Estimating the willingness to pay for community health prepayment schemes in rural area: A case study of the use of contingent valuation surveys in centre Cameroon.

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Abstract

Measure of willingness to prepay were conducted using a bidding game techniques on 471 rural households in the center region of Cameroon. Our statistical results shows that: 21% of the respondents were willing to prepay at mean CFA F 4800/person/year with a mean of 5995 while 31% were willing to prepay CFA F 6000/person/year with a mean of 6025, 9% the amount of CFA F 7200/person/year and 39% CFA F 8400/person/year. The analysis of the whole sample suggests that the mean value of the willingness to prepay is equal to CFA F 7230/person/year with a median of CFA F 6000/person/year.

In a second step analysis, our econometric results based on ordered probit model of willingness to prepay determinants suggest that some attributes such as the level of revenue, the gender, the habit of frequenting the health service center, the associative experience, the household health status, due to the respondents and, attributes such as the availability of the basic drugs at the health service center and the regular or periodical attendance of the physician at the health service center due to the health service centers have a significant impact on the willingness to prepay value.

The results of this study suggest that it is possible to do a contingent valuation survey among a very poor population and obtain reasonable, consistent answers. There does not appear to be a major problem with starting point bias. From this research we cannot, of course, judge whether individuals in the villages would in fact pay the amounts they indicated in the survey if the NGOs tried to collect the money. Nevertheless, we believe that the preliminary results of this research strongly suggest that contingent valuation surveys are feasible method for estimating individual's willingness to prepay for improved health accessibility in rural Cameroon. This has important policy implications for rural health prepayment scheme projects because it seems to show that going into a village and conducting a relatively simple survey can yield reliable information on the population’s willingness to prepay for improved health care accessibility in the rural area. The implication of these preliminary research findings are not, however, limited to the rural health sector. Our research suggests that contingent valuation surveys may prove to be a viable method of collecting information on individual’s willingness to prepay or pay for a wide range of public infrastructure projects and public services in developing countries.
Introduction

Cameroon has recorded excellent economic performances which have been revealed by an annual growth rate of about 7% during the first two decades which followed its political independence. These performances have enabled this country to equip with sanitary infrastructures. However, economic difficulties becoming untenable since the beginning of the 1980s, have necessitated political reforms implemented by the World Bank and the International Monetary Fund. The steps have imposed among others, the disengagement of government and the reduction of public expenses.

Contrarily to theoretical predictions, the CFA franc devaluation which has taken place in 1994, has not reduced poverty in Cameroon in general and particularly, in rural areas (Republic of Cameroon, 2000). It has been estimated that the incidence, the intensity and the seriousness of poverty has risen in Cameroon during the last decade; meaning not only that poverty is generalized, but it is also equally very deep and serious. Poverty is considerable in all rural areas. In 2001, 50.5 percent of Cameroonians were poor. That’s about 6.217058 million individuals.

In rural areas, poverty has now become more widespread, so that by 2001, 56.7 percent of poor households were in rural areas. The adjustment measures, even those not targeting them directly, implemented by the Government had serious repercussions on rural inhabitants. For example, the reduction of earning income among civil service employees and workers in the formal private sector caused a decline in both the demand for foodstuffs produced by rural inhabitants and family income transfers to them.

In Cameroon, the Well-being of poor and vulnerable households is essentially based on good health. The low capacity of households to pay for health care has pushed them to look for other solutions. It is now common from all treatments or practice auto-medication with drugs traditionally made or to turn towards traditional doctors. Likewise, Facing budgetary difficulties, the state has implemented a policy of recovering the costs of health services. In fact, there is no problem applying this policy, if it is accompanied by an amelioration or improvement of these services in terms of quality (Diop, 1994; Schneider et al, 2000; Griffin, 1998). However, in developing countries like Cameroon, household groups with low revenue tend to reduce substantially their demand (Shepard, 1992; Schneider et al, 2000).

The state of Health take a great place among the Well-being indicators, in the development process of every country. Health can be appreciated not only as indicator of economic development, but also as a form of human Capital. As indicator of economic development, health helps to appreciate the success or the failure of a country in its attempt to procure necessary life means. As a form of human
capital, it is an important element of future development of a country. Health is also an indicator of human poverty.

