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Eliciting the Economic Value and Preferences for Health Insurance Reform in Nigeria: Evidence from a Discrete Choice Experiment

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Abstract

National health insurance systems across the world are confronted with mounting demands for reforms to make them fit for purpose and deliver as planned. There is, however, a dire paucity of empirical evidence from which policymakers can draw inferences to make informed reform decisions. Such evidence needs to detail the economic cost as well as consumers' preferences for reforms. Using orthogonal coding to generate three attributes and a full factorial design with all three attributes having three levels each to generate 27 possible scenarios with only 9 scenarios presented to each respondent to reduce the cognitive burden, conditional logistic regression was used to estimate McFadden's discrete choice model in a discrete choice experiment conducted in Nigeria. McFadden's R^2 value of 0.5346 indicates that the model is well fitted. The Chi-squared statistic of 1057.13 shows that the estimated model has the required explanatory power and statistical significance for the attributes with

confidence level set at 95%. Results show that respondents are willing to pay for health insurance reform, opting for health insurance types with attributes that they deem would meet their needs, rather than settle for status quo health insurance. Respondents were willing to pay as high as 24% of annual income to access insurance types that have comprehensive benefits package, which indicates that risk pooling could potentially fund universal health insurance in Nigeria.

Keywords: reforms, national health insurance, stated preferences, discrete choice experiment, logistic regression, willingness-to-pay, choices, economic value

1. Introduction

Nigeria is a country in West Africa with a population density ranked as the 6th in Africa, occupying an area of 923,768 km2 (National Bureau of Statistics, 2012). Nigeria's rapid population growth with an annual growth rate of 2.6% and fertility rate of 5.6% has grave implications for its development, including the health status of citizens (Bank, 2019). The National Bureau of Statistics (2016) estimated the proportion of the population living below the national poverty line as 62.6%; the prevalence of undernourishment as 25.5%; under-five mortality rate as 89 per 1000 live births and the population covered by health insurance per 1000 inhabitants by year as 294 per 1000.

It has been established that health insurance increases access to health care, prevents out-of-pocket and catastrophic health expenditure as well as improves health outcomes, obviating the need for societies to experience abysmally poor health indices as highlighted above (McIntyre et al., 2008). As is the case with many developing nations, access to health insurance in Nigeria is limited, making the attainment of universal health coverage an uphill task. Using Lagos State which is mostly an urban and cosmopolitan society as a case study, Nwani (2015) found that the awareness, penetration, access to and coverage of health insurance is low in Nigeria.

Nigeria has an existing National Health Insurance Scheme which mainly targets the formal sector (Arin & Hongoro, 2013). There have been efforts to expand healthcare access through the implementation of programmes such as the Community-Based Social Health Insurance Programme, Tertiary Institution Social Health Insurance Programme and the Vital Contributors Social Health Insurance Programme, amongst others (Odeyemi & Nixon, 2013). Nigeria's health insurance programme is deployed through a structure comprising of a regulatory body at the national level with more than 60 accredited Health Maintenance Organizations and a list of accredited healthcare providers (Obalum & Fiberesima, 2012).

In spite of this structure and more than a decade and a half of the establishment of Nigeria's health insurance scheme, coverage remains abysmally low with less than 10% of the population enrolled (Adewole et al., 2017). Nigeria has, however, committed to the World Health Organization's agenda on Universal Health Coverage as well as the Sustainable Development Goals Framework which stipulates that no one should be left behind (Federal Republic of Nigeria, 2017).

The low uptake of health insurance in Nigeria has been attributed to a number of reasons. The benefits package, cost-sharing arrangement, inadequate resourcing, constraints with risk pooling, poor accountability for health insurance funds, weak regulatory framework and problems with the actual healthcare purchase and provision are some of the challenges that impede health insurance progress in Nigeria (Lawan et al., 2012).

1.1 Importance of Research Problem

There are increasing widespread calls for the overhaul of the health insurance programme with interventions by the Nigerian National Assembly to improve the effectiveness of the scheme (Gabriel & Oluseye, 2017). However, there is paucity, attended by a dire need of empirical evidence from which policymakers can draw inferences to make informed reform decisions. Such evidence needs to detail the economic cost as well as consumers' preferences and demands which are to be taken into account for a successful reform of the health insurance sector in Nigeria (Gustafsson-Wright & Schellekens, 2013).

A discrete choice experiment (DCE) provides the appropriate research framework for this urgently needed empirical evidence for health insurance reform (Nanna, 2011). Therefore, this study aims to determine citizens' preferences and the economic cost of health insurance reform in Nigeria using a DCE. In addition, the study aims to ascertain whether it is possible to implement a universal National Health Insurance programme in Nigeria funded by risk pooling.

This research is the first known study that set out to use a DCE to determine preferences and the value of health insurance reform in Nigeria. By providing such direly needed data, the study aim to make evidence available for policymakers who are urgently in need of reliable data to guide decision-making in their effort to reform the nation's health insurance programme and expand access to healthcare. The data generated by the study is envisaged to be a substantial contribution to the body of knowledge, thereby bridging the data gap that hinders development.

1.2 Literature Review

Health Insurance is a mechanism established to ensure guaranteed access to healthcare when insured participants pay periodic premiums to offset the cost of health services (Adefolaju, 2014). Health Insurance fosters equity in healthcare access and allows the poor and vulnerable who live at the margins of society to improve their health outcomes (Sanusi & Awe, 2009). In addition, health insurance broadens the sources of health care financing, reduces dependence and pressure on government budget, increases financial resources for healthcare, harnesses private sector participation and entrenches justice and human rights in the body polity (Adefolaju, 2014). Health insurance not only reduces the widespread occurrence of out-of-pocket payment for health services but it also prevents catastrophic health expenditure, defined as having to spend 20 percent or more of non-subsistence income on healthcare (Arin & Hongoro, 2013).

A number of health insurance models exist to cater to the needs of several segments in society. The Bismarck model of health insurance was created in the 19th Century when the German

Chancellor at the time established a social health insurance system to mitigate the risks experienced by workers, including adverse health risks (Kutzin et al., 2009). The Beveridge model was, however, founded on a mandatory tax-funded system that ensures that the British population has unfettered access to health services (Kutzin et al., 2009). Many countries in the developing world have fashioned their health care systems as variants of these social health insurance financing options in order to meet the urgent healthcare needs of their people.

The Nigerian National Health Insurance Scheme (NHIS), founded in 2005 by Act 35 of the 1999 Nigerian Constitution is a variant of the United Kingdom's NHS (Adibe et al., 2011). One of the main aims of creating the NHIS is to ensure that every Nigerian is able to access quality, affordable healthcare services through the payment of capitation to accredited healthcare providers through Health Maintenance Organizations. As is the case with the NHS, the NHIS was established with the vision of reaching all citizens since pooling of resources would ensure that the poor's access to health services is subsidized. The financing mechanism for the Scheme is, however, not as robust as the NHS' as the former is not tax-based or made mandatory.

There are other drawbacks to the successful implementation of health insurance programmes in resource-poor settings. One of these is the fact that developing economies are characterized by a large proportion of citizens in the informal sector who are not able to participate in the formal economy which is a condition contingent on successful implementation (Durairaj et al., 2010). Another limitation arises as a result of the rudimentary nature of the financial institutions of developing economies with weak social protection, narrow tax base, incomplete registry of citizens and inefficient resource collection and pooling mechanisms.

Health insurance is based on the assumption that individuals are risk averse and would take rational steps to prevent future adversity. Individuals are thus willing to contribute regular premiums to prevent ill health. While many are willing, not all are able to contribute the pre-paid revenues for health services such as taxes, compulsory insurance contributions or voluntary insurance payments, amongst others (Evans & Etienne, 2010). Pooling ensures that funds collected for health insurance are aggregated into a single source or resource basket from which the population – whether they contribute to the pool or not - can draw from to finance health services. Pooling thus spreads risks so that the sick is subsidized by the healthy, the poor by the rich and the old by the young (McIntyre, 2008). Fragmentation occurs when there are multiple, non-consolidated sources of funds to draw from and when the redistribution of pooled funds is hampered by inefficiencies that limit the protection of the entire population against financial risk and catastrophic health expenditure (Evans & Etienne, 2010). Fund management in the Nigerian Health Insurance Scheme is fragmented as many of the private enrollees using the Health Maintenance Organizations' services pay directly to them with the attendant moral hazard with the result that the margins on such payments are regarded and dispensed with as economic rents by the HMOs.

