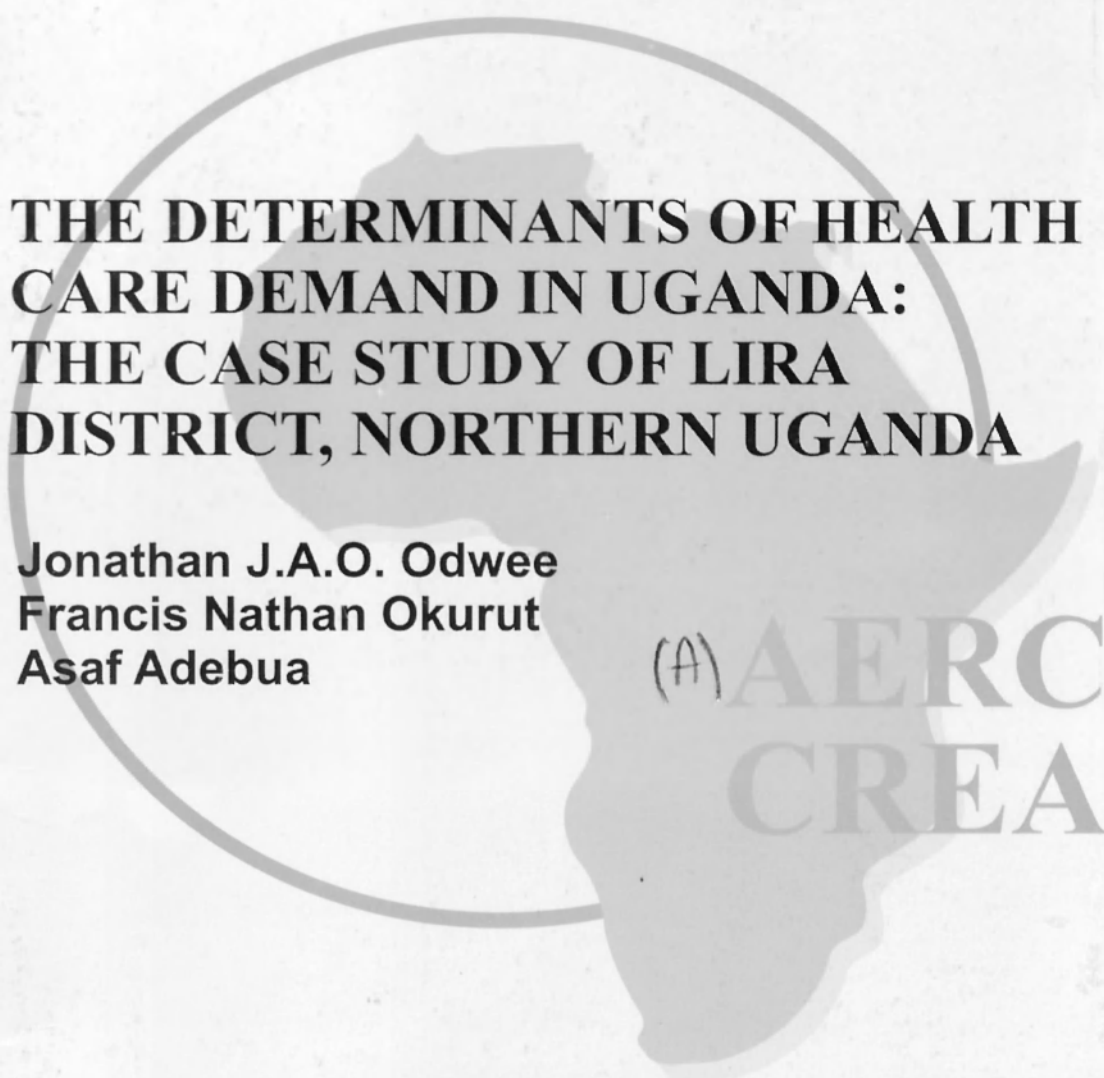


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**THE DETERMINANTS OF HEALTH
CARE DEMAND IN UGANDA:
THE CASE STUDY OF LIRA
DISTRICT, NORTHERN UGANDA**

**Jonathan J.A.O. Odwee
Francis Nathan Okurut
Asaf Adebua**

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 **AFRICAN ECONOMIC RESEARCH CONSORTIUM**

CONSORTIUM POUR LA RECHERCHE ECONOMIQUE EN AFRIQUE

The determinants of health care demand in Uganda: The case study of Lira District, Northern Uganda

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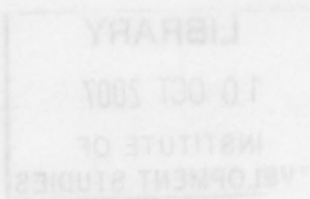
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Northern Uganda



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1. Background and problem statement

In a study of the determinants of regional poverty in Uganda (Okurut et al., 2002), the national food poverty line was computed to be US\$68.6 per annum, far surpassing that of the Northern region's level of US\$44.0, the lowest food poverty line in the country. The study also found that household size determines the level of poverty. Northern region recorded the highest mean of 5.27, followed by Eastern region (5.00), Western region (4.77) and Central region (4.60). The poor households in Northern Uganda had the highest mean household size of 5.92, compared with the poor in other regions.

Manifestations of poverty in Uganda

Low levels of education are closely linked to high poverty levels. The majority of households whose heads had no education were poor except for Central region, where only 47.0% of those without education were poor. A very high percentage (73.8%) of households in Northern Uganda whose heads had no education were poor. Furthermore, of Northern Uganda households whose heads had secondary education, 58.1% were poor compared with 25.9% in Central, 28.8% in Western and 42.7% in Eastern regions. More than three-quarters of the households in Northern Uganda stay in huts (78.1%), which accounts for 76.7% of the population of the region. The corresponding figures for Lira district are 72.5% and 71.1%, respectively (MFEP, 1995).

Income variability has been a concern of many direct interventions against poverty. The poor are generally economically disadvantaged; they are mostly less educated and do not own capital and therefore may not easily engage in high-income generating activities. Poor households earn much less annual income compared with non-poor households, and poor households in the North earn the least of all the regions.

One way of coming out of poverty is through remittances that supplement household incomes. The higher the remittances, the better off the recipient becomes. Here too, Northern region lags behind; findings indicate that poor households in Northern Uganda received the fewest remittances (Okurut et al., 2002).

As a tropical country, Uganda experiences a high prevalence of tropical diseases such as malaria, with a disease pattern that is similar across the regions. Thus households inevitably have to spend on medical care. The health status of a household, therefore, depends on access to health services, which depends on factors like household income and education levels. In all these factors, Northern Uganda performs badly: The overall mean monthly household expenditure on health was Sh4,957, but the lowest expenditure

was in Northern region (Sh3,163). Regions with the highest mean income are also those that spend more on medical care. With a healthy labour force being necessary for productive activities that will lead to higher incomes, hence enabling the household to move out of poverty, the poverty situation may tend to be perpetuated in the North.

As has been evidenced by a number of other scholars, poverty is more pronounced in rural areas because economic activities tend to be concentrated in urban areas. Northern region has a unique feature in that respect – whether one is in the urban or rural area, one is likely to be poor. This reflects the general level of poverty that is prevalent in Northern region.

Health care policy reforms have been adopted as a strategy of supplementing government budgets in order to revitalize health care delivery systems. The strategy for decentralized health care delivery and financing has two critical components: user-fees and improved quality.

Prior to the introduction of user-fees, government hospitals/health centres provided patients with consultations and, in theory, treatments free of charge. In reality, drug supplies were never consistent in the public sector owing to problems of budget cutbacks in the health sector and the diversion of drugs to private hands. Patients received the consultation, but in most cases only a prescription to purchase drugs at the private pharmacies, not the drugs themselves.

The user-fee policy was intended to improve the quality of health care by making funds from the fees available to purchase drugs and pay incentives to staff. Fee revenues were also supposed to support other primary health care activities (e.g., community outreach), refresher training courses for staff and in some cases hospital renovations as in Jinja Hospital. Community health and management committees were to be established and trained to oversee these cost recovery activities.

It is known that poor people do not have enough money to meet their medical bills. It has also been found (Okurut, et al., 2002) that poor households are generally larger than non-poor households, with the larger household size implying larger numbers of people who may fall sick.

Rationale, objectives and relevance of the study

Since the poor are argued to be the most vulnerable because they are more likely to fall ill (due to poor sanitary living conditions and lower intake of nutritious food) and to have the least means to obtain efficacious care, the study examines whether user-fees are discouraging poorer households from obtaining access.

