommendations had a better nourished children than those who were introduced earlier than six months (Madise & Mpoma, 1997)

Walsh et al (2002) assessed the impact of nutrition education program on nutrition status of children aged 2-5 years over a period of 2 years in South Africa. Anthropometric measurement of the children in the study area was taken before and after intervention and compared with the control group. Two years after, the study revealed that there were improvements in underweight and wasting among the study group. However no significant improvement was recorded for stunting. Authors suggested further that an integrated approach should be adopted in order to reduce stunting. Integrated interventions including sanitation, employment, and literacy were suggested.

Guldan et al (2000) a community-based-pilot nutrition education intervention program conducted in China involved training and mobilization of village nutrition educator who are involved in growth monitoring and complementary feeding counseling for pregnant mothers and relatives of infant born during the intervention in the study area. The study revealed that the nutritional knowledge of mothers in the intervention group improved significantly; this translates into better infant feeding practice and their infants gained more weight compared to the control group.

Sheikholeslam et al (2004) a trial of multi-disciplinary educational intervention conducted in Iran involved giving training to mothers through provincial health centers and other government institutions on basic child

care, growth, hygiene practices and also support literacy programme for women, promoting home gardening and healthy eating. Authors found that three year after the intervention the prevalence of stunting and underweight decreased significantly in all the intervention area.

A systematic review on efficiency and effectiveness of complementary feeding interventions conducted by Dewey & Adu-Afarwuah (2008) established that complementary feeding interventions on its own cannot change the underlying factors that contribute to child undernutrition. Thus, an integrated approach such as improved water and sanitation, good housing, and better health care was suggested to be included.

Colecraft et al (2004) assessment on diet and growth of undernourished children undergoing nutrition rehabilitation in Ghana shows that the nutrition education alone does not have impact on the dietary intake of the children. The study pinpoints that poor knowledge on food preparation, financial constraints to purchase food stuffs, child preferences and the practices of purchasing ready-to-eat foods affects the continuation and sustainability.

Sunguyal et al. (2013) systematic review on counseling caregivers/ mothers of children aged 6-23 months through nutrition training for health workers on dietary diversity, frequency of feeding and dietary intake. The findings show that children in the intervention groups were more likely to consume more diverse food than their counterpart. The daily energy intake and feeding frequency of the children aged 6months-2years improved.

The important lesson learned from the evidence based interventions presented above is that single intervention is not sufficient and feasible in reducing under-nutrition. Hence, a multiple intervention approach would benefit Nigeria in reducing the current level of under-nutrition if some of this can be adopted.

CHAPTER 5: DISCUSSION

5.1 Discussion

The discussion of my findings on determinants of under-nutrition in children under-five years in Nigeria would be guided by the conceptual framework of malnutrition developed by UNICEF that was introduced earlier in my chapter 2 and my objectives will form the basis of the discussion.

5.2 Trends and Determinants of stunting, wasting, and underweight.

The findings showed that Nigeria has one of the highest levels of stunting, underweight and wasting in sub-Saharan Africa. Under-nutrition is widespread in the country but more rampant in the Northern parts of the country, rural areas and among mothers with low education and socio economic status. Looking at the trends of undernutrition in Nigeria as illustrated figure 4, it indicated that prevalence of malnutrition in Nigeria between 1990-2008 has not improved. It is worrisome, that in spite the enormous rate of malnutrition in the country, Nigerian government commitment towards nutrition activities is lacking and even the light of the MDGs. This level is comparing badly with other country in sub-Saharan Africa like Ghana, Ethiopia, Senegal and Tanzania which were more committed and have made a remarkable reduction in malnutrition level over same period of time (World Bank, 2011).

Key determinants related to wasting seem to be those related to immediate causes because it is an acute form of malnutrition that occurs with a short period of time due to inadequate diet and repeated episodes of diseases. On the other hand, key determinants of stunting, which are a chronic issue, lie more amongst the basic causes because is an indicator of for overall country development. It is generally influenced by economy, health, infrastructure, food security both at country and individual level. It is a long term process and often irreversible causing a permanent damage on the survivor.

5.3 Immediate causes of undernutrition

Inappropriate feeding practices

Findings showed that inappropriate feeding practice is a key determinant of under-nutrition among children under-five years in Nigeria. Evidence indicates that the dietary make up of these vulnerable group are not adequate in terms of quality and quantity to meet their dietary needs and

not sufficient to support growth and development especially in the first two years of life resulting in chronic malnutrition.

The importance and benefit of breast milk for infants and mothers has been well established, yet exclusive breast feeding is not widely practiced in Nigeria as less than one fifth of the children were exclusively breastfed. Early initiation of breastfeeding was also not encouraging. Untimely/earlier introduction of complimentary food below the recommended time (six months) were commonly practiced. Reason for low practice of EBF, late initiation of breastfeeding and early introduction of complementary is influenced by traditional belief, religion, taboos, assistance at delivery and place of delivery, lack of knowledge on food diversity and poor maternal knowledge on nutrition. All these socio-cultural factors have contributed to high prevalence of under-nutrition in Nigeria.