The Sustainable Development Goals Declaration stipulates that no one should be left behind in development efforts with Target 3.8 urging Member States to "Achieve universal health

coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all". Indicator 3.8.2 is a metric to estimate the "Proportion of population with large household expenditures on health as a share of total household expenditure or income" (United Nations, 2015). Earlier development paradigms such as the Millennium Development Goals (MDGs) and other Internationally Agreed Development Goals (IADGs) also emphasized the place of health insurance in improving health outcomes (Declaration, 2000). The WHO established that countries will reach their goals of universal coverage if they defragment, consolidate and pool their financial resources for health services. Addressing the three fundamental and interrelated constraints that impede progress on universal coverage such as inadequacy of resources, overreliance on direct payments, and the inefficient and inequitable use of resources will be crucial for success (Evans & Etienne, 2010).

Okpani & Abimbola (2015), both of the Nigerian National Primary Healthcare Development Agency, identified system-wide inequities resulting from lack of financial protection of most Nigerians as a major challenge impeding progress towards the attainment of Universal Healthcare Coverage. They classified the Nigerian health system as being largely public sector driven with some private sector involvement that see citizens access care at more than 34,000 health facilities, 66% of which are owned by the three tiers of Government. They estimated government expenditure on health as a percentage of total government expenditure as 7.2%, private prepaid plans as a percentage of private expenditure on health at only 3% and private out-of-pocket expenditure as a percentage of total expenditure on health at an alarming 70%. They suggested that the current situation where the Federal Government is mainly responsible for the administration and deployment of the National Health Insurance Scheme is simply not sustainable, proposing the establishment of an Insurance Fund, devolution of the insurance system to subnational governments but at the same time encouraging greater pooling through an improved premium collection and risk equalization mechanism.

Onwujekwe et al. (2011), however, suggested that a mix of different types of insurance schemes with comprehensive benefits packages is what is needed for Universal Health Coverage in Nigeria. The positions held by Okpani & Abimbola (2015) as well as Onwujekwe et al. (2011) are in agreement with findings and recommendations by the WHO as highlighted previously. Therefore, to expand universal healthcare access through health insurance, it is crucial to increase both the quality and quantity of the suites of benefits in different packages presented to enrollees. Indeed, it is the case that the widespread apathy of the majority of Nigerians to the NHIS as well as the attendant low uptake are mainly due to the problems perceived in relation to choices presented, health insurance funds management and the appropriateness of the annual premiums demanded of enrollees. Thus, the successful implementation of any health insurance programme in Nigeria is contingent on the adequate treatment of these issues.

Ideally, health systems should be designed to supply services demanded by users in order to foster sustainability. In many countries and especially in emerging economies, health services are usually planned, implemented, funded, managed and reviewed after the requisite due diligence has been completed. Part of ensuring due process is the recommendation that the

preferences of consumers be determined beforehand so as to design efficient health systems. Where the preferences of users with regards to benefits package, health insurance administration, funds management, premium levels, amongst others, are taken into cognizance in planning health systems, the outcomes are usually better (Mooney, 2003; Dong et al., 2005 & De Allegri et al., 2006).

Stated Preference approaches such as the Contingent Valuation method, Conjoint Analysis and Discrete Choice Experiments have been used not only to determine consumer preferences but also to evaluate Willingness-to-pay (WTP) which is a measure of economic cost. While the Contingent Valuation method has some weaknesses such as starting point bias and the occurrence of a large number of protest votes, the Discrete Choice Experiment performs better at these in that the respondents undergo a choice selection process where these weaknesses do not affect the outcomes of the experiment (Zweifel et al., 2006). However, scenario mis-specification and incentives to misrepresent responses as found in under- or over-estimation of Willingness-to-Pay are potential drawbacks of DCEs (Lancsar & Louviere, 2006).

Based on the Random Utility Theory, the Discrete Choice Experiment (DCE) is a technique that has been used widely in the developed economies to determine consumers' preferences and willingness to pay for health services through health insurance (Bergrath et al., 2014). DCE presents hypothetical market profiles often referred to as attributes and attribute levels to consumers to determine their preferences. The assumptions of the Random Utility Theory play a significant role in choice selection by consumers as they consistently select utility-maximizing bundles of goods at certain prices and income levels given their budget constraints. Becker and Zweifel (2008) as well as Nguyen et al. (2017) used Discrete Choice Experiments to successfully determine consumers' preferences for health insurance packages in Europe and Asia respectively while Obse (2016) used the technique to elicit preferences for social health insurance in Ethiopia. There is no known study that has used DCE to determine preferences and willingness to pay for health insurance reform in Nigeria.

1.3 Research Questions and Objectives

The following are questions are addressed by this research:

i. What is the economic value, measured by Willingness to Pay, of health insurance reform in Nigeria?

ii. Which are the main preferences demanded by consumers for the reform of the National Health Insurance Scheme?

iii. Is universal health care, funded by risk pooling, feasible in Nigeria?

The specific objectives of the study are to:

i. Determine the cost of health insurance reform in Nigeria;

ii. Ascertain the attribute and attribute levels of the National Health Insurance Scheme desired by healthcare users in Nigeria; and

iii. Assess the feasibility of implementing a National Health Insurance Scheme funded by

risk pooling that covers the entire population.

2. Method

2.1 Research Design and Data Sources

A Discrete Choice Experiment is often made up of two parts. The first elaborates the socioeconomic profiles of respondents which allows for an understanding of the background to the responses provided in the second part which is the choice experiment itself. The characteristics of the participants of this study are elaborated through a determination of the mean and frequencies of defining attributes common to the sampling frame. Divergence from central tendency has implications for the choices made in the DCE by participants. It is thus the case that the first part is inextricably linked to the second. In order to understand the divergences and relationships between participants and the choices made, the SPSS and Stata statistical packages were used with regression analysis done as highlighted in subsequently below.

The research participants are healthcare users who visit Bwari General Hospital (BGH) to access health services using health insurance. The sampling frame thus comprised of all healthcare users registered with BGH who are on one form of health insurance or the other. The sampling units are thus health insurance enrollees who access care in BGH. These were selected from the sampling frame using simple random sampling. A two-stage purposive sampling method was used, styled after Nguyen et al. (2016), who used the same method to select study participants in a discrete choice experiment to determine preferences for social health insurance benefits package in Thailand. BGH was selected purposely from all other health facilities in Abuja while participants were selected from the sampling frame in the second stage. Bryman (2012) had established that as sample sizes increase, the precision of a study improves significantly. In view of this, 100 study participants were thus estimated to be adequate for the study and recruited

Data was collected from research participants through structured interviews using questionnaires after informed consent was secured. Prior to this, discussions were held with some health care users who access services at the General Hospital to elicit typical health insurance users' preferences ranked as attributes and attribute levels. Due consideration was given to preferences that border on cost sharing, risk pooling, health insurance resourcing, regulation, resource administration, benefits package, services purchasing and provision. Extensive literature review helped to streamline the preferences before, during and after the discussions. The information gathered from literature and the discussions were aggregated and included in choice cards as hypothetical but context-specific preferences, including the amounts the participants are willing to pay to have the current health insurance system reformed.

The questionnaire was structured in such a way that the relevant covariates are covered. It was made up of two parts with the first part addressing the socioeconomic profiles of the respondents such as age, gender, marital status, income, occupation, health status, educational level, and healthcare use, amongst others. The second aspect was designed to perform the

DCE by presenting the respondents with a number of choice sets, including the amount they are willing to pay for health insurance reform. The questionnaire was administered face to face with each session lasting about 30 minutes. Before the survey, the questionnaire was initially piloted and subsequently

adjusted based on the inputs from respondents. The author and a research assistant administered the questionnaires.

2.2 Model Specification and Data Analysis Method

This Discrete Choice Experiment is made up of two parts. The first elaborates the socioeconomic profiles of respondents which allows for an understanding of the background to the responses provided in the second part which is the choice experiment itself. The characteristics of the participants of this study are elaborated through a determination of the mean and frequencies of defining attributes common to the sampling frame. Divergence from central tendency has implications for the choices made in the DCE by participants. It is thus the case that the first part is inextricably linked to the second. In order to understand the divergences and relationships between participants and the choices made, the SPSS and Stata statistical packages were used with regression analysis done as highlighted in subsequently below.

2.2.1 Model Specification

The design, conduct and analysis of this research draws from the random utility theory that specifies that healthcare users often make a choice of the health insurance types to purchase based on the attributes of the insurance schemes that allow these users to maximize their utility. The three attributes considered in this study are benefits package available to enrollees, efficiency of funds management and the premium paid for health insurance. The econometric specification is laid out as follows:

$$\mathbf{U} = \beta_0 + \beta_1 \text{BenefitsPackage} + \beta_2 \text{FundsMgt} + \beta_3 \text{Premium} + \varepsilon$$

where U is the utility derived from health insurance having BenefitsPackage, FundsMgt and Premium as benefits package, funds management and premium respectively being the three health insurance attributes considered in this study. This utility can be estimated indirectly from the component attribute levels given by:

$$\mathbf{V} = \beta_1 \text{Basic} + \beta_2 \text{Med} + \beta_3 \text{Comp} + \beta_4 \text{NHIS} + \beta_5 \text{Counc} + \beta_6 \text{Fadmin} + \beta_7 \text{Premium}$$

where V is the linear and additive indirect utility and where Basic, Med, Comp, NHIS, Counc, Fadmin, Premium are basic, medium, comprehensive, NHIS, Insurance Council, Independent Fund Administrator and annual premium, being attribute levels for hypothetical health insurance types named Insurance Type 1 and Insurance Type 2.

