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Factors Determining the Choice of Healthcare Providers in Uganda

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Abstract

Since early 1990s, the government of Uganda has implemented a number of reforms in the health sector, such as decentralization of health service delivery and removal of user fees in public health facilities aimed at achieving equitable access to quality healthcare. Despite these reforms, low levels of healthcare utilisation has remained a serious challenge in Uganda; and out-of-pocket health expenditure remains very high: at 41% of total health expenditure. This study seeks to examine factors that influence patients' choice of healthcare providers in Uganda. A multinomial logistic model was estimated using data from the 2019/20 Uganda National Household Survey. The results showed that cost of healthcare, household welfare, level of education insurance, and region were significant in determining the choice of a healthcare provider. Duration of illness, distance to a health facility and type of illness were also significant determinants. The findings highlight the need for the government to introduce a national health insurance scheme to reduce out-of-pocket payments for healthcare, which will enable vulnerable individuals visit health facilities. It should also increase investments in the health sector by constructing and equipping more health facilities.

Keywords: *determinants, demand, multinomial logit, healthcare provider, Uganda*

JEL Classification: *C25, I11, I12, I18*

1. Introduction

Uganda is a signatory to the Agenda 2030 for Sustainable Development with 17 sustainable development goals (SDGs) that was adopted by the United Nations member states at the UN summit in September 2015 (Republic of Uganda, 2018b). This agenda was adopted alongside other continental and regional development agendas, namely, the African Agenda 2063, East African Community Vision 2050, and the Uganda Vision 2040. Healthcare systems in developing countries, such as Uganda, are poorly developed; and always overstretched in terms of capacity, availability of drugs and qualified personnel (Bossert et al., 2000). Access and utilisation of healthcare is increasingly a subject of debate partly due to the global movement for attaining SDGs, particularly SDG three.

In Uganda, the government has implemented a number of reforms in the health sector for the last three decades, namely: restructuring of the Ministry of Health, decentralization of health service delivery, autonomy of public hospitals, management of human resource, establishment of public-private partnerships, as

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well as introduction of health financing reforms like community-based health insurance and removal of user fees in public health facilities (Republic of Uganda, 2010; 2015b). These reforms aimed at improving financing and delivery of quality healthcare services.

Despite the government's reform efforts, low levels of healthcare utilisation has remained a serious challenge. For instance, the rate of the utilization of out-patient departments in 2018/19 was 1.0, compared to the target of 1.5 per 100 population set by the Health Sector Development Plan (Republic of Uganda, 2019). Additionally, many Ugandans still experience very high out-of-pocket expenditure on health, and contributes about 41% of the total health expenditure (Republic of Uganda, 2018c). This not only limits access to healthcare, but also creates financial risks especially for the poor who allocate much of their household resources to treatment, which could have gone into other productive investments to boost their wellbeing.

According to the 2019/20 Uganda National Household Survey (UNHS), 19% of the population suffered from an illness or injury within 30 days preceding the date of the survey. This was a 9% reduction from 28% in 2016/17. The findings also indicated that 85% of the individuals who fell sick or were injured in the 30 days before the survey sought health care, and 15% did not seek health care. The cost of healthcare, distance to a health facility, and quality of healthcare remain a challenge: the majority of the individuals who were ill and did not seek care were partly hindered by the cost of healthcare and distance to a health facility.

Healthcare services in Uganda are delivered by both public and private healthcare providers. In 2018, Uganda had a total of 6,937 health facilities, of which 3,134 (45%) were government-owned; 1,009 (15%) were private-owned, but not-for-profit; while 2,795 (40%) were private-owned and for-profit (Republic of Uganda, 2018a). In 2001, the government removed user fees in all government health facilities except at hospital level where a dual system exists (Nabyonga Orem et al., 2011). Although a majority of studies indicate that patients are price-sensitive, many Ugandans prefer private health facilities to less expensive government health facilities. In 2019/20, only 37% of the individuals who fell sick, or were injured, sought care from public facilities; 47% sought care from private facilities; while 16% sought care from pharmacies (Republic of Uganda, 2021). This is inconsistent with the objectives of the policy on the abolition of user fees. Also, it has implications for policy reforms to reduce the cost of healthcare, or the provision of sustainable healthcare financing alternative, such as national health insurance schemes.

The rest of the paper is organised as follows. The next section presents a review of theoretical and empirical literature on the demand for healthcare. This is followed by a methodology section presenting the theoretical model, empirical model, data and variables used in the study. Section four presents the empirical results and discussion, while section five presents the conclusion and policy implications.

2. Literature review

2.1 Theoretical Review

Theoretically, demand for health and healthcare follows the consumer utility theory. According to Grossman (1972), demand for healthcare is a derived demand from the demand for health, i.e., healthcare is demanded as an input into the production of health. Healthcare is both a consumer good that yields direct satisfaction, and an investment good that yields satisfaction to consumers indirectly through increased productivity, fewer sick days, and higher wages (Grossman, 1972). Therefore, health is demanded because it is a source of utility and also has an effect on production of income: for instance, ill-health reduces one's ability to earn and to being happy. When an individual invests in healthcare, human productivity is improved, and the number of health days increases for other productive activities. Healthier people are happier since their welfare is improved (Grossman, 1999; Takudzwa et al., 2020).

According to the human capital theory, an individual applies health inputs as investment in health capital. The level of health of an individual is not exogenous but depends, at least in part, on the resources allocated to its production; such as medical care, exercises, diet, education, smoking, and alcohol consumption, among others. Medical care is considered the most important, and as such health is a function of medical care.

2.2 Empirical Review

There are a number of existing empirical studies that have investigated the determinants of demand for healthcare by individuals or households when faced with an illness or injury in many countries. These include: Wellay et al. (2018) and Asteraye (2002) in Ethiopia; Mwami and Oleche (2017), Awiti (2014) and Muriithi (2013) in Kenya; Qian, Pong, Yin, Nagarajan and Meng (2009) in China; Halasa and Nandakumar (2009) in Jordan; Awoke et al. (2017) and Osei et al. (2014) in Ghana; Lepine and Le Nestour (2013) in Senegal; Borah (2006) in India; and Sahn et al. (2003) in Tanzania, among others.

