ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Exploring the association between health insurance and primary healthcare utilization: The Case of Nigeria

Bachelor Thesis

[Behavioral & Health Economics]

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Date final version: 27-06-2024

Abstract

The main aim of this study is to investigate the relationship between health insurance and primary healthcare utilization in Nigeria. Like many developing countries, Nigeria has embarked on the journey towards Universal Health Coverage, yet, there are still many obstacles to be considered. Health insurance and a well-established primary healthcare system are fundamental in achieving healthcare access and equity. By interpreting the marginalized effects of three Probit regressions, this study found that having health insurance decreases the probability of using primary healthcare. However, the results were not significant. Moreover, individuals in Nigeria rely heavily on out-of-pocket payments when it comes to healthcare utilization. This study delves deeper into the differences in out-of-pocket payments between rural and urban residents. The findings show significant differences in out-of-pocket transportation costs between those who live in rural areas and those who live in urban areas.

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List of Abbreviations

Primary healthcare (PHC)
Universal Healthcare Coverage (UHC)
Out-of-pocket (OOP)

Chapter 1: Introduction

Achieving universal health coverage (UHC) is a shared aspiration among many countries (Reich et al., 2015). The objective of UHC is for all people to be provided with quality health services across all levels of care - primary, secondary, and tertiary[1]- while not facing financial burdens from out-of-pocket (OOP) payments (Boerma et al., 2014). However, in many developing countries, numerous challenges have delayed this achievement.

The concept of UHC is closely related to accessibility and equity in healthcare provision and utilization of health services. Aregbeshola & Khan (2018) state that a failure to provide efficient coverage to the population, especially to vulnerable groups, leads to a financial burden, which in turn gives rise to inequity as healthcare services become obtainable only by those who can afford to pay. The expansion of health coverage and the elimination of inequities in access to - and utilization of - healthcare are two challenges that must be addressed by every country moving towards UHC (Reich et al., 2015). Inequities in the healthcare system are costly and avoidable differences that can negatively impact the health of the population (Whitehead, 1992). If inequities persist in healthcare utilization, more people will not be treated, increasing the risk of poor population health (Terraneo, 2014).

A fundamental pillar of a well-established healthcare system is primary healthcare (PHC) (Binagwaho & Ghebreyesus, 2019). According to Stigler et al. (2016), UHC can only be realized through effective and well-established PHC. PHC is closely related to health equity, especially in developing countries, as it is associated with (1) increased access to healthcare services, (2) better health outcomes, (3) decreased hospitalization rate, and (4) reduced adverse effects of income inequality in both developed and developing countries (Shi, 2012). Despite the commitments made to strengthen primary healthcare, this level of care has been underfinanced throughout the years, especially in low- and middle-income countries (Binagwaho & Ghebreyesus, 2019). In addition, the shortage of PHC providers, while medical specialists increase in number due to developments in medical technology and higher reimbursement for specialist care compared to PHC, poses a prevalent concern (Shi, 2012).

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[1] Primary healthcare is provided by general practitioners or family doctors and it is the first contact with medical services. Secondary healthcare is provided by specialists like gynecologists or cardiologists. Tertiary healthcare, usually provided in teaching hospitals, deals with highly specialized medical care.

To achieve the desired equity and quality of the healthcare system, it is crucial to understand why individuals use or refrain from using healthcare services (Kimani, Mugo & Kioko, 2016). In developing countries, because of weakened political commitment to tackle problems in the health sector, healthcare utilization patterns are distorted (Forster et al., 2020). It is thus important to further investigate such countries, to identify gaps in healthcare infrastructures that contribute to utilization disparities. By gaining better insights, policy reforms and interventions can be designed to ameliorate insurance schemes and, therefore, increase the number of individuals opting for healthcare.

Hence, this paper will focus on Nigeria, a developing country that relies heavily on OOP payments when it comes to healthcare spending and healthcare utilization (Ogundeji et al., 2023). The main aim of this study is to explore the relationship between health insurance and primary healthcare utilization. This relationship will be observed separately for those individuals who suffered an illness and for those who did not. It is important to look at the effects of health insurance for those individuals who were not sick and individuals who were not sick to understand whether having health insurance incentivizes people to seek preventative care or regular checkups.

The two main hypotheses to be tested in this study are as follows:

H_1: There is a significant association between health insurance and primary healthcare utilization among individuals who did not suffer an illness.

H_2: There is a significant association between health insurance and primary healthcare utilization among individuals who suffered an illness.

