



Partners for Health Reform *plus*


Determinants of Financial Stability of Mutual Health Organizations in the Thies Region of Senegal: Household Survey Component

September 2005

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Abstract

This report summarizes the results of the household component of a study of determinants of the financial stability of mutual health organizations (MHOs) in the Thies region, implemented by Partners for Health Reform *plus* in Senegal in 2004. The report is based on information of a paired-sample of households that are MHO members and households that are not members. Demographic and socio-economic characteristics of households and individuals who are beneficiaries and non-beneficiaries of MHOs are analyzed in order to assess the likelihood of adverse selection processes in enrollment into the organizations as a potential source of MHO financial instability. Household characteristics associated with the regularity of contributions and dues payments are analyzed to assess the effects of household characteristics and behavior on MHO income stability/instability. Information on the patterns of use of health care services, curative care, and hospital care, is summarized in order to assess the potential contribution of patterns of health care utilization on MHO expenditure stability/instability. Finally, other financial relations between MHOs and their members are analyzed as potential sources of MHO financial instability.

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Acronyms

FCFA	<i>Franc de la Communauté Financière Africaine</i>
HH	Household
IPRES	<i>Institution de Prévoyance Retraite au Sénégal</i>
MHO	Mutual Health Organizations
OOP	Out-of-pocket
PHR<i>plus</i>	Partners for Health Reform <i>plus</i>
USAID	United States Agency for International Development

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Executive Summary

Background and Methods

Mutual health organizations (MHOs) are local health insurance schemes which are owned, designed, and managed by their members. Most of the MHOs in the Thies region of Senegal have emerged recently and are developing in an environment where the history and experiences of such organizations are very limited. Over the past several years, some of the Thies MHOs have experienced financial fluctuations and instability which could threaten their sustainability. In response, Partners for Health Reform *plus* (PHR*plus*)/Senegal implemented a three-part study intended to expand understanding of the factors associated with or contributing to MHO financial stability or instability. The current report is on the household component of the study. Other components are a ‘mutual health organization’ component and a ‘provider component.’

The objectives of the household component are to analyze (i) factors at the household level that contribute to MHO expenditures, (ii) factors at the household level that contribute to MHO revenues, and (iii) other financial relations between members and MHOs which may have implications on MHO financial stability. To achieve these objectives, a sample of 540 households that were MHO members were selected from all the MHOs in the Thies region, and have been paired on a geographical basis with a sample of 540 non-member households.

The report describes the Thies region, with a particular focus on recent changes in the MHOs there. It summarizes earlier investigations into MHO enrollment and utilization of health care. Enrollment is examined to assess the likelihood that adverse selection occurs in MHO enrollment. Levels and patterns of health care utilization among MHO beneficiaries and non-beneficiaries are analyzed to assess moral hazard (overuse of health care services among beneficiaries). The report looks at ability to pay MHO premiums and the regularity of contributions as potential sources of income instability of MHOs. Finally, it analyzes other financial relations between MHOs and their members that may contribute to MHO financial instability.

Key Findings

Changing features of MHOs in the Thies region

Key parameters of MHOs in the Thies region have experienced significant changes in the past several years. Before 1999, designs featured benefit packages limited to inpatient care and contracts with a mission hospital. Starting in 1999, existing MHOs and newly founded ones started to extend their benefit packages, usually to include outpatient curative care consultations, essential drugs, and simple deliveries. This has been accompanied by increased use of copayments by MHOs; coverage of benefits runs between 50 percent and 80 percent depending on the MHO and the individual benefit. To deliver the expanded benefit packages, MHOs have contracted with networks of health posts and health centers.

Adverse selection, moral hazard, and use of health care services

Household behavior may affect MHO financial stability through adverse selection in enrollment and moral hazard in beneficiary behavior. The analyses presented in this report suggest that adverse selection may operate in MHO enrollment in the Thies region at two levels: In respect to enrollment of households, larger households and households with a greater number of high-risk women (women of childbearing age) are more likely to enroll than other households. In respect to coverage of individual members within enrolled households, high-risk women, male children, and males older than 55 years are most likely to be covered. Results also suggest that individuals with poorer health and chronic conditions are more likely to be provided coverage than are healthier individuals.

It should be noted, however, that this tendency to enroll and cover women of childbearing age may be a factor of broader differences in how women and men relate to health care, cooperation, and social solidarity in Senegal. Adult women are traditionally caregivers in the Senegalese family. As such, they may be more likely than men to understand the costs and uncertainty associated with health care. They also are more likely to be involved in community-based associations – including MHOs.

Analyses of utilization of curative health care suggest no significant differences between MHO beneficiaries and non-beneficiaries in the overall use of modern health care providers. However, significant differences in the choice of provider are observed. MHO beneficiaries are more likely to bypass health posts and health centers and seek care in hospitals; non-beneficiaries rely mainly on health posts.

Finally, during the two years preceding the survey, it was observed that hospitalization levels among beneficiaries are twice those of non-beneficiaries. Among women, hospitalization rates for women of childbearing age, especially those 30 to 44 years of age, are much higher for beneficiaries than for non-beneficiaries. Hospitalization rates are relatively low for men 15 to 29 years of age; they peak after 45 years of age: at older ages, male beneficiaries of MHOs are four times more likely to be hospitalized compared to male non-beneficiaries. As more elderly people enroll in MHOs and the organizations expand their benefit packages to cover consultations and drugs, the bias for more costly hospital care may jeopardize MHO financial stability unless these changes are associated with greater use of primary health care services and less use of hospital services.

Regularity of contributions

Another way in which household behavior may affect the level and stability of MHO income is through the levels and regularity of their contributions. Current contribution policies among Thies MHOs and household information presented in this report suggest that contribution levels are affordable for most households that are members of MHOs. Among member households, the incidence of the contribution is about 1.2 percent of total household expenditure and around 5 percent of non-food expenditures. Even among the poorest 10 percent of households, MHO contributions are less than 4 percent of total household expenditure and around 15 percent of non-food expenditures. In other words, the data suggest that current levels of contributions are economically accessible for the majority of households.

The proportion of members who report regularly paying their contributions is as low as 60 percent. Regularity of contributions, however, is not related to the level or stability of household income, which in turn is a factor of member's occupation or household expenditures. Indeed, the proportion of members who report paying their contributions regularly is much lower in the Mbour department (28 percent), which is relatively wealthier, than in the poorer departments of Thies (65 percent) and Tivaouane (74 percent). Only 53 percent of male members report paying regularly their

contributions compared to 70 percent of female members. Regularity of contributions into MHOs is mostly associated with gender, religious affiliation, and ethnicity. Hence, the relatively low levels of regularity of contributions may be explained by gaps in sensitization of members and/or weaknesses in the administration of contribution collection processes.

Other financial relations

Other, non-insurance financial relations between MHOs and their members are a final mechanism through which household behavior may affect MHO financial stability. In the Thies region, these relations include MHO loans to its members to cover health care-related copayments, to finance income-generating activities, and/or to finance the purchase of mosquito nets. Analyses in this report, however, suggest that the proportion of members indebted to MHOs is relatively low: only 6.4 percent of members reported being in debt to their MHO at the time of the survey. In addition, indebtedness seems to be a local phenomenon: 12 of the 27 MHOs in the survey sample have levels of member indebtedness that are higher than 10 percent; three of the 27 MHOs have levels of member indebtedness that are higher than 17 percent; in contrast, no indebtedness is observed among seven of the MHOs.

The main source of member indebtedness is related to health care. However, it is only in the Thies and Tivaouane departments that MHOs lend to members for coverage of health care-related costs. As MHOs restructure their benefit packages toward more primary and preventive services, and large copayments are to be paid by beneficiaries at the time of need, member indebtedness may come to threaten MHO financial stability. This is particularly true as MHOs in Thies typically pay for services and then seek reimbursement from the member.

1. Introduction

Mutual health organizations (MHOs) are local health insurance schemes that are owned, designed, and managed by their members. MHOs have a recent history in Senegal in general, and in the Thies region in particular. In 1997, there were only 19 MHOs operating in all of Senegal; the number of functioning MHOs increased to 28 in 2000 and 79 in 2003. By 2003, nearly 48 new MHOs were being founded throughout the country. The first MHO in the Thies region was founded in 1990; by 2000, 15 MHOs were operating there. In 2003, 27 MHOs were functional in the region, while 10 new were being founded; several were experiencing financial fluctuations and instability which threatened their sustainability. As these numbers show, most of the MHOs in the Thies region are young; in addition, they are developing in an environment where the history and experiences of insurance schemes are very limited. Consequently, like many pioneering organizations, it is not surprising that they are experiencing difficulties.

This report describes the household component of a study that responds to the need for better understanding of the factors associated with or contributing to MHO financial stability or instability in the Thies region. Other components are a ‘mutual health organization’ component and a ‘provider component.’ The objectives of the household component are to analyze (i) factors at the household level that contribute to MHO expenditures, (ii) factors at the household level that contribute to MHO revenues, and (iii) other financial relations between members and MHOs that may have implications on MHO financial stability.

The remainder of the report is organized in seven sections. Section 2 describes the Thies region, with emphasis on MHOs there. Section 3 presents the objectives and key research questions of the study’s household component, the sampling methodology, and the data collection instruments. Section 4 presents analysis of MHO enrollment intended to inform the discussion of the likelihood of adverse selection taking place. Section 5 looks at the capacity to pay for MHO contributions and the regularity of contributions. Section 6 analyzes the levels and patterns of health care utilization among MHO beneficiaries and non-beneficiaries in order to inform the discussion of moral hazard (overuse of health care services). Section 7 discusses other financial relations between MHOs and their members that may contribute to MHO financial instability. The last section summarizes the main findings on each theme.

All of the information presented and discussed in the report is based on aggregated analyses across the entire sample of MHOs in order to detect patterns related to study objectives and key research questions. Conditional on sample size, however, some of the information can be produced for individual MHOs and linked directly with information from other components of the study. Tables in Annex A illustrate the type of summaries that could be based on individual MHOs for further analyses.

2. The Thies Region

2.1 An Overview of the Region

The Thies region is located in the middle-west of Senegal. In the most recent census, in 2002, the region's population was estimated at 1,290,000 inhabitants spread over 6,201 squared kilometres; population density was 200 inhabitants per km². Thies is a transition region. It is between the industrialized and urbanized region around Dakar, the capital city, and rural regions of middle Senegal; between the northern and southern parts of the country's groundnut basin; and the Wolof-dominated regions of Louga and Diourbel and the Serer-dominated region of Fatick. This location has contributed to the urbanization of the region: in 2002, nearly 43 percent of the population lived in urban areas (see Table 2.1). In rural areas, there are relatively large villages of the Serer ethnic stock or the Wolof group, as well as Fulani (Poular) and Mandingo villages. All the major religions of the country reside in harmony in the region: most people are Muslims, mainly of the Tidjanya and the Mourid brotherhoods, and Catholics.

Improvement in living standards has been uneven over the past decades. The regional economy has been dominated traditionally by rain-fed agriculture based on millet, sorghum, and peanuts (the main cash crop), and mining industries in the northern part of the region. Over the past two decades, however, the economy has witnessed structural changes with the development of tourism and fishing industries along the western borders; these new industries have resulted in widening disparities in living standards between the two northern departments (provinces) of Tivaouane and Thies, and the southern department of Mbour.

Thies has one of Senegal's lowest regional infant and child mortality rates after the Dakar region: under-5 mortality rate was estimated at 98 deaths per 1,000 live births at the end of the 1990s, compared to a national average of 145 per thousand. Its epidemiological profile is still dominated, however, by communicable diseases, in particular a combination of malaria, diarrhoeal diseases, and respiratory infections.

2.2 Health Care Providers

The Thies region has among the best basic health infrastructure in the country, after the Dakar region. Basic health infrastructures, which correspond to the health service delivery components of the health district, are typically organized into three tiers as in other regions of the country (see Table 2.1). The lower tier consists of health huts, which are staffed by community health workers. These health huts are under the supervision of health posts, staffed by nurses; only a few health posts have certified midwives. At the highest tier are health centers, staffed by medical doctors, dentists, certified midwives, and nurses. Most health posts and centers are public. Mission health posts also exist and contribute to the district health system. As a consequence of urbanization and changing economic conditions, the region has witnessed an important growth of private providers, both clinics and pharmacies.

Table 2.1 Profile of Health Infrastructure in the Thies Region, by department circa 2002

	Mbour	Thiès	Tivaouane
Population			
Population	461,000	496,000	336,000
Proportion (%) living in the urban areas	46.3	56.9	19.5
Density (inhabitants per square kilometers)	242	329	127
Basic infrastructure at the health district level			
Number of health huts	76	79	89
Number of health posts	40	57	28
Number of health centers	4	2	3
Number of inpatient beds in health districts	272	96	105
Hospital infrastructures			
Number of hospitals		2	
Number of hospital beds			
Regional Hospital of Thiès		257	
St Jean de Dieu			
Health personnel at the health district level			
Number of nurses	125	114	56
Number of midwives	22	22	7
Number of medical doctors	10	4	3

There are only two hospitals in the Thies region. Both are located in the Thies department, in the city of Thiès. The public regional hospital is newly renovated and among the most modern hospitals in the country; as a consequence, it is gaining a good reputation and has become very attractive not only to Thiès residents but also to neighboring regions. The mission hospital of St Jean de Dieu also has earned a good reputation since its founding in the mid-1980s, as have other mission health facilities in the region. St Jean de Dieu hospital's promotion of MHOs has been instrumental in the emergence and sustainability of the MHO movement in the Thies region.

2.3 Mutual Health Organizations¹

The Thies region is the birthplace of rural MHOs in Senegal. The first MHO was founded in the village of Fandene in 1990; during the 1990s, MHOs spread to surrounding villages in the Thies department. By the end of the decade, MHOs were started in the other departments of the Thies region, Tivaouane and Mbour.

The founding of many of these MHOs was done with the interaction of the St Jean de Dieu mission hospital, the Catholic diocese and the diocesan division of the Catholic non-government

¹ See the "MHO component" of this study: Atim, C., F. Diop, and S. Bennett. Forthcoming. Determinants of the Financial Sustainability of Mutual Health Organizations: A Study in the Thies Region of Senegal. Bethesda, MD: Partners for Health Reform/plus, Abt associates Inc.

organization, CARITAS, and Catholic communities of the departments of Thies and Tivaouane.² The mission hospital offers a 50 percent price discount to MHOs and their members in order to improve the poor's access to hospital services. In addition to assisting the founding of MHOs, CARITAS provided support to the first coordination initiatives.

The interaction of the mission hospital and the first generation of MHOs produced the typical pattern of MHO benefit packages. Most MHOs founded before 1999 provided primarily inpatient care, under contract with the St Jean de Dieu hospital. By the end of the 1990s, members of a few MHOs started to complain about the limits of their respective benefit packages; indeed, their need for inpatient care is relatively rare. Accordingly, they found it unacceptable to contribute to an organization where the likelihood of their benefiting was very limited, while they had to pay for primary health care needs at health posts without any coverage. In response, existing MHOs in the region started to restructure their benefit packages after 1999, and most MHOs founded after that date started with benefit packages that put greater emphasis on primary health care provided at health posts and health centers.

This restructuring is still evident in benefit packages among Thies MHOs in 2004. As Table 2.2 shows, services and products included in benefit packages are essential drugs (23 schemes), curative care consultation (23 schemes), and normal delivery (16 schemes). In the department of Mbour, only three of the six MHOs include inpatient care in their benefit packages, as the part of the district covered by the Mbour MHOs is located relatively far away from the two regional hospitals (in the city of Thies).

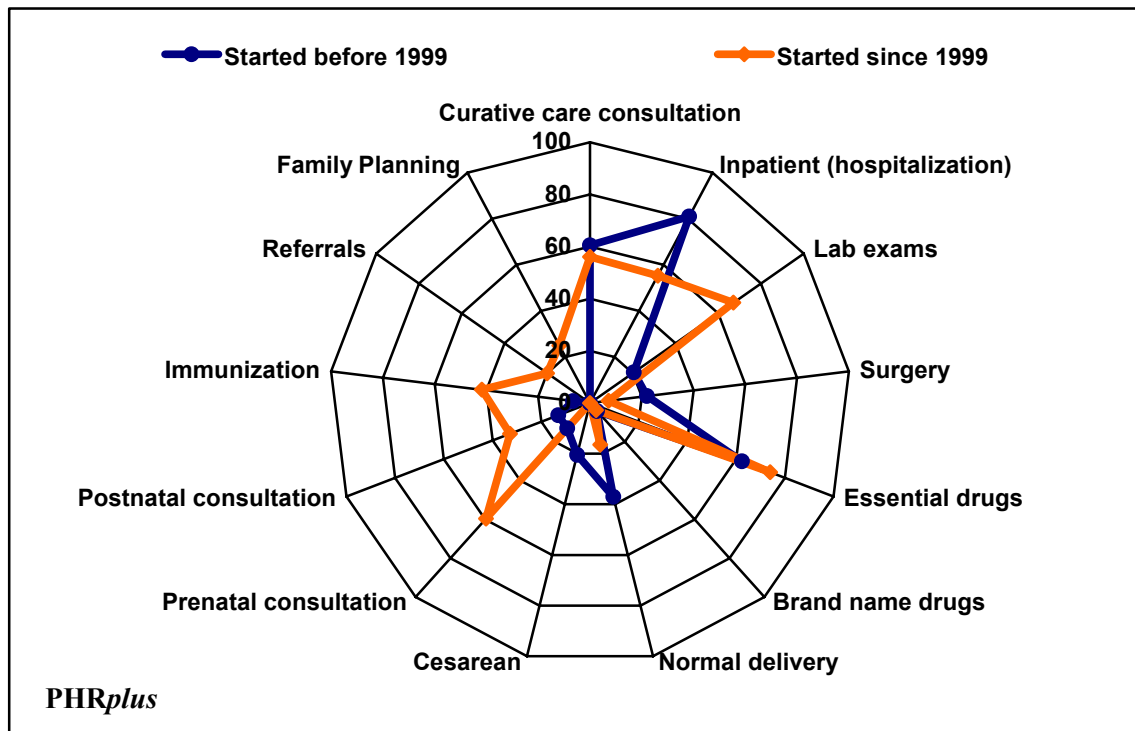
Table 2.2 Number of MHOs in Thies Region with Specific Services in Their Benefit Packages

Service or product	Initial benefit package	Current benefit package by department (province)			
		Mbour	Thies	Tivaouane	Total
Curative care consultation	14	5	12	6	23
Essential drugs	15	6	10	7	23
Brandname drugs	3		2		2
Laboratory exams	10	1	9	3	13
Inpatient care (hospitalization)	19	3	13	6	22
Surgery	3		4	3	7
Prenatal care consultation	9	4	5	4	13
Simple delivery	10	6	6	4	16
Cesarean	3		6	1	7
Postnatal consultation	8	4	3	2	9
Family planning	4	2	3		5
Immunization	8	5	4	1	10
Number of MHOs	27	6	14	7	27

² There is no geographical overlap between the boundaries of Catholic dioceses and the regional and provincial administrative divisions of Senegal. Most of the Catholic communities in the Mbour department are the diocese of Dakar. This may explain the different history of the founding of MHOs among Catholic villages in the Thies and Tivaouane departments, compared to the founding of MHOs in Mbour.

