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Utilization, Cost, and Financing of District Health Services in Rwanda

March 2001

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Mission

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- *better informed and more participatory policy processes in health sector reform;*
- *more equitable and sustainable health financing systems;*
- *improved incentives within health systems to encourage agents to use and deliver efficient and quality health services; and*
- *enhanced organization and management of health care systems and institutions to support specific health sector reforms.*

PHR advances knowledge and methodologies to develop, implement, and monitor health reforms and their impact, and promotes the exchange of information on critical health reform issues.

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Abstract

Growing concerns over rising poverty and the sharp drop in demand for health services during the post-genocide period motivated the Rwandan government to seek innovative ways to assure access to quality health care. The Ministry of Health (MOH) decided to look for local, alternative methods of financing health care by pilot testing prepayment schemes in three of the country's 40 health districts. The MOH spearheaded the design of the scheme and encouraged a highly participatory process. A steering committee, headed by the Director of Health Care and including government and civil society representatives from the central and regional levels, was established to coordinate the activities. The 54 prepayment schemes, each affiliated to a health center and managed by the scheme members, enrolled more than 88,000 members during their first year, and continue to do so. A quasi-experimental design was used to evaluate the schemes' impact on the MOH objectives to improve quality of care, strengthen community participation, improve health facilities' financial sustainability, and at the same time improve the population's financial accessibility to care. This report presents the schemes' impact on utilization, cost, and finances of district health care services. First year results show that prepayment scheme members use curative and preventive care services considerably more often than nonmembers. As a result, prepayment has improved members' access to care and providers' productivity. Cost analysis in health centers has shown that members' report lower average personnel and drug cost due to faster access to care. The schemes' capitation provider payment motivates health centers to use their limited resources rationally. Due to their annually prepaid premium, members contributed considerably higher per capita to health center care compared to nonmembers. This was possible without deteriorating members' access to curative, maternal, and child care services, whereas nonmembers' utilization indicators continued on their historical downslide. The controlled implementation of well designed prepayment combined with capitation provider payment is an option, which aims to improve the dismal health status of the majority of the population, and that should be available to everyone in Rwanda.

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Acronyms

BCG	Bacille-Calmette-Guerin (vaccine against tuberculosis)
BOD	Burden of Disease
CAMERWA	Centrale d'Achat des Médicaments Essentiels au Rwanda
C-Section	Cesarean Section
CUSP	Centre Universitaire pour la Santé Publique (University Health Center)
DED	*Deutscher Entwicklungsdienst* (German Development Service)
DHS	Demographic Health Survey
DPT	Diphtheria, Pertussis, Typhoid
DSS	*Direction de Soins de Santé* (Directorate of Health Care)
EU	European Union
FFS	Fee-For-Service
GDP	Gross Domestic Product
GNP	Gross National Product
HERA	Health Research for Action
HC	Health Center
MOH	Ministry of Health
MsF	*Médecins sans Frontières* (Doctors without Borders)
NHA	National Health Accounts
ONAPO	*Office National de la Population* (National Population Office)
PHR	Partnerships for Health Reform Project
PPS	Prepayment Schemes
Q	Quintile
RwF	Rwandan Franc
SPP	*Systèmes de Prépaiement* (Prepayment Schemes)
USAID	United States Agency for International Development
WHO	World Health Organization

Nominal Exchange Rate (Source: National Bank of Rwanda)

USD 1$ = RWF 317 (official period average in 1998)

USD 1$ = RWF 335 (official period average in 1999)

USD 1$ = RWF 370 (official period average in 2000)

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Executive Summary

This report is a follow-up paper to the PHR technical report No 45, "Development and Implementation of Prepayment Schemes in Rwanda" (Schneider et al., 2000b), which describes the development and implementation of prepayment schemes in Rwanda and presents preliminary result for the schemes' first six operational months. The following study examines the impact of health care financing by prepayment schemes on utilization, cost, and finances in three Rwandan health districts: Byumba, Kabgayi, and Kabutare. It seeks to describe the effect of the one year prepayment scheme pilot test on the four objectives of the Ministry of Health (MOH). These objectives are to improve the financial accessibility to care, enhance the quality of care in health centers, strengthen the community participation in the organization and management of health services, and reinforce human capacity in financial management of health facilities and prepayment scheme funds.

During their first year of operation (7/99-6/00), the 54 prepayment schemes (PPS) in the three pilot districts have been managed by scheme members elected during the PPS general assemblies. They have enrolled more than 88,000 members. By paying an annual premium of RwF 2,500 per family up to seven members, enrollees are entitled, after a one month waiting period, to a basic health center package covering all services and drugs provided in their preferred health center, ambulance referral to the district hospital, and a limited package at the district hospital. Members pay a co-payment of RwF 100 per episode of care at the health center. PPS reimburse health centers by monthly capitation payment. They forward 5 to 15 percent of their monthly disbursement fund to their district federation, which will reimburse the district hospital a per episode payment for a cesarean section, treatment of malaria and non-surgical pediatric cases, and a fee-for-service payment for physician consultation and overnight stays. The per episode payment covers readmissions related to same case of illness (e.g., caused by an infection during surgery). Thus, on a health center level, members' risk is shared within the PPS community at the health center level, whereas on a hospital level, members' risk is shared on the district level, including all PPS who participate in the district's federation of prepayment.

The development and implementation phase of the pilot tests was supported by four on-going interventions. First, health care providers were trained on the effective use of available financial and medical resources. Second, prepayment schemes were encouraged to give loans to district pharmacies to ensure the availability of drugs in the district, given that health centers are expected to report a higher demand for drugs with a larger membership pool. Third, prepayment scheme bureau members and health center personnel in the three pilot districts attended continuous training sessions before and after the launch of prepayment schemes. These workshops focused on the scheme modalities, provider payment methods, new accounting tools, scheme administration, organizational and financial issues, information and awareness campaigns, and collaboration with different local authorities. The fourth intervention aims to strengthen financial and organizational management capacities on the provider side to help the health centers cope with changes with the health financing reform through prepayment and capitation payment.

First Year Results of Prepayment Schemes

The one year performance of prepayment is measured and analyzed under a quasi-experimental design with qualitative and quantitative data gathered from households, stakeholders, and patients. In

addition, monthly quantitative data from health centers, hospitals, and prepayment scheme bureaus in the three pilot districts (Kabtuare, Byumba, Kabgayi), and in two control districts (Kibungo and Bugesera) are collected and analyzed. This paper examines the routine data collected in all health facilities in the five districts the year before and since the launch of prepayment schemes, and explores the differences in health care utilization, cost, and finances over time, and between members and nonmembers.

PPS are evaluated on how well they achieve the MOH objectives to improve the financial accessibility to care, the quality of health services, the community participation in the schemes, and the financial viability of health facilities. The fourth goal requires mobilization of additional financial resources and increased provider productivity to sustain the recovery of recurrent costs in health centers. Discussions during the preliminary evaluation workshop in March 2000 and during the final workshop in September 2000 provided the MOH the necessary information base to strengthen the schemes' current implementation phase and to respond to other regions in Rwanda which would like to launch PPS.

Utilization and Access to Health Care

Prepayment scheme members have shown considerably better financial accessibility to health care than have nonmembers. While utilization rates for patients have declined in each district, new case consultations for PPS members were up to five times higher than for nonmembers. On average, PPS members visited health centers more often, reporting annualized rates of about 1.2 new case consultations in Byumba, 1.5 consultations in Kabutare, and roughly 1.6 in Kabgayi. By contrast, annual consultation rates for nonmembers were at only .2 per capita in the pilot and the two control districts Kibungo and Bugesera. Byumba, and Kabgayi, with larger membership pools, have reported 50 percent increases in child vaccination, 25 percent in prenatal care, and 45 percent more assisted deliveries in health centers. PPS had a particularly strong effect on increasing members' utilization levels in previously low, and medium performance health centers. Prepayment has helped to eliminate the gap in the population's demand for health care services that existed before the reform. Thus, members' higher service utilization shows that the MOH goal of improving the population's financial accessibility to care has been attained.

Cost of Health Care

The general decline in consultations before the reform has left many health centers with idle capacity and declining patient revenues, causing lower productivity and revenue levels. Costs were analyzed for health centers' members and nonmembers according to the variable costs that each group incurred, by accounting for their occurred variable costs and distributing fixed costs proportionally, by member and nonmember utilization of services (based on number of curative and preventive care consultations and lab tests). With members' service utilization increasing, health centers reported lower average fixed costs for members compared to nonmembers. In this sense, personnel productivity had improved. Health center personnel reported that PPS members seek care earlier and need fewer drugs per visit than nonmembers, who usually spend several days seeking money with family and friends to pay the relatively high user charges. By adding more members to the pool, prepayment enhances the overall rational use of limited health care resources such as personnel and drugs. Prepayment combined with capitation payment encourages members to increase their demand for health services and health centers to provide more preventive care services to keep members healthy and to constrain service caused by members' frivolous use. As a result, health facility productivity has improved.

Finances of Health Care Services

Before they contracted with PPS, health centers had three main revenue sources: patients' out-of-pocket payments, donor funds, and government subsidies, the last mainly in the form of salary payments to government employees working in facilities. Prepayment scheme revenue as a fourth source was added during the pilot phase for health centers which were affiliated with the schemes. Per capita contributions from members to health centers were up to five times higher than from nonmembers. In the district of Byumba, where 10 percent of the population had enrolled in the schemes, the overall increase in health centers' financial resources during the pilot year is the direct result of additional resources from the PPS. Generally, the degree to which health centers could improve their cost recovery ratio and financial sustainability for their member and non member line of business depended on their fixed cost structure and productivity, the extent to which patients used health care services, and the prices charged to nonmembers. Health centers with low PPS enrollment rates, which continued depending on nonmembers' declining revenue from fee-for-service payments and at the same time maintained their fixed cost structure, could cover less of their costs with patient revenue. Thus, PPS have contributed to the MOH objective to improve the financial sustainability in health facilities-without limiting the population's financial accessibilty to care.

During its monthly meetings, the MOH steering committee in charge of the controlled development and implementation process of PPS discussed and analyzed the routine data collected in health facilities and prepayment schemes. During district meetings, health facility and prepayment managers received regular feedback on their monthly utilization, financial, and membership situation, helping them to recognize the need for data collection, which has subsequently improved. The participants have learned to apply the information received in successfully managing the use, cost and finances of health services and in managing membership and finances in prepayment scheme.

Policy Relevance of Prepayment Schemes Key Findings

A number of important lessons have been generated in the initial year of the pilot schemes and contribute important relevance to Rwanda's health sector policy, which is currently being revised.

First, the schemes have demonstrated community participation and the willingness to prepay for care of an important segment of the low-income population if certain conditions are fulfilled. These are: quality of care, financial trustworthiness of scheme managers, strong degree of community solidarity, and the "right" incentives to increase enrollment rates but at the same time limit moral hazard and adverse selection (e.g., affordable premiums and co-payments, provider capitation payment), and provider cost are kept from escalating. The long-term sustainability of prepayment schemes in Rwanda requires the government's political support, strong leadership among scheme managers and health administrators, and technical assistance in supporting their implementation in other districts.

Second, prepayment schemes have proven to ensure finances and regularity of funding for health facilities and at the same time improve a low-income population's financial accessibility to care, thereby contributing to utilization, quality, and productivity improvements. As the pilot experience has shown, this will depend on sustained membership growth, and discouraging over-use of health services caused by members' moral hazard and adverse selection.

Third, the schemes are not to be seen as a justification for government disengagement in financing health care. On the contrary, PPS schemes can be effectively used as a mechanism for improving equity in access to care by targeting the poor through subsidizing their demand for care.

The Rwandan government and donors could assume financial responsibility for membership of vulnerable groups by paying their premiums at a higher level, and thereby providing incentives to providers to continue to accept higher cost patients, such as sero-positive community members.

Fourth, the introduction of the PPS had some positive secondary effects on the community's socio-political life and the current democratization process in Rwanda. Among these are greater local participation and empowerment of consumers in issues related to health care. Schemes with large membership pools who met in general assemblies have become important interest groups in the communities, and contributed to adding "health" on the political agenda. In a post-genocide society where the social fabric was seriously destroyed, the introduction of these risk sharing plans has the potential to rebuild trust and support the democratic processes.

The findings of this study support the MOH plan to scale-up prepayment to all districts in Rwanda where this is wished by the population and providers. A final synthesis report to be presented to the MOH and USAID will contain recommendations on the strengthening of the current schemes in the pilot districts and on the MOH plan to scale-up PPS nationwide to facilitate equal access to care to Rwanda's rural poor.

1. Introduction

1.1 Performance of Health Sector in Rwanda

Rwanda is one of the poorest countries in the world, with an unsustainable external debt burden of about 34 percent of Gross National Product (GNP), which corresponded to 520 percent of the total country exports in 1999. Since 1994, Rwanda's economy has been recovering due to the massive influx of foreign monies, as a result of being treated as a special case for exceptional international assistance, to help overcome the legacies of the genocide in 1994, and make the transition to peace and development (World Bank, 2000a). In 1997, about 70 percent of Rwanda's population of eight million lived below poverty, up from 53 percent in 1993 (World Bank, 1998). Rwanda has been classified as a heavily indebted poor country and has currently entered the assessment cycle of the International Development Association and the International Monetary Fund to receive debt relief and reduce the poverty level in the country. The Rwandan government has declared the reduction of poverty as the central economic and social policy. The implementation of a poverty reduction strategy needs a healthy population, that is able to attend educational training and to be productive and rewarded in the economic cycle.

Table 1.1 shows Rwanda's per capita GNP for 1999 is estimate at US$250, which is low even by sub-Saharan standards. Real GNP growth rate in 1998 reached almost 5 percent, and the average annual growth projection is estimated to remain on that level for the next four years. Rwanda is densely populated, leaving little space for the mainly rural population (90 percent) to cultivate their fields. Despite the progress achieved in economic reconstruction and national reconciliation since 1994, social indicators score below sub-Saharan averages. Rwanda reports lower life expectancy and higher mortality rates for women, children under five, and babies, compared to the average of other sub-Saharan countries.

The lack of trained personnel in the medical and financial sector is a serious constraint in Rwanda. In 1998, Rwanda counted one physician per 66,000 inhabitants, one nurse for 9,500 people and one hospital bed per 1,700 people. In 1998, Rwanda's National Health Accounts (NHA) showed total health expenditures of US$12.7 per capita. This level is comparable to neighboring countries. The Rwandan health sector is largely financed by international assistance (50 percent) and private sources (40 percent), leaving the government to finance the remaining 10 percent. NHA findings show, while health centers offer care to the majority of the population, only 11 percent of total health monies were spent on this primary care level.

Table 1.1: Selected Economic, Demographic, and Health Indicators in Rwanda and sub-Saharan Region

Indicator	Rwanda	Sub-Saharan Africa
Economic Output and Growth		
GNP per capita, 1999 (US$)	250	500
Average Annual Growth Rate in GNP per capita (%, 1998-99)	4.8	-0.3
Population and Fertility		
Population, 1999 (millions)	8	642
Population Density per square km, 1999	337	27
Total Fertility Rate, 1998	6.1	5.4
Health Indicators		
Life Expectancy at Birth, 1998		
Males, years	40	49
Females, years	42	52
Adult Female Mortality Rate, 1998 (ages 15-59)	527	383
Under-5 Mortality Rate, 1998 (per 1,000)	205	151
Infant Mortality Rate, 1998 (per 1,000 live births)	123	92
Health Expenditures		
Total per capita Health Expenditure, 1998 (US$, official exchange rate)	12.7	33
Foreign Assistance for Health per capita, 1990 (US$)	6.4	2.5
Health Expenditures as Percentage of GDP, 1998		
Total	5	3.2
Public Sector (sub-Saharan Africa for Most Recent Year)	0.5	1.5

(Source: World Bank,2000c, World Bank 2000b, National Health Accounts Rwanda 1998)

Preliminary year 2000 Demographic Health Survey results for the prefecture of the city of Kigali reveal that 68 percent of births, by mothers living in urban areas, take place in health facilities. Assisted deliveries in health centers, identification of high-risk pregnancies, and tetanus vaccinations before delivery affect mother and child health and – for the country overall – maternal and infant mortality rates. Women who deliver in health centers report better health status than those who deliver without professional assistance. In 1996, user fees were re-introduced in the public sector, which caused utilization of health center services to drop from 0.3 curative consultations per capita in 1997 to a national average of 0.25 curative consultations per capita per year in 1999.

Consequently, the Ministry of Health (MOH) has identified the financial accessibility of health services to be a key problem that needs improvement by changing the health care financing mechanism. The MOH selected prepayment for health services as the policy to be developed and implemented aiming to reach the MOH four objectives: first, to improve the population's financial accessibility to care, second, to enhance the quality of care in health centers, third, to strengthen the community participation in the organization and management of health services, and fourth, to reinforce human capacity in financial management of health facilities and prepayment scheme (PPS) funds.

This study aims to provide information to the MOH on the extent to which prepayment for health services has achieved the MOH main objectives during the one year pilot phase. This report follows a previous report by analyzing provider and prepayment routine data, the scheme performance during the pilot year, and its impact on utilization, cost, and finances in health centers and district hospitals in three pilot districts(Byumba, Kabgayi, Kabutare), compared to the two control health districts (Kibungo, Bugesera), where patients pay at the time of service use (Schneider, et al., 2000b).

