

# Social Protection in Rural Areas of Developing Countries: Investigating the Impact of Community Based Health Insurance in Rural Senegal

Johannes Jütting

E-Mail: [j.juetting@uni-bonn.de](mailto:j.juetting@uni-bonn.de)



**Paper prepared for presentation at the X<sup>th</sup> EAAE Congress  
'Exploring Diversity in the European Agri-Food System',  
Zaragoza (Spain), 28-31 August 2002**

*Copyright 2002 by Johannes Jütting. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.*

# **Social protection in rural areas of developing countries: Investigating the impact of community based health insurance in rural Senegal**

*Johannes Jütting, Center for Development Research<sup>1</sup>*

Key words: community based health insurance, impact analysis, social protection, Senegal

## Abstract:

Community based health insurance schemes are becoming increasingly recognized as an instrument which help farmers in rural areas of low income countries to better manage health. Health risks present a permanent threat to the income earning capacity of poor people. Beside direct economic cost for treatment and lost working time, indirect cost such as a reduction in labor supply materialize which increases the vulnerability of the household. It is often hypothesized that community based health insurance improve social protection, but quantitative analysis is largely missing. Against this background, this paper analyzes if members in a mutual health insurance scheme have a better access to health care than non-members taking “les mutuelles de santés” (mutual health organization) in rural Senegal as an example. Limited dependent and log linear regressions are used to capture the impact of health insurance on the probability of visiting a health care provider and the out-of-pocket expenditure at the point of use . The results of the analysis show that while community based health insurance schemes reach otherwise excluded people, the poorest of the poor in the communities are not covered. Regarding the impact on the access to health care, members have a higher probability of using hospitalization services compared to non-members and pay substantially less when they need care. Given the results from this study, community financing schemes have the potential to improve the risk management capacity of rural households.

---

<sup>1</sup>Contact: Dr. Johannes Jütting • Center for Development Research • Walter-Flex-Straße 3 • 53113 Bonn, Germany • Phone: +49-228-73-1859 • E-Mail: [j.juetting@uni-bonn.de](mailto:j.juetting@uni-bonn.de) • Internet: <http://www.zef.de>

# 1 Introduction

Although it is widely agreed that poverty alleviation has a positive effect on health, the knowledge that better health care provision can be an important contribution to economic development and social protection is only slowly becoming accepted. Recent studies on the economic costs of illness stress the detrimental effect of health shocks on rural households as beside of financial and time cost, indirect costs of illness such as a reduction in labour supply materialise (Asfaw et al. 2001). In order to reduce the cost of illness for households, the introduction of community based health insurance is being discussed (WHO 2000, Jütting 2000, Creese and Bennett 1997). Partly as a response to the lack of public social protection, to the negative side-effects of user fees and to persistent problems with health care financing and quality, non-profit, voluntary insurance schemes for urban and rural self-employed and informal sector workers have recently emerged. These schemes are characterised by the pooling of health risks, and frequently, though not always, by an ethic of mutual aid and solidarity (Atim 1998, Ziemek and Jütting 2000).

Existing studies on mutual insurance schemes in agricultural economics have largely focused on a) crop and yield insurance (e.g. Hazell 1992 and Verhul and Mersh) or b) at the question, weather or not mutual insurance schemes can smooth income and/or consumption of rural households (e.g. Morduch 1995). In this discussion, however, mutual *health* insurance schemes have been largely ignored. Against this background, this paper analyzes if mutual health insurance schemes improve the access to health care of the rural poor. We tackle two central questions: What are important socio-economic determinants explaining membership in a voluntary health insurance scheme? This allows us to identify important factors influencing the demand for health insurance. We are specifically interested in analyzing whether or not every segment of the society is equally represented in the mutuals or if adverse selection undermines the stability of the scheme. Second, what is the impact of the schemes on the utilization of health care and social protection comparing members and non-members?

To answer these question we use a binary probit model for estimating marginal coefficients for the determinants of participation and a logit/log-linear model to analyze the impact on health care utilization and financial protection between members and non-members. With this methodology applied we go beyond most of the available studies on the impact of community financing schemes so far, which have either relied on secondary literature (e.g. Bennett et al. 1998) or restricted their data analysis to qualitative interpretations (e.g. Atim 1998).

We have chosen the case of Senegal which is specifically interesting, as we find here (Tine 2000):

- a relatively long, 10-year experience with mutual health insurance schemes.
- an innovative institutional setting. There exists a contract between a non-profit health care provider, a catholic-run hospital, and the mutuals, which allows them to receive health care at a lower rate.