MHOs appear to have behaved cautiously in the extension of their respective benefit packages (Figure 2.1). Among those founded before 1999, inpatient care was covered at 100 percent and, in 2004, remained unchanged in eight of 10 MHOs. Among the MHOs that added curative care consultation, normal delivery, and essential drugs to their benefit packages, coverage was provided at a rate varying from 50 percent to 75 percent; only three provided 100 percent coverage for curative care consultation and essential drugs. A similarly prudent design of benefit packages is observed among MHOs created after 1999; most have large copayments for curative care consultation, normal delivery, and essential drugs. It should be noted that typically MHOs pay the entire fee directly to the facility and then seek reimbursement from the member.

Figure 2.1 Profile of Benefit packages among MHOs in Thies in 2004, by the Time of Inception of the MHO



Note: The averages represented in the figure are the arithmetic average rates of coverage of the benefit among MHOs. For example, among MHOs which started since 1999, the average coverage rate for curative care consultation was 60% representing the share of curative consultation costs paid or reimbursed by the MHOs; 40% were paid as copayments by beneficiaries.

The restructuring of the benefit packages resulted in the expansion of MHOs' contractual relationships with providers. Before 1999, contractual relations of MHOs were primarily with St Jean de Dieu hospital. Starting in 1999, however, most of the contracts established by MHOs were with public and mission health posts, and health centers to a lesser degree – among the nearly 100 contracts established between the 27 MHOs of the study and providers in 2004, 77 were with health posts, 16 with a hospital, and only seven with a health center.

Most of the MHOs in the study area have enrollment policies based on family membership, meaning that all members of the nuclear family should join the MHO. As we will observe in the results, however, not all members of households who are members of MHOs are covered by the MHO. In addition, the periodicity of contributions among most of the MHOs is on a monthly basis.

Contribution rates vary between 100 FCFA (US\$ 0.20) per beneficiary per month to 200 FCFA (US\$ 0.40) per beneficiary per month.³

In summary, key design features of MHOs in the Thies region have experienced significant changes in the past years. Before 1999, MHOs were dominated by benefit packages limited to inpatient care, and contractual relations were with St Jean de Dieu hospital before 1999. Since 1999, existing and new MHOs started to expand their benefit packages to include mostly curative care consultation, essential drugs, and normal deliveries. This expansion was accompanied by increased use of copayments; these low-risk benefits are covered 50–80 percent depending on the MHO and the benefit. Consequently, MHOs have extended their contractual relations from the mission hospital to health posts and health centers. The resulting patterns of key parameters of MHOs, including contractual relations with health providers, will be undoubtedly reflected in enrollment patterns and health seeking behavior patterns of members of MHOs.

³ At an exchange rate of US\$1 = FCFA 500.

3. Methodology

3.1 Objectives and Key Research Questions

3.1.1 Objectives

The objectives of the household component of the investigation into the determinants of MHO financial stability are threefold: to analyze factors at the household level that contribute to MHO expenditures; to analyze factors at the household level that contribute to MHO revenues; and to analyze other financial relations between members and MHOs which may have implications on MHO financial stability.

At the household level, the main factors that affect MHO expenditures are related to enrollment in MHOs and the prevalence of adverse selection on one hand, and the implications of adverse selection on the levels and patterns of utilization of health care and on the overuse of health care services (moral hazard) on the other hand. Main factors that contribute to the levels of MHO revenues are related to member willingness and capacity to prepay and the regularity of contributions. Finally, MHOs and their members have other financial relations that are not directly related to insurance services; they could contribute positively or negatively to the financial stability of MHOs.

3.1.2 Key Research Questions

To achieve the objectives of the household component, the investigation and analysis were organized around the following key questions:

- ▲ *Enrollment in MHOs/Adverse selection.* Are there demographic, social, and economic differences between MHO member and non-member household? What are the characteristics of individuals and households that contribute to the likelihood of enrollment in MHOs? What are the effects of parameters of MHOs on the likelihood of enrollment?
- ▲ *Contributions and stability of revenues of MHOs/Willingness and capacity to prepay, regularity of contributions.* What is the level of regularity of contributions from MHO members? What are the household characteristics that contribute to the regularity of contributions among members? What are the effects of the parameters of MHOs on the regularity of contributions?
- ▲ *Utilization of health care and stability of expenditures of MHOs/Adverse selection and moral hazard.* Do individuals who are covered by MHOs present risk profiles that are different from individuals who are not covered? Do these differences affect health care utilization patterns of MHO beneficiaries and non-beneficiaries? What are the effects of MHO's parameters on the patterns of utilization of health care services?

- ▲ *Other financial relations between MHOs and members/Indebtedness of members, reimbursement and recovery of debts.* What is the level of indebtedness of members to their MHOs? What are the sources of indebtedness of members with MHOs? What are the household characteristics that contribute to indebtedness of members? What are the effects of MHOs parameters on indebtedness of members with MHOs?

3.2 Sampling Methodology

The study area is limited to the Thies region for the following reasons: The region has the highest number of MHOs in the country, outside of the capital city of Dakar. Many MHO initiatives emerging in other regions of the country are building on the models and experiences of Thies; in other words, the region serves as a natural demonstration site for MHO development. Finally, MHO leaders in Thies are currently working on proposals to strengthen the financial sustainability of MHOs, including debates over the feasibility of a social reinsurance scheme, and have called for PHR^{plus} technical assistance.

The study area is the MHO target population. Households that are MHO members are considered as *cases*, while non-member households are considered as the *comparison group*. Hence, a paired-sampling methodology is used to support the comparison between members and non-members of MHOs, with the household as the sampling unit.

Since all the 27 mutual health organizations in the Thies region that have been functional during the last two years are included in the investigation sample, the sampling frame of the study was built on the list of MHOs and the lists of members in the MHO registrars. Member households were selected from the list of members of the MHOs. For each selected household that is a member of the MHO, a household that is not a member is randomly selected in the neighborhood as a control. Operationally, neighborhood was interpreted as the same village in the rural areas and city neighborhood in the urban areas.⁴

In each MHO, 20 member households were randomly selected; 20 non-member households were selected to serve as comparison group. All individuals in the selected households were selected in the sample and were used, as the households, as units of observations of the study.

The resulting sample information is summarized in Table 3.1:

Table 3.1. Sample Size and Composition Information

	Members	Non-members	Total
Number of households	540	540	1,080
Number of heads of nuclear family	556	647	1,203
Number of individuals	4,095	5,131	9,226
Number of sick individuals (in past 2 weeks)	195	217	412
Number of women of childbearing age	785	929	1,714
Number of hospitalization/surgery in past 2 years	65	54	119

⁴ For the Faggu MHO, which covers retired persons, the control households were selected from the list of retirees in the Thies regional office of IPRES, Senegal's social security organization.

3.3 Data Collection Instruments

Data collection is based on four main instruments: the household questionnaire, the head of nuclear family questionnaire, the curative care questionnaire, and the reproductive health care questionnaire. A head of nuclear family questionnaire was integrated into the data collection instruments because enrollment in most of the MHOs in the study area is based on the nuclear family.

The household questionnaire, which was administered to the head of the selected household, includes four sections. The first section describes individual characteristics of household members, including eligibility of the head to the nuclear family questionnaire, the curative care questionnaire, and the reproductive health care questionnaire. The second section collects information on characteristics of the head of the household. The third section describes collective characteristics of the household including assets and durable goods owned by the household and its members. The last section collects monthly expenditures of the household during the month preceding the survey.

The head of nuclear family questionnaire was administered to each head of a nuclear family of the selected households. It collects information on characteristics of the head of the nuclear family, information on membership, contributions, debts, and other relations with the MHO. Finally, it collects information on the occurrence during the past two years of hospitalization or surgery events and related expenditures in the family.

The curative care questionnaire was administered to individuals who reported an episode of illness during the two weeks preceding the survey. It describes the symptoms associated with the illness and the self-perceived severity of the illness in a first section. In a second section, it collects information on home care and self-medication. In a final section, it collects information on the type of providers, the services and products prescribed, coverage of the MHO or other mechanisms, and direct payments for services and products prescribed.

Finally, the reproductive health questionnaire was administered to women of childbearing age, 15 to 49 years of age. It includes five sections. The first collects information on the characteristics of the woman. The second covers the use of prenatal care services among women who are currently pregnant or women who delivered during the 12 months preceding the survey. The third section collects information on health services used at delivery among women who delivered during the past 12 months. The fourth section covers the use of postnatal care services among women who delivered during the past 12 months. The final section collects information on the use of family planning services among all women of childbearing age.

3.4 Data Collection and Analysis

Field data collection took place between August and October 2004. The household component personnel included four teams of four interviewers each and a controller per team: each team of interviewers included a female interviewer for administering the reproductive health care questionnaire. For three of the 27 MHOs in the sample, it was difficult to find a comparison group for the following reasons: almost all the inhabitants of the village of one MHO are MHO members; it was difficult to find all the paired non-member households for the MHO of retired person; one MHO is facing difficulties and administrative information for selection of the sample was lacking.

Descriptive and regression techniques were used for the analysis of the data in the following sections. The descriptive techniques respond to the need for communicating the results of the household component of the investigation to a wider audience, including MHO leaders in the Thies

region and Senegal; in addition, results of the descriptive analyses provided background information for the regression methods and results. However, conclusions relative to the relationships between key dependent and independent variables were based only on regression results. While the data for the descriptive and bivariate analyses were weighted, the data were not weighted for the regression analyses, because regression parameter estimates of interest were not sensitive to the weighting of the data.

Dependent variables are presented and discussed in the introduction of the following sections. Two key independent variables need to be discussed here: socio-economic quintiles and deciles, and benefit package groups. Socio-economic quintiles and deciles are based on the distribution of household monthly expenditures per capita in the merged sample of MHO member households and non-member households.

Analysis of the composition and coverage of MHO benefit packages reveals that there are two dimensions that distinguish the MHOs: the size of copayments and the inclusion of reproductive health care services. Based on this finding, four indicator variables were constructed to define groups of MHOs. The group *high curative care coverage* includes MHOs where the coverage of curative care consultations, essential drugs, and hospitalization was at least 75 percent; otherwise, MHOs were classified in the *low curative care coverage group*.

4. Enrollment in Mutual Health Organizations

As stated above, enrollment in MHOs in the Thies region is on a family basis. Consequently, family enrollment can be determined based on the enrollment status of the head of the household or of the nuclear family. Enrollment of the head of the household or of the nuclear family, however, is not translated automatically into coverage for all members of the household; only the household members who are registered by the head of the household are provided coverage by the MHO under the condition of regular contributions to the MHO. Hence, enrollment and coverage in MHOs in the Thies region can be summarized as a sequential decision process at the household level for enrollment and coverage at the individual level. In such a process, adverse selection in MHO enrollment could operate at two levels of decision: at the household level, depending on the household risk profile; and at the individual level, depending on the individual risk profile.

To discuss the likelihood of adverse selection in the Thies region, the current section will attempt to answer the following questions: Are there demographic, social, and economic differences between member and non-member households? What are the characteristics of individuals and households that contribute to the likelihood of enrollment in MHOs? What are the effects of parameters of MHOs on the likelihood of enrollment in MHOs? Given the institutional features of household enrollment and individual coverage summarized in the paragraph above, information based both on households and individuals will be used to discuss these questions.

4.1 Household Enrollment

Analyses in this subsection compare socio-demographic and economic characteristics of households that are MHO members and non-members. A regression model is fitted to the data in order to identify household characteristics that contribute to the likelihood of enrollment in MHO, with a greater emphasis on the demographic structure and socio-economic status of the household.

Table 4.1a provides a summary of socio-demographic characteristics of member and non-member households. It suggests that member households are on average larger (9.4) than non-member households (7.8). Nearly 32 percent of member households are headed by women, compared to 20 percent of non-member households. The age distribution of heads of member households is more skewed toward older ages compared to non-members, suggesting that heads of member households are relatively older than non-members: 27 percent of heads of households who are members are age 65 years or above compared to 16 percent of non-member household heads.

The ethnic and religious composition of member and non-member households are comparable: the relatively large proportion of the Serer ethnic group and Christians reflects the initiation of the founding of the rural MHOs in the dominantly Serer and Catholic villages of the Thies region (see Section 2.3). In addition, the level of education of members and non-members are comparable except that 26 percent of members have at least a secondary level, compared to 14 percent of non-members.

Table 4.1a Socio-demographic Characteristics of Households of the Thies Region by MHO Enrollment Status

	Enrollment status	
	Members	Non-Members
Average household size	9.4	7.8
Proportion (%) of female-headed households	31.9	19.8
Proportion (%) of households headed by an individual aged <in years>:		
20-24	-	0.8
25-29	0.8	3.4
30-34	8.4	5.8
35-39	9.4	12.2
40-44	11.3	12.2
45-49	11.4	15.4
50-54	13.2	13.6
55-59	10.1	10.6
60-64	8.6	9.5
65 & +	26.7	16.4
Proportion (%) of households headed by an individual belonging to ethnic group:		
Wolof	30.3	25.2
Poular	12.9	8.7
Serer	36.5	32.7
Others	10.2	10.4
Proportion (%) of households headed by an individual belonging to religious group:		
Muslim - Mourids	27.5	25.8
Muslim - Tidjans	28.5	25.5
Other Muslims	6.4	6.8
Christians	26.1	18.6
Proportion (%) of households headed by an individual with the level of education:		
No schooling	38.8	41.6
Primary	27.0	21.5
Secondary & +	24.2	14.0
Number of households	542	538

Table 4.1b summarizes socio-economic characteristics of member and non-member households. As the table shows, MHO enrollment in the Thies region is a rural as well as an urban phenomenon: more members reside in the urban areas than non-members.

Table 4.1b Socio-economic Characteristics of Households of the Thies Region by MHO Enrollment Status

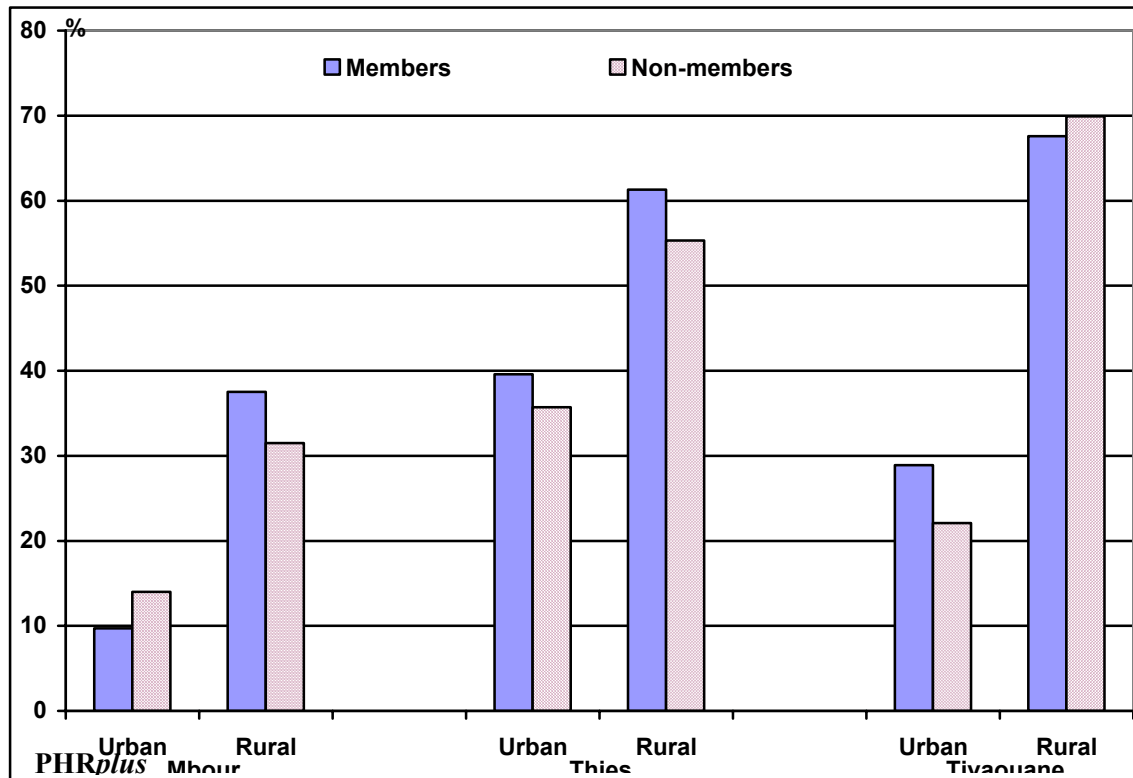
	Enrollment Status	
	Members	Non-members
Type of residence		
Urban	61.2	40.3
Rural	38.8	59.7
Proportion (%) of households with the head of household employed in:		
Not employed	33.7	26.0
Agriculture/fishing	11.2	13.8
Trade/Commerce	18.5	8.4
Industry and mining	0.4	2.7
Administration/Services	15.6	7.9
Others	10.5	18.4
Proportion (%) of households belonging to the following socio-economic group:		
Poorest 20%	17.5	23.3
Middle-poor 20%	21.1	17.4
Middle %	21.0	21.0
Middle-rich 20%	20.5	20.7
Richest 20%	19.9	17.6
Average household monthly expenditures per capita (in FCFA)		
Poorest 20%	6,711	6,405
Middle-poor 20%	11,991	12,187
Middle 20%	16,697	16,753
Middle-rich 20%	24,081	23,119
Richest 20%	40,023	44,849
All	20,119	19,824
Number of households	542	538

In addition, the employment status profile of members and non-members are relatively different. The data suggest that there are more unemployed heads of households among members (34 percent) than among non-members (26 percent). In addition, there are more heads of households who are employed in petit trade and commerce (19 percent) among members compared to non-members (8 percent). Finally, 16 percent of heads of household who are members are employed in the administration compared to 7 percent among non-members.

