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# Determinants of Demand for Health Care Services and their Implication on Health Care Financing: The Case of Bure Town<sup>1</sup>

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## *Abstract*

*This study attempts to identify the factors that determine the medical treatment seeking behaviour during illness and the demand for health care services by employing a maximum likelihood estimation technique and using primary data collected from a small woreda town in western Gojjam. The factors that are expected to have an influential impact are categorized as individual and/or household specific variables and choice specific variables.*

*According to the estimated results of the two logit models employed in the study, individual and/or household specific variables such as sex of the patient, severity of illness, monthly income of the household and family size, and distance to reach the nearest health facility (a choice specific variable) are found to significantly affect whether treatment was sought at times of illness. On the other hand, patients' choices of health care service providers are found to be influenced by the age of the patient, sex of the household head and education level of the patient (from the category of individual and/or household specific variables) and by medical cost of treatment per visit and waiting time for treatment (from the choice specific category). All these, therefore, call for the intervention of the government in devising mechanisms that would help reduce the discrepancies observed in terms of sex, age, level of education and income, on the one hand, and in introducing appropriate policy measures that would facilitate the expansion of health facilities that provide best quality health care services at a cost affordable to the majority of the population, on the other.*

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## 1. Introduction

### 1.1. Background

Health is a major target of all households and governments in all countries. In addition to its direct importance to individual welfare, health indirectly affects the development of a country through its influence on the efficiency of human capital and on the productivity of work. In Zweifel and Breyer (1997), the dual property of health is stated as: "Health is not everything in life, but without health, life is nothing". According to these authors,

- health is a highly valued asset (i.e., other values and goals do exist in life, yet compared to health, they ranked lower on the preference scale of most people).
- health is a prerequisite for success in other activities (i.e., poor health limits the production capabilities of the affected person, including his or her ability to enjoy the good things of life (apart from health)).

The nature and level of a country's economic development are believed to be the major determinants of the health status of its inhabitants. But at the same time, the health of the population can also influence economic progress (Mills, et al, 1988). Hence, the two are interdependent as people are both the driving forces and final targets of socio-economic development. Consequently, the provision of health services becomes an important aspect of the socio-economic development of a country. It was this fact and the view that health is a basic human right which forced most governments to accept the declarations of Alma Ata that aimed to attain "Health for all" by the year 2000 (WDR, 1993).

Due to its low per capita income, food insecurity, recurrent famines, huge overseas aid, high infant mortality, and low life expectancy, Ethiopia is one of the poorest countries of the LDCs. The latter indicates that not only the health status of the population is very low but also diseases are widespread in the country (Kloos, 1998). According to the Ethiopian Social Sector Note (WB, 1998), the low health status of the population is characterized by vulnerability to largely preventable infectious diseases and nutritional deficiencies, high rate of population growth, low per capita income, low education level and high rates of illiteracy, inadequate access to clean water and sanitation facilities, and poor access to health services.

For instance, in 1995 life expectancy was 49 years and infant mortality was 112 out of 1,000 live births (compared to 52 years and 92 in SSA, respectively). Moreover, Table

1.1 shows how poor the health status of Ethiopia is as compared to the sub-Saharan African and other low-income countries.

**Table 1.1: Basic health status indicators**

Indicators	Ethiopia	Eritrea	Kenya	Tanzania	Uganda	Africa
Crude Death Rate (per 1,000)	18	15	9	14	19	<b>15</b>
Life Expectancy (years)	49	46	59	51	42	<b>52</b>
Infant Mortality (per, 1000)	120	135	59	84	122	<b>92</b>
Child Mortality (per 1000)	240	204	94	167	185	<b>172</b>
Maternal Mortality (Per 1,000,000)	452-1528 <sup>a</sup>	...	510-646	200-748	550	<b>573</b>
Immunization Coverage (percent)						
DPT	28	...	82	82	73	<b>50</b>
Polio	28	...	81	81	74	<b>50</b>
Measles	22	...	79	79	73	<b>51</b>
Access to Proper Sanitation (%)	10	...	86	86	67	<b>26<sup>b</sup></b>
Access to Safe Water (%)	18-26	...	52	52	...	<b>37<sup>b</sup></b>
Access to Health Care (%)	55	...	93	93	...	<b>54<sup>b</sup></b>
Attended Births (%)	10	...	60	60	...	<b>34<sup>b</sup></b>

Source: WB, 1998

Note: (a) Maternal Mortality Estimates for Ethiopia vary widely depending on sources used.

(b) Excludes South Africa

As can be seen in the table, Ethiopia stands low in all health indicators compared to some of its neighbouring countries and Africa in general. These, therefore, indicate the tremendous efforts the country should make in order to alleviate the prevailing problems and thereby improve the health status of the people.

One aspect which guarantees the effectiveness and sustainability of the programmes and policies in the health sector would be the involvement of households. For instance, identifying the factors that determine households' demands for health care services could be of paramount importance in assisting the formulation of rational strategies. To this end, an econometric analysis is a tool at our disposal that allows making inferences, with known statistical confidence, how demand is affected by each of its multiple determinants. This case study is an exercise in this regard.

The study is concerned with determining empirically the factors that are associated with the decision of seeking medical treatment and the choice of health service providers in times of illness. It also tries to indicate the implications of these demand determinants on health care financing in a rural area setting. Hence, the study was conducted in Bure, a town of Bure-Womberma Woreda in West Gojjam Administrative Zone of the Amhara Regional State. Bure is located along Addis Ababa – Bahir Dar road 410 km away from Addis Ababa and 160 km from Bahir Dar, the regional capital. At the time when the survey was conducted (between February and March 1999), there were one health center, two private clinics and three pharmacies providing health services to 13,437 people of the town and the whole population of the woreda, estimated to have been more than 200,000 based on the 1994 CSA census.

## 1.2. Objectives of the study

Assurance of accessibility of health care for all segments of the population and promotion of participation of the private sector and non-governmental organizations in health care are among the main policies of the government of Ethiopia. The policies seem to have facilitated the provision of modern health care services by various health facilities (hospitals, health centers, clinics, etc.) owned by the government, private-for-profit providers and other NGOs. The service fees of most private-for-profit providers are observed to be higher compared to other providers, particularly to the subsidised provision of government health services since "their service fees are not structured on a full cost recovery basis" (MOH/WB, 1995).

Nevertheless, various health status indicators show that the health status of the Ethiopian population is still very low. As the government priority area is improving the health status of the population, it would be essential to investigate in detail the different factors that directly and indirectly influence the provision and demand of the health care services. That is, it is necessary to know what makes people seek medical care in times of illness, the kind of health care services people need to use and which facility to use.

In other words, demand analysis should be conducted in order to identify the factors that affect individuals' decisions to seek health care and to choose from among different providers. Moreover, an understanding of the determinants of demand would enable health policy makers to introduce and implement appropriate incentive schemes that could be used to encourage certain patterns of service uses and discourage others. Demand analysis would also help investigate the implications different health related policies have on health care financing.

Therefore, the broad objective of this study is to conduct demand analysis for health care services and show the implications on health care financing. More specifically, the study tries to assess the utilization patterns of the sample households using a series of variables; to identify the determinants of demand for health care services being provided by different providers; and to look into the policy implications of the results obtained, including the implications on health care financing.

## 2. Theoretical and empirical perspectives

### 2.1. Theoretical background

Generally, demand for a particular type of health care service produced by a given type of supplier is the quantity of that service people are willing to obtain as a function of the characteristics attributed to consumers and all the providers. Consumers consider their demand for health care services both as consumption and investment commodity (Grossman, 1972).

As consumption commodity, health care makes consumers feel better so that it directly enters their preference function; and as investment commodity the state of health determines the amount of work and leisure time available to consumers. The lower the number of sick days the larger is the time available for work and leisure. Hence, the return to investment in health is the monetary value of the decrease in the number of sick days. It can thus be concluded that the demand for medical services is not for the services per se; rather it is the demand for "good health" (ibid.)

In this regard, analyzing the demand for health care services as being derived from the individuals' demand for good health provides a sound basis for determining which factors to be included in the model specifying the demand for health care services and for hypothesizing their effects.

Hence, a utility maximization problem, an indirect utility function or minimization of expenditure function (Deaton and Muelbauer, 1980; Varian, 1992) can be employed as a tool of demand analysis. Let's consider the usual utility function employed by scholars such as Gertler and Van der Gaag (1990) to show the behaviour of medical service users.

Consider individual  $i$  seeking medical treatment from health care service provider  $j$ . The direct utility derived by the individual could be formulated as a function of improvement in health status attained after treatment and consumption of consumer goods as:

$$U_{ij} = U_{ij}(H_{ij}, C_{ij}) \quad (2.1)$$

where  $U_{ij}$  is the expected utility individual  $i$  derives by receiving health care services from provider  $j$ ;  $H_{ij}$  the expected improvement in health status of individual  $i$  after receiving treatment from provider  $j$ ; and  $C_{ij}$  is the consumption of all other goods and services other than the health care services. The amount of  $C_{ij}$  is assumed to depend upon the choice of provider  $j$  because of the associated monetary and non-monetary treatment costs.

