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Health insurance for the poor? Determinants of participation in community-based health insurance schemes in rural Senegal

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SUMMARY

Poor people lack access to health care with a negative impact on their dignity, human capital formation and their risk-management options. Recently an emerging movement of community-based health insurance schemes has attracted the attention of policy makers and researchers as it seems that these schemes target the poor more efficiently. Taking the example of community-based health insurance schemes in rural Senegal this paper identifies the factors explaining participation in these schemes. Using household survey data of non-members and members, we found that household income, religion, village characteristics and the belonging to a certain ethnic group exert the strongest influence on the probability of participation. From these findings, it follows that *i)* although the schemes reach the "poor" in general, the "poorest of the poor" within the villages find it financially difficult to participate; *ii)* social exclusion due to religion or ethnic group might persist. Several options for designing the schemes in order to address these weaknesses are discussed.

I. INTRODUCTION

The state in most low-income countries has not been able to fulfil the health care needs of the poor, and especially of the rural population. Shrinking budgetary support for health care services, public health provision inefficiency, unacceptably low quality of public health services, and the resultant imposition of user charges bear testimony to, and is reflective of, the state's inability to meet health care needs of the poor. In the last decade, the "health care crisis" led to the emergence of many community-based health insurance schemes or community financing schemes (CF)[1] in different regions of the developing word, particularly in sub-Saharan Africa (Jütting, 2001; Wiesmann and Jütting, 2001; Preker *et al*., 2001)[2]. The decentralisation process unleashed in these countries to empower lower layers of government and the local community further fuelled their emergence (Atim, 1998; Musau 1999). The success of micro-credit schemes may have also contributed to the emergence of community-based health initiatives designed to improve access through risk and resource sharing (Dror and Jacquier, 1999; Brown and Churchill, 1999). Elsewhere, particularly in regions of Asia and Latin America, community-based health initiatives have come about independently and as part of income protection measures or to fill the void created by missing institutions[3].

Direct public provision of health care services for people lacking resources is only one of the ways of meeting their health care needs. This strategy was tried in the past in the belief that the poor are too poor to be able to save and contribute towards meeting their health care needs. This belief has been questioned in the recent past, and there is now a growing realisation that even the poor can make small, periodic contributions that can go towards meeting their health care needs. As a result, health insurance is increasingly being recognised as a tool for financing health care provision in low-income countries.

Why health? Of all the risks facing poor households, health risks probably pose the greatest threat to their lives and livelihoods. Health shocks have a direct impact on human capital formation. It thrusts health expenditure on a poor household precisely at a time when they can ill-afford it due to income shortfall resulting from the shock. Moreover, the uncertainty of the timings of illness and unpredictability of its costs make financial provision for illness difficult for households receiving low and irregular income (Tenkorang, 2001). Furthermore, given the strong link between health and income at low-income levels, a health shock affects the poor the most.

Why insurance? First, many health risks such as those relating to isolated illness, injury, disability, maternity and the like are considered to be eminently insurable as these risks are mostly independent or idiosyncratic, that is, not correlated among community members[4]. Secondly, insurance separates time of payment from time of use of health

services for each member, and thereby makes possible demand for such services by its members who would not have otherwise been able to afford the cost. Insurance is particularly beneficial to the poor who often bear high indirect costs of treatment due to their limited ability to mitigate risk on account of imperfect labour and credit markets[5]. Also, community-based insurance is considered to be pro-poor as it strengthens the demand side and thereby helps the poor to articulate their own needs (Develtere and Fonteneau, 2001).

Whereas the actual or potential benefits of the CF schemes have been described in the literature[6], surprisingly little has been said so far on the determinants of participation in these schemes. In particular, very little is known about the equity of participation and health care utilisation of participants categorised by income, ethnic group, religion, age, gender and health care status. These characteristics are important to judge whether the schemes are able to address the problem of social exclusion from access to social protection. Moreover, it provides evidence about the magnitude of adverse selection problems in voluntary health insurance schemes. In any case, there is a lack of empirical studies using household survey and community data in order to look beyond issues referring to the design of the schemes.

Against this background, and by using a household survey data set collected in 2000 in four communities in Senegal, this paper analyses determinants of demand for health insurance. By comparing “member” and “non-member” attributes and using limited dependent variable models on the household and individual level, we identify those variables which explain participation.