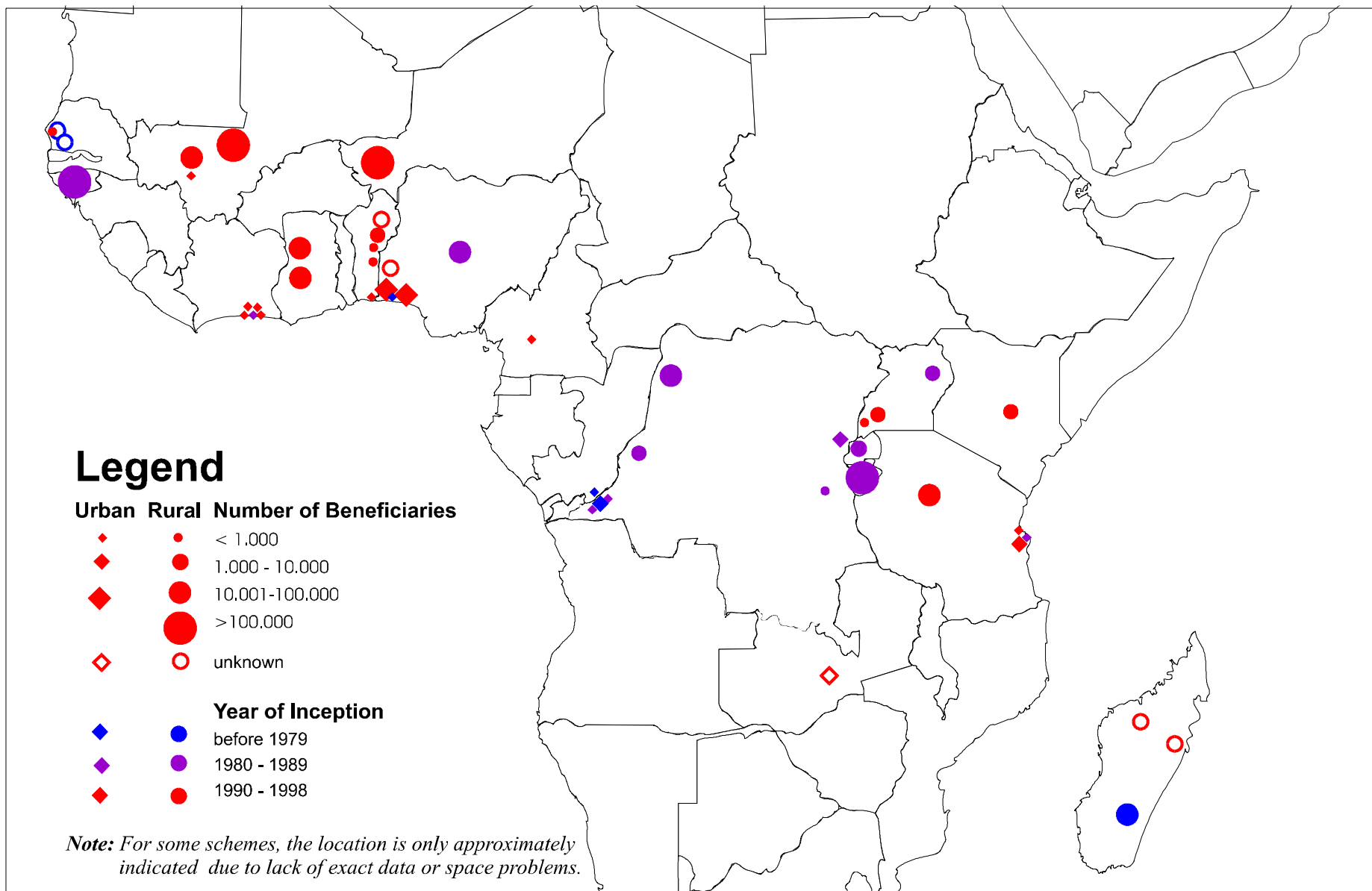
The outline of the paper is as follows: Section 2 gives a quick overview on health insurance schemes in rural Sub-Sahara Africa and presents the specific situation in Senegal. Following that, section 3 describes the research design and the methodology used. The results of the estimations are discussed in section 4. Section 5 concluded the paper.

## **2 Health insurance in rural Sub-Sahara-Africa**

Wiesmann and Jütting (2001) present in detail an overview of health insurance schemes outside formal sector employment in Sub-Saharan Africa, which is based on extensive research which has been done in the past few years (Bennett et al. 1998, Atim 1998, Musau 1999). The majority of the schemes have been set up in the nineties. The reasons which promote and foster the development of mutual health insurance schemes have not been analyzed in depth so far, but some tendencies are quite obvious (Wiesmann and Jütting 2001): First, people have been forced to think about alternative solutions as health care at the public facilities is no longer offered for free and the introduction of user fees has had negative effects especially for the poor. Second, in the context of decentralization more power has been delegated to the communities which allow them to take over more responsibilities also in the provision of local public goods. Third, the quite positive experience with credit and financing institutions is leading to the discussion if the mutuels should enlarge their portfolio to include also insurance products. Finally, the cost of illness debate in the literature has shown that health shocks often force households to high cost risk coping strategies. Access to insurance could reduce these costs substantially (Weinberger and Jütting 2000, Asfaw et al. 2001).

