

Impact of mutual health organizations: evidence from West Africa

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Mutual health organizations (MHOs) are voluntary membership organizations providing health insurance services to their members. MHOs aim to increase access to health care by reducing out-of-pocket payments faced by households. We used multiple regression analysis of household survey data from Ghana, Mali and Senegal to investigate the determinants of enrolment in MHOs, and the impact of MHO membership on use of health care services and on out-of-pocket health care expenditures for outpatient care and hospitalization. We found strong evidence that households headed by women are more likely to enrol in MHOs than households headed by men. Education of the household head is positively associated with MHO enrolment. The evidence on the association between household economic status and MHO enrolment indicates that individuals from the richest quintiles are more likely to be enrolled than anyone else. We did not find evidence that individuals from the poorest quintiles tend to be excluded from MHOs.

MHO members are more likely to seek formal health care in Ghana and Mali, although this result was not confirmed in Senegal. While our evidence on whether MHO membership is associated with higher probability of hospitalization is inconclusive, we find that MHO membership offers protection against the potentially catastrophic expenditures related to hospitalization. However, MHO membership does not appear to have a significant effect on out-of-pocket expenditures for curative outpatient care.

Keywords Community health financing, health insurance, mutual health organizations, financial protection

KEY MESSAGES

- The frequency of premium contributions and benefit package structure can potentially affect enrolment by the poorer in MHOs.
- MHOs need to tailor their marketing strategies to cater to those with less or no education, to ensure that these segments of the population are not excluded.
- Development of MHOs in West Africa should take into account the higher propensity of female-headed households to join such schemes.
- For MHOs to improve access and lower out-of-pocket expenditures for outpatient care, attention should be paid to the structure of the benefits package and co-payment policies.
- MHOs are an effective tool for protecting households from the potentially catastrophic expenditures for hospitalization.

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Introduction

Out-of-pocket payments, most often in the form of user fees, remain the principal means of financing health care across low-income countries. Often, such payments have resulted in decreased utilization of health services, particularly among the poorest (Gilson 1997; Palmer *et al.* 2004). Catastrophic out-of-pocket payments for care, such as payments for hospitalization or surgery, can push entire households into poverty (Van Doorslaer *et al.* 2006). Lack of prepayment or health insurance mechanisms is a key precondition for catastrophic payments for care (Xu *et al.* 2003). In recent years, a growing number of governments and international donors have promoted mutual health organizations (MHOs) as a means for providing financial risk protection. MHOs, also known as community-based health insurance or community-based health financing schemes, are voluntary membership organizations providing health insurance services to their members. MHOs are typically owned, designed and managed by the community that they serve (such as a district, a trade association, or a hospital catchment area), and differ from commercial insurance organizations in that they are always not-for-profit and are based on the principles of mutual aid and social solidarity (Bennett *et al.* 2004). They are increasingly being advocated as an alternative to user fees and a way to improve access to health care in low-income countries (Hope 2003; Bennett 2004).

Since the late 1990s, MHOs have been growing in number and in membership at a rapid pace in sub-Saharan Africa and other regions of the world (Bennett *et al.* 2004). In West and Central Africa, the number of MHOs grew from 76 in 1997 to more than 800 by 2004 (Gamble-Kelley *et al.* 2006), and MHO-based health insurance is now part of the national health financing strategy in Benin, Ghana, Rwanda, Senegal and Tanzania. While MHOs typically cover a small percentage of their target population, the potential contribution of MHOs to improving financial access to health care for the informal sector and rural populations is attracting increased attention from governments and donors (WHO 2001; Carrin 2003). However, the role that MHOs can play in overall health system financing has been the subject of continuous debate among health financing experts. Some argue that MHOs can only play a small-scale role in health financing in low-income countries (ILO 2002), while others advocate MHOs as a promising approach that can complement public and donor financing, or serve as a step towards national health insurance (Carrin 2003).

The evidence base on the impact of MHOs on utilization and out-of-pocket payments for health care is still limited (Preker *et al.* 2002; Ekman 2004). Debates are ongoing on whether MHOs include the poor and the socially excluded segments of the population. Some studies have found that MHOs tend to exclude the poor (Bennett *et al.* 1998; Jütting 2004; De Allegri *et al.* 2006), while others have found that MHOs are inclusive of the poorest (Ranson *et al.* 2006). Another group of studies did not find a significant association between enrolment and households' socio-economic status (Gumber 2001; Schneider and Diop 2001) or showed mixed evidence for this relationship (Jowett 2003). In a survey of the literature on the impact of community health insurance published in the 1990s, Jakab and Krishnan (2001) found mixed evidence on social inclusion in MHO schemes, while a later literature review by Ekman (2004)

found strong indications that such schemes tend to exclude the poorest.

A number of studies provide evidence that MHO membership is associated with higher utilization of modern health care, in the form of outpatient visits or hospitalization (Criel and Kegels 1997; Atim 1999; Musau 1999; Jakab and Krishnan 2001; Schneider and Diop 2001; Jütting 2004). At least one study found the surprising result that MHO members were less likely than non-members to seek care when ill (Gumber 2001).¹

There is growing but still limited evidence on the effect of MHOs as a vehicle for reducing out-of-pocket health care expenditures, particularly the catastrophic expenditures associated with hospitalization or surgery. The available evidence indicates that MHO members tend to have lower out-of-pocket payments compared with non-members (Schneider and Diop 2001; Ranson 2002; Jowett *et al.* 2003; Jütting 2004), and MHOs that cover inpatient care can reduce the percentage of hospitalizations resulting in impoverishment (Ranson 2002; Devadasan *et al.* 2007). The literature reviews by Jakab and Krishnan (2001) and Ekman (2004) also conclude that there is consistent evidence that MHO membership is associated with lower out-of-pocket payments for health care.

