DETERMINANTS OF CHOICE OF HEALTHCARE PROVIDERS AMONG FARMING AND NON-FARMING HOUSEHOLDS: EVIDENCE FROM SELECTED RURAL AREAS OF IBADAN, OYO STATE.

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ABSTRACT

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The study is aimed at isolating factors influencing choice of healthcare providers among farming and non-farming households. Primary data were collected from the farming and non-farming households’ heads using questionnaires. The sample was selected using a multi-stage sampling technique. Patients in the study area were more inclined to seek curative services than other available services. Self-medication offers the least curative service in the area. Majority (14%) of the non-farming households prefers to use private healthcare providers, while most (19%) of the farming households preferred informal healthcare facilities. The socio-economic and access factors affect choice of various healthcare providers of the households’ categories in the rural areas of Ibadan. The healthcare providers choice of Farming households were influenced by gender, asset factors(owning house(s) and not on rent), quality of care, waiting time and cost of care. While the healthcare providers choice of Non-farming households were influenced by age, gender, years of formal education of household’s head, cost of care, operating hours of facility, quality of care, waiting time and distance to facility. This study recommends the need to encourage education among children and adults and establish more primary healthcare centers with quality services at moderate costs among respondents.

Keywords: Choice of healthcare provider, farming households, non-farming households

INTRODUCTION

The rural household is made up of the agrarian households (farming households who spend most of their time on farming activities and) and the non-agrarian households [those whose source of livelihood is in off-farm jobs alone or combine off-farm jobs(mainly) and farm jobs (as part-time job)].The rural households are seeking for more productivity and better health as good health affects production by boosting people’s capacity for work, increase how much they can produce, restructure their small farm sector, increasing agricultural incomes and creating a demand for input services. Good health enhances their ability to take risk especially the farming household, on the new crops or farming methods that might pay off with better production and income (IFPRI 2006). When unhealthy non-farm sector are unable to produce its non-agricultural goods and the farm sector is unable to produce enough goods to earn a decent livelihood, their poverty and consequently malnutrition statuses worsen their health (IFPRI, 2006). Based on these factors, the health institutions needs to be readily available to help the rural sectors’ dwellers combat or solve any unhealthy problem through the provision of health directed agencies or healthcare providers. However, the rural sector seek to increase production in both farming and non-farming households in good and better health as they have access to good health services from accessible healthcare providers.

There are various healthcare providers in the state, ranging from public, private and informal (traditional healers, medicine store dealers or hawkers). Most patients’ choice of healthcare providers differs as they depend on various characteristics of potential providers and patient themselves. Such factors can influence accessibility of healthcare, even when facilities exist around them. Theoretically, the choice of providers by patient is mainly determined by the price of care, quality of care, perception of consumer, attitude, type of illness and severity, socioeconomic and demographic condition of consumers. Although, healthcare from public facilities in the country is highly subsidized and open to all, given that the average technical competence in public facilities is higher than that of the modern private providers, Patient rationally should have a higher preference for public providers but empirical evidence reveals that in developing countries, private care is a good alternative to public healthcare and a considerable amount of substitution is observed between public and private healthcare (Hamid et al, 2005). However, it is obvious that the choice of healthcare providers by the households in the farm sector could differ from those of the households in the non-farm sector since Knight and Song (1993) found that the distribution of non-farm income is more unequall than that of farm income. Hussain et al, (1994) comparing the distribution of farm and non-farm income, concluded that the unequal distribution of non-farm income is a key factor explaining the rise in inequality in household income [Reardon et al., 2001; Barrett et al., 2001; ]. These studies suggest that the sharp increase in inequality in rural household incomes should be mainly attributed to
differences in skills, knowledge, and capital endowments which created disparities in chances to participate in and earn from non-farm activities. They opined that with the resulting differences in capital accumulation and in know-how, these two factors are expected to further widen inequality. Since there is a disparity in their income quintile and capital accumulation between the two groups of households, it significantly shows there is a difference in their expenditure pattern and differences in the level of energy demand and the work condition exposed to in the kind of job they do. These factor variables could impose differences in the choice of healthcare providers available to them. However, just as there could be differences in the factors that influence the choice of healthcare providers between the households in the farm and non-farm sectors, there could be similarities. It is pertinent to determine the factors responsible for the choice of healthcare providers between these groups of households in Ibadan metropolis.

By literature, the use of healthcare facility in the rural areas of Nigeria is limited or restricted by inadequate healthcare facilities, insufficient staff, equipments or medical training; other limitations include far distance location of facility, method of payment, income, household size, years of formal education, main-occupation of households and more importantly limited access to healthcare services. There is evidence that the consumers choose the facilities in which access is easier and the payment system is flexible (Nguyen et al., 2008). There is further evidence that socio-economic and demographic conditions play an important role in choosing providers (Bir and Eggleston, 2002).

Arising from the foregoing, the objective of this study is to identify factors influencing farming and non-farming household’s preference for different healthcare providers. It will therefore attempt to provide answers to the following research questions. What are the socioeconomic and demographic characteristics of the household in the study area? What are the patterns of choice of healthcare providers between farming and non-farming households? What difference exists between determinants of healthcare providers’ choice of farming and non-farming households in the study area?

Theoretical and Conceptual Framework

A healthcare provider according to the Federal Regulation of United State of America (1995), is defined as a doctor of medicine authorized to practice medicine as appropriate by the state and any person determined by the secretary to be capable of providing healthcare services such as podiatrists, dentists, clinical psychologists, optometrists, chiropractors, nurse practitioners, nurse mid-wives and clinical social workers who are authorized to practice and performing within the scope of their practice as defined under the law. It is further defined by the law as a provider of medical or health services or any person or organization that furnishes bill or is paid for healthcare in the normal course of business. A healthcare provider is highly necessary in every community, towns and cities most especially the primary healthcare so that health status can be checked regularly not to avoid it from worsening. They can help make smart choices to stay healthy. He or she can talk to his/her client about health risks such as smoking, alcohol, sex, seat belts, nutrition and give advice about treatments. In a situation of serious or unusual medical problem, the Primary Care Provider can refer one to a specialist. One of the advantages to choosing a Primary care provider is that there may be more time for counseling and questions. They perform regular check-ups and help with health problems (CYWH, 2008).

