The Effects of Loan Amounts on Health Care Utilization in Ghana

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Abstract

Utilization of health care services - both preventive and curative, is among the myriad of important determinants of health and remains an issue of significant policy concern and focus in developing countries. Despite the importance of health care utilization, there is evidence to confirm that many people in Ghana go without health care from which they could benefit greatly. This disturbing, yet preventable, state of affairs causes' untold suffering and, given its wide scale, presents a major obstacle to the development process. A range of socioeconomic, demographic, and public health related factors work together to influence household health utilization but the extent to which access to formal and informal credit plays in the Ghanaian context has not been addressed in the empirical literature. Using recently released Ghana Household Living Standard Survey round six (GLSS, 6) in 2012/2013, this study examines the extent to which an individual's relative control over household resources, gauged by loan amounts influence health care utilization. The results, based on logistic and multinomial regression model estimation, demonstrate that a one percent increase in the amount of credit accessed from a financial institution is associated with 0.611 probability that an individual will consult a health practitioner when ill. Other variables that significantly predict the tendency that a respondent will consult a health practitioner when suffering any infirmity include income of the household, insurance status of the individual, place of residence and household size. We also find that Individuals in different socio-economic strata (region, rural/urban) face different risks with health care utilization. Policies aimed at making credit available to individuals and households can make an important contribution to health care utilization in Ghana. Moving forward, health programs and interventions should be embedded in financial services and they need to be tailored to particular socio-economic groups.

Introduction

Health is vital for every individual and has been generally accepted as a fundamental right of everyone. A healthy population is very likely to produce healthy labour force that contributes valuably and immensely to economic activity. Grossman (1972) reiterates this idea by assuming that a person's health stock which forms part of human capital raises his or her efficiency in production. This notwithstanding, good health is not just the outcome of genetic or biological processes but is also influenced by the social and economic conditions in which people live in. Utilization of healthcare services, for example, both preventive and curative, is one of such important determinants of health and remains an issue of significant policy concern and focus in developing countries. According to the World Health Organization (WHO), healthcare should be universally accessible without barriers based on affordability, physical accessibility, or acceptability of services (Doroh et al (2013).

Despite the importance of health care utilization in promoting good health status of the population, there is substantial evidence to confirm that many people in the developing world go without health care from which they could benefit greatly (WHO, 2014). In the case of Ghana, there are reasons to believe that significant differences exist in the utilization of different types of health services across population groups (GSS, 2014). In fact, according to the recently released sixth round of the Ghana living standards survey, more than one-third of those who reported ill or injured did not consult a health practitioner. The data indicated that utilization of health services varied across different social stratification groups. For example, more persons in urban localities consulted health practitioners than persons in rural forest and rural savannah areas. Between sexes, more females (67.1%) than males (65%) consulted health practitioners and the pattern is the same for all localities, except rural savanna where the proportion of males and females are almost the same (GSS, 2014). With regards to the use of contraception by women or their partners, the report revealed that utilization of contraceptive methods is low in the country, with 16 percent of households using modern methods of contraception and 78.1 percent reporting not using any method at all. This is true for other interventions such as child immunization and oral rehydration therapy, for which need is much greater among the poor.

Ideally, it is reasonable to expect that insurance coverage and appropriate health financing mechanisms should help improve health care utilization in any country. But, as is generally known from the literature, financing health care still appears to be a major challenge

for many developing countries, including Ghana. For example, despite the introduction of the national health insurance scheme as a health financing scheme in 2004, out-of-pocket expenditure where individuals and households pay for health care out of their own resources remains an important feature of the economy of Ghana. In fact, households bear a greater proportion (54.5 percent) of the medical bills including the cost of consultations, medicines and hospital admissions. It is important to note that a serious cause of poverty in developing countries is the burden of expenses in various activities including health utilization.

The afore-mentioned concerns motivate the need to examine additional factors that can potentially help address household challenges with the distribution and utilization of health care. In this study, the size of loans is hypothesized as having a role to play in health care utilization. Intuitively, increased access to financial services allows clients to seek health care services when needed, rather than wait until an illness, injury or conditions deteriorate. In addition, low-income households with access to financial services have better nutrition, preventable health practices, and develop positive health outcomes than comparable non-client households (Leatherman et al, 2011).

Identifying the relationship between access to financial services and health care utilization is generally difficult to ascertain (Leatherman et al, 2011). On the one hand, the client profiles advertised by the financial institutions usually highlight the transforming power of micro-loans for selected poor people (Meyer, 2007). On the other hand, carefully designed quantitative impact studies provide a mixed and nuanced view of the benefits of borrowing. Some of these authors argue that access to finance worsens poverty by making borrowers poorer. Once a poor person borrows money, the chances of repaying are slim so he/she cannot leave the cycle of poverty (Meyer, 2007, Akudugu, 2012).

Within the above context and given the fact that there is limited knowledge about the conditions necessary for credit amounts to achieve positive impacts on health care utilization in Ghana, this study seeks to investigate whether there is credible evidence that the size of loans can be a major contributor to improving health outcomes and health utilization. Given the fact that existing empirical studies on the relationship between access to financial services and health care utilization will almost certainly differ in terms of the context, research methods as well as in the use of econometric and statistical techniques, the best approach may be to continue to accumulate studies of this kind in the hope of gaining a better understanding and insights. This is

particularly important in Ghana where existing studies that have investigated patterns of healthcare utilization have not explicitly considered the role of formal and informal credit. The ultimate goal is to communicate key findings from existing research and policy initiatives to a wide audience and stimulate the development of improved policies and programs that best serve the continent. As a prelude to exploring these issues, the paper continues in the next section with theoretical perspectives on the linkages between access to credit and health utilization. This is followed with a discussion on the empirical strategy, estimation techniques and data sources. The results and discussions are provided in section 4 before the conclusions of the study are summarized in the last section.