Since  $H_{ij}$  and  $C_{ij}$  are not directly observable it becomes necessary to introduce new functions that relate them with observable variables. Following Behrman and Deolaikar (1988) and Senauer and Garcia (1991) with some modifications (i.e. by picking out those variables that are not observable, for instance, genetic endowment, nutrient intake, etc.) the health care production function for the  $i^{\text{th}}$  individual can be expressed as:

$$H_{ij} = H(I_i, F_{ij}) \quad (2.2)$$

where  $I_i$  is a vector of observable socio-economic characteristics of individual  $i$  and his households (e.g., their age, gender, education, household size, etc); and  $F_{ij}$  is a vector of characteristics that individual  $i$  faces at the health care service provider  $j$  (e.g., the quality of treatment obtained, treatment costs, etc.).

Moreover, along with this production function the individual is constrained by the following usual full-income constraint, which combines both time and income into one total resource constraint:

$$Y_i = P_h H_{ij} + P_c C_{ij} + W_i T_H \quad (2.3)$$

where  $Y_i$  is the total monthly income of individual  $i$ ;  $P_h$  and  $P_c$  are prices associated with the consumption of health care services and all other goods and services, respectively;  $W_i$  the opportunity cost of time for individual  $i$ ; and  $T_H$  is total time spent by individual  $i$  for treatment (i.e., in travelling to and waiting for treatment) at the health care service provider  $j$ .

Then, maximizing the utility function (2.1) subject to the health care production function (2.2) and the full-budget constraint (2.3) yields a system of demand equations for health care services that can be expressed as a function of the health care service prices, income and other exogenous variables.

Generally, the demand functions for health care services that can be derived based on this theoretical framework and by taking into account all the other factors that are expected to affect demand, can have the following functional form involving individual/household specific and choice specific variables:

$$D_{ij} = f(Z_i, X_{ij}) \quad (2.4)$$

where  $D_{ij}$  is individual  $i$ 's demand for health care service of type  $j$ ;  $Z_i$  a vector of individual and household specific variables, such as education, age, income, etc; and  $X_{ij}$  is a vector of choice specific variables individual  $i$  faces when choosing provider  $j$ , such as treatment cost, waiting and travel time for treatment, distance, perceived quality, etc.

## 2.2. Empirical literature review

A study done in Kenya to evaluate the effects of health service pricing reform revealed that following the introduction of user charges, the utilization of health services dropped by some 38 percent. But after the abolition of registration fees, the use of health services increased, though it is insufficient to reverse the overall downward trend in demand (Mwabu, et al, 1995). As patients were observed to be more sensitive to fees paid for diagnostic services than to registration, the study recommended that while introducing or adjusting fees the proportional increase in charges for diagnostic services should in general be smaller than that for outpatient services.



Based on a utility maximization model, Acton (1975) analysed the role of money price, time prices, and income in determining the demand for medical services in New York City by using data obtained from a 1965 survey of users of the outpatient departments of the same city. The result of the study supported the prediction that travel time functions as price in determining the demand for medical services when free care is available. Further, the study showed that individuals with higher income are more likely to use the private sector, which is relatively less time intensive, than the public sector.

Hay, et al. (1982) evaluated the determinants of demand for dental health by developing an econometric model. The result indicated that the number of annual dental visits were significantly and positively related to total annual dental expenses and negatively related to out of pocket expenses. Moreover, while age was significantly and negatively related to dental visits, variables representing income, other family demographic characteristics, and past oral health status were not found to be significantly related to the number of dental visits.

Using data from one of the low income rural areas of Kenya, Mwabu et al. (1995) employed a logit model to analyze the quality of medical care and choice of medical treatment. The estimation revealed that income exerted a strong positive effect on the probability of seeking medical care from a mission or private provider compared to self-treatment. More schooling made patients to consult a government health facility than resorting to self-treatment. Though the signs on the coefficients for user fees and distance were negative as expected, they were not significant. In addition, the quality variables that reflect drug scarcity were found to be significant determinants of demand.

These same authors' earlier study tried to examine the efficiency and equity effects of introducing user fees on Kenya's public facilities (Mwabu et al., 1986). The study predicted demands (or probabilities of seeking treatment) in various health facilities when user fees are charged for health services in government clinics. Accordingly, the results obtained showed that the demand for health services in government and mission clinics and pharmacies (shops) is highly sensitive to changes in relative money prices, while it is quite inelastic in government hospitals, private clinics and traditional clinics. These results were obtained when demand prediction was made by assuming the government uses the revenue obtained from user fees for purposes other than the improvement of health services in its clinics. On the other hand, when the government was assumed to use the revenue from its clinics to upgrade the quality of health services, government-owned clinics were chosen over mission clinics at all levels of user fees (ibid.)

Viewed in general, the study showed the net welfare effect of user charges on medical services to be ambiguous. Because, if user fees were imposed across the board in all government health facilities, the equity trade-offs would be large so that the user fees would be socially and politically unacceptable. But if user charges were restricted to only government hospitals, the attendant equity problem would not be too difficult to manage (i.e., they would promote equity) because they would benefit the poor more than the rich.

Hotchkiss (1998) examined the trade-off that consumers make between price and quality in the demand for health care in the Philippines. In this paper, a discrete choice model was used to estimate the effects of quality, price, distance and individual characteristics on the choice of obstetric care providers. The estimation result suggested that such facility attributes that influence quality of care as crowding, practitioner training and drug availability are significant determinants of the choice of obstetric care provider. Price effects for both the poor and non-poor households were negative, but were statistically significant only for the former.

Moreover, distance to the health facility had a negative and highly significant effect on facility choice. Assets were found to be positively and significantly associated with choosing alternatives that are associated with higher quality. Having health insurance has also the same effect. Regarding the trade-off between price and quality among women in the Philippines, the policy simulations indicated that when prices and quality were simultaneously increased in government health care facilities, the mean probability of using public facilities would increase for both the poor and non-poor households (ibid).

A study conducted in Nigeria showed that price and quality of care are significant determinants of health care choices (Akin et al., 1995). It was observed that higher prices at either type of facility tend to reduce usage of that type, and that usage tends to increase for each type of care as the quality of the care is increased. The result also indicated that there is no difference in the price responsiveness of different income groups.

In studying the household demand for health care services in Ethiopia, KUAWAB (1996) consultants, using a logistic regression model, tried to identify the factors determining the choice for health providers (i.e., government, private, religious and individual health facilities) for those individuals obtaining medical treatment. The regression analysis revealed that distance to the nearest health facility has strong impact on the choice of all health providers. Income, proxied by per capita household expenditure, was also

observed to have a stronger positive effect on the choice of all health facilities, except those run by religious institutions.

The above study further indicated that mothers' education positively influences the choice for private, individual and missionary health facilities, implying the greater role mothers' education could play in determining the household demand for health care. On the other hand, while age produces a positive influence on the choice of government and private facilities, age square has negative and positive effects on the choices of private and individual facilities, respectively. The latter relationships depict the tendency of older people to obtain treatment from individual health providers.

However, the major limitation of this study is its failure to take into consideration the non-monetary costs of treatment (i.e. time spent in travelling to reach a facility and waiting for treatment) and the monetary cost (i.e. medical cost) that would have their own effects on the choice of providers.

In an attempt to identify the main socio-economic factors that determine access to and utilization of health care services in urban Ethiopia, Abdulhamid and Alem (1996) employed binomial probit models and applied multinomial (conditional) logit models for the analysis of the choice of facility types. On the one hand the probit models identified income as the major determinant of whether treatment was sought or not and also generated interesting results regarding utilization of health care services on the other. Accordingly, residents of most of the towns (Bahir Dar, Awassa, Dessie, and Jimma) were more likely to seek treatment than residents of Addis Ababa. But residents of Dire Dawa were observed to have a lower probability of seeking medical treatment, while residents of Mekele were as likely as those of Addis Ababa in seeking treatment.

On the other hand, the regression analysis performed on the choice of providers (multinomial logit models) showed that richer households were the most utilizers of private facilities than the poorer households. In addition, older people were also found to use private facilities more often, the rate ultimately falling with an increase in age. Sex of the household head was found to significantly determine the choice of private and public service providers while it was insignificant in all other cases. Moreover, mothers' education has a significant effect in determining the choice of service providers and type of facilities, favouring private services in the first case and hospital treatment in the other case. Fathers' education was not significant in any of the cases.

The major limitation of this study was that certain choice specific variables, such as distance, waiting time for treatment, time spent to reach the facility and medical cost, were not included in the estimated models due to the paucity of the available data set. This might have some impact on the reliability of the estimated results.

In estimating willingness to pay for health care in Ethiopia, the Health Care Financing Secretariat conducted a survey in 2001 to generate data and relevant information from surveys at household level and at the gate of health facilities and by convening focus groups.

The results obtained from the three components all supported the conclusion that perceived quality was a very important determinant for both patients' choices of provider and of their willingness to pay for services and drugs. Moreover, the cost of medical care was the second most important determinant of provider choice. But some complaints were registered by respondents about the high prices charged by private for profit medical practitioners. However, it was clear, particularly from the household survey, that patients do pay considerable amounts for medical care, and are willing to pay even higher amounts than they now do if they obtain higher quality care in return.