Cameroon has a long standing tradition of charging user fees for health services and drugs which have a discernible detrimental impact on utilization by the rural population. According to the 2002 Cameroonian living conditions and poverty profile report (Republic of Cameroon, 2000) utilization of primary health care services dropped significantly. Among the individual reporting that they were ill in 2001, less than half (48.7 percent) were able to secure medical attention, while among the poor and most vulnerable populations, only 36.1% were attended to at a formal health service. As to household health expenditure, the amount spend annually per person is CFAF 13,000: CFAF 5,600 per person in poor households compared to 37,000 CFAF in other households (DSCN, 2002).

It is widely recognized that rural risk-sharing scheme such as prepayment for future consumption of health services, are really capable of raising significant amounts of revenue for health sector or to enhance equity in health care access (Atim, 1999; Schneider et al, 2000). Therefore, community initiatives to generate health care financing through voluntary prepayment schemes are an option for promoting equity of access to quality health services for the rural population in the Centre Region of Cameroon.

The main objective of this study is to appreciate the real possibilities of poor households for the community pre-payment of health care services which will be done by assessing the willingness to pay of the households and identifying the determinants of the willingness to pay.

2- Existing empirical literature on health prepayment schemes in Africa

2.1 Voluntary and non-profit health pre-payment systems.

The last decade there has been a growing interest in the introduction or expansion of solidarity-based health care financing schemes in Africa (Abel-Smith, 1986; World Bank, 1987, 1993; Vogel, 1990a, b; Shepard et al, 1992; WHO, 1993; Ahrin, 1995 and Schneider et al, 2000). The reasons invoked for encouraging health care pre-payment schemes are its potential for raising additional and stable revenue to fund cost of health care prevision, its capacity to reduce financial barriers to health care utilization and its redistributive effects (Schneider et al, 2000).

There is evidence that the introduction of national compulsory health financing schemes in Sub-Saharan Africa is neither an equitable nor efficient financing policy option in contexts where only a small part of the population in many cases formal sector employees would be covered. Vogel has carried out an overview of health financing systems in 23 countries in Sub-Saharan Africa and concluded that they
did not promote greater equity in access to health services by the poor (Vogel, 1990b). Moreover, the forms of health financing adopted do not encourage efficiency in a context where these systems often are heavily subsidized by general taxes. Gruat confirmed this assessment when analyzing the trends and problems with social security schemes in Africa (Gruat, 1990).

There has been a growing literature on voluntary non-profit health pre-payment schemes in recent years, attesting to increasing academic and policy interest in this area. This interest has been propelled in part by recognition that user fees adversely affect important health care policy goals of equity and extension of access to the poor (Gilson, 1988; De Bethume et al., 1989; Waddington and Enyimayew, 1989; Abel-Smith, 1993; Criel, 1998; Schneider et al, 2000).

De Ferranti (1985) examined the feasibility of payments by users of health services in Africa. His paper foreshadowed the new directions in health care financing policy that have become commonplace today on the Africa health policy landscape, especially with regard to user fees. De Ferranti (1985) considered that user contributions to the costs of health services could take the form not only of user fees at the point of receiving the services but also of prepayments for future services. The latter, he stated, had a high cost recovery potential because relatively modest coverage charges, spread across the entire participating population could have substantial revenue.

Extending this theme, Carrin (1987) examined the appropriateness for Sub-Saharan Africa of a system of community financing of health care, by which households in rural areas or distinct urban communities contribute to the financing of their health services either directly at the point of services (user fees) or by some form of prepayments or local health insurance insisted however that community financing always implied "a certain involvement of the population in the organization of the financing scheme". He highlighted two advantages of such decentralized scheme of communizing financing. One was that the local control of revenues might have a positive effect on the incentive of health workers to collect revenues; while the local retention of such revenues might have the effect of making the health workers even more committed to the financing scheme. The second advantage was that such a scheme might be more responsive to the preferences and demands of the local population, which in turn would facilitate acceptance of the cost recovery measures.