Although the existing policy on food and nutrition and IYCF practices stressed the importance of appropriate feeding for infants and young children and aim at promoting such act, this has not yielded substantial result because of lack of government commitment in nutrition, low budgetary allocation to nutrition programmes and inadequate well-trained staff and institutional capacity to implement policies. It is also noted that most of the activities at the PHC were facilities based intervention therefore incorporating community-based health and nutrition approach becomes essential in improving health and nutrition of mothers and children.

Nigeria government through the FMOH, SMOH, and LGAs must be committed and give more priority to nutrition programmes in order to reduce the level of malnutrition. Based on international best practices, it is evident that interventions require the promotion of adequate behaviors, such as initiating breastfeeding soon after delivery, breastfeeding exclusively for six months and then continuing breastfeeding until two years and beyond. In order for those interventions to be successful there is need for community involvement.

At the facilities level the FMOH, SMOH and LGAs need to promote healthy behaviors; to create a supportive environment, such as a conducive hospital environment, skilled health workers, support in the community and the workplace; and protection from commercial and other negative influences. Nigeria can learn lessons from the practices from Malawi, Iran and South Africa. For example, at the community level, the community and religious

leaders, NGOs and other key members of the society can be involved in promoting good behavioral practices among caregivers/mothers.

Morbidity

Diseases like malaria, diarrhea, acute respiratory infection and gastrointestinal worms are the common childhood illness leading to high under-five mortality in Nigeria. Evidence indicates that continuous infections coupled with inadequate dietary intake are key immediate causes of under-nutrition among children under-five years in Nigeria. Lack of access to information, low maternal knowledge about diseases and its relationship with dietary intake, tradition and cultural belief and food taboos are the leading causes.

Poor sanitary condition, lack of access to portable water, poor hand-washing practice, poor vaccine coverage, micronutrient deficiencies especially in rural areas and Northern parts of Nigeria contributed to high incidence of diarrhea. Addressing the root causes of malnutrition requires government will and commitment. Issues relating to high morbidity require multi sectoral and multi-disciplinary approach. Ensuring access to prompt preventive and curative health care services and improving access to water and sanitation becomes imperative as suggested by Dewey & Adu-Afarwuah (2008). Nigerian government should invest more in health and water and sanitation by increasing the allocation. Efforts toward reducing poverty rate and empowering women can be advocated by the FMOH in collaboration with other ministries. This will improve household's access to portable water and improved sanitation.

5.4 Underlying and basic causes of undernutrition

The underlying and basic causes of undernutrition are matched and discussed together due to the interconnectedness of the two. Thus, the basic roots causes of undernutrition as identified in the study are poverty, economic situation, socio cultural factors and political environment were discussed intermittently with the immediate and underlying causes.

Lack of access to food and poverty

Household food insecurity is a major issue contributing to malnutrition in Nigeria. This condition is aggravated by high level of poverty and gender inequity. The majority of poor are women who lives in rural areas and are predominately farmers this has led to low financial access to purchase nutritious food. Studies have established that female headed household are more food secured than male headed household and women spend their

income on food than their male counterpart, yet women have denied access to land and credit facilities despite their contribution to agriculture and child caring.

Access to food in terms of production was also not sufficient to ensure household for security. Nigerian government have shifted from agriculture to oil and gas putting about 60% of the farmers in rural areas and 70% of those working in agriculture labour force and their household in abject poverty and food insecurity. Most highly affected are women and children. The implication of these is the country plight in achieving the health related MDG 1, 4, and 5 and reducing the current high prevalence of under-nutrition which has not seen any significant changes over decades. The high poverty rate has contributed to high level of under-nutrition and high under-five mortality rate.

The existing food and nutrition policy failed to clearly give an institutional framework to incorporate agricultural sector to nutrition and also in defining the stage in which the community can suggest research priorities for different agricultural research institutes and the university.

Improving the agricultural sector through provision of basic infrastructure and preservative techniques to reduce post-harvest loss will help in reducing the poverty level of an average Nigerians who rely on agriculture for both income and access to healthcare and food for his family. Promoting home gardening as evidence in Iran will not only serve as a source of income for the family but also reduce household food insecurity. Addressing the issue of food production is beyond the scope of FMOH but with collaboration with Ministry of Agriculture and other research institutes this will be attainable.

Inadequate health care and poor sanitary condition

Inadequate access to health care and poor hygiene and sanitary is another determinant of undernutrition in Nigeria. Findings have indicated that about half of Nigeria households do not have access to safe drinking water and improved sanitary facility. This exposes the children to infection and diseases like diarrhea, typhoid, cholera and parasitic infections due to unhygienic practices which leads to immediate causes of under-nutrition. This poor sanitary condition have been shown to aggravate existing malnutrition and alter the immune system of the children leading growth faltering especially at age 6-23months when the child is introduced to complementary food.

