DETERMINANTS OF CHILD MORTALITY IN NIGERIA: A SOCIO-ECONOMIC ANALYSIS

Bhola Khan
Department of Economics
Yobe State University
Gujba Road Damaturu
Email: bholakhan.apj@gmail.com

Abstract

In a developing country to assure a good child health is an important issue of any public policy. If there is any declining trend in their child mortality rate, it indicates that their Human Development Index (HDI) is improving. But regrettably, in developing world often ignore this core issue of sustainable development and they spent less than half of per cent of their Gross Domestic Product (GDP) on health. Moreover, out of this half of per cent of the GDP, they spent meager amount on child health issues. Therefore, it's become an important issue in Nigeria to investigate the problem. In this study, attempt is made to analyze the various determinants of child mortality such as female literacy rate, expenditure on education and sanitation and per capita income at Purchasing Power Parity (PPP). For this purpose, Ordinary Least Square (OLS) regression analysis is used. It is evident for the regression analysis that the female literacy rate has negative and significant impact on child mortality. Expenditure on education, in general, have also negative and significant effects on child mortality in Nigeria.

Key Words: Child Mortality, Female Literacy Rate, Per Capita Income, Regression.

INTRODUCTION

Health is an important issue of an any economy to achieving sustainable development and to ensure good child health is more important agenda of any country because good child health will ensure the future growth of that country. In Nigeria, several policies have been implemented from time to time to check child mortality and it shows very significant and swift impact on child mortality. In 1990, child mortality rate in Nigeria was 212.9 per thousand live births and it has decreases significantly 104.6 per thousand live births in 2016 (World Development Indicators Report, 2017). In the period of 1999 to 2016, it is fell by 49 per cent. But still it has higher than the international standards.

Though, there is a drastic declination of child mortality rate in Nigeria. But it is still quite high in comparison to other countries (table-1). Table no. 1 revealed a comparison of child mortality rate of some developed and developing countries whereas table no. 2 shows neonatal, post-neonatal, infant, child, and under-5 mortality rates for Nigeria's various zone and residence (Nigeria Demographic Household Survey, 2013).

Child mortality in urban Nigeria is 42 per thousand live births whereas in rural Nigeria is 89 which is almost double. It is evident from table no. 2 is that the health facility is more access in urban Nigeria as compare to rural one.

Similarly, if one can see zone wise child mortality rate in Nigeria then one can find out that the north-east and north-west are more vulnerable in terms of child mortality in Nigeria which are 90 and 105 respectively. However, the south-west and south-south are performing well in terms of child mortality which are 31 and 35 respectively.

In this context, the socioeconomic factors are highly responsible behind the child mortality which put some lights on the differences the child mortality rates in different zones, and it may be help to understand that why child mortality has decline faster in some zone than others. For this purpose, one can need to estimates the effects of socioeconomic factors on child mortality rates and then one can understand the relative importance of these variables which help to make an appropriate policy instruments to make a significance reduction in child mortality rate in Nigeria.

Table:3 shows neonatal, post-neonatal, infant, child, and under-5 mortality rates for successive five-year periods before the survey. The infant mortality rate was 69 per 1,000 live births for the five years preceding the survey, the child mortality rate was 64 per 1,000 children surviving to age 12 months, and the under-5 mortality rate was 128 per 1,000 live births. This implies that one in

15 Nigerian children die before their first birthday and that one in eight dies before their fifth birthday. During the same five-year period, the neonatal mortality rate was 37 deaths per 1,000 live births, and the post-neonatal mortality rate was 31 deaths per 1,000 live births (Nigeria Demographic Health Survey 2013).

Table 1. International Infant Mortality Rates (per 1,000 live births)

Countries	1990	1999	2009	2016
Africa				
Benin Republic	178.4	147.6	113.2	97.6
Nigeria	**212.9**	**192.8**	**134.8**	**104.4**
Niger	328.9	235.3	131.6	91.3
Ghana	126.9	103.2	77.6	58.8
Asia				
China	53.9	39.3	17.0	9.9
India	125.9	95.1	61.9	43.0
Indonesia	84.3	54.8	34.8	26.4
Japan	6.3	4.7	3.3	2.7
Latin America				
Argentina	28.8	20.2	15.0	11.1
Bolivia	123.8	84.0	48.9	36.9
Brazil	64.3	38.1	20.8	15.1
Chile	19.1	11.5	8.9	8.3
Europe				
Austria	9.5	5.6	4.5	3.5
France	9.0	5.5	4.3	3.9
Germany	8.5	5.5	4.3	3.8
United Kingdom	9.3	6.7	5.4	4.3
North America				
Canada	8.3	6.3	5.7	4.9
United States	11.2	8.6	7.5	6.5

**Source: World Bank, World Development Indicators (2017)**

Table:2 shows mortality rate at National level. It indicates that the mortality rate is higher in rural area than urban, while at zone level North-West having more child mortality than South-West. Same argument may have been proved by the Figure No1.

