Humanities & Social Sciences Communications

ARTICLE

https://doi.org/10.1057/s41599-022-01282-6 OPEN

The effect of the price of time on healthcare provider choice in Ghana

Adu Owusu Sarkodie[1]✉

The existing literature confirms that the cost of treatment affects the choice of a particular healthcare provider. The Ghana National Health Insurance Scheme was established in 2003 to reduce the cost of healthcare provision and increase access to healthcare. However, we find that that even when the price is assumed to be "zero", there remain some economic costs for choosing a particular healthcare provider over the other. This is called the price of time or opportunity cost. The study uses data from the seventh round of the Ghana Living Standards Survey (GLSS 7) conducted in 2016/2017 and employs multinomial probit regression as the technique for the analysis. The study finds that travel time and waiting time have significant effects on the choice of healthcare provider. If travel time and waiting time increase by 1 h, it will decrease the probability of seeking healthcare by 12% and 17%, respectively. Travel cost was not found to have a significant effect. The recommendations are that policymakers should make the effort to decrease travel time and waiting time at the health facilities in the country to improve healthcare delivery.

[1] Department of Economics, University of Ghana, Accra, Ghana. ✉email: brosark@yahoo.com

Introduction

When a person is sick, he/she is faced with an array of healthcare providers to choose from, and making such a decision is often difficult (Zhu et al., 2019; Sarasohn-Kahn, 2011; Russell, 2008). People visit the health facility for various reasons including seeking treatment, undergoing surgery, immunizing their children, going for check-ups, etc (Osei et al., 2014). The amount paid out of pocket, health insurance, income, and the distance to the health facility may all influence a person's choice of healthcare provider (Dahlgren et al., 2021; Odwee et al., 2006; Asenso-Okyere, 1995). The decision may also be influenced by a friend's advice, a physician's recommendation, one's experience with and information about a particular health provider, risks and benefits, and the severity of illness, among others (Schaik, et al., 2019; Nicholson and Snyder, 2007; Cisse, 2011).

The various healthcare providers from which an individual can choose are public modern, private modern, pharmacy, or the traditional/spiritual healer (Dawson, 2012; Nonvignon and Aglobitse, 2007; Anyanwu, 2007). Depending on their health status, income, price, and health insurance, the individual will choose a particular healthcare provider that maximizes their utility (Sarkodie, 2021; Baidoo, 2009). When a patient is an active subscriber of a health insurance scheme, they are likely to seek healthcare without paying directly out of pocket. There can still be underutilization of healthcare services even if healthcare services are provided at "zero price" (Mueller, 2002). The focus of this study is to identify the possible determinants of the choice of healthcare provider even if the patient pays nothing out of pocket due to the presence of health insurance.

Some studies have been done on the choice of healthcare provider. A review of the existing literature suggests that some of the papers did not use a nationally representative dataset (Dahlgren et al., 2021; Einav and Finkelstein, 2018; Nketiah-Amponsah and Sarkodie, 2014; Owoo and Lambon-Quayefio, 2013; Ringel et al., 2001; Gaddah, 2011; Mwabu et al., 1993; Anyanwu, 2007; Blanchet et al., 2012). Others focused on other determinants such as health insurance, information, quality of health service, and rural-urban dynamics (Sarkodie, 2021; Schaik, et al., 2019; Zhu et al., 2019; Zweifel et al., 1997; Collins et al., 2014; Arthur, 2014; Kuunibe and Domanban, 2012; Nketiah-Amponsah and Arthur, 2013).

This study adds to the body of knowledge by testing the hypothesis that even if healthcare is delivered free of charge (may be due to the presence of health insurance), the opportunity cost of seeking healthcare will still affect the probability of healthcare utilization, and whether or not the differences in probabilities differ across the types of providers. Travel cost, travel time, and waiting time have been identified as the possible opportunity costs of healthcare utilization, also called the "attributes of healthcare". The study refers to them as the "price of time" in this study.

