

# Effects of mutual health organizations on use of priority health-care services in urban and rural Mali: a case-control study

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**Objective** To examine the effects of a community-based mutual health organization (MHO) on utilization of priority health services, financial protection of its members and inclusion of the poor and other target groups.

**Methods** Four MHOs were established in two districts in Mali. A case-control study was carried out in which household survey data were collected from 817 MHO member households, 787 non-member households in MHO catchment areas, and 676 control households in areas without MHOs. We compiled MHO register data by household for a 22-month period. Outcome measures included utilization of priority services, health expenditures and out-of-pocket payments. Independent variables included individual, household and community demographic, socioeconomic and access characteristics, as determined through a household survey in 2004.

**Findings** MHO members who were up to date on premium payments (controlling for education, distance to the nearest health facility and other factors) were 1.7 times more likely to get treated for fevers in modern facilities; three times more likely to take children with diarrhoea to a health facility and/or treat them with oral rehydration salts at home; twice as likely to make four or more prenatal visits; and twice as likely, if pregnant or younger than 5 years, to sleep under an insecticide-treated net ( $P < 0.10$  or better in all cases). However, distance was also a significant negative predictor for the utilization of many services, particularly assisted deliveries. Household and individual enrolment in an MHO were not significantly associated with socioeconomic status (with the exception of the highest quintile), and MHOs seemed to provide some financial protection for their members.

**Conclusion** MHOs are one mechanism that countries strengthening the supply of primary care can use to increase financial access to – and equity in – priority health services.

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Une traduction en français de ce résumé figure à la fin de l'article. Al final del artículo se facilita una traducción al español. الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة.

## Introduction

In most African countries, including the low-income, landlocked Sahelian nation of Mali, poor and rural populations have low utilization and coverage rates for key preventive and primary curative interventions. Because of their poverty, these populations tend to suffer more health problems; because of their health problems, they tend to be poorer.<sup>1</sup> There are many reasons for low utilization of priority health services in Africa, including poor physical and financial access to care, socioeconomic factors, cultural factors and perceptions about the quality of care.<sup>2–9</sup>

In western Africa, mutual health organizations (MHO) have sprung up with amazing speed.<sup>10,11</sup> MHOs are voluntary organizations that provide health insurance services to their members and they are usually owned, designed and managed by the communities they serve. Member households pay an enrolment fee and then regular premiums to cover a membership-defined benefits package. After a waiting period, the MHOs reimburse providers of care for the services used by beneficiaries in the member households, with users making a small co-payment. MHOs are not for profit and are based on ethical principles of mutual aid and social solidarity.<sup>10</sup> The

rise in popularity of MHOs reflects a need in communities to address the difficulty of paying for health care when care is required. The government of Mali recognized the potential of MHOs in its 1997 10-year health and social sector development plan.<sup>12</sup>

Promoted as a solution to many health system problems, MHOs can provide additional avenues of resource mobilization and financial protection against devastating health-care expenditures, increase financial access to care, promote equity through risk-pooling as well as strengthen community solidarity and demand for quality care.<sup>13–15</sup> At a minimum, MHOs should contribute

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to increased use of effective and needed health services<sup>16</sup> and serve as a proxy for improved health.

Although there is enthusiasm and consensus on the worthiness of the principles and concepts behind the MHO movement,<sup>17</sup> concerns exist about their ability to meet all expectations. There is still little robust evidence of MHO cost-effectiveness, of their ability to cover significant portions of the population, or of the sustainability or effectiveness in increasing access to care and financial protection. Recent broad reviews of the MHO literature<sup>16,18</sup> found few studies that measure the effects of MHOs on health care utilization and even fewer that used econometric regression analysis.<sup>18</sup>

What is known from the few studies that have rigorously investigated the effects of MHOs is that: (i) there is an ever-growing demand for such financial protection mechanisms; (ii) MHOs seem able to enrol individuals from a variety of socioeconomic strata, although perhaps not the very poor;<sup>19–21</sup> (iii) members tend to have lower out-of-pocket expenditures than do non-members;<sup>19,20,22</sup> and (iv) members tend to use health services more when needed than do people not enrolled in MHOs.<sup>19,23,24</sup> The literature also highlights that MHOs require technical support to attain functionality, that they still tend to be small, and that they will be only one of many mechanisms for financing the health sector.<sup>13,16,17</sup>

In this paper we examine the effects of a community-based MHO intervention on the use of curative, maternal and child health interventions; inclusiveness of MHO membership, and MHOs' ability to provide financial protection in a rural and urban setting in Mali.