Generally, Northern Ugandans are less educated than their compatriots in other regions. Results of the 1991 census reveal that the North had the highest proportion of those who never went to school (MFEP, 1995) and that it is in the North where the current enrolment in school is very low. Overall, Northern Uganda is the country's poorest region and has the lowest expenditure on health services and lowest proportion of surviving children (Okurut et al., 2002). This implies that besides the lack of education, earnings are low in the region because of a weak labour force, which is likely to perpetuate a vicious circle

of poverty. The problem here is: How can the situation be rectified so that they become healthy and able to produce more and thus come out of poverty?

The study thus had two objectives:

- To analyse the factors affecting health care demand in Uganda.
- To derive policy implications for improving access to quality health care by the poor.

The very high poverty levels in Northern region are reflected in the very low household expenditure on medical services. This means that with the current cost sharing, Northern region may not benefit much from the improved services that user-fee administration is expected to bring. This study has identified the relative importance of the different types of medical facilities. Government can use the findings to put in place policies that will cater for the poor and improve their accessibility to medical services.

2. Literature review

When the Bamako Initiative was launched in 1988, many African governments embarked on comprehensive primary health care programmes relying on revenues generated through user-fees to revitalize health care systems. These programmes emphasized two critical components: user-fees and improved quality (i.e., reliable drug supply). Evidence from Cameroon by Litvack and Bodart (1993) suggests that the user-fees plus quality policy lead to increased utilization of health care facilities. The travel and time costs involved in seeking alternative sources of care are high, and when good quality drugs are available at the local centre, the fee charged for care and treatment represents an effective reduction in the price of care and thus utilization rises. Evidence further suggests that poorer households benefit more than rich ones from the local availability of drugs. If user-fees are levied without a corresponding increase in quality of care, however, then this represents an effective increase in the price of health care, which affects the poor. Gertler et al. (1987) argued that the poor are more sensitive to price changes than the wealthy and that since user-fees increase the price of care, the poor respond by decreasing their consumption more than the rich.

According to Litvack and Bodart (1993), in the absence of a user-fee and quality policy, local health centres were confronted with constant drug shortages and people had to incur substantial travel and time costs in addition to the high mark up on expensive brand name drugs used to fill prescriptions in the private drug store. The wealthier one is, the more able one is to afford these expenses and meet care needs. For a poor person whose time is spent on vital daily life saving activities (such as gathering wood, fetching water, preparing food and cultivating farmland – which may be small but vital for the family welfare), medical care can only be sought after the very basic necessities are met. The travel and time costs associated with seeking distant care serves as prohibitive barrier to the poorer people. The poor, who are unable to obtain care at the distant/expensive private pharmacy, tend to purchase drugs (usually partial dosages) from local drug dealers despite the common perception of poor quality. In some cases such local drugs may be potent, but others are merely cosmetic imitations of brand name drugs and contain no pharmacological value. Or they may be expired and potentially toxic. In such a scenario, the effective price of care for the poor is met at a price they are willing to pay through the user-fee plus quality policy.

Litvack and Bodart (1993) further argue that from a public health perspective, increased utilization of the health facility under the user-fee plus quality policy is good because the people receive proper consultation and diagnosis prior to consuming drugs (unlike the local drug shops/pharmacies) and this improves the efficacy of care. In addition, by

increasing the use of curative care, population contact with the health facility rises, enabling greater delivery of cost-effective preventive and promotive care that will lead to decreased morbidity and mortality. Mwabu et al. (1993) argue that while the results of a natural experiment in Cameroon show that a combination of increased fees and improved quality result in a net increase and demand for government health care, with the greatest beneficiaries being the poor (Litvack and Bordart, 1993), the study results do not make it possible to disaggregate the size of the price and quality effects or specifically which components of quality might have an effect on demand. Further, it is unclear the extent to which the increase in demand arose from shifts among care alternatives, as opposed to generation of new demand for health care.

Carrin (1988) argues that health status in sub-Saharan Africa is still a far cry from the goal of health for all, with average shares of public health expenditure in gross domestic product of only about 1%. There is general constraint on public sector budgets and the situation is exacerbated because health has to compete for resources with defence, education and housing. In an effort to lessen the restrictions on health development caused by limited public health budgets, Carrin (1988) suggested a number of alternative methods of health financing: health insurance; foreign aid; raising taxes; reallocation of public money or cost-recovery scheme (user-fee). He cautions, however, that although a cost-recovery scheme can be operated nationally, the administrative costs may be excessive. Even at the local level there are appreciable costs associated with the collection of fees, accounting, the safeguarding and storing of revenues, and supervision. Local control of revenues may encourage health workers to collect fees and be more committed to the financing scheme, however, since they will expect to have a say in the allocation of the revenues. Furthermore, a community financing scheme may respond better to local preferences and encourage compliance with cost-recovery measures.

Shortages of essential drugs may prevent the full potential of village health workers from being realized. People may be willing to participate in community financing schemes that are intended to achieve a satisfactory drug supply and enhance the efficiency of these workers. In addition, community financing of essential drugs may lead to broader involvement in the financing of health services if patients come to understand that there is a link between their monetary contributions and regular supplies of drugs. Carrin (1988) further argues that under the full cost-recovery policy, patients will be able to reach their optimum demand: they will pay for the drugs and enjoy an improvement in health. They will also realize that paying for and receiving all drugs needed is better than obtaining an inadequate amount of drugs free of charge (although this may not apply to the poor).

The wider community may derive benefit from the consumption of drugs by patients. In malaria infested areas, for example, people gain from other people's use of anti-malarials if this reduces the prevalence of disease. According to economic theory, if people experience benefits from other people's consumption of drugs, the optimum demand for drugs from society's point of view is greater than the demand that would be forthcoming from individuals. This is because individual patients underestimate the social value of their own consumption. The benefits of changes in access and quality of health care services should be measured via their impact on the health outcomes of the population and not consumption of health care services per se (Capalbo and Heggem, 1999).

One caution is if prices are charged for drugs, the demand for them by poor people may fall and the health situation may deteriorate (Carrin, 1988). Concern about equity may dictate policies whereby the poor pay only a fraction of the cost price of the drugs they use, the subsidy coming from government. In combating important diseases, it may be socially desirable to provide drugs free of charge to the poor. A major difficulty resides in determining who should be given the right to free drugs. It should be the responsibility of the local authorities to devise such criteria given that they have the best information about people's socioeconomic status. Furthermore, equity considerations may justify setting fees according to socioeconomic status, the poorest patients paying less (or even receiving free of charge), which is certainly rational from the standpoint of social welfare. It is desirable that the community be involved in establishing the rules of a financing scheme, and when selecting a scheme consideration should be given to people's capacity and willingness to pay for the drugs and health care and to their notion of equity.

Carrin (1988) also points out that the alternative health care financing could be health insurance schemes. The different forms of health insurance schemes include personal; family and compulsory. All are designed so that potential patients pool their risks and share in the financing of health care. The basic economic rationale for health insurance follows patients' aversion to risk. Risk-averse patients prefer to shift the risk to an insurance firm by paying a premium. But insurance contracts are difficult to draw up for two main reasons: For one, an insurer does not have all the information about an insured person's risk situation. This asymmetry of information is particularly marked when the insured's behaviour is characterized by moral hazard. That is, the insured's demand for health care is sensitive to the excessive demands for medical attention. If insurers do not make adequate allowances for such behaviour, premiums may be too small to cover treatment costs. Second is uncertainty of the probability of occurrence of adverse selection. *In the absence of knowledge about the risks of illness in different population groups,* insurers may be compelled to charge a uniform premium that is likely to be higher than people in low-risk groups are willing to pay. This may lead to an upward movement of the premiums, making them unaffordable to many, including even the high-risk individuals. This explains why there is a general lack of a market for health insurance in sub-Saharan Africa.

To effectively administer a user-fee policy, Carrin (1988) suggests that a minimum knowledge of accounting and revenue management is required, along with the ability to cost the various inputs in the operation of a health centre and subsequently to set appropriate fees.

Pangu and Lerberghe (1990) argue that while self-financing of identifiable elements of the system provides a link with development and participation, it is desirable to concentrate self-funding on the parts of the health system that depend least on technology, where people understand the choices made and where the results are clearly visible. Funding from outside the community, on the other hand, should go to the referral hospitals and other parts of the system where technical arguments have a greater bearing on decision making.