2.2.2 Definition of Willingness to Pay

This study requires that Willingness to Pay (WTP) for health insurance reform in Nigeria be determined. WTP can be estimated from the Marginal Rate of Substitution (MRS) which is

the negative of the ratio of the derivatives of the indirect utility functions of the attributes listed above. The Marginal Rate of Substitution is given by:

$$\mathbf{MRS} = -\frac{\partial v/\partial \Lambda_k}{\partial v/\partial \Lambda_z} = -\beta_k/\beta_z$$

where **k** and **z** are attributes with **z** being a financial attribute, ν is indirect utility and Λ_k and Λ_z are vectors for attributes **k** and **z** respectively. Willingness to pay can thus be estimated from the negative of the ratio of the coefficients of the attributes.

2.2.3 Conduct of Discrete Choice Experiment

To set up the Discrete Choice Experiment, 8 sequential steps were used as described by Hensher et al. (2005) as listed in Table 1 below:

Table 1. Design Stages of Discrete Choice Experiment

Step	Task	Sub-task
1	Problem refinement	-
2	Stimuli refinement	Alternative identification Attribute identification Attribute level identification
3	Experimental design consideration	Type of design Model Specification Reduction of experiment size
4	Generate experimental design	-
5	Allocate attribute to design columns	-
6	Generate choice sets	-
7	Randomize choice sets	-
8	Construct survey instrument	-

To achieve stimuli as in step 2 above, open questionnaires were first administered to 50 respondents in Bwari General Hospital before the main choice experiment itself with the results as shown in Table 2 below:

Table 2. Attributes Specification

S/N	Top 7 factors listed by respondents	No of respondents with Yes response, Total=50	Percentage (%)
1	Premium	50	100
2	Benefits Package	48	96
3	Fund Mgt	44	88
4	Provider Choice	40	80
5	Resource Pooling	38	76
6	Coverage	36	72
7	Others	14	28

The top three attributes in Table 2 were then selected in view of the cognitive burden, financial, time and other logistic constraints that would have been experienced if all the attributes were to be considered. Three levels were thereafter determined for each attribute, drawing substantially from literature and existing practice in the NHIS as shown in Table 3 below (Alawode & Adewole, 2021):

Table 3. Identification of Attributes Levels

S/N	Attributes	Attribute Levels
1	Premium	1. 3% of annual income 2. 6% of annual income 3. 9% of annual income
2	Benefits Package	1. Comprehensive 2. Medium 3. Basic
3	Fund Mgt	1. National Health Insurance Scheme 2. Health insurance Council 3. Independent Fund Administrator

In conducting this Discrete Choice Experiment, there are three alternatives being compared as follows:

1. Insurance Type 1
2. Insurance Type 2

3. Status Quo Insurance (that is, the NHIS)

This DCE is thus unlabeled as the insurance types being studied are not named and are simply hypothetical alternatives presented to respondents to enable them make utility-maximizing choices from the insurance types presented while comparing these with the status quo insurance.

Hensher et al. (2006) further described 4 sequential stages needed to conduct a Full or Fractional Factorial Design as follows:

1. Determine main effects with the selected interaction effects to be tested
2. Determine the degrees of freedom required for the estimation of the model
3. Determine the number of treatment combinations required for the model estimation
4. Generate the minimum orthogonal design for the DCE

This unlabeled and non-linear DCE uses a full factorial design with all the 3 attributes having three levels each to generate all the 27 possible scenarios (i.e $L^A=3^3=27$ where L= number of levels and A is number of attributes). Since there are two insurance types being compared with the Status Quo Insurance, 3 attributes were generated each for Insurance Type 1 and Insurance Type 2 in order to properly set up the experiment.

Deploying orthogonal coding, SPSS was used to generate the 3 attributes each for Insurance Type 1 and Insurance Type 2 (total of 6) listed as A to F with G as a blocking variable in Table 4.

Table 4. Attributes Coding

AB	BC	CD	DE	EF	FG
AC	**BD**	**CE**	**DF**	**EG**	
AD	**BE**	**CF**	**DG**		
AE	**BF**	**CG**			
AF	**BG**				
AG					

Coding was also conducted on the attributes and levels, ensuring that all values sum up to zero in Table 5 as follows:

Table 5. Coding Attributes Levels

S/N	Attributes	Attribute Levels	Orthogonal Coding
1	Premium	1. 3% of income 2. 6% of income 3. 9% of income	-1 0 1
2	Benefits Package	1. Comprehensive 2. Medium 3. Basic	-1 0 1
3	Fund Mgt	1. NHIS 2. Insurance Council 3. Fund Administrator	-1 0 1

Orthogonal main and two-way interaction effects as well as design correlation were determined which show 21 two-way interactions for the 6 attributes (3 each for Insurance Types 1 and 2) as shown in Tables 6 and 7 below:

Table 6. Estimating 2-way interactions

Combination	A	B	C	D	E	F	G	AB	AC	AD	AE	AF	AG	BC	BD	BE	BF	BG	CD	CE	CF	CG	DE	DF	DG	EF	EG	FG
1	1	0	-1	0	-1	1	1	0	-1	0	-1	1	1	0	0	0	0	0	0	1	-1	-1	0	0	0	-1	-1	1
2	0	-1	1	0	0	0	1	0	0	0	0	0	0	-1	0	0	0	-1	0	0	0	1	0	0	0	0	0	0
3	-1	0	0	-1	0	1	1	0	0	1	0	-1	-1	0	0	0	0	0	0	0	0	0	0	-1	-1	0	0	1
4	1	-1	-1	-1	1	0	1	-1	-1	-1	1	0	1	1	1	-1	0	-1	1	-1	0	-1	-1	0	-1	0	1	0
5	-1	0	-1	0	0	0	-1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
6	0	0	-1	0	1	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	1	0	0	0	0	-1	0	0
7	1	1	1	-1	0	1	-1	1	1	-1	0	1	-1	1	-1	0	1	-1	-1	0	1	-1	0	-1	1	0	0	-1
8	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	-1	1	0	1	-1	-1	-1	1	0	1	-1	-1	-1	0	-1	1	1	0	1	-1	-1	0	0	0	-1	-1	1
10	1	1	-1	1	0	-1	1	1	-1	1	1	-1	1	-1	1	0	-1	1	-1	0	1	-1	0	-1	1	0	0	-1
11	1	0	1	1	-1	0	-1	0	1	1	-1	0	-1	0	0	0	0	0	1	-1	0	-1	-1	0	-1	0	1	0
12	-1	1	-1	1	1	1	-1	-1	1	-1	-1	-1	1	-1	1	1	1	-1	-1	-1	-1	1	1	1	-1	1	-1	-1
13	0	1	1	-1	-1	-1	1	0	0	0	0	0	0	1	-1	-1	-1	1	-1	-1	-1	1	1	1	-1	1	-1	-1
14	-1	0	1	1	0	-1	0	0	-1	-1	0	1	0	0	0	0	0	0	1	0	-1	0	0	-1	0	0	0	0
15	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
16	1	-1	0	1	1	1	0	-1	0	1	1	1	0	0	-1	-1	-1	0	0	0	0	0	1	1	0	1	0	0
17	0	1	0	0	-1	1	-1	0	0	0	0	0	0	0	0	-1	1	-1	0	0	0	0	0	0	0	0	-1	1	-1
18	0	0	0	-1	1	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	1	0	-1	0
19	0	-1	0	1	0	-1	-1	0	0	0	0	0	0	0	-1	0	1	1	0	0	0	0	0	-1	-1	0	0	1
20	-1	1	0	0	1	-1	1	-1	0	0	-1	1	-1	0	0	1	-1	1	0	0	0	0	0	0	0	-1	1	-1
21	-1	1	1	-1	1	0	0	-1	-1	1	-1	0	0	1	-1	1	0	0	-1	1	0	0	-1	0	0	0	0	0
22	0	1	-1	1	-1	0	0	0	0	0	0	0	0	-1	1	-1	0	0	-1	1	0	0	-1	0	0	0	0	0
23	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	-1	-1	-1	0	1	0	0	0	0	0	0	0	1	1	0	-1	0	1	0	-1	0	0	-1	0	0	0	0
25	-1	-1	1	0	-1	1	0	1	-1	0	1	-1	0	-1	0	1	-1	0	0	-1	1	0	0	0	0	-1	0	0
26	-1	-1	0	1	-1	0	1	1	0	-1	1	0	-1	0	-1	1	0	-1	0	0	0	0	-1	0	1	0	-1	0
27	1	0	0	-1	-1	-1	0	0	0	-1	-1	-1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0

