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**Article (Accepted version)
(Refereed)**

Original citation:

Mladovsky, Philipa (2014) *Why do people drop out of community-based health insurance?: findings from an exploratory household survey in Senegal*. [Social Science and Medicine](#), 107. pp. 78-88. ISSN 0277-9536

DOI: [10.1016/j.socscimed.2014.02.008](https://doi.org/10.1016/j.socscimed.2014.02.008)

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Available in LSE Research Online: January 2015

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Why do people drop out of community-based health insurance? Findings from an exploratory household survey in Senegal

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Acknowledgements

The author would like to thank Bart Criel, Pascal Ndiaye, Alfred Ndiaye, Werner Soors and all national stakeholders in Senegal for their contributions to the research project, the team of fieldwork assistants and supervisors, staff of the three CBHI schemes who gave up their time to facilitate the research, all the interviewees who also gave their time, the Institute of Tropical Medicine, Antwerp and the Stewart Halley Trust for providing funding for the research, and the two anonymous reviewers who provided valuable comments and insights.

Abstract

Although a high level of drop-out from community-based health insurance (CBHI) is frequently reported, it has rarely been analysed in depth. This study explores whether never having actively participated in CBHI is a determinant of drop-out. A conceptual framework of passive and active community participation in CBHI is developed to inform quantitative data analysis. Fieldwork comprising a household survey was conducted in Senegal in 2009. Levels of active participation among 382 members and ex-members of CBHI across three case study schemes are compared using logistic regression. Results suggest that, controlling for a range of socioeconomic variables, the more active the mode of participation in the CBHI scheme, the stronger the statistically significant positive correlation with remaining enrolled. Training is the most highly correlated, followed by voting, participating in a general assembly, awareness raising / information dissemination and informal discussions / spontaneously helping. Possible intermediary outcomes of active participation such as perceived trustworthiness of the scheme management / president; accountability and being informed of mechanisms of controlling abuse/fraud are also significantly positively correlated with remaining in the scheme. Perception of poor quality of health services is identified as the most important determinant of drop-out. Financial factors do not seem to determine drop-out. The results suggest that schemes may be able to reduce drop-out and increase quality of care by creating more opportunities for more active participation. Caution is needed though, since if CBHI schemes uncritically fund and promote participation activities, individuals who are already more empowered or who already have higher levels of social capital may be more likely to access these resources, thereby indirectly further increasing social inequalities in health coverage.

Keywords:

Senegal, community-based health insurance, participation, insurance coverage, drop-out, cross-sectional survey

1. Introduction

Community-based health insurance (CBHI) aims to provide financial protection from the cost of seeking health care through voluntary prepayment by community members; typically it is not-for-profit and community owned and controlled (Atim, 1998; Hsiao, 2001). The Senegalese government elected in 2012 views CBHI as a key mechanism for achieving universal coverage (Ministère de la Santé, 2012), a policy initiated by the previous government (Ministère de la Santé, 2004). Senegal has witnessed a rapid increase in the number of CBHI schemes, reaching around 139 between 1997 and 2004 (Hygea 2004). Yet as in most low- and middle-income countries (LMIC), overall population coverage remains low, with 4% or less of the Senegalese population enrolled in CBHI (Soors et al., 2010). Another problem for CBHI schemes is retaining enrollees; it is estimated that in Senegal in 2004, 47% of people who had ever enrolled in CBHI had ceased paying the premium and therefore lost access to the benefits of CBHI (Hygea, 2004). In order to explore why people drop-out of CBHI schemes, this paper develops a conceptual framework of community participation in CBHI and draws on data collected in a household survey on the relationship between CBHI membership, active community participation and social capital.

2. Background

Drop-out from CBHI

While drop-out from CBHI is frequently reported as a problem it has rarely been analysed in depth (De Allegri et al., 2009). Two exceptions come from West Africa. One is a quantitative study of a CBHI scheme in Burkina Faso which had been operational for three years and had a drop-out rate of 30.9 to 45.7% (Dong et al., 2009). The study focuses entirely on demographic, economic and health-related indicators and finds that female household head, increased age, lower education, fewer

illness episodes, fewer children or elderly in a household, poor health care quality, less seeking care, higher household expenditure and shorter distance to the contracted health facility were correlated with increased drop-out. The other paper is a qualitative study from Guinea-Conakry (Criel & Waelkens, 2003) where CBHI population coverage fell from 8% of the target population to about 6% in the following year. The main reasons for non-enrolment and drop-out were poor quality of care and reported inability to pay the premium.

Understanding of the concept of insurance, information flow, mistrust of institutionalised associative movements, confidence in the management of CBHI and integration of CBHI with existing systems of mutual aid were found not to be underlying causes, possibly because CBHI promoters discussed the scheme with community members from the start (Criel & Waelkens, 2003). However, as with the Burkina Faso study, the Guinea-Conakry study was conducted only two years after the commencement of the scheme. This makes it difficult to assess the longer-term determinants of drop-out and the sustainability of the participatory dynamic of the scheme.

Community participation in CBHI

Community participation, ownership and control in scheme design and management are in principle key defining features of CBHI (Atim, 1998; Hsiao, 2001; Soors et al., 2010). Smallness of CBHI schemes has been seen as a drawback in terms of risk pooling, but an advantage in terms of community focus (Davies & Carrin, 2001). As CBHI was rolled out in LMIC, policymakers and researchers hoped that the community-oriented approach would promote a set of important benefits: trust in CBHI management, solidarity and acceptance of cross-subsidisation, the flow of information, the quality of health services; and reduced fraud, moral hazard and adverse selection (Davies & Carrin, 2001; Hsiao, 2001; Pauly, 2004; Pauly et al., 2006; Zweifel, 2004). Implicit in this view was the idea that CBHI would benefit from existing social capital (Mladovsky & Mossialos, 2008), defined as “the information, trust and norms of reciprocity inhering in one’s social network” (Woolcock, 1998, p. 153). It was hypothesised that the community-oriented dynamic would in turn

promote high levels of enrolment in CBHI. However, this hypothesis has hardly been studied and the various possible modes of community participation in CBHI have never been rigorously conceptualised in the form of an overarching theoretical framework.

