

# Social Capital and Willingness-to-Pay for Community-Based Health Insurance in Rural Cameroon

Hermann Pythagore Pierre Donfouet (Corresponding author)

Faculty of Economics and Management, University of Yaounde II-Soa

PO Box 1365, Yaounde, Cameroon

Tel: 237-7555-7201 E-mail: donfouetz@yahoo.fr

Jean-Roger Edimo Essombè

Faculty of Economics and Management, University of Yaounde II-Soa

PO Box 1365, Yaounde, Cameroon

Tel: 237-9975-0790 E-mail: jressombe@yahoo.fr

Pierre-Alexandre Mahieu

Faculty of Economics, University of Rouen

P.O Box: 3, Avenue Pasteur 76 186 Rouen, France

Tel: 33-(0)-2-276-9670 E-mail: pamahieu@gmail.com

Eric Malin

Faculty of Economics, University of Rennes I, France

PO Box 7 Place Hoche, 35 065 Rennes Cedex, France

Tel: 33-(0)-2-2323-3364 E-mail: Eric.Malin@univ-rennes1.fr

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## Abstract

Community-based health insurance in developing countries is often perceived as a way to improve the health state of rural households. An open question is whether the social capital has a positive impact on the demand for health insurance. A contingent valuation study was conducted to explore the influence of the social capital on the demand for health insurance. The main results are that (i) most of the rural households are willing to pay for community-based health insurance (ii) the social capital has a positive impact on the willingness to pay for community-based health insurance. The policy implications of the results are discussed.

**Keywords:** Community-based health insurance, Contingent valuation, Social capital

## 1. Introduction

Poor households living in Cameroon rural areas do not have access to medical care due to lack of income and/or medical facilities (Matul et al. 2009). When getting sick, they typically try to borrow money or sell their properties. Another alternative for them is community-based health insurance. The involvement of the community in health financing was spurred, among others, by the Declaration of Alma Ata in 1978 (Bose and Desai 1983), urging maximum community participation in organization of primary health care (Carrin et al. 2005). The importance of community-based health insurance emanates from the limitations of conventional

health insurance to protect the poor from all sorts of events. It has three main features: prepayment for health services by community members; community control; and voluntary membership (Hsiao 2001). Major international development agencies often consider community-based health insurance as an effective mechanism to achieving universal coverage for health care in poor countries (Gottret and Schieber 2006; WHO 2005). There is a growing interest in (i) knowing the premiums that poor people would pay to join this type of low-cost health insurance and (ii) assessing the impact of the social capital on the demand for community-based health insurance.

Dror et al. (2007) study households' Willingness-To-Pay (WTP) for health insurance in a large bidding game survey conducted in India (3,000 households). About half of the sample is willing to pay at least 1.35% of annual household income and a positive link between households' income and WTP is found. Furthermore, in another study, Asgary et al. (2004) show that rural households in rural Iran are willing to pay on average US\$2.77 per month for health insurance. Nevertheless, very few studies have examined so far the influence of the social capital on the demand for community-based health insurance. Popularized by Putnam (1993), a good number of researchers and international organizations have put in place some tidemarks to measure social capital. Their approach treats the social capital as a dependent variable. Recently, an alternative way has been developed and it mainly consists of studying the role or the impact (contribution) of social capital on health, environmental protection. Hence, the social capital is studied as an explanatory variable. The concept of social capital emerged from Sociology (see e.g., Portes 1998; Putnam 2000) where it is associated to concepts like social networks, reciprocity, trustworthiness, and civic engagement. Social capital can be defined as: "...investment and use of embedded resources in social relations for expected returns" (Lin 2000, p.786). Social capital is increasingly recognized as having a positive effect on health status (Coleman 1990; Putnam et al. 1993; Wilkinson 1996) and there are still active research activities on this link. Recent research typically shows that a low level of trust among citizens leads to a high mortality rate (Baum 1997; Kawachi et al. 2004). Moreover, trust in the community facilitates cooperation, gives access to support, aid and care services that is provided by informal institutions which are mainly based on reciprocity. This informal institution provides health insurance to the poor. By showing solidarity, poor groups may indirectly increase their income and social well being (Flores and Rello 2003). There is no consensus in the literature on how social capital ought to be measured (Note 1), mainly because there is a large variety of social capital. Social capital can refer to a social group or an individual asset; it can be informal or mediated by formal institutions; it can be inclusive or exclusive.