The paper is organised as follows: Section II gives an overview on the health care situation in Senegal focusing on the poor and the rural population in the selected survey area. Following this, Section III presents the study design, the data set and the estimation method. In Section IV, the regressions results of participation on the individual and household level are discussed. Based on the findings of the empirical analysis, different approaches to overcome the identified barriers are explored in Section V. Section VI concludes the paper.

II. HEALTH CARE SITUATION IN SENEGAL

In Senegal, as in most African countries, large proportions of people are not covered by formal health insurance, and access problems in terms of financing and geographic outreach are reported.

The Senegalese health care system has three different levels: the first level is the health district, the second the region and the third the central level. The health district has a health care centre as well as health posts. In total, 50 health districts are existing that are run by a chief health doctor. The regional level is attached to the administrative division of a region and the central level is attached directly to the Ministry of Health (PNDS, 1999).

Using the WHO's international norms, Senegal's health infrastructure can be said to be underdeveloped. Whilst the "inhabitants per health post" criteria was nearly reached in 1999, the staffing and the equipment indexes lagged considerably behind international norms.

Table 1. **Health Infrastructure in Senegal in 1999**

	Senegal	WHO norm
Inhabitants / doctor	17 000	7 500
Inhabitants / nurse	8 700	300
Women in reproductive age / midwife	4 600	300
Inhabitants / health post	11 500	10 000
Inhabitants / health centre	175 000	50 000
Inhabitants / hospital	545 000	150 000

Source: PNDS (1999).

Fifty per cent of the overall funding of the Senegalese health sector is undertaken by the central government, 10 per cent by user fees, 6 per cent by local governments and approximately 30 per cent by donors. Even though the public sector plays a major part in financing and providing services, the private sector, due to its size and geographical distribution, also plays an important role in the Senegalese health system. Private providers are a mix of for-profit providers, serving urban high- and middle-income groups and charging relatively high fees, and non-profit providers, mostly church-run facilities, serving rural and poor populations for only modest fees. Company clinics are also important: around 40 private clinics (1994), three quarters of which are located in Dakar, while 14 diagnostic labs, 11 of them in Dakar (PNDS, 1999), operate in Senegal.

In the non-profit-sector, the Catholic Church plays an important role as a health care provider with around 70 health posts (mainly in rural areas) and the well-known hospital St. Jean de Dieu in Thiès. The church deliberately puts most of its non-profit services in the rural areas, to reach the otherwise excluded and the poor. The church network developed mostly in the 1950-70 period. Church-based providers are especially important in reaching rural areas with preventive services.

The Movement of "les mutuelles de santé" in Senegal

The idea of community-financing schemes in Senegal has it roots in the Thiès region, which is located in the western part of Senegal and is, with over 1 million inhabitants, the second most densely populated region in the country. Roughly one third of the region's population lives in the town of Thiès, the rest living in the rural areas. Agricultural activities are the main income source for the rural population. For a long time peanut production dominated, but with sinking world market prices in the early 1990s, farmers have started diversifying by producing vegetables, fruits and food crops such as cassava. Poverty is widespread, notably among rural households (Tine, 2000).

The health care situation is equally unsatisfactory: people are exposed to a variety of illnesses and health risks such as malaria and diarrhoea. However, access to health care is constrained by the limited number of health facilities accessible to the population and by financial constraints[7]. The latter point poses a very important problem for the rural poor: when facing an illness, they have to rely on risk-coping strategies such as the selling of assets, or on transfers from their families and local networks to be able to pay the fees of a treatment. In consequence the majority of the rural population still frequent the *pharmacie de la rue* which offers medicine at lower prices but with an insecure and often lower quality (Tine, 2000).

Against this unfavourable background, the *mutuelles de santé* (mutual health organisations or mutuals) have been developed as one form of risk sharing at the community level. In Senegal, the first experience with health mutuals in rural areas started in 1990 in the village of Fandène in the Thiès region. From the beginning, the movement in Thiès was supported by a local health care provider, the non-profit hospital St. Jean de Dieu. At the time of the survey, 16 mutual health insurance schemes operated in the region of Thiès, covering around 27 000 persons[8].