However, very few of these studies are based on household or individual level data and a limited number use quantitative techniques, in particular regression analysis (Preker *et al.* 2002; Ekman 2004).² Studies that are based on administrative data from MHOs or health facilities typically lack data on important differences in factors such as health status and socio-economic profile between (1) MHO members and non-members, and (2) those who seek and those who do not seek health care. If such factors are associated with utilization of care and with MHO membership, results on the impact of MHOs on utilization that do not account for them may be biased. Omission from the study sample of those who do not seek care when ill (both MHO members and non-members) would further distort the effect on utilization and out-of-pocket payments attributed to MHO membership. Quantitative studies of MHOs often simply base their conclusions on differences in means between MHO members and non-members. Multiple regression analysis has an important advantage over comparison of means, by controlling for additional factors that may confound the relationship between MHO membership and utilization or out-of-pocket payments.

Our study aims to add to the limited evidence on the impact of MHOs on utilization and out-of-pocket payments that is derived from household or individual level data, and that is based on robust quantitative analysis. In addition, our study adds to the evidence on whether MHOs include the poorest and socially marginalized segments of the population. We use multiple regression analysis of household survey data collected in three study sites with functioning MHOs in Ghana, Mali and Senegal to investigate three key policy-related questions. First, we investigate social inclusion of MHOs: do MHOs include vulnerable population groups, such as the poor, the less educated and households headed by women. Secondly, we investigate whether MHOs have a positive impact on utilization of curative health care services: are MHO members more likely to seek care from a modern provider when ill, compared with non-members? Lastly, we investigate the impact of MHOs on

Table 1 Characteristics of MHOs in the three study sites

	Ghana	Mali	Senegal
General characteristics of MHOs in study site			
MHO scheme(s) in study site	1 MHO: Nkoranza Health Insurance Scheme	4 MHOs: Bougoulaville, Wayerma, Kemeni, Blaville	27 MHOs—all MHOs in Thies region that had been operational in the 2 years preceding the study
Membership (in 2004)	43 658 individuals	1470 households; 8672 individuals	2200 individuals (average per MHO)
Date established	1992	2002	1990
Participating providers	St. Theresa's Mission Hospital	8 community health centres, 2 referral health centres and 1 regional hospital	Health posts, health centres and 2 regional hospitals
Enrolment requirements	Entire household enrolment encouraged	Entire household enrolment encouraged	Entire nuclear family for most MHOs
Premium payments ^a	Annual premiums: US\$3.61 per individual for first year; US\$3.01 annual renewal	US\$1.04–2.08 annual household membership; in addition, US\$0.28–0.54 per individual per month	Monthly premiums for most MHOs; US\$0.20–0.40 per individual per month
Coverage of health services by MHO			
Outpatient visit	No (except dog/snake bites)	Covered by all 4 MHOs at 75% for all consultations	Covered by 23 MHOs at 50–100%
Hospital admission	Yes	Only covered by Blaville MHO, at 75%	Covered by 22 MHOs; some MHOs have ceilings on the number of hospitalization days covered
Drugs	100% for hospital admission	Covered by all 4 MHOs at 75–80%	Essential drugs covered by 23 MHOs at 50–100%

^aUS\$ at exchange rate at time of survey.

protection from health care expenditures: do MHO members pay less out-of-pocket for health care services related to outpatient visits and hospitalization, compared with non-members? While our study is based on data from West Africa, our findings could contribute to policy decisions on MHOs in other parts of Africa and beyond.

Methods

The data for this cross-country study come from three comparable household surveys conducted in Ghana, Mali and Senegal in 2004. The research protocols for the individual country studies were approved by the Abt Associates Inc. Institutional Review Board. We obtained the free and informed consent of all individuals who were interviewed as part of the household survey. Selection of study sites and sampling was guided by the respective objectives of the three individual country studies. The Ghana study served as a baseline for evaluating a change in national health financing policy, going from voluntary MHO schemes to a nationally mandated set of district-wide MHO schemes. The Mali survey was a follow-on to one conducted in 1999 and focused on evaluating the impact of MHO schemes on a specific set of indicator services.³ The Senegal study focused on the financial viability of the MHOs in the Thies region. Additional specific objectives of the individual country studies and household sample selection in each site are described in greater detail elsewhere (Diop 2005; Sulzbach *et al.* 2005; Franco *et al.* 2006).

The Ghana study was conducted in the rural district of Nkoranza, home to one of the oldest MHOs in the country, and the rural district of Offinso, which had no MHO at the time of the study. In Mali, the study site covered two areas where four MHOs had been established and developed since 2002 with assistance from the USAID-sponsored project Partners for Health Reform^{plus}: the rural district of Bla and the urban commune of Sikasso. In Senegal, the Thies region was selected because it had some of the most numerous and longest-running MHOs in the country.

Availability of health services varied across the three study sites. In Senegal, the population/hospital ratio is seven times higher than in Ghana, and there are fewer hospitals for a much larger geographical area. In addition, the population/physician ratio is three times higher in Senegal compared with Ghana. The health care service delivery system in the Senegal study site has a very wide base, with community health structures (health huts and health posts), and a very narrow top level with geographically concentrated referral facilities. In contrast, in the Ghana and Mali study sites, the health care service delivery system has a narrow base and more referral facilities.

Table 1 summarizes the main characteristics of the MHOs in the three study sites. The number of MHOs covered varies from one MHO in Ghana to 27 in Senegal. However, the MHO in the Ghana study site, with more than 40 000 members, is much larger than the MHOs in the other two sites. All MHOs covered by the study encouraged enrolment of the entire household, as a measure to prevent adverse selection among members,

Table 2 Sample size and distribution

	Ghana		Mali		Senegal	
	No.	%	No.	%	No.	%
Households						
MHO members	620	34%	817	31%	540	50%
Non-members	1186	66%	1842	69%	540	50%
Total	1806	100%	2659	100%	1080	100%
Individuals						
MHO members	3126	33%	4969	34%	4095	44%
Non-members	6427	67%	9721	66%	5131	56%
Total	9553	100%	14 690	100%	9226	100%
Individuals reporting illness or injury in the 2 weeks preceding survey ^a	415	4%	1401	10%	412	4%
Individuals reporting recent hospitalization ^b	232	2%	n/a	–	119	1%

^aIn Mali, number of individuals who reported having fever in the 2 weeks preceding the survey.

