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Assessment of Rural Households' Willingness to Pay for Healthcare Insurance in Bauchi State of Nigeria

Mohammed Sanusi SADIQ[1], Invinder Paul Singh[2], Muhammad Makarfi Ahmad[3], Mahmood Umar Bala[4]

[1] Professor, Department of Agricultural Economics & Agribusiness, FUD, Dutse, Jigawa State, Nigeria
Correspondence: sadiqsanusi30@gmail.com

[2] Professor, Department of Agricultural Economics, SKRAU, Bikaner, India

[3] Professor, Department of Agricultural Economics and Extension, BUK, Kano, Nigeria

[4] Graduate Student, Department of Agricultural Extension & Rural Development, FUD, Dutse, Nigeria

تقييم استعداد الأسر الريفية لدفع تكاليف التأمين الصحي في ولاية باوتشي في نيجيريا

محمد سنوسي صادق[1]، إنفيندر بول سينغ[2]، محمد مكارفي أحمد[3]، محمود عمر بالا[4]

[1] أستاذ، قسم الاقتصاد الزراعي والأعمال الزراعية، جامعة فود، دوتسي، نيجيريا
المراسلة: sadiqsanusi30@gmail.com

[2] أستاذ، قسم الاقتصاد الزراعي، SKRAU، بيكانير، الهند

[3] أستاذ، قسم الاقتصاد الزراعي والإرشاد الزراعي، BUK، كانو، نيجيريا

[4] طالب دراسات عليا، قسم الإرشاد الزراعي والتنمية الريفية، جامعة فود، دوتسي، نيجيريا

Mohammed Sanusi SADIQ
Invinder Paul Singh
Muhammad Makarfi Ahmad
Mahmood Umar Bala

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Abstract

The research aims at determining rural households' willingness to pay (WTP) for health insurance in Bauchi State, Nigeria. Using an easy-cost route approach, cross-sectional data were elicited by a well-structured questionnaire coupled with an interview schedule from a total of 319 households selected through a multi-stage random sampling technique. Besides, the collected data were subjected to descriptive and inferential statistics to achieve the specified objectives. Empirically, malaria and typhoid were the major morbidities affecting the households and, on average, cost a household an economically large sum of ₦70,944.70 per month. Consequently, though marginally above half of the sampled households, the majority showed interest in social health insurance to access better healthcare services. However, the premium rate is a portent threat to the scheme's sustainability, as evident by its inverse relationship with WTP. Thus, a low premium rate at takeoff is suggested, pending the beneficial impact of the scheme manifested in the lives of the majority in the study area. Besides, old age, poor agricultural holdings, and lack of credit facilities were the stumbling blocks to WTP for health insurance in the study area. Therefore, the study advises policymakers to improve social safety health coverage for old-aged households and provide adequate credit facilities leverage for income generation, thus enhancing the scope and sustainability of social health insurance in the study area.

Keywords: Health insurance, morbidity, WTP, rural households, Nigeria

Introduction

The healthcare sector has expanded quickly in recent years to satisfy the demands of a constantly expanding population that faces various health-related problems in sub-Saharan Africa (Addis et al., 2022; Ayanore et al., 2023). Governments are pressured to devote more funds to the health sector due to the sharp increase in healthcare expenses (Garedew et al., 2020; Kaso et al., 2022). As official annual health budgets struggle to match the community's need for healthcare, most health services are acquired out-of-pocket in developing countries and some developed countries (Oga et al., 2019; Berry et al., 2020; Njie et al., 2023). Setting priorities among conflicting health programs is a difficult challenge in such situations. In addition to valuing society's preferences concerning their willingness to pay, it is essential to consider the non-health benefits of healthcare (Alhassan et al., 2022; Kaonga et al., 2022).

Willingness to pay (WTP) refers to the maximum amount an individual or household is ready to spend to obtain a good, service, or benefit, such as health insurance (Michael et al., 2024; Ogungbemi et al., 2024). It reflects their perceived value of the service and ability to afford it. In health economics, WTP is often used to assess demand for health services or insurance, guiding policy design for affordability and accessibility (Nwoku, 2024; Yahaya et al., 2024; Adepoju et al., 2024). In these circumstances, WTP is more important to take into account when making decisions than simply using a Quality Adjusted Life Year (QALY) (Jeetoo and Jaunky, 2021; Anbesu et al., 2022). From a consumer sovereignty viewpoint, WTP is superior to QALYs in that there are no limitations on which characteristics of a healthcare plan individuals are permitted to value (Addis et al., 2022; Agyei-Baffour et al., 2022).

