Lafia Journal of Economics and Management Sciences (LAJEMS) Volume 4 Number 1, June, 2019.
ISSN: 2550 -732X

PARENTAL SOCIO-ECONOMIC STATUS AND ACCESS TO CHILD HEALTHCARE UTILIZATION IN NIGERIA

[1]PAUL JOSEPH AND [2]ADOFU ILEMONA
[1&2] Department of Economics, Federal University Lafia Nasarawa State.
[1]pajoforreal@gmail.com and [2]ilemonaadofu@yahoo.com

ABSTRACT

This paper examines socioeconomic status and child health care utilization in Nigeria, using NMIS data. The primary objective of this study is to determine the socioeconomic factors that influence child health care utilization in Nigeria. Using Binary logistic regression as method of analysis, the research result found a positive and significant relationship between socioeconomic status especially wealth differential and child health care utilization. The result is robust to inclusion of relevant covariates such as child and parents individual and regional characteristics. Other indicators of child health care use included were region, family structure, gender of household head and place of residents which were also found to be important determinants of child health care use. Programs that will improve the wealth and education of the poor such as investment in agriculture, free and quality education and increase insurance coverage was recommended to increase child health care access in Nigeria.

Key Words: Socioeconomic Status, Child healthcare utilization, Mortality rate
JEL Code: I14

1.0 INTRODUCTION

Recent breakthrough in medical research worldwide has resulted to significant progress in child health. For instance, under five mortality rate globally dropped from 93 deaths per 1,000 live birth in 1990 to 41 in 2016 (UNICEF-WHO-World Bank Group-UNIGME, 2017). The report also shows that despite this reduction in child mortality, 5.6 million children in 2016 died before reaching age 5. Most of these deaths were caused by preventable diseases and 80% of these deaths occur in Sub-Saharan Africa and Southern Asia with India and Nigeria accounting for about 32%. Despite the effort by both governmental and non-governmental health organizations across the world, this inequality remains large especially across countries.

The large differences in child mortality rate across countries can also be attributed to a large extent on the quality and accessibility of child healthcare of these countries. The better the quality of health care in a country and the more accessible it is, the better the health of the populace. As reported by WHO (2017) that large percentage of under-five mortality rate in low income countries were due to acute respiratory infections, diarrhea and malaria. For instance,

20% of under-five age death in Nigeria are caused by malaria infection while, 11% are connected to diarrhea (UNICEF, 2012 and WHO, 2010). These child diseases can be reduced to their barest minimum given well equipped and functional healthcare systems that are accessible to a wide populace of a country.

Adika, Balarabe, Agada and Nneoma (2013) and Okeke and Okeibunor (2009) found that most at times parents resort to self-medication, seeking medical care from medical stores, traditional healers and drug peddlers for their children. To further show the poor nature of child health care access in Nigeria, report from NDHS (2013) shows that only 25% of children under-five were fully immunized at months 23 giving the fact that immunization is free. This is an indication that determinants of child health care utilization in Nigeria such as socioeconomic factors and child health care education need to be tackled to increase access to child health care by parents and guardians.

The major focus of this study is to determine the important socioeconomic factors and mechanisms that influence access and utilization of healthcare by children. The argument was that children depend on their parents' decision about the frequency and quality of healthcare they receive. Parents' decision to influence not only the health but also education (human capital) of their children is determined by both financial, non-financial resources and family structure. For instance, Link and Phelan (1995), found that socioeconomic factors were important elements of the causal pathways to both child and adult ill health and diseases.

Minkovitz, Campo, Chen and Grason (2002) and Takai, Dlakwa, Bukar, Audu and Kwayabura (2015); Takai, Dlakwa, Bukar, Audu and Kwayabura (2015) and Ugbor, David, Arua and Nwannosike (2017) found wealth and education which are important factors of socioeconomic status to increased physician, child health utilization and antenatal visits, but was not associated with emergency department use, mental health visits and hospitalization. These differences in association between poverty and utilization of these services might be due to billing systems of providers, systems characteristics and patients' acuity. They added that emergency department use and hospitalization might less likely require out of pocket payment compared to physician visit at delivery point.

Other factors found to influence child healthcare access and utilization includes: cultural and resource related factors (Adedini, Odimegwu, Bamiwuye, Fadeyibi and Wet 2014); Distance (Kadobera, Sartorius, Mesanja and Mathew, 2012 and Owoseni, Jegede and Ibikunle, 2014).
Health insurance Coverage (Baker, Shapiro and Schur 2000); poor healthcare financing, long waiting times and poor healthcare systems (Davidson, Silva, Ganzi and Palfrey 2002)
Due to the fact that several studies reported different factors to be responsible to poor access and utilization of child healthcare in low income countries and few studies were found to study this topic in Nigeria. This study will focus on socioeconomic status and access to child healthcare in Nigeria to uncover the socioeconomic factors responsible for low access to child healthcare use.

2.0 THEORETICAL LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Behavioural Theory of Health Care Use

This paper adopted the behavioural theory of health care utilization by Anderson and Newman (1973). The theory specifies factors that determine health care utilization by individual households. The theory also categorized these health care utilization factors or health seeking behavior into: predisposing, enabling and need factors. Anderson proposes that these factors are responsible for health care utilization. The breakdowns of these factors are briefly explained below:

Predisposing Factor: Anderson proposes that the actual behavior to seeking health care services is based on conditional and sequential function of and person's predisposition to use the service. These predisposing factors refer to demographic characteristics (age and sex) and social factors (Education of parents, occupation, religion, ethnicity, marital status, place of residence, parental values concerning health and attitudes towards healthcare services).

Enabling Factors: enabling factors refers to the ability of an individual to obtain or pay for health care services (financial and organization factors). It also involves individual's knowledge about other health care access like insurance available to them. Enabling factors refers to family and individual resources (wealth index, material possession and extent of social relations) and community factors (proximity to health facility, quality and ratio of health care workers in relation to populace in the region and health care facility to the rate of services demanded).