In contrast, community participation has been extensively conceptualised and analysed in the broader literature on health (Morgan, 2001; Rifkin, 1986, 2009; Zakus & Lysack, 1998). Rifkin (1986), points to three main approaches to community participation in health programmes: medical; health services; and community development. The latter approach defines participation as “community members being actively involved in decisions about how to improve [health]”, where health is seen as a “human condition which is a result of social, economic and political development” (Rifkin, 1986, p. 241). Key factors are “people’s perceptions of health and their motivation to change health care” as well as the importance of communities “learning how to decide the ways in which change can best be achieved” (Rifkin, 1986, p. 241). This approach seems to best match the goals of CBHI as described by policymakers and researchers and is the definition adopted in this study. Rifkin further distinguishes between different modes of community participation. The most passive mode is participating in benefits of the programme: in CBHI this accords with becoming a member of the scheme by paying the premium. More active modes in ascending order of range and depth of participation are: activities, management, monitoring and evaluating, and planning (Table 1) (Rifkin, 1986).

It is not clear whether low CBHI enrolment in sub-Saharan Africa could be linked to a lack of active participation, as there is little evidence on this topic. The few studies on community participation in CBHI present contradictory results. Two qualitative studies (De Allegri et al., 2006; Ridde et al., 2010) compare the views of members of CBHI to non-members and find that although levels of active community participation in CBHI were generally low, people did not point to this as a reason for not enrolling. In contrast, two other qualitative studies (Atim, 1999; Basaza et al., 2007) compare

schemes in which the level of active community participation was high with schemes with low active participation and suggest that higher active participation may be one of the factors accounting for higher levels of enrolment. A further qualitative study (Schneider, 2005) suggests that active participation may have positively influenced enrolment by building trust, transparency, solidarity and honesty.

Objectives of the study

This study brings together the two aforementioned under-explored themes in CBHI: drop-out and active community participation. It is hypothesised that active participation in CBHI and its potential intermediary benefits, such as trust, information and solidarity are negatively correlated with drop-out. This hypothesis is explored by comparing levels of active participation among members and ex-members of three CBHI schemes in Senegal.

To provide a conceptual framework to guide the analysis, examples of active community participation in CBHI identified in the literature on sub-Saharan Africa (Atim, 1999; Basaza et al., 2007; Criel et al., 2005; Criel & Waelkens, 2003; De Allegri et al., 2006; Ridde et al., 2010; Schneider, 2005; Waelkens & Criel, 2007) are categorised according to Rifkin's (1986) framework (Table 1).

INSERT TABLE 1 AROUND HERE

3. Methods

Case study selection

Fieldwork was conducted in Senegal from March to August 2009. Case study selection criteria were the following:

(a) The CBHI schemes had enrolled a greater than average number of households (the average was 329 (Hygea, 2004)). Enrolment in Senegal is typically on a household basis. A representative of the household enrolls in the CBHI scheme ("adhérent" in French) and purchases a membership card on which a certain number (typically up to 12) household members may be registered. The premium is paid monthly (per household member). In this paper, "households" refers to the number of membership cards purchased.

(b) The schemes had been established for a minimum of eight years.

(c) The schemes had a relatively high drop-out rate compared to the national average (47% in 2004 (Hygea, 2004)). The rationale for selecting schemes with high drop-out was to focus on contexts where there was potentially the most to gain from a policy intervention.

(d) The CBHI schemes had achieved a basic measure of success (criteria (a) and (b)); this was in order to control for the possibility that drop-out was mainly due to fundamental supply-side failures ending in the suspension of the scheme.

In order to obtain a range of contextual factors, additional considerations were: region and geographic zone; economic sector of the target population; and the type of contracted health facility (primary care or hospital).

On basis of local documentation and information provided by Senegalese CBHI experts, three CBHI schemes which met these criteria were selected (Table 2). Ethical approval for the research was obtained from the Senegalese Ministry of Health.

CBHI schemes in Senegal (including those selected for the study) typically aimed to promote community participation through a model of democratic governance promoted by the International Labour Organization (ILO, 2000). A President, Treasurer, Secretary and Board of Directors are elected by scheme members. Schemes are expected to organise training sessions, annual general assemblies

and regular meetings through which members of the scheme and the local community can participate in implementation and decision-making and hold scheme staff accountable.

INSERT TABLE 2 AROUND HERE

Sampling design

Lists of members (households that were up-to-date with premium payments) and ex-members (households that had not paid the monthly premium – see details below) were obtained for each CBHI scheme and used as sampling frames. Each scheme was sampled separately and members and ex-members were sampled separately using disproportionate stratified random sampling (Table 3), in order to ensure the inclusion of sufficient numbers of current members in the study. The analysis was conducted on merged data from all three schemes.

The household questionnaire was administered to the named member / ex-member (i.e. the “adhérent”) in each household.

INSERT TABLE 3 AROUND HERE

Questionnaire design

A questionnaire was developed with six components: socioeconomic and demographic characteristics; a household roster; economic characteristics; social capital; membership of CBHI; and health and utilisation of health services. The full list of variables included in the study is presented in Table 4.

INSERT TABLE 4 AROUND HERE

Model

A logit model was used to analyse the probability of retaining CBHI membership (i.e. not dropping out). Several regressions were run. The first was a restricted model which contained a basic set of

socioeconomic variables (equation 1). In each subsequent regression (equations 2 to 31), an extra independent variable or set of variables was analysed separately, in order to test various hypotheses regarding the determinants of CBHI drop-out (the hypotheses are explained below).

A model of the following form was estimated:

$$\text{Logit } [p (Y= 1)] = \log \left(\frac{p}{1-p} \right) = \alpha + \beta_1 X_{1,i} + \dots + \beta_6 X_{6,i}$$

where Y is being a current member of CBHI or not, X_{1-6} are dummies indicating whether the individual has or does not have a specific characteristic, p is the probability of retaining CBHI membership, α is the constant and β s are the model parameters. All models include all observations from all three schemes and were estimated using STATA 10.0.

Dependent variable

The dependent variable was CBHI membership status (current member = 1, ex-member = 0). The design of the dependent variable was not straightforward. Two sources of information were available for defining membership status. The first was information provided by the scheme administration which was used to create the sampling frame for the study. However, some of the households that had not paid the monthly premium may not have considered themselves to have dropped-out of the scheme and may have intended to pay the outstanding payments and a penalty charge (mandated by the schemes' rules) in order to re-gain membership. The second source of information on membership status was self-reported (the respondent was asked whether they were a current member or an ex-member, the latter being defined as having decided to permanently drop out of the scheme); this information was collected in the questionnaire. The latter source (i.e. self-reported status) is used in the analysis.