Methodology

Data source. The source of data for this study is the seventh round of the Ghana Living Standards Survey (GLSS 7), which was conducted in 2016/2017. It is a nationwide household survey designed to generate information on the living conditions in the country at the individual level. The GLSS 7 collects detailed information from households including, health, education, employment and time use, migration, tourism, housing, agriculture, access to finance, and asset ownership. A two-stage stratified sampling design was adopted. In the first stage, 1000 enumeration areas (EAs) were selected to form the Primary Sampling Unit (PSUs), giving a sample size of 15,000 households and about 53,000 individuals. Section three (3) of Part A of the questionnaire asks for information about an individual's health status. Respondents indicated whether or not they sought treatment when ill, the type of healthcare facility they visited, the direct and indirect costs of utilizing the healthcare, and their demographic factors. This is the population of the study.

Estimation technique. The dependent variable which is the type of healthcare is categorized into public modern, private modern, chemical store, traditional/spiritual healer (including homeopathy and patient's home), with no care as the base category.

Some of the most common nonlinear economic relationships can be adequately presented by polynomials in the determinants (Greene, 2003; Grossman, 1972). Assume the following nonlinear demand function for healthcare:

$$M_i = \alpha + \beta C + \gamma T + \delta W + \lambda(P = 0) + \theta D + \varepsilon \qquad i = 1, 2. \tag{1.1}$$

where M_i is the healthcare utilization categorized into public modern, private modern, chemical seller, traditional/spiritual healer.

$\alpha, \beta, \gamma, \delta, \lambda$ and θ are the coefficients;

C is travel cost. It measures how much the patient paid to travel to the health facility.

T is the time it took to travel to and from the health facility;

W is the waiting time. Thus, time spent at the facility excluding admission;

P is the price paid for receiving healthcare, upon the assumption that the price is zero, $P = 0$

D represents the control variables, which are age, gender, education, location, income, and severity of illness.

E is the error term.

To estimate the effect of the price of time on demand for healthcare when the money price is assumed to be zero, there is the need to interact $P = 0$ with the travel cost, travel time, and waiting time so that the equation will be:

$$M_i = \alpha + \beta PC + \gamma PT + \delta PW + \theta PD + \varepsilon \qquad \text{i} = 1, 2. \tag{1.2}$$

Where PC, PT, PW, and PD are the interaction terms of the zero money price variable with travel cost, travel time, waiting time, and the controls, respectively.

Most often than not, researchers are advised to test a property of the model known as the independence of irrelevant alternatives (IIA) (Williams, 2016). In a discrete choice theory, the assumption says that if individuals are asked to choose among a set of alternatives, the odds of choosing one over the other should not depend on the presence of other alternatives. In other words, in this study, a person who suffers from illness or injury or both can choose one healthcare service provider over the other regardless of whether or not other facilities exist (Williams, 2016). The multinomial probit estimation method is preferred to multinomial logistic regression because the latter is likely to suffer from IIA.

Following Williams (2016), the probit regression estimates and reports the marginal effects because the dependent variable is categorical. Marginal effects behave like partial derivatives of the dependent variable with respect to the independent variable. It also measures the slope of a given function of covariates and coefficients of the preceding estimation. It measures a change in the predicted probability for a unit change in the predictor. The marginal effect is computed differently for discrete and continuous variables. For binary variables, marginal effects measure a discrete change. A binary predictor has values 0 and 1. Therefore, the marginal effects of a binary variable measure how the predicted probabilities change as the binary independent variable changes from 0 to 1, holding all other variables constant.

Table 1 Variable description: categorical and continuous variables.