Table 2: Early childhood mortality rates by socioeconomic characteristics

Neonatal, post-neonatal, infant, child, and under-5 mortality rates for the 10-year period preceding the survey, by background characteristics, Nigeria 2013					
Background characteristic	Neonatal mortality (NN)	Post-neonatal mortality (PNN)1	Infant mortality (1q0)	Child mortality (4q1)	Under-5 mortality (5q0)
Residence					
Urban	34	26	60	42	100
Rural	44	42	86	89	167
Zone					
North Central	35	31	66	36	100
North East	43	33	77	90	160
North West	44	46	89	105	185
South East	37	45	82	54	131
South South	32	26	58	35	91
South West	39	21	61	31	90
Mother's education					
No education	44	45	89	100	180
Primary	42	33	74	57	128
Secondary	34	24	58	35	91
More than secondary	30	20	50	13	62

1 Computed as the difference between the infant and neonatal mortality rates
Source: Nigeria Demographic Health Survey 2013

Figure No. 1
Under Five Mortality in the 10 years preceding the survey by socio-economic character
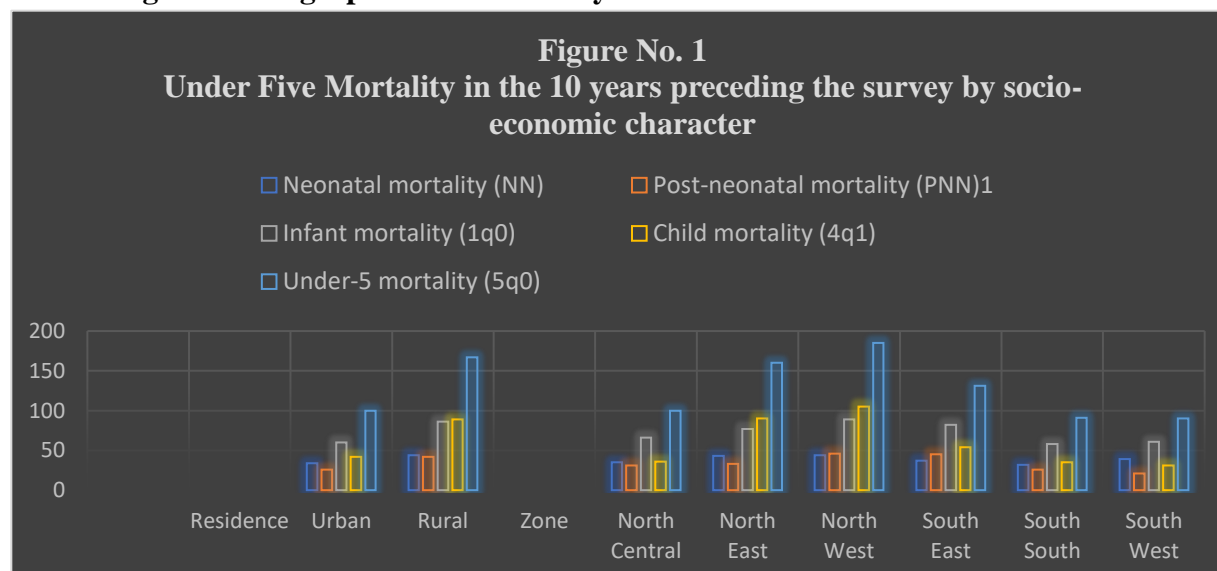
Source: Nigeria Demographic Health Survey 2013

Table: 3 has been revealed about the early childhood mortality rate in Nigeria which have been performed for five- year periods preceding the survey in Nigeria.