### 3. Methodology

#### 3.1. Methods of analysis and data sources

Given the theoretical framework under which a demand function for any type of good or service is derived, an empirical analysis that employs a logit model through a maximum likelihood estimation technique, supplemented by a descriptive analysis, is used in this study.

The data used for this study are primary data collected through structured questionnaire from the residents of Bure town, a small woreda town in western Gojjam Administrative Zone. Bure town is selected mainly because no study on demand for health care services has been done not only in this area but also in similar rural towns at national level. Therefore, as Bure is the most populated rural town with heterogeneous population in terms of socio-cultural conditions, it is hoped to represent the conditions prevailing in Amhara Region in particular and those of other similar rural towns of the country in general.

The sampling frame included all the 2019 households in the survey area from which 400 households (20%) are selected using a systematic random sampling method. Then the designed questionnaires were administered to the sample households that experienced illness or injury over the four weeks immediately preceding the date of the interview. At times when no one was found to have been sick in the specified period of time in the sample household, the next door household was visited as a replacement. In this way, detailed data on individual's illness and utilization of health care services, including many socio-economic variables specific to the respondent and to the choice of health facilities made, and all other information relevant to the estimation of the demand for health care services were collected.

In this regard, the first question presented to the respondents was whether they have been ill in the past four weeks. Based on the reply to this question, respondents were grouped into two: those who were sick and not sick in the specified period of time. Two follow up questions were posed to those who were sick to elicit what they did first and second in terms of seeking medical treatment, and categorized based on their responses. Accordingly, while those who replied 'no consultation' to the two questions were grouped as 'not seeking treatment', those who reported to have visited any one health facility were classified as utilizers of a given facility.

Therefore, respondents were grouped as utilizers of public health facilities if they went to a government-owned facility first or if they went to a government facility second after responding 'no consultation' to the first question. On the other hand, if the respondents replied a combination of government and private facility use, what they did first was considered to be vital to group them and define the dependent variable. Utilizers of 'private facilities' were also categorized in a similar fashion. In addition, patients that sought treatment from traditional healers were grouped as utilizers of 'traditional health care services', while those that bought medicine from drug shops and pharmacies without consulting a physician were taken as utilizers of 'self treatment'.

The rest of the questions in the questionnaire tried to assess the quality of treatment patients received and also prompted them to evaluate the behaviour of the staff members at the times of treatment, because these factors were regarded as important variables which affect decisions as to where to seek treatment.

In addition, in order to determine the monetary cost of treatment, respondents were asked to state the amount of medical expenditure (comprising fees paid for registration, treatment, laboratory test, drug cost, etc.) they incurred per visit. And to capture the non-

monetary costs of treatment, questions relating to travel time to and from health care centers and waiting time for treatment were included. Envisaging the influence household income has on the choice of a health facility, respondents were also asked to state their households' total monthly incomes from all sources.

### 3.2. Specification of the empirical model

When individuals are faced with an accident, illness or injury, they would decide whether to seek a medical treatment or not, and those who are seeking would also decide which health care unit to use (i.e., the modern or the traditional services). Moreover, from the modern health care services that are available to them, individual users would choose from among governmentally or privately provided services that would enable them to maximize their utility.

Hence, in order to determine the probability of individuals seeking treatment at times of illness and/or the probability of choosing any one health care unit, the following logit model is employed:

$$P_r(D_i = 1) = P_i = F(\beta X_i) = \frac{\exp(\beta X_i)}{1 + \exp(\beta X_i)} = \frac{1}{1 + \exp(-\beta X_i)} = \lambda(\beta X_i) \quad (3.1)$$

And hence,

$$P_r(D_i = 0) = 1 - P_i = 1 - F(\beta X_i) = \frac{\exp(-\beta X_i)}{1 + \exp(-\beta X_i)} = 1 - \lambda(\beta X_i) \quad (3.2)$$

where  $P_r(D_i = 1) = P_i$  is the probability of individuals seeking a medical treatment, or the probability of choosing a certain health service provider in times of illness.

$\beta$ 's are vector of parameters to be estimated,

$X_i$ 's are vector of explanatory variables that are defined in Exhibit 1 for the first outcome and in Exhibit 2 for the second outcome.

$\lambda(\cdot)$  denotes the logistic distribution function.

**Exhibit 1: Vector of explanatory variables included in the first outcome (i.e., seeking treatment or not)**

Variable	Description of the variable
<b>SX/SXH</b>	Dummy variable, one if the sex of the patient/head of the household is male and zero otherwise.
<b>AG</b>	Age of the patient in years.
<b>LDAY</b>	Length of days that the patient has been ill.
<b>HHS</b>	Household size in number.
<b>INCH</b>	Households' monthly income in Birr.
<b>OH</b>	Dummy variable, one if the patient's household owns its own house and zero otherwise.
<b>DMS</b>	Dummy variable, one if the patient is married and zero otherwise.
<b>DOCCP</b>	Dummy variable, one if the patient is employed and zero otherwise.
<b>AGESQ</b>	Age square.
<b>DIST1</b>	Distance to reach the nearest health facility in km.
<b>DSCCUH/</b>	Dummy variable, one if the head of the household/the patient's level of education is secondary & above and zero otherwise.
<b>DSCCU</b>	
<b>CONS</b>	Constant term

**Exhibit 2: Vector of explanatory variables included in the second outcome (i.e., the choice of private versus public health facilities)**

Variable	Description of the variable
<b>SX/SXH</b>	Dummy variable, one if the sex of the patient/head of the household is male and zero otherwise.
<b>AG</b>	Age of the patient in years.
<b>LUW</b>	Length of days that the patient was unable to perform his/her regular activities.
<b>MEDC</b>	Medical cost that includes all monetary expenses incurred per visit.
<b>WAIT</b>	Waiting time for treatment in minutes.
<b>DIST2</b>	Distance to reach the health facility attended in km.
<b>HHS</b>	Size of the household in number.
<b>INCH</b>	Total income of the household per month in Birr.
<b>DMS</b>	Dummy variable, one if the patient is married and zero otherwise.
<b>DPQUAL</b>	Dummy variable, one if perceived quality of treatment is excellent or very good and zero if good or poor.
<b>DBSTAF</b>	Dummy variable, one if the behaviour of the staff members at times of treatment is excellent or very good and zero otherwise (as evaluated by the patient).
<b>DSCCU</b>	Dummy variable, one if the patient's level of education is secondary & above and zero otherwise.
<b>AGESQ</b>	Age square
<b>CONS</b>	Constant term

## 4. Findings of the study

The analyses carried out on the determinants of demand for health care are presented in two subsections. The first reviews the descriptive statistical results and the second presents the empirical results obtained from the estimation of the specified econometrics models.

### 4.1. Descriptive statistics results

In this subsection the level of utilization of the different health care providing establishments by the sample households is assessed vis-à-vis some demographic factors as well as the important determinants of demand, such as economic factors (e.g., income and medical cost), and access variables (e.g., time spent by waiting for treatment), and subjective factors (e.g., perceived quality of treatment and behaviour of the staff members while providing treatment).

Generally, the survey revealed that out of the total 400 respondents (58 and 42% females and males, respectively) included in this study, nearly 14% of them reported that they did not seek any medical treatment at all though they were sick in the four weeks preceding the date of the interview. Of the remaining 86% of the respondents, who sought medical treatment, 53.6, 43.1 and 1.5% visited government, private and traditional health services providers, respectively, while the rest 1.7% treated themselves without consulting any health care practitioner (Table 4.1).

**Table 4.1: Medical care seeking behaviour and facilities choices by sex of respondents**

Sex	Seeking treatment			Facilities chosen*						
	No		Yes		Total		Government	Private	Traditional	Self treatment
	Count	Row %	Count	Row %	Count	Column %	Row %	Row %	Row %	Row %
<b>Female</b>	36	15.5	197	84.5	233	58.3	53.3	43.1	2.0	1.0
<b>Male</b>	21	12.6	146	87.4	167	41.8	54.1	43.2	0.7	2.7
<b>Total</b>	<b>57 (14.3)</b>		<b>343 (85.7)</b>		<b>400</b>	<b>100</b>	<b>(53.6)</b>	<b>(43.1)</b>	<b>(1.5)</b>	<b>(1.7)</b>

\* The figures in parentheses under these columns indicate the proportion of respondents that chose the various facilities out of those who sought medical treatment.



Table 4.1 further reveals that females are not only the ones who encountered illness most (57.4) in the period of analysis, but also account for the largest proportion (63.2%) of those who declined to take any form of medical treatment. However, with regards to the utilization of the different health care services, no significant difference is observed between females and males.

Asked as to why they did not seek medical treatment, the majority identified incapability to cover the cost of treatment (50%) and long distance of the health facilities (38%) to have been the main reasons for not seeking treatment in the specified period of time (Table 4.2).