According to Titus et al. (2014), healthcare access is crucial in the development of rural areas. However, in Nigeria, primary care clinics in rural areas often do not have quality equipment or well-trained staff. Hence, this paper will additionally investigate the differences in OOP payments between individuals who live in rural areas and those who live in urban areas. These OOP payments include consultation, transportation, and medicine costs that individuals pay themselves. The hypotheses to be tested are as follows:

H_3: There are significant differences in the average out-of-pocket consultation expenditures between rural and urban residents.

H$_4$: There are significant differences in the average out-of-pocket transportation expenditures between rural and urban residents.

H$_5$: There are significant differences in the average out-of-pocket medicine expenditures between rural and urban residents.

Although there are studies investigating the relationship between health insurance and PHC utilization in developing countries, there are not many which focus solely on Nigeria. Thus, this study contributes to the literature by further exploring the case of Nigeria. However, this study goes beyond the effect of insurance by also looking at other determinants of PHC utilization, such as demographic or socioeconomic factors. Moreover, by separately studying individuals who did not suffer an illness, this paper sheds light on preventative care incentives. Another contribution is the analysis of the disparities in OOP payments between urban and rural residents. The findings of this paper can aid policymakers in designing more effective health insurance plans to reduce the financial burden of OOP payments, especially for vulnerable groups in rural areas. The methodology used in this study is widely used in the field of health economics. However, with the high prevalence of OOP payments in countries like Nigeria on one hand, and the inadequate provision of PHC on the other hand, continuous research is needed not only to identify solutions to these problems but also to improve the existing methods and add the growing body of literature.

The next chapter consists of the literature review. The methodology and data will be explained in Chapter 3 and Chapter 4, respectively. Moreover, the results are included in Chapter 5. Finally, the discussion of the results and the limitations is found in Chapter 6, and the conclusion is presented in Chapter 7.

Chapter 2: Literature Review

2.1 The Healthcare System in Nigeria

Although the health sector has been the main focus of Nigeria over the years, the healthcare system is not equipped to face today's global challenges (Kingsley & Godwin, 2019). Nigeria is characterized by inequity and low access to healthcare (Odeyemi & Nixon, 2013). According to Abubakar et al. (2022), despite Nigeria having the largest gross domestic product in Africa, the population health is poor, and the life expectancy is low. There are many obstacles keeping Nigeria from moving towards a healthy population and a well-established healthcare system (Abubakar et al., 2022). The inefficient use of resources, insufficient budget allocation towards healthcare, poor governance, and corruption impede achieving equitable and quality care.

Among the obstacles mentioned above, inadequate health financing is a major issue in the health sector of Nigeria, and most healthcare spending comes from out-of-pocket expenditures (Abubakar et al., 2022). Thus, low-income families are unable to access the health services they need.

Nigeria has three layers of government, and all three are responsible for providing health services across all three levels of care (Ilesanmi et al., 2023). The structure of the government in Nigeria is mirrored in the approach the country takes regarding the provision of health (Kingsley & Godwin, 2019). The federal government handles the provision of tertiary healthcare, the state government is responsible for the provision of secondary healthcare, and the local government is in charge of primary healthcare. However, these three levels of care are poorly structured and poorly managed (Ilesanmi et al., 2023). For instance, those patients who must be consulted in primary healthcare centers are sent to tertiary hospitals, and vice versa. This confusion in the structure has created many inefficiencies in how healthcare is delivered.

2.1.1 Primary Health Care in Nigeria

In many developing countries, delivering quality primary healthcare services is still a challenge, surrounded by many constraints (Ang et al., 2017). Nigeria lags behind compared to other African countries in most PHC performance indicators (Kress, Su & Wang,2016). A distinguishable concern is that in Nigeria, primary healthcare is assigned to the weakest and most underfunded tier of government, namely the local government (Adewole et al., 2016).

Thus, the development of a well-established PHC system in Nigeria is limited by low government spending (Ogundeji et al., 2023).

There are three types of primary health centers in Nigeria; Comprehensive Health Centers, Primary Health Centers, and Basic Health Clinics (Obionu, 2007). Even though these centers are also built in rural areas, individuals are underserved, face challenges in access, and are rarely provided with quality service (Abdulraheem et al., 2012). It is important to highlight that most centers in rural areas are outdated, lack infrastructure, and do not provide services to everyone when needed (Ilesanmi et al., 2023). Inadequate funding, old equipment, shortage of health workers, and conflicts between government tiers are gaps in the system, contributing to only 20% of the total PHC facilities being functional (Kingsley & Godwin, 2019). Individuals have thus created a perception of poor quality, which has led to less utilization of PHC services (Alenoghena et al., 2014).

