Socio-economic Inequalities and Healthcare Utilization in Ghana

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ABSTRACT

A socio-economic inequality in the use of healthcare services in Ghana is investigated in this paper. The data employed in the study were drawn from Global Ageing and Adult Health survey conducted in Ghana by SAGE and was based on the design for the World Health Survey (WHS, 2003). The survey was conducted in 2007 and collected data on socio-economic characteristics and other variables of the individuals interviewed. Using generalized logit model, the study found that health status is a very strong determinant of the type of healthcare services Ghanaians look for. In Ghana, there are still important socio-economic gradients in the use of some healthcare services. These differences may be due to socio-economic inequities but could also indicate that the existing health facilities are not always used in an optimal way. Patient factors may be more important than supply factors in explaining the differential use of health services.

Keywords: Healthcare Utilization, Generalized Logit, Socio-economic inequities, Ghana.

1. INTRODUCTION

Sickness is inevitable and forms part in human's life. An effective and efficient healthcare system is therefore important for mankind's survival which can significantly influence his life expectancy. In recent years, there has been a steady improvement in healthcare conditions in many countries including Ghana. Improving health status increases individual satisfaction and perception of positive self-worth and overall well-being. It also leads to an indirect increase in productivity as well as national investment and revenue. Many people in the world especially in the developing countries face problem in healthcare utilization due to socio-economic differences (Celik and Hotchkiss, 2000; Habicht and Knust, 2005; Onwujekwe and Uzochukwu, 2005; Nikiema *et al.,* 2008). According to Ojanuga and Gilbert (1992) women in developing countries are frequently confronted with a myriad of socio-cultural factors which negatively impinge upon physical well-being and accessibility to appropriate healthcare services. To improve equity in the provision of healthcare and provide risk protection to poor households, low income countries are increasingly moving to social health insurance (Jehu-Appiah *et al.* 2011).

In Ghana, an affordable, effective, equitable and wide coverage of healthcare service delivery is the central aim of the Ministry of Health and the Ghana Health Service. In order to remove financial constraints posed by the

poor to access healthcare system in Ghana, a National Health Insurance Scheme (NHIS) policy was introduced in 2003. One of the aims of the NHIS policy is to replace the cash and carry health system in order to provide equal access to healthcare for all Ghanaians. In spite of the effort to provide healthcare service to all, demographic and socio-economic differences might influence the use of healthcare facilities. According to Jehu-Appiah *et al.* (2011), the national health insurance scheme in Ghana is not, in general, reaching the poor.

Among the different factors that might influence healthcare utilization, socioeconomic factors are of interest to researchers because, in practice, the effect of these factors can be controlled as compared to other factors. Hence, research aiming to understand the socio-economic disparities in healthcare utilization has been an area of interest.

Many studies in the field of medical and social science have examined the effect of socio-economic disparities on healthcare utilization. For instance, Celik and Hotchkiss (2000) assessed the impact of socio-economic factors on maternal healthcare utilization in Turkey using logistic regression model. The results of the study indicated that educational attainment, health insurance coverage, ethnicity, household wealth and geographic region are statistically significant factors that affect the use of healthcare services thought essential to reduce infant and child mortality rates. By applying logistic regression model on survey data from Nova Scotia in Canada, Veugelers and Yip (2003) examined whether lower socioeconomic groups use more health services, as would be expected given their poorer health status. Their study found that people with lower socioeconomic background used comparatively more family physician and hospital services and that, the use of specialist services was significantly higher in the highest income group. Habicht and Knust (2005) assessed social inequalities in healthcare service utilization rate in Estonia after eight years of healthcare reform. Using logistic regression model, the study found existence of geographical, financial and information barriers to healthcare utilization. Onwujekwe and Uzochukwu (2005) explored socio-economic and geographical inequalities that exist in healthcare seeking, expenditure and method of paying for healthcare in Southeast Nigeria using chi-square test and logistic regression model. The study concluded that, poorer socio-economic status and rural dwellers are the major sufferers of inequalities. Nikiema *et al.* (2008), evaluated the link between gender and access to healthcare in Rural Burkina Faso using quantitative approach. The study concluded that women may suffer delays in or exclusion from healthcare. Hoeck *et al.* (2011) analyzed the association between healthcare utilization and socio-economic status of elderly persons in Belgium using multiple logistic regression model. The study found healthcare utilization increasing with age and more widespread among females.