Theoretical Perspectives

To provide a theoretical frame of reference for analyzing the relationship between loan amounts, this study draws from the standard neoclassical approach to consumer utility maximization and household health production theory which has been documented in several health economics textbooks and papers including Neun and Santere (2013), Feldstein (2005), Grossman (1972), Getler et al (1987) and Fenny et al (2014). In these models, demand for good health status by consumers is categorized as a consumer good as well as an investment good. As a consumer good, individuals derive satisfaction and have a high preference for a good health status in their preference function. As an investment commodity, having good health status determines the total amount of time available for market activities (that will bring in some economic return) and non-market activities (that produce commodities that enter the utility function).

Following an earlier paper by Asmah et al (2013), utility (U), within the consumer utility maximization framework for any household member is assumed to depend on a health-neutral good (X), a health-related good or behavior (Y) and home produced health status, (H). It is also assumed that the household member's home health production function is of the form:

$$H = f(Y, M, \eta) \quad \text{..} \quad (1)$$

Where, *M* stands for market and/or non-market inputs into the household member's health production such as medical care, and utilization of all kinds of health services such as contraceptive use. η captures the component of the individual's health due to genetic endowments, environmental factors and other components not influenced by preferences. It is

within this vector of variables that we conceptualize the role of access to financial services. Thus, the objective function of this household member becomes:

$$\text{Max } U = U(X, Y, H) \dots\dots\dots\dots\dots\dots\dots \quad (2)$$

Subject to the budget and time constraints as in equations (3) and (4) below

$$wh = XP_x + YP_y + MP_m \dots\dots\dots\dots\dots\dots\dots \quad (3)$$

Where w is the wage rate, h the number of hours worked and P_x, P_y, P_m are prices of health neutral good, health related consumer goods and health services.

The time constraint is also given as:

$$T = h + L \quad \dots\dots\dots\dots\dots \quad (4)$$

Where, T, is the total time available, and L is leisure. Substituting (4) into (3) yields;

$$w(T - L) = XP_x + YP_y + MP_m \dots\dots\dots\dots\dots.. \quad (5)$$

The solution to this utility maximization problem of the household member requires assumptions of continuous, differentiable and quasi-concave utility functions, as well as a convex restriction set (Asmah, 2013). Maximizing the objective function subject to the constraints yields the Lagrangian function as follows:

$$L = U(X, Y, H) + \lambda_1 \{w(\lambda - L) - (XP_x + YP_y + MP_m)\} + \lambda_2 \{H - F(Y, M, \eta)\} \dots\dots \quad (6)$$

The task facing this household member is to simultaneously choose the amount of health-neutral goods, health related goods and health production inputs so as to maximize utility. Taking first order conditions and jointly solving the resulting equations provides the optimal solution to the above problem in the form of health input demand functions given by:

$$X = D_x(P_x, P_y, P_m, w, h, \eta) \dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (7)$$
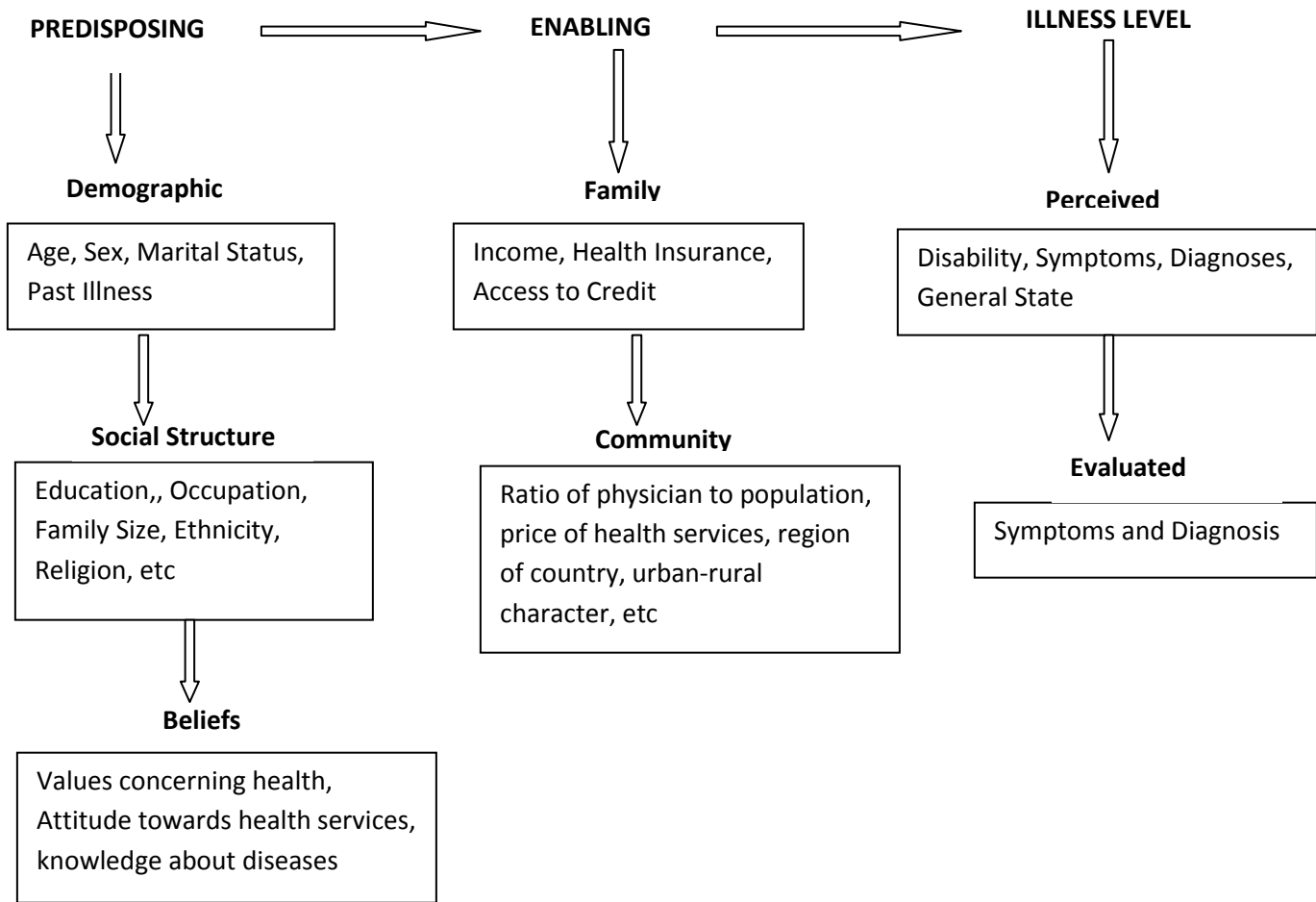
$$Y = D_y(P_x, P_y, P_m, w, h, \eta) \dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (8)$$