A considerable literature has been written on estimation of the economic determinants of health care provider choices. One important point of consideration is the estimation of

the price elasticities of health care demand, particularly in the poorer regions of developing countries where there are varying arguments about appropriate levels of user-fees in government medical facilities (Dow, 1999). Accurate estimation of price elasticities is crucial in evaluating the trade-offs between health promotion and revenue generation in rural areas where poorly funded government health facilities are often the only choices for the people. Pangu and Lerberghe (1990) urged that health care prices (user-fees) be low enough to permit access and high enough for the health centre to function. Evidence suggested that each price increase was accompanied by a drop in the numbers attending, followed by an increase to a level lower than previously.

Wamai (1992), in his study of Kasangati Health Centre cost recovery programme, observed that the demand for curative services was not significantly affected by the user-fee scheme and was independent of the general price index. A uniform user-fee was set for curative services irrespective of age, diagnosis or treatment but preventive health services were free. The overall patient load remained unchanged throughout the trial period, although the study rightfully admitted that they could have either been the same group of people using the services of the centre before charging user-fees started or alternatively there could have been a shift in the clientele. Wamai further pointed out that some people may have left the centre because they could not afford the user charges and instead opted for free services offered by the dispensary and primary health care workers. Other new users may have come in because of a number of possible reasons, for example because they: (a) appreciated the improved quality of service; (b) equated charging with better services and less corruption; (c) decided against private clinics or travelling to Kampala. It should be noted here that the serious limitation of the Wamai report was its inability to identify the economic status of the people who were using health services before the user fee policy; those who opted out; and those new users. In effect, the study does not inform on the effects of user fee policy on access to quality health care by poor households.

Furthermore, evidence by Wamai suggests that staff absenteeism remained unaffected by the cash incentive from the user-fees. This suggests that other factors, apart from the cash incentive, could be significant in explaining the medical workers' attitude to work, these include supervision; administration; training or merely an obligation to work; and that the value of the cash incentive was too low to influence behaviour. It should be noted that one of the objectives of the user-fee policy was to improve staff morale by providing a supplement to the official salary from the user-fees collected whereby each worker got a monthly pay of approximately Sh1,000 depending on attendance. The monthly cash incentive may not have been high enough to entice staff away from pursuing alternative sources of income with which they "make ends meet".

Wamai also observed that even though the indigent group (i.e., those unable to pay user-fees) had been guaranteed free treatment, they did not significantly change over time and did not pose any significant threat to centre income. It is argued that the indigent may have sought free treatment elsewhere or chosen to stay at home. This could have resulted from active discouragement of the indigent by the staff or self-decision by patients not wishing to be categorized as indigent. According to Wamai, the user-fee policy led to increased demand for all types of treatment consultations by patients, while health workers

prescribed more drugs (especially oral antibiotics and injections) in an effort to give value for money to the patients. The effect was that the user-fee could not cover the cost of all the drugs supplied to the patients. In addition, the planned objective of using generated funds to purchase additional essential and non-kit drugs to supplement the Uganda Essential Drug Management Programme (UEDMP) kit so as to ensure 100% drug supply to the patients (without having to fill their prescriptions at private pharmacies) was not fully realized. The mitigating factors included: inadequate user-fee revenue; difficulty in procuring all essential drugs as some drugs are rare and patients for whom they are prescribed are few; and shift in the nature of clientele with more serious conditions.

Mwabu et al. (1993) argue that the quality of medical care is a key factor in determining the success of health care financing reforms in Africa. A given improvement in service quality might increase demand for medical care by attracting new users or by increasing the intensity of service use by existing users. However, demand may fall if the improved service is more effective in dealing with patients' problems or with the underlying illness patterns. Although there is broad consensus among health care workers and policy makers about the importance of service quality in health care demand, improvements in service quality (e.g., staff redeployment or investment in facilities) have either not been undertaken or have been implemented without the necessary information about their impact on the demand for health care.

3. Theoretical framework

McNamara (1999) states that a travel cost model of hospital choice assumes that the travel effect is a weak complement to hospital services delivered at a particular location. Therefore, patients may visit facilities further away from their residential location, thus leaving the nearest options, in order to derive the desired satisfaction. The value of the facility's services delivered can thus be established by observing the decision of residents of a location to travel to alternative medical facilities.

The a priori expectations on behavioural parameters are based on consumer theory and related health care demand studies. The demand effect of user-fee charges and distance (both of which are price variables) is expected to be negative. The quality of care (efficiency of treatment) has multiple attributes (Mwabu et al., 1993). The impact of improvement in medical care quality on demand is ambiguous. An improvement in medical care quality from the perspective of health practitioners will not have any effect on demand if patients do not *perceive* it as a quality improvement. On the other hand, if the improvement is perceived as efficacious (i.e., a benefit in treatment), it would increase demand. But to the extent that the improvement reduces population morbidity, its effect would be to reduce medical care demand in the long run. The observed demand effect of improved medical care quality is thus a net effect that depends on which of these two factors is dominant. Evidence by Denton et al. (1990) suggests a positive demand effect of availability of drugs in a health facility. As the drug variety increases in a health facility, it is expected that utilization of the health facility increases because people can expect to find medicines for their ailments. In the long run, however, availability of drugs may contribute to a reduction in morbidity in a community and hence reduce the demand for medical services for any given individual in the community because the individual is less likely to contract an illness. The coefficient for drug availability may therefore be positive or negative. The same applies to coefficients of other quality-related variables.

The signs of the coefficients of the individual and household level variables may be ambiguous. For example the sign of income coefficients may be positive if health care services are perceived by households to be normal goods. If the households consider health services to be inferior goods, however, the income coefficients will be negative. The signs of coefficients on education and sex are also ambiguous a priori. A general education level will make the community more sensitive to seeking proper diagnosis and treatment from a qualified medical staff for any disease, hence having a positive demand effect for health care. On the other hand, at very high educational levels, the households will be able to practice good primary health preventive measures (such as boiling drinking water, maintaining good hygiene, eating a balanced diet), which effectively reduces the incidence of some diseases, hence the coefficient for education may be negative.

4. Methodology

Since good health of household members is one of the critical components influencing the potential of households to increase production and hence move out of poverty, the study sought to investigate the demand for health care in Northern Uganda. Survey data were collected from 594 households sampled using a multi stage sampling technique. A variance and multinomial logit regression model was fitted in analysing the data.

Data sources

Three sets of questionnaires were used in this study. The household questionnaire was used to collect general information on household members, their age, sex, education, ethnicity, occupation, household income and expenditure as well sickness history of each member of the household and the health facilities utilized. The questions on income and expenditure were based on the Integrated Household Survey conducted in 1992 by the Department of Statistics, Ministry of Planning and Economic Development with the technical assistance of World Bank and UNDP under project UGA/91/RO2. The health facility utilization questionnaire collected information on type of sicknesses, health facility visited and the cost incurred by households for health care. The third questionnaire collected information from health care providers on type of facilities they have, services they provide and charges levied for the services.

Lira district comprises six counties: Dokolo, Erute, Kyoga, Lira Municipal, Moroto and Otuke. Three counties were selected with probability proportional to size with replacement. This was done by listing their 1991 census populations and adding up to make the county populations. Cumulative distribution was then obtained for each county. One subcounty was randomly selected from each of the selected counties again with probability proportional to size. Two parishes were randomly selected from each subcounty again with probability proportional to size with replacement. Three random numbers in the range of 0 to 100 were generated from a computer. Using the cumulative distributions in the previous step, the random numbers were assigned to the county in which they fell. This process was repeated in the selection of the subcounties one from each county. Two parishes from each subcounty were selected again with probability proportional to size. The parishes in the selected subcounties were again listed in order in which they appeared in the 1991 census report and cumulated to make the subcounty populations. The cumulative percentage distribution was again obtained for each selected

subcounty. Six random numbers, in the range 0 to 100, two for each subcounty, were generated from a computer. Using the cumulative distributions obtained in the previous step, the random numbers were assigned to the parishes in which they fell. This resulted in six sampled parishes.

The list of households in the selected parishes was obtained from Parish Chiefs or Local Council II chairs. This list was updated to eliminate households that had moved away and to include those that had moved into the areas as well as newly formed ones. One hundred households were selected from each parish using simple random sampling method without replacement. This gave a total of 600 households to which the household questionnaire was administered. From the information generated from household questionnaires, households whose members had been sick in the last one month or were currently sick at the time of the survey were selected for administration of the health facility utilization questionnaire. From the information obtained from the health facility utilization questionnaire, the health facility questionnaires were administered to the mentioned health providers in the district as well as in the neighbouring districts and those not mentioned but located within the district. The selected parishes are shown in Table 1.