The map in Figure 1 gives a view of health insurance schemes outside the formal employment sector in Sub-Saharan Africa. The map clearly shows that so far, community based health insurance is more common in West Africa than in Central or East Africa. In some countries, these new schemes are mainly an urban phenomenon – such as in Côte d’Ivoire and in Tanzania – whereas in other states, they are predominantly covering people in rural areas; examples are Uganda, Ghana and Benin.

**Figure 1: Urban and rural health insurance schemes in Sub-Saharan Africa – year of inception and size**



*Source: Wiesmann and Jütting (2001)*

Some of the schemes are confined to a local cooperative of craftsmen or traders, therefore they are often very small and may cover less than 100 beneficiaries (Kiwara 1997). Other insurance schemes are extended over the whole country and many communities and include up to 1 million or even more beneficiaries (Bennett et al. 1998). The number of beneficiaries can change rapidly and neither reveals the financial balance of the schemes, nor does it say much about the scheme's sustainability. Indeed, a few schemes had to be terminated after some years (Criel 1998, Bennett et al. 1998), whilst others have been in operation for decades.

In Senegal there has been a relative long tradition with mutual health insurance. The first experience started in the village of Fandène in the Thiès region in 1990. From the beginning, the movement in Senegal has been supported by a local health care provider, the non-profit hospital St. Jean de Dieu. Today there are 16 mutual health insurance schemes operating in the area of Thiès. The main features of the schemes are:

- the schemes are community based
- 90 % of the schemes operate in rural areas
- with the exception of one mutual – Ngaye Ngaye - they only cover hospitalization
- the mutuels have a contract with the hospital St. Jean de Dieu, where they get a reduction of up to 50 % for treatment
- in general the household is a member of a mutual, who participates in the decisions. He has a membership card on which he can put all or selected members of his family (beneficiaries). The membership fee is per person insured.

Table 1 presents the details of the different payment forms at the hospital.

**Table 1: Hospitalization fees for members and non-members at St. Jean de Dieu Hospital**

|                     | <b>Hospitalization</b>         |                   |                            |
|---------------------|--------------------------------|-------------------|----------------------------|
|                     | <b>Ticket for consultation</b> | <b>Daily cost</b> | <b>Operation (surgery)</b> |
| <b>Members</b>      | 3 000 F CFA                    | 3 750 F CFA       | 750 F CFA/unit             |
| <b>Payment by :</b> | member                         | mutual            | member                     |
| <b>Non-members</b>  | 6 000 F CFA                    | 7 500 F CFA       | 1 500 F CFA/unit           |
| <b>Payment by:</b>  | non-member                     | non-member        | non-member                 |

Source: ZEF-ISED survey, 2000

It shows that a member has to pay a minimum amount of 3.000 F CFA for a treatment. If he needs surgery he has to pay himself 50 % of the total costs for the operation. The daily cost of hospitalization, including also laboratory analysis, consultation and to some extent radiography, is paid by the mutual which benefits of a reduction of 50 %. A mutual pays 3750 F CFA/day for each hospitalization of its members, compared with 7500 F CFA/day a non-member has to pay. In case of hospitalization, the member has to bring with him a letter

of guarantee which is given to him by the manager of the mutual if the member has paid the insurance premium regularly. A stay at the hospital between 10 and 15 days is integrally paid by the mutual. If the hospitalization exceeds this limit, the mutual pays the hospital for the entire invoice, because it guaranteed to do so. Afterwards the member reimburses the mutual step by step. To receive the described benefits the members of a mutual have to pay a monthly premium between 100 and 200 F CFA and the head of the household has to buy once a membership card for 1.000 F CFA.

### 3 Research design and methodology

#### 3.1 Research design

A household survey was carried out by the Institute for Health and Development (ISED) in Dakar in cooperation with the Center for Development Research in Bonn. It started with a pre-test in March 2000 and the final survey took place in May 2000. The participation rate in the interviews was with more than 95% very high.

For the survey, we chose a two stage sampling procedure: First, we selected 4 villages out of the 16 villages in which mutuels operate. In each of the selected villages Fandène, Sanghé, Ngaye Ngaye and Mont Rolland only one mutual is in place, which has the same name as the village itself.

