

# Differentials in Childhood Morbidities in Northern Nigeria

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**Abstract** – The study examined the socio-economic and household environmental factors that influences the differentials in childhood diseases prevalence among under-five children in Northern Nigeria. The study examined the pattern of childhood diseases in the Northern part of Nigeria; investigated the relationship between socio-economic factors and childhood diseases; and examined the association between environmental household factors and childhood diseases among under-five children. The study employed primary and secondary data. Primary data were obtained through conduct of in-depth interviews (IDI) with mothers of childbearing age with one or more births within the five years and whose children experienced childhood diseases two weeks preceding the survey. Three IDIs were conducted with mothers of childbearing age with under five children among thirty (30) women in three purposively selected local government areas in Kaduna, Kogi and Kano state across varied socioeconomic status. An interview guide was developed to elicit information based on the themes of the study. Content analysis was used to analyse responses from the IDI8. Secondary data for this study was extracted from the Nigeria Demographic and Health survey (NDHS) 2013. Data on women age 15-49 years with one or more birth within the last five years preceding the survey was extracted from a total of 4282 respondents. Secondary data were analyzed using appropriate descriptive and inferential statistics. The result showed the relationship between household environmental indices and childhood diseases. For diarrhoea, source of drinking water ( $\chi^2 = 0.62, p > 0.05$ ), types of toilet facility ( $\chi^2 = 4.53, p > 0.05$ ), type of cooking fuel ( $\chi^2 = 1.67, p > 0.05$ ) and use of mosquito nets ( $\chi^2 = 14.72, p > 0.05$ ) were not statistically significant with incidence of diarrhoea, for malaria, source of drinking water ( $\chi^2 = 0.00, p > 0.05$ ), type of toilet facility ( $\chi^2 = 5.43, p > 0.05$ ), types of cooking fuel ( $\chi^2 = 5.21, p > 0.05$ ), use of mosquito nets ( $\chi^2 = 4.45, p > 0.05$ ) were not significant with incidence of malaria. The results further showed source of drinking water ( $\chi^2 = 2.97, p > 0.05$ ), use of mosquito treated nets ( $\chi^2 = 0.20, p > 0.05$ ) were not significantly associated with incidence of acute respiratory infections, however, type of toilet facility ( $\chi^2 = 7.57, p < 0.05$ ) and type of cooking fuel ( $\chi^2 = 17.09, p < 0.05$ ) were significantly associate with incidence of acute respiratory infections. The study concluded that poor maternal socioeconomic and household environmental status contributes to the risk of childhood diseases in Northern Nigeria. Therefore, the strongest thrust of this paper is that government should endeavor to input the findings into a gazette, later-on could be transformed into veritable tool for government policy. Thereby, engendering millennium development goals on health and its achievement in Nigeria.

**Keywords** – Childhood, Diseases, Education, Morbidity, Responsive-Government.

## I. INTRODUCTION

Child mortality reduction, which has precedentedly backup by goal number four of Millennium Development Goals (MDGs) is unequivocally an agenda of public health and international development agencies [1]. Accordingly, Espo[2] asserts that approximately 10million children under the age of five die each year with large variation across region and countries in Africa.

Though, global records of number of mortality among children under age five has reduced from 12.4million in 1990 to 8.1million in 2009 – United Children Nations Children’s Fund [3]. Further still, the report states that this reduction is mostly attributed to the interventions targeted at communicable diseases such as malaria, measles, diarrhea, respiratory infections and other preventable childhood infections which have been major causes of child mortality.

Nevertheless, these improvements were brief especially in Africa because disease slanted towards vertical programmes alone were not effective [1] posits.

The environment and social-economic situation of the household mitigate whatever health improvements as regards health assistance put in place with a view to reducing child mortality.

Implicitly, health assistance strategies remain a mirage in an atmosphere where household, social-economic and environmental factors are awful and people’s disposition to creative ideas is abridge by their profoundly rooted culture.

Turning to how malaria and diarrhea have been contributing to under-five mortality in the world and in Nigeria in particular, earlier studies have shown that one child died almost every minute from malaria in 2012 [4].