The Nigeria Health Sector

Healthcare provision in Nigeria is a concurrent responsibility of the three tiers of government in the country. However, because Nigeria operates a mixed economy, private providers of healthcare have a visible role to play in healthcare delivery. The federal government’s role is mostly limited to coordinating the affairs of the university teaching hospitals, while the state government manages the various general hospitals and the local government focus on dispensaries, (which are regulated by the federal government through NAFDAC). The current health policy of Nigeria is embodied in the National Health Policy and Strategy to achieve health for all Nigerians. It was introduced in 1988 (FMH, 1988) and subsequently revised in 2004 founded on egalitarian principles, the policy seeks to improve the health of all Nigerians by devising a sustainable health system based on primary healthcare (PHC), that is, protective, preventive, restorative and rehabilitative. The policy adopts WHO’s strategy for realizing primary health care as elaborated in the Declaration of Alma Ata (WHO and UNICEF 1978). This information by policy is meant to be passed on through a three-tier system of healthcare, namely: Primary Health Care, Secondary HealthCare, and Tertiary HealthCare (Duckett, 2004). Detail definition on the three-tier health system is provided as follows:

Primary healthcare: The Provision of healthcare at this level is largely the responsibility of Local Governments with the support of State Ministries of health and within the overall national health policy. Private medical practitioners also provide healthcare at this level.

Secondary healthcare: This level of healthcare provides specialized services to patients referred from the primary healthcare level through out-patient and in-patient services of hospitals for general medical, surgical, pediatric patients and community health services. Secondary healthcare is available at the district, divisional and zonal levels of the states.
Tertiary healthcare: This level consists of highly specialized services provided by teaching hospitals and other specialist hospitals which provide care for specific diseases such as orthopedic, eye, psychiatric, maternity and pediatric cases.

One of the strategies to achieve the National health policy is through the National Health Insurance Scheme (NHIS) Act, promulgated in 1999. It seeks to bring changes to this system of healthcare financing by reducing the cost burden on individuals and improving the quality, availability and affordability of services. The Act provides for the creation of health maintenance organizations (HMOs) which in-turn are allowed to contract with healthcare providers for provision of care to insured individuals.

Having known that Nigeria healthcare is partly provided by the government, hospitals and clinics run by religious groups or individuals also play an important role. The major urban centers are well served, but rural areas often have no appreciable standard modern healthcare. Patients in these areas either rely on traditional medicine or travel great distances for care (Wikipedia, 2008). According to AHCPR (1996), the key healthcare issues facing rural areas of the world are;

Access to care: Many small rural hospitals have closed, while other healthcare facilities are financially constrained. Unavailability of resources and transportation problems are barriers to access for rural populations.

Supply of primary care physicians and other healthcare providers: The supply of primary care practitioners and other healthcare providers in rural areas is decreasing. Some are leaving rural areas to join and managed care organizations elsewhere.

Health promotion and disease prevention: Goals for improving the nation’s health over the next decade can be achieved only if rural populations are included in efforts to remove barriers to access and use of clinical preventive services.

Healthcare technology: Technologies including telemedicine offer promise of improved access to health care, but their most efficient and effective applications need further evaluation and of which the rural households do not have access to them.

Organization of services for vulnerable rural populations: Low population density in rural areas makes it inherently difficult to deliver services that target persons with special health needs. Groups at particular risk include: the elderly, the poor, people with HIV or AIDS, the homeless, mothers, children, and adolescents, racial or ethnic minorities and persons with disabilities.

Consumer choice and the rural hospital: Factors that drive changes in rural hospitals have a critical effect on consumer choice and access. Based on rural health services research conducted and funded by AHCPR (1996), findings showed that almost one in three adults living in rural America has poor access to health facilities and nearly half have at least one major chronic illness, rural residents have less average fewer physician contacts per year than those in urban communities. Result revealed traumatic injuries being more common in rural areas and residents face worse outcomes and higher risks of death than urban patients, partly because of transportation problems and lack of advanced life support training for emergency medical personnel. Rural hospitals show a greater shift toward outpatient services, greater declines in admissions and lengths of stay than urban hospitals.

Their findings also showed that economic pressures have driven rural hospitals to shift rapidly to outpatient care; alcoholism and drug abuse were growing problems in rural areas and with a scarcity of mental health professionals in rural areas, fewer than one in five rural hospitals has treatment services for these conditions.

Identifying these factors, may help shape solutions. The study emphasized that the rural and urban residents are equally likely to lack adequate health insurance. Stating underinsurance as a problem as being the report suggested analytic geographic mapping techniques for rural health policy and health services research to ensure a rational health insurance for all. In as much as these inadequacies exist in a developed country like America, it is more pronounced in a developing country like Nigeria. Hence such issues need to be addressed and be well managed in a county where equity in healthcare distribution is the optimum desire of its government.

Factors and constraints to choice of healthcare providers
Some important empirical and theoretical contributions of researchers related to the study were reviewed to help understand and give a clear view on the topic.

Nwabu et al. (1993) found that distance and user fee were both factors that reduced demand for healthcare, but men were less constrained than women. Hutchinson and Akin (1999) found out that increase in a woman’s jewellery in a household resulted in a decrease in the use of modern curative services, reflecting a greater value for her work than the time spent seeking care. For Uganda, Lawson (2003) found distance to have a major impact on whether health care was sought. Nguent et al. (2008) found Women to use healthcare services more often than Men do.