Access to health care and quality of services rendered in most PHC in Nigeria is not impressive especially in rural areas. The study further revealed that nutrition counseling and other nutrition programmes were poorly implemented at various PHC. Facilities offering treatments for SAM is not accessible to the vulnerable group in the rural areas. Inequitable distribution of health facilities and work force, lack of training and institutional capacity and lack of government commitment in nutrition programme have been identified to be the factors militating against poor implementation of policies and nutrition program.

The FMOH should ensure equitable distribution of HRH across the region's most especially the underserved areas like the Northern zones and rural areas. Effort should be made toward retaining health workers at rural areas by given incentives to the workers. On job training should be offered to the health workers on nutrition counseling. Nutritionist should also be employed at each LGA to ensure effective coordination of nutrition programs and activities at various health centers.

Low level of women Education

Maternal education is another key determinant of nutritional status of children. Finding shows that the literacy level of women in Nigeria is still very low. However, the literacy level of women in the Southern zones is better off to that of the Northern zone. This underscores the high prevalence of stunting and underweight in the Northern zones. This group of marginalized women lack access to health care and always dependent on their husband and relatives.

There is no evidence to showcase the casual relationship between maternal education and malnutrition but education has a great impact as it increases the mother's income and decision-making power. Studies have clearly established the association between maternal education and undernutrition, with primary education already increasing the likelihood of having well nourished child. Maternal education is important because it increases mother's knowledge on how to combine food and health seeking behaviour. A literate mother is more likely to breastfeed her baby exclusively, initiate breastfeeding at the appropriate time and immunize the baby against killer disease, therefore addressing immediate causes of malnutrition at an early stage, reducing levels of wasting as well as stunting and underweight.

In other to improve this, girl child/women education should be promoted, adult literacy centre can be organize where woman will be given basic education on nutrition and child care. Income generating activities can be incorporated to improve the status of women as practiced in Iran. Addressing female enrollment in primary school is out of the scope of FMOH but through advocacy and collaboration with the Ministry of Education and Ministry of Women affairs this issue can be addressed especially in Northern part of the country where for girl/child education is not well embraced.

5.5 Consideration in improving nutrition program

Evidence has shown that a direct intervention has significant effect in reducing malnutrition. In spite of these, less value and recognition was given to direct intervention Nigeria. Nutrition programs are grossly underfunded and lack institutional capacity to implement policies. Less than 0.37 percent of donors fund is been allocated to nutrition.

Nigerian Government financial commitment to health, agriculture and social protection programs is quite low and not impressive. Hence, Nigerian government needs to improve financial commitment in nutrition activities and programs and other sectors in order to reduce the current scales and trends of undernutrition among these vulnerable groups (children and women). More so, institutional capacity needs to be strengthened.

Reflection on conceptual framework

The conceptual frame work that I used in the course of this study was developed by UNICEF in 1990. The framework actually guided me and anchored this study in attaining my research objectives.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Undernutrition in form of chronic malnutrition (stunting), acute malnutrition (wasting), and underweight is widespread across Nigeria. The severity varies according to geographical zones with the Northern zones contributing the highest percentage of stunting and underweight. This study established that the determinants of under-nutrition are interrelated and thus requires a multi sectoral and multi-disciplinary approach in addressing. Inadequate /inappropriate feeding practices coupled with diseases have been identified as a major cause of chronic and acute malnutrition among under-five children in Nigeria.

Contributing to this are; poor health care services, poor access to water and sanitation, poor maternal and child care practices, food insecurity, poverty, gender inequality and low maternal educational status. Lesson learned from other countries in developed and developing countries shows that single intervention in addressing undernutrition is not sufficient hence multiple interventions must be encouraged.

Importantly, most nutrition intervention delivered through the health sector, non-health interventions is also important in addressing under-nutrition in Nigeria through effective collaborations of the FMOH with other ministries like Ministry of Education, Ministry of Agriculture and Non-governmental Organization. In a nutshell, addressing the issue of high prevalence of under-nutrition in Nigeria requires an overarching policy framework, government commitment to nutrition programmes and interventions through adequate funding and improvement of social protection programme.

6.2 Recommendations

The following recommendations are provided to various stakeholders and policy makers in Nigeria towards addressing under-nutrition problems especially for under-five children in Nigeria:

Improve policy environment

1. Increasing allocation and Political will

The FGN needs to increase the annual budget allocation for health to meet Abuja declaration of 15% as pledge in 2001. Effort should be made in exploring financing mechanisms to improve government revenue. Government should also be more committed in financing nutrition programmes and continue collaboration and facilitate communication between bilateral and multilateral to restart funding and continue donor assistance.

