Determinants of Membership in Mutual Health Insurance in Diourbel Region (Senegal)

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Abstract: *Introduction*: Like everywhere else, access to healthcare remains a concern. Mutual health insurance is an alternative solution. The aim of this study is to analyze the determinants of membership of mutual health insurance in Diourbel region. *Methodology*: This was a cross-sectional, descriptive and analytical study conducted from May 12 to June 4, 2023. Two-stage stratified sampling was used. The study population was made up of patients in health facilities (hospital, health center and health post) in the region. Data analysis was performed using a bivariate technique and logistic regression. *Results*: The level of mutual insurance membership was 18.7% in the region. With bivariate analysis, membership was associated with gender, level of education, socio-professional status, membership of an association, knowledge of mutual insurance, perception of providers' competence and perception of waiting time. Regression showed that membership was associated with level of education, socio-professional status, membership of an association, income and waiting time. *Conclusion*: To help increase membership of mutual health insurance schemes, in terms of recommendations, we consider it necessary to strengthen policies aimed at improving incomes, education levels and free health care as a mechanism for affiliation to mutual health insurance companies.

Keywords: Mutual Health Insurance, Membership, Access to Healthcare, Diourbel Region, Senegal

1. Introduction

Access to healthcare has always been a concern for both the population and the health authorities of all countries [1]. After independence, most countries, especially those in sub-Saharan Africa, applied free health care (welfare state) to enable the population to access care [2]. However, the economic crisis and structural adjustment led to a reduction in healthcare spending, resulting in only 2.6% of the population benefiting from social protection [2]. Several policies have been initiated worldwide (Primary Health Care, Bamako Initiative, Millennium Development Goals, Sustainable Development Goals, Universal Health Coverage) to improve access to healthcare [2-5]. In addition to the

policies mentioned above, Senegal has put in place Act III of decentralization to improve territorial governance for greater efficiency and equity in healthcare provision, the Plan Senegal Emergent and the Universal Health Coverage [6, 7]. Through these policies, a great deal of effort has been made by the State. Nearly half the world's population still has no access to basic health care [8], and inequalities in social protection are observed worldwide, with different characteristics such as inequalities in access to care and social and territorial inequalities [9, 10].

In sub-Saharan Africa, 50% of the population lives below the poverty line [11]. These economic difficulties have led to the emergence of community health insurance to facilitate access to quality care and contribute to poverty reduction [12, 4, 11]. However, the lack of available resources, the limited

availability and equity of the services offered, the phenomenon of adverse selection and the non-existence or lack of subsidies, transport costs, the low level of knowledge about health insurance and the very uneven consideration of beneficiaries' needs slow down the development of mutual health insurance [3, 13-15]. In many African countries, these obstacles result in low coverage (1%) of the population through mutual health insurance schemes [4]. In Ghana, 30% of the population is covered; in Mali, coverage concerns 17% of the formal sector and 5% of the non-contributory system for the poor [16, 19, 20]. In Senegal, mutual health insurance coverage is low (33%) and over 80% of people working in the informal sector have not joined a mutual health insurance scheme [16, 17, 2]. The Diourbel region, one of the poorest in Senegal [21], is no exception in terms of the problems faced by mutual health insurance schemes, such as the lack of commitment on the part of local authorities and the low level of contributions. Moreover, mutual health insurance is little known [22], and its penetration rate is low (28.3%) compared with other regions of Senegal. The aim of this study is to analyze the determinants of membership of mutual health insurance in the Diourbel region.

2. Methodology

2.1. Study Area

The study area was the Diourbel region, bounded by the Thiès region to the south, west and north, the Fatick region to the south and east, and the Louga region to the north and east. It comprises three departments, eight arrondissements and forty-three local authorities. It has a population of 1,919,098, 52% of whom are women. It covers an area of 4,824 km^2 with a population density of 398 inhabitants/km^2 [24-26]. In terms of health, it has four districts (four health centers and 130 health posts), four hospitals (two level 3, one level 2 and one level 1). It has 2404 health workers. In terms of social protection, there is a Regional Department of Social Action, a regional department of the Universal Health Coverage Agency (ACMU), seventy mutual health insurance companies covering six thousand nine hundred and forty (6,940) members and twenty-five thousand nine hundred and thirty-two (25,932) beneficiaries to date. On the other hand, the penetration rate of Universal Health Coverage is 58.3% [26]. However, the problems noted in the development of mutuals relate to the low level of enrolment, the low involvement of local elected representatives, the lack of professionalism in the management of mutuals, the inadequacy of mass and proximity activities, etc. [26]

2.2. Sampling Procedure and Sample Size

The sampling procedure chosen for this study was a two-stage cluster survey. Two criteria were used for clustering the study population: department and health facility (district and hospital). For the first level, the quota of patients to be surveyed was based on the population size of each department.

