

Analysis of Infant and Child Mortality Rates in Kaduna State-Nigeria

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ABSTRACT

Infant and child mortality rate in Kaduna State is a major concern as the State recorded 88 deaths per 1,000 live births and 179 deaths per 1,000 live births in 2010. The aimed of this study is to analyze infant and child mortality rates in Kaduna state, Nigeria. Data from the hospitals in three Local Government Areas purposively selected from 2005 to 2014 were analyzed to assess the rates of infant and child mortality. A total of four hundred (400) copies of semi structured questionnaire were administered using purposive sampling technique, of which 386 were found useful for analysis. The data were analyzed using descriptive statistics, and regression analysis using SPSS 20.0 version. The descriptive statistics showed that 66.3% of the respondents are between the ages of 20 and 34 years, 36.8% are Hausa/Fulani. Malaria was discovered to be the major cause of under-five deaths with 30.1%. The level of under-five mortality in Kaduna State has remained high since the past 10 years with an estimated under-five mortality rate of 163/1,000 live births. Logistic regression revealed that distance from the health facility had the most significant correlation (0.379), followed by age at first marriage (0.138), age of mother (0.118), marital status (0.064), level of education (0.064) and length of breast feeding contribute (0.054). On the basis of the findings, the study recommends that programme interventions need to focus on mothers with low socioeconomic status.

Keywords: Kaduna State, Child Mortality, Infant And Interventions

I. INTRODUCTION

Infant mortality is defined as the death of a live born child between the day of birth and span of 12 months United Nation International Children Fund (UNICEF), (2008). The mortality rate among infants is the measure of probability of children dying before reaching the age of one year. Child mortality includes deaths that occur at ages 1 to 5 years. The reduction of infant and child mortality is a worldwide target and one of the most important key indices among Sustainable Development Goals (SDGs) of reducing infant and under-five child mortality rates by two-thirds from the 1990 levels by 2015 (Desta, 2011). As a result of this, in October 2008, the Nigerian government's National Health Insurance Scheme

(NHIS) launched a pilot health project, titled the NHIS/SDG Maternal and Child Health Project (Bello and Joseph, 2014). The Project focuses on reducing maternal and child mortality and is assisted by the World Bank's Heavily Indebted Poor Countries Initiative funds (HIPC). Cases of infant and child mortality are largely under-reported and seldom documented in developing countries (Nigeria inclusive). Survival efforts can be effective only if they are based on accurate information of the cause of morbidity (Abhulimhen and Iyoha, 2012). The environment where the child is born and raised is increasingly becoming so unhealthy so that the life of the child is continually threatened by diseases. Another factor that is affecting the survival of infants and children has been identified to be the

increasing devastating effect of Human Immunodeficiency Virus / Acquire Immune deficiency Syndrome (HIV/AIDS). This threat has become a major concern affecting the lives of families and thereby reducing the survival chances of the child (Baingana and Bos, 2009). Many countries have shown considerable progress in tackling child mortality rate and it has been more than halved in Northern Africa, Eastern Asia, Western Asia, Latin America the Caribbean and Europe. It has placed them on track to achieving the (SDG) in contrast to many countries with unacceptably high rates of child mortality. Sub-Saharan Africa which accounts for 1/5th of the population of children under 5 years, also accounts for half (8.8 million) of deaths in 2008 indicating insufficient progress to meet the SDG 2020 target world health organization (WHO, 2014). Smith (2010), posited that infant and child mortality rate is high in Sub-Saharan Africa. Despite the region having only one fifth of the world's infants population, it harbors half of childhood deaths globally. Worldwide, mortality in children younger than 5 years has dropped from 11.9 million deaths in 1990 to 7.7 million in 2010. About 33.0 percent of deaths of children younger than 5 years occur in South Asia and 49.6% occur in Sub-Sahara Africa with less than one (1) percent of deaths occurring in high income countries (Rajaratnam, Tran, Lopez, and Murray, 2010). In Nigeria, an examination of mortality levels across three successive five-year periods show that under-five mortality decreased from 199 deaths per 1,000 births during the middle to late 1990s (1993-1998) to 157 deaths per 1,000 births in the middle part of this decade (2003-2008) and 128 deaths per 1, 000 births in 2013 (NPC and ICF Macro, 2013). Infant mortality rates have remained steady at 75 deaths per 1,000 births for 1999 and 2008 while under-five mortality rates show increase between 1999 and 2008. Under-five mortality rates increased from 140 deaths per 1,000 live births in 1999 to 157 deaths in 2008 (Buwembo, 2010). Socio-demographic and economic factors