Several studies have demonstrated that a high social capital in the community increases the chance for the community-based health insurance to be successful (Woolcock 2001; Woolcock and Narayan 2006). Hence, examining the influence of the social capital on the demand for community-based health insurance can provide precious information to policymakers when promoting or establishing community-based health insurance in rural areas. The main objective of this paper is to investigate the influence of the social capital on the WTP for community-based health insurance. The remainder of the paper is organized as follows. Section 2 presents the methodology used, while section 3 focuses on the questionnaire. Section 4 considers the empirical results of the study and section 5 concludes with some policy implications.

## 2. Econometric model

Proposed by Davis (1963), the contingent valuation method has been used in many areas including environment, health, transport and marketing and has proven to be a useful instrument to provide information on people's preferences for non-marketed goods. The contingent valuation method which belongs to the family of the stated preference techniques is a "survey-based method frequently used for placing monetary values on environmental goods and services not bought and sold in the marketplace" (Carson 2000, p.1413). Over the last two decades, improvement has been made regarding the method, and some practice has been discarded, like the use of open-ended question to elicit WTP. Nowadays, the referendum format is often used (Bishop and Heberlein 1979; Hoehn and Randall 1987; Arrow et al. 1993). People are faced with a given payment, the payment amounts varying across participants, and they are to state whether they would accept to pay the assigned payment. This format which is incentive compatible and places a low cognitive burden on the participants has an important drawback: it provides little information on the WTP: just that the WTP is below or above the given payment. To overcome this issue, Hanemann et al. (1991) used a second payment, higher or lower to the first depending on the first response. When using this format the researcher can use both parametric and non-parametric approaches to estimate the mean WTP. Furthermore, the parametric approach can also be used to estimate the WTP function, i.e. the function that relates the respondent's characteristics to the WTP.

The econometric procedure follows Cameron (1988). An interval data regression is used to compute the WTP function and the mean WTP. Let  $WTP_i$  denote the willingness-to-pay,  $x_i$  a vector of explanatory variables

including social capital and  $\varepsilon_i$  a random component following a normal distribution with mean zero and standard deviation  $\sigma$ . Then, the equation to be estimated is:

$$WTP_i = x_i' \beta + \varepsilon_i$$

In the study  $WTP_i$  is unobserved, and there are three possible cases depending on the participants' yes/no answers to the valuation questions. (a)  $WTP_i$  is inferior to a bid amount say  $t_l$ , (b)  $WTP_i$  is superior to a bid amount, say  $t_u$  (c)  $WTP_i$  is between two bid amounts  $t_l$  and  $t_u$ . Situation (a) corresponds the case where the individual states "no" twice (the second bid amount is  $t_l$ ) while situation (b) corresponds to the case where the individual states "yes" twice (the second bid amount is  $t_u$ ). Finally, situation (c) is the case where the individual states "yes" and "no", regardless of the order (the higher and lower bid amounts are denoted  $t_u$  and  $t_l$  respectively). The probability associated to each case is the following:

$$P(WTP_i < t_l) = P\left(z_i < \frac{t_l - x_i' \beta}{\sigma}\right) = \Phi(z_{li})$$

$$P(t_u < WTP_i) = P\left(\frac{t_u - x_i' \beta}{\sigma} < z_i\right) = 1 - \Phi(z_{ui})$$

$$P(t_l < WTP_i < t_u) = P\left(\frac{t_l - x_i' \beta}{\sigma} < z_i < \frac{t_u - x_i' \beta}{\sigma}\right) = \Phi(z_{ui}) - \Phi(z_{li})$$

