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**An Account of Disproportionate Child Healthcare Utilization in Nigeria <sup>1</sup>**

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**An Account of Disproportionate Child Healthcare Utilization in Nigeria****Godfrey I. Ihedimma & Godwin I. Opara**

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**Abstract**

Adults are capable of self-assessment of their health status and are at the rudimentary level, able to determine if they need to consume more of health services or not. This however, lacks in children below the age of 5 years and as such, they rely on their parents and or guardians for healthcare utilization. The study acknowledges the mismatch between utilization and prevalence of illness across the country and the attendant inequality in healthcare utilization across regions. The study adopts the NDHS 2013, the Grossman Framework on the demand for health and the Logistic Regression Analysis and found that higher maternal educational levels increase child healthcare utilization. Other factors include increased wealth, frequency of older mothers, vaccination and exclusive breastfeeding. Frequency of older children and larger household sizes were however found to reduce the probability of child healthcare utilization. The study finds strong regional variations across the country with utilization more enabled in some regions than others, under same conditions and recommends that households maintain a size they can cater for health-wise. The study recommends an all-inclusive health policy to cater for disparities across regions and the retraining of mothers since secondary education alone is requisite for child healthcare utilization.

**Keywords:** Healthcare Utilization, Logit Model, Child Healthcare, Regional Variation, Grossman

**JEL Code:** I10, I15, I31, J13

## 1.1 Introduction

Good health has been instituted in literature (Aggarwal, Rowe & Sernyak, 2010) as an economic commodity and like every other commodity which possesses utility, it would be consumed, and at a price. The demand for good health by adults is predicated on the need to stay healthy, primarily based on self-assessed health (Cislaghi & Cislaghi, 2019). This reflects that adults are capable of assessing their health status to some degree and are at the rudimentary level, able to determine if they need to consume more of health services or not. More likely is the question of where to consume these services and or whom to patronise. The ability for self-assessment of health is not as spelt out in children as children may lack the ability to show a revealed preference, thus the reliance on parents or guardians to ascertain when and where to consume more health services. This by implication reflects that the health seeking behaviour and wellbeing of children to a great extent depends on that of their parents or guardians (Abubakar, van Baar, Fischer, Bomu, Gona & Newton (2013). Child healthcare utilization in this study refers to the demand for health and health services by children under the age of 5 years as this period may define the most vulnerable period of the growing child within which most of the nutritional and hormonal vulnerability are imminent (Sahoo, *et al*, 2015). Grossman (1972) acknowledges that investment in health – health expenditure – takes the form of periodic purchase of medical care and other inputs since health depreciates over time. This is also indicative that income of the user (child's parent or guardian) would go a long way in determining how much of health inputs would be consumed.

Heaton, Forste, Hoffman & Flake (2005) and Oladipo (2014) outline that the low- and middle-income countries are dotted with underutilization of child healthcare facilities and this has over time, resulted in the disproportionate distribution of health outcomes across the various subgroups of the populace. Oladipo (2014) attributes this to curable illnesses and preventable deaths and he goes on to link utilization with coverage in terms of ambulatory medical care services, hospitals and preventive services and acknowledges that for health utilization to be optimised, the population must have access to these. Other factors which might determine healthcare utilization according to Chakraborty, Islam, Chowdbury, Barl & Akhter (2005); Onah, Ikeako & Ilobachie (2009) and Manzoor, Hashmi & Mukhtar (2009) would include the socioeconomic status of the populace and the personal physiognomies of the end users.