The price, or cost of care, is a significant determinant of demand for healthcare. A study by Halasa and Nandakumar (2009)—using a multinomial logit to examine factors influencing choice of healthcare provider—found that patients using public sector providers were price-sensitive. An increase in out-of-pocket expenditure was negatively associated with choosing public sector health facilities compared to the private facilities. In their study conducted in rural Tanzania, Sahn et al. (2003) found that prices influenced the demand for healthcare from public clinics and hospitals. They noted that as prices of public health services rose, there was a substantial substitution to private health services. Doubling prices of private clinics was accompanied by a large increase in the use of public clinics. Another study by Qian et al. (2009) found that price played a significant role in the choice of a healthcare provider in Gansu Province, in China. They further noted that price elasticity was higher for low-income groups than for higher income groups.

Distance to a health facility is significantly factor associated with decreases in healthcare demand, although evidence on the effect is mixed. A negative effect of distance on utilization of health services was found by Mwami and Oleche (2017) in Kenya; and Wellay et al. (2018) in Ethiopia. This suggests that the likelihood of seeking health care would increase significantly if accessibility was easier. On the other hand, a study by Qian et al. (2009) in rural China indicated that some people may have a preference for a given healthcare provider further away, if that provider has a better reputation or skills. Akin and Hutchinson (1999) found that more seriously ill patients were likely to travel long distances than those that are less ill.

The level of education also plays a significant role in influencing the demand for healthcare. Many empirical studies have found a strong positive relationship between high levels of education and the choice of public and private healthcare providers (Ali & Noman, 2013; Asteraye, 2002; Osei et al., 2014; Wellay et al., 2018). Preference for modern private care and public care, compared with traditional care, rises with increase in the level of education.

Furthermore, age and gender significantly influences the demand for healthcare services (Lepine & Le Nestour, 2013; Qian et al., 2009; Wellay et al., 2018). In a study by Qian et al. (2009), the elderly were more likely to visit lower level providers or go for self-treatment. This finding was also supported by other studies such as Awoke et al. (2017) in Ghana. Likewise, women have significantly lower probability of seeking health care compared to men. This is due the fact that, in some cases, women need their husband's permission to seek healthcare, in addition to not having easy access to household resources. Also, time constraint and opportunity costs faced by women are higher than for men, thus deterring them from accessing healthcare services to a large extent (Awiti, 2014; Sahn et al., 2003; Wellay et al., 2018).

Health insurance is also a significant determinant of patients' choice of healthcare providers. In Rwanda, Ruhara and Urbanus (2016) found that health insurance had a positive and significant effect on the demand for outpatient medical care. In their study in China, Qian et al. (2009) found that individuals enrolled in the National Cooperative Medical Scheme were more likely to seek treatment from public clinics relative to self-treatment. On the other hand, Halasa and Nandakumar (2009) found that health insurance was not important in choosing the Ministry of Health facilities over other providers in Jordan.

Income or household welfare has also been found to be a significant predictor of the choice of a healthcare provider. Ruhara and Urbanus (2016b), in their study to investigate the role of economic factors on the choice of medical provider in Rwanda, found that health insurance and household income were important factors in the choice of medical providers. Similarly, a study by Awiti (2014) in Kenya found that poverty reduces the probability of visiting modern healthcare providers. Other studies such as Ali and Noman (2013) in Bangladesh, and Awoke et al. (2017) in Ghana, found that household income had a positive and significant effect on the demand for healthcare. Additionally, previous studies by Wellay et al. (2018) in Northern Ghana, and Ali and

Noman (2013) in Bangladesh, found that the quality of care or treatment was positively and significantly associated with the demand for healthcare: as the quality of services increase, the demand for healthcare increases, and vice versa.

In Uganda, Ssewanyana et al. (2004) examined the nature and determinants of individuals' decisions to seek care using the 2002/03 UNHS data. They found that the cost of care, income, education, and quality of services were significant determinants. Cost of care was regressive, and remained a barrier to the utilisation of public facilities. A study by Ridde and Morestin (2011) indicated that the abolition of user fees in healthcare had positive effects on the utilisation of healthcare services in African countries. Likewise, Nabyonga Orem et al. (2011) found that the abolition of cost-sharing by the government increased access to health services at clinic and health centre levels, and benefited the poor in Uganda. Odwee et al. (2006), on the other hand, investigated the determinants of healthcare demand in rural Uganda using household data from Lira district in northern Uganda. They found that the demand for government healthcare services was negatively influenced by user fees and drug availability. An increase in medical charges led to a fall in the demand for government health facilities. In addition, the level of education and household income were also significant determinants.

Although there are a number of studies on healthcare issues in many countries, studies addressing factors influencing the choice of a healthcare provider in Uganda are still scanty. The few empirical studies conducted in Uganda discussed above have focused on rural areas, and have not taken into consideration key variables such as health insurance. As indicated above, several studies have found a positive and significant effect of health insurance on healthcare utilisation (Ruhara & Urbanus, 2016; Sahn et al., 2003; Yaya et al., 2019; and Kazungu & Barasa, 2017). However, little is known in the case of Uganda. This paper contributes to a greater understanding of factors that determine patients' choice of healthcare providers in Uganda.

3. Methodology

3.1 Theoretical Framework

The study was guided by Michael Grossman's model of demand for health and healthcare. According to the Grossman's model (1972), what consumers demand when they buy medical care is good health, and not services per se. Health is viewed as a durable capital stock that produces an output of healthy life. Therefore, demand for healthcare is best studied by first constructing a model of the demand for health itself. In this study, the demand variable model is a patient's choice of a healthcare provider in the event of illness or injury. This is a discrete choice variable, and is estimated as the probability that one selects a given option on the basis of utility-maximizing behaviour (Qian et al., 2009; Sahn et al., 2003; Ssewanyana et al., 2004).