Kutzin and Barnum examined the effects of health financing programs on developing country health systems trough a review of the key institutional characteristics of four schemes including the Bwamanda Hospital Community Financing Health Scheme in ex-Zaire and an assessment of their impact on efficiency and equity in the health sector (Kutzin and Barnum, 1992). The review concludes that the Bwamanda scheme achieved its purpose of increasing resources mobilization for the health services in that region but that the principal drawback of the voluntary insurance approach of the scheme was that it involved inequitable access to health care between insured and non-insured.
Moreover, there was convincing evidence of moral hazard, i.e. the tendency of the insured persons to use the services more intensively because the cost of doing so is much less to them than for the non-insured. It was also possible that adverse-selection existed, i.e. a greater tendency for those who are ill or more prone to be ill to enroll on the scheme, compared to healthier persons.

A recent study by Creese and Bennett goes so far as to question whether rural risk-sharing schemes such as those discussed by Atim (1999) are really capable of raising significant amounts of revenue for the health sector or to enhance equity in health care access, two of the reasons to promoting such schemes (Creese and Bennett 1997). Based on the world-wide survey of studies of non-profit financing schemes, most voluntary in character the authors conclude that schemes in low income countries have generally only limited coverage, low cost recovery rates and little ability to protect the poorest society. The authors attenuate this pessimistic view by noting that many of the schemes studied were poorly designed. Consequently, it was possible that with better design and wider dissemination of lessons from experience, many of the problems identified could be resolved.

Elsewhere, the studies conducted by Shepard et al (1992) and by Schneider et al (2000) on the development and the implementation of prepayment schemes Rwanda showed that prepayment scheme appears to be a viable tool for improving financial autonomy of health centers, thereby contributing to quality and efficiency improvement. Secondly, appears to be a viable tool for the improvement of equity of access to quality health services for the rural population.

By contrast, the traditional solidarity networks, such as the Cameroonian case study by Atim (1999) have not received similar attention in the context of the health care financing debate.

2.2 Typology of voluntary, non-profit financing schemes

At least five types of voluntary non-profit health financing schemes are discernible in Africa from literature and observation. First, there is the traditional social solidarity networks based on a narrow (clan or ethnic) definition of the target group as described above, but these can be and are often based in urban areas as typified by the Cameroonian case study in Atim (1999). Secondly, there are the more inclusive mutual health association or movements which are based on rural or urban communities, enterprises, trade unions, professional associations, etc., and with a mass base unrestricted by ethnicity or similar factors. Thirdly, there is the “simple” or low participation model of community financing, usually organized by a health care provider in the context of cost recovery and in which participation by the insured in the running of the scheme is low or sometimes non-existent. The fourth type is the “complex” or high participation community financing model in which the community participates in managing, at least, the first level of health care (health centres), usually in partnership with the health provider,
through participatory structures. The fifth and final type is the “Medical Aid Societies”. There are arguably the most advanced and highly developed variant of the mutual aid social movement, organized on such a big scale, in terms of members, that is usually involves professional staff and some techniques of management borrowed from private commercial insurance to run it. There are generally found in Zimbabwe and South Africa (Atim, 1998).

3 The willingness to Pay (WTP)

This deals with the amount that the respondents willing prepaid to be beneficiary members of health services such as diarrheas, malaria and prenatal consultations provided by the public or denominational health centres.

In the literature, this willingness to pay technique is founded in the contingent Valuation Method (CVM). The fundamental principle of this method is that the preferences of individuals must serve as base of evaluation for gains and losses of non-market goods and services. It is now left to individuals to express their preferences through the concept of willingness to pay. Due to the fact that it is base on auto-report, economists in particular remain sceptical concerning the value of this Method, in the case where the declared intentions sometimes don’t correspond to the real behavior of individuals. More over, due to its hypothetic nature, many bias can arise during the survey (Mitchell and Carson, 1989; Neill et al., 1994; Whittington, 1998; Frykblom, 1998; Bateman and Willis, 1999; Smith, 2001)