Furthermore, long-term health outcomes are often the goal of public health interventions (Habib and Zaidi, 2021). The health and non-health advantages of interventions must be valued when developing and implementing preventive health programs (Chiwire et al., 2021; Negera and Abdisa, 2022). Cost-benefit analysis, which includes WTP, can be claimed to have the theoretical underpinnings of welfare economics to support the economic analysis for decision-making in publically financed healthcare (Rahman et al., 2020; Giannouchos et al., 2021). Cost-benefit analysis using WTP tries to quantify allocative efficiency to ensure that health gains are allocated fairly (Nugraheni et al., 2022; Steigenberger et al., 2022). The implementation of preventive public health initiatives, cross-border health insurance, assessing health state advancement, health insurance retention, implementing WTP to reduce waiting times for medical procedures, WTP for child survival, and health-related safety strategies are just a few of the topics covered in WTP studies that have been reported globally (Amaghionyeodiwe, 2020; Jeetoo et al., 2022). As proven, getting WTP information is helpful in the decision-making process concerning healthcare service delivery when patients must shoulder most of their medical costs (Sarker et al., 2020; Laksono et al., 2022). To enhance health outcomes, it is possible to provide healthcare services at prices acceptable to the target populations by getting WTP values (Chanie and Ewunetie, 2020; Behzad et al., 2022).

WTP-based health insurance plans are a good example of how people can be covered by health insurance depending on the weight of their expressed preferences (Alam et al., 2023). In nations like the UK, where healthcare is either free or heavily subsidized, conducting WTP research may be challenging since participants may find it difficult to relate to the hypothetical market scenarios

included in the contingent value approach. According to Minyihun et al. (2020) and Taddesse et al.(2020), thorough consideration and including data from WTP combined with QALYs can support the decision-making process. This process could be accomplished by taking into account both the non-health advantages of the health outcomes linked to interventions and the stated desires of the patients lobbying for broader healthcare benefits (Nageso et al., 2020; Addis et al., 2022).

Given that most of the rural population is engaged in agriculture, rural livelihoods, and this sector are synonymous (Coker *et al.*, 2022). Morbidity is logically prevalent among Nigeria's impoverished rural resource farmers. Contrary to other agricultural studies, there is a shortage of cross-disciplinary research on the Value of Health Risk Reduction (VHRR), Value of Statistical Life (VSL), and Value of Statistical Case (VSC) in Nigeria's agriculture sector (Akwaowo *et al.*, 2021; Elegbede *et al.*, 2022; Tabansi *et al.*, 2022), with no evidence of such research in Bauchi State. Access to affordable, high-quality healthcare in rural areas remains a significant problem in Bauchi State of Nigeria. Due to their low financial resources and lack of proper health insurance coverage, many rural households encounter considerable obstacles when getting healthcare. This research aims at offering insights into the feasibility and sustainability of health insurance programs suited to the particular needs of rural communities by comprehending the factors impacting their desire to spend on health insurance. As a result, this problem statement emphasizes the urgent need for research to understand rural households' willingness to pay for health insurance and create practical solutions to these healthcare challenges.

Nevertheless, it highlights the pressing problem of healthcare access and affordability in rural areas of Bauchi State. The results of this study will help stakeholders and policymakers devise focused measures to improve rural households' access to healthcare, affordability, and general health outcomes in Bauchi State. In addition, by utilizing the VSL and VSC methodologies, the study will contribute essential background knowledge and possibly address the lack of information on "benefit transfer (i.e., cost sharing public-private partnership on health care services)" on environmental health risk reduction due to morbidity incidence within the agricultural sector. The study will also help estimate the value of health-related benefits linked to initiatives and programs of intervention in the agricultural sector. Consequently, this research aimed at assessing rural households' willingness to pay (WTP) for health insurance in Bauchi State of Nigeria. The specific objectives were to identify the morbidity(s) affecting rural households, estimate the economic cost of morbidity per month, assess the household's WTP for health insurance, and determine the factors affecting WTP for health insurance among the rural households in the study area.

Research Methodology

Bauchi State is situated between longitudes 8°45' and 11°0' east of the Greenwich meridian and latitudes 9°30' and 12°30' north of the equator. According to the 2006 census, the state's population was 4,655,073, with a growth rate of 3% to reach 7,685,312 in 2021 (NPC, 2021). Due to its size and geographical changes, Bauchi State, located in northeastern Nigeria, has a wide range of agro-climatic conditions and a landmass of 49,259 square km. The state's location in the Sahel area, which has a semi-arid to sub-humid climate, significantly impacts the state's climate. Typically, the rainy season starts in May and lasts through September or October. The majority of the state's yearly precipitation falls during this time. The dry season often begins in November and lasts through April. The Harmattan wind from the Sahara desert can blow during this time, bringing dry

and dusty conditions along with the hot, dry weather. The climate in Bauchi State is often warm to hot all year round. During the dry season, temperatures are higher, frequently topping 40°C (104°F) during the day and occasionally going over 30°C (86°F) during the night. The state's vegetation ranges from guinea savannah in the south to savannah grasslands in the north. While Bauchi State's southern regions see comparatively higher rainfall and more intensive agricultural operations, the state's northern regions are more desert. In Bauchi State, agriculture has a vital economic role. The state frequently cultivates crops like millet, sorghum, maize, rice, and groundnuts. Raising cattle, sheep, and goats is important for the economy.