Need Factors: the need factors refer to the perceived need by an individual to use healthcare service. These factors include: general assessment of individual's health condition and child perceived illness level. It refers to how people view and experience their general health, functionality state, illness and evaluated need (Babitsch, Gohi and Lengerke, 2012)
It is important to note that both predisposing and enabling factors are important determinants of health care utilization, but not sufficient condition for utilization. Actual child health care utilization is triggered by prenatal and child health condition (illness level and how is perceive by parents). This paper seeks to examine the extent to which these factors (predisposing and enabling) influences child health care use/parents health seeking behavior for their children.

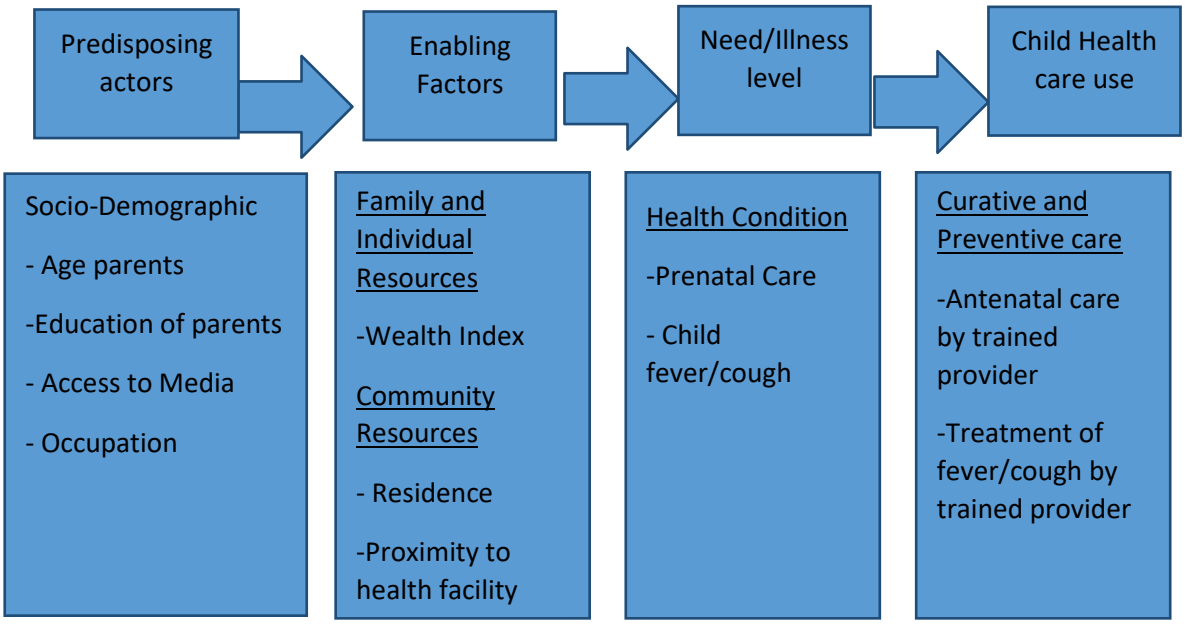

Figure 2 theoretical framework for child health care use in Nigeria.
Source: Adopted from Amin, Shan and Becker (2010) and modified

2.2 Empirical Literature Review

This paper reviewed literatures on socioeconomic factors and other important factors that influence access to child healthcare and antenatal use. The inclusion of antenatal care is necessary because child health care starts with antenatal care. The major socioeconomic factors used in this study are household wealth and parental educational level. Other important covariates are place of residence, child and parents' individual characteristics.

Adedokun, Adekanmbi, Uthman and Lilford (2017) study contextual factors associated with health care service utilization for children with acute childhood illnesses in Nigeria. Data from 2013 Nigeria Demographic and Health (NDHS) was analyzed using multilevel logistic regression model. The study found that children from higher wealth index households are more likely to utilized health care service compared to their counterparts from lower wealth index. This finding is similar to the finding of Sina, Jegede and Ayodele (2014) who reported positive relationship between children and pregnant mothers from richest households and health care use compare to children and pregnant mothers from poorer households. This is possible because most healthcare expenditure in Nigeria is incurred through out of pocket payment by households. Therefore, it is reasonable that children and pregnant women from higher income household to have higher utilization of health care facilities. These findings agree with reports from United State of America Minkovitz et al (2002) and studies from Bangladish by Amin, Shan and Beker

(2010). These findings confirmed the facts of the behavioural theory of healthcare use that wealth is an important determinant of health care use. Therefore, wealth inequalities lead to child health inequalities which will peradventure lead to adult health inequalities.

Some studies found a conflicting result. For instance, Raso, Utzinger, Silue, Ouattara, Yapi, Toty, Matthys, Vounatsou, Tanner and Goran (2005), reported that no relationship existed between wealth and emergency department use, mental health visits and hospitalization. While, Ogunlesi and Olanrewaju (2010), studied Socio-demographic factors and appropriate health care seeking behavior for childhood illnesses using cross-sectional survey of mothers who took their children to Olabisi Onabanjo University Teaching Hospital in Sagamu Ogun State. They found low rate of prompt and appropriate healthcare seeking behaviours of mothers towards their children ill health to cut across all socioeconomic group. The authors reported lack of significant relationship between child healthcare utilization and household wealth. The reason for non-association between wealth and these health services might be due to differences in health center characteristics, provider billing systems and patients' acuity. Payment at the point of delivery of services which is more common to physician visits but not to emergency departmental visit and hospitalization may be an important reason for the positive association between wealth and physician visit. Another reason could lack of variation due to small sample size.