Table 7. Estimating design correlation

	A	B	C	D	E	F	G	AB	AC	AD	AE	AF	AG	BC	BD	BE	BF	BG	CD	CE	CF	CG	DE	DF	DG	EF	EG	FG
A	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.6	0	0	0	0	0	-0.6	0	0	0	0	0	0
B	0	1	0	0	0	0	0	0	0	0	-0.6	0	0	0	0	0	0	0	-0.6	0	0	0	0	0	0	0	0	-0.6
C	0	0	1	0	0	0	0	0	0	0	0	0	-0.5	0	-0.6	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	1	0	0	0	0	0	0	0	0	0	-0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	1	0	0	-0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	1	01	0	0	0	0	0	0	0	0	0	0	-0.6	0	0	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0	-0.6	0	0	0	0	0	0	0	-0.6	0	0	0	0	0	0	0	0	0	0	0
AB	0	0	0	0	-0.6	0	-0.6	1	0	0	0.3	0	0	0	0	0.3	0	0	0	0	0.5	0	0	-0.3	0.5	0	0	0
AC	0	0	0	0	0	0	0	0	1	0	0	0	-0.3	0	0	0	0.5	0	0	0	0	0.3	0.3	0.3	0	0.3	0	0
AD	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	-0.3	0.5	0	0.3	0.3	0	0	0	0	0	0.3	0.3
AE	0	-0.6	0	0	0	0	0	0.3	0	0	1	0	0	0	0	-0.3	0	0	0.3	0	0.3	0	0	0	0.3	0	0	0.3
AF	0	0	0	0	0	0	0	0	0	0	0	1	0	0.5	-0.3	0	0	0	0.3	0.3	0	0	0	0	0.3	0	0.3	0
AG	0	0	-0.6	0	0	0	0	0	-0.3	0	0	0	1	0	0.5	0	0	0	0	0	0	0.3	0.3	0.3	0	0.3	0	0
BC	0	0	0	-0.6	0	0	0	0	0	0	0	0.5	0	0.5	-0.3	0	0	0	0.3	0	0	0	0	0	0	0.3	0.3	0
BD	0	0	-0.6	0	0	0	-0.6	0	0	0	0	-0.3	0.5	-0.3	1	0	0	0	0.3	0	0	0	0	0	0	0	0.3	0
BE	-0.6	0	0	0	0	0	0	0.3	0	0	-0.3	0	0	0	0	1	0	0	0	0	0.3	0.3	0	0	0.3	0	0	0
BF	0	0	0	0	0	0	0	0	0.5	-0.3	0	0	0	0	0	0	1	-0.3	0	0.3	0	0	0	0	0	0	0	0.3
BG	0	0	0	0	0	-0.6	0	0	0	0.5	0	0	0	0	0	0	-0.3	1	0	0.3	0	0	0.3	0	0	0	0	0.3
CD	0	-0.6	0	0	0	0	0	0	0	0	0.3	0.3	0	0.3	0.3	0	0	0	1	0	0	0	0	0	0	0	0.5	0.5
CE	0	0	0	0	0	0	0	0	0	0.3	0	0.3	0	0	0	0	0.3	0.3	0	1	0	0	0	0	0.5	0	0	0.5
CF	0	0	0	0	0	0	0	0.5	0	0.3	0.3	0	0	0	0	0.3	0	0	0	0	1	0	0	0	0.5	0	0.5	0
CG	-0.6	0	0	0	0	0	0	0	0.3	0	0	0	0.3	0	0	0.3	0	0	0	0	0	1	0.5	0.5	0	0.5	0	0
DE	0	0	0	0	0	0	0	0	0.3	0	0	0	0.3	0	0	0	0	0.3	0	0	0	0.5	1	0.5	0	0.5	0	0
DF	0	0	0	0	0	0	0	-0.3	0.3	0	0	0	0.3	0	0	0	0	0	0	0	0	0.5	0.5	1	0	0.5	0	0
DG	0	0	0	0	0	0	0	0.5	0	0	0.3	0.3	0	0	0	0.3	0	0	0	0.5	0.5	0	0	0	1	0	0	0
EF	0	0	0	0	0	0	0	0	0.3	0	0	0	0.3	0.3	0	0	0	0	0	0	0	0.5	0.5	0.5	0	1	0	0
EG	0	0	0	0	0	0	0	0	0	0.3	0	0.3	0	0.3	0.3	0	0	0	0.5	0	0.5	0	0	0	0	0	1	0
FG	0	-0.6	0	0	0	0	0	0	0	0.3	0.3	0	0	0	0	0	0.3	0.3	0.5	0.5	0	0	0	0	0	0	0	1

This was then followed by the assignment of the attributes to design columns as shown in Table 8 below:

Table 8. Assignment of Attributes to Design Columns

A	D	B	E	F	C	G	
Insurance Type 1			Insurance Type 2				
Premium	Benefits	Fund Mgt	Premium	Benefits	Fund Mgt	Block	Card No
1	0	0	-1	1	-1	1	1
0	0	-1	0	0	1	1	2
-1	-1	0	0	1	0	1	3
1	-1	-1	1	0	-1	1	4
-1	0	0	0	0	-1	-1	5
0	0	0	1	-1	-1	0	6
1	-1	1	0	1	1	-1	7
-1	-1	-1	-1	-1	-1	-1	8
1	0	-1	1	-1	1	-1	9
1	1	1	0	-1	-1	1	10
1	1	0	-1	0	1	-1	11
-1	1	1	1	1	-1	-1	12
0	-1	1	-1	-1	1	1	13
-1	1	0	0	-1	1	0	14
0	1	0	1	1	1	1	15
1	1	-1	1	1	0	0	16
0	0	1	-1	1	0	-1	17
0	-1	0	1	0	0	-1	18
0	1	-1	0	-1	0	-1	19
-1	0	1	1	-1	0	1	20
-1	-1	1	1	0	1	0	21
0	1	1	-1	0	-1	0	22
1	0	1	0	0	0	0	23
0	-1	-1	0	1	-1	0	24
-1	0	-1	-1	1	1	0	25
-1	1	-1	-1	0	0	1	26
1	-1	0	-1	-1	0	0	27

To reduce the cognitive burden to respondents, scenarios reduction was done using the blocking variable as shown in Tables 9 and 10 below, resulting in only 9 scenarios being presented to each respondent.

Table 9. Scenarios Reduction Using Blocking

Insurance Type 1			Insurance Type 2				
Premium	Benefits	Fund Mgt	Premium	Benefits	Fund Mgt	Block	Card No
-1	0	0	0	0	-1	-1	5
1	-1	1	0	1	1	-1	7
-1	-1	-1	-1	-1	-1	-1	8
1	0	-1	1	-1	1	-1	9
1	1	0	-1	0	1	-1	11
-1	1	1	1	1	-1	-1	12
0	0	1	-1	1	0	-1	17
0	-1	0	1	0	0	-1	18
0	1	-1	0	-1	0	-1	19
0	0	0	1	-1	-1	0	6
-1	1	0	0	-1	1	0	14
1	1	-1	1	1	0	0	16
-1	-1	1	1	0	1	0	21
0	1	1	-1	0	-1	0	22
1	0	1	0	0	0	0	23
0	-1	-1	0	1	-1	0	24
-1	0	-1	-1	1	1	0	25
1	-1	0	-1	-1	0	0	27
1	0	0	-1	1	-1	1	1
0	0	-1	0	0	1	1	2
-1	-1	0	0	1	0	1	3
1	-1	-1	1	0	-1	1	4
1	1	1	0	-1	-1	1	10
0	-1	1	-1	-1	1	1	13
0	1	0	1	1	1	1	15
-1	0	1	1	-1	0	1	20
-1	1	-1	-1	0	0	1	26

Thereafter, codes were now replaced with attributes' and levels' names giving rise to the 27 Choice Sets in Tabular Form as shown below:

Table 10. Replacement of Codes with Attributes' and Levels' Names

Insurance Type 1			Insurance Type 2				
Premium	Benefits	Fund Mgt	Premium	Benefits	Fund Mgt	Block	Card No
3% of Income	Medium	Insurance Council	6% of Income	Medium	NHIS	A	5
9% of Income	Comprehensive	Fund Administrator	6% of Income	Basic	Fund Administrator	A	7
3% of Income	Comprehensive	NHIS	3% of Income	Comprehensive	NHIS	A	8
9% of Income	Medium	NHIS	9% of Income	Comprehensive	Fund Administrator	A	9
9% of Income	Basic	Insurance Council	3% of Income	Medium	Fund Administrator	A	11
3% of Income	Basic	Fund Administrator	9% of Income	Basic	NHIS	A	12
6% of Income	Medium	Fund Administrator	3% of Income	Basic	Insurance Council	A	17
6% of Income	Comprehensive	Insurance Council	9% of Income	Medium	Insurance Council	A	18
6% of Income	Basic	NHIS	6% of Income	Comprehensive	Insurance Council	A	19
6% of Income	Medium	Insurance Council	9% of Income	Comprehensive	NHIS	B	6
3% of Income	Basic	Insurance Council	6% of Income	Comprehensive	Fund Administrator	B	14
9% of Income	Basic	NHIS	9% of Income	Basic	Insurance Council	B	16
3% of Income	Comprehensive	Fund Administrator	9% of Income	Medium	Fund Administrator	B	21
6% of Income	Basic	Fund Administrator	3% of Income	Medium	NHIS	B	22
9% of Income	Medium	Fund Administrator	6% of Income	Medium	Insurance Council	B	23
6% of Income	Comprehensive	NHIS	6% of Income	Basic	NHIS	B	24
3% of Income	Medium	NHIS	3% of Income	Basic	Fund Administrator	B	25
9% of Income	Comprehensive	Insurance Council	3% of Income	Comprehensive	Insurance Council	B	27
9% of Income	Medium	Insurance Council	3% of Income	Basic	NHIS	C	1
6% of Income	Medium	NHIS	6% of Income	Medium	Fund Administrator	C	2
3% of Income	Comprehensive	Insurance Council	6% of Income	Basic	Insurance Council	C	3
9% of Income	Comprehensive	NHIS	9% of Income	Medium	NHIS	C	4
9% of Income	Basic	Fund Administrator	6% of Income	Comprehensive	NHIS	C	10
6% of Income	Comprehensive	Fund Administrator	3% of Income	Comprehensive	Fund Administrator	C	13
6% of Income	Basic	Insurance Council	9% of Income	Basic	Fund Administrator	C	15
3% of Income	Medium	Fund Administrator	9% of Income	Comprehensive	Insurance Council	C	20
3% of Income	Basic	NHIS	3% of Income	Medium	Insurance Council	C	26

The output from Spearman Correlation Test using SPSS is shown in Table 11 below:

Table 11. Spearman Correlation Test Output

	Premium(1)	Benefits(1)	Fund Mgt(1)	Premium(2)	Benefits(2)	Fund Mgt(2)
Premium(1)	1					
Coverage(1)	0	1				
Fund Mgt(1)	0	0	1			
Premium(2)	0	0	0	1		
Coverage(2)	0	0	0	0	1	
Fund Mgt(2)	0	0	0	0	0	1

3. Results

3.1 Socioeconomic Characteristics of Respondents

Table 12 below presents some of the descriptive statistics of the respondents. The average age of research participants was 45 years with a standard deviation of 8. This is reflective of the fact that either the head or spouse in the household was sampled. This selection criteria, along with others that requires that the respondent hold a health insurance policy skews the average age to this age group. The average household size was 5.1, which is in agreement with the 2003 National Demographic, and Health Survey which puts the average Nigerian household size at 5 with a rural-urban preponderance of 5.1 versus 4.7 (Macro International et al., 2008).

The mean annual income for all participants was N1,420,600. The category of income earners who fall in this bracket are usually not able to afford private health insurance plans, as this would deplete their resources significantly. Hence, majority of respondents had the public sector health insurance plan. Most of the dependents in participants' households were aged 18 years and below (mean 1.44) as against those under-five (mean 0.83) and those 65 years and above (mean 0.18). The more the number of dependents, the more the number of hospital attendance and health insurance use. The average no of hospital visits among the sample population was 15 times a year with those visiting the hospital using their health insurance plans almost all the time. The mean out-of-pocket-expenditure was N10,943 with some respondents spending as high as N240,000 which is reflective of the high out-of-pocket health expenditure trend in Nigeria (Onoka et al. 2011).

Table 12. Averages of Socioeconomic Characteristics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	100	31.00	62.00	45.1700	7.98364
Annual_income_naira	100	.00	3000000.00	1420600.0000	782400.88930
Household_size	100	2.00	8.00	5.1000	1.20185
No_5y_below_in_household	100	.00	4.00	.8300	1.01559
No_18y_below_in_household	100	.00	7.00	1.4400	1.33576
No_65y_above_in_household	100	.00	2.00	.1800	.41145
Total_no_annual_hosp_visits	100	2.00	40.00	15.3900	7.67114
Total_no_annual_insuran_use	100	2.00	40.00	15.3900	7.67114
Out_of_pocket_exp_6mo_naira	100	.00	240000.00	10943.0000	28965.82192
Valid N (listwise)	100				

The study has a preponderance of males as respondents with Table 13 and Figure 4 showing that only 42% were female.

Table 13. Gender Distribution

		Frequency	Percent	Cumulative Percent
Valid	Male	58	58.0	58.0
	Female	42	42.0	100.0
	Total	100	100.0	

In preparing the questionnaire for the study, the three major ethnic groups were included on the data collection instrument on the premise that these made up the population of residents of Bwari as is often assumed with surveys and censuses at the national level, to the detriment of other ethnicities. However, 59% of research participants belonged to the 'other' group leaving only 41% as the total population of Hausas, Yorubas and Ibos in Bwari (Figure 1). This demographic picture may be due to the cosmopolitan nature of Abuja where many migrate from other states to the center or it may be due to the fact that the minority tribes that make up the 'other' group have their native state of origin contiguous to the Federal Capital Territory.

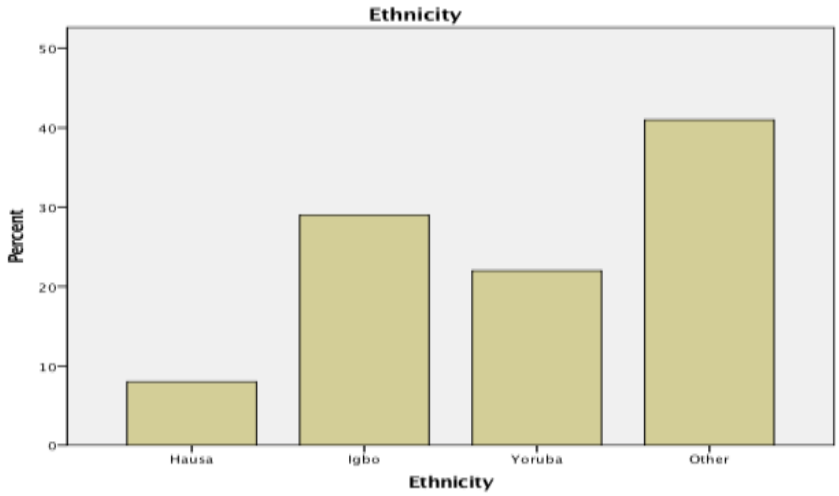

Figure 1. Respondents' Ethnicity

Most of those who participated in the study work with Government putting the unemployment rate of this sample at 6% (Table 14 and Figure 2). This data may be misleading if extrapolated to the general population. The unemployment rate in Nigeria stood at 18.8% in the third quarter of 2017 with total unemployment and underemployment combined standing at 40% in the same period (National Bureau of Statistics, 2017). This has dire consequences for peace, security, national fragility, health insurance uptake, general well-being and overall health outcomes. The lower figure of unemployment obtained in this study points to the fact that most of those who have health insurance in Nigeria are enrolled under the public sector health insurance program (the NHIS) which requires that you are employed in the first place. As was found in this study, only a few are enrolled in private health insurance programs.

Table 14. Employment Status

		Frequency	Percent	Cumulative Percent
Valid	Not employed	6	6.0	6.0
	Working full time	89	89.0	95.0
	Other	5	5.0	98.0
	Total	100	100.0	

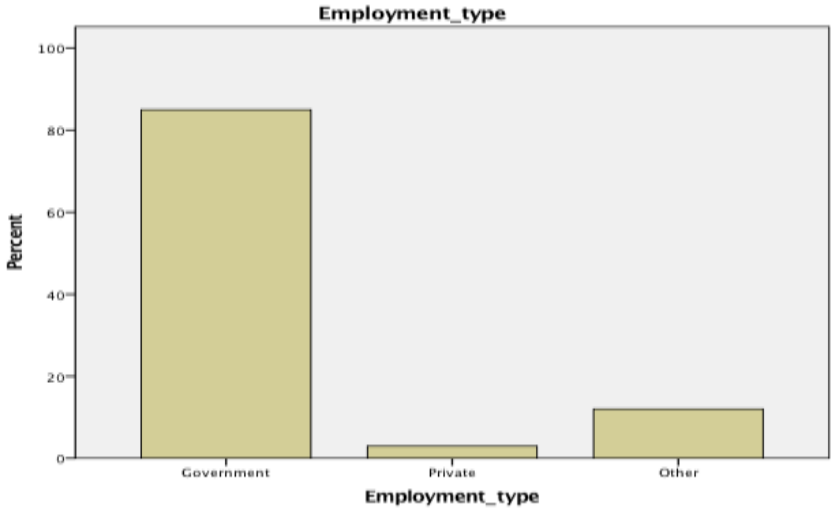

Figure 2. Employment Type

Most of the participants in this study were heads of households who were married and well educated (Tables 15, 16 and Figure 3). More than 80% had a post-secondary school degree. The cognitive burden placed by such a demanding research was thus matched by those who could cope with the level of recall and reasoning required to participate successfully in the study.