For the second level, the number of consultants in each district and hospital was taken into account. From the second stratification level onwards, all hospitals and health centers were selected; however, at district level, three posts were chosen at random. To determine the sample, a margin of error of 3% and a confidence level of 97% were defined. t is the confidence level, which was set at 97% (implying t=2.17), L is the margin of error defined at 3% and P is the rate of membership of mutual insurance companies in the region. According to the Universal Health Coverage Agency in Diourbel, this is 28.3% (about 0.28). Applying the formula below:

$$n = (t^2 \times p(1-p))/L^2$$

The minimum sample size was set at 1055 patients to be surveyed. We weighted the sample by adding a margin of 10% to account for non-response or registration errors. For this purpose, the sample size was estimated at 1161.

2.3. Collection Tools and Techniques

A questionnaire was designed and administered to patients in the various selected health facilities from May 12 to June 4, 2023, after a one-day training session targeting eight interviewers. This questionnaire was pre-tested in the Bambey and Diourbel populations, and enabled the correction of certain questions relating to socio-economic characteristics and those concerning mutual insurance companies. Using ODK Collect (Open Data Kit), we developed a data entry mask with a specification of control procedures. Data input was sent via tablet computers via the Internet. The data sent and processed provided feedback to the interviewers whenever errors were noted.

2.4. Analysis Plan

The database was constructed in Excel format and then transferred to Stata version 13. We performed a univariate description of our variables by calculating frequencies (qualitative variables) and averages (quantitative variables). We also determined the rate of membership of mutual insurance companies in the region. In the bivariate analysis, the associations between the dependent variable (membership) and the independent variables were checked. Based on the results of the bivariate analysis, logistic regression was applied. The overall model was fitted, and the goodness of fit of the model was tested using the Chi-Square Goodness of Fit test (P = 0.196). Variables were eliminated top-down, using Akaike's information criterion to determine the final model.

2.5. Ethical Considerations

The protocol was submitted to the ethics committee and accepted on April 13, 2023 under number 00000072MSAS/CNERS/SP. Free and informed consent was obtained from respondents on a signed form. An information letter was read in the local language to the respondents to explain the objectives of the study and the survey procedures.

3. Results

3.1. Description of the Sample (Tables 1, 2 and 3)

One thousand five (1005) patients were surveyed, representing a response rate of 86%. Seventy-six point three (76.3%) of the patients surveyed lived in urban areas and 23.7% in rural areas. The sample was distributed between the departments of Diourbel (20%), Mbacke (57.7%) and Bambey (22.3%), then between the care structures (District and EPS). The average age was 34. Households averaged 9 individuals. Just under three-quarters (72.7%) of patients surveyed were female. Wolof (58.6%) and Serer (30%) were the majority ethnic groups. More than three-quarters (79.5%) were in union. Forty-one point seven (41.7%) had no formal education. The dominant socio-professional statuses of the patients surveyed were shopkeepers (31.5%) and housewives (28.7%). Fifty-six point one (56.1%) of respondents belonged to an association. 44.4% had an income of less than thirty thousand francs. Seventy-one point one (71.7%) of respondents were aware of mutual health insurance. Of those who were aware of the mutual health insurance, 96.1% said they had confidence in them. In terms of quality of care, 98.3% were positive about the skills of the healthcare providers, 52.5% considered the waiting time to be very long, 96.4% were satisfied with the quality of care and 70.6% considered the distance between their home and the health facility to be close (less than 5km). The mutual health insurance membership rate in the region was 18.7%.

Table 1. Socio-economic characteristics of respondents.