The second section in this report describes the methodology used. The third section presents results of the analysis on utilization, cost, and finances of district health services. Patients' service and drug utilization will help to analyze the first and second objectives to improve financial accessibility and quality of care, which are expected to lead to improved health status. Information on cost and finances will support analysis on the extent to which the financial sustainability in health centers was impacted by prepayment schemes, responding to the MOH third and fourth objectives. Key findings and their policy relevance are summarized in section four. These key findings will lead to a final synthesis report evaluating the overall results of PPS in Rwanda based on the different data sources and providing recommendations for a nationwide health care financing reform.

1.2 Study Goals and Objectives

The evaluation plan designs the analysis to measure the achievements of the MOH objectives by the one year PPS pilot test, to improve the financial accessibility to care, to enhance the quality of care in health centers, to strengthen the community participation in the organization and management of health services, and to reinforce human capacity in financial management of health facilities and prepayment scheme funds. The objective of this report is to evaluate the extent to which prepayment has contributed to these four MOH objectives, by focusing on the districts' utilization, cost, and finances of health services.

1.3 Role of This Study Within the Prepayment Scheme Agenda

This report is part of a set of several reports describing various aspects of PPS and their impact on district health care services in Rwanda. As noted above, it expands upon an earlier report on the development and implementation of prepayment schemes in Rwanda. This report presents utilization, cost, and financing results as designed in the evaluation plan, based on data collected over a two year period in control and pilot health facilities. Additional reports are written on the household survey, two focus group surveys, a patient exit interview survey, and a provider market analysis. Findings of all these reports will be integrated in a final synthesis report with policy recommendations to the MOH on the institutionalization and scale-up of prepayment schemes, on health care financing and on service delivery issues in Rwanda.

1.4 Background on Prepayment Schemes in Rwanda

In 1998, two years after the re-introduction of user fees in public health facilities, the Rwandan MOH expressed concerns about low utilization rates in district health centers and hospitals. As a consequence, improving the financial accessibility to quality care for the low-income population became one of the main objectives of the MOH. The MOH and USAID Kigali invited the

Partnerships for Health Reform Project (PHR) to assess the feasibility of changing the population's health financing modality from primarily patients' out-of-pocket payments to a community-based risk-sharing module with prepayment. PHR responded to the MOH plan to develop and pilot test in close community participation PPS in three Rwandan health districts. Based on the evaluation of the schemes' contribution to the MOH overall objectives, policy recommendations should be suggested considering a nationwide scale-up of the reform

1.4.1 Organizational Structure

In early 1999, the MOH set up an organizational structure, first on the central and second on the district level to develop and implement the schemes. This structure included on the central level the PPS steering committee, and on the district level community meetings with representatives from the health, political, administrative and church sectors. The steering committee was presided over by the Directorate of Health Care (*Direction de Soins de Santé*, DSS). It included stakeholders from the health regions, pilot and control districts, and international organizations working in the three districts' health sector. The committee had a strategic role in the schemes' development, implementation and monitoring of monthly enrollment, and provider results. In February 1999, a first workshop on PPS was held in Bethesda, Maryland with representatives from the steering committee and the former and the new ministers of health attending. As a result, the MOH strategy to develop and implement prepayment in three Rwandan districts was outlined.

Following the Bethesda workshop, the MOH steering committee selected three health districts, Kabutare, Kabgayi, and Byumba, to participate in the pilot test. Selection criteria for the three districts were availability of a functioning district hospital and health centers, political will of the district management team to launch prepayment for health care and the interest of the population in participating in the development and management of a solidarity fund to prepay for health care. For comparison, two districts without any mutual health experience, Kibungo and Bugesera, were selected to evaluate the schemes' impact on districts' health services during the one year pilot phase.

Between April and June 1999, the district level stakeholders from the health and administrative sector met several times during one-day community workshops, to discuss and agree upon the schemes modalities and management features. The districts' health authorities, MOH, and PHR organized the district workshops. Each workshop averaged about 80 attendees including men and women from professional groups such as nurses, mayors, teachers and farmers representing their communities. Their discussion results were forwarded to the central steering committee and integrated into the scheme bylaws and contractual agreement with the affiliated providers. These documents have been accepted by the schemes' general assembly in each pilot district and signed by their representatives before implementation in June 1999. This entire development and implementation process of prepayment schemes in the pilot district has enhanced community participation leading to sustainability in the prepayment schemes.

Organizationally, each health center in the three districts became the partner of one prepayment scheme. A contractual agreement regulates the relationship between the two partners, describing their rights and duties. On July 1, 1999, Rwanda's 52 prepayment schemes in the three pilot districts were constituted and ready to accept members. Two additional schemes/health centers were added during the pilot year in the three districts, bringing the number of schemes up to 54, each affiliated with one health center. Members enroll in the scheme which partners with their preferred health center by selecting one of three enrollment categories: households of up to seven members, individual membership, and group enrollment of eight and more people. Following the Rwandan law, the schemes are mutual health associations, headed by an executive bureau with four volunteers, elected

by and from among the scheme members during a general assembly. Initially in July 1999, the schemes started with an executive bureau constituted by local representatives that have been elected to the local parliament by the population during Rwanda's first election on a sector and cell level in April 1999. By September 1999, all PPS executive bureaus had invited their members to a PPS general assembly where members elected among themselves the representatives for their executive bureau. On a district level, the schemes have federated. The PPS federation committee comprises five members who have been elected in a general assembly of all district PPS executive bureau representatives. The federation is the partner to the district hospital as well as to the health district and other authorities.

Table 1.2 summarizes the benefit package as selected during the district level community workshops and the enrollment categories. All preventive and curative services provided in health centers and drugs on the MOH essential drug list are covered in the member's "preferred" health center, including the ambulance transport to the district hospital. With a health center referral, members also receive a limited package at the district hospital. Health centers play a gatekeeper function to discourage the inappropriate use of hospital services. For example, the MOH encourages women to deliver in health centers, thus normal deliveries are excluded from coverage if they take place in the hospital. To discourage members from moral hazard behavior, sick members pay a co-payment of 100 RwF (US$0.3) for each visit at the health center. At the hospital, members pay out-of-pocket for the non-covered services.

District workshop participants decided to select a provider payment mechanism within the scheme that would set financial incentives to encourage providers to improve their productivity and the quality of care. Consequently, workshop participants voted for capitation payment to health centers whereas hospitals are reimbursed on a per episode level.

Since July 1999, PPS in the three districts have started to enroll members, who benefit from services once their one month waiting period was over. Membership is for one year and members pay a premium at the beginning to their membership year. Members have the option to sign up as a family with up to seven members, which costs RwF 2,500 (US$7.6) per family per year. Members regularly implemented their democratic rights and duties and met for the schemes' general assemblies. The average number of general assemblies per PPS was three during the first year. Members discussed questions and issues related to their membership's rights and duties and to health service delivery. Elections were held during general assemblies and the financial results were presented (see PHR, July 2000)Providers used the opportunity to teach members about preventive care measures, such as the use of mosquito nets.

Table 1.2: PPS Benefit Package, Enrollment Categories and Annual Premium

Package	Byumba	Kabgayi	Kabutare
Health Centers	Services covered during each visit: Preventive and curative care by nurses Drugs on essential drug list Hospitalization at health center Ambulance transfer to district hospital	Same as Byumba	Same as Byumba
District Hospital	Covered with health center referral: Consultation with physician Overnight stay Cesarean Section	Covered with health center referral, full treatment per episode: Pediatric cases (<5 years) Malaria cases (>5years) Cesarean Section	Same as Byumba
Enrollment Categories and Annual Premium	Individual: RwF 2,000 Household: RwF 2,500 up to 7 people; if 8+ persons: RwF 530 for each additional person Groups (with 8+ people): RwF 530 per person	Individual: RwF 2,200. Household: RwF 2,600 up to 7 people; if 8+ persons: RwF 550 for each additional person Groups (with 8+ people): RwF 550 per person	Same as Byumba

An awareness campaign supporting the development and implementation phase, informed the population regularly about PPS, and invited the inhabitants in the three districts to enroll with their preferred PPS/health center. The MOH and the local health, administrative and church authorities in collaboration with PHR have been informed about PPS during local community meetings, on the national radio and television, in newspapers, and during the Sunday church services.

1.4.2 Information Monitoring Process

During the one year pilot phase, the PPS bureaus, health centers and hospitals collected monthly information on enrollment, service utilization, cost, and finances for members and nonmembers. This information was analyzed by PHR and discussed during regular monthly steering committee meetings with the MOH and donors, and during district workshops with prepayment scheme and health facility managers. Based on the information received, the steering committee was entitled to implement eventual changes in the PPS modalities. To enhance competition between the 54 schemes/health center teams, monthly information was sent to all 54 PPS / health centers ranking them according to their overall performance and in comparison with all PPS / health centers. Health centers and their affiliated PPS used the information received to inform members during general assembly about their premium fund and service use. During these PPS member meetings, members were encouraged to use care moderately and to comment on their experience with care received at the health center.

A workshop with preliminary results was held in Kigali in March 2000 and a workshop with final results in September 2000. The purpose of both workshops was to present performance results of

health facilities and affiliated prepayment schemes in the three districts, and to develop plans to strengthen the PPS implementation process. During the preliminary workshop, a regional committee was created in each pilot district with members from the regional administrative and political authorities to support the awareness campaigns in the districts and encourage the population to enroll. The final workshop concluded with recommendations to strengthen the process in the three districts and to institutionalize and support a nationwide scale-up of prepayment schemes.

1.4.3 Prices Paid by Prepayment Schemes and Uninsured Patients

In 1996, health facilities re-introduced user fees on a level comparable to pre-war and as a result patient revenue became the health centers' main financial resource. With government sources low and declining donor support in 1996/97, health centers raise their patient's fees to maintain their total revenue and cost level instead of decreasing costs and improving their productivity. As a result, consultation rates and service utilization in health centers decreased. Health centers are excluded from financial audits and there is limited competition among public and church owned centers. When a population is poor and rural, patients react to price increases by seeking outside care or self treatment. Thus, health services' strong price elasticity has a direct impact on the poor population's access to health care and health status.

1.4.3.1 Prices in Health Centers

Health centers are supposed to set prices for drugs and services following the prices recommended by the MOH and the district medical authorities. However, there is no financial audit system within the Rwandan health sector that monitors the financial situation in health centers and hospitals.

Table 1.3 presents prices in health centers for the most frequent services as observed in 1999 and 2000. Price lists in health centers are usually visible for the patients. Due to the absence of a financial auditing system, health facilities charge prices at their discretion. For example, several health centers charge the higher weekend consultation prices (RwF 250) on weekdays and after three o'clock in the afternoon, whereas other health centers cash prenatal consultation fees without informing the pregnant woman that the price paid entitles her to three visits. Also, most health centers add considerably more than 5 percent as a mark up to the drug price paid at the district pharmacy, generating important benefits from drug sales. The prices presented (lower end) in Table 1.3 have been used to calculate health centers' capitation payment and members' premium.

Table 1.3: Prices in Health Centers in Pilot and Control Districts (RwF), 1999/2000

Service Provided at Health Center	Price Ranges per Service in Health Centers, Five Districts
Curative Consultation, first visit, weekdays	80-250 RwF
Curative Consultation, follow-up visit	80-200 RwF
Prenatal Consultation, all 3 visits	100-300 RwF
Delivery, normal	400-600 RwF
Overnight stay, per night	50-100 RwF
Drugs on MOH essential drug list	District pharmacy price + (5%-100%)

Patients who are not members of PPS pay a price for each service and drug received at the health center. Some uncertainty remains about the final bill, as patients mainly in public health centers have to pay additional payments "under the counter" to the health center staff (HERA, 1999). Thus, the prices paid by patients are higher compared to the prices presented in Table 1.3.

PPS reimburse health centers by a monthly capitation payment, which depends on the number of members who have signed up with the scheme. Under capitation arrangements, prices have been negotiated initially and become less important for members and the schemes. With capitation payment, the health center will still try to increase profits. However, because prices have been set in a contract, health centers will try to influence other components, such as decreasing fixed cost levels and moral hazard behavior of members increasing the number of members enrolled with the partner prepayment scheme, or decreasing the number of services provided to sick members. Also, members are more likely to complain during the PPS general assembly if they are required to pay under the counter payments, knowing that they only have to pay the 100 RwF co-payment per visit.

1.4.3.2 Prices in District Hospitals

Hospitals charge user fees to their non member patients. District hospitals in Rwanda have set prices based on their estimated costs, on their other revenue sources (donors and government) and on neighboring hospitals' prices. Per episode and fee-for-service prices paid by the prepayment federation have been negotiated initially between the hospitals and the steering committee by applying hospitals' historical user charges. The prepayment federation paid Kabgayi hospital a per episode rate for the full treatments covered (malaria, cesarean section, and children up to 5 years). They also paid Byumba and Kabutare hospital a per episode payment for cesarean sections and fees for overnight stays and physician consultations. Table 1.4 shows the fee-for-service and per episode prices paid by the federation and nonmember patients to the three district hospitals. Members continue to pay out-of-pocket fees for all hospital services and treatments that are not covered by the PPS.

Table 1.4: Hospital Prices Paid by the Federation and Non member Patients (RwF)

Service / Episode	Pilot Districts					
	Byumba		Kabgayi		Kabutare	
	Members	Non-memb	Members	Non-memb	Members	Non-memb
Overnight Stay, per night						
Before PPS	100	100	per service	per service	100	100
Since PPS	100	100	per service	per service	100	100
Physician Consultation, per consultation						
Before PPS	200	200	per service	per service	200	200
Since PPS	200	200	per service	per service	200	200
Cesarean Section, per episode of illness						
Since PPS	12,000	per service	20,000	per service	12,000	per service
Malaria, per episode, patient age >5years						
Since PPS	per service	per service	5,000	per service	per service	per service
Pediatrics, per episode, patient age up to 5 years						
Since PPS	per service	per service	3,000	per service	per service	per service

The following section focuses on the different incentives that have been set with the reform in the financing of district health care in Rwanda by adding prepayment as a financing option. It is of interest to know how these incentives inherent in the systems, interact, and what effects they cause.

1.4.4 Incentives Set by Prepayment

The different modalities in the design of PPS has caused several incentives to providers, members and prepayment scheme managers. The schemes are managed by the community, and they reimburse health centers with a capitation payment that includes a quality bonus. These effects create adverse and beneficial incentives that motivate the consumers and providers to behave in a certain way. This section provides an overview of the different effects, namely prepayment schemes, community participation, capitation payment and quality bonus, and the adverse and beneficial incentives they have created. Results presented in Table 3.1-3.3 will be compared with expected outcomes caused by the incentives of the insurance effect, capitation payment, capitation quality bonus and consumer choice.

1.4.4.1 Insurance Effect

The insurance effect causes two main adverse incentives on consumers: moral hazard and adverse selection by members. Moral hazard means that members of an insurance scheme are more likely to use health care as long as they are not financially limited by a co-payment or a maximum coverage amount. Adverse selection by members causes people to enroll who know that their health is fragile and who anticipate a need for treatment within a certain period of time. Adverse selection among enrollees affects the risk distribution in a membership pool mostly at the beginning when the plan counts few members. Both incentives caused by the insurance effect cause members' utilization of curative services to be higher than nonmembers' and the overall cost of health care services to rise. In addition to these two incentives, a poor population that has been under-served with health services when their access to care was limited by their ability to pay user fees will immediately use health care once insured.

1.4.4.2 Capitation Payment

Health centers are paid by PPS a monthly capitation payment per PPS member, regardless of the amount of health care services actually rendered to the patients. Capitation payment involves health centers in sharing the risk of health care costs. When health centers manage the health needs of their members from their capitation budget, their remuneration may fluctuate according to the type and level of care provided and drugs prescribed. Thus, the beneficial incentives of capitation payment will trigger health centers to increase revenue by attracting more members to their partner scheme, and at the same time to contain their costs in order to maximize income. Larger membership pools can be achieved by a better health center reputation for improved quality of care. A cost containment strategy will lead health centers to use cost-reducing standard treatment protocols and prescribe drugs from the MOH recommended essential drug list, as well as to keep members in good health and provide them with more preventive care services (see Schneider et al., 2000b, section 3.2.4.1)

The adverse incentive of capitation payment causes health centers to limit the number of curative services provided to member patients and to refer patients to the hospital for treatment. This will decrease members' curative utilization, and affect negatively the health centers' quality of care and reputation. Depending on the health center's attitude, this adverse capitation effect may be neutralized

by the beneficial capitation incentive and the above insurance effect (moral hazard and accumulated demand).

Compared to fee-for-service reimbursement which requires the organizational set-up of a provider claims reimbursement system, capitation payment is easier and at considerably lower costs to administer for prepayment scheme managers.

1.4.4.3 Capitation Quality Bonus

Health centers' overall capitation rate was divided into two equal parts:

> Base payment (50 percent of total capitation amount), which was fully paid to health centers at the beginning of each month, and

> Quality payment, depending on the centers' performance of care.

Table 1.5 presents the criteria and indicators used to define on a quarterly base the health centers' quality payment. The quality payment creates a financial incentive to health centers to improve their performance in conjunction with drug inventory, preventive and curative care utilization, health promotion and administrative collaboration including data collection (See section 3.2.4.1 in Schneider, et al., 200b).