play important roles in determining child survival all over the world (Shawky and Milaat, 2011). For instance mothers' education has an implicit effect on the health of children (Abuqamar, Coomans and Louckx, 2011). Early marriage has also been identified in several studies to have affected both the socioeconomic condition and infant mortality (Othman and Saadat, 2009). A study conducted by Raj, Saggurti, Micheal, Alan, Michele, Decker, Balaiah and Jay (2010) in India showed that children born to mothers who were married before attaining the age of 18 were at a higher risk of stunting and underweight compared to children of women who had married at age 18 or older. Sufficient details are lacking in understanding the levels and determinants of infant and child mortality at the local government level, given the peculiarities of each local government area in Nigeria. Kaduna State has unacceptably high mortality rate and disease burden profile. In 2008, the infant mortality rate (IMR) was 115 per 1,000 live births; under-five mortality rate (U5MR) was 205 per 1,000 live births and Maternal Mortality Ratio (MMR) was 980 maternal 800/100,000 live births (about 1 death for every 12 pregnant women) (PATHS, 2010). An alarming fact was that these figures represented a worsening trend over the previous five years. Corresponding figures for 2007 were 91, 191 and 950 respectively (NPC and ICF Macro, 2009). Leading causes of morbidity and mortality are communicable disease, malaria, diarrhea diseases, respiratory tract infection and vaccine-preventable diseases (VPD). Pandey (1998) examined infant and child mortality in India. The research revealed that sex of the child, mother's residence, mother's exposure to mass media, use of clean cooking fuel, mother's literacy status, access to a toilet facility, mother's religion and ethnicity, income of the household, birth order, mother's age at birth and mother's health care were important determinants of infant and child mortality. Rasheed (2008), examined the trend and pattern of under-five death in Lagos

state, Nigeria was able to examine closely the trend in under-Five mortality rate in the country and his work showed that the projection of 55 per 1000 for 2015 may be unattainable because of the inhabiting increase recorded in the past five years. This study using secondary data shows that 73.8% of the children die before their first birthday while 37% die before the end of their first month.

II. RESEARCH HYPOTHESIS

H₀ There is no significant difference between infant and child mortality rates across socio-demographic characteristics in the study area.

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III. MATERIALS AND METHODS

Descriptive analysis was used in this study because of the importance of this strategy to health care administration and the need for health care planning. The collected data were coded and entered into the Statistical Package for Social Sciences (SPSS) version 20.0 computer software. The descriptive and inferential statistics was used to describe the socio-demographic characteristics using frequency distribution and presentation of results in percentages. For the purpose of this study, all values with coefficient of 0.60 will be selected as factor defining variables. Kaduna state comprises of Twenty three (23) Local Government Areas with the total population of 6,113,503, comprising of 3,090,438 male and 3,023,065 females. Purposive sampling technique was used to select a local government area each from the three senatorial districts in the study area, and up-to-date medical records of infant and child mortality. Therefore the selected local government areas are Zaria, Kaduna South and Jema'a with total population of about 265,028 female which was projected to 2014 totaling 531,277 female. The respondents of this study

were the young mothers and older women that have experienced the lost of child/children under-five who can give information about infant and child mortality in the study areas. A sample of 400 respondents was administered questionnaire while 386 were found useful for the study.

IV. RESULTS AND DISCUSSION

Table 1. Demographic Analysis of Infant and Child Mortality Differentials

Variable	Infant Mortality (%)
Age of mothers	
15-19	2.7
20-24	3.8
25-29	2.5
30-34	1.7
35-39	1.9
40 and above	1.0
Average	2.1
Children Ever Born (CEB)	
One	3.4
Two	1.4
Three	3.9
Four	2.6
Five	3.8
Average	
Children Surviving	
One	0.6
Two	1.2
Three	4.2
Four	0.8
Five	1.8
Average	
Antenatal attendance	
Yes	2.3
No	
Average	0.2

Immunization	4.4
Yes	2.0
No	
Average	

Source: Field survey, 2015

Among the children surviving in Table 1.0, the average infant mortality differentials revealed, high number of surviving children is within the older women. In the case of child mortality, the situation is not different from that of the infant mortality. As observed, those with few children ever born had more number of infants and children under-five year compared to mothers with more children ever born. We can say that there is a significant association between children ever born and child mortality. This is consistent with Mojekwu, (2012) findings that in certain cultures, women appear to be more likely to state duration of marriage correctly than to give correct information.

Table 2. Causes of Infant and Child Mortality

Cause of Death	Frequency	Percentage
Malaria	116	30.1
Diarrhea	82	21.2
Sepsis	25	6.5
Dehydration	48	12.4
Diphtheria	19	4.9
Pneumonia	36	9.3
Measles	37	9.6
Others (Specify)	23	6.0
Total	386	100

Source: Field Survey, 2015

Table 2.0 shows the distribution of the causes of infant and child mortality. Malaria has the highest percentage (30.1%) while others account for 6%, which include HIV/AIDS, accidents and cerebrospinal meningitis (CSM) among others in

Table 2.0. The distribution of children according to the cause of mortality closely resembles the regional findings in Sub-Saharan Africa (SSA) by Rao, Rao, Lopes and Hamed (2006) where the leading cause of death were malaria (10.1%), Diarrhoea (6.5%), Lower Respiratory infection (9.8%), measles (4.1%) and HIV/AIDS (20.4%). Although the distribution may be similar in hierarchy, it also shows a remarkable difference in absolute figures. The difference might be as a result of the fact that this research work was carried out within the months of August and November that coincide with high malaria prevalence (Sitas, Parkin, Chirenje, Stein, Mqoqi and Wabinya, 2006). Diarrhea on the other hand is associated with causes other than infection. Most mothers belief that diarrhea is a manifestation of further growth by the child or a reaction to the consumption of excessive sugary or sweet items. This position is supported by Asakitikpi (2007), who, while quoting statistics obtained from UNICEF (2003) and WHO (2001), explained that diarrhea alone killed about three million children below the age of five annually.