Although the literature on socio-economic effect on healthcare is fairly extensive, most of the studies discussed previously have used different approaches to determine the significant of these socio-economic disparities on healthcare utilization, however the set of variables used as proxies for socio-economic factors vary from each study.

The main aim of the study is to explore the variations in the use of healthcare facilities in Ghana in relation to socio-economic differences. Understanding the influence of socio-economic disparities on healthcare utilization may provide useful information to policy makers for the development of actionable plan to improve healthcare policies and its implementations. Also the findings could help to determine whether Ghanaian healthcare utilization policies over the years have been able to control for equitable utilization of healthcare facilities. The study will also contribute to the existing literature on healthcare by examining healthcare utilization in an African country with different social and cultural environment. Previous healthcare related studies in Ghana had focused mainly on gender-sensitive rapid appraisal of socio-cultural influences on health-seeking behaviour for malaria (Tolhurst and Nyonator, 2006), gendered dynamics of intra-household bargaining around treatment seeking for children with fever in the Volta Region of Ghana (Tolhurst *et al.*, 2008), equity aspects of the National Health Insurance Scheme in Ghana (Jehu-Appiah *et al.*, 2011). There is no available study that deals with socio-economic disparities on healthcare utilization in Ghana.

The rest of the paper is organized as follows: Section 2 describes the concept of methods employed in the research. The data, empirical analysis and results are presented in Section3. Section 4 provides the concluding remarks.

2. METHODOLOGY

The data employed in this study were drawn from Global Ageing and Adult Health survey conducted in Ghana by SAGE The survey was conducted in 2007 and collected data on socio-economic characteristics and other variables of the individuals interviewed.

2.1. Sampling Design and Implementation

The sampling method used for the Ghana SAGE survey was based on the design for the World Health Survey (WHS, 2003), in which the primary sampling units (PSUs) were stratified by region and location (urban/rural). Selection of the PSUs was based on proportional allocation by size. Each enumeration area (EA) was selected independently within each stratum. A total of 6,000 households were interviewed in the WHS and, therefore, 300 EAs were selected nationwide. Twenty households were randomly selected in each EA using systematic sampling. The number of EAs per region was based on the population size of the region. For SAGE, a total of 5,000 respondents of 50+ years and 1,000 respondents 18-49 years old were required and, therefore, 250 EAs out of the 298 EAs of the WHS were used based on the availability of respondents aged 50 years and older within the EAs. The EAs with 18-49 years individuals were not included.

Within each EA, 20 households with one or more 50+ individuals and four households with members aged 18–49 years were selected. All respondents aged 50+ from the WHS were automatically selected and additional households with members aged 50+ years were randomly selected to make a total of 20 households. The four households members of the 18–49 years age group were randomly selected from the WHS households. All the 50+ year olds within the selected households were to be interviewed together with the four identified under-50 year olds respondents. The number of households and individuals selected from each urban and rural PSUs is shown in Table 1

Table 1: Number of rural and urban enumeration areas for WHS and covered in SAGE

Region	WHS		SAGE	
	Rural	*Urban*	*Rural*	*Urban*
Ashanti	27	30	22	21
Brong Ahafo	18	10	15	10
Central	16	9	15	9
Eastern	22	12	17	11
Greater Accra	6	40	5	24
North	21	8	20	6
Upper East	13	2	13	2
Upper West	7	2	6	2
Volta	19	7	16	7
Western	20	11	20	9
Total	**169**	**131**	**149**	**101**

A total of 30 interviewers and supervisors were trained in two phases. Initially, the full survey team was trained for 7–10 days centrally in Accra with support from WHO Geneva. Three teams were formed and assigned to regions and then were retrained in the field.

Field work and data entry were undertaken between May 2007 and June 2008. All the data in the tables are from this period, unless otherwise indicated.