Independent variables

Variables in the restricted model

The variables included in the restricted model are described in Table 4 (sections a and f). Scheme dummies were included to account for the fixed effect of which scheme the members/ex-members (had) belonged to. Demographic variables control for differences in age and gender. Socioeconomic variables control for the possibility that wealthier and more educated people are more likely to remain enrolled. An expenditure variable was based on reported monthly household expenditure on 14 different categories and adjusted (providing a weight of 1 for the first adult, 0.7 for other adults and 0.5 for each child) (Forster, 1994; OECD). To proxy household wealth, an asset index was constructed by performing a principal component analysis using household possession of goods (Howe et al., 2009).

Variables measuring active participation

Five variables measure modes of active participation in CBHI (Table 4, section d). Four of these are formal modes, measuring participation in: raising awareness of / disseminating information on the scheme; a general assembly; electing leaders of the scheme; and training. The fifth variable measures informal active participation: having ever had informal discussions about and/or spontaneously helped the scheme. All five variables can be categorised as “activities” in Table 1.

Another set of variables measures the potential intermediary outcomes of active participation (Table 4, section e): information flow, measured using two variables (being informed of mechanisms of controlling abuse/fraud by scheme staff/members/health providers; and source of information on the existence of the scheme); accountability (perceptions of influence over scheme operation; trust (perceptions of trustworthiness of scheme management / president); solidarity, measured using three variables (perception of shared values / solidarity; belief that solidarity is advantage of CBHI; and opinions about cross-subsidisation); perceptions of inclusiveness of the scheme measured by two variables (opinions about the diversity of members of the scheme; and perception of whether people are excluded from the scheme); interpersonal relationships within the scheme, measured using three variables (knowing the scheme President/Secretary/Manager/other staff; knowing other

members of the scheme; and perception of having something in common with other scheme members).

These variables test the aforementioned hypothesis that active participation in CBHI and its potential intermediary benefits, such as trust, information and solidarity are negatively correlated with drop-out.

Other independent variables

The remaining independent variables test competing hypotheses (table 4, sections a-c and f). Two variables measure religion and ethnicity respectively, to account for the possibility that drop-out was related to socio-cultural factors. The household size variable measures whether larger households may have dropped out due to the increased financial burden of premium payments. Variables focusing on satisfaction with premium price and source of premium payments also measure whether drop-out is related to financial barriers. The health and health services variables account for the possibility that adverse selection, geographic access to health service providers, and reliance on traditional medicine explain drop-out from CBHI. The two social capital variables measure the structure of people's social networks, in order to test the hypothesis that CBHI benefits from existing social capital (Mladovsky & Mossialos, 2008), discussed above. The first variable measures having privileged social relationships (with people who may or may not also be members of the CBHI scheme). In Senegal "privileged social relationships" such as being a godfather or godmother constitute emotional and affective ties but can also be a medium for reciprocal instrumental support. The second social capital variable measures membership of community associations other than CBHI. Having privileged relations and membership of other community associations are assumed to be antecedent to membership CBHI, since CBHI was established relatively recently in Senegal compared to these other social structures. The "satisfaction with scheme functioning" variable measures whether negative experiences of CBHI functioning (such as premium collection) affect drop-out.

4. Results

The total sample size is 382 households, corresponding to a response rate of 78%. The sample contains 227 members and 155 ex-members (60 households defined as ex-members by the scheme's administration defined themselves as members in the questionnaire, while 14 households defined by the scheme administration as members defined themselves as ex-members).

The results of the logistic regression are presented in Tables 5 to 7. The results indicate that although members of the CBHI schemes were wealthier and had higher expenditure levels than ex-members the difference was not statistically significant (equations 1-31). Satisfaction with the accessibility of premium price was quite low in the sample, at 38.68% (see supplementary material for descriptive statistics) [INSERT LINK TO SUPPLEMENTARY MATERIAL] but the odds ratio for this variable was not significant (equation 31). The odds ratios for the demographic, education (equations 1-31), ethnicity and religion (equations 2-3) variables were also not significant, except for age.

INSERT TABLES 5 – 7 AROUND HERE

The correlation between the health and health service variables and scheme membership was more pronounced (equations 4-9). Member households were twice as likely to have had an illness, accident or injury, and nearly twice as likely to have a disability, than ex-member households, pointing to adverse selection. They were more than twice as likely to be situated closer to a health service provider. They were three times more likely to report that health care access is an advantage of membership and had a much higher probability of reporting that the quality of health service providers was satisfactory. All these variables have significant odds ratios, with quality of care being the strongest in the study. Three quarters of members felt that the quality of care of all the providers contracted by the scheme was satisfactory, compared to half of ex-members.

Rates of active participation ranged between 8% and 48% for ex-members and 20% and 65% for members. Members were statistically significantly twice as likely or more to: have had informal discussions about and/or ever spontaneously helped the scheme; participated in raising awareness and/or information dissemination; voted in scheme elections; attended a general assembly; and received training (equations 12-16). The latter variable had the highest odds ratio.

Source of information on existence of the scheme was significantly correlated with scheme status, with members being more likely than ex-members to have heard of the scheme from a family member or friend compared to another source (equation 17).

All the odds ratios for the following variables measuring perceptions or knowledge of scheme management were greater than two and significant, with members being more likely than ex-members to: be informed of mechanisms of controlling abuse and/or fraud by scheme staff, members and/or health providers (equation 18); think they could influence scheme operation (equation 19); be satisfied with the trustworthiness of scheme management and/or president (equation 20); know the scheme President, Secretary, Manager and/or another staff member (equation 26); and rate the operation of the scheme as excellent or satisfactory (equation 29). The biggest difference was in the trust variable; while nearly 70% of scheme members reported that the scheme managers or leaders were trustworthy, only around one third of ex-members did so (equation 20).