III. STUDY DESIGN, DATA AND ESTIMATION METHOD

A household survey was carried out by the Institute for Health and Development (ISED) in Dakar in co-operation with the Centre for Development Research in Bonn. It started with a pre-test in March 2000 and the final survey took place in May 2000[9]. The participation rate, at more than 95 per cent, was very high. The aim of the survey was to collect information about five major aspects:

— socio-demographic data of the concerned population;

— impact of mutuals and the reasons why people joined or did not join;

— health status and health care seeking behaviour;

— income, expenditure and consumption patterns; and

— evaluation of living conditions.

For the survey, a two-stage stratified sampling procedure was chosen: first, four villages out of the 16 in which mutuals operate were selected. In each — Fandène, Sanghé, Ngaye Ngaye and Mont Rolland — one mutual is in place and is named for the village. As selection criteria of the four villages/mutuals, we used the age of the scheme proxied by the number of years in operation, the distance to the hospital, the types of services provided, and the participation rate (see Table 2). The second stage consisted in randomly selecting the households for the interviews. In all four villages, members and non-members were interviewed. Members and non-members were interviewed from household lists of all the inhabitants in order to calculate the percentage distribution between members and non-members and their respective weight in the sample.

Table 2. **Selection Criteria for Mutuals to be Included in the Survey**

Name of the village/mutual	Years of Operation	Distance from Hospital (km)	Services	Participation rate of households in the mutuals (%)
Fandène	10	6	Hospitalisation	90.3
Sanghé	3	8	Hospitalisation	37.4
Ngaye Ngaye	6	30	Primary health care	81.5
Mont Rolland	4	15	Hospitalisation	62.6

Source: Jütting (2002*a*).

A total of 346 households were interviewed, 70 per cent of which were members and 30 per cent of which were non-members, a ratio corresponding to the distribution of member and non-member households throughout our total population. The data set contains information on roughly 2 900 persons, of which 60 per cent members and

40 per cent non-members. This means that some household heads have not insured their entire family. In the empirical analysis of determinants of participation on the individual level, we discuss in detail which family members have a higher probability of being insured.

The data was entered immediately after completing the survey, using SPSS Windows. In addition to the household survey, we interviewed key persons (leaders of the mutuals) in order to get complementary information about the functioning, problems and success of the mutuals.

To estimate the determinants of participation in a mutual health organisation, we follow an approach applied by Weinberger and Jütting (2001)[10]. In that approach, participation in a local organisation depends on the rational choice of an individual weighting costs and benefits of membership. It is assumed that participation of a household (p) in a mutual depends on: the current income of the household (y), characteristics of the household head (H) who decides if the household joins or not, household characteristics (Z), community characteristics (C) and on the error term u, which is uncovariant with the other regressors.

The following equation describes our model:

$p_i = f(y_i, Z_i, H_i, C)$ (1)

In order to estimate the probability of participation, we use a binary probit model:

Binary probit model:

$p_i^* = ßy_i + \phi Z_i + \alpha H_i + \delta C + u_I$ (2)

$p_i = 1$ if $p^* > 0$, meaning the household $_i$ is member of the insurance scheme.

$p_i = 0$ otherwise.

IV. ESTIMATION OF DETERMINANTS OF PARTICIPATION

Variables Included into the Analysis

The following table gives an overview of the variables which are included in the analysis of the determinants of participation.

Table 3. **Overview of Variables Used and Expected Effects**

Variable	Description	Expected sign for participation decision
Individual characteristics of household head and household characteristics		
Sex	Male headed household (1=yes)	+
Age group 1	Age between 21 and 40 years	+
Age group 3	Age between 61 and 90 years	-
Literacy (dummy)	Ability to read/ read and write (1=yes)	+
Other organisation (dummy)	Household head member in other group (1=yes)	+
Relationship (dummy)*	Relation to household head (1= self, spouse, parents, children and 0 otherwise)	+
Wolof (dummy)	Household belonging to ethnic group of Wolof (1=yes)	+
Religion (dummy)	Christian household (1=yes)	+
Income	Average log expenditure / household member in F CFA	+
Income terziles	Lower terzile of expenditure Middle terzile of expenditure Upper terzile of expenditure	- +/- +
Self-wealth	Self-classification of the household (poor, average, rich)	-; +/-; +
Frequency of illness*	Number of cases ill in the last six months	+
Illness-ratio	Number of cases of illness per household in the last 6 months divided by number of household members	+
Community characteristics		
Fandène (dummy)	Household belonging to Fandène community (1=yes)	+
Sanghé (dummy)	Household belonging to Sanghé community (1=yes)	-
Ngaye Ngaye (dummy)	Household belonging to Ngaye Ngaye community (1=yes)	?
Mont Rolland (dummy)	Household belonging to Mont Rolland community (1=yes)	?
Solidarity (dummy)	Perceived solidarity in the village by household head (1=yes)	+