**Table 4.2: Pooled reasons for not seeking treatment**

<b>Reasons</b>	<b>Percentage of responses</b>
Incapability to cover cost of treatment	50.0
Distance to reach the nearest health facility	37.5
Non seriousness of the illness	4.7
Religious case	4.7
Other reasons	3.1
<b>Total</b>	<b>100</b>

On the other hand, those who sought medical treatment from different health service providers have also indicated their reasons for choosing a particular provider. Accordingly, the large majority of the respondents (84%) who attended government owned health facilities did so mainly because the cost of treatment was lower. But 11% of the users chose government facilities because they provided best quality treatment with sufficient medical inputs. For about 77% of the respondents who attended private health care units, best quality of treatment together with their availability for providing urgent services were the major reasons for choosing them. Eighty percent of the traditional facility users thought that the diseases they faced could not be treated by modern health care units. And close to 67% of those who treated themselves without consulting health care practitioners on their parts gave the frequent occurrence of an illness as the main reason for their choice (Table 4.3).

In order to identify those factors that might determine the treatment seeking behaviour and the choice of health care providers, the responses of the sample households are cross tabulated against some demographic, economic, access and subjective factors as depicted below.

**Table 4.3: Pooled reasons for attending the chosen facility**

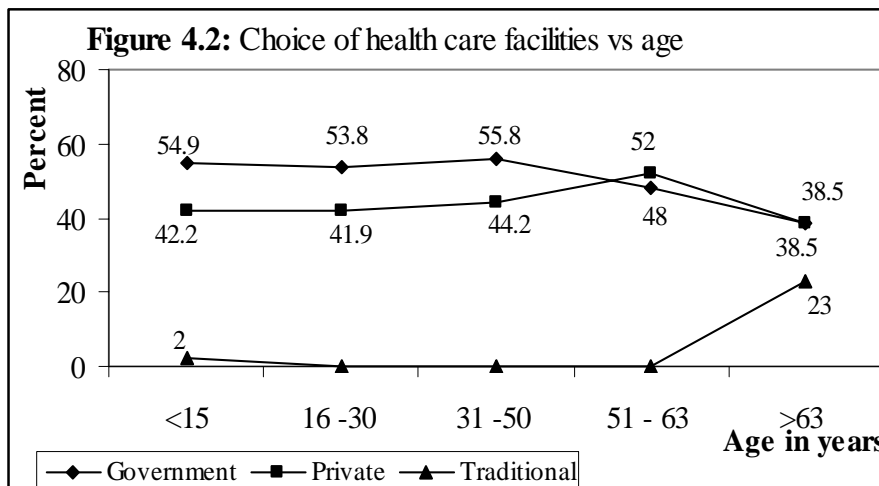
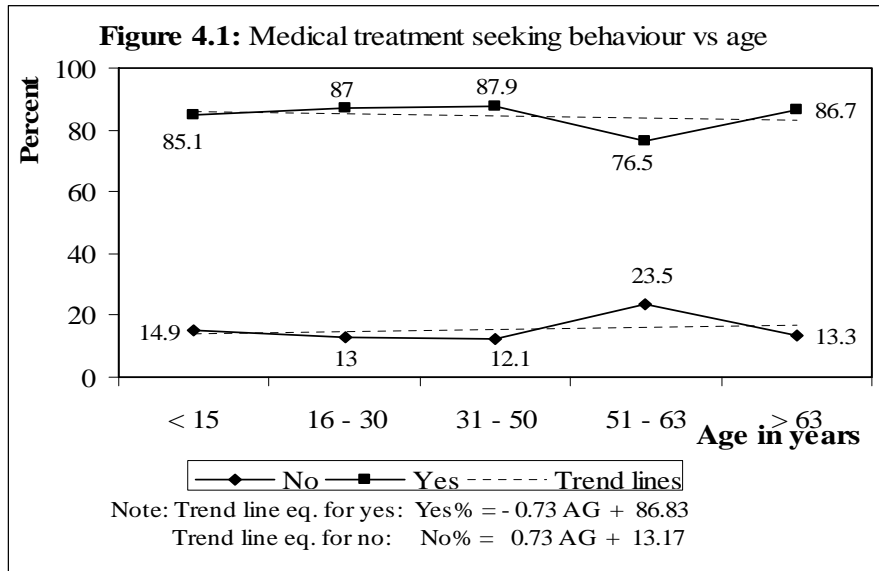
Reasons	Government	Private	Traditional	Self Care
	%	%	%	%
Lower cost of treatment	83.69	0	0	0
Best quality of treatment with sufficient instruments	10.87	55.41	0	0
Availability of Services	0	21.62	0	0
Nearness of the facility	1.09	9.45	0	0
Off working day/time	0	6.76	0	0
Frequent occurrence of illness	0	0	0	66.67
Not treated by modern treatment	0	0	80.00	0
Others*	4.35	6.76	20.00	33.33
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

\* Others include: others' advice, treatment is free, and missing cases.

a) Age:

Viewed in terms of age groups, medical treatment seeking behaviour of respondents seems to show no association with an increase in age. However, close examination of the curves drawn for 'yes' and 'no' responses using trend lines indicates that:

- (1) the percentage of those seeking treatment shows a slight decline with an increase in the age of respondents; and
- (2) the respondents' behaviour of not seeking medical treatment tends to rise with age (Figure 4.1). On the other hand, the rate of utilization of public and private health care units appear to rise with an increase in age up to the mid fifties, beyond which not only the rate declines but also the use of traditional healers starts to increase from its low level (Figure 4.2). Hence, traditional health care services seem to be frequented more by older people than their younger counterparts.



*b) Marital status:*

The married and unmarried groups of respondents account for the largest proportion (with 35 and 48%, respectively) (Table 4.4). However, the majority of the respondents in all groups seem to show similar behaviour both in seeking medical treatment and

utilizing the various health care services. That is, marital status is observed not to markedly influence the demand for medical services, as opposed to the assertion of Feildstein (1988).

**Table 4.4: Medical care seeking behaviour and facility choices vs marital status of respondents**

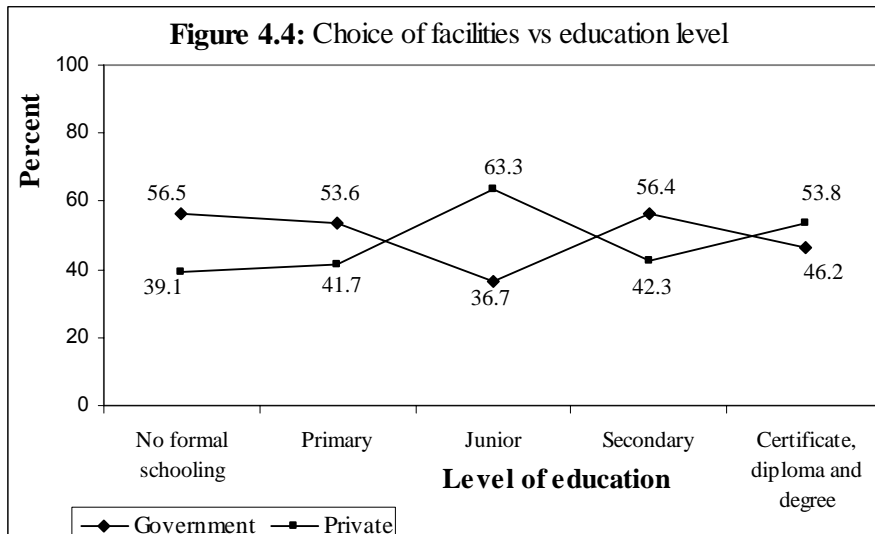
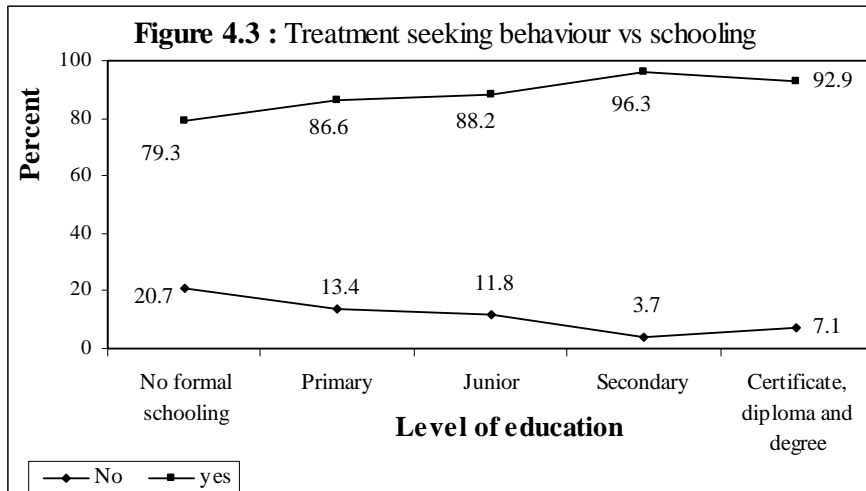
Marital Status	Seeking treatment			Facilities chosen*				
	No	Yes	Total	Government	Private	Traditional	Self treatment	
	Row %	Row %	Count	Column %	Row %	Row %	Row %	
<b>Married</b>	9.2	90.8	141	35.3	50.8	47.7	0.8	0.8
<b>Unmarried</b>	15.6	84.4	192	48.0	56.8	38.9	1.2	3.1
<b>Divorced</b>	20.0	80.0	45	11.2	55.6	44.4	0	0
<b>Widowed</b>	22.7	77.3	22	5.5	41.2	47.1	11.8	0
		<b>Total</b>	<b>400</b>	<b>100</b>	<b>(53.6)</b>	<b>(43.1)</b>	<b>(1.5)</b>	<b>(1.7)</b>

\* The figures in parentheses indicate the proportion of respondents who chose the various facilities out of those sought medical treatment.