Table 1: Sampled parishes

County	Subcounty	Parishes
Dokolo	Dokolo	Alwitmac Awiri
Kyoga	Aputi	Agikdak Otira
Lira	Lira Central	Bazaar Senior Quarter

Source: Author from field survey data.

The model

According to Dow (1999), the own-price elasticity of demand for choice of a facility depends only on the probability of choosing the facility and the price level at the facility. In Uganda, however, price level is greatly influenced by taxes. Therefore, it is the anticipated satisfaction (among other things) that drives people to a certain medical facility. Health care demand depends on the price of that service, prices of alternative services, household income, time costs associated with using the services, and demographic characteristics of patients (e.g., sex, education, age), which can be specified as a utility maximization function (Gertler et al, 1987). A number of utility functions have been developed in the study of the demand for health care services (Gertler et al., 1987; Dor et al., 1987; Gertler and van der Gaag, 1990; Lavy and Quigley, 1993; Ellis and Mwabu, 1991; Mwabu et al., 1993; Mwabu, 1989; Ngugi, 1999; Creese, 1991). In the event of an illness, a patient is assumed to seek help from a health care system characterized by many providers. The patient (or a relative) is further assumed to choose the health care alternative that yields the maximum expected utility.

The functional form of the utility function that was chosen was the one that is consistent both with the actual demand behaviour and with rules of rational choice. The preferred functional utility function used is one that is loglinear in health status and consumption, or a utility function that is linear in health status but loglinear in consumption. A crucial property of such a utility function is the non-constancy of the marginal rate of substitution of commodities in consumption. In these specifications, it is the variation in monetary or time prices across health care providers that ensures identification of behavioural parameters. Given this role of prices, and a further assumption that consumer preferences over the entire range of consumption goods are well defined, the empirical health care demands can be shown to be consistent with the assumption that ill individuals maximize an indirect conditional utility function given by

$$V_{ij} = f(x_i, z_{ij}, y_i, r_{ij}, a_i) \quad (1)$$

where

- x_i = a vector of observable socioeconomic attributes of individual i , such as age, education, employment status, household size and sex.
- z_{ij} = a vector of medical and physical attributes faced by individual i in facility j , such as availability of drugs and medical equipment and sanitary conditions of the facility.
- y_i = annual income of household i .
- r_{ij} = the price of health care received by individual i from health facility j . This also includes distance to the facility, transport cost, waiting time at the facility.
- a_i = the prices of non health care goods consumed by individual i .

Equation 1 is the standard expression of the indirect utility function in consumer demand theory. It shows the maximum utility that individual i can achieve, conditional on seeking treatment for an illness, controlling for income y_i , health care prices r_{ij} , the prices of other goods a_i , personal attributes x_i , and facility specific characteristics z_{ij} . All elements of the indirect conditional utility function in Equation 1 are directly observable and are the variables of interest to policy makers.

Econometric implementation of the model requires the standard assumption that the utility function in Equation 1 is stochastic, and is of the form:

$$V_{ij} = V_{ij}^* + \varepsilon_i \quad (2)$$

where V_{ij}^* is the systematic component of utility and ε_i is an additive disturbance term.

In semi-loglinear form, the systematic part of utility may be expressed as:

$$V_{ij}^* = \beta_j Q_{ij} + a_{ij} s_i \quad (3)$$

where Q_{ij} is a vector of facility attributes (in log form) that individual i faces in facility j , S_i is a vector of characteristics (in log form) specific to individual i , including some income facility interaction terms; a and β are vectors of parameters to be estimated.

Assuming that ε_i is normally distributed, Equation 2 leads to a multinomial logit specification of individual choice of medical treatments (Hosmer and Lemeshow, 1989). The probability P_{ij} that individual i will seek treatment from health facility j can be expressed as:

$$P_{ij} = \frac{e^{\beta_j Q_{ij} + a_{ij} S_i}}{\sum_j e^{\beta_j Q_{ij} + a_{ij} S_i}} \quad (4)$$

Estimation of Equation 4 requires use of numerical methods to find values of parameter vectors and that maximize the likelihood (the log-likelihood) of observing the sample data Q and S (McCullagh and Nelder, 1995). The log-likelihood function that needs to be maximized in order to estimate values of the parameter vectors a and β is:

$$L = \sum_i \sum_j G_{ij} \log P_{ij} \quad (5)$$

where L is the logarithm of the likelihood function; $G_{ij} = 1$ if individual i chooses health facility j ; otherwise G_{ij} takes a value zero. The estimated values for a and β show the marginal effects of social and provider characteristics on conditional utility from a medical care provision alternative as shown in Equation 3. Equation 5 can be used to estimate multinomial logit functions as well as the nested multinomial logit functions, the most commonly used formulations in empirical studies on health care decisions. In estimating the behavioural parameters, we assume that each household member faces three distinct health care provision alternatives: the nearest government clinic, the nearest private health facility and the residual self-treatment alternative. Self-treatment includes traditional healers as well as retail drug shops, where patients often buy drugs when they are not available in modern health facilities, especially government health centres. Individuals or their relatives are presumed to pick and choose treatment from these treatment options.

5. Empirical findings

The analysis was based on self-reporting by households, which may have problems based on hypotheticals because people may not always do what they say they do. A total of 600 households were sampled and 594 of these were interviewed, giving a response rate of 99%.

The demographic characteristics of the households

Out of the interviewed households, 384 (64.6%) reported having at least one sick person in the four weeks prior to the survey. The total number of people in the surveyed households was 3,572. Of these, 50.1% were males and 49.9% were females.

Table 2: Percentage distribution of household members by sex

Sex	N	%
Males	1,792	50.1
Females	1,780	49.9
Total	3,572	100.0

Source: Author from field survey data.

Sex of household heads

Of the sampled households, 87.9% were male headed and the other 12.1% were female headed. Out of the 517 male-headed households, 66.2% reported having at least one sick member within the last one month. For the female-headed households, 54.9% reported having at least one sick person.

Table 3: Percentage distribution of households by sex of head by sickness status

Sex	At least one sick		No sick person		Total	
	N	%	N	%	N	%
Males	342	66.2	175	33.8	517	87.9
Females	39	54.9	32	45.1	71	12.1
Total	381	64.8	207	35.2	588	100.0

Source: Author from field survey data.

Educational level of household heads

On average, the households that reported having at least one sick person had higher educational levels of the heads than the households that did not report any illness. Of the 70 households whose heads never went to school, 62.9% reported having no sick person, while 37.1% reported having at least one sick person.

Table 4: Percentage distribution of households by level of education of household head by sickness status

Educational level	At least one sick		No sick person		Total	
	N	%	N	%	N	%
Never	26	37.1	44	62.9	70	11.9
P1-4	35	56.5	27	43.5	62	10.6
P5-7	125	62.8	74	37.2	199	34.0
S1-2	23	71.9	9	28.1	32	5.5
S3-4	61	70.9	25	29.1	86	14.7
S5-6	28	87.5	4	12.5	32	5.5
Tertiary certificate	44	80.0	11	20.0	55	9.4
Tertiary diploma	24	72.7	9	27.3	33	5.6
University degree	13	76.5	4	23.5	17	2.9
Total	379	64.7	207	35.3	586	100.0

Source: Author from field survey data.

The rate of reporting sickness tends to be higher with higher level of education of the household head as evidenced by at least 70% of the households whose heads had a minimum of secondary education. These results should not be interpreted to mean that the more educated households had higher rates of illness as compared with the less educated households, but rather that the level of awareness of the various symptoms of diseases is likely to be higher among the more educated people than the less educated. This implies that the less educated households may have more sickness prevalence but do not report because of lack of knowledge.

Age of household heads

The mean age of heads of the households that reported having a sick person within the last one month was 36.0, compared with 43.0 for those who reported having no sick person (Table 5). This suggests that households headed by elderly people are less likely to report sicknesses. The elderly heads may be less educated and this may explain why the degree of reporting sickness is low as they may not attach much value to medical attention.

Table 5: Mean age of household heads by sickness status

Sickness status	N	Mean
At least one sick	379	36.0
No sickness reported	207	43.0
Total	586	38.5

Source: Author from field survey data.