## Methods

### Setting

Four MHOs were developed by the Ministry of Health of Mali and the USAID-funded Partners for Health Reform project<sup>25</sup> as part of a pilot programme to improve financial access to health services. A steering committee chaired by the Mali Ministry of Health selected four MHO pilot sites for the study: two in the rural district of Bla (BlaVille and Kemeni) and two in the urban commune of Sikasso (Wayerma and Bougoula). These sites were selected for their representativeness of

the socioeconomic conditions faced by a large portion of Mali's population.

The USAID-funded Partners for Health Reform and Partners for Health Reform *plus* projects provided funding and technical assistance for MHO development and evaluation design. To ensure the sustainability of the organizations, no direct financial support was provided for the ongoing operation of the MHOs. At the start of the MHO intervention, a baseline household survey revealed low levels of coverage for antenatal care (57%); assisted deliveries (26%); child immunizations (29%); and treatment of child diarrhoea with oral rehydration therapy (30%). Utilization of curative services ranged from 0.24–0.30 visits per person per year.<sup>26,27</sup> In Bla district, roads are few and there is no ambulance service.

### MHO intervention and study design

Table 1 presents descriptive information for the four pilot MHOs. Member households paid a once-off enrolment fee and a monthly or annual premium (based on the number of beneficiaries). On joining, members committed to make use of preventive services, such as immunizations, prenatal care and insecticide-treated mosquito nets. The MHOs signed agreements with local primary health-care centres and referral health centres (where available). When members or their beneficiaries needed curative or maternal care and were up to date on their premium payments, they paid a portion of charges (usually 20–25%) at the time of service, and the MHO covered the larger remaining portion.

Using a case–control design, we sought to answer three major research questions:

1. Does MHO membership affect utilization of priority health services such as modern treatment for fever and diarrhoea (in children), prenatal care and assisted deliveries, childhood immunizations, vitamin A supplementation, and use of insecticide-treated mosquito nets?
2. Are MHOs inclusive in their enrolment of members? That is, do the schemes capture the poor, women of reproductive age and children under 5 years of age?
3. Does MHO membership provide financial protection against health expenditure?

The intervention (case) group consisted of households joining one of the four MHOs. Controls fell into two categories: those who were living in areas where there was a functioning MHO but who did not join, and those who lived in areas where there was no MHO.

To evaluate the impact of the MHO intervention, we collected data from two sources: a household survey conducted in September and October 2004 and a review of MHO registers. The household survey collected household and individual data through interviews with the head of the household on socioeconomic variables, self-reported distance to the nearest health facility, utilization of priority health services, reasons for non-utilization and MHO membership.<sup>25</sup> Questionnaires were pilot tested in an area outside the study sites. MHO registers provided data on membership, premium payment and services covered from January 2003 (when the MHOs became operational) to October 2004. Both sources used the same set of unique household identifiers, allowing the data sets to be linked.

Household survey sampling was conducted separately for members and non-members. All MHO member households in BlaVille, Kemeni and Bougoula study sites were included in the sample. However, because the MHO in Wayerma was much larger than those at the other three sites, we randomly selected 350 households from this site to allow statistically any existing significant differences to be detected among three groups: (i) members joining before April 2004, (ii) members joining after April 2004 and paying premiums for September 2004, and (iii) members joining after April 2004 but not up to date on premium payments. MHO registers provided a full list of member households.

Sampling of non-member households was based on a random selection of enumeration areas (census-defined population clusters), an updated mapping of all households in the selected enumeration areas, and systematic selection of individual households based on a random number.

Because rural Mali's economy is largely non-cash and most household production is consumed, household wealth was measured by an approximation of consumption.<sup>28</sup> Information on consumption was systematically

collected from each household and included data on food (purchased and self-grown), transportation, lodging, utilities (water, electricity, combustibles, etc.), school fees, health, and clothing. All estimations were annualized and summarized for the household, and then converted to an adjusted overall per capita figure by dividing the total value of household consumption by the number of members of the household, weighting adults (aged > 14 years) at a value of 1 and children (aged ≤ 14 years) at a value of 0.75. The mean per capita income for all sampled households was US dollars (US\$) 358 (US\$ 231 in rural Bla district and US\$ 510 in urban Sikasso), well within the range of The World Bank's 2004 estimate of US\$ 390. All consumption rates were converted into US dollars at the October 2004 rate of 527 CFA francs to 1 US\$. Five equally-sized socioeconomic quintiles were developed, based on the adjusted per capita consumption figures: poor, middle poor, middle, middle rich and rich quintiles.