*c) Education level:*

Disaggregated by the level of education, variations are observed in the medical treatment seeking behaviour of respondents. As depicted by Figure 4.3 the percentage of those who sought medical treatment at times of illness is increasing with the level of schooling. On the contrary, the higher the level of education of the respondents the lower is the tendency not to seek medical treatment at time of illness. It can thus be concluded that education positively influences the decisions of individuals whether or not to seek medical treatment at times of illness.

On the other hand, education seems to have no impact on the choice of health care service providers. However, it can in general be observed that (1) private and public health care units are the most widely utilized facilities by the majority of the respondents irrespective of the level of education (as opposed to the traditional and self treatment which are used only by a very small proportion of respondent, and so not shown in the figure), (2) the choices of government and private health care facilities, respectively, show a slight tendency of decreasing and increasing with the level of education (Figure 4.4).



d) Income:

Based on the stated monthly income that the household of the patient obtained, households are divided into four quartiles representing income groups ranging from lowest to highest: quartile one (poorest), quartile two (lower-middle), quartile three (upper-middle) and quartile four (richest). Cross tabulation of the responses against

the level of income revealed that the higher the household income the higher will be the tendency to seek medical treatment. That is, as expected, income is observed to have an influential effect on the decision to seek treatment in times of illness. Thus, the richer the household of the patient, the more likely would be the probability of seeking treatment.

**Table 4.5: Medical care seeking behaviour by income groups**

Income Quartiles	Seeking treatment		Facilities chosen*					
	No	Yes	Total	Government	Private	Traditional	Self treatment	
								Row %
<b>Quartile 1 (poorest)</b>	23.0	77.0	113	28.3	63.2	28.7	3.4	4.6
<b>Quartile 2 (Lower middle)</b>	17.8	82.2	90	22.5	55.4	40.5	1.4	2.7
<b>Quartile 3 (Upper middle)</b>	14.4	85.6	97	24.3	56.6	42.2	1.2	0
<b>Quartile 4 (richest)</b>	1.0	99.0	100	25.0	41.4	58.6	0	0
	<b>Total</b>		<b>400</b>	<b>100</b>	<b>(53.6)</b>	<b>(43.1)</b>	<b>(1.5)</b>	<b>(1.7)</b>

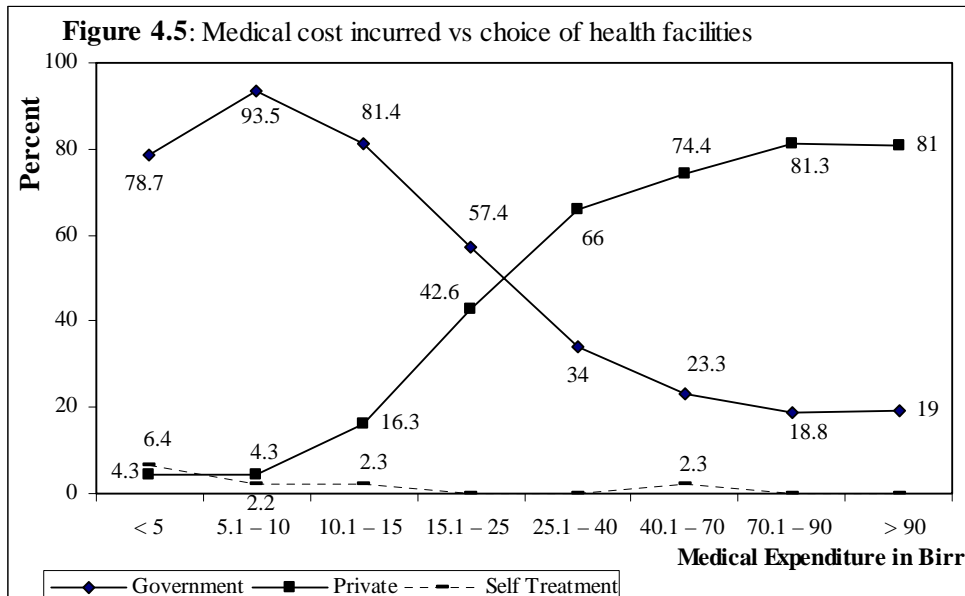
\* The figures in parentheses indicate the proportion of respondents who chose the various facilities out of those sought medical treatment.

With regards to the choice of a provider of health care services, on the average the majority (54%) of all the income groups frequent government facilities followed by private health care units (43%). The proportion of those using traditional health services and self treatment are significantly low, with a share of only 3% (Table 4.5). However, households' preferences seem to shift from government facilities to those of private ones as their income level rises, because the choice of government health care units tends to fall with the increase in the level of income while it rises in the case of private facilities. Moreover, lower income group households are observed to frequent traditional health services and self treatment, though the proportion is low.

*e) Medical cost:*

Generally, viewed in terms of cost of treatment, government health care units are the most utilized (54%) as compared to private health care facilities (43%). It was also

found that public and private providers on average charge Birr 24 and 83 per visit per patient, respectively. But close examination of the responses indicates that, given the types of illnesses that made patients visit a physician, with the rising medical cost of treatment, the percentage of patients visiting the government health care services declines while it is rising in the case of private health facilities (Figure 4.5). For instance, about 94% of the respondents reported to have paid Birr 5 – 10 for medical treatment at public health care units while the proportion of those who paid more than Birr 90 were only 19%. For private health care providers the corresponding response rates were 4.3 and 81%, respectively.



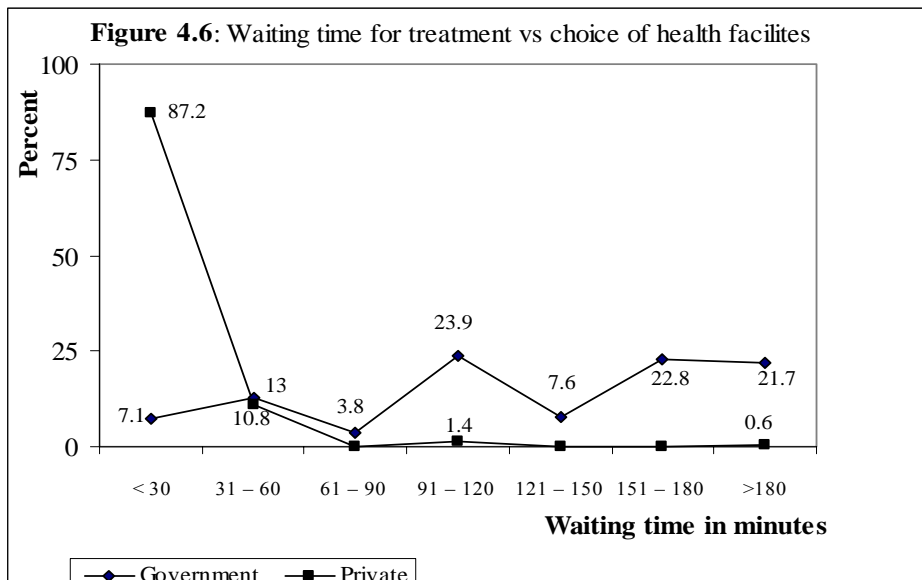
It can thus be safely deduced that, assuming all other factors to be constant, as the cost of medical treatment rises the probability of choosing the services being provided by the governmental health facilities falls while the reverse takes place for the private health care units. This means that at higher cost of treatment, private health care provisions are preferred to government ones. This may probably be due to the fact that, on the one hand, respondents associate quality with higher charges to medical treatment, and on the other, a larger portion of the private health care services are being utilized by the higher income groups in which case higher medical cost does not preclude them from using the private services. If these could be supported by an empirical analysis, they

would have significant policy implications regarding the relationship between the medical cost and quality of services. Finally, it should be noted that the proportions of responses on expenditure for traditional and self treatment are significantly low.

*f) Waiting time:*

Generally, close to 97% of the respondents indicated the associations between waiting time and the choice of government and private health facilities. The responses of the rest 3% of the respondents failed to show any clear relationship between waiting time and choosing traditional health care services and self treatment. Moreover, the average waiting time for treatment at the public health care units was found to be about 148 minutes while it was only about 23 minutes in the private ones.

Figure 4.6 shows the relationship between waiting time for treatment in minutes and the choice of the two major health care providers: government and private facilities. As can be seen, the majority (87%) of those who attended private health facilities get treatment on average within less than 30 minutes. It is only a small proportion (11%) of the respondents that reported to have waited up to an hour before they get treatment. It should be noted that the percentage of the respondents that waited for treatment longer than an hour is insignificantly small.





In the case of government health care units, the picture is different. While only about 24% of those who visited government health facilities obtained treatment within an hour and half, about half (54%) of the respondents had to wait for 1.5 to 3 hours to get medical attention. The remaining respondents (22%) reported to have waited for longer than 3 hours before receiving any medical attention.