MSI membership	Non-member of MHI%, mean [sd] N= 818	Member of MHI %, mean [sd] N= 187	Total N (%), mean [sd] N= 1005	P[1]
Age	33,58 [11,18]	36,49 [11,23]	34,12 [11,25]	0,0014
Household size	9,18 [3,30]	9,18 [3,56]	9,18 [3,35]	0,9902
Département				
Bambey	82,1	17,9	224 (22,3)	0,854
Diourbel	80,1	19,9	201 (20)	
Mbacké	81,6	18,4	580 (57,7)	
Sex				
Female	83,6	16,4	731 (72,7)	0,004
Masculine	75,5	24,5	274 (27,3)	
Study level				
None	88,1	11,9	419 (41,7)	<0,001
Koranic	82,6	17,4	207 (20,6)	
Elementary	79,9	20,1	159 (15,8)	
High school	71,9	28,1	153 (15,2)	
Senior	61,2	38,8	67 (6,7)	
Income				
[<30]	88,3	11,7	446 (44,4)	<0,001
[30-60]	82,9	17,1	251 (25)	
[60-100]	80,2	19,8	162 (16,1)	
[100-200]	66,7	33,3	102 (10,1)	
[>200]	40,9	59,1	44 (4,4)	
Place of residence				
Rural	79	21	238 (23,7)	0,276
Urban	82,1	17,9	767 (76,3)	
Professional status				
Farmer/breeder	86,4	13,6	132 (13,1)	<0,001
Public employee	47,7	52,3	44 (4,4)	
Auto-entrepreneur	84,7	15,3	177 (17,6)	
Tradesman	79,5	20,5	317 (31,5)	
Private employee	55,3	44,7	47 (4,7)	
Housewife/Inactive	88,5	11,5	288 (28,7)	
Marital status				
Single	87,3	12,7	158 (15,7)	0,194
Divorced	82,8	17,2	29 (2,9)	
Married	80,1	19,9	799 (79,5)	
widower	84,2	15,8	19 (1,9)	
People over 60 years in the household				
Non	83,3	16,7	426 (42,4)	0,175
Yes	80	20	579 (57,6)	
People under 5 years in the household				
No	78	22	236 (23,5)	0,122
Yes	82,4	17,6	769 (76,5)	

***Table 2.** Knowledge and perception of respondents on mutual health insurance.*

MHI membership	Non-member of MHI%, mean [sd] N= 818	Member of MS %, mean [sd] N= 187	Total N (%), mean [sd] N= 1005	P
Association membership				
No	47,8	26,7	441 (43,9)	<0,001
Yes	52,2	73,3	564 (56,1)	
Knowledge of MHI				
No	34,7	0	284 (28,3)	<0,001
Yes	65,3	100	721 (71,7)	
Among people who know the MHI				
	Non-member of MHI %, N= 534	Member aux MHI%, N= 187	Total N (%), N= 721	P
Confidence in MHI				
No	3,7	4,3	28 (3,9)	0,746
Yes	96,3	95,7	693 (96,1)	
Membership mode				
Family	91,4	91,4	659 (91,4)	0,161
Group or associatve	1,7	0	9 (1,2)	
Individual	6,9	8,6	53 (7,4)	
Among people who know the MHI but are non members N= 534				
MHI membership N (%)				
No	75 (14)			
Yes	459 (86)			
Payment method N (%)				
Annual	209 (45,5)			
Monthly	184 (40,1)			
Semi-annual	36 (7,8)			
Quarterly	30 (6,5)			
Annual amount of contributions in CFA proposed N=391 [sd]		6230,82 [6675,05]		

MHI: Mutual Health Insurance; MS: health mutual; MHIM: Mutual Health Insurance Membership

***Table 3.** Respondents perception of the quality of care provided.*

MHI membership	Non-member of MHI %, N= 818	Member of MHI %, 187	Total N (%), N= 1005	P[1]
Practices in case of illness				
Self-medication	6,2	4,3	53 (5,8)	0,160
Traditional healers	3,7	6,8	39 (4,3)	
Hospital	90,1	88,9	817 (89,9)	
Distance from home to nearest health center				
[<5]	70,8	70,1	710 (70,6)	0,040
[5-10]	20,7	16,6	200 (19,9)	
[10-20]	5,7	11,2	68 (6,8)	
[>20]	2,8	2,1	27 (2,7)	
Perception of healthcare staff qualifications				
Incompetent	1,8	1,1	17 (1,7)	0,046
Competent	65,9	57,2	646 (64,3)	
Moderately compétents	17	18,7	174 (17,3)	
Very competent	15,3	23	168 (16,7)	
Perception of waiting times in health centers				
Brief	8,9	12,3	96 (9,6)	0,076
Normal	36,9	42,2	381 (37,9)	
Very long	54,2	45,5	528 (52,5)	
Invoicing in line with expectations				
About right	34,5	34,2	346 (34,4)	0,749
Right	58,6	57,2	586 (58,3)	
Not at all compliant	7	8,6	73 (7,3)	
Perception of inequality in the care of MHI and non-MS patients				
No	58,7	44,4	563 (56)	<0,001
Yes	41,3	55,6	442 (44)	
Satisfaction with quality of care				
No	3,5	3,7	36 (3,6)	0.895
Yes	96,5	96,3	969 (96,4)	

The P column shows the significance of the chi-square test on the contingency table between each variable in the rows and the dependent variable in the columns, or of the ANOVA test for continuous variables.