Following Borah (2006), Grossman (1972, 1999), Qian et al. (2009), Ruhara and Urbanus (2016b), and Sahn et al. (2003), an individual maximises utility defined as:

$$U_{ij} = U(C_{ij}, H_{ij}) \qquad (1)$$

where H_{ij} is the expected level of improvement in health by individual i after receiving treatment from a provider j; and C_{ij} is the consumption of composite goods other than healthcare after paying for the cost of a provider.

The health production function for provider j can be expressed as:

$$H_{ij} = H_0 + H_{ij}(M, X, Z) \qquad (2)$$

where M is medical care received; X a set of individual and household characteristics; and Z a set of provider-specific characteristics. The production function is a function of medical care an individual receives from provider j, i.e., $H_{ij} = f(M_{ij})$ where $M_{ij} > 0$ is the medical care an individual i gets after receiving treatment from provider j; with $H_m > 0$ and $H_{mm} < 0$, implying that the production function exhibits diminishing marginal product with respect to medical care.

The budget constraint of an individual is defined as:

$$Y_i = P_j + C_{ij}\ j \in J = \{1, 2, \ldots J\}$$
$$\text{Thus, } C_{ij} = f(Y_i - P_j) \qquad (3)$$

Equation (3) means that a disposable income held by individual i after consulting a healthcare provider j is a function of her/his individual income Y_i, and the price P_j s/he pays to healthcare provider j represents both direct costs such as user fees, and indirect costs such as transport costs and waiting time.

Substituting equations (2) and (3) into equation (1), gives the conditional utility function of provider j defined as:

$$U_{ij} = H_{ij}(M, X, Z) + f(Y_i - P_j) \qquad (4)$$

Equation (4) states that the maximum utility of individual i is obtained by choosing healthcare provider taking into consideration the individual's health production function, and the budget (income) that includes direct costs such as user fees; and indirect costs such as transaction costs and waiting time. The other variables are explained in equations (2) and (3).

The study considered a nonlinear specification of $f(Y_i - P_j)$ to avoid responsiveness of prices being independent of income. A quadratic functional form in logs of net income was adopted in line with frameworks used by Borah (2006), Qian et al. (2009), Ruhara and Urbanus (2016b), and Wellay et al., (2018) as indicated in equation (5).

$$f(Y_i - P_j) = \alpha_1 \ln(Y_i - P_j) + \alpha_2[\ln(Y_i - P_j)]^2 \qquad (5)$$

Therefore, a quadratic utility function linear in health goods and logs of consumption in non-health goods was employed. An individual chooses an alternative that maximises the welfare utility, which also reflects the individual's future health state. Thus, individual i chooses a healthcare provider alternative j if—and only if—$U_{ij} > U_{im}\ \forall\ j \neq m\ and\ m \in J$.

3.2 Empirical Model

Following the theoretical frameworks of Borah (2006), Qian et al. (2009), and Ruhara and Urbanus (2016b), the empirical model of this study is specified as:

$$U_{ij} = \beta_0 + \beta_1 \ln(Y_i - P_j) + \beta_2[\ln(Y_i - P_j)]^2 + +\beta_3 M + \beta_4 X + \beta_5 Z + \varepsilon_{ij} \qquad (6)$$

Where the variables are as defined above.

We estimated a multinomial logit model with four options: self-care (or self-treatment), public health facility, private health facility, and pharmacies/drug shops. A multinomial logit was preferred because it is easy to apply compared to a multinomial probit due to its complexity in estimating log likelihood equations. The probability that an individual chooses a healthcare provider *j* over other healthcare providers is, therefore, given as:

$$P\{y_i = j|X\} = \frac{\exp\{X_{ij}\beta\}}{\sum_{j=1}^{J}\exp\{X_{ij}\beta\}} \; j = 1, 2, \ldots \ldots J \qquad (7)$$

This structure implies that $0 \leq P\{y_i = j\} \leq 1$ and $\sum_{j-1}^{n} P\{y_i = j\} = 1$. One of the deterministic utility level is normalising to zero, i.e., $X_{i1}\beta = 0$, giving rise to equation (8):

$$P\{y_i = j|X_i\} = \frac{\exp\{X_{ij}\beta\}}{1 + \sum_{j=2}^{J}\exp\{X_{ij}\beta\}} \; j = 1, 2, \ldots \ldots J \qquad (8)$$

The probability of an individual choosing alternative *j* is a simple expression of explanatory variables and coefficients because of the convenient assumption made about the distribution of unobserved errors. The model is non-linear in parameters, rendering estimated values for βs difficult to interpret. Therefore, the relative risk ratio are preferred, and the odds ratio is given by:

$$\frac{P\{y_i = j\}}{P\{y_i = 1\}} = \exp\{X_{ij}\beta\} \qquad (9)$$

This means that the ratio of choice probabilities for alternatives *j* and *k* do not depend on other alternatives. Therefore, a multinomial logit requires that the assumption of the 'independence of irrelevant alternatives' (IIA)[1] is satisfied (Greene, 2012; Verbek, 2008). The Hausman's specification test is used to test if IIA assumption holds.

3.3 Data and Variable Description

The study used secondary data from the 2019/20 UNHS conducted by the Uganda Bureau of Statistics. The survey used two-stage stratified sampling. In the first

[1] The IIA assumes that if an individual i's choice alternative is introduced or removed, the relative probabilities assigned to each of the other choice alternatives will not change.

stage, enumeration areas were grouped by district and rural-urban location. The enumeration areas were then selected using probability proportional to size. In the second stage, households were selected using systematic sampling. A total of 1,651 enumeration areas were selected, and targeted 10 households per enumeration area for interview, giving a total sample of 16,510 households.