2.1.2 National Health Insurance Scheme

The National Health Insurance Scheme (NHIS) was initiated in 1999 by the Federal Nigerian Government and became functional only in 2005 (Obalum & Fiberesima, 2012). It aims to lead Nigeria towards universal health coverage, facilitate access to health services for all, and improve population health (Azeez et al., 2020). It is a collaboration between public and private entities: NHIS, Health Maintenance Organizations (HMOs), other healthcare providers, and enrollees (Alawode & Adewole, 2021). There are two main concerns the NHIS intends to resolve. The first is the low rate of insured individuals in Nigeria, where about 70% of the population endures out-of-pocket payments when it comes to health (Ahmad & Prisno, 2022). The second issue is the prevalence of the informal sector, which is a consequence of the odd population positioning in Nigeria, where more than half reside in rural areas (Omoruan et al., 2009). Over the past decade, the NHIS has represented only 40% of the population.

To address this issue, the scheme has included several specific financing systems targeting different population groups (Adewole & Osungbade, 2016). These financing systems are designed to increase access in both the formal and informal sectors by reducing the number of uninsured (Alawode & Adewole, 2021). In particular, the Social Health Insurance (SHI) and the Community-Based Health Insurance (CBHI) stand out. SHI scheme requires individuals to make contributions in order to create a pool of funds to increase accessibility in healthcare

services (Olakunde, 2019). CBHI, on the other hand, is a private health insurance that aims to target those who are part of the informal sector and live in rural areas (Olakunde, 2019). However, in the case of Nigeria the impact of CBHI is still questionable.

Regarding recent policy changes, in 2022, the National Health Insurance Act (NHIA) was signed (Ahmad & Prisno, 2022). This replaced the scheme of 1999, making insurance mandatory for all citizens. Moreover, the NHIA has increased the provision subsidies for health insurance coverage to disadvantaged individuals (Wada et al., 2023). This new law aims to increase the number of insured, focusing on the poor residing in rural areas.

2.2 Theoretical framework

2.2.1 Determinants of Healthcare Utilization

To achieve the UHC, disparities in the determinants of healthcare use must be eliminated (Braveman et al., 2018). It is essential to identify these determinants of healthcare utilization. By better understanding their role in shaping patterns of use across inpatient and outpatient care, better strategies can be implemented to tackle disparities, improve resource allocation, and make healthcare more accessible. To introduce some of these determinants, the Behavioral model of use of health services by Andersen (1968) will be briefly mentioned, together with a collection of papers revisiting and adding to the model. This influential model has been frequently used in health economics not only to understand why individuals use healthcare services but also to interpret and measure equitable access to healthcare (Osei, 2015). When revisiting the model, Andersen (1995) highlights that efficient access to care becomes evident when the health status rises in relation to the consumption of healthcare services.

The conceptual framework provided by Andersen (1968) identifies a set of individual, environmental, and provider-related factors associated with people's decision to utilize health services (Philips et al., 1998). Simply put, individuals' healthcare utilization is a function of their predisposing characteristics (i.e., age, gender, health beliefs), enabling resources (i.e., income, insurance status, availability of care), and needs (Andersen, 1995). However, another relevant category was added to the model, namely environmental variables (Philips et al., 1998). These variables are divided into (1) healthcare system characteristics (i.e., resource allocation, policies, financing) and (2) external environment factors (i.e., politics, economic

climate). At a contextual level, institutional traits or healthcare systems can impact healthcare utilization patterns (Figueras et al., 2009). Hence, it is important to understand such external variables, particularly when considering enabling factors (Gilbert, Branch, & Longmate, 1993).

2.2.2 Health Insurance, an enabling factor

Among these enabling factors, health insurance stands out. It is a beneficial financing tool to help individuals, especially the poor, meet healthcare needs (Ahuja, 2004). Empirical findings show that health insurance has a protective effect as it significantly reduces the financial burden (Nguyen, Rajkotia & Wang, 2011). A considerable amount of research supports the idea that having health insurance improves healthcare access and health itself (Hadley, 2003). Moreover, it is evident that individuals who do not have health insurance face difficulties in attaining care (Burstin et al., 1998). As mentioned by Reich et al. (2015), health coverage plays a great role in the establishment of an accessible and equitable healthcare system, as well as in achieving UHC. Research shows that health insurance coverage reduces the burden of out-of-pocket payments (Prinja et al., 2017). These out-of-pocket expenditures are an inefficient way of financing health, which have considerable implications on poverty, especially in developing countries (Garg & Karan, 2009; Ahuja, 2004).