Households may pay the enrolment fee but later fail to make premium payments, causing their MHO coverage to lapse. Thus, additional groupings were used in the analyses: active household membership in an MHO – households having paid premiums at least once in the 6 months before the survey; and eligibility for MHO coverage – being registered as a beneficiary in an MHO household that paid premiums in the month(s) when services were used.

All survey instruments and confidentiality and data security protocols were reviewed by Abt Associates Inc.'s institutional review board and the Mali Study Steering Committee.

### Statistical analyses

Data entry was conducted with use of MSACCESS data entry screens (Microsoft, Redmond, WA, United States of America). Data manipulation and analysis were performed with Intercooled STATA 8.0 (Stata-Corp. LP, College Station, TX, USA). Household data were weighted by the inverse of the probability of selection at the household level, and weights were incorporated into all subsequent analyses. Non-MHO households were weighted based on the probability of the enumeration section being selected

Table 1. Comparison of fees, benefits packages, membership and coverage in areas served by MHOs, Mali, 2003–2004

MHO characteristic	BlaVille <sup>a</sup>	Kemeni <sup>b</sup>	Wayerma <sup>c</sup>	Bougoula <sup>d</sup>
<b>Fees<sup>e</sup></b>				
One-time enrolment fees per household	F 1 000 (US\$ 1.90)	F 1 000 (US\$ 1.90)	F 1 000 (US\$ 1.90)	F 500 (US\$ 0.95)
Monthly premiums per beneficiary	F 260 (US\$ 0.49)	F 155 (US\$ 0.29)	F 135 (US\$ 0.26)	F 190 (US\$ 0.36)
<b>Benefits packages (% reimbursed)</b>				
Consultation	75	75	75	75
Drugs	75	75	80	80
Normal delivery	75	75	75	75
Complicated delivery	100	100	100	100
Hospitalization	75	No	No	No
<b>Membership and coverage (October 2004)</b>				
Member households	218	126	850	276
Individual beneficiaries	875	374	6508	915
Total population in MHO catchment area	27 805	8 223	57 275	27 514
Population covered (%)	4.1 <sup>f</sup>	4.5	11.4	3.3

F, CFA franc; MHO, mutual health organization.

<sup>a</sup> Small urban centre and surrounding villages.

<sup>b</sup> Rural villages.

<sup>c</sup> Large urban centre and a few remote hamlets.

<sup>d</sup> Large urban centre.

<sup>e</sup> US\$ 1 = 527 CFA francs at the time of the survey in 2004.

<sup>f</sup> 4.1 overall; 5.8 in Bla town; 0.4 in rural Bla.

and of a household being selected in that enumeration area. The base sampling weight for MHO households was 1.0 but was adjusted for non-response, and in Wayerma it was also adjusted for sampling.

Multivariate statistical analysis used STATA's survey logit regression function to ascertain whether being an MHO beneficiary was a predictor of higher rates of health service utilization using the following formula:

$$\text{Model: } \ln[\text{Prob}(\text{individual used care}) / \text{Prob}(\text{individual did not use care})] = \alpha 1 + \beta X.$$

The formula for establishing MHO household and individual enrolment determinants was:

$$\text{Model: } \ln[\text{Prob}(\text{being enrolled}) / \text{Prob}(\text{not being enrolled})] = \alpha 1 + \beta X$$

if living where there was an MHO.

We used a multivariate linear regression to examine whether MHO membership translated into lower out-of-pocket payments for health services,

both at the household and the individual level, using the formula

$$\text{Model: } \ln[Y + 1] = \alpha + \beta X$$

### Results

Table 1 shows MHO packages from the four study sites with a comparison of fees, benefits, membership and coverage. Table 2 presents sample sizes for all groups and for priority-health-service target populations and Table 3 summarizes the characteristics of the households surveyed in the sample.