These Authors recorded six (6) major bias: (1) The strategic bias which arises when the individual thinks he may influence an investment or policy decision by not answering the interviewer’s question truthfully; (2) certain bias agree with the lack of information at the level of the respondent, these potential bias called information bias, in this category, we distinguish: (2a) The procedural bias, it is introduced by the process or procedure (the referendum technique or that of a statement) used to discover the respondent’s preference; (2b) the starting-point bias, the value proposed by the interviewer can serve as reference to the respondent; (2c) the specification bias, it arises when the good to be valued is not well explained to the respondent; (3) The hypothetical bias, comes from the fact that the individual is confronted to an imaginary situation; (4) the constant budget bias may arise from two kinds of reasons. First if the respondent may not understand or correctly perceive the characteristics of the goods being described by the interviewer. Second, it was founded due to the fact that, certain individuals who has many times been interviewed on the topic, have in their mind, a fixed budget allocated to a problems of this nature which are posed to them. (5) The sampling bias or the non
respondent bias; (6) The status quo bias can also permit to enlarge the estimation of the willingness to pay (WTP).

Generally, according to Kriström (1993); Jordan (1994); Li and Fredman (1994, three procedures are sometimes used to express the willingness to pay of the respondents:
- The first one called direct open format question procedure. It consists of asking directly to the respondent his WTP for higher consumption of a particular good or service;
- The second procedure currently called list Model, offers a diversity of values (a list) to the respondent and ask him to propose the maximum amount he wishes to pay for the good or service.
- The last and the most popular one is the referendum model. Here, the respondent is been asked if he wishes to pay a specific amount of Money (proposed by the interviewer) for the good or not.

For certain authors, the direct open format question all like the list model, are sources of mistakes, because in reality these types of markets are not frequent. For the last one, the fundamental criticism is that it leads generally to values lower than those revealed by the other procedures. Still for these authors, individuals instead face similar situations as those of the auctioneer where the seller announces a price for which he decides to buy our not.

In the literature, we have noticed an expansion of research on the contingent analysis Method, and notably many of these investigations have been made in the environmental sector. Neither has been adequately tested in the health field.

Munasinghe (1996), Smith (2001) give more examples on the contingent Method of evaluation, to evaluate the quality of environmental resources in developing countries. Whittington et al. (1990) have used that method to assess the financial contribution of the rural population in to pay for water services in developing countries, particularly, in Southern Haiti.

In Sub-Saharan Africa, Wasikama (1998) used this method to evaluate the international community's financial contribution to preserve the TAI forest in Côte d'Ivoire. Houdegbek (1999) used this method to evaluate the Monetary value of protect areas in the cynegetic zone of Djona in Benin. Moreover, Treiman (1993) quoted by Pokou (1998), used this method to equally estimate protected areas of Pendjari. Besides, this instrument has equally been used in several socio-economics fields other than environmental ones: It is case with the investigations of N'guessan (1997) and Pokou (1998), where it enable to estimate the importance of impregnated mosquito in Memni and Montezo regions in Côte d'Ivoire; and the financial contribution of pastoral populations in the fight against trypanosomiasis in Northern Côte d'Ivoire respectively.
4 The determinants of the Willingness to pay

In literature, some authors concluded that the willingness to pay was influenced by economic characteristics, socio-demographic characteristics and the characteristics of the good itself (Whittington et al., 1990; Coffie, 1997; Flores and Richard, 1997; Pokou, 1998; Houdegbe, 1998; Bloom and Shenglan, 1999; Atim, 1999; Criel et al., 1999).

Tshinko et al. (1995) in the ex-post evaluation, classify these factors into three different categories which are: Predisposition factors, facilitating factors and reinforcing factors.

In addition to socio-demographic changes such as age, the level of education, the gender, religion, the family size, the predisposition factors generally arise from the socio-cultural environmental of the respondent: it is concerned generally with the local mutual help tradition (associative experience) and the open-mind of the respondent.

Facilitating factors are essentially issued by economic conditions of the respondent. In this case, the households revenues level is considered as relevant indicator of this factor. And, lastly, the reinforcing factors synthesize characteristics to the proposed good: it is concerned with the sanitary experience undergone by the respondent (availability of drugs, the efficiency of the physician, the welcoming etc).

From this literature review, it appears clearly that very little investigations on the analysis of the willingness to pay have been carried out in health sector in general and in Cameroon in particular. This study will contribute to the understanding of strategies used by rural household in order to improve their access to health service centers, while contributing to the empirical literature with respect to African access to basic services more generally, and Cameroonian more particularly.