The socioeconomic characteristics of households

The mean total annual income for the sampled households was about 2 million shillings, with a mean expenditure of about 1 million shillings (Table 6). It is interesting to note that households that reported having at least one sick person in the one month prior to the survey had a higher mean income and expenditure and were headed by people with relatively higher educational levels, hence better income earning capacities. The difference in mean income between the households with at least one person sick and those without any sick person is significant at 2.6%.

Table 6: Mean annual household income and expenditure by sickness status (in Uganda shillings)

Sickness status	N	Mean income	Mean expenditure
At least one sick	384	2,338,341	1,163,967
No sick person	210	1,469,531	812,479
Total	594	2,031,186	1,039,704

Source: Author from field survey data.

Mean annual household expenditure

The proportion of household expenditure is lowest on medical care compared with other expenditure items like food, education and clothing (Table 7), but the differences are not significant for foods ($p=0.0660$). It can also be seen that the mean difference of medical expenditure is not significant ($p=0.12$). This may be explained by the general level of poverty in the study area, which means that preferences are on very basic needs.

Table 7: Detailed mean household expenditure by sickness status

Sickness status	N	Food	School fees	Clothing	Taxes	Medical
At least one sick	384	53,436	233,612	129,465	31,425	22,233
No sick person	210	41,481	132,060	99,193	24,789	16,971
Total	594	49,210	197,710	118,792	29,079	20,373

Source: Author from field survey data.

Mean household size

The households that reported having at least one sick person had a higher mean household size: a mean of 6.05 compared with 5.94 for households that did not have any sick person (Table 8). This result suggests that it is mainly the larger households that tend to have sick people. In case of airborne diseases, the rate of infection in a large household is expected to be high given the poor ventilation in the majority of the houses.

Table 8: Mean household size by sickness status

Sickness status	N	Mean
At least one sick	384	6.05
No sick person	210	5.94
Total	594	6.01

Source: Author from field survey data.

Diseases and sources of treatment

The common diseases identified were malaria, which was reported by 58.3% of respondents, cough and flu (13.2%), worms (5.9%), diarrhoea (3.9%), chicken pox (3.0%), and measles (2.5%). This is shown in Table 9.

Table 9: Diseases suffered by the respondents

Disease	N	%
Malaria	346	58.3
Cough/Flu	78	13.2
Worms	35	5.9
Diarrhoea	23	3.9
Miscarriage	3	0.5
Chest/Back pain	13	2.2
Fracture	7	1.2
Pneumonia	3	0.5
Boil	6	1.0
Appendicitis	2	0.3
Skin disease	3	0.5
Typhoid	4	0.7
Syphilis	5	0.8
Measles	15	2.5
Chicken pox	18	3.0
Cholera	1	0.2
Ulcer	2	0.3
Elephantiasis	4	0.7
TB	1	0.2
Mumps	1	0.2
Tonsillitis	4	0.7
Eye/Ear	5	0.8
Liver, heart, kidney	4	0.7
Dental problem	7	1.2
Anaemia	1	0.2
Goitre	2	0.3
Total	593	100.0

Source: Author from field survey data.

Common diseases by age of patients

The majority of the reported sick persons were infants and children aged less than ten years who were suffering mainly from malaria, diarrhoea, cough/flu and worms as the major diseases (Table 10).

Table 10: Common diseases by age group of patients

Age group	0-4		5-9		10-14		15+		Total
	N	%	N	%	N	%	N	%	
Malaria	132	38.7	61	17.9	32	9.2	116	34.0	341
Cough/flu	26	33.8	15	19.5	14	18.2	22	28.6	77
Worms	10	28.6	4	11.4	2	5.7	19	54.3	35
Diarrhoea	15	65.2	3	13.0	0	0.0	5	21.7	23
Chest/back pain	1	7.7	0	0.0	0	0.0	12	92.3	13
Measles	6	40.0	5	33.3	1	6.7	3	20.0	15
Chicken pox	5	27.8	7	38.9	3	16.7	3	16.7	18

Source: Author from field survey data.

Common diseases by sex of patients

Analysis by gender of the people reported sick indicates that it was mainly females who were suffering from most of the common diseases: malaria (56.3%), cough/flu (54.5%), worms (68.6%), chest/back pain (53.8%) and chicken pox (55.6%). In the case of diarrhoea (52.2%) and measles (53.3%), the patients were mainly males. (See Table 11.)

Table 11: Common diseases by sex of patients

Common disease	Males		Females	
	N	%	N	%
Malaria	149	43.7	192	56.3
Cough/flu	35	45.5	42	54.5
Worms	11	31.4	24	68.6
Diarrhoea	12	52.2	11	47.8
Chest/back pain	6	46.2	7	53.8
Measles	8	53.3	7	46.7
Chicken pox	8	44.4	10	55.6

Source: Author from field survey data

Sources of treatment sought by patients

Here we sought to know where patients went for the initial treatment for an episode of illness. Options were private clinics, government health centres, mission hospitals and pharmacies. Or they could opt for self-treatment.

First source of treatment

The majority of the patients (57.3%) had visited private clinics for their first treatment (Table 12). This was followed by government health centres (17.7%), mission hospitals (6.2%) and pharmacies (6.2%). Self-medication accounted for about 7.1%.

These results would seem to confirm the observed phenomenon of the constant lack of drugs in the government facilities. Even after the introduction of user-fees in the government medical facilities, drugs are consistently inadequate and patients are therefore forced to purchase most of the prescribed drugs from private clinics and pharmacies. This effectively means that they are paying twice at the government facilities – for cost sharing and for drugs from private shops or clinics, plus the cost and inconvenience of travelling from one facility to another.

Table 12: First source of first treatment

Facility	N	%
Government hospitals	32	5.4
Government health centres	105	17.7
Mission hospitals	37	6.2
Pharmacy	37	6.2
Private clinic	340	57.3
Traditional healers	78	1.4
Others	34	5.7
Total	593	100.0

Source: Author from field survey data.

Number of people reported sick and duration of sickness

A total of 593 (16.6%) of the sampled household members were reported to be sick (or to have been sick), with the majority of the households (65.4%) reporting having had one sick person. In addition, 23.4% of the households had two sick people, while those households having three or more sick members accounted for 11.1% (Table 13).

Table 13: The number of people reported sick per household

Number of sick persons	Number of households	
	N	%
1	251	65.4
2	90	23.4
3	25	6.5
4	9	2.3
5	4	1.0
6	4	1.0
7	1	0.3

Source: Author from field survey data.

The reported household members had been sick for less than one week prior to the survey (71.1%), followed by those who had been sick for 2–3 weeks (21.4%). This is shown in Table 14.

Table 14: Duration of sickness

Duration	N	%
Less than 1 week	422	71.1
1–2 weeks	14	2.4
2–3 weeks	127	21.4
More than 3 weeks	30	5.1
Total	593	100.0

Source: Author from field survey data.

Mode of transport to first facility

The commonest mode of transport to health facility was the bicycle (56.5%), followed by walking (32.7%) as shown in Table 15. Most of the patients either used self-owned or borrowed bicycle or walked, as the majority of them did not incur any transport cost.

Table 15: Mode of transport

	N	%
None	9	1.5
Motorized	51	8.6
Bicycle	335	56.5
Walking	194	32.7
Others	4	0.7
Total	593	100.0

Source: Author from field survey data

Availability of drugs

Of the 584 patients who visited at least one health facility for first treatment, the majority went to a private clinic (58.0%), followed by government health centre/dispensary (17.8%). This is presented in Table 16. Of the 339 patients who visited the private clinic, 93.5% reported that all the prescribed drugs were available. Those who visited government health facilities and reported that all the prescribed drugs were all available were 45.2% for government health centres and 66.3% for dispensaries. Over 91% of the sick who visited mission hospitals reported that all the drugs were available. This suggests that patients tend to visit a facility on the expectation of getting the drugs.

Table 16: Percentage distribution of availability of drugs in a facility by the first source of treatment

	Yes		No		Total	
	N	%	N	%	N	%
Government hospital	14	45.2	17	54.8	31	5.3
Government health centre	69	66.3	35	33.7	104	17.8
Mission hospital	34	91.9	3	8.1	37	6.3
Pharmacy/drug shop	37	100.0	0	0.0	37	6.3
Private clinic	317	93.5	22	6.5	339	58.0
Traditional healer	4	57.1	3	42.9	7	1.2
Other	28	96.6	1	3.4	29	5.0
Total	503	86.1	81	13.9	584	99.9

Source: Author from field survey data.