The second socioeconomic factor found to influence child health care use is the level of parents' education. Takai et al (2015) study the factors responsible for under-utilization of postnatal care services in Maiduguri using multivariate logistic regression to analyze data collected from 350 women of child bearing age at specialist hospital Maiduguri. They found children with mothers having higher education to utilize more postnatal care service compared to children whose mothers have lower educational qualification. This finding is similar to a country level studies by Antai (2011) and Ugbor, David-Wayas, Arua and Nwanosike (2017) who reported a positive relationship between prenatal care use and educational level of pregnant women in Nigeria. Women with higher educational qualification enjoy better opportunity of health care utilization for their children and themselves during pregnancy. This is possible because they have better chances of higher paid job which enable quality health care use; proper knowledge and awareness about child health care use.

Ogunlesi and Olanrewaju (2010) reported a contrary result with respect to mothers' education. They found no relationship between mothers' education and child health care service use, this may be due to small sample size leading to selection bias as explained earlier. Agunwa, Obi, Ndu, Omotowo, Idoko, Umeobieri and Aniwada (2017) studied the determinants of patterns of maternal and child health service utilization in a rural community in south eastern Nigeria using logistic regression, they reported similar result to that of Ogunlesi and Olanrewaju (2010). The fact that these two studies used small sample size from small population verify the fact that data from sample of similar characteristics usually leads to results without significant variation.

Place of residence was reported to be an important determinant of child health access by Onwujekwe and Uzochukwu (2005). They studied the socioeconomic and geographic differentials in costs and payment strategies for primary healthcare services in Southeast Nigeria. They used logistic regression to analyzed data collected through the use of questionnaire. The authors discovered a negative relationship between general healthcare usage and rural dwellers. They opined that the higher utilization of healthcare in the urban communities could be attributed to the fact that urban dwellers have higher socioeconomic status, have better educational levels and uses a number of payment strategies for healthcare.

A contrary result was reported by Antai, Wedren, Bellocco and Moradi (2010), who studied migration and child health inequalities in Nigeria using data from Nigerian Demographic and Health Survey 2003. Antai et al (2010) reported that children of rural-urban migrants had lower access to child healthcare utilization in terms prenatal care by doctors and receiving of tetanus toxoid injection by pregnant mothers compared to rural none migrants and urban dwellers. The study added that lower utilization of child healthcare by rural-urban migrants could mostly be due to difficulty in migrants' adaptation to urbanization coupled with their low socioeconomic status.

Marital Status was also reported by Sina, Adewumi and Oluwatoyin (2015) to influence child health service access. Their results show that married women are more likely to utilize antenatal care compared to their unmarried counterparts. This is possible because married couples combine resources and time to care for their children. Most at times single mothers might not have the finances to access quality care for their children and sometimes because they are the providers, they spend less time to care for their children. On the contrary, these results differ from a finding by Heck and Parker (2002), who found higher access to child healthcare by single mothers to be attributed to the higher frequency of Medicaid insurance coverage among single mothers. This higher prevalence among single mothers might be as a result of programme requirement that favours them. The authors concluded that universal insurance coverage will reduced the inequality in child health care access existing among different socioeconomic household and family structure.

Other important covariates that influence child health utilization includes cultural and resource related factors (Adedini, Odimegwu, Bamiwuye, Fadeyibi and Wet, 2014). They opined that some of the cultural barriers to child health care utilization was difficulty in getting permission from mothers to seek care especially in the northern part of the country. Kalu et al (2017) and Sina and Adewumi (2015) reported higher utilization of antenatal and child health care among younger women and children of middle age women. A study from Enugu state by Agunwa, Obi, Ndu, Omotowo, Idoko, Umeobieri and Aniwada (2017) reported higher utilization of antenatal care and child healthcare among women of older age compared to younger women. Yar'Zever and Said (2013) and Titus, Adebisola and Adeniji (2015) found higher health care utilization among women with first and second pregnancy compared to women with higher number of

pregnancy. Takai et al (2015) found antenatal and child care service use to increase with large family size and with household where the household head is male. In a contrary view, Nnonyelu and Nwankwo (2014) and Kalu et al (2017) found child health care use to increase where the household head is female and antenatal care to be negatively associated with larger family size respectively.

The empirics reviewed above reported different factors influencing access to child health care utilization. For instance, while Adedokun et al (2017); Sina, et al (2014) Minkovitz, Campo, Chen and Grason (2002) and Amin, Shah and Becker (2010) found positive relationship between child health care service use and household wealth, Ogunlesi and Olanrewaju (2010) and Raso et al (2005) found negative relationship. In the same light, while Takai et al (2019); Antai (2011) and Ugbor, et al (2017) reported increase child health care service use with increased level of parental education, Ogunlesi and Olanrewaju (2010) and Agunwa et al (2017) found no relationship between child health care use and parental level of education. In respect to place of residence, result from Onwujekwe and Uzochukwu (2005) shows higher utilization of child health care among urban dwellers compared to their rural counterparts, while Antai et al (2010) reported lower child health care utilization among households of rural-urban migrants.
The fact that these studies presented different factors to influence child health care use and most of the studies either used Nigerian Demographic and Health Survey for 2003 and 2008 as country level data and primary data from community level study. This paper intends to use a different and more recent data source from Nigerian Malaria Indicator Survey (NMIS) 2015 containing rich data on child diseases and parental socioeconomic status to study the relationship between socioeconomic status and access to child health care utilization. This is also aimed act reconciling the different factors reported by reviewed literature to determinant child health care access.

2.0 DATA SOURCE AND DESCRIPTION

This paper analyzed data from the Malaria Indicator Survey (MIS) 2015 conducted under the Nigerian Demographic and Health Survey. This survey data gathered information across the 36 states of Nigeria including FCT on malaria indicators and other children diseases. Two-stage probability sampling method was used to collect samples for MIS 2015 Survey. These samples were collected in form of cluster; nine clusters were selected from each of the 36 states including FCT.

Complete household listing was conducted and a total of 8,148 households were selected for survey samples. Out of the household selected, 7,841 households were occupied and 7,745 were successfully interviewed. In respect to respondents' category, 8,034 women from the selected household were interviewed within the age bracket of 15-49 and children age 6-59 months were eligible for malaria and anemia testing.