Table 3: Early childhood mortality rates
Neonatal, post-neonatal, infant, child, and under-5 mortality rates for five-year periods preceding the survey, Nigeria 2013

Years preceding the survey	Approximate time period of estimated rates	Neonatal mortality (NN)	Post-neonatal mortality (PNN)1	Infant mortality (1q0)	Child mortality (4q1)	Under-5 mortality (5q0)
0-4	2009-2013	37	31	69	64	128
5-9	2004-2008	43	42	86	83	162
10-14	1999-2003	46	47	93	102	185

1 Computed as the difference between the infant and neonatal mortality rates
Source: Nigeria Demographic Health Survey 2013

1.1 LITERATURE SURVEY

In whole Africa, Nigeria is the most populated country characterized by socially and economically advantages and disadvantages regions. Moreover, it is also having diversity in geographically, religiously, socially, ecologically, and economically. These diversities have led to a varied exposure and different child health outcomes (Adekanmbi, *et al*., 2011; Akinbami *et al*., 2010; Chirdan, *et al.,* 2008; Grais *et al*., 2007; Lawoyin, 2001; Okoro *et al*., 2009; Oniyangi *et al*., 2006; Udo *et al*., 2008; Wall,1998).

The northern region of the country is belonging to arid whereas west belong to savannah; North-west and North-east having predominated Islamic culture while South-east and South-south vastly dominated by Christian, the country is highly heterogeneous and diverse. As a result, this has led to huge diversities in regional environment, culture, and practice (Antai, 2011a; Antai *et al*., 2009), health-seeking practices (Adeboye*, et al*., 2010; Antai, 2009; Babalola & Fatusi, 2009), socio-economic positions (Antai, 2011a; Aremu, *et al*., 2011) and the political milieu.

To date, Nigeria has a very high rate of under-five mortality and the rate is among the highest in the world. About 1 in every 5 children born in the country dies before the age of five (National Population Commission & ICF Macro, 2009)

In addition, as earlier noted, Nigeria is by far the most populous country in Africa and it has a very huge childhood population. According to 2006 population and housing census, Nigerian's population is 140,431,790 and the population of the under-five children is 16.1% of the total population (National Population Commission, 2009).

1.2 OBJECTIVE OF THE STUDY

The main aim of this study is to estimate one such econometric model. Using data from Nigeria Demographic Health Survey, 2008 and 2017 and others sources of data, a regression model has been estimated for child mortality in Nigeria at National level.

1.3 HYPOTHESES

1- **Ho:** Child Mortality does not affect from Mothers Education.
2- **Ho:** Chile Mortality does not affect from use of sanitation.
3- **Ho:** Child Mortality does not affect from per capita income.
4- **Ho:** Child Mortality does not affect from the expenditure on education.

1.4 METHODOLOGY

The study based on secondary data for 21 years which has been collected from the Nigerian Demographic Health Survey, 2008 and 2017, National Population Commission, 2009, Central Bank of Nigeria, National Bureau of Statistics, 2015, World Development Indicators, 2015. For the analysis of the determinants of child mortality, the study used a multivariate log linear regression model which has analyzed the determinants of child mortality in Nigeria at National level.

The model can be expressed mathematically as:

$CM = \beta_o + \beta_1 (Flite) \beta_2 + (Sani) + \beta_3 (Exp\ Edu) + \beta_4 (PCI) + \mu_i$

But for the estimation purpose we need to transform the above equation into the regression equation.

$\log Y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + ui$

1.5 DETERMINANTS OF CHILD MORTALITY

The present study point-out that there are various determinants of child mortality in Nigeria. However, for the analysis of the data and above regression equation we divided into two categories, which are economic and noneconomic in nature.

Table:4 pointed out the female literacy rate in Nigeria. Female literacy is one of the important determinants of the child mortality rates in any country. In 1997, it was 43.5 per cent while in 2017, it increases meagerly by 10 per cent.

Table:4- Literacy rate, adult female (% of females ages 15 and above)

Year	Female Literacy Rate
1997	43.50
1998	43.00
1999	44.50
2000	44.00
2001	44.50
2002	45.25
2003	43.32
2004	44.00
2005	44.25
2006	44.50
2007	40.00
2008	41.38
2009	42.50
2010	42.80
2011	45.25
2012	45.75
2013	47.80
2014	48.70
2015	49.68
2016	51.00
2017	52.10

Source: World Development Indicators, 2015

Apart from female literacy rate, others determinants are also equally important and sanitation is one of them Table: 5. The government expenditure on sanitation show that how government is concern about the use of proper sanitation to reduce the mortality rates in Nigeria. In 1997, the Nigerian government spent about 4,429. 46$ on sanitation while in 2017 it has decreased about 5,000$ on this sector.