Age may also play a role in access to health care providers in that children are given priority in accessing health services. Hallman (1999) found that demand for modern care was high up to the age of six months and there after declined sharply. Lindelow (2002) found that the percentage of infants and children that attended a consultation in response to an illness was higher than older age groups. This implies that attitude towards a sick
child and an adult in seeking healthcare services from a facility differs. An individual’s level of education also plays a significant role in decision-making regarding seeking health care. Nguyet et al. (2008) found that those with higher education tend to chose modern healthcare rather than self-treatment, Kasirye et al. (2004) found the level of formal education to have positive and significant effect on the use of modern health facility relative to no care; they found out that education of household head influences the probability of children visiting a private care provider but has no effect on public provider. This implies that the probability of not seeking care decreases with increase in education. Similarly, Juarez (2002) asserted that preference for private modern care to public care and traditional care increased with increase in education among women. However, improving the woman’s educational level was shown to facilitate the adoption of preventive medicine, particularly in more rural communities. Studies that looked at both rural and urban communities had similar finding, individuals in households with women of higher levels of education were more likely to use curative care than the less educated (Hutchinson and Akin, 1999).

In terms of quality of care, studies use different indicators of quality such as; total expenditure per person in the population served (Akin et al., 1986), presence of well functioning diagnostic equipment such as X-ray machines and number of medical staff (Nwabu et al., 1993), drug availability, and physical infrastructure (Ellis et al., 1994). The findings indicate that availability of essential inputs such as drugs and medical staff is positively associated with the use of medical services. A review of more than 50 users fee experiences in Africa showed that use of health service increased when quality was improved and reduced when quality deteriorated (Wills, 1993). Tembon (1996) stipulated from his findings that quality of care is the most important factor influencing the choice of healthcare provider. He emphasized that as the quality of care increases in governmental health centers, choice probability also increases. Hallman (1999) found that there were strong positive quality impacts on demand for healthcare. Ndeso-Atanga (2003) opined that service quality and disease severity dominate choice of providers of curative and maternity services in area of rural Cameroon. The study stated that when a disease demands quality treatment, the factors dominate the choice made and the reasons given to it. When a condition is less sensitive to quality of treatment, decision and reasons then reflect consideration of price, distance and income. He found out that patients who are seriously ill seek hospital despite great distances and cost as many women who faces complicated deliveries seek to deliver their children in hospitals despite great cost. This implies that patients evaluate the medical needs of their condition in a manner similar to the evaluation of healthcare professionals.

Akin et al. (1995) found that when quality of care is controlled, the price of healthcare is a significant determinant of choice of healthcare provider. However, the magnitude of the price effect is very small. The low price elasticity is more pronounced for public healthcare providers than with private health providers. Nwabu et al. (1993) from his findings, that a 10% increase in the price of public health services reduces demand by only 1% on the other hand a 10% increase in prices of private medical facilities would reduce demand in private clinics. These findings were in line with that of the finding by Sahn et al. (2003). This explains that doubling the price of public clinics or public hospitals resulted in a decline in the probability of their use by 0.10, while doubling the price of private clinic was accompanied by a large increase in the use of public clinics. It could be said that the magnitude of the price effect is sensitive to the way the price variable is specified. This implies that the demand for healthcare services does not decrease with increase in price of health services. Equally important, the responsiveness of the poor and non-poor individuals to changes in prices of health care may be different. Some of the studies found that the poor are not affected any differently from the non-poor, when prices of health services are increased (Dor and Van De Gaag 1993; Mwabu et al., 1993). On the other hand, there is evidence that the magnitude of the price effect varies with changes in an individual’s welfare status. In particular, demand is more elastic for the lowest or poorest quintile and inelastic for the top quintile (Lindelow, 2002). In this case, increase in access charges would be regressive since the poor are more adversely affected than the non-poor were. Kasirye et al. (2004) found out that cost of care is regressive and substantially reduces the healthcare utilization for any formal provider by the poorer individuals after controlling for other factors. This is to say that among public facilities cost of care remains a barrier to utilization.

**Other factors empirically demonstrated as influencing access to health care providers are:**

**Availability of health facilities:** The medical and health services that are in existence in rural areas are physically out of reach of the people, which is to say that health services were not accessible to the bulk of the Nigerian population (Okafor, 1982). Healthcare delivery services between the rural and urban areas show very critical imbalances, with regard to access of the population to these facilities.

**Financial inadequacies:** General financial inadequacy and high rate of poverty that ravage all over Africa has contributed to the reasons why some households will prefer self medication or the herbal home which they believe charge less to the modern health care providers available to them in there environs (Eke, 2004).

Transport mobility and access to health services: In low income countries, mobility is a key factor to accessing health services and technologies. USAID (2004) highlights the importance of transport for urban poor populations, especially rural dwellers, accessing health facilities, which tend not to be located in poor areas of

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cities. Musa (2002) asserted that the construction of feeder roads providing motorized transport that connect villages in the Darfur region of Sudan are reported to have influenced measurable impacts on community health, such as a rise in immunization of children. In support to this idea, Matin et al., (2002) reported that women experience better access to health services and improve services provision by outreach workers in areas of rural Bangladesh that are near all-weather roads. This explains that access to healthcare provision in a facility at a distant place will be explored if there are good roads providing effective movement to the facility.

Distance and Time factor: Ensor and Cooper (2004) in their review of literature on barriers to health services accessed asserted that reduced demand for health services in low-income countries are key barriers to healthcare use. It emphasized that among many rural poor, the lack of local health resources entails long and slow journeys that enforce breaks in subsistence activities and loss of wages. This is to say that in many low-income countries the direct cost of transport constitute a substantial proportion of overall expenditure on healthcare. However, health facility at a distance are not likely to be patronized by the rural poor who is conservative on his health expenditure and considers the time spent on the road traveling to the place of his healthcare provider as a time that should have been invested in a better venture or in his farm.