Based on these observations, it appears that waiting time for treatment and choice of government and private facilities, respectively, are positively and negatively related. Thus, one might expect that when waiting time for treatment at the private facilities rises, the probability of choosing those facilities would decline, and the reverse would be true for the choice of government facilities. But from the point of view of economic theory, the latter case seems to give apparently less sense, because waiting time and demand for health care services are inversely related as waiting time involves an opportunity cost. However, the possible explanations for such an observation could be (1) the lower cost of treatment prevailing at government health care units; and (2) the inability of the majority of the households to afford the medical cost of treatment private providers are charging. Further the opportunity cost is less pronounced here because respondents are ill and are not able to work. In both cases, patients had no choice but wait as long as they get the required treatment at government health facilities.

*g) Perceived quality of treatment and evaluation of the behaviour of staff members:*

Table 4.6 presents the perceived quality of treatment and evaluation of the behaviour of the staff members of the various health care facilities under consideration. According to 78 to 88% of the respondents, the perceived quality of treatment as well as the behaviour of the staff members of government health care units fall on the scale of poor to good. On the other hand, more than 60% of the respondents valued the quality of treatment and the behaviour of the staff members of private facilities to be in the range of very good to excellent. These may indicate that private facilities are more preferred to those owned by the government. The latter observation could probably be one of the reasons for individuals to choose the private providers at a higher cost of treatment than the government ones.

Thus, one might conclude that not only offering better quality of treatment but also improving the way staff members treat their customers raise the probability of choosing a particular health care unit. It is also necessary to note that traditional health care services and self treatment are low quality options for medical treatment.

**Table 4.6:** Subjective factors and choice of health facilities

Facility Type	Perceived Quality of Treatment				Evaluation of the Behaviour of Staff Members			
	Poor to Good		Very Good to Excellent		Poor to Good		Very Good to Excellent	
	Count	%	Count	%	Count	%	Count	%
Government	112	78.3	72	36.0	128	88.2	56	29.2
Private	23	16.1	125	62.5	14	9.7	134	69.8
Traditional	3	2.1	2	1.0	3	2.1	2	1.0
Self treatment	5	3.5	1	0.5	-	-	-	-
<b>Total</b>	<b>143</b>	<b>100</b>	<b>200</b>	<b>100</b>	<b>145</b>	<b>100</b>	<b>192</b>	<b>100</b>

Finally, it is important to note that the statistical significances of the relationships depicted above by cross tabulation would be further examined and tested using the regression models developed for the two-stage analyses of medical treatment seeking behaviour and choice of health care service providers. The ensuing section is a follow-up to these general observations.

#### 4.2. Empirical results

In this subsection, the regression results obtained from the estimation of the two empirical models discussed in section 3 are analyzed in the light of the objectives of the study. Hence, the analyses would be carried out in two stages. First, attempt would be made to identify the factors that influence the decisions of individual patients to seek medical treatment at times of illness. In the second stage, the factors that determine the probability of choosing a health care service provider (i.e., the factors that affect the demand for health care services) would be analyzed for those who sought medical care. For such analyses binomial logit models are employed as the dependent variables are discrete choice (dummy) variables.

Furthermore, to check for multicollinearity (i.e., whether the independent variables are correlated to one another), a correlation matrix of the independent variables is established. The correlation analysis revealed that distance travelled to reach the chosen health facility (DIST) and time spent in travelling to reach to that health facility (TRAT) are highly correlated. In addition, the length of days the patient has been ill (LDAY) and the length of days the patient was not able to perform his/her regular activity due to the illness (LUW) are also found to be highly correlated (Annex). Consequently, only one of them from each group of correlated variables is included in the regression

analysis. In addition, variables that have little or no contribution to the improvement of the adjusted  $R^2$  are excluded from the regression analysis.

The coefficients obtained in Logit models are not directly interpreted as the change in the probability of occurrence caused by a unit change in the independent variables. But the signs of these coefficients, as usual, indicate the directions of association between the explanatory variables and the probability of occurrence. To capture the marginal effects (i.e., the magnitude of the change in the probability of occurrence) caused by the changes in the explanatory variables, the odds ratios are calculated. Hence, an odds ratio greater than one indicates the increase in the probability of an event occurring compared for it not occurring, while the reverse holds when the ratio is less than one.

Taking the value of the pseudo  $R^2$  to be similar to  $R^2$  in the regression analysis, it can be concluded that almost in 83 percent of the cases the explanatory variables included in the model explain the variation in the probability of seeking treatment in times of illnesses. However, examining each variable included in the model reveals that only five variables (SX, LDAY, HHS, INCH and DIST1) significantly influence the decisions of patients in seeking or not seeking treatment (Table 4.7).

Accordingly, sex of the patients (SX) is one of the variables having significant effect on the patients' decision whether or not to seek medical treatment outside from home. Noting that a unit change in the dummy variable SX indicates the switch from female to male, the odds ratio indicates that, other things being equal, the probability of male patients to consult a physician at times of illness is nearly 12 times as high as that of females. In addition, the positive sign of the parameter depicts the direct relationship between the probability of seeking treatment and sex of the individual. That is, compared to females, males are more inclined to seek medical treatment at times of illness. This result is consistent with the findings of KUWAB Consultants (1996).

The second variable that has a fairly significant effect (with the expected sign) is the length of days that the patient has been ill (LDAY) in the last four weeks prior to the survey date. This variable can be taken as a proxy for the severity of the illness. Thus, other things being equal, additional days of illness of the patient are estimated to raise the odds of consulting a physician by a factor of 1.14.

The other variable that has a fairly significant effect on the patients' probability of seeking treatment is the size of the household (HHS). The negative value of this coefficient shows that the larger the household size the lower would be the probability of seeking

treatment, other things held constant. This could probably be due to lower income per capita associated with large family households. Observe also that an additional member in the patients' family would reduce the odds of consulting a physician by a factor of 0.72. This finding is also consistent with that of KUAWAB Consultants (1996).

**Table 4.7: Decisions whether treatment was sought or not**

Binomial Logit Model: Maximum Likelihood Estimates (seeking treatment = 1, not seeking = 0)				
Variable	Coefficient	Odds ratio	t-ratio	Significance level
<b>SX</b>	2.443887	11.51772	2.088**	.037
<b>AG</b>	-.0501915	.9510473	-0.695	.487
<b>LDAY</b>	.1278142	1.136342	1.845*	.065
<b>HHS</b>	-.3333731	.7165028	-1.751*	.080
<b>INCH</b>	.0076866	1.007716	2.005**	.045
<b>SXH</b>	-.5583246	.5721669	-0.562	.574
<b>OH</b>	.9941459	2.702415	1.085	.278
<b>DMS</b>	1.427257	4.167253	1.099	.272
<b>DOCCP</b>	-.4584896	.6322379	-0.423	.672
<b>AGESQ</b>	.0003575	1.000358	0.417	.677
<b>DIST1</b>	-3.953213	.0191929	-5.578***	.000
<b>DSCCUH</b>	.023129	1.023399	0.015	.988
<b>DSCCU</b>	.952921	2.593274	0.640	.522
<b>CONS</b>	7.23342		3.413	.001

LR Chi<sup>2</sup> (13) = 255.85<sup>3</sup>      Prob > chi<sup>2</sup> = 0.0000      Pseudo R<sup>2</sup> = 0.8307<sup>4</sup>

Note: The estimates are significantly different from zero at \* 10%, \*\* 5% and \*\*\* 1% significance levels.

Monthly income of the household (INCH) is the fourth variable found to produce a significant effect (with the expected sign) on the probability of seeking medical treatment. The regression result indicates that the higher the monthly income of the household, the higher would be the probability of the household seeking treatment. More specifically, the increase in the income of a household is estimated to raise the probability or the odds of consulting a physician by the same proportion. Abdulhamid and Alem (1996) and KUAWAB Consultants (1996) have also arrived at the same conclusion.

<sup>3</sup> Using the chi square test with 13 degrees of freedom, the likelihood ratio (LR) statistic 255.85 describes the result of the joint significance hypothesis tests about the coefficients involved indicating that the model is significantly different from the intercept-only model.

<sup>4</sup> The pseudo R<sup>2</sup> measures the proportion of the "uncertainty" involved in the data as explained by the empirical results.

The last variable observed to strongly and negatively influence the medical seeking behaviour of households is the distance between the patients' homes and the nearest health facility (DIST1). Accordingly, if the distance to the nearest health care unit increases by one kilometre, the odds of consulting a physician fall by a factor of 0.02. The same result was found by KUAWAB Consultants (1996).

By way of winding up the discussion on the regression results obtained by the first model, it should also be noted that variables such as the education level of the household head (DSCCUH) and that of the patient (DSCCU), and age (AG) and marital status (DMS) of the patient were found to have no statistically significant impact on the decisions households are taking to seek or not to seek medical treatment.