Table 1.5: Quality Payment Criteria and Indicators

Quality Payment Criteria	Indicator
Availability of Drugs at Health Centers	Number of days health center is out of stock of 9 essential drugs
Utilization of Preventive Care Services	Vaccination coverage among all patients
	Prenatal coverage among all patients
Utilization of Curative Care Services	Consultation rate at health centers among members
	Health center deliveries as a ratio of prenatal care consultations
	Risk pregnancies referred to hospital as a ratio of prenatal care consultations
Health Promotion in Health Centers	Number of public meetings on STDs and AIDS offered
Administrative Collaboration	Participation rate in Health Information System reporting
	Rate of correctly filled in patient register summaries submitted

(Source: Schneider et al., 2000b)

Health centers are ranked into five performance groups based on their quality results. Health centers who rank highest and score full points will receive full quality payment which equals 100 percent of base payment. Each lower classified rank causes a 10 percent payment decrease, resulting in a 60 percent of base payment for the lowest group in the fifth rank. Health centers may pay a quality salary bonus to its staff, depending on the level of quality payment received from PPS (Schneider et al., 2000b) . For example, health centers ranking highest will receive 100 percent quality capitation payment, of which staff will be paid a quality salary mark-up in the amount of ten percent of the quality payment. The staff quality bonus decreases by 2.5 percent per lower quality ranking. Thus, if a health center ranks in the third performance category, the center will receive quality capitation payment, corresponding to 90 percent of base payment.

The staff is entitled to receive a salary quality bonus which is 5 percent of the health centers quality payment. This financial quality incentive should cause health center management to maximize its capitation revenue by providing quality care, and the staff to contribute to the quality objectives in order to increase its remuneration. Quality bonus payments to staff is an alternative to discourage staff members to charge "under the counter fees" to patients.

Quality payment as described in this section has not been introduced in the three districts because the health districts could not guarantee that the payment would continue once the pilot phase ended. However, during the pilot year, the above quality performance indicators were measured quarterly, and the results were communicated to the health center personnel during regular workshops and field trips. This process was transparent to all participating health centers and created a certain competition when comparing their ranking with the others. Health centers were told that their quality results of the past quarter would be used to implement the payment for the next quarter, then the decision was postponed for three months. Thus, health centers performed in the constant anticipation of the quality payment, but were all paid full amounts during the pilot phase. Health centers continued to pay salaries to their staff with their overall revenues, and those with large membership pools started to pay quality bonuses to staff, as their overall monthly capitation amounts became important revenue sources. For example, the health center of Bungwe in Byumba counted at the end of the first year almost 9,000 prepayment scheme members with 24 percent of the community population enrolled. With a growing membership pool, the health center's monthly capitation revenue was larger than the revenue paid by nonmembers' user fees, and as a result, the health center paid a staff bonus and intensified the enrolment strategy.

1.4.4.4 Consumer Choice

Members have the choice to select and enroll with the prepayment scheme affiliated with their preferred health center. Their choice is to a certain extent limited by their possibility to travel when they are sick. Hence, consumers' choice is limited to enroll or not to enroll at their nearest health center, with the exception of those who live in bordering areas of more health centers. Preferably, if consumers enroll in better quality health centers, providers will be motivated to improve quality of care to attract more members and increase their financial revenue. Consumers will continue to require additional information to make their choice.

1.5 Prepayment Scheme Pilot Year Results

This section presents prepayment pilot year results and the incentives that have been introduced to health care providers and consumers with the health care financing reform through prepayment and capitation payment.

1.5.1 Prepayment Scheme Membership

Annex A, Table 1, ranks 52 of the 54 PPS according to their first year enrollment rates. The table also shows per scheme the ownership of the health center, the population in the health center's catchment area and in the affiliated scheme's membership pool. Table 1.6 presents the study sample with the number of PPS per pilot district, their target population and their enrollment results at the end of the first year of operation. Over the year, the 54 bureaus, each affiliated with a health center, have sold membership cards to 88,303 people living in the rural areas in Byumba, Kabutare and Kabgayi, which corresponds to 8 percent of the three districts' population. Prepayment schemes have open enrollment during the entire year, which allows the population to buy their annual membership card at any time and whenever they have the necessary cash amount available to pay the premium.

Table 1.6: Prepayment Schemes in Rwanda, First Year Performance (7/1999-6/2000)

Prepayment Schemes Indicators	Pilot Districts with PPS			
	Byumba	Kabgayi	Kabutare	All 3 Districts
All Prepayment Schemes:				
Total Number of PPS	21	17	16	54
Total Target Population in Districts	459,329	368,020	288,160	1,115,509
Total Population Enrolled in PPS	48,837	21,903	17,563	88,303
Average Number of Members per PPS	2,326	1,288	1,098	1,635
First Year Average PPS Enrollment Rate	10.6%	6.0%	6.1%	7.9%
Prepayment Schemes in Sample:				
Number of PPS in Sample Size	20	17	15	52
Members in Sample Size	48,498	21,903	16,341	86,742

Two health centers, namely University Health Center (*Centre Universitaire pour la Santé Publique*, CUSP) in Butare and Kinihirira in Byumba are excluded from the analysis because they joined the process later during the test year (January and March 2000, respectively). Thus, the study sample includes 52 prepayment schemes and 52 health centers that have participated during the entire pilot year.

1.5.2 Prepayment Scheme Financial Situation

Prepayment members pay their annual premium at any time to the prepayment bureau, which entitles them to 12 months of benefits in the affiliated health center and the district hospital, once their one month waiting period is over. During their first operational year, the 54 prepayment schemes in the three districts have collected almost 50 million RwF (US$150,000) premium funds. Each of the 54 prepayment schemes had monthly administrative and provider payments to the district PPS federation and to the affiliated health center, which were calculated based on their accumulated 12-month premium fund.

Table 1.7 shows financial results for the 54 prepayment schemes and the three district PPS federations in the three districts during the first year of operation. Overall, and in terms of the total premium fund accumulated during the first year in the three districts, PPS used 4 percent for the schemes' own administrative charges, 4 percent were paid to the district PPS federation's hospital fund, and 49 percent were paid to health centers in the form of monthly capitation payments. The 54 prepayment schemes keep the remaining 43 percent (28.5 million RwF) of the total premium fund collected during the first year on their bank accounts. This fund includes members' remaining months premium payments, depending on their enrollment month, and is used to cover the future monthly capitation and per episode payments to the providers[1]. In terms of their total annual expenditures (RwF 28.5 million), the schemes have paid 7 percent for their administrative costs, 7 percent for hospital care and 86 percent for health center care.

[1] For example: a family enrols in a PPS on March 10, 2000 and pays 2,500 RwF premium for one year of service. One-twelfth of this amount will be disbursed to providers on March 31, and then monthly until February 28, 2001. Thus, the PPS financial statement made on July 31, 2000 shows four-twelfths of this family's premium in the cost line item, whereas eight-twelfths is still in the PPS saved premium fund to be used for the family's remaining eight membership months.

Table 1.7 shows the three federations of PPS that have received during the first year in terms of total sources 49 percent premium contributions from their district schemes, 40 percent donor subsidies for care and administrative support and 10 percent government subsidies to cover members' hospital expenses. PHR provided limited administrative support, proportional to the federation's own generated administrative budget. At the end of the first year, Byumba and Kabutare federations reported excess revenue, whereas the Kabgayi federation failed to pay the full amount of the hospital bill from the schemes' own resources due to the disproportional high cesarean section (C-Section) rate among the Kabgayi members. The Kabgayi federation has received financial support from the Belgian Cooperation and from the MOH to pay the members' 115 C-Sections at the hospital (see section 3.1.4). During their first operational year, the three federations kept 4 percent of their total revenue to cover administrative charges while 93 percent were used for hospital payments, and 3 percent were accumulated to cover future care for members.

Donors and the government have paid for the demand for mother and child health care with their payments to the Kabgayi federation. Similarly, the Bishop of Butare subsidized the demand of care by financing the annual PPS premium for 3,000 widows and orphans in the Kabutare district and thus targeting in an effective and efficient way to the care for women and children. Demand subsidies to prepayment schemes, as it happened in Kabgayi and in Kabutare, are an efficient way to finance health care services for a targeted population group such as mothers, children or vulnerable high-risk patients. They provide an efficient alternative to supply-side subsidies.

Table 1.7: Cost and Finances in Prepayment Schemes (7/1999-7/2000) (RwF)

Prepayment Schemes Finances	Pilot Districts with Prepayment Schemes				
	Byumba	**Kabgayi**	**Kabutare**	**Total**	**% Distrib**
PPS Enrollment, Members (7/99-6/00)	48,837	21,903	17,563	88,303	
54 Prepayment Schemes Affiliated to 54 Health Centers: Finances in PPS (7/99-6/00) (RwF)					
Premium Fund Collected During First Year	26,105,580	12,807,250	11,011,950	49,924,780	100%
Cost, PPS (8/99-7/00)					
Administration PPS	916,515	506,999	456,359	1,879,873	4%
Health Centers (capitation payment)	14,115,723	5,440,340	5,119,567	24,675,630	49%
Federation	920,238	679,507	392,529	1,992,273	4%
Total Costs Prepayment Schemes	15,952,475	6,626,846	5,968,455	28,547,776	57%
Saved Premium Fund at PPS*	10,153,105	6,180,404	5,043,495	21,377,004	43%
3 Federations of PPS Affiliated to 3 District Hospitals: Finances, Federation (8/99-7/00) (RwF)					
Premiums Received from PPS	920,238	679,507	392,529	1,992,273	49%
Donor Subsidy for Care (Belgian Coop.)	0	1,550,000	0	1,550,000	38%
Donor Subsidy for Administration (PHR)	36,648	29,488	17,066	83,202	2%
Government Subsidy for Care	0	405,107	0	405,107	10%
Total Revenue	956,885	2,664,101	409,595	4,030,582	100%
Cost, Federation (8/99-7/00)					
Administration Federation	100,014	45,102	26,526	171,642	4%
Hospital (fee for service [FFS] and per episode payment)	841,400	2,619,000	277,400	3,737,800	93%
Total Costs Federation of PPS	941,414	2,664,102	303,926	3,909,442	97%
Reserves at Federation	15,472	0	105,669	121,140	3%

*The saved premium fund is different from an insurance reserve fund. If premiums are prepaid for 12 months, but providers only receive each month one twelfth of the accumulated premium fund, then the remaining premium fund serves to cover care for the remaining months that have been prepaid by members' premium contributions. For example, at the end of the first operational month, the PPS will have a premium revenue to cover care for the consequent 12 months. Each month, the PPS will pay the capitation amount to the health center, disbursing the accumulated premium fund.

2. Methodology

This second section presents the methodology used to analyze data collected in health facilities and prepayment schemes. Technical terms used in the report will be defined in 2.1. Section 2.2 describes the health sector universe included in the study. Section 2.3 introduces three different evaluation approaches used to analyze utilization, cost, and finance performance in health facilities during the pilot phase.

A first evaluation plan for the prepayment scheme pilot was presented to the steering committee in June 1999 and the final draft was finalized in September 1999 (Diop, 1999). This plan defines the research framework to demonstrate the schemes' impact on the Ministry of Health (MOH) overall objectives. A quasi-experimental design was used to assess the impact of the schemes on the service delivery system, organization of and financing of health districts in the three pilot, and two control districts. This methodological approach takes into consideration other factors not related to the prepayment scheme's interventions, which could affect the performance of the health districts relative to the MOH objectives. The impact of prepayment schemes is evaluated between:

(a) the year before and the year since PPS have been introduced,

(b) pilot districts (Byumba, Kabgayi, Kabutare) and control districts (Kibungo, Bugesera),

(c) members and nonmembers of prepayment schemes in the three pilot districts,

(d) pilot health centers based on their first year PPS enrollment results, and

(e) pilot health centers based on their performance status during the year prior to the introduction of PPS.

Performance variables on utilization, cost, and finances were identified in the pilot and control health districts and health facilities as historical controls. These variables were measured over a two year period of time, before health facilities provided care to PPS members (8/1/98-7/31/99) and since PPS members have received treatment (8/1/99-7/31/00).

2.1 Definitions

This section provides the definitions for terms frequently used in the report.

Total cost: Health facilities' overall costs that include operational costs by different sources and those that occurred during a certain time period (e.g., personnel, functioning, material, drugs, and transport).

Total average costs: Total costs of all health centers in a district divided by the number of health centers in the district.

Marginal cost: The change in total cost caused by the production of one more unit of output, which in a health center can be measured by one more patient.

Unit cost: Total cost of a health facility in terms of total output.

Profit: Expression of revenue exceeding costs.

Profit ratio: Expression of profit in terms of its costs.

Provider payment: A mechanism that transfers financial resources from the payers of health services to the providers of health care. Multiple provider payment methods exist (e.g., fixed budged, fee-for-service, capitation, and case-base payment).

Capitation payment: Occurs when the provider is paid a fixed periodic amount per person covered by the insurance plan, regardless of the amount of services actually rendered to the insured patients.

Fee-for-service: Occurs when the provider is paid an agreed-upon fee for each unit of output (e.g., health center visit, a lab-test, or an overnight stay).

Per episode payment: Occurs when the provider is reimbursed a fixed average amount of money for each medical case (e.g., a C-Section), irrespective of the medical resources actually used to resolve each individual case.

Fixed budget: Occurs when the provider periodically receives a fixed amount of money, which is not tied to its output of quality of care provided. Budgets are usually paid by the government to providers and linked to providers' budget line items. Global budgets are one type of fixed budget where more flexibility is given to the spender within the budget amount.

Utilization: The number of services used by patients in a health facility during a certain time period (per month or per year).

Expected number of births in the reference year at a health center: The population in a health center's theoretical catchment area multiplied by Rwanda's crude birth rate of 45 per 1,000.

Demographic Health Survey: During the years 2000 / 2001, the Rwandan National Population Office ONAPO in collaboration with Macro International conducted a Demographic Health Survey (DHS) which collects socio-demographic and health information from 10,000 women aged 15-49, and 3,000 men aged 15 and 59 years old.

2.2 Districts, Prepayment Schemes, Health Centers, and Hospitals Included

Pilot and control health districts and health centers were selected ex ante in March 1999, before any PPS intervention had been implemented. The methodological approach with the ex ante controls in the analysis includes the changing environment of health services and health financing in Rwanda, that could influence the achievements of the MOH objectives. Table 2.1 presents the district's size. The three pilot districts Byumba, Kabgayi and Kabutare, count a larger population than the control districts, which is due to the MOH decision to select and test the feasibility of PPS in the largest districts in anticipation of a nationwide scale-up. The five districts are financially and technically supported by different donors.

Table 2.1: Population in Pilot and Control Districts, 1999

Population in Sample Size	Districts with PPS			Control Districts		Total
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo	5 Districts
Total Population in Health District	459,329	368,020	288,160	262,465	265,313	1,643,287
Donors Supporting Health District	DED	Belg. Coop	MsF, GTZ	WHO, NL	EU, China	

Annex A, Table 1 ranks 52 of the totally 54 prepayment schemes according to their first year enrollment rates, showing per scheme the ownership of the health center, the population in the health center's catchment area and in the scheme's membership pool. Prepayment schemes showed a wide range of enrollment, spreading from below 0.9 percent to 55 percent of the health center's catchment area enrolled.

Table 2.2 presents the number of health centers and their catchment size in the three pilot and two control districts. Health centers provide outpatient care and usually have a limited number of inpatient beds. They are staffed with nurses and auxiliary personnel, and offer preventive, curative and delivery services. Malaria, fever, intestinal diseases, pneumopathies, respiratory infections, and skin lesions account for about 90 percent the diseases treated in health centers, pointing to a rather homogeneous burden of sickness among the rural population.

Table 2.2: Universe of Health Centers and Population in Pilot and Control Districts, 1999/2000

Health Facilities and Population in Sample Size	Districts with PPS			Control Districts		Total
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo	5 Districts
Number of District Health Centers	21	17	16	14	10	78
Nbr of Health Centers in Sample Size	20	17	15	14	10	76
Nbr of Public Centers in Sample	14	8	7	10	7	46
Nbr of Church Centers in Sample	6	9	8	4	3	30
Average Pop Catchment Area per Health Center	21,873	21,648	18,010	18,748	26,531	21,362

On a district level, the 54 prepayment schemes have formed a federation of PPS. Each federation partners with the district hospital in the pilot district. District hospitals serve as referral points for district health centers. The three hospitals in the three pilot districts participated in prepayment plans with a limited package of services covered. Table 2.3 presents the number of hospitals and population size for the pilot and control districts. Kabutare counts two hospitals, the University and the district hospital. The University hospital did not contract with the PPS federation and is excluded from this analysis. All district hospitals in the sample are owned by the government with the exception of Kabgayi hospital, which belongs to the catholic church of Gitarama.

Table 2.3: Hospitals in Pilot and Control Districts, 1999/2000

Hospitals and Sample Size	Districts with PPS			Control Districts		Total
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo	5 Districts
Number of District and Referral Hospitals	1	1	2*	1	1	6
Number of Hospitals in Sample Size	1	1	1	1	1	5
Ownership	public	church	public	public	public	
Total Population District	459,329	368,020	288,160	262,465	265,313	1,643,287

* The University hospital in Butare is not partnering with PPS and thus is excluded from this study.

After the description of the study universe, the following section will present the data collection process and the different methodological approaches to evaluate the schemes' impact on health facilities performance and the achievement of the MOH objectives.

2.3 Data Collection and Analysis

Monthly routine data were collected on the prepayment scheme during their pilot year (7/1999–6/2000), and on the provider side the year before (8/1998-7/1999) and since members benefited from coverage (8/1999–7/2000). Due to members' one-month waiting period between premium payment and benefit from coverage, the data collection period for prepayment schemes started on July 1, 1999, whereas the pilot phase on the provider side started one month later on August 1, 1999. Table 2.4 presents the collection tool in prepayment scheme bureaus who reported monthly on the composition of their executive bureau, number of new members, premium revenues, and their uses of funds.