The data collection was then done in two phases between September 2019 and November 2020, and covered 13,732 households; giving a response rate of 83%. This was a multi-purpose study covering three modules: social-economic, labour force, and community. The 2019/20 UNHS is the most recent dataset with indicators of health status and a range of demographic, social and economic variables. In addition, its coverage was drawn from all the districts; hence making the sample national representative, and the one most suitable for this study.

3.3.1 Dependent Variable

The dependent variable was the healthcare provider selected by an individual when ill/injured. This was a categorical variable with four categories: self-care/ self-treatment; public/ government healthcare providers; private healthcare providers; and pharmacies, including drug shops. Self-treatment included the use of drugs available at home and home-made medicines, including roots, herbs, drugs from shops and/or from the market; while clinics and hospitals—along with NGO clinics, hospitals, and laboratories—are listed as private healthcare providers. The choice of healthcare provider is defined as:

$$y_i = \begin{cases} 1 \text{ if self care was used (no modern healthcare provider consulted)} \\ 2 \text{ if consulted public healthcare provider} \\ 3 \text{ if consulted private healthcare provider} \\ 4 \text{ if a pharmacy or drug shop was used} \end{cases}$$

3.3.2 Independent Variables

The independent variables included different attributes of the individual patient, family, community and the healthcare provider. Anderson's behavioural model of healthcare utilisation and literature review guided the selection of the explanatory variables. According to Anderson's model, factors that influence healthcare utilisation can be classified into three categories: predisposing factors, enabling factors, and need factors—i.e., severity of illness or incapacity (Andersen, 1995).

Predisposing factors included were age, gender, education, marital status, and occupation. Age is the number of completed years considered as a continuous variable. Sex was taken as a binary variable with male as the base category. Education was considered in terms of the highest level attained. Education level was recorded as a categorical variable with: 'no formal education', 'primary', 'secondary' and 'post-secondary' education categories. The education level of a household head was used as a proxy for a child's education level (all members below 15 years of age) because a child's decision to visit a healthcare provider is mainly made by his/her mother or father (Borah, 2006; Sahn et al., 2003).

Enabling factors included price or cost of care, income, distance, health insurance, residence, region, and religion. Out-of-pocket health expenditure was used as a proxy for the cost of healthcare. Indirect costs like transportation and waiting time were missing—or not available in many cases—and thus were not part of the cost of care. Log of household welfare was used as a proxy for household income. Distance to a healthcare provider was measured through a set of dummy variables, with distance less or equal to 3km being used as the base category. Health insurance status was a dummy, with having no health insurance cover as base category. A regional variable was also included to capture geographical effects of the central, eastern, northern, and western regions.

Need factors considered were bed-days (i.e., the number of days an individual had to stop doing his/her usual activities due to illness or injury) during the 30 days' period preceding the date of the survey, and the type of illness. Table 1 presents variable definitions, and the expected effects of the variables used in the study.

Table 1: Variable Description

Variable	Description	Exp. sign
Healthcare provider	Dependent Variable = 1 if self-care or treatment is used = 2 if public or government health facility is consulted = 3 if private clinic or hospital is consulted = 4 if a pharmacy or drug shop is used	
Cost of care	Cost of care for provider j measured by out-of-pocket health expenditure, net of any insurance reimbursements.	-
Lnconsumption	Natural log of household consumption	+
lnconsumption squared	Natural log of household consumption squared	+/-
Insurance	= 1 if the individual had health insurance cover; = 0 otherwise	+
Age	Age in years of the injured/ill person	+/-
Gender	= 1 if female; = 0 otherwise	+/-
Marital Status	= 1 if married; = 0 otherwise	+/-
Education level	The highest level of education of the patient;	+
Not educated*	=1 if no formal education;	
Primary	= 2 if primary school;	
Secondary	= 3 if secondary school; and	
Post-secondary	= 4 if tertiary / university.	
Bed-days	Number of days an individual is confined to bed due to illness	+
Distance	The distance to the healthcare provider in kilometres	-/+
0 to <3kms*	= 1 if distance is 0 to < 3kms;	
3 to <5kms	= 2 if distance is 3 to <5kms;	
5 to <8kms	= 3 if distance is 5 to <8kms; and	
8kms or more	= 4 if distance is 8kms or more.	
Residence	= 1 if the individual lives in an rural household; = 0 otherwise	-/+
Region		-/+
Central*	= 1 if individual is from the central region;	
Eastern	= 2 if individual is from the eastern region;	
Northern	= 3 if individual is from the northern region; and	
Western	= 4 if individual is from the western region.	

Employment status		
Subsistence Farmer*	= 1 if substance farmer or unemployed;	+
Salaried	= 2 if salaried worker; and	
Self employed	= 3 if owns a business.	
Types of illness		
Minor/Fever*	= 1 if individual suffered from fever or minor illness;	+
Severe/Chronic	= 2 if individual suffered from severe or chronic illness;	
Injury	= 3 if individual suffered from injury; and	
Other illness	= 4 if individual suffered from other illness.	
Household size	Household size	+/-
Sex of hh head	Sex of the household head. = 1 if male and 0 otherwise	+/-
Age of hh head	Age in years of the household head	+/-

Notes: *These variables are reference groups in the MNL model

4. Empirical Results

4.1 Descriptive Statistics

Table 2 presents the summary statistics for each variable, namely: the number of observations, mean or proportion by healthcare provider, as well as minimum and maximum values.

We can see from Table 2 that out-of-pocket health expenditure had a mean of UGX34,890 for self-treatment, UGX26,340 for government facilities, UGX54,000 for private healthcare providers, and UGX11,580 for pharmacies and drug shops. This means that out-of-pocket health expenditure among the four healthcare providers was highest for private health facilities, and lowest in government facilities and pharmacies. This indicates that some of the healthcare services are subsidised or free in government health facilities, while pharmacies and drug shops do not have other costs such as transport and consultation fees. The minimum amount paid was zero; and the maximum was UGX10,000,000. The average ages (years) of patients were 21, 23, 22 and 21 for self-treatment, government, private healthcare providers, and pharmacies, respectively; with a minimum value of 0 and a maximum value of 108 years.