With regards to the second binomial logit model set to identify the factors that contribute to the probability of choosing health care service providers, it is generally observed that close to 73 percent of the variation in the probability of choosing a health care facility for treatment is explained by the explanatory variables included in the specified regression analysis. Moreover, the likelihood ratio statistic 315.78 (estimated by a chi square test with 14 degrees of freedom) shows that the result obtained by the regression analysis using the specified model is significantly different from the intercept-only model. Note that as the proportion of those choosing traditional health care services and self treatment are relatively small, the regression analysis was carried out only for those who chose private and public health care units.

Table 4.8 shows that, among the 14 variables included in the logit model, only 8 variables (AG, MEDC, WAIT, SXH, DPQUAL, DBSTAF, DSCCU and AGESQ) are found to have significant impact in determining the choice of health care facilities at 1 to 10% significance levels. Hence, age (AG) and the square of age (AGESQ) of the patient are found to influence the probability of choosing a private health facility positively and negatively, respectively, at 10% significance level (i.e., the probability of this being not the case is only 10%). The former result indicates that younger patients tend to utilize private health facilities more often as compared to their older counterparts. But this tendency falls as the age of the individual increases (as depicted by the negative coefficient of the AGESQ term).

More specifically, assuming all other factors to be constant the odds ratios depict that a one year rise in the age of the patient at the early stage would raise the probability of choosing private health care facilities by a factor of 1.13 while at the latter stage it would reduce it by a factor of 0.998.

**Table 4.8: Choice of health care service providers (private versus public)**

Binomial Logit Model: Maximum Likelihood Estimates (private = 1, public = 0)

Variable	Coefficient	Odds ratio	t-ratio	Significance Level
<b>SX</b>	.7622588	2.143112	1.363	.173
<b>AG</b>	.1221595	1.129934	1.880*	.060
<b>LUW</b>	.0255233	1.025852	.650	.156
<b>MEDC</b>	.0168779	1.017021	2.525***	.012
<b>WAIT</b>	-.0466857	.9543874	-6.257***	.000
<b>DIST2</b>	.2372199	1.26772	.501	.617
<b>HHS</b>	-.075606	.9271814	-.663	.507
<b>INCH</b>	-.0002718	.9997283	-.224	.823
<b>SXH</b>	1.663938	5.280065	2.234**	.025
<b>DMS</b>	-1.167203	.3112362	-1.464	.143
<b>DPQUAL</b>	1.698189	5.46404	2.680***	.007
<b>DBSTAF</b>	1.727149	5.624597	2.726***	.006
<b>DSCCU</b>	-1.433797	.2384019	-2.038**	.042
<b>AGESQ</b>	-.0015787	.9984225	-1.683*	.092
<b>CONS</b>	-2.483857		-2.008	.045

LR  $\chi^2$  (14) = 315.78    Prob >  $\chi^2$  = 0.0000    Pseudo R<sup>2</sup>=0.7330

Note: The estimates are significantly different from zero at \* 10%, \*\* 5% and \*\*\* 1% significance levels.

The other two variables that are defined as dummy, namely SXH and DSCCU have positive and negative significant influence on the probability of choosing private health care units respectively. Thus, other things being equal, male headed households have higher tendencies to use private health care units for treatment at times of illness as compared to female headed households; the males' probability of choosing private facilities being 5.28 times as high as those of females'. The result obtained on the level of education, on the other hand, shows that the more a patient is educated, the less likely would be private facilities to be chosen for medical treatment. Ceteris paribus as the odds for choosing private facilities by those with education level of secondary and above is 0.24 times those of below secondary level, it means that there is a decreased chance of choosing private health care units by relatively educated patients.

Among the economic variables included in the model, while medical cost of treatment per visit (MEDC), which represents the monetary cost aspect, becomes significant determinant of the probability of choosing the private health facility for treatment, income of the patient failed to show any significant impact on the choice of health care facilities

as opposed to the general expectation and the cross-tabulation result. Based on the sign of the estimated coefficient and the odds ratio, it can be concluded that a unit rise in the medical cost of treatment increases the probability of choosing private health care units by a little more proportionately than that of public facilities (as the odds ratio is 1.02). This result, however, is not expected from the point of view of economic theory because it implies that raising medical cost of treatment raises the probability of choosing health facilities. The fact that more individuals utilize private facilities at higher cost of treatment can be attributed to the quality of health care services being provided by these facilities and their availability for urgent services.

Waiting time for treatment, i.e. the access variable that denotes the non-monetary cost of treatment, on the other hand, is observed to reduce the probability of choosing private health care facilities by a factor of 0.95 as compared to those of public facilities. That is, the higher the time patients spend at private health facilities before they get treatment, the lower would be the probability of choosing them for medical treatment.

The last two variables that are found to significantly and positively influence one's choice of where to get treatment are the subjective factors, defined as the perceived quality of treatment obtained (DPQUAL) and the behaviour of the medical staff while giving treatment (DBSTAF). In this regard, a unit change in the perceived quality of treatment and in the patients' evaluation of the behaviour of the staff members (from 0 to 1) indicates shifts in patients' ratings of the dummy quality variables from "poor to good" to "very good to excellent". Therefore, as a result of a unit change in these two subjective variables, the chances for choosing private health facilities are estimated to be more than five times as high as choosing public facilities, if all other factors are kept constant. This indicates that there is a higher chance of choosing the private than the public health service providers because of the effect of these quality variables. The study conducted in Kenya by Mwabu, et al. (1995b) also arrived at the same result.

## 5. Conclusions and policy implications

### 5.1. Conclusions

The provision of proper health care services is discussed as a major component of the drive to improve both the health status of the people and the level of economic development of a country. This paper, using primary data collected from households in Bure town, tried to examine the factors that determine the medical treatment seeking

behaviour at times of illness and the choice of health care service providers (i.e. the demand for health care services) through both descriptive and empirical analyses.

The descriptive statistics showed that out of the 400 patients that have been addressed by this study, only about 14% of them did not seek treatment while 86% sought medical treatment mainly from public and private health care units (54 and 43%, respectively). The proportions of those who attended traditional healers and practiced self treatment were very small (3%). High cost of treatment and long distance to the nearest health care facility were found to be the main reasons for not seeking treatment. But for those who sought treatment, while low cost of treatment was the principal factor for choosing public health care units, private health facilities were chosen primarily for the best quality of treatment they were providing.

Cross tabulations of households' responses against demographic, economic, access and subjective variables and analyses of the estimated empirical results generated the following major findings and conclusions.

First, the sex of the patient (being male), the length of time that the patient had been ill (which is a proxy for the severity of the illness), and the monthly income of the household were found to have a strong positive effect on medical treatment seeking behaviour but not on the choice of health care service providers. That is, males compared to females, those who have been ill for longer days and those with higher monthly income per household have higher tendency to seek treatment whenever they fall ill. However, these same factors do not seem to help in the decisions patient are taking as to which health care service provider to choose for medical treatment. It can thus be concluded that the gender of the patient and the monthly income of the family have significant roles in medical treatment seeking decisions. Females and those with low monthly income are less likely to take any medical treatment when they fall ill.

Second, the size of the household and distance to the nearest health facilities were also found to have a strong negative effect on whether or not treatment was sought but not on the choice of health facilities. According to the results obtained, the higher the number of family members in the household and the longer the distance a patient has to travel to reach the nearest health care unit, the larger will be the probability of not seeking medical treatment at all. Thus, at such small tendency for medical treatment, it would not be surprising to observe these two factors having no impact on the choice of health care facilities.



The conclusions that can be drawn from these observations are: (a) in households with larger family size the per capita income is likely to be low so that a patient in such family is less likely to seek treatment at times of illness; and (b) due to the longer distance of a health care facility from a household, the higher would be the opportunity cost incurred by other family members in transporting the patient so that the lesser would be the chance to get medical treatment.

Third, age level of the patient in years and sex of the household head (i.e. being male) were found to have a positive influence on choosing the private health facilities but not on whether treatment was sought at times of illness. Moreover, the square of the age level of the patient was also found to have a negative effect in choosing the private health facilities but not on whether treatment was sought. The same result was also found by cross tabulation. These results indicate that the probability of choosing private health care facilities increases with the increase in the age of the patient up to a certain level and then it starts to decrease afterwards. Thus, based on the results obtained for age and age square, it can be concluded that private health care services are utilized more by younger and adult patients than the older patients.

Fourth, the regression result revealed that both the level of education of the patient and the household head (i.e. being secondary level and above) have no significant impact on treatment seeking behaviour, though cross tabulation established a positive relationship. However, the education level of the patient was found to significantly and negatively affect the choice of private health facilities. Accordingly, the more the patient is educated the less likely would he be to prefer private to public health care units for medical treatment at times of illness. In this connection, one would be prompted to conclude that (a) compared to other factors the level of education plays an insignificant role in determining the treatment seeking behaviour of patients; and (b) education does not necessarily make patients choose private facilities.

Fifth, the results of the quality variables that denote the perceived quality of treatment obtained and the behaviour of the staff members while providing treatment (i.e. being very good and excellent) were found to positively affect the choice of privately provided health care services. That is, viewed in terms of the perceived quality of medical treatment and the welcoming reception of the staff, patients prefer more private health care units to government ones. It can, therefore, be noted that the quality of medical services being provided and the attitudes and behaviour of the medical team towards the patients are important factors to attract patients to a particular health care unit.