Table 2.4: Structure of Routine Data Collection Tool in Prepayment Schemes

New Members	Costs	Revenue
This matrix summarizes information from the membership book. For each month, the number of new members is counted for each enrollment category: Individual Enrollment Households, by number of family members Groups, specifying the number of group members.	Bureaus report from their treasury books, the following monthly expenditures: Administrative Charges Payment to Federation for Hospital Treatment Base Capitation Payment to Health center (base payment) quality Capitation Payment to Health Centers (quality payment).	This includes premium revenue from new members per enrollment category, and the monthly total premium revenue.

*Health centers' quality measures for quality payment have been analysed and fed-back to health centers. Providers anticipated the introduction of quality payment quarterly. However, this has been delayed due to the district's need for more time to set up a sustainable monitoring system.

Bureau members were trained during workshops to respond to the monthly questionnaire. The member and premium information was used to assess membership and the financial situation and to calculate capitation provider payments to health centers and payments to the PPS federation who reimbursed the hospital. PPS bureaus sent the survey instrument to the federation and to PHR for validity tests and data entry in excel computer software

Table 2.5 presents the structure of the routine data collection tools used in health facilities in the three pilot and two control districts. Data in health centers and hospitals were collected over two years in five collection periods. The first period included the full base year before providers started to treat PPS patients (August 1, 1998–July 31, 1999). The remaining four data collections covered each of the four quarters of the pilot year from August 1, 1999 until July 31, 2000. Health facilities were asked to report their utilization (for member and non member patients), total cost and revenue data. Health centers reported drug costs documenting the price paid and quantity bought at the district pharmacy, and valued drug donations based on district pharmacy prices.

Table 2.5: Structure of Routine Data Collection Tools in Health Centers and Hospitals

Utilization	Total Cost	Revenue
This section collected information on the number of services provided and drug prescribed to patients in health centers and in hospitals. Services in Health Centers Included: Curative Outpatient Visits Prenatal Care Visits Deliveries Family Planning Vaccinations (BCG, 3 DPT doses, measles) Laboratory Hospitalization Admissions Hospitalization Days Services in hospitals included: Curative Outpatient and Inpatient visits Deliveries Laboratory and X-Ray Hospitalization (wards, maternity) Hospitalization Days The volume of drugs prescribed in health centers and hospitals for drugs on the MOH essential drug list.	Total recurrent fixed and variable costs in health centers and hospitals were collected (e.g., personnel, drugs, medical material, other operational charges, and equipment). Personnel Cost Data Included: Number of Staff in Categories Monthly Salary Costs Facility costs on purchase of drugs, medical material and other operational charges (e.g., gas, water, and electricity) was collected Cost information was categorized by payer category, (e.g., personnel expenditures paid by government subsidies, or drug donations received from donors valued at the district pharmacy price). Cost-recovery was calculated for health centers' two lines of business (PPS members and nonmembers).	Revenue sources in facilities include the four payer categories. Government User Fees PPS Contribution Donors and Others Nonmembers' prices for services and drugs was collected.

Health center managers and hospital administrators learned, during workshops, how to answer the questionnaires. Each district selected supervisors to assist health centers in filling in the questionnaires. If questionnaire responses were not valid, a PHR agent would assist the responsible health facility staff person. Both, providers and PPS managers improved their data reporting skills over the year, as fewer questionnaires had to be returned to correct information received. Health

centers improved their knowledge and recognized the need for service utilization, cost and financial data, as they were regularly informed about their performance results[2].

Data entry was done by PHR using excel computer software. In addition, provider and PPS data were analyzed using the same software.

Each health center's total costs were analyzed quarterly for the patient segment of members and nonmembers. Actual variable costs (drugs) were accounted to each segment according to their drug use, and fixed costs (e.g., staff, equipment, maintenance, operational costs) were proportionally distributed to members and nonmembers according to their utilization of total services (e.g., number of curative and preventive care consultations, deliveries, nutrition service, family planning, lab tests, and health center hospitalization). Revenues were distributed to members and nonmembers. Nonmembers' patient revenue was allocated to nonmembers, and PPS revenue and co-payments to the member segment according to the cash book's revenue amount. Donor and government donations were proportionally allotted to the two patient segments – like fixed costs – according to their overall service use.

Following a quasi-experimental design, health centers and affiliated PPS were categorized and analyzed on service utilization, cost, and finances. The performance of these key variables will be evaluated by addressing three different methodological approaches:

- Comparison between health centers' performance in pilot districts control districts (section 2.3.1);
- Comparison between health centers' performance in pilot district based on their PPS enrollment results (section 2.3.2);
- Comparison between health centers according to their previous year low, medium, or high performance and their PPS enrollment results (section 2.3.3).

2.3.1 Comparison by Districts

Section 2.2 provided an overview on the health facility structure in the pilot and control districts. This approach compares the utilization, cost and financial performance in health centers and attached PPS by districts. First, overall performance changes from before to since PPS are compared between the three pilot and two control districts, then, performance differences between members and nonmembers within the three pilot districts are evaluated.

2.3.2 Comparison by First-Year PPS Enrollment Quintile

This comparison analyses the performance in pilot district health facilities based on their first-year PPS enrollment results. All 52 pilot district health centers are ranked according to their PPS enrollment results, and categorized in five enrollment quintiles depending on the proportion of the population in the catchment area enrolled with the affiliated prepayment scheme (see Annex A, Table 1). This will result in 10 to 11 health centers per quintile (Q). Health centers' utilization performance

[2] Health centers complained about the number of data sheets,they had to submit monthly and annually to the MOH and to donors, without receiving any feed-back on the evaluated results. According to health centers, during the prepayment scheme pilot phase, they experienced for the first time the full monitoring and evaluation process, with regular data collection, evaluation, and feed back of results to improve their performance.

for members and nonmembers is compared across the enrollment quintiles during the performance year (8/1999-7/2000). This comparison includes key variables such as the number of consultations, deliveries, prenatal care services, and vaccinations.

Table 2.6 summarizes Table 1 in Annex A, and presents for each of the five enrollment quintiles, the number of health centers, their PPS one year average enrollment rate, the enrollment range per quintile, and the total and average population in health centers' catchment areas[3].

Table 2.6: Health Centers and their PPS One year Enrollment Rates (8/99–7/00)

Health Centers in Sample	PPS First-Year Enrollment Quintiles					Total Pilot Districts
	Q1	Q2	Q3	Q4	Q5	
Number of Health Centers	**10**	**11**	**10**	**11**	**10**	**52**
Average PPS Enrollment Rate	2.1%	4.1%	5.8%	8.9%	24.3%	7.99 %
Range of PPS Enrollment Rate	< 3.24%	3.24%-4.96%	4.96%-6.85%	6.85%-11.98%	> 11.98%	0.9 %-55.18 %
Total Pop Catchment Area	215,760	266,609	225,954	199,064	178,122	1,085,509
Average Catchment Area per Health Center	21,576	24,237	22,595	18,097	17,812	20,875

2.3.3 Comparison by Health Center Performance Level Before Prepayment Schemes

The third comparison approach takes into account two classification levels: performance level of health centers the year prior to prepayment and health centers' first-year PPS enrollment rate. Based on the pilot health centers' utilization the year before PPS, facilities are categorized in low-, medium- and high-performance. Then, as in the quintile comparison in section 2.3.2, pilot health centers were ranked and categorized by their first-year PPS enrollment quintiles. This approach attempts to respond to two questions; Does the prior year performance impact the enrollment rate and how does the performance in health centers change with prepayment, given their previous year performance classification and enrollment rates? The analysis will be controlled using information prior to the performance of health centers or health seeking behavior of their respective catchment area population. Previous year performance is defined by health centers' utilization level of curative and prenatal consultations, which were correlating variables for higher one year enrollment rates. Annex B provides a more detailed description of the health centers' performance level classification.

Table 2.7 presents the total number and average enrollment rates of health centers within their PPS enrollment quintile and performance level (low, medium, high) the year prior to prepayment schemes.

[3] For example, the 11 health centers classified in the second quintile (Q2) have on average 4.1 percent (between 3.24 and 4.96 percent) of the population living in their catchment area enrolled with the partner PPS. Their total target population counts 266,609, resulting in an average of 24,237 inhabitants per PPS and health center.

Table 2.7: Performance Categories per PPS Enrollment Quintiles

Health Centers in Sample	PPS First-Year Enrollment Quintiles				
	1	**2**	**3**	**4**	**5**
Distribution of Health Centers					
Low Performing Health Centers	6	6	3	3	0
Medium Performance Health Centers	2	2	9	6	6
High Performance Health Centers	1	2	0	1	5
Total	**9**	**10**	**12**	**10**	**11**
Average Enrollment Rate 1-Year					
Low Performing Health Centers	1.8	4.0	6.4	8.3	-
Medium Performance Health Centers	2.7	4.3	5.6	8.6	19.0
High Performance Health Centers	2.3	3.5	-	11.4	26.8
Average Consultation Rate, Year Before PPS					
Low Performing Health Centers	0.2	0.2	0.2	0.2	-
Medium Performance Health Centers	0.2	0.3	0.4	0.2	0.4
High Performance Health Centers	1.2	0.8	-	0.5	0.8
Average Prenatal Care Rate per 100 Population, Year Before PPS					
Low Performing Health Centers	2.7	2.2	2.3	2.5	-
Medium Performance Health Centers	3.6	3.7	4.8	4.5	6.2
High Performance Health Centers	7.8	6.0	-	9.3	6.8
Average Vaccination Rate per 100 Population, Year Before PPS					
Low Performing Health Centers	12.3	10.8	11.9	15.2	-
Medium Performance Health Centers	20.1	15.3	20.0	22.6	21.7
High Performance Health Centers	32.5	26.4	-	31.5	33.6

This classification in Table 2.7 allows to compare members' and nonmembers' deliveries in health centers in relation to the expected delivery rates. This indicator provides information on the proportion of mothers delivering at the health centers, and those delivering at home or with traditional birth assistance. The evaluation will focus on if prepayment scheme mothers are more likely to deliver at health centers than non member mothers are.

The third section will present the first year's results for health centers and hospitals, that have been analyzed based on the methodological approach described.

3. Results

The results of this analysis are based on the performance of 52 health centers and three hospitals with one year prepayment scheme experience and 24 health centers in the three pilot districts, and two hospitals in the two control districts without any PPS experience. Performance results include utilization of health services (section 3.1), cost of services provided (section 3.2), and finances of health care in the three pilot and two control districts (section 3.3). Results are discussed at the end of each section. Section 3.4 analyzes health centers' overall profits and those profits generated by their drug sales.

3.1 Utilization of Health Services

This section seeks to evaluate the extent to which the expected insurance effect of prepayment, which will lead to increased service utilization, was caused by members' improved financial accessibility to health care, moral hazard behavior, adverse selection, and better quality care.

3.1.1 Results by District

Table 3.1 presents pilot and control district health centers' performance for the year prior and since the prepayment schemes. Byumba is the district with the largest number of PPS members, and Byumba and Kabgayi count more members than Kabutare. The two districts with more PPS members show the same patterns and similar magnitudes in changes when comparing all patients' utilization over the two years. Overall, the number of curative consultations per capita remained on the same low level (0.21 in Byumba and 0.31 in Kabgayi), whereas significant increases were reported in the number of deliveries at the health center (49 percent and 43 percent), and preventive care services such as prenatal care (27 percent and 24 percent) and vaccinations (56 percent and 46 percent). In the third pilot district Kabutare, consultation rates are still higher but decreased from a high average of 0.5 to 0.37 per capita, whereas the number of deliveries and preventive care services increased, although not to the same extent as in the two other pilot districts.

The pattern and magnitude of changes in the two control districts Bugesera and Kibungo shows a different analysis. While consultation rates increased slightly in Bugesera and remained on the same level in Kibungo, deliveries and preventive care utilization decreased in Bugesera, and went in different directions in Kibungo.

Table 3.1: Health Centers: Utilization by District, Before (8/98-7/99) and Since (8/99-7/00) PPS

All Patients Utilization		Pilot Districts			Control Districts	
		Byumba	Kabgayi	Kabutare	Bugesera	Kibungo
Number of PPS Members		48,837	21,903	17,563	0	0
Number Health Centers in Sample		20	17	15	14	10
Total Utilization all Health Centers:						
Curative Consultations, per capita						
	Before PPS	0.21	0.31	0.50	0.25	0.19
	Since PPS	0.21	0.31	0.37	0.29	0.18
	Change in %	0%	0%	-27%	15%	-3%
Deliveries, total number:						
	Before PPS	1,765	2,234	1,004	1,699	632
	Since PPS	2,635	3,195	1,148	1,493	719
	Change in %	49%	43%	14%	-12%	14%
Prenatal Care Consultations, total number:						
	Before PPS	19,704	14,958	10,525	11,043	12,753
	Since PPS	25,107	18,586	11,000	8,784	11,962
	Change in %	27%	24%	5%	-20%	-6%
Vaccinations, total number:						
	Before PPS	82,427	73,934	43,565	45,595	40,960
	Since PPS	128,705	107,606	50,102	43,958	53,865
	Change in %	56%	46%	15%	-4%	32%
Average per Health Center:						
Deliveries, average per facility:						
	Before PPS	88	131	67	121	63
	Since PPS	132	188	77	107	72
Prenatal Care Consultations, average per facility:						
	Before PPS	985	880	702	789	1,275
	Since PPS	1,255	1,093	733	627	1,196
Vaccinations, average per facility:						
	Before PPS	4,121	4,349	2,904	3,257	4,096
	Since PPS	6,435	6,330	3,340	3,140	5,387

Table 3.1 also shows that since the introduction of PPS and compared to the control districts, Byumba and Kabgayi health centers became performance leaders on the average number of deliveries and the two preventive care services. The higher number of services delivered in the three pilot districts will improve health centers' productivity level, if providers are successful in maintaining their cost level and as a result decrease their average and marginal cost.

Table 3.2 presents PPS enrollment, consultation rates and deliveries in health centers for prepayment members and nonmembers per pilot district. On a per capita level, PPS members are five

times more likely to receive curative consultations compared to nonmembers in all three districts. During the pilot year, 10 percent of the Byumba district population have enrolled in PPS, 32 percent of all curative consultations were provided to PPS members, and 25 percent of women who gave birth in health centers were PPS members. Clearly, Byumba PPS members have proportional better access to curative care and assisted deliveries than nonmembers do. Kabgayi and Kabutare districts with fewer PPS members report the same PPS enrollment (6 percent) and delivery proportions (8 percent), whereas, the proportion of all curative consultations provided to members was almost three times higher compared to the district's enrollment rate.

Table 3.2: Health Centers: Utilization by Pilot District, PPS Members and Nonmembers (8/99–7/00)

Members / Nonmembers Utilization	Pilot Districts		
	Byumba	Kabgayi	Kabutare
PPS Enrollment Rate, first year	10.6%	6%	6.1%
Curative Consultations, per capita :			
PPS Members	1.16	1.52	1.56
Nonmembers	0.15	0.27	0.30
Members in proportion to all patients	32%	16%	15%
Deliveries, total number :			
PPS Members	652	267	90
Nonmembers	1,983	2,928	1,058
Members in proportion to all patients	25%	8%	8%

3.1.2 Results by PPS First-year Enrollment

As described in 2.3, pilot district health centers were grouped in five quintiles according to their first year PPS enrollment results (see Annex A, Table 1). Table 3.3 compares health center performance for all patients for the year before and since the introduction of PPS by their PPS enrollment quintile classification.

Since the introduction of PPS, Q5 health centers with an average of 24 percent of the population among the PPS members, have even improved their previously highest performance level for deliveries and preventive services. When comparing overall utilization, the Q4 health centers had on average 9 percent of the population enrolled in PPS, and reported prior to PPS lowest consultation rates. Since the introduction of PPS, Q4 health centers reported highest changes for curative consultation and prenatal care service use. The average number of deliveries has increased most in Q2 health centers, where enrollment scored around 4 percent and in Q4 health centers. Health centers in quintile 1, 2 and 4 reported increases in prenatal care services from lowest previous year performance. Similar results can be observed in the lowest three enrollment quintiles where since the introduction of PPS vaccination increased most in health centers with previously lowest performance levels.

Table 3.3: Health Centers: Utilization by PPS Enrollment Quintile, Before (8/98–7/99) and Since (8/99–7/00) PPS

All Patients	Health Centers in First-Year PPS Enrollment Quintile				
Utilization	Q1	Q2	Q3	Q4	Q5
Average PPS Enrollment Rate	2.1%	4.1%	5.8%	8.9%	24.3%
Curative Consultations, average per health center					
Before PPS, all patients	6,602	6,222	7,501	5,000	8,965
Since PPS, all patients	5,033	4,616	6,313	5,644	8,182
Change in %	-24%	-26%	-16%	13%	-9%
Curative Consultations, per capita per health center					
Before PPS, all patients	0.37	0.30	0.35	0.31	0.58
Since PPS, all patients	0.28	0.21	0.29	0.35	0.55
Change in %	-25%	-29%	-16%	14%	-6%
Deliveries, average per health center					
Before PPS, all patients	94	84	121	119	134
Since PPS, all patients	116	136	148	181	184
Change in %	24%	61%	22%	52%	38%
Prenatal Care Consultations, average per health center					
Before PPS, all patients	730	816	835	774	1,205
Since PPS, all patients	908	1,022	924	984	1,431
Change in %	24%	25%	11%	27%	19%
Vaccinations, average per health center					
Before PPS, all patients	34,779	37,014	37,886	42,953	47,294
Since PPS, all patients	51,696	56,769	54,138	59,755	64,055
Change in %	49%	53%	43%	39%	35%

The results from the district comparison have shown that members use care proportionally more often than nonmembers do. Table 3.4 supports this argument by comparing health centers' members and nonmembers utilization, according to the facilities enrollment quintile classification. While Q1 health centers report 2 percent of the population enrolled, members account for almost 10 percent of total curative consultations. Quintile 3 health centers, with 6 percent of the population enrolled in PPS, provided more than 20 percent of all curative consultations to members. Adverse selection, moral hazard and accumulated demand for care over a certain time period, are all factors that have contributed to members' higher utilization rate in small membership pools. Nonmembers' lower utilization rates for curative consultations and assisted deliveries in all health centers with the exception of Q5 raise concerns about equity in access to care.