*: Only used in the equation for determinants of participation on an individual level.
Source: Own compilation.

As outlined above the decision of a household to participate in a mutual health organisation is supposed to be influenced by individual, household and community characteristics. The variables representing individual characteristics of the household head involves age, education, sex and proxies for the health status. With respect to age, we hypothesise that younger household heads are more open to innovations (age group 1: positive coefficient) and that with increasing age people tend to participate less (age group 3: negative coefficient). Furthermore, we expect that better educated people tend to join a mutual more than people with less education.

The following characteristics of the household are supposed to influence membership in a mutual: income, ethnic group, religion, and a proxy for the health status of the household.

The most important variable to be looked at in the context of our research question is income and its effect on the decision to participate or not. As outlined before, we use the income as a proxy for social exclusion. In our study, we have measured "income" as calculated by the average expenditure of the household per year and member[11]. We assume that income has a positive influence on the decision to participate and that the poorer strata of the population will not participate due to difficulties in paying the premium. Also, it will be of interest to analyse whether the richer part of the population participates as this is important for risk-pooling reasons. Hence, we included income terziles into the regression analysis, i.e. we divided our sample into three subgroups "rich", "average" and "poor". Added to the quantitative measures of wealth was relative wealth. Households were asked to classify themselves according to relative wealth within the community on a rank from one (poorer than the average) to three (wealthier than the average). We expect the same findings in tendency for the relative measures than for the quantitative measures.

We have included a dummy variable "Wolof" in order to measure the influence of belonging to a specific ethnic group[12]. The Wolofs are known for their openness to institutional innovations in the Senegalese context (Diallo, 2000). The variable "religion" is included in order to take into account the fact that mutuals have an exclusive contract with the Catholic-owned hospital, St. Jean de Dieu. Moreover, the mutuals get active support by the diocese de Thiès. Hence, we expect that Christians tend to enrol proportionally more than Muslims. We also assume a positive relationship between membership in a mutual and membership in other organisations. People who already have experience of participation in local organisations are more likely to be willing to join a mutual insurance than people who have no such experience[13]. To control for adverse selection, we integrate two variables that try to capture the health status of a household (illness ratio) and of an individual (frequency of illness). We assume that less healthy households tend to join mutuals more than healthier ones, leading to a potential adverse selection effect.

Finally, we include dummy variables capturing village characteristics. We assume that household heads acknowledging a high value of solidarity in their village tend to participate more.

Descriptive statistics

The following table shows the result from the descriptive analysis of differences between members and non-member households of a mutual health organisation.

Table 4. **Descriptive Statistics for Socio-Economic Characteristics of Member and Non-Member Households in Senegal**