Table 15. Position in Household

		Frequency	Percent	Cumulative Percent
Valid	Head	80	80.0	80.0
	Spouse	20	20.0	100.0
	Total	100	100.0	

Table 16. Marital Status

		Frequency	Percent	Cumulative Percent
Valid	Married	92	92.0	92.0
	Single	2	2.0	94.0
	Widowed	4	4.0	98.0
	Divorced or Separated	2	2.0	100.0
	Total	100	100.0	

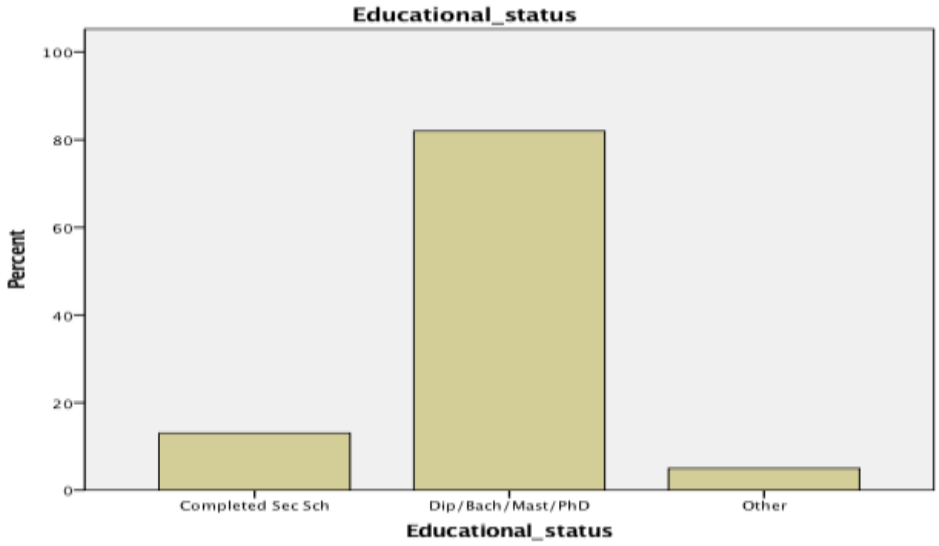

Figure 3. Educational Status

It is instructive to find that 68% of health insurance enrollees are not satisfied with the services currently rendered by their health insurance program (Table 17). Many of them reported financial hardship from health expenditure (Table 18) while almost all desire to have a reform of the health insurance system in Nigeria where there is universal healthcare coverage through the use of health insurance (Table 19). However, a high proportion of these respondents think it would be difficult to implement such a health insurance reform (Figure 4).

Table 17. Proportion of Respondents satisfied with Insurance System

		Frequency	Percent	Cumulative Percent
Valid	Yes	32	32.0	32.0
	No	68	68.0	100.0
	Total	100	100.0	

Table 18. Financial hardship from Health Expenditure

		Frequency	Percent	Cumulative Percent
Valid	Yes	18	18.0	18.0
	No	82	82.0	100.0
	Total	100	100.0	

Table 19. Universal Health Coverage using Health Insurance

		Frequency	Percent	Cumulative Percent
Valid	Yes	99	99.0	99.0
	No	1	1.0	100.0
	Total	100	100.0	

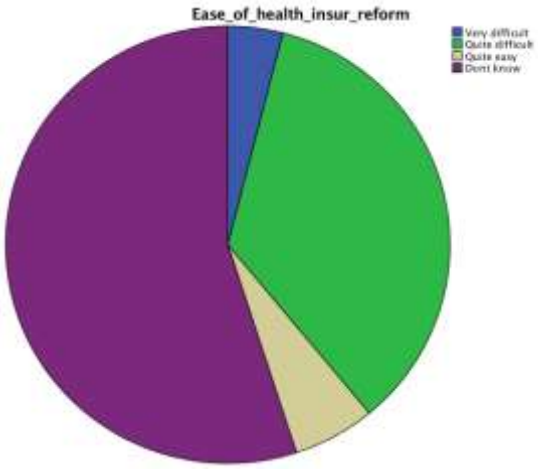

Figure 4. Ease of Implementing Health Insurance Reform in Nigeria

3.2 Result of Discrete Choice Experiment

The Discrete Choice Experiment required that each participant first compare Insurance Type 1 and Insurance Type 2 with the Status Quo Insurance and make a choice. A choice is then made between Insurance Type 1 and 2 if the Status Quo Insurance was not chosen. In this study, no single respondent chose the Status Quo Insurance. Each respondent had nine choice cards presented to him. In all, there were 900 choices made by the 100 respondents resulting in a total of 2700 observations, as there were three alternatives per choice.

The data from the questionnaires were coded and entered into Excel in preparation for analysis using Stata 15. The data entry format is as shown in Table 20 with abbreviations and shortened forms indicating the different variables. In Table 20, 'Pers_id' refer to each resondent's identifier's code while 'Choice_no' is the choice set number ranging from 1 to 9. 'Card_no' is the number found on each choice card as written in the choice cards in Appendix 1. 'Alt' refers to the alternatives with 'Alt1', 'Alt2' and 'Alt3' meaning Insurance 1, Insurance 2 and Status Quo Insurance respectively. 'Tot_Csets' is 3 on each occasion. Data analysis with Stata requires the variable 'C_id' which represents a unique value for each choice set, locating each observation as a unique choice when data is grouped together. It therefore ranges from 1 to 9 for respondent 1, 10 to 18 for respondent 2, 19 to 27 for respondent 3 and so on. A choice of 'Stand' and 'Undef' mean that the respondent chooses the standard benefits package or the poorly defined fund management option under the Status Quo Insurance plan. The variables 'Basic', 'Med', 'Comp', 'NHIS', 'Counc' and 'Fadmin' have earlier been defined.

Table 20. DCE Data Entry Format

Pers_id	Choice_no	Card_no	Alt	Tot_csets	Alt1	Alt2	Alt3	C_id	Basic	Med	Comp	Stand	NHIS	Counc	Fadmin	Undef	Premium	Choice
1	1	6	1	3	1	0	0	1	0	1	0	0	0	1	0	0	6	0
1	1	6	2	3	0	1	0	1	0	0	1	0	1	0	0	0	9	1
1	1	6	3	3	0	0	1	1	0	0	0	1	0	0	0	1	1.75	0
1	2	14	1	3	1	0	0	2	1	0	0	0	0	1	0	0	3	0
1	2	14	2	3	0	1	0	2	0	0	1	0	0	0	1	0	6	1
1	2	14	3	3	0	0	1	2	0	0	0	1	0	0	0	1	1.75	0
1	3	16	1	3	1	0	0	3	1	0	0	0	1	0	0	0	9	0
1	3	16	2	3	0	1	0	3	1	0	0	0	0	1	0	0	9	1
1	3	16	3	3	0	0	1	3	0	0	0	0	1	0	0	0	1.75	0
1	4	21	1	3	1	0	0	4	0	0	0	1	0	0	0	1	3	1
1	4	21	2	3	0	1	0	4	0	1	0	0	0	0	0	1	9	0
1	4	21	3	3	0	0	1	4	0	0	0	0	1	0	0	0	1.75	0
1	5	22	1	3	1	0	0	5	1	0	0	0	0	0	0	1	6	1
1	5	22	2	3	0	1	0	5	0	1	0	0	1	0	0	0	3	0
1	5	22	3	3	0	0	1	5	0	0	0	0	1	0	0	0	1.75	0
1	6	23	1	3	1	0	0	6	0	1	0	0	0	0	0	1	9	0
1	6	23	2	3	0	1	0	6	0	1	0	0	0	0	1	0	6	1
1	6	23	3	3	0	0	1	6	0	0	0	0	1	0	0	0	1.75	0
1	7	24	1	3	1	0	0	7	0	0	1	0	1	0	0	0	6	1
1	7	24	2	3	0	1	0	7	1	0	0	0	1	0	0	0	6	0
1	7	24	3	3	0	0	1	7	0	0	0	1	0	0	0	1	1.75	0
1	8	25	1	3	1	0	0	8	0	1	0	0	1	0	0	0	3	0
1	8	25	2	3	0	1	0	8	1	0	0	0	0	0	1	0	3	1
1	8	25	3	3	0	0	1	8	0	0	0	1	0	0	0	1	1.75	0
1	9	27	1	3	1	0	0	9	0	0	1	0	0	1	0	0	9	0
1	9	27	2	3	0	1	0	9	0	0	1	0	0	1	0	0	3	1
1	9	27	3	3	0	0	1	9	0	0	0	1	0	0	0	1	1.75	0
2	1	6	1	3	1	0	0	10	0	1	0	0	0	1	0	0	6	0
2	1	6	2	3	0	1	0	10	0	0	1	0	1	0	0	0	9	1
2	1	6	3	3	0	0	1	10	0	0	0	1	0	0	0	1	1.75	0
2	2	14	1	3	1	0	0	11	1	0	0	0	0	1	0	0	3	0
2	2	14	2	3	0	1	0	11	0	0	1	0	0	0	1	0	6	1
2	2	14	3	3	0	0	1	11	0	0	0	1	0	0	0	1	1.75	0
2	3	16	1	3	1	0	0	12	1	0	0	0	1	0	0	0	9	0
2	3	16	2	3	0	1	0	12	1	0	0	0	0	1	0	0	9	1
2	3	16	3	3	0	0	1	12	0	0	0	1	0	0	0	1	1.75	0
2	4	21	1	3	1	0	0	13	0	0	1	0	0	0	1	0	3	1
2	4	21	2	3	0	1	0	13	0	1	0	0	0	0	1	0	9	0
2	4	21	3	3	0	0	1	13	0	0	0	1	0	0	0	1	1.75	0
2	5	22	1	3	1	0	0	14	1	0	0	0	0	0	0	1	6	0
2	5	22	2	3	0	1	0	14	0	1	0	0	1	0	0	0	3	1
2	5	22	3	3	0	0	1	14	0	0	0	1	0	0	0	1	1.75	0