The second source of treatment

Table 17 indicates that 86.4% of the patients visited only the first facility choice; they were probably cured and/or satisfied with the services rendered. Those who visited pharmacies as first facility choice did not visit any other facility. A very high proportion of the patients who visited private clinics (93.5%), mission hospitals (91.9%) and government health centres (67.3%) did not visit another facility. (The government health centres refer to dispensaries, sub-dispensaries and health centres that are located in the rural areas.) Of the patients who visited a second choice health facility, the majority ended up in private clinics (7.0%) and pharmacies (5.1%). The highest movement was away from government health facilities as first choice to private clinics or pharmacies as the second choice. The results suggest that the user-fees in government facilities are not contributing to the intended objective of improving health service delivery as evidenced by the continued movement from government health facilities to private clinics or pharmacies.

Table 17: Percentage distribution of patients who visited second source of treatment by first source of treatment

	Nowhere		Govt hosp		Pharmacy		Private clinic		Traditional healer		Others		Total
	N	%	N	%	N	%	N	%	N	%	N	%	
Government hospital	15	46.9	1	3.1	8	25.0	6	18.8	0	0.0	2	6.3	32
Government H/C	70	67.3	0	0.0	9	8.7	23	22.1	2	1.9	0	0.0	104
Mission hospital	34	91.9	0	0.0	0	0.0	3	8.1	0	0.0	0	0.0	37
Pharmacy/drug shop	37	100.0	-	-	-	-	-	-	-	-	-	-	37
Private clinic	315	93.5	-	-	12	3.6	8	2.4	1	0.3	1	0.3	337
Traditional healer	4	57.1	-	-	1	14.3	1	14.3	-	-	1	14.3	7
Others	33	97.1	-	-	-	-	-	-	-	-	1	2.9	34
Total	508	86.4	1	0.2	30	5.1	41	7.0	5	0.9	3	0.5	588

Source: Author from field survey data.

Satisfaction with treatment

The patients or their caregivers who reported having been satisfied were asked to specify the reasons for their satisfaction with treatment from the first source. The commonly cited reasons were availability of drugs (37.8%), low cost of services (26.0%) and improvement in health (11.5%). The private clinics ranked highest in terms of availability of drugs (39.4%) and full treatment obtained (5.9%). The pharmacies ranked highest as the cheapest source of treatment, followed by mission hospitals (37.8%). It is interesting to note that no patients reported having received full treatment from the government hospital.

Whereas the private clinics and government health centres are reported to allow instalment payments for services, the government hospitals, pharmacies and mission hospitals do not have such provisions. In terms of improvement of health after the visit to the facilities, government health centres (18.1%) and private clinics (12.6%) ranked highest. Table 18 summarizes the responses on satisfaction with treatment.

Table 18: Reasons for satisfaction by first source of treatment

	Available drugs		Full treatment		Cheap		Good service		Improved health		Allows instalment		Total who visited
	N	%	N	%	N	%	N	%	N	%	N	%	
Government hospital	9	28.1	-	-	9	28.1	2	6.3	1	3.1	-	-	32
Government health centre	34	32.4	4	3.8	18	17.1	2	1.9	19	18.1	2	1.9	105
Mission hospital	14	37.8	1	2.7	14	37.8	2	5.4	2	5.4	-	-	37
Pharmacy	12	32.4	1	2.7	16	43.2	1	2.7	2	5.4	-	-	37
Private clinic	134	39.4	20	5.9	89	26.2	17	5.0	43	12.6	6	1.8	340
Self-treatment	21	18.8	3	2.7	8	7.1	1	0.9	1	0.9	-	-	112
Total	224	37.8	29	4.9	154	26.0	25	4.2	68	11.5	8	1.3	593

Source: Author from field survey data

With regard to dissatisfaction related to the first source of treatment, government hospitals were mentioned with the highest frequency for insufficient treatment (18.8%) and government health centres for no improvement (19.0%).

Table 19: Reasons for dissatisfaction by first source of treatment

	Expensive		Waste of time		Insufficient treatment		No improvement		Total who visited
	N	%	N	%	N	%	N	%	
Government hospital	-	-	1	3.1	6	18.8	4	12.5	32
Government health centre	-	-	1	1.0	6	5.7	20	19.0	105
Mission hospital	1	2.7	-	-	-	-	6	16.2	37
Pharmacy	-	-	-	-	3	8.1	2	5.4	37
Clinic	-	-	-	-	3	0.9	53	15.6	340
Self treatment	1	0.9	-	-	-	-	6	5.4	112
Total	2	0.3	2	0.3	18	3.0	91	15.3	593

Source: Author from field survey data.

Reasons for not visiting nearest health facilities

A nearby facility is typically expected to serve households in the cluster in which it is located. The respondents were asked whether they visited the nearest health facilities. Table 20 shows that 10.6% of the households did not visit the nearest private clinic and about 15% did not visit the pharmacy or drug shop nearest to their homes. The least visited nearest health facilities were the health centres, dispensaries and sub-dispensaries (24.9%). Nearest hospitals were not visited by 22.6% of the households.

Table 20: Percentage of households that never visited particular medical facility

Facilities	N	%N=594
Private clinic	63	10.6
Pharmacy/drug shop	91	15.3
Health centre/Dispensary/Sub-dispensary	148	24.9
Hospital	134	22.6

Source: Author from field survey data.

In truth, there are only three hospitals in Lira district. Two of them, one government and the other mission, are both in Lira Town and the third is a private hospital in Kyoga county about 150km south of Lira Town. There is also one mission hospital in Soroti district, which is in an adjacent county to one of the surveyed counties. The hospitals are so few that they cannot serve people for all illness episodes in the district. This might be one of the reasons why there were many people who did not visit hospitals. The respondents referred to them as nearest hospitals when they are actually far and there are other health facilities that are nearer. It is the health centres, dispensaries and sub-dispensaries that are more accessible, but most of these are government owned and not visiting them may arise from the quality of services they offer.

The respondents from households whose members did not visit these facilities were asked to give reasons why they did not visit the facilities. The results are reported in Tables 21–24. Table 21 shows that 49.2% of the households reported they did not visit the nearest private clinic because of lack of money. Other common reasons were that it is not well equipped (14.3%), that it is distant (12.7%) and that the government hospital is preferred (11.1%).

Table 21: Reasons for not visiting the nearest private clinic

	N=63	%
No money	31	49.2
Not well equipped	9	14.3
Far	8	12.7
Poor service	5	7.9
Feared expired drugs	1	1.5
Doctor rare	3	4.8
Preferred government hospital	7	11.1
New in the place	5	7.9
Have personal doctor	2	3.2
They are expensive	1	1.5

Source: Author from field survey data.

As in the case for private clinics, lack of money featured as the most frequently mentioned reason for not visiting the nearest pharmacy or drug shop (Table 22), but 11% of the households cited lack of acquaintance with the nearest facility. Some respondents (8.8%) distrusted the nearest pharmacy/drug shop and thus would not visit them.

Table 22: Reasons for not visiting the nearest pharmacy/drug shop

	N	%N=91
Drugs were already given	6	6.6
No money	16	17.6
Lack of acquaintance	10	11.0
Distrust	8	8.8
Prefer government hospital	5	5.5
Not always present	2	2.2
New in the place	5	5.5

Source: Author from field survey data.

The majority of the health centres, dispensaries and sub-dispensaries in Lira district are run by government. Despite the introduction of the cost-sharing scheme that was intended to improve health care services by improving the availability of drugs and better medical equipment, government expenditures on medical services have continued to be budget constrained. One result is the reaction shown in Table 23, where 37.8% of the respondents indicated that they did not visit these facilities because they did not have sufficient drugs while 24.3% cited poor services by the government health centres/dispensaries/sub-dispensaries. Moreover, poor households may not be in a position to meet the user-fee charges. Table 23 shows that 12.2% of the households reported that their members did not visit these facilities because of lack of money. About 12% doubted

the services offered in these facilities. Some people had preference for private clinics only, probably because clinics are run by medical doctors. Distance was also cited as a reason for not visiting health centres/dispensaries/sub dispensaries (19.6%). This implies that clinics, pharmacies and drug shops are more distributed in the area and thus more easily accessible.

Table 23: Reasons for not visiting the nearest health centre/dispensary/sub-dispensary

	N	%N=140
Not serious disease	7	4.7
Poor service	36	24.3
Do not have enough drugs	56	37.8
No money	18	12.2
Medical personnel rude	2	1.4
Doubt of quality	18	12.2
Not for civilians	5	3.4
Have personal doctor	8	5.4
Prefer clinic only	14	9.5
Far	29	19.6
My preference	1	0.7
Close to other health facility	4	2.7

Source: Author from field survey data.