$$M = D_y(P_x, P_y, P_m, w, h, \eta) \dots\dots\dots\dots\dots\dots\dots\dots.. \quad (9)$$

Ideally, the system of equations (7) - (9) should be estimated simultaneously, but the focus is placed on equation (9) to reduce the extent of complexity and for the purposes of achieving the objectives of the study. In line with equation (9), Andersen and Newman, (2005) outline a framework for health service utilization that takes into consideration societal and individual characteristics. This conceptual framework summarized in equation (10) and in the figure below serves as a guide in the selection of variables for the analysis of health care utilization pattern:

$$Utilization = f\ (predisposing,\ enabling\ and\ illness\ level)\dots\dots\dots \quad (10)$$

Figure 1: Individual Determinants of Health Service Utilization

PREDISPOSING	ENABLING	ILLNESS LEVEL
Demographic	**Family**	**Perceived**
Age, Sex, Marital Status, Past Illness	Income, Health Insurance, Access to Credit	Disability, Symptoms, Diagnoses, General State
Social Structure	**Community**	**Evaluated**
Education,, Occupation, Family Size, Ethnicity, Religion, etc	Ratio of physician to population, price of health services, region of country, urban-rural character, etc	Symptoms and Diagnosis
Beliefs		
Values concerning health, Attitude towards health services, knowledge about diseases		

Clearly, household's health care choices are assumed to be derived from the desire to have good health status, which is also based on the desire to maximize utility. The choices depend on several factors including: the cost of medical care, income, education, genetic traits or environmental factors such as place of residence, ethnicity, and other relevant variables. The effects of loan amounts in the framework are to enhance the capacity of the household member as a consumer and producer of health to make the right choices and decisions about healthy practices.

Overview of the Empirical Literature

Quite a number of empirical studies already exist to support the linkage between financial access and different development and welfare indicators at the micro level. A study in Ghana by MkNelly and Dunford (1998) (as reported in Littlefield et al, 2003) found that Freedom from Hunger clients had better breastfeeding practices, and their one-year-old children were healthier than non-client children in terms of weight-for-age and height-for-age. Clients also showed significant positive changes in a number of health practices-breast-feeding immediately after birth (so newborns get colostrum), introducing liquids and first foods to infants, and giving rehydration therapy to children with diarrhea. Litlefield et al (2003) also reports of a survey of microfinance clients in Bangladesh who indicated that rates of contraceptive use were significantly higher for Grameen clients (59 percent) than for non-clients (43 percent). Similar findings of increased contraceptive use were reported in a later study by Rahman and DaVanzo (2000). This is generally due to greater awareness of contraceptive programs gained by attending group meetings and from increased mobility that allows women to seek out such services.

Arthur (2012) used the 2008 Ghana Demographic and Health survey data to investigate the effect of wealth on maternal health care utilization in Ghana via its effect on Antenatal care use. Results show that wealth has a significant influence on adequate use of Antenatal care in Ghana. Education, age, number of living children, transportation, regions and health insurance are other factors that were found to influence the use of Antenatal care in Ghana. Titaley et al (2010) used primary data analyzed why some women do not attend antenatal and postnatal care visits in six villages in three district of Indonesia. Results showed that financial constrain, cost of health services, transport cost in remote areas, limited availability of health services, distance

from facilities and lack of community awareness of the importance of the services were major factors that deter most women from attending antennal and post natal care.

Penh (2013) analyzed the utilization of child health services for children who had diarrhea and fever two weeks prior to the survey in Cambodia. The results shows that Mothers aged 35 years old or older were less likely to seek healthcare from a provider for their children. Children from wealthier households were less likely to go to the public health sector but more likely to go to the private health sector for treatment. When distance to a healthcare facility was not perceived as a big problem, the children were more likely to be taken to the Private health sector for treatment and not necessarily to the public sector. When women said that money was not a big problem, sick children were less likely to be taken to a health care facility for medical. treatment. Oresanya et al (2008) found education and wealth index as a determinant factor in the use and possession of ITN. Their findings high lights poverty as a potential barrier to scaling up ITN use in Nigeria.