Moreover, Garg & Karan (2019) highlight that the adverse effects of such health expenditures are higher in poor countries, particularly in rural areas. If individuals continuously face financial barriers in accessing health services, this would lead to negative health outcomes, specifically for those who need special care. The findings of Berman, Ahuja & Bhandari (2010) show that out-of-pocket payments are higher in rural areas and usually are associated with outpatient services. Thus, understanding how health insurance relates to healthcare utilization is crucial for policy decisions to reduce the financial burden and make healthcare accessible for all.

2.2.3 The relationship between health insurance and primary healthcare utilization

This section will provide a summary of findings from previous research on the relationship between health insurance and primary healthcare utilization. It is important to look at this relationship in both developed and developing countries because it provides context-specific

insights. Measuring the impact of health insurance on healthcare utilization is challenging as there are pre-existing differences between those who have insurance and those who do not (Finkelstein et al., 2011). Factors like age, income, travel distance, or health are all expected to be correlated with, in this case, the utilization of PHC. An influential randomized control trial conducted to test the relationship between health insurance and PHC utilization is the Oregon Health Insurance Experiment. Through randomization, this study enhances internal validity and allows for a more precise analysis of the effect of health insurance (Hattab et al., 2024).

Individuals in Oregon were drawn from a waiting list and were given the chance to apply for Medicaid coverage programs. This is how the randomized Oregon Health Insurance Experiment was brought about (Allen et al., 2013). The main finding of this experiment is that those who obtained health coverage had significantly higher healthcare utilization across all three levels of care and lower out-of-pocket payments (Finkelstein et al., 2011).

Another study by Shen et al. (2020) explores a different setting. The authors find that in a developed city in China, a change in cost-sharing significantly increased primary-care utilization, but it decreased utilization in other healthcare levels. The intention of this policy change was to incentivize individuals to use primary healthcare services as a strategic way to improve overall health.

In the context of developing countries, Demissie & Negeri (2020) find that in Ethiopia, Community-based health insurance had a positive effect on primary healthcare utilization. They also found that individuals used more services from public providers compared to private providers. Likewise, Astuti et al. (2024) show a significant correlation between having a health insurance membership and the utilization of primary healthcare services in Indonesia. Thuong et al. (2020) found that having insurance increased the probability (5%) of primary healthcare visits in Vietnam. For inpatient care however, there was a smaller increase in the probability to visit (2%).

In a study conducted by Ugbor et al. (2021), it was found that for Nigerian women who participated in the Community Health Insurance Scheme, PHC utilization increased compared to those who did not participate. Moreover, their findings show that the women who participated in the CHIS were more likely to have antenatal care visits. The authors conclude that having health insurance improves the healthcare utilization patterns of women in Nigeria through a reduction of OOP payments.

Chapter 3: Methodology

In this study, the dependent variable can either be 0 or 1, meaning that one has or has not used primary healthcare. When dealing with such binary outcome variables, a Probit model can be used. This study will follow a similar methodology path as Gibbons & Wilcox (1997) who use a multivariate Probit analysis to determine the effect of insurance coverage on healthcare utilization. This model gives the probability estimates for the use of primary healthcare conditional on health insurance and other control variables.

The model is written as:

$$p_i = P(primary_{healthcare} = 1|X) = \phi(\beta 0 + \beta 1 * health\ insurance + \beta_2 X_i)$$

In the equation above, it is important to note that $0 < p_i < 1$. Moreover, the phi symbol (ϕ) indicates the cumulative standard normal distribution. The first term of the equation ($\beta 0$), captures the constant term, and $\beta 1$ is the coefficient of the main independent variable, health insurance. X_i reflects all the control variables that are included in the model to better explain primary healthcare utilization. To be precise, the model includes demographic variables such as (gender, age, marital status), socioeconomic (education), and other health-related variables (OOP spending on health).

Three Probit regressions are conducted. The first includes only those individuals who did not suffer an illness. The results from this regression can infer whether individuals seek primary healthcare services to prevent illness or regularly check on their health. The second regression includes only those who did suffer an illness. It is important to mention that the variable indicating illness cannot be included in the regression as a control due to high collinearity. The third regression is the same as the second, however, a new control variable will be added, namely the total out-of-pocket expenditures. It should be noted that the coefficients obtained from the Probit regression do not directly give the change in probability. Hence, to interpret the results, the marginalized effects of the Probit regressions are estimated.

