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Choice of Healthcare Providers among Insured Persons in Ghana

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Abstract

Since the introduction of the National Health Insurance Scheme in Ghana in 2003, there has been little evidence with regards the type of providers from whom these insured persons seek healthcare. This study examines the choice of healthcare providers under the National Health Insurance Scheme in Ghana, using nine hundred and eighty eight (988) insured persons. Stratified random sampling technique was employed in selecting respondents, while the multinomial logistic regression was employed. Factors such as cash amount paid, waiting time and proximity to facility were found to discourage the use of orthodox healthcare among insured persons. The study recommend that social and economic infrastructure such as roads, telecommunication, and health centres should be expanded and / or improved in some cases to make orthodox healthcare providers more accessible and affordable, at the same time, it reduce the demand for unorthodox healthcare among the insured persons.

Keywords: Multinomial Logit, Insured Persons, NHIS, Ghana

1. Introduction

Adequate utilization of healthcare services is important to maintaining a quality life. Economic productivity of any nation depends largely on the health of its labour force. This fact dictates that any nation desirous of improving its productivity must put in place policies to ensure adequate access to quality healthcare (Kamgnia, 2008; Kouadio, Monsan and Gbongue, 2008).

In Ghana, several policy interventions have been executed over the years aimed at improving the quality of health of Ghanaians. Components of the seven-year and five-year development plans in the early days of independence for example focused on reducing morbidity, mortality and malnutrition among children. The Economic Recovery Program (ERP) and Structural Adjustment Program (SAP) in the 1980s emphasised primary healthcare and preventive care (Aryeetey and Kanbur, 2008). Ghana's health system has therefore undergone various changes; free health care prior to independence, cost sharing in the 1970s and full cost recovery in the 1980s during the period of economic reforms.

All these health systems were inadequate in addressing the health needs of Ghanaians. Especially, the full cost recovery system resulted in the creation of a financial barrier to accessing public health facilities. The Government of Ghana declared its intention to abolish the system and began exploring the feasibility of introducing a National Health Insurance Scheme to be managed at the district/municipal/metropolitan levels (Sulzbach et al., 2005). In 2003, the National Health Insurance Act (Act 650) was passed, giving mandate to all metropolitans, municipalities and districts to set up mutual health insurance schemes. The National Health Insurance Scheme (NHIS) is to provide accessible, affordable and good quality healthcare to all Ghanaians especially the poor and vulnerable in society (MoH, 2004a).

The NHIS has been running for the past eight years and according to SEND-Ghana Report (2010), the number of registered people has been increasing in all the regions since its inception. As at 2009, 14,283,620 card bearing Ghanaians representing 69.73% (based on the 2000 Population estimates) have registered with the scheme out of the

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total population of the country (NHIA, 2009). For those registered under the scheme, there is no out of pocket payment at the point of health service delivery and hence improved access to health care at public health facilities.

However, the NHIS does not cover all diseases and illnesses and also, it does not cover all drugs/treatments that may be prescribed. Also, besides the explicit costs which are covered under the NHIS, there are also implicit costs which are borne by insured persons on NHIS. These, among other factors are likely to play a role with regards to the choice of healthcare providers among the NHIS insured persons. In a study of health seeking behaviour among insured persons under the social security act, 1990 in Thailand, Sirisinsuk et al. (2003) identified the patterns of health seeking behaviours among the participants that confirms the reality that, although they have health insurance, they may seek care from other health facilities where they have to be financially responsible for the cost. Studies elsewhere have identified out-of-pocket payments and the individual belief in the competencies of the provider as important determinants of the choice of healthcare provider (Hibbard & Weeks, 1987; Odwee, Okurut & Adebua, 2006; Ngugi, 2008 and Thuan, Lofgen, Lindholm & Chuc, 2008).

