

## Rural Households' Awareness and Willingness to Pay for National Health Insurance Scheme (NHIS) in Ilesha West Local Government Area, Osun State Nigeria: A Recursive Bivariate Probit Approach

Abayomi Samuel Oyekale and Adedotun Adeyeye

Department of Agricultural Economics and Extension, North-West University Mafikeng Campus, Mmbatho 2735 South Africa. [asoyekale@gmail.com](mailto:asoyekale@gmail.com)

Department of Agricultural Economics, University of Ibadan, Ibadan, Nigeria.

**Abstract:** The Nigerian health policy seeks to ensure adequate access of the population to affordable and quality healthcare services. The NHIS seeks to complement efforts already put in place for achieving this goal. This paper therefore analyzed the factors influencing awareness and willingness to pay for NHIS in rural Nigeria. The data were collected with structured questionnaires using multi-stage sampling method. Data were analyzed using Recursive Bivariate Probit model. Results show that 47.27 percent of the respondents were using general (public) hospital while 15.45 percent were not using medical treatments. Also, 54.55 percent of the households were aware of NHIS whereas 71.82 percent were willing to pay. Awareness and willingness to pay were negatively correlated although both were positively and significantly influenced by years of education and sick time ( $p < 0.10$ ). It was concluded that efforts to properly educate rural people can facilitate subscription into the program.

[Abayomi Samuel Oyekale and Adedotun Adeyeye. **Rural Households' Awareness and Willingness to Pay for National Health Insurance Scheme (NHIS) in Ilesha West Local Government Area, Osun State Nigeria: A Recursive Bivariate Probit Approach.** *Life Sci J* 2012;9(4):2086-2093] (ISSN:1097-8135).  
<http://www.lifesciencesite.com>. 312

**Keywords:** health insurance, willingness to pay, awareness, Recursive Bivariate Probit

### 1. Introduction

The objective of the Nigerian national health policy is attainment of a level of health that will enable all citizens to achieve socially and economically productive lives. In order to achieve this, the National Health Insurance Scheme (NHIS) was established under the Federal Government of Nigeria Act 35 of 1999. Health insurance is social security system that guarantees access to healthcare services from funds created by pooling monthly contributions of all participants. Thus, health insurance scheme aims to mobilize resources in a sustainable manner for the provision of accessible and quality health care for every Nigerian irrespective of status (Benneth and Gilson, 2001; Bossert *et al.*, 2003).

Conceptually, health is a fundamental dimension of human well-being. The World Health Organization (WHO) defined it as a state of complete physical, mental and social well-being and not merely absence of diseases or infirmities (WHO, 1946). Good health is instrumental for improving other dimensions of human life (Dollar, 2001). Although traditional economists measured well-being in monetary term, health indicators are direct measures of well-being. Other factors that impact households' health include household assets, human capital, leisure time use, structure and stability of family, healthy practices, income level and stability, relative prices of essential goods, public health expenditure and uptake of health insurance.

In an economic perspective, an individual's propensity to utilize healthcare is determined by the costs of utilization and the perceived benefits of health care. Since costs are mainly determined by the allocation of healthcare resources, utilization will in practice be determined by the interaction between demand and provision of health care (Mc-Guire *et al.*, 1988). The provision of health care determines the availability of health care resources. The price of health care is occasionally a result of market "outcome" but more commonly the government regulates it. Similarly, public policies often determine the location of facilities, budgets, waiting times, among others.

Demand for health care, on the other hand depends on several factors of which some are interrelated. The individual's attitudes, perceptions and decisions are important determinants of health care utilization, with respect to the initial contact with a healthcare provider. Influential factors on demand for health care are health status, income and education (Grossman, 1992). An individual's health status will of course greatly affect her or his perceived benefit of medical treatment. However, perceived benefit is also influenced by education (Habtom and Ruys, 2007).

In developing countries, households that are headed by an individual with secondary level of education or higher would more likely be willing to seek health care (Diop *et al.*, 1998). Income is important since it determines ability to pay and it

influences earnings foregone when seeking care. Benefits and costs of treatment may be expected to vary with age and gender because of differences in health status and work productivity. Finally, individual differ in preferences and personal taste, and to the extent that education influence preferences this may lead to systematic socio-economic differences (Gottret and Schreber, 2006).