^bRecall period for hospitalization was 1 year in Ghana and 2 years in Senegal. The Mali survey did not collect information on hospitalization.

but this norm was not strictly enforced. In the Senegal and Mali study sites, for most MHOs contribution policies are based on monthly premiums with temporary exclusion from MHO benefits for households who do not regularly pay their dues; in Ghana, the MHO premium is paid once a year. The amount of premium payments and coverage of health services and drugs varies widely among MHOs in the three sites. While curative outpatient care was mostly covered by the MHOs in Mali and Senegal, the MHO in Ghana only covered curative outpatient care for snake and dog bites. Costs associated with hospital admission were fully covered by the Ghana MHO, and covered by 22 of the 27 MHOs in Senegal; however, only one of the four MHOs in Mali included hospitalization in its package of covered benefits. Some of the MHOs in Senegal had ceilings on the number of hospitalization days covered.

The sample of households in each of the three study sites was chosen to include residents of both urban and rural areas. In each study site, the sample was also selected to include households that were members of MHOs (serving as *cases* for the study) and households that were not members of MHO schemes (serving as a *comparison group*). The method of household selection differed among the three study sites, as a result of varying numbers of MHO member households available in each MHO catchment area, and the different number and size of MHOs included in the study for each country.⁴ The resulting sample size was 2659 households in Mali, 1806 in Ghana and 1080 in Senegal (Table 2).

The data collection instruments included a household characteristics questionnaire and a curative care questionnaire. In Ghana and Senegal, the curative care questionnaire was administered to those who had been ill or injured in the 2 weeks preceding the survey, while in Mali only those reporting fever (presumed malaria) were administered this questionnaire. The Ghana and Senegal surveys also included modules for capturing information about hospitalizations, with a recall

period of 1 year in Ghana and 2 years in Senegal.⁵ The results reveal that the propensity to be hospitalized is much higher in Ghana than in Senegal (Table 2), perhaps due to greater access to hospitals in the Ghana study site.

While temporary exclusion from MHO benefits is enforced for those who do not pay regularly the monthly premium in Mali and Senegal, the sample of MHO members used in our analysis does not distinguish whether members are up-to-date with their contribution or not. We considered those who were registered with the MHO at the time of the survey as enrolled. We constructed three measures of household economic status, based on data collected at each site. Economic status was measured by an asset-based wealth index in Ghana, by the value of consumption per household member (including the value of self-produced foods) in Mali, and by monthly expenditures per household member in Senegal. For each site, households were divided into five economic status quintiles: poorest, middle-poor, middle, middle-rich and richest. Proximity of the household residence to a health facility was measured by the presence of a health facility in the community in Senegal, and by whether there was a health facility within 1 km in the Mali study site. Information on proximity to a health facility was not collected in Ghana.

We employed multiple logistic regressions to investigate our first two research questions: (1) whether MHOs include the poor and less educated, and (2) whether MHO enrolment is associated with higher utilization of modern care and hospitalization in the event of illness. We used a log-linear regression model to investigate our third research question: whether MHO enrolment is associated with lower out-of-pocket payments for outpatient care and hospitalization. The selection of independent variables included in our regression models was informed by previous studies examining the effects of insurance enrolment in developing countries (Schneider and Diop 2001; Jowett 2003; Jütting 2004). Although not all variables were available in all three datasets, we attempted to standardize the models across the datasets to the extent possible. Our results are adjusted for survey clustering, sample weights and stratification, and we calculated robust standard errors to address heteroskedasticity.⁶ We calculated variance inflation factors (VIFs) to test for possible collinearity among independent variables, but found no substantial collinearity (all VIFs were less than 6, and all except the VIFs for the household size variables were less than 3). All analyses were performed in Intercooled Stata 8.0.

Results

Table 3 summarizes the descriptive statistics of the sample used in our analyses. While there are no substantial differences in the mean age and sex distribution of individuals in the three study sites, as well as between MHO members and non-members, there are some notable differences in the characteristics of the households to which individuals belong. While in the Mali study site only 10% of individuals are from female-headed households, 24% of individuals in Senegal and 33% of individuals in Ghana are from households headed by women. In all three study sites, the proportion of individuals from female-headed households is higher among MHO members

Table 3 Descriptive statistics of study sample: Senegal, Mali and Ghana study areas, 2004 data^a

	Ghana ^b			Mali			Senegal		
	Non-member	Member	All	Non-member	Member	All	Non-member	Member	All
Individual characteristics									
Sex									
Male	48.0	44.0	46.3	48.9	48.7	48.8	49.8	48.0	49.1
Female	52.0	56.0	53.7	51.1	51.3	51.2	50.2	52.0	50.9
Mean age (years)	22.5	25.7	23.9	20.5	23.2	20.6	22.8	24.9	23.6
Household characteristics									
Female headed household	29.8	36.7	32.7	6.9	16.3	10.4	21.0	28.2	23.8
Economic status quintile									
Poorest 20%	26.2	15.5	21.5	16.0	10.0	13.8	26.5	25.3	26.0
Middle-poor 20%	22.1	18.8	20.7	19.9	16.9	18.8	23.5	23.7	23.6
Middle 20%	21.6	17.7	20.0	22.6	16.9	20.4	19.8	19.8	19.8
Middle-rich 20%	17.3	22.4	19.5	22.8	25.7	23.9	18.3	16.9	17.8
Richest 20%	12.9	25.7	18.4	18.8	30.6	23.2	11.9	14.3	12.9
Education of household head									
No education	42.4	39.2	41.0	39.2	24.3	33.7	33.9	29.3	32.0
Primary	49.0	45.3	47.4	45.0	41.6	43.7	42.7	42.8	42.8
Secondary or higher	8.6	15.5	11.6	15.8	34.1	22.6	23.4	27.9	25.2
Occupation of household head									
Unemployed	12.1	9.7	11.1	22.2	24.8	23.1	30.0	21.9	26.5
Agriculture	69.0	62.4	66.2	15.9	13.8	15.1	26.3	25.9	26.1
Trade/commerce	15.8	21.3	18.1	29.4	40.1	33.4	18.8	26.4	22.1
Government	3.1	6.6	4.6	32.5	21.3	28.4	13.6	16.1	14.7
Other							11.4	9.8	10.7
Residence									
Urban	57.6	62.1	59.5	70.3	88.0	76.9	44.9	44.1	44.6
Rural	42.4	37.9	40.5	29.7	12.0	23.1	55.1	55.9	55.4
Total number of individuals	6406	3147	9553	6620	3927	10 547	5621	3605	9226

^aAll descriptive statistics show percentage of total sample of individuals, unless noted otherwise.