There has however not been any empirical study that has established the determinants of choice of healthcare providers among NHIS insured persons in Ghana. If the health seeking behaviour of insured persons is established, it can guide policy formulation and adoption of appropriate strategies that will enhance participation, improved health service delivery and sustainability of the NHIS in Ghana. This study therefore aimed at analysing the factors determining choice of healthcare providers of persons registered under the National Health Insurance Scheme in the Upper West Region of Ghana, based on the traditional consumer theory approach (Grossman, 1972; Muurinen, 1982).

2. Methodology

2.1. Study Design

The study uses primary data from two districts based on rural-urban dichotomy in the Upper West Region of Ghana in 2010. The stratified random sampling technique was employed due to the heterogeneous nature of the study population. Since the study focused on households, location (rural or urban) could have some implications for household characteristics and socio-economic infrastructure, both of which could impact on the health seeking behaviour of individuals within such households. In this wise, the Region was first stratified into rural and urban locations based on the population size (GSS, 2005) of the District capital. Following this, the Wa Municipality, Sissala East, Lawra and Jirapa Districts were categorized as urban because their capitals had population sizes exceeding 5000 while Nandowli, Sissala West, Wa West, Wa East and Lambussie-Kani Districts were categorized as rural since the population size of their capitals were less than 5000 (GSS, 2005). The Wa Municipality and the Sissala West Districts were randomly selected from each category for the study. Given that the dependent variable, provider choice, is categorical, Bartlett II, Kotrlik and Higgins (2001) propose the use of Cochran's sample size formula assuming an alpha of 0.05.

$$n_o = \frac{(t)^2 * (p)(q)}{(d)^2}$$

Where

n_o is the sample size to be determined

t is the value for selected alpha level of .025 in each tail = 1.96,

P is the proportion of the sample that became ill and sought treatment,

q is the proportion that did not seek treatment and

d = acceptable margin of error for proportion being estimated = .05 (the maximum error researcher is willing to accept).

From a pilot survey conducted by the researchers, 0.75 proportion of households were ill and sought treatment. This gives p = 0.75 and q = 1-p =0.25, in which case the sample size becomes,

$$n_o = \frac{(1.96)^2 * (0.75)(0.25)}{(0.05)^2} = 288$$

The sample size of 288 was rounded up to 300 to take care of maximum error.

To ensure representativeness, the sample size was distributed according to the proportion of households in the two locations in relation to total households in the Region (20:80 for rural: urban). In this sense 80 percent of the sample size which is 240 households was drawn from Wa Municipality while 20 percent of the sample size which represents 60 households, was drawn from Sissala West District. Six communities were randomly selected in the Wa Municipality, while three communities were randomly selected from the Sissala West District.

As there was no listing of houses or households, one household was interviewed from every 6th house in the selected communities in Wa Municipal while one household was interviewed from every 4th house in the selected communities in Sissala West because of the sparse distribution of houses in the latter than the former. Household heads or their representatives responded on behalf of all household members giving a total of 988 respondents out the 300 households.

2.2 Data analysis

The demand for healthcare like any other economic commodity follows the principles of utility theory. The ultimate role of utility is the determination of the welfare of individuals. In developing countries, health status is hypothesized to be important, both as a direct indicator of welfare and because of its possible impact on productivity.

In the human capital tradition analysis of healthcare provision, individual health status is viewed as determined by individual demand factors given supply prices, environment, age and resources (including genes). As such, healthcare utilization is a derived demand for a service which is used to produce better health (Wolfe & Behrman, 1984). Health care is demanded as a means for consumers to achieve a larger stock of "health capital."

Early attempts at modelling healthcare (the Grossman's model) view each individual as both a producer and a consumer of health (Phelps, 1992). Health is treated as a stock which degrades over time in the absence of "investments", so that health is viewed as a sort of capital. As a commodity, healthcare thus satisfies both a consumption need, in that it yields direct satisfaction (utility), and satisfies an investment need, yielding satisfaction to consumers indirectly through increased productivity, fewer sick days, and higher wages. Investment in health is costly as consumers must trade off time and resources devoted to health, such as exercising at a local gym, against other goals. These factors are used to determine the optimal level of health that an individual will demand.