	Members Mean (SD)	Non-members Mean (SD)	Differences (t-test for significance)	Total Mean (SD)
Individual characteristics of household head and household characteristics				
Sex	0.82	0.86	0.04	0.83
	(0.39)	(0.35)		(0.37)
Age group 1	35.93	35.44	0.49	35.85
	(4.09)	(4.22)		(4.07)
Age group 2	50.63	51.21	0.58	50.85
	(5.86)	(5.46)		(5.70)
Age group 3	71.09	70.89	0.2	71.03
	(6.10)	(6.16)		(6.10)
Literacy (dummy)	0.39	0.29	0.1**	0.36
	(0.49)	(0.45)		(0.48)
Other organisation (dummy)	0.36	0.19	0.17***	0.30
	(0.48)	(0.39)		(0.46)
Wolof (dummy)	0.16	0.0463	0.1137***	0.13
	(0.37)	(0.21)		(0.33)
Religion (dummy)	0.73	0.42	0.31***	0.63
	(0.44)	(0.50)		(0.48)
Income	106 280	66 752	39 528***	93 877
	(121 347)	(48 597)		(105 663)
Income terzile: lower	38 465	36 028	2 437	37 322
	(9 924)	(9 855)		(9 923)
Income terzile: middle	69 673	67 421	2 252	68 961
	(11 213)	(10 777)		(11 079)
Income terzile: upper	178 407	15 5877	22 530	174 850
	(163 371)	(53 243)		(151 437)
Self-wealth: poor	75 401	57 631	17 770**	66 377
	(26 851)	(37 522)		(43 135)
Self-wealth: average	114 349	75 241	39 108	106 820
	(141 909)	(51 955)		(130 336)
Self-wealth: rich	145 437	114 629)	30 808	138 043
	(98 548)	(93 802		(96 422)
Illness-ratio	0.4319	0.3749	0.057	0.4141
	(0.3457)	(0.2987)		(0.3324)
Community characteristics				
Fandène (dummy)	0.43	0.10	0.33***	0.33
	(0.50)	(0.30)		(0.47)
Ngaye Ngaye (dummy)	0.18	0.093	0.087**	0.16
	(0.39)	(0.29)		(0.36)
Sanghé (dummy)	0.13	0.46	0.33***	0.23
	(0.33)	(0.50)		(0.42)
Mont Rolland (dummy)	0.26	0.34	0.08	0.29
	(0.44)	(0.48)		(0.45)
Solidarity (dummy)	0.82	0.78	0.04	0.81
	(0.38)	(0.41)		(0.39)

* Significant at 0.1 level; ** Significant at 0.05 level; ***Significant at = 0.01 level.
Source: Own estimation based on ZEF-ISED survey data.

The results of the descriptive statistical analysis suggest that the household head of a member family seems to be better educated and joins more often other organisations than the head of a household not belonging to a mutual. Regarding differences in household characteristics, member households tend to belong more to the Wolof ethnic group, are in the majority Christians, and dispose of a higher income. Finally, with respect to community characteristics member households seem to be more frequent in the villages of Fandène and Ngaye-Ngaye, than in Sanghé and Mont Rolland.

Marginal Coefficients

To measure the determinants of participation in mutual health insurance schemes, we have developed three models. Model 1 includes “income” as a continuous variable to find out whether or not income has an influence on the decision to participate. Model 2 includes income terziles as regressors, which enable us to see the effects for the different wealth stratas of the population. Finally, in model 3, we use the self-reported wealth status as exogenous variables. Table 5 reports the marginal coefficients of participation which we have calculated with LIMDEP, which facilitates the interpretation of the estimated coefficients.

All three models are highly significant and their explanatory power is relatively good. Model 1 shows that income has the expected positive and highly significant effect on the probability of participation. If we look at how the different strata of the population participate, we find that the poorer part of the population is represented to a lesser extent than people with an average or high income. The results of model 2 suggest that the probability of participation of people belonging to the poorest terzile is 11 percentage points less, while in model 3 the equivalent figure for the self-classified poor people is 26 percentage points. We also have indications that the “upper income” strata tend to participate more than the average group with 16 percentage points (model 2)[14].

This result had to be put into perspective of the general living conditions in the survey area. The overall income of a household in the studied area is quite low. The income of the richest quintile of the surveyed populations — approximately 18 500 F CFA/per month/per household member — still lies below the minimum monthly salary that amounts to 37 000 FCFA per *person.* This result has been confirmed in other studies covering the same study area (Tine, 1998). In addition, cross-tabulations reveal that also among the poorest quintile of the surveyed households, members are present. To conclude, mutuals reach the poor but they do have difficulties to reach the most disadvantaged persons within a village.