Beside the above cited scholars, several substantive contributions to the determinants of utilization of health care services have been made to-date. These include papers by Fenny et al (2015), Akudugu (2014), Adu-Gyamfi and Abane (2013), Owoo and Lambon-Quayefio (2013), Nketia-Amponsah et al. (2012), Alhassan and Akudugu (2012), Bakeera et al (2009) and Oresanya et al (2008). Utilization of health services in these studies has been analyzed through the attendance rate of different types of health services namely: consultations, medical examinations, hospitalizations and use of preventive services. The review of the above-related literature, together with the conceptual framework by Andersen and Newman, (2005) helped to unearth the theoretical and empirical factors that informed the choice of health care utilization explanatory variables that informed this study.

Empirical Strategy and Estimation Method

In order to assess whether the size of loans have any effect on health care utilization by households in Ghana and following from the theoretical framework earlier discussed, we follow a general specification of the form:

$$M_i = X_i \beta + \varepsilon_i$$ .... (10)

Where M_i the dependent is variable representing selected health care utilization variables. In this paper, two proxies are used to capture health care utilization: (i) Percentage of individuals who reported ill or injured and consulted a health practitioner during the two weeks preceding survey); and (ii) choice of health provider by the sick/injured. X_i is a vector of the explanatory variables (income, age, education, region, residence, insurance, household size, marital status and previous health status) that also include individual's loan amount (the variable of interest), β is a vector of parameters to be estimated and ε_i is the disturbance term which includes all the unobserved factors that affect health care utilization.

Since health care utilization decisions are discrete in nature, their estimations can be made using discrete choice formulations. Under the scenario where the dependent variable is dichotomous or polychotomous, the appropriate empirical technique for estimation is one of the probability models. The particular choice depends on the distributional assumptions of the disturbance term, ε_i. For example, when ε_i are identically and independently distributed according to the Weibull extreme value distribution, the difference between two disturbance terms will be logistically distributed, leading to the popular easily computed logit model. Under the scenario where the error term is assumed to be normally distributed as N (0, 1), the probit specification is used. According to Long (1997) the choice between logit and probit models is largely one of convenience and convention, since the substantive results generated are indistinguishable. However, the logit model has been widely used in many fields. For ease of interpretation of the sign and significance of the coefficients, this study adopts the logit model.

In doing this, the binary response can be defined by transforming $X\beta$ into a probability such that:

$$p(y_i = 1) = F(X_i\beta) \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (11)$$

The logistic model specifies that the probability of seeking health care as:

$$p(y_i = 1) = p_i = \frac{e^{X\beta}}{1 + e^{X\beta}} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (12)$$

and the probability of not seeking health care is therefore,

$$p(y_i = 0) = 1 - p_i = 1 - \frac{e^{X\beta}}{1 + e^{X\beta}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (13)$$

Hence the logit model becomes,

$$\frac{p(y = 1)}{p(y = 0)} = \frac{p_i}{1 - p_i} = e^{X\beta} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (14)$$

and the log-odds ratio is:

$$\ln\left[\frac{p_i}{1 - p}\right] = X\beta \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. \quad (15)$$

that is

$$\ln\left[\frac{p_i}{1 - p_i}\right] = X_i\beta + \varepsilon_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. \quad (16)$$

Since the specification of the binary dependent variable for health care utilization may be too restrictive, we relax this specification by considering a polychotomous dependent variable which reflects four health care alternatives available to the individual who is ill or injured: (i). non-treatment $(j = 0)$, (ii) treatment by a doctor or dentist $(j = 1)$, (iii) treatment by a trained assistant/nurse/midwife $(j = 2)$ and (iv) treatment by a traditional healer/spiritualist/untrained birth attendant $(j = 3)$. The multinomial logit model to be estimated is defined as:

$$\Pr oby_i = j / y_i = j = \frac{\exp X_i'\beta_j}{1 + \exp X_i'\beta_j}$$

Where $j = 0,1,2,3$ and Prob $(Yi = j)$ denote the probability that individual i chooses alternative j, and Xi represent the individual characteristics and other factors that influence individual i to choose the *jth* alternative. Using this multinomial logit (MNL) model however requires the assumption of 'Independence of Irrelevant Alternatives' (IIA) (McFadden, 1974). This property requires that the relative probability of choosing between two alternatives is unaffected by the presence of additional alternatives. To check whether this property holds, a Hausman test

procedure was run and the results satisfy the assumption (Hausman and McFadden, 1984). Our task in the estimation process is to look for $\hat{\beta}$ that maximizes the log likelihood functions and interpret the sign and significance of the coefficients which reflects the effect of a change in the independent variable on the odds ratio. In other words, estimation of the equations are based on the maximum likelihood technique.

Data

The study is based on data from the recent round of the Ghana Living Standards Survey Round Six (GSS, 2014). It is a nationally representative sample of 18,000 households in 1,200 enumeration areas with valuable information on the living conditions and well-being of households in Ghana. The survey data includes data on demographic statistics, health, education, economic activities and time use and migration. The survey consists of both a household questionnaire and a community questionnaire, and data from either of these are combined for this paper. The summary statistics of all the variables included in the models as well as an overview of the data on health care utilization and household access to credit has been provided in the appendix.

Econometric Results and Discussion

We first present Table 1 the results of the logit estimation of the effect of loan amounts on consultation of health practitioner. The results are generally satisfactory in terms of the sign and significance of the parameter estimates, both within the logit and multinomial logit models. It was observed that variables that significantly predict the tendency that a respondent will consult a health practitioner when suffering any infirmity are amount of credit obtained from the financial institution, income of the household, insurance status of the individual, place of residence and household size. With a 1 percent level of significance, a one percent increase in the income of the household is associated with a probability of 0.131 that he/she will seek health care when suffering from any form of illness or injury holding all other socio demographic factors constant. It can also be observed that one percent increase in the amount of credit accessed from financial institution is associated with 0.611 probability that an individual will consult a health practitioner when ill. With insurance as a hedge against catastrophic health

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expenditure, it turns out in this analysis that given that an individual is registered and covered by health insurance, he/she stands about 0.1 probability of consulting a health practitioner when suffering from either illness, injury or both.