Variable	Description	Continuous or Categorical
No care	Did not seek treatment	Categorical
Public modern	Hospitals and clinics that have modern facilities but are owned by the government.	Categorical
Private modern	Hospitals and clinics that have modern facilities but are owned by the private sector	Categorical
Chemical/pharmacy	Pharmacy and drug/chemical seller	Categorical
Traditional/spiritualist	Traditional healer and spiritualist	Categorical
Travel cost	Amount of money paid to travel there and return	Continuous variable
Travel time	Amount of time spent to travel to and from the facility (in hours)	Continuous variable
Waiting time	Amount of time spent at the health facility (in hours)	Continuous variable
Price	The total amount paid to receive treatment	Continuous variable
Gender	Gender of the household member	
Male	Male	Categorical
Female	Female	Categorical
Age	Age of respondents	Continuous variable
Education	Whether or not individuals attended school and what highest qualification attained	
No qualification	The individual has no educational qualification	Categorical
Primary	From kindergarten to primary	Categorical
JHS/JSS/Middle	From kindergarten to JHS/JSS/Middle school	
Secondary	Secondary qualification	Categorical
Tertiary	Bachelor's, Master's, and Ph.D. degree	Categorical
Location	Where individual lives, rural or urban	
Urban	Individuals live in urban	Categorical
Rural	Individuals live in rural	Categorical
Income	Monthly earnings from the main occupation	Continuous variable
Severity of illness	Whether or not the patient stopped usual activities and for how many days if they stopped	
Not severe	The person did not stop usual activities	Categorical
Less severe	The person stops usual activities for up to three days due to illness	Categorical
More severe	The person stops usual activities for more than three days due to illness	Categorical

Source: Author's computation using GLSS 7.

Assume a dependent variable, y, and a binary independent variable, x. the marginal effects of x will be equal to

$$\text{Marginal effects}\, x = \Pr\left(y = 1 \middle| X, x = 1\right) - \Pr\left(y = 1 \middle| X, x = 0\right). \tag{1.3}$$

That is marginal effect shows how $P(y = 1)$ is predicted to change as x changes from 0 to 1 holding all other Xs equal.

Marginal effects for continuous variables measure the instantaneous rate of change. Marginal effects for continuous variables indicate the amount of change in the dependent variable that will be produced by a unit change in the predictor (which is a continuous variable).

That is:

$$\text{Marginal effects of } x = \text{limit}\left[\Pr\left(y = 1 \middle| X, x + \Delta\right) - \Pr(Y = 1|X, x)\right]/\Delta\Big]. \tag{1.4}$$

As Δ gets closer and closer to 0

For categorical variables (more than two possible outcomes), the marginal effects indicate the difference in the predicted probabilities for cases in one category relative to the reference category. A full description of the variables is provided in Table 1 below.

Results

Summary statistics. The summary statistics indicate that out of the total population of 59,864, about 8307 respondents representing 14% reported having suffered from illness or injury or both in the 2 weeks before the survey. Out of the total number of people (8307) who reported having suffered from illness or injury or both, about 3, 873 representing 46.6% did not seek treatment. The remaining 53.4% who sought treatment did so from Public providers (24%), Private provider (18%), Chemical store (10%), and Traditionalists/spiritualists (1.0%) (see Table 2).

According to Table 2, the average monthly income is GH₵ 991.64 ($220.4 using the exchange rate of GH₵ 4.5/$[1]). On average a patient pays GH₵ 46.0 ($10.2) out of pocket for all medical expenses and spends GH₵ 5.98 ($1.33) to travel to the health facility. It takes a patient 1.45 h to travel to a health facility and spends 3.17 h at the health facility to receive treatment. A greater percentage (44%) did not stop their usual activities. Whereas 27% stopped usual activities for at most three days, 29% stopped for more than three days because their illness was more severe. The mean age of the sample is 25.13 years. There are more females (52%) than males (48%). In terms of education, those without educational qualifications account for 17 percent, while the remaining 73.4 percent have different qualifications. This includes Primary (35%), JHS/JSS/Middle (28%), Secondary and Vocational (14%), and Tertiary (6%). There are more urban dwellers (51%) than rural folks (49%).