Three different questionnaires were used to collect data for this survey. The first was the women questionnaire administered to the selected women age 15-49. Information on background characteristics; birth history; antenatal care and malaria prevention and treatment were collected of these women. The second questionnaire administered was the household questionnaire. Information was gathered from household members on individual characteristics and their relationship to household head. The third questionnaire was that of the biomarker. This was used to record information on malaria and anaemia testing conducted for children.

3.1 Data Variables

The variables used for analysis in this paper follow the theoretical framework. The dependent variable (indicators for child health care use) signifies parental health seeking behavior for their children as indicated in the framework above. Two different indicators are used as dependent variables to examine child health care use which are prenatal use (care received during pregnancy) and postpartum/child health care use.
In respect to prenatal care, child health utilization is analyzed through the use of antenatal care during pregnancy of mothers' which is the first point of care for a child. The independent variables include socioeconomic factors (wealth and Education) and other control variables. The table below shows the definition and coding of these variables.

Table 3.1 Variable Definition and Coding

Variables	Description	Coding
Dependent Variables		
Prenatal care by a doctor	Pregnant woman was attended to by a doctor during antenatal	Yes = 1 No = 0
Child access to health care	Child received medical treatment when sick (cough and fever)	Yes = 1 No = 0
Independent Variables		
a. Predisposing Factors		
Head of household age	Age of household head	Numeric response in years
Child age	Age of child at time of survey	1 and below = 0, above 1 to 2 years = 1, 3 years = 2, 4 years = 3 and 5 years = 4
Family Structure	Whether a household comprises of nuclear or extended family	Nuclear family = 0 Extended family = 1

b. Enabling Factors

Wealth index	Household wealth quintile, based on total income earned	Poorest = 0, poor = 1, middle income = 2, richer = 3 and richest = 4
Place of residence	Whether parents reside in urban or rural center	Rural = 0 Urban = 1
Region	Geopolitical zone of households	North west = 0, North Central = 1, North East = 2 South West = 3, South South =4 and South East = 5

Owner's Computation, 2019.

Among these factors used as independent variables, household wealth index and educational level were variables of interest to proxy parents' socioeconomic status.

3.2 Models

This paper used binary logistic regression as method of analysis, due to the binary nature of the dependent (explained) variable. Logistic model is a better and more sophisticated binary response model that overcame the limitation of linear probability model (Ordinary Least Square model for binary dependent variable). Logistic model uses a latent or unobserved variable y*
Where:

$$yy * = \beta\beta_0 + XX\beta\beta + \varepsilon\varepsilon - - - - - EEEEll\ 1$$

Assuming that the observed variable y is such that

$$yy = \begin{cases} 0\ iiii\ yy * \leq 0 \\ 1\ iiii\ yy * > 0 \end{cases}$$

Having our dependent variable as [0 1] means the variable is coded 1 if a child utilized health care otherwise 0, hence we obtain the binary response model for the latent form as:

$$ll(yy) = \frac{1}{xx} = GG(\beta\beta_0 + \beta\beta_1 XX_1 + - - - - + \beta\beta_{kk} KK_{kk}) - - - - - - - - EEEEll\ 2$$

Due to the non-linear function of the above model, the estimates from equation2 are difficult to explain except for their sign. The estimates can only be explained when transformed by using calculus to obtain their marginal effects which can easily be done in stata software by typing the command mfx after running the logistic regression.
As regression results predicts values from negative infinity to positive infinity, the importance of equation2 is that it ensures estimated probabilities lies within the range of zero and one. The marginal effect of equation 2 provides values that explain the latent or unobserved variable.
For the sake of this paper, the specify model is given below:

$$ll\left(CCHHCCii = \frac{1}{XX}\right) = (\beta\beta\beta\beta + WW_{ii}\beta\beta_1 + HHeeHH_{ii}\beta\beta_2) \quad \text{Model A}$$

$$ll\left(CCHHCCii = \frac{1}{XX}\right) = (\gamma\gamma_{oo} + WW_{ii}\gamma\gamma_1 + HHeeHH_{ii}\gamma\gamma_2 + CC_{ii}\gamma\gamma_3 + RReeRR_{ii}\gamma\gamma_4 + CCCC_{ii}\gamma\gamma_5 + HHCC_{ii}\gamma\gamma_6 + FFFF_{ii}\gamma\gamma_7) \quad \text{Model B}$$

Where:

- $CCHHCCii$ is child health care use when he or she is ill with fever or cough which is categorized into two (child was treated at a government hospital or child was treated at a private hospital). These two dependent variables constitute the models estimated in this paper. Each model is divided into A and B, models with only socioeconomic status as covariates and models with the necessary control variables.
- WW = Wealth index
- $HHeeHH$ = Head of household education level
- $RReeRR$ = Region of household
- CC = Household reside in urban area
- $CCCC$ = child individual characteristics (age and gender)
- $HHCC$ = Household head characteristics (age and gender)
- $FFFF$ = Family structure
- ii= Individual household

ll in the models is the probability of a child using a health facility when he or she is sick, $\beta\beta$ and $\gamma\gamma$ are the coefficients of estimate. The major objective of this paper is to estimate the relationship between socioeconomic status and child health care utilization.