Table 1: Logit estimation on consultation of health practitioner

Variable	Marginal Effect	Std. Err.
Income	0.131***	0.007
Credit	0.611**	0.008
Region (Base outcome=Greater Accra)		
Western	0.003	0.063
Central	0.014	0.045
Volta	0.093*	0.056
Eastern	-0.072	0.051
Ashanti	-0.051	0.057
Brong Ahafo	-0.055	0.062
Northern	-0.050	0.060
Upper East	0.056	0.057
Upper West	-0.103	0.068
Age	0.001	0.001
Ethnicity (Base outcome=Akan)		
Ga/Damgbe	-0.053	0.049
Ewe	-0.035	0.050

Guan	-0.128**	0.061
Gruma	0.053	0.065
Mole Dagbani	0.042	0.046
Grusi	0.062	0.069
Mande	0.052	0.093
None Ghanaians	0.136	0.105
Insurance status	0.080***	0.02331
Education (Base outcome=None)		
Primary	0.017	0.028381
JSS/JHS/Middle	-0.005	0.031555
Secondary+	-0.056	0.03927
Urban	0.044*	0.026315
Household size	-0.008**	0.003671
Previous health status	0.408***	0.019929
N		1238
LR chi2(2)		601.08
Prob > chi2		0.000
Pseudo R2		0.3509
Goodness-of-fit test		0.3171
Linktest		0.113

***p<0.001, **p<0.05, *p<0.01

Household size is found to be negatively associated with the tendency of consulting a health practitioner when ill. The result shows that at 5 percent level of significance, if the number of household members increases by 1, an individual in that household who suffers from any form infirmity is 8 percent less likely to seek for health care. The previous health condition of the individual is found to be positively and significantly associated with the tendency of consulting a health practitioner in the two weeks preceding the GLSS 6 survey. It can be observed that an individual who has a history of illness has about 41percent tendency of consulting a health practitioner. In addition to the mentioned predictors, place of residence of the individual is also positively associated with the probability of seeking for health care when ill or injured. Furthermore, an individual who lives in the urban area is 4.4 percent more likely to consult a health practitioner when ill compared to his or her rural counterpart.

With Greater Accra as the base category, a respondent in the Western, Central, Volta and Upper East regions is more likely to seek health care when ill. Particularly, a resident in the Volta region is about 9 percent more likely to seek health care when ill. Also, using Akan as the base outcome, an individual from the Guan, Ewe and Ga/ Dambge ethnic groups is less likely to seek health care when ill. Holding other factors unvarying at 5 percent level of significance, a Guan is less likely to consult a health practitioner when ill. Although none of the categories of education of the individual is significant, it can be observed that compared to an individual with no education, an individual with JHS/JSS/Middle and above level of education is more likely to seek health care when ill. Two post estimation tests were conducted to assess the robustness of the estimates obtained. One of which is the specification-error tests with the null hypotheses that the model is correctly specified and the alternative that states otherwise. The second post estimation test conducted in this study is the Pearson goodness-of-fit test which asserts that the model used is fit. From the two post estimation tests, we respectively fail to reject the null hypotheses at 1 percent level of significance.

Table 2 depicts the multinomial estimates of the sources from which respondents sought health care when they were injured or ill. The dependent variable was categorized into four based on the nature of training and expertise of the health providers at the source in question. The Doctor, Dentist, Nurse, Medical Assistants, Midwives and Trained Traditional Birth Attendants were in one group and categorized as specialists while the second and third categories were respectively

Pharmacy and Drugstore/Chemical Seller. The final is composed of Traditional Healers, Untrained Traditional Birth Attendants (Untrained TBA) and Spiritualist into Traditionalist/Herbalist. Table 2 presents the results based on the multinomial logit estimation.

Table 2: Multinomial Logit estimation on sources of consultation

Base outcome (Specialist)	Pharmacy		Drugstore/Chemical seller		Traditionalist/Herbalist	
	RRR	Std. Err.	RRR	Std. Err	RRR	Std. Err.
Natural log of income	0.634***	0.311	0.929	0.102	0.921	0.197
Natural log of credit	0.351***	0.059	0.428***	0.049	0.086	0.183
Region (Base outcome= Greater Accra)						
Western	0.000	0.000	0.000	0.000	1.734	2.038
Central	0.194**	0.125	1.137	0.625	0.385	0.400
Volta	0.170*	0.143	1.106	0.744	0.326	0.333
Eastern	0.001	0.000	0.000	0.000	0.220	0.280
Ashanti	0.001	0.000	0.996	0.691	0.000	0.000
Brong-Ahafo	0.001	0.000	2.063	1.501	0.000	0.000
Northern	0.001	0.000	0.165**	0.137	0.161	0.279
Upper East	0.626	0.607	0.182**	0.155	1.478	2.376
Upper West	0.168	0.195	0.027***	0.032	1.165	2.056
Ethnicity (Base outcome= Akan)						
Ga/Damgbe	0.893	0.597	1.387	1.048	0.000	0.000
Ewe	1.084	0.769	1.262	0.841	1.886	1.829