Many production and consumption decisions are made at the household decisions. This implies that the utilization of individual household members depend on household factors, including relation to other household members and their characteristics. The family can be viewed as the producer of health rather than the individual (Jacobson, 1999) and utilization of health care depends on household income etc. Furthermore, decisions are influenced by several intra-household factors. It has been shown that the education of the member of a household have an influence on the other household members health-related behaviour, such as health care utilization (Gilson and McIntyre, 2005).

Most researches on utilization of healthcare are concentrated on the individual as the customer of health, however much speak for viewing the household as the main producer of health and consumer of health care. This may be even more important to take into account when analyzing utilization in African countries, where the family union is stronger and the dependency ratio higher. Utilization is measured in terms of expenditure on health care. However, the determination of health care expenditure is done by individuals and the households in which they reside, given their resources and the prices that they face. Studies of utilization of health care generally use the individual as the unit of analysis. Much of this work has taken its point of departure in Grossman's seminar work (1972), where he argued that the individual produces the commodity "good health". This commodity is part of the individual's human capital and affects the total amount of time the individual can spend on productive activities. Even if Grossman's work provided the field of health economics with great input, it lacked the fact that individuals are household members and take much influence from (willing or not willing) from other household members.

Income and education are among the most important factors influencing health care utilization. However, other factors such as age also influence utilization since age reflects on perceived benefit and income. There have been a number of studies showing relationship between household income and utilization, of health care. However, all these have shown that the income elasticity is rather high, in developing countries. Utilization of healthcare is in

practice very much influenced by decisions by the provider, physicians' advice among others (Grossman, 1972).

The objective of this paper is to determine the interrelationship between awareness about NHIS and willingness to pay among rural households. This can be motivated from the fact that as a new policy initiative in the Nigerian health sector, NHIS adoption can boost access of people to healthcare services with immense welfare impact. The paper therefore determined the key factors that influence awareness and willingness to pay for NHIS with adequate correction of endogeneity. In the remaining parts of the paper, the methodology, results and finding and conclusion have been presented.

## **Materials and methods**

### **Area of study and sampling procedures**

The study was conducted in Ilesha West Local Government which was created from the old Ilesha local government in November 1996. Ilesha enjoys an average rainfall of 1300 mm per annum. The local government is geographically located on latitude  $7^{\circ} 37' 12''$  North and longitude  $4^{\circ} 44' 24''$  East. The local government is divided into 10 wards namely, Egbedi (ward 1), Cocacola (ward 2), Okeola (ward 3), Omofe (ward 4), Isokun (ward 5), Ikoti (ward 6), Ilaje (ward 7), Odo Esira (ward 8), Ereja (ward 9) and Oke-Ese (ward 10). The inhabitants are predominantly Yoruba speaking people with Ijesha accent.

The target populations for this study were the households in Ilesha West Local Government. Multi stage stratified random sampling technique was used. The first stage was selection of one local government area (Ilesha West) from the two local government areas that make up Ilesha town. The second stage involves the selection of ten political wards that make up Ilesha West Local Government, while the third stage involved selection of eleven (11) households from each of the ward by random sampling procedure. A total number of one hundred and ten households were selected randomly, with sample size distributed proportionate to size of the wards. Willingness of the respondents (household heads) to pay for health insurance scheme was elicited by randomly giving them bids that ranged between ₦120- 150.

### **Estimated model**

The Seemingly Unrelated Bivariate Probit (SUBP) was used to determine the factors that influence the probability of rural households' awareness and willingness to pay for NHIS. It was noted that willingness to pay and awareness can operate in a recursive manner, thereby implying that one of them is endogenous dependent variable. We first tested the endogeneity of awareness in the

willingness to pay model, which statistical insignificance of rho rejected. It was then proposed that awareness could as be influenced by willingness to pay. Therefore, if this holds, our estimated parameters from Probit regression will not meet the conventional conditions for being Best Linear Unbiased Estimate (BLUE). We estimated a recursive bivariate model based on propositions by Maddala (1983). The structural form of the model can be stated as:

$$Q_{i1} = \alpha + \beta_i \sum_{i=1}^n X_i + v_i \quad 1$$

$$Q_{i2} = \gamma + Q_{i1} + \delta_i \sum_{i=1}^n X_i + z_i \quad 2$$

$Q_{i1}$  and  $Q_{i2}$  are latent variables of willingness to pay and awareness about NHIS respectively. These variables are dummy variables with values of 1 if willing to pay for NHIS and 0 otherwise for equation 1 and values of 1 if aware of NHIS and 0 otherwise for equation 2. Also,  $\alpha, \beta, \gamma, \delta$  are the estimated parameters and  $X_i$  are the socio-economic variables of rural households. Included explanatory variables are farming (yes = 1, 0 otherwise), sex (male =1, 0 otherwise), age (years), years of education, household size, total monthly earnings (N), sick time in a month, malaria in the past one week (yes = 1, 0 otherwise), high blood pressure in the last one month (yes = 1, 0 otherwise), treatment cost of disease (N), affordability of the scheme (yes = 1, 0 otherwise), workability of the scheme (yes = 1, 0 otherwise), visit hospitals (yes = 1, 0 otherwise), scheme has coverage for all family members (yes = 1, 0 otherwise), cost is okay (yes = 1, 0 otherwise) and prefers pre-paid health system (yes = 1, 0 otherwise). The error terms of the model are dependent and distributed as a bivariate normal such that:  $E(v_i) = E(z_i) = 0$ ,  $var(v_i) = var(z_i) = 1$  and  $\rho = cov(v_i, z_i)$ . The Wald test, which is reflected by statistical significance of  $\rho$  was used to determine whether the models would be best estimated jointly in a recursive manner or not.

## Results and Discussions

### Descriptive Analysis of Household Head Socio-Economic Characteristics

Table 1 shows that 80.9 percent of the respondents are males. This is expected in typical Nigerian family setting where the man heads the house except he is dead or on transfer. Also, 18.2 percent of the respondents had no formal education, 26.4 percent had primary education, while 32.7 percent had tertiary education. Average year of

schooling is 8.97 for all the respondents with standard deviation of 5.96. The age distribution of the respondents is also provided in table 1. It shows that 34.55 percent of the household heads falls into age group 40<50 years while 30.00 percent belongs to 30<40 years. Also, the aged in the range of  $\geq 60$  years constitute 14.55 percent whereas the youth that were less than 30 years accounts for 7.27 percent of the respondents. Average age of all the respondents is 44.37 years with standard of 11.86. Distribution of household size shows that majority of the households (52.73 percent) had 1-4 members, while 37.27 percent had 5-8 members. Average household size is 5.00 with standard deviation of 3.23.

Table 1: Socio-economic characteristics of the respondents

Socio-economic characteristics	Frequency	Percentage
<i>Sex of household heads</i>		
Male	89	80.9
Female	21	19.1
<i>Education</i>		
No formal education	20	18.2
Primary school	29	26.4
Secondary school	25	22.7
Tertiary	36	32.7
<i>Age</i>		
20<30	8	7.27
30<40	33	30.00
40<50	38	34.55
50<60	15	13.64
$\geq 60$	16	14.55
<i>Household size</i>		
1-4	58	52.73
5-8	41	37.27
9-12	7	6.36
$\geq 13$	4	3.64

Source: Field survey, 2008

### Healthcare choices and assessment of their present state

Table 2: Healthcare service choices

Healthcare Provider	Frequency	Percentage
General hospital	52	47.27
Mission hospital	11	10.00
Private hospital	24	21.82
Primary health care centers	6	5.45
None	17	15.45

Source: Field survey, 2008

Results in table 2 show that 15.45 percent of the respondents was not using any health centers and therefore unable to provide assessment of health facilities. Also, 47.27 percent of the households was using publicly owned general hospitals, while 21.82 percent was using private hospitals. Similarly, 10.00 percent and 5.45 percent of the respondents had preferences for mission hospitals and public primary

healthcare centers respectively. This shows that public hospitals were in highest demand possibly due to lowest cost charges and efficiency of services. It should be noted that implementation guidelines of NHIS requires availability of public hospitals. Therefore, there is not going to be implementation difficulty in the local government.