4.0 RESULTS

4.1 Summary Statistics

Summary statistics is presented in table 1 showing the association between socioeconomic statuses other important individual characteristics and access to child health care utilization. The table started with the association between prenatal care use which is the first point of care for a child and socioeconomic status. It shows that 96 percent of women in the richest category of the wealth index use prenatal health care facilities during pregnancy, while only 61 and 41 percent of women in the poorer and poorest category of the wealth index respectively used prenatal health care facilities. The table also shows that women with higher educational level tend to use prenatal care facilities more than those with lower level of education (98 percent of women with higher education used prenatal care compared to 54 percent of women with no education). Among children aged 0 to 5 years that had cough/fever, 4 percent of children from poorest household access care from government hospital and 1 percent access care from private hospital compared to 72 percent from the richest household who received some form of medical treatment, 12 percent access care from government hospital and 9 percent access care from private hospital. The value in the table also shows that greater percentage of women in the urban areas use prenatal care compared to women from rural areas. Greater percentage of children that access some form of medical care either from private or public hospital came from the urban areas. The last row of the table presents values that favour children from household with female

head to access more care compared to children from household where the head is male. In summary, the percentage values presented in table 1 implies that children from higher socioeconomic household, who reside in urban communities and those from household where the household head is female, had higher access to child health care utilization compared to their counterparts.

Table 1 Percentage of access to child healthcare utilization by parent socioeconomic status and Individual Characteristics

Indicators	Prenatal care	Prenatal by Doctor	Child Received Care	Government Hospital	Private Hospital
Wealth Index					
Poorest	41	6	56	4	1
Poorer	61	12	69	5	3
Middle	77	24	69	4	6
Richer	88	39	70	8	5
Richest	96	61	72	12	9
Education					
No Education	54	11	63	6	2
Primary	80	26	70	3	5
Secondary	89	45	69	7	5
Higher	98	65	74	13	13
Resident					
Rural	63	19	65	4	3
Urban	92	47	72	10	7
Gender					
Male	72	27	66	6	7
Female	83	42	71	5	4

Source: Owner's Computation, 2019.

4.2 Logistic Regression for Child Health Care Utilization

Table 2, 3 and 4 presented binary logistic result of the relationship between different indicators of child health care use and socioeconomic status. The results revealed that relative wealth as indicated by wealth index is positively related to access to child health care utilization which conforms to the result in table 1 (summary statistics). 6 models were estimated, two each for the same indicator of child health utilization (dependent variable): one for model without covariates and the other with the inclusion of important covariates.

4.2.1 Logistic Regression for Prenatal Care Utilization

Table 2 contains models 1 to 4 with two dependent variables: women who had some prenatal health care services and those who were attended to by a doctor during prenatal care, as

compared to not using prenatal care during pregnancy and seeking prenatal care from other care givers rather than a doctor. Outcomes from model1 in table 2 indicated that moving from poorer wealth quintile to the richest wealth quintile increases the likelihood of using prenatal care. For instance, pregnant women from the poorer and the richest wealth quintile had coefficients ranging from 0.9 to 0.26 percentage point respectively. This signifies that compared to pregnant women from the poorest quintile, women from the richest household are 0.26 percentage point more likely to use prenatal care services. On the other hand, compared to pregnant women with no education, pregnant women with higher education were 0.19 percentage point more likely to use prenatal care. Model 2 included all other important covariates and the coefficients for highest wealth quintile reduced to 0.19 percentage point and higher educational attainment decreased to 0.16 percentage point. This shows that other covariates like place of residence, region and child age influence prenatal health care use. These coefficients were statistically significant at less than 0.01 percent ($p< 0.01$). Model 3 and 4 tested the robustness of model 1 and 2 by stepping further to use the dependent variable prenatal care by a doctor (woman was attended by a doctor during prenatal) against other care givers and the results follow the same pattern. Variables such as age of household head, gender and gender of child did not influence prenatal care use.

Table 2 Logistic Result for Prenatal Care Utilization and Socioeconomic Status

	Model 1(Pre-care)		Model 2(Pre-care)		Model 3(Pre-Dr)		Model 4(Pre-Dr)	
Indicators								
Poorer	0.949***	(0.012)	0.066***	(0.012)	0.096**	(0.035)	0.048	(0.034)
Middle	0.156***	(0.122)	0.113***	(0.012)	0.229***	(0.037)	0.135***	(0.037)
Richer	0.205***	(0.012)	0.155***	(0.014)	0.331***	(0.038)	0.209***	(0.041)
Richest	0.267***	(0.013)	0.196***	(0.016)	0.479***	(0.036)	0.329***	(0.046)
Highest Level of Education								
Primary	0.102***	(0.012)	0.088***	(0.011)	0.121***	(0.024)	0.066**	(0.024)
Secondary	0.120***	(0.014)	0.121***	(0.014)	0.191***	(0.022)	0.136***	(0.023)
Higher	0.190***	(0.015)	0.163***	(0.014)	0.320***	(0.037)	0.257***	(0.040)
Malkill			0.027	(0.016)			0.016	(0.019)
Usual Residence								
Urban			0.097***	(0.015)			0.061***	(0.018)
Region								
N. Central			0.009***	(0.016)			-0.069**	(0.020)
N. East			-0.91***	(0.020)			-0.14***	(0.019)
S. East			0.0024**	(0.031)			0.055*	(0.029)
S. South			-0.199**	(0.034)			-0.01***	(0.023)
S. West			0.115***	(0.020)			0.016***	(0.024)

Gender of Household Head								
Male			0.009	(0.025)			-0.0022	(0.023)
Age of Household Head								
Hage			-0.00014	(0.0004)			-0.0011*	(0.0005)
Gender of Child								
Male			0.0009	(0.0111)			-0.005	(0.054)
Child age								
Age			-0.15***	(0.0044)			0.004	(0.005)
Family Structure								
Monogamy			0.001	(0.024)			-0.041	(0.028)
Number of Children in Household								
No. of children			0.011	(0.007)			-0.011	(0.009)
_cons	-0.475***	(0.0742)	-0.714**	(0.239)	-2.720***	(0.142)	-2.778***	(0.243)
N	4340		4205		4340		4205	
adj. R-sq								

Standard errors in parentheses
="* p<0.05 **p<0.01 *** p<0.001"

Source: Owner's Computation, 2019.