#### Utilization of priority health services

Appendix A (available at: <http://www.urc-chs.com/mali-article.html>) presents the results of logit regression on the utilization of modern paying health services: fever treatment (all ages), diarrhoea treatment in children younger than 5 years, prenatal care and delivery in a modern health facility. The regressions control for individual, household and community characteristics. Results (significant at the  $P < 0.10$  or better)

Table 2. Sample sizes for all groups and by health-service target population in areas served by MHOs and a control area without MHOs, Mali, 2003–2004

Health service target	Bla			Sikasso <sup>a</sup>		Overall			Total
	M	NM	C	M	NM	M	NM	C	
Households	268	341	676	549	446	817	787	676	2 280
Individuals in households	2 113	2 157	4 473	3 663	2 604	5 786	4 761	4 473	15 020
Fever cases	251	268	611	299	272	550	540	611	1 701
Women 15–49 years old	405	393	819	125	163	530	556	819	1 905
Women who delivered in previous 12 months or pregnant	144	177	366	114	151	258	328	366	952
Women who delivered in previous 12 months	102	118	246	76	101	178	219	246	643
Children < 5 years old	294	270	486	135	215	429	485	486	1 400 <sup>b</sup>

C, households in control area (no MHO access); MHO, mutual health organization; M, MHO member households; NM, MHO non-member households in areas with MHO access.

<sup>a</sup> The non-MHO access control group does not exist for Sikasso because the two MHOs cover the entire urban area.

<sup>b</sup> Data on the utilization of diarrhoea treatments, immunizations, vitamin A, and insecticide-treated bednets were available only on a subset of children younger than 5 years (i.e. those whose mothers were pregnant or delivered in the 12 months before the survey).

indicate that, compared with non-members and lapsed members, up-to-date MHO members were 1.7 times more likely to seek treatment for fever in a modern facility; three times more likely to seek modern and/or oral rehydration therapy for diarrhoea in their children under 5 years; and twice as likely to make at least four prenatal visits during pregnancy.

Among control variables, distance to the health facility was a significant negative predictor for health-care seeking; those living more than 2 km away were half as likely to seek fever treatment and two-thirds to four-fifths less likely to deliver in a modern facility than were people who lived within 2 km of a health facility; those living 6–10 km from a health facility were two-thirds less likely to complete at least four prenatal visits. The diarrhoea treatment variable includes home treatment with oral rehydration therapy, which may explain why distance here was not a significant predictor. Household wealth quintiles did not show any consistent pattern of influence on use of services.

Appendix A also shows the results of logit regression on utilization of preventive services provided free of charge by health facilities (diphtheria-tetanus-pertussis 3 immunization before the first birthday among children aged 12–23 months; vitamin A supplementation in children 6–59 months as reported on a card or by a caretaker if no card available) and use of insecticide-treated mosquito nets (which are promoted but not

subsidized by the MHO) by children younger than 5 years and by pregnant women. Although MHO membership did not appear to influence the use of child vaccinations or vitamin A supplementation, it was a significant predictor of treated-mosquito-net use in both children and women during pregnancy. Having access to an MHO was a significant predictor for treated-mosquito-net use in pregnant women, but not in children. Again, household wealth quintiles showed no consistent association with the use of insecticide-treated mosquito nets.

### Inclusion of the poor and key target populations

Appendix B (available at: <http://www.urc-chs.com/mali-article.html>) presents the results of logit regression on overall household and individual enrolment in an MHO. While enrolment for all categories (household, individual, women 15–49 years and children under 5 years) was significantly higher in the rich household wealth quintile, enrolment rates did not differ between the poor, middle poor, middle or middle rich households. A key predictor of enrolment for all categories was distance to a health facility, except for children under 5 years. Household size had a significantly positive association with enrolment across all categories, as did education levels of the household head and female/caretaker. Households headed by a female were five times more likely to be enrolled in an MHO;

four times more likely to enrol women of reproductive age; and eight times as likely to enrol children.

Ethnicity was also associated with enrolment: the majority ethnic group (Bambara) was significantly less likely to enrol across all categories. Finally, some adverse selection appears to be present: households with a household head who reported being in less than excellent health and households with chronically ill and/or handicapped individuals were more likely to enrol.

### MHOs, financial protection and affordability

Appendix C (available at: <http://www.urc-chs.com/mali-article.html>) presents the results of linear regressions on overall household health expenditures, annual household health-care expenditures as a percentage of total household cash consumption, and out-of-pocket expenditures for fever treatments. Being an active MHO member was associated with lower household health expenditures as a percentage of overall cash consumption and lower out-of-pocket payments for fever treatments. Positive predictors for all household health expenditure measures included a high education level for the household head and higher household wealth quintiles. Health expenditure tended to be lower in urban areas than in rural ones; data from the study do not provide any explanation for this finding, but it may be due to competition and a wide choice of options in urban areas.