Going by statistics, the NPC & ICF International (2014) in the report of the Nigerian Demographic and Health Survey (NDHS) 2013 explain that for national cases of diarrhoeal treatment in children ranging between the ages of less than 6 months to 59 months, there is an average health facility or provider utilization of 28.9% while those who were not treated at all has a percentage of 20.8% out of 2,966 cases of diarrhoea in 2013 with utilization being highest in the North Central (42%) and lowest in North East (24.4%). The utilization is also higher in urban areas (35%) than in rural areas (26%) and no treatment estimated at 39%. For the 3,632 cases of fever, there is a utilization rate of 31.5%. in cases of acute respiratory infection, the utilization rate was estimated at 34.5% with the highest found in the North West region (40.5%) and the lowest in South East (29.9%). In terms of vaccination (immunization), the distribution of participation rates across the geopolitical zones of Nigeria shows 26.9%, 14.2%, 9.6%, 51.7%, 52.0% and 40.9% for the North Central, North East, North West, South East, South South and South West respectively (NPC & ICF International, 2014). These figures give a revelation on the demographics in terms of patronage of health facility of provider for the aforementioned cases. Though, utilization is strongly tied to prevalence as prevalence spurs demand for healthcare, we assume a *ceteris paribus* condition for prevalence across the zones since it is identical to the living conditions, religious practices, cultural beliefs and educational background of the respective zones. On this assumption, the current study is an attempt at accounting for inequality in child healthcare utilization in Nigeria especially across the geopolitical zones while accounting for the factors that may necessitate the prevalence of illnesses which should be matched with utilization. The study also attempts identifying the significant demographic factors which may determine child healthcare utilization in Nigeria.

## **2.0 Empirical Literature Review**

Oladipo (2014) explains that health status varies across countries' developmental levels and these are mostly measured by indices such as the maternal mortality, child mortality, and even the infant mortality. He argues that these differences are not just observed across countries but even within countries along the dichotomy of rural and urban distinctions, however, these events are spurred, surprisingly by avoidable deaths and treatable illnesses. This roused the interest of the study to verify use of healthcare utilization across households in Kwara State. In line with Mosley & Chen's (1984), Oladipo (2014) studied Kwara State

across individual, family and community levels using a primary survey data conducted in 2011. The survey used a sample size of 1200 individuals and adopted the multi-stage sampling. The study accounted for predisposing factors (age, household size, sex, belief and education), enabling factors (proximity, availability, free healthcare, costs, third-party influence, health insurance, motivational benefits and family income), need variables (disability days, disease, health status and symptoms) and the health services factors (bed supply, quality of care, ambulatory care and treatment). This formed a four-stage model. It was found that the need factors were the most important determinants of healthcare utilization while the enabling factors proved to appear of more importance than the predisposing factors. At individual level, all need factors were found significant in influencing utilization while quality of care was found to be most crucial among all health services factors in predicting health service utilization. In the urban area, it was found that the health services factors could be dropped and the four-stage model would still remain adequate in analyzing and predicting healthcare utilization in Kwara State.

Alene, Yismaw, Berelie & Kassie (2019) investigated healthcare utilization in the rural parts of Ethiopia for common childhood illnesses. The study used the 2016 Demographic and Health Survey for the Ethiopian economy which consisted a total of 1576 mothers of children who are under the age of five years. They employed the logistic regression analysis in estimating the factors which influence healthcare utilization and found that for specific illnesses as diarrhea, fever, and cough, about 49.7%, 40.9% and 38% of children respectively utilized healthcare. They further found that various factors influenced child healthcare utilization for specific illnesses in children. For diarrhea, the significant factors include age of children (specifically between ages 12 and 23 months), mother's education, and child bearing at health facility. These were significant at 5% level. For cases of fever, the significant factors found in their study include the marital status of mother, husband's education, and child bearing at health facility, while for cases of cough, the significant factors are same as in the cases of diarrhea. The study however is limited in examined cases of illness and does not account for endogenous factors to illness or alternatively, preventive measures to these illnesses by households.

