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User Charges and Health Care Provider Choice in Cameroon

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The paper estimates the factors affecting health care provider choice in Cameroon as well as the marginal effects of these factors. The estimates enable us to establish a trade-offs between user charges and utilization of health services and to draw conclusions on the welfare implications of these charges. The data used are drawn from the second Cameroon Household Survey conducted in 2001. The appropriate functional form selected for the analysis is the multinomial probit model. The results from the regression show that, price is a significant determinant of health care provider choice in Cameroon. Also, when price was interacted with income, the variable was significant and had a negative sign indicating that individuals with lower income are more responsive to price adjustments than those with higher incomes. The results also reveal that factors such as income, perceived quality and proximity are significant determinants of health care choice in Cameroon.

1.0 Introduction

The public sector is the most important provider of health services in Cameroon and has relied on government revenues for financing these services. Budgetary shortfalls during the period of economic decline required a shift away from the general tax revenue and donor based financing of recurrent and development health expenditures respectively to one based on cost recovery. However, given that poverty is widespread, and the poor suffer disproportionately from ill health than the rich, they are likely to have been affected more in terms of reduction in access to services than the rich following the introduction of fees.

Besides, there is increasing concern about the ability of the poor to afford basic health services, and the impact of user charges on access. In particular, the implementation of user charges across Africa has produced mixed results. While equity proponents are concerned that the introduction of fees would be a financial burden to the poor and reduce their access to care (Cornia et al., 1987, Gilson 1997), others found that health care utilization has improved due to

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improvement in quality (World Bank 1987, Akin et al., 1986, Litvack and Bodart 1993). The variability in the effects of user charges on welfare can be attributed to significant flaws in the methodologies adopted for previous studies on health care demand. These include limited scope and spatial service coverage, omission of relevant variables from the regression models and sample selection bias. This study is an attempt to redress some of these problems.

The effects of user charges on access to health care have been studied widely with various data sets arriving at various conclusions. Although some of the studies show little significant effect of price on the demand for medical care, (Akin et al. 1986; Schwartz et al, 1988), many of the results are consistent with econometric findings, that demand is sensitive to price (Lavy and Germain 1994; Gupta and Dasgupta 2000 and Sahn et al, 2003). The differential responses by various consumer groups to variations in the price of health services estimated from the elasticities of income and prices of facility choice mean that user charges may not have the same impact on various income groups. The poor for example, tend to be more responsive to price changes than the non-poor for the simple reason that such changes may significantly affect their disposable incomes.

To gain an insight into the effects of user charges on access to health care services in Cameroon, this study provides a clear understanding of the determinants of health care demand and specifically the effects of price on health care demand and this should contribute to policy debates regarding the welfare consequences of user charges on health services. We estimate a model of health care provider choice conditional on reporting illness using data from the 2001 Cameroon Household Survey. The demand for health care is considered as the probability of seeking care from different health care providers conditional on being ill given the relevant characteristics of patients and providers. This study uses the multinomial probit model as an appropriate functional form for the analysis.

1.1 The Institutional and Health Policy Framework

Besides being a major provider of health services, the government of Cameroon defines the health policy and also manages the health system. The organization of the Cameroon health system distinguishes three distinct levels in the national health system namely: the central level at the top of the health system, the intermediate level, and the district level at the bottom. The health system is structured such that more care is delivered at the district level than at other levels taken separately. While this is actually the situation, health service delivery at this level is less efficient than in other levels. As a bulk of government investment on human resource formation, facilities and equipment are concentrated on health services provided at the tertiary level; the urban elite tends to be the primary beneficiaries of such investments. Since the allocation of resources does not seem to respect any established norm, about 60 percent of the Ministry of Public Health

budget is managed at the central level. The strongly centralized management system does not allow for free flow of information thus creating openings for fraud, rent seeking and inefficiency in the public health sector.

In 1999, of the 1689 health centers and 339 hospitals, the Ministry of Public Health operated a total of 1362 hospitals and health centers. A bulk of other facilities is operated by the private sector particularly facilities operated by churches. During the same year, the private sector operated 579 and 87 health centers and hospitals respectively (Ministère de la Santé Publique, Carte Sanitaire, 2001). Public and private sectors play complementary roles in the provision of health care in order to improve the supply of health care to the population in terms of quality and access. In addition to the Ministry of Public Health, a number of state-owned enterprises, the ministries of Defense, National Education and Higher Education also provide health services.

Table 1: Health Facilities, 1997-2000

Facility	1997	1999	2000
National and Provincial hospitals	15	15	15
District hospitals	212	130	130
Assimilated district hospitals	68	192	191
Integrated health centers	866	976	977
Other health centers	473	713	713
Pharmacies	229	225	237

Source: Ministère de la Santé Publique (MINSANTE), Carte Sanitaire, 2001.