2. Relocate NCFN

The NCFN which is currently under the NPC is neither being funded nor does the NPC have the institutional capacity that can assist NCFN to coordinate nutrition activities efficiently and effectively. Therefore it should be placed directly under the presidency where nutrition program will be prioritized and attended to. More so, the nutrition division under the FMOH and SMOH should be adequately funded for Nutritionist to implement nutrition programs

3. Coordination between nutrition and agriculture

The national policy on food and nutrition should be revisited, there should be collaboration between agriculture and nutrition sector. The agricultural sector should be involved in formulation of nutrition policy.

For more successful intervention in addressing household food security, strategies that can promote household access to nutritious food should be incorporated. Programs like fortification of commonly consumed staple foods to improve the micronutrients content and home gardening especially for women should be promoted.

4. Educate Women

Female enrollment in schools should be encouraged especially in the northern part where male children were given preference than female. The FMOH should collaborate with Ministry of Education, Ministry of women affairs and other relevant stakeholders to advocate for girl child education and women education.

5. Advocate for women empowerment

The FMOH should consider series of activities to sensitize the ministry of women affairs, concerned line ministries and donors of agencies to empower women with necessary supports and policy actions especially in relation to access to resources like land and microcredit facility.

6. Surveys, monitoring and evaluation and research

Tracking the trend of malnutrition to know the progress may require constant survey. The FMOH, NPC, NCFN and other relevant bodies should ensure periodic survey so that progress on the health indicators and nutrition can be monitored.

There is paucity of studies on household food security at nation level, therefore the FMOH, NPC, NCFN and other relevant bodies should encourage and finance research in such area through the academic institutes.

Strengthening health facility based nutrition interventions

7. Training

Regular training of health workers on nutrition counseling especially PHC health worker on growth monitoring and promotion, child care and hygiene nutrition counseling on breastfeeding and complementary feeding. These activities can be carried out through the FMOH and SMOH in conjunction with Ministry of Education.

8. Health Promotion and Nutrition Education

Health promotion and education consisting of teaching women about the synergism between nutrition and diseases, child caring practices and hygiene food preparation using locally available staples to make nutritious diet, personal hygiene should be strengthened. The activities should be carried out at various PHC by trained health workers during ANC and postnatal visit. SMOH and LGAs should be committed in raising fiancé for such activities.

Additionally, mass media campaigns using posters, radio message, and Television programs as well as telephone messages need to be strengthened to sensitize the mothers.

9. Strengthen mother's roles

Community-based health and nutrition intervention should be promoted to encourage good practices at the community level. The LGA with the cooperation of FMOH and SMOH take the leadership by advocating through the community and religious leader and NGOs.

REFERENCES

Addo A (2005) Improving the Nutrition of the Nigeria Child through Dietary Modification" paper presented at a Seminar on child Nutrition by West Africa Milk Company (Nig) PLC, Lagos.

Adebayo OO (2012) Family Income among Small Scale Farmers a Panacea for Household Food Security in Oyo State, Nigeria. *Research on Humanities and Social Sciences*, vol.2, no.7 pp. 32-36.

African Economic Outlook (2013) [accessed 14 June 2013] Available from: <http://www.africaneconomicoutlook.org/en/countries/west-africa/nigeria/> updated 01-05-2013.

African Union (2001) Abuja declaration on HIV/AIDS, Tuberculosis and other related infectious diseases. (Apr 2001) African summit on HIV/AIDS, Tuberculosis and other related infectious diseases.OAU/SPS/Abuja/3. Abuja, Nigeria

Ajani Olubunmi IY (2008) Gender Dimensions of Agriculture, poverty, Nutrition and Food Security in Nigeria. Nigeria Strategy support Program (NSSP) Background Paper No. NSSP 005.

Ajao KO, Ojofeitimi EO, Adebayo AA, Fatusi AO, &Afolabi OT (2012) Influence of family size, household food security status and child care practices on the Nutritional status of under-five children in Ile- Ife, Nigeria. *African Journal of Reproductive Health*, vol.14, no.4, pp 123-132

Akinsanmi AW Doppler, and C Nwajiuba (2005)"Gender inequalities and their implications for living standard and food security among male and female-headed households in Imo State, Nigeria" Conference on International Agricultural Research for Development, October 11-13, Tropentag, Stuttgart- Hohenheim.

Akinyele IO (2001) *Review of nutrition programs and essential nutrition actions in primary health care in Nigeria*. Health, Nutrition, and Population Unit Study Report. Washington, D.C. World Bank.

Akinyele Isaac O. 2009. Ensuring food and nutrition security in rural Nigeria An assessment of the challenges, information needs, and capacity analytical. International Food Policy Research Institute (IFPRI).