In a given period of illness, patients or their relatives make healthcare consumption decisions in stages. The first stage is awareness of the illness. At this stage, the patient or a relative must decide whether to seek treatment for an illness. If the decision is to seek medical care, then the next decision is on the choice of source of treatment. The outcome of the choice at this point is a visit to a particular health facility (Odwee, Okurut & Adebua, 2006). Healthcare decisions are discrete in nature and their estimation therefore makes use of discrete choice formulations (Mwabu, Ainsworth & Nyamete, 1993).

The direct utility derived by individual i from treatment alternative j is expressed as

$$U_{ij} = u_{ij}(h_{ij}, c_i) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where; U_{ij} is the direct conditional utility for individual i after receiving treatment from provider j, h_{ij} is the amount of healthcare received by individual i from provider j and c_i is the consumption of non-health care goods by individual i, the amount of which does not depend on choice j.

The unobservable variable h_{ij} is expressed as:

$$h_{ij} = h(x_i, z_{ij}).....(2)$$

Where; h_{ij} is the amount of healthcare received by individual i from provider j, x_i is a vector of observable socio-economic attributes of individual i and z_{ij} is a vector of attributes faced by individual i in facility j.

Similarly c_i can be expresses as;

$$c_i = y_i - e_{ij}.....(3)$$

Where; c_i is consumption of non-health care goods by individual i which is independent of the cost of treatment for healthcare from provider j, y_i is annual income of individual i and e_{ij} is the value of resources that individual i devotes to care received from facility j. Expression (3) is merely an accounting identity, to permit identification of c_i, a variable for which information is normally not collected in health care demand surveys.

Assuming the utility function in Equation (1) is linear in health status and quadratic in consumption, and is consistent with well-ordered preferences, it will generate typically observed demand patterns. Given the role of prices, and a further assumption that consumer preferences over the entire range of consumption goods are well defined, empirical healthcare demands are said to be consistent with the assumption that ill individuals maximize an indirect conditional utility function, V_{ij} as shown in Equation (4) (Mwabu et al., 1993).

$$V_{ij} = v_{ij}(x_i, z_i, y_i, r_{ij}, a_i).....(4)$$

Where; x_i, z_{ij} and y_i are as previously defined; r_{ij} is the price of health care received by individual i from health facility j and a_i is the price of non-health care goods consumed by individual i.

Equation (4) permits an investigation of direct demand effects of prices and incomes. In the present context, it shows the maximum utility that individual i can achieve, conditional on seeking treatment for an illness, controlling for income y_i, health care prices r_{ij}, prices of other goods a_i, personal attributes x_i and facility specific characteristics z_j.

By their discrete nature, healthcare demand models can only identify the relative propensity of choosing one of the alternatives; consequently a normalization rule is needed. In this study the drug store j=1 will be used for the normalization purpose. For econometric application in this study, a_i is treated as an intercept since it is constant for all individuals; while z_j is redefined as access to a particular facility, x_i will be treated as socio-economic attributes and r_{ij} as cost of healthcare from a particular facility.

Furthermore all the elements of the indirect conditional utility function in Equation (4) are directly observable and are the variables of interest to policymakers. The final step in econometric implementation of the model requires the standard assumption that the utility function in Equation (4) is stochastic, and is of the form.

$$V_{ij} = v^*_j + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Where, v^*_j is the systematic component of utility and μ_i is an additive disturbance term.