Availability of health workers: Urban areas in Nigeria due to better opportunity and availability of social amenities are more attractive to healthcare professionals for their comparative social, cultural and professional advantages. However these medical professionals are reluctant to relocate to remote areas and forest locations that offer poor communications with the rest of the country and few amenities for health professionals and their families (Adesanya, 2005) This is to affirm that better remunerations, welfare packages and infrastructural facilities in our rural communities will attract medical doctors, trained nurses and attendants to work and stay back to carry out their professional duties in the right attitude.

Harsh culture and religious beliefs: These factors held tight by most members of the Africa community, believing the mystic nature and origin of disease would prevent them from going to the hospital when ill. They will rather visit the churches, traditional specialist or sorcerer

**Poor sanitary health and environmental condition:** Overcrowding, poorly ventilated and unhygienic environments has discouraged some members of our communities from the use of public facilities like the public hospitals and thereby opt for a better option like the use of private clinics and hospitals. In most cases, it is worst in the informal settings.

The review of these theoretical/empirically related studies serves as guide in the use and operationalization of variables for this study.

In order to have a good understanding of the concepts of this study, the following definitions are provided below:

**Definitions used in this study**

- **Illness:** A state of being sick with signs or symptoms where one is either restricted from normal activities or able to do normal activities.

- **Healthcare provider:** A provider of healthcare services; classified as

  - **Self-treatment:** An action whereby patients treat themselves using medicines available at home, purchased from drug sellers.

  - **Informal Providers:** Facilities where patients receive treatment or medicines from traditional healers, drug sellers or medicine store dealers or drug hawkers without any medical examination or without formal medical background.

  - **Private Providers:** These include healthcare facilities where patients receive treatment or medicines from private clinics, hospitals, health workers where they practiced privately after regular work or are retired health workers practicing at home.

  - **Public providers:** These include healthcare facilities where patients receive treatment or medicines from government healthcare facilities like primary healthcare units, dispensaries, state clinics and hospitals and teaching hospitals amongst others.

**METHODOLOGY**

**The study area:** The study was carried out in some selected local government areas in Ibadan. Ibadan is considered an ideal place for this study, because it is a cosmopolitan city well industrialized and a state capital with rural and non-rural areas. Ibadan is at longitude. 7°23'47"N 3°55'0"E and latitude. 3°35' and 4°10'N, was founded in 1829, initially occupied by immigrants. It is now the largest indigenous city in tropical Africa and is the capital of Oyo state. It covers an area of about 1,189.2 sq m (3,080 km²). It was estimated that of the total land area 36.2km were for urban use while the remaining 67km is devoted for non-urban uses such as farmlands, rivers, flood plains, forest reserves and water bodies (Areola, 1994). Ibadan is at the junction of the savannah and the forest, is the third largest city in Nigeria by population (after Lagos and Kano), and the largest in geographical area. It is located in south-western Nigeria, 78 miles inland from Lagos and is a prominent transit point between...
the coastal region and the areas to the north. Its population is 2,550,593 according to 2006 census results (NPC, 2006), including 11 local government areas with 5 in the inner areas and 6 in the outer areas. The principal inhabitants of the city are the Yoruba people. The city is a major center for trade in cassava, cocoa, cotton, timber, rubber, and palm oil. The main industries in the area are involved in the processing of agricultural products, flour-milling, leather-working and furniture-making (NBS, 2006). The Local Government Areas selected for the study include Akinyele Local Government Area, Oluyole Local Government Area and Ona-Ara Local Government Area.

**Sampling techniques/sample size:** The data used for this study was collected using a well-structured questionnaire. A multistage sampling technique was used in this study to select the respondents. Akinyele, Ona-Ara and Oluyole Local Government Areas were selected purposively from among the eleven Local government Areas that make up Ibadan due to the fact that they are among the few less developed (rural) areas in the city and have at least a modern healthcare facility in each of its ward. Four wards were proportionately selected from each Local Government Areas Selected. Wards 1, 5, 8 and 9 in Akinyele L.G.A, three wards including wards 1, 3 and 5 from among ten wards in Oluyole L.G.A and wards 1, 3 and 4 from among eleven wards in Ona-Ara L.G.A. were selected. Household’s heads from each ward were randomly selected on the average, 18 and 20 respondents were interviewed from the non-farming and farming households respectively, from each chosen wards. A total of one hundred and sixty respondents of the non-farming households and two hundred respondents from the farming households were interviewed based on proportionate sampling principle.

**Analytical tools used for data analysis:** The economic tools employed in the analysis of the survey data collected include the following: Descriptive statistics such as percentages distribution were used to analyze the socio-economic and demographic characteristics of the respondents using SPSS-14 (sex, age, marital status, main occupation, secondary occupation and household size amongst others.). Patterns of choice of healthcare providers(mainly cross-tables) and a multinomial logit model specification was used to determine the different factors influencing the choice of healthcare providers among the farming and non-farming household’s heads using stata 9.

**Detail description of the multinomial logit model is presented as follows:**

**Multinomial logit model:** The multinomial logit tool was used to determine the factors influencing the choice of healthcare providers between the households (in the farming and non-farming households). This tool is necessary because it is a qualitative response regression model. Where our dependent variable Y the health care providers are qualitative. Objective here which is to find the probability of making a specific choice is influenced by a specific explanatory variable. The tool is also relevant where there are polychotomous or multiple category response variables and one assume that all the alternatives are mutually exclusive. In this case each choice variable stands as an unordered category and the self-medication is chosen as the base line. This tool was used to generate the marginal effect of the variables falling into a given category.

**The model:** The multinomial logit model is best understood first in terms of probability that a respondent i will fall in one of the j = 1, ..., J category of the dependent variable.