^bTotal study sample, including Nkoranza and Offinso districts.

than among non-members. Economic status quintiles were assigned at the household level, and the distribution of individuals by quintile in Table 3 reflects differences in household size by quintile: in Ghana and Senegal, household size decreases with increase in household economic status, while in Mali the opposite pattern is observed. In Ghana and Mali, MHO members belong to wealthier households, compared with non-members, but this pattern is not observed in Senegal. The proportion of individuals from households headed by a person with no education is similar across the three countries. Unemployment of the household head is slightly lower in Ghana than in the other two countries, and agriculture is the predominant occupation in Ghana, compared with a more diversified employment distribution in the other two countries.

Social inclusion of MHOs

We used logistic regression analysis to investigate the determinants of individual enrolment in MHOs (Table 4). The results provide strong evidence that households headed by women are

more likely to join MHOs than households headed by men. Education of the head of household is also positively associated with MHO enrolment in all three settings, while older age of the household head is significantly associated with enrolment only in Ghana and Senegal. The results in Table 4 also show that in Ghana and Senegal, individuals from households headed by an unemployed individual are less likely to enrol in MHOs than households where the head was employed in agriculture, commerce/trade or administration. In Mali, there is a positive association between employment and MHO membership only for those employed in agriculture. Availability of a health facility in the community is associated with higher likelihood of enrolment in a MHO in the Mali and Senegal sites.

In all three study sites, the evidence on the association between household economic status and MHO enrolment indicates that individuals from the richest quintile are more likely to be enrolled compared with those from the poorest quintile. In Ghana, there is stronger evidence that economic status is associated with MHO enrolment, as probability of

Table 4 Determinants of individual enrolment in MHOs (logistic regression results)

Independent variables	Odds ratio		
	Ghana	Senegal	Mali
Individual characteristics			
Handicap (base: no)		1.21	1.70***
Chronic illness (base: no)		1.42***	1.21
Self-perception of health status (base: less than good)			
Good		0.90	1.11
Very good		0.85*	0.97
Individual demographics (base: male 15–49 years)			
Male: 0–4 years	0.78**	0.88	0.90
Male: 5–14 years	0.95	1.09	0.97
Male: ≥50 years	1.25*	1.21*	1.18*
Female: 0–4 years	0.97	0.71***	0.85
Female: 5–14 years	1.07	0.99	0.92
Female: 15–49 years	1.12	1.20***	1.03
Female: ≥50 years	1.80***	1.32***	1.21
Household characteristics			
Household size (base: less than 3)			
3–5 members	1.83**	0.95	0.88
6–8 members	1.46	1.02	1.53
9 members +	1.38	1.66	1.71*
Female headed household (base: male headed)	1.65***	1.60***	6.15***
Household headed by individual aged (base: less than 40)			
40–49 years	1.31*	1.22***	1.02
50–59 years	1.93***	1.12	1.20
60 years +	1.94**	1.21**	1.23
Education of head of household (base: none)			
Primary	0.99	1.12**	1.80***
Secondary or higher	1.51**	1.20***	5.04***
Occupation of head of household (base: none)			
Agriculture	2.14***	1.60***	1.93***
Commerce/trade/artisan	2.25***	1.74***	0.66*
Administration	2.34***	1.76***	0.91
Household economic status (base: poorest 20%)			
Middle-poor 20%	1.39	1.05	1.09
Middle 20%	1.43	1.08	0.94
Middle-rich 20%	2.88**	1.00	1.46
Richest 20%	4.09**	1.42***	2.17***
Community characteristics			
Urban (base: rural)	0.85	0.84***	2.29***
Availability of health facility in the community (base: no)		1.24***	1.78***
Number of cases (individuals)	6712	9226	10 526

 * $P < 0.10$; ** $P < 0.05$; *** $P < 0.01$.

Dependent variable: individual enrolment in MHO (yes = 1; no = 0).

enrolment in each of the top two quintiles is higher than in the poorest quintile. Additional regression analyses (not shown) indicated that, in each of the three study sites, the probability of MHO enrolment among those in the top quintile was significantly higher than for everyone else, while there was no evidence that the probability of enrolment of the poorest quintile is different than that of the other four quintiles grouped together.

We further explored the finding related to female-headed households by including interaction terms between female head of household and (1) education of household head, and (2) wealth quintile (results not shown). In each of these additional models for Ghana and Mali, the coefficients for the interaction variables were not significant, and the coefficients for the remaining variables were largely unchanged. However, for Senegal we found that probability of MHO enrolment for those from female-headed households increased with wealth quintile, while no such pattern was observed for individuals from male-headed households. The likelihood of enrolment decreased with education in female-headed households, while the opposite pattern was observed for male-headed households.

Utilization of health care

Among individuals who reported an illness during the 2 weeks preceding the survey nearly half (46%) sought care from a modern health care provider in the Ghana site, and 80% did so in the Senegal site.⁷ In Mali, 30% of those who had fever (presumed malaria) sought modern health care. The high rate of care-seeking in Senegal is likely due to the fact that MHOs in rural areas are typically established in communities with a modern health care facility (most often a public or mission health post).