Assuming μ_i is normally distributed; equation (5) leads to a multinomial logit specification of individual choice of healthcare services. The probability that individual i will seek treatment from facility j is thus expressed as

$$P(H_{ij}) = \frac{\mu_i^{v^*_{ij}}}{\sum \mu_i^{v^*_{ij}}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Equation (6) is the multinomial specification where, $P(H_{ij})$ is the probability that individual i will seek health care from provider j; H_{ij} is healthcare provider alternatives from which individual i can seek treatment for j=1……..j=5 and include 1= medical doctor, 2= medical assistant, 3= midwife/nurse, 4= Traditionalist, 5= self-medication; μ_i and v^*_{ij} are as previously defined. But v^*_{ij} can be expressed as

$$v^*_{ij} = \beta x_i + \phi z_j + \lambda r_{ij} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

Where the variables are as defined previously. In which case, equation (6) becomes

$$P(H_{ij}) = \frac{\mu_i^{\beta x_i + \phi z_j + \lambda r_{ij}}}{\sum \mu_i^{\beta x_i + \phi z_j + \lambda r_{ij}}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

Where, $P(H_{ij})$, H_{ij} and μ_i are as previously defined; β, ϕ and λ are vectors of coefficients of x_i, z_j and r_{ij} respectively and $\sum$ is a summation sign.

Based on the specification in (8), the specific equation used in estimating the determinants of provider choice among NHIS registered persons is specified as;

$$P(F_{ij}) = \frac{\mu_i^{\beta_0 A+\beta_1 LOS+\beta_2 AR+\phi_1 TTF+\phi_2 PXF+\lambda_1 APF+\lambda_2 PAP+\lambda_3 TAF}}{\sum \mu_i^{\beta_0 A+\beta_1 LOS+\beta_2 AR+\phi_1 TTF+\phi_2 PXF+\lambda_1 APF+\lambda_2 PAP+\lambda_3 TAF}} \quad (9)$$

Where: P(Fij) is the probability of individual i choosing a particular provider j; A is the intercept term; LOS is the level of schooling of the individual, measured in terms of educational attainment as in basic, secondary and so on; FOS measures how often the individual falls sick; IHH is the income level of the household head, measured in hundreds of Ghana cedis, AR is the age group of respondent; TTF is time taken in minutes to the facility; PXF is a dummy seeking to find out if the facility visited is the nearest; APF is the amount paid at the facility visited and is measured in Ghana cedis; PAP is household's perception about payment; TAF is time taken (in minutes) at the facility visited and μ is the disturbance term. β_0, β_1 and β_2 are the coefficients of A, LOS and AR respectively and are the socio-economic attributes of the household. ϕ_1 and ϕ_2 are coefficients of TTF and PXF respectively and are access variables. λ_1, λ_2 and λ_3 are the coefficients of APF, PAP and TAF respectively and are costs variables.

3. Results and Discussion

3.1 Choice of Service Provider

Table 1 represents the distribution of insured household members by healthcare provider consulted. The results show that self-medication recorded the highest patronage (27.43%) followed by the nurse (26.61%) and medical assistant (20.44%). Segregating the healthcare providers into orthodox and non-orthodox, about 65% of the insured household members consulted orthodox healthcare providers (medical doctor, medical assistant and nurse) while about 35% consulted non-orthodox healthcare providers (self-medication/drug store and alternative providers such as traditional healers).

The results thus show that non-orthodox sources of healthcare still remains important for persons insured under the NHIS in Ghana. Amaghionyeodiwe (2007) highlighted non-monetary factors such as distance to facilities which may account for the tendency of people to self-medicate. Sirisinsuk et al. (2003) found patterns of health seeking behaviours of insured persons to vary depending on the stage of treatment, perceived severity of illness and types of additional health benefits. In general, factors such as education, age, travel time, proximity to the care provider, amount paid for services, perception about the amount paid and waiting time taken at the facility have been found to influence household or individual choice of healthcare providers (Dzatora & Asafu-Adjayeb, n.d; Ngugi, 1999; Aryeetey & kanbur, 2008; Nonvignon & Aglobitse, 2007).

[Table 1 about here]

3.2 Determinants of Choice of Healthcare Providers

Equation (9) is estimated to determine the probability of a household member choosing either a particular healthcare provider, conditional on level of schooling (LOS), age (AR), time taken to travel to facility (TTF), proximity to facility (PXF), amount paid for services at the facility (APF), perception about the amount paid (PAP) and time taken at the facility (TAF).