During the late 1980s and until 1992, health allocations accounted for 5 percent of the total central government budgets on average. However, these allocations fell short of the 10 percent recommendation of the World Health Organization. The rapid economic growth and the priority accorded to the health sector were reflected in the expansion of the network of health structures and medical personnel. At present, there are over 40 public and private schools that train paramedical personnel in the country compared to 1970 when the Ministry of Public Health operated only two nursing schools in Bamenda and Yaounde in addition to the teaching hospital in the national capital (Ministère de la Santé Publique, 1992). The growth of health care training facilities in Cameroon has led to a substantial increase in health care personnel. Despite this increase, there is a considerable disparity in the distribution of personnel within health facilities as a bulk of them is concentrated in the hospitals serving urban and semi-urban areas.

Presently, there is a doctor per 9,764 inhabitants and a nurse for 2,214 inhabitants at the national level. In the Far North Province for example, the ratio is a doctor per every 31,102 inhabitants compared to the Center Provinces where this ratio is one doctor for 4,941 inhabitants. The number of inhabitant per nurse in that province is 6,205 compared to the national average of 2,214 (Republique du Cameroun, 2001). Even when health coverage is better, the distance to a facility is often long

and patients incur high costs of travelling to health facilities. At the national level and on average, about 29 per cent of the population covers more than 30 km from an integrated health centre to a district hospital. The present orientation of the Government's health policy towards the decentralization of the health care delivery system in addition to the increasing private role in health care delivery is expected to upgrade the quality of services and expand access to meet the rising needs for health care of the expanding population.

1.2 The 1992 Health Care Policy Changes

The Cameroon health policy has evolved significantly since the 1960. It was in 1982 that Cameroon put in place the policy of primary health care. The policy was aimed at making health care universally accessible to all individuals and to all members of the community with their full participation providing health care at a cost that the community and country could afford. The strategy put in place emphasis on primary health care and on the participation of the beneficiary communities in co-financing and co-management of health care facilities (Ministère de la Santé Publique (MINSANTE), 1992). The government's health policy reforms emphasis equity, increased access to health services, better quality, availability of generic drugs, and the fight against infectious diseases.

The reforms introduced user charges in government health facilities so as to raise more resources for the provision of health services. A number of laws were signed that enabled substantial portions of the revenue collected to be retained at the site of collection, which can help to remedy budget cuts and enable the facilities to satisfy local needs in drugs rather than deposit in the central treasury as was the case before the reforms. The desire and determination of the government to improve health care has been clearly stated in its health policy papers and the conditionality framework for the heavily indebted Poor Countries (HIPC) Initiative which noted that improved access and quality to health is an important component of the global strategy to fight poverty. This forms an important building block of the Interim Poverty Reduction Strategy Paper (IPRSP) (Republic of Cameroon 2003).

The rest of the paper is organized as follows: A review of the literature is done in section 2. Section 3 discusses the methodology used for the study as well as the data types. Section 4 presents the empirical results and findings. Section 5 presents the summary and conclusion of the study.

2.0 Review of Previous Studies on health care provider choice

The implementation of user fees in many developing countries is closely related to the structural adjustment policies initiated to address the severe economic recession of the 1980s (Chawla and Ellis 2000; Mariko 2003). User charges refer to out-of-pocket payments at the time of utilization of a service such as health care (Arhin-Tenkorang 2001). These payments include the opportunity costs of the patient's time in terms of lost wages for paid and unpaid work, transportation costs

and other costs that the patient and the accompanying relatives and friends incur for food and lodging add to the overall costs of seeking treatment. In order to assess the overall impact of costs on access and equity, all these costs need to be accounted for. Unfortunately, most of the data available in developing countries do not possess all these information.

Access to health care has been viewed as a basic right for the individual (Gottret and Schieber 2006), and as a result, most developing countries have extensively used public resources to support health systems (Gupta and Dasgupta 2000). However, because of the recession in the 1980s and early 1990s, there was a decline in the resources available for financing publicly provided services. It was within this backdrop and the exigencies of the Structural Adjustment Programs that user charges were introduced to supplement government budgetary resources (Gupta and Dasgupta 2000; Arhin-Tenkorang 2001; Gottret and Schieber 2006). Furthermore, charging consumers for services provided by the state was believed to raise resources to improve access to health services (Akin et al. 1986; Griffen 1988; Litvak and Bodart 1993; Jimenez 1995). Also, charging a price for publicly provided services could stimulate price competition between the private and the public sectors leading to an increase in the efficiency of the overall health care delivery system.

