

District-based Health Insurance in sub-Saharan Africa

Part II: Case studies

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Introduction

The second part of this study on district-based health insurance in sub-Saharan Africa presents the empirical basis for the theoretical analysis of the first part. It contains the detailed results from three case-studies in Africa: the *Bwamanda* and *Masisi* schemes in the Democratic Republic of Congo (former Zaire), and the *Murunda* scheme in Rwanda.

The analysis of the Bwamanda hospital insurance scheme—which is still functioning today—is presented along three distinct chapters. Chapter 1 presents the rationale for its creation in 1986 and provides a detailed account of the scheme's design and organisational features. The scheme's general results are analysed along the lines of effectiveness, efficiency and equity. In its conclusion, Chapter 1 looks at the various conditions for the relative success of this health insurance scheme. Chapter 2 investigates in much more detail the Bwamanda scheme's impact on hospital utilisation patterns. Most of the information used in this analysis was derived from the routine health information system of the Bwamanda hospital. The spatial analysis of hospital utilisation indicates that the scheme greatly improved the access to justified hospital care, even for people living in remote areas. It succeeded in doing so without jeopardising the overall health system's sustainability. Chapter 3 presents an investigation conducted through focus groups of the Bwamanda population's social perceptions of the risk-sharing arrangement. The findings pertain to the reasons for people to subscribe to the scheme; to the perception of its redistribution effects; to people's frustrations and questions; and finally to the relationships between the insurance scheme and traditional mutual aid arrangements. The implications of this study on the management of the Bwamanda health insurance scheme are reviewed.

In Chapter 4, the Masisi hospital insurance scheme is presented. It was launched at the end of the eighties but was stopped after a few years. The scheme's development is described in a chronological way. Although this case-study was not successful, it yields important lessons concerning the organisation and evaluation of locally developed health insurance schemes in developing countries. The Masisi experiment is a nice illustration of the fact that health insurance is not a "magic bullet". The lessons drawn from it—in particular concerning the design of health insurance schemes—are certainly relevant for people considering the implementation of risk-sharing arrangements in similar settings.

Finally, Chapter 5 looks at the Murunda hospital insurance scheme in

Rwanda. The scheme functioned from 1988 to 1994. Like the Masisi scheme, it was not successful but nevertheless an important source of understanding and learning. The Murunda experience makes a strong case for the message that health insurance is likely to fail when considered in a context where the district health services are not organised along the lines of an integrated functional entity.

1. *The Bwamanda scheme: Rationale and results*

*The Bwamanda hospital insurance scheme**

THE BWAMANDA DISTRICT

The Bwamanda health district is located in the Northwest of the Democratic Republic of Congo (ex Zaire). It covers an area of 3,000 square kilometres and had a population of about 158,000 in 1994. About 90% of the population are farmers who live by subsistence agriculture. Their annual per capita income is about U.S.\$75. The health services in this district are based on a two-tier system[†]: a network of 23 health centres scattered throughout the district and a 138-bed referral hospital (Figure 1). The diocese is the formal owner of the hospital but in functional terms the Bwamanda hospital fully acts as a referral hospital for the Bwamanda area in accordance with prevailing national health policies. The development of the health services in Bwamanda was one of the activities of a larger integrated development project, the CDI Bwamanda (*Centre de Développement Intégral*). The CDI Bwamanda is a Zairian non-profit organisation; it was established at the end of the sixties and gradually developed a wide range of activities in other fields than health care: agriculture, communications infrastructure, primary education, rural development, etc. The Catholic mission, which has been established in Bwamanda for several decades, was, at least initially, the structure round which the project's activities were developed.

Throughout its existence the CDI has enjoyed considerable external support: financial and in human resources. Belgian bilateral aid had a team of 2 to 3 Belgian doctors in the Bwamanda district from the late 1960s to the beginning of 1990. Three expatriate religious nursing sisters (Sisters of the Medical Mission) worked in Bwamanda hospital until the mid-nineties. From the early eighties a number of Zairian doctors joined the district ex-

* This chapter is based on the paper *A health insurance scheme for hospital care in Bwamanda district, Zaire. Lessons and questions after ten years of functioning* (Criel and Kegels, 1997).