Table 3. The use Insecticide Treated Nets by the Respondents

Uses of ITNs	Frequency	Percentage
Yes	215	55.7
Partially	72	18.7
No	99	25.6
Total	386	100.0

Source: Field Survey, 2015

Table 3.0 shows the percentage distribution of respondents by the use of mosquitoes net. About (55.7%) confirmed the used of mosquitoes nets (18.7%) do not while (25.6%) did not respond. The low level of illiteracy among the respondents results to the non usage of the treated insecticide nets as only 40.0% are literate. Despite the effort of government and Non-Governmental Organizations (NGOs) to provide mosquito nets for the populace especially

pregnant women and nursing mothers, majority of them (55.7%) used mosquitoes' nets so as to prevent their children from malaria and any other related diseases.

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11.736

.0

01

Source: Field Survey, 2015

Table 4. Regression Analysis Under Five Mortality

Variables	Adjusted	R	Change	Statistics
Multiple R	R square		Sig. F	
Square	change		F	Change
1	.1	.142	. 66.805	.
44		144	000	
2	.2	.262	. 66.859	.
67		123	000	
3	.4	.399	. 90.286	.
03		136	000	
4	.4	.483	.	
88		085	65.697	.
5	.5	.578	. 000	
83		095		
6	.6	.663	. 89.355	.
68		085	000	
7	.6	.694	. 100.392	.
99		032	000	
8	.7	.727	. 41.250	.
33		033	000	
9	.7	.755	.	
61		028	48.954	.
10	.7	.764	. 000	
70		009		
11	.7	.769	. 45.813	.0
75		005	00	
12	.7	.772	.	
79		004	14.966	.0
13	.7	.778	. 00	
86		007		
			9.366	.0
			02	
			6.595	.0

Key: 1. Distance from the health care center 2. Age at first marriage 3. Age of the mother 4. Current marital status 5. Level of education 6. Length of breast feeding 7. Child sleep under net 8. Occupation 9. Type of health care center 10. Cause of death 11. Post natal attendance 12. Monthly income and 13. Age at first birth.

The Table 4.0 shows that the adjusted r-squared value was 0.778, meaning that 78 percent of the variance in mortality rate are explained by the model. The standardized beta coefficient and beta weights presented in Table 4.0 suggest that distance to health facility, age at first marriage, age of mothers, current marital status, level of education, length of breast feeding, factor contribute most to predicting mortality rate and that child sleep under net, type of occupation, type of healthcare centre, cause of death, postnatal attendance, monthly income and age at first birth factor also contribute to this prediction. "R" indicate the direction of the relationship, whether positive (+) or negative (-). The absolute "r" can be used as an index of the relative strength of the relationship.

V. DISCUSSION

The hypothesis stated above examines the relationship between socio-demographic sub groups and infant/child mortality in Kaduna State. Regression analysis was used to test the hypotheses.. The significance of this relationship was tested by examining the p-value corresponding to the estimated hazard ratios, with the p value set at 95% significance level ($\alpha=0.05$). Multilevel Cox proportional hazard models were fitted to examine

the effects of socio-demographic sub group variations in infant and child mortality in Kaduna State. To do this, socio-demographic sub groups were first considered separately in the multilevel analysis, followed by inclusion of variables at various levels of operation into the multilevel analysis. The tabulated value is 163.00 and the calculated value is 174.95 with 14 degree of freedom. Results from analysis indicated that high proportion of women who had secondary or higher education was significantly associated with lower risks of infant and child mortality at 5% level of significance (thereby leading to the rejection of null hypothesis), with community education having significant effects for regional variations in child mortality and overall for under-five mortality, but not for infant mortality. Generally, it could be said that the findings of this study confirmed the hypothesis 1 - that a lower risk of infant and child mortality is significantly associated with socio-demographic sub groups that had a high proportion of women with secondary or higher education. However, results of this hypothesis tested showed that a socio-demographic sub group was more important in explaining regional variation in child mortality than infant mortality.

VI. RECOMMENDATIONS

The researchers suggest the need for more research to determine the additional variable needed to further reduce the observed infant and child mortality levels, since only 95% of their variance can be ascribed to the selected socio-economic indicators considered in this study. Also, providing more basic health facilities within the urban and rural communities and raising the level of girl-child education hold the key to our rapid advance to meeting the millennium development goals.

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