Logistic regression results show that one of the strongest determinants of the likelihood of accessing modern health care in case of illness is perceived seriousness of the condition: in Ghana and Mali, those who perceived their condition as serious or very serious were significantly more likely to seek care from a modern health care provider, compared with those who perceived their condition as not serious (Table 5). In the Ghana site (where outpatient care was not covered) and in Mali, MHO coverage is positively associated with the use of modern health care providers for outpatient curative services, but this result was not confirmed in Senegal. There is evidence from the Mali and Senegal study sites that individuals from wealthier households were more likely to seek modern health care when ill, compared with individuals from the poorest households. Availability of a health facility in the community is positively associated with higher likelihood of seeking modern curative care in Mali, but similar evidence was not found in Senegal. We also tested whether the effect of MHO membership on care-seeking varied by wealth quintile, and did not find strong evidence to support this hypothesis in any of the three study sites.

Our model of the impact of MHO membership on health care utilization is subject to possible problems of endogeneity and self-selection (Waters 1999). MHO membership may be endogenous with respect to utilization of health care, as those who choose to enrol in MHOs may also be more likely to seek care when ill, due to unobservable (endogenous) personal

Table 5 Determinants of seeking modern curative care (logistic regression results)

Independent variables	Odds ratio		
	Ghana	Senegal	Mali
Individual characteristics			
Self-perception of illness (base: not serious)			
Serious	2.57***	1.38	2.21***
Very Serious	4.28***	1.89	3.00***
Under 5 years of age (base: 5 years and over)			
Female (base: male)	1.34	0.90	0.89
Household characteristics			
Female headed household (base: male headed)			
Female headed household	0.98	1.27	0.89
Level of education of head of household (base: none)			
Primary	0.70	1.18	1.10
Secondary or higher	0.74	0.90	1.04
Occupation of head of household (base: none)			
Agriculture	0.63	1.16	0.87
Other (Commerce/trade/artisan/administration)	0.61	1.37	0.91
Household economic status (base: poorest 20%)			
Middle-poor 20%	0.87	1.99*	1.26
Middle 20%	0.81	3.09***	1.44
Middle-rich 20%	1.73	1.94	1.79***
Richest 20%	1.53	4.33***	2.28***
Community characteristics			
Urban (base: rural)			
Urban (base: rural)	1.23	0.55*	1.98***
Availability of health facility in the community (base: no)			
Availability of health facility in the community (base: no)		1.21	1.74***
MHO enrolment			
Enrolled in MHO (base: not enrolled)			
Enrolled in MHO (base: not enrolled)	1.81**	0.90	1.48**
Number of cases	415	363	1701

* $P < 0.10$; ** $P < 0.05$; *** $P < 0.01$.

Dependent variable: visit to modern provider for curative care when ill (yes = 1; no = 0).

characteristics such as individual preferences. Self-selection of such individuals in MHOs would result in biased coefficients or overestimation of the impact of MHO membership on utilization of care.

We tested for endogeneity using household size as an instrumental variable for MHO enrolment. Household size was significantly positively associated with the likelihood of MHO enrolment in both Mali and Senegal, but was not directly correlated with the likelihood of utilizing care given illness. For Mali, the Wu-Hausman F-test for endogeneity returned a large P -value ($P=0.62$), indicating that endogeneity is not a substantial problem. For Senegal, the same test indicated that endogeneity was not a significant concern with these data ($P=0.36$). Unfortunately, household size was not a relevant instrumental variable for MHO enrolment in the Ghana data

and we did not have better candidate instrumental variables. Accordingly, we acknowledge that endogeneity may potentially affect our results on utilization of care in the Ghana study site.

In both the Ghana and Senegal study sites, where data on hospitalizations were collected, MHO members are more likely to be hospitalized compared with non-members. In Ghana, 28 per 1000 surveyed MHO members reported hospitalization in the year preceding the survey, compared with 23 per 1000 non-members. In Senegal, 14 per 1000 surveyed MHO members reported a hospitalization event in the 2 years preceding the survey, compared with 6 per 1000 non-members. Logistic regression results confirm that MHO members in Senegal are significantly more likely to be hospitalized than non-members, while results were non-significant for the Ghana study site (Table 6).

Out-of-pocket payments for health care

Table 7 provides a summary of the level and structure of illness-related out-of-pocket expenditures for outpatient care among those who sought care at a modern health care provider in the 2 weeks preceding the survey. Those who sought curative outpatient care from modern providers in Ghana spent US\$6–7 to treat their illness, while in Senegal such expenditures were US\$12–17. Out-of-pocket expenditures for modern care sought for fever averaged around US\$10–11 in the Mali study site. In all three study sites, drugs comprised a large proportion of total out-of-pocket expenditures.

In the Mali study site, expenditures for fever-related care were nearly the same for MHO members and non-members, while MHO members in Senegal paid much less than non-members for curative care. These findings are largely confirmed by the results from a log-linear regression controlling for factors other than MHO enrolment that can influence the level of out-of-pocket expenditures for care (Table 8). In both Mali and Senegal, MHO coverage does not appear to have a significant protective effect on out-of-pocket expenditures for outpatient curative care. This result can be explained by the fact that the MHOs in both study sites had co-payments for outpatient care ranging from 25 to 50%, which may have mitigated the protective effect of MHO membership on out-of-pocket expenditures.

In contrast to the findings related to outpatient care, analysis of hospitalization-related out-of-pocket expenditures shows that there are large differences in payments by MHO members who are hospitalized for a MHO-covered event, and non-members who are hospitalized for a comparable event. For members who benefited from MHO coverage in Ghana, hospital out-of-pocket expenditures averaged US\$2, compared with US\$44 for non-beneficiaries. Similarly, inpatient out-of-pocket expenditures for a covered event averaged US\$61 for MHO members in Senegal, whereas non-members paid US\$234 on average (Table 7). The much higher hospital expenditures among MHO members in Senegal, compared with MHO members in Ghana, reflect different copayment policies and quantitative limits on benefits (such as ceilings on the number of hospitalization days covered). In addition, while the Ghana study site had a district hospital, the site in Senegal had only a regional hospital. Therefore, the Senegal sample of hospitalized individuals is likely to include more severe cases, treated in

Table 6 Determinants of hospitalization (logistic regression results)