Table-5: Expenditure on Sanitation in USD (1997-2017)

Year	Expenditure on Sanitation in USD ('000)
1997	4,429.46
1998	4,733.29
1999	5,217.72
2000	5,342.44
2001	5,521.83
2002	5,756.27
2003	6,053.53
2004	6,108.41
2005	6,142.73
2006	6,270.29
2007	2,087.29
2008	2,159.16
2009	2,193.22

2010	2,351.15
2011	2,504.94
2012	2,645.99
2013	2,938.70
2014	3,196.95
2015	3,490.06
2016	3,792.45
2017	3,951.25

Source: National Bureau of Statistics, 2015

Table:5 shows the total expenditure on education in USD by the Nigerian Government. In 1997, it has only 500 USD, while in 2017 it has been increased significantly about 100,000 USD.

Table-6: Expenditure on Education in USD (1997-2017)

Year	Expenditure on Education in USD (,000)
1997	500
1998	10,000
1999	15,000
2001	20,000
2002	25,000
2003	30,000
2004	35,000
2005	40,000
2006	45,000
2007	50,000
2008	55,000
2009	60,000
2010	65,000
2011	70,000
2012	75,000
2013	80,000
2014	85,000
2015	90,000
2016	95,000
2017	100,000

Source: National Bureau of Statistics, 2015

Table:7 shows per capita income at purchasing power parity (PPP) in US Dollar which has been about 2,087$ in 1997, while it has been increased about 6,217$ in 2017.

Table-7: GDP Per Capita Income (PPP), USD for Nigeria (1997-2017)

Year	USD
1997	2,087.29
1998	2,159.16
1999	2,193.22
2000	2,351.15
2001	2,504.94
2002	2,645.99
2003	2,938.70
2004	3,196.95
2005	3,490.06
2006	3,792.45
2007	4,132.51
2008	4,429.46
2009	4,733.29
2010	5,127.72
2011	5,342.44
2012	5,521.83
2013	5,756.27
2014	6,053.53
2015	6,108.41
2016	6,142.73
2017	6,270.29

Source: Central Bank of Nigeria's Bulletin

1.6 RESULTS AND DISCUSSION

A log linear regression equation has been created for the estimation of child mortality rate in Nigeria. The regression coefficient indicates the importance of main factors affecting the Child Mortality rate in Nigeria. The regression results for child mortality given in Table:8.

It is evident from the regression equation that the female literacy rate has positive and significant impact on child mortality. It is significant at one percent level. Education, in general, increases awareness in female about the use of contraceptives and other health related issues.

It is also evident from the regression equation that sanitation, expenditure on education and per capita income have negative and significant effects on child mortality rate in Nigeria. Expenditure on education and per capita income both are negatively significant at one percent level and sanitation has been negatively significant at five percent level (Table:8).

Therefore, one can see the effect of female literacy, sanitation, expenditure on education and per capita income have been affect significantly the child mortality rate in Nigeria.

Table:8 Linear Regression of Child Mortality in Nigeria
Dependent variable log Child Mortality

Model	Unstandardized Coefficient Beta	Std. Error	Standardized Coefficient Beta	t	Sing.	95% Confidence Interval of Beta	
						Lower Bound	Upper Bound
Constant	188.747	5.129		36.800	.000*	177.874	199.620
FLITE	-.790	.142	.075	5.577	.000*	-.490	1.090
SANIT	-.001	.000	-.043	-2.472	.025**	-.002	.000
EXEDU	-.001	.000	-.709	-10.397	.000*	-.001	-.001
PCIPPP	-.008	.002	-.366	-4.694	.000*	-.011	-.004
R^2	.699						

Source: Author's estimation.
Note: * Significant at One per cent and ** Significant at Five per cent level.

CONCLUSION AND SUGGETIONS

It may be concluded that the effect of female literacy having negative impact on child mortality. It means, if more women educated then they may do good take care of their children and it this way, there is reduction on child mortality rate in Nigeria. It is also, evident from the regression results that if the female literacy rate increase at the rate of one per cent then the child mortality reduced by 0.79 per cent. For this purpose, government may have to start spending more on female education via opening more girls' schools in both rural and urban areas and offering free and compulsory education. Similarly, the expenditure on education, sanitation and per capita income revealed their negative and significant impact on child mortality. It explained that the more and proper uses of sanitation reduce the morbidity rates among under five-year children and further it reduces mortality rate.

Similarly, more expenditure on education help to educate more people and create more awareness about the various disease related to the children. And lastly, if per capita income at purchasing power parity will increase then, the individual increases their standard of living and in this way they may able to do good take care of their children and finally it reduces child mortality rates in Nigeria.

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