The following table summarizes the major differences between the analyzed schemes:

**Table 2: Selection criteria for mutual to be included in the survey**

| Name of mutual/Village | Years of operation | Distance from Hospital | % of member household in villages | Services            |
|------------------------|--------------------|------------------------|-----------------------------------|---------------------|
| <b>Fandène</b>         | 10 years           | 6 km                   | 90,3 %                            | Hospitalization     |
| <b>Sanghé</b>          | 3 years            | 8 km                   | 37,4 %                            | Hospitalization     |
| <b>Ngaye Ngaye</b>     | 6 years            | 30 km                  | 81,5 %                            | Primary health care |
| <b>Mont Rolland</b>    | 4 years            | 15 km                  | 62,6 %                            | Hospitalization     |

Source: ZEF-ISED survey, 2000

In a second step, we selected randomly the households for the interviews. In all four villages, members and non-members were interviewed. In order to get a random sample out of the four villages, we used household lists of all inhabitants (members and non-members) of the four villages in order to calculate the percentage distribution between members and non-members and their respective weight in the sample. We interviewed a total of 346 households, 70% of which are members and 30 % of which are non-members. The data set contains information of roughly 2.900 persons, from which are 60 % members and 40 % non-members. This means that some household heads have not insured their complete family.

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.

### 3.2 Methodology

In order to estimate the determinants of participation in a mutual health organization, we follow an approach used by Weinberger and Jütting (2001) for determinants of participation in local organizations. In that approach participation in a local organization is depended on the rational choice of an individual weighing costs and benefits of membership. Cost and benefits are dependent on the existence, quality and access to assets. Hence it is assumed that participation ( $p$ ) in a mutual depend on the current income of the household ( $y$ ), characteristics of the household head ( $Z_i$ ), who decides if the household joins or not, household characteristics ( $Z_h$ ) and on community characteristics ( $Z_c$ ).

The following equation describes our model:

$$(1) \quad p = f(Z_c, Z_h, Z_i, y)$$

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

(2) Binary probit model:

$$p^* = \beta_1 y + \beta_2 Z_c + \beta_3 Z_h + \beta_4 Z_i + u_v$$

$$p = \begin{cases} 1 & \text{if } p^* > 0, \text{ i.e. the household has membership in a health insurance scheme} \\ 0 & \text{if not} \end{cases}$$

In order to measure the effect of health insurance on access to health care services, a model approach is used, which is applied in the USA to measure the demand for health care services ( e.g. Manning et al. 1987)<sup>2</sup>. With this approach the determinants of demand for health care services are recorded in a first step using a logit model and, in a second step, a log linear regression model of the costs in the case of illness is estimated. Formally this approach can be written as follows:

- Logit model for the demand for health care services for the full sample:

$$\text{Probability (visit } > 0) = X_{\beta} + u$$

- Log linear model for estimating direct payments for those people with at least one visit:

$$\text{Log (direct payment/consultation } > 0) = X_{\phi} + e$$

with  $X$  as a vector for a set of independent variables influencing individual pattern of utilization, including membership in a mutual.  $\beta$  and  $\phi$  are vectors of coefficient estimates of the respective models.  $u$  and  $e$  are error terms.

---

<sup>2</sup> For a recent application see Yip and Berman (2001).



The independent variables determining the demand for health care and expenditure in the case of illness are – among others – age, gender, education, health status, income and, membership in a health insurance scheme.

## 4 Results

### 4.1 Determinants of membership in a health insurance scheme

As outline above the decision of a household to participate in a mutual health organization is supposed to be influenced by individual, household and community characteristics. The variables representing *individual* characteristics of the household head involves age, education and sex and membership in another organization. With respect to age we hypothesize that younger household heads are more open for 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 and male headed households tend to join a mutual more often than people with less education and female headed households.

The following characteristics of the *household* is supposed to influence membership in a mutual: income; ethnic group, religion and the illness ratio. The most important variable to be looked at in the context of our research question is income and it's effect on the decision to participate or not. In our study we have measured "income" as calculated by expenditure of the household per year and member. 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 analyze whether the richer part of the population participates as this is important for risk pooling reasons. Hence, we include into the regression analysis income terzils, i.e. we divided our sample in 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. The Wolof are know for their openness for institutional innovations in the Senegalese context (Diallo 2000). The variable "religion" is included in order to take into account that the 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 enroll proportionally more than Muslims. We assume also a positive relationship between membership in a mutual and membership in other organizations. People who have already experience in participation in local organizations are most likely more willing to join a mutual insurance than people who have no experience in participation at all. To control for adverse selection we integrate the illness ratio of the household as a proxy for the health status. The variable describes the number of cases of illness of household members in relation to the overall household size. It is assumed that less healthier households tend to join mutuals more than healthier ones, leading to adverse selection problems.

Finally, we include dummy variables capturing *village* characteristics: acknowledgement of solidarity in the village (solidarity) and village factors. We assume that people acknowledging a high value of solidarity in their village tend to participate more. With respect to the village effects, we want to control if the type of insurance matters, i.e. hospitalization care versus primary health care (Ngaye Ngaye) as well as for the specific local setting, i.e. the cultural environment in the specific village and specific characteristics of the mutual, i.e. distance to the hospital, the functioning of the mutual etc.