Independent variables	Odds ratio	
	Ghana	Senegal
Individual characteristics		
Handicap (base: no)		3.07***
Chronic illness (base: no)		3.08***
Individual demographics (base: male 15-49 years)		
Male: 0-4 years	4.84***	0.99
Male: 5-14 years	1.69	0.73
Male: ≥50 years	8.22***	2.21**
Female: 0-4 years	5.20***	0.91
Female: 5-14 years	0.92	0.85
Female: 15-49 years	6.73***	2.01*
Female: ≥50 years	9.19***	1.20
Household characteristics		
Female headed household (base: male headed)	1.17	1.00
Education of head of household (base: none)		
Primary	0.99	1.28
Secondary or higher	0.85	0.96
Occupation of head of household (base: none)		
Agriculture	0.60***	0.85
Commerce/trade/artisan	0.86	1.24
Administration	0.45	1.17
Household economic status (base: poorest 20%)		
Middle-poor 20%	0.69	0.97
Middle 20%	0.86	0.84
Middle-rich 20%	0.83	0.97
Richest 20%	1.39	0.88
Community characteristics		
Urban	0.86	1.28
Availability of health facility in the community (base: no)		1.43
MHO enrolment (base: not enrolled)		
Enrolled in MHO with high outpatient care coverage		1.18
Enrolled in MHO with high inpatient care coverage	1.09	2.28***
Number of cases	9554	9226

* $P < 0.10$; ** $P < 0.05$; *** $P < 0.01$.

Dependent variable: hospitalized in past year (Ghana) or past 2 years (Senegal) (yes = 1; no = 0).

a service delivery setting with higher costs. Results from log-linear regressions controlling for additional factors confirmed that MHO coverage for inpatient care reduced out-of-pocket expenditures for hospitalization in both the Ghana and Senegal study sites (Table 9).

Discussion

Comparison of our results across the three country study sites reveals several patterns. We found strong evidence that education of the head of household increases the likelihood

of MHO enrolment of household members. Education of the head of household is likely to contribute to a better understanding of the benefits of MHO membership, and may thus lead to a higher propensity to enrol. Our results suggest that managers of MHOs need to promote MHOs to potential members in a way that caters to those who have no education or are illiterate, to ensure that these segments of the population are not excluded.

Our finding that individuals from the richest quintile are more likely to be enrolled, compared with others, is supported by previous studies, suggesting that premium payments, even when small, can be unaffordable to many households and become a major barrier to MHO enrolment: the literature review by Jakab and Krishnan (2001) found that the most frequently cited reason for not being enrolled in a MHO is inability to pay the premium. In the Ghana study site, expensive premiums were also cited as the main reason for not enrolling (60%) or for ending membership (79%) in the MHO (Sulzbach *et al.* 2005). Based on the Senegal data, Diop (2005) finds that the ratio of premium contributions to household expenditures declines steadily from 3.8% among the poorest decile of households to 0.4% among the richest decile. However, the main reason for non-enrolment reported in the Senegal study is the lack of information about MHOs (31% of households), while only 17% of households not enrolled reported expensive contributions as the reason for not enrolling. A similar result was found in Mali: 71% of non-member households said that they had not enrolled because they did not know about the MHOs, while 13% said that the premiums were too expensive (Franco *et al.* 2006). These findings stress the importance of intensive dissemination of information on MHOs in their target areas.

Previous studies have found that inclusion of the poorest varied across MHOs and was dependent on the design and implementation features of the scheme (Bennett *et al.* 1998; Jakab *et al.* 2001). Our finding of a stronger association between economic status and MHO membership in Ghana, than in Mali and Senegal, is consistent with that conclusion. In Mali and Senegal, the MHOs included in the study typically collect premiums at intervals throughout the year, whereas the Ghana MHO collects the entire premium once per year, which may make MHO enrolment less affordable for poorer households. A key feature of the Mali and Senegal MHOs is that their benefit packages include outpatient care serviced through primary health facilities. In contrast, the MHO covered in the Ghana study site provides primarily inpatient benefits. It is likely that the structure of MHO benefit packages and their contractual relations with health care providers may influence a variety of costs of accessing health services covered by the MHO and, therefore, influence the decision of the poor to enrol. For example, MHOs that cover health services provided at primary health facilities, which are located in close proximity to the poor, reduce access costs (such as transportation) to the services covered by MHO benefits. Accordingly, including outpatient care provided at primary health facilities in the MHO benefits package may increase enrolment among the poor. It can also help build confidence among members in the benefits of being in a MHO, and sustain and increase membership. In Senegal, for example, many of the earlier MHOs tended to

Table 7 Out-of-pocket expenditures for outpatient curative care and hospitalization (in US\$)

	Ghana ^b		Senegal ^c		Mali ^c	
	Non-members	MHO members	Non-members	MHO members	Non-members	MHO members
Out-of-pocket expenditures for outpatient curative care^a						
Home care/self-medication	0.59	0.39	3.51	3.50	2.91	2.48
Transportation	0.51	0.50	0.26	0.52	0.31	0.93
Payments at modern provider:						
Consultation	0.38	0.61	2.72	0.98	1.19	1.46
Drugs	2.94	3.23	2.37	3.24	6.14	5.30
Laboratory exams	0.56	0.35	7.40	3.41	–	–
Other ^d	1.75	1.28	0.57	0.44	–	–
Total modern provider payment	5.63	5.47	13.07	8.08	7.33	6.76
Total illness-related expenditures	6.73	6.35	16.84	12.10	10.55	10.18
Number of individuals	98	79	157	137	442	192
Out-of-pocket expenditures for hospitalization						
Event covered by MHO	–	1.77	–	60.52		
Event not covered by MHO	43.88	16.29	234.30	243.27		
All events	43.88	4.25	234.30	145.66		
Number of hospitalized individuals	146	86	54	65		

^aIn Senegal and Ghana the expenditures are for all reported illnesses or injuries treated on an outpatient basis; for Mali the expenditures are only for reported fever (presumed malaria), treated in outpatient setting.

^bReported expenditures in Ghanaian Cedis converted at exchange rate US\$1=¢8300.

^cReported expenditures in FCFA converted at exchange rate US\$1 = 527 FCFA.