While the economic profiles of members and non-members are relatively similar, the variability between MHOs is relatively important: the proportion of households that live on less than US1\$ per capita per day varies from less than 20 percent to more than 80 percent among MHO members. Among the lowest third of MHOs, the proportion of member households that live with less than US1\$ per capita per day is less than 30 percent; among the middle third of MHOs, the proportion of households that are members that live with less than US1\$ per capita per day varies between 45 percent and 50 percent; among the highest third of MHOs, between 55 percent and 90 percent (see Table A I.3 in Annex A).

As Figure 4.2 suggests, members of MHOs in rural areas are relatively poorer than members of MHOs located in urban areas. Similarly, members of MHOs in the Tivaouane and Thies departments are relatively poorer than members of MHOs in the Mbour department. Such a pattern may reflect the agricultural conditions in the peanut basin of central Senegal, which deteriorate along a north-south gradient. In addition, while the non-agricultural economy of the northern departments of Thies and Tivaouane are dominated by old mining industries, the Mbour department has a more vibrant non-agricultural economy with a new tourism industry and a growing fishing industry.

Figure 4.2 Proportion (%) of Households that Live with less than US\$ 1 per Capita per Day among Members and Non-members of MHOs in the Thies Region in 2004 by Department and Type of Residence



How do these household characteristics contribute to the likelihood of enrollment in MHOs? Table 4.1c provides a summary of results of a binary logit model fitted to the data in order to assess how specific household characteristics affect enrollment while other factors are controlled for. The discussion will focus on the demographic and economic characteristics of households for their relationship with adverse selection and willingness and capacity to prepay respectively.

Table 4.1c Regression Results: Household Enrollment in MHOs in the Thies Region

Model: $\ln[\text{Prob}\{\text{household is enrolled}\} / \text{Prob}\{\text{household is not enrolled}\}] = \alpha + \beta X$				
		B	Exp(b)	Sig.
Household Size		0.104	1.109	0.000
Number of children under 5 years of age in the household (base: less than 2)	2 children	0.169	1.184	0.332
	3 children+	-0.404	0.668	0.112
Number of women aged 15-49 years in the household (base: less than 2)	2 women	0.366	1.442	0.029
	3 women	0.690	1.994	0.002
	4 women+	0.437	1.549	0.104
Number of adult aged 50 and above years in the household (base: less than 2)	2 adults	0.247	1.280	0.127
	3 adults+	0.291	1.337	0.344
Female-headed household		0.887	2.429	0.000
Ethnic group of head of household (HH) (base: others)	Wolof	0.196	1.217	0.398
	Serer	-0.016	0.984	0.946
	Poular	0.124	1.132	0.656
Religious group of HH (base: others)	Mouride	-0.176	0.838	0.488
	Tidjane	-0.003	0.997	0.989
	Christian	1.097	2.995	0.000
Level of education of HH (base: no schooling)	Primary	0.074	1.077	0.675
	Secondary +	0.118	1.125	0.569
Occupation of HH (base: Not employed)	Agriculture	0.362	1.437	0.091
	Trade/commerce	0.901	2.461	0.000
	Administration	0.491	1.634	0.056
Economic status of household (base: Poorest 20%)	Middle-poor 20%	0.368	1.445	0.086
	Middle 20%	0.372	1.451	0.099
	Middle-rich 20%	0.200	1.221	0.402
	Richest 20%	0.919	2.507	0.000
Availability of health facility in the village or urban neighborhood (base: No)	Yes	0.078	1.081	0.625
Type of residence (base: Rural)	Urban	-0.320	0.726	0.038
<i>Constant</i>		<i>-2.467</i>	<i>0.085</i>	<i>0.000</i>

First, household size is positively associated with higher likelihood of enrollment in MHOs; in other words, the larger the size of the household, the higher the likelihood that the household will enroll in a MHO. The number of children under the age of 5 years in the household does not significantly contribute to the household likelihood of enrollment in a MHO. The number of women of childbearing ages in the household, however, contributes significantly to the likelihood of household enrollment in a MHO. The number of the elderly above 50 years of age in the household, while positively associated with higher enrollment, does not contribute significantly to the likelihood of enrollment of households in MHOs. Finally, female-headed households are more likely to enroll in MHOs than male-headed households.

Second, the head of household's occupation contributes significantly to the likelihood of the household enrolling in an MHO. Indeed, compared to unemployed heads of households, households headed by individuals employed in agriculture, petit trade or commerce, or administration are more likely to enroll in a MHO. In addition, the household's income is positively associated with higher enrollment in MHOs. Compared to the poorest 20 percent, middle-income quintiles have a higher likelihood of enrollment; the richest 20 percent are 2.5 times more likely to enroll than are the poorest 20 percent. These results are consistent with Jütting reported results based on four MHOs included in the current investigation (Jütting, 2004).⁵

Other significant results include the association between enrollment on one hand and religious affiliation and type of residence on the other hand. Christians, Catholic in the specific context of Thies, are more likely to enroll in MHOs than other religious groups, reflecting the history of the emergence of MHOs in the region (see Section 2.3). In addition, controlling for other factors, rural households are more likely to enroll in MHOs than urban households; indeed, the founding of MHOs in the urban areas of the Thies region is more recent than the establishment of MHOs in rural communities.

In summary, household size, the number of women of childbearing age in the household, and gender of the head of household (female) have a positive contribution on the household likelihood to enroll in a MHO. The number of children under 5 years of age does not contribute significantly to the household likelihood of enrollment. Finally, better-off households are more likely to enroll in MHOs than poorer households. The next section will assess the consistency of such results based on household enrollment with enrollment based on individuals.

4.2 Individual Coverage

This subsection contributes to the discussion of research questions related to MHO enrollment based on information on individual coverage by MHOs and individual characteristics. First, it presents descriptive results that compare the demographic profiles of individuals who are covered by MHOs with individuals who are not covered. Second, levels of coverage by MHOs are determined and compared for various demographic and socio-economic groups based on the sample of members of households who are enrolled in MHOs.⁶ Finally, regression results on the coverage of individuals by MHOs are discussed. As in subsection 4.1, the emphasis will be on demographic characteristics, other indicators of high health risks, and economic status of individuals and their households.

Table 4.2a provides a descriptive summary of demographic characteristics of individuals who are enrolled in MHOs and individuals who are not, and a summary of indicators of high health risk profiles among these groups. The age distribution of individuals who are not enrolled is relatively younger than the age distribution of individuals who are enrolled. While 46 percent of individuals who are not enrolled are under the age of 15 years, this proportion falls to 38 percent among individuals who are enrolled. There are relatively more adults at intermediate ages and the elderly among individuals who are enrolled.

⁵ Jütting, Johannes P. 2004. "Financial protection and access to health care in rural areas of Senegal." In Preker, A. S. and G. Carrin (eds). *Health Financing for Poor People: Resource Mobilization and Risk Pooling*. Washington, DC: The World Bank.

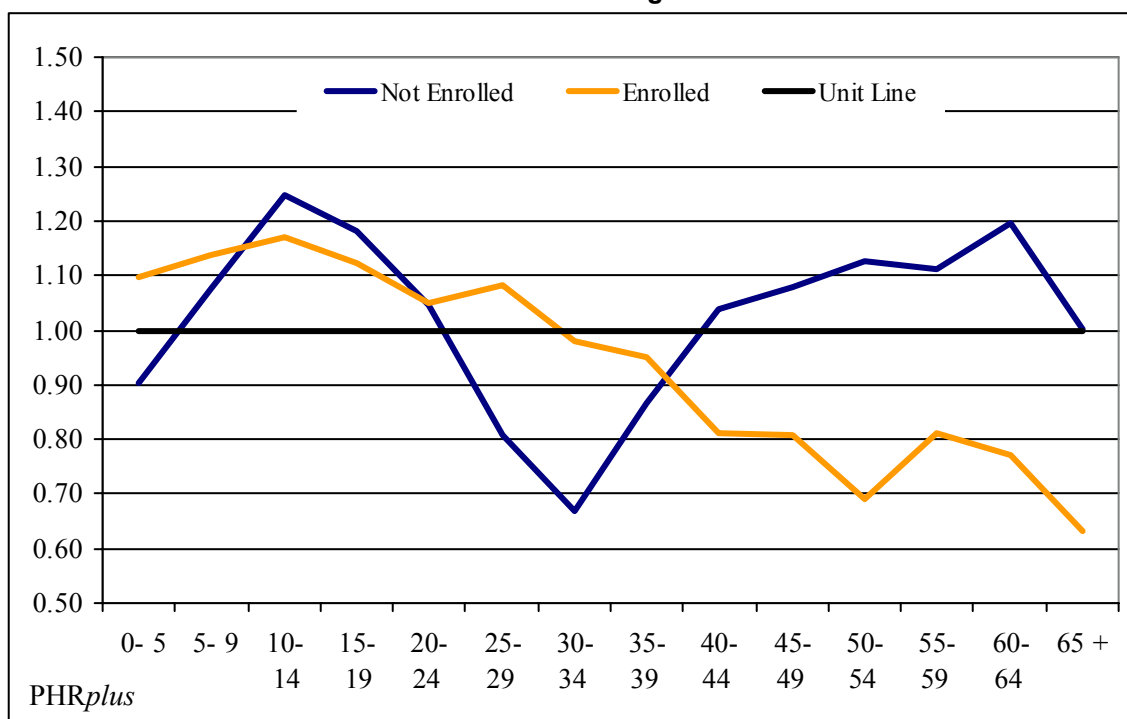
⁶ Given the sampling methodology of the investigation, it is not possible to estimate the level of enrollment in the study area based on the entire sample. Based on the sample of households who are members of MHOs, however, the level and the variability of coverage of individuals by MHOs among these households can be determined and analyzed.

Table 4.2a Demographic Characteristics of Members and Non-members of MHOs in the Thies Region

	Not enrolled		Enrolled	
	%	Sex ratio	%	Sex ratio
Age (years)				
0- 4	14.6	0.90	10.7	1.10
5- 9	15.7	1.24	13.0	1.22
10-14	16.0	1.09	13.9	1.10
15-19	9.3	1.42	11.5	1.19
20-24	8.5	1.03	9.2	1.08
25-29	6.4	0.68	6.6	0.88
30-34	4.9	0.70	5.7	1.29
35-39	4.9	0.62	4.3	0.77
40-44	3.7	1.27	4.4	0.80
45-49	3.6	1.22	3.7	0.88
50-54	3.9	0.75	3.6	0.75
55-59	2.3	1.42	3.2	0.45
60-64	2.0	1.17	2.4	1.24
65 +	4.2	1.00	7.7	0.63
Total	100.0	1.02	100.0	0.99
Proportion (%) reporting a disability		1.97		4.70
Proportion (%) reporting chronic illness		4.77		8.49
Self-perception of health status				
Very good		25.09		26.80
Good		67.15		58.92
Average		5.23		10.16
Bad		0.75		1.59
Very bad		0.87		1.65
Number of individuals		5,621		3,605
<small>Note: The sex ratio at age x and x+n, $S_{x,x+n}$, is the ratio of the number of male aged between x and x+n, $M_{x,x+n}$, over the number of female aged between x and x+n, $F_{x,x+n}$. $S_{x,x+n} = M_{x,x+n} / F_{x,x+n}$.</small>				

While the distribution by sex of the two groups shows a relatively balanced distribution in the aggregate, the age patterns of the distribution by sex display marked differences between individuals who are not enrolled and individuals who are enrolled (see Figure 4.1). Among individuals who are not enrolled, sex ratios fluctuate around 1, except between 25 and 40 of ages where the levels are below 1. Among individuals who are enrolled, however, there is distinctive age pattern of sex ratios, with a negative linear trend with age. In other words, under 30 years of age, there are more men than women among individuals who are enrolled; from 30 years of age, however, the sex ratios fall below the unit line and continue to decline with age, and they fall below 80 percent beyond 45 years of age.

Figure 4.1 Sex Ratio (male/female) by Age of X Members and Non-members of MHOs in the Thies Region



Note: Lines in the graphic are based on data from table 4.2a, but are smoothed for graphical presentation purposes.

Overall, the proportion of individuals who reported a disability or a chronic illness is relatively low in the study area. The data suggest, however, that the prevalence of these conditions is higher among individuals who are enrolled compared to individuals who are not enrolled. Indeed, the proportion of individuals who reported a disability among individuals who are enrolled is 5 percent compared to 2 percent among individuals who are not enrolled. Similarly, the proportion of individuals who reported a chronic illness among individuals who are enrolled is 9 percent compared to 5 percent among individuals who are not enrolled.

Finally, individuals who are not enrolled report a relatively better health status compared to individuals who are enrolled in MHOs. While 7 percent of individuals report that their health status were either 'average,' 'bad,' or 'very bad' among individuals who are not enrolled, this proportion reach 13 percent among individuals who are enrolled in MHOs.

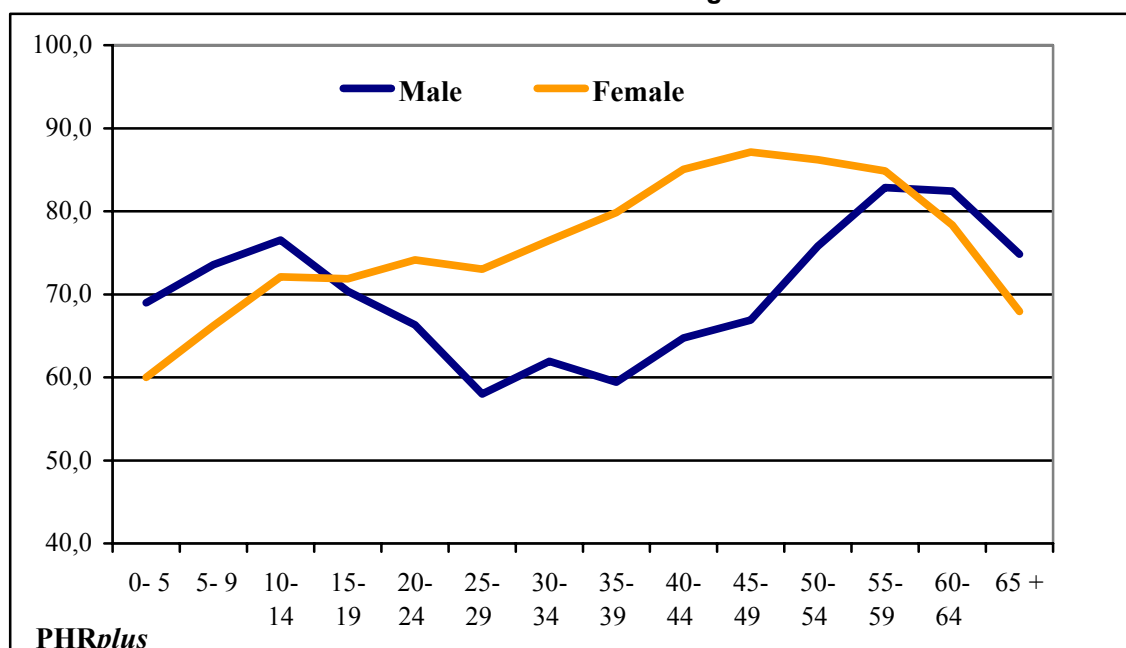
Table 4.2b provides a summary of patterns of individual enrollment among members of households who are members of MHOs. Although enrollment in MHOs in the Thies region is on a family basis, only 72 percent of members of households who are members of MHOs are enrolled and covered by the MHOs. On average, differences between men (70 percent) and women (73 percent) are relatively low.