5-Methodology

5.1 The assessment of willingness to pay health care

The households contribution for financing the health care brings up the problem of furniture and tarification of public goods as discussed by Whittington et al. (1990); Kristöm (1993); Diamond (1994); Li and Fredman (1994); Frykblom (1997) and Whittington (1998).

Two basic theoretical approaches are available for making reliable estimates of households’ willingness to pay. The first, “indirect” approach, uses data on observed goods or services use behaviour (such as quantities used, travel times to collection points, perception of goods or services
quality) to assess the response of consumers to different characteristics of and improved accessibility of goods or services. Several modelling approaches are possible candidates here, among them varying parameter demand, hedonic property value, and hedonic travel cost models. The second "direct" approach, consists simply to ask an individual how much he or she would be willing to pay for the improved for the use of good or service. This survey approach is called the contingent valuation method.

This approach then seeks to construct hypothetic markets for goods in order the enable the estimation of the demand for these goods. This Method which has been applied to several domains has revealed itself appropriate to evaluate non marketed resources and public goods. It will be used to assess the willingness to prepay for the access to health care.

One of the major problems with the contingent valuation method is that, for variety of reasons, respondents may not answer willingness to pay question accurately and thus not reveal their “true” willingness to pay.

The most two popular variants often used in the contingent valuation analysis are both open-ended and direct questions- for example, “What is the maximum you would be willing to pay per year by advance, to be beneficiary members of health services such as diarrheas, malaria and prenatal consultations provided by the public or denominational health center A?” , and two forms of bidding games in which we ask a series of yes-no questions-for example “Would you be willing to pay X CFA francs per year by advance to be beneficiary members of health services such as diarrheas, malaria and prenatal consultations provided by the public or denominational health center A?”.

### 5.2 The determinants of the willingness to pay

Although the value households place on the proposed health prepayment scheme is a continuous variable, we believe the most reliable data generated from the bidding game are the set of yes/no responses to questions about specific, discrete prices. Thus, the observed dependent variable obtained from the bidding game procedure is not the maximum amount the household would be willing to pay but, rather, an interval within which the “true” willingness to pay falls. Linear regression is not an appropriate procedure for dealing with such an ordinal dependent variable because the assumption regarding the specification of the error term in the linear model will be violated (Maddala, 1983). We have therefore used an ordered probit model, discussed below, to explain the variations in WTP bids.

Let $V_h$ be the maximum willingness to pay of household $h$ for the proposed health service. Based on consumer demand theory, we hypothesize that $V_h$ is a function of the attributes of the health services and the household socio-economic characteristics.
\[ V_h = a + X_h B + e_h \]  \hspace{1cm} (1)

Where \( X_h \) is a vector of individual’s characteristics and of the health service’s attributes, \( a \) and \( B \) are the parameters of the model, and \( e_h \) is a random term with a standard normal distribution. Since \( V_h \) is not observable from the bidding game, equation (1) cannot be estimated. However, from the interview responses we know the range within which \( V_h \) will fall. Let \( R_1, \ldots, R_m \) be the \( m \) values which divide the range of willingness to pay (WTP) space into \( m+1 \) categories, and \( y_h \) be a categorical variable such that

\[
y_h = \begin{cases} 
1 & \text{if } V_h < R_1 \\
2 & \text{if } R_1 \leq V_h < R_2 \\
\vdots & \\
m & \text{if } V_h \geq R_m 
\end{cases} \]  \hspace{1cm} (2)

Let \( i = 1, \ldots, M+1 \). From equation (1), we have \( y_h = i \) if:

\[
R_{i-1} < a + X_h B + e_h \leq R_i \]  \hspace{1cm} (3)

or \( R_{i-1} - a < X_h B + e_h \leq R_i - a \)  \hspace{1cm} (4)

or \( (R_{i-1} - a - X_h B) / \sigma \leq (R_i - a - X_h B) / \sigma \)  \hspace{1cm} (5)

were \( \sigma \) is the standard deviation of \( e_h \). Assuming \( e_h \) follows a standard normal distribution, then

\[
P(y = i) = P(R_{i-1} < V_h < R_i) = P(u_i - X_h B < e_h < u_{i-1} - X_h B) = F(u_i - X_h B) - F(u_{i-1} - X_h B), \]  \hspace{1cm} (6)

where \( u_i = R_i - a \) \text{ and } \( F(.) \) is the cumulative standard normal density function. (Equation (6) is the ordered probit model we have used to explain the variations in WTP bids. The maximum likelihood estimates of \( u_i \) \text{ and } \( B \) are consistent (Maddala, 1983). Table 1 gives the description of an explanatory variables to be used for the analysis.
Table 1: Description of socio-economic and cultural variables will be used for the OLS and Two-limit TOBIT regression

