

# Determinants of Out-Of-Pocket Healthcare Expenditure in the South-South Geopolitical Zone of Nigeria

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## ABSTRACT

This study examines the determinant of out-of-pocket healthcare expenditure in the south-south geopolitical zone of Nigeria using the 2010 national harmonized living standard survey data. Using the Heckman selection two-step model, the study concludes that state of residence, age of household head, family size, per capita consumption expenditure and adult equivalent weight together determines whether a person who falls sick will spend out-of-pocket for healthcare. Also, if a person falls sick and seeks healthcare service(s) age, age squared, household size, household size squared and per capita consumption expenditure proxy for per capita income. These are the factors that determine how much he/she spends out-of-pocket for healthcare, while aged people (those beyond 50 years of age) spend more out-of-pocket for healthcare households with more than 7 members have little to spare and so spend less out-of-pocket on healthcare. This reveals that healthcare is a normal good. The study therefore, recommends a comprehensive health insurance scheme irrespective of the state of residence for households in the zone.

**Keywords:** *Out-of-Pocket Healthcare Expenditure, South-South Geopolitical Zone, Nigeria*

## 1. INTRODUCTION

Nigeria as a developing country and has more of its inhabitants dwelling in the rural areas most of whom are engaged in the informal sector and so may not have access to a third-party paid healthcare services such as the health insurance scheme. Also, the favour of the market forces in the payment system for healthcare services implies that most people may not be able to access major healthcare services for which the cost is beyond some threshold and if they do, the consequence could be catastrophic to the household's welfare.

WHO (2011), reported that Nigeria's private healthcare spending as a percentage of Gross Domestic Product (GDP) increased from 2.91 to 3.71 between 2002 and 2009. Similarly, the country's consolidated public healthcare spending as percentage of total expenditure stood at 37.89 in 2010. Whereas a maximum value of 41.17 was recorded in 2008, a minimum value of 20.76 was recorded in 1996. Public healthcare spending in the sense used here include the provision of healthcare services, family planning activities, nutrition activities, and emergency aid designated for health but does not cover the provision of water and sanitation. Further, Nigeria's total healthcare expenditure as percentage of GDP which was 5.07 in 2010 had a maximum value of 7.55% recorded in 2003 and a minimum value 3.91 which was recorded in 2002.

In the light of above, Nigeria has had a very poor population health as measured by several health indicators. Although, a comparison of mortality rates recorded in the 2013 NDHS with the estimates from the 2003 NDHS to 2008 NDHS shows that the rates have decreased in all categories. The under-5 mortality rate decreased from 201 deaths per 1,000 live births in 2003 NDHS to 128 deaths per 1,000 live births in the 2013 NDHS; infant mortality decreased from 100 deaths per 1,000 live births in the 2003 NDHS to 75 deaths per 1,000 live births in the 2008 and further to 69 deaths per 1,000

live births in the 2013 NDHS (NBS, 2013). However, the current achievement is far from the MDG target of reducing the under-5 mortality to 64 deaths per 1,000 live births and the infant mortality to 30 deaths per 1,000 live births by 2015 (NBS, 2013).

Furthermore, the 2013 NDHS preliminary report shows that only 38 percent of births in Nigeria are delivered by a skilled health provider and a similar proportion of deliveries (36 percent) take place in health facilities. Differentials in delivery care by background characteristics of the mother shows that rural women and less educated women are less likely than others to receive assistance from a skilled provider during delivery and to be delivered in a health facility. For example, urban mothers are much more likely (67 percent) than rural mothers (23 percent) to have assistance from a skilled provider during delivery. The likelihood of receiving assistance from a skilled provider for delivery also increases substantially with the mother's educational level, from 12 percent among births to mothers with no education to 93 percent among births to mothers with more than secondary education (NBS, 2013). These statistics are overwhelming. They do not only show the wide inequality in health outcomes, but also the sorry state of public health in Nigeria. This study therefore seeks to examine the determinants of out-of-pocket healthcare expenditure in the South-South Geopolitical Zone of Nigeria.

## 2. LITERATURE REVIEW

Hopkins (2010) was concerned with the comparison of health expenditure aggregates and the contributions of the public and private sectors in 31 selected low, middle and high income countries. The findings are that low and middle income countries relied more on household out-of-pocket payments while public funding is more on curative care than for pharmaceuticals in all three categories of countries.