Most of the studies especially the early studies in the developing countries (Akin et al 1986; Dor et al; 1987; and Gertler et al; 1987) are within the context of user fee policy which requires households to contribute to the financing of health care provision by paying for services provided in public facilities. These studies seek to determine the potential capacity of user charges to increase revenue and improve the quality of health services provided in public facilities.

The empirical literature has given rise to two conflicting sets of results. The first set of studies that examine the demand behavior of health seekers in developing countries following the introduction of fees in public health facilities find the demand for health to be inelastic with respect to price and income (Heller 1982; Akin et al. 1986; Birdshall and Chuhan 1986). These early results contrast sharply with evidence from more recent studies by (Dor et al. 1987; Gertler et al 1987; Gertler and van der Gaag 1990; Mwabu et al. 1993; Mwabu, Ainsworth and Nyamete 1993; Mwabu and Wang' ombe 1994; Bolduc et al. 1996; Dow 1995; Sahn et al. 2003). These authors use estimates from model specifications that differ from those used for the early studies to report statistically significant price elasticities. However, the econometric methodologies as well as the results on the price and income variables have differed widely making general policy implications difficult and inconsistent.

Although the inelastic price elasticities in the early studies were attributed to several flaws in the econometric methods and the specification of the price variable, evidence from more recent studies based on more sophisticated model specifications and estimation techniques also find the demand for health care to be

inelastic with respect to price. These recent studies use models that assume an interaction between price and income as well as the role of quality as a key variable in the demand equations. These studies essentially were carried out in Mali by Juillet (1999) in Niger by Chawla and Ellis (2000) and in Bamako Mali by Mariko (2003).

A bulk of the recent studies that assume the interaction of the price and income variables have found the demand for health care to be inelastic with respect to price (Mwabu et al. 1993; Dow 1995; Gupta and Dasgupta 2000). Other studies have focused on the impact of quality on demand rather than prices. These studies have shown that it is indeed the quality of services provided that has a large effect on the choice of health care providers (Litvack and Bodart 1993; Chawla and Ellis 2000; Mariko 2003; Sahn et al. 2003).

3. Methodology and Data

3.1 Theoretical Model of healthcare provider choice

The model proposed for this study is based on the assumption that an individual selects a health care provider conditional on having reported illness or injury during the two weeks prior to the survey. We estimate the probability that the individual actually selects a given health care provider. The specification used is the multinomial probit model with three provider alternatives: self-medication, care at public facility, and care at a private facility. The model follows Gertler, Locay and Sanderson (1987).

The model assumes that the individual derives utility from consumption of both health and non-health goods. Given the three provider options, a patient will choose the provider alternative, which yields the highest utility. The conditional utility that individual *i* derives from provider *j* is given by the following expression

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

where, H_{ij} is the improvements in health status of the individual who gets treatment from provider *j*; C_{ij} is consumption expenditure on goods other than health care after choosing health care provider *j*. The improvement in health status H_{ij} is a function of individual and provider characteristics Z as follows:

$$H_{ij} = Q(X, Z_j) + \varepsilon_j \qquad (2)$$

The net income of the individual after paying for health care services is a function of the individual's income Y and the price P. The price represents payments made to obtain care from the j facility and these include both direct and indirect costs such as travel and waiting time. Thus consumption is specified as:

$$C_{ij} = c(Y_i - P_j) \quad (3)$$

where, p_j is the total price for using provider *j* and consists of treatment cost paid by the individual to the jth provider and the travelling costs or the opportunity cost of time incurred by the individual when seeking care from the jth provider while, Y_i is the share of the individual in the household budget. The utility that a person derives from choosing alternative j now becomes:

$$U_{ij} = c(Y - P) + Q(X, Z_j) + \varepsilon_j \quad (4)$$

where $(Y - P_j)$ is net income after paying for health care in alternative j. The variable X represents a set of individual variables that do not vary with the discrete choice; Zj is a set of choice specific variables. The function Q(X, Zj) represents the quality of provider j and is a function of the provider characteristics as well as individual characteristics. Utility thus depends on the quality of health care received and the consumption of other goods $(Y - P_j)$.

The coefficients of the individual variables are allowed to vary across alternatives. Based on the specification of Sahn et al., (2003), the functional form for prices and income is quadratic in the logs of net income expressed as:

$$c(Y - P_j) = \alpha_1 \ln(Y - P_j) + \alpha_2 [\ln(Y - P_j)]^2 \quad (5)$$

where, αs are equal across alternatives. This specification constraints the marginal utility of income to be the same across alternatives.