Using a multi-stage random sampling technique, a total of 322 respondents were chosen in households' survey conducted in the year 2022, and subsequently, cross-sectional data were elicited. Firstly, all the Bauchi State Agricultural Development Project (BASADP) stratified agricultural zones, namely, zones (A) Western, (B) Central, and (C) Northern were selected as livelihood challenges are general phenomena. Subsequently, given the disproportionate distribution inherent with Local government areas (LGAs) across the strata, the representative LGAs were proportionately selected. After that, two villages were randomly selected from each of the selected LGAs. Based on the sample frame generated by the reconnaissance survey (Table 1), (Krejcie and Morgan, 1970) formula (Equation 1) was used to determine the representative sample size. Thus, a total sample size of 322 households was randomly chosen for the study. Using an easy cost-route approach, a well-structured questionnaire coupled with an interview schedule was used to collect the relevant information for the research. Objectives I, II, III, and IV were achieved using descriptive statistics, cost of morbidity technique, contingent valuation method, and tree regression, respectively.

$$n_p = \frac{N(X)}{X+(N-1)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(1)}$$

$$X = \frac{Z^2 \ x \ P(1-P)}{e^2}$$

n = Sample size; N = Population size; e = Acceptable sampling error; X= Finite sample size; and, P = Proportion of the population

Table 1
Sampling frame of rural households

Zones	LGAs	Villages	Sampling frame	Sample size
Western	Dass	Kagadama	3,230	9
		Wandi	9,210	26
	Kirfi	Badara	5,767	16
		Beni	5,322	15
	Tabawa-Baleawa	Burga	5,532	16
		Zango	4.127	12
	Toro	Polchi	4,241	12
		Zalau	5,300	15
Central	Ningi	Zidinga	3,403	10
		Tsangayan Dirya	5,350	15
	Darazo	Lanzai	9,120	26

		Yautare	8,423	24
Northern	Katagum	Chinede	5,437	15
		Ragwam	4,216	12
	Gamawa	Wabu	9,326	26
		Lariski	2,671	8
	Giade	Jugudu	3,310	9
		Hardori	3,221	9
	Misau	Akuyam	5,324	15
		Zindi	3,350	10
	Shira	Kilbore	2,320	7
		Yana	5,230	15
Total	**11**	**22**	**113,330**	**322**

Source: Reconnaissance survey, 2022.

Empirical model

Cost of morbidity technique

Following Oparinde *et al*.(2018) and Aboaba (2020), the costs of morbidity technique was used to estimate the economic burden of mortality among farm families.

$$FC = \sum_{i=0}^{n}(F_d + F_m + F_t) \ \dots\dots\dots\dots\dots\dots\dots\dots \ (2)$$

$$T = \sum_{i=0}^{n}(Ts * as * w) + (Tc * ac * w) \ \dots\dots\dots\dots\dots \ (3)$$

$$E = \sum_{i=0}^{n}(FC + T) \ \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \ (4)$$

Where,

FC= Total financial cost of health care during the farming season (₦)
F_d = Financial cost of drugs, herbs, etc. (₦)
F_m = Financial cost of medical consultancy (₦)
F_t= Financial cost transportation (₦)
T = Total time cost (days of forgone production)
Ts = Time cost of the sick person (s) (days of forgone production)
Tc = Time cost of the caregiver (s) (days of forgone production)
w = Daily wage rate of sick person/caregiver (₦)
as = Age coefficient of the sick person (s)
ac = Age coefficient of caregiver (s)

According to Sauerborn *et al.* (1996), an individual's financial production rises from early 20s to roughly 40 and gradually declines afterward. This information was used to determine the age coefficient "a" value. The values of coefficient "a" were as follows:
Age ≤ 17 years = 0.5; Age ≥ 18 = 1; Age ≥ 41=0.75; Age ≥ 56 = 0.67; Age > 65 = 0.45

Contingent valuation method (CVM)

In non-marketed commodities like health insurance, CVM is frequently used to evaluate WTP modifications (Gidey *et al*., 2019); (Ogundeji *et al*., 2019); (Njie *et al*., 2023). According to a research by Njie *et al*. (2023), double-bounded dichotomous choice (DBDC) questions with a follow-up approach are more effective because they allow respondents to share more details about their WTP. The arithmetic mean was utilized to estimate WTP in the present and ideal case scenarios to establish the average WTP needed to pay for health insurance. The following formula is used to get the average WTP:

$$Average\ WTP = \frac{\sum_{i=1}^{n} bidding\ amount}{\sum_{i=0}^{n} number\ of\ respondents\ who\ are\ WTP} \dots\dots\dots\dots\dots\dots (5)$$

Tree regression

$$WTP_i = f(X_1, X_2, \dots\dots\dots\dots\dots X_n) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6)$$

$$WTP_i = \beta_0 + X_1\beta_1 + \cdots \dots\dots\dots\dots X_n\beta_n + \varepsilon_i \dots\dots\dots\dots\dots\dots\dots\dots (7)$$

Where, WTP_i = Willingness to pay (yes =1, no=0); X_1= Age [young aged adult (< 31) =0, middle-aged adult (>= 31) =1, old-aged adult (> 45) =2]; X_2= Gender (male =1, otherwise=0); X_3 = Marital status (single =0, married =1); X_4= Education (non-formal =0, primary =1, secondary=2, tertiary=3); X_5= Household size (small= 0, moderate =1, large=2); X_6= Farming experience (small= 0, moderate =1, high=2); X_7= Extension service (yes= 1, no=0); X_8= Credit access (yes =1, no=0); X_9= Co-operative membership (yes =1, no=0); X_{10}= Agricultural holding [marginal (< 1) = 0, small (>= 1) = 1, semi-medium (>=2) =2, medium (>=3) = 3, large (>=4) =4]; X_{11}= Operational holding [marginal (< 1) = 0, small (>= 1) = 1, semi-medium (>=2) =2, medium (>=3) = 3, large (>=4) =4]; X_{12}= Income (small = 0, semi-medium =1, medium = 2, large =3]; X_{13}= Initial bidding (IBID) (yes =1, no=0); X_{14}= Livestock ownership (small= 0, moderate =1, large=2); X_8= Off-farm occupation (yes =1, no=0); ε_i = Noise; β_0= Intercept; and, β_{1-n}= Regression parameters.