Less than half of the sample reported that they share a vision on values and/or solidarity with other members of the scheme, and only one third believed that solidarity is advantage of CBHI membership. The odds ratios for these two variables were not statistically significant (equations 21 and 22). Principal component 1 was statistically significant, with members being more likely to have more solidarity than ex-members (equation 23). The highest scores (0.45 - 0.40) in the PCA (principal component analysis) were for agreement with the following three statements (in order of their scores): members of the scheme should sponsor families who are very poor; members should

support families who are very poor by increasing the amount of their contribution; and families who are very poor should be members of the scheme without paying. The next highest scores (0.35 - 0.31) were for: the scheme should merge with other CBHI schemes in the region; families who do not have the means to contribute must be supported by the government; it is acceptable that the beneficiaries of the scheme who become ill benefit more from the services of the scheme. The lowest score (0.29) was for: it is acceptable for someone to pay the CBHI premium even though s/he has not yet benefited from the services offered by the scheme. Only around 10% of the sample reported believing that some people are excluded from the scheme; there was almost no difference between members and ex-members (equation 25). Members were nearly seven times more likely to know half or nearly all the other members of the scheme than ex-members (equation 27). Furthermore, they were less likely than ex-members to report having nothing in common with the other members of the scheme (equation 28).

The results suggest that members may have higher levels of social capital than ex-members, as *ceteris paribus* their households were nearly eight times more likely to belong to six or more community associations other than CBHI than ex-members (equation 11).

The scheme 2 dummy variable is significant in almost all of the regressions. However, this is an artefact of the sampling procedure (the proportion of ex-members sampled in scheme 2 is much higher than in the other two schemes) and does not reflect the real level of drop-out which is lower in scheme 2 than in scheme 1 (Table 2).

5. Discussion

All five variables measuring active community participation are negatively correlated with drop-out. Interestingly, the more active the mode of participation, the stronger was the correlation. As discussed, researchers and policymakers have hypothesised that information, accountability, trust

and solidarity would increase enrolment in CBHI. The results to some extent support this view as perceived trustworthiness of scheme management / president; accountability and being informed of mechanisms of controlling abuse/fraud are all correlated with remaining in the scheme. The result that members were more likely than non-members to hear about the CBHI scheme from a family member or friend also seems to support the hypothesis that high levels of trust promote population coverage, presuming that family and friends were the most trusted source of information. However solidarity does not, on the whole, seem to affect drop-out.

These results suggest that schemes may be able to reduce drop-out by creating more opportunities for more active participation. Caution is needed, however, in attributing the direction of causality; it is possible that people never actively participated in the CBHI schemes because they had dropped out of the schemes rather than vice versa. The significance of the results for the possible intermediary outcomes of active participation such as trust, information and accountability suggest this is not the case. It would make little sense, for example, that a person did not trust the scheme leaders when they were a member of the scheme, because they had dropped out of the scheme.

Arguably, the two variables which conceptually link all the active participation variables are knowing the scheme leaders/staff and knowing other scheme members. It is possible that through active participation, members of CBHI developed personal relationships with the scheme leaders, staff and with each other, thereby increasing their access to information and trust in the scheme and ultimately reducing the likelihood of dropping out. As such, it could be argued that active community participation in CBHI may increase levels of social capital of CBHI members and that this may in-turn reduce the likelihood of drop-out.

Quality of health services was identified as the most important determinant of drop-out, as in previous studies (Criel & Waelkens, 2003; Dong et al., 2009). It is possible that the participatory dynamic in CBHI empowered members to successfully demand good quality care, as proposed in

other literature on CBHI (Criel et al., 2005; Michielsen et al., 2011; Schneider, 2005; Waelkens & Criel, 2007).

Overall, the results suggest that active community participation does take place in CBHI and that it may reduce drop out. This may be because active participation increases (a) trust, information and accountability, through increased social capital and (b) quality of care through increased empowerment. However, more research is needed to explore these causal pathways. While this is ostensibly good news for proponents of active community participation in CBHI it also raises concerns. The majority of people who dropped out of CBHI did not take up opportunities to actively participate, did not trust the scheme staff or leaders, felt they were not able to hold the CBHI scheme to account, did not know many other members and did not believe that CBHI promotes solidarity. Given the high drop-out rates from CBHI (Table 3), this suggests that active participation only benefited a small minority of people who enrolled in CBHI.

It is not clear why ex-members of CBHI did not actively participate in CBHI when they were members; further research would be needed to understand this. One possible explanation comes from the community participation literature which argues that participatory development may obscure local power differences by uncritically celebrating “the community” (Williams, 2004). It is argued that projects promoting community participation are often initiated by international development agencies which fail to take into account local power relationships and instead accept inequalities as social norms. Because of this, if uncritically applied, participatory community programmes can inadvertently exacerbate disadvantage (Kothari, 2001). This critique may be relevant to CBHI which has typically been introduced with the support of international development agencies (Criel & Van Dormael, 1999). It is possible that CBHI has been uncritically introduced in the Senegalese context in a manner which inadvertently prevents some less empowered social groups from actively participating. While there do not seem to be inequalities in wealth between members and ex-members, the results on social capital (measured by membership of other community

associations) suggest that there may be other social inequalities at play. A possible explanation may be that if CBHI schemes have very limited funds to support active community participation, only some members of CBHI are likely to be successful in accessing these resources. These individuals are likely to be those who already have higher levels of social capital or who are already more empowered. This interpretation is supported by Bourdieu's theory (Bourdieu, 1986) that people who already hold forms of capital (economic, social, cultural and/or symbolic) are strategically adept at accumulating and transforming it (he argued that these types of capital are fungible). It also echoes the findings of an extensive literature review of studies on participatory development and decentralization which finds that participants in civic activities tend to be wealthier, more educated, of higher social status (by caste and ethnicity), male, and more politically connected than nonparticipants. The authors suggest the reason for this may be that resource allocation processes of organisations inducing participation typically reflect the preferences of elite groups (Mansuri & Rao, 2013).

6. Limitations

The study has important limitations. Firstly, as it is an exploratory study, it covers a small number of schemes and the sample size is small. The study would merit from being repeated on a larger scale. Furthermore, the study is limited to schemes with high levels of drop-out. Further comparative research analysing schemes with low levels of drop-out would be useful for drawing lessons at the scheme level. Another limitation is that due to the cross-sectional and non-experimental study design, it is difficult to attribute causality. It is also difficult to attribute the direction of causality, as already discussed. These issues could be addressed with further qualitative research investigating members' and ex-members' views of participation and drop-out. Qualitative research could also have been useful for informing the content of the questionnaire. Indeed, because intended beneficiaries were not involved in developing the questionnaire, it is possible there is a researchers'

bias. Finally, because of the sampling procedure, it is not possible to determine the rate of active participation in the schemes.