Sahn et al; (2003) further develop the right hand side of equation (5) so that the function becomes:

$$c(Y-P_j) = \alpha_1\{\ln(Y) + \ln(1-P_j/Y)\} + \alpha_2\{\ln(Y)^2 + 2\ln(Y)\ln(1-P_j/Y) + \ln(1-P_j/Y)^2\} \quad (6)$$

Approximating ln(1-Pj/Y) by – (Pj/Y), we further develop equation (6) into the following:

$$c(Y - P_j) = \alpha_1\{\ln(Y) - P_j/Y\} + \alpha_2\{\ln(Y)^2 - 2\ln(Y)(P_j/Y)\} \quad (7)$$

In the above specification, only $\ln(Y)$ and $\ln(Y)^2$ are constant across provider alternatives. The logit identifies only differences in utilities, by taking the difference $U_j - U_0$ where U_0 is a reference utility or utility from self-medication in the case of this study. Actually the quality of self-medication is normalized to zero. After taking the difference in utilities, we obtain:

$$U_{ij} = \beta_{1j} X_i + \beta_{2j} Z_j + \alpha_1(-P_j / Y) - \alpha_2[2\ln(Y)(P_j / Y_j)] + \varepsilon_{ij} \quad (8)$$

3.2 The Multinomial Probit Model

The demand for a provider is the probability that the utility from that provider is higher than the utility from any other alternatives. The demand function takes the multinomial probit form which relaxes the Independence of Irrelevance Alternatives property (McFadden 1981) by allowing the errors to be correlated with each other. The multinomial probit model allows the errors to be correlated with each other.

The utility that an individual obtains from choosing a particular provider alternative j can be represented as:

$$U_{ij} = V_{ij} + \varepsilon_{ij} \quad (9)$$

where, $V_{ij} = Q(X_i, Z_j) + c(Y_i - P_j)$, is the deterministic utility, and is expressed as a sum of a systematic component that depends on the attributes of the provider alternatives and individual characteristics and a stochastic component that represents the influence of unobserved factors on an individual's choice.

Since our choice set is limited to three provider alternatives, we shall follow a framework originally proposed by Hausman and Wise (1978) to propose a multinomial probit model for three-choice setting. We assume that the individual chooses the alternative, which yields the greatest utility. The probability that individual i choose the first alternative is given by

$$P_{i1} = \Pr\left[(V_{i1} + \varepsilon_{i1} > V_{i2} + \varepsilon_{i2}) \quad \text{and} \quad (V_{i1} + \varepsilon_{i1} > V_{i3} + \varepsilon_{i3})\right] \quad (10)$$

$$P_{i1} = \Pr\left[(\varepsilon_{i2} - \varepsilon_{i1} < V_{i1} - V_{i2}) \quad \text{and} \quad (\varepsilon_{i3} - \varepsilon_{i1} < V_{i1} - V_{i3})\right] \quad (11)$$

Since we are actually concerned with differences between disturbances, we define $\varepsilon^*_{i,21} = \varepsilon_{i2} - \varepsilon_{i1}$ $\varepsilon^*_{i,31} = \varepsilon_{i3} - \varepsilon_{i1}$ and both have a bivariate normal distribution $V^*_{i,12} = V_{i1} - V_{i2}$ and $V^*_{i,13} = V_{i3} - V_{i3}$. The joint distribution for the $\varepsilon^*_{i,j1}$ will be bivariate normal allowing us to write the probability that individual *i* will choose alternative 1 as:

$$P_{i1} = \int_{-\infty}^{\frac{V_{i1}-V_{i2}}{\sqrt{\sigma_1^2+\sigma_2^2-2\sigma_{12}}}} \int_{-\infty}^{\frac{V_{i1}-V_{i3}}{\sqrt{\sigma_1^2+\sigma_3^2-2\sigma_{13}}}} \phi(\varepsilon_{21,}\varepsilon_{31;}r_1)d\varepsilon_{21}d\varepsilon_{31} \quad (12)$$

With ϕ being the standardized bivariate normal distribution and r_1 being the correlation between $\varepsilon^*_{i,21}$ and $\varepsilon^*_{i,31}$. We can equally obtain similar expressions for P_{i2} and P_{i3}. In order to simplify the exposition, we define:

$$V^{*}_{i,12} = \frac{V_{i1} - V_{i2}}{\sqrt{\sigma_1^{\,2} + \sigma_2^{\,2} - 2\sigma_{12}}} \tag{13}$$

This allows us to obtain similar definitions for $V_{i,jk}$. Thus our earlier expression for P_{i1} can be written as follows:

$$P_{i1} = \int_{-\infty}^{V^{*}_{i,12}} \int_{-\infty}^{V^{*}_{i13}} \phi(\varepsilon^{*}_{i,21}\varepsilon^{*}_{i,31}; r_1) d\varepsilon^{*}_{i,21} d\varepsilon^{*}_{i,31} \tag{14}$$

where ϕ is the standardised bivariate normal distribution and r_1 is the correlation between $\varepsilon^{*}_{i,j1}$ and $\varepsilon^{*}_{i,31}$. P_{i2} and P_{i3} can be expressed similarly and the multinomial probit model can be estimated by maximum likelihood once the covariance matrix of the error term is specified.