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description of the variable</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENDER</td>
<td>A categorical variable representing the gender of the respondent</td>
<td>1 for the male; 0 otherwise</td>
</tr>
<tr>
<td>AGE</td>
<td>Age of the respondent</td>
<td>Number of years old</td>
</tr>
<tr>
<td>MASTAT</td>
<td>A Dummy variable representing the marital status</td>
<td>1 if married; 0 otherwise</td>
</tr>
<tr>
<td>EDUC</td>
<td>A categorical variable representing the average educational level of the respondent</td>
<td>1 if the respondent has at least 4 years of schooling; 0 otherwise</td>
</tr>
<tr>
<td>FANACT</td>
<td>Number of active individuals in the household</td>
<td>Number of individuals which can contribute financially at the household</td>
</tr>
<tr>
<td>ASSEXP</td>
<td>A categorical variable representing membership to a community club or association</td>
<td>1 if yes; 0 otherwise</td>
</tr>
<tr>
<td>CONFIDENCE</td>
<td>A categorical variable representing the habit of frequenting the health services</td>
<td>0 if yes; 0 otherwise</td>
</tr>
<tr>
<td>REVENUE</td>
<td>Monthly revenue of the respondent</td>
<td>In CFAF</td>
</tr>
<tr>
<td>FHEALTH</td>
<td>Family health status</td>
<td>Percentage of individuals in the household who were ill from 6 to 12 months prior to the survey as proxy of household Family illness rate in percentage</td>
</tr>
<tr>
<td>RECEPTION</td>
<td>A categorical variable representing the rapidity in the reception of the patient at the health service center</td>
<td>1 if yes; 0 otherwise</td>
</tr>
<tr>
<td>CLEANLINESS</td>
<td>A categorical variable representing the cleanliness of the health service center</td>
<td>1 if yes; 0 otherwise</td>
</tr>
<tr>
<td>PHYSICIAN</td>
<td>A categorical variable representing the regular or periodical attendance of the physician at the health service center</td>
<td>1 if yes; 0 otherwise</td>
</tr>
<tr>
<td>DRUGSAVAIL</td>
<td>A categorical variable representing the availability of basic drugs at the health service center</td>
<td>1 if yes; 0 otherwise</td>
</tr>
</tbody>
</table>
6. Results and Discussion

6.1 Analysis of the contingent valuation bids

In the Nyong and Kelle Division located at the center of Cameroon, 471 questionnaires were completed out of approximately 590 households in the village. Our impression from sitting on many of the households interviews is that respondents took the contingent valuation questions, and indeed the entire interview, quite seriously. 13% of the households gave an answer of “I don’t know” in response to the WTP question for health prepayment scheme for public health service centers while there was 7% non response rate. Based on the pretest, we felt that the bidding game question format worked better than the direct, open-ended questions. People generally felt more comfortable with the bidding games, and, in fact, our interviewers remarked that the bidding game format was very familiar and easily understood because it was similar to the ordinary kind of bargaining that goes on in the local market in rural Cameroon particularly. Hence we used only the bidding game format.

Table 2: Test du biais du point de départ (test for starting point bias)

<table>
<thead>
<tr>
<th>Values</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>Median per groupe</th>
</tr>
</thead>
<tbody>
<tr>
<td>4800</td>
<td>95</td>
<td>5995</td>
<td>1005</td>
<td>4800</td>
</tr>
<tr>
<td>6000</td>
<td>141</td>
<td>6025</td>
<td>1190</td>
<td>6000</td>
</tr>
<tr>
<td>7200</td>
<td>41</td>
<td>7125</td>
<td>1435</td>
<td>6400</td>
</tr>
<tr>
<td>8400</td>
<td>186</td>
<td>8800</td>
<td>1685</td>
<td>6000</td>
</tr>
<tr>
<td>Total</td>
<td>471</td>
<td>7230</td>
<td>1350</td>
<td>6000</td>
</tr>
</tbody>
</table>

\[ F(3,467) = 1.29 \quad P(F) = 0.28 \]

Table 2 presents the results of the statistical analysis of the data obtained from the household surveys in Nyong and Kelle Division.