Let $Y_{ij}$ be a set of j = 1… J Bernoulli random variable such that $y_{ij} = \begin{cases} 1 & \text{if } i \text{ is in category } j, \\ 0 & \text{if } i \text{ is not in category } j \end{cases}$

With $y_{ij}$ distributed as a Bernoulli random variable, $E(y_{ij}) = P(y_{ij} = 1)$

Letting $P_{ij} = P(y_{ij} = 1)$ for convenience, the multinomial logit can be represented as:

$$P_{ij} = \frac{e^{x_iB_j}}{\sum_{h=1}^{J} e^{x_iB_h}} \quad \text{------------------- (1)}$$

Where $x_i = (x_{i1}, x_{i2}, ..., x_{ik})$ and $B_j = (B_{j1}, B_{j2}, ..., B_{jk})$

When the numerator and denominator grow large without bound while the ratio remains constant, the $B_{jk}$ become unidentified. Therefore restriction is applied.

When restriction is applied $B_{j} = 0$ giving

$$P_{ij} = \frac{e^{x_iB_j}}{1 + \sum_{h=1}^{J} e^{x_iB_h}} \quad \text{for categories } j=1...j-1 \quad \text{------------------- (2)}$$

$$P_{ij} = \frac{1}{1 + \sum_{h=1}^{J} e^{x_iB_h}} \quad \text{for category J} \quad \text{------------------- (3)}$$

Interpreting the parameter estimate in terms of probability that i fall in category j giving a change in $X_{ik}$ is given by

$$\frac{\delta P_{ij}}{\delta X_{ik}} = B_{jk}P_{ij}(1-P_{ij}) - P_{ij} \sum_{h \neq j} B_{kh}P_{ih} \quad \text{------------------- (4)}$$
With the identifying restrictions given for category J, the log odd is given as
\[
\delta \log \frac{P_{ij}}{\sum B_{kh} P_{ih}} \quad \text{(5)}
\]

The maximum likelihood estimator which is log likelihood maximized was used because it guarantees consistent parameter estimates and corrects large sample statistics (Scott, 2000). This and Chi-square \((X^2)\) distribution were used to test overall model adequacy at 95\% significant level

Log-likelihood function formula is given as
\[
L = \sum_{i=1}^{N} \sum_{j=1}^{J} y_{ij} \ln(P_{ij}) - \sum_{i=1}^{N} \{\sum_{j=1}^{J-1} y_{ij} \ln(e^{x_{ij}B_{ij}}/(1+\sum_{j=1}^{J-1} e^{x_{ij}B_{ij}})) + y_{ij} \ln(1/(1+\sum_{j=1}^{J-1} e^{x_{ij}B_{ij}}))\}\]

The marginal effects are interpreted as the change in probability of using a particular kind of health service facilities as one unit change in the explanatory variable occur (Cavagnero et al., 2006). Having “k” health providers, we consider the effect of changing by one unit a regressor on the jth probability as follows:

The formula for marginal effect estimation is given by:
\[
\delta \frac{Pr_{ij}}{\delta X_{j}} = Pr_{ij} \left( B_{ij} - \sum_{k=1}^{K} Pr_{ik} B_{ik} \right) \quad \text{----------------------------- (6)}
\]

Where \(Pr_{ij}\) is Probability that a respondent i used a particular healthcare facility jth

Where j = serves as the dependent variable 1, 2, 3 and 4 standing for Public providers, Private providers, Informal Providers and Self-medication.

(1 is assigned for belonging to a category, 0 otherwise)

K = 1…hm (total number of respondents)

Bo = intercepts

Bi = coefficient

X = value of explanatory or independent variable for the ith individual

X = f (C, D)

C = socio-economic characteristics of household’s head

Where

\(X_1\) = Gender (male =1, female = 0)

\(X_2\) = Age (years)

\(X_3\) = Marital status (married = 1, 0 - otherwise)

\(X_4\) = Household size (number)

\(X_5\) = Main occupation (1 for farmer, 0 for non-farmer)

\(X_6\) = Years of formal education (in years)

\(X_7\) = Own house (1 for yes, 0 - otherwise)

\(X_8\) = Live on rent (1 for yes, 0 - otherwise)

\(X_9\) = Annual income (in naira)

While D = Represents access variables

\(X_{10}\) = Cost of treatment (naira)

\(X_{11}\) = Distance to provider (kilometer)

\(X_{12}\) = Waiting time before seeing the physician (hour)

\(X_{13}\) = 24hours operation of facility (1 for yes, 0 - otherwise)

\(X_{14}\) = Quality of care rating (0 for fair, 1 for good)

The multinomial logit result for this study was analyzed using stata 9 package and results are better reported using marginal effect estimates (see the appendix).