3.2. Factors Associated with Mutual Health Insurance Membership

Bivariate analysis (Tables 1, 2 and 3) had revealed that age, gender, level of education, socio-professional status, association membership, income level, knowledge of mutual health insurance, competence of care providers, distance from home to care facility, perception of inequality in the intake of member and non-member patients, and waiting time were associated with membership of mutual health insurance (p<0.003).

On the other hand, with multivariate analysis (Table 4), for p<0.01 level of study (secondary and higher), income above 152.45-euro, socio-professional status (private employee) and membership of an association were associated with membership. Next, for p<0.05, were socio-professional status (public employee), marital status (married) and the presence in the household of people aged 60 and over. Finally, for p<0.1, the factors associated with adherence were level of education (primary) and waiting time.

Table 4. *Determinants of membership of mutual health insurance.*

Determinants	MHI membership
Study level	
Koranic school	0,292 (0,255)
Primary	0,523* (0,269)
High school	1,078*** (0,269)
Senior	1,159*** (0,377)
Income	
[30-60]	0,201 (0,256)
[60-100]	0,284 (0,288)
[100-200]	1,033*** (0,306)
[>200]	1,723*** (0,432)
Socio-professional status	
Public employee	1,128** (0,476)
Auto-entrepreneur	0,00183 (0,351)
Tradesman	0,428 (0,310)
Private employee	1,242*** (0,429)
Housewife/Inactive	0,0635 (0,354)
Marital status	
Divorced	-0,0223 (0,628)
Married	0,647** (0,288)
Widower	0,816 (0,718)
People aged 60 and over in the household	0,392** (0,186)
Association membership	0,826*** (0,196)
Perception of waiting times in health centers	
Normal	-0,227 (0,299)
Very long	-0,574* (0,294)
Regular	-4,741*** (1,001)
R2 username	0,1504
Comments	1005

Standard deviations are shown in brackets.; *** p<0,01, ** p<0,05, * p<0,1

4. Discussion

4.1. Membership of Mutual Health Insurance

The mutual health insurance membership rate found in the region was low (18.7%) compared with mutual health insurance penetration rates in the Ziguinchor (39%) and Diourbel (28.3%) regions, and in Senegal (39%) [2, 16-18,

20, 23]. The same observation was made when compared with studies carried out in Ghana (30%) [19] and Rwanda (61%) [20]. On the other hand, in Tanzania (17%) [27] and Mali (17%) [28], it appears to be comparable to our result. This low level of membership among mutuals can be explained by a number of factors. The Diourbel region is one of the poorest in Senegal [21], and in the study 44.4% declared an income of less than 45.7 euros, compared with the smig (89.79 euros). We also noted a lack of commitment on the part of local authorities in promoting mutual health insurance schemes [22]. Local authority officials are leaders, with the social capital to provide social support, share information on mutual health insurance schemes, and motivate and encourage individuals to join mutual health insurance schemes [4, 23]. Their absence would be a limiting factor to mutual health insurance membership.

4.2. Factors Associated with Membership of Mutual Health Insurers

4.2.1. Level of Education

In our research, membership of mutual health insurance was associated with secondary and university education. It has been shown that the higher the level of education, the more likely an individual is to join a mutual health insurance scheme [29]. Education may play a key role in health insurance coverage, particularly for women and the less affluent [30]. Education is thought to promote membership of mutual health insurance schemes through the effects it has on attention to disease, openness to innovation, knowledge development and understanding of the benefits of an insurance system [30].

4.2.2. Income Level

People with an income of over 152.45 euros were more likely to be enrolled in mutual health insurance plans. The level of household income is considered to be a factor in mutual health insurance membership. Some studies carried out in Senegal, Rwanda, Tanzania and Guinea have revealed that low household financial capacity is a cause of non-membership in mutual health insurance schemes [4, 19, 20, 23]. Exclusion of the poor is observed in all systems [19]. Financial difficulties in paying the premium are the main reason why these populations do not join mutual health insurance schemes [31-34]. On the other hand, it has been noted that households with a high financial capacity do not join mutual health insurance schemes. This is explained by their apprehension as to their future ability to bear the costs, but above all to continue paying contributions at a time when some members are experiencing difficulties in honouring their commitment [2].