A lower standard deviation indicates a more concentrated values around the mean, and therefore, a lower standard deviation is desirable. Since almost all the standard deviations are less than 1, the data can be said to be very much concentrated around the mean. It means that there are only a few outliers, making the data spread very good. The only variables with large standard deviations are the three continuous variables – price, income, and age. Log transformation of these variables has the tendency of reducing the standard deviations and the means while maintaining the same number of observations. Consequently, the continuous variables have been logarithmized.

Determinants of healthcare provider: multivariate analysis. Multivariate regression analysis is required to predict the value the healthcare utilization based on the independent variables. The coefficient is the expected amount of change in the predicted probability for each unit change in the independent variable. It is

the odds of membership in the predicted category compared with the reference group. As discussed earlier, the results will be presented in marginal effects because marginal effects describe the partial derivates of the predictors with respect to the dependent variable (Williams, 2016; Williams, 2012).

Table 2 Summary statistics of the dependent and independent variables.

Variables	Observation	Mean	Standard deviation
Healthcare			
No care	3873	0.47	0.50
Public modern	2022	0.24	0.43
Private modern	1478	0.18	0.38
Chemical store	820	0.10	0.30
Traditional/spiritual	113	0.01	0.12
Independent variables			
Price	5028	46.00	1721
Travel cost	5032	5.98	9.10
Travel time	5032	1.45	2.20
Waiting time	5032	3.17	3.40
Income	5021	991.64	1.30
Severity of illness			
Not severe	3679	0.44	0.50
Less severe	2211	0.27	0.44
More severe	2406	0.29	0.45
Age	59,864	25.13	19.8
Gender			
Male	29,018	0.48	0.50
Female	30,846	0.52	0.50
Education			
No qualification	9059	0.17	0.37
Primary	19,298	0.35	0.48
JSS/JHS/Middle	15,312	0.28	0.45
Secondary	7498	0.14	0.34
Tertiary	3350	0.06	0.24
Location			
Urban	30,277	0.51	0.50
Rural	29,587	0.49	0.50

Source: Based on GLSS 7.

Table 3 reports the regression results together with the number of observations, Wald chi^2, prob > chi^2, and Pseudo R^2, the marginal effects, and the robust standard errors with their significance levels. The number of observations indicates the sample size. Wald chi^2 tests the overall significance of the independent variables. Prob > chi^2 is the probability of obtaining the Wald chi^2 if there is no significant effect of all the predictors. A small value shows that at least one of the predictors is not equal to zero (0) (Williams, 2016).

McFadden's Pseudo R^2 does not give the same interpretation as R^2 gives in ordinary least square (OLS) regressions, and therefore, it must be interpreted with caution. Unlike OLS, the model estimates from a multinomial probit regression are maximum likelihood estimates arrived at through the iteration process. They are to minimize the variance. At every stage, different pseudo R^2 are calculated. They are called pseudo R^2 because they behave like R^2 in OLS ranging from 0 to 1. A higher value is preferred to a lower value. Pseudo R^2 of 0.2–0.4 indicates a good fit for the model (Ringel et al., 2001). It indicates the relationship that exists between the dependent variable and the independent variables, such that this relationship predicts the chance of accuracy of the predictors.

It must be noted that travel cost and travel time have multicollinearity and therefore only one variable is put into the regression model. Since about 41% of the patients traveled on foot and 15% traveled by motorcycle and bicycle, travel time is more preferred to travel cost. In addition, the Travel time result is in line with achieving the objective of the paper (of estimating the price of time) and therefore gives better results in terms of significant coefficients than travel cost.

Even when the price is assumed to be zero, there remain some economic costs for choosing a particular healthcare provider over the other. These may be due to the effect of the opportunity cost of visiting that health facility. For the general case, if the time taken to travel to the health facility increases by 1 h, the probability that someone will seek healthcare when ill will decrease by 12 percentage points. When the waiting time increases by 1 more hour, the probability of utilizing healthcare decreases by 17 percentage points. The effect of the price of time differs across the types of healthcare providers.