Though Nigeria, efforts has been made to stem the tide. In Nigeria, there is a moderate decline in its (malaria) prevalence on average overtime but the northern parts of Nigeria share higher proportion of under-five children diseases. Much study has focused on determinants of child survival. Little attention has been paid on social-economic and environmental variances in diarrhea, acute respiratory infections, and malaria among under-five children given the preponderance of childhood maladies in the Northern Nigeria. Against this backdrop that the study aim at examining the determinants of the variances in childhood maladies in Northern Nigeria. Therefore, the study posed the research question: **Do Environmental Factors Influence Childhood Diseases (Diarrhoea, Malaria and ARIs)?**

In other to sustain this research question, there is the need to note the principal objective of the paper; examining the association between environmental factors (type of toilet, source of portable water, waste disposal, cooking fuel pattern and childhood maladies (diarrhoea and ARIs) among under-five children.

Data collection for the study would be guided by the following null hypothesis:

H<sub>0</sub>1: The Environmental conditions and management of human by products. Utilities pose insignificant relationship to childhood mortality and morbidity as entrenched in MDGs-goal four.

The paper is therefore structured into five sections. Section one provides a general overview of the subject matter of the paper. Section two presents conceptual framework, literature review and theoretical foundation. Section three deals with methodology and techniques of data collection. While section four presents analysis and interprets the results of the study. Section five summarises the paper and provides conclusion and recommendations based on the findings of the study.

## **II. CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW**

### *Conceptual Clarification*

Child survival is a field of public health embedded in demography concerned with plummeting child mortality [3]. Child survival involvement are designed to discourse the fundamental causes of child deaths that occur, which the state of the home environmental (physical structures, water source, sanitation facilities and household amenities), morbidity and other proximate determinant of childhood diseases.

The environment in which man habituates is surrounded by air and water which naturally has been set up to assist man achieving his/her sojourn in this terrestrial world. The topographical nature of the earth and its surrounding has been designed in a manner that the endowed resources to man for his/her usage often has adverse consequences, due to careless handling by man in his/her relationship with the environment. In relation to this, has to do with the pattern of household physical structure in term of space – ventilation, type of utilities, type of fuel for cooking, electricity, waste disposal methods among others. The use of pit latrine, the use of wood or open fire/store without a chimney or hood in the house has been linked to poor health outcome [1].

On the other hand, morbidity has been defined as departure from a state of physical or psychological well-being, resulting from disease, illness injury or sickness, especially where the affected individual is aware of his or her condition [4].

The state of child health and child mortality globally shows a substantial progress, reducing the under-five mortality rate over the successive years. In Nigeria for instance, the state of child health and child mortality compared to the previous survey though there is disparity in the decline among the six-geo-political zones of the country.

The South West Zone has the lowest rates for all five childhood mortality estimates compared with the other zones. Infant mortality is lowest in South West (59 deaths per 1000 births) and highest in North East (109 deaths per 1000 births).

Inspite of geographical locations – urban and rural dwellers compared, and level of educational attainment are generally associated with lower mortality rates. Child mortality rate still remains unacceptably high in sub-Saharan Africa countries as approximately half of under five deaths take place in sub-Saharan Africa despite the region having only one fifth of the World's Children Population [5]. For instance, in sub-Saharan African, 1 child in 8 dies before age five nearly 20 times the average of 1 in 167 in developed parts of the World [6].

Maladies, another discourse that need a conceptual clarification. In this context and going by reference books and research studies; the paper connotes maladies to mean any state of disorder or disease of the body, especially one that is chronic or deep-rooted. A state of any undesirable condition that affect human health both in adult and the young.

### *LITERATURE REVIEW*

#### *Links between Childhood Morbidity and Mortality*

The environment of man is complex, resulting in numerous diseases affecting man as products of his own environment [7] gave a broad taxonomy of the environment as the physical, biological, disposable income, behaviour and the availability of quality health care services. In tropical Africa, for instance, the main causes of infant and child deaths are more or less the same in most countries.

These have been identified as infections, protein-calorie malnutrition, and birth trauma, neonatal tetanus, diarrhea, respiratory infections, measles, and malaria. Conditions which exacerbates the above causes of death include low birth weight, poor sanitation and water supply, poverty, inadequate food supplies, lack of education and information and inadequate health care [8].