RESULTS

Based on the survey data, there were 360 respondents interviewed who had fallen ill in the last one year and obtained treatments for their illness. 56\% of them were the farming households, the non-farming households’ make-up 44\% of the respondents. The major secondary occupation in the area is trading (34\%) and farming (9\%). Most of the household’s heads in the area were males (89\%) and female heads accounting for 11\% interviewed. Average age of household heads is 47 years, average household size is 6 and most respondents have moderately large family size between 5 to 9. About 45\% of the respondents have above ten years of formal education. 28\% the households belong to the lowest income quartile while households in the richest quartile account for 23\%. 58\% pay no rent on their apartment while 42\% live on rent. 55\% of households hold or own between zero to 2 acres size of land and 6\% of the households hold or own above 6 acres of land. Data showed that the prevalent illness in the area include malaria fever (60\%), typhoid fever (13\%) and leg ache or rheumatism (10\%). Result
further indicates that treatment on ailment were obtained mainly from informal providers as 31% of household used this option, this is followed by 29% of household who obtain cure from private providers, 25% of households who obtained cure from public providers and 15% who obtained cure from the use of self-medication. Mainly farming households (35%) obtained curative need from informal healthcare providers, followed by 27% who used private healthcare services, 23% obtained treatment from public providers, self-medication offer less cure as 15% used this means. Most non-farming households (31%) relatively obtained cure from private providers, followed by 28% who use public providers, 27% used informal provider and 14% obtained cure from self-medication. Most males (29%) of the non-farming households obtained treatments from the private healthcare providers and just 4% of their female used informal providers. Relatively most males (29%) and female (6%) of the farming households obtained cure from informal providers. Most single parents of the non-farming household chose informal providers and self-administration on equal proportion at 6% for curative treatment and fewer respondents sought care from the public and private medical facilities. Most non-farming households relatively (27%) with household size below 7 sought care from private healthcare centers and most with increased size of about 7 and above (8%) sought care from the public providers. On the other hand, most patients in the farming category with household size below 7 accounting for 47% sought treatment from informal providers, those with household size from 7 and above (11%) sought care from the informal providers. Informal healthcare providers were mainly utilized for curative treatments by patients with less than ten years formal education in both non-farming and farming households accounting for 17% and 31% respectively. Educated patients with ten years and above formal education tend to use private healthcare providers more followed by the public providers. This accounts for 26% private healthcare users, 25% public healthcare facility users for the non-farming households, 21% private provider users and 14% public users among the farming households. 31% of the patients among non-farmers who are landless or hold less than two acres of land per household opt for private providers when compared to public (28%) and informal (27%) healthcare providers which has a narrow difference in the user percentage between them. The farmers are the largest land holders, most of those (10%) with less than two acres and most (25%) holding the largest size of land from two or more acres, sought treatments among the informal providers than other sources of obtaining treatments. More than 80% of the respondents in all the households suffered non-communicable diseases. Most non-farming households who suffered non-communicable diseases accounting for 31% used private providers followed by 24% who used informal providers. In the case of the farmers, about 31% of the patients used informal providers. The few who suffered communicable diseases sought for treatment from the public providers (6%) among the non-farming households and informal providers (4%) among the farmers. Most households’ healthcare providers options for curative services were informal providers and self-medication among the lowest income earners in both type of households rated 22% and 11% respectively in the non-farming households, 25% and 12% respectively among the farming households. The public providers and self-medication were equally used in the same proportion by the farming households in the lowest quintile rated 12%, while the private providers were the least sought in both type of households. On the other, most households in the highest quintile used private providers accounting for 27% among the non-farmers and 19% for the farmers, this is followed by public providers rated 20% for the non-farmers and 11% for the farmers.
The patterns of choice of healthcare providers by socio-economic characteristics of respondents are presented in figures 1 to 6.
Econometric analysis: The multinomial logit model was estimated to determine factors influencing choice of healthcare providers (Public, Private, Informal and Self-medication while) self-medication was used as reference outcome in each category of household. A total of 200 and 160 observation were from farming and non-farming households respectively (who sought treatment from any of the above four mentioned sources) were used to estimate this model. The result and detailed description of the variables entered in the model are shown in the appendix.

The Multinomial Logit analysis result of the rural households (farming and non-farming households combined) on comparing public provider relative to self-medication, revealed that main occupation, gender, household size, years of formal education, land size, ownership of house(s), distance to facility, waiting time and cost of care were the factors driving the choice of public health care providers. Choice of private healthcare providers relative to self-medication were highly influenced among households in the rural areas by years of formal education, distance to provider, quality of care, cost of care, main occupation and land size. While the choice of informal providers relative to self-medication among rural households were influenced by the operating hours, cost of care, distance to provider, household size, land size, quality of care and that household’s head own house(s) and do not pay rent (see table 1 of the appendix).

The result above was further decomposed to isolate factors influencing the choice of each type of households’ healthcare providers (as in table 2 and 3). Result revealed that age is not an influencing factor among rural farming households but a significant factor among the non-farming households. The finding further indicates that a year increase in the age of the rural non-farmers reduces the probability of choosing public provider by 0.001 unit over the use of self-medication. Years of education has no effect on the choice of public providers over self medication among farming households, but affects the choice of public providers among the non-farming households. It further explains that a year increase in the years of formal education of the non-farmers will increase the probability of choosing the option of public healthcare units by 0.001 unit. Cost of treatment is not an influencing factor among the farmers but influences the choice of non-farming households, which further explains that one naira increase in the cost of care among non-farming households reduces the probability of choosing public healthcare facilities over self-medication by 3.16x10^-6 unit. Distance to provider has no effect on the farmers but on the non-farming households, as a one kilometer decrease in the distance to provider increases the probability of choosing public healthcare units over self-medication by 0.001 unit. Both types of households were influenced by waiting time factor and result further explained that a minute decrease in waiting time increases the probability of non-farming households choosing public provider units over self-medication by 0.001 unit which is lesser to that of the farming households at 0.024 unit. Operating hours and quality of care had significant effect on the non-farmers, and not on the farmers. The findings further illustrates that an hour increase in the operating hours of the public providers, the non-farming households are less likely to choose this option at the probability of 0.011 unit relative to self-medication and also as there is an improvement in the quality of care, the probability of choosing public healthcare facilities increases by 0.004 unit.

Households choosing private healthcare facilities were influenced negatively by age among the non-farming households which further shows that a year increase in the age of non-farmers reduces the probability of choosing private healthcare by 0.023 unit. Years of formal education has no effect on the farming households but positively influence the choice of using private healthcare units over self-medication among the non-farming households, showing that a year increase in the years of formal education of non-farming households increases the probability of choosing private healthcare facilities relative to self-care by 0.063 unit. Distance to facility has no effect on the farming households but highly influences the non-farming household private healthcare facility option, which shows that a kilometer decrease in the distance to place of healthcare unit increases the probability of choosing the private care units by 0.203 unit. Waiting time has no significant influence among the non-farming households choosing private health care facilities relative to self-medication but significantly influences the farming households, result further shows that a minute decrease in the waiting time increases the probability of farming households choosing private healthcare by 0.008 unit. Quality of care has a positive significant effect on the choice of private healthcare relative to self-care in all the household categories. This further illustrates that an improvement in the quality of care increases the probability of choosing private healthcare facilities by 0.289 unit among the non-farming households which is close to the probability of farming households choosing private healthcare relative to self-medication by 0.286 unit.