Kiplagat, et al (2013) explored the determinants of choice of health insurance schemes in Kenya. Utilizing a multinomial logit model on the 2008-2009 Kenya Demographic Health Survey (KDHS), they showed that wealth index, employment status, education level and household size are important determinants of health insurance ownership and choice, and that lack of awareness prevents many from enrolling in any form of health insurance scheme. Mhere (2013) examined the determinants of health insurance participation in Gweru Urban in Zimbabweans. Using a probit model he showed that the household head's level of education, household income, age, family size, and chronic illnesses, are all significant predictors of participation in health insurance schemes. Chen et al (2012) explored Taiwanese patients' decision-making process to access healthcare and how the cost issue impacts patients' access to healthcare and explored patients' cost-saving strategies. Hypertensive patients from different tiers of medical facilities (community, regional hospitals, and medical centers) in the Kao-Ping area of southern Taiwan were invited to participate in focus groups and 40 participants were recruited for nine focus groups. The physicians' reputation, tiers of hospitals, and the convenience of transport and registration were the three major reasons why participants accessed different medical facilities. It was also discovered that the current out-of-pocket payment is affordable by participants and not as important as other reasons for their choices. Continuous prescription was considered a cost-saving strategy for patients visiting higher tiers of medical facilities. Their conclusion is that hypertensive patients can afford the current out-of-pocket payment. Abollahaj et al (2012) examined the determinants of unpredictable healthcare expenditure in Iran. They analyzed the shares of households' expenditures on main groups of goods and services in urban and rural areas and in groups of deciles using data from households' expenditure surveys. They showed nearly equal out-of-pocket payment rates and the rate of total health expenditure. Liu et al (2003), using data from the 1998 China National Health Services Survey, examined the impact of healthcare expenditure on poverty headcount for different rural regions in China. They showed that out-of-pocket healthcare expenditure increased the number of rural households living below the poverty line by 44.3%. Brinda, et al (2014), investigated the determinants of out-of-pocket health expenditure among adults population in the United Republic of Tanzania. They also investigated the prevalence and associated determinants of household catastrophic healthcare expenditure. Employing multiple generalized linear and logistic regression models they showed the major determinants of out-of-pocket healthcare expenditure to be age, gender, obesity, functional disability and visits to traditional healers. Further, large household size, household head's occupation as a manual laborer, household member with chronic illness, domestic violence against women and traditional healer's visits were associated with high catastrophic health expenditure in the United Republic of Tanzania.

Odoh and Nduka (2014) examined the determinants of public health expenditure in Nigeria for the period of 1977 to 2008. They showed the existence of cointegration between per capita health care expenditure, per capita income, petroleum prices, population with age below 15 years, under-five mortality, inflation rate, unemployment rate and government regime shift. They also showed that public health care expenditure in Nigeria is income inelastic and positive; implying that health care in Nigeria is a necessity rather than luxury and that military government spend less on health care than civilian government about 75.59%. They concluded that civilian government is not only more people-oriented, but also more responsive to the health care needs of the people and that government intervention (both direct and indirect) is required to improve the health status of Nigerians.

Uzochukwu, and Uju, (2012) analyzed the out of pocket healthcare spending of Nigerian households to determine if they are catastrophic. Using intensity and incidence methods they showed that 24% of Nigerian households incur catastrophic health expenditure and this was more prevalent among the richest income quintiles in Nigeria and as such has succeeded in changing the poverty situation (pushing households below poverty line) of most households who were originally on or above the poverty line. Sambo et al (2004), examined the causes of illnesses among under-fives, sources of healthcare and out of pocket expenditure among children under-five in Layin Zomo, a semi-urban area of Northern Nigeria. Using a sample size of 324 they showed that 26.9% of the children had been ill within three months of the study with fever, cough and diarrhea and majority of respondents (41.7%) sought medical care from patent medicine vendors. Riman and Akpan (2012), study utilized a multivariate analytical tool to describe the relationship between health care financing, health facility utilization and health outcome in Nigeria. They focused on women who are of child bearing age and who had given birth to at least one child within the past five years. The study adopted the stratified sampling technique comprising of two rural Local Government Areas and one Urban Local Government Area in Cross River State of Nigeria. The study demonstrated that the high levels of infant mortality and morbidity rate was associated with high incidence of out-of-pocket payment, and the wide disparity and inequality in income distribution. The study also showed a disproportionate disparity in the spatial distribution of health facilities, with concentration of health facilities at the urban areas rather than the rural areas, which of course contributed to the poor service demand.