In addition, the differences in OOP spending between rural and urban residents will be observed. To derive the results, two-sampled t-tests with equal variances are used for each category of OOP expenditures

Chapter 4: Data

4.1. Sample

The data used for this study was collected from The World Bank's household survey, Living Standard Measurement Study (LSMS)[2] for Nigeria. LSMS serves as a household survey program that aims to ensure the quality of microdata. Wave 4, corresponding to the period 2018/2019, is used. The household survey is completed for each individual in every household and consists of different sections, each including multiple questions. For this study, data from the (1) demographics, (2) education, (3) labour, and (4) health sections were used. From each section the variables of interest were collected and then merged into one dataset using the household and individual code as common identifiers. This process was done using STATA. There are 30,337 observations ranging from the age of 0 to 100.

4.2 Variables

The chosen dependent variable is primary healthcare utilization at the individual level. This is a binary variable. Individuals are asked whether they used primary healthcare services during the past four weeks. The main independent variable is health insurance, and it is also binary variable indicating whether the individual possesses health insurance or not. Moreover, to ensure better estimation of the effects of insurance, a number of important control variables, which may affect PHC utilization are included.

1. *Demographic variables:* Age, gender, marital status, and location of residence are chosen as variables to include in the analysis. Different age groups have different health needs and therefore healthcare utilization patterns. This study divides the age variable into three categories: age below 35, age below 65, and age above 65. Gender is important to include, as previous findings have shown that women are more prone to contact general practitioners, preventative checkups, and outpatient consultations regarding maternal health (Glaesmer et al., 2012). Marital status can be related to the ownership of health insurance. In some cases, one working house member can get employee insurance which also benefits the whole household. The location, in this case,

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is whether the individual lives in a rural or urban area. This is derived from the Local Government Area (LGA) code provided in the data.

2. *Socioeconomic variables:* Education is another important variable to include in the Probit regression. Empirical evidence shows that those individuals with low levels of education or no education at all tend to use healthcare services less, especially in rural areas where education opportunities are scarce (Agyemang & Asibey, 2018).

3. *Health variables:* Besides the primary healthcare utilization, four other health related variables are chosen. Firstly, the variable illness, which indicates whether the individual has suffered an illness during the past 4 weeks is very useful for the analysis. Although this variable is not included as a control in the model due to high collinearity, it is used to separately analyze individuals in two groups, those who did suffer an illness and those who did not. The Probit model, including only those individuals who were not sick during the past 4 weeks can show utilization patterns regarding preventative primary healthcare services, such as regular checkups or consultations. Moreover, three separate variables on OOP expenditures will be used to test whether there are differences between rural and urban residents. This OOP expenditures include payment for consultation, transportation, and medicine over the counter. These three variables will not be included separately in the model. Instead, a new variable is created to use in the model. This variable gives the total OOP expenditures by adding the three variables above.

Table 1: Definition of variables

Variable	Definition
Primary healthcare	1=Used primary healthcare services during the past 4 weeks 0=Did not use primary healthcare services during the past 4 weeks
Health insurance	1=Has Health Insurance 0=Does not have Health insurance
Gender	1=female 0=male
Education	1=Has obtained any level of education

0=Has not obtained any level of education

Rural   1= Lives in rural area

0=Lives in urban area

Illness   1=Has suffered any illness the past 4 weeks

0=Has not suffered any illness the past 4 weeks

Age   age_below_35; age_below_65(between 35 & 65); age_above_65(reference category)

Marital_Status   1= Individual is married or in an informal union

0=Individual is divorces, separated, widowed or never married

Oop_consult   Out-of-pocket expenditures for the consultation

Oop_medicine   Out-of-pocket expenditures for medicine over the counter

Oop_transport   Out-of-pocket expenditures for transportation to primary healthcare center

Oop_total   Total out-of-pocket expenditures (oop_consult, oop_medicine, oop_transport)

4.3 Descriptive Statistics

Table 2: Descriptive Statistics

Variable	Mean	Standard Deviation	Min	Max
Primary healthcare	0.178	0.383	0	1
Health insurance	0.025	0.157	0	1
Gender (female=1, male=0)	0.503	0.500	0	1
Education	0.777	0.416	0	1
Rural	0.715	0.451	0	1
Illness	0.093	0.291	0	1
age_below_35	0.634	0.481	0	1
age_below 65	0.198	0.398	0	1
age_above_65	0.167	0.373	0	1
Marital_status	0.483	0.500	0	1
Oop_consult	400.971	2012.629	0	50000
Oop_medicine	1740.576	3881.687	20	117000
Oop_transport	189.698	469.9903	0	12000
Oop_total	2852.602	5528.076	25	121200
Number of Observations	30,337			