2.2. Model Specification

The primary variable of interest is:- the type of healthcare facility used by Ghanaians. It is nominal in nature with eight outcomes namely, (Private Doctor, Private Hospital, Public Clinic, Public Hospital, Charity run, Pharmacy/Dispensary, Others/don't know and Traditional healer). These cut across private and public facilities, charity run clinics/hospitals and traditional healers. The goal of the study then is to examine the effect of socio-

economic factors such as age, marital status, gender, income, education, religion, and health status on the type of health services Ghanaians choose.

The appropriate choice of model for the analysis was, therefore, a generalization of the logistic regression model (generalized logit model, also called multinomial logit model or discrete model following the early work of McFadden (1974)). Currently, there is a rich literature on the model (McCullagh and Nelder, 1989; Agresti, 2007) and their applications.

The generalized logit is defined as (Agresti, 2007):

$$\log(\pi_j) = \alpha_j + X\beta_j \qquad\qquad j = 1,\ldots,D \tag{1}$$

where π_j is defined as

$$\pi_j = \frac{\Pr(Y = j \mid X)}{\Pr(Y = D+1 \mid X)} \tag{2}$$

and α_j and β_j represent a series of intercepts and slopes for the D logits respectively. This means that the model allows for D different and non-redundant sets of regression parameters, one for each logit. The matrix X defines the predictors or explanatory variables measured on each individual. Since the dependent variable is categorical, the approach is to fit D logit models, each one comparing a given health service to *traditional healers* which is the reference category. SAS handles this by having all D parameters sum to zero, by definition, so that the Dth parameter is equal to the negative sum of all other parameters $(\Sigma\ to\ zero\ restrictions)$. The choice of this reference category is justified by the fact that traditional healers still play an important role in the Ghanaian society regardless of the level of education attained by the individual or his/her economic status. It remains however irrelevant for estimation purpose except to make comparisons more meaningful in African context in general and in Ghanaian context in particular. In all, there are D such comparisons to be estimated, thus D degrees-of-freedom. The total number of parameter estimates are $D*k$ where k is the number of variables including the intercept. In these analyses, we assume the independence from irrelevant alternatives. By defining π_j as the odds ratio of choosing the jth healthcare facility relative to the traditional healers $(D+1)$, various comparisons are estimable. They assess whether each of the socio-economic variables has a differential effect on the kind of service people prefer. The probability to favour the jth healthcare facility can be expressed as (Agresti, 1990, 2007):

$$\Pr(Y = j \mid X) = \frac{e^{\alpha_j + X\beta_j}}{1 + \sum_1^D e^{\alpha_j + X\beta_j}} \tag{3}$$

which is a function of the vector of determinants X selected from the survey questionnaire. The probability that a case falls in the reference category in this case, the traditional healers is equal to

$$\Pr(Y = D+1 \mid X) = \frac{1}{1 + \sum_1^D e^{\alpha_j + X\beta_j}} \tag{4}$$

In addition, other comparisons of interest can be derived by simple subtraction from the estimated ones. This is possible because all the comparisons involve the same control. Furthermore such operation performed on estimable functions is also estimable (Searle, 1971). Alternatively, one may rearrange the sequence of the categories and re-estimate the model. The overall statistical inference is implemented through the likelihood-ratio statistic of the usual form:

$$Chi - square\ [K] = 2(\log L - \log L_0), \tag{5}$$

where $\log L$ is the log-likelihood calculated using the unrestricted estimator, $\log L_0$ is based on the restricted estimator and K represents the number of restrictions and thus the degrees-of-freedom. Since all the predictors

are categorical, the Chi-Square [K] test is a goodness of fit test for the entire model and its *p-value* indicates whether the model fit the data. In our case, the null hypothesis is that the model fits the data well versus the alternative that it does not.