For Adekanmbi, Adedokun, Taylor-Phillips, Uthman & Clarke (2017), they observed the deaths, especially in low- and middle-income countries could be prevented with adequate utilization of interventions. They also acknowledged that some communities in Nigeria are

characterized by low health services utilization but it is not clear if this is as a result of any or all of low parental levels of education, low maternal health seeking behavior, ethnicity, deprivation or even weak regional health systems. This informed the purpose of their study in identifying factors which forecast the differentials in child health service utilization in Nigeria. They employed the Nigerian Demographic and Health Survey Data for 2013. Child healthcare utilization in their study was measured using the hospital attendance rate for acute illnesses at the community level for children under the age of 5 years and specifically for any or all of diarrhea, fever or cough 2 weeks prior to the survey. Various indices were generated using the Principal Component Analysis and they include the community environmental factor index, the childhood deprivation index, the maternal deprivation index, ethnicity diversity index and the maternal health-seeking behavior index. These indices with the gender of the child all form the independent variables in the study. The results of this study show that there is higher child healthcare utilization among children with high multiple childhood deprivation indices. Ethnicity diversity was found to increase the child healthcare utilization while enhanced maternal health-seeking behaviour reduced the healthcare utilization for children. Lastly, they found that the male gender for children imposes higher effect of community environmental factor on healthcare utilization and dampens the effect of maternal health-seeking behaviour on healthcare utilization.

Nghargbu & Olaniyan (2017) investigates horizontal inequity in maternal and child healthcare utilization and by extension, the drivers of inequity in healthcare utilization in Nigeria. The study adopts the NDHS for 1999, 2003, 2008 and 2013 and maternal healthcare utilization was measured as the frequency of antenatal visits during pregnancy and also by a coding of skilled delivery, 1 if delivered off by a professional (doctors, midwives, nurses and their auxiliaries) and 0 if by traditional birth attendants, relatives and friends. Child healthcare on the other hand was measured by a binary variable of vaccination, 1 if child has had vaccination and 0 if otherwise. The study's objective was executed using the Concentration Index and a probability model. It was found that there is the presence of a positive horizontal inequity in antenatal, skilled delivery and immunization, thus a pro-rich finding. Education and wealth status were found to be the major non-need drivers of inequity in healthcare utilization such that inequity rose for maternal healthcare utilization but dropped for child healthcare utilization over time.

It was observed by Agunwa, Obi, Ndu, Omotowo, Idoko, Umeobieri & Aniwada (2017) that very few women received skilled attendance during delivery and this is accompanied by a low rate of immunization despite the almost free nature of the service. This spurred their interest in the determinants of maternal and child health services utilization. They collected data from 602 women in rural Enugu state of Nigeria and both the Chi-Square and Logistic Regression Analysis were employed to achieving their objectives. It was found from their logistic regression analysis that increases in monthly income, age (i.e. women aged between 25 and 34 years), educational level, number of children and occupation of both spouses significantly increased maternal and child health service utilization. Family planning was found to be more prominent among the more educated couples and utilization increased as occupation ranged towards white collar job spouses, while decreasing among the unemployed. Utilization was low for women below 25 and above 34. The study identified the attitude of health workers as a catalyst to health services utilization as utilization rose with more care from the health workers and vice versa. The Chi-Square analysis showed also that there would be an increase in utilization among the group of users who self-assessed health facilities as being “good”, thus a positive relationship between perception of health facility and utilization.

### **3.0 Methodology**

#### **3.1 Theoretical Framework**

This study draws extensively from Grossman’s (1972) model on the demand for health. He assumes that an individual is endowed with an initial stock of health and this depreciates over time. However, the stock of health can be increased by an investment in health. Death however, comes when the stock of health for the given individual falls below a certain level. The uncertainty associated with the level upon which death is hinged is anticipated to spur the individual into increasing his investment in his health. An increase in the investment in health is strongly tied to the demand for health and healthcare as commodities, thus the individual is faced with and constrained by factors which would ensure his bad health.