As shown in Table 2, only 17.8% used primary healthcare services and only 2.5% have health insurance. Health insurance also has a very low standard deviation which suggests that there is not a lot of variability. Regarding gender, it can be seen that 50.3% of the sample are females. This suggests a balanced distribution of both genders. Furthermore, the mean of education is considerably high, with (77.7%) having attended school. It is important to note that a large portion (71.5%) of the sample resides in rural areas. Moreover, there is a low percentage (9.3%) of individuals who reported suffering from illness. It can be seen that the majority of the sample is below the age of 35 (63.4%), followed by 19.8% being between the age of 35 and 65 and 16.7% being above the age of 65. Regarding marital status, almost half (48.3%) of the observations are married or in informal unions. The rest are either divorced, separated, widowed, or never married. Out of the three OOP expenditures, the average expenditure for medicine is the highest, 1740.576 Nigerian Naira (NGN). The maximum paid for medicine was 117000 NGN. The average OOP expenditure for the consultation is 400.971 NGN, and for transportation, the average OOP expenditure is 189.698 NGN. On average, the total OOP expenditures are 2852.602 NGN.

Chapter 5: Results

This chapter provides a detailed explanation of the results. Three two-sample t-tests with equal variances were conducted, as well as three Probit regressions followed by the estimation of the marginal effects.

5.1 Urban-rural differences in OOP payments for consultation

Table 3 shows the results of the t-test for OOP consultation payments. The mean OOP payments for rural residents (403.040 NGN) is higher than the mean for urban residents (395.434 NGN). The p-value (0.9004) appears to be higher than 0.05, meaning that there are no significant differences. Hence, there is not enough statistical evidence to reject the two-sided null hypothesis that there are no differences in OOP consultation payments between rural and urban residents.

Table 3: Urban-rural differences in OOP payments for consultation

	Mean	Std. deviation	[95% conf. interval]	
Urban	395.434	1749.752	307.021	483.848
Rural	403.040	2102.55	338.114	467.966
Difference	-7.605		-126.74	111.529

No. obs = 5,538
t value = -0.125
df = 5536
P - value = 0.9004

Note: Table 5 presents the results of the two-sample t-test with equal variances. It aims to test whether there are differences in OOP consultation payments between rural and urban residents. In column 1 the mean for urban and rural is presented together with the mean difference. The second and third columns present the standard deviations and 95% confidence intervals, respectively. Degrees of freedom = df.

5.2 Urban-rural differences in OOP payments for transportation

Table 4 presents the results of the two-sample t-test for OOP transportation payments. For rural residents, the mean is 202.297 NGN, and it is higher than the mean for urban residents (156.091 NGN). The p-value obtained, which is less than 0.05, shows that there are indeed significant differences in OOP transportation payments. Thus, the null hypothesis stating that there are no significant differences can be rejected. This result makes sense as those who live in rural areas, far from accessible and quality healthcare, endure more financial burden to get to clinics.

Table 4: Urban-rural differences in OOP payments for transportation

	Mean	Std. deviation	[95% conf. interval]	
Urban	156.091	382.313	307.021	483.848
Rural	202.297	498.364	338.114	467.966
Difference	-46.206		-74.523	-17.888

No. obs = 5,329
t value = -3.199
df = 5327
P - value = 0.0014

Note: Table 5 presents the results of the two-sample t-test with equal variances. It aims to test whether there are differences in OOP transportation payments between rural and urban residents. In column 1 the mean for urban and rural is presented together with the mean difference. The second and third columns present the standard deviations and 95% confidence intervals, respectively. Degrees of freedom = df.

5.3 Urban-rural differences in OOP payments for medicine

Table 5 shows the results of the t-test for OOP medicine payments. The mean OOP medicine payments for rural and urban residents are 1742.882 NGN and 1735.302 NGN. By looking at the p-value (0.9363), which is higher than 0.05, it can be concluded that there are no significant differences, and thus the null hypothesis cannot be rejected.

Table 5: **Urban-rural differences in OOP payments for medicine**

	Mean	Std. deviation	[95% conf. interval]	
Urban	1735.302	3389.746	307.021	483.848
Rural	1742.882	4078.507	338.114	467.966
Difference	-7.580		-193.379	178.219
No. obs = 7,924				
t value = -0.080				
df = 7922				
P - value = 0.9363				

Note: Table 5 presents the results of the two-sample t-test with equal variances. It aims to test whether there are differences in OOP medicine payments between rural and urban residents. In column 1, the mean for urban and rural is presented together with the mean difference. The second and third columns present the standard deviations and 95% confidence intervals, respectively. Degrees of freedom = df.