The estimation of the multinomial probit model has been a difficult empirical problem since the choice probabilities often require the evaluation of high dimensional normal integrals particularly when the number of alternatives $J > 3$. McFadden (1989) and Pakes and Pollard (1989) have proposed solutions to the dimensionality problem. The solution consists of replacing the multi-fold normal integral with a smooth (asymptotically) unbiased efficient simulator computed from an underlying latent variable.

3.3 Sources of Data, and Definition of Variables

3.3.1 Sources of Data

The data employed for the study is drawn from the second Cameroon Household Survey (ECAM II). ECAM II conducted in 2001 by the National Institute of Statistics with the support of the World Bank is a multipurpose household survey covering all 10 provinces of Cameroon. The survey was conducted in both urban and rural areas using a sample of 12,000 households of which 10,922 were actually visited. The survey was designed to measure socio-economic factors relevant to the standards of living.

Health care provider choice analysis is based on the sub sample of individuals who reported illness and sought medical care over the two weeks immediately preceding the interview. Information collected included many socio-economic variables relevant to demand for medical care such as income, family size and education.

3.3.2 Variables of the provider choice model

The dependent variable is the probability of seeking care from different providers conditional on illness, given the relevant characteristics of the individual and the health care provider. The self-medication option captures those who reported illness but did not seek any form of formal care and those who resorted to traditional healers. The various providers have been regrouped into three alternatives for the purpose of the econometric estimation, namely: 1) public health facility, 2) private facility and 3) self-medication (traditional healers and self-care).

The vectors of individual characteristics include age, gender, education, consumption per capita which is a proxy for household per capita income, household size, and illness severity. This study uses total monthly per capita consumption of household normalised by the number of adults in the household as a proxy for total monthly per capita income of household members. For the attributes of the provider alternative, the relevant explanatory variables of provider alternatives include; (1) the price paid for health services provided by provider j, (2) price squared, (3) a price/income interaction term, (4) proximity to the different providers 5) quality which is represented by the variable. The model examines the influence of price, not only as a separate argument in the utility function, but as naturally interacting with income. Thus the response to price of health care demand is regarded as closely related to the income of the individual.

4.0 Determinants of Health Care Provider Choice

4.1 Descriptive Statistics

Before we discuss the empirical results, we briefly discuss features that characterize our data. The summary statistics relating to some of the variables that were used for estimating the provider choice model are presented in table 2 below. The number of households considered in the estimation was 10,922. The mean values as well as the standard deviations are based on only those who actually sought treatment as distinct from those who did not. The socio-economic variables used were per capita income of individuals, gender, age, and the educational level reported by the individual. The facility type variables used in the estimation exercise are fees, proximity and perceived quality.

Thirteen percent of those who reported illness or injury visited hospitals, 36 percent went to public health centers, 15 percent visited for-profit clinics, 17 percent visited facilities owned by churches and 18 percent visited traditional healers. The average age in the sample was 42 years and the majority of those interviewed had primary school education. The mean consultation fee is FCFA 858 and the mean monthly per capita consumption per individual is FCFA 43,415.

Table 2 Descriptive of variables in the Estimation

Variables	Mean	Standard Deviation	Minimum	Maximum
Hospital	0.1320	0.3385	0.0000	1.0000
Public health centre	0.3625	0.4807	0.0000	1.0000
Private clinic	0.1511	0.3582	0.0000	1.0000
Mission clinic	0.1716	0.3771	0.0000	1.0000
Traditional healer	0.1828	0.3865	0.0000	1.0000
Age (years)	42.8996	15.053	13.000	98.000
Gender (male)	0.7563	0.4296	0.0000	1.0000
Education (level)	5.9554	1.7850	1.0000	7.0000
Price	858.028	306.39	734.30	12,732.30
Income (monthly)	43, 415	58, 535	1034.32	2,350,000
Household size	5.1341	3.5223	1.0000	38.000
Urban	0.4524	0.4524	0.0000	1.0000
Sample size		10 922		

Source: Constructed with data from the second Cameroon Household Survey, 2001

Table 3 below contains the results from multinomial probit model specification for three alternatives respectively and Table 4 presents the marginal effects for each variable in the multinomial probit estimation calculated at the mean of each of the variable. These results will be discussed in the section that follows.