To alleviate the exclusion of the underprivileged, the State has introduced a policy of subsidies for vulnerable groups (people aged 60 and over, children under 5, etc.) and mutual health insurance for the disabled (equal opportunity card) and beneficiaries of family security grants.

4.2.3. Marital Status

Marital status (married) has been found to influence membership of mutual health insurance schemes. Married men have been found to be more willing to join a mutual health insurance scheme than unmarried men [29]. Polygamous households are more likely to join mutual health insurance schemes [9].

4.2.4. Socio-Professional Status

It was found that both private and public sector employees (salaried workers) influence membership of mutual health insurance schemes. This could be explained by the fact that these employees had an acceptable and stable income (income above 152.45 euros). Moreover, some studies have shown that low capacity can be a cause of non-membership of mutual health insurance companies [4, 19, 20]. On the other hand, some studies have shown that the profession of the head of household does not seem to have an influence on whether or not people join mutual health insurance schemes [35, 29].

4.2.5. Membership of an Association

We noted in the study that being or having been a member of an association is a factor in membership of mutual health insurance. However, according to the literature [4, 36, 37], individuals' associative experience does not automatically lead to a decision to join a mutual health insurance scheme. In some cases, associative experience is a factor in mutual health insurance membership, which can be explained by group dynamics, a sense of belonging to the group, a feeling of not losing the resources invested in the association, and members' greater predisposition to get involved in a risk-sharing system [4, 36]. Intra-group awareness, group norms and values are said to have a knock-on effect on the emergence of these mutual membership mechanisms [4]. In other cases, previous negative experiences (associative past and interventions) can alter people's confidence, group dynamics and sense of belonging, leading them not to join mutual health insurance [4, 36, 37].

4.2.6. Waiting Times

The study identified long waiting times as a potential barrier to membership of mutual health insurance schemes. Waiting time is one of the indicators of quality of care for users [4]. People's assessment of the quality of care, whether objective or perceived, can influence their decision to join a mutual health insurance scheme [4]. In experiments carried out in Bwamanda in DR Congo, Nkoranza in Ghana and Thiès in Senegal, people's positive perception of the quality of care had the effect of improving the level of membership of mutual health insurance schemes [19]. On the other hand, poor quality of care, such as very long waiting times, was one of the reasons why people did not want to join mutual health insurance schemes [31, 4]. Poor quality of care, such as stock-outs of medicines and medical products, poor attitude of health care providers and long waiting times for care, have a negative influence on membership of mutual health insurance schemes [33].

4.2.7. People Aged 60 and over in a Household

The presence of people aged over 60 in households is a barrier to membership of mutual health insurance schemes. In the literature, the role of age in membership of mutual health insurance schemes has not been elucidated. The study carried out in Tanzania showed an association between age (26 to 60+) and membership of mutual health insurance schemes [34]. While others indicate that age associated with a context (free access, economic and social exclusion, etc.) may or may not induce membership [20, 34, 29]. As is the case in our study context, free health care (SESAM plan) for people aged 60 and over [20]. Free health care does not encourage them to join a mutual health insurance scheme. What's more, they are more likely to suffer from Chronic Non-Communicable Diseases (CNCD), which are not covered by mutual health insurance schemes due to their high cost.

4.3. Study Limitations

Our study only targeted the Diourbel region, which could be a limitation in generalizing the results. There are also information biases relating to the collection of certain information such as the income and competence of care providers. Patients are often unwilling to give their income, or if they are not salaried, they have difficulty determining their monthly income. On the subject of provider competence, patients lacked the technical skills to evaluate providers. They could only express their perception of the provider's behavior, how long they had to wait before receiving care, whether or not they were cured after treatment, and so on. Finally, opinion variables have been used, such as satisfaction with care. In this case, respondents' answers may be tendentious, or even more important than what they feel, which can lead to judgmental bias [38].

5. Conclusion

The study carried out in the Diourbel region has enabled us to gain a better understanding of the various determinants identified in the literature. These factors will help the various decision-makers (central, intermediate and local levels) to put in place strategies to contribute further to the development of mutual health insurance. The study showed the need to reinforce policies aimed at improving people's income and education levels, and to use free health care as a means of encouraging the targets of this policy to join mutual insurance schemes. At the local level, the involvement of associations and local government officials would contribute further to the promotion of mutuality. To achieve this, the implementation of communication strategies at local level needs to be strengthened.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

Acknowledgments

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