Table 3: Adequacy of healthcare centers based on buildings

Healthcare Providers	Poor	Fair	Average	Good	Excellence	All
General hospital	0.91	3.64	8.18	28.18	6.36	47.27
Mission hospital	0.00	0.00	1.82	3.64	0.00	5.45
Private hospital	0.00	0.91	5.45	7.27	5.45	19.09
Private maternity/clinics	0.00	0.91	3.64	5.45	0.00	10.00
Primary health care centers	0.91	0.00	1.82	2.73	0.00	5.45
Total	1.82	5.45	20.91	47.27	11.82	87.27

Source: Field survey, 2008

Table 3 shows that 28.18 percent of the respondents indicated that the building structures of general hospitals are good while 6.36 percent ranked them as excellent. Also, 3.64 percent of the respondents ranked general public hospitals as fair while 0.91 percent indicated that it was poor. The private hospitals were ranked as good by 7.27 percent

of the respondents, while 5.45 percent indicated that it was excellent. Private maternity/clinics were ranked as good by 5.45 percent of the respondents. The table also shows that 47.27 percent of the respondents ranked the health centers buildings as good, while 11.82 percent ranked them as excellent.

Table 4: Adequacy of healthcare center ranking based on number of staff

Healthcare Providers	Poor	Fair	Average	Good	Excellence	All
General hospital	0.00	1.82	11.82	30.00	3.64	47.27
Mission hospital	0.00	0.91	0.91	3.64	0.00	5.45
Private hospital	0.00	0.91	2.73	10.91	4.55	19.09
Private maternity/clinics	0.91	0.00	1.82	7.27	0.00	10.00
Primary health care centers	0.91	0.00	0.91	3.64	0.00	5.45
Total	1.82	3.64	18.18	55.45	8.18	87.27

Source: Field survey, 2008

Table 4 shows that 30 percent and 3.64 percent of the respondents ranked general hospital as good and excellent respectively based on adequacy of number of staff. Also, 10.91 percent and 4.55 percent of the respondents indicated that private hospitals

were in good and excellent conditions respectively. In all, 55.45 percent indicated that health centers were in good condition while 8.18 percent noted that they were in excellent condition.

Table 5: Adequacy of healthcare center ranking based on staff competency

Healthcare Providers	Poor	Fair	Average	Good	Excellence	All
General hospital	1.82	7.27	4.55	30.00	3.64	47.27
Mission hospital	0.00	0.00	0.91	4.55	0.00	5.45
Private hospital	0.00	3.64	1.82	9.09	4.55	19.09
Private maternity/clinics	0.00	1.82	1.82	5.45	0.91	10.00
Primary health care centers	0.00	0.00	0.00	4.55	0.91	5.45
Total	1.82	12.73	9.09	53.64	10.00	87.27

Source: Field survey, 2008

Table 5 shows that 30 percent and 3.64 percent of the respondents ranked general hospital as good and excellent respectively based on staff competency. Also, 9.09 percent and 4.55 percent of the respondents indicated that based on staff

competency private hospitals were in good and excellent conditions respectively. In all, 53.64 percent of the respondents ranked health centers' staff to be good while 8.18 percent noted that they were excellent.

Table 6: Adequacy of healthcare center ranking based on standard of services

Healthcare Providers	Poor	Fair	Average	Good	Excellence	All
General hospital	2.73	5.45	9.09	22.73	7.27	47.27
Mission hospital	0.00	0.91	0.00	4.55	0.00	5.45
Private hospital	0.91	0.91	4.55	10.00	2.73	19.09
Private maternity/clinics	0.00	0.91	1.82	7.27	0.00	10.00
Primary health care centers	0.00	0.00	3.64	1.82	0.00	5.45
Total	3.64	8.18	19.09	46.36	10.00	87.27

Source: Field survey, 2008

Table 6 shows that 22.73 percent and 7.27 percent of the respondents ranked general hospital as good and excellent respectively based on adequacy of standard of services. Also, 10.00 percent and 2.73 percent of the respondents indicated that standard of

services in private hospitals were in good and excellent conditions respectively. In all, 46.36 percent indicated that standard of services in the health centers were in good condition, while 10.00 percent noted that they were in excellent condition.