4.2 Empirical Results

The relative sizes of the coefficient estimates of the independent variables have limited information so that only their signs and level of significance are relevant. On the other hand, the influence of an independent variable can be evaluated by the size of its marginal effect. The marginal effect is a measure of the instantaneous effect that a change in a particular explanatory variable has on the predicted probability of the dependent variable. The larger the marginal effect, the larger the impact of an independent variable on the probability of an individual choosing a health provider alternative in response to a change in the independent variable. The marginal effects are calculated at the means of all the independent variables and as the average effects in the choice probability of health care facility choice conditional on the unobserved attributes of the facility.

Table 3 Multinomial Probit Estimation Results

	Public Facility		*Private Facility*	
Variables	*Coefficient*	*Z-Value*	*Coefficient*	*Z-Value*
Gender	-0.24564	-4.63	-0.33169	-6.04
Age	0.00429	0.55	0.00463	0.57
Age Squared	-0.00003	-0.33	0.00002	0.22
Education	0.05074	9.02	0.07593	12.91
Household Size	0.07089	9.02	0.03287	3.97
Price	- 0.00213	-10.00	-0.00221	-11.53
LnConsumption	0.15807	0.22	2.78894	3.86
LnConsumption. Squared	0.02106	0.75	0.11873	4.16
Price*Consumption	-0.00014	-9.22	-0.00015	-10.46
Illness Severity	0.00089	0.01	0.11490	1.39
Location (Urban = 1)	0.19522	3.98	0.41641	8.17
Proximity	1.39950	25.26	1.01485	17.26
Quality	1.49464	23.84	1.50021	23.38
Constant	-1.97655	-0.44	15.16685	3.32
No. of observation	10960.00			
Wald chi2 (26)	1895.08			
Log Likelihood	-10014.50			
Prob>chi2	0.0000			

Source: Estimates based on data from the second Cameroon Household Survey, 2001
* Self-medication is the base outcome

The results show that the age of the individual is not a significant determinant of where to seek treatment following an illness episode. The coefficient of education in the multinomial probit model is significant at 1 percent and is an important determinant of health care provider choice in Cameroon. The results also suggests that an increase in the level of education by one unit increases the probability of seeking health care from public facility by 0.05 percent and correspondingly increases the probability of choice of private facility by 1.04 percent. Thus education exhibits a positive effect on the choice of formal care relative to self-medication. The effect is greater for private facility than for public facility.

The sign on the gender variable in the multinomial probit model is positive and this indicates that females are in general terms more likely to seek care in the formal sector than males. While we would expect individuals from larger households to be less likely to seek for medical treatment because of the competition for resources in the household, this study finds the coefficient of the household variable to be positive and significant in the choice of public and private facilities. This result

suggests that an increase in household size by one unit increases the probability of treatment in a public facility by 1.6 percent and 0.6 percent in a private facility.

Table 4: Estimation Results of Multinomial Probit Model (Marginal Effects)

Variable	Pr(choice=public)= 0.5344		Pr(Choice= private) =0.3395	
	dy/dx	Z-Statistics	dy/dx	Z-Statistics
Gender*	-0.00283	-0.24	-0.03987	-3.49
Age (Years)	0.00033	0.18	0.00038	0.22
Age Squared	-0.00001	-0.62	0.00001	0.58
Education (By level)	-0.00053	-0.43	0.01043	8.80
Household Size	0.01458	8.39	-0.00572	-3.42
Price/consultation cost	-0.00618	-4.27	-0.00017	-4.90
LnConsumption	0.53582	3.70	0.74016	5.51
LnConsumption Sq.	-0.01847	-3.25	0.02851	5.43
Price*Consumption	-0.00001	-4.12	-0.00001	-4.02
Illness Severity*	-0.02416	-1.34	0.03209	1.84
Urban*	-0.02856	-2.59	0.07458	7.07
Proximity*	0.18520	15.61	-0.03287	-2.82
Quality*	0.10508	9.05	0.07945	7.05

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Source: Estimated using data from the second Cameroon Household Survey, 2001

The price of health services is a significant determinant of health care provider choice in Cameroon. The coefficient of the price variable is significant at 1 percent and is negative as expected. The implication is that at higher prices, the health seeker will choose a public facility over a private facility but will choose self-medication over public and private facility respectively. Thus it is economically and theoretically plausible to expect the cost of consultation to be a hindrance to health care utilization. As suggested by the marginal effects, an increase in price by one unit decreases the probability of the choice of a public facility and private facility by 0.6 percent and 0.02 percent respectively.

If perceived quality was taken into consideration, individuals will choose public over private facility and private facility over self-medication. The choice of a facility based on how individuals perceive the quality of services provided increases treatments in public facility by 10.5 percent and correspondingly increases the probability to seek treatment from private facility by 8.0 percent. The strongly significant impact of perceived quality in our regression results strongly supports the view that the impact of the cost of consultation on health care demand can be offset by higher quality.