The mean of the bids in Nyong and Kelle Division, CFA F 7230 (US $ 1= CFA F 550) per person/year seemed realistic to us with respect to the Cameroon Statistic and National Accounting data on household health expenditures(DSCN, 2002). According to this report, the amount spent annually per person is range from 5600 to 13000 CFA francs per person in poor household compare to the 37000 in other households. As this data shows, the 7230 WTP means found in this study in the line with the finding reported in the literature.

Table 2 also shows the results of our starting point bias for the WTP questions. If starting point bias were a problem, we would expect that the low starting point (CFA F 4800) would result in a lower bid, and that the high starting point (CFA F 8400) would result in higher bid. The null hypothesis that the
three samples are from the same population (that there is no difference in the responses from individuals who received different starting points) cannot be rejected.

On the basis of these results, there was no reason to attempt to adjust the WTP bids for starting point bias. Assuming and average monthly income in Nyong and Kelle Division CFA F 24,000, the mean bid is about 2.5% per person of household income.

6.2 The ordered probit model results

The results of the estimation are presented in table 3. According to the results, the chi-square statistic illustrate that the overall model is highly significant. The adjusted likelihood ratio 
\[ 1 - \frac{\text{Log} - L}{\text{Log} - L(0)} \] is 0.005, where \( K \) is the number of independent variables in the models. The coefficients for all the independent variables are in the direction expected. The results reported in table 3 reveal the presence of respondent and health service centers specific attributes variables affecting the willingness to prepay value.

Tableau 3 : Résultats du modèle Probit ordonné des déterminants de la valeur du CAP

<table>
<thead>
<tr>
<th>Variables</th>
<th>Moyennes</th>
<th>Coefficients</th>
<th>T-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTANTE</td>
<td>-0.41</td>
<td>-0.53</td>
<td></td>
</tr>
<tr>
<td>LREVENUE</td>
<td>9.82</td>
<td>0.03</td>
<td>2.28**</td>
</tr>
<tr>
<td>LCHIELD</td>
<td>0.23</td>
<td>0.66</td>
<td>1.86*</td>
</tr>
<tr>
<td>GENDER</td>
<td>0.62</td>
<td>0.21</td>
<td>1.89*</td>
</tr>
<tr>
<td>MSTAT</td>
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<td>-0.02</td>
<td>-0.19</td>
</tr>
<tr>
<td>EDUC</td>
<td>0.49</td>
<td>0.15</td>
<td>1.08</td>
</tr>
<tr>
<td>ASSEXP</td>
<td>0.29</td>
<td>0.20</td>
<td>1.75*</td>
</tr>
<tr>
<td>LAGE</td>
<td>3.48</td>
<td>0.08</td>
<td>0.44</td>
</tr>
<tr>
<td>FHEALTH</td>
<td>0.17</td>
<td>0.42</td>
<td>2.25**</td>
</tr>
<tr>
<td>CONFIDENCE</td>
<td>0.55</td>
<td>0.11</td>
<td>2.05**</td>
</tr>
<tr>
<td>RECEPTION</td>
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<td>-0.02</td>
<td>-0.12</td>
</tr>
<tr>
<td>CLEANLINESS</td>
<td>0.17</td>
<td>0.03</td>
<td>0.21</td>
</tr>
<tr>
<td>DRUGSAVAIL</td>
<td>0.21</td>
<td>-0.03</td>
<td>-2.56***</td>
</tr>
<tr>
<td>PHYSICIAN</td>
<td>0.12</td>
<td>0.37</td>
<td>2.15**</td>
</tr>
</tbody>
</table>

\[ \chi^2(13) = 31.88*** \]

RATIO DE VRAISEMBLANCE AJUSTE 0.005
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***P<0.01 ; **P<0.05 ; * P<0.1
6.2.1 Attributes due to the respondent

The results reported in table 3 show that variables such as the household revenue level (LREVENUE), the gender (GENDER), the habit of frequenting the health service center (CONFIDENCE), the associative experience (ASSEXP) and the household health status (FHEALTH) affect significantly the willingness to prepay value. According to the results of the ordered probit regression, the variables GENDER, FHEALTH and ASSEXP have a positive and significant impact on both willingness to prepay. This shows that, families where heads are males, are more likely to participate to the health prepayment scheme probably because, they generally have the decision power in the allocation of the household revenue.