If we assume the price is zero and the time taken to travel to public modern, private modern, and chemical stores increases by

Table 3 Effect of time price on a choice of type of healthcare providers: no care as the reference group.

Variable	General case	Public modern	Private modern	Chemical shop	Traditional/spiritualists
Travel time	−0.12***	−0.002***	−0.015*	−0.036***	0.005*
Waiting time	−0.17***	−0.075**	−0.06*	−0.031*	0.003**
Income	0.04	0.003*	0.023***	0.004	0.016
Age	0.44***	−0.032	−0.006	0.018***	0.009***
The severity of illness (with Not Severe as reference)					
Less severe	0.43***	0.063***	0.083**	0.27	−0.03
More severe	0.75***	0.13***	0.10**	0.32	0.07***
Gender (with the female as reference)					
Male	−0.35***	−0.21	−0.21	0.06***	0.02*
Education (with no education as reference)					
Primary	0.15***	0.17*	0.16**	0.04*	−0.03***
JSS/JHS/Middle	0.16***	0.10**	0.19**	0.08**	−0.09**
Secondary and Vocational	0.19***	0.18*	0.32***	−0.006	0.039
Tertiary	0.32***	0.23**	0.39*	−0.01	0.06
Location (with no rural as reference)					
Urban	−0.21***	0.09*	0.44**	0.05	−0.06
Constant	−0.21***	0.98***	0.10**	0.24	
No. of obs = 2778		No. of obs = 2353		Pseudo R^2 = 0.2487	
Pseudo R^2 = 0.2957					

10%* 5%** 1% ***.
Source: Author's computation based on GLSS 7.

1 h, the probabilities of visiting these healthcare facilities will decrease by 0.2, 1.5, and 3.6 percentage points, respectively, but increase the chances of visiting traditional/spiritual healthcare facility by 0.5 percentage points, and are all statistically significant. If the waiting time increases by 1 h, the probabilities of visiting public modern and traditional/spiritual health facilities will increase by 7.5 and 0.3 percentage points, respectively. The effect of waiting time on the private and chemical stores will be a decrease in probabilities by 0.3 and 3.1 percentage points, respectively.

The control variables also influence the choice of healthcare providers. Having GH₵ 1 increment in the monthly income is likely to increase the probability of seeking healthcare by 4 percentage points. The effect will be a 0.3, 2.3, 0.4, and 1.6 percentage points increase in the probability of choosing the Public, Private, Chemical stores, and Medical Alternative providers, respectively, even though only the public and private healthcare providers' coefficients are significant. If the age of the respondent increases by 1 year, the probability of seeking healthcare increases by 44 percentage points. If age increases by 1 year, the probability of visiting the Public and Private providers decrease by 3.2 and 6 percentage points, respectively, though not statistically significant, it increases when seeking healthcare from Chemical and Medical Alternative by 1.8 and 0.09 percentage points, respectively. Compared with females, being a male increases the probability of seeking healthcare by 35 percentage points. However, the results are different among the types of healthcare providers. It increases the chances of choosing Chemical Store and Medical Alternative healthcare providers by 6.0 and 2.0 percentage points, respectively.

When illness is less severe, as compared with not severe illness, it will increase the probability of consulting a physician by 43 percentage points. This result is different from one provider to the other. For Public and Private providers, it will increase by 6.3 and 8.3 percentage points, respectively, but increases for Chemical store and Medical Alternative providers by 4 and 1.6 percentage points but is not statistically significant. A similar conclusion can be made about situations where the illness is more severe. When illness is so severe that it stops people from doing their usual activity for more than three days, it will increase the chances of seeking healthcare by 75 percentage points. With regards to the types of healthcare, it will increase their probabilities by 13, 10, 32, and 7 percentage points, respectively, for Public, Private, Chemical Store, and Medical Alternative providers by 13, 10, and 7.0 percentage points, respectively. Though the coefficient of Chemical Store is insignificant.