The most frequently mentioned reasons for not visiting the nearest hospital are poor service (23.9%), distance (23.1%), high cost of treatment (22.4%) and lack of money (14.2%). This is presented in Table 24. Poor service in hospitals is likely to be referring to the government hospital as noted earlier. Patients' perception of the seriousness of the sickness also influences their decision to visit hospitals.

Table 24: Reasons for not visiting the nearest hospital

	N	%N=134
Poor service	32	23.9
Congested	8	6.0
No money	17	14.2
Doctors always absent	3	2.2
Bureaucracy	3	2.2
Prefer clinic	6	4.5
Give underdose	3	2.2
Not serious disease	23	17.2
Same doctor who operates a nearby clinic	2	1.5
They are not friendly	1	0.7
Waste of time	5	3.7
Far	31	23.1
Corrupt	7	5.2
Expensive	30	22.4
Was not referred there	4	3.0
Planning to go	1	0.7
Prefer doctors in government hospital	1	0.7
New hospital	5	3.7
New in the place	4	3.0

Source: Author from field survey data.

Facility characteristics

Two government health facilities – one hospital and one health centre – were surveyed (Table 25). There were also two NGO/mission health facilities, one a hospital and the other a health centre. The majority of the surveyed health facilities were private, mostly clinics and drug shops as presented in Table 26.

Table 25: Percentage distribution of facilities by ownership

	N	%
Government	2	13.3
Private	11	73.3
NGO/Mission	2	13.3
Total	15	100.0

Source: Author from field survey data.

Table 26: Percentage distribution of facilities by type

	N	%
Hospital	2	13.3
Health centre	2	13.3
Clinic	6	37.5
Pharmacy	1	6.7
Drug shop	4	26.7
Total	15	100.0

Source: Author from field survey data.

The medical superintendents or administrators were asked to indicate the common diseases they treat; the analysis of the responses is presented in Table 27, which shows that malaria (73.3%) and respiratory infections (80.0%) were rated as very common. Other diseases also rated as common were diarrhoea (40.0%), intestinal worms (40.0%), sexually transmitted diseases (33.3%) and pelvic inflammatory disease (PID; 33.3%).

Table 27: Common diseases reported by health facilities

	N	%
Malaria	11	73.3
Respiratory infection	12	80.0
Diarrhoea	6	40.0
Intestinal worms	6	40.0
STDs	5	33.3
Musculo-skeletal diseases	4	26.7
Pelvic inflammatory disease	5	33.3
Measles	3	20.0
Wounds	3	20.0
Typhoid	2	13.3
Skin diseases	2	13.3
Injuries	2	13.3
Ulcers	2	13.3
Dental cases	2	13.3
Surgical cases	1	6.7
Ear diseases	1	6.7
Mental cases	1	6.7
Conjunctivitis	1	6.7

Source: Author from field survey data.

The leadership of the facilities were also asked to give the amount of money they charge for treating those diseases. Table 28 gives the average charge for some selected diseases. The table shows that for both children and adults, the private facilities charge much higher rates than the NGO/mission health facilities.

Table 28: Medical charges (in Uganda shillings) for some selected diseases

	Children		Adult	
	Private	NGO/Mission	Private	NGO/Mission
Malaria	2,543	600	3,476	1,250
Respiratory infection	2,257	875	2,833	2,500
Diarrhoea	2,250	200	-	-
Worms	3,333	-	3,250	-
Genito-urinary diseases	8,167	1,500	-	-
Wounds	-	-	3,000	-
STDs	6,000	2,400	7,000	6,000

Source: Author from field survey data.

Determinants of health facility selection

It is known that in a given period of illness, patients or their relatives make health care decisions in stages (Mwabu, 1986). The first stage is awareness of the illness. At this stage, the patient or a relative must decide whether to seek treatment for an illness. If the decision is to seek medical care, then the next decision is on the choice of source of treatment. The outcome of the choice at this point is a visit to a particular health facility. In this study, three different choices of sources of treatment are investigated. They are government, pay facilities and self-medication. The pay facility includes mission health facilities, private clinics and drug shops.

Structural adjustment programmes implemented in Uganda brought cost sharing in some of the social sectors that for a long time had been the obligation of government to supply. These are sectors like education and medical. Consultation and treatment in public health facilities had been free, but these facilities often lacked drugs because of budget constraints. This made mission and private sources more popular. Now government has introduced user-fees, which are expected to be used to purchase drugs and pay top-up allowances for medical workers. For the poor, who may not be able to pay the fees, the decision may be to opt for self-medication.

The model was fitted with poverty status as one of the independent variables. The computation of the poverty status was based on the reasoning that 43.6% of the people in Northern Uganda are poor (Okurut et al., 2002). Using cumulative distribution of the households, the households whose income fell on the 43.6 percentage point mark or above were recorded as poor and the rest as non-poor. This means that the income level of the 43.6 percentage point in the cumulative distribution position is regarded as the poverty line.

A multinomial model was built on poverty status, who decided to go to that facility, logarithms of charge for drugs and income, and whether the drugs were available.

The models are of the form

$$\ln\left[\frac{P(Y=2/x)}{P(Y=1/x)}\right] = \beta_{20} + \beta_{21}x_1 + \beta_{22}x_2 + \dots + \beta_{2p}x_p \quad (6)$$

$$\ln\left[\frac{P(Y=3/x)}{P(Y=1/x)}\right] = \beta_{30} + \beta_{31}x_1 + \beta_{32}x_2 + \dots + \beta_{3p}x_p \quad (7)$$

Comparing the choice between government facility and self-medication, the cases decided by persons other than the head, spouse or parent were likely to opt for self-medication (Table 29). The head was 4.9 times likely to decide to take the patient to government health facilities than opt for self-medication, while the parent was 2.0 times likely to opt for government facility rather than self-treatment. The spouse was 5.9 times likely to take patients to a government health facility. Poor households were more likely

to give patients self-treatment ($B = -1.7899$), but non poor households were likely to take their patients to a government health facility. The poor were just 0.2 times likely to visit a government health facility than the non poor. The model shows that as household income increases, there is a tendency to shift away from government health facilities ($B = -0.2086$). In a related model with government as the comparison group, the households with higher income tended to shift from government to private facilities. By implication, as income increases, the ultimate preference is the private facility. This explains the negative coefficient given in Table 29.

Table 29: Parameter estimates for choice of medical facilities

Variables	Government			Private		
	B	p	Exp(B)	B	p	Exp(B)
Constant	11.3533	0.002		2.3509	0.443	
<i>Poverty status</i>						
Poor	-1.7899	0.021	0.2	-1.1128	0.081	0.3
Non poor	0.0000		1.0	0.0000		1.0
Head	1.5990	0.152	4.9	1.7155	0.050	5.6
Spouse	1.7696	0.038	5.9	0.3603	0.575	1.4
Parent	0.6767	0.376	2.0	0.2991	0.586	1.3
Other	0.0000		1.0	0.0000		1.0
Log charge	-0.8290	0.000	0.4	-0.2468	0.090	0.8
Log income	-0.2086	0.343	0.8	0.1542	0.388	1.2
<i>Drug availability</i>						
Yes	-1.5885	0.014	0.2	0.3054	0.610	1.4
No	0.0000			0.0000		1.0

Source: Author from field survey data

With a higher charge on medicine, patients were likely to shift from visiting a government facility to self-treatment ($B=-0.8290$). This has multiple implications for both the cost sharing objectives in public facilities and wider disease control issues. Even since the implementation of cost sharing, government has not been able to stock its medical facilities with all necessary drugs. The charges are likely to scare away poor people who are not able to afford the fee. As the increase in medical charges leads to a shift from government to self-medication, the money expected to be generated through cost sharing cannot be realized, hence further reducing the government's ability to stock the necessary drugs in those health facilities.

Self-medication may also bring other public health problems. When people themselves decide which drugs to buy, they most probably will be guided by the amount of money they have regardless of the correct dosage and prescription. The wrong self-prescription may lead to non-effective treatment of the disease, while the under dosage increases the disease resistance to the drugs thus increasing the risk of fatal attacks on the poor. Malaria is a good case in point. Self-treatment may also mean opting for local medicine. The self-treatment option by the poor is thus not likely to enhance disease control.