The variables listed above, including the final choice made were all dummy coded to take the value of 1 if represented or chosen and 0, otherwise. 'Choice' in Table 20 is thus the respondent's selection of insurance type. After importing to Stata 15, data analysis was done using the 'Clogit' command which carries out conditional logistic regression, estimating McFadden's discrete choice model in the process. The output is as shown in Table 21 below.

Table 21. Logistic Regression using Stata 15

Number of obs = **2,700**
LR chi2(**5**) = **1057.13**
Prob > chi2 = **0.0000**
Log likelihood = **-460.18575** Pseudo R2 = **0.5346**

Choice	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Basic	**25.89659**	**.1666127**	**15.54**	**0.000**	**25.57004**	**26.22315**
Med	**26.4682**	**.1548869**	**17.09**	**0.000**	**26.16463**	**26.77178**
Comp	**27.89181**	**.1498931**	**18 .07**	**0.000**	**27.53807**	**27.91976**
NHIS	**-1.292245**	**.1444645**	**-8.95**	**0.000**	**-1.57539**	**-1.0091**
Counc	**-1.269414**	**.1474663**	**-8.61**	**0.000**	**-1.558442**	**-.9803852**
Fadmin	**.1169296**	**.4355464**	**0.00**	**0.000**	**-.8535382**	**.8537721**
Premium	**-1.156663**	**.0238909**	**-4.84**	**0.000**	**-.1624917**	**-.068841**

McFadden's Pseudo R^2 value of 0.5346 indicates that the model is well fitted. The Chi-squared statistic of 1057.13 show that the estimated model has the required explanatory power with significant results for the attributes with confidence level set at 95%.

The coefficient of each attribute in Table 21 reveal to which extent and in what direction each attribute has a bearing on the choice of which insurance type is made. The larger the coefficient is, the more likely that the attribute influences the healthcare user in selecting a certain type of health insurance than attributes with lower coefficients. Thus, the 'comprehensive' benefits package is more likely to influence healthcare consumers choice of health insurance. That is, patients would rather opt for Insurance Type 1 or 2, rather than the Status Quo Insurance, given that Type 1 or 2 is likely to present them with a suite of benefits that meets their needs. In this same vein, going by the foregoing rationale, respondents would rather have health insurance plans with a 'medium' benefits package rather than the 'basic'.

On the other hand, the lower and negative coefficient of 'premium' indicates that respondents would rather prefer annual insurance premiums that are lower. This is indeed consistent with the assumptions of the random utility theory where a rational decision-maker maximizes his utility relative to his choice of available alternatives, subject to his budget constraint. This is however, not at variance with his willingness to pay higher premiums to further increase his utility, where possible, provided he is able to find attributes with the desired qualities.

3.3 Estimation of Willingness to Pay

The Status Quo health insurance being used by most of the research participants requires enrollees to pay 1.75% of their annual income being public sector workers. This sum is deducted from source before salaries are paid. This study reveals that most of the enrollees are not satisfied with the services they receive from their insurance plans for a number of reasons including the benefits package and the way health insurance funds are managed. The descriptive statistics reveal that almost all of the respondents desire to have a reform of the health insurance sector in Nigeria. This desire was expressed in the choices they made as they participated in the Discrete Choice Experiment. As stated earlier, Willingness to Pay can be computed from the Marginal Rate of Substitution as earlier laid out. The WTP computed below are measures of amounts that respondents are willing to part with to bring about reform in the health insurance sector.

Table 22. Computation of Willingness to Pay

S/N	Notation	Marginal Rate of Substitution	Willingness to Pay
1	$WTP_1 = -\beta_1/\beta_7$	-25.89659 -1.156663	Willing to pay **22.39%** of annual income to access the 'Basic' benefits package
2	$WTP_2 = -\beta_2/\beta_7$	-26.46820 -1.156663	Willing to pay **22.88%** of annual income to access the 'Medium' benefits package
3	$WTP_3 = -\beta_3/\beta_7$	-27.89181 -1.156663	Willing to pay **24.11%** of annual income to access the 'Comprehensive' benefits package
4	$WTP_4 = -\beta_4/\beta_7$	--1.292245 -1.156663	Willing to pay **1.12%** of annual income for the NHIS to solely manage all insurance funds
5	$WTP_5 = -\beta_5/\beta_7$	--1.269414 -1.156663	Willing to pay **1.10%** of annual income for the Health Insurance Council to solely manage all insurance funds

6	$WTP_6 = - \beta_6/\beta_7$	-.1169296 -1.156663	Willing to pay **0.10%** of annual income for an Independent Fund Administrator to solely manage all insurance funds

The study participants are willing to pay as high as 24% of annual income to access the comprehensive benefits package while they are willing to pay slightly lower amounts for the medium and basic benefits package. Figure 5 shows that of benefits package and fund management attributes, respondents see greater value in paying for a reform of the options presented to them in the form of the services rendered rather than paying for a reform of the way health insurance funds are managed. They therefore would pay lower for a reform of the health insurance funds management system.

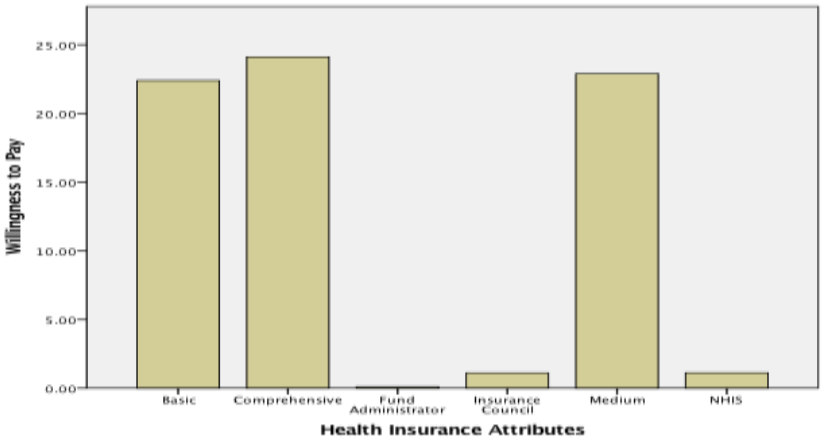

Figure 5. Willingness to Pay by Attribute

Figure 6 further reinforces the fact that the comprehensive benefits package is priced slightly higher than the other two. As the attribute levels make up the attributes themselves, close attention need to be paid to the components of the attribute levels as these are the 'commodities' being traded during decision making. The absence of certain services in the medium benefits package make the comprehensive package more desirable to the rational healthcare consumer, accounting for the difference he is willing to pay for this package. The same reasoning can be applied to amount respondents are willing to pay for a reform of the fund management attribute as revealed in Figure 6.