Furthermore, Table 2 shows that the average household size for patients who visited self-treatment, public, private healthcare providers and pharmacies was 5.6, 5.7, 5.7, and 5.8, respectively. The minimum household size was 1, and the maximum size was 20. The proportion of male-headed households was 44%, 40%, 45% and 46% for self-treatment, public, private, and pharmacies, respectively. This means that the majority of male-headed households sought care from private healthcare providers and pharmacies. The average ages of household heads in completed years were 45 years for self-treatment, and 44 years for other private healthcare providers.

With regard to categorical variables, Table 2 provides the number of observations and the proportion of each category other than the reference category. None of the patients that chose self-treatment had health insurance, while 0.6% of the patients who visited government health facilities had health insurance.

Table 2: Summary Statistics by Healthcare Provider

Variable	Self-care		Government		Private		Pharmacy		Min	Max
	N	*Mean*	*N*	*Mean*	*N*	*Mean*	*N*	*Mean*		
Cost of care '000	296	34.89	3,968	26.34	4,732	54.00	1,762	11.58	0	10,000
ln-welfare	292	11.09	3,952	11.08	4,715	11.44	1,759	11.17	0.58	16.26
ln-welfare squared	292	123.46	3,952	123.05	4,715	131.22	1,759	125.20	13.01	264.37
Age	296	20.8	3,968	23.3	4,734	22.2	1,762	21.1	0	108
Age-squared	296	1025	3,968	1060	4,734	964	1,762	888.7	0	11664
Bed days	296	4.598	3,968	4.832	4,734	4.935	1,762	3.190	0	30
Household size	292	5.6	3,952	5.7	4,715	5.7	1,759	5.8	1	20
Age of hh head	296	44.9	3,968	44.5	4,734	43.7	1,762	44.5	15	108
Health Insurance	18	0.000	313	0.006	520	0.058	135	0.022	0	1
Distance										
3 to <5kms	296	0.078	3,968	0.205	4,734	0.102	1,762	0.083	0	1
5 to <8kms	296	0.037	3,968	0.070	4,734	0.038	1,762	0.015	0	1
8kms or more	296	0.054	3,968	0.071	4,734	0.049	1,762	0.013	0	1
Education										
Primary	238	0.387	3,372	0.493	3,903	0.478	1,491	0.521	0	1
Secondary	238	0.080	3,372	0.116	3,903	0.156	1,491	0.109	0	1
Post-secondary	238	0.025	3,372	0.018	3,903	0.047	1,491	0.028	0	1
Sex (1 if female)	296	0.443	3,968	0.402	4,734	0.453	1,762	0.455	0	1
Married	144	0.438	2,367	0.513	2,831	0.520	1,019	0.462	0	1
Urban	296	0.145	3,968	0.186	4,734	0.229	1,762	0.173	0	1
Type of illness										
Chronic	296	0.196	3,968	0.192	4,734	0.166	1,762	0.183	0	1
Injury	296	0.172	3,968	0.178	4,734	0.182	1,762	0.180	0	1
Other illness	296	0.088	3,968	0.086	4,734	0.082	1,762	0.058	0	1
Employment status										
Salaried	192	0.083	2,983	0.074	3,462	0.094	1,333	0.100	0	1
Self-employed	192	0.073	2,983	0.133	3,462	0.150	1,333	0.168	0	1
Region										
Central	296	0.125	3,968	0.104	4,734	0.190	1,762	0.169	0	1
Northern	296	0.463	3,968	0.383	4,734	0.212	1,762	0.304	0	1
Western	296	0.091	3,968	0.125	4,734	0.198	1,762	0.112	0	1
Sex of hh head	296	0.669	3,968	0.652	4,734	0.725	1,762	0.670	0	1

Source: Author's Computation

Further, Table 2 shows that 5.8% of the patients who visited private healthcare providers had health insurance, while 2.2% of those who visited pharmacies had health insurance. This means that the proportion of patients that had health insurance in private health facilities was about ten times the proportion of those in government health facilities. Regarding the level of education of the patients that had self-treatment, 39%, 8% and 3% had primary, secondary, and post-secondary education, respectively; while for patients that consulted government healthcare providers, 49%, 12% and 2% had primary, secondary and post-secondary education, respectively. For patients that consulted private healthcare providers, 48%, 16% and 5% had primary, secondary, and post-secondary education, respectively; while for patients that visited pharmacies and drug shops, 52%, 11% and 3% had primary, secondary, and post-secondary education, respectively.

The results from the correlation analysis show that the cost of healthcare has a positive correlation with log welfare, age, bed days, and the level of education. Although most correlation coefficients were significant at 5% level of significance, they were all low and moderate: not exceeding a magnitude of 0.30.

4.2 Regression Results

Two models were estimated: model 1 included all possible variables; while model 2 dropped the variable lnwelfare squared, but introduced age-squared to check for the non-liner effect of age. Diagnostic tests were performed to check for possible multicollinearity, model specification error and independence of irrelevant alternatives assumption. The variance inflation factor (VIF) and correlation analysis were used to check for multicollinearity. As a rule of thumb, a VIF of 10 or greater is a cause for concern. In the presence of high multicollinearity, the coefficients are biased and standard errors tend to be inflated; giving small values of the t-statistic, and with very wide confidence intervals of coefficients. The mean VIF was 38.0, and 4.42 for model 1, and 2, respectively *(*see Table A1*)*. The mean VIF was far lower than the acceptable maximum of 10 for model 1, which means that there was no concern for multicollinearity. In addition, the study used ad-hoc solutions through the use of proxies to deal with the endogeneity problem. For example, households' out-of-pocket health expenditure was used as a proxy for the cost of healthcare. Multinomial logit models also use maximum likelihood estimation methods, which in themselves reduces the endogeneity problem (Antolín et al., 2014; Guevara, 2015; Louviere et al., 2005).