Amaza PS, PV Kwagbe and AA Amos (1999) Analysis of women participation in agricultural cooperatives: Case study of Borno state, Nigeria. *Annals of Borno*, vol.15, no.16, pp.187-196.

Amosu AM, AM Degun, NOD Atulomah, and MF Olarenwaju (2011) of the Nutritional Status of Under-5 Children in Western Nigerian Community. *Current Research Journal of Biological Sciences*, vol.3, no.6, pp.578-587.

Anigo KM, Ameh DA, Ibrahim S, and Danbauchi S (2009) Infant feeding Practices and Nutritional Status of Children in North Western Nigeria. *Asian Journal of Clinical Nutrition*, vol.1, no.1, pp.12-22.

Babatope Alabadan 40 percent of Nigerians lack access to adequate food. *Premium Times (Nigeria)* 2013 Feb 1. [accessed 23 July 2013] Available from: <http://premiumtimesng.com/regional/118338-40-of-nigerians-lack-access-to-adequate-food-says-don.html>

Bahman Khalili, Antony Hart , Masoud Mardani, Mehdi Khalili, Frank Mcardle, Luis Cuevas (2007) Diarrhea-associated micronutrient deficiencies and risk of subsequent diarrhea in admitted children to Hajar hospital in Shahrekord, Iran. *Iranian Journal of Clinical Infectious Diseases*, vol. 2 no.3, pp. 121-128.

Bhutta ZA, Das JK, Rizvi A ,Gaffey MF, Neff Walker, Susan Horton, Patrick Webb, Anna Lartey, Black RE (2013) 'Evidence-based interventions for improvement of maternal and child nutrition, what can be done and at what cost?', *Lancet*, vol. 382 (9890), pp. 452-477

Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, Mathers C, Rivera J (2008) Maternal and child Undernutrition Study, G. Maternal and Child Undernutrition: global and regional exposures and health consequences. *Lancet*, 371243-260

Bolajoko OO and Folahan OO (2013) The Comparative Study of the Nutrient Intake of Pregnant Women Attending Antenatal in Hospital and Traditional Birth Home in Owo, Ondo State, Nigeria. *IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS)*, vol.5, no.4, pp. 110-114.

Colecraft EK, Marquis GS, Bartolucci AA, Pulley L, Owusu WB &Maetz HM (2004) A longitudinal assessment of the diet and growth of malnourished

children participating in nutrition rehabilitation centres in Accra, Ghana. *Public Health nutrition*, vol.7 no.4, pp. 487-494.

Dewey KG, & Adu-Afarwuah s (2008) Systematic review of the efficacy and effectiveness of complementary feeding interventions in developing countries. *Maternal and child Nutrition*, 4(suppl 1), pp. 24-85.

Food and Agricultural Organization (1996) Rome Declaration on Food Security and World Food Summit. Plan of action November 13-17 Rome: FAO.

Food and Agricultural Organization- International Labour Organization -IUF (2005) Agricultural workers and their contribution to sustainable agriculture and rural development. Rome: FAO

Federal Ministry of Health (2002) Technical report on Nigeria Reproductive Health Resources and Services at the Primary Health Care level of government facilities: Federal Ministry of Health, Nigeria and World Health Organization; 2002.

Federal Ministry of Health (2005a) Inventory of Health Facilities in Nigeria Abuja: Federal Ministry of Health, Abuja.

Federal Ministry of Health (2005b) National Policy on Infant and Young Child Feeding in Nigeria. Nutrition Division, Abuja

Federal Ministry of Health (2006) National Health Management Information Systems.

Federal Ministry of Health, Nigeria (2006) National Human Resources for Health Policy, Abuja.

Federal Ministry of Health (2007) Integrated Maternal, Newborn and Child Health Strategy. Abuja: FMOH, p29.

Federal Ministry of Health (2011) Saving Newborn Lives in Nigeria: Newborn health in the context of the Integrated Maternal, Newborn and Child Health Strategy. 2nd edition. Abuja: Federal Ministry of Health, Save the Children, Jhpiego.

Federal Office of Statistics and IRD Macro (1992) Nigeria Demographic and Health Survey 1990 Columbia, Maryland USA: FOS and IRD Macro.

Guldan GS, Fan HC, Ma X, Ni ZZ, Xiang X, and Tang MZ (2002) Culturally appropriate nutrition education improves infant feeding and growth in rural Sichuan, China. *Journal of Nutrition*, 130(5): 1204-1211.

Hagen-Zanker and Tavakoli (2012) *An Analysis of Fiscal Space for Social Protection Nigeria*, ODI/UNICEF Nigeria.

Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS, & Bellagio Child Survival Study Group. (2003) How many child deaths can we prevent this year? *The Lancet* 362:65–71.

Labiran A, Mafe M, Onajole B, Lambo E (2008) Health workforce country profile for Nigeria: first edition. Nigeria Africa Health Workforce Observatory. Available from: www.unfpa.org/.../resources/.../R050_AHWO_2008 ..