... [9] develop a flexible parametric framework for analyzing infant and child mortality. This framework is based on widely used hazard rate models, in which they extend with two features. First, the model allows individual characteristics and household's socio-economic and environmental characteristics to have different impacts on infant and child mortality at different ages. Second, they allow for frailty at multiple levels, which can be correlated with each other. The first feature seems to be particularly relevant in describing infant and child mortality, child specific and household's socio-economic and environmental characteristics have significantly different impacts on mortality rates at different ages of the child. They also use the estimated model to perform a number of policy experiments. The policy experiments show that infant and child mortality rates can be reduced substantially by improving the household's socio-economic and environmental characteristics. Their model predicts that a significant number of under-five year's deaths can be averted by providing access to electricity, improving the education of women, providing sanitation

facilities and reducing indoor air pollution. In particular, reducing indoor air pollution and increasing the educational level of women might have substantial impacts on child mortality.

#### *Linkages between Household Environmental Factors and Childhood Morbidity*

Environmental health is defined as those health outcomes that are a result of environmental risk factors. It addresses all the physical, chemical, and biological factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health. It is targeted towards preventing disease and creating health-supportive environments [4]. Interest in environmental health has mounted in recent years, spurred by concern that the most vulnerable groups including children under-five years of age are disproportionately exposed to and affected by health risks from environmental hazards. More than 40 percent of the global burden of disease attributed to environmental factors falls on children below five years of age, who account for only about 10 percent of the world's population [4].

These environmental health relates to human activity or environmental factors that have an impact on socioeconomic and environmental conditions with the potential to reduce human disease, injury and death, especially among vulnerable groups-mainly the poor, women and children under five [9]. The top killers of children under five are acute respiratory infections (from indoor air pollution); diarrheal diseases (mostly from poor water, sanitation, and hygiene); and malaria (from inadequate environmental management and vector control). This report concentrates on three specific environmental risk factors that influence a child's health: poor water, sanitation, and hygiene; indoor air pollution; and inadequate malaria vector control.

#### *Theoretical Framework*

Social ecological models are thus applicable to the processes and conditions that govern the lifelong course of human development in the actual environment in which human beings live [9]. Ecological systems theory considers a child's development within the context of the systems of relationship that form his or her environment. The model helps to understand factors affecting behaviour and also provides guidance for developing successful programs through social environments. The models emphasize multiple levels of influence (such as individual, interpersonal, organizational, community and public policy) and the idea that behaviours both shape and are shaped by the social environment. The principles of social ecological models are consistent with social cognitive theory concepts which suggest that creating an environment conducive to change is important to making it easier to adopt healthy behaviours. The model recognizes the interwoven relationship that exists between the individual and their environment. While individuals are responsible for instituting and maintaining the lifestyle changes necessary to reduce risk and improve health, individual behavior is determined to a large extent by

social environment, e.g. community norms and values, regulations and policies.

The relationship in this context is such that the impact of human on the environment causes discomfort to themselves and other organisms in the environment in the short and long run. This discomfort could be in form of childhood morbidity and mortality. The theory stressed that the physical environment where children live affect their well-being and that of their mother. It then follows from the fact that the household environmental characteristics denoted by the type of housing, toilet, cooking facilities, source of water, cultural and socioeconomic factors act together to impact positively or negatively on the inhabitants of the environment.

### **III. METHODOLOGY**

The data for the study was obtained from Nigeria Demographic and Health Survey (NDHS) data set [10]. The sample for the 2008 NDHS was designed to provide population and health indicators at National, Zonal and state levels. Administratively, Nigeria was divided into states. Each state was subdivided into local government areas (LGAs), and each LGA was divided into localities. Summarily, the study utilized information based on total number of 33,385 women of reproductive aged 15-49 interviewed in NDHS 2008. Equally, the study utilized information on the 6,790 women age 15-49 who has given birth to at least one child in the last five years preceding the survey sampled in South Western Nigeria. The extracted sample size was weighted by applying the weighting factors ( $1 \text{ weight} = \sqrt{005 / 1000000}$ ) in the Stata 12.