The corresponding binary indicators are:

$I_i^{YY} = \mathbf{1}$  (the individual  $i$  states "yes" twice),

$I_i^{NN} = \mathbf{1}$  (the individual  $i$  states "no" twice),

$I_i^{YN} = \mathbf{1}$  (the individual  $i$  states "yes" and "no" irrespectively of the order),

where the function  $\mathbf{1}(\cdot)$  takes value one when the argument is true and zero otherwise.

The following log-likelihood function can be is maximized for  $N$  independent observations to estimate both  $\beta$  and  $\sigma$ :

$$\ln L = \sum_{i=1}^N \left[ I_i^{YN} \cdot \ln(\Phi(z_{ui}) - \Phi(z_{li})) + I_i^{NN} \cdot \ln(\Phi(z_{li})) + I_i^{YY} \cdot \ln(1 - \Phi(z_{ui})) \right]$$

The unconditional mean WTP, based on the parametric approach, corresponds to the intercept when all the explanatory variables have been removed from the model.

### 3. Questionnaire

In November 2009, 399 households living in a rural area of Cameroon (Bandjoun) were surveyed by trained interviewers. A two-stage cluster sampling was used. First, six villages were selected-based on population size and availability of health centres. Second, people in these villages were randomly picked. In an attempt to conduct a state-of-the-art contingent valuation, guidance provided in Arrow et al. (1993), Carson (2000), Carson et al. (2001), and Whittington (1998, 2002) were followed. Furthermore, a "consequentialism" (Note 2) script built on Bulte et al. (2005) was integrated to mitigate the tendency to overestimate WTP called hypothetical bias (Blumenschein et al., 2008) (Note 2). The wording of the script was as follows:

*Many studies reveal that a good health status is a requirement to achieve some of the goals in life, like for instance building houses, bringing up children, having a good job etc. Nevertheless, people may, including you, fall sick and use various methods to treat themselves-such as borrowing money, selling belongings, visiting traditional healer/shaman or religious organization etc, meaning that they have to pay out-of-pocket before using any health facility. If the individual fails to obtain any financial help, his health condition will deteriorate and he will probably die. Due to this, a trustworthy NGO plans to establish a health insurance scheme in your community so that you and your whole family (ten members at most) will be able to use health care services at any nearest public health centers. The following health services will be offered to you: diagnosis, laboratory tests, surgeries, drugs, delivery etc. If you decide to join such a system and be covered when you and your family are sick, you will pay a monthly amount as premium.*

*Before answering the questions below, consider the advantages associated with the proposed scheme, your monthly income, and also that, there are other things your money could be spent on. Note that the results of this study will be made available to policymakers, and could serve as a guide for future decisions. Before I proceed, do you have any question?*

Focus groups and pretests were conducted to set the bid amounts to be used in the final survey. The first payment was one of the following amounts: 250, 350, 450, 550, 650 and 800 CFA francs, the payment being randomly assigned to the respondents as recommended in Mitchell and Carson (1989). The second bid amount was half of the first bid if the respondent said “no” and twice if he said “yes”. For instance, an individual stating “yes” to 350 CFA francs was asked whether he would pay 700 CFA francs in the second round. Focus groups and pretests were also used to ensure that the questionnaire was properly worded.

#### 4. Results

##### 4.1 Descriptive statistics

Table 1 provides descriptive statistics of the study, while Table 2 displays the response rate to both the first and second bid amounts respectively. As can be seen, only 8.52% of the participants stated “no” to both amounts, i.e. they stated “no” twice. This means that very few participants are not willing to pay for the program. Or, to say it differently, that most participants are willing to pay for the program.

Insert Table 1 here.

Insert Table 2 here.