When we compare pay facilities and self-treatment, it can be seen that the poor were less likely to go to pay facilities ($B = -1.1128$). The head of household, spouse and parents were more likely to decide against self-medication. Those whose moves were decided by persons other than those above were likely to opt for self-medication possibly because of the monetary implications. The head of household was 5.6 times likely to decide on a pay facility rather than self-medication. The spouse was 1.4 times and parents 1.3 times likely to choose a pay facility rather than self-medication. The model shows that drugs were generally available in the pay facilities ($B = 0.3054$); when the charge for drugs is raised, patients are more likely to opt for self-medication than to go to a pay facility. As discussed earlier, the poor may either go for traditional medicine or visit a shop and buy drugs without proper prescription with all the associated risks. The results also show that a household with higher income is likely to take their patient to a private facility ($B = 0.1542$).

The probabilities of choosing a medical facility type are given by the three equations presented below, where Equation 8 is the probability of choosing self-medication, Equation 9 gives the probability of choosing government facility and Equation 10 gives the probability of choosing a private facility.

$$P(y = 1) = \frac{1}{1 + e^{XB^{(2)}} + e^{XB^{(3)}}} \quad (8)$$

$$P(y = 2) = \frac{e^{XB^{(2)}}}{1 + e^{XB^{(2)}} + e^{XB^{(3)}}} \quad (9)$$

$$P(y = 3) = \frac{e^{XB^{(3)}}}{1 + e^{XB^{(2)}} + e^{XB^{(3)}}} \quad (10)$$

When income rises by 3.4%, the probability of visiting a government facility falls by 1.1%. This means that when people become poorer, they resort to government health facilities. With the same increase in income, the probability of visiting a private facility increases by 0.2%. An increase of 3.4% in income of a household would reduce probability of opting for self-medication by 0.4%.

A person from a non poor household is more likely to visit a private medical facility, with demand for government medical facility falling by 81.5% for the non poor and demand for pay facility rising by 10.9%. But self-medication also rises by 9.7% for a non poor household. Nevertheless, the overall implication is that patients from a well-off family will go to a private facility where drugs are usually available.

To investigate the effect of each independent variable in determining the facility choice, a simulation was done using the parameters obtained from the model fitting. Table 30 shows that the probability of a person choosing a private facility is 0.8126. It was 0.0998 for choice of a government health facility and 0.0876 for self-medication.

Table 30: Probability distribution of determinant of facility choice

	Government	Private	Self-medication
Model	0.0998	0.8126	0.0876
Non poor	0.0449	0.7193	0.2358
Head decided	0.0969	0.8860	0.0172
Spouse decided	0.3186	0.6337	0.0476
Parent decided	0.1423	0.7942	0.0634
No drugs	0.0168	0.9109	0.0723

Source: Author from field survey data.

The demand for a government facility for a patient from a non poor household falls by 55.0% compared with a poor household. The demand for such a person for a pay facility falls by 11.5%, but demand for self-medication rises by 169.3% (self-medication included those who bought drugs from the market).

When the head decides where to take the patient, the probability of a private facility rises by 9.0%. The demand for a government facility falls by 3.0% and self-medication by 80.4%. When this decision is made by the spouse, demand for government facility rises by 219.2%, while demand for private facility falls by 22.0% and self-medication by 45.6%. If a parent makes the decision, the demand for government facility rises by 42.6% but the demand for private facility and self-medication fall by 2.3% and 27.5%, respectively.

When medical charges increase by 11.7%, other things remaining constant, demand for government facility falls by 5.9% but demand for private facility rises by 0.4% and self-medication by 3.2%.

Table 31: Percentage change in choice of medical facilities

	Government	Private	Self-medication
Poor to non poor	-55.0	-11.5	169.3
Another person to head	-3.0	9.0	-80.4
Another person to spouse	219.2	-22.0	-45.6
Another person to parent	42.6	-2.3	-27.5
Medical charge ¹	-5.9	0.4	3.2
Household income ²	-1.1	0.2	-0.4
Drugs available to no drugs	-83.1	12.1	-17.4

¹ With 11.7% increase in drug prices.

² With 3.4% increase in household income.

Source: Author from field survey data

But if income increases by 3.4% the probability of choosing a government facility falls by 1.1% and that of self-medication by 0.4%, while demand for private facility increases by 0.2%. Controlling for drug availability, the demand for government facility falls by 83.1% when drugs are not available and by 17.4% for self-medication. In the same circumstances the choice of private facility rises by 12.1%.

Table 32 presents the income and price elasticities of demand for various medical services. The results suggest that the demand for medical services is income inelastic. However, the income elasticity of demand is higher for government facilities and self-treatment than for private facilities. As for medical charges, when the charge for medicine increases, most people would move away from government to private facilities and self-medication: An 11.7% increase in the price of drugs would reduce the probability of visiting a government health facility by 5.9%. The same change in cost of drugs would increase the probability of visiting a private clinic by 0.4% and it would increase the probability of opting for self-medication by 3.2%.

Table 32. The income and price elasticities of demand for medical services

Facility	Income elasticity of demand	Price elasticity of demand
Government	0.32	0.50
Private	0.06	0.03
Self-medication	0.12	0.27

The price elasticity of demand for medical services is also generally inelastic, but it is higher for government facility followed by self-treatment. The inelastic price elasticity of demand for private facility may be explained by the high likelihood of drug availability. Because there are usually no drugs in the government facilities, changes in prices of drugs in private facilities is unlikely to shift demand from private to government facilities.

The lower price elasticity of demand for private health facilities (especially private clinics) may also be accounted for by the distance to government hospitals. A spatial analysis of the distribution of health facilities suggests that private clinics are located closer to the surveyed households as compared with government hospitals, hence an increase in the prices charged in private clinics leads to a small reduction in demand when distance to other facilities is taken into account.

6. Conclusions and policy recommendations

Conclusions

Most of the sampled households went to private clinics as the first source of treatment. The second choice was government health facilities. The highest satisfaction derived by patients from visiting a facility was the availability of the prescribed drugs. It is in fact the likely availability of drugs that is the major motivation for the choice of a particular health facility. Because government facilities were the least stocked with all the drugs, the highest movement was from government health facilities as first source of treatment to private clinics or pharmacies as second choice.

Households with more educated heads were more likely to report sicknesses, and the most commonly reported diseases by patients or their relatives and the health care providers were malaria and respiratory infections. Most reported sicknesses had a duration of less than one week. This shows high levels of awareness of the various illnesses among the population, which can be attributed to the many primary health care programmes run by Ministry of Health through the print and electronic media.

NGO/mission health facilities generally charge lower fees than private facilities. The price elasticity of demand for medical care is inelastic although the elasticity is higher for government and self-treatment options. Medical care demand is also income inelastic. Despite the lack of drugs in the government health facilities, the people, especially the poor, still visit them in anticipation of getting free treatment. Some people also visit them just for the sake of getting a prescription and then go to buy the drugs elsewhere. Households with relatively higher income visited private health facilities as they had a means to pay for the services. In cases where there were prolonged periods of sickness, the people tended to shift from modern to herbal medicine, possibly because of loss of trust in modern medicine.

Policy Recommendations

The results suggest that there is a general awareness of various diseases among the households, attributable to the primary health care programme campaigns. It is recommended that more resources should be allocated to the primary health care programmes to sustain and further increase levels of public awareness.

The results also show that the poor tend to shift from a government health facility to self-medication options because of their inability to pay for cost sharing. This may have

the implication of aggravated fatal attacks among the population and increased drug resistance for diseases such as malaria. It is therefore recommended that government put in place a mechanism to provide affordable medical services for the poor.

The price elasticity of demand for government medical services is higher compared with other sources. The implication here is that setting cost sharing fees too high will force even the non poor to opt for other sources of treatment. It is thus recommended that the user-fees should be set taking into account the price elasticity of demand for the services.

The study reveals that the government health facilities were the least stocked with necessary drugs. It is recommended that government increase the budgetary allocations to the health sector so as to ensure the availability of the necessary services. Government should also put in place strict accountability systems for the drugs to avoid their being siphoned from government facilities to private facilities.

An alternative policy option would be to set up a social health insurance scheme so as to enhance access to medical services. Given that the availability of drugs in the private health facilities is the main motivation for visiting them despite their higher prices, a social health insurance scheme would be a plausible option.

It is observed that the people working in government health facilities are very often the same people running private clinics, basically as a survival strategy. It is recommended that the salary structure of government health workers be reviewed so as to give them a living wage.

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