Figure 6 is a chart showing average willingness to pay for all attributes as the area under the curve shown in the diagram. It is evident that WTP for benefits package predominates when compared with funds management.

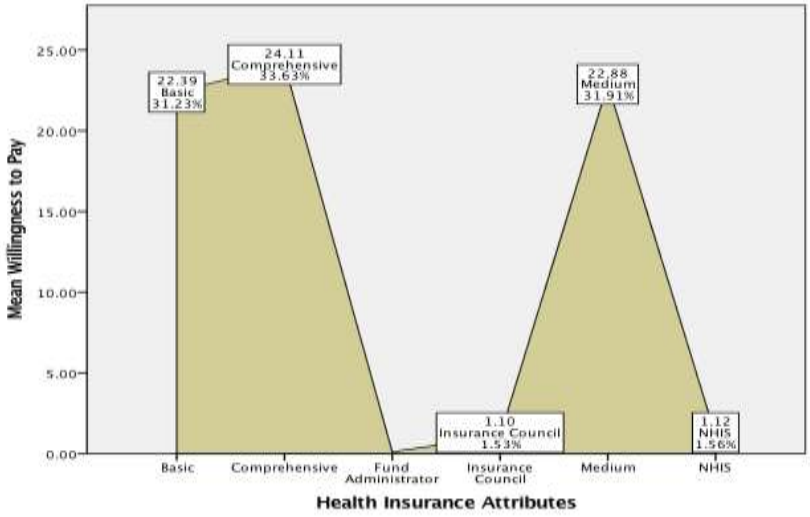

Figure 6. Mean Willingness to Pay for all Attributes

4. Results and Discussion

4.1 Study Results: An Important Feedback to Inform Policy

Nigeria, as is the case with many other countries in the developing world, faces a peculiar challenge in ensuring that citizens' development demands are taken into consideration in conceptualizing and executing policy. Oftentimes, nations adopt policy prescriptions such as the Millennium Development Goals, the Sustainable Development Goals, the Health for All Agenda and other such treaties without adaptation and proper domestication (Ahmed-Hameed, 2016). The top-bottom approach used by Government in the establishment and subsequent implementation of the national health insurance program without adequate citizens' involvement may be responsible for the little success the program has recorded. While the enrolment level is quite high with the sample population of this research due to the selection criteria, health insurance coverage in Nigeria is quite low (Adewole et al., 2017).

Being quite aware that the health insurance program does not cover the majority of Nigerians, 99% of respondents desire a health insurance program that covers all Nigerians while 100% of respondents preferred that a reform of the current program takes place. The respondents expressed these views in spite of the fact that they know that reforming Nigeria's health insurance system will be difficult but this crucial feedback from citizens can improve uptake if taken into consideration by policymakers.

There are a number of other findings from this study that can prove useful such as the preferences for health insurance, the attributes and attribute levels and the Willingness to Pay elicited. Elements of the former two of these findings began to appear early in this research from the results collated (Table 2) from the open questionnaire and literature review about health insurance preferences. These findings represent initial inputs from Nigerians that could guide the direction for the reform of the health insurance system.

4.2 Respondents' Characteristics

This research received feedback from 100 respondents with diverse backgrounds. While Nanna (2011) used a larger sample size to determine the Willingness to Pay for health insurance in Thailand, the time, cost and logistic constraints placed a limit on the number of respondents that could be enrolled in this study. Nevertheless, the study is a significant step forward with respect to its contribution to the body of knowledge.

The diversity of the respondents is manifested in the fact that not only the major ethnicities were represented but that the so-called minor ethnic groups consisted of 59% of research participants. This allows for a somewhat national outlook in feedback even though the study was not conducted in all the geopolitical zones. Indeed, in a major step such as the reforms of an health insurance program that is expected to impact everyone, the wider the sphere from where opinion is received, the better the acceptability. This is in view of the fact that Nigeria is a culturally diverse multi-ethnic nation.

The cognitive burden presented by this Discrete Choice Experiment where respondents had to make a minimum of 9 choices comprising of 27 observations required that they could easily comprehend the choices presented to them. The minimum qualification for about 80% of respondent was a diploma with many being advanced degree holders. This level of education was an advantage as it was not an arduous task to administer the choice experiment.

In addition, many of the 85% of these respondents who work in Government are senior public servants who are aware of Government policy and may actually be either policy makers or influencers. This group is similar to those sampled by Obse et al. (2016) in Ethiopia when performing a Discrete Choice Experiment to elicit preferences for social health insurance in Ethiopia. The drawback with sampling this category of the population is that the opinion of many who are not employed in Government and who thus do not hold any health insurance plans are excluded. It is anticipated that future research can address this issue.

Other respondents' characteristics worthy of mention are age and marital status as these have a bearing on the uptake of health insurance in Nigeria. The average age of all respondents was 45 years while the average number of those 18 years and below per household is 1.4. About 92% of respondents were married. The Nigerian health insurance program caters to a family with four children who are below 18 years. Although enrollees can pay additional premiums to enroll other family members, the insurance program did not make any overt concessions for polygamous homes or families who have their children older than 18 years still staying at home with them. This was a concern raised by some respondents who were from polygamous homes.

4.3 Derivation of the Economic Value of Health Insurance Reform

This study derived Willingness to Pay from the negative of the ratios of the coefficients of the health insurance attributes shown to be preferred by respondents from the Discrete Choice Experiment. These coefficients were estimated by computing the McFadden's model in Stata using conditional logistic regression. Nanna (2011) had earlier used similar methods for a study to determine Willingness to Pay in Asia.

Willingness to Pay is a measure of the economic value attached by respondents to health insurance reform. Given that respondents were willing to pay as high as 24% of their annual income to have a health insurance program with a comprehensive benefits package that caters to all their health needs, it is conceivable that the paucity of funding that limits the desired performance of Nigeria's health insurance system can be addressed by raising the funds needed directly from the citizens.

Respondents opted to pay as low as 1% of their annual income to ensure that reforms take place so that insurance funds are judiciously managed. From Table 12, the mean annual income for respondents was N1,420,600. One percent of this amount comes to N14,206 and when multiplied by Nigeria's current population of about 200 million people, given that all are enrolled and the resources pooled, the total sum that could potentially be raised to fund universal health insurance is in excess of 3 trillion Naira annually. Given this willingness to pay, substantial resources can be pooled for health insurance that covers the population.

In spite of the foregoing assumptions, research generalization and a somewhat optimistic view used in computing the foregoing sums, it is clear that the cost of economic reform simply cannot be borne by Government alone. The current situation where Government funds health insurance majorly by premiums paid by public servants and less than 10% of the population has sustainability and equity implications. Simply put, Government does not possess the required resources for universal health insurance but needs to tap into a pool of resources within the remit of its populace who are willing to pay for health insurance with certain desired attributes. The implementation of reforms within the national health insurance system is a way to ensure wealth redistribution, leveraging additional resources through pooling and solving equity problems in the health sector in a sustainable way.

5. Conclusions

Nigeria is an emerging economy which needs a healthy population for growth. Nigeria's health indicators are quite poor and a major reason why this persists is the pervasive lack of access to healthcare. Universal health insurance could improve the health profile of citizens, turn the tide of underdevelopment and accelerate Nigeria's growth.

While the case has been made for mandatory health insurance, the very attributes of an insurance program is what makes it attractive to consumers. Therefore, Nigeria's health insurance program needs the kind of reform that can bring the qualities that improves demand side dynamics. This study has thus elicited attributes such as benefits package, premium and judicious funds management, amongst others, as preferences desired in an effective insurance system. The study also determined the economic value of health insurance reform through the estimation of Willingness to Pay from a Discrete Choice Experiment. Drawing inferences from the study, deductions can be made that show that it is possible to implement a national health insurance program that covers the entire population funded by risk pooling.

The first objective of this study was achieved by evaluating the cost of health insurance reform through an assessment of willingness to pay for the reform. The second objective was achieved prior to evaluating citizens' willingness to pay in that the attributes and attribute

levels of the desired health insurance were determined. Given that respondents were willing to pay a minimum of 1% of their annual income for health insurance reform, the third objective to determine if the national health insurance scheme can be funded through risk pooling was attained.

Going forward, this study can be replicated at a larger scale to allow for generalization. While at it, policy makers could begin to think through and put in place the required conditions for the reform of Nigeria's health insurance system in terms of the cost and quality of services rendered, drawing from the outputs of this study.

6. Study Limitations

In a study of this nature to determine preferences and willingness to pay for health insurance reform, it would have been ideal to sample health care users across geopolitical zones and subnational federating units for representativeness and potential generalization. Nigeria is, however, a large country with hard-to-reach areas due in part to difficult terrains and security challenges. The use of technology such as online surveys could have mitigated this challenge but low literacy levels and suboptimal Internet penetration would pose substantial challenge, potentially limiting response rates and turnaround times.

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