7. Conclusions

This study contributes to the literature on CBHI by providing a conceptual framework of passive and active community participation which is relevant to understanding drop out from CBHI. The results suggest that there may be many potential benefits of active community participation in CBHI. These include increased trust, information flow and accountability, increased population coverage due to fewer households dropping out of CBHI, increased social capital of CBHI members and increased empowerment of CBHI patients when accessing health care. However, it is also possible that people with already high levels of social capital benefit more from the participatory dynamic, meaning that CBHI inadvertently exacerbates inequalities in communities and in health coverage. One possible way of addressing this would be to target participatory activities to members with less social capital, although this is likely to be a challenging task as it implies overturning established social inequalities and hierarchies. This in turn suggests that alternative or complementary financing policies are needed to target vulnerable groups.

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Tables

Table 1. Mode, definition and examples of community participation in CBHI in Sub-Saharan Africa

Mode of participation (in ascending order ranging from passive to active)	Definition	Examples of active community participation in CBHI in Sub-Saharan Africa
1. Benefits	Passive: community members are recipients of services	Enrolment / paying the premium
2. Activities	Active: community members contribute to health programmes but do not participate in the choice of what activities are to be undertaken or how they will be carried out	Disseminating information, attending meetings and general assemblies, voting in elections, receiving training
3. Management	Active: those involved in activities have some managerial responsibilities. They make decisions about how these activities are to be run, but do not decide which activities are undertaken	Managing the day-to-day operation of the scheme (e.g. enrolling members, collecting premiums, managing finances, holding meetings and general assemblies)
4. Monitoring and evaluating	Active: community members are involved in measuring objectives and in monitoring activities, but not involved in developing programme objectives	Collecting information, reporting and reviewing
5. Planning	Active: community members (usually key individuals such as leaders and teachers) decide what programmes they wish to undertake and ask health staff, agencies and/or government to provide the expertise and/or resources to enable the activities to be pursued	Identifying the need for the scheme; deciding on the scheme design and objectives (e.g. benefits package, premium price, mode of collection, target population); leading the scheme (e.g. contracting providers, hiring and training staff, setting the agenda for general assemblies, attracting funding, research and technical assistance); coordinating CBHI on a regional level; developing CBHI policy.

Source: Adapted from (Rifkin 1986) and literature on community participation in CBHI in Sub-Saharan Africa

Table 2. Characteristics of the CBHI schemes included in the study

Name of scheme	Year of scheme commencement	Tier of services contracted by the scheme	Region	Geographic zone	Characteristics of the population targeted by the scheme
Soppante	1997	Health post (public sector) Hospital (private and public sectors)	Thies	Rural, peri-urban and urban	Formal and informal sectors
Ndondol	2001	Health post and health hut (public sector) Maternal and child health centre (private sector)	Diourbel	Rural	Informal agricultural sector
Wer Ak Werle (WAW)	2000	Health post Health centre Pharmacy (all public sector)	Dakar	Peri-urban	Predominantly informal sector, female petty traders

Table 3. Household survey sample design

Scheme	Total number of ever-members (members + ex-members)	Scheme drop-out rate	Number of members selected (% of total members)	Number of ex-members selected (% of total ex-members)	Total number of members and ex-members sampled
1. Soppante	985 (166 + 819)	83%	70 (42%)	91 (11%)	161
2. Ndongol	463 (136 + 327)	71%	58 (42%)	98 (30%)	156
3. Wer ak Werle (WAW)	678 (281 + 397)	58%	85 (30%)	85 (21%)	170
Totals	2,126 (583 + 1,543)	72%	213 (36%)	274 (17%)	487

Table 4. Variables included in the study

Variable	Description
Dependent variable	
Member	1 = current member of the scheme. 0 = ex-member (i.e. dropped out)
Independent variables	
a. Demographic and socioeconomic characteristics	
Age quintiles	1 = age quintile, otherwise 0. Age1 is the lowest quintile (baseline)
Gender	
Male	1 = male, 0 = female
Education	
None	1 = no education, otherwise 0 (baseline)
Literate	1 = highest educational attainment is literacy, otherwise 0
Primary	1 = highest educational attainment is primary education, otherwise 0
Secondary or higher	1 = highest educational attainment is secondary education or higher, otherwise 0
Household expenditure quintile (%)	1 = expenditure quintile, otherwise 0. Ex q1 is the lowest quintile (baseline)
Household asset quintile (%)	1 = asset quintile, otherwise 0. Ass q1 is the lowest quintile (baseline)
Ethnicity and religion	
Wolof	1 = wolof, otherwise 0
Muslim	1 = muslim, otherwise 0
HH size tertile	1 = HH size tertile, otherwise 0. HH size1 is the lowest tertile (baseline)
b. Health and health service access	
Health of HH	
Disability	1 = one or more members of the household has a disability, otherwise 0
Chronic illness	1 = one or more members of the household has a chronic illness, otherwise 0
Recent illness	1 = one or more members of the household had an illness, accident or injury in the last 15 days, otherwise 0
Health care access is advantage of scheme membership	
Advantage	1 = when asked "what are / were the advantages of scheme membership for your household?" selected "health care access", otherwise 0
Quality of health service providers contracted by the scheme	
No providers satisfactory	1 = when asked "are / were you satisfied with the quality of the health service providers contracted by the scheme" selected "no" for all providers, otherwise 0 (baseline)
Some providers satisfactory	1 = "yes" for some but not all providers, otherwise 0
All providers satisfactory	1 = "yes" for all providers, otherwise 0
Household use of traditional medicine	
Traditional	1 = at least one member of the household used traditional medicine in the last