The results presented in table 3 show the marginal effects of the probit analysis. Three different models were evaluated, differing in their definition of the income variable. In the first model income is defined as a metric variable so as to analyze whether income has an influence on membership in a mutual. In the second model income groups are established, in order to determine effects between different income groups. In the third model income groups were also formed, but in contrast to model 2 they were not determined based on expenditure, but on the basis of self-assessment by the people surveyed<sup>3</sup>.

Table 3 shows that all three methods used are highly significant. Income has the anticipated positive influence on membership. Models 2 and 3 show furthermore that the lower income groups in the villages are significantly less represented in the mutuals. That means that the wealthy people in the communities are more likely to (be able to) participate in the insurance schemes. At the household level, religion and ethnic identity play an important role in addition to income. The clearly higher participation by Christians – the probability increases by about nearly 40 %-age points compared to non-Christians – was to be expected because of the intensive promotion of the mutuals by the Catholic church.

While household characteristics do have an influence on the decision as to membership, this is obviously not the case for the individual characteristics of the head of the household, such as education, gender and age. All three characteristics are not significant. Membership in other organizations is a positive factor however. People who have already experienced the advantages and disadvantages of being associated to local groups are obviously more disposed towards membership in a health insurance scheme.

The village effects that were discovered are also interesting. Different model variations show, for example, that the inhabitants of the villages Sanghé and Mont Rolland have a significantly lower probability of membership than people coming from the village Ngaye Ngaye and Fandène. These results indicate, that obviously the different type of health insurance provided – primary health care in Ngaye Ngaye and in patient care in the other three mutuals - had no significant influence on the decision to participate. Instead specific village factors, i.e. the management of the mutual seem to play a role. The mutual of Sanghé has faced several financing and managerial difficulties which have lead to a stop of operation for some time. As a consequence several people left the mutual. Efforts to reestablish the mutual have been successful and today the mutual is functioning again, however with a lower participation rate than before.

---

<sup>3</sup> Estimating the income of households in developing countries is difficult. Since many of the people surveyed are reluctant to reveal their real income, income is generally measured by using expenditure. This method of measuring can be supplemented by asking the protagonists to do a self-assessment, comparing themselves with other households in the neighbourhood.

**Table 3: Marginal coefficients for determinants of participation in mutual health insurance (household level)** Dependent variable: Membership in a mutual (1 if the household is member and 0 otherwise)

| <b>Variable</b>   | <b>Model 1</b>       | <b>Model 2</b>      | <b>Model 3</b>       |
|---|----------------------|---------------------|----------------------|
| Constant  | -2,048***<br>(0,541) | -0,223<br>(0,155)   | 0,064<br>(0,147)     |
| <b><i>Individual charact. of household head</i></b>   |                      |                     |                      |
| Sex (1 = male)  | 0,054<br>(0,083)     | 0,071<br>(0,083)    | -0,001<br>(0,083)    |
| Age group 1 (age 21-40)   | 0,088<br>(0,092)     | 0,085<br>(0,092)    | 0,079<br>(0,091)     |
| Age group 3 (age > 60)  | 0,087<br>(0,061)     | 0,079<br>(0,061)    | 0,101<br>(0,062)     |
| Literacy ( can read/ read and write, 1 = yes)   | 0,059<br>(0,063)     | 0,062<br>(0,063)    | 0,043<br>(0,063)     |
| Other organization (membership in other group, 1=yes)   | 0,180***<br>(0,066)  | 0,183***<br>(0,066) | 0,120*<br>(0,065)    |
| <b><i>Household characteristics</i></b>   |                      |                     |                      |
| Wolof (household belonging to ethnic group of Wolof, 1= yes)                                    | 0,249*<br>(0,135)    | 0,284**<br>(0,137)  | 0,229*<br>(0,133)    |
| Religion (1=Christian)  | 0,370***<br>(0,085)  | 0,369***<br>(0,085) | 0,347***<br>(0,083)  |
| Income (expenditures per household member log)  | 0,167***<br>(0,046)  |                     |                      |
| Income tertile: Lower   |                      | -0,110*<br>(0,063)  |                      |
| Income tertile: Upper   |                      | 0,165**<br>(0,073)  |                      |
| Self-wealth (self-classification of household): Poor  |                      |                     | -0,254***<br>(0,058) |
| Self-wealth: Rich   |                      |                     | 0,018<br>(0,113)     |
| Illness-ratio (number of cases of illness per household divided by number of household members) | 0,002<br>(0,088)     | 0,007<br>(0,088)    | 0,037<br>(0,086)     |
| <b><i>Community characteristics</i></b>   |                      |                     |                      |
| Fandène (household belonging to Fandène community, 1 = yes)                                     | -0,029<br>(0,151)    | -0,011<br>(0,152)   | -0,119<br>(0,150)    |
| Sanghé (household belonging to Sanghé community, 1 = yes)                                       | -0,277**<br>(0,132)  | -0,261*<br>(0,134)  | -0,383***<br>(0,130) |
| Mont Rolland (household belonging to Mont Rolland community, 1 = yes)                           | -0,225<br>(0,139)    | -0,202<br>(0,141)   | -0,308**<br>(0,137)  |
| Solidarity (perceived solidarity in the village, 1=yes)   | 0,103<br>(0,066)     | 0,100<br>(0,067)    | 0,104*<br>(0,065)    |
| Number of observations  | 338                  | 338                 | 341                  |
| Pseudo R <sup>2</sup>   | 0,567                | 0,569               | 0,568                |
| Chi <sup>2</sup>  | 120,32               | 121,39              | 127,96               |
| Prob > Chi <sup>2</sup>   | 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