The results also show that the interaction term of price and income is statistically significant at 1 percent and with a negative sign indicating that, over the range of

prices observed, members of different income classes or groups do respond differently to price. As the results of the multinomial probit estimations show, the choice of health care provider is much more sensitive to price for low income groups of patients than for higher income groups and this is in line with findings from previous studies.

The results also show that even in the absence of user charges, the proximity of the health facility to the patient is a significant determinant of health care provider choice indicating that the closer the patient is to the facility, the more likely that health care services will be solicited from that facility over other alternatives with a probability of 18.5 percent and 3.0 percent for public and private facilities respectively. This indeed implies that access to services might be greatly impeded if the patient does not live closer to a health care facility.

The location of the patient given in our estimates is a dichotomous variable which assumes the value of 1 if the patient resides in an urban area and 0 otherwise. The coefficient is positive and is statistically significant implying that an urban resident is more likely to seek care from the formal sector on one hand and from public as well as private providers on the other hand than one residing in the the rural area. This is consistent with the view in the developing countries that households living in urban areas where a bulk of health services are located have more access to care than those living in rural areas where access is likely to be limited due to the lack of financial means or spatial distribution of service providers.

Estimates in Table 3 indicate that the logarithm of consumption is significant in the choice of private providers indicating that patients from richer households tend to opt out of other sectors to the private sector where care is assumed to be of higher quality and is more expensive. The overall results on the income variable show that with higher revenue, individuals will choose private over public facility and public facility over self-medication.

All the estimated parameters of the variables included in the multinomial probit model are consistent with economic theory. The findings suggest that households with higher incomes are more likely to seek medical treatment from facilities providing formal care such as public and private clinics than poorer households. The findings also reveal that more educated households are more likely to seek medical care from public and private facilities when they are sick. It is in conformity with expectation that the price of health care and proximity are significant determinants of access to health facilities.

5.0 Summary and Conclusion

The negative impact of user charge policy on access and most particularly for the poor renders it a controversial policy option for the government within the context of poverty reduction and achievement of the Millennium Development Goals. The

greater participation of the population in the financing of the health care system as envisaged by the reforms has negative consequences on households with low incomes. In addition, the quest for an increasing role of the market in the financing of the health system can be detrimental as markets cannot adequately address the problem of inequity in access. In order to ensure that these charges do not cut access, there is a need for adequate implementation of exemptions policies that work for the poor.

The study has shown that perceived quality is an important determinant of health care provider choice in Cameroon. Patients evaluation of quality based on how they perceive the services provided as is the case in this study can provide a very useful tool for guiding policy on issues concerning the financing of quality health service in the country.

The analysis of the estimates from the provider choice models in a general view suggests that the cost of consultation is an important determinant of health care provider choice in Cameroon. Also, the interaction term of consumption and price indicates that lower income groups will be more affected by price increases than those with higher incomes. The implication of this result is that if the impact of user charges on the poor were to be minimized, people who can afford to pay should be charged and fee relief be provided to the poorest people to increase their utilization of health care services.

In further analysis however, there should be an adequate distinction between the socioeconomic groups in order to assess specific evidence of the impact of user charges on various groups. In addition to the out of pocket payments for health services, other components of costs such as transportation, time costs and costs of drugs need to be taken into consideration in studies of health care provider choice.

Reference

Akin, J., Griffin, C. Guilky, B. M., and Popkin, B. M. 1986. “The Demand for Primary care in the Bicol Region of the Philippines”, *Economic Development and Cultural Change*, Vol. 34, No. 4, pp. 755-782.

Arhin-Tenkorang, D. 2001. “Mobilizing Resources for Health: The Case for User Fees Revisited”. *Working Paper* No. 81. Cambridge MA: Centre for International Development.

Birdsall N., and Chuhan P. 1986. Client Choice of health treatment in rural Mali. Population and Human Resources Department World Bank, Washington DC,

Bolduc D., Lacroix G., Muller C. 1996. The Choice of Medical Providers in Rural Benin: A Comparison of Discrete Choice Models. *Journal of Health Economics*, Vol. 15, no.4, pp. 477-498

Ntembe

Chawla, M. and Ellis, R. 2000. “The impact of financing and quality changes on health care demand in Niger”. *Health care Policy and Planning*; Vol. 15, No. 1 pp. 76-84

Cornia G., Jolly R., Stewart F. 1987. Adjustment with a Human Face: Protecting the Vulnerable and promoting growth, Oxford, Clarendon Press.

Dor, A., Gertler, P. and van der Gaag, J. 1987. “Non-Price Rationing and the Choice of Medical Care Providers in Rural Cote d’Ivoire”, *Journal of Health Economics*, Vol. 6, 291-304.

Dow, William. 1995. “Discrete choice Estimation of Price-Elasticities: The Benefits of a Flexible Behavioural Model of Health Care Demand”, Rand Labour and Population Program, *Working Paper Series*, 95-20/DRU-1232-RC.