4.2. Logistic Regression for Child Health Care Utilization

Access to child health care utilization of children aged 0 to 5 are shown in table 3 and 4. Model 5 shows that children from richer and richest household wealth index were 0.07 ($p < 0.05$) and 0.12 ($p < 0.01$) percentage point more likely to use government hospital when having fever/cough compared to children from the poorest household. While, children with household heads having primary and secondary certificates were -0.03 ($p < 0.001$) and -0.02 ($p < 0.01$) percentage point less likely to use government hospital when having fever/cough. These coefficients on richest household reduced to 0.11 percentage point after including important variables like region, place of residence and family structure. The coefficients on region shows that residing in the North Central, North East and South East increased the use of government hospital when a child suffered from fever/cough compared to residing in the North West. The coefficient on urban indicated that, children who reside in the urban centers were 0.023 percentage more likely to utilize health care services when they suffered from fever/cough. While, children who reside in a nuclear family are 0.017 percentage point more likely to utilize health care services in the event of sickness (fever/cough).

Model 7 shows that children from the richest household were 0.095 percentage point more likely to be treated in private hospital compared to children from the poorest household. The coefficient on richest wealth index reduced to 0.048 after inclusion of necessary control variables such as region. These coefficients are statistically significant at 0.01 and 0.05 level for the model without covariates and the model with covariates respectively. This implies that relative wealth influences the use of child health care services. Increased educational level of parents was also positively related to use of private hospital by their children: higher educated parents were 0.63 percentage point more likely to treat their children in a private hospital compare to parents with no education. This coefficient reduced to 0.026 due to the effect of other covariates. These coefficients on parents' higher level of education are also statistically significant.

Table 3 Logistic Result for Child Access to Health care Utilization and Socioeconomic Status

	Model 5 (G. Hospital)		**Model6 G. Hospital**		**Model 7 (P. Hospital**		**Model8(P. Hospital)**	
Indicators								
Wealth Index								
Poorer	0.023	(0.016)	0.024	(0.015)	0.037*	(0.021)	0.005	(0.011)
Middle	0.021	(0.019)	0.029	(0.020)	0.072***	(0.028)	0.018	(0.014)
Richer	0.071**	(0.028)	0.073**	(0.031)	0.062**	(0.030)	0.019	(0.017)
Richest	0.123***	(0.042)	0.105**	(0.046)	0.095**	(0.042)	0.034*	(0.026)
Highest Educational Level								
Primary	-0.038**	(0.009)	-0.028**	(0.009)	0.023*	(0.013)	0.008	(0.008)
Secondary	-0.021*	(0.011)	-0.004	(0.012)	0.013	(0.012)	0.010	(0.008)
Higher	-0.0021	(0.018)	0.010	(0.021)	0.63**	(0.031)	0.026*	(0.019)
Usual Resident								
Urban			0.023*	(0.013)			0.006	(0.0074)
Region								
N. Central			0.010	(0.016)			-0.040***	(0.0056)
N. East			0.045*	(0.019)			-0.048***	(0.0071)
S. East			-0.017*	(0.014)			-0.027***	(0.004)
S. South			-0.014	(0.014)			-0.031***	(0.0045)
S. West			0.0005	(0.018)			-0.022***	(0.0037)
Household Head Gender								
Male			0.0022	(0.017)			-0.007	(0.010)
Age of Household Head								
Age			-0.0002	(0.0003)			-0.005	(0.0017)
Child Gender								
Male			-0.008	(0.0081)			0.0007	(0.0047)
Child Age								
Chdage			0.003	(0.003)			0.0004	(0.0018)
No. of children			0.008	(0.005)			0008	(0.0033)
monogamy			-0.017**	(0.0058)			-0.0079	(0.0061)
Malakil			0.016	(0.012)			0.006	(0.0077)
_cons	-3.014***	(0.198)	-2.579***	(0.517)	-4.317***	(0.340)	-4.533***	(0.645)
N	2622		2622		2622		2622	
adj. R-sq								

Standard errors in parentheses
="* **
p<0.05 p<0.01 *** p<0.001"

4.3 Discussion

This paper studied access to child health care utilization and socioeconomic status using data from NMIS 2015 and using models consisting of predisposing and enabling factors. Some of the predisposing factors (education) and enabling factors (wealth and region) were significantly related to different types of child health care services. The major socioeconomic factor that explained the inequality in child health care use as found in this study was the wealth index. This finding is consistent with the result from Adedokun et al (2017); Sina, et al (2014), Raso et al (2005), Amin et al (2015) and Antai et al (2010), but in contrast to Ogunlesi and Olanrewaju (2019) who found no relationship between wealth and child health care utilization. The strong impact of wealth differential on access to child health care use in Nigeria is possibly due to mode of healthcare care payment which is usually out of pocket payment. While, the conflicting result from Ogunlesi and Olanrewa (2010) might be due to lack of variation in the data use. The study used data from Olabisi University Teaching hospital in Sagamu, the data size is small and it might be that most of the women interviewed were of similar socioeconomic status. When this happened there might not be variation especially with respect to socioeconomic status, therefore the disadvantage of using small data or data from population of similar characteristics.

Educational level was found to be positively related to use of prenatal services and private hospital for medical treatment in event of child fever/cough. This finding agrees with the finding of Takai et al (2019), Antai (2010) and Adedini et al (2014). Agunwa et al (2017) and Ogunlesi and Olanrewaju (2010) on the other hand found no relationship between parents' education and child health care use, while Amin et al (2010) found negative relationship. This paper also found negative relationship between increased educational level and use of government hospital when a child suffers from fever/cough. This could be due to the poor nature of public hospitals in Nigeria especially in terms of facilities, negative attitudes of health workers, congestion and poor sanitation. Educated parents' that understood the value of their children health may prefer to seek care from other health centers with better services, even if it entails spending large percentage of their earnings. Studies that found negative or insignificant relationship between educational level and socioeconomic status might be as a result of data used and area of coverage.