Guan	2.186	2.252	0.895	0.857	2.809	3.499
Gruma	1.157	1.413	0.607	0.575	3.877	6.578
Mole Dagbani	1.369	1.155	4.288**	2.760	1.139	1.758
Grusi	0.000	0.000	1.837	1.934	0.326	0.640
Mande	0.000	0.000	2.728	2.664	0.000	0.001
None Ghanaians	1.837	3.130	2.479	3.878	0.000	0.001
Age	0.991	0.011	1.007	0.006	1.033***	0.012
Education (Base outcme=None)						
Primary	2.398*	1.189	1.843*	0.677	1.319	1.060
JSS/JHS/Middle	0.941	0.549	2.378**	0.895	1.714	1.203
Secondary+	1.306	0.845	1.840	0.844	1.406	1.209
Urban	6.576***	3.939	0.677	0.223	0.792	0.521
Household size	0.840*	0.079	1.016	0.056	1.096	0.091
Previous health status	0.153***	0.093	0.184***	0.087	0.252*	0.191
Insurance status	0.243***	0.102	0.329**	0.099	2.196	1.494
Cons.	0.925	1.710	23.139**	27.587	0.033	0.072
N	1238					

It can be observed from the Table 2 that using specialist as the base category, the main variables that significantly predict the probability of seeking for health care at any of the remaining sources were natural logs of the income of the household and total amount of credit available to respondents. Other control variables that were significant in predicting the odds of visiting either

pharmacy or drugstore for health care were education level of respondents, place of residence, household size, health condition during the two preceding the survey and health insurance ownership and coverage status of respondents. The table indicates that compared to the specialist group, the odds that a respondent who is either ill, injured or both would consult a pharmacy for health care given that there is 1 percent increase in the income of the household is 0.634 times lower. It can also be observed that at a one percent level of significance, the odds of visiting a pharmacy given a one percent increase in amount of credit are about 0.351 times lower. Compared to a respondent who lives in the Greater Accra Region, the odds that a respondent in the Central and Volta Regions would consult pharmacy are respectively 0.194 times and 0.170 times lower.

With "no education" as the base outcome, the odds that a respondent with primary education would seek health care from pharmacy in the event of any form of infirmity are 2.398 times higher. Compared to a respondent in the rural area, the odds that a respondent in an urban area would visit a pharmacy are six and half times more. However, the odds of visiting a pharmacy given that household size increases by 1 is 0.840 lower. The table further shows that when a respondent is covered by health insurance or has some form of chronic illness, the odds of visiting pharmacy for health care are lower by 0.153 and 0.243 respectively. The odds that a respondent will visit a drugstore or consult chemical seller for health care is about 0.43 lower than the odds of consulting a specialist. The same lower odds are associated with respondents in the Northern, Upper East and Upper West regions. With respect to the educational level, a person with primary or JSS/JHS/Middle level of education has higher odds of visiting a drugstore or chemical seller for health care. However, the same negative odds are associated with household size and previous health condition of respondents.

With respect to consultation of herbalist during the state of infirmity, the result indicates that age of a respondent increases there is a positive are odds of consulting a herbalist when ill, injured or both. At 1 percent level of significance, the odds of consulting a herbalist when a respondent's age increases by a year is 1.033 more than consulting a specialist. On the contrast, previous health status is found to have negative association with the odds of consulting a herbalist.

Table 3: Odds comparing Alternative 1 to Alternative 2

Alternatives	B	z	P>z	e^b	e^bStdX
Pharmacy-Drugstore	-0.11324	-0.745	0.456	0.8929	0.8438
Pharmacy-Traditionalist/Herbalist	-1.00145	-4.627	0.000	0.3673	0.2227
Pharmacy-Specialist	-0.9561	-6.505	0.000	0.3844	0.2384
Drugstore-Pharmacy	0.11324	0.745	0.456	1.1199	1.1851
Drugstore-Traditionalist/Herbalist	-0.88822	-4.723	0.000	0.4114	0.2639
Drugstore-Specialist	-0.84287	-8.133	0.000	0.4305	0.2825
Traditionalist/Herbalist-Pharmacy	1.00145	4.627	0.000	2.7222	4.4904
Traditionalist/Herbalist-Drugstore	0.88822	4.723	0.000	2.4308	3.789
Traditionalist/Herbalist-Specialist	0.04535	0.274	0.784	1.0464	1.0704
Specialist-Pharmacy	0.9561	6.505	0.000	2.6015	4.1951
Specialist-Drugstore	0.84287	8.133	0.000	2.323	3.5399
Specialist-Traditionalist/Herbalist	-0.04535	-0.274	0.784	0.9557	0.9342

b = raw coefficient, z = z-score for test of b=0, P>|z| = p-value for z-test; e^b = exp(b) = factor change in odds for unit increase in X; e^bStdX = exp(b*SD of X) = change in odds for SD increase in X; Variable: Natural log of amount Credit (sd=1.4997539)

From Table 3, it can be observed that total amount of loan available to a respondent has no effect on the tendency that a respondent will either switch from consulting pharmacy to drugstore or specialist to traditionalist/herbalist. In every other contrast though, the difference is significant at 1 percent. The post estimation test (as presented in Table 4) indicates that apart from education and ethnicity, the effect of all other variables in the multinomial logit model is significant. This means that with the exception of the combinations with insignificant effect of credit, no other categories should be combined. The post estimation results also shows that the condition for the

log likelihood ratio test is satisfied. Since we used the multinomial logit model, we make a stringent assumption that outcome categories for the model have the property of independence of irrelevant alternatives (IIA). This assumption requires that the inclusion or exclusion of categories does not affect the relative risks associated with the regressors in the remaining categories. From the result, it can be seen that Hausman test of Independence of Irrelevant Alternatives (IIA) has not been violated.