Results and Discussion

Health Challenges Encountered by Rural Households

A perusal of Table (2) showed malaria to be the significant (30.1%) morbidity that affected the rural households during the study period, distance followed by typhoid fever (yellow fever) (17.87%), and then headache (15.05%) and black/waist pain (11.91%). Besides, measles (3.13%) and rheumatism (3.13%) were the least morbidities that challenged the study area. Thus, it can be suggested that the malaria pandemic is still a stumbling block to a healthy rural environment despite several medical interventions by government and non-governmental agencies to ensure its total eradication. However, the possible reason for the slow pace of arresting malaria might be the use of stereotype-applied medication. Besides, the side effects of malaria preventive medication (mosquito insecticide-treated nets, mosquito insecticides, etc.) in causing redness of the eyes and itching, breath contraction, and skin reaction are possible contributory factors affecting the success of malaria eradication in the study area. Thus, the study advises policymakers to adopt appropriate preventive malaria medical measures and sensitize rural households to practice indigenous sanitary measures (e.g., public cleanliness) to make the environment healthy.

Table 2

Distribution of health challenges suffered by rural households

Disease	Frequency	%
Malaria	96	30.1
Typhoid	57	17.87
Cholera	19	5.96
Measles	10	3.13
Cough	25	7.84
Tuberculosis	0	0
Rheumatism	10	3.13
Stomach upset	16	5.01
Headache	48	15.05
Back/waist pain	38	11.91
Total	319	100

Source: Field survey, 2022.

Cost of Morbidity Incurred by Rural Households per Month

On a per head basis, the incurred economic cost of morbidity was ₦5618.45, while the incurred financial and time costs of morbidity were ₦ 1961.58 and ₦ 3656.86, respectively (Table 3). Besides the economic cost of morbidity, the percentage proportions of financial and time costs of morbidity were 35 and 65%, respectively. Decomposition-wise, the time cost of the caregiver had the highest proportion (41.14%), followed by the cost of drugs (26.39%) and time cost of a sick person (23.95%). In comparison, the cost of travel to the healthcare was the least incurred morbidity cost (2.78%). Nevertheless, on average, the economic, financial, and time costs of illness were ₦70,944.70, ₦24859.05, and ₦46085.65, respectively. Besides, the proportion of the financial and time costs to the economic cost exhibited the same trend as that of the morbidity cost per head. Therefore, it can be suggested that time cost accounted for the bulk cost incurred on morbidity in the study area. As a rider, the outcome of this research clearly points to the fact that apart from lost labor productivity, the rural economy was challenged with a high loss of economic labor time, affecting the rural economy's productivity. In a related study, Aboaba (2020) and Adekunle *et al*.(2016) established time cost to be the highest cost that contributed to the economic cost of morbidity in their various study areas.

Table 3

Cost estimates of morbidity

Items	Per-head (₦)	%	Average (₦)	%
Cost of drugs/herbs, etc	1482.81	26.39	18687.07	26.34
Consultancy medical fees	322.34	5.74	4166.95	5.87
Cost of travel	156.43	2.78	2005.02	2.83
TCS	1345.52	23.95	16956.95	23.9
TCC	2311.34	41.14	29128.71	41.06
FC	1961.58	34.91	24859.04	35.04
TC	3656.86	65.09	46085.66	64.96
EC	5618.44	100	70944.7	100

Source: Field survey, 2022.

Note: ₦ means Naira (Nigerian currency); $1 = ₦ 417 as of the period (2022) of the study

WTP for Health Insurance

A cursory review of the results showed that marginally above half (54.2%) of the sampled population were WTP for health insurance (Table 4a). Therefore, it can be inferred that the rural populace is interested in social health insurance. Further, at initial premium bidding pegged at ₦1000, only 30.7% of the rural households were willing to pay for the health insurance. However, when the premium amount was reduced to ₦500, 35.4% of the households were willing to pay for health insurance. At the second premium bidding of ₦2000, only 11.3% were willing to pay for the health insurance, and when the premium amount was reduced to ₦1500, 27.6% of the rural households were willing to pay for the health insurance. At the highest premium bidding of ₦3000, only 5.5% of the rural households were willing to pay for health insurance. However, when the premium was decreased to ₦2500, 20.1% of the rural households were WTP for health insurance. Evidently, an increase in the bidding premium is accompanied by a decrease in WTP for health insurance, i.e., an inverse relationship exists between the premium rate and WTP for health insurance. Therefore, to ensure wide acceptability and sustainability of the health insurance scheme in the study area, the study advises policymakers to introduce low-rate premiums at takeoff, pending when the rural economy will feel the impact of the social insurance scheme and, afterward, a gradual increase in the premium rate.