Gross investment in health capital are produced by household production functions whose direct inputs are but not limited to, own time, dieting and health-seeking behaviour among others and by health practitioners in the form of health services. This study analyses the

investment in health in the form of healthcare utilization, in cognizance of the possibility of a disproportionate ratio enabled by other socio-economic factors. The logistic regression analysis is adopted to predict the probability that child healthcare services are utilized so as to improve the stock of health and keep it from falling below the death-associated level.

### 3.2 Model Specification

To analyze the inequality in child health care service utilization in Nigeria on the basis of geopolitical zone, gender of household head and educational attainment, a Logit model is specified below as;

$$Pr[utilz_i|x_i] = \beta_0 + \beta_1 educa_i + \beta_2 occup_i + \beta_3 weinx_i + \beta_4 distn_i + \beta_5 ageyr_i + \beta_6 chage_i + \beta_7 gendr_i + \beta_8 hsize_i + \beta_9 exclu_i + \beta_{10} immun_i + \beta_{11} regin_i + \mu_i \dots (3.1)$$

where *utilz*= 1 if individual *i* uses modern healthcare facilities, 0 = otherwise, *educa* is the mother's educational attainment, *occup* is mother's occupation, *weinx* is household income proxied by wealth index, *distn* is the distance to healthcare facility which proxies the availability of healthcare service, *ageyr* is mother's age in years, *chage* is the child's age in months, *gendr* is the gender of the household head, 1= male, 0 = female, *hsize* is the household size, *exclu* measures if the child is breastfed up to 6 months, 1 = yes, 0 = no, *immun* measures if child has been vaccinated, 1 = yes, 0 = no and *regin* representing the geopolitical zones in Nigeria.

### 3.3 Sources, Description and Measurement of Data

The data to be used in this study is obtained from the Nigerian Demographic and Health Survey. The survey was last conducted in 2013 [though the 2018 edition is yet to be released]. The survey is conducted within a 5-year interval and is aimed at summarising the health situation of Nigerians by common demographics. This survey comprises a total of 40,680 households (NPC & ICF International, 2014) and responses are drawn from these households across the geopolitical zones of the country. The table 3.1 below defines the variables used in this study and how they are measured.



**Table 3.1: Description of Variables**

<b>Variable code</b>	<b>Variable Label</b>	<b>Unit of Measure</b>
<i>utilz</i>	Modern Healthcare facilities and services utilization	1 = yes, 0 = no
<i>educa</i>	Mother's educational attainment	0 = no education, 1 = primary education, 2 = secondary education, 3 = higher education
<i>occup</i>	Mother's occupation	Sectoral occupational distribution
<i>weinx</i>	Household income/wealth level	1 = poorest, 2 = poorer, 3 = middle, 4 = richer, 5 = richest
<i>distn</i>	Household distance to health facility being a problem	1 = big problem, 2 = not a big problem, 9 = not sure
<i>ageyr</i>	Mother's age in years	12-Calendar months
<i>chage</i>	Child's age in months	4-week period
<i>gendr</i>	Household head gender	1 = male, 0 = female
<i>hsize</i>	Number of household members	Count
<i>exclu</i>	Child is breastfed up to 6 months	1 = yes, 0 = no
<i>immun</i>	Child has been vaccinated	1 = yes, 0 = no
<i>regin</i>	Geopolitical zone	1 = north central, 2 = north east, 3 = north west, 4 = south east, 5 = south south, 6 = south west

**Source: Authors' compilation, 2019**

#### **4.0 Discussion of Findings**

The model estimates the utilization probability while varying inequalities in specific demographic variables as geopolitical zones, gender of the household head and then the educational levels. The result for the model is summarised and presented in the table below;