Table 3 presents the multinomial regression model results of patients' choice of healthcare providers. The self-treatment alternative was used as the base alternative; and hence the relative risk ratios are presented and interpreted.

Table 3: Multinomial Logistic Regression Results Showing Relative Risk Ratios (Odds Ratios) of Patient's Choice of Healthcare Provider

	Model 1			**Model 2**		
Variables	***Public***	***Private***	***Pharmacy***	***Public***	***Private***	***Pharmacy***
Cost of care	0.99958***	0.99998	0.99789***	0.99956***	0.99996	0.99787***
	(0.00014)	(0.00005)	(0.00024)	(0.00014)	(0.00004)	(0.00024)
Ln-welfare	6.88970	152.5536**	243.0329**	0.91651	2.05079***	1.59174**
	(13.3090)	(379.8396)	(669.0883)	(0.16365)	(0.36731)	(0.29320)
Ln-welfare sq.	0.91300	0.82551*	0.79915*			
	(0.08184)	(0.09337)	(0.09891)			
Age	0.99822	0.99303	0.99378	1.01733	1.01048	1.01373
	(0.00589)	(0.00587)	(0.00630)	(0.01913)	(0.01923)	(0.02061)
Age-squared				0.99978	0.99980	0.99977
				(0.00020)	(0.00020)	(0.00022)
Distance						
3 to <5kms	2.45640***	0.92390	0.87037	2.44003***	0.91674	0.86005
	(0.65755)	(0.25043)	(0.25004)	(0.65277)	(0.24855)	(0.24693)
5 to <8kms	2.32446**	1.01731	0.45996	2.31283**	1.01532	0.45910
	(0.96505)	(0.42818)	(0.22327)	(0.98643)	(0.44021)	(0.22712)
8kms or more	2.94679***	0.90145	0.67792	2.91123***	0.89366	0.66730
	(1.11560)	(0.33386)	(0.30649)	(1.10072)	(0.33039)	(0.30119)

Education						
Primary	1.70062**	1.47371	1.77866**	1.70218**	1.49261	1.80981**
	(0.42497)	(0.37114)	(0.47501)	(0.43350)	(0.38226)	(0.49021)
Secondary	2.15925**	1.95474*	1.86662*	2.03751**	1.86172*	1.77883
	(0.75349)	(0.67903)	(0.68686)	(0.70746)	(0.64390)	(0.65094)
Post-secondary	1.04257	1.39677	1.31463	0.97335	1.28921	1.20146
	(0.52898)	(0.69280)	(0.69116)	(0.49490)	(0.64282)	(0.63471)
Sex						
Female	0.72140*	0.93888	0.96750	0.72766*	0.94348	0.97336
	(0.13877)	(0.18004)	(0.19282)	(0.13981)	(0.18074)	(0.19380)
Bed days	0.99015	0.98155	0.94613***	0.98989	0.98130	0.94596***
	(0.01399)	(0.01385)	(0.01603)	(0.01410)	(0.01400)	(0.01611)
Marital status						
Married	1.54742**	1.59983**	1.37913	1.43864	1.50257*	1.28578
	(0.33553)	(0.34544)	(0.31620)	(0.32385)	(0.33773)	(0.30502)
Residence						
Urban	1.36654	1.16983	0.98378	1.34071	1.14105	0.95726
	(0.32607)	(0.27687)	(0.24636)	(0.31907)	(0.26960)	(0.23905)
Type of illness						
Chronic	0.73378	0.61428**	0.78991	0.72731	0.61000**	0.78371
	(0.16249)	(0.13588)	(0.18205)	(0.16187)	(0.13566)	(0.18143)
Injury	0.68082*	0.71671	0.85848	0.66551*	0.70261	0.83898
	(0.15863)	(0.16674)	(0.20825)	(0.15389)	(0.16221)	(0.20208)
Other illness	1.09480	1.18380	0.73895	1.07697	1.16334	0.72500
	(0.41310)	(0.44770)	(0.29121)	(0.40515)	(0.43834)	(0.28471)
Employment status						
Salaried	0.92560	0.88863	1.21551	0.87673	0.84092	1.13877
	(0.28457)	(0.27270)	(0.38362)	(0.27770)	(0.26594)	(0.37101)
Self-employed	1.94062**	1.85638**	2.91796***	1.81568*	1.73731*	2.71530***
	(0.58467)	(0.55674)	(0.90218)	(0.56322)	(0.53817)	(0.86397)
Region						
Eastern/central	1.97335**	1.34298	1.34124	2.00751**	1.37066	1.37218
	(0.57127)	(0.38242)	(0.39690)	(0.58082)	(0.39059)	(0.40600)
Northern	1.01907	0.52232**	0.62910	1.02922	0.52438**	0.63097
	(0.27991)	(0.14134)	(0.17833)	(0.28243)	(0.14200)	(0.17869)
Western	1.93316*	2.23477**	1.31440	1.91155*	2.23450**	1.31635
	(0.66196)	(0.75328)	(0.46689)	(0.66278)	(0.76406)	(0.47273)
Household size	1.01558	1.06844*	1.06955*	1.01924	1.07266*	1.07311*
	(0.03708)	(0.03863)	(0.04078)	(0.03743)	(0.03901)	(0.04107)
Sex of hh head						
Male	0.89183	0.90932	0.80495	0.90816	0.92623	0.82178
	(0.19399)	(0.19690)	(0.18240)	(0.19633)	(0.19927)	(0.18510)
Age of hh head	1.00376	1.00132	1.00683	1.00573	1.00316	1.00901
	(0.00672)	(0.00666)	(0.00715)	(0.00669)	(0.00662)	(0.00723)
Constant	0.00024	0.00000**	0.00000**	11.68828	0.00260***	0.02184*
	(0.00253)	(0.00000)	(0.00000)	(25.31867)	(0.00566)	(0.04895)
Observations	6,246			6,246		
LR chi2(75)	932.5			913.4		
P-value	0.000			0.000		
Pseudo R-squared	0.104			0.103		

Notes: Base category = self-care or treatment; standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

The Hausman test of the independence of irrelevant alternatives (IIA) assumption was performed with the null hypothesis that the odds are independent of other alternatives. The test results indicated that the IIA assumption was not violated for model 2 (see Table A2). Therefore, model 2 was preferred and its results are presented and discussed.