Lambert LM, Walker CLF, Noiman A, Victora C, & Black RE (2011) Breastfeeding and the risk for diarrhea morbidity and mortality. *BMC Public Health*, 11(S3): S15-27.

Madise NJ and Mpoma M (1997) Child malnutrition and feeding practices in Malawi. *Food and Nutr. Bull.*, 18: 190-201.

Maziya-Dixon BI, O; E O Akinyele, S Oguntona, RA Sanusi and Harriss (Eds) (2004) Nigeria Food Consumption and Nutrition Survey 2001-2003. Summary International Institute of Tropical Agriculture (IITA) Ibadan Nigeria.

Mijindadi NB (1993) Agricultural Extension for Women: Experience from Nigeria. Presentation at the 13th World Bank Agricultural Symposium on Women in Agricultural Resource Management Washington D.C January 6-7

National Bureau of Statistics (2011) Nigeria Multiple Indicator Cluster Survey 2011 Summary Report, ABUJA NIGERIA.

National Planning Commission (2001) National Policy on Food and Nutrition in Nigeria, Abuja.

National Population Commission [Nigeria] and ORC Macro (2004) Nigeria Demographic and Health Survey 2003. Calverton, Maryland: NPC and ORC Macro.

National Population Commission (2007) Nigeria Millennium Development Goals 2006 Report. Abuja: NPC

National Population Commission and ICF Macro (2009a) Nigeria Demographic and Health Survey 2008: Calverton, Maryland, USA: NPC and ICF Macro.

National Population Commission and ICF Macro (2009b) Nigeria Demographic and Health Survey 2008: Key Findings. Calverton, Maryland, USA: NPC and ICF Macro.

Nel ED (2010) Diarrhea and Malnutrition. South Africa Journal of Clinical Nutrition, vol.23, no.1, s15-18.

Nigeria Gender Statistics Book. In: Federal Ministry of Women Affairs; 2006

Obayelu AE (2008) Determinants of household food security and food demand in the North Central zone, Nigeria. A PhD dissertation submitted to the department of Agricultural Economics, University of Ibadan, Nigeria

Ogunbiyi BO and Akinyele IO (2011) Knowledge and belief of nursing mothers on nutritional management of acute diarrhea in infants, Ibadan, Nigeria. *African Journal of Food Agriculture Nutrition and Development*, vol.10, no.3, pp.2291-2304.

Ogunjuyigbe PO, and Ojofeitimi EO (2006) Culture and feeding Practices: Major underlying causes of childhood malnutrition in developing countries. [Accessed 28 July 2013]. Available from: epc2006.princeton.edu/papers/60025.

Olayiwola Kolawole, Adedoyin Soyibo and Tola Atinmo (2003) Impact of globalization on food consumption, health and nutrition in Nigeria. [accessed 4 July 2013] Available from: <http://www.ftp://ftp.fao.org/docrep/fao/007/y5736e01.pdf>

Olusanya JO (2008) Essential of food and nutrition. 1st Edition, Lagos: Apex books Lagos. Limited

Oluwatayo IB (2008) Explaining inequality and welfare status of households in rural Nigeria: Evidence from Ekiti State. *Humanity & Social Sciences Journal*, vol.3, no.1, pp.70–80.

Omonona, Bolarinwa Titus and Agoi, Grace Adetokunbo (2007) An analysis of Food Security Situation among Nigerian Urban Households: Evidence from Lagos State, Nigeria. *Journal of Central European Agriculture*, vol.8, no.3, pp. 397-406.

PAHO/World Health Organization (2003) Guiding Principles for Complementary Feeding of the Breastfed Child. Pan American Health Organization/World Health Organization: Washington, DC.

Quadri JA and Ojure MA (2013) Assessment of Nutritional Status of Underfive children in Akure South Local Government, Ondo State. *IJRRAS*, vol .14, no.3, pp. 671-681.

Sanusi RA, CA Badejo and BO Yusuf (2006) Measuring Household Food Insecurity in selected Local Government Area of Lagos and Ibadan, Nigeria. *Pakistan journal of Nutrition*, vol.5, pp.62-67

Save the Children UK (2010) Nutritional Anthropometric Survey: Daura and Zango LGAs, Kastina State, northern Nigeria.

Save the Children (2012) Social Protection and Child Malnutrition Nigeria. [Accessed 5 April 2013] Available from: www.savechildren.org.uk/.../social-protection-Nigeria-briefing-BT.pdf...

Save the Children (2013) Nutrition for Growth: A game changer for nutrition, but where are the countries with the most malnourished children? [Accessed 27 July 2013] Available from: <http://everyone.savethechildren.net/articles/nutrition-growth-game-changer-nutrition-where-are-countries-most-malnourished-children>

Scrimshaw NS, Taylor CE, Gordon JE (1968) Interaction of nutrition and infection. Geneva: World Health Organization, Monograph Series 57.