Table 3.4: Health Centers: Utilization by PPS Enrollment Rate, for PPS Members and Nonmembers (8/99–7/00)

Members / Nonmembers	Health Centers in First-Year PPS Enrollment Quintile				
Utilization	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
Ave PPS Enrollment Rate	2.1%	4.1%	5.8%	8.9%	24.3%
Curative Consultations, average per health center per year					
PPS Members	442	954	1,057	1,159	2,957
Nonmembers	4,591	3,662	5,256	4,485	5,225
Members in Proportion of All Patients	9.4%	21.5%	21.6%	26.2%	34.5%
Curative Consultations, per capita					
PPS Members	1.64	1.76	1.56	1.33	1.36
Nonmembers	0.26	0.17	0.26	0.30	0.45
Deliveries, per 1,000 members or nonmembers					
PPS Members	14.8	12.0	12.5	11.9	13.8
Nonmembers	5.3	4.7	6.3	6.1	13.5
Members in Proportion of All Patients	5.5%	9.6%	10.7%	15.8%	23.6%

Health centers classified in lower enrollment quintiles report considerably lower use rates for nonmembers than Q5 health centers, but equally high levels for members. Thus, even in health centers with small PPS pools and generally low utilization rates, members' per capita utilization is as high as in centers with larger pools and considerably higher compared to nonmembers. This finding confirms the expected insurance effect, that PPS improve financial accessibility to covered services for members.

The following section presents utilization results by adding a second component to the analysis. First, as in section 3.1.2, health centers are classified into five first-year PPS enrollment quintiles. Second, health centers are grouped based on their prenatal and curative care consultation rate during the year prior to the introduction of prepayment schemes. It is assumed that, as already observed in the above comparison, the effect of prepayment schemes on health centers' service utilization is strongest in health centers with previously low performance results and subsequently high PPS enrollment rates.

3.1.3 Results by First-year Enrollment and Previous Year Performance

Health centers with higher curative and prenatal care consultation rates during the year prior to PPS, have consequently enrolled more members during the pilot year. Table 3.5 categorizes health centers based on their first year enrollment quintile and their previous year curative and prenatal care performance level (low, medium, and high). For the pilot year, the rates of assisted delivery in health centers in terms of total expected deliveries for members and nonmembers are compared[4]. Members in previously low and medium level health centers are more likely to deliver in health centers than nonmembers. Several previously low performance health centers underwent structural quality

[4] Expected number of births in the reference year at a health center: the population in a health center's theoretical catchment area multiplied by Rwanda's crude birth rate of 45 per 1,000.

changes with the position of the health centers' manager filled by a better-qualified staff person, which had immediate effects on prepayment scheme membership and the centers' performance[5]. Members and nonmembers who signed up in previously high performance health centers report similar likelihood in having an assisted delivery.

Table 3.5: Assisted Delivery Rates in Health Centers, by PPS First-Yeat Enrollment Quintile and Prior Performance Level, PPS Members and Nonmembers (8/99–7/00)

Health Center Performance Level Utilization	Health Centers in First-Year PPS Enrollment Quintile				
	Q1	Q2	Q3	Q4	Q5
Low Performance Health Centers					
Proportion of Total Expected Deliveries at Health Centers					
PPS Members	27.18%	26.87%	30.95%	23.32%	n/a
Nonmembers	6.56%	10.02%	7.23%	7.40%	n/a
Medium Performance Health Centers					
Proportion of Total Expected Deliveries at Health Center					
PPS Members	42.89%	32.74%	30.45%	27.28%	25.20%
Nonmembers	19.13%	11.92%	17.76%	14.57%	16.21%
High-Performance Health Centers					
Proportion of Total Expected Deliveries at Health Center					
PPS Members	21.79%	22.68%	n/a	29.75%	34.40%
Nonmembers	43.17%	15.22%	n/a	26.91%	44.00%

The results in Table 3.5 show that prepayment improve financial accessibility to save motherhood. Compared to the 68 percent of assisted deliveries in the Kigali urban prefectures as reported by preliminary DHS 2000 results, considerably fewer women in the rural pilot districts Byumba, Kabgayi and Kabutare deliver with professional assistance.

3.1.4 Results in District Hospitals

Most Rwandan hospitals only started to collect utilization data for the MOH health information system in 1999. Therefore, and although data collection with the PHR tools in the hospitals was extensive, this report will focus on an extract of reliable utilization information collected. For future analysis, it is recommended that district hospitals in Rwanda implement and follow a sound utilization and accounting data system, which allows regular reporting on utilization, financial sources, costs, and an inventory of drugs and other equipment.

The following section presents information on members' and nonmembers' hospital utilization and compares the year before and since the introduction of PPS. PPS members received a limited package at the three district hospitals covered by the scheme (see Table 1.2). Each of the five districts counts one or two health centers, which do not offer maternity services, and refer women to the district hospitals for normal deliveries. In these cases, the district hospitals are reimbursed by the referring health center who has received the PPS members' capitation payments.

[5] For example, PPS membership doubled within four months and the monthly number of assisted deliveries increased from eight to more than 20 since a trained nurse is heading the Buramba health center in Kabgayi.

Table 3.6 presents information about the use of maternal health services the year prior and since PPS for all patients. The number of hospital deliveries has increased in all pilot and control districts with the exception of Kabutare, a district hospital competing with a better subsidized University hospital for a small catchment area. While Kabgayi is a smaller district than Byumba, the Kabgayi hospital counted more than twice as many deliveries during both years, and historically has had a higher delivery and C-Section rate compared to other Rwandan district hospitals. Although a C-Section was covered for members, the total number of C-Sections decreased in Byumba and Kabutare. In addition, the rates of C-Sections increased in Kabgayi from 468 per year, an already high number, to 558 per year since the introduction of PPS. High increases were also reported by the two control district hospitals. All hospitals reported C-Section or rates between 20 and 30 percent in terms of their total number of hospital deliveries. This large discrepancy reveals either too many deliveries and C-Sections in the Kabgayi hospital, or a problematic referral structure and access to hospital care in Byumba, Kabutare, Kibungo and Bugesera. The MOH and its partners are encouraged to investigate both reasons to assure quality maternal care services in district hospitals.

Table 3.6: Hospitals: Utilization by District, Before (8/98–7/99) and Since (8/99–7/00) PPS

All Patients		Pilot Districts			Control Districts	
Hospital Utilization		Byumba	Kabgayi	Kabutare	Bugesera	Kibungo
Number of Hospitals in Sample		1	1	1	1	1
Deliveries (including Cesarean Sections), total number						
	Before PPS	803	1,679	822	456	781
	Since PPS	941	2,114	595	484	964
	Change in %	17%	26%	-28%	6%	23%
Cesarean Sections, total number						
	Before PPS	210	468	220	97	201
	Since PPS	188	558	201	127	285
	Change in %	-10%	19%	-9%	31%	42%
Cesarean Section Ratio, in proportion of all hospital deliveries						
	Before PPS	26%	28%	27%	21%	26%
	Since PPS	20%	26%	34%	26%	30%

Table 3.7 compares, for members, the number of assisted deliveries in health centers and deliveries referred to the district hospital. Overall, 228 women were referred by health centers for delivery to the district hospital, and an unknown number of member women went directly to the hospital for delivery. Once in the hospital, providers have a financial incentive to do a C-Section for members. It is paid by a per episode payment, whereas patients pay less for normal deliveries. Health centers in Kabgayi and Kabutare were twice as likely to refer members to the hospital for deliveries than Byumba health centers. The fact that there are a higher number of PPS members delivering babies by C-Section in Kabgayi, than referred to by health centers, points to supply-side induced C-Section. This implies serious quality of care problems in the Kabgayi hospital that need to be investigated by the MOH and its partners.

Table 3.7: Health Centers: Members' Assisted Deliveries and Referral Rates (8/99–7/00)

Members Assisted Deliveries and Referrals	Pilot Districts		
	Byumba	Kabgayi	Kabutare
Health Center Deliveries, total number, members			
Assisted Deliveries at Health Center	590	256	86
Assisted Deliveries Outside Health Center	62	11	4
Total Deliveries, health center assisted	652	267	90
District Hospital Deliveries, total number, members			
Deliveries Referred to District Hospital	97	104	27
Number of Cesarean Sections at Hospital	34	115	18
Referrals to Hospital in Proportion to Total Assisted Health Center Deliveries	15%	39%	30%
Cesarean Sections in Proportion of Total Deliveries Referred to Hospital	35%	111%	67%

During the first year, 1,009 PPS members delivered their babies with health center assistance in the three pilot districts, and another 167 female members had a C-Section at a hospital. Figure 3.1 compares members' C-Sections in proportion of total members' deliveries. Byumba reported that 5 percent of all deliveries by PPS members were C-Sections; the rates were 30 percent in Kabgayi and 17 percent in Kabutare.

Figure 3.1: Proportion of Cesarean Sections among PPS Member Deliveries, (8/99–7/00)

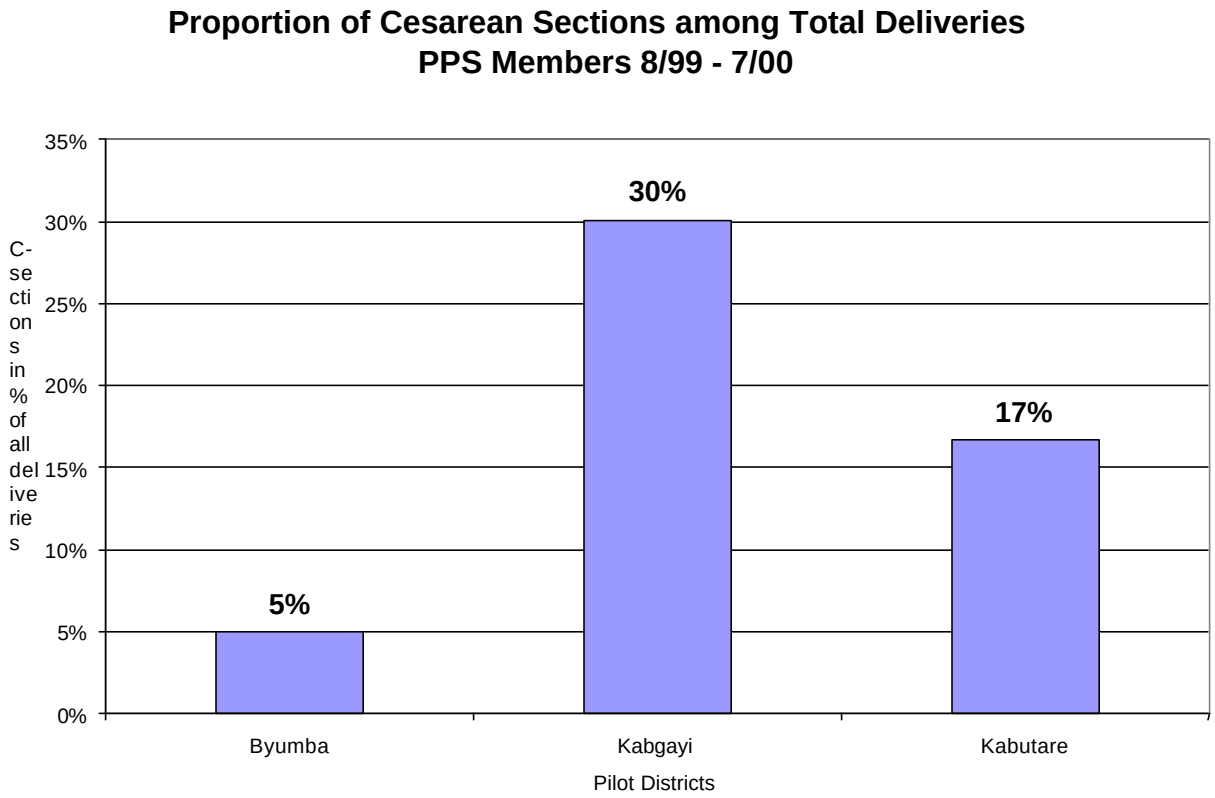


Table 3.8 compares members' and nonmembers' hospital utilization of covered services in the three pilot district hospitals. PPS members use hospital services proportionally more often than nonmembers, and the proportion of members among all patients is relatively higher than the percentage of the population enrolled in the scheme. While almost 11 percent of the Byumba district population are PPS members, they accounted for 18 percent of all C-Sections, 13 percent of all hospital admissions, and 15 percent of all physician consultations. Although data reporting for nonmembers was incomplete, the high number of overnight stays and physician consultations provided to members in Byumba hospital has contributed to the overall hospital service use increase.

Table 3.8: Hospitals: Utilization by Pilot District, for PPS Members and Nonmembers (8/99–7/00)

Members / Nonmembers Hospital Utilization	Pilot Districts		
	Byumba	Kabgayi	Kabutare
Ave PPS One year Enrollment Rate	10.6%	6.1%	6.0%
Cesarean Sections, total number			
PPS Members	34	115	18
Nonmembers	154	443	183
Members Proportion to all Patients	18.1%	20.6%	9.0%
Hospital Admissions, total number of admits			
PPS Members	259	202	148

Members / Nonmembers Hospital Utilization	Pilot Districts		
	Byumba	Kabgayi	Kabutare
Nonmembers	1,667	1,890	1,867
Members Proportion to all Patients	13.4%	9.7%	7.3%
Hospital Overnight Stays, total number of nights			
PPS Members	2,230	N/A	360
Nonmembers	N/A	N/A	N/A
Members ALOS, nights	8.6	N/A	2.4
Physician consultations, total number			
PPS Members	1,052	N/A	127
Nonmembers	5,747	N/A	4,097
Members Proportion to all Patients	15.5%	N/A	3.0%

Hospital utilization results show that during their first year of operation, PPS have improved financial accessibility for members to hospital services covered, and in particular, financial accessibility to maternal health care services, such as C-Sections. In the long-term and with more women enrolling with prepayment schemes, improved access to quality hospital maternal services will improve Rwanda's currently dismal maternal and infant mortality results (see Table 1.1).

3.1.5 Discussion of Utilization Results

Utilization findings show that members seek care more frequently and earlier at the onset of illness compared to the non-insured. After the first operational year, prepayment membership pools are too small to cause overall consultation rates to change. However, the historical decline in curative consultation rates in Byumba and Kabgayi may have been stopped by members' better financial accessibility. PPS fosters family and group enrollment, which prevents weaker members of the society – women and children – to be excluded from coverage, and the quality of care messages on the reverse side of the PPS membership card remind members to vaccinate their children, and pregnant women to seek prenatal care services. Thus, PPS membership and intensified preventive care campaigns organized by the health districts have contributed to the overall increase in the use of child and women's health services in the three pilot districts.

Members who were seeking care in health centers with small membership pools have scored equally high utilization results as members in health centers with large PPS pools. Two utilization situations in health centers can be distinguished. First, the marginal impact of prepayment on increased utilization is relatively small in health centers that have already performed on a higher utilization level compared to low-performance centers before they affiliated with schemes. However, when previously high performing centers count large membership pools with members using services considerably more often, overall service utilization increases. Second, the additional impact of PPS on utilization is highest in centers with prior low utilization rates who have managed to partner with large PPS pools. This is a strong argument for the population living in the catchment area of health centers with previously low and medium utilization levels to enroll in prepayment, which will improve their financial accessibility to curative, preventive and maternal health care services, and contribute to a better use of idle resources in health centers.

The high proportion of C-Sections in Kabgayi can be explained by adverse selection, supply-side induced increases, and incentives caused by provider payment. Adverse selection among prepayment scheme members' creates an incentive for all pregnant women to enroll in the schemes, in anticipation of coverage in case of a complicated delivery; however, this argument counts for all districts and not only for Kabgayi. Historically, the Kabgayi hospital reports, nationwide, the highest numbers of C-Sections, supporting a supply-side induced increase by the operating physicians, and per episode provider payment. The hospital is paid more by the PPS federation compared to out-of-pocket paying nonmembers. A surgical intervention is a health risk for a woman in developing countries, thus it is strongly recommended that the medical authorities in the Kabgayi region and the MOH evaluate the appropriateness of the C-Section situation in the Kabgayi hospital. To prevent providers from increasing the number of C-Sections, the recommended action is to change the provider payment method and optimize the related financial incentive. The federations of prepayment schemes in the three districts should consider replacing the per episode and per service payment to the district hospitals by a monthly capitation payment as it is already done with health centers.