Table 7: Adequacy of healthcare center ranking based on cost of services

Healthcare Providers	Poor	Fair	Average	Good	Excellence	All
General hospital	2.73	6.36	10.00	23.64	4.55	47.27
Mission hospital	0.00	0.91	1.82	2.73	0.00	5.45
Private hospital	1.82	0.00	7.27	5.45	4.55	19.09
Private maternity/clinics	1.82	0.91	5.45	1.82	0.00	10.00
Primary health care centers	0.00	1.82	0.91	2.73	0.00	5.45
Total	6.36	10.00	25.45	36.36	9.09	87.27

Source: Field survey, 2008

Table 7 shows that 23.64 percent and 4.55 percent of the respondents ranked general hospital as good and excellent respectively based on cost of services. Also, 5.45 percent and 4.55 percent of the respondents indicated that cost of services in private

hospitals were good and excellent respectively. In all, 36.36 percent indicated that cost of services in the health centers were good, while 9.09 percent noted that they were excellent.

Table 8: Adequacy of healthcare center ranking based on drug availability

Healthcare Providers	Poor	Fair	Average	Good	Excellence	All
General hospital	3.64	6.36	10.00	19.09	8.18	47.27
Mission hospital	0.00	0.91	0.00	4.55	0.00	5.45
Private hospital	0.00	0.91	1.82	10.91	5.45	19.09
Private maternity/clinics	0.91	2.73	1.82	4.55	0.00	10.00
Primary health care centers	0.91	1.82	0.91	1.82	0.00	5.45
Total	5.45	12.73	14.55	40.91	13.64	87.27

Source: Field survey, 2008

Table 8 shows that 19.09 percent and 8.18 percent of the respondents ranked general hospital as good and excellent respectively based on drug availability. Also, 10.91 percent and 5.45 percent of the respondents indicated that drug availability in

private hospitals were good and excellent respectively. In all, 40.91 percent indicated that drug availability in the health centers were good, while 13.64 percent noted that it was excellent.



Table 9: Adequacy of healthcare center ranking based on timeliness in patient attendance

Healthcare Providers	Poor	Fair	Average	Good	Excellence	All
General hospital	7.27	5.45	10.00	12.73	11.82	47.27
Mission hospital	0.91	0.00	0.00	1.82	2.73	5.45
Private hospital	2.73	4.55	1.82	4.55	5.45	19.09
Private maternity/clinics	0.91	0.00	5.45	2.73	0.91	10.00
Primary health care centers	0.00	1.82	0.91	1.82	0.91	5.45
Total	11.82	11.82	18.18	22.73	21.82	87.27

Source: Field survey, 2008

Table 9 shows that 12.73 percent and 11.82 percent of the respondents ranked general hospital as good and excellent respectively based on timeliness in attending to patients. Also, 4.55 percent and 5.45 percent of the respondents indicated timeliness in attending to patients in private hospitals were good and excellent respectively. In all, 22.73 percent indicated that timeliness in attending to patients in the health centers were good, while 21.82 percent noted that it was excellent.

#### Awareness, willingness to pay for NHIS and their correlates

Table 10: Awareness about National Health Insurance Scheme (NHIS)

Awareness	Frequency	Percentage
Yes	60	54.55
No	50	45.45
Total	110	100

Source: Field survey, 2008

Table 10 shows that 54.55 percent of the respondents had heard about National Health Insurance Schemes (NHIS), while 45.45 percent were not aware at all. This means that more effort should be put in place to sensitize the aware of NHIS through the media, and social agents to most especially the farmers who may not have access to television or radio.

Table 11: Level of awareness of the respondents about NHIS

Level of Awareness	Frequency	Percentage
Very aware	20	18.18
Aware	22	20.00
Average aware	18	16.36
Not aware	50	45.45
Total	110	100

Source: Field survey, 2008

The level of awareness of National Health Insurance Schemes (NHIS) among the respondents as revealed in table 11 shows that only 18.18 percent of the sampled respondents were very aware of the schemes, while 20.00 percent were aware. Also,

16.36 percent indicated that they were just averagely aware. This could mean that the impact of NHIS is not felt by the respondents in Ilesha West.

Table 12: Willingness to pay for NHIS

Willing	Frequency	Percentage
Yes	79	71.82
No	31	28.18
Total	110	100

Source: Field survey, 2008

In table 12, 71.82 percent of the respondents were willing to pay for the scheme while 28.2 percent were not willing to pay. The respondents that did want to pay considered the scheme as a waste of money and time. Therefore, the sampled respondents that indicated willingness to pay considered the scheme to add value to their households and were optimistic about the workability of the scheme. Those that were not willing to pay viewed the scheme in the opposite.