Table 4.2b Proportion of Enrolled Individuals among Members of Households who are Members of MHOs in the Thies Region

	Male		Female		Both Sexes	
	Proportion (%) enrolled	Number of individuals	Proportion (%) enrolled	Number of individuals	Proportion (%) enrolled	Number of individuals
Age (years)						
0- 4	69.0	264	60.0	243	64.7	506
5- 9	76.4	240	71.7	273	73.9	513
10-14	75.3	292	66.9	316	70.9	608
15-19	77.9	229	77.8	208	77.9	437
20-24	57.9	211	70.9	213	64.4	424
25-29	63.2	117	73.8	146	69.0	263
30-34	53.0	139	74.4	117	62.8	256
35-39	69.5	93	81.3	109	75.9	202
40-44	55.7	91	83.9	98	70.4	189
45-49	68.9	42	90.0	68	82.0	110
50-54	76.1	67	87.5	76	82.1	143
55-59	82.4	41	81.1	54	81.7	95
60-64	90.0	43	85.9	42	88.0	85
65 +	74.8	117	68.0	145	71.0	261
Reported disability						
No	69.5	1,893	73.6	2,027	71.6	3,920
Yes	81.8	84	57.2	80	69.8	164
Reported chronic illness						
No	69.1	1,841	72.9	1,935	71.1	3,776
Yes	80.6	142	74.8	168	77.5	311
Self-perception of health status						
Very good	61.9	596	64.1	555	63.0	1,151
Good	70.3	1,169	75.9	1,291	73.2	2,460
Average	88.9	141	80.4	180	84.1	321
Bad	100.0	28	77.8	36	87.4	63
Very bad	90.5	42	63.1	39	77.3	81
Total	70.0	1,988	72.9	2,107	71.5	4,095

This overall result, however, hides major gender patterns related to age or other factors. The age profile of male enrollment in MHOs displays a bathtub pattern (see Table 4.2b and Figure 4.2). Among men under 20 years of age, enrollment rate are relatively higher; they drop below 60 percent between age 20 and 50 years; after age 50, enrollment rates increase and reach more than 80 percent between 55 and 65 years of age. In contrast, the age profile of female enrollment in MHOs is nearly linear between 0 and 55 years of age: enrollment rates increase steadily with the age of women. From mid-childbearing ages (30–34) to late childbearing ages (45–49), enrollment rates of women are much higher than enrollment rates of men at the same ages. Beyond 55 years of age, however, enrollment rates of women drop below the male enrollment rates.

Figure 4.2 Proportion of Individuals who are Enrolled among Members of Households that are Members of MHOs in the Thies region



Gender differences are also observed in relation with other risk factors. There is no consistent difference in enrollment rates between individuals who reported a disability, a chronic illness, or variable self-reported health status among women, perhaps because women join predominantly for the reproductive health benefits. Among men, however, individuals who have reported a disability are more likely to be enrolled in MHOs than are their counterparts. Similarly, individuals who have reported a chronic illness are more likely to be enrolled in MHOs than their male counterparts. Finally, men who self-reported a poorer health status are more likely to enroll in MHOs than their counterparts.

Regression analysis results summarized in Tables 4.2c, 4.2d-A, and 4.2d-B provide further evidence of the effect of demographic and other risk factors on enrollment of individuals in MHOs. Table 4.2c presents regression results based on a binary logit model and the entire sample of individuals from both households who are members and households who are not members of MHOs. Table 4.2d presents regression results based on a binary logit model limited to individuals from households that are MHO members; in other words, the dependant variable is the probability that the individual is covered by a MHO given that his household is enrolled in the MHO. Two versions of this second model are presented in Tables 4.2d-A and 4.2d-B; the version in Table 4.2d-B is an extended model with the inclusion of indicator variables that describe the benefit package of the MHO in which the household is enrolled.⁷

Results in Table 4.2c are consistent with results based on household and presented in Table 4.1c. Men age 55 years and above are more likely to enroll in MHOs compared to men of middle ages; at

⁷ The rationale of the extended model is to test whether adverse selection in MHO enrollment is influenced by the structure of the benefit package of the MHO. For example, self-selection of women of childbearing age in MHOs may be influenced by a benefit package biased towards reproductive health care benefits.

other age groups, however, the effects of age on enrollment among men are not significant. Among women, except for women under 15 years of age, the likelihood of enrollment is significantly higher.

While reported disability is positively associated with a higher likelihood of enrollment in MHOs, its effects are not statistically significant. Chronic illness, however, significantly increases the likelihood of enrollment in MHOs. Similarly, individuals who reported a very good or a good health status are less likely to enroll in a MHO than their counterparts.

Table 4.2c Regression Results: Individual Coverage in MHOs in the Thies Region (All individuals)

Model: $\ln[\text{Prob}\{\text{Individual is a beneficiary}\} / \text{Prob}\{\text{Individual is not a beneficiary}\}] = \alpha + \beta X$				
		b	Exp(b)	Sig.
Individual Characteristics				
Male	0-14 years	0.0840	1.0876	0.3946
(base: Male aged 30-44 years)	15-29 years	0.1276	1.1361	0.2261
	45-54 years	-0.1385	0.8707	0.3640
	55 years +	0.2854	1.3302	0.0330
Female	0-14 years	-0.0446	0.9563	0.6533
(base: Male aged 30-44 years)	15-29 years	0.2336	1.2631	0.0254
	30-44 years	0.1795	1.1966	0.1226
	45-54 years	0.3540	1.4248	0.0117
	55 years +	0.3150	1.3702	0.0182
Handicap (base: No)	Yes	0.1759	1.1924	0.1778
Chronic illness (base: No)	Yes	0.3071	1.3594	0.0026
Reported health status (base: < Good)	Very good	-0.2109	0.8099	0.0214
	Good	-0.1048	0.9005	0.2106
Household Characteristics				
Female-headed household (base: Male)		0.3408	1.4061	0.0000
Ethnic group of head of household (base: others)	Wolof	0.2421	1.2739	0.0016
	Serer	-0.0943	0.9100	0.2367
	Poular	0.0667	1.0690	0.4740
Religious group of HH (base: others)	Mouride	-0.2943	0.7450	0.0004
	Tidjane	-0.0424	0.9585	0.5836
	Christian	0.5948	1.8126	0.0000
Level of education of HH (base: No schooling)	Primary	-0.0115	0.9885	0.8439
	Secondary	0.0781	1.0813	0.2617
Occupation of HH (base: not occupied)	Agriculture	0.4248	1.5293	0.0000
	Trade\Commerce	0.6340	1.8852	0.0000
	Administration	0.6276	1.8730	0.0000
Type of residence (base: rural)	Urban	-0.1873	0.8292	0.0002
Availability of health facility in the village or urban neighborhood (base: No)	Yes	0.2266	1.2543	0.0000

Model: Ln[Prob{Individual is a beneficiary}/ Prob{ Individual is not a beneficiary }]=α* + βX				
		b	Exp(b)	Sig.
Economic status of household (base: Poorest 20%)	Middle-poor 20%	0.0456	1.0466	0.4736
	Middle 20%	0.0221	1.0223	0.7461
	Middle-rich 20%	-0.1478	0.8626	0.0431
	Richest 20%	0.1199	1.1273	0.1403
<i>Constant</i>		<i>-0.9347</i>	<i>0.3927</i>	<i>0.0000</i>

Tables 4.2d-A and 4.2d-B provide additional information on selection within households that are MHO members. As evidenced by results related to the effects of age among men in both tables, enrolled households are more likely to provide coverage for males under the age of 15 and over the age of 55 compared to the middle-aged male. These results are consistent with the bathtub pattern of enrollment by age observed among men in the descriptive results of Table 4.2b and Figure 4.2.

**Table 4.2d-A Regression Results: Individual Coverage in MHOs in the Thies Region
(All individuals who are members of enrolled households)**

Model: Ln[Prob{Individual is a beneficiary}/ Prob{ Individual is not a beneficiary }]=α + βX				
		B	Exp(b)	Sig.
Individual Characteristics				
Male	0-14 years	0.3287	1.3892	0.0408
(base: male 30-44 years)	15-29 years	0.0715	1.0741	0.6727
	45-54 years	0.0530	1.0544	0.8397
	55 years +	0.4903	1.6329	0.0416
Female	0-14 years	0.0754	1.0784	0.6352
(base: male 30-44 years)	15-29 years	0.2537	1.2888	0.1344
	30-44 years	0.5616	1.7535	0.0053
	45-54 years	1.1234	3.0752	0.0002
	55 years +	0.2373	1.2678	0.2835
Handicap	Yes	-0.1606	0.8516	0.4656
Chronic illness	Yes	0.3462	1.4137	0.0898
Reported health status	Very good	-0.5641	0.5689	0.0006
	Good	-0.2085	0.8118	0.1806
Household Characteristics				
Female-headed household		-0.2123	0.8088	0.0274
Ethnic group of head of household (base: others)	Wolof	-0.2183	0.8039	0.1156
	Serer	-0.2151	0.8065	0.1378
	Poullar	-0.2128	0.8083	0.2182
Religious group of HH (base: others)	Mouride	-0.5173	0.5961	0.0005
	Tidjane	-0.1092	0.8966	0.4375
	Christian	0.1432	1.1540	0.3505

Model: Ln[Prob{Individual is a beneficiary}/ Prob{ Individual is not a beneficiary }]=α + βX				
		B	Exp(b)	Sig.
Level of education of HH (base: No schooling)	Primary	-0.2300	0.7945	0.0207
	Secondary	-0.2865	0.7509	0.0153
Occupation of HH (base: Not occupied)	Agriculture	0.3539	1.4246	0.0016
	Trade\Commerce	0.5683	1.7653	0.0000
	Administration	0.9589	2.6088	0.0000
Type of residence (base: rural)	Urban	-0.0767	0.9262	0.3824
Availability of health facility in the village or urban neighborhood (base: No)	Yes	0.4575	1.5800	0.0000
Economic status of household (base: Poorest 20%)	Middle-poor 20%	-0.1286	0.8793	0.2271
	Middle 20%	0.4848	1.6239	0.0002
	Middle-rich 20%	0.2374	1.2680	0.0747
	Richest 20%	0.2617	1.2991	0.0698
<i>Constant</i>		<i>1.0866</i>	<i>2.9643</i>	<i>0.0000</i>

Among women, however, the data suggest that enrolled households in MHOs, are more likely to provide coverage for women between the ages of 30 and 54 years. The linear age pattern of enrollment among women observed in Table 4.2b and Figure 4.2 is consistently replicated in Tables 4.2d-A and 4.2d-B: parameter estimates of the effects of the age group among women double from one age group to the next from under 15 years of age to the 45–54 range.

Results in Tables 4.2d-A and 4.2d-B suggest that disability is not significantly associated with a higher likelihood enrollment in MHOs. Individuals with a chronic illness, however, are more likely to be provided coverage by households who are members of MHOs. Similarly, individuals who reported a very good or a good health status are less likely to be provided coverage by households who are members of MHOs than other household members with a poorer reported health status.

Which enrolled households are more or less likely to provide coverage to a selective subset of their members? As Tables 4.2d-A and 4.2d-B suggest, although female-headed households are more likely to enroll in MHOs, they are less likely to provide coverage to all their members than are male-headed households. In addition, households headed by an individual with at least a primary level of education are less likely to provide coverage to all their members than are households headed by individuals with no schooling. Compared to households headed by unemployed individuals, households headed by an individual employed in agriculture, petit trade and commerce, or the administration are more likely to provide coverage to more members of their households. Finally, compared to the poorest 20 percent, households in the middle-or upper-income classes are more likely to provide coverage to a larger number of their members when they enroll in MHOs.

Inclusion of MHO benefit package indicators suggests that provision of coverage to individual members of the family is associated with the structure of the benefit package. Households that are members of MHOs with high coverage of curative care are less likely to provide coverage to all members of the household. In contrast, households that are members of MHOs with high coverage of reproductive health care are more likely to provide coverage to all members of the household. Intuitively, benefit packages oriented to curative care are likely to encounter greater adverse selection than benefit packages oriented to preventive care. Most MHOs with high reproductive health care

coverage are recently founded ones, with a target population among networks of women groups. Hence, the observed patterns of relationships between benefit package structure and individual enrollment may reflect these structural changes in the development of MHOs in the Thies region.

**Table 4.2d-B Regression Results: Individual Coverage in MHOs in the Thies Region
(All individuals who are members of enrolled households)**

Model: $\ln[\text{Prob}\{\text{Individual is a beneficiary}\} / \text{Prob}\{\text{Individual is not a beneficiary}\}] = \alpha + \beta X$				
		b	Exp(b)	Sig.
Individual Characteristics				
Male (base: male 30-44 years)	0-14 years	0,2562	1,2921	0,1218
	15-29 years	-0,0083	0,9917	0,9619
	45-54 years	0,0197	1,0199	0,9421
	55 years +	0,4018	1,4945	0,1023
Female (base: male 30-44 years)	0-14 years	0,0093	1,0094	0,9546
	15-29 years	0,2211	1,2475	0,2068
	30-44 years	0,5726	1,7729	0,0063
	45-54 years	1,0206	2,7747	0,0008
	55 years +	0,2764	1,3184	0,2301
Handicap (base: no)	Yes	-0,0993	0,9055	0,6646
Chronic illness (base: no)	Yes	0,3735	1,4528	0,0779
Reported health status (base: less than good)	Very good	-0,5563	0,5733	0,0011
	Good	-0,2535	0,7761	0,1142
Household Characteristics				
Female-headed household		-0,3838	0,6812	0,0001
Ethnic group of head of household (base: others)	Wolof	-0,3846	0,6807	0,0076
	Serer	-0,2401	0,7865	0,1115
	Poular	-0,3490	0,7054	0,0465
Religious group of HH (base: others)	Mouride	-0,5139	0,5981	0,0007
	Tidjane	-0,1387	0,8705	0,3411
	Christian	0,2554	1,2909	0,1128
Level of education of HH (base: No schooling)	Primary	-0,2087	0,8117	0,0403
	Secondary	-0,1903	0,8267	0,1212
Occupation of HH (base: Not occupied)	Agriculture	0,3590	1,4319	0,0018
	Trade\Commerce	0,5971	1,8168	0,0000
	Administration	0,7609	2,1402	0,0000
Type of residence (base: rural)	Urban	0,1001	1,1053	0,3010
Availability of health facility in the village or urban neighborhood (base: No)	Yes	0,3840	1,4682	0,0000
Economic status of household (base: Poorest 20%)	Middle-poor 20%	-0,0266	0,9738	0,8082
	Middle 20%	0,5122	1,6689	0,0001
	Middle-rich 20%	0,2562	1,2920	0,0600
	Richest 20%	0,3284	1,3888	0,0263

Model: Ln[Prob{Individual is a beneficiary}/ Prob{ Individual is not a beneficiary }]=α + βX				
		b	Exp(b)	Sig.
Benefit package of CBHI*	High coverage of curative care	-0,2732	0,7610	0,0058
	High coverage of RH care	0,4292	1,5360	0,0001
	Low coverage of RH care	0,4470	1,5637	0,0001
<i>Constant</i>		<i>0,9906</i>	<i>2,6928</i>	<i>0,0002</i>

*Benefit package of CBHI:
 High coverage of curative care: benefit packages where curative consultations, essential drugs and hospitalization are covered at least at 75%.
 Low coverage of curative care: benefit packages where curative consultations, essential drugs or hospitalization are covered, but at less than 75%.
 High coverage of reproductive health care: benefit packages where prenatal consultations, deliveries, and postnatal consultations are covered at least at 75%.
 Low coverage of reproductive health care: benefit packages where prenatal consultations, deliveries, or postnatal consultations are covered, but at less than 75%.

4.3 Reasons for Non-enrollment

Based on heads of nuclear families that are not enrolled in MHOs, Table 4.4 provides a summary of reported reasons of non-enrollment in the Thies region. The most common reported reason for non-enrollment is the lack of information about the existence of the MHOs: 31 percent of heads of nuclear families that are not enrolled in MHOs reported the lack of information as the main reason for non-enrollment. The proportion of heads of nuclear families that are not enrolled in MHOs who reported the lack of information as the main reason for non-enrollment is 33 percent in urban areas, 30 percent in rural areas. It is as high as 34 percent in the Mbour department, 31 percent in Thies, and 28 percent in Tivaouane.

Table 4.4 Reported Reasons for Non-enrollment in MHOs in the Thies region among Heads of Families that are not Members

Reported reasons for non-enrollment	Type of residence		Province			Total
	Urban	Rural	Mbour	Thies	Tivaouane	
Not informed about the existence of the CBHI	32.8	30.1	34.4	31.2	28.1	31.3
Contributions too expensive	7.7	23.4	8.3	11.2	30.8	16.5
Benefit package too limited	3.4	0.3	2.2	2.2	0.6	1.7
Lack of trust in the management	2.7	1.8	1.9	3.2	1.4	2.2
Waiting period too long	1.2	1.9	0.0	1.4	3.5	1.6
Covered by other mechanisms	13.6	5.7	5.0	14.8	7.6	9.2
Do not use health care services	0.9	1.1	1.9	1.1	0.0	1.0
Others	37.6	35.7	46.3	34.8	28.1	36.5
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of individuals	323	353	132	361	183	676

The second reported reason for non-enrollment is that contributions in MHOs are too expensive: 17 percent of heads of nuclear families that are not enrolled in MHOs reported the costs of contributions as the main reason for non-enrollment. This proportion reaches 23 percent in rural areas. It is as low as 8 percent in urban areas; however, it is higher in the Tivaouane department (the poorest department), where it levels-up at 31 percent, and it is the most common reported reason for non-enrollment before the lack of information. In the Thies and Mbour departments, however, it falls at 11 percent and 8 percent respectively.