First of all, the medical doctor was selected as the base outcome to compare how households made their choices relative to the base outcome. The choice of the medical doctor is due to the fact that this option is the best available (at least scientifically proven) choice and it is interesting to find out the factors that are likely to cause people to go for other options instead of the best.

The summary statistics from the estimated model indicate that the model had a good fit. Both the Cox and Snell R^2 and the Nagelkerke R^2 were above 0.7. These imply that about 70 percent variation in the choice of healthcare providers by household members can be attributed to variations in the variables included in the model. The Wald statistic of 194.35 was also significant at the 1 percent alpha level. This means that the likelihood of choosing a particular provider is statistically attributed to all explanatory variables included in the model.

All cost variables negatively affect preference for alternative providers compared to a doctor. Amount paid for treatment for example negatively affects the tendency to seek care from alternative providers (B= -0.790; $p < 0.01$) as well as the tendency to self-treat (B= -1.6844; $p < 0.01$). This means that people would rather pay more when seeking treatment from a medical doctor than self-medicate or seek from alternative providers and pay less. Similarly time spent at the facility seeking treatment also significantly affect the preference for the choice of a medical doctor compared to other providers. People would rather spend more time seeking treatment from a medical doctor compared to seeking treatment from a medical assistant (B= -0.6368; p< 0.01), a nurse (B= -0.6203; p< 0.01), the traditionalist (B= -0.7913; p< 0.01) or self-medicate (B= -1.6877, p< 0.01). These findings conform to those by Kamgnia (2008) that the most important reason for choosing health service providers is quality. People are therefore ready to pay to consult a doctor since by training the medical doctor is the most skill personnel in the health delivery system.

Similarly proximity to the facility had a negative effect on the preference for a medical doctor compared to alternative treatment (-1.5413, p< 0.05). These imply that access by distance to orthodox medicine is difficult especially when it comes to accessing treatment from medical doctors in the region.

This stems from the fact that there are very few hospitals in the region (which are mostly in the regional and district capitals) and the road infrastructure in the region is so bad that people find it difficult commuting from one town or village to the other. Only two districts (Nandowli and Jirapa) are linked to the regional capital by tarred road, and this discourages commercial vehicles from plying the roads. Clearly non-monetary costs affect negatively people's decisions to seek care from medical doctors. Findings by Ngugi (1999) points out that such indirect cost discourage the use of orthodox healthcare in general. However travel time to the facility positively affected the preference for alternative treatment (B=0.738, p< 0.05) compared to seeking treatment from a medical doctor. The results are presented in Table 2.

Even though the coefficients are useful in pointing the relativity in terms of preference for one provider choice over the other, it does not indicate how various factors influence the likelihood to choose a particular provider.

To come round with this the predicted probabilities were calculated from the coefficients. The marginal effects shows the probability that an insured person will resort to self-medication reduced by 0.251($p < 0.01$) if the amount paid increased by one cedi. Thus even though it might be convenient for insured persons to walk into a chemical shop and prescribe medicines for themselves, such people will be less willing to do so if they have to pay a high price for the medicines. Perception about the amount paid had a positive effect on the probabilities of seeking healthcare from all providers but had a negative effect on self-medication. If insured persons perceive that the amount spent doing self-medication is higher, the probability of self-medication reduces.

Similarly the probability that one will seek treatment from all providers increased given that such a person will spend an extra hour waiting for treatment. However the probability of self-medication reduces by 0.24186 if one has to spend an extra hour administering self-treatment. The implication is that insured persons can only have access to the services of the doctor and the nurse only if they are prepared to spend more time at the facility. This research supports findings by Ngugi (1999), Amaghionyediwe (2008) and Aryeetey and Kanbur (Eds) (2008) that cost of seeking care both in terms of cash payment and time spent waiting for services affects the decision to seek care from a particular provider.