^dIncludes x-rays and other treatment-related expenses.

exclude outpatient benefits and covered only high-risk events associated with hospital care. Because hospitalization events are rare, the likelihood that members experienced MHO coverage was very low and they questioned the usefulness of membership. In response, many MHOs in Senegal extended their benefit packages to include outpatient care through primary health facilities (Atim *et al.* 2005).

We found strong evidence that households headed by women are more likely to be enrolled than households headed by men. This finding may reflect the traditional roles of women: as the main health caregivers in the family, women may be more likely to internalize the costs and consequences associated with health care than men, and thus prioritize health-related expenditures, including MHO enrolment. Khandker (1998) presents evidence that women have a higher propensity to spend in health-related areas such as nutrition, compared with men. Additionally, trust and familiarity with various community-based organizations may influence the decision to enrol in a MHO (Jowett 2003; Schneider 2005; Mladovsky and Mossialos 2008). Women, as a result of their more frequent participation in community risk-sharing initiatives such as the *tontines* saving schemes prevalent across West Africa, may be more attuned than men to the institutional features of MHOs in the West Africa setting. In Rwanda, for instance, enrolment in one MHO was facilitated through tontine membership; each week tontine members used the total amount from their individual contributions to pay premiums and insure several tontine households (Schneider *et al.* 2001). A number of micro-finance organizations serving women in the informal sector have initiated health insurance schemes for their

members or have linked members to independent MHOs (McCord 2001).

It may also be the case that some of our findings on the association of household and individual characteristics with MHO enrolment are linked to differences between socio-economic and demographic groups in willingness to pay the MHO premiums (Dong *et al.* 2004). Perceptions of the quality of care by the providers contracted by the MHO may also influence the decision to enrol (Chee *et al.* 2002; Criel and Waelkens 2003; Schneider 2004; Schneider 2005). However, we did not collect data to study this issue and it remains an area for further research.

Our finding that availability of a health facility in the community is associated with higher likelihood of enrolment in a MHO indicates that while MHOs are a promising tool to improve access to affordable health services for populations living close to health facilities, MHOs alone may have a limited role in improving access for those far from health facilities.

With regard to utilization of care, in Ghana and Mali our findings suggest that MHO coverage has a positive effect on the likelihood that the sick will seek care from a modern health care provider. This is consistent with results reported elsewhere (Jakab and Krishnan 2001). In the Senegal study site, however, MHO coverage does not seem to contribute significantly to seeking outpatient care from the modern health sector. With respect to inpatient care, our results for Senegal support the previous findings of Atim (1999) and Jütting (2003) that the likelihood of hospitalization is positively associated with MHO coverage. However, the fact that our data from Ghana do not show significant association between MHO enrolment and

Table 8 Determinants of out-of-pocket expenditures for modern outpatient curative care

Independent variables	Coefficient estimates	
	Senegal	Mali
Individual characteristics		
Self-perception of illness (base: not serious)		
Serious	0.75**	0.22
Very serious	0.80*	0.08
Under 5 years of age (base: 5 years and over)	-0.58	-0.88**
Female (base: male)	0.27	-0.69**
Household characteristics		
Female headed household (base: male)	-0.23	-1.07
Education of head of household (base: none)		
Primary	-0.21	-0.05
Secondary or higher	-0.68	-0.58
Occupation of head of household (base: none)		
Agriculture	-0.05	-1.04**
Other (Commerce/Trade/ Artisan/Administration)	-0.36	-0.58
Household economic status (base: poorest 20%)		
Middle-poor 20%	0.18	0.61
Middle 20%	0.92*	0.49
Middle-rich 20%	0.06	0.71
Richest 20%	1.30**	1.21*
Community characteristics		
Urban	0.53	-0.31
Availability of health facility in the community (base: no)	0.04	-0.72*
MHO enrolment		
Enrolled in MHO (base: not enrolled)	-0.48	0.09
Constant	6.82***	8.60***
Number of cases	283	574

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

Dependent variable: log (total out-of-pocket expenditures +1).

probability of hospitalization leads us to conclude that the evidence from our study on this issue is inconclusive. Measuring equity in access and utilization of health care, as related to health care needs, is relevant in the context of MHOs (Schneider and Hanson 2006); however, such research is outside the scope of this paper.

The patterns emerging from our analysis indicate that the structure of MHO benefit packages and the copayment policies appear to play key roles in the relationship between MHO coverage and household income protection from illness-related expenditures. First, our results do not provide evidence that MHO coverage reduces out-of-pocket expenditures for outpatient curative care. In Mali and Senegal, where MHO benefit packages included curative outpatient care, we did not find a protective effect of MHO membership against out-of-pocket

Table 9 Determinants of out-of-pocket expenditures for hospitalization event

Independent variables	Coefficient estimates	
	Ghana	Senegal
Individual characteristics		
Individual demographics (base: male 15-49 years)		
Male: 0-4 years	0.05	0.95
Male: 5-14 years	0.25	-3.73***
Male: ≥50 years	-1.03	-0.41
Female: 0-4 years	1.03	-0.97
Female: 5-14 years	-1.42	-0.70
Female: 15-49 years	-0.44	-0.91
Female: ≥50 years	0.74	0.35
Household characteristics		
Female headed household (base: male)	-1.23**	-0.13
Education of head of household (base: none)		
Primary	-0.74*	-0.61
Secondary or higher	0.05	-2.33***
Occupation of head of household (base: none)		
Agriculture	0.74	0.22
Other (Commerce/trade/ artisan/administration)	0.12	0.70
Household economic status (base: poorest 20%)		
Middle-poor 20%	0.77	-0.05
Middle 20%	-0.06	1.02
Middle-rich 20%	1.41**	1.65*
Richest 20%	1.23**	1.29
Community characteristics		
Urban (base: rural)	-1.76***	-0.82
Availability of health facility in the community (base: no)		-1.01
MHO enrolment (base: not enrolled)		
Enrolled in MHO with high outpatient care coverage		0.58
Enrolled in MHO with high inpatient care coverage	-9.44***	-1.81***
Constant	11.91***	12.30***
Number of cases	232	101

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

Dependent variable: log (total out-of-pocket expenditures +1).

expenditures for outpatient care. This result can be explained by the fact that the MHOs in both study sites include copayments for outpatient care ranging from 25 to 50%, which implies that the effects of MHO coverage on the level of out-of-pocket expenditures for curative outpatient care are somewhat diluted.