##### 4.2 Results of the parametric approach

We use the interval data model Cameron (1988) to study the determinants of the WTP, and check, whether social capital affects WTP. As stated before, there is a major problem among social scientists on how to measure social capital. Nevertheless most of the existing definitions of the concept (Coleman 1988; Putnam et al. 1993; Bowles and Gintis 2002) consider the association membership as one of the main component of the stock of social capital. Hence, in the current study, we focus on association memberships as a measure of individual’s social capital, as in previous studies. We use an indicator of individual participation in local organizations denoted *involvement*. The variable *involvement* takes on the value 1 if the individual has been involved in a health policy before or is currently enrolled in an association (‘jangy’ or ‘tontines’) which aims at improving the health state of his member.

Table 3 presents the results of the regression. As expected, the social capital has a positive impact on WTP. Most of the rural households involved in associations such as ‘tontines’ or ‘jangy’ have a higher WTP than those who are not *ceteris paribus*. The positive and significant coefficient of social capital reveals that the degree of community solidarity is an important factor in establishing a community-based health insurance. Hence, social capital has a positive and significant effect on the WTP for community-based health insurance. It is consistent with other studies (Hsiao 2001; Zhang et al. 2006) which show that social cohesion and solidarity facilitated collective action, which might increase willingness to pay for community-based health insurance. Income has a positive and statistically significant impact on WTP which is consistent with economic theory and increase the validity of our results. Furthermore, health status does not affect WTP for community-based health insurance. Gustafsson et al. (2009) found the same results in a case study conducted in Namibia and concluded to an absence of adverse selection. The coefficient age is significant at 5% level and positive implying that young people tend to have a higher WTP.

The coefficient related to religion is positive and statistically significant implying that Catholic household has a higher WTP than the rest of the participants. The households in the rural areas of Bandjoun who are more knowledgeable about community-based health insurance tend to have a higher WTP than their counterparts. Besides, the positive and significant coefficient of the usual means of seeking treatment implies that the household heads who regularly use the orthodox means of seeking treatment (clinics/hospitals) when they get sick are more willing to pay than those who use other means (traditional healers, herbalists). This variable is a nub factor for establishing community-based health insurance since the establishment of the community-based health insurance requires the frequent use of orthodox means of treatment. The heads of the household who are farmers/sellers are less willing to pay than those who are self employed or working in the private/public sector.

Insert Table 3 here.

The parametric mean WTP is approximately 1010 CFA francs/month/person or \$2.15 /month/person.

##### 4.3 The mean WTP of the non parametric approach

Non-parametric estimation offers an advantage to parametric estimation since it does not rely on the distributional assumptions made by the researcher. Furthermore, nonparametric models are more robust and offer greater flexibility in the shape of the response function, but they provide less economic information. Hence, we compute Turnbull estimator of WTP (Turnbull 1976) for community-based health insurance. In contingent valuation studies, respondents sometimes overstate their WTP, since the Turnbull is a lower bound estimate, it

can be seen as a conservative estimate of WTP. Following Haab and McConnell (2002) and Bateman et al. (2002), the lower bound of the mean WTP for community-based health insurance is 659 CFA francs/month/person or \$ 1.4/ month/person.

Based on the two approaches (the non-parametric and parametric ones) the mean WTP for community-based health insurance ranges from \$1.4/month/person to \$2.15/month/person. This information is crucial for the policymakers and actuaries to set premiums that will not exceed the amount households in rural areas can afford to pay.