**Table 4.1: Child Healthcare Utilization Determinants**Dependent Variable:  $Pr(utiliz)$ 

Variable	$\frac{dy}{dx}$	Std. Err.	t - statistics	p-value
<i>educa</i>				
<i>primary</i>	0.0653196*	0.0001607	406.35	0.000
<i>secondary</i>	0.1051242*	0.0001926	545.94	0.000
<i>higher</i>	0.1543362*	0.0003414	452.11	0.000
<i>occup</i>	0.0000286*	0.000000187	152.49	0.000
<i>weinx</i>	0.0524917*	0.0000539	973.90	0.000
<i>distn</i>	0.0246165*	0.0000733	335.84	0.000
<i>ageyr</i>	0.0046085*	0.00000846	544.56	0.000
<i>chage</i>	-0.0561314*	0.0000568	-988.67	0.000
<i>gendr</i>	-0.0289339*	0.0001751	-165.20	0.000
<i>hsize</i>	-0.0069643*	0.0000199	-350.06	0.000
<i>exclu</i>	0.0000647*	0.00000207	31.22	0.000
<i>immun</i>	0.0072081*	0.0000493	146.33	0.000
<i>regin</i>				
<i>north east</i>	-0.0658008*	0.0002146	-306.58	0.000
<i>north west</i>	-0.1256421	0.0001914	-656.27	0.000
<i>south east</i>	-0.0572777*	0.0002551	-224.50	0.000
<i>south south</i>	-0.11892*	0.0001988	-598.05	0.000
<i>south west</i>	-0.0187363*	0.0002282	-82.09	0.000

**Source: Authors' computation, 2019**

\* denotes significance at the 1% level of significance

Mother's education in the study is disaggregated into attainment levels and it was found that primary educational attainment of mothers increases the probability of child healthcare utilization in Nigeria by 0.065%. The probability for mothers with secondary educational attainment is estimated at 0.105% while for tertiary educational attainment is 0.154%. The findings also reflect that the probability of child healthcare utilization increases as the educational attainment of the mother rises. All results were significant at the 1% level of significance. The mother's occupation is found to increase the likelihood of child healthcare utilization in Nigeria. As the wealth index of households rises, the probability of child healthcare utilization rises. The difference in utilization for households which do not perceive distance from the health facilities as a problem and those that perceive it as a problem is 0.0246%. this means that the former is more likely to have child healthcare utilization than the latter by 0.0246%. As age of the mother increases, the probability of child healthcare utilization is expected to increase by 0.0046% while as the child grows older, the probability

of utilization drops such that there is a 0.0561% likelihood of not utilizing healthcare services for the child, all significant at the 1% level.

**Table 4.2: Child Healthcare Utilization Determinants by Region**

**Dependent Variable:  $Pr(utilz)$**

Variable	National	NC	NE	NW	SE	SS	SW
<i>educa</i>	0.0513702 0.000	0.06044961 0.000	0.0391602 0.000	0.0249561 0.000	0.0876259 0.000	0.0943735 0.000	0.0348608 0.000
		3	4	6	2	1	5
<i>occup</i>	0.0000445 0.000	0.000572 0.000	0.0000095 0.000	0.0000155 0.000	-0.0000194 0.000	0.00000392 0.000	0.0000559 0.000
		1	4	3	6	5	2
<i>weinx</i>	0.0533856 0.000	0.0855975 0.000	0.0360187 0.000	0.024944 0.000	0.0306585 0.000	0.0669426 0.000	0.0962872 0.000
		2	4	6	5	3	1
<i>distn</i>	0.0255966 0.000	0.0338752 0.000	0.0198757 0.000	0.0107179 0.000	-0.001073 0.020	0.0447665 0.000	0.103784 0.000
		3	4	5	6	2	1
<i>ageyr</i>	0.004678 0.000	0.0078594 0.000	0.0014501 0.000	0.0009349 0.000	0.0148758 0.000	0.0091234 0.000	0.0168169 0.000
		4	5	6	2	3	1
<i>chage</i>	-0.0521242 0.000	-0.0871871 0.000	-0.04329 0.000	-0.0225242 0.000	-0.1304284 0.000	-0.0576061 0.000	-0.121903 0.000
		3	5	6	1	4	2
<i>gendr</i>	-0.0243357 0.000	-0.0809955 0.000	-0.0198649 0.000	-0.0134346 0.000	-0.0100438 0.000	-0.0114584 0.000	-0.0757063 0.000
		1	3	4	6	5	2
<i>hsize</i>	-0.0082351 0.000	-0.0114414 0.000	-0.0006637 0.000	-0.0029195 0.000	-0.0072935 0.000	-0.0190927 0.000	-0.0376473 0.000
		3	6	5	4	2	1
<i>exclu</i>	0.000068 0.000	-0.0002434 0.000	0.0002098 0.000	0.0000684 0.000	-0.0001619 0.000	0.0002059 0.000	-0.0003378 0.000
		2	3	6	5	4	1
<i>immun</i>	0.0054984 0.000	0.0095326 0.000	0.0093912 0.000	0.0057772 0.000	-0.0166084 0.000	0.0126839 0.000	-0.0133384 0.000
		4	5	6	1	3	2