Sellen DW (2007) Evolution of infant and young child feeding: implications for contemporary public health. *Annual Review of Nutrition*, vol.27, pp.123-148.

Sheikholesalm R, Kimiagar M, Siasi F, Abdollahi Z, Jazayeri A, Keyghobadi K, Ghaffarpour M, Noroozi F, Kalantari M, Minaei N, Eslami F, & Hormozdyari H (2004) Multidisciplinary intervention for reducing malnutrition among children in the Islamic Republic of Iran. *Eastern Mediterranean health journal*, vol.10, no.6, pp. 844-852

Smith, LC & Haddad, L (1999) *Explaining Child Malnutrition in Developing Countries: A Cross-Country Analysis*. IFPRI FCND Discussion Paper No. 60, IFPRI, Washington, D.C. USA.

Smith LC, Ramakrishnan U, Ndiaye A, Haddad L, and Martorell R (2003) The importance of women's status for child nutrition in developing countries. International Food Policy Research Institute. 2033 K Street. N.W. Washington. D.C. 20006-1002 USA

Spielloch A (2007) A row to hoe. The Gender Impact of Trade Liberalization on our System, Agriculture Markets Women's Human Rights. Institute for Agriculture and Trade Policy (IAIP)/ International. Gender and Trade Network (IGTN): Friedrich-Ebert-Stiftung Geneva, Switzerland.

Sunguya Bruno F, Krishna C Poudel, Linda B Mlunde, Linda B Mlunde, Prakash Shakya, David P Urassa, Masamine Jimba, and Junko Yasuoka (2013) Effectiveness of nutrition training of health workers toward improving caregivers' feeding practices for children aged six months to two years: a systematic review. *Nutrition journal*, [Accessed 5 August, 2013] Available on <http://www.nutritionj.com/content/12/1/66>.

United Nation Children's Fund (2006) A REPORT CARD ON NUTRITION [Accessed on 5 April 2013] Available from: http://www.unicef.org/nutrition/index_33721.html

United Nation Children's Fund 2007. The Nigerian Situation Overview [Accessed on 13 March 2013] Available from: <http://www.unicef.org/nigeria/1971.htmls>

United Nation Children's Fund (1990) Conceptual framework in 'Strategy for Improved Nutrition of Children and Women in Developing Countries'. Monograph, June 1990. Programme Division, Nutrition Section, New York.

United Nation Children's Fund Nigeria (2008) Media center- Launch of hand wash campaign. [Accessed 31 July 2013] Available from: http://www.unicef.org/nigeria/media_2364.htm.

United Nation Children's Fund Nigeria (2009) Tracking Progress on Child and Maternal Nutrition. A survival and development priority [Accessed on 3 April 2013] Available from: www.childinfo.org/.../Tracking_Progress_on_Child_and_Maternal_Nutritio...

United Nation Children's Fund (2010) Fact of life 4th edition. New York: UNICEF, WHO, UNESCO, UNFPA, UNDP, UNAIDS, WFP and World Bank.

United Nations Children's Fund, World Health Organization, The World Bank. UNICEF/WHO-World Bank Joint Child Malnutrition Estimates (2012a) (UNICEF, New York; WHO, Geneva; The World Bank, Washington, DC; 2012).

United Nation Children's Fund (2012b) Nutrition Glossary. A resource for communicators. Division of communication. [Accessed 30 July 2013] Available from: [http://www.unicef.org/lac/Nutrition_Glossary_\(3\).pdf](http://www.unicef.org/lac/Nutrition_Glossary_(3).pdf)

United Nations Development Programme (2013) Nigeria country profile: Human Development Indicators. [Accessed 8 July 2013]. Available from: <http://www.hdrstat.undp.org/en/countries/profile/NGA.html>

United State Agency International Development Nigeria (2012) Health Population and Nutrition. [Accessed 8 February 2012] Available from: <http://www.nigeria.usaid.gov/program/4> Last updated 03-16-2012.

Walsh CM, Dannhauser A & Joubert G (2002) The impact of a nutrition education programme on the anthropometric nutritional status of low-income children in South Africa. *Public Health Nutrition*, vol.5, no.1, pp. 3-9.

Wikipedia (2013) The free encyclopedia. Map of Nigeria. [Accessed 5 February 2013]. Available from: <http://en.wikipedia.org/wiki/Nigeria>.