This research study based on its major objective and hypotheses raised. The study succinctly summarizes its analysis, discussions, findings and recommendations as follows.

In table 1 as shown above, binary logistic regression analyses are employed to examine the relationship between childhood diseases and the explanatory variables (independent and intervening variables). The analyses are in three models. Model X shows the regression of independent variable on dependent variable, model XI describes the regression of intervening variables on dependent variable, while model XII describes the regression of independent variables and intervening variables on dependent variable.

Considering the results in model X, it is observed that the odds of childhood diseases vary significantly with the age of mothers. Older women aged 25-34 and those aged 35 years or above are 32% and 49% less likely to have under-five children with childhood diseases respectively, compared to the younger women aged 15-24 ( $p$ -value $<0.05$ ). This could be as a result of age maturity on the part of the women. Age of the women's partners does not have any remarkable impact on the likelihood of occurrence of childhood diseases. However, in terms of place of residence, the incidence of childhood diseases is 28% more likely to be experienced by women in the rural

area compared to their counterparts in the urban area. In fact, the result shows that place of residence has made a significant contribution to the incidence of childhood diseases in the study areas (p-value<0.05).

Table 1: Logistic Regression Analysis (Odds Ratio of Childhood Diseases) Showing the Relationship Between Childhood Diseases and Household Correlates and Socio-Economic Factors

Variables (Categories)	Model X		Model XI		Model XII	
	Odds Ratio	P-value	Odds Ratio	P-value	Odds Ratio	P-value
<b>Use of Mosquito net</b>						
Used			RC		RC	
Non-use			1.0828	0.625	0.9995	–
<b>Use of Vaccination</b>						
Vaccinated			RC		RC	
Not vaccinated			1.5117	0.021***	0.8637	0.480
<b>Age of respondents</b>						
15-24	RC				RC	
25-34	0.6811	0.043***			0.6787	0.043***
35 or above`	0.5095	0.005***			0.5020	0.005***
<b>Age of partner</b>						
15-24	RC				RC	
25-34	0.9396	0.886			0.9567	0.920
35 or above	1.5537	0.335			1.5298	0.355
<b>Place of Residence</b>						
Urban	RC				RC	
Rural	1.2778	0.307			1.3061	0.267
<b>Wealth status</b>						
Poor	RC				RC	
Middle	1.978	0.009***			1.9535	0.011***_
High	1.1880	0.618			1.1538	0.681
<b>Currently working</b>						
No -	RC				RC	
Yes	0.9680	0.829			0.9781	0.885
<b>Education</b>						
No education	RC				RC	
Prim	0.5358	0.001***			0.5144	0.000***
Second	0.3112	0.000***			0.2941	0.000***
Higher	0.4258	0.034***			0.4052	0.027***

Source of drinking Water						
Improved	RC				RC	
Non-improved	0.9227	0.597			0.9135	0.556
Type of toilet facility						
Improved	RC				RC	
Non-improved	0.6716	0.019			0.6540	0.013***
Electricity						
Not using	RC				RC	
Using	1.7756	0.008***			1.7484	0.010***
Main floor materials						
Non-improved	RC				RC	
Improved	1.2035	0.334			1.2528	0.247
Main Wall materials						
Non-improved	RC				RC	
Improved	0.3629	0.000***			0.3501	0.000***
Main Roof materials						
Non-improved	RC				RC	
Improved	2.0283	0.387			2.0354	0.385
Type of Cooking Fuel						
Non-improved	RC				RC	
Improved	0.8327	0.545			0.8154	0.502

Source: Nigeria Demographic and Health Survey (NDHS) [10]

\*\*\*p- value <0.05

There is greater likelihood of childhood diseases among women in the middle wealth status and rich women than the poor women. Currently working women are 4% less likely to have under-five children with childhood diseases than non-working women.

There exit a strong negative relationship between level of education and childhood diseases. The greater the educational attainment of mothers, the less is the likelihood of childhood diseases i.e. among the mothers, those who had primary education are 46%, those with secondary education are 69% and those with higher education are 57% less likely to have under five children with childhood diseases, compared to women who had no education.