This paper also found place of residence and region to be important determinants of child healthcare use. While this paper found residing in the urban area and region other than North west to predict higher use of prenatal care as reported in the work of Antai (2011) and Unwujekwe and Ugochukun (2005), child medical care use as reported by Onwujekwe and Ugochukun (2005). It found no relationship between place of residence and child healthcare use through private hospital. This lack of relationship between the place of residence and the use of private hospital might be due to the effects of wealth and region which form strong determinants of child health care utilization. It could also be as a result of limited number of private hospital in the rural areas. While, the positive relationship between residing in an urban area and prenatal care, child medical care uses and health care access through government hospital could be due to

presence of educated, higher social status parents and higher number of healthcare facilities in the urban communities.

Women who had younger children, living in smaller family household and having household head to male were also found to increase utilization of prenatal and child health services. This finding conforms to the result of Yar'zever and Said (2013) and Nnonyelu and Nwankwo (2014). But in contrast to the finding by Agunwa et al (2017) and Takai et al (2015). The higher use of child health care service among younger women is a result of inexperience and anxiety with handling first pregnancy or child. While, smaller families will have higher proportionate income to the number of household members and better afford quality care.
The limitation of this study is the omission of some control variables such as distance to health care facilities, insurance coverage and perception of household heads to the use of health services which is inherit in NMIS data 2015. Despite this identified limitation, this study provided valid empirical evidence, that socioeconomic factors such as household wealth and parental education are important determinants of child health care utilization in Nigeria.

5.0 CONCLUSION

This study is motivated by the high rate of child mortality prevalent in Nigeria. Surprisingly, most of the child diseases responsible for under-five mortality in Nigeria are preventable and curable which can be reduced to their minimum levels through access to quality health care. It is rather unfortunate that there is high rate of inequality in child health care utilization which is possibly responsible for child health inequality and mortality rate. Using binary logistic regression to analyzed data from the NMIS 2015, this paper found wealth differential to be the important factor that determine the high rate of inequality in access to child health care utilization in Nigeria. The result of this study also found residding in region other than the North West and residing in the urban area, having male household head and having small family size were positively associated to utilization of child healthcare services. This paper suggests that: improving the wealth of the poor through investment in agriculture and making access of fund to poor women especially those involved in petty trading; free and quality education especially at the primary and secondary level; improving primary health centers and citing of secondary health care facilities in the rural areas; increased incentives to health care workers in the rural areas and the most important which is increasing the effectiveness and coverage of National Health Insurance Scheme (NHIS) to include everyone in the country. These will close the gap of inequality in child healthcare utilization and reduce the rate of child mortality in the country.

REFERENCES:

Adedini, S. A., Odimegwu, C., Bamiwuye, O., Fadeyibi, O. & Wet, N. D. (2014) Barriers to accessing health care in Nigeria: implications for child survival, Global Health Action, Vol.7 No.1, 23499, DOI: 10.3402/gha.v7.23499.

Adedokun, S. T., Adekanmbi, V. T., Uthman, O. A. and Lilford, R. J. (2017). Contextual factors Associated with health care service utilization for children with acute childhood illnesses In Nigeria. *PLoS ONE.* VOL. 12 No. 3, pp.1-14

Adeyanju, O., Tubeuf, S. & Ensor, T. (2017). Socio-eocnomic Inequalities in Access to Maternal and Child Healthcare in Nigeria: Changes Over Time and Decomposition Analysis. *Health Policy and Planning,* Vol.32 No. 8 pp1111-1118.

Agunwa, C, C., Obi, I. E., Ndu, A. C., Omotowo, I. B., Idoko, C. A., Umeobieri, A. K. and Aniwada, E. C. (2017). Determinants of Patterns of Maternal and Child Health Service Utilization in a Rural Community in South Eastern Nigeria. *BMC Health Service Journal.* Vol 17 No. 715 Doi 10.1186/s12913-017-2653-x

Ahmed, S., Creanga, A. A., Gillespie, D. G. & Tsui, A. O. (2010). Economic Status, Education and Empowerment: Implications for Maternal Health Service Utilization in Developing Countries. PLoS One Vol 5:6: e11190. doi: 10.1371/journal.pone.0011190.

Akinbami, L. J. & Schoendorf, K. C. (2002). Trends in Childhood Asthma: Prevalence, Health Care Utilization, and Mortality. *Journal of the American Academy of Pediatrics,* Vol.110 No.2: http://pediatrics.aappublications.org/content/110/2/315.full.html.

Amin, R., Shah, N. M. & Becker, S. (2010). Socioeconomic Factors Differentiating Maternal and Child Health Seeking Behaviour in Rural Bangladesh: A Cross-Sectional Analysis. *International Journal for Equity in Health,* Vol. 9:9 pp. 1-11. http://www.equityhealthj.com/content/9/1/9 [Accessed 7 June, 2018].

Amooti-Kaguna, B. & Nuwaha F. (2000). Factors influencing choice of delivery sites in Rakai district of Uganda. *Social Science andMedicine* **50**: 203–13.

Andersen, R., & Newman, J. F. (1973). Societal and Individual Determinants of Medical of Medical Care Utilization in the United States. *The Milbank Quarterly, Health and Society.* Vol.51 pp 95-124.

Antai, D., Wedrén, S., Bellocco, R. & Moradi, T. (2010). Migration and child health inequities in Nigeria: a multilevel analysis of contextual- and individual-level factors. Tropical Medicine & International Health, 15(12), pp. 1464-1474. doi: 10.1111/j.1365-3156.2010.02643.x.

Antai, D. (2011). Regional Inequalities in Under-5 Mortality in Nigeria: A population-based Analysis of individual and Community-level Determinants. *Population Health Metrics,* Vol.9, No.6. http://www.pophealthmetrics.com/content/9/1/6 [Accessed 2 Febraury, 2018].