World Bank (2008) World development report. Agriculture for development: The gender dimensions. Washington, DC: World Bank

World Bank (2011) Nigeria-Community-based maternal and child nutrition and health interventions in Nigeria: a comparative case study analysis on best practices. Vol. 1 of Nigeria-Community-based maternal and child nutrition and health interventions in Nigeria: a comparative case study analysis on best practices. Washington D.C-The World bank. [Accessed 30 July 2013] Available from: <http://documents.worldbank.org/curated/en/2011/02/16589188/nigeria-community-based-maternal-child-nutrition-health-interventions-nigeria-comparative-case-study-analysis-best-practices-vol-2-2>

World Bank (2013) World Development Indicators, Data by country: Nigeria. The World Bank [Accessed 7 July 2013]. Available from: <http://data.worldbank.org/country/nigeria>

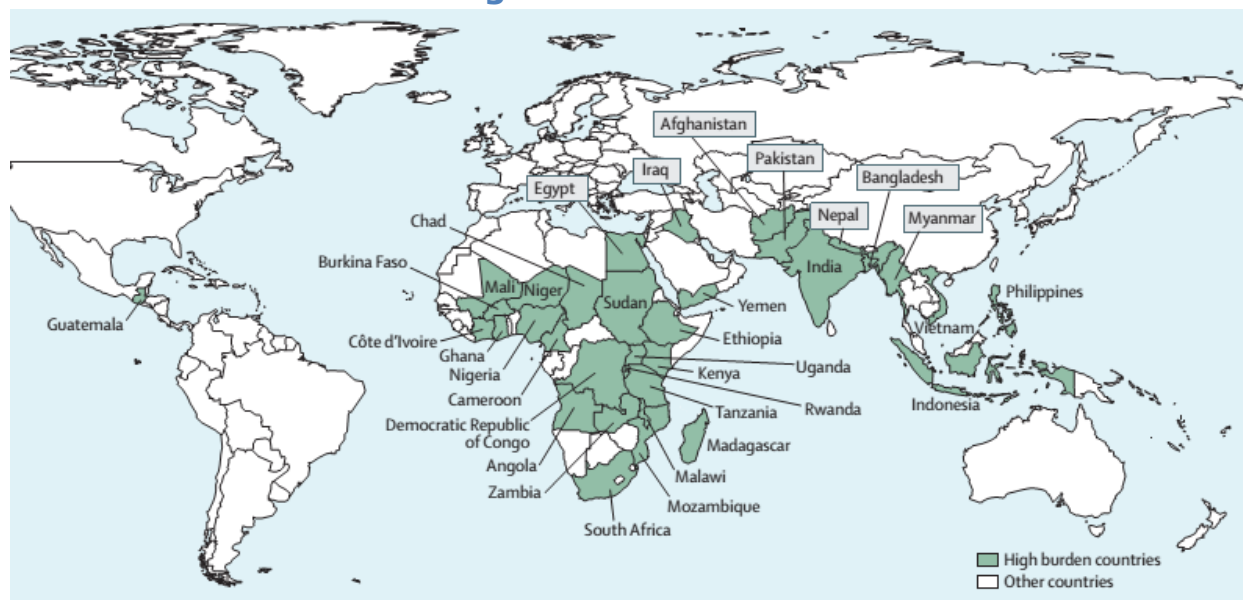
World Health Organization, Regional Office for Africa (2006) The African regional health report, 2006: The health of the people. [Accessed 28 June 2013]. Available from: <http://www.who.int/bulletin/africanhealth/en/index.html>

World Health Organization (2013) World Health Statistics 2013. [Accessed 8 July 2013] Available from: <http://www.who.int>

World Health Organization (2009) WHO child growth standards and identification of severe acute malnutrition and children: Joint statement by WHO and UNICEF.

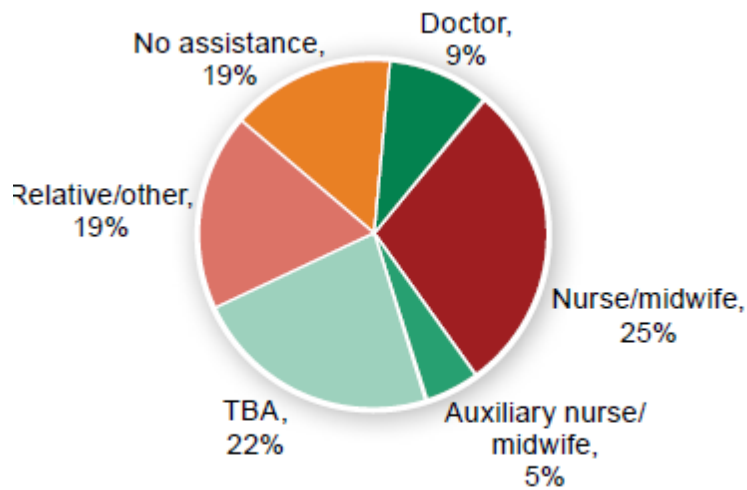
ANNEXES

Annex 1: Countries with highest burden of malnutrition



Source: Black et al., 2008

Annex 2: Distribution of birth attendants



Source: NDHS 2008¹¹