3. EMPIRICAL RESULTS AND DISCUSSION

3.1. Data Description

Table 2 presents the descriptive statistics of the data used in the current study. It shows the total number and row percentage for characteristics of interest. After careful grouping of each factor into categories with meaningful sample sizes, additional model analyses were performed. The total number of observations for this study is 4466 distributed as shown. Most of the people prefer to visit public hospitals (31.48%) and public clinics (21.03%). More than 50% are either *currently married or live in cohabitation (*59.29%) followed by widowed (24.79). There is equal distribution of *males* and *females* (51.19 vs. 48.81) as well as whether the individual went to *school or not* (50.16 vs. 49.84). The majority of the interviewers are *Christians* (71.54%) followed by Islam (15.47%). Self-rated health scores indicate that 40.10% consider themselves to have *moderate* health, while 37.26% enjoy *good* health. Very few declare to *have enough money to meet their needs* (6.78%). A large proportion of individuals have a *little* (43.48%), the rest is equally distributed among *moderate income* and *not at all* (24.21 and 25.53%).

Table 2: Descriptive Statistics of the Healthcare Utilization Data

Variable	Total	Percentage
Healthcare facility		
Private Doctor	328	7.34
Private Hospital	222	4.97
Public Clinic	939	21.03
Public Hospital	1406	31.48
Charity run	198	4.43
Pharmacy/Dispensary	695	15.56
Others/don't know	558	12.49
Traditional healer	120	2.69
Marital Status		
Never married	106	2.37
Married/cohabited	2648	59.29
Separated/divorced	605	13.55
Widowed	1107	24.79
Gender		
Male	2286	51.19
Female	2180	48.81
Education		
Educated	2240	50.16
Not educated	2226	49.80

Table 2: (Continued)

Variable	Total	Percentage
Religion		
None	216	4.84
Christian	3195	71.54
Islam	691	15.47
Indigenous	364	8.15
Health Status		
Very good	291	6.52
Good	1664	37.26
Moderate	1792	40.13
Bad	719	16.10
Income		
Completely	303	6.78
Moderate	1081	24.21
A little	1942	43.48
Not at all	1140	25.53

3.2. Healthcare Utilization Model Specification and Estimation

To determine the significant socio-economic variables that influence healthcare utilization in Ghana, a generalized logit model was specified. Table 4 summarized the estimated odds ratio for the model using SAS version 9.0. The parameters of the model were estimated using maximum likelihood approach. In Table 4 the estimates for each independent variable are interpreted relative to the referenced category. The Chi-Square post-estimates and tests on the parameters across all D models are done by computing $\left(\dfrac{\hat{\beta}}{SE_{\hat{\beta}}}\right)^2$. Each answers the null hypothesis of no relationship between the independent variable and the corresponding logit.

Table 3: General Model Diagnostic

Source	Degree of Freedom	Chi-square Statistic	P-value
Intercept	7	127.29	<0.0001
Age	7	41.51	<0.0001
Marital Status	21	31.72	0.0625
Gender	7	14.14	0.0488
Education	7	31.20	<0.0001
Religion	21	97.85	<0.0001
Health Status	21	101.43	<0.0001
Income	21	76.14	<0.0001
Likelihood Ratio		4663.72	1.0000

Table 4: Estimated Odds Ratio for Healthcare Utilization Model

Variables	Private Doctor	Private Hospital	Public Clinic	Public Hospital	Charity run	Pharmacy/ Dispensary	Others/ don't know
Age	0.736*	0.964	0.611***	0.855	0.937	0.716**	0.666**
Gender							
Male	Ref	---	---	---	---	---	---
Female	1.171	1.316*	1.234*	1.163	1.209	1.030	1.080
Marital Status							
Never married	Ref	---	---	---	---	---	---
	1.449	1.199	1.464	1.317	1.551	1.732*	1.341
Married/cohabited							
	0.651	0.593*	0.553**	0.663	0.636	0.890	0.815
Divorce/separated							
Widowed	1.030	0.797	0.960	0.957	0.714	0.915	0.946
Education							
Not educated	Ref	---	---	---	---	---	---
Educated	0.845	0.691***	1.015	0.880	0.743**	0.993	0.888
Religion							
None	Ref	---	---	---	---	---	---
Christian	1.259	1.094	1.065	1.326	1.314	0.843	0.857
Islam	0.783	0.752	0.486***	0.672*	0.339***	0.671*	0.630**
Indigenous	1.632	0.836	1.991**	1.292	1.507	1.042	1.852*
Health Status							
Very good	Ref	---	---	---	---	---	---
Good	0.810	0.782	0.885	0.875	1.155	0.703*	0.673*
Moderate	1.891***	1.169	1.895***	1.418**	1.516**	1.060	1.289
Bad	1.818***	1.606**	1.469**	1.410**	0.977	1.275	1.636***
Income							
Completely	Ref	---	---	---	---	---	---
Moderate	0.661*	0.766	1.098	0.797	0.754	1.178	1.293
A little	0.805	0.630**	0.798	0.805	0.861	0.876	0.773
Not at all	0.894	0.849	0.849	0.867	0.670	0.614**	0.704