[Table 2 about here]

5. Conclusion

This paper investigates the determinants of choice of healthcare providers by insured persons on the National Health Insurance Scheme in Ghana. The study concludes that insured persons tend to seek healthcare from both orthodox

and non-orthodox healthcare providers. Especially self-medication still remains an important part of the life of the insured persons. Monetary and non-monetary factors still discourage the use of orthodox healthcare under the National Health Insurance Scheme. This contradicts the notion in Ghana and elsewhere that insurance increases utilization of orthodox healthcare but confirms the negative price effect of healthcare utilization (Kamgnia, 2008; Kouadio et al, 2008; Odwee, Okurut and Adebua, 2006). Sensitization of Ghanaians in general is required to dissuade them from seeking self-treatment, which is done without proper diagnosis to establish the particular medical condition. Insured persons as well as the non-insured should be persuaded to respond early to orthodox health providers before their conditions reach unmanageable levels.

The current health portfolio under the National Health Insurance Scheme should be expanded to cover many more services for efficient and effective healthcare delivery. Social and economic infrastructure such as roads, telecommunication, and health centres should be expanded and / or improved in some cases to make orthodox healthcare providers more accessible, while at the same time reduce the demand for unorthodox healthcare and self-treatment among the insured persons.

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List of Tables

Table 1: Service Providers Consulted

Service Provider	Frequency	Percent
Medical Doctor	177	17.91
Medical Assistant	202	20.44
Nurse	263	26.61
Alternative Providers	75	7.59
Self-Medication	271	27.43
Total	**988**	**100.0**

Table 2: Coefficients and marginal effects of explanatory variables for provider choice

Var.	Doctor	Medical Assistant		Nurse		Traditionalist		Self-medication	
	Marginal effects	Coefficients	Marginal effects	Coefficients	Marginal effects	Coefficients	Marginal effects	Coefficients	Marginal effects
LOS	-0.009	0.0357	-0.001	0.0633	0.003	-0.0563	-0.005	0.0558	0.004
	(n/a)	(0.760)	(0.872)	(0.580)	(0.805)	(0.635)	(0.224)	(0.607)	(0.747)
AR	-0.008	0.1870	0.008	-0.0563	-0.024	0.2290	0.007	0.1161	0.157
	(0.407)	(0.151)	(0.281)	(0.627)	(0.021)	(0.135)	(0.193)	(0.333)	(0.311)
TTF	0.004	0.2081	0.033	-0.4287	-0.005	0.7538	0.045	-0.2457	-0.037
	(0.616)	(0.591)	(0.130)	(0.292)	(0.35)	(0.054)	(0.001)	(0.550)	(0.520)
PXF	-0.008	0.0058	-0.030	0.4421	0.016	-1.5413	-0.155	0.6459	0.176
	(0.487)	(0.990)	(0.338)	(0.327)	(0.699)	(0.006)	(0.001)	(0.177)	(0.005)
AP	0.027	-0.4728	0.068	-0.6154	0.131	-0.7909	0.025	-1.6844	-0.251
	(0.009)	(0.009)	(0.001)	(0.001)	(0.001)	(0.001)	(0.028)	(0.001)	(0.001)
PAP	0.012	-0.6133	-0.003	-0.3384	0.045	-0.4503	0.006	-0.6675	-0.060
	(0.096)	(0.110)	(0.859)	(0.353)	(0.098)	(0.274)	(0.617)	(0.073)	(0.090)
TAF	0.027	-0.6368	0.056	-0.6203	0.133	-0.7913	0.026	-1.6877	-0.242
	(0.002)	(0.008)	(0.001)	(0.004)	(0.001)	(0.004)	(0.008)	(0.001)	(0.001)
cons		4.2520		5.7511		5.0336		10.735	
		(0.006)		(0.001)		(0.001)		(0.001)	

Log pseudo likelihood = -447.497 Wald chi^2 (78) = 207.84 Prob > chi^2 = 0.0001
Cox & Snell R^2 = 0.718 Nagelkerke R^2 = 0.761