Table 3. Household characteristics in areas served by MHOs and a control area without MHOs, Mali, 2003–2004

Characteristic	Household membership in MHO			Total n = 2 280
	MHO member n = 817	MHO non-member in MHO catchment area n = 787	Control n = 676	
<b>Head of household</b>				
<b>Age in years* (%)</b>				
≤ 24	3	6	4	5
25–34	17	27	31	28
35–49	39	37	34	36
≥ 50	41	30	31	31
<b>Educational level*** (%)</b>				
No education	26	43	61	49
Primary	43	47	38	43
Secondary	31	11	1	8
<b>Ethnic group*** (%)</b>				
Bambara	18	29	64	42
Senofe	43	34	10	25
Other	39	37	26	33
<b>Female*** (%)</b>				
	21	6	2	5
<b>Occupation*** (%)</b>				
None	21	17	10	15
Agriculture	21	25	83	48
Commerce	55	54	6	35
Other	3	4	1	3
<b>Household</b>				
<b>Mean size</b>	7.0***	6.0***	6.6***	6.3
<b>Mean number women 15–49 years old</b>	1.7***	1.4	1.4	1.4
<b>Mean number children &lt; 5 years old</b>	0.9**	1.1**	1.4***	1.2
<b>Religion (%)</b>				
Muslim	97	97	95	95
Other	3	3	5	5
<b>Kilometers to health facility<sup>a</sup>*** (%)</b>				
< 1	88	77	30	59
2–5	8	13	23	17
6–10	1	8	32	17
≥ 11	3	2	14	7
<b>Residence*** (%)</b>				
Rural	10	19	100	50
Small urban	13	14	0	9
Large urban	77	67	0	41
<b>Mean per capita income<sup>b</sup></b>				
CFA francs	283 738	227 644	121 097	188 409
US\$	538	432	230	358
<b>Household wealth (consumption quintiles)<sup>c</sup>** (%)</b>				
Poor	5	12	33	20
Middle poor	12	16	27	20
Middle	17	21	19	20
Middle rich	25	24	14	20
Rich	41	27	7	20

\* $P < 0.10$ ; \*\* $P < 0.05$ ; \*\*\* $P < 0.001$ . MHO, mutual health organization.

<sup>a</sup> Distance to the closest health facility is self-reported.

<sup>b</sup> Mean income was calculated based on family consumption divided by household size. US\$ 1 = 527 CFA francs at the time of the survey in 2004.

<sup>c</sup> Income quintiles were determined by dividing the total study population in the 5 equally sized income groups.

Table 4. Characteristics of annual household spending on health in US dollars (US\$) among MHO members and the entire community in areas served by MHOs, Mali, 2003–2004

Measure	Bla		Sikasso		Overall
	MHO member	All Bla	MHO member	All Sikasso	Total sample
A. Health expenditures <sup>a</sup> (mean)	129	108	164	172	134
B. Health expenditures <sup>a</sup> (median)	46	15	30	23	17
C. Health expenditures out of total cash <sup>b</sup> (mean %)	6.4	8.9	5.6	6.2	7.8
D. Health expenditures out of total cash <sup>b</sup> (median %)	3.2	2.6	1.7	1.5	2.1
Ratio of mean health expenditures to median health expenditures (A/B)	2.8	7.2	5.5	7.5	7.9
Ratio of mean health expenditures out of total cash <sup>b</sup> to median health expenditures out of total cash <sup>b</sup> (C/D)	2.0	3.4	3.3	4.1	3.7

MHO, mutual health organization.

<sup>a</sup> US\$ 1 = 527 CFA francs at the time of the survey in 2004.

<sup>b</sup> Annual cash expenditure is used as the denominator here, rather than total value of consumption (which includes self-produced items), since health expenditures must be made in cash.

Table 4 presents two other financial protection measures for active MHO members and the overall population. The ratio of mean-to-median expenditures expresses a measure of financial risk: when the ratio is high, some households in the group are spending considerably higher amounts than others. Whether examining expenditures as an absolute value or relative to cash consumption, MHO members spend more, but have less financial

risk, as their mean-to-median ratios are lower, especially in Bla district (BlaVille and Kemeni) with its largely rural population.

Table 5 presents estimates of annual household MHO expenditure, including premiums and co-payments for care, based on MHO register data. At US\$ 29 to US\$ 54 per household, estimated MHO spending is 1.7% to 3.0% of annual income at Mali's poverty line (US\$ 295 per capita or

US\$ 1765 per household<sup>29</sup>). Examining these estimated household MHO expenses in light of cash income shows that even if MHO households enrolled all their members (which many currently do not), MHO-related spending would come to between 2% and 8% of cash income, and this expanded MHO spending still falls between mean and median household cash expenditures on health as a percentage of total cash income (for the whole study population – MHO members and non-members).