medicine	month, otherwise 0
Nearest health care provider	
<= 2km	1 = nearest health care provider is located 2km or less from the household, otherwise 0
c. Social capital	
Privileged social relationships	
Yes	1 = has a "privileged social relationship" with at least one other person, otherwise 0
Household membership of community associations other than the CBHI scheme	
0 associations	1 = nobody in the household is a member of a community association, otherwise 0 (baseline)
1-5 associations	1 = household is member of 1 to 5 community associations, otherwise 0
>6 associations	1 = household is member of more than 6 community associations, otherwise 0
d. Active participation in the scheme	
Informal participation	1 = has ever participated in informal discussions about / spontaneously helped the scheme, otherwise 0
Raising awareness / information	1 = has ever participated in raising awareness / disseminating information about the scheme, otherwise 0
General assembly	1 = has ever participated in the scheme's general assembly, otherwise 0
Voting	1 = has ever elected a leader of the scheme, otherwise 0
Training	1 = has ever received training under the scheme, otherwise 0
e. Intermediary outcomes of active participation	
Source of information on existence of the scheme	
Friend or family	1 = learnt of CBHI scheme from a friend or family member, 0 = learnt of CBHI scheme from a health service provider, CBHI staff, CBHI members, a community association, community leader, media, or other source
Mechanisms of controlling abuse/fraud by scheme staff/members/health providers	
Informed	1 = when asked "do/did you know of mechanisms of controlling abuse/fraud by people in the scheme?" selected "yes" for at least one of the following categories: staff; other members; health providers. 0 = selected "no" for all categories
Believes can influence scheme operation	
Influence	1 = when asked "do/did you think you are able to influence the functioning of the scheme?" selected "yes". 0 = "no"
Trustworthiness of scheme staff / leaders	
Satisfied	1 = when asked "what aspects of the scheme are/were satisfactory?" selected "scheme leader is/was trustworthy" and/or "scheme staff are/were trustworthy", otherwise 0
Vision on values / solidarity	
Shared vision with other members	1 = when asked "what do you think you have in common with the other members of the scheme?" selected "same vision on values / solidarity". 0 = neighbours, village, family, relatives, religion, gender, age group, ethnicity, language, caste, level of education, occupation, political affiliation, economic status, nothing, members of another association, or other
Solidarity is advantage of scheme membership	

Advantage	1 = when asked "what are / were the advantages of scheme membership for your household?" selected "solidarity", otherwise 0
Types of cross-subsidisation that should occur in the scheme	
Principle component 1	Respondents were asked whether they agreed with 7 statements about solidarity in the scheme, providing answers on a likert scale, with 1 representing "strongly disagree" (lowest level of solidarity) and 5 representing "strongly agree" (highest level of solidarity)
Principle component 2	As above
Scheme should accept diverse members	
Principle component 3	Respondents were presented with the statement "should the scheme accept people from diverse..." and were asked about the following categories: neighbourhood or village, family or relatives, religion, gender, age group, ethnicity or language, caste, education, profession, political affiliation, economic status. They provided answers on a likert scale, with 1 representing "strongly disagree" (lowest level of solidarity) and 5 representing "strongly agree" (highest level of solidarity)
Some people excluded from the scheme	
Yes	1 = when asked "do you think some members of the community are excluded from the scheme" replied "yes". 0 = "no"
Scheme President/Secretary/Manager/other staff	
Knows	1 = when asked "do/did you know the people who work in the scheme" selected "yes" for at least one of the following categories: President; Secretary; Manager; other staff. 0 = selected "no" for all categories
Knows other members of the scheme	
None	1 = knows no other members of the scheme, otherwise 0 (baseline)
Few	1 = knows few other members of the scheme, otherwise 0
Half or nearly all	1 = knows half or nearly all the other members of the scheme, otherwise 0
Has characteristics in common with other scheme members	
None	1 = when asked "what do you think you have in common with the other members of the scheme?" selected "nothing". 0 = neighbours, village, family, relatives, religion, gender, age group, ethnicity, language, caste, level of education, occupation, political affiliation, economic status, same vision on values / solidarity, members of another association, or other
f. Other CBHI variables	
Scheme of which household is / was a member	
Scheme1	1 = scheme 1 (Soppante), otherwise 0 (baseline)
Scheme2	1 = scheme 2 (Ndondol), otherwise 0
Scheme3	1 = scheme 3 (WAW), otherwise 0
Scheme operation	
Excellent or satisfactory	1 = when asked "how well do / did you feel the CBHI scheme functions?" selected "excellently or satisfactorily". 0 = replied "average, badly or very badly"
Source of money for paying the premium	
Salary	1 = source of money for paying the premium is salary or regular income generated by the household. 0 = sale of harvest, savings, one-off sale of goods, remittances, other

Premium price accessibility

Satisfied	1 = when asked "what aspects of the scheme are/were satisfactory?" selected "premium price is accessible", otherwise 0
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Note: all variables are individual level unless the household level is specified

Table 5. Odds ratios for retaining insurance, part 1

Equation	1	2	3	4	5	6	7	8	9
Scheme									
Scheme2: Ndondol	0.42***	0.53*	0.40***	0.41***	0.47**	0.39***	1.16	0.42**	0.41***
Scheme3: WAW	0.68	0.69	0.67	0.65	0.68	0.62	0.99	0.66	0.56
Demographic characteristics									
Age2	0.67	0.67	0.67	0.68	0.64	0.67	0.44*	0.66	0.67
Age3	0.96	0.98	0.95	0.97	0.98	0.98	1.03	0.96	1.01
Age4	0.51*	0.56	0.53*	0.53*	0.51*	0.54	0.26***	0.52*	0.56
Age5 (highest)	0.31***	0.32***	0.31***	0.32***	0.31***	0.29***	0.38*	0.31***	0.34***
Male	0.81	0.79	0.78	0.82	0.76	0.86	1.48	0.78	0.8
Education									
Literate	0.88	0.87	0.93	0.86	0.72	0.78	1.09	0.86	0.9
Primary	1.12	1.16	1.07	1.1	1.1	1.06	1	1.11	1.02
Secondary or higher	0.94	1.02	0.92	0.89	0.95	0.88	0.64	0.93	0.91
Household expenditure quintile									
Ex q2	0.93	0.91	0.98	0.9	1.11	0.91	1.24	0.99	1.09
Ex q3	0.68	0.63	0.67	0.67	0.73	0.67	0.65	0.68	0.8
Ex q4	0.59	0.56	0.57	0.54	0.71	0.6	0.63	0.6	0.75
Ex q5 (highest)	1.34	1.29	1.31	1.19	1.75	1.24	2.77*	1.38	1.64
Household asset quintile									
Ass q2	0.93	0.95	0.93	0.93	0.88	0.86	1.01	0.95	1
Ass q3	1.1	1.12	1.11	1.09	0.98	0.92	0.9	1.09	1.09
Ass q4	1.49	1.49	1.52	1.51	1.45	1.3	1.28	1.5	1.34
Ass q5 (highest)	1.62	1.74	1.69	1.72	1.39	1.49	2.55*	1.62	1.35
Ethnicity and religion									
Wolof		1.57							
Muslim			0.82						
HH size tertile									