## 4.2 Impact of membership on access to modern health care services

In this section we test the hypothesis that members of a mutual have a better access to modern health care facilities than non-members. As outlined before we measure access in two respects: the probability of frequentation of a health care facility, i.e. to visit a hospital and the out-of-pocket expenditure at the point of use. Our primary variable of interest is membership in a mutual. We hypothesize that the probability of members to frequent a hospital is higher, while at the same time they pay less for their treatment in comparison to non-members after controlling for individual, household and community characteristics. This would mean that membership has a positive coefficient for the demand for health care and a negative one for the effect on expenditure. Beside membership, the other variable of key interest is income as we want to see how much demand health care utilization and out of pocket expenditure is due to the income level and the ability to pay.

As control variables we include age, sex, education and the frequency of illness, which capture the need for health care and the health status of an individual. Village effects are taken into account for differences in the cost of seeking health care as well as the specific design of the mutuals. One assumption is that inhabitants from the village in Fandène have a better access to health care due to their relatively close distance to the hospital as well as to the reported well functioning of the mutual. The results of the estimates for the determinants of demand for health care services and the costs in the case of illness are presented in table 4.

Both models are highly significant. 151 of the 2,856 people have been in hospital within the last two years<sup>4</sup>. The findings of the estimates for both models suggest that the members of a mutual have better access to health care services than non-members. The probability of making use of hospitalization increases by 2 %-age points with membership and expenditure in case of need is reduced by about 50% compared with non-members. Regarding the individual characteristics and besides membership, age and gender play a role. Moreover, the results suggest that younger people make less use of the hospital than the elderly and they pay less on average if they do get ill. Furthermore, women use the hospital more than men. Women go to hospital especially when they have problems during pregnancy or birth.

As far as the variables at the household level are concerned, it turns out that income has an impact on the demand for health care services and expenditure. The relatively better-off people in a community make more use of services and spend more money in the case of hospitalization. This is in line with findings on the demand for health care in other developing countries (Gertler and van der Gaag 1990).

With respect to village effects, it seems that people living in Fandène have a higher effective demand for hospitalization than the people in the other three communities<sup>5</sup>. A possible explanation is the fact that Fandène is the oldest mutual, which is according to our interview partners well organized and well functioning. In addition it is also the closest mutual to the hospital St. Jean de Dieu.

---

<sup>4</sup> A certain percentage of the hospitalized persons had to be excluded from the “expenditure” analysis as they were not aware of the costs which they had to pay because other family members paid for them.

<sup>5</sup> This effect clearly pops up, when leaving the mutual Fandène outside and the remaining mutuals get a significant negative coefficient.