Note: ***, ** and * indicates1%, 5% and 10% significance level respectively

The overall null hypothesis thus the model fits the data well versus the alternative that it does not is not rejected as shown in Table 3, implying that the independent variables used in the multinomial logit model are good predictors of the healthcare utilization in Ghana. The partial effects on the odds of falling into a given category as opposed to the traditional healers' category were examined by the parameter estimates from selected contrasts among the 8 categories that define the current health services in the country. The effect of an estimate is evaluated in terms of its magnitude and sign,thus its statistical significance. This reflects the marginal effects on the log-odds ratios themselves as well as the transformed odds ratios. The predicted probabilities for a set of predictors are also of interest and are explored. Furthermore, *ceteris paribus*, each estimated $\hat{\beta}$ obtained from a continuous response represents its specific *partial* effect while the effects of other predictors are accounted for. In a discrete independent variable case, the expected response is evaluated at different values of the variable, with the elements of the other control variables hold fixed at the same values.

From table 4, the individual age, which is a continuous covariate, has significant marginal effects on the contrasts involving private doctor (*p*=0.0691), private clinic (*p*=0.0013), pharmacy and dispensaries (*p*=0.0324), and 'others' category (*p*=0.0107). In the first contrast, the odds of using services from a private doctor instead of traditional healers decreased by 0.7355 times with a one-year increase in age all other things being equal. The odds of using services provided by public clinic instead of traditional healers also decreased by 0.6105 times with a one-year increase in age. Similarly the results indicate that the odds of using pharmacy or a dispensary and 'others' facilities decrease significantly by a factor of 0.7157and 0.6663 with one-year increase respectively. As people get

older, traditional healers become an attractive alternative choice for their health care needs. Although not significant (p>0.05), this trend is observed for all the remaining contrasts.

Compared to males, the results indicated that females tend to favor non-traditional healers. In all the logits, the odds of choosing non-traditional healers are higher than their male counterparts. The p-values are significant for private hospital (p=0.0522), and to a certain extent public clinic (p=0.0854). The respective odds ratios are 1.1711 and 1.3164 times higher for females to seek health services other than the traditional healers. It is worth noting that the partial coefficients are all non-significant but positive toward the choices *other than* the traditional healers.

Compared to 'never-married' group, widowed, both men and women, tend to seek out available health services outside the traditional healers. The results suggest a non-negligible effect (p=0.0594) of the widowed utilizing pharmacy and dispensary rather than traditional healers compared to the never-married group. This is in contrast to other groups (separated or divorced, currently married or cohabitate) given that all the estimated coefficients are negative. The individuals currently married or in cohabitation do not differ from the never-married category (p>0.05) in all the logits. However, individuals who are separated or divorced from their spouses use services from the traditional healers than the never-married individuals. This is especially true as reflected in the observed significant choice of public clinic (p=0.0293) and to a certain extent the choice of private hospital (p=0.0866). The odds ratios are 0.5927 and 0.5527 times for these groups versus never-married group respectively.

In contrast with non-educated, educated Ghanaians tend to prefer any other alternative health service other than traditional healers. The estimated coefficients are negative in all the comparisons. However the effects on the log-odd ratios are more pronounced for private hospitals (p=0.007). Educated individuals look for private hospitals rather than traditional healers more so than the uneducated group. The odd ratios are 0.6911 times for private doctors meaning that educated Ghanaians are 30.8% more likely than non-educated Ghanaians to use health services from private hospital as their first choice as opposed to seeking services from traditional healers. This might be due to the fact that educated individuals are more knowledgeable with respect to their health needs (Chahal *et al.*, 2004).