Compared with no educational qualification, attaining primary qualifications increases the probability of choosing public modern, private modern, and chemical stores by 17, 16, and 4 percentage points, respectively, but decreases traditional/spiritual by 3.0 percentage points. Having a JSS/JHS/Middle educational level, compare with no qualification, increases the probability of seeking healthcare from public modern, private modern, and chemical store by 10, 19, and 8 percentage points, respectively, but decreases traditional/spiritual by 9.0 percentage points, respectively. Having secondary/vocational qualifications increases the probability of visiting public modern, and private modern by 18 and 32 percentage points, respectively. People with tertiary education are more likely to choose public and private modern by increasing their chances by 23 and 39 percentage points, respectively. Compared with rural folks, the probability of urban dwellers seeking healthcare from public and private modern healthcare facilities increases by 9 and 44 percentage points, respectively. This result about the location is not surprising at all given that there are more private health facilities in urban areas than the rural areas. More than half of all private facilities are found in the Greater Accra region alone.

Discussion

The study focuses on the effect of the price of time on the choice of healthcare provider. The bivariate analysis indicates that the price of time, holding demographic factors constant, has significant effects on healthcare provider choice. The study finds that even when the price is assumed to be "zero", there remain some economic costs for choosing a particular healthcare provider over the other. These may be due to the effect of the opportunity cost of visiting that health facility. For the general case, if the time taken to travel to the health facility and the time taken to wait at the health facility to receive treatment increase by 1 h, the probability of utilizing healthcare decreases. The effect on the types of healthcare providers is that if the travel time increases by 1 h, the probabilities of visiting public modern, private modern, and chemical stores decrease. The effect of travel time on the Traditional/Spiritual Healthcare provider is positive. This is not surprising at all because, in Ghana, the Traditionalist/Spiritualist is regarded to have the cure for all ailments that cannot be cured by modern medicine. This is very true in a situation where sickness is judged chronic or caused by spiritual forces. Many patients are prepared to travel miles to seek treatment as long as they believe their ailments will be cured. This type of healthcare provider is scarce, and the few ones establish their health facilities far from the cities. The same reason is given to explain why waiting time relates positively with this type of healthcare provider. Patients are prepared to wait for many hours in order to receive treatment from this particular provider. The effect of waiting time on the other types of providers is negative, indicating that if waiting time increases by 1 h, the probability of utilizing those healthcare facilities will decrease.

The control variables influence the choice of healthcare providers. People with high incomes are more likely to utilize public and private modern facilities. Older people demand healthcare mostly provided by chemical stores and Traditionalists. This conclusion is in agreement with Agyemang-Duah et al. (2020) who found that older people with basic education, no previous illness, and no family support are less likely to utilize healthcare in the Atima Nwambiagya District of Ghana. When an ailment is severe, the patient is more likely to visit any type of physician. This finding is in agreement with Peprah et al. (2018), who found that pregnant women in rural Ghana only seek healthcare from modern health facilities when they have severe complications. Males are not likely to consult a physician, and if they do at all, they prefer the chemical store and traditionalists/spiritualists. Education increases the probability of seeking healthcare from other providers except for the Traditionalists. Compared to rural dwellers, urban folks are less likely to visit a physician, and if they do they prefer public and private modern healthcare facilities. This finding is consistent with Sarkodie (2021) who found that females and urban people are more likely to insure and therefore are more likely to seek healthcare when ill.

One limitation of the study is the mode of transportation to the health facility. About 41% of the respondents said they walked to the health facility to receive treatment. It is still not very clear whether they chose to walk, or they did not have transport fare. Future studies can probe further.

Conclusion

The paper estimates the effect of the price of time on healthcare utilization and the choice of healthcare provider even if healthcare is provided free of charge. The price of time is often called the attribute of a healthcare provider. They are travel time and waiting time (opportunity cost). Travel time and waiting time significantly reduce the likelihood of utilizing general healthcare. An hour increase in the travel time and waiting time, decreases

the probability of seeking healthcare from public, private, and chemical store providers, except for the Traditionalist/Spiritualist where the effect of travel time and waiting time is positive.