Conclusions and Recommendations

In Ghana, significant differences exist in the utilization of different types of health services across population groups. Many factors contribute to this phenomenon. The main purpose of this study is to investigate the role of credit amounts on health care utilization in Ghana using data drawn from the sixth round of the Ghana Living Standards Survey. The influence of loan amounts on health care utilization is assessed by binary logit and multinomial logit regression technique. Estimation gave satisfactory results in terms of the signs and significance of the parameters in both the binary logit and multinomial logit regressions. We have found that household borrowing is positively and significantly related to health care utilization. But, credit is not the only tool in a health care utilization program. Other variables that significantly predict the tendency that a respondent will consult a health practitioner when suffering any infirmity include income of the household, insurance status of the individual, place of residence and household size. We find that individuals in different socio-economic strata (region, rural/urban) face different risks with health care utilization. For now, what seems clear from the study is that a one percent increase in the amount of credit accessed from financial institution is associated with 0.611 probability that an individual will consult a health practitioner when ill. The implication is that policies aimed at making credit available to individuals and households can make an important contribution to health care utilization in Ghana. By building an awareness of the potential impacts of their programs, financial institutions can design products, services, and service delivery mechanisms that emphasize the health benefits of finance. Health programs and interventions should be embedded in financial services and needs to be tailored to particular socio-economic groups. All of this would require that proper collaboration between Ministry of Health and Financial institutions needs to be developed. Government should provide the enabling environment for financial institutions (especially MFIs) to be effective and efficiently operate to maximum capacity. Collectively, the findings highlight the need for program

interventions to adopt a multi-level approach and address all significant factors affecting health care utilization at various levels – individual, household, community and regional. For example, NHIS subscription and enrolment needs to be strengthened and sustained together with health education and promotion. Also, even though there are obviously unmeasured factors at the rural/urban/regional levels that may predict health care utilization, the significant effects from residence/region variables demonstrate the need to contextualize efforts at promoting health care utilization. In concluding, is significant to point out that the study relied on cross-sectional data with the attendant potential selectivity and endogeneity bias. There is the possibility that the relationships we found in our study are due to influence of unmeasured individual, community/health facility-level variables that are associated with both the dependent and independent variables in our estimated models. Moving forward, these are the issues that will be addressed to improve the paper.

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Appendix 1: Overview of the Data on Health Care Utilization

Figure 1: Health status of respondents and by Consultation of Health Practitioner

Health status of respondents in the past two weeks

N=10,342

Did not consultation / consult

Health status of respondent by consultation of health person

Pearson chi2(2) = 38.9336   N=7571
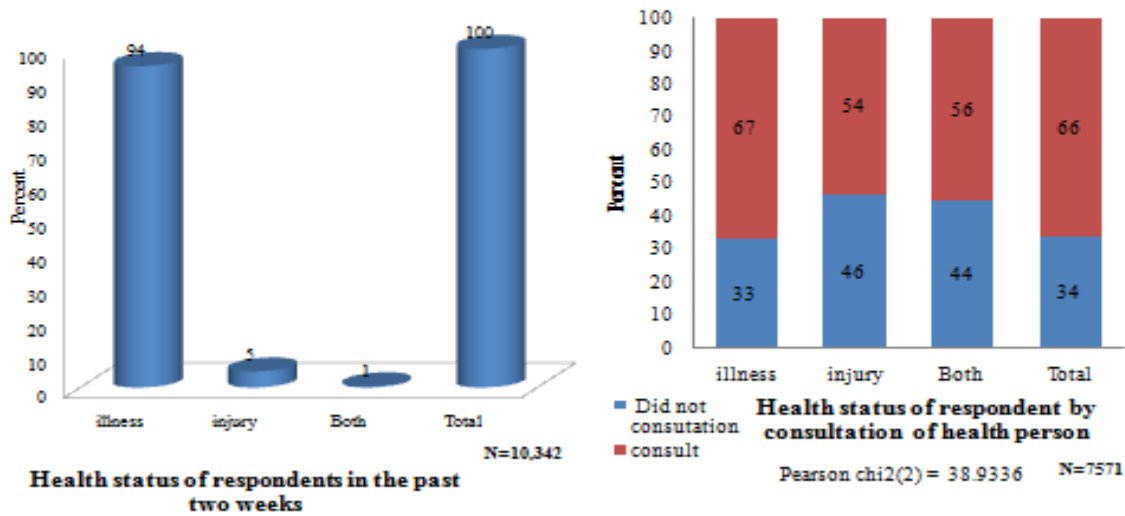
Figure 2: Source from which respondents seek health care/receive credit

Doctor/Dentist
Trained Ass/Nurse/Midwife
Drugstore/Pharmacy
Traditional Healer/Spiritualist