### **3. DATA AND METHODOLOGY**

#### **3.1 Study Area and Data**

Akwa-Ibom, Bayelsa, Cross-river, Delta, Edo and Rivers states constitutes the South-South Geopolitical Zone and it is located at latitude 4<sup>0</sup>N longitude 6<sup>0</sup>E. The zone covers an area of 84,587km<sup>2</sup> and has a coastline

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which spread over 540km. The area is bordered to the South by the Atlantic Ocean and to the East by Cameroun. The IZONS, Urhobo, Isoko, Ikwere, Ika, Ukwuani, Abua, Itsekiri, Ogoni, Efik, Ibibio, and Bini are the major inhabitants of the area (Ibaba, 2005; Etekpe, 2007). People in the zone mostly engaged in subsistence agriculture. Before the discovery of oil crude and the attendant environmental degradation and disturbance of the ecosystem, fishing has been a major economic activity in the area. The major crops grow include cassava, yam, plantain, oil palms and banana. The people also involve in palm oil milling, lumbering, palm wine tapping, local gin making, trading, carving and weaving. Apart from oil crude other minerals found in the area include natural gas, clay and industrial sand. Oloibiri where crude oil was first found in commercial quantity in Nigeria is located in the area (Edoumiekumo et al, 2013).

This study used secondary data that were collected during the National Living Standard Survey (NLSS) of households carried out between 2009 and 2010 in Nigeria. The survey covered the six geopolitical zones (36 states) and the Federal Capital Territory. A total of 34,900 households were covered for the whole country and 1204 in the South-South geopolitical zone. This study focused on the 1204 households covered in the zone.

### 3.2 Model Specification

In developing countries, people generally seek healthcare services only when they perceive they are ill and so may spend on health only when they report sick and seek medical attention. People who report sick but did not seek medical services and those who did not report seek spend zero. People who report sick and sought medical attention will spend varying amount treating the illness. Therefore healthcare expenditure data is often times characterized by a large cluster at zero (0) and a right skewed distribution of the remaining observations. In such cases the traditional OLS is inadequate. If there are unobserved factors that are correlated with the individual's perception of illness and healthcare expenditure, the coefficients in the healthcare expenditure equation will be biased (Rous and Hotchkiss, 2003). This study therefore employed the 'Heckman two step' selection model to control for sample selection bias. The Heckman selection model assumes that there is an underlying relationship between healthcare expenditure and its covariates as follows

$$y_j = x_j \beta + u_{1j} \quad \dots \quad (1)$$

Where:  $y_j$  is healthcare expenditure of the  $j$ th household;  $x_j$  is health expenditure covariates and  $u_{1j}$  is the error term.

However, healthcare expenditure is not always observed. Rather it is observed when a household member falls sick and therefore seeks healthcare services. Therefore healthcare expenditure is observed only when the following selection equation holds

$$z_j \gamma + u_{2j} > 0 \quad \dots \quad (2)$$

Where:

$$\begin{aligned} u_{1j} &\sim N(0, \sigma) \\ u_{2j} &\sim N(0, 1) \\ \text{corr}(u_{1j}, u_{2j}) &= \rho \end{aligned}$$

When  $\rho \neq 0$ , standard regression techniques applied to (1) will yield biased results. Heckman provides consistent, asymptotically efficient estimates for all the parameters in such models.

## 4. RESULTS AND DISCUSSION

Results from the selection model show that households in Bayelsa and Cross-rivers states are more likely to incur out-of-pocket healthcare expenditure (to be selected) than households in Akwa-Ibom state. Households in Delta, Edo and Rivers state are less likely to incur out-of-pocket healthcare expenditure than households in Akwa-Ibom state respectively. Also, households headed by older people, having larger family size and higher per capita consumption expenditure are more likely to incur out-of-pocket healthcare expenditure (to be selected) but households with higher adult equivalent scales are less likely to be selected. All of these variables were statistically significant at least at the 5 percent level except Bayelsa State dummy that was statistically not significant at all. Results from the regression revealed the following. Given that a household's member falls sick and therefore seeks healthcare services households in Bayelsa and Cross-rivers states spends N13082.79 and N95242.08 less than households in Akwa-Ibom State but households in Delta, Edo and Rivers state spends N35111.46, N44047.16 and N26609.63 respectively more than households in Akwa-Ibom state on healthcare. Furthermore, households headed by older people spends N41075 less on healthcare provided he/she has not reached the threshold age of approximately 50 [=41075/2(412.5806)] years. Households with larger family sizes on average spend N284956.9 more out-of-pocket for healthcare provided the household size has not reached a threshold of 7 [=284956.9/2(19570.41)] members. Also, households with larger per capita consumption expenditure spend N2.49 more as out-of-pocket healthcare expenditure. All the variables were statistically significant at the 1 percent level except the state dummies that were statistically not significant at all. These results indicate that age, household size and per capita consumption expenditure are the major determinants of out-of-pocket health expenditure in the south-south geopolitical zone of Nigeria. The health status of people perhaps deteriorates as the age of the person goes beyond 50 years or closer to retirement and so beyond this age they spend more on healthcare to cater for age related health issues. Also, as a household size grows beyond 7 the household loses its ability to care for the health of members as it tends to channel more of its resources to other consumer goods to meet the most basic human need of food. Furthermore, healthcare is a normal good in the zone as households that