5.4 Probit Regression Analysis

The first column in Table 6 presents the results of the first Probit regression, which includes only those individuals in the sample who were not sick. The coefficients from Table 7 show the marginal effect of the Probit regression. These will be used to interpret the results. The number of observations is quite large, and as mentioned before (Table 2), the mean of those who suffered an illness is relatively low (9.3%). Contrary to previous findings, health insurance has a negative effect on primary healthcare utilization. The coefficient in Table 7 implies that having health insurance decreases the probability of PHC utilization by 0.1%, however, this effect is not significant. Gender, on the other hand, has a positive significant effect ($p<0.01$) on the use of primary healthcare. Being a female increases the probability of using primary healthcare by 1.2%. Likewise, marital status has a positive and significant effect ($p<0.01$). Hence, being in a marriage or informal union increases the probability of using primary healthcare by 1.4%. The education coefficient shows that having attended school increases the chances of primary healthcare utilization by 0.2%. The effect is significant at 10% level.

Furthermore, living in a rural area significantly(p<0.01) decreases the probability of PHC utilization. Regarding the age variables, the variable indicating age above 65 was omitted and serves as the reference category. In column 1, it can be seen that the coefficients of both age categories are negative. This implies that being below the age of 35 and between the ages of 25 and 65 significantly decreases the chances of using PHC.

The second column presents the results of the Probit regression including only those individuals who did suffer an illness. In this case, the number of observations decreases significantly. Similar to the first result, health insurance seems to have a negative effect, yet, it is not significant (Table 7). Moreover, being a female who has suffered an illness increases the likelihood of using PHC by 4.4%. This effect is significant at a 1% level. Likewise, being married significantly increases the probability of PHC utilization by 6.5%. Different from the result in the first column, the coefficient of education is negative but not significant. Contrary to the first regression, the coefficient of rural in this case seems to be positive but not significant. Regarding the age groups, being below 35 significantly decreases the probability of primary healthcare utilization by 3.7% when compared to the reference category. Being between the ages of 35 and 65 significantly decreases the probability of PHC utilization by 6.9%.

The third column presents the results of the Probit regression, including again only those individuals who suffered an illness and also a new control variable, namely the total out-of-pocket payments for the consultation, transportation, and medicine. Although its effect is very small, it is highly significant (p<0.01). Once again, it can be seen that health insurance has a negative effect, but it is not significant.

In summary, the marginal effects of all three Probit regressions show that health insurance has a negative, not significant effect. Gender and marital status show consistent positive and significant effects in all three regressions. Moreover, education seems to be significant and positive only in the first regression, whereas in the second and the third, the coefficients are negative and not significant. OOP payments, on the other hand, show a very small yet significant effect.

Table 6: Probit regression

	(1)	(2)	(3)
Health insurance	-0.048	-0.507	-0.634
	(0.168)	(0.427)	(0.462)
Gender	0.519***	0.376***	0.529***
	(0.068)	(0.114)	(0.150)
Marital_Status	0.635***	0.560***	0.560***
	(0.086)	(0.122)	(0.153)
Education	0.112*	-0.038	-0.065
	(0.078)	(0.136)	(0.168)
Rural	-0.364***	0.148	-0.092
	(0.061)	(0.114)	(0.145)
Age_below_35	-0.698***	-0.320**	-0.257
	(0.103)	(0.155)	(0.197)
Age_below_65	-0.725***	-0.593***	-0.471**
	(0.107)	(0.165)	(0.210)
Oop_total			0.000***
			(0.000)
Constant	-2.101	-1.570	-86154
	(0.135)	(0.203)	(0.262)
Number of Observations	12,987	1,428	761

Note: In the first column, the results for the regression (illness=0) are presented. In the second column the results for regression (illness = 1) are presented. In the third column, oop_total is added as a control in the regression (illness = 1). *p<0.1; **p<0.05; ***p<0.0.1

Table 7: Marginal effects

	(1)	(2)	(3)
Health insurance	-0.001	-0.059	-0.094
	(0.004)	(0.050)	(0.069)
Gender	0.012***	0.044***	0.079***
	(0.001)	(0.013)	(0.021)
Marital_Status	0.014***	0.065***	0.083***
	(0.002)	(0.014)	(0.021)
Education	0.002*	-0.004	-0.010
	(0.002)	(0.016)	(0.025)
Rural	-0.008***	-0.017	-0.014
	(0.001)	(0.013)	(0.022)
Age_below_35	-0.016***	-0.037**	-0.038
	(0.003)	(0.018)	(0.029)
Age_below_65	-0.017***	-0.069***	-0.070**
	(0.002)	(0.019)	(0.030)
Oop_total			0.000***
			(0.000)
Number of Observations	12,987	1,428	761

Note: *p<0.1; **p<0.05; ***p<0.0.1. Table 7 shows the marginal effects of the Probit regressions. These coefficients are used to interpret the results.