Religious affiliation has an important and significant marginal effect on the log-odds ratios (p<0.001). For the most part, the coefficients showed mixed direction. The mixed signs of contrasts seem to indicate that the selected faith denomination use existing health care facilities rather than the non-believers. Ghanaians of Christian faith tend to access other health services except services from traditional healers. However, this trend is not significant compared to atheists in almost all the logits. On the average, individuals of Islam faith use services from traditional healers compared to non believers in all the logits. With the exception of private hospital and private doctors, all the other coefficients are statistically significant (see Table 4). In particular, the results indicate that compared to non-believers, members of Islamic faith significantly favor traditional healers rather than public clinic (p=0.0009) and charity run facilities (clinics and hospitals) (p=0.0006) and 'others' (p=0.037). On the contrary, all the coefficients of indigenous group are positive but only significant for the contrast involving public clinic (p=0.0335). The observed significant difference (p=0.0624) seems to suggest that members of the indigenous group tend to seek 'other' alternative methods as compared to individuals with no religion at all. In that respect the indigenous use public clinic for their health care rather than seek services from traditional healers as opposed to the non-believers (*odds ratio*=1.852).

Health status is a very strong determinant of the type of health services Ghanaians look for (p<0.001). Individuals with bad health tend to visit alternative mode ('others') of taking care of their health needs compared to individuals who enjoy good health. All the coefficients are negative and non-significant except for the comparison involving 'others' category. On the contrary, and in comparison with good health group, individuals of moderate health use services from private doctors and hospitals (p=0.0008), public clinic (p=0.0001), public hospital (p=0.030), charity run clinics and hospitals (p=0.035), and 'others' (p=0.004) than traditional healers. In general, the same thing can be said for people with *good* health status compared to those with *very* good health. For the most part, good health is positively related to all the services available: from private doctor and clinic (p=0.0017),

private hospital (p=0.0140), public clinic (p=0.0231), public hospital (p=0.0351).This group takes advantage to explore even 'others' alternative (p= 0.0041) rather than choosing the reference group namely the traditional healers.

As one might expect, individuals with '*no enough money to meet their needs*' invariably seek help from traditional healers compared to *wealthy* individuals especially in their capacity to access private doctors and private clinics (p=0.0781). The same conclusion is reached when examining the health care choice of individuals with '*little money*' and '*moderately meet their needs*'. It can be safely concluded that, compared to the *well to do* group, all income levels, from low to moderate, tend to look for health services offer by traditional healers as opposed to any other services that the government offers.

4. CONCLUSION

Improving health status increases individual satisfaction and perception of positive self-worth and overall well-being. It also leads to an indirect increase in productivity as well as national investment and revenue. An affordable, effective, equitable and wide coverage of healthcare service delivery is the central aim of the Ministry of Health and the Ghana Health Service. This paper has investigated the variations in the use of healthcare facilities in Ghana in relation to socio-economic differences. The study found existing relationship between socio-economic status and health care utilization in Ghana. This implies that the aims of the NHIS policy have not been achieved.

In line with the analysis of the data obtained from WHO Study on Global Ageing and Adult Health and also other observations made in the course of this research, we make the following recommendations:
• The aims of the NHIS policy needs to be realized and fully implemented as speedily as possible so as to bring relief to the masses who are sometimes denied healthcare..
• The socio-economic factors could be structured to take into account explicitly the underlying assumptions involved in healthcare utilization. This could help health practitioners concerned with healthcare delivery to appreciate the problems and advise the Ministry of Health accordingly.
• Individuals with '*no enough money to meet their needs*' invariably seek help from traditional healers compared to *wealthy* individuals and for that matter must be educated to be more careful as they are likely to worsen their situation with their alternative
• The Information Bill which has been with our law-makers in Parliament (the legislature) for long be passed by the law makers with the view of removing the bottlenecks associated with data acquisition which was a a serious challenge of this study.
• Reform in the health care system is widely accepted. It is therefore recommended that further study be done on the methods so as to bring the desired outcomes of assuring access to quality services, stopping cost escalation, preserving the best aspects of our present system, and compensating providers fairly.

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