HH size2	0.93		
HH size3 (highest)	0.79		
Health of HH			
Disability		1.74*	
Chronic illness		1.01	
Recent illness		2.00**	
Health care access is advantage of scheme membership			
Advantage			3.05***
Quality of health service providers contracted by the scheme			
Some providers satisfactory			5.54***
All providers satisfactory			13.92***
Household use of traditional medicine in last month			
Traditional medicine			1.21
Nearest health care provider			
<= 2km			2.25**

Notes: *P<0.10; **P<0.05; ***P<0.01.

Dependent variable: membership of CBHI (current member = 1; ex-member = 0)

Table 6. Odds ratios for retaining insurance, part 2

Equation	10	11	12	13	14	15	16	17	18	19	20
Scheme											
Scheme2: Ndongol	0.26***	0.41***	0.38**	0.23***	0.42**	0.42**	0.45**	0.44**	0.41***	0.40**	0.53
Scheme3: WAW	0.57	0.68	0.48*	0.41**	0.59	0.64	0.69	0.73	0.67	0.6	0.52
Demographic characteristics											
Age2	0.82	0.76	0.51*	0.51	0.72	0.69	0.66	0.68	0.71	0.66	0.87
Age3	1.1	0.98	1.04	1.08	0.9	0.87	0.88	0.95	1	1.09	1.08
Age4	0.41**	0.50*	0.48*	0.39**	0.48*	0.42**	0.45**	0.50*	0.51*	0.48*	0.83
Age5 (highest)	0.28***	0.31***	0.29***	0.25***	0.31***	0.34***	0.31***	0.33***	0.30***	0.31***	0.42*
Male	0.82	0.82	0.82	0.8	0.74	0.74	0.84	0.8	0.8	0.67	0.64
Education											
Literate	0.8	0.83	0.7	0.55	0.76	0.84	0.82	0.91	0.81	0.78	1.05
Primary	0.77	1.18	1.43	1.17	1.15	1.12	1.09	1.19	1.09	1.16	0.87
Secondary or higher	1.04	0.83	0.75	0.78	0.71	0.72	0.73	0.92	0.77	0.65	0.81
Household expenditure quintile											
Ex q2	1.03	1	0.91	0.79	1.11	1.02	1.04	0.91	0.95	0.86	1.33
Ex q3	0.57	0.66	0.72	0.58	0.79	0.74	0.78	0.7	0.76	0.6	0.97
Ex q4	0.41*	0.64	0.69	0.58	0.76	0.61	0.61	0.58	0.62	0.55	1.06
Ex q5 (highest)	1.13	1.38	1.41	1.06	1.90	1.47	1.51	1.37	1.35	1.26	1.96
Household asset quintile											
Ass q2	0.94	1.02	1.26	1.41	1.04	0.99	0.95	0.97	0.86	0.98	1.11
Ass q3	1.24	1.03	1.11	0.83	1	1.03	1.15	1.15	0.96	1.13	1.01
Ass q4	2	1.33	1.37	1.2	1.29	1.32	1.34	1.51	1.31	1.43	1.49
Ass q5 (highest)	1.5	1.52	1.46	1.47	1.6	1.6	1.6	1.69	1.6	1.66	1.48
Privileged social relationships											
Yes	1.9										
Household membership of community associations											

1-5 associations	2.22						
>6 associations	7.84***						
Active participation in the scheme							
Informal discussions/spontaneously helped (frequently/sometimes/rarely)	2.04**						
Raising awareness / information		2.08**					
General assembly			2.45***				
Voting				2.96***			
Training					3.00***		
Source of information on existence of the scheme							
Friend or family						1.70*	
Mechanisms of controlling abuse/fraud by scheme staff/members/health providers							
Informed						2.04**	
Believe can influence scheme operation							
Influence							2.32***
Trustworthiness of scheme staff / leaders							
Satisfied							4.01***

Notes: *P<0.10; **P<0.05; ***P<0.01.

Dependent variable: membership of CBHI (current member = 1; ex-member = 0)

Table 7. Odds ratios for retaining insurance, part 3

Equation	21	22	23	24	25	26	27	28	29	30	31
Scheme											
Scheme2: Ndongol	0.48**	0.40***	0.41***	0.39***	0.41***	0.45**	0.35***	0.50**	0.48**	0.41***	0.46*
Scheme3: WAW	0.65	0.7	0.65	0.57	0.67	0.58	0.50*	0.68	0.51*	0.6	0.6
Demographic characteristics											
Age2	0.69	0.69	0.64	0.66	0.72	0.76	0.65	0.71	0.59	0.73	0.87
Age3	1.01	0.99	0.9	1.01	0.98	1.18	0.92	1.05	0.95	1.05	1.07
Age4	0.50*	0.53*	0.48*	0.54*	0.53*	0.54	0.51*	0.51*	0.55	0.53*	0.69
Age5 (highest)	0.37**	0.30***	0.31***	0.36***	0.30***	0.34***	0.34***	0.37**	0.35**	0.38**	0.44*
Male	0.75	0.81	0.81	0.8	0.78	0.71	0.64	0.77	0.71	0.78	0.68
Education											
Literate	0.75	0.86	0.86	0.86	0.95	0.71	0.73	0.76	0.87	0.83	0.98
Primary	1.39	1.12	1.06	1.19	1.12	1.23	1.02	1.36	1.05	1.26	0.87
Secondary or higher	0.88	0.92	0.88	0.9	0.95	0.76	0.57	0.85	0.97	0.86	0.98
Household expenditure quintile											
Ex q2	1.01	0.89	0.9	0.97	1.01	1.03	0.89	1	1.22	0.86	1.23
Ex q3	0.67	0.63	0.64	0.66	0.71	0.8	0.66	0.64	0.82	0.65	0.76
Ex q4	0.54	0.55	0.56	0.6	0.61	0.86	0.69	0.53	0.89	0.57	0.79
Ex q5 (highest)	1.47	1.22	1.27	1.47	1.37	1.72	1.51	1.43	2	1.34	1.54
Household asset quintile											
Ass q2	0.99	0.91	0.94	0.87	0.88	1	0.94	0.94	1.16	0.97	1.35
Ass q3	0.93	1.1	1.06	1.1	1.06	0.99	1	0.97	1.14	1.1	1.19
Ass q4	1.29	1.49	1.48	1.43	1.33	1.3	1.21	1.3	1.82	1.64	1.47
Ass q5 (highest)	1.48	1.62	1.58	1.65	1.5	1.58	1.66	1.55	1.87	1.88	1.67
Vision on values / solidarity											
Shared vision with other members	1.05										