Table 4a

Willingness to pay and Bidding premium rate(s)

Items	Frequency	%
WTP		
No	146	45.8
Yes	173	54.2
Total	319	100.0
Initial bidding premium at ₦1000		
No	221	69.3
Yes	98	30.7
Total	319	100.0
Lower premium at ₦500		
No	206	64.6
Yes	113	35.4
Total	319	100.0
Second bidding premium at ₦2000		
No	283	88.7
Yes	36	11.3
Total	319	100.0
Lower premium at ₦1500		
No	231	72.4
Yes	88	27.6
Total	319	100.0

Last bidding premium at ₦3500		
No	302	94.7
Yes	17	5.3
Total	319	100.0
Lower premium at ₦2500		
No	255	79.9
Yes	64	20.1
Total	319	100.0

Source: Field survey, 2022.

Furthermore, at the maximum amount, the average WTP for households in the present situation was ₦10147.11, and the average WTP for households with positive WTP was ₦1869.94 (Table 4b). Besides, at minimum amount, the average WTP for households in the present situation was ₦408.46, and the average WTP for households with positive WTP was ₦753.18. In the ideal situation, the maximum amount, the average WTP for households was ₦1496.87, and the average WTP for households with positive WTP was ₦2023.31. At minimum amount, the average WTP for households was ₦615.67, and the average WTP for households with positive WTP was ₦832.20. Comparatively, the average WTP in an ideal situation is greater than that of the present situation, which reflects that the households will be willing to pay more if they derive better services from the social health insurance scheme.

Table 4b
WTP for Health Insurance at Present and Ideal Situations

Condition	Amount	Level	Mean (₦)
WTP present	Maximum	Non-truncated	1014.11
		Truncated	1869.94
	Minimum	Non-truncated	408.46
		Truncated	753.18
WTP ideal	Maximum	Non-truncated	1496.87
		Truncated	2023.31
	Minimum	Non-truncated	615.67
		Truncated	832.20

Source: Field survey, 2022.

Driver(s) of WTP for Health insurance

A perusal of the growth model showed that the tree regression had thirteen nodes, of which seven were terminal nodes and a depth of three, i.e., three levels below the root node. Of the sixteen specified independent variables in the model, only six predictors significantly contributed to WTP for health insurance, thus being retained in the final model. The significant predictors were initial bidding (IBID), extension contact (EXT), age (AGC), educational level (EDC), agricultural holding (AGHC), and credit access (CRCD). The remaining variables that made no significant contribution to WTP were automatically eliminated from the final model. The diagnostic test summary of the index value showed that in nodes 3, 8, and 9, the observed percentage of households WTP in the

target category is more than the expected percentage in the target category of the root node that is WTP as evident by their respective index values that are higher than 100% (Table 5). Contrarily, for the terminal nodes 7, 12, 10, and 11, the observed percentage of households in the target category that are WTP is less than the expected percentage of households in the target category of the root node that is WTP as indicated by their respective index values that are less than 100%.

Nevertheless, the gain chart index showed the model to be fairly good, as evidenced by its cumulative gain chart that steeply rises towards 100% and then levels off (Figure 1). Also, the index chart indicated the model's goodness, as evidenced by its cumulative index chart, which starts above 100% and gradually descends until it tip-offs at 100% (Figure 2). Nevertheless, the risk of the model in misclassifying a household's WTP was 24.8%, as indicated by the risk estimate value of 0.248.
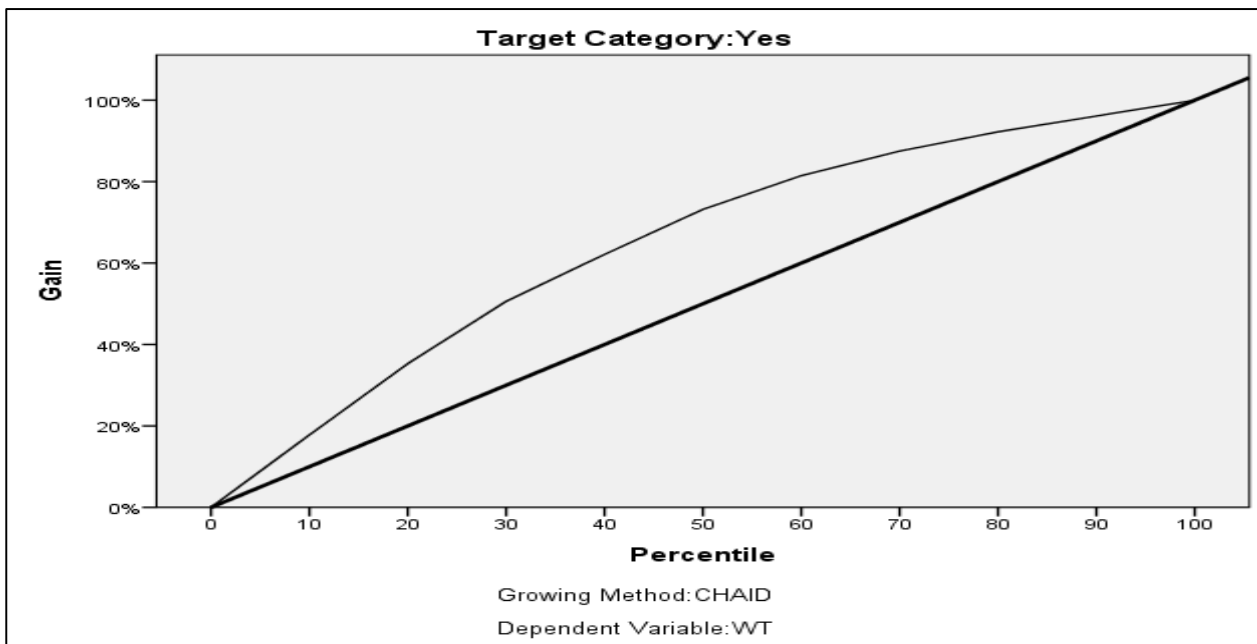
Table 5