The third reported reason is coverage by other mechanisms such as social health insurance. Other reasons related to the attractiveness of the benefit package, trust in the management, or waiting period measures of MHOs were rarely given as reasons for non-enrollment; this is not surprising given the high proportion of individuals who reported the lack of information as the main reason for non-enrollment.

4.4 Section Summary

To discuss the likelihood of adverse selection among MHOs of the Thies region, the current section compared demographic and socio-economic profiles of households that are MHO members and non-members based on descriptive analyses and regression results. It also compared demographic characteristics of individuals who are enrolled with individuals who are not enrolled; similarly, it analyzed demographic characteristics of individuals who are covered by MHOs among members of enrolled households compared to individuals who are not covered although their households are MHO members.

Analyses at the household level suggest the following conclusions. First, households of larger sizes are more likely to enroll in MHOs than are households of smaller sizes. Second, the higher the number of women of childbearing age, the higher the likelihood that the household will enroll in a MHO. Neither the number of children under age 5, nor the number of the elderly above age 50, in the household contribute to the likelihood of household enrollment. Third, households that are headed by a woman are more likely to enroll compared to households headed by a man. Finally, the higher the income of the household, the higher the likelihood that the household will enroll in a MHO; most member households in the study area, however, are poor by any standard, except for households in the Mbour department.

At the individual level, enrolled household are more likely to provide coverage to male children under 15 years of age and elderly men above 55 years of age. In addition, enrolled household are more likely to provide coverage to women between 30 and 54 years. Moreover, individuals with chronic illness are more likely to be covered than are individuals with no reported chronic illness; the proportion of individuals with reported chronic illness represent a small proportion of the population. Individuals who report a better health status are less likely to be provided MHO coverage compared to individuals who report better health status. Finally, households with higher capacity to prepay (employed, higher-income) are more likely to provide coverage to a higher number of their members.

Overall, the analyses suggest that selection processes may be operating in MHO enrollment in the Thies region at two levels. At the level of enrollment of households, households with a greater number of higher-risk women at reproductive ages are more likely to enroll than other households. At the level of coverage of individual members of enrolled households, only 72 percent of members are benefiting from coverage. Higher-risk women of childbearing age, male children, and males over 55

years of age are more likely to be provided coverage among members of households who are enrolled.⁸ There are signs also that individuals with poorer health status and chronic conditions are more likely to be provided coverage than healthier individuals. The implications of such adverse selection processes (adverse from the MHO's perspective) on MHO financial stability will depend on the patterns of utilization of health care services among MHO beneficiaries.

Three reasons have been reported by non-members of MHOs as the main reasons for non-enrollment in the Thies region. By far, the most common reported reason is the lack of information about the existence of the MHOs. The second reported reason is to the cost of contributions into MHOs; the cost constraint is more frequently reported in rural areas or the Tivaouane department than in urban areas or other departments. Finally, in urban areas and the Thies department, coverage by other mechanisms, such as social health insurance, was reported as another reason for non-enrollment in MHOs.

⁸ The selectivity of enrollment and coverage of women of childbearing ages may not be related to the perception of higher health risks only. It may be reinforced by the traditional caregiver role of adult women; in other words, as the main health caregivers in the family, adult women may understand the costs and uncertainty associated with health care more than men. It may also reflect the higher propensity of women to be involved into community-based associations compared to men.

5. Capacity to Prepay and Regularity of Contributions

The main sources of MHO income are member contributions; the financial stability of MHOs depends partly on the levels and regularity of these contributions. In addition to membership fees, enrolled households pay regular contributions to the MHO; among the MHOs of the Thies region, contributions are paid on a monthly basis. While enrollment is on a family basis, household contributions are determined based on a community-based rate per capita and the number of individuals covered within the household. MHOs have different policies and procedures for the collection of contributions and different rules regarding sanctions for individuals who do not pay regularly their contributions.⁹

Based on this background, this section will provide information for answering the following questions. What is the level of regularity of contributions into MHOs? What are the factors at the household level that contribute to the regularity of contributions to MHOs?

5.1 Capacity to Prepay

This subsection provides an assessment of the capacity to pay contributions into MHOs by member households. It is based on the estimation of household monthly expenditures per capita, which is used as a proxy of household permanent income, and the structure of household expenditures (food expenditures, non-food expenditures, health-related expenditures). The incidence of MHO contributions on households is estimated based on the ratio of expected MHO contributions if all household members are covered over current household expenditures.¹⁰

Table 5.1a provides a summary of the levels and structure of household monthly expenditures by socio-economic status among households that are members of MHOs and households that are not members. As suggested in Section 4, the majority of households that are MHO members are poor and live with US\$1 per day per capita. This incidence of poverty is reflected in the share of food expenditures among household expenditures: among all income groups in the sample, food represents at least 70 percent of total household expenditures. In other words, a high level of the share of household expenditures among MHO members is constituted by non-compressible food expenditures.

However, the levels of monthly contributions into MHOs, which vary between FCFA 150 and FCFA 200 per capita per month, are within the reach of most households, both households that are MHO members and those that are not members. Indeed, member households spend monthly on average nearly FCFA 5,300 per capita on non-food consumption. Among the poorest 20 percent, non-food expenditures average FCFA 1,700 per capita per month; it levels-up at FCFA 11,561 per capita

⁹ See Atim C., F. Diop, and S. Bennett. Forthcoming. *The Determinants of Financial Stability of MHOs in the Thies Region of Senegal*. Bethesda, MD: Partners for Health Reformplus, Abt Associates Inc.

¹⁰ Most MHOs have current contribution rates per beneficiary that vary between FCFA 150 and FCFA 200 per month. A contribution rate of FCFA 200 has been assumed for the tables in this subsection.

per month among the richest 20 percent of member households. Member households continue to spend an additional FCFA 750 per capita on health, or 3.7 percent of total household expenditures, compared to FCFA 850 among non-member households, or 4.3 percent of total household expenditures. Among the poorest 20 percent, health expenditures average FCFA 190 per capita per month; they are FCFA 1,700 per capita per month among the richest 20 percent of households who are MHO members.

Table 5.1a Capacity to Pay
Levels and structure of household monthly expenditures by socio-economic status among households that are members and non-members of MHO schemes in the Thies Region

Type of household	Economic status of household	Household monthly expenditures per capita (FCFA)			
		All	Food	Non-food	Health
Households that are MHO members	Poorest 20%	6,711	5,041	1,670	190
	Middle-poor 20%	11,991	8,754	3,237	421
	Middle 20%	16,697	12,339	4,358	629
	Middle-rich 20%	24,081	18,539	5,542	742
	Richest 20%	40,023	28,463	11,561	1,700
	Total	20,119	14,790	5,329	745
Households that are not MHO members	Poorest 20%	6,405	4,732	1,674	289
	Middle-poor 20%	12,187	9,143	3,044	528
	Middle 20%	16,753	12,186	4,567	589
	Middle-rich 20%	23,119	16,830	6,289	1,190
	Richest 20%	44,849	31,409	13,441	1,817
	Total	19,824	14,274	5,550	850

If member households provided coverage to all their members, their monthly MHO contribution obligations would average FCFA 1,900 per household: 1.2 percent of the average household total monthly expenditures; 4.7 percent of non-food expenditures; and 31.5 percent of current health expenditures (Table 5.1b). The incidence of monthly MHO contribution obligations is obviously higher among the poorest households; among the poorest 10 percent, monthly MHO contribution obligations would represent 3.8 percent of total monthly expenditures, 15.1 percent of non-food expenditures. These ratios decline steadily through the income scale to reach respectively 0.4 percent and 1.6 percent among the richest 10 percent of member households.

Table 5.1b Capacity to Pay
Incidence of premium contributions on households who are members of MHOs in the Thies region
(Households that are members)

Per capita household monthly expenditure deciles	Household monthly expenditures (FCFA)			Expected monthly premium payment if all household members are enrolled in MHO	Ratio (%) of expected premium contribution over actual expenditures		
	All	Non-food	Health		(4)/(1)	(4)/(2)	(4)/(3)
	(1)	(2)	(3)	(4)			
1	82,705	20,635	2,663	3,111	3.8	15.1	116.8
2	95,467	22,509	2,288	2,222	2.3	9.9	97.1
3	120,103	33,044	4,263	2,196	1.8	6.6	51.5
4	139,751	38,026	5,957	2,149	1.5	5.7	36.1
5	141,427	35,396	5,612	1,847	1.3	5.2	32.9
6	156,846	40,413	5,624	1,759	1.1	4.4	31.3
7	187,688	49,809	8,305	1,755	0.9	3.5	21.1
8	197,279	41,016	5,007	1,526	0.8	3.7	30.5
9	212,821	56,500	10,275	1,383	0.6	2.4	13.5
10	210,135	60,297	9,344	942	0.4	1.6	10.1
Total	155,997	40,004	5,939	1,872	1.2	4.7	31.5

Hence, current contribution rates among MHOs in the Thies region can be borne economically by households, except perhaps for the extremely poor households. It remains, however, to assess if households do not face financial constraints for paying their contributions on a monthly basis as expected under current contribution policies of MHOs.

5.2 Regularity of Contributions

This subsection is based on the direct responses of MHO members relative to the regularity of their contributions to their respective MHO. Their description of their last contribution to the MHO is also used to construct another indicator variable for the regularity of contributions: the number of months the individual's contribution is overdue at the time of the survey.

Table 5.2a provides a summary of the regularity of contributions among heads of nuclear families that are members of MHOs in the Thies region. On average, 60 percent of members reported regularly paying their monthly contributions to the MHO, while 16 percent and 13 percent reported paying frequently and rarely respectively. Direct responses of MHO members are consistent with their description of their last contribution to the MHO: indeed, nearly 48 percent of members paid their contributions on time, while only 16 percent had at least three months of contributions overdue; one member out of three had contributions overdue for less than three months.

Table 5.2a Regularity of Contributions
Distribution (%) of nuclear family units that are MHO members, by the reported regularity of contributions
(Heads of nuclear family units)

	Self-reported regularity of contributions			Number of months contributions overdue at the time of the survey*		
	Regularly	Frequently	Rarely	Paid on time (zero month)	At least 3 months	At least 6 months
Department						
Mbour	28.3	31.5	37.3	18.8	38.3	34.5
Thies	64.5	11.4	7.8	52.3	8.7	7.5
Tivaoune	74.2	14.1	6.0	61.7	12.5	5.7
Type of residence						
Urban	62.4	11.6	14.2	49.7	7.8	5.4
Rural	55.3	21.8	12.2	44.9	25.7	22.0
Sex of household head						
Male	53.4	17.7	11.3	41.2	18.8	16.0
Female	70.0	13.0	17.0	59.1	9.7	6.4
Age of household head						
20-24	57.1	17.9	8.7	63.5	5.0	5.0
25-29	63.3	6.6	20.3	31.5	7.8	7.8
30-34	67.3	6.2	6.0	37.8	12.5	5.9
35-39	39.6	46.6	6.8	39.4	38.0	36.6
40-44	55.8	13.5	14.3	37.2	18.5	15.4
45-49	55.2	13.1	20.8	49.4	12.3	9.4
50-54	51.7	9.6	32.8	43.8	8.7	6.6
55-59	78.9	9.3	9.1	72.6	10.6	7.8
60-64	60.9	27.3	4.4	52.2	1.6	1.6
65+	67.2	7.9	9.1	55.6	14.4	9.5
Economic status of household						
Poorest 20%	64.8	11.3	6.1	61.8	9.0	8.2
Middle-poor 20%	70.6	14.2	5.7	43.5	10.4	4.3
Middle 20%	42.4	30.3	14.8	38.4	30.1	27.6
Middle-rich 20%	47.5	9.9	35.6	33.4	16.2	13.0
Richest 20%	75.2	9.4	9.9	60.4	8.5	6.1
Total	59.4	16.0	13.3	47.6	15.5	12.5

* Determined based on description of the last contribution payment made to the MHO

The variability of the regularity of contributions into MHOs is relatively important, however. While 65 percent and 74 percent members of MHOs in the Thies and Tivaouane departments (the poorest departments) reported respectively to pay regularly their contributions, this proportion levels down to 28 percent among members of MHOs in the Mbour department (the richest department). Indeed, only 19 percent of members of MHOs in the Mbour department paid their contributions on time; one member out of three had contributions overdue for at least six months.

Demographic characteristics of MHO members contribute to the variability of the regularity of contributions. The data suggest that female members of MHOs pay their contributions more regularly than their male counterparts. Indeed, while 70 percent of female members reported paying their monthly contributions regularly, only 53 percent of male members reported paying regularly their contributions. In addition, older members seem to pay more regularly than younger members.

Finally, the data do not suggest any systematic relationship between the economic status of the household and the regularity of contributions to MHOs. Indeed, the regularity of contributions seems to be lower among the middle 20 percent and middle-rich 20 percent compared to the poorest 40 percent and the richest 20 percent.

These patterns are confirmed by the regression results summarized in Table 5.2b. Regularity of contributions is associated mostly with variables that capture social characteristics (gender, ethnicity, religion), rather than the economic status (occupation of head of household, economic status of household) of household. After controlling for other variables, female members are 1.7 times more likely to pay their contribution regularly than their male counterparts. In addition, the regularity of contributions is very sensitive to ethnic affiliation of the members. Religion of the members also plays a strong influence on the regularity of contributions.

Surprisingly, the occupation of the head of household does not influence the regularity of contributions to MHOs. Nor, according to the data, does household income have an effect on the regularity of payment of contributions to MHOs.

**Table 5.2b Regression Results:
Regularity of contributions among nuclear family units that are members of MHOs
in the Thies Region
(Heads of nuclear family units)**

$Y_i = 1$, if the head of the nuclear family report regular contributions to the MHO $= 0$, otherwise. $\ln[\text{Prob}(Y_i = 1) / \text{Prob}(Y_i = 0)] = \alpha + \beta X_i$				
		B	exp(b)	Sig.
Household size		-0.0022	0.9978	0.9328
Female-headed household		0.5642	1.7581	0.0315
Ethnic group of head of household (base: others)	Wolof	0.9133	2.4925	0.0074
	Serer	0.5614	1.7531	0.1066
	Poular	1.2563	3.5125	0.0053
Religious group of HH (base: others)	Mouride	0.7345	2.0845	0.0573
	Tidjane	0.6503	1.9161	0.0705
	Christian	2.0273	7.5932	0.0000
Level of education of HH (base: No schooling)	Primary	0.0351	1.0357	0.8949
	Secondary	0.1992	1.2204	0.5082

$Y_i = 1$, if the head of the nuclear family report regular contributions to the MHO $= 0$, otherwise. $\ln[\text{Prob}(Y_i = 1) / \text{Prob}(Y_i = 0)] = \alpha + \beta X_i$				
		B	exp(b)	Sig.
Occupation of HH (base: Not occupied)	Agriculture	0.0330	1.0335	0.9191
	Trade\Commer ce	0.3546	1.4257	0.2457
	Administration	0.4740	1.6064	0.2278
Type of residence (base: rural)	Urban	-0.3194	0.7266	0.1924
Availability of health facility in the village or urban neighborhood (base: No)	Yes	-0.2558	0.7743	0.3170
Economic status of household (base: Poorest 20%)	Middle-poor 20%	0.2922	1.3394	0.3897
	Middle 20%	-0.2389	0.7875	0.5015
	Middle-rich 20%	-0.1090	0.8967	0.7777
	Richest 20%	0.6493	1.9142	0.1233
<i>Constant</i>		-1.0837	0.3383	0.0504

Table 5.2c suggests that the main sources of contributions to MHOs are, in order of magnitude, salaries, savings, and transfers. The patterns of sources vary, however, from one group to another. Among members of MHOs in the Mbour department, the main sources of contributions are by far salaries and savings: one out of three members reports using their salaries to pay for their contributions; similarly, one out of three members reports using their savings for paying for their contributions. In the Thies department, however, only salaries are reported as a major source of contributions. In contrast, members of MHOs in the Tivaouane department rely on a variety of sources to pay for their contributions into MHOs, including transfers, exceptional sale of goods, and salaries. In none of these departments is income from the harvest the main source for paying for contributions to MHOs. Even in the rural areas, the main sources for paying for contributions into MHOs are salaries: a comparable proportion of members of MHOs report harvest, exceptional sale of goods, and transfers as other sources.

The profile of sources that members use for paying their contributions into MHOs are very different for male and female members. While male members rely heavily on salaries and harvest, female members rely mostly on savings, the exceptional sale of goods, transfers, and other sources.

Finally, households at different levels of income rely on different combinations of sources for paying for their contributions into MHOs. Among the poorest 20 percent, the main sources for paying for their contributions are harvest, the exceptional sale of goods, and transfers. Among the better-off members, the main sources are salaries and savings.