**Source: Authors' computation, 2019**

Legend: *b/p/ranking*

Households with males as the household head are less to have child healthcare utilization than households that are female headed. The probability portends that male headed households have 0.0289% less likelihood of patronising a child healthcare facility or service. An increase in the household size reduces the probability of child healthcare utilization for households in Nigeria by 0.00696%, significant at 1% level. Exclusive breastfeeding of babies increases the probability of healthcare utilization by 0.000065% and then immunization is found to increase the probability of child healthcare utilization, and these are significant at 1% level. The effect of location of residence by region shows for that all

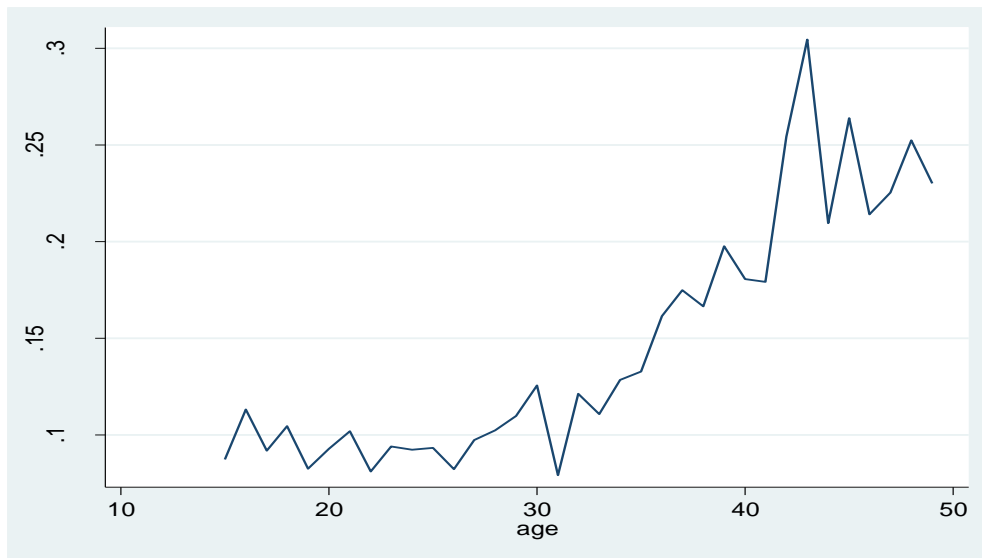
regions in Nigeria, the location reduces the probability of child healthcare utilization. However, the most unlikely to patronise a child healthcare service or facility is the North West Nigeria while the least unlikely is the South East region. The Table 4.2 however shed more light on the regional distribution of the probability of child healthcare utilization in Nigeria.