Solidarity is advantage of scheme membership				
Advantage	1.4			
Types of cross-subsidisation that should occur in the scheme				
Principle component 1	1.12*			
Principle component 2	1.1			
Scheme should accept diverse members				
Principle component 3		1.06		
Some people excluded from the scheme				
Yes		1.03		
Scheme President/Secretary/Manager/other staff				
Knows			3.53***	
Knows other members of the scheme				
Few			2.05	
Half or nearly all			7.68***	
Has characteristics in common with other scheme members				
None				0.38*
Scheme operation				
Excellent or satisfactory				2.80***
Source of money for paying the premium				
Salary / revenue				1.27
Premium price accessibility				
Satisfied				1.4

Notes: *P<0.10; **P<0.05; ***P<0.01.

Dependent variable: membership of CBHI (current member = 1; ex-member = 0)

Supplementary material: descriptive statistics

Variable	Current members (%*)	Ex-members (%*)	All (%*)
<i>a. Demographic and socioeconomic characteristics</i>			
Age quintile			
Age1 (lowest)	27.52	17.53	23.39
Age2	23.39	18.83	21.51
Age3	22.94	18.18	20.97
Age4	14.68	20.78	17.20
Age5 (highest)	11.47	24.68	16.94
Gender			
Male	39.64	50.00	43.88
Education (%)			
None	49.78	58.44	53.32
Literate	17.94	16.88	17.51
Primary	17.94	13.64	16.18
Secondary or higher	14.35	11.04	13.00
Household expenditure quintile (%)			
Ex q1 (lowest)	17.70	22.58	19.69
Ex q2	15.49	14.84	15.22
Ex q3	18.14	22.58	19.95
Ex q4	20.80	25.16	22.57
Ex q5 (highest)	27.88	14.84	22.57
Household asset quintile (%)			
Ass q1 (lowest)	16.51	18.12	17.17
Ass q2	15.60	22.15	18.26

Ass q3	20.64	26.85	23.16
Ass q4	19.27	15.44	17.71
Ass q5 (highest)	27.98	17.45	23.71
Ethnicity and religion			
Wolof	55.95	38.96	49.08
Muslim	92.95	92.21	92.65
HH size tertile			
HH size1 (lowest)	34.96	28.39	32.28
HH size2	29.65	31.61	30.45
HH size3 (highest)	35.40	40.00	37.27
<i>b. Health and health service access</i>			
Ill health of HH			
Disability	18.50	16.13	17.54
Chronic illness	45.37	40.91	43.57
Recent illness	39.21	24.52	33.25
Health care access is advantage of scheme membership			
Advantage	93.83	84.52	90.05
Quality of health service providers contracted by the scheme			
No providers satisfactory	4.52	21.59	9.76
Some providers satisfactory	19.10	27.27	21.60
All providers satisfactory	76.38	51.14	68.64
Household use of traditional medicine in last month			
Traditional medicine	54.63	51.30	53.28
Nearest health care provider			
<= 2km	86.30	71.43	80.16
<i>c. Social capital</i>			
Privileged social relations			
Yes	95.31	90.91	93.52
Household membership of community associations			
0 associations	3.52	9.09	5.77

1-5 associations	83.26	86.36	84.51
>6 associations	13.33	4.55	9.71
d. Active participation in the scheme			
Informal discussions/spontaneously helped (frequently/sometimes/rarely)	64.12	47.50	57.24
Raising awareness / information	61.88	46.61	55.40
General assembly	48.85	32.24	42.00
Voting	26.76	14.00	21.49
Training	20.28	8.05	15.24
e. Intermediary outcomes of active participation			
Source of information on existence of the scheme			
Friend or family	22.83	13.07	18.82
Mechanisms of controlling abuse/fraud by scheme staff/members/health providers			
Informed	30.67	21.29	26.84
Believe can influence scheme operation			
Influence	46.85	28.77	39.67
Trustworthiness of scheme staff / leaders			
Satisfied	68.21	36.96	58.19
Vision on values / solidarity			
Shared vision with other members	43.44	43.18	43.34
Solidarity is advantage of scheme membership			
Advantage	35.68	31.61	34.03
Types of cross-subsidisation that should occur in the scheme			
Principle component 1	0.29	-0.18	0.00
Principle component 2	0.08	0.01	0.00
Scheme should accept diverse members			
Principle component 3	0.17	0.04	0.00
Some people excluded from the scheme			
Yes	9.82	11.04	10.32
Scheme President/Secretary/Manager/other staff			

Knows	82.06	59.87	73.07
Knows other members of the scheme			
None	5.29	14.84	9.16
Few	54.63	67.10	59.69
Half or nearly all	40.09	18.06	31.15
Has characteristics in common with other scheme members			
None	3.62	7.58	5.10
<i>f. Other CBHI variables</i>			
Scheme			
Scheme1: Soppante	40.53	29.68	36.13
Scheme2: Ndondol	23.79	41.29	30.89
Scheme3: WAW	35.68	29.03	32.98
Scheme operation			
Excellent or satisfactory	79.82	60.14	72.13
Source of money for paying the premium			
Salary / revenue	78.32	65.97	73.51
Premium price accessibility			
Satisfied	40.51	34.78	38.68
Totals	227	155	382

Notes: *all results are reported as percentages except principle components 1, 2 and 3