Table 5.2c Regularity of Contributions
Proportion (%) of nuclear family units that are members of MHOs
who reported any source for their periodic contributions to the MHOs
(Heads of nuclear family units)

	Source of contributions					
	Salary	Harvest	Savings	Exceptional sale of goods	Transfers	Other Sources
Department						
Mbour	33.4	6.2	33.1	6.4	2.9	5.4
Thies	28.6	9.5	8.3	5.4	6.7	17.3
Tivaoune	16.2	13.8	7.1	26.6	27.4	20.1
Type of residence						
Urban	30.8	4.3	15.3	5.8	6.0	19.0
Rural	21.4	17.1	9.9	16.4	16.5	10.8
Sex of household head						
Male	33.1	13.9	5.5	4.6	5.4	12.8
Female	15.6	2.5	26.2	20.5	19.7	20.2
Economic status of household						
Poorest 20%	11.0	22.3	4.4	23.9	22.9	11.4
Middle-poor 20%	16.9	8.0	11.6	8.7	4.6	16.6
Middle 20%	46.2	4.7	6.9	4.8	7.8	12.8
Middle-rich 20%	19.1	5.6	31.0	4.2	9.2	19.7
Richest 20%	42.4	5.0	20.0	6.0	4.5	20.5
Total	26.8	9.8	13.0	10.3	10.5	15.5

5.3 Section Summary

The levels and regularity of member contributions to MHOs are the main factors contributing to income stability of MHOs. Current contribution policies among MHOs of the Thies region and household information presented in this section suggest that MHOs' levels of contributions are affordable for most member households. Among households that are MHO members, the incidence of MHO contribution is about 1.2 percent of total household expenditures and around 5 percent of non-food expenditures: among the poorest 10 percent of households that are MHO members, the incidence of MHO contribution is less than 4 percent of total household expenditures and around 15 percent of non-food expenditures; for the richest 10 percent, these proportions level down to 0.4 percent and 1.6 percent respectively. In other words, the data suggest that current levels of contributions are economically accessible for the majority of households; the combination of contribution policies and procedures and monthly fluctuations of incomes and poor access to credit, however, may impair the financial accessibility of the current levels of contributions.

These conclusions are consistent with the information on the regularity of contributions into MHOs. The proportion of members who report paying their contributions regularly is as low as 60 percent. The proportion of members who report paying regularly is much lower in the Mbour department (28 percent), which is relatively wealthier, compared to the poorer departments of Thies

(65 percent) and Tivaouane (74 percent). Only 53 percent of male members report paying their contributions regularly compared to female members (70 percent). Indeed, regularity of contributions into MHOs is mostly associated with gender, religious affiliation, and ethnicity rather than variables related to the level or stability of household income such as member's occupation or household expenditures. Finally, members use a variety of sources for paying for their contributions into MHOs including salaries and savings, harvest products, the exceptional sale of goods, and transfers.

6. Levels and Patterns of Health Care Utilization

Section 4 concluded that adverse selection may be operating in the MHO enrollment process in the Thies region. For such selection processes to be reflected in the levels and stability of MHO expenditures; however, they have to be mediated through the patterns of health care utilization among MHO beneficiaries. Even in the absence of adverse selection, as financial barriers to access to health care are reduced by coverage through MHOs, levels and stability of MHO expenditures may be influenced by beneficiary over-utilization of health care, or unanticipated patterns of provider choice, and/or over-prescription by providers.

This section presents a comparative analysis of the patterns of health care utilization by beneficiaries and non-beneficiaries. It first discusses analyses of the utilization of curative care services and then looks at hospital services.

6.1 Curative Care

This subsection is based on data compiled from the curative care questionnaire and individual characteristics of household members and collective characteristics of households collected in the household questionnaire. The analyses summarize rates of self-medication and the use of modern health care providers in the case of illness. The levels and patterns of health care utilization are compared for beneficiaries and non-beneficiaries. Regression analysis results on the use of modern health providers and provider choice are used to reach more robust conclusions on the patterns of utilization of curative care. Finally, out-of-pocket payments related to illness and MHO coverage of the sick are summarized.

It should be noted that use of curative care during the two weeks preceding the survey is mainly outpatient care. Indeed, only less than 4 percent of individuals who reported an illness during the two weeks preceding the survey were hospitalized during the reference period. Section 6.3 provides an analysis of hospital services based on a reference period of two years.

Table 6.1a provides a summary of the percentages of individuals who reported an illness during the two weeks preceding the survey, estimates of the unconditional probability of using modern health care providers for curative purposes, and the resulting annualized number of visits per capita. Overall, the proportion of individuals who reported an illness is relatively small: 58 per thousand among MHO beneficiaries and 47 per thousand among non-beneficiaries. Self-reporting of illness is higher among beneficiaries than among non-beneficiaries, and among men in particular: while 42 non-beneficiaries per thousand reported being sick during the last two weeks preceding the survey, this proportion reached 61 per thousand among beneficiaries. Women present comparable levels of self-reporting of illness.

The age patterns of self-reporting of illness differs between men and women. Under 5 years of age, the proportion of individuals who reported being sick is much higher among boys than girls,

among both beneficiaries and non-beneficiaries. While the proportion of individuals who reported being sick declines with age among men, it increases among women, peaking in late childbearing years. Hence, the proportion of women 30–49 who reported being sick is much higher among both beneficiaries and non-beneficiaries.

Table 6.1a Utilization of Curative Care among all Individuals during the two weeks preceding the survey in the Thies Region (All individuals)

	Beneficiaries			Non-beneficiaries		
	Proportion of individuals who reported an illness (per 1000)	Proportion of individuals who used a modern health care provider during the last two weeks (per 1000)	Annualized number of visits per capita	Proportion of individuals who reported an illness (per 1000)	Proportion of individuals who used a modern health care provider during the last two weeks (per 1000)	Annualized number of visits per capita
Age group						
0-4	61.7	57.6	1.497	52.2	18.5	0.480
5-14	47.7	29.6	0.770	31.3	20.2	0.525
15-29	47.5	24.0	0.624	48.3	28.8	0.749
30-49	91.6	18.4	0.478	59.7	27.0	0.702
50 & +	50.6	15.7	0.409	62.8	41.0	1.067
Sex						
Male	60.7	29.2	0.759	41.6	24.5	0.636
Female	54.7	24.1	0.626	52.9	27.1	0.704
Level of instruction of head of household						
No schooling	50.9	24.1	0.626	43.8	25.0	0.651
Primary	77.9	37.5	0.976	58.6	21.5	0.558
Secondary +	47.3	18.9	0.491	42.1	34.3	0.891
Socioeconomic status						
Poorest 20%	36.2	15.5	0.402	55.1	21.8	0.567
Middle-poor 20%	85.5	27.4	0.714	37.4	20.1	0.524
Middle 20%	62.4	36.5	0.949	48.5	27.2	0.707
Middle-rich 20%	59.8	40.0	1.041	50.7	33.0	0.859
Richest 20%	54.5	23.6	0.613	44.0	31.7	0.825
Type of residence						
Urban	39.0	18.6	0.484	38.6	20.4	0.531
Rural	78.6	35.6	0.927	52.9	29.3	0.762
Department						
Mbour	54.5	32.2	0.837	53.0	33.4	0.867
Thies	53.9	24.6	0.639	47.0	27.2	0.707
Tivaouane	70.9	23.9	0.621	39.9	13.8	0.360

	Beneficiaries			Non-beneficiaries		
	Proportion of individuals who reported an illness (per 1000)	Proportion of individuals who used a modern health care provider during the last two weeks (per 1000)	Annualized number of visits per capita	Proportion of individuals who reported an illness (per 1000)	Proportion of individuals who used a modern health care provider during the last two weeks (per 1000)	Annualized number of visits per capita
MHO coverage of curative care ^a						
High coverage	54.3	37.8	0.984			
Low coverage	58.7	23.1	0.602			
Total	57.6	26.6	0.692	47.2	25.7	0.669
Number of individuals	3,653			5,593		
*MHO coverage of curative care: High coverage of curative care: benefit packages where curative consultations, essential drugs, and hospitalization are covered at least at 75%. Low coverage of curative care: benefit packages where curative consultations, essential drugs, or hospitalization are covered, but at less than 75%.						

The proportion of individuals who sought care at a modern health care provider declines with age among MHO beneficiaries: from 58 per thousand among children under 5 years of age to less than 30 per thousand at middle age and less than 20 per thousand among the elderly. This pattern is not observed among non-beneficiaries; the proportion of non-beneficiaries who sought care at a modern health care provider is relatively low for those under 5 years, while it is relatively higher among the elderly. These contrasting age patterns are reflected on the estimates of annualized number of visits per capita among beneficiaries and non-beneficiaries.

No clear pattern emerges relative to the economic status of households that are MHO beneficiaries. Among non-beneficiaries, however, utilization increases with household income as demonstrated by increasing estimates of annualized number of visits per capita as household income increases.

In contrast, marked differences are observed by type of residence. Rural beneficiaries and non-beneficiaries reported a much higher level of illness than their urban counterparts. These differences are maintained in the levels of use of modern health care providers.

Finally, the structure of the MHO benefit package is not associated with the likelihood of reporting an illness. As expected, however, beneficiaries of MHOs with a higher coverage of curative care report a higher level of use of modern health care providers than do beneficiaries with a lower coverage and non-beneficiaries.

Most of the presented differences, however, are not controlled for the effects of other variables or confounding factors. Table 6.1b provides a summary of regression analysis results on the probability of using modern health care providers based all individuals (left panel) and based on individuals who reported an illness in the two weeks preceding the survey (right panel). The controlled analysis suggests that the difference in the use of modern health care providers (entry in

the modern health care system) between beneficiaries and non-beneficiaries of MHOs are not significant.

The only variables that contribute significantly to increased use of modern health care providers are related to demographic characteristics of individuals, the economic status of the household, and community characteristics. Both male and female children under 15 years of age are more likely to use modern health care services than adult males (reference group). Similarly, women at late childbearing ages and elderly women are more likely to use modern health care services than adult males.

Sick members of households headed by an individual employed in the administration benefit from higher levels of utilization of modern health care providers than their counterparts. Compared to the sick who are members of the poorest 20 percent of households, members from higher-income groups present relatively higher levels of utilization of modern health care providers after controlling for other factors. Individuals who reside in rural areas have a higher likelihood of using modern health care providers compared to urban areas: this may reflect the fact most community-based MHOs are located in villages where at least a public or mission health post is available. Finally, geographical accessibility is also an important factor, with people being significantly more likely to seek modern health care if there is a health facility in their village or neighborhood.

Table 6.1b Regression Results: Utilization of Curative Care – Entry in the Modern Health Care System

Y = 1, if curative care with a modern health care provider = 0, otherwise. $\ln[\text{Prob}(Y = 1) / \text{Prob}(Y = 0)] = \alpha + \beta X$								
		All 9,246 Individuals: Unconditional probability of using modern health care providers			376 Individuals who reported an illness: Conditional probability of using modern health care providers			
		B	Exp(b)	Sig.	b	Exp(b)	Sig.	
Individual Characteristics								
Perception of severity of illness (base: not severe)	Severe				0.4443	1.5593	0.1519	
	Very Severe				0.7216	2.0577	0.0907	
Male (base : male aged between 30 and 45 years)	0-14 years	0.7561	2.1300	0.0482	1.0036	2.7281	0.1072	
	15-29 years	0.6222	1.8630	0.1235	0.7376	2.0910	0.2668	
	45-54 years	0.6054	1.8320	0.2481	0.1197	1.1272	0.8935	
	55 years +	0.6436	1.9033	0.1719	-0.2081	0.8121	0.7744	
Female (base : male aged between 30 and 45 years)	0-14 years	0.6407	1.8978	0.0968	0.4848	1.6239	0.4188	
	15-29 years	0.4796	1.6155	0.2386	0.5009	1.6501	0.4517	
	30-44 years	1.1116	3.0392	0.0062	0.6323	1.8819	0.3190	
	45-54 years	0.9815	2.6684	0.0318	-0.1679	0.8454	0.8203	
	55 years +	0.8891	2.4330	0.0457	0.3825	1.4659	0.5911	
Household Characteristics								
Ethnic group of head of household (base : others)	Wolof	0.0870	1.0909	0.7238	-0.4552	0.6343	0.4477	
	Serer	0.3905	1.4777	0.1162	-0.4263	0.6529	0.4742	
	Poular	0.3458	1.4131	0.2202	-0.4122	0.6622	0.5541	

Religious group of head of household (base : others)	Mouride	0.1807	1.1980	0.4960	0.6862	1.9862	0.2720
	Tidjane	0.3702	1.4480	0.1386	0.6861	1.9860	0.2708
	Christian	0.2478	1.2813	0.3836	0.7144	2.0429	0.2740
Level of education of head of household (base : no schooling)	Primary	0.2895	1.3357	0.0818	0.0940	1.0986	0.7910
	Secondary	-0.0585	0.9432	0.7784	-0.5072	0.6022	0.2322
Occupation of head of household (base : not occupied)	Agriculture	0.0403	1.0411	0.8350	0.1456	1.1568	0.7163
	Trade\Commerce	0.0113	1.0114	0.9556	-0.1310	0.8772	0.7524
	Administration	0.1774	1.1941	0.4768	1.5591	4.7546	0.0566
Economic status of household (base: Poorest 20%)	Middle-poor 20%	0.1748	1.1911	0.4035	0.8607	2.3647	0.0308
	Middle 20%	0.6709	1.9560	0.0011	1.1343	3.1091	0.0071
	Middle-rich 20%	0.4954	1.6412	0.0269	0.6710	1.9562	0.1288
	Richest 20%	0.8313	2.2963	0.0004	1.6950	5.4465	0.0018
Availability of health facility in the village or urban neighborhood (base: No)	Yes	0.5584	1.7478	0.0008	0.2593	1.2960	0.4468
Type of residence (base: rural)	Urban	-0.8002	0.4492	0.0000	-0.6015	0.5480	0.0555
Benefit Package of CBHI* (base: no coverage)	High coverage of curative care	0.2039	1.2262	0.3740	-0.4621	0.6300	0.3628
	Low coverage of curative care	0.0387	1.0394	0.7925	-0.3624	0.6960	0.2256
	Constant	-5.3471	0.0048	0.0000	-0.3251	0.7225	0.6558
*Benefit package of CBHI : High coverage of curative care: benefit packages where curative consultations, essential drugs, and hospitalization are covered at least at 75%. Low coverage of curative care: benefit packages where curative consultations, essential drugs, or hospitalization are covered, but at less than 75%.							

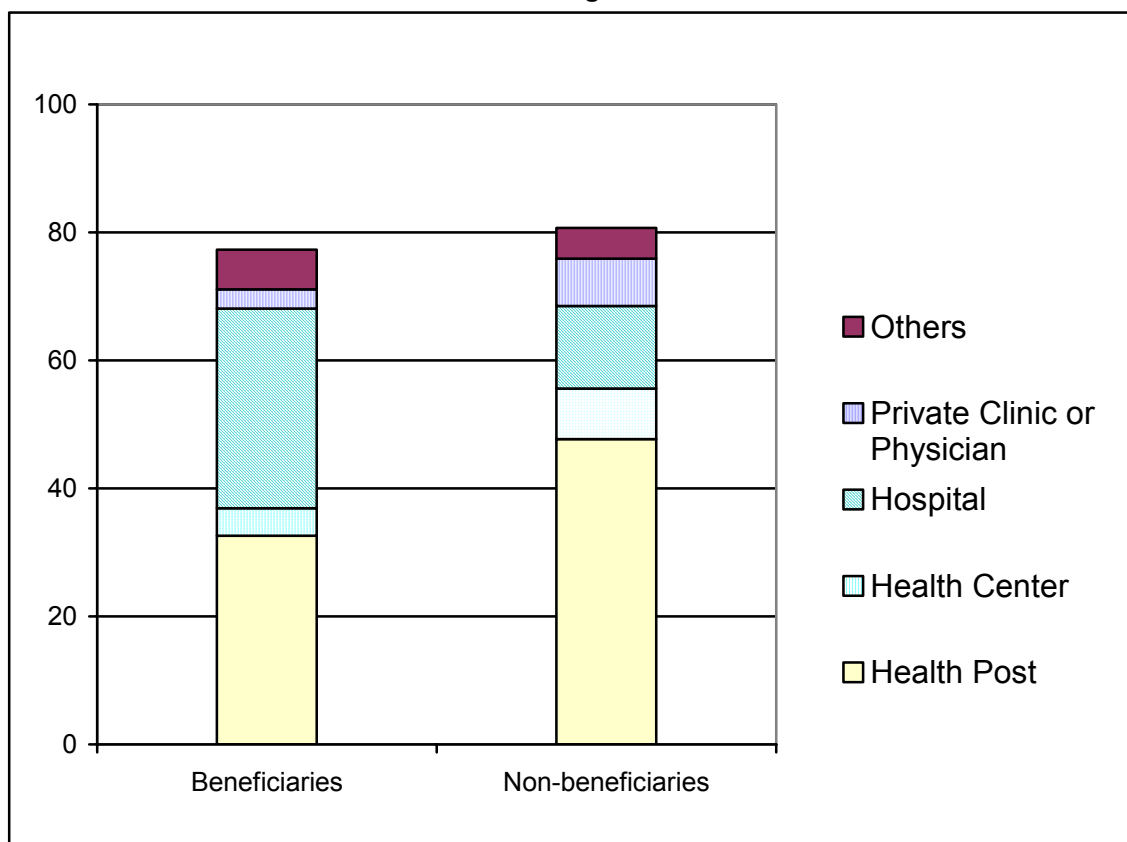
Table 6.1c provides a summary of the patterns of health seeking behavior among individuals who reported an illness during the two weeks preceding the survey. A large proportion of sick beneficiaries and non-beneficiaries use self-medication: nearly 40 percent of beneficiaries and 42 percent non-beneficiaries who are sick used drugs available at home to remedy their illness. A larger proportion sought care at health care providers: nearly 80 percent of non-beneficiaries and 77 percent of beneficiaries.