Gertler, P. Locay L. and Sanderson, W. 1987, “Are User Fees Regressive: Welfare Health Care in Peru”, *Journal of Econometrics*, Vol. 36, No. 33 pp. 67-88.

Gerlter, P. and Van de Gaag, J. 1990, The Willingness to Pay for Medical Care: Evidence from two Developing Countries*.* Baltimore; MD: John Hopkins University Press.

Gilson L. 1997. "Lessons of user fee experience in Africa", *Health Policy and Planning*, Vol. 12, No. 4 pp. 273-285

Gottret, P. and Schieber, G. 2006. Health Financing Revisited. A Practioner’s Guide. The World Bank, Washington, D.C.

Griffen C. C. 1988. “User Charges for Health Care in Principle and in Practice”. *EDI Seminar Paper*, No.37, World Bank, Washington D.C.

Gupta I. and Dasgupta P. 2000. Demand for Curative Health Care in Rural India. Choosing between Private, Public and No Care. Institute of Economic Growth, University Enclave Delhi.

Hausman, J. and D. Wise. 1978. “A Conditional Probit Model for Qualitative Choice: Discrete Decisions Recognizing Interdependence and Heterogeneous Preferences.” *Econometrica* Vol. 46 No. 2 pp. 403-26.

Heller, P. S. 1982. “A Model of Demand for Medical and Health Services in Peninsular Malaysia”, *Social Sciences and Medicine*, Vol. 16, No. 3 pp. 267-84.

Jiminez E. 1995. Human and Physical Infrastructure: Public Investment and Pricing Policies in Developing Countries. in T. N. Srinivasan and J. Behrman, (eds), *Handbook of Development Economics*, Vol. 3, Amsterdam: North Holland Press

Juillet A. 1999. « L’impact des tarifs des services de santé et des revenues sur les décisions de recours aux soins des maladies a Bamako. *Revue d’Economie du Développement »*, No. 4, pp 69-89.

Lavy, V., and Germain J. M. 1994. “Quality and Cost in Health Care Choice in Developing Countries”. *Living Standard Measurement Study Working Paper* No. 105, the World Bank.

Litvack, I.J. and Bodart C. 1993. “User Fees Plus Quality Equals Improved Access to Health Care: Results of a Field Experiment in Cameroon” *Social Science and Medicine*. Vol. 37, No. 3, pp. 369-383.

Ntembe

Mariko, M. 2003. “Quality of Care and the Demand for Health Services in Bamako, Mali, the specific role of structural, process, and outcome components”, *Social Science and medicine* 56, No. 6 pp. 118-1196.

McFadden, D. 1989. “A Method of simulated moments for estimation of discrete response models without numerical integration”. *Econometrica*. Vol. 57 pp: 995-1026

McFadden, D. 1981. “Econometric Models of Probabilistic Choice”, in Manski, C. and McFadden, D. (Eds), Structural Analysis of Discrete Data*:* With Econometric Applications MIT Press, Cambridge, MA.

Ministère de la Santé Publique (MINSANTE). 1992. Déclaration de Politique Sectorielle de Sante, Yaounde

Ministère de la Santé Publique (MINSANTE), DEPI. 2001. Carte Sanitaire, Yaounde Cameroun.

Ministère de la Santé Publique (MINSANTE). 2002. Stratégie Sectorielle De Santé, Yaounde

Mwabu G. M. and Nwangi W. 1986. “Health Care Financing in Kenya: A Simulation of Welfare Effects of User Fees”. *Social Science and Medicine*, Vol. 22, No. 7, pp. 763 – 767.

Mwabu, G. M., Ainsworth M., and Nyamete A. 1993. “Quality of Medical Care and Choice of Medical Treatment in Kenya: An Empirical Analysis”. *The Journal of Human Resources*, Vol. 28, No. pp. 838-862.

Mwabu, G. M., and Wang ‘Ombe J. 1994. “Health Services Pricing Reforms in Kenya, 1989-1993” Washington, D.C., *International Health Policy Program*, the World Bank.

Pakes, A., and D. Pollard (1989). “Simulation and Asymptotics of Optimization Estimation,” *Econometrica*, Vol. 57, No. 5 pp. 1027-1057.

Republic of Cameroon. 2003. Poverty Reduction Strategy Paper (PRSP), Yaounde.

Sahn, D. E., Younger, S. D., and Genicot G. 2003. “The Demand for Health Care Services in Rural Tanzania”, *Oxford Bulletin of Economics and Statistics*, 65, 2, 0305-9049.

World Bank.1987. *Financing Health Services in developing countries*. *An agenda for reform*, Washington, D.C.