The insurance effect for prepaid health care causes adverse selection as demonstrated by an increased interest for the less healthy to enroll. There is also evidence of moral hazard as demonstrated by enrolled members seeking care easily when they feel sick. However, the PPS members' curative consultation rates, between 1.1 and 1.6 consultations per capita per year, are too low to conclude that there was a moral hazard problem and care was used frivolously. Instead, they point to the fact that demand for care to treat non-emergency diseases increases over time, due to user charges. By enrolling in prepayment, the financial barriers to care are lessened causing the sick to immediately seek care. Capitation combined with the quality capitation effect set by prepayment schemes have contributed to the significant increase of preventive care services such as prenatal care consultation and vaccinations in the pilot districts. Health centers have experienced a considerably stronger insurance and beneficial capitation effect causing the adverse capitation effect – to constrain supply of curative services – to be deactivated.

It is important that improve financial accessibility through PPS membership is available to all society members. At the same time, contractual incentives made through provider payment are to be set in hospitals and health centers that encourage providers to improve quality of care and personnel productivity.

This section has presented utilization results and discussed the prepayment's impact on members' financial accessibility to care in health facilities based on the methodology described in the second section. The following section describes the health centers' cost situation before and since they have affiliated with prepayment schemes.

3.2 Costs

This section presents annual costs in pilot and control district health centers the year prior to and following prepayment schemes. Detailed cost analysis was performed for health centers' member and non member line of business and unit costs were calculated for comparison for both groups. Total costs were analyzed for health centers' members and nonmembers segment, by accounting for their actual variable costs (drugs), and distributing fixed costs according to members and nonmembers utilization of all services (number of curative and preventive care consultations and lab tests). The data collected in hospitals was not valid enough to analyze costs as it has been done in health centers. The following financial comparisons from August 1998 to July 2000 are not adjusted by inflation rate. Inflation in Rwanda has remained on a 4 percent average during this time period.

3.2.1 Total Average Costs in Health Centers

Health centers total costs are dominated by personnel and drug costs. Table 3.9 presents the average total costs per health center per year, as well as the health centers' cost structures (e.g., personnel and drugs) for years prior to and following PPS. Health centers in Kabgayi and during the second year in Kabutare, operated (on average) on a considerably higher total cost level than the centers in the other three districts. Over the two-year time period, total costs per health center have increased in Kibungo (22 percent), Kabutare (12 percent) and Byumba (10 percent). In Byumba, at the same time deliveries increased (45 percent), prenatal care (25 percent) and immunization (50 percent) also increased considerably. Kabgayi reported higher utilization rates without an increase in cost which shows an increased use of previously underutilized resources.

Table 3.9: Health Centers: Average Total Facility Costs by District, Before (8/98–7/99) and Following (8/99–7/00) PPS

Cost Categories	Pilot Districts			Control Districts		Total
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo	5 Districts
Sample Size	20	17	15	14	10	76
Costs, year before PPS (1000s of RwF)						
Personnel	2,055	3,288	2,587	2,233	2,397	2,512
Medicines	1,290	2,035	1,386	1,764	919	1,479
Other	664	1,177	727	638	376	716
Total Cost	4,009	6,499	4,700	4,635	3,692	4,707
Costs, year since PPS (1000s of RwF)						
Personnel	2,311	3,020	2,520	2,477	2,593	2,584
Medicines	1,404	2,209	1,948	1,200	1,271	1,606
Other	714	1,324	784	513	625	792
Total Cost	4,430	6,552	5,252	4,190	4,489	4,983
Change in Costs from Year Before to Since PPS						
Personnel	12%	-8%	-3%	11%	8%	3%
Medicines	9%	9%	40%	-32%	38%	9%
Other	8%	12%	8%	-20%	66%	11%
Total	10%	1%	12%	-10%	22%	6%
Cost Structure (percent), Before PPS						
Personnel	51%	51%	55%	48%	65%	53%
Medicines	32%	31%	29%	38%	25%	31%
Other	17%	18%	15%	14%	10%	15%
Total	100%	100%	100%	100%	100%	100%
Cost Structure (percent), Since PPS						
Personnel	52%	46%	48%	59%	58%	52%
Medicines	32%	34%	37%	29%	28%	32%
Other	16%	20%	15%	12%	14%	16%
Total	100%	100%	100%	100%	100%	100%

During both years, personnel dominated the health centers' total cost structure by 50 percent and 30 percent by drugs, revealing a high fixed cost level. Health centers average fixed cost will decrease when the number of patients increases, leading to improved productivity and efficient use of critical resources.

3.2.1.1 Average Personnel Costs in Health Centers

Idle capacity occurs if health centers maintain their staff level and salary expenditures while fewer patients are cared for. On average, health centers count three government employees on the government payroll, whereas the other staff, up to 20, are hired and paid by the health center. Staff receives salary mark ups as well as additional payments for training sessions from donors. Monthly salary payments are the largest and a regular expenditure component for health centers. Average personnel costs per health center have increased in Byumba and in the two control districts, while Kabgayi and Kabutare health centers reported slightly less personnel costs since the introduction of prepayment.

Average total personnel costs in health centers will decrease and staff productivity will increase with more members joining the schemes and seeking care.

3.2.1.2 Average Drug Cost in Health Centers

Drug costs are variable costs that change with the health facilities' workload and purchasing price paid at the district pharmacy. Table 3.9 shows that since the introduction of PPS, drug costs have increased in Kibungo by 38 percent and in Kabutare by 40 percent. Kabgayi and Byumba reported smaller increases of 9 percent, and Bugesera, the control district, reported 32 percent less drug costs and overall utilization decreases. Kabutare's cost increase was caused by an increase in drug sales prices at the district pharmacy[6]. Consequently, health centers drug expenditures increased. The Health Center has risen prices for drugs sold to patients. This drug price increase might have influenced the decrease in Kabutare's consultation rate from 0.5 to 0.37 per capita per year, since the withdrawal of the donor's drug subsidies.

3.2.2 Average Personnel and Drug Unit Costs per New Case Curative Consultation

Based on the data collected in health centers during the two-year period, total costs in health centers were analyzed per new consultation. Table 3.10 presents health centers' unit costs for personnel and drugs per new consultation for the year before and following PPS. Personnel unit costs provide an indicator for personnel productivity which show personnel costs in relation to the overall number of curative consultations. The personnel unit costs in the two control districts, Kibungo and Bugesera, have increased more than the pilot districts. Personnel costs per consultation increased 11 percent in Byumba and decreased 7 percent in Kabgayi, although overall consultation rates in the two districts remained on the same level prior to and following PPS. Personnel costs per consultation are still on the lowest level in Kabutare, but have increased significantly (32 percent), due to fewer consultations during the second year.

[6] Until July 1999, Doctors without Borders (MsF) provided subsidized drugs to the district pharmacy. This subsidy was passed on to health centers. With MsF's drug subsidies coming to an end in July 1999, the district pharmacy bought drugs from CAMERWA and immediately adjusted the drug sales prices to health centers.

Drug costs per consultation show the centers' total drug purchasing costs in terms of the total number of curative consultations. Drug costs per consultation change in the following situations: a change in the price paid by health centers when buying drugs at the district or other pharmacies, or if the quantity of drugs needed to treat patients has changed. Health centers' drug costs per consultation have doubled in Kabutare since the donor subsidies to the district pharmacy were stopped in July 1999. Kabgayi reports the highest drug costs (355 RwF per curative consultation), revealing an increase in the drugs prescribed per consultation in comparison to other districts. During the year following PPS, the two control districts reported less drug costs per consultation than health centers in the pilot districts. This is due to either lower drug purchase prices paid at the district pharmacy or incomplete drug quantities prescribed per consultation.

Table 3.10: Health Centers: Unit Costs per New Case Curative Consultation, by District, Before (8/98–7/99) and Since (8/99–7/00) PPS

All Patients	Pilot Districts			Control Districts		Total
Unit Costs	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo	5 Districts
Sample Size	20	17	15	14	10	76
Personnel Cost per Curative Consultation, all patients new cases (RwF)						
Before PPS	423	492	301	401	439	411
Since PPS	469	457	398	475	486	457
Change in %	11%	-7%	32%	19%	11%	11%
Drug Cost per Curative Consultation, all patients new cases (RwF)						
Before PPS	303	302	166	317	168	251
Since PPS	314	355	320	230	238	292
Change in %	4%	18%	92%	-27%	42%	16%

Table 3.11 presents personnel and drug costs per consultation for members and nonmembers. As a result of members' higher utilization rates, personnel costs per consultation for a member patient are considerably lower than for non member patients in all pilot district health centers. Members report less drug cost per consultation as they seek care immediately at the onset of their illness, a result of improved financial accessibility to care, which is observed by increased consultation rate at the same time.

Table 3.11: Health Centers: Unit Costs per New Case Curative Consultation, by District, for PPS-Members and Nonmembers (8/99–7/00)

Members / Nonmembers	Pilot Districts		
Unit Costs per Curative Consultation	Byumba	Kabgayi	Kabutare
Number of PPS Members	48,837	21,903	17,563
Personnel Cost per Curative Consultation, (RwF)			
PPS Members	249	272	235
Nonmembers	592	457	398
Difference between Nonmembers and Members	138%	68%	69%

Members / Nonmembers Unit Costs per Curative Consultation	Pilot Districts		
	Byumba	Kabgayi	Kabutare
Drug Cost per Curative Consultation, new cases (RwF)			
PPS Members	272	313	277
Nonmembers	325	363	328
Difference between Nonmembers and Members	20%	16%	18%

3.2.3 Total Average Costs in Hospitals

Due to the lack of a hospital accounting system, data collection in hospitals was incomplete. Table 3.12 reveals that the main cost components in Byumba and Kabgayi were personnel and drug costs. Costs have increased in Byumba, however, this could be due to better reporting during the pilot year. It is strongly recommended that hospitals begin using basic accounting tools and document their cash, bank, revenue and expenditure flow . In addition, it is also recommended that hospitals establish a sound drug inventory to help them manage their scarce resources.

Table 3.12: District Hospitals: Average Total Facility Costs by Hospital, Before (8/98–7/99) and Since (8/99–7/00) PPS

Cost Categories	Pilot Districts			Control Districts		Total
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo	Hospitals
Sample Size	1	1	1	1	1	5
Costs, year before PPS (1000s of RwF)						
Personnel	12,864	36,237	4,858	8,395	34,194	19,310
Medicines	9,709	27,099	N/A	N/A	N/A	18,404
Other	4,359	7,847	N/A	N/A	N/A	6,103
Total	26,931	71,184	N/A	N/A	N/A	49,057
Costs, year since PPS (1000s of RwF)						
Personnel	18,934	39,536	10,310	13,700	43,288	25,154
Medicines	19,036	8,550	14,718	N/A	16,980	14,821
Other	6,695	20,688	N/A	N/A	15,576	14,320
Total	44,664	68,775	N/A	N/A	75,845	63,094
Change in Costs from Year Before to Since PPS						
Personnel	47%	9%	112%	63%	27%	30%
Medicines	96%	-68%	N/A	N/A	N/A	-19%
Other	54%	164%	N/A	N/A	N/A	135%
Total	66%	-3%	N/A	N/A	N/A	29%
Cost Structure (%), Before PPS						
Personnel	48%	51%	N/A	N/A	N/A	39%
Medicines	36%	38%	N/A	N/A	N/A	38%

Cost Categories	Pilot Districts			Control Districts		Total
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo	Hospitals
Other	16%	11%	N/A	N/A	N/A	12%
Total	100%	100%	N/A	N/A	N/A	100%
Cost Structure (%), Since PPS						
Personnel	42%	57%	N/A	N/A	57%	40%
Medicines	43%	12%	N/A	N/A	22%	23%
Other	15%	30%	N/A	N/A	21%	23%
Total	100%	100%	N/A	N/A	100%	100%

3.2.4 Discussion of Cost Results

Health centers' cost findings have shown that with more members among their patients, health centers' can lower their total average and unit costs by better use of their idle capacities. Members report lower average drug costs per consultation than nonmembers. This is caused by less intense drug treatment due to members' faster financial accessibility to care.

Drug costs per consultation is an important indicator for the quality of care related to drug treatment. If patients are poor, and pay out-of-pocket fees, then they will very likely lack the money to buy all the drugs prescribed, and due to their deteriorating financial accessibility, patients will seek care only when they already are in an advanced stage of their illness and need more drugs. Quality of care concerns occur when sick patients who do not consume the full prescriptions of antibiotics, develop resistance against drugs. This makes future treatment more difficult and expensive.

The previous two sections have presented results on service utilization and costs in health facilities. The following section evaluates the different financial sources in health centers and hospitals before and since the introduction of prepayment.

3.3 Financing of District Health Services

This section presents health centers' financial resources, and total cost recovery rates. The resource situation in the five district hospitals will be discussed in section 3.3.4.

3.3.1 Total Average Sources in Health Centers

Before health centers and hospitals were affiliated with prepayment schemes, they had three main revenue sources: patients' out-of-pocket payments, donor funds, and government subsidies mostly in the form of salary payments to government employees working in the facilities. Prepayment revenue as a fourth source was added during the pilot phase for health centers who are affiliated with the schemes.

Table 3.13 presents the total resources in health centers during the year before and since prepayment. Total financial resources and contributions from the population have risen in each pilot district and in Kibungo. Nonmembers in Byumba have contributed less to health care compared to the

year before, a decrease that was more than compensated by the additional revenue from prepayment schemes. Thus, the overall increase in financial resources in Byumba during the pilot year is the direct result of additional resources from PPS. Kabgayi and Kabutare increased nonmembers' contribution although nonmembers' consultation rates dropped during the same time period. The 350 percent increase in government sources in Kabutare from before to since PPS was caused by improved data reporting in health centers. The contributions from the PPS to the financing of the district health centers have become just as significant as the grants from the government or donors. In Byumba, during their first year of operation and with 10 percent of the population enrolled, prepayment schemes contributed to health centers (19 percent), which was more than donors (15 percent), and almost as much as the government (20 percent).

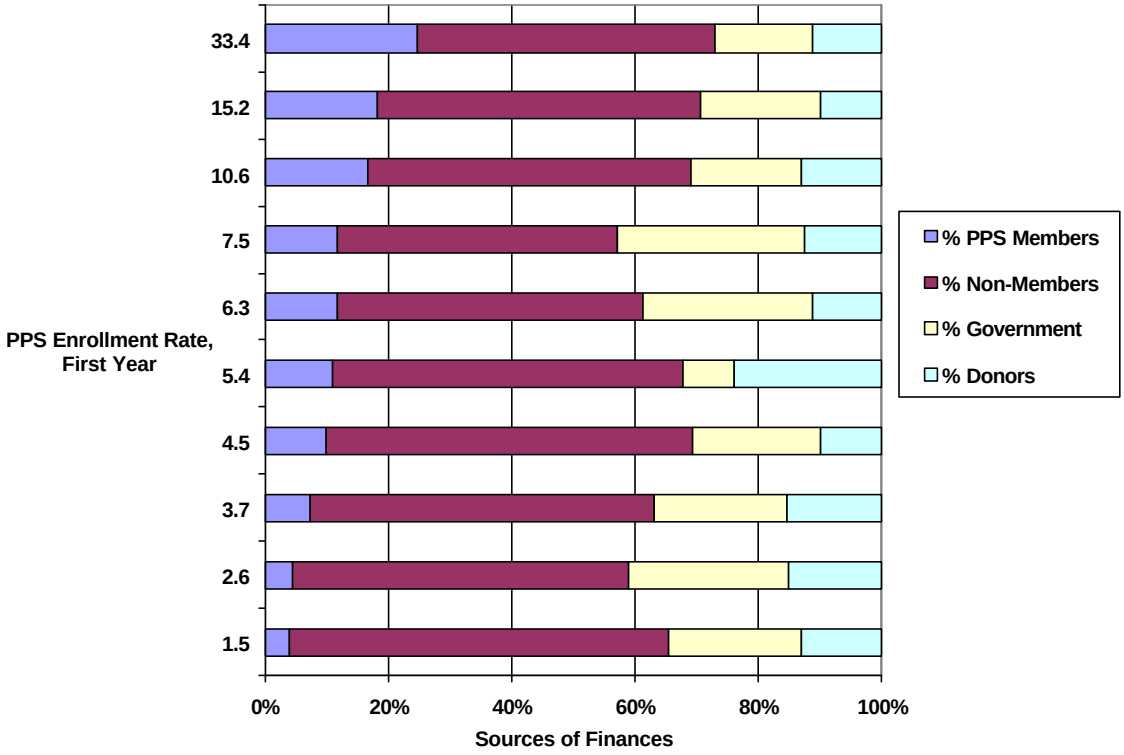
Table 3.13: Health Centers: Average Total Facility Sources by District, Before (8/98–7/99) and Since (8/99–7/00) PPS

Source Categories	Pilot Districts			Control Districts		Total
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo	5 Districts
Sample Size	20	17	15	14	10	76
Sources, year before PPS (in 1000s of RwF)						
Population: N/M User Fees	2,898	3,878	2,846	3,102	2,153	2,975
Donors	604	1,292	1,571	1,094	1,015	1,115
Government	948	1,935	622	480	777	953
Total	4,450	7,106	5,039	4,677	3,945	5,043
Sources, year since PPS (in 1000s of RwF)						
Population: PPS Members	905	441	426			590
Population: N/M User Fees	2,241	3,947	3,027	2,415	2,787	2,883
Donors	738	656	902	1,203	1,478	995
Government	951	1,588	2,846	474	913	1,354
Total	4,834	6,631	7,202	4,092	5,178	5,587
Change in Sources from Year Before to Since PPS						
Population (PPS and FFS)	8.5%	13.1%	21.3%	-22.2%	29.5%	16.8%
Donors	22.1%	-49.3%	-42.6%	10.0%	45.6%	-10.8%
Government	0.3%	-18.0%	357.8%	-1.4%	17.5%	42.2%
Total	8.6%	-6.7%	42.9%	-12.5%	31.3%	10.8%
Source Structure, year before PPS (in 1000s of RwF)						
Population: User Fees (FFS)	65%	55%	56%	66%	55%	59%
Donors	14%	18%	31%	23%	26%	22%
Government	21%	27%	12%	10%	20%	19%
Total	100%	100%	100%	100%	100%	100%
Source Structure, year since PPS (in 1000s of RwF)						
Population: PPS Members	19%	7%	6%	0%	0%	11%
Population: N/M User Fees	46%	60%	42%	59%	54%	52%
Donors	15%	10%	13%	29%	29%	18%

Source Categories	Pilot Districts			Control Districts		Total
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo	5 Districts
Government	20%	24%	40%	12%	18%	24%
Total	100%	100%	100%	100%	100%	100%

Figure 3.2 ranks the 52 health centers in 10 groups on the vertical axis according to their first year PPS enrollment rate. The horizontal axis distributes financial resources in health centers during the pilot year. Revenue from nonmembers remains the main revenue source for most centers[7]. However, with growing membership pools, prepayment contributions become more important. Facilities with more than 20 percent of the population enrolled in the affiliated PPS, have received more than 20 percent of total sources from prepayment, which is comparable to the combined subsidies of government and donors.