Table 5. Mean household cash income and estimated household annual expenditure in US dollars (US\$) on MHO premiums and co-payments in areas served by MHOs, Mali, 2003–2004

Estimate in US\$	Bla		Sikasso	
	Kemeni (US\$ 458) <sup>a</sup>	BlaVille (US\$ 850) <sup>a</sup>	Wayerma (US\$ 1 359) <sup>a</sup>	Bougoula (US\$ 1 359) <sup>a</sup>
<b>Annual expenditure on MHO premiums and co-payments per household<sup>b,c</sup></b>				
Based on current beneficiaries (% of household enrolled)	15.56 (43)	33.80 (62)	24.71 (79)	19.72 (67)
With entire household enrolled	36.31	54.22	31.12	29.34
<b>MHO expenditures as percent of cash income</b>				
Based on current beneficiaries	3.4	4.0	1.8	1.5
With entire household enrolled	7.9	6.4	2.3	2.2
<b>Actual health expenditure as percent of total cash consumption</b>				
Median	2.6		1.5	
Mean	8.9		6.2	

MHO, mutual health organization.

<sup>a</sup> Figures in parentheses are estimated mean household cash income.

<sup>b</sup> These expenditure estimates are lower than those in Table 5 because here costs related to care not covered by the MHO (such as self-care and hospitalization in all MHOs but BlaVille) are not included.

<sup>c</sup> US\$ 1 = 527 CFA francs at the time of the survey in 2004.

## Discussion

These four Malian MHOs sought to rearrange community financing provisions, building on community-based organizations to mitigate barriers associated with Bamako Initiative resource mobilization strategies. Further, they aimed to improve access to health-care services while protecting the income of the poor and strengthening their voice in the health sector. While confirming the effects of traditional determinants of health-care utilization (illness severity, education, income, and distance), our results support evidence that MHOs improve utilization, even for the poor, and help households to better manage their health-care expenditures. The results of this study corroborate findings from other MHO studies in Ghana,<sup>30,31</sup> India,<sup>21</sup> Rwanda,<sup>20,23</sup> Senegal<sup>19,30,31</sup> and Viet Nam.<sup>22</sup>

Our results show that MHOs have a positive effect on the utilization of many priority services. Up-to-date MHO members and beneficiaries, compared with controls, were 1.7 times more likely to have their fever treated

in a modern health facility; three times more likely to use oral rehydration salts or seek modern care for their children under 5 years with diarrhoea; and twice as likely to make at least four prenatal visits during pregnancy. Sleeping under an insecticide-treated mosquito net was also twice as likely during pregnancy and in children under 5 years of age in the up-to-date group.

However, distance to health facilities remains a significant negative predictor of utilization of treatment for fever, prenatal services and assisted-delivery care, indicating that even 2 km can represent a geographic barrier to the seeking of health care. Geographic barriers related to preventive services for children, such as immunization, vitamin A supplementation and insecticide-treated bednets, seem to have been overcome, probably due to outreach activities. The distance barrier was especially strong for assisted deliveries, suggesting that the inclusion in the MHO package of transportation to health-care facilities for women about to give birth might be beneficial.

MHOs reached most parts of the population, and even though higher-income groups are more likely to enrol, MHOs do not exclude the poor. Analysis by household wealth quintiles showed that only membership of the richest quintile was a significant predictor of enrolment for households, individuals, and women of reproductive age, but no discrimination was

seen among the other quintiles. Approximately half of the population in Sikasso commune and about 80% in Bla district fall below the poverty line, and MHO membership is drawn from a broad cross-section in both areas. While the very poor may have difficulty enrolling and paying premiums, they join as frequently as those in other quintiles, with the exception of the richest quintile. The outlay for 1 year of premiums plus co-payments for an entire household would average US\$ 29–54 per year and represent approximately 2–3% of annual household income at the poverty line in Mali, and 2–8% of household cash consumption of MHO households. MHO membership reduced the variability of health-care spending and saved households money on care for fevers, although there was no reduction or savings for active members in terms of overall health spending.

In developing countries where health insurance coverage is generally limited to formal sector employees in urban areas, MHOs are a promising mechanism for reaching households in the rural and informal sector. This study has provided evidence of MHOs' positive effects on the utilization of many priority health services, on reaching many poor people, and on providing some income protection, even though MHOs may not achieve complete coverage of the poorest of all. Our results also demonstrate the need to address not only financial but also geographical barriers to care. Since the proportion

of those eligible who joined MHOs in the study areas was well below 100%, efforts are needed both to expand coverage with MHOs and find alternative methods to improve financial access to health care.