The results of econometric analysis of the determinants of awareness and willingness to pay are presented in table 13. The model produced a good fit of the data as evidenced by statistical significance of the Wald Chi square parameters ( $p < 0.01$ ). Inclusion of willingness to pay variable in the awareness model as an explanatory variable is also justified by the statistical significance of rho ( $p < 0.01$ ). This implies that estimation of the models as ordinary Probit regression would have yielded inefficient parameters. The results of the awareness model show that awareness significantly reduces willingness to pay. This implies that those households that were aware of the scheme prior to the research were not willing to pay. This may have resulted from detailed information already had. However, years of education parameters in the two models are with positive sign and statistically significant ( $p < 0.05$ ). This implies that education increases awareness and willingness to pay. Also, the parameters of sick time have positive sign and statistically significant ( $p < 0.10$ ) in the two models. This implies that as sick time increases, awareness and willingness to pay for NHIS increases. However, those households that

perceived that the scheme is workable in Nigeria have significantly higher probability of willingness to pay ( $p < 0.05$ ). This is expected because workability is going to be a major issue of concern for subscribing. Also, those that were of the opinion that the cost is okay have significantly higher probability ( $p < 0.05$ ) of being aware about NHIS. This is also expected because access to some information about cost

denotes that the person is aware and would have compared the cost across time. Also, households that indicated that they have preference for health insurance have significantly higher probability of willing to pay. This is expected because individual's preference will connote usage and willingness to subscribe.

Table 13: Recursive bivariate results of factors influencing awareness and willingness to pay for NHIS

Variables	NHIS Awareness			Willingness to pay		
	Coef.	Standard Error	z	Coef.	Standard Error	z
wtp	-1.156183	.2583424	-4.48	-	-	-
farming	-.0256672	.8390677	-0.03	-.0062623	.8025374	-0.01
sex	.0975138	.4676084	0.21	.1287649	.573509	0.22
age	.0196959	.0140394	1.40	.0309801	.0217185	1.43
yedu	.1169209	.0293944	3.98***	.0968292	.0416303**	2.33
size	-.0052113	.2746187	-0.02	-.0072302	.3472274	-0.02
totalear	.0000185	.0000109	1.69	.0000175	.0000154	1.14
sicktime	.2684846	.1331731	2.02**	.2956125	.1573923*	1.88
malaria	-.0432113	1.119365	-0.04	9.989241	5276725	0.00
hbp	-.6864567	.4447723	-1.54	.3208926	.5234628	0.61
treatcos	-9.42e-06	.0000155	-0.61	4.80e-06	.0000161	0.30
afford	-.3539805	.5822471	-0.61	-.301715	.6468158	-0.47
workable	.6378509	.4207933	1.52	1.298384	.5524058**	2.35
visithop	.347439	.3345236	1.04	.3315481	.4696631	0.71
coverage	-.0527206	.4278181	-0.12	.1033798	.5146399	0.20
costokay	.7957769	.4030503	1.97**	.6514492	.5288412	1.23
prefer	.4781107	.4410356	1.08	1.274108	.5428131**	2.35
cons	-2.119348	.7988408	-2.65***	-3.391445	1.357496***	-2.50
athrho	15.85368	566.1558	0.03			
rho	1	3.85e-11				
Likelihood-ratio test of rho=0, chi2(1) = 12.7228 Prob > chi2 = 0.0004						
Wald chi2(33) = 71.47***						
Log likelihood = -83.772487						

## Conclusion

Workability of NHIS will offer a lot of impacts on health service utilization and delivery in Nigeria. There is no reason to doubt the fact that implementation of such scheme was long overdue. However, sustainability is a major issue that can ensure that lasting impacts are felt by the scheme. This will also translate into better well-being by the people. The major findings of this paper have pointed to the need for better awareness creation and proper education of the people about potential efficiency gains in health service delivery and utilization. Awareness was still low in the study area although this also reduced willingness to pay. There is the need for adequate education through different media for addressing low willingness to pay among those that were ever aware. Also, ensuring workability of the scheme will lead to utilization of health services through the scheme. This is vital because if the

people are not sure about the extent of its workability, it will be difficult to persuade many to subscribe.

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10/12/2012