**Table 4: Probability of hospitalization and determinants of expenditure in case of hospitalization**

| Variable  | Model 1a<br>(hospital) | Model 1b<br>(hospital) | Model 2a<br>(expend.) | Model 2b<br>(expend.) |
|---|------------------------|------------------------|-----------------------|-----------------------|
| Constant  | -0,301***<br>(0,065)   | -0,137***<br>(0,021)   | 4,611***<br>(2,016)   | 9,445***<br>(0,642)   |
| <b>Individual and household characteristics</b>                       |                        |                        |                       |                       |
| Sex (1= male)   | -0,014**<br>(0,007)    | -0,014**<br>(0,006)    | 0,370<br>(0,214)      | 0,401<br>(0,21)       |
| Age group 1 (age < 26)  | -0,016**<br>(0,008)    | -0,016**<br>(0,008)    | -0,495***<br>(0,258)  | -0,520***<br>(0,210)  |
| Age group 3 (age > 50)  | 0,022**<br>(0,009)     | 0,022**<br>(0,009)     | -0,008<br>(0,323)     | -0,141<br>(0,327)     |
| Literacy (can read/ read and write, 1= yes)                           | -0,107<br>(0,007)      | -0,010<br>(0,007)      | 0,07<br>(0,243)       | 0,035<br>(0,239)      |
| Membership ( in health insurance without Ngaye Ngaye, 1=yes)          | 0,020**<br>(0,009)     | 0,020**<br>(0,009)     | -0,452**<br>(0,287)   | -0,514**<br>(0,291)   |
| Frequency of illness  | 0,009<br>(0,006)       | 0,008<br>(0,006)       | -0,02<br>(0,16)       | -0,03<br>(0,157)      |
| Type of illness (complications during pregnancy/childbirth, 1=yes)    |                        |                        | 1,273**<br>(0,303)    | 1,125**<br>(0,299)    |
| Severity of illness (number of days hospitalized)                     |                        |                        |                       | 0,015***<br>(0,005)   |
| Wolof (household belonging to ethnic group of Wolof, 1 = yes)         | -0,007<br>(0,020)      | -0,005<br>(0,019)      | -0,002<br>(0,576)     | -0,033<br>(0,582)     |
| Religion (1 = Christian household)                                    | -0,005<br>(0,012)      | -0,004<br>(0,012)      | 0,089<br>(0,324)      | 0,142<br>(0,323)      |
| Income (expenditures per household member log)                        | 0,015***<br>(0,005)    |                        | 0,441**<br>(0,174)    |                       |
| Income tertile: Lower   |                        | -0,008<br>(0,008)      |                       | -0,120<br>(0,273)     |
| Income tertile: Upper   |                        | 0,016**<br>(0,008)     |                       | 0,67***<br>(0,238)    |
| <b>Community characteristics</b>                                      |                        |                        |                       |                       |
| Fandène (household belonging to Fandène community, 1 = yes)           | 0,046**<br>(0,022)     | 0,046**<br>(0,022)     | 0,550<br>(0,67)       | 0,568<br>(0,676)      |
| Sanghé (1= household belonging to Sanghé community, 1 = yes)          | 0,017<br>(0,020)       | 0,018<br>(0,020)       | 1,573<br>(0,643)      | 1,588<br>(0,643)      |
| Mont Rolland (household belonging to Mont Rolland community, 1 = yes) | 0,027<br>(0,022)       | 0,027<br>(0,021)       | 1,986*<br>(0,636)     | 1,779<br>(0,629)      |
| Number of observations  | 2855                   | 2855                   | 118                   | 118                   |
| Chi <sup>2</sup> / F value  | 103,00                 | 103,96                 | 3,990                 | 4,176                 |
| Corrected r squared   |                        |                        | 0,264                 | 0,289                 |
| Prob > Chi <sup>2</sup> / F value                                     | 0,000                  | 0,000                  | 0,000                 | 0,000                 |
| Frequencies of actual / predicted outcomes                            | 94,7 %                 | 94,7 %                 |                       |                       |

\* Significant at 0,1 level    \*\* Significant at 0,05 level    \*\*\*significant at 0,01 level

Source: own estimation based on ZEF-ISED survey data

To sum up, it can be said that members are (can be) hospitalized more often and pay considerable less for treatment than non-members. Other important factors are "age", "type of illness", "gender", "income", and "village effects".

The case study on the community-based health insurance schemes in Senegal shows that the formation of a health insurance scheme for households in rural areas is possible and can result in a better access to health care for otherwise excluded people. Especially in places where local institutions have already developed forms of mutual help, there seem to exist possibilities to develop them to more formalized approaches. From the Senegalese case study it turns out that beside an existing local network, the existence of viable health care provider is of tremendous importance. Without the financial support of the hospital as well as the well perceived quality provided – the hospital is well known for its good quality in service provision – , it is difficult to imagine that the mutals would still exist. Hence, subsidies seem to be necessary if one wants to set up an insurance scheme for poor people.

Finally, also individual and household characteristics play a role for the viability of rural health insurance schemes. In areas with widespread poverty and a scattered population setting up a health insurance scheme is much more difficult than in more richer and populated areas. As the analysis of the determinants of participation in micro-insurance schemes has revealed against the expectations of most donors and policy makers they do not necessarily reach all population groups in a village. In fact, for the lowest income group the premium to insure the whole family reaches nearly 8 % of the annual income of the household<sup>6</sup>. Support for this group should therefore be secured by the state. This could be done for example in the form of subsidized premiums.

## 5 Outlook

The results of the experience with mutual health organization in Senegal suggests, that rural health insurance for the poor is under certain conditions feasible. More importantly, it could be shown that access to health insurance can have a positive impact on the economic and social situation of their members. To what extent health insurance, or rather the lack thereof affects people's labor productivity and willingness to undertake risky, but potentially profitable investments needs to be further investigated.

To enlarge the access to health care of the poor and the rural population, community based health insurance schemes can be an important element and a first step. It allows to a limited degree to pool risks and thereby leads to an improvement in the health care system, where most people otherwise have to pay their health expenditure out-of-pocket. However, the study also points to the persisting problem of social exclusion, i.e. that the poorest of the community have no opportunity to participate and they have not enough resources to pay the required premium. In order to overcome these limitations of community based health insurance, broader risk pools are required. In particular, the role of external financial support such as government subsidies, donor funding, re-insurance in encouraging social inclusion needs to be further explored. Further research is needed, how these schemes can be scaled up and replicated as well as how to link them to other social risk management instruments like social funds.