Based on the findings, it is recommended to the Ministry of Transport, Ghana Private Road Transport Union (GPRTU), National Petroleum Authority (NPA), and other driver unions to improve public transport and make it more accessible, especially to the poor and vulnerable in society, and at a cheaper fare. In the light of persistent increases in fuel prices, it is recommended to the government to provide a cost-effective transportation system with less traffic on the roads and subsidize fares. It is also suggested to policymakers to construct more health facilities to increase healthcare utilization. The government's policy of providing CHPS compounds in most parts of the country including the rural areas should be improved.

Waiting time is also found to be another significant determinant of the choice of healthcare provider even if the price is assumed "zero". Most of the time, people wait for so long at the health facility either because the number of health facilities in the area is inadequate and therefore the only facility serving the community is so congested, or there are just a few physicians and other healthcare professionals at the facility. It is therefore recommended that health facilities be provided at every reasonable distance, and resourced with qualified health professionals. Revamping existing and abandoned medical facilities across the country is also important. Doctors and nurses are also encouraged to accept postings to areas deficient in health professionals to help improve the physician-patient ratio.

Received: 1 December 2021; Accepted: 25 July 2022;
Published online: 15 October 2022

Note

1 This was the prevailing exchange rate in 2017 when the data was collected.

References

Agyemang-Duah W, Peprah C, Arthur-Holmes F (2020) Predictors of healthcare utilization among poor older people under the livelihood empowerment against poverty programme in the Atwima Nwabiagya District of Ghana. BMC Geriatr 20:79

Anyanwu JC (2007) Demand for health care institutions' services: evidence from malaria fever treatment in Nigeria. Afr Dev Rev 19(1):304–334

Arthur E (2014) Socioeconomic correlates and the choice of treatment for childhood fever. Afr Popul Stud 28(2):946–955

Asenso-Okyere WK (1995) Financing health care in Ghana. World Health Forum 1995 16(1):86–91

Baidoo R (2009). Toward a comprehensive healthcare system in Ghana. Master of Arts thesis, Ohio University, International Development Studies

Blanchet NJ, Fink G, Osie-Akoto I (2012) The effect of Ghana's National Health Insurance scheme on healthcare utilization. Ghana Med J 46(2):76–84

Cisse A (2011) Analysis of health care utilization in Cote d'Ivoire. African Economic Research Consortium, Research Paper, 150

Collins SR, Rasmussen PW, Doty MM, Beutel S (2014) The rise in health care coverage and affordability since health reform took effect. The Commonwealth Fund

Dahlgren C, Dackehag M, Wandell P, Rehnberg C (2021) Simply the best? The impact of quality on the choice of primary healthcare provider in Sweden. Health Policy 125(11):1448–1454

Dawson S (2012, February 1). Aging America creates demand for healthcare workers, tackling healthcare for the very poor. Health News, p. 1

Einav L, Finkelstein A (2018) Moral hazard in health insurance: what we know and how we know it. J Eur Econ Assoc 16(4):957–982

Gaddah M (2011) Progressivity of healthcare services and poverty in Ghana. National Graduate Institute for Policy Studies (GRIPS), pp. 7–22

Greene, WH (2003). Econometric Analysis (fifth edition ed.). Prentice-Hall, USA

Grossman M (1972) On the concept of human capital and the demand for health. J Polit Econ 80(no. 2):223–55.