Diagnostic test of gain and index

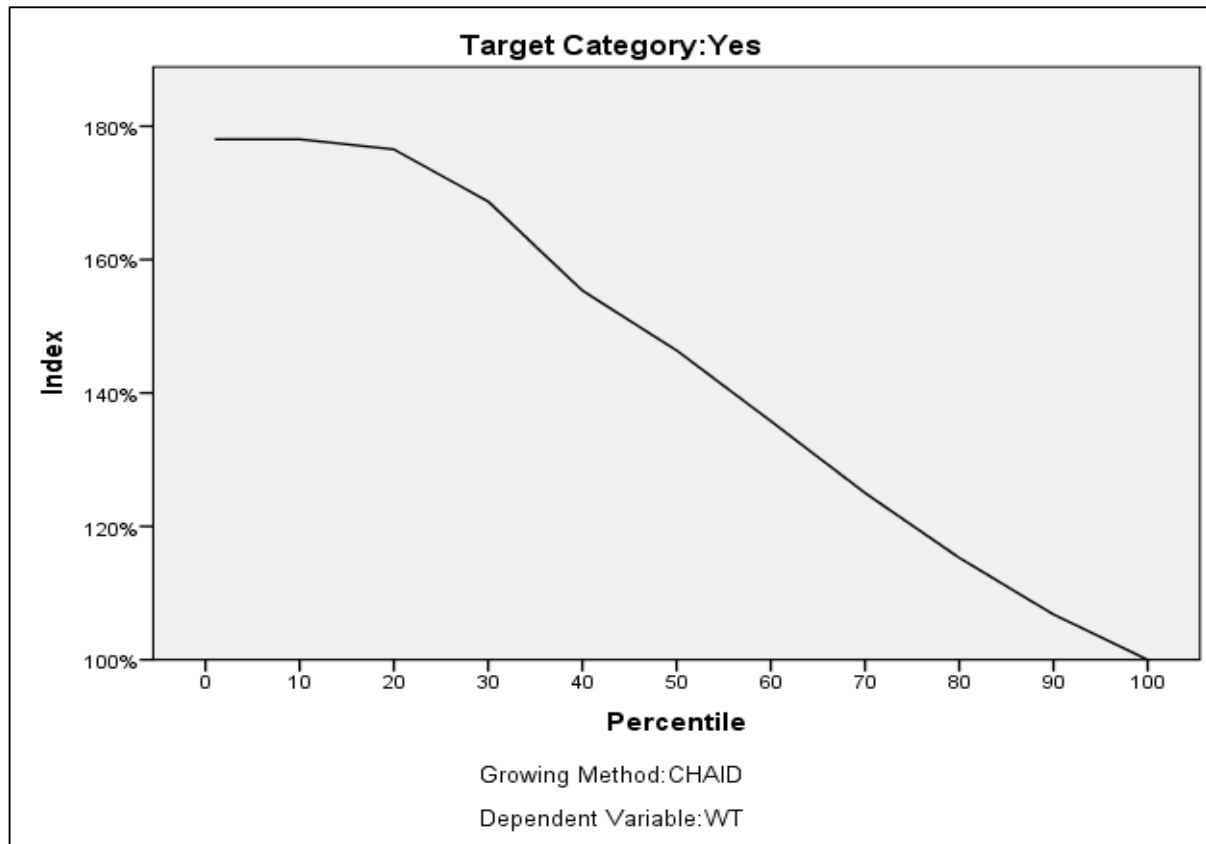| Node	Node		Gain		Response	Index
	Frequency	%	Frequency	%		
3	58	18.2%	56	32.4%	96.6%	178.0%
8	32	10.0%	28	16.2%	87.5%	161.3%
9	64	20.1%	40	23.1%	62.5%	115.2%
7	21	6.6%	10	5.8%	47.6%	87.8%
12	26	8.2%	11	6.4%	42.3%	78.0%
10	42	13.2%	12	6.9%	28.6%	52.7%
11	76	23.8%	16	9.2%	21.1%	38.8%

Source: Computer print-out, 2022.

Figure 1

Gain chart distribution

Source: Prepared by the author.

Figure 2

Index chart distribution

Source: Prepared by the author.