---

<sup>6</sup> An individual household has to weight these costs against the probability to be hospitalized and the average cost for treatment. The direct average financial costs for one hospitalization of a household member lies already above 20 % of the annual income of the household.

## 6 Bibliography

- Asfaw, A.; Admassie, A.; von Braun, J. and Jütting, J.: (2001): New dimensions in measuring economic costs of illness: the case of rural Ethiopia. Submitted to: Social Science and Medicine, 2001
- Atim, C. (1998), Contribution of Mutual Health Organisations to Financing, Delivery and Access to Health Care: Synthesis of Research in Nine West and Central African Countries. Technical Report No.18. Partnerships for Health Reform Project, Abt Associates Inc., Bethesda, MD.
- Bennett, S.; Creese, A.; Monash, R. (1998), Health Insurance Schemes for People outside Formal Sector Employment. ARA Paper No. 16, WHO, Geneva.
- Creese, A.; Bennett, S. (1997), Rural Risk-Sharing Strategies. In: Schieber, G.(ed.), Innovations in Health Care Financing. Proceedings of a World Bank Conference, March 10-11, 1997, Washington, D.C.
- Criel, B. (1998), District-based Health Insurance in sub-Saharan Africa. Part II: Case-studies. Studies in Health Services Organisation and Policy 10, Antwerp.
- Diallo, I. (2000): Impact des mutuelles de sante sur l'accessibilite des populations aux soins de sante modernes dans la region de Thiès au Sénégal. Institut for Health and Development, Dakar.
- Gertler, P. and van der Gaag, J. (1990): The willingness to pay for medical care. The World Bank. Johns Hopkins University Press, Baltimore
- Gilson, L. (1998), The Lessons of User Fee Experience in Africa. In: Beattie, A. et al. (eds.), Sustainable Health Care Financing in Southern Africa: Papers from an EDI Health Policy Seminar Held in Johannesburg, South Africa, June 1996. EDI Learning Resources Series, Washington, D.C.
- Griffin, C. (1992), Health Care in Asia: a Comparative Study of Cost and Financing. World Bank Regional and Sectoral Studies, Washington, D.C.
- Hazell, P. (1992): The appropriate role of agricultural insurance in developing countries. In: Journal of International Development, 4 (6), pp. 567 – 581.
- Jütting, J. (2000): Social security systems in low income countries: concepts, constraints, and the need for cooperation. In: International Social Security Review, Vol. 4 (2000), Vol. 53, No. 4, pp. 3-25
- Kiwara, A. (1997), UMASIDA Backup Report – January to August 1997. Dar es Salaam.
- Manning, W.; Newhouse, J.; Duan, N.; Keeler, E.; Leibowitz, A.; Marquis, M. (1987), Health insurance and the demand for medical care: evidence from a randomised experiment. American Economic Review 77, 251-277.
- Musau, S. (1999), Community-Based Health Insurance: Experience and Lessons Learned from East Africa. Technical Report No. 34. Partnerships for Health Reform Project, Abt Associates Inc., Bethesda, MD.

- Morduch, J. (1995): Income Smoothing and Consumption Smoothing. In: Journal of Economic Perspectives 9, pp. 103-114.
- Tine, J. (2000): Les mutuelles de santé rurales de la région de Thiès au Sénégal : Des initiatives communautaires pour améliorer l'accès aux soins de santé. ILO/ZEF project. Project report No. 4. Center for Development Research, Bonn
- Waters, H. (1999): Measuring the impact of health insurance with a correction for selection bias – a case study of Ecuador. In: Health Economics and Econometrics 8, pp. 473 - 483
- Wiesmann, D. and Jütting, J. (2001): Determinants of viable health insurance schemes in rural Sub-Sahara-Africa. In: Quarterly Journal of International Agriculture, Vol. 50, No. 4, in print
- Weinberger, K. and Jütting, J. (2000): The role of local organizations in risk management: some evidence from rural Chad. In: Quarterly Journal of International Agriculture, Vol. 39, No. 3, pp. 281-299
- Weinberger, K. and Jütting, J. (2001): Women's participation in local organizations: conditions and constraints. In: World Development, Vol. 29, no. 8, pp 1391 - 1404.
- WHO (2000): World Health Report 2000 – Health Systems: Measuring Performance. Geneva: WHO
- Yip, W.; Berman, P. (2001): Targeted health insurance in a low income country and its impact on access and equity in access: Egypt's school health insurance. In: Health Economics 10, pp. 207 – 220
- Ziemek, S. ; Jütting, J. (2000): Mutual insurance schemes and social protection: an overview, Mutual insurance schemes and social protection: an overview. ILO-STEP research group on civil society and social economy. Paper 2. International Labour Organization, Geneva