Figure 3.2: Distribution of Sources in Health Centers, by their PPS Enrollment (8/99–7/00)



3.3.2 Per Capita Contribution by the Population to Health Centers

Table 3.14 presents the district population's per capita contribution to health centers during the previous year and since PPS, and for members and nonmembers. With the exception of Bugesera, per

[7] This is not the case in health centers with large membership pools, such as Bungwe, where prepayment reimbursement exceeded out-of-pocket revenue after the ninth month of the pilot year.

capita contributions to health centers have risen in all districts. Increases were highest in Kabutare and Kibungo, although the latter remained on the lowest level. PPS members contribute five times more per capita than nonmembers for health center care in Byumba, and almost four times more in Kabgayi and Kabutare.

Table 3.14: Health Centers: Population's Per Capita Contribution, by District, Before (8/98–7/99) and Since (8/99–7/00) PPS, Members and Nonmembers

Members / Nonmembers Sources	Pilot Districts			Control Districts	
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo
Contribution to Health Centers, per capita total population (RwF)					
Before PPS	126.2	179.1	165.4	174.5	73.0
Since PPS	136.8	202.7	200.7	136.0	94.5
Change in %	8%	13%	21%	-22%	29%
Contribution to Health Centers, per capita members and nonmembers (RwF)					
PPS Members	580.4	626.0	679.7		
Nonmembers	104.0	188.4	182.7		
Members / Non members Ratio	5.6	3.3	3.7		

The next section will calculate cost recovery rates from patient revenue, compared by the extent to which health centers' total costs are covered by their revenue from the population.

3.3.3 Cost Recovery Rates in Health Centers

Health centers cover their operational fixed and variable costs with financial resources from patients, donors and the government. Cost recovery rates from population revenue provide an indicator on health centers financial autonomy. Figure 3.3 shows that, compared to the year before PPS, pilot health centers have risen cost recovery rates in Byumba from 68 to 75 percent, in Kabgayi from 61 to 71, and in Kabutare from 61 to 67 percent. The two control districts have reached lower levels compared to the pilot health centers, and have even signaled a decrease in Bugesera from 67 to 58 percent, while Kibungo reported a small increase from 58 to 62 percent of total costs covered by patient out-of-pocket revenue.

Figure 3.3: Health Centers: Cost Recovery by Population, by District, Before (8/98–7/99) and Since (8/99–7/00) PPS

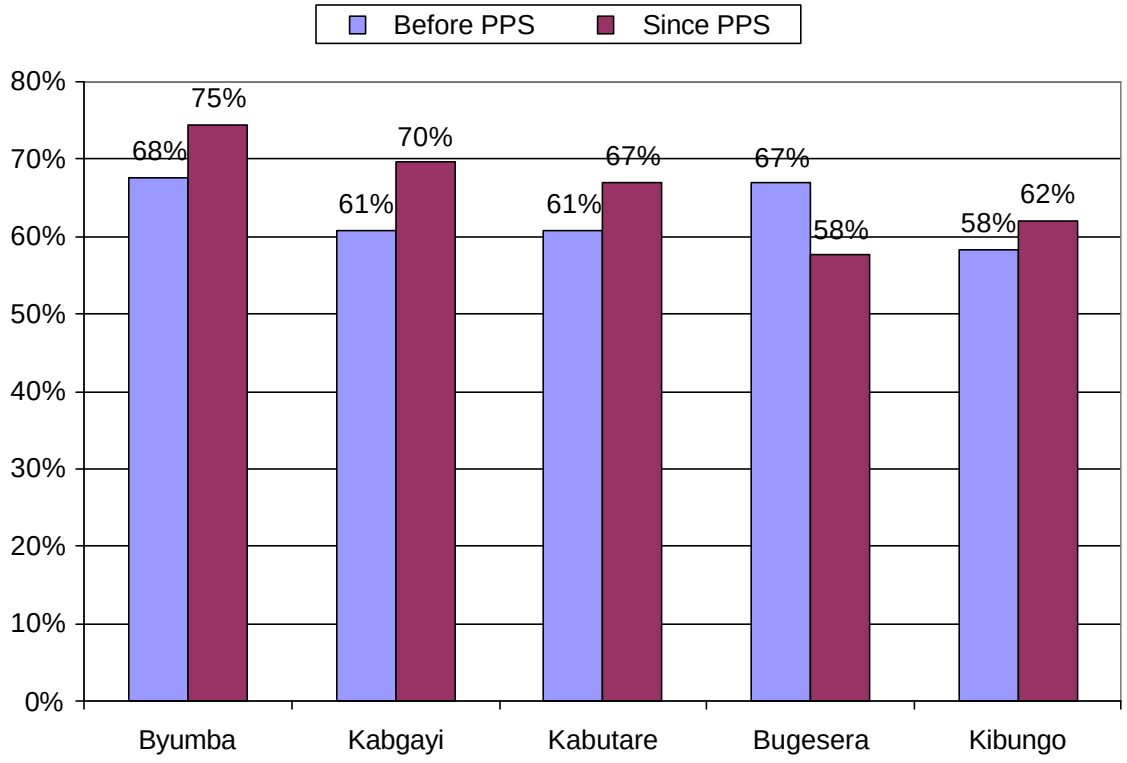
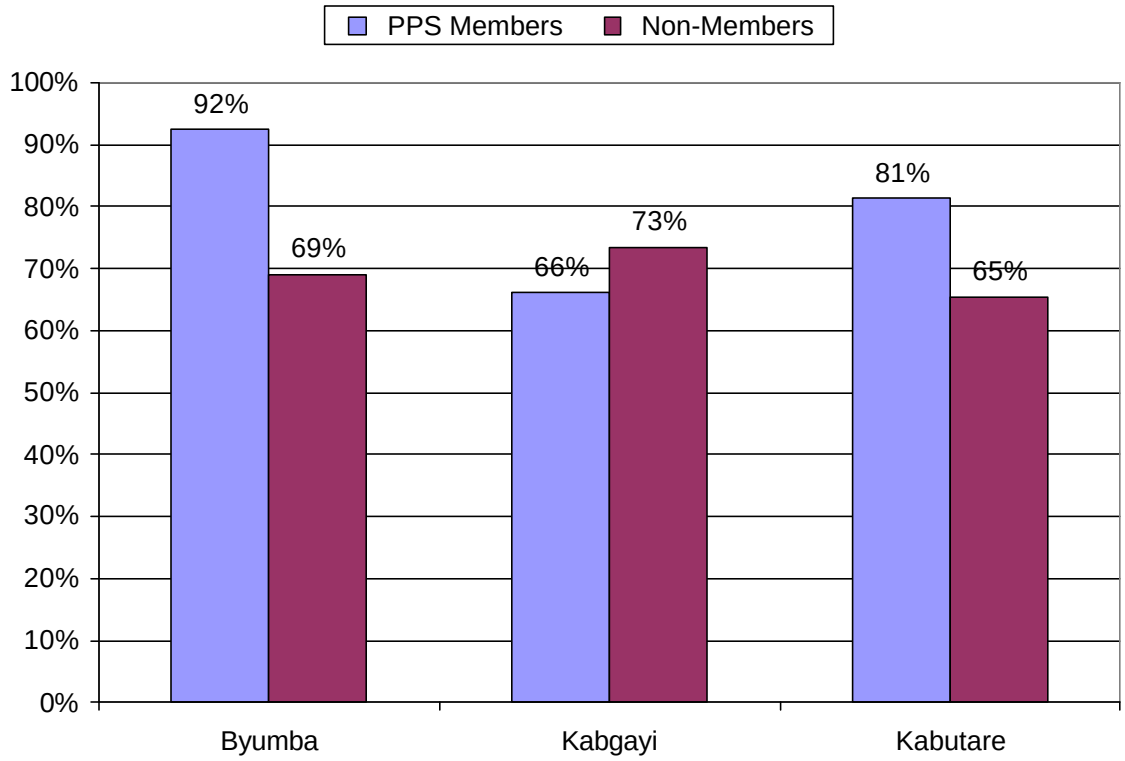


Figure 3.4 compares cost recovery rates for members and nonmembers in pilot district health centers. Byumba and Kabutare report considerably higher cost recovery rates for members than for nonmembers. The increase in the overall cost recovery rate in Kabutare and Byumba districts, as shown in Graph 3.3, has been a direct consequence of contributions from PPS members.

In Kabgayi, however, the recovery rate rose more for nonmembers than for PPS members. Kabgayi health centers operate on a much higher than average cost level compared to the health centers in the other districts (see Table 3.9), revealing that Kabgayi health centers need overall more resources to cover their higher average costs.

Figure 3.4: Health Centers: Cost Recovery by Population, by District, Members and Nonmembers (8/99–7/00)



The following is a description of hospital sources during the year before and since prepayment schemes.

3.3.4 Total Average Sources in District Hospitals

Table 3.15 provides an overview of the financial resource situation in the five district hospitals. The validity of hospital data in Rwanda needs to be improved by implementing an accounting system in hospitals. Revenue from patient out-of-pocket payments constitute hospitals main revenue source. The Kabgayi hospital reported overall higher revenue levels than the other hospitals. The PPS federation of Kabgayi had to pay a hospital bill for members service use, which was six times higher than the bill presented to the Byumba federation, and 10 times higher than the ones paid by the Kabutare federation to the hospital. As documented in Table 3.1, Kabgayi hospital reported overall and specifically among PPS members considerably more C-Sections. The Kabgayi PPS federation received financial support from the Belgian Cooperation in the amount of 1.5 million RwF and from the Rwandan government, who agreed to subsidize the higher number of cesarean sections (see Table 1.7) during the pilot phase.

Table 3.15: District Hospitals: Average Total Facility Sources by Hospital, Before (8/98–7/99) and Since (8/99–7/00) PPS

Source Categories	Pilot Districts			Control Districts		
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo	Total
Sample Size	1	1	1	1	1	5
Sources, year before PPS (in 1000s of RwF)						
Population: User Fees (FFS)	17,266	50,494	8,354	4,807	18,411	19,866
Donors	2,522	15,701	N/A	N/A	11,067	9,763
Government	2,114	13,228	1,472	2,657	13,731	6,640
Total	21,901	79,423	9,826	7,464	43,209	32,365
Sources, year since PPS (in 1000s of RwF)						
PPS Members	841	2,619	277			1,246
Nonmembers User Fees	19,266	37,642	11,643	3,642	28,334	20,105
Donors	4,051	26,797	892	N/A	14,359	11,525
Government	5,471	1,958	6,476	11,488	15,939	8,266
Total	29,629	69,015	19,289	15,130	58,631	38,339
Change in Sources from Year Before to Since PPS						
Population (PPS and FFS)	16.5%	-20.3%	42.7%	-24.2%	53.9%	7.5%
Donors	60.6%	70.7%	N/A	N/A	29.7%	18.0%
Government	158.8%	-85.2%	340.0%	332.4%	16.1%	24.5%
Total	35.3%	-13.1%	96.3%	102.7%	35.7%	18.5%
Source Structure, year before PPS (in 1000s of RwF)						
Population: User Fees (FFS)	79%	64%	85%	64%	43%	61%
Donors	12%	20%	N/A	N/A	26%	30%
Government	10%	17%	15%	36%	32%	21%
Total	100%	100%	100%	100%	100%	100%
Source Structure, year Since PPS (in 1000s of RwF)						
PPS Members	3%	4%	1%	0%	0%	3%
Nonmembers User Fees	65%	55%	60%	24%	48%	52%
Donors	14%	39%	5%	N/A	24%	30%
Government	18%	3%	34%	76%	27%	22%
Total	100%	100%	100%	100%	100%	100%

Table 3.16 presents per episode revenue paid by patients and the prepayment scheme for maternity care. Hospitals receive from the prepayment scheme federations a fixed amount per C-Section in Kabgayi (RwF 20,000) and in Byumba and Kabutare (RwF 12,000). Nonmembers pay on

average considerably less per C-Section[8]. Overall revenue from C-Sections has increased in the three pilot districts, but it decreased in the control districts. The average amount paid by the prepayment scheme per episode exceeded the revenue paid per case by nonmembers in each of the three districts. Prepayment schemes helped to improve the financial situation in district hospitals in the three districts and at the same time guaranteed access to professional maternity care.

Table 3.16: Revenue per Episode in District Hospitals (RwF), 1999/2000

Average Revenue	Pilot Districts			Control Districts	
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo
Cesarean Section Revenue per Case, all patients (RwF)					
Before PPS (excl. drugs)	4,551	13,697	5,898	4,289	14,088
Since PPS (excl. drugs)	5,214	14,749	8,473	3,614	9,503
Change in %	15%	8%	44%	-16%	-33%
Cesarean Section Revenue per Case, members and nonmembers (RwF)					
PPS Members (incl. drugs)	12,000	20,000	12,000		
Nonmembers (excl. drugs)	3,716	13,356	8,126		
Revenue per Delivery, all patients (not covered by PPS)					
Before PPS (excl. drugs)	1,862	5,796	2,442	1,588	5,718
Since PPS (excl. drugs)	1,337	5,491	3,823	1,479	4,151
Change in %	-28%	-5%	57%	-7%	-27%

3.3.5 Discussion of Finances Results

Health facilities resource and cost situation show that although the government and the church own the health centers and hospitals, their financial dependency on consumer revenue forces them to behave like private providers, and set prices to maximize their revenue and profits, when service utilization is declining. The revenue increase in Kabgayi and in Kibungo indicates that with fewer patients seeking care, health facilities tend to either raise service prices or the number of services provided per consultation to out-of-pocket paying patients, in order to maintain the same revenue level instead of lowering their fix costs (personnel costs) and to become more productive.

The financial revenue from the population remains the primary financial source in health centers. Prepayment schemes were found to have mobilized additional financial resources in health centers and at the same time improved the population's financial accessibility to care. This has led to better resource allocation and improved staff productivity in health centers. Prepayment has contributed to higher cost recovery rates in health centers if membership pools are large enough, and if health centers manage their costs and operate at average cost levels comparable to those in Byumba.

The difference between health facilities' revenue and actual cost occurred to the provider is the provider's profit, which is discussed in the following section.

[8] Nonmembers' Cesarean section revenue per case, excluding drugs in hospitals was calculated based on the total gynecology department revenue per year, the average length of stay (ALOS) for C-Sections (10 days) and for other deliveries (2 days) :
Cesarean section revenue per non member case = Total gynecology hospital revenue from nonmembers *10 ALOS / {[(Number of non member deliveries – Number of non member C-Section) * 2 ALOS for deliveries] + (Number of non member C-Section *10 ALOS per C-Section)}

3.4 Profits in Health Centers

Average profits in health centers are estimated by comparing health centers' total sources in Table 3.13 with their total costs as shown in Table 3.9. This comparison is depicted in Table 3.17 and shows that during both years, health centers in the three pilot districts and in Kibungo have accumulated important profits, with their total sources exceeding total costs[9].

Profit ratios around 10 percent as reported in the three pilot districts and in Kibungo are very high. The Kabgayi health centers need to manage their costs better, for example by adjusting their staff capacity to their workload, and investigating their drug prescription pattern. Kabgayi health centers have the opportunity to reach similar profit ratios as in Byumba, if they enroll more PPS members, which will also help the centers to become more productive. Health centers in Kabutare have reported higher government contributions during the second year (see Table 3.12), which has led to important savings in health centers.

Table 3.17: Health Centers: Average Annual Profits, by District, Before (8/98–7/99) and Since (8/99–7/00) PPS

Sources, Costs and Profits in Health Centers	Pilot Districts			Control Districts		Total
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo	5 Districts
Sample Size	20	17	15	14	10	76
Profit, year before PPS (in 1000s of RwF)						
Total Sources	4,450	7,106	5,039	4,677	3,945	5,043
Total Costs	4,009	6,499	4,700	4,635	3,692	4,707
Total Profit in Health Centers	441	606	339	42	253	336
Profit in proportion of cost	11%	9%	7%	1%	7%	7%
Profit, year since PPS (in 1000s of RwF)						
Total Sources	4,834	6,631	7,202	4,092	5,178	5,587
Total Costs	4,430	6,552	5,252	4,190	4,489	4,983
Total Profit in Health Centers	405	78	1,950	(98)	689	605
Profit in proportion of cost	9%	1%	37%	-2%	15%	12%

The following section compares health centers drug unit cost and drug revenue.