A positive and significant coefficient of ASSEXP demonstrates the importance of strong degree of community solidarity (social movement dynamism) on the willingness to prepay for the future utilization of certain health care services provided both by public health service centers.

Elsewhere, the positive and statistically robust relationship between the variable FHEALTH support the notion that families with high illness rate or more prone to be ill have a greater tendency to participate or to be members of the health prepayment scheme. This finding is consistent with other results reported in the literature and known as adverse selection (Atim, 1999; Tsinko et al., 1995; Schneider et al., 2000).

Variables LREVENUE and CONFIDENCE were found to have a positive and statistically significant connection with the willingness to prepay value. This finding is consistent with Tsinko’s (1995) argument that the revenue level of the family and the habit of frequenting the health service centers are factors that may predispose and facilitate individuals to enroll on the health prepayment scheme.

6.2.2 Attributes due to the health service centers

The health service centers specific characteristics (as perceived by respondents) which seem to affect the willingness to prepay value are variables related to the availability of the basic drugs at the health service center (DRUGSAVAIL) and the regular or periodical attendance of the physician at the health service center (PHYSICIAN).

According to the results reported in table 3, it appears that, variable DRUGSAVAIL has a negative and highly significant impact on the willingness to prepay value. This result pointed out the ticklish problem of the non availability of essential drugs in the public health service centers of our countries is often detrimental to their being frequented.
The result concerning the variable PHYSICIAN is positive and statistically significant with the willingness to prepay value for the public health service centers. This is due to the fact that, public health service centers are generally provided by physician who are civil servants. Consequently, the presence of a physician in the health service center has seemed to consider as moral caution for the efficiency of the center by the respondents.

7 Conclusion and recommendations

The objective of this research was to appreciate the willingness to prepay health cares of the rural household in the Nyong and Kelle region by assessing their willingness to prepay value and their determinants. A sample of 471 rural households was retained for our study. Our statistical results based on the contingent valuation method shows that:

- 21% of the respondents were willing to prepay at mean CFA F 4800/person/year for certain cares (such as diarrheas, malaria and prenatal consultations) delivered by the public health service centers with a mean of 5995;
- 31% were willing to prepay CFA F 6000/person/year with a mean of 6025;
- 9% were willing to prepay the amount of CFA F 7200/person/year and;
- 39% CFA F 8400/person/year.

The analysis of the whole sample suggests that the mean value of the willingness to prepay is equal to CFA F 7230/person/year with a median of CFA F 6000/person/year.

In a second step analysis, our econometric results based on ordered probit model of willingness to prepay determinants suggest that some attributes such as the level of revenue, the gender, the habit of frequenting the health service center, the associative experience, the household health status due to the respondents and, attributes such as the availability of the basic drugs at the health service center and the regular or periodical attendance of the physician at the health service center due to the health service centers have a significant impact on the willingness to prepay value.

The results of this study suggest that it is possible to do a contingent valuation survey among a very poor population and obtain reasonable, consistent answers. There does not appear to be a major problem with starting point bias. From this research we cannot, of course, judge whether individuals in the villages would in fact pay the amounts they indicated in the survey if the NGOs tried to collect the money. Nevertheless, we believe that the preliminary results of this research strongly suggest that contingent valuation surveys are feasible method for estimating individual’s willingness to prepay for
improved health accessibility in rural Cameroon. This has important policy implications for rural health prepayment scheme projects because it seems to show that going into a village and conducting a relatively simple survey can yield reliable information on the population’s willingness to prepay for improved health care accessibility in the rural area. The implication of these preliminary research findings are not, however, limited to the rural health sector. Our research suggests that contingent valuation surveys may prove to be a viable method of collecting information on individual’s willingness to prepay or pay for a wide range of public infrastructure projects and public services in developing countries.
References