† The health district (or health zone) is the basic unit of the health system of the Democratic Republic of Congo. There are 306 health zones, each of which has virtually full autonomy in the organisation of health care services. A health zone has at least one referral hospital and a number of health centres. Its population, within a clearly delimited geographical area, ranges between 50,000 and 200,000.

ecutive team. In June 1990 the termination of the arrangements for co-operation between Zaire and Belgium ended the presence of expatriate doctors.

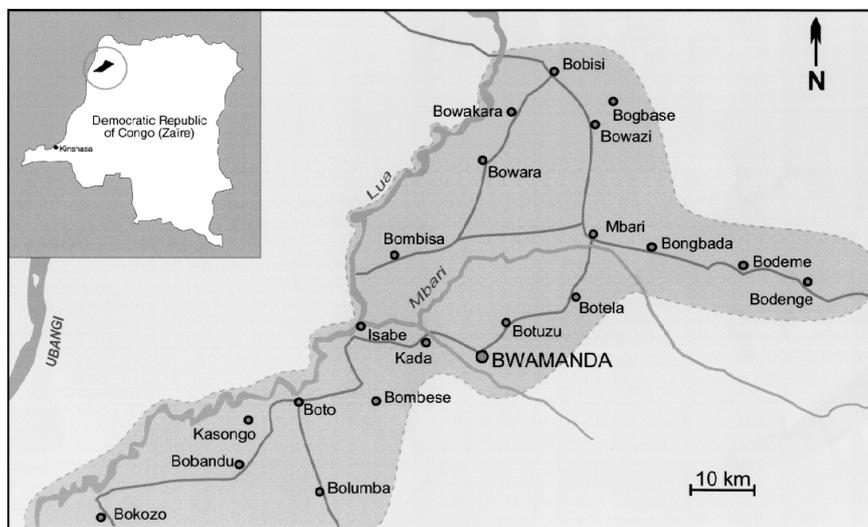
Government subsidies always remained very limited and stopped completely in the mid-eighties. The CDI Bwamanda developed in an environment from which the state was absent. This led those responsible for running the project, and the managers of the system of health care in particular, to develop, the various social and economic services provided for the population of Bwamanda on a more or less autonomous basis. Thus the CDI Bwamanda progressively took up a considerable share of the responsibilities public authority.

It was in this context that the health care insurance system developed from 1986 onwards. In this period, the Bwamanda health care system was functioning relatively well. Quality health care was accessible to the vast majority of the population through the establishment of an integrated district health system. Most of the population had reasonable access to a health centre (95% lived within 7 km of a health centre). The population covered by a health centre ranged between 3000 and 13,000 inhabitants. The villages in the area of responsibility of each health centre were organised in rural committees for integrated development (*Comités Ruraux de Développement Intégral* or CRDI). Each month these committees met to discuss health issues as well as other problems related to development. In 1986, the average utilisation rate for the curative clinics at health centre level was 0.6 new cases/inhabitant/year; coverage for antenatal care was 84%; coverage for measles vaccination was 50%. The annual hospital admission rate was about 30‰. Referral and counter-referral systems functioned reasonably well.

In the mid-eighties many of the health centres managed to recover to recover their recurrent costs through community financing mechanisms. These costs related to staff salaries (on average three staff members in each centre: a nurse, a nursing aid and a general hand), drugs, medical and other minor supplies. They did not include depreciation costs, or the cost of the monthly supervision visits. The method of payment was a flat fee per episode of illness and episode of risk. In 1987 for instance, 9 of the 21 health centres in the district recovered all these recurrent costs; the 12 other centres reached levels of cost-recovery ranging between 73% and 98% (Ministry of Health 1987)*.

* Such high levels of cost-recovery were certainly not exceptional in Zaire, which is confirmed by the results of a large study done by USAID on the financing of ten effectively functioning health districts in Zaire (USAID/Kinshasa, 1987). Other

Figure 1. Bwamanda district



At the hospital there were five possible different flat fees for admission, according to the type of care required. In practice this amounts to a simplified diagnosis-related-groups system: one fee for admission in paediatrics, internal medicine or gynaecology, and four progressively higher fees for surgical interventions categorised from minor to major (Table 1).