**Table 6.1c Utilization of Curative Care
among Beneficiaries and Non-beneficiaries of MHOs in the Thies Region
(Individuals who reported an illness)**

		Coverage status by MHOs	
		Beneficiaries	Non-beneficiaries
Self-medication			
Proportion (%) of the sick who use drugs available at home		40.4	41.5
Proportion (%) of the sick who bought drugs		52.9	41.5
Utilization of health care services			
Entry in the modern health system			
Proportion (%) of the sick who sought care at any health care provider		77.3	80.2
Health care provider choice			
Proportion (%) of the sick who sought care at a given health care provider:	Hospital	31.2	12.9
	Health Center	4.3	7.9
	Health Post	32.6	47.7
	Private clinic or physician	3.0	7.4
	Others	6.2	4.8
Number of sick individuals in the past 15 days		178	198

Although there is not much difference in the proportions of beneficiaries and non-beneficiaries who sought care at health care providers, the data suggest that the patterns of provider choice are relatively different for the two groups. As observed in Figure 6.1, the main sources of care for ill non-beneficiaries are health posts: indeed, 48 percent of the sick went to health posts, compared to 13 percent who went to hospitals, 8 percent to health centers, and 7 percent to private clinics and physicians. Among beneficiaries, however, the main sources of health care were health posts and hospitals: 33 percent of the sick sought care in health posts, 31 percent in hospitals, and only 4 percent and 3 percent in health centers and private clinics respectively.

Figure 6.1 Utilization of Curative Care – Provider Choice
Proportion (%) of the sick who choose a given health care provider by coverage status by MHOs in the Thies region



Regression analysis results on provider choice are summarized in Table A II.1d of Annex B. The results suggest that MHO coverage significantly affects provider choice. Inclusion of consultation in the MHO's benefit package is associated with significantly increased use of hospitals and private clinics and physicians. The inclusion of essential drugs, however, is negatively associated with the private clinics and physicians, and a positive use of health centers and health posts where essential drug policies are applied under the Bamako Initiative. Finally, the inclusion of laboratory exams is associated with the positive use of private clinics and physicians, and hospitals.

In addition to the coverage of individuals by MHOs, socio-demographic characteristics of the individual and socio-economic characteristics of his household influence provider choice in the modern health sector. Children under 5, for instance, were more likely to be taken to the hospital or to a private clinic or physician. Individuals who reside in the Thies department were more likely to use hospitals and private clinics and physicians, while residents of the Tivaouane department were less likely to use hospitals and highly likely to use private clinics when other factors are controlled for, including the economic status of the households. Indeed, occupation of the head of household and the level of income of the household significantly affect provider choice in the Thies region.

Finally, Table 6.1d provides a summary of illness-related out-of-pocket payments (OOPs) and coverage of specific services and products by MHOs among individuals who reported an illness in the two weeks preceding the survey. The main factors that contribute significantly to the levels of OOPs include the severity of illness of the individual, the economic status of his household, department of residence, and MHO coverage status.¹¹

Table 6.1d Curative Care: Illness-related Out-of-Pocket Payments (in FCFA) among beneficiaries and non-beneficiaries of MHOs in the Thies Region (Individuals who reported an illness in the past two weeks)

	Coverage status by MHO	
	Beneficiaries	Non-beneficiaries
Illness Out-Of-Pocket Expenditures (FCFA)		
Self-medication drugs (A)	1,511	1,765
Transport costs (B)	213	115
Direct payments at modern providers		
Consultation (C1)	403	1,152
Exams (C2)	1,317	1,002
Drugs (C3)	1,391	3,126
Other services (C4)	180	242
Total C=C1+C2+C3+C4	3,292	5,521
Total T=A+B+C	5,017	7,400
Number of sick individuals in past 15 days	178	198
Proportion(%) of the sick who reported being covered by the MHO for the following services		
Consultation	19.2	
Exams	12.3	
Drugs	7.9	
Other services	1.7	

Indeed, there is an appreciable difference in the levels of OOPs between beneficiaries and non-beneficiaries of MHOs. Non-beneficiaries who are sick spent approximately FCFA 7,400 on average, compared to beneficiaries' expenditure of FCFA 5,000. These differences result mainly from payments for consultations and drugs at modern health care providers. The lower panel of Table 6.1d suggests, however, that a limited proportion of MHO members benefited from coverage when they sought care at modern health care providers. Such a result, and even the high levels of OOPs among beneficiaries of MHOs, is consistent with the profile of benefit packages of MHOs summarized in Section 2. Indeed, either the MHOs do not cover consultation or drugs, the largest sources of OOPs at primary health care levels, or if they do, the rate of coverage is relatively low.

¹¹ Regression analyses results not shown in this report.

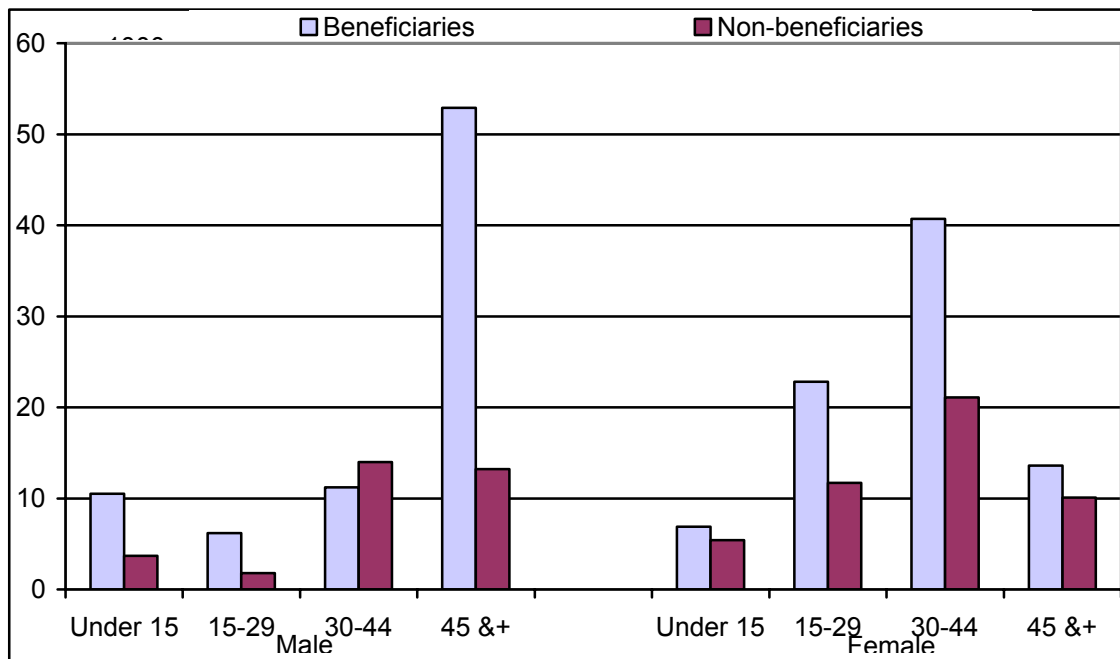
6.2 Hospitalization

Hospitalization has been a preferred benefit covered by MHOs in the Thies region, along with curative consultation and essential drugs. While most other benefits are covered at rates ranging from 50 percent to 75 percent, hospitalization is mostly covered at a rate of 100 percent.

This subsection builds on the hospitalization and surgery module of the nuclear family questionnaire which was administered to each head of a nuclear family within selected households. For the retrospective period of two years preceding the survey, 120 events of hospitalization and surgery were reported. Information generated based on these events is summarized in Tables 6.2a and 6.2b.

Overall, the incidence of hospitalization is higher among MHO beneficiaries compared to non-beneficiaries. Indeed, 17 beneficiaries per thousand were hospitalized during the two years preceding the survey, compared to 8 non-beneficiaries per thousand. Figure 6.2 provides a summary of hospitalization patterns among beneficiaries and non-beneficiaries of MHOs by age and sex. For women, hospitalization rates by age group were very similar for beneficiaries and non-beneficiaries: hospitalization rates increased from under 15 years to the 30–44 age range, and then declined afterward. The main difference remains in levels of hospitalization rates at childbearing ages: among non-beneficiaries, levels increase from 12 per thousand at the 15–29 year range to 21 per thousand between 30 and 44 years of age; among beneficiaries, they increase from 23 per thousand at the 15–29 year range to 41 per thousand between 30 and 44 years of age.

Figure 6.2 Proportion (per 1000) of Individuals who have been Hospitalized in the Past Two Years, by age and sex among beneficiaries and non-beneficiaries of MHOs in the Thies Region



Among men who are not beneficiaries of MHOs, hospitalization rates declined from 4 per thousand at under 15 years of age to 2 per thousand at 15-29 years of age, and increased afterward to 13-14 per thousand above 44 years of age. Hospitalization rates were much higher among men who are beneficiaries. From 11 per thousand under 15 years of age, hospitalization rates declined to 6 per thousand at 15-29 years of age, and increased steadily to reach 53 per thousand among male beneficiaries age 45 years and older.

Hospitalization rates varied by place of residence among both beneficiaries and non-beneficiaries, probably as a consequence of geographical accessibility constraints. Rates were much higher in the Thies department, where the public regional hospital and the mission hospital (St Jean de Dieu) are located, compared to the departments of Tivaouane and Mbour. In addition, hospitalization rates were higher in urban areas than in rural areas.

Among non-beneficiaries, rates of hospitalization increased with income. Among the poorest 40 per thousand the levels of hospitalization are around 6 percent. They increased with economic status of the household and reached 13 per thousand among the richest 20 percent. This income gradient disappears among MHO beneficiaries.

Table 6.2b provides a summary of MHO coverage and out-of-pocket payments associated with hospitalization events. While almost none of the non-beneficiaries benefited from any type of coverage mechanism for the hospitalization event and related expenditures, nearly 51 percent of MHO beneficiaries who had experienced an hospitalization event during the preceding two years benefited from MHO coverage. Such low coverage may be explained by non-inclusion of hospitalization in the MHO benefit package, or exclusion from benefiting from MHO coverage if the individual failed to pay its contribution regularly at the time of need.

Such coverage reduced dramatically the levels of OOPs for beneficiaries who were covered for the hospitalization event and related expenditures. Among non-beneficiaries, OOPs related to the hospitalization reached FCFA 123,475 (US\$ 247); a comparable sum, FCFA 128,207 (US\$ 256), was spent on average by MHO beneficiaries who did not have coverage for the hospitalization. In contrast, among beneficiaries who were covered for the hospitalization event and expenditures, OOPs dropped to FCFA 31,892 (US\$ 64); only about one quarter of the OOPs by individuals without coverage.

**Table 6.2a Hospitalization and Surgical Event
Proportion (per 1000) of individuals who have been hospitalized in the past two years among
beneficiaries and non-beneficiaries of MHOs in the Thies Region**

	Coverage status by MHO	
	Beneficiaries	Non-beneficiaries
Sex and age (in years)		
Male		
Under 15	10.5	3.7
15-29	6.2	1.8
30-44	11.2	14.0
45 and +	52.9	13.2
All	16.7	6.0
Female		
Under 15	6.9	5.4
15-29	22.8	11.7
30-44	40.7	21.1
45 and +	13.6	10.1
All	17.6	10.0
Both sexes		
Under 15	8.8	4.5
15-29	14.2	6.6
30-44	26.3	18.0
45 and +	29.9	11.7
All	17.2	8.0
Department		
Mbour	11.4	7.4
Thies	22.5	11.2
Tivaoune	9.0	5.5
Type of residence		
Urban	24.4	11.7
Rural	9.0	5.5
Economic status of household		
Poorest 20%	10.9	6.5
Middle-poor 20%	23.7	4.5
Middle 20%	10.6	7.2
Middle-rich 20%	29.5	11.6
Richest 20%	17.6	13.5
Total	17.2	8.0
Number of individuals	3,605	5,631

* Nearly 93% of the events are hospitalization cases

**Table 6.2b Coverage of Hospitalization and Surgical Event
Among beneficiaries and non-beneficiaries of MHOs in the Thies Region***

	Coverage status by MHO		
	Beneficiaries	Non-beneficiaries	
Proportion (per 1000) of individuals who have been hospitalized in the past two years	17.2	8.0	
Number of individuals	3,605	5,631	
Proportion (per 100) who benefited of any coverage for the event	50.5	0.1	
Number of individuals	65	54	
Average direct payment (FCFA) for hospitalization event			
Coverage status of event by MHO or other sources:	Did not benefit of any coverage for the event	128,207	123,475
	Benefited of coverage for the event	31,892	
	All	76,762	123,475
Number of individuals	65	54	

* Nearly 93% of the events are hospitalization cases

6.3 Section Summary

In summary, the data suggest that there are no significant differences in the overall use of modern health care providers for curative purposes between MHO beneficiaries and non-beneficiaries. Significant differences in the patterns of provider choice, however, are observed: beneficiaries have a significantly higher tendency to use hospitals while non-beneficiaries rely mainly on health posts. Indeed, access to hospital care was the founding motive of the first generation of MHOs in the Thies region (Section 2), and this is reflected in the patterns of beneficiaries' utilization of curative care. These patterns are consistent with the current belief among MHO promoters in the Thies region – that members of MHOs bypass health posts and health centers to go to the hospitals when in need of health care. Now that MHOs are extending their benefit packages to include coverage of consultations and drugs, unless these changes are translated into greater use of primary health care services and lower use of hospital services, such patterns of utilization of care may adversely affect the stability of MHO expenditures.

Rates of hospitalization among beneficiaries are twice those of non-beneficiaries. Hospitalization rates are higher among women of childbearing ages and peak between 30 and 44 years of age; they are much higher among women who are beneficiaries compared to non-beneficiaries. Among men, hospitalizations rates are relatively low between 15 and 29 years of age, they increase steadily afterwards and a peak after 45 years of age; at these older ages, male beneficiaries of MHOs are four times more likely to be hospitalized compared to male non-beneficiaries. While non-beneficiaries do not benefit from any form of explicit solidarity mechanism, nearly 50 percent of beneficiaries of MHOs benefit from coverage for hospitalization-related expenditures; a large portion of beneficiaries did not benefit from hospital care coverage at the time of need either because it was not included in their MHO benefit package or they were excluded from benefits as a consequence of non-payment of their monthly contributions. Consequently, out-of-pocket payments related to hospitalization reached FCFA 123,000 (US\$ 247) among non-beneficiaries, and FCFA 128,000 (US\$ 256) among MHO beneficiaries who were not covered for hospitalization, while they were FCFA 32,000 (US\$ 64) among MHO beneficiaries who were covered for hospitalization.

7. Other Financial Relations

This section assesses the prevalence of financial relations other than the insurance function that exist between MHOs and their members. Some of these financial relations, however, are directly or indirectly related to the health insurance function of MHOs. They include loans by the MHO to its members to cover health care-related copayments, to finance income-generating activities, and to finance the purchase of mosquito nets, among other reasons. The first subsection covers the assessment of the prevalence of indebtedness among MHO members; the second subsection will discuss the sources of indebtedness.

7.1 Prevalence of Indebtedness

The proportion of members indebted to MHOs is relatively low: only 6.4 percent of members reported owing a debt to their MHO. The levels of indebtedness are comparable between members who reside in urban and rural areas. However, the data suggest that indebtedness is relatively higher in the Thies and Tivaouane departments compared to the Mbour department.

All income groups seem to be affected by the prevalence of indebtedness. The levels of indebtedness are lower among the extreme income groups (the poorest 20 percent and the richest 20 percent), compared to the middle-income groups.

Table 7.1a Prevalence of Indebtedness
Proportion (%) of MHO members who are indebted to their MHO in the Thies Region
(Heads of nuclear family units who are members of MHOs)

	Proportion (%) of individuals who contracted a any debt	Number of individuals
Type of residence		
Urban	6.4	275
Rural	6.4	294
Department		
Mbour	3.6	114
Thies	7.4	279
Tivaouane	6.7	176
Economic status		
Poorest 20%	5.1	118
Middle-poor 20%	7.0	128
Middle 20%	7.7	119
Middle-rich 20%	7.6	102
Richest 20%	4.2	102
Total	6.4	569

Indebtedness of members towards their MHOs, however, seems to be a local phenomenon.¹² Twelve out of the 27 MHOs in the sample have levels of indebtedness of members which are higher than 10 percent; three out of the 27 MHO have levels of indebtedness of members which are higher than 17 percent. In contrast, indebtedness of members towards the MHO is not observed in seven of 27 MHOs.

7.2 Sources of Indebtedness

The main source of indebtedness is related to health care. Nearly half of the members who reported a debt to their respective MHO declared that it was related to health care, including hospitalization, drugs, and other health care-related services. Among nine of the 27 MHOs, members reported debts related to health care. Only a small proportion of members reported owing a debt to their MHO for investment in income-generating activities. Indeed, MHO loans for income-generating activities are at an experimental phase among MHOs of the Thies region: such loans are reported by only five MHOs. Finally, a small proportion of members reported having contracted a loan for the purchase of mosquito nets: only three MHOs deal in such transactions.

Table 7.2a Prevalence of Indebtedness
Proportion (%) of MHO members who are indebted to their MHO by sources in the Thies region
(Heads of nuclear family units who are members of MHOs)

	Proportion (%) of individuals who contracted a any debt	Proportion (%) of individuals who contracted a debt related to the following sources:				Number of individuals
		Health care	Income-generating activities	Purchase of mosquito net	Other sources	
Type of residence						
Urban	6.4	3.2	1.7	0.3	2.5	275
Rural	6.4	2.9	0.5	0.6	2.4	294
Department						
Mbour	3.6	0.0	1.8	0.0	1.8	114
Thies	7.4	4.7	1.2	0.6	1.6	279
Tivaoune	6.7	2.2	0.4	0.4	4.9	176
Economic Status						
Poorest 20%	5.1	4.2	0.8	0.5	1.0	118
Middle-poor 20%	7.0	3.1	2.7	0.0	3.0	128
Middle 20%	7.7	5.2	0.6	0.0	2.0	119
Middle-rich 20%	7.6	0.6	0.8	1.6	4.6	102
Richest 20%	4.2	0.7	0.8	0.4	2.3	102
Total	6.4	3.1	1.2	0.4	2.5	569

¹² See also Atim, C., F. Diop, and S. Bennett. Forthcoming. Determinants of the Financial Sustainability of Mutual Health Organizations: A Study in the Thies Region of Senegal. Bethesda, MD: Partners for Health Reform/plus, Abt associates Inc.