Babitsch, B., Gohi, D. & Lengerke, T. V. (2012). Re-revisiting Andersen's Behavioural Model of Health Service Use: a systematic review of studies from1998 – 20111. *GNS Psycho-Social-Medicine Journal,* Vol.9, Special Issue. Pp1-15

Baker, D. W., Shapiro, M. R. & Schur, C. L. (2000). Health Insurance and Access to Care for Symptomatic Conditions. *ARCH INTERN MED,* Vol 160 No.1 pp1269-1274.

Davidson, E. J., Silva, T. J., Sofis, L. A., Ganz, M. L. & Palfrey, J. S. (2002). The Doctor's Dilemma: Challenges for Primary Care Physician Caring for the Child with Special Health Care Needs. *Ambul Pediatr.* Vol.2 pp218-223.

Heck, K. E. & Parker, J.D. (2002). Family Structure, Socioeconomic Status, and Access to Health Care for Children, *Health Service,* Vol 37:1 pp. 171-184.

Kadobera, D., Sartorius, B., Masanja, H., Mathew, A. & Waiswa, P. (2012). The effect of distance to formal health facility on childhood mortality in rural Tanzania, 2005_2007. Glob Health Action, Vol. 5: pp.1_9.

Lavy, V., Strauss, J., Thomas, D. and de Vreyer, P. (1996). Quality of Health Care, Survival and Health Outcomes in Ghana. *Journal of Health Economics,* Vol. 15 No.3, pp333-357.

Link, B. and Phelan, J. (1995). Social Conditions as Fundamental Causes of Diseases. *Journal of Health and Social Behaviour,* Extra Isue, pp.80-94.

Minkovitz, C. S., Campo, P. J. O., Chen, Y. & Grason, H. A. (2002). Associations Between Maternal and Child Health Status and Patterns of Medical Care Use. *Ambulatory Pediatrics,* Vol.2 No.2 pp 85-92.

Nnonyelu, A. N. & Nwankwo, I. U. (2014). Social Determinants of Differential Access to Health Services Across Five States of SouthEast Nigeria. *European Scientific Journal.* Vol. 3 Special Edition, pp. 286-296. ISSN: 1857-7881.

Ogunlesi, T. A. & Olanrewaju, D. M. (2010). Socio-demographic Factors and Appropriate Health Care-seeking Behaviour for Childhood Illnesses. *Journal of Tropical Pediatrics,* Vol. 56, No. 6.

Onwujekwe, O. & Uzochukwu, B. (2005). Socio-economic and Geographic Differentials in Costs and Payment Strategies for Primary Healthcare Services in Southeast Nigeria. *Health Policy Journal,* Vol. 71 pp 383-397.

Owoseni, J. S., Jegede, L. I. & Ibikunle, A. M. (2014). Socio-economic Status and Utilization of Healthcare Facilities in Rural Ekiti, Nigeria. *Journal of Medicine and Medical Sciences,* Vol. 2 No. 1 pp1-43.

Peters, D. H., Garg, A., Bloom, G., Walker, D. G., Brieger, W. R. & Raham, M. H. (2008). Poverty and Access to Health Care in Developing Countries. *Annals of the New York Academy of Science,* 1136 pp 161-171: doi: 10.1196/annals. 1425.011.

Raso, g., Utzinger, J., Silue, K. D., Ouattara, M., Yapi, A., Toty, A., Matthys, B., Vounatsou, P., Tanner, M. & N'Goran, E. K. (2005). Disparities in Parasitic Infections, Perceived Ill Health and Access to Health Care Among Poorer and Less Poor Schoolchildren in Rural Cote d'Ivoire . *Tropical Medicine and International Health,* Vol.10 No.1 pp 42-57.

Simoes, E. A. F., Peterson, S., Gamatie, Y., Kisanga, F. S., Mukasa, G., Nsungwa-Sabiiti, J., Were, M. W. & Weber, M. W. (2003). Management of Severely Ill Children at First-Level Health Facilities in Sub-Saharan Africa When Referral is Difficult. Billetin of World Health Organization, Vol 81 No.7 pp522-531.

Sina, O. J., Jegede, L. Y. & Ibikunle, A. M. (2014). Socio-economic Status and Utilization of Healthcare Facilities in Rural Ekiti, Nigeria. *Journal of Medicine and Medical Sciences.* Vol. 2 No.1 pp. 1-43.

Takai, I. U., Dlakwa, H. D., Bukar, M., Audu, B. M. & Kwayabura, A. S. (2015). Factors Responsible for Under-Utilization of Postanatal Care Services in Maiduguri, North-East Nigeria. *Sahel Medical Journal.* Vol. 18 No. 3, pp. 109-115.

Titus, O. B., Adebisola, O. A. & Adeniji, A. O. (2015). Health-care Access and Utilization Among Rural Households in Nigeria. *Journal of Development and Agricultural Economics.* Vol. 7, No. 5, pp. 195-203.

Ugbor, I. K., David-Wayas, O. M., Arua, M. & Nwanosike, D. U. (2017). The Socioeconomic Factors That Determine Women Utilization of Healthcare Services in Nigeria. *International Journal of Asian Social Science,* Vol.7 No.5 pp359-366.

UNICEF-WHO-World Bank Group-UNIGME. (2017). Levels & Trends in Child Mortality Report, Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation, United Nations Children's Fund, New York, 2017.

World Health Organization and International Initiative for Impact Evaluation. (2016). An Evidence Map of Social Behavioural and Community Engagement Interventions for Reproductive, Maternal, Newborn and Child Health Geneva: Licence: CCBY-NC-SA3.OIGO.

World Health Organization and International Initiative for Impact Evaluation. (2017) An evidence map of social, behavioural and community engagement interventions for reproductive, maternal, newborn and child health. Geneva: World Health Organization. Licence: CC BY-NC-SA 3.0 IGO.

Yar'zever, I. S. & Said, I. Y. (2013). Knowledge and Barriers in Utilization of Maternal Health Care Services in Kano State, Nigeria. *European Journal of Biology and Medical Science Research.* Vol. 1 No. 1, pp.1-14