Households choosing informal provider were influenced significantly by gender in both type of household, this further indicates that a male gender headed household increases the probability of choosing informal provider over self-medication by 0.01 unit among the non-farming households and more increasing among the farming household by 0.86 unit. Years of education has no effect among the farming households but significantly influence the choice of the non-farming households, as a year increase in the years of formal education of the non-farmers reduces the probability of choosing informal healthcare facilities relative to self-medication by 0.054 unit. House ownership, no rent and cost of care have no significant influence on the choice of informal provider among the
non-farmers, but a negative influence on the choice of informal healthcare providers among the farmers, result further shows that an increase in individual owning a house decreases the probability of choosing informal health providers over self-medication by 0.081 unit, a reduction in households on rent reduces the probability of households choosing informal provider over self-care by 0.024 unit and one naira increase in the cost of care reduces the probability of the farming households choosing informal provider by 0.0001 unit. Waiting time has no effect on the non-farming households’ choice of informal healthcare provider but significantly influence the choice of the farming households which further explains that a minute increase in the waiting time will likely reduce the probability of choosing informal healthcare provider over self-medication by 0.015 unit. Operating hours of provider do not influence the choice of farming households but has an influence over those of non-farming households which further explains that an hour increase in the operating hours of facility reduces the probability of choosing informal healthcare facilities by 0.007 unit. However, the hypothesis test to establish whether difference exist in the households choice of healthcare providers shows that there is no significant difference in the healthcare providers choice of the farming household compared to the non-farming household (see table 4).

CONCLUSION

With reference to the pattern of choice of healthcare providers sought by households’ heads on curative treatments over the different cases of diseases encountered in the study, the most widely used facilities were private healthcare facilities followed by public healthcare facilities among the non-farming households, while the farming households widely preferred the private and informal health care facilities. It is obvious that the households categories has no significant influence in the choice of healthcare providers used but the socio-economic and access factors affect choice of various healthcare providers of the households categories in the rural areas of Ibadan. Hence, the prevalent factors influencing the healthcare providers’ choice of Farming households were gender, asset factors (owning house(s) and not on rent), quality of care, waiting time and cost of care. While the choice of Non-farming households were influenced by age, gender, years of formal education of household’s head, cost of care, operating hours of facility, quality of care, waiting time and distance to facility. The above listed factors could impede the maximum utilization of patient’s choice of facility where any of them becomes a constraint to the individual in question.

RECOMMENDATION

Based on findings of this study, it is recommended that there should be conscious campaign on family planning among respondents to encourage them to give birth to the number of children they can easily cater for. This is so since findings have shown that large household sizes reduce access of respondents to healthcare provider, households in the study area should be encouraged to educate their children as well as adults within the household since findings have shown that years of formal education enhances access to good health care providers and importantly, more healthcare centers that can provide quality services at moderate cost ought to be established among respondents of this rural study area, since findings have shown that quality of care, distance to providers and costs of care determine significantly access to healthcare providers.

REFERENCES


Hallman, K. (1999): Child Health Care Demand in a Developing Country Unconditional Estimates from the Philippines; IFPRI Food Consumption and Nutritional Division Discussion Paper, No.70.


International Food Policy Research Institute (IFPRI, 2006): Healthy Agriculture for Healthy People; IFPRI forum, March.


Nwabu,G. M, Anisworth and A. Nyamete.(1993):“Quality of Medical care and choice of Medical Treatment in Kenya”.The Journal of Human Resources; vol. 28, No.4: Pp 838-862.
Table 1: Multinomial logit result for the determinant of choice of healthcare providers by households in the study area.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Public Provider</th>
<th>Private Provider</th>
<th>Informal Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main occupation</td>
<td>3.0797** (1.3132) 0.2500^*</td>
<td>2.3871* (1.2030) 0.1600^*</td>
<td>-0.9501 (0.9080) -0.2760^*</td>
</tr>
<tr>
<td>Sex</td>
<td>2.9472** (1.4354) 0.2600^*</td>
<td>1.0130 (1.108) 0.1528^*</td>
<td>1.4247** (0.6281) 0.0180^*</td>
</tr>
<tr>
<td>Age</td>
<td>-0.0062 (0.3111) -0.0003</td>
<td>-0.2266 (0.0262) -0.0067^*</td>
<td>0.0177 (0.0196) 0.0063^*</td>
</tr>
<tr>
<td>Marital Status</td>
<td>-1.9410 (1.4112) -0.4378^*</td>
<td>1.3813 (1.9752) 0.4128^*</td>
<td>-0.9250 (0.1185) -0.0069^*</td>
</tr>
<tr>
<td>Household size</td>
<td>0.3663** (0.1762) 0.0504^*</td>
<td>0.0601 (0.1561) 0.0500^*</td>
<td>0.2140** (0.11845) 0.0100^*</td>
</tr>
<tr>
<td>Years of formal education</td>
<td>0.2667*** (0.0838) 0.0230^*</td>
<td>0.2414*** (0.0708) 0.0240^*</td>
<td>-0.0422 (0.0565) -0.0370^*</td>
</tr>
<tr>
<td>Own house</td>
<td>-1.8280** (0.8963) -0.2430^*</td>
<td>-0.4391 (0.8141) -0.2040^*</td>
<td>-0.9794** (0.4939) 0.0120^*</td>
</tr>
<tr>
<td>Rent apartment</td>
<td>1.4166 (0.9255) 0.1410^*</td>
<td>-0.5124 (0.8618) -0.1470^*</td>
<td>-1.0810 (0.5871) 0.0564^*</td>
</tr>
<tr>
<td>Annual income</td>
<td>2.996e-06 (2.34e-06) 0.24e-06^*</td>
<td>2.22e-06 (2.05e-06) 0.17e-06^*</td>
<td>2.60e-07 (2.12e-06) -0.40e-07^*</td>
</tr>
<tr>
<td>Land size</td>
<td>-0.1241** (0.0553) -0.0100^*</td>
<td>-0.08377 (0.05018) 0.0030^*</td>
<td>0.0894** (0.0820) -0.0010^*</td>
</tr>
<tr>
<td>Cost of treatment</td>
<td>-0.004** (0.0002) -0.00003</td>
<td>-0.0001 (0.00004) -0.0001^*</td>
<td>-0.006** (0.0002) -0.0001^*</td>
</tr>
<tr>
<td>Distance to provider</td>
<td>1.1443** (0.4440) 0.0170^*</td>
<td>1.4136*** (0.4330) 0.1439^*</td>
<td>-0.6501 (0.4248) -0.1089^*</td>
</tr>
<tr>
<td>Waiting time</td>
<td>0.1800** (0.0386) 0.02030^*</td>
<td>-0.0883** (0.0385) -0.0070^*</td>
<td>-0.0761** (0.0368) -0.0080^*</td>
</tr>
<tr>
<td>Operating time</td>
<td>-0.9762 (0.6439) 0.0270^*</td>
<td>-0.2777 (0.5082) 0.2430^*</td>
<td>1.8602** (0.4137) -0.2614^*</td>
</tr>
<tr>
<td>Quality of care</td>
<td>0.6749 (0.6439) 0.1420^*</td>
<td>1.9498** (0.6121) 0.3097^*</td>
<td>0.8032 (0.4588) 0.1039^*</td>
</tr>
<tr>
<td>Constant</td>
<td>-7.1912** (2.4866)</td>
<td>-6.9914 (2.7026)</td>
<td>-0.1902 (1.5370)</td>
</tr>
</tbody>
</table>