Chapter 6: Discussion

The obtained results fail to support the main hypotheses. These results can partly be explained by the limitations of this study. As shown in Table 7, in all three Probit regressions, health insurance had a negative, nonsignificant effect. A limitation that can explain this is the low frequency in the variable of health insurance. In other words, in the chosen sample the average of those who were insured is very low. Thus, this variable does not have much weight, making the results not significant. The negative coefficient, on the other hand, can be explained by several reasons. Firstly, having health insurance decreases the likelihood of using PHC because individuals may opt for specialist care and skip PHC clinics. A reason for this, which was also

mentioned throughout this paper, is the lack of trust that individuals have regarding PHC services in Nigeria (Alenoghena et al., 2014). Since they are aware of the poor quality of PHC, being covered by health insurance may lead these individuals to use other levels of care. Besides the low number of insured and the lack of trust, another reason that can explain this result is the prevalence of informal providers in Nigeria, such as traditional healers. According to (Onwujekwe et al., 2010), individuals who lived in rural areas were more likely to choose traditional medicine as the first option. In most African countries, traditional medicine is deeply rooted in the culture and is considered to be an important source of healthcare (Nasgha et al., 2020). Furthermore, the results show a positive significant effect of being a female on using PHC. This can be explained by the demand for prenatal services that women need. Regarding age, the findings show that being under the age of 65 reduces the probability of using PHC compared to older age groups. A reason for this is that younger individuals have different health statuses and health beliefs than those who are above the age of 65. Education, on the other hand, shows a positive effect only in the first regression. In the other two regressions, the results are ambiguous, showing a negative nonsignificant result. Residing in a rural area significantly decreases the chances of using PHC, as shown only in the first regression. This can be explained by the lack of adequate centers in rural areas. Individuals have to travel long distances to get to health centers. The results show a small yet significant effect of total OOP payments, indicating that when individuals pay, it makes PHC more accessible and thus increases utilization. Moreover, the results of the two-sample t-tests show that for all three categories of OOP payments, the mean was higher in rural areas. However, only the differences in OOP transportation payments were significant. This result identifies distance as a barrier to access and utilization of PHC.

6.1 Other limitations

In addition to the low average of insured individuals in the sample, another limitation regarding the data is the prevalence of missing values, which can bias the results. Moreover, the dependent variable, the utilization of PHC, is measured in a relatively short period of time, namely 4 weeks. This timeframe may not capture conventional utilization patterns. Furthermore, the internal and external validity of this study are questionable. This study establishes an association rather than a causal effect since there are other variables not present in the dataset or the model that can influence PHC utilization. The statistical method used does not ensure a causal effect. Regarding external validity, this study may be generalized to other

African countries, however, there are many differences in these fragmented systems that must be considered.

Chapter 7: Conclusions

The main aim of this study was to explore the association between health insurance and primary healthcare utilization. In conclusion, it was found that health insurance has a negative non-significant effect on PHC utilization for both groups, namely those who suffered an illness and those who did not. Moreover, the results showed no significant differences in consultation and medicine OOP payments between rural and urban residents. However, there were significant differences found in transportation OOP payments. This study can inform policymakers to design health coverage schemes more efficiently to reduce the burden of OOP payments. Moreover, this study provides insights into the gaps in the healthcare system of Nigeria, particularly the primary healthcare sectors. Thus, policymakers can make use of these findings to optimize primary healthcare centers and find new ways to allocate resources efficiently.

With regard to further research suggestions, the role of traditional medicine in countries like Nigeria and its link to primary healthcare should be investigated. It is important to understand how tradition and culture can affect patterns of healthcare utilization. Moreover, longitudinal studies that measure PHC utilization in a longer timeframe can provide a more accurate representation of changes in healthcare utilization patterns. For instance, one can measure the impact of the recent policy change in Nigeria that made health insurance mandatory for all. All in all, studying the long-term effects through statistical methods that ensure higher internal validity can give better insights into designing a more accessible and equitable healthcare system

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