4.3 Interpretation and Discussion of Results

The multinomial logit regression results indicate that an increase in out-of-pocket health expenditure as a proxy for the cost of care reduces the likelihood of choosing government healthcare providers and pharmacies. Holding other factors constant, with a unit increase in the cost of care, the odds of choosing a government health facility and pharmacy or drug shop were 0.99956 and 0.99787 times, respectively, relative to self-treatment. This result is consistent with the findings by Qian et al. (2009) in China; Sahn et al. (2002) in Tanzania; Muriithi (2013) in Kenya; and Nabyonga et al. (2011) in Uganda: all found the cost of treatment to be significant in determining healthcare demand by the sick. This study-finding is as per Nabyonga et al. (2011): that the abolition of cost-sharing increased access to health services, and benefited the poor in Uganda. However, the finding is not supported by the study by Akin and Hutchinson (1999), who found the cost of treatment to be insignificant in determining the choice of a healthcare provider.

Relative to self-treatment, household welfare as a measure of the level of household income, is significantly associated with the choice of private health facilities and pharmacies. A unit increase in the log of welfare increased the relative risk of choosing a private health facility and a pharmacy by a factor of 2.051 and 1.592 times, respectively, relative to self-treatment. This means that patients from well-off households are more likely to choose private sector healthcare providers and pharmacies than the poor counterparts. This might be because patients from households with high incomes are more likely to be able to pay for the healthcare services received compared to poor ones. In addition, self-employed individuals were more likely to choose government and private healthcare providers compared to those in substistence farming or unemployed. Relative to self-treatment, the odds that a self-employed individual choses a government healthcare provider, a private healthcare provider, or a pharmacy are, respectively, 1.816, 1.737, and 2.715 times than those of a subsistence farmer or an unemployed individual. These findings are consistent with those of Mwami and Oleche (2017) in Kenya; Halasa and Nandakumar (2009) in Jorden; Ssewanyana et al. (2004) in Uganda; Ruhara and Urbanus (2016) in Rwanda; and Awoke et al. (2017) in Ghana.

Education significantly influenced the choice of public health facilities and pharmacies. Relative to self-treatment, individuals with primary education were 1.702 and 1.810 times likely to visit public healthcare providers and pharmacies, respectively; compared to those without formal education. Also, individuals with secondary education were 2.038 times and 1.862 times likely to choose a government health facility and a private healthcare provider, respectively, relative to self-treatment. Having higher levels of education (primary education and above) increased the relative risk of choosing any of the three healthcare providers. This may be because educated individuals earn more income, and thus are likely to afford to pay for healthcare. This result is consistent with the findings of Wellay et al. (2018) in Ethiopia; Ssewanyana et al. (2004) in Uganda; and Osei et al. (2014) in Ghana: all found that having post-secondary education was significant in choosing public and private health facilities. Wellay et al. (2018) also noted that educated individuals understand the importance of utilizing modern healthcare.

Distance to a health facility (in kilometres) was statistically significant for public healthcare providers. Relative to self-treatment, the probability that an individual chose a government health facility within 3km to less than 5km was 2.440 times that of less than 3kms; the probability that an individual chose a government health facility 5km to less than 8kms was 2.313 times that of less than 3kms; while the probability that an individual chose a government health facility located 8km or more was 2.911 times that of less than 3kms. Contrary to what was expected, the relative risk ratio of choosing public healthcare providers relative to self-treatment were greater than 1. This may be because public health facilities are cheaper, sometimes providing free health services, and therefore patients are willing to travel long distances to them. This result is consistent with the findings by Qian et al. (2009), who asserted that some patients may prefer to visit a more distant provider if that provider has a better reputation; or the patients' individual health status is such that only that provider can treat their illnesses. This is evidenced by the higher odds ratio for government facilities relative to self-treatment as distance increases.

Further, married patients were more likely to visit public and private healthcare providers than their single counterparts. Relative to self- care or treatment, the probability that a married patient chose a government healthcare provider and a private healthcare provider was 1.438 and 1.503 times, respectively; compared to a single patient. This result is consistent with the findings of Mwami and Martine (2017) and Muriithi (2013) in Kenya, and Halasa and Nandakumar (2009) in Jordan.

The need factors—namely type of illness and bed days—were significant determinants. Patients with long illness days were less likely to seek care from pharmacies or drug shops relative to self-treatment. Similarly, patients with chronic illnesses were less likely to visit private healthcare providers while, on the other hand, patients with injury were less likely to visit public healthcare providers. Relative to self-treatment, the probability that a patient with a chronic illness chose a private health facility was 0.610 times the probability of one with a minor illness; while the probability that a patient with injury visited a government healthcare provider was 0.665 times the probability of a patient with minor illness. This may be attributed to the use of complementary medicine, and that chronic patients obtain their drugs from farmacies and drug shops rather than going to formal healthcare providers. These findings are consistent with the those by Wellay et al. (2018) in Ethiopia, and Qian et al. (2009) in China, who found the type and severity of illness to be significant in influencing the choice of a healthcare provider.

Having a health insurance cover significantly influenced the choice of public and private health facilities. However, health insurance coverage in Uganda remains low; with only 5% of individuals aged 15 years and above having a health insurance cover. This result is consistent with the findings by Awoke et al. (2017) and Osei et al. (2014) in Ghana; Ruhara and Urbanus (2016a) in Rwanda; Qian et al. (2010) in China; and McNamara et al. (2013) in Ireland: all found that health insurance

positively influences healthcare demand. On the other hand, Halasa and Nandakumar (2009) found that insurance in Jordan was not significant for ministry of health facilities, and patients were price-sensitive.