Further research may be needed to validate our findings in other settings and to evaluate strategies to increase access for the poorest. In particular, results related to equity in MHO membership and the specific effects on service use should be confirmed in other settings. MHOs remain one viable mechanism, among others, to increase financial access to – and equity in – the utilization of essential health services. However, a more concerted effort from governments is needed to develop coherent strategies for MHO development, to develop and sustain MHO support capacities through effective partnerships, and to continuously learn from the experiences of other MHOs with respect to strengthening these organizations and their ability to reach the key target populations of women, children and the poor. ■

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## Résumé

### Influence des mutuelles de santé sur le recours aux services de santé prioritaires en milieu rural et urbain au Mali : étude cas témoins

**Objectif** Examiner comment la présence d'une mutuelle de santé communautaire influe sur le recours aux services de santé prioritaires, sur la protection financière de ses affiliés et sur la couverture des pauvres et autres groupes cibles.

**Méthodes** Quatre mutuelles de santé ont été mises en place dans deux districts du Mali. On a réalisé une étude cas témoins qui a permis de recueillir des données d'enquête auprès de 817 ménages affiliés, de 787 ménages non affiliés vivant dans une zone de desserte des mutuelles et de 676 ménages témoins vivant dans une zone non desservie par les mutuelles. Nous avons compilé les données des registres des mutuelles par ménage sur une période de 22 mois. Parmi les mesures de résultat figuraient le recours aux services prioritaires, les dépenses de santé et les débours directs des ménages. Les variables indépendantes étudiées comprenaient des paramètres démographiques, socioéconomiques et qualifiant l'accès aux soins qui s'appliquaient aux individus, aux ménages

et aux communautés et avaient été tirées de l'enquête auprès des ménages de 2004.

**Résultats** Les affiliés des mutuelles à jour de leurs primes (en contrôlant pour l'éducation, la distance au centre de santé le plus proche et d'autres facteurs) avaient une probabilité 1,7 fois supérieure d'être traités pour une fièvre dans un établissement moderne, une probabilité 3 fois supérieure de présenter leur enfant atteint de diarrhée dans un centre de santé et/ou de le traiter par des sels de réhydratation orale à domicile et une probabilité 2 fois supérieure de bénéficier de quatre visites prénatales ou plus et de dormir sous une moustiquaire imprégnée d'insecticide ( $p < 0,10$  ou mieux dans tous les cas) s'ils avaient moins de cinq ans ou attendaient un enfant. Néanmoins, la distance au centre de santé le plus proche constituait aussi un facteur prédictif important de l'absence de recours à de nombreux services, notamment l'accouchement assisté. Il n'a pas été relevé

d'association significative entre l'affiliation familiale ou individuelle à une mutuelle et le statut socioéconomique (sauf pour le quintile le plus riche) et les mutuelles semblent apporter une certaine protection financière à leurs affiliés.

**Conclusion** Les mutuelles sont un mécanisme que peuvent utiliser les pays qui renforcent leur fourniture de soins primaires pour rendre les services de santé prioritaires plus accessibles sur le plan financier et plus équitables.

## Resumen

### Efectos de las mutuas de salud en la utilización de servicios de atención sanitaria prioritarios en zonas urbanas y rurales de Malí: estudio de casos y controles

**Objetivo** Analizar los efectos de una mutua de salud comunitaria sobre la utilización de servicios de salud prioritarios, la protección financiera de sus miembros y la cobertura de pobres y otros grupos destinatarios.

**Métodos** Se llevó a cabo un estudio de casos y controles en relación con cuatro mutuas establecidas en dos distritos de Malí, reuniéndose datos de encuestas domiciliarias sobre 817 hogares acogidos a las mutuas, 787 hogares no acogidos a ellas en las zonas de captación correspondientes, y 676 hogares de control de zonas que carecían de mutuas. Compilamos datos de los registros de las mutuas por hogares para un periodo de 22 meses. Como medidas de resultados se emplearon la utilización de servicios prioritarios, los gastos sanitarios y los pagos directos. Las variables independientes abarcaron características de los individuos, los hogares y la comunidad y datos demográficos, socioeconómicos y referentes al acceso, sobre la base de una encuesta de hogares de 2004.