N=7571

Source from which respondents seek health care

N=1990

Source from which respondent received credit
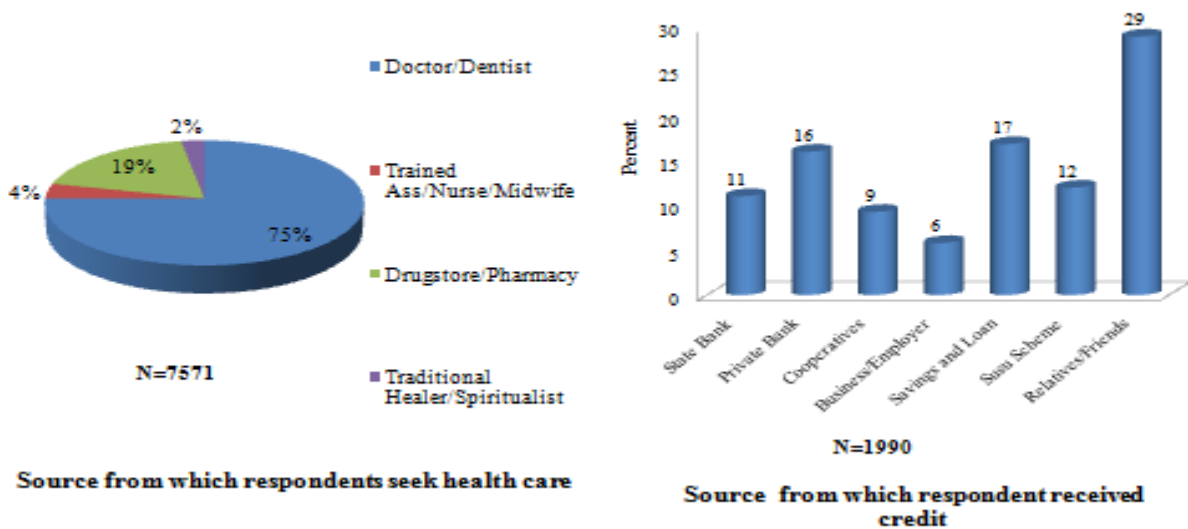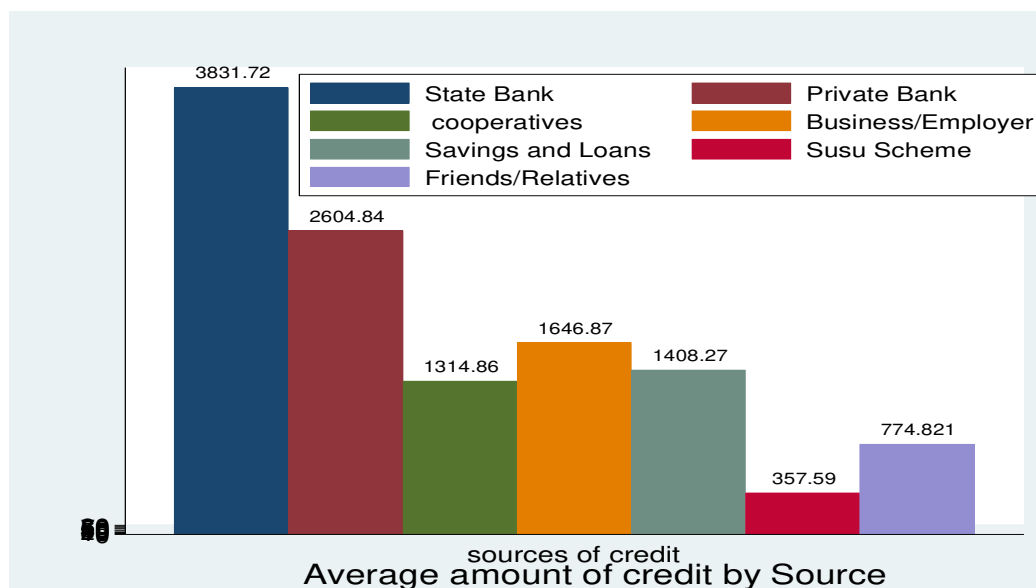
Figure 3: Average Amount of Credit by Source

Average amount of credit by Source

Summary statistics of the variables included in the models

Variable	Observation	Mean	Std. Dev.	Min	Max
Consultation	71381	0.106009	0.307851	0	1
Source of consultation	7570	1.486526	0.879677	1	4
Income of household	69478	9380.638	26600.49	0.080734	1232713
Total amount of credit	1238	1563.116	4876.824	0.2	150000
Region					
Western	72372	0.096142	0.294788	0	1
Central	72372	0.084356	0.277923	0	1
Volta	72372	0.093669	0.291369	0	1
Eastern	72372	0.096861	0.29577	0	1
Ashanti	72372	0.102968	0.303919	0	1
Brong Ahafo	72372	0.0978	0.297046	0	1
Northern	72372	0.133049	0.33963	0	1

Upper West	72372	0.093876	0.291658	0	1
Upper East	72372	0.109186	0.311874	0	1
Age of respondent	72371	24.48573	19.86593	0	99
Ethnicity					
Ga/Damgbe	71009	0.056711	0.231291	0	1
Ewe	71009	0.11845	0.323142	0	1
Guan	71009	0.044487	0.206177	0	1
Gruma	71009	0.072822	0.259846	0	1
Mole Dagbani	71009	0.265882	0.441805	0	1
Grusi	71009	0.054303	0.226616	0	1
Mande	71009	0.01159	0.107032	0	1
None Ghanaians	71009	0.01221	0.109822	0	1
Insurance status	71301	0.692206	0.461584	0	1
Education level					
Primary	72371	0.305606	0.460667	0	1
JSS/JHS/Middle	72371	0.201863	0.401393	0	1
Secondary+	72371	0.115046	0.31908	0	1
Place of residence	72371	0.379669	0.485308	0	1
Household size	72371	6.066422	3.325071	1	29
Previous health status	71381	0.144871	0.351973	0	1

Table 4: Post-estimation test for Multinomial Logit

LR tests for independent variables	chi2	Df	P>chi2
Ho: All coefficients associated with given variable(s) are 0			
Natural log of income	12.509	3	0.006
Natural log of amount of Credit	118.39	3	0.000
Region	13.499	3	0.004
Ethnicity	6.214	3	0.102
Age	17.357	3	0.001
Education	5.514	3	0.138
Urban	36.866	3	0.000
Household size	7.744	3	0.052
Previous Health status	15.999	3	0.001
Insurance status	32.238	3	0.000

Hausman tests of IIA assumption

Ho: Odds(Outcome-J vs Outcome-K) are independent of other alternatives

Omitted	chi2	Df	P>chi2
Pharmacy	16.673	22	0.781
Drugstore/Chemical Seller	20.128	22	0.575
Traditionalist/Hebarlist	13.124	22	0.930