Our finding that MHO coverage is associated with lower out-of-pocket payments in case of hospitalization is consistent with the evidence presented by Jütting (2003) and Ranson *et al.* (2006). Assessing the extent to which MHO coverage reduces

the proportion of households pushed into poverty by hospitalization-related out-of-pocket expenditures—an important emerging area of research (Ranson 2002; Schneider and Hanson 2006)—would be a valuable future addition to our results.

Limitations of the study

Several limitations of the study may affect comparability of results among the three study sites. First, the Mali analysis of curative outpatient care is based only on a homogeneous sample of individuals who reported a recent case of fever (presumed malaria); in contrast, the Ghana and Senegal data are based on a heterogeneous sample of individuals who reported an illness including fever, diarrhoea, respiratory infections, trauma, etc. As patterns of health care utilization vary as a consequence of the type of illness, it is not clear how such differences may affect the comparability of our results.

Secondly, the different measures of household economic status in the three studies may weaken the comparability of results related to economic status. Asset indices tend to reflect more ‘permanent’ wealth, while consumption-based measures can reflect greater short-term fluctuations in economic status.

Thirdly, differences in general availability of health services among the three study sites—particularly differences in the health service delivery system with regard to geographic access to hospitals versus health centres/posts—may affect the patterns of seeking care in a way that limits comparability of our study findings on utilization of care.

Lastly, while most of the Mali and Senegal MHOs collect monthly premiums and have temporary exclusion from MHO benefits for households who do not pay regularly, the sample of MHO members in our analysis does not distinguish whether members are up to date with their contribution or not. Accordingly, the results relating to the impact of MHO coverage on access and use of health care and household income protection are lower bound estimates.

Conclusion

The findings that emerged from the three study sites in Ghana, Mali and Senegal support several policy conclusions. The first of these is that collection of MHO premiums on a monthly basis, rather than once a year, may promote enrolment by poorer households. Including outpatient care provided at primary health care facilities in the MHO benefits package may also increase enrolment among the poor. In addition, it can help build confidence among members in the benefits of being in a MHO, and reduce drop-out rates. The evidence that education of the household head is a strong determinant of MHO enrolment indicates that information on MHOs has to be disseminated in a way that caters to those who have little or no education to ensure that these segments of the population are not excluded from MHOs. The higher propensity of MHO enrolment for households headed by women, compared with those headed by men, has strategic implications for the development of MHOs in West Africa, not only relative to the initiation and establishment of MHOs, but also for the empowerment of women in the health sector.

Our finding that availability of a health facility in the community is associated with higher likelihood of enrolment indicates that promotion of MHOs may be more appropriate in communities where geographical accessibility of health services is good, and that MHOs may have a limited role in improving access to affordable health services for populations that live far from health facilities. Accordingly, improving financial accessibility through MHOs and extending geographical accessibility may be two strong pillars of a strategy for improving access to quality health care. We found that the effect of MHO coverage on use of modern health care varies according to the structure of the benefit package and co-payment policies, and that enrolment in a MHO does not appear to lower out-of-pocket expenditures for outpatient care. For MHOs to have a significant impact on access and out-of-pocket expenditures for outpatient care, more attention should be put into the technical design of benefit packages and co-payment policies. However, MHOs may need to consider a difficult trade-off between expanding the benefit package or reducing co-payments, and charging a premium that is affordable to the poorer. Finally, the evidence that MHOs are an effective tool for protecting households from the potentially catastrophic expenditures associated with hospitalization indicates that MHOs should be considered as an effective health financing mechanism in settings where health care is largely financed by out-of-pocket spending.

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Endnotes

¹ As noted by Jakab and Krishnan (2001), the available literature may be subject to ‘publication bias’. In other words, research that found no evidence of increased utilization of health care associated with MHOs might be less likely to be published. Furthermore, failed schemes would not be likely to be included in studies, whereas successful schemes are more likely to be studied.

- ² For example, the systematic assessment by Ekman (2004) of the evidence on the impact of MHOs on mobilization of resources and on providing financial protection for health care finds that, among 36 studies selected for review, only five used regression analysis of data collected in household surveys.
- ³ The MHOs in the Mali site were developed as part of the Equity Initiative, a research-action project developed in 1999 by the Ministry of Health, USAID and UNICEF, aimed at testing the assumption that cost recovery through user fees limits the use of care, particularly among the poorest and most vulnerable. The establishment of MHOs was one of the interventions selected by the Equity Initiative during the initial situation analysis in the two pilot districts, Bla and Sikasso.
- ⁴ In Ghana, the number of households selected in each municipality was proportional to the total number of households in the municipality. In Mali, the sample of MHO members included all households from three of the four MHOs in the study area, and about half of the households that were members of the fourth (much larger) MHO. The number of non-member households selected in Mali was based on estimation of the minimum number of households needed for the purposes of comparison with the baseline survey conducted in 1999. In Senegal, a paired-sampling methodology was used to select member and non-member households: from each MHO, 20 member households were randomly selected, and for each of these households a non-member household was randomly selected from the same neighbourhood.
- ⁵ A potential criticism could be directed against our use of a two-year recall period in Senegal, which may result in higher recall bias for out-of-pocket payments for care. However, due to the relatively infrequent occurrence of hospitalization in that study site (1% of individuals included in the survey reported hospitalization over the previous 2 years), using a shorter recall period would likely result in small-sample bias.
- ⁶ Data analyses for Ghana and Mali use sampling weights, which were assigned to each household to reflect probability of selection into the sample. Data for Senegal were not weighted, due to the paired-sampling methodology utilized in this study.
- ⁷ Patients who did not access a modern health care provider may have sought care from an informal provider or self-treated. This may also be the case for some of those who eventually accessed a modern provider. The variable of interest here is whether or not, at any time during illness, a patient accessed a modern provider.

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