**Resultados** Tras controlar en función de la educación, la distancia al centro de salud más próximo y otros factores, se observó que los miembros de las mutuas que tenían al día el pago de las

primas presentaban una probabilidad 1,7 veces mayor de recibir tratamiento para una fiebre en servicios modernos; tres veces más probabilidades de llevar a los niños con diarrea a un establecimiento de salud y/o tratarlos con sales de rehidratación oral en el hogar; dos veces más probabilidades de realizar cuatro o más visitas prenatales; y dos veces más probabilidades, en el caso de las embarazadas y los menores de 5 años, de dormir bajo un mosquitero tratado con insecticida ( $p < 0,10$  o inferior en todos los casos). Sin embargo, la distancia fue también un factor predictivo negativo en lo relativo a la utilización de muchos servicios, en particular de asistencia al parto. La pertenencia familiar o individual a una mutua no se asoció de forma significativa a un determinado estatus socioeconómico (exceptuando el quintil superior), y parece que las mutuas procuraban efectivamente cierta protección financiera para sus miembros.

**Conclusión** Las mutuas son un mecanismo al que pueden recurrir los países que están reforzando la oferta de atención primaria para ampliar el acceso financiero a servicios de salud prioritarios y mejorar la equidad en ese terreno.

## ملخص

### تأثير المنظمات الصحية المشتركة على استخدام خدمات الرعاية الصحية ذات الأولوية في ريف وحضر مالي: دراسة للحالات والشواهد

**الغرض:** فحص تأثير إحدى المنظمات الصحية المشتركة، المجتمعية المرتكز، على الاستفادة من الخدمات الصحية ذات الأولوية، وتوفير الحماية المالية لأعضائها، وإدراج الفقراء وغيرهم من الفئات المستهدفة.

**الطريقة:** أنشئت أربع منظمات صحية مشتركة في مقاطعتين في مالي، وأجريت دراسة للحالات والشواهد حيث جُمعت معطيات لمسح أسري من 817 أسرة من الأسر الأعضاء في هذه المنظمات، ومن 787 أسرة من غير الأعضاء، تقطن مناطق تقع ضمن دوائر نشاط هذه المنظمات، و676 أسرة من الشواهد في مناطق لا توجد بها مثل هذه المنظمات. وجمّع الباحثون معطيات تسجيل من هذه الأسر على مدى 22 شهراً. وتضمّنت مقاييس النتائج مدى الاستفادة من الخدمات ذات الأولوية، والنفقات الصحية، والمدفوعات من جيوب المواطنين، وشملت المتغيرات الحرّة الخصائص الديمغرافية والاجتماعية والاقتصادية للأفراد وللأسر وللمجتمع وقدرتهم على الوصول إلى الخدمات والحصول عليها، وفقاً لما تحدّد من خلال المسح الأسري الذي أجري عام 2004.

**النتائج:** تبين أن الأعضاء في المنظمات الصحية المشتركة، الذين كانوا مستوفين لجميع أقساط التأمين (الشاهدين للجوانب الخاصة بالتعليم، والمسافة لأقرب

مرفق صحي، وغيرها من العوامل)، كانت إمكانية تلقيهم المعالجة للحميات في مرافق حديثة أكبر بـ 1.7 مرة، وإمكانية أخذهم الأطفال المصابين بالإسهال إلى المرفق الصحي أو معالجتهم بأملاح الإمهاء الفموي في المنزل، أكبر بثلاث مرات، وإمكانية عمل أربع زيارات أو أكثر لتلقي رعاية الحمل أكبر بمرتين، وإمكانية النوم تحت ناموسية معالجة بمبيدات الحشرات، إذا كانت امرأة حاملاً أو طفلاً دون سن الخامسة، أكبر بمرتين (نسبة الاحتمال أقل من 0.10 أو أفضل من ذلك في جميع الحالات). ومع ذلك، فقد كانت المسافة عاملاً منبئاً سلبياً يُعتمد به إحصائياً في ما يتعلق بالاستفادة من العديد من الخدمات، ولاسيما ما يختص بالولادات التي تتم بمساعدة. ولم يكن إدراج الأسر والأفراد في المنظمات الصحية المشتركة مرتبطاً ارتباطاً يعتد به إحصائياً بالوضع الاجتماعي والاقتصادي (باستثناء الخمس الأعلى). وبدا أن المنظمات الصحية المشتركة توفر بعض الحماية المالية لأعضائها.

**الاستنتاج:** تُعدّ المنظمات الصحية المشتركة واحدة من الآليات التي تستخدمها البلدان التي تقوم بتعزيز إيتاء الرعاية الأولية، من أجل زيادة الإتاحة المالية، والإنصاف في الحصول على الخدمات الصحية.



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