Table 1: Fee structure prior to the introduction of the health insurance system (1985)

	Paediatrics/ internal medicine/ gynaecology	Surgery I	Surgery II	Surgery III	Surgery IV
Children	30 Z	100 Z	150 Z	200 Z	250 Z
Adults	120 Z	100 Z	150 Z	200 Z	250 Z

NOTE: 50 Zaire = U.S.\$1

sources show an average cost-recovery rate for health centres of almost 50% (Pangu, 1988). The USAID study also indicated that the salaries of hospital and health centre staff constituted respectively 50% and 35% of the recurrent expenditure of these health institutions. It must however be emphasised that these salaries were always very poor.

In 1985, revenue from patients in the Bwamanda hospital constituted 40% of total hospital revenue (Thsinko 1992). The remaining 60% came from subsidies from the 'mother-organisation' (i.e. the CDI Bwamanda), from external funds of the Belgian bilateral aid agency, and from various non-governmental organisations. The fee schedule presented in table 1 clearly indicates that the functioning of the Bwamanda hospital was largely subsidised. For instance, the *total* fee charged for a caesarean section in 1985 (category surgery IV) was U.S.\$5, which is obviously insufficient to cover the real cost of such an intervention.

Different surveys of hospital recurrent cost analysis, carried out in relatively similar contexts, support this statement. A recurrent cost analysis of an effectively functioning rural district hospital in Uganda showed that the average cost of a single major surgical operation was U.S.\$11 in 1992. If the cost of 10 inpatient days (an average length of stay in hospital for a patient receiving major surgery) is added to this figure, then the total cost was U.S.\$30 (unpublished data). A study of unit costs for inpatient services carried out in three Zimbabwean hospitals identified an average cost for major surgery of approximately U.S.\$35 (Blijmakers and Chihanga 1996). Another study in six Malawi hospitals identified a cost per single inpatient (all services together) ranging from U.S.\$20 to \$30 (Mills *et al.* 1993). Finally, a Medicus Mundi International (MMI) survey of 59 non-governmental hospitals in sub-Saharan Africa identified a median cost per inpatient of U.S.\$33 (Van Lerberghe *et al.* 1992).

A HEALTH INSURANCE SCHEME FOR HOSPITAL CARE

In the eighties, the hospital charges in Bwamanda hospital had to be raised several times a year because of inflation. At the same time, the health district managers had to identify other stable sources of funds because of the virtual non-existence of government funding and the increasing reluctance of external donors to subsidise the hospital's recurrent costs. In addition there was the problem of financial accessibility to hospital care, at least during certain periods of the year. The payment of the hospital fees became a growing problem for the poor rural population of Bwamanda district, whose cash income fluctuated with seasonal crops. Some patients referred from the health centre only arrived at the hospital after several days. This late arrival was due to the time needed to find the necessary funds. Hence the challenge for the district management team was to improve access to hospital care for all people needing it by designing a financing strategy, while guaranteeing the hospital's financial viability at the same time.

With this in mind, the district executive team initiated discussions in the CDI on various possible strategies for financing hospital care. These were compared on basis of the following criteria: political and social acceptability, ability to pay, risk-sharing potential, likely effect on the financial viability of the hospital, and likely effect on the hospital's financial accessibility. The team considered insurance schemes superior to the current system of fees per type of hospital service. It identified the main variables relevant to a health insurance scheme about which a decision needed to be taken:

- * What would be the nature of the insurance premium payments?
- * When and how often would one have to pay?
- * What would be the unit of membership?
- * Which services would be covered by the insurance scheme?
- * Should co-payments or deductibles be considered?

The discussion was pursued during one of the regular workshops with the nurses heading the health centres in Bwamanda. The various options concerning the above-mentioned variables were analysed and compared. Eventually a consensus was reached on the following features:

- * A cash payment of a premium identical for all, independent of age, sex, domicile, health status etc., i.e. a community rating system;
- * One annual subscription period, at a time coinciding with the purchase of the coffee and soy bean crops (months of March and April);
- * The household as subscription unit, with individual premiums;
- * Risk coverage limited to hospital care, with a 20% co-payment rate;
- * The decentralised collection of premiums at health centre level;
- * The implementation of the scheme in the whole district at the same time, and *only* for the district population;