There is evidence to support that mother's educational attainment though found to increase the probability of utilization in Nigeria, is least in the North West region and most in the South South region of Nigeria. The region of Nigeria in which mother's occupation improves the probability of child healthcare utilization most is the North Central region, followed by the South West region. The region with the lowest likelihood is the South East and its estimation reveals reduction in probability. For the wealth index, the probability of child healthcare utilization is increased. the probability is highest in the South West region and lowest in the North West region of Nigeria. Only in the South East was it found that those who do not perceive distance as a problem have less probability of utilization than those that do. In other regions however, those who do not perceive distance as a problem have higher probabilities of utilization with the South West leading and the South East lagging followed by the North West. Mother's age is a leading determinant of child healthcare utilization in the South West region while it is weakest in the North West region, whereas increase in the age of the child reduces the probability of child healthcare utilization. Male headed households are less likely to utilize child healthcare services and facilities across all geopolitical zones. This probability is strongest in North Central and weakest in North West.

Increase in household size reduces the probability of child healthcare utilization across the regions with the strongest likelihood occurring in South West and the least in the North East. The probability that exclusive breastfeeding would influence child healthcare utilization varies across the regions. For the North Central, South East and South West, exclusive breastfeeding would reduce the probability of healthcare utilization while for the North East, North West and the South South, exclusive breastfeeding increases the probability of healthcare utilization. Vaccination varies in influence on healthcare utilization. For South West and South East region, vaccination reduces the probability of child healthcare utilization, however, for the North Central, North East, the North West and the South South, vaccination reduces the probability of healthcare utilization. All findings are significant at the 1% level of significance.

Lastly, it was discovered that as mother’s age increases by 1 year – 12 calendar months – the probability of utilization increases, but till about the age of 43 years of the mother. This reflects that after attaining menopause, mothers become less likely to patronise child healthcare facilities. The figure 4.1 below lends credence to this claim.

**Figure 4.1: Probability of Child Healthcare Utilization versus Age of Mother.**



**Source: Authors’ computation, 2019**

## 5.0 Conclusion and Recommendations

An increase in educational levels of mothers enable them to be more knowledgeable including for the use of healthcare utilization. Attaining higher academic qualifications also endears mothers to healthcare utilization as found that the probabilities rise with educational attainment. This study thus recommends that more effective programmes be instituted to train mothers on the need for healthcare utilization. Improved wealth increases the probability of utilization. This has an economic implication that poorer families maybe unable to afford healthcare costs, thus, reduction in utilization. The study recommends subsidization of healthcare especially for common illness among children. Distance may or not be perceived as a problem to utilization, however, there is an implication that the transport cost maybe a disincentive for some households especially those in the South East region of Nigeria. The study concludes also that increase in mother’s age increases the probability of child healthcare utilization, but as the mother approaches the menopausal age, there is reduced probability of healthcare utilization for children. This is corroborated by the finding that as the child ages, there is reduction in utilization. Mothers closer to menopausal age are less

likely to have children under the ages of 5, thus an implication that the fertility rate would drop. This, on the other hand implies that younger nursing mothers (including first time mothers) are more likely to utilize child healthcare services and facilities than the older mothers.

The study recommends that mothers should be given more opportunities to make decisions about healthcare utilization since it was found that households headed by males are less likely to be akin towards utilization. This though is not to say there should be a change in household head. Increase in household size reduces probability of healthcare utilization. The economic implication of this finding is that more costs would be associated with bigger household sizes. The study recommends smaller household sizes for households to be able to cater for the need of every child as and when due. Regional residence across the country reduces the probability of utilization. This implies that living in any part of Nigeria alone is enough risk factor for the utilization of child healthcare services and facilities, thus a deficiency in facilities and services. This draws on availability. The study recommends an all-inclusive health policy which would be aimed and implemented towards reducing inequality in utilization. Regional models of this study also reveal that for some regions, utilization is enhanced by some factors and reduced by same factors in other regions. This is also a clear case of inequality. The study recommends that state health policies in Nigeria should be in tandem with the federal health policies. More so, evaluation of policies should be empirical based to ascertain level of acceptances, implementation and results thereof for various intervention programmes.

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