3.4.1 Profits on Drugs in Health Centers

Following the MOH recommendations, health centers buy generic drugs at the district pharmacy. Health centers may add a 5 percent mark-up on their purchasing drug price paid to the pharmacy to define the price at which they sell drugs to patients. Health centers use the additional income resulting from this drug profit to pay for other costs, such as staff and operational costs. The regular monitoring

[9] Assuming that health centers without proper bookkeeping methods are likely to underreport total sources, they might have earned even higher profit ratios than the results shown in Table 3.17.

of drug prices in health centers has revealed that several health centers, mainly in Kabgayi, have added mark-ups that are considerably higher than the recommended 5 percent. This finding is supported when comparing health centers' costs for drug with patients' payments as the findings from the patients exit interview survey conducted in the five districts show.

Figure 3.5 shows the average amount paid by non-insured patients for drugs during a visit in August 2000 at the health center according to the patient exit interview survey[10]. Average drug costs in health centers per new consultation were calculated with a total cost analysis. The difference between non member patients' payments and health centers' drug costs are considerable and point to important drug benefits in health centers with the exception of Byumba.

Figure 3.5: Drug Benefits in Health Centers on Nonmembers per Visit (8/99–7/00) (RwF)

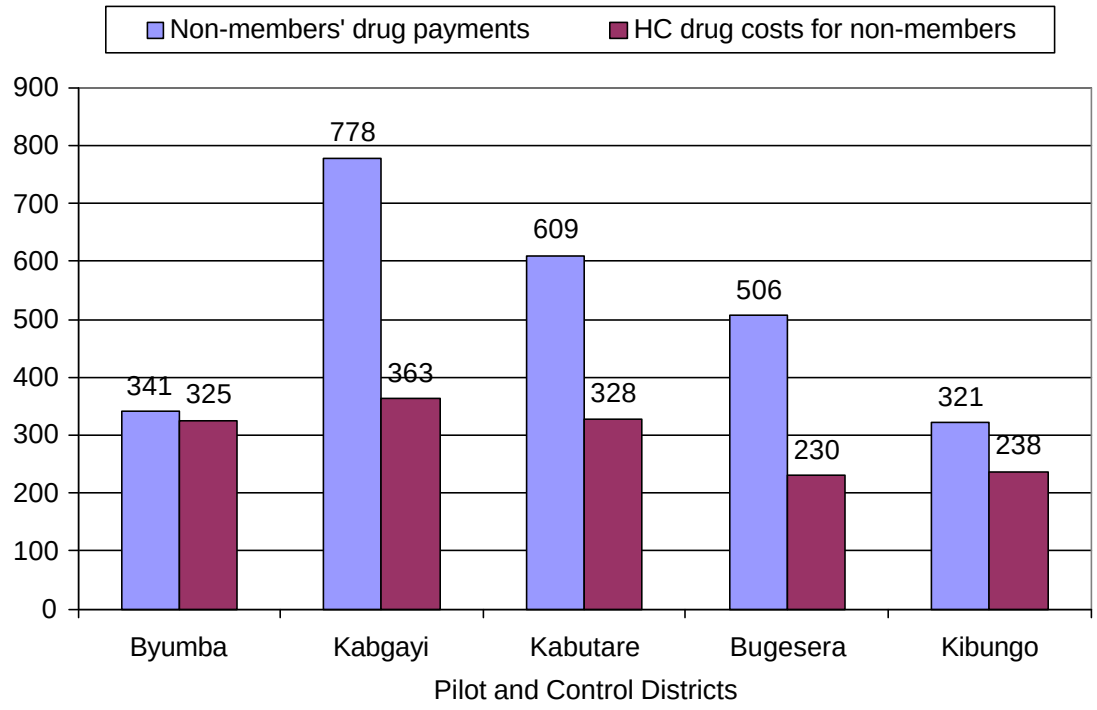


Table 3.18 presents drug payments made by patients per visit who are PPS members and nonmembers and health centers' drug profit ratio for non member patients. PPS cover generic drugs for members, thus members' out-of-pocket payments include drugs not covered which are excluded from the MOH essential drug list. Comparing information from patients and from health centers shows that Byumba health centers follow the MOH and district recommendations and apply on average a 5 percent mark-up on their drug costs occurred at the time of drug purchase at the district pharmacy. Drug profit ratios on drug sales to nonmembers are highest in Bugesera, where the average drug price paid by non member patients interviewed was 120 percent higher than the average drug costs reported by the health centers for nonmembers. Equally high drug profit ratios for nonmembers drug sales were reported in Kabgayi (114 percent), in Kabutare (86 percent) and to a lower extent in Kibungo (35 percent).

[10] The patient exit interview survey conducted in the 5 districts by ONAPO, reports on patients' average payments per visit in August 2000.

Table 3.18: Patients' Average Payments for Drugs per Health Center Visit, for PPS-Members and Nonmembers (8/2000)

Drug Payments and Profit Ratios	Pilot Districts			Control Districts	
	Byumba	Kabgayi	Kabutare	Bugesera	Kibungo
Patients' Drug Payments per Visit, (RwF)					
PPS Members	11	2	28		
Nonmembers	341	778	609	506	321
Health Centers' Drug Benefit Ratio per Visit, in percent					
Nonmembers' Drug Costs	325	363	328	230	238
Nonmembers' Drug Payments	341	778	609	506	321
Drug Benefit on Nonmembers	5%	114%	86%	120%	35%

(Source: Patient Exit Interview Survey and health center routine data collection)

3.4.2 Discussion of Profit Results

The difference in health centers' average drug cost per visit and patients' average drug payment per visit point to the need to investigate drug payment practices in health centers, to prevent patients facing financial access constraints because of overpriced drugs. In order to foster better access to care, subsidies from the government and donors should be passed on from the providers to the patients by decreasing service and drug prices in health centers, or by exempting more poor from paying fees.

The findings in this section have shown that health centers accumulate considerable profit ratios, and patients who are not members of prepayment schemes might succumb to important "under-the-table-payments" to health center personnel. Findings from the patient exit interviews have revealed that 20 percent of the Kibungo and Bugesera patients lack the full amount of money to buy the drugs prescribed during the visit. This was also the case for 10 percent of the non member patients in the two pilot districts Kabgayi and Kabutare. Partial exclusion from care and under-the counter payments are access concerns the MOH needs to investigate.

Prepayment schemes have proven to be an effective tool to prevent under-the-table payments and improve all members' access to the necessary drug treatment at any time of the year.

The last section of this report summarizes key findings in relation to the MOH objectives, and discusses their policy relevance for Rwanda.

4. Key Findings and Discussion of their Policy Relevance to Rwanda

This study has evaluated the financial and membership results achieved by PPS in Byumba, Kabgayi and Kabutare during their first operational year, and has analyzed the impact of prepayment combined with capitation provider payment on utilization, cost, and finances of district health services in the three pilot and in two control districts of Kibungo and Bugesera. With more than 88,000 people enrolled, the 54 prepayment plans, managed by volunteer members, have improved financial accessibility to care for 8 percent of the rural population in Byumba, Kabgayi and Kabutare. Prepayment instantly contributed to equity in access to care, as they fostered family and group enrollment at an affordable price, and were identified by the communities and churches as effective tools to help finance premium for impoverished community members (see PHR, July 2000). PPS members' higher use rate of preventive care and professional birth assistance will have an impact on members' health status and women and children survival rates. The additional utilization impact of PPS was highest in health centers with previously low and medium utilization levels, where they have contributed to the better use of idle resources. This finding is a strong argument to offer prepayment to the population in all health centers independent of their utilization level.

Quality of care is a major factor that attracts people to PPS membership and, at the same time, allows them to become better informed patients who are more demanding, which contributing to better quality care. Health center personnel reported that due to members' better financial accessibility to care, members use preventive care services more often, seek care faster at the onset of illness (thus need less drugs to recover) and as a result recover faster than nonmembers.

Because of their democratic organization and management style, the plans have become important interest groups in the communities, and have successfully pushed health to the local political agenda. PPS and their member general assemblies became forums for the rural population to exercise their democratic rights and duties, and contribute to the overall political reform process in the country.

Prepayment has improved the financial sustainability in health centers without deteriorating the population's financial accessibility to care. PPS members contributed up to 5 times more per capita for care to health centers compared to nonmembers in pilot and control. Generally, health centers reported higher total cost recovery rates for members than for nonmembers, if they operated on a reasonable average cost level and had reasonable membership pools. PPS with capitation provider payment have provided an incentive to facilities to contain costs, control for members moral hazard behavior for curative service use, increase the number of preventive care service to keep members healthy, and follow the Ministry of Health's guidelines in prescribing drugs from the essential drug list and according to the standard treatment protocols. Given health facilities' financial results, it is recommended that the prepayment premium levels remain on the same level; however, with an increasing membership pool, additional services should be covered at the same premium level. Capitation payment should be favored for hospitals and replace per episode and per service payment.

These results strongly support the plan of the MOH to expand the developed PPS models to the remaining health districts in Rwanda, and make prepayment an option for all.

4.1 Policy Relevance of Prepayment Schemes

The Rwandan MOH is currently finalizing its health policy, which was drafted in 1995, in collaboration with the World Health Organization. The findings of the PPS first year pilot experience provide important information to the MOH to define how health care should be financed.

Rwanda's National Health Accounts (NHA) show that the Rwandan health sector is strongly donor dependent, and the large majority of the population living in rural areas seeks care in health centers. Before prepayment, and in districts where patients still pay out-of-pocket, health centers' main revenue source are patients' user fees (about 70 percent). Since 1996, user fees have proved to be an unsuccessful method to finance basic health care as they had a deteriorating effect on the population's access to care. The policy relevance of prepayment to finance Rwanda's health sector is striking. This prepayment evaluation supports the argument that health care financing through well designed community-and district-based risk sharing schemes is a valuable alternative to user fees in order to achieve objectives including improved financial accessibility to better quality care, active community participation, and better financial sustainability in health facilities and prepayment schemes. The final Rwandan health policy should endorse and promote prepayment with capitation provider payment as a financing alternative to the still dominating patients out-of-pocket user fees.

Based on the above results, findings from the household and stakeholder surveys, and the patient exit interview, a final synthesis report will be presented to the MOH and USAID. This final report will contain recommendations on the strengthening of the current PPS in the pilot districts and on the MOH plan to scale-up PPS nationwide to facilitate equal access to care to Rwanda's rural poor.

Annex A: Additional Tables

Table 1: Prepayment Schemes and Health Centers in Pilot District Sample, (7/1999–6/2000)

Rank	Name of PPS and HC	Health District	Owner	First Year % PPS Enrollment Rate	Population in HC catchment area	Number of PPS Members	Quintile Classific
1	Muyanza	Byumba	Church	55.18	7,088	3,911	5
2	Karama	Kabutare	Church	41.32	10,621	4,389	5
3	Bungwe	Byumba	Church	24.09	36,167	8,711	5
4	Gisiza	Byumba	Church	23.55	13,024	3,067	5
5	Rushaki	Byumba	Church	22.98	31,549	7,249	5
6	Mulindi	Byumba	Public	17.50	21,686	3,795	5
7	CS Kabgayi	Kabgayi	Church	16.57	23,143	3,835	5
8	Kabilizi	Kabutare	Public	15.86	10,891	1,727	5
9	Buramba	Kabgayi	Public	13.87	10,899	1,512	5
10	Mbazi	Kabutare	Public	12.10	13,054	1,579	5
11	Kivumu	Kabgayi	Church	11.91	14,215	1,693	4
12	Ruhango	Kabgayi	Church	11.44	21,544	2,465	4
13	Mukono	Byumba	Public	10.68	24,741	2,643	4
14	Manyagiro	Byumba	Church	10.29	22,921	2,358	4
15	Kivuye	Byumba	Public	8.81	13,107	1,155	4
16	Tumba	Byumba	Public	8.28	19,815	1,640	4
17	Shyogwe	Kabgayi	Church	7.88	10,509	828	4
18	Rutare	Byumba	Church	7.46	27,964	2,086	4
19	Mukoma	Kabgayi	Church	7.39	9,519	703	4
20	Gishweru	Kabgayi	Public	6.94	14,823	1,028	4
21	Rwesero	Byumba	Church	6.93	19,906	1,379	4
22	Musambira	Kabgayi	Public	6.55	34,020	2,228	3
23	Biwisige	Byumba	Public	6.26	11,021	690	3
24	Nyarusange	Kabgayi	Church	6.25	23,738	1,483	3
25	Kigogo	Byumba	Public	6.19	20,845	1,290	3
26	CS Byumba	Byumba	Public	6.02	31,550	1,900	3
27	Save	Kabutare	Church	5.89	33,108	1,949	3
28	Buyoga	Byumba	Public	5.72	18,677	1,068	3
29	Matyazo	Kabutare	Church	5.41	17,098	925	3
30	Cyahinda	Kabutare	Church	5.15	23,954	1,234	3
31	Ruhashy	Kabutare	Public	4.97	11,943	594	3

32	Miyove	Byumba	Public	4.97	25,239	1,254	2
33	Byimana	Kabgayi	Public	4.89	23,207	1,135	2
34	Giti	Byumba	Public	4.72	23,862	1,127	2
35	Gisagara	Kabutare	Church	4.29	25,331	1,086	2
36	Sovu	Kabutare	Church	4.19	16,193	679	2
37	Kinazi	Kabgayi	Public	3.96	21,583	855	2
38	Rukozo	Byumba	Church	3.95	34,705	1,371	2
39	Mushishiro	Kabgayi	Church	3.92	32,510	1,273	2
40	Munyinya	Byumba	Public	3.83	29,151	1,117	2
41	Rubona	Kabutare	Public	3.48	14,071	490	2
42	Mbuye	Kabgayi	Church	3.41	20,757	708	2
43	Rango	Kabutare	Public	2.98	7,323	218	1
44	Gitarama	Kabgayi	Public	2.70	33,256	897	1
45	Rutobwe	Kabgayi	Public	2.63	28,908	761	1
46	Musenyi	Byumba	Public	2.61	26,311	687	1
47	Nyantang	Kabutare	Public	2.26	9,007	204	1
48	Simbi	Kabutare	Church	2.07	27,838	575	1
49	Gishamv	Kabutare	Public	1.98	22,591	447	1
50	Maraba	Kabutare	Public	1.62	15,137	245	1
51	Kizibere	Kabgayi	Church	1.38	18,901	260	1
52	Nyabikenke	Kabgayi	Public	0.90	26,488	239	1
Total Prepayment Schemes / Health Centers in Pilot District Sample Size				7.99	1,085,509	86,742	

Table 2: Health Centers in Control District Sample, (7/1999–6/2000)

Name of PPS and HC	Health District	Owner	Population in HC catchment area
Gakurazo	Bugesera	Public	13,600
Karama	Bugesera	Public	24,060
Gitagata	Bugesera	Church	10,050
Gashora	Bugesera	Public	7,475
Nyamata	Bugesera	Public	30,945
Gihinga	Bugesera	Public	20,086
Mareba	Bugesera	Public	23,602
Rilima	Bugesera	Church	23,950
Ruhuha	Bugesera	Church	23,950
Kabukuba/Mwogo	Bugesera	Church	35,605
Kamabuye	Bugesera	Public	28,971
Mayange	Bugesera	Public	20,171
Rukira	Kibungo	Public	50,107
Jarama	Kibungo	Church	15,959
Nyange	Kibungo	Public	15,442
Kibungo	Kibungo	Public	44,250
Zaza	Kibungo	Church	25,348
Rukumbeli	Kibungo	Public	15,416
Mutendeli	Kibungo	Public	47,380
Gahara	Kibungo	Public	34,917
Rukoma/Sake	Kibungo	Church	16,494
Total Health Centers in Control District Sample Size			527,778

Annex B: Comparison by Performance Level

There are many ways the health centers could be classified and compared using a metric which captures the variability of performance between health centers. We can choose to use all the information contained in the different levels of activities of health centers (e.g., curative care consultations, prenatal care consultations, vaccination, deliveries) and classify health centers based on the transformation of this information through "factor analysis". Factor analysis constructs new, uncorrelated variables (orthogonal factors) which are based on the information contained in the original variables (e.g., curative care consultations, prenatal care consultations, vaccination, and deliveries). Health centers can be classified further based on the combination of factor scores for the main factors (factors which contain most of the information of the original variables but rarely more than two factors). By looking at the correlation of the original variables and the factors, we can suggest which factor represents which dimension of performance. The principal component extraction showed health centers with higher consultations and prenatal care rates accounting for 83 percent of the variation of the partnering PPS one year enrollment rates.

Alternatively, we can choose one key variable among the original variables (e.g., curative care consultations, prenatal care consultations, vaccination and deliveries) for the classification of health centers since these are highly correlated. This is why one would consider the use of factor analysis for the definition of classification rule. It just happens that with the data at hand, we ended up with the same classification of health centers using the factor scores or curative care consultations. Since it is much easier to understand the latter classification rule, we suggest the use of it.

What is important is that the classification of health centers using either rule may be reflecting differences in quality of services between classes of health centers, such that we may have quality determining in which class a health center is located, at the same time that it contributes to the PPS enrollment rate. Under such a pattern of relationships, differences in utilization between members and nonmembers will be high among low-performance class health centers and will decline as we move to high-performance class.

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