Sixth, both cross tabulation and regression analysis produced unexpected result by establishing the per visit cost of medical treatment to have significant positive impact on the choice of private health care provisions. This means that an increase in the medical cost of treatment per visit would increase the probability of choosing private health facilities. This being contrary to economic theory, one can conclude that this is a grey area which warrants more research before the result can be relied on.

Lastly, waiting time for treatment was found to have a strong negative effect on the probability of choosing private health facilities as expected. Hence, the probability of choosing private health care service providers would fall as the time patient are expected to wait before they get medical treatment increases. Hence, reducing the time patients are to stay at health care units is likely to improve the rate at which the facilities are utilized.

## 5.2. Policy implications

On the basis of the descriptive and analytical findings of this study, some policy implications can be drawn.

The age and sex of the patient and of the household head, the monthly household income, and the family size of the household are observed to significantly influence the decisions individuals are making whether to seek treatment and/or which health care facility to choose. These imply that, as the elderly and women are the most vulnerable to diseases (due to age and maternity related cases), mechanisms should be devised to enable the provision of special health care services to both these groups. In addition, the much lower treatment seeking behaviour of females than that of males implies the need to raise the awareness of women in particular and the community at large in seeking medical treatment at times of illness. Introducing appropriate family planning strategies would also be of indispensable importance in improving the general health status of the family.

Moreover, creating additional income generating opportunities that improve family income (particularly that of women), which of course is a general macroeconomic policy of most governments, is likely to raise the demand for health care services from the formal health sector, thereby improving the health status of the population at large, which in turn is the basis for the economic development of a country. However, the fact that raising the income of the people is not a task that can be achieved within a short period of time would require the supply side interventions a necessary measure to prevent the poor, the aged and the women from not being marginalized.

Reducing the distance to the nearest health care facilities, irrespective of the type of the provider, is likely to raise demand for health care services. But increasing access by constructing new health facilities alone cannot be a panacea to increase utilization because both the quality of treatment being provided (i.e., availability of sufficient medical inputs of all sorts) and the way the staff members deliver the treatment were found to be important determinants of demand for health care services. Particularly, most patients perceived public health care services to be not only of poor quality compared to their private counterparts, but also the way the medical staff at government owned health care units attend the patients are evaluated to be below the expected standard. Hence, increasing the availability of public health care facilities must be accompanied by the necessary medical inputs (such as essential drugs and medical equipment) and well trained personnel. This seems to have an important implication on the MOH's future plan to operate on cost-recovery basis. Therefore, if the Ministry at all wants to capture a greater share of patients and secure higher revenues by introducing higher user charges, it should necessarily have to improve first the quality of health care services being provided by the facilities under its control.

The average waiting time for treatment at the public health facilities was found to be about 148 minutes while it was only 23 minutes at the private ones. On the other hand, the average medical costs of treatment per visit were about Birr 24 and 83, respectively. Thus, any public policy to be structured with regards to such issues must take these discrepancies into consideration.

The contributions of the private health care service providers could not be overlooked as they are utilized by relatively large proportion (43%) of the respondents. Hence, the policy of the Ministry of Health aimed at promoting the participation of the private sector in the provision of health care services should further be strengthened by introducing various incentive schemes that would enable private facilities to expand. Not only that, the Ministry should devise mechanisms that ensure the provision of best quality health care services to the users.

To sum up, though it is difficult to generalize based on findings obtained using data from a single sample area, what looms out of this preliminary study is the need for the intervention of the government in improving the quality of health care services being provided and reducing the waiting time for medical treatment before any attempt is made to raise user fees at government health facilities, as these variables are the main determinants of demand for health care services.

## References

- Abdulhamid and Alem. (1996). "Access and Utilization of Health Care Services in Urban Ethiopia," Institute of Development Research, Addis Ababa University, (Unpublished).
- Acton, J.P. (1975). "Non-monetary Factors in the Demand for Medical Services: Some Empirical Evidence", *Journal of Political Economy*, 83(3), 595-613.
- Akin, J.S., D.K. Guilkey, and H.E. Denton. (1995). "Quality of Services and Demand for Health Care in Nigeria: A Multinomial Probit Estimation," *Social Science and Medicine*, 40(11), 1527-1537.
- Behrman and Deolalikar. (1988). "Health and Nutrition," In *Chenery, Hollis and Srinivasan, T.N., "Hand Book of Development Economics"*, Volume 1, Elsevier Science Publishers B.V., PP. 633-711.
- Deaton, A. and J. Muellbauer. (1980). "Economics and Consumer Behaviour", Chap. 2, 25-59.
- Gertler, P. and J. Van der Gaag. (1990). "The Willingness to pay for Medical Care: Evidence from two Developing Countries", *The World Bank*, 59-97
- Grossman, M. (1972). "On the Concept of Health Capital and the Demand for Health", *Journal of Political Economy*, 80 (2), 223-255.
- Hay, J.W., H. Balit, and D.A. Chiriboga. (1982). "The Demand for Dental Health," *Social Science and Medicine*, 16, 1285-1289.
- Hotchkiss, D.R. (1998). The Trade off Between Price and Quality of Service in the Philippines," *Social Science and Medicine*. 46(2), 277-242
- Kloos, H. (1998). "Primary Health Care in Ethiopia Under Three Political Systems: Community Participation in a WarTorn Society", *Social Science and Medicine*. 46 (4-5), 505-522.
- KUAWAB Consultants. (1996). "Household Demand for Health," Ethiopia Social Sector Study Report, PHRD, Office.
- Mills, A. and Gilson, L. (1988). "Health Economics for Developing Countries: A Survival Kit," EPC Publication, No. 17.
- Ministry of Health. (1998). "Health and Health Related Indicators", Addis Ababa
- Mwabu, G. and J.W. Ombi, (1995a). "User Charges in Kenya Health Services Pricing Reforms in Kenya: 1989-93" IHPP Working Paper.
- Mwabu, G., M. Ainsworth, and A. Nyamete, (1995b). "Quality of Medical Care and Choice of Medical Treatment in Kenya: An Empirical Analysis." In *Investment in Women's Human Capital*, Shultz, T.P., 214-235.
- Mwabu, G., and W.M Mwangi. (1986). "Health Care Financing in Kenya: A Simulation of Welfare Effects of User Fees," *Social Science and Medicine*, 22(7), 763-767.
- Senauer and Garcia. (1991). "Determinants of the Nutrition and Health Status of Preschool Children: An Analysis with Longitudinal Data," Reprinted from "Economic Development and Cultural Change", Vol. 39. No.2
- Varian, H.R. (1984). "Microeconomic Analysis", Second Edition, New York, London.
- World Bank. (1998). "Ethiopia Social Sector Note," Report No. 16860-ET.
- World Development Report. (1993). "Investing in Health".
- Zweifel and Breyer. (1997). "Health Economics", New York, Oxford University Press.

**Annex: Correlation Matrix of Independent Variables**

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	sx	ag	1day	luw	medc	trat	wait
sx	1.0000						
ag	-0.0110	1.0000					
1day	-0.0250	0.2074	1.0000				
luw	-0.0420	0.2288	0.8435	1.0000			
medc	-0.0731	0.1835	0.2597	0.3280	1.0000		
trat	0.0525	0.0387	0.1065	0.0914	-0.1122	1.0000	
wait	0.0316	-0.0064	-0.0069	-0.0624	-0.3015	0.1813	1.0000
dist	0.1540	-0.0016	0.1922	0.1276	-0.0055	0.6878	0.0845
hhs	0.0519	-0.1029	-0.0315	-0.0368	-0.0164	-0.1007	0.0333
inch	0.0800	-0.1266	-0.1606	0.1030	0.0618	-0.0831	-0.1146
sxh	0.2203	-0.1391	-0.0794	-0.0081	-0.0279	0.0027	-0.0360
doccp	0.2081	0.4642	0.0620	0.0218	0.1318	-0.0392	-0.0454
dpqua1	-0.0798	0.0461	-0.0808	-0.0445	0.1940	-0.0901	-0.3096
dbstaf	-0.0548	0.0454	-0.0178	0.0143	0.2377	-0.1570	-0.4846
dscu	0.1787	-0.0063	-0.0641	0.0002	0.0798	-0.0688	-0.0228
dscuh	0.0893	-0.2643	-0.1936	-0.1433	0.0478	-0.1225	-0.0185

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	dist	hhs	inch	sxh	doccp	dpqual	dbstaf	dscu	dscuh
dist	1.0000								
hhs	-0.0939	1.0000							
inch	-0.0085	0.4095	1.0000						
sxh	0.1198	0.2709	0.3292	1.0000					
doccp	-0.0565	-0.0327	0.0330	-0.0974	1.0000				
dpqual	-0.1678	-0.0745	0.0373	-0.0665	0.0341	1.0000			
dbstaf	-0.1618	-0.0832	0.0211	-0.0413	0.0280	0.4065	1.0000		
dscu	-0.1045	-0.0863	0.0563	0.0588	0.1362	0.0531	0.0210	1.0000	
dscuh	-0.0230	-0.0383	0.4270	0.2521	-0.0714	-0.0614	0.0119	0.3849	1.0000