## 5. Conclusions

Many poor households in rural areas are excluded from the formal insurance. An alternative for these households which has proven to be effective at delivering adequate health care is the community-based health insurance. Nevertheless, developing this community-based health insurance from a policy perspective is relevant only if there is a potential demand for it. The overall objective of the study was to investigate the effects of the social capital on the demand for community-based health insurance. By means of a face-to-face contingent valuation survey, we explored this effect of the social capital on the demand for community-based health insurance. The results of our case study indicate that the social capital has a positive impact on WTP. This indicates that the degree of community solidarity is an important factor in establishing a community-based health insurance. As such, our findings coincide with those of other researchers that find that social capital has a positive and significant impact on the WTP for community based-health insurance (Zhang et al.2006). Hence, policymakers should strengthen the social ties in the community in an attempt to increase the enrolment rate and the demand for community-based health insurance in rural areas. This may improve the well being of the poor in rural areas who are most often exposed to diseases and poverty. Furthermore, age is also a determinant of WTP: younger people are more willing to pay as compared to older individuals. Thus, policymakers ought to subsidize or reduce the premiums of the older individuals in order to encourage them to be enrolled. Lastly, the mean WTP for community-based health insurance ranges from \$1.4/month/person to \$2.15/month/person, depending on the approach used.

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### Notes

Note 1. One drawback of the social capital is its measure. Up to date there is not a general consensus in the scientific community on how to measure the social capital. Most studies use the membership. Nevertheless there is a wide consensus about association membership as proxy of social capital.

Note 2. This was done to mitigate the hypothetical bias. This bias refers to the fact that respondents are not making real transactions and the willingness to pay (WTP) can be overestimated. This script explicitly informs the respondents they should consider that the results of the study will have an actual effect and that the respondents must integrate this before answering the valuation question.

Table 1. Description of the variables and summary statistics

Variable	Description	Mean	Standard Deviation	Min	Max
Bid1	First bids (250, 350, 450, 550, 650, 800 CFA francs)	510.40	184.89	250	800
Bid2	Second bids	850.31	422.28	125	1600
Yesno1	First yes/no response (1 if yes, 0 otherwise)	0.81	0.40	0	1
Yesno2	Second yes/no response (1 if yes, 0 otherwise)	0.58	0.50	0	1
Male	Gender of the respondent (1 if the male, 0 otherwise)	0.62	0.48	0	1
Hfamily	Family health status (percentage of individuals in the household who were ill in the last 9 months)	0.17	0.45	0	5
Knowledge	Knowledge regarding the concept of community health insurance (1 if know the concept, 0 otherwise)	0.27	0.44	0	1
Hhnumber	Number of people in the household(continuous)	6.18	3.81	1	30
Catholic	Religion (1 if Catholic, 0 otherwise)	0.59	0.49	0	1
Age	Age (number of years)	42.39	12.42	22	82
Farmer	Profession (1 if farmers/sellers, 0 otherwise)	0.53	0.50	0	1
Meantreatment	The means of seeking treatment when any member of the household falls sick (1 if orthodox, 0 otherwise)	0.83	0.38	0	1
Education	Level of education of the respondent (1 if the respondent has been to school at least 7 years, 0 otherwise)	0.94	0.23	0	1
Involvement	Participation in a health policy and/or in an association which aims at improving the health status (1 if yes, 0 otherwise)	0.55	0.50	0	1
Income	Level of income (1 if equal or above average income, 0 otherwise)	0.16	0.37	0	1

Table 2. Response to the assigned bids

<b>Yesno1</b>	<b>Yesno2</b>	
	Yes (Yesno2 = 1)	No (Yesno2 = 0)
Yes (Yesno1 = 1)	46.87%	33.83%
No (Yesno1 = 0)	10.78%	8.52%

Table 3. Econometric estimation of the interval data model

<b>Variable</b>	<b>Coefficient</b>	<b>Standard error</b>
Age	-8.86***	2.77
HHnumber	9.923	9.20
Catholic	178.46**	74.07
Male	57.46	75.85
Involvement	177.56**	72.93
Hfamily	10.54	88.49
Knowledge	141.99*	83.11
Meanstreatment	217.21**	93.79
Education	136.00	114.70
Income	212.25*	105.42
Farmer	-120.68*	71.77
Intercept	767.70***	199.96

\*\*\*, \*\* and \* mean significant at 1, 5 and 10% respectively.