Table 5. **Marginal Coefficients for Determinants of Participation in a Mutual Health Insurance in Senegal** (household level)

Variable	Model 1	Model 2	Model 3
Constant	-2.048***	-0.223	0.064
	(0.541)	(0.155)	(0.147)
Individual characteristics of household head and household characteristics			
Sex (1 = male)	0.054	0.071	-0.001
	(0.083)	(0.083)	(0.083)
Age group 1 (age 21-40)	0.088	0.085	0.079
	(0.092)	(0.092)	(0.091)
Age group 3 (age > 60)	0.087	0.079	0.101
	(0.061)	(0.061)	(0.062)
Literacy (can read/ read and write, 1 = yes)	0.059	0.062	0.043
	(0.063)	(0.063)	(0.063)
Other organisation (membership in other group, 1=yes)	0.180***	0.183***	0.120*
	(0.066)	(0.066)	(0.065)
Household characteristics			
Wolof (household belonging to ethnic group of Wolof, 1= yes)	0.249*	0.284**	0.229*
	(0.135)	(0.137)	(0.133)
Religion (1=Christian)	0.370***	0.369***	0.347***
	(0.085)	(0.085)	(0.083)
Income (expenditures per household member log)	0.167***		
	(0.046)		
Income terzile: Lower		-0.110*	
		(0.063)	
Income terzile: Upper		0.165**	
		(0.073)	
Self-wealth (self-classification of household): Poor			-0.254***
			(0.058)
Self-wealth: Rich			0.018
			(0.113)
Illness-ratio (number of cases of illness per household in the last)	0.002	0.007	0.037
6 months divided by number of household members	(0.088)	(0.088)	(0.086)
Fandène (household belonging to Fandène community, 1 = yes)	-0.029	-0.011	-0.119
	(0.151)	(0.152)	(0.150)
Sanghé (household belonging to Sanghé community, 1 = yes)	-0.277**	-0.261*	-0.383***
	(0.132)	(0.134)	(0.130)
Mont Rolland (household belonging to Mont Rolland community, 1 = yes)	-0.225	-0.202	-0.308**
	(0.139)	(0.141)	(0.137)
Solidarity (perceived solidarity in the village, 1=yes)	0.103	0.100	0.104*
	(0.066)	(0.067)	(0.065)
Number of observations	338	338	341
Pseudo R^2	0.567	0.569	0.568
Chi^2	120.32	121.39	127.96
Prob > Chi^2	0.000	0.000	0.000
Frequencies of actual/predicted outcomes	80%	80%	80%

* Significant at 0.1 level; ** Significant at 0.05 level; ***Significant at 0.01 level.
Source: Own estimation based on ZEF-ISED survey data.

Besides income, the other important household characteristic determining participation is the belonging to a specific religion. Being a Christian, increases on average the probability of being a member of a mutual by roughly 37 percentage points. This result is not surprising since the Catholic Church, as outlined above, supports the mutuals in various ways. During the interviews, Muslims reported that they thought that mutuals are exclusively for Christians and not open to everyone. Finally, another interesting household characteristic with an influence on participation is the ethnic group. As expected, the probability of participation is higher for the Wolofs than for other ethnic groups such as the Sérère and the Peulh[15].

Whereas household characteristics have an influence on the determinants of participation, the individual characteristics of the household head do not seem to play a role with the exception of "membership in other organisations". In all models, it turned out that those household heads with previous experience of membership in a local organisation tend to participate more. These people already have an experience of the costs and benefits of participation in local organisations, notably the reduction of the initial high transaction costs.

The village effects that were discovered are also interesting. Different model variations show that the inhabitants of Sanghé and Mont Rolland have a significantly lower probability of being members than inhabitants of Ngaye Ngaye and Fandène (in Tables 5 and 6 *vis-à-vis* Ngaye Ngaye). These results indicate clearly that the different types of health insurance provided — primary health care in Ngaye Ngaye and inpatient care in the other three mutuals — had no significant influence on the decision to participate. Instead there are indications that specific village factors, i.e. the management of the mutual, seem to play an important role. The Sanghé mutual faced several financing and managerial difficulties which lead to a temporary cessation of its activities. As a consequence several people left the mutual. Efforts to re-establish the mutual have been successful and today the mutual is functioning again, albeit with a lower participation.

So far the results have shown that the main factors influencing the demand for health insurance in rural Senegal at the household level are income, access to social networks, religion, belonging to a certain ethnic group and village effects. These results are largely confirmed by looking at the determinants of participation at the individual level. Regarding the individual level, it is specifically interesting to analyse which type of household members is insured. From a theoretical perspective, one would assume that those individuals that are insured are more prone to the risk of illness. As Table 6 shows, this seems to be confirmed by the fact that the probability for women and older people of being insured is higher than for male and younger persons in the household. It is reasonable to assume that women of child-bearing age and older people do need hospital care more often than other household members. Whilst the coefficient for both variables is significant, the marginal effect is, with less than 0.1 per cent points, rather low, which makes it difficult to diagnose severe adverse selection problems of the schemes. In addition, within a household, and controlling for other variables, the better-educated person is insured. Finally, and not surprisingly, within a household the persons closer to the household head — spouse, children, and parents — have a higher probability of being members than persons like uncles, aunts, etc.