Controlling for all other factors, residence and region were also a significant determinant influencing the choice of a healthcare provider. Residents in urban areas were more likely to use any public or private health facilities than their rural counterparts. Regarding the region of residence, the relative risk of choosing a public health facility increased for eastern and western regions; while the relative risk of choosing a private healthcare providers reduced for northern regions; and increased for western regions relative to self-treatment. Relative to self-treatment, the probability that residents in eastern regions visited a public healthcare provider was 2.008 times that of residents in central regions; while the probability that residents in northern regions visited a private healthcare provider was 0.524 times that of residents in central regions. Relative to self-treatment, the probability that residents in western regions visited a public healthcare provider or a private healthcare provider was, respectively, 1.911 and 2.235 times that of residents in central regions. This result is also supported by the findings of Ssewanyana et al. (2004) in Uganda; Mwami and Martine (2017) in Kenya; and Halasa and Nandakumar (2009) in Jordan, among others.

Household size was statistically significant for private health facilities and pharmacies. An increase in household size by one, increased the odds of a patient choosing a private health facility and a pharmacy by 1.073 and 1.076 times, respectively, compared to self-treatment. This finding is supported by the findings of Halasa and Nandakumar (2009) in Jordan; Awiti (2014) and Mungai and Oleche (2016) in Kenya: who found that household size is a significant determinant of the choice of a healthcare provider.

Despite the strengths of this study, there are limitations particularly related to the nature of the data used. The study was based on data from a cross-sectional survey, and thus the results could not establish causality, but rather show associations between variables. The analysis was also limited to variables available in the data set—e.g., waiting time, quality of care—while other provider characteristics were not included. Also, other variables such as attitudes and cultural factors were not analysed. Additionally, it was not possible to distinguish drug shops and pharmacies given the differences in the technical expertise of the medical personnel in the two providers. The study considered healthcare providers where individuals first sought healthcare, and therefore future studies need to consider the different providers of healthcare given that an individual can seek care from multiple providers during the period of illness or injury.

5. Conclusion and Policy Implications

The study examined factors that determine patients' choice of a healthcare providers in Uganda using the 2019/20 UNHS data. The study employed a multinomial logit model, and the findings show that the cost of healthcare,

household welfare, insurance, employment status, residence, duration of illness, distance to a health facility, type of illness, and region significantly influenced a patients' choice of healthcare providers in Uganda.

Cost of healthcare negatively influenced the choice of government health facilities and pharmacies. On the other hand, patients with health insurance were more likely to visit government and private health faculties compared to patients without health insurance. Therefore, the government needs to take measures to decrease out-of-pocket payments for healthcare. Uganda lacks a national health insurance scheme to enable the poor and vulnerable population visit health facilities; thus, establishing such a scheme would improve their ability to pay for quality healthcare services and cushion them against catastrophic health expenditures.

Household welfare was positively associated with the choice of private healthcare providers and pharmacies. Rich households are more likely to pay for healthcare services than poor ones. This has implications on the capacity of the population, especially the poor, to pay for healthcare services. In addition, relative to self-treatment, individuals who were self-employed were more likely to seek care from public and private health facilities compared to individuals in subsistence farming or unemployed.

Furthermore, duration and attributes—or the type of illness, such as chronic or severe illnesses and injuries—were significant determinants, and have important implications on the choice of a healthcare system through the increased burden and ability of patients to pay for services received.

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Appendices

Appendix A

The mean VIF was 38.0, 4.42, and 4.21 for models 1, 2, and 3, respectively. As a rule of thumb the VIF of 10 or greater (equivalently tolerance of 0.1 or less) is a cause for concern. The mean VIF was far lower than the acceptable maximum of 10 except for model one. All variables in model 2 except age and age-squared had VIF of less than 3 implying that they passed the test. On the other hand, correlation coefficients for most variables were very low with a magnitude of less than 0.50 except for correlation between lnwelfare and lnwelfare squared with a coefficient of 0.9999, and between age of the patient and age of the household head with a coefficient of 0.503. Thus, lnwelfare squared was dropped in model 2. This means that there was no concern for multicollinearity in the model 2.

Table A1: Multicollinearity Diagnostics

	Model 1		**Model 2**	
Variables	***VIF***	***1/VIF***	***VIF***	***1/VIF***
Price of care	1.28	1.13	1.26	1.12
Lnwelfare	293.66	17.14	1.37	1.17
lnwelfare squared	295.26	17.18		
Distance	1.15	1.07	1.15	1.07
Education	1.29	1.14	1.30	1.14
Sex	1.14	1.07	1.15	1.07
Age	2.34	1.53	26.05	5.10
Age squared			25.93	5.09
Bed days	1.20	1.10	1.20	1.10
Marital status	1.77	1.33	1.98	1.41
Residence	1.09	1.04	1.08	1.04
Illness type	1.05	1.03	1.05	1.03
Employment status	1.19	1.09	1.25	1.12
Region	1.04	1.02	1.04	1.02
Household size	1.25	1.12	1.25	1.12
Sex of household head	1.44	1.20	1.45	1.20
Age of household head	2.01	1.42	2.16	1.47
Mean VIF	**38.0**		**4.42**	

Notes: **1/VIF is tolerance*

Source: Authors Computation

Appendix B

None of the test statistic rejects Ho that IIA holds for model 2 but not for model 1. One of the test statistics was negative which according to Hausman & McFadden (1984), is evidence that IIA has not violated.

Table A2: Hausman Test for IIA Assumption

Omitted	chi2	Df	P>chi2	evidence
Model 1				
Self-treatment	-3.682	24	1.000	for Ho
Public	238.523	28	0.000	against Ho
Private	1326.21	29	0.000	against Ho
Pharmacy	-5.11	30	1.000	for Ho
Model 2				
Self-treatment	2.989	30	1.000	for Ho
Public	18.56	30	0.949	for Ho
Private	-468.48	31	1.000	for Ho
Pharmacy	15.746	30	0.985	for Ho

Source: Author's Computation