Kuunibe N, Domanban PB (2012) Demand for complementary and alternative medicine in Ghana. Int J Humanit Soc Sci 2(14):1–5

Mueller KJ (2002) Meeting the demand for healthcare services: workforce supply for rural america. Session of the 2002 Annual Collaboration Meeting Joplin, Missouri

Mwabu GM, Ainsworth M, Nyamete A (1993) Quality of medical care and choice of medical treatment in Kenya. an empirical analysis. J Hum Resour 28(4):283–291

Nicholson W, Snyder C (2007) Microeconomic theory: basic principles and extensions (10 edn). West Group Eagan, MN, United States

Nketiah-Amponsah E, Arthur E (2013) Choice of delivery facility among expectant mothers in Ghana: does access to health insurance matter? J Health Manag 15(4):509–524

Nketiah-Amponsah E, Sarkodie AO (2014) Choice of healthcare provider in Ghana: empirical evidence. In: Twerefou DK, Quartey P, Boakye-Yiadom L, Baah-Boateng W (eds), Readings on key economic issues in Ghana. Digibooks Ghana Ltd. Social Science, Accra

Nonvignon J, Aglobitse P (2007) The choice of healthcare services by households in Ghana. iHEA 2007 6th World Congress: explorations in Health Economics Paper. Available at SSRN: http://ssrn.com/abstract=992746. Retrieved 1st Sept 1st, 2016

Odwee JJ, Francis NO, Asaf A (2006). The determinants of health care demand in Uganda: the case study of Lira District, Northern Uganda. AERC research paper 155. AERC, Nairobi

Osei B, Kunawotor ME, Anane E (2014) Determinants of health care demand in Ghana using the ordered probit model analysis. Int J Bus Econ Res 3(6):259–265

Owoo NS, Lambon-Quayefio MP (2013) National health insurance, social influence and antenatal care use in Ghana. Health Econ 3(19):1–3

Peprah P, Abalo ME, Nyonyo J, Okwei R, Agyemang-Duah W, Godfred A (2018) Pregnant women's perception and attitudes towards modern and traditional midwives and the perceptional impact on health-seeking behavior and status in rural Ghana. Int J Africa Nurs Sci 8:66–74

Ringel JS, Hosek SD, Vollaard BA, Mahnovski S (2001) The elasticity of demand for healthcare: a review of the literature and its application to the military health system. National defense research institute RAND Health

Russell S (2008) Demand-side factors affecting health seeking behaviour in Ghana. J Health Sci GUJHS 5(1):1–5

Sarasohn-Kahn J (2011) Overestimating consumer demand for healthcare technology. The new role of technology in Consumer Health and Wellness from the Consumer Electronics Association (CEA)

Sarkodie AO (2021) Effect of the National Health Insurance Scheme on healthcare utilization and out-of-pocket payment: evidence from GLSS 7. J Humanit Soc Sci Commun 8:293

Schaik PV, Thornhill E, Davies M, Flynn D, Kusev P (2019) The use of information in online healthcare provider choice. Int J Human-Comput Stud 128:41–60

Williams R (2012) Using the margins command to estimate and interpret adjusted predictions and marginal effects. Stata J 12(2):308

Williams R (2016) Marginal Effects for Continuous Variable. Retrieved September 1st, 2016, from University of Notre Dame: http://www3.nd.edu/~rwilliam

Zhu J, Li J, Zhang Z, Li H, Cai, L (2019) Exploring determinants of health provider choice and heterogeneity in preference among outpatients in Beijing: a labeled discrete choice experience. BMJ Open, 9, 023363. https://doi.org/10.1136/bmjopen-2018-023363

Zweifel P, Breyer F, Kifmann M (1997) Health Economics (2nd edn.). Oxford University Press, Oxford

Acknowledgements

The author declares that except for references to other people's work, which have duly been acknowledged, this research article the author's own work. The author did not receive any financial support for this research article.

Competing interests

The author declares no competing interests.

Ethical approval

This study uses secondary data collected by Ghana Statistical Service. Therefore, ethical approval was not necessary.

Informed consent

This study uses secondary data collected by Ghana Statistical Service. Therefore, consent was not required.

Additional information

Correspondence and requests for materials should be addressed to Adu Owusu Sarkodie.