The tree diagram shows that IBID is the best predictor of WTP for health insurance (Figure 3). The possible reason might be associated with the price sensitivity of the households to the premium to be paid for the services given their low-income status vis-à-vis large vulnerable household size that characterized the study area. For the rural households in the 'yes IBID' category, extension contact is the next best predictor for WTP. For the households in the 'yes EXT' category, EXT is the only significant predictor of WTP for health insurance. Of the households in this category, 96.6% are WTP for health insurance, while 3.4% are not WTP for health insurance. Thus, it can be inferred that the healthcare component of extension services, *viz.* sensitization of rural households on the importance of good health, a relegated function of advisory services in the study area, played a key role in shaping the mindset of rural households on the necessity of affordable healthcare services.

Nevertheless, this category of 'yes EXT' is considered a terminal node as it has no child node(s) below it. Meanwhile, for the 'yes IBID' households with 'no extension contact', the model includes one predictor: the household head's age. Pieces of evidence show that slightly less than half (47.6%) of those households in the middle-aged category are WTP for health insurance. In comparison, over 87% of those

households in the youthful age category are WTP for health insurance. The possible reason for high WTP among the youthful-aged category might be attributed to modernity, which influences their social orientation against the middle-aged category, which tends to have reservations/skepticism about any innovative development in a typical African agrarian setting.

On the other hand, educational level was the next best predictor of WTP for health insurance for the 'no IBID' households. For the 'no IBID' households with secondary education, the model includes one more predictor, *viz.* agricultural holding. The results showed that over 62% of households with medium-scale agricultural holdings are WTP for health insurance. In comparison, just a handful of 28.6% of households with small-scale agricultural holdings are WTP for health insurance.

The possible reason for low WTP among the households with small-scale agricultural holdings might be attributed to the subsistence nature of their scale of operation, whose business turnover ratio is poor compared to their counterparts with medium-to-large scale agricultural holdings in which the business turnover ratio is fair due to opportunities of enterprise diversification and intensification, thus the likelihood of high WTP for health insurance. Likewise, for the 'no IBID' households with primary education, the model includes one more predictor, *viz.* credit access. It was established that 42.3% of the households with access to credit are WTP for health insurance, while approximately 21.1% of households with no credit access are WTP for health insurance. Thus, the direct relationship of credit with income generation might be the possible reason for the WTP for health insurance. However, the low educational level is the possible reason why slightly above half of the sampled population are not WTP for health insurance among the category of households with credit access.

Therefore, policymakers must enhance credit facilities and out-of-class health educational enlightenment, thus enhancing rural households' social orientation on the necessity of affordable healthcare by exploring social health insurance schemes in the study area. This act will go a long way in addressing the challenges of poor healthcare in the study area, inadequate public expenditure for healthcare, limited public healthcare facilities, etc., thus enhancing the growth and development of the rural economy in the study area.

Figure 3

Determinants of WTP for health insurance
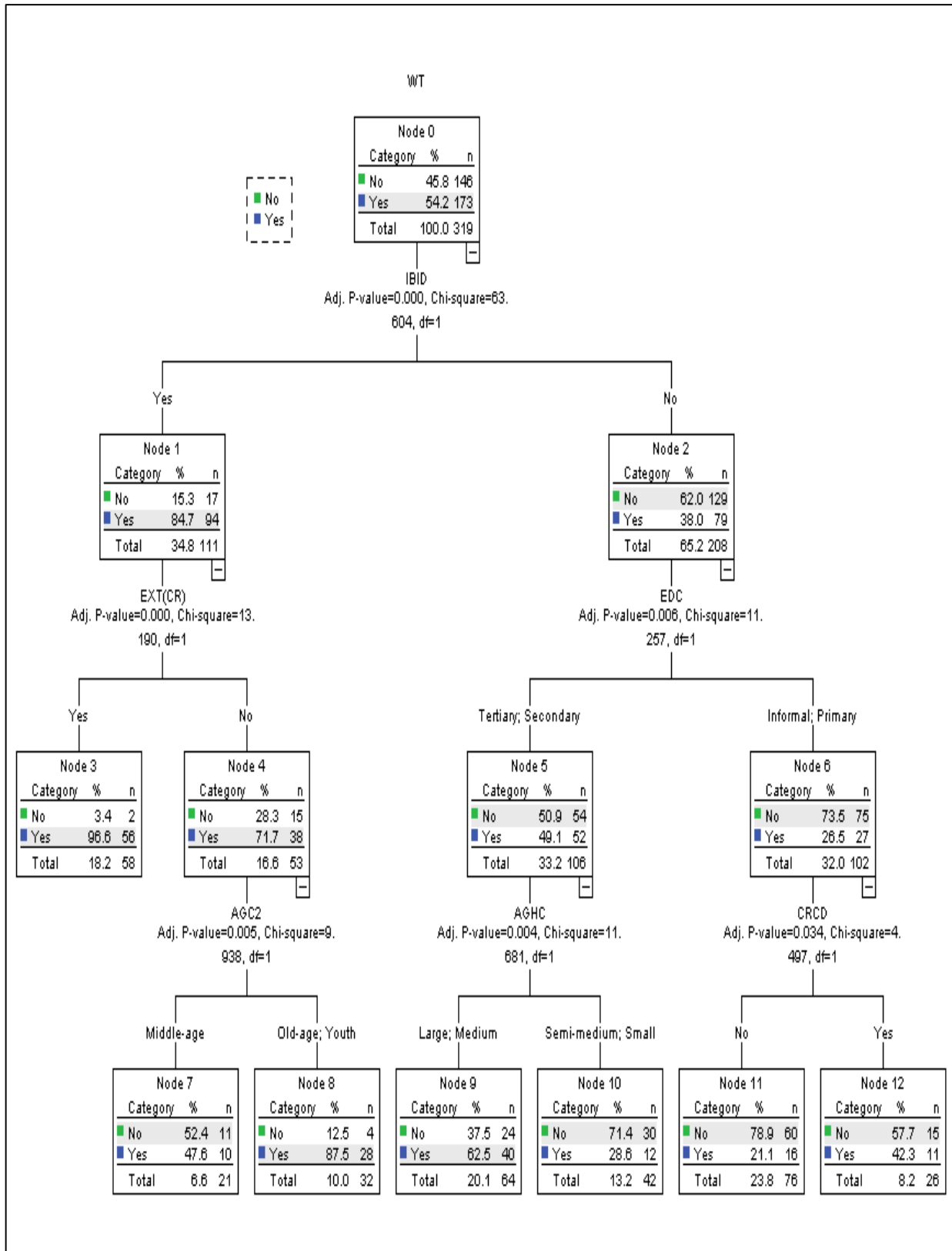
Source: Prepared by the author.