Table 6. **Marginal Coefficients for Determinants of Participation in a Mutual Health Insurance in Senegal** (individual level)

Variable	Model coefficients
Constant	-0.100*
	(0.056)
Individual characteristics of member and household characteristics	
Sex (1= male)	-0.042**
	(0.021)
Age group 1 (age <26)	0.000
	(0.027)
Age group 3 (age >50)	0.077**
	(0.035)
Literacy (can read/read and write, 1= yes)	0.109***
	(0.022)
Other organisation (membership in other group, 1= yes)	0.070**
	(0.028)
Relationship (self, spouse, parents, children, 1 = yes)	0.115***
	(0.022)
Frequency of illness (number of cases ill in last 6 months)	-0.011
	(0.020)
Wolof (household belonging to ethnic group of Wolof, 1= yes)	0.182***
	(0.049)
Religion (1= Christian)	0.386***
	(0.033)
Income terzile: Lower	-0.047**
	(0.024)
Income terzile: Upper	0.219***
	(0.028)
Community characteristics	
Fandène (individual belonging to Fandène community, 1 = yes)	-0.058
	(0.058)
Sanghé (individual belonging to Sanghé community, 1 = yes)	-0.358***
	(0.050)
Mont Rolland (individual belonging to Mont Rolland community, 1 = yes)	-0.332***
	(0.055)
Number of observations	2,855
Pseudo R^2	0.549
Chi^2	989.02
Prob > Chi^2	0.000
Frequencies of actual / predicted outcomes	77%

* Significant at 0.1 level; ** Significant at 0.05 level; ***Significant at 0.01 level.
Source: Own estimation based on ZEF-ISED survey data.

In conclusion, the analysis reveals that religion, community matters, the belonging to an ethnic group and income have the strongest influence on the decision for a household to join a community-based health insurance scheme. This means that for the poorest of the poor in a community, other solutions have to be found in order to help them join the community-based health insurance schemes.

V. OVERCOMING THE PARTICIPATION CONSTRAINT

Formal health insurance schemes cover only a marginal proportion of the population in low-income countries. Due to economic constraints, lack of good governance and institutional weaknesses, formal social protection for the vulnerable segments of the population is widely absent. In this context, community involvement in the financing of health care is a first step in the long march towards improved access to health care and better social protection. The analysis has however also shown that community involvement is not sufficient in preventing social exclusion since the very poor face strong difficulties to participate fully in these schemes. Furthermore, existing barriers due to other social characteristics might be increased. The following options might be considered to overcome these constraints:

- *Well-targeted subsidies*

The non affordability of the premiums by the poorest segment in the villages could be addressed by subsidising their premiums. Poor people are willing to pay a part of their premium if their contributions are supplemented by a government subsidy and if the benefits they receive provide access to quality services that address their most frequent health problems. With these kind of subsidies governments would promote the demand side with a potentially longer lasting effect than with subsidies for public health facilities which have proven to be often ineffective. However, research is needed on ways of designing and implementing these subsidies.

- *Flexibility in payment procedure*

Households which cannot afford to pay the premium at once should be allowed to pay in instalments to a “tontine” before joining a community financing scheme. In addition, church-based groups can collect fees for the indigent, disabled, orphans, etc. The paying of contributions by charitable organisations has also been reported for some members of the schemes, which have given people otherwise excluded the chance to participate in the mutuals. Some mutuals have even started collective activities from which they are used to pay membership fees. The timing of collection is also important. After the harvest period, the chances that the poor can afford to spend money on insurance are higher.

- Education and strengthening of the management capacity

Public health policies can promote the technical and organisational know-how of the schemes through management and training. Institution building may prove to be a cost-effective way for creating local ownership and capacity. Specifically, it would be useful:

— to assist communities in organising and promoting community financing schemes and provide information about their viability;

— to provide an appropriate regulatory framework for these initiatives; and

— to promote financial literacy through education.