Log-likelihood = -196.3157###; Chi-Squared = 435.49###; Pseudo R^2 = 0.5259; Number of observation = 302; Figures in parenthesis are standard error of the coefficient, ^* = marginal effect coefficient; *** meaning variable is significant at 1%; ** meaning variable is significant at 5%; * meaning variable is significant at 10%
Table 2: Multinomial logit model result for the determinant of farming households healthcare provider choice in the study area

<table>
<thead>
<tr>
<th>Variable</th>
<th>Public Provider</th>
<th>Private Provider</th>
<th>Informal Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>1.0031</td>
<td>0.1224</td>
<td>0.0103</td>
</tr>
<tr>
<td>Age</td>
<td>0.3730</td>
<td>0.0371</td>
<td>0.0030</td>
</tr>
<tr>
<td>Marital status</td>
<td>0.6364</td>
<td>0.0648</td>
<td>0.0048</td>
</tr>
<tr>
<td>Household size</td>
<td>0.6848</td>
<td>0.0847</td>
<td>0.0047</td>
</tr>
<tr>
<td>Years of formal education</td>
<td>-0.6848</td>
<td>0.0847</td>
<td>0.0047</td>
</tr>
<tr>
<td>Own house</td>
<td>-0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Rent apartment</td>
<td>-0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Annual income</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Cost of treatment</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Distance to provider</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Waiting time</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Operating time</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Quality of care</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Constant</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
</tbody>
</table>

Log-Likelihood = -104.4237***; Chi-squared = 327.88***; Pseudo R² = 0.6109; Number of observation = 196; Figures in parenthesis are standard error of the coefficient, * = marginal effect coefficient; *** meaning variable is significant at 1%; ** meaning variable is significant at 5%; * meaning variable is significant at 10%

Table 3: Multinomial logit model result for the determinant of non-farming households’ healthcare provider choice in the study area

<table>
<thead>
<tr>
<th>Variable</th>
<th>Public Provider</th>
<th>Private Provider</th>
<th>Informal Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>1.0031</td>
<td>0.1224</td>
<td>0.0103</td>
</tr>
<tr>
<td>Age</td>
<td>0.3730</td>
<td>0.0371</td>
<td>0.0030</td>
</tr>
<tr>
<td>Marital status</td>
<td>0.6364</td>
<td>0.0648</td>
<td>0.0048</td>
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<tr>
<td>Household size</td>
<td>0.6848</td>
<td>0.0847</td>
<td>0.0047</td>
</tr>
<tr>
<td>Years of formal education</td>
<td>-0.6848</td>
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<td>0.0047</td>
</tr>
<tr>
<td>Own house</td>
<td>-0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Rent apartment</td>
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<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Annual income</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Cost of treatment</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Distance to provider</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Waiting time</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Operating time</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Quality of care</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
<tr>
<td>Constant</td>
<td>0.5000</td>
<td>0.0500</td>
<td>0.0002</td>
</tr>
</tbody>
</table>

Log-Likelihood = -104.4237***; Chi-squared = 327.88***; Pseudo R² = 0.6109; Number of observation = 196; Figures in parenthesis are standard error of the coefficient, * = marginal effect coefficient; *** meaning variable is significant at 1%; ** meaning variable is significant at 5%; * meaning variable is significant at 10%

Table 4: Chi-square table of value

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>X² value</th>
<th>p-value</th>
<th>Degree of freedom</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.4020</td>
<td>0.3340</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 5: Summary statistics of socio-economic characteristic of respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>27 years</td>
<td>70 years</td>
<td>47 years</td>
<td>10.4220 years</td>
<td>16837 years</td>
</tr>
<tr>
<td>Household size</td>
<td>2</td>
<td>15</td>
<td>6</td>
<td>2.2764</td>
<td>2222</td>
</tr>
<tr>
<td>Years of formal Education</td>
<td>0</td>
<td>23 years</td>
<td>9 years</td>
<td>5.5966 years</td>
<td>3241.50 years</td>
</tr>
<tr>
<td>Land size (in acre)</td>
<td>0.1</td>
<td>10</td>
<td>12.7288</td>
<td>12.3869</td>
<td>648.666</td>
</tr>
<tr>
<td>Income (in naira)</td>
<td>#120,000.00</td>
<td># 500,000.00</td>
<td>#386,833.30</td>
<td>#21,814.87</td>
<td>#3,926,000.00</td>
</tr>
</tbody>
</table>