Conclusion and Recommendation

According to the findings, it can be suggested that malaria, followed by typhoid fever, were the significant morbidities affecting the livelihood of rural households, costing a household an average morbidity economic cost of ₦70,944.70. Besides, rural households are interested in the social health insurance scheme, but a fair premium rate is a portend threat to the wide acceptability and sustainability of the scheme. Nevertheless, an inverse relationship exists between premium and WTP. Comparatively, there is a clear indication that the households will be willing to pay more if the scheme offers them better services. Furthermore, the key factors affecting WTP are old age, poor agricultural holding, and lack of credit facilities. Thus, the study recommends social safety net insurance for aged households and the provision of credit facilities- a catalyst for rural households to generate incremental income vis-à-vis agricultural intensification and diversification. In addition, the households are advised to adopt eco-friendly medical preventive and environmental sanitary measures, pruning down the consequences of malaria and typhoid fever in the study area.

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محمد سنوسي صادق
إنفيندر بول سينغ
محمد مكارفي أحمد
محمود عمر بالا

تقييم استعداد الأسر الريفية لدفع تكاليف التأمين الصحي في ولاية باوتشي في نيجيريا

المستخلص

يهدف هذا البحث إلى تحديد مدى استعداد الأسر الريفية للدفع مقابل التأمين الصحي في ولاية باوتشي في نيجيريا. وباستخدام نهج easy−cost route، تم استنباط البيانات المقطعية من خلال استبيان جيد التنظيم مقترن بجدول زمني للمقابلة من إجمالي 319 أسرة تم اختيارها من خلال تقنية أخذ العينات العشوائية متعددة المراحل. ولتحقيق الأهداف المحددة، تم إخضاع البيانات المجمعة للإحصاء الوصفي والاستنتاجي. من الناحية التجريبية، كشفت النتائج أن الملاريا والتيفوئيد هما المشكلتان الصحيتان الرئيستان التي تؤثران في الأسر، مما يفرض عبئًا اقتصاديًا كبيرًا بتكلفة متوسطها 70,944.70 نيرة نيجيرية شهريًّا لكل أسرة. وعلى الرغم من هذا العبء المالي، فقد أبدى ما يزيد قليلًا على نصف المشاركين اهتمامًا بالتأمين الصحي الاجتماعي لتحسين الوصول إلى الخدمات الصحية. ومع ذلك، يشكل معدل القسط خطرًا كبيرًا على استدامة البرنامج؛ حيث أظهرت النتائج وجود علاقة عكسية بين مُعدل القسط واستعداد الأسر للدفع. علاوة على ذلك، أشارت نتائج الدراسة إلى أن التقدم في السن، وضعف الموارد الزراعية، ونقص التسهيلات الائتمانية، تمثل عقبات رئيسة أمام استعداد الأسر لدفع تكاليف التأمين الصحي. لذا، توصي الدراسة ببدء البرنامج بمعدل قسط منخفض لبناء الثقة وإظهار فوائد البرنامج على المدى الطويل، كذلك يجب بدء تطبيق البرنامج بمعدل قسط منخفض لبناء الثقة وإظهار فوائد البرنامج على المدى الطويل. وتحث الدراسة صانعي السياسات على تعزيز تغطية التأمين الصحي الاجتماعي للأسر المسنة، وتوفير أنظمة ائتمان كافية لتحفيز توليد الدخل، من المتوقع أن تُسهم هذه الإجراءات في توسيع نطاق البرنامج وضمان استدامة التأمين الصحي الاجتماعي في المنطقة.

الكلمات الدالة: الرعاية الصحية، تأمين، الاعتلال، الاستعداد للدفع، الأسر الريفية، نيجيريا