The overall aim should be to enlarge the risk pool and to make the schemes known and attractive to all parts of the concerned population. CF schemes are often set up by voluntary, non-profit-organisations. These organisations act as insurance brokers between the interests of a health care provider and the expectations and needs of their members. To deal with these ambiguities is of major importance and requires trained personnel. In this context, it must be stressed that the administrative procedure for handling claims should be as simple and transparent as possible. The collapse of a large number of mutual health insurance schemes in West Africa underlines the importance of financial literacy by both staff and members. For most people, the concept of insurance is something new, which means that intensive and continuous extension work is needed. Information campaigns are probably useful in this respect.

VI. CONCLUSIONS

In the past, policy makers and donors have largely focused on *public* policy measures for social protection of people living in low-income environments. The household has been seen mainly as beneficiary of action on the part of the public sector, not as an actor itself. This perspective mainly took into account government and donor activities in this area, largely overlooking the diverse and often rich institutional environment in which most of these households are embedded. As a matter of fact most people working in the informal sector or in rural areas are largely excluded from formal social security.

In many countries, new forms of risk sharing at the local level are developing, community financing schemes being a prominent example. This study shows that while it has been reported in the literature that these schemes can substantially reduce transaction costs and help to better protect people against health shocks, participation of all segments of the community is not ensured. Participation in community financing schemes requires resources, i.e. time and money, which the most disadvantaged group in societies often does not possess. Donors and policy makers should hence be aware that it might be very difficult, even impossible, to reach the poorest part of the population when promoting participation in these kind of local organisations. In order to both promote these initiatives and lower the barriers of participation, well-targeted subsidies and a linkage to social funds is a possible solution. As one major objective of social funds is to finance investments benefiting the poor and, since in most parts it is the public sector which administers social funds, such a support would also strengthen the linkage to more formalised health care systems. By the same token, it would also enlarge the small risk pool of community financing schemes, a major weakness of the schemes, thereby also helping to prevent a further fragmentation of the population.

Future research should address the question of how subsidies for the poorest in a community can be designed in order to preserve the incentives for a viable management of the schemes and to achieve optimal targeting. In addition, more research is needed on other promising measures to fight social exclusion in access to social protection in low-income environments.

NOTES

1. These terms are used interchangeably throughout the paper.
2. The schemes are more concentrated in central and western parts than in eastern and southern parts of sub-Saharan Africa.
3. Health insurance by Self-Employed Women Association (SEWA), India, and insurance provided by Grameen Bank, Bangladesh are just two of the many such examples.
4. Unlike many health risks, political, social and institutional risks are often covariate in nature (Weinberger and Jütting, 2000). On insurability of risks, see Jütting, 2002*b*, and Brown and Churchill, 1999.
5. According to Tenkorang (2001), several studies on Africa show that demand for health care services is often hindered by immediate cash payments involved.
6. For a recent paper on the impact of CF schemes on access to health services, see Jütting (2002*a*).
7. For example, it is estimated that one doctor has to cover 21 000 persons and one hospital covers more than 580 000 people. Both figures are above national averages (Tine, 2000).
8. For details, see Tine (2000).
9. The interviewer team consisted of 15 enumerators and 4 supervisors, all with an educational background in public health. They have been selected by the Institute for Health and Development on the basis of past performance in surveys.
10. Weinberger and Jütting (2001) analyse determinants of participation in local self-help groups in rural regions of Pakistan and Chad.
11. Alternatively, we have also measured income as calculated by the returns of on-farm and off-farm activities as well as remittances. It turned out, however, that there was some estimation bias in the data due to the non-willingness of some interviewed people to report their true income.
12. In the region of Thiès, there exist three important ethnic groups: Wolof, Sérère and Peulh.
13. See, for example, the case study of women's participation in local development groups in Pakistan and Chad (Weinberger and Jütting, 2001).
14. The difference between model 2 and model 3 with respect to the effect of the upper class can be explained by the fact that people tend to classify themselves as being in the middle or poor and only 9 per cent classified themselves as rich.
15. The majority of Wolof are Moslems not Christians, so potential collinarity problems do not pose a problem.

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