Improvement in some of the household characteristics are not proxies for avoiding childhood diseases in the study areas including source of drinking water, type of toilet facilities, electricity, main roof materials and main floor materials. Households that have non-improved kind of facilities stated above are less predisposed to childhood diseases than households with improvement in such facilities. Notwithstanding, improved wall materials is

observed as having a significant contribution to reducing the incidence of childhood diseases (p-value<0.05). The likelihood of childhood diseases in households with improved wall materials is 64% less than households with non-improved wall materials. Again, households with improved type of cooking fuel are less likely to experience childhood diseases compared to those with non-improved cooking fuel by 17%.

The importance of the intervening variables cannot be over-emphasized in predicting the occurrence of childhood diseases. In model XI, the result shows that the use of mosquito net slightly decreases the tendencies of childhood diseases among the children population. In households where mosquito nets are not used, the odds of childhood diseases is 8% greater compared to households where mosquito nets are being used. Similarly, households whose children were not vaccinated are 49% more likely to experience childhood diseases, relative to households whose children were vaccinated. Based on the p-value obtained (p-value = 0.021), it can be reasonably concluded that the use of vaccination significantly reduces

the incidence of childhood diseases among under-five children population.

However, the results in model XII reveals that after adjusting for the net effect of the intervening variables and independent variables on childhood diseases, the effect of the independent variables remains the same as observed in model 1. However, the intervening variables (use of mosquito net and vaccination) are no longer proxies for reducing the incidence of childhood diseases. It is observed that in model III, households that do not use mosquito nets and those that did not receive vaccination become less predisposed to childhood diseases compared to households where there are mosquito nets. and where children were vaccinated.

#### IV. DISCUSSIONS

This study has revealed some salient findings on socio-economic and household environment of women and under-five children morbidity. The study confirms that prevalence of diarrhoea, acute respiratory infections and malaria is largely a consequence of household's socio-economic and household environment characteristics. The prevalence of diarrhoea, acute respiratory infection and malaria as the major childhood diseases in this study, similar to other studies in Nigeria [9] [3] [1] suggests the existence of long-term endemic nature of childhood diseases in households' deprivation indices.

The results revealed that maternal socio-economic and household environmental factors influence access to immunization programmes and use of insecticide treated nets which in turn determine exposure of under-five children to diarrhoea, AR Is and malaria. Although, mixed results were derived considering the relationship of socio-economic and household environment factors, the study revealed substantially that households with poor deprivation indices and poor socio-economic status are predispose more exposed to diarrhoea, acute respiratory infections and malaria.

#### V. CONCLUSION

The study concluded that poor maternal household deprivation indices with regard to lower socio-economic and household environment status in Northern Nigeria fuelled the risk factors of childhood diseases such as non-utilisation of immunization programmes, lack of use of insecticide treated nets and proper feeding practices which are the drivers of higher prevalence of diarrhoea, malaria and acute respiratory infections. In the same vein, the high prevalence of under-five morbidity in Northern Nigeria is occasioned by lower socio-economic status, poor physical and environmental condition in the North, low use, of immunization programmes and not using insecticide treated nets. The existence of traditional and cultural belief system in the Northern part of the country contributes the so-called high risk maternal characteristics in the Northern Nigeria.

#### RECOMMENDATIONS

Based on the findings of the study, the following recommendations have been made; Government should use information, education and communication programmes to enlighten mothers on the detrimental effects of non-utilizing vaccination programmes and not seeking health facilities when their children have any of the childhood diseases. Primary health care system should be functional in each community and mothers should be educated on the short term therapy for malaria, diarrhoea and ARIs such as oral rehydration salt, use of insecticide treated nets and prompt clinical management of childhood diseases. Women empowerment programme should be encouraged -as this will lessen or alleviate the poverty situation of the households for affordability of hospital medications. Finally, immunization programmes, distribution of insecticide treated nets and motivation of community health facilitators should be encouraged or integrated in the primary health care system.

All these could be integrated into the government gazette, later-on to become a veritable tool for government policy. Thereby, sustaining millennium development goals, achievement in Nigeria.

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