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have more money to throw around spend more on it with the poor having less to spare. This means that as income increases the people want to spend more on health. These are serious policy issues. Further results showed the absolute rho value to be less than unity indicating that the heckman model is appropriate for the analysis. Furthermore, out of the 1204 persons sampled 793 had zero out-of-pocket health expenditure and were therefore censored and the remaining 411 respondents who had

spent varying amount on healthcare where uncensored. A Wald chi-square statistic of 300.11 had a probability value of 0.0000 and is therefore statistically significant at the 1 percent level. This shows that the overall model is statistically significant and the explanatory variables adequately captured variations in out-of-pocket healthcare expenditure, implying that the model is robust and appropriate for policy analysis.

**Table 1:** Heckman Selection two-step Model estimates

	Hltxp	Coefficient	Standard error	Z	p> z	
Regression	Bayelsa	-13082.79	101693.1	-0.13	0.898	
	Cross-rivers	-95242.08	117819	-0.18	0.419	
	Delta	35111.46	125480.3	0.28	0.780	
	Edo	44047.16	104026.1	0.42	0.672	
	Rivers	26609.63	129959	0.20	0.838	
	Agey	-41075	10883.13	-3.77	0.000	
	Agey2	412.5806	104.3892	-3.95	0.000	
	Hhsize	284956.9	47208.47	6.04	0.000	
	Hhsize2	-19570.41	4161.764	-4.70	0.000	
	Pcexpdr	2.490968	0.2940154	8.47	0.000	
	Constant	368413.8	489216.9	0.75	0.451	
	Selection	Bayelsa	0.0703069	0.1679581	0.42	0.676
		Cross-rivers	0.47796204	0.1566931	3.06	0.002
		Delta	-0.4562594	0.1330547	-3.43	0.001
Edo		-0.3263261	0.1260626	-2.59	0.010	
Rivers		-0.5162085	0.1346858	-3.83	0.000	
Agey		0.0120199	0.0028886	4.16	0.000	
Hhsize		0.3076427	0.0935656	3.29	0.001	
Pcexpdr		2.40e-06	2.97e07	8.08	0.000	
Foa_adq		-0.2518454	0.1157833	-2.18	0.030	
Constant		-1.39587	0.1699602	-8.21	0.000	
Millis		Lambda	-235110.6	265564.3	-0.89	0.376
	Rho	-0.43138				
	Sigma	545020.17				
	Lambda	-235110.59				
Number of observations		1204				
Censored observations		793				
Uncensored observations		411				
Wald Chi2(10)		300.11				
Prob > chi2		0.0000				

**Source:** Author's Computation

## 5. CONCLUSION AND RECOMMENDATION

This study concludes that the geographic region that is the state of residence, age of household head, family size, per capita consumption expenditure and adult equivalent weight together determines whether a person who falls sick will spend out-of-pocket for healthcare. Also, if a person falls sick and seeks healthcare service(s) age, age squared, household size, household size squared and per

capita consumption expenditure proxy for per capita income are the factors that determined how much he/she spends out-of-pocket for healthcare. While aged people (those beyond 50 years of age) spend more out-of-pocket for healthcare households with more than 7 members have little to spare and so spend less out-of-pocket on healthcare to be able to meet other basic needs. This study also showed that healthcare is a normal good in the zone as healthcare expenditure was found to be income elastic. These underscore the need for a more people oriented health insurance scheme.

Based on the findings this study recommends a comprehensive health insurance scheme irrespective of the state of residence for households in the zone. Private firms/corporate organizations and government agencies should be encouraged to take on a compulsory and comprehensive health insurance schemes for their employees. This will help in risk sharing in cases of major health challenges, since not all who are covered in the scheme will have major health needs simultaneously.

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