None of the loans in the Mbour department MHOs is related to health care. It is only in the Thies and Tivaouane departments that MHOs make loans to members for coverage of health care-related costs. Given that the poorest households that are MHO members are located in these two last departments, health care-related debts are more prevalent among lower-income groups than higher-income groups.

8. Conclusions

8.1 Adverse Selection, Moral Hazard and Use of Health Care

Household behavior may affect MHO financial stability through adverse selection in enrollment and moral hazard in beneficiary behavior. The analyses presented in this report suggest that adverse selection may operate in MHO enrollment in the Thies region at two levels: In respect to enrollment of households, larger households and households with a greater number of high-risk women (women of childbearing age) are more likely to enroll than other households. In respect to coverage of individual members within enrolled households, high-risk women, male children, and males older than 55 years are most likely to be covered. Results also suggest that individuals with poorer health and chronic conditions are more likely to be provided coverage than are healthier individuals.

It should be noted, however, that this tendency to enroll and cover women of childbearing age may be a factor of broader differences in how women and men relate to health care, cooperation and social solidarity in Senegal. Adult women are traditionally caregivers in the Senegalese family. As such, they may be more likely than men to understand the costs and uncertainty associated with health care. They also are more likely to be involved in community-based associations – including MHOs.

Analyses of utilization of curative health care suggest no significant differences between MHO beneficiaries and non-beneficiaries in the overall use of modern health care providers. However, significant differences in the choice of provider are observed. MHO beneficiaries are more likely to bypass health posts and health centers and seek care in hospitals; non-beneficiaries rely mainly on health posts.

Finally, during the two years preceding the survey, it was observed that hospitalization levels among beneficiaries are twice those of non-beneficiaries. Among women, hospitalization rates for women of childbearing age, especially those 30 to 44 years of age, are much higher for beneficiaries than for non-beneficiaries. Hospitalizations rates are relatively low for men 15 to 29 years of age; they peak after 45 years of age: at older ages, male beneficiaries of MHOs are four times more likely to be hospitalized compared to male non-beneficiaries. As more elderly people enroll in MHOs and the organizations expand their benefit packages to cover consultations and drugs, the bias for more costly hospital care may jeopardize MHO financial stability unless these changes are associated with greater use of primary health care services and less use of hospital services.

8.2 Regularity of Contributions

Another way in which household behavior may affect the level and stability of MHO income is through the levels and regularity of their contributions. Current contribution policies among Thies MHOs and household information presented in this report suggest that contribution levels are affordable for most households that are members of MHOs. Among member households, the incidence of the contribution is about 1.2 percent of total household expenditure and around 5 percent of non-food expenditures. Even among the poorest 10 percent of households, MHO contributions are

less than 4 percent of total household expenditure and around 15 percent of non-food expenditures. In other words, the data suggest that current levels of contributions are economically accessible for the majority of households.

The proportion of members who report regularly paying their contributions is as low as 60 percent. Regularity of contributions, however, is not related to the level or stability of household income, which in turn is a factor of member's occupation or household expenditures. Indeed, the proportion of members who report paying their contributions regularly is much lower in the Mbour department (28 percent), which is relatively wealthier, than in the poorer departments of Thies (65 percent) and Tivaouane (74 percent). Only 53 percent of male members report paying regularly their contributions compared to 70 percent of female members. Regularity of contributions into MHOs is mostly associated with gender, religious affiliation, and ethnicity. Hence, the relatively low levels of regularity of contributions may be explained by gaps in sensitization of members and/or weaknesses in the administration of contribution collection processes.

8.3 Other Financial Relations

Other, non-insurance financial relations between MHOs and their members are a final mechanism through which household behavior may affect MHO financial stability. In the Thies region, these relations include MHO loans to its members to cover health care-related copayments, to finance income-generating activities, and/or to finance the purchase of mosquito nets. Analyses in this report, however, suggest that the proportion of members indebted to MHOs is relatively low: only 6.4 percent of members reported being in debt to their MHO at the time of the survey. In addition, indebtedness seems to be a local phenomenon: 12 of the 27 MHOs in the survey sample have levels of member indebtedness that are higher than 10 percent; three of the 27 MHOs have levels of member indebtedness that are higher than 17 percent; in contrast, no indebtedness is observed among seven of the MHOs.

The main source of member indebtedness is related to health care. However, it is only in the Thies and Tivaouane departments that MHOs lend to members for coverage of health care-related costs. As MHOs restructure their benefit packages toward more primary and preventive services, and large copayments are to be paid by beneficiaries at the time of need, member indebtedness may come to threaten MHO financial stability.

Annex A. Social, Demographic, and Economic Characteristics of MHOs' Membership Pool

Table A I.1 Ethnic and Religious Structure of Membership Pool: MHOs of Thies Region

MHO identification number	Ethnicity			Religion		
	Proportion (%) of Wolof in membership pool	Proportion (%) of Poular in membership pool	Proportion (%) of Serer in membership pool	Proportion (%) of Muslim Mourides in membership pool	Proportion (%) of Muslim Tidjanes in membership pool	Proportion (%) of Christians in membership pool
1	0,0	5,3	89,5	0,0	31,6	57,9
2	61,1	16,7	11,1	33,3	61,1	0,0
3	5,9	0,0	23,5	5,9	0,0	17,6
4	7,1	0,0	35,7	7,1	14,3	21,4
5	21,4	28,6	21,4	7,1	21,4	42,9
7	57,1	21,4	0,0	28,6	64,3	0,0
9	52,6	26,3	15,8	52,6	36,8	0,0
10	0,0	0,0	94,4	0,0	27,8	66,7
12	71,4	7,1	14,3	42,9	35,7	7,1
13	36,4	9,1	18,2	27,3	36,4	9,1
14	5,3	0,0	89,5	5,3	5,3	89,5
15	0,0	0,0	82,4	5,9	0,0	76,5
16	6,3	6,3	56,3	0,0	12,5	81,3
19	36,4	9,1	27,3	63,6	9,1	0,0
21	24,7	11,2	59,6	68,6	20,2	0,0
22	7,1	7,1	85,7	71,4	28,6	0,0
24	35,3	0,0	0,0	41,2	23,5	0,0
26	46,7	6,7	13,3	0,0	53,3	0,0
27	31,3	12,5	18,8	12,5	62,5	0,0
31	55,0	40,0	0,0	30,0	65,0	0,0
32	94,7	0,0	5,3	63,2	26,3	0,0
33	10,0	0,0	30,0	5,0	5,0	65,0
34	52,9	23,5	0,0	23,5	58,8	0,0
35	60,0	10,0	10,0	25,0	55,0	0,0
36	0,0	6,3	93,8	12,5	12,5	75,0
37	0,0	5,6	94,4	0,0	11,1	88,9
39	7,7	3,9	80,6	0,0	0,0	92,3

**Table A I.2 Gender and Membership Pool:
MHOs of Thies Region**

MHO identification number	Proportion (%) of female-headed household in membership pool
1	15,8
2	38,9
3	17,6
4	14,3
5	21,4
7	42,9
9	36,8
10	16,7
12	21,4
13	90,9
14	47,4
15	11,8
16	37,5
19	18,2
21	9,0
22	28,6
24	52,9
26	73,3
27	50,0
31	45,0
32	21,1
33	30,0
34	35,3
35	55,0
36	12,5
37	38,9
39	15,5

Table A I.3 Income and Poverty of Membership Pool: MHOs of Thies Region

MHO Identification number	Average household monthly expenditure per capita (FCFA)	Proportion (%) of households with less than US\$1 per capita per day in the membership pool
1	15 414	63,2
2	18 954	50,0
3	15 000	64,7
4	14 296	64,3
5	21 253	35,7
7	21 831	14,3
9	21 541	47,4
10	13 149	77,8
12	16 363	57,1
13	23 383	27,3
14	25 637	26,3
15	20 789	41,2
16	16 723	56,3
19	17 337	54,5
21	28 798	4,5
22	16 599	50,0
24	20 575	23,5
26	27 522	20,0
27	27 062	18,8
31	20 053	50,0
32	18 071	47,4
33	24 829	20,0
34	21 882	29,4
35	28 057	15,0
36	10 736	87,5
37	12 005	66,7
39	12 488	80,6

**Table A I.4 Demographic Structure (sex and age) of Membership Pool
Distribution of Beneficiaries by Age and Sex: MHOs of the Thies Region**

MHO id number	Male					Female				
	0-14	15-29	30-44	45-54	55 &+	0-14	15-29	30-44	45-54	55 &+
1	0,160	0,139	0,060	0,005	0,050	0,283	0,169	0,055	0,025	0,055
2	0,224	0,071	0,134	0,014	0,067	0,297	0,121	0,034	0,017	0,020
3	0,202	0,116	0,087	0,023	0,023	0,249	0,104	0,110	0,035	0,046
4	0,291	0,063	0,035	0,035	0,063	0,174	0,098	0,049	0,056	0,138
5	0,127	0,169	0,025	0,017	0,161	0,093	0,144	0,093	0,042	0,127
7	0,260	0,156	0,078	0,000	0,052	0,104	0,130	0,078	0,104	0,039
9	0,201	0,089	0,096	0,026	0,038	0,233	0,144	0,089	0,032	0,051
10	0,098	0,277	0,151	0,025	0,016	0,074	0,044	0,041	0,008	0,266
12	0,249	0,155	0,083	0,036	0,026	0,171	0,124	0,067	0,041	0,047
13	0,187	0,131	0,031	0,031	0,025	0,219	0,200	0,075	0,044	0,050
14	0,111	0,079	0,032	0,063	0,111	0,190	0,159	0,063	0,079	0,111
15	0,138	0,125	0,038	0,050	0,138	0,113	0,163	0,138	0,013	0,088
16	0,168	0,148	0,060	0,040	0,027	0,154	0,228	0,087	0,027	0,060
19	0,288	0,081	0,054	0,000	0,036	0,243	0,126	0,072	0,063	0,036
21	0,202	0,135	0,079	0,056	0,022	0,124	0,169	0,135	0,056	0,022
22	0,178	0,109	0,069	0,010	0,059	0,238	0,109	0,079	0,069	0,079
24	0,271	0,149	0,048	0,005	0,032	0,213	0,144	0,064	0,032	0,043
26	0,211	0,105	0,060	0,023	0,015	0,211	0,211	0,105	0,038	0,023
27	0,267	0,148	0,140	0,026	0,021	0,106	0,159	0,048	0,053	0,032
31	0,291	0,162	0,054	0,014	0,068	0,176	0,088	0,081	0,041	0,027
32	0,196	0,092	0,071	0,033	0,033	0,272	0,136	0,092	0,043	0,033
33	0,172	0,131	0,051	0,030	0,091	0,141	0,182	0,061	0,061	0,081
34	0,234	0,158	0,032	0,032	0,032	0,177	0,158	0,101	0,038	0,038
35	0,183	0,151	0,048	0,040	0,048	0,175	0,183	0,087	0,056	0,032
36	0,218	0,134	0,028	0,021	0,092	0,232	0,099	0,049	0,056	0,070
37	0,225	0,184	0,022	0,136	0,030	0,104	0,070	0,033	0,026	0,166
39	0,205	0,165	0,087	0,016	0,079	0,134	0,094	0,079	0,047	0,094

Table A I.5 Regularity of Contributions: MHOs of Thies Region

MHO identification number	Proportion (%) of members who report paying		
	Regularly	Frequently	Rarely
1	87,5	0,0	12,5
2	87,5	0,0	12,5
3	33,3	0,0	0,0
4	33,3	8,3	0,0
5	75,0	8,3	8,3
7	57,1	7,1	28,6
9	78,9	15,8	5,3
10	82,4	5,9	5,9
12	64,3	7,1	21,4
13	55,6	33,3	11,1
14	88,9	11,1	0,0
15	64,7	17,6	5,9
16	66,7	13,3	20,0
19	66,7	0,0	22,2
21	23,5	11,8	64,7
22	25,0	25,0	50,0
24	80,0	20,0	0,0
26	78,6	0,0	21,4
27	64,3	14,3	14,3
31	63,2	26,3	5,3
32	68,4	26,3	5,3
33	61,1	22,2	5,6
34	33,3	33,3	20,0
35	77,8	11,1	5,6
36	71,4	28,6	0,0
37	88,9	11,1	0,0
39	72,2	11,1	5,6

Annex B: Additional Regression Analysis Results

Table B.1 Regression Results: Utilization of Curative Care – Health Care Provider Choice

$Y_{ij} = 1, 2, 3$ if modern health care provider is respectively ‘hospital’, ‘health centers and posts’, or ‘private clinics and physicians’

= 0, no care or traditional care.

$$\ln[\text{Prob}(Y_{ij} = 1) / \text{Prob}(Y_{ij} = 0)] = \alpha_j + \beta X_i$$

(Sample : 376 individuals who reported an illness in the last two weeks)

	Hospital			Health Centers and Posts			Private Clinics and Physicians		
	b	Exp(b)	Sig.	b	exp(b)	Sig.	B	exp(b)	Sig.
Intercept	-0.3152		0.6172	-2.4741		0.0091	-3.6923		0.0147
Perception of severity of illness (base=Not severe)									
Severe	0.1810	1.1984	0.5566	0.2498	1.2838	0.5871	-0.3023	0.7391	0.6279
Very Severe	0.3092	1.3624	0.4469	1.0756	2.9317	0.0432	-1.0609	0.3462	0.3316
Age of the sick (base: 5 years and above)									
Less than 5 years of age	0.7770	2.1750	0.0432	-0.5629	0.5696	0.3835	0.6567	1.9283	0.3944
Sex of the sick (base: Male)									
Female	0.0605	1.0624	0.8281	-0.5116	0.5995	0.2060	0.6633	1.9411	0.3330
Ethnic group of head of household (base: Others)									
Wolof	-0.4802	0.6187	0.4465	-1.7237	0.1784	0.0411	-3.1850	0.0414	0.0039
Serer	-0.2629	0.7688	0.6767	-1.5882	0.2043	0.0545	-3.2422	0.0391	0.0030
Poular	-0.4919	0.6115	0.4904	-1.0394	0.3537	0.2399	-3.6588	0.0258	0.0103
Religious group of HH (base: Others)									
Mourid	0.7954	2.2153	0.2173	1.4051	4.0758	0.1140	3.5931	36.3454	0.0051
Tidjan	0.7328	2.0809	0.2419	1.2269	3.4106	0.1594	3.8869	48.7575	0.0022
Christian	0.3635	1.4384	0.5940	1.4029	4.0669	0.1506	4.0600	57.9741	0.0034
Level of education of HH (base: No schooling)									
Primary	-0.2911	0.7475	0.4082	-0.1933	0.8242	0.7029	-0.8337	0.4344	0.2850
Secondary +	-0.6623	0.5157	0.1214	-0.1428	0.8669	0.8151	-1.8439	0.1582	0.0779
Occupation of HH (base: Not occupied)									
Agriculture	0.2890	1.3351	0.4607	-0.2718	0.7620	0.6912	-0.6941	0.4995	0.5958
Commerce/trade	-0.4272	0.6523	0.3095	0.3487	1.4172	0.5261	1.1863	3.2750	0.1287

Administration	1.3884	4.0085	0.0552	1.3091	3.7027	0.1463	3.1234	22.7231	0.0149	
Economic status of household (base: Poorest 20%)										
Middle-poor 20%	0.8857	2.4246	0.0270	1.1609	3.1929	0.0616	0.5156	1.6746	0.5962	
Middle 20%	1.2710	3.5645	0.0023	0.8708	2.3887	0.1875	-0.8577	0.4241	0.4378	
Middle-rich 20%	0.7372	2.0900	0.0986	0.9000	2.4597	0.1799	-1.5252	0.2176	0.2330	
Richest 20%	1.5506	4.7144	0.0037	1.9572	7.0798	0.0080	2.1490	8.5762	0.0302	
Department (base: Mbour)										
Thies	0.7716	2.1633	0.0198	0.2323	1.2615	0.6077	1.5896	4.9015	0.0890	
Tivaouane	-1.0344	0.3554	0.0010	0.2168	1.2421	0.6162	1.6446	5.1788	0.0406	
Type of residence (base: Rural)										
Urban	-0.6065	0.5453	0.1349	0.9270	2.5268	0.1361	-1.2021	0.3006	0.1298	
Availability of health facility (Yes)	-0.2284	0.7958	0.6329	0.6601	1.9350	0.3820	-3.2809	0.0376	0.0160	
Covered by MHO (yes)	-1.0049	0.3661	0.0299	0.0424	1.0433	0.9423	-3.6345	0.0264	0.0255	
Service included in the MHO benefit package										
Consultation	0.7580	2.1340	0.0991	-1.0919	0.3356	0.1066	3.5990	36.5600	0.0234	
Essential drugs	0.1422	1.1528	0.7521	0.5301	1.6990	0.4370	-4.7026	0.0091	0.0065	
Lab exams	0.5480	1.7298	0.2344	-0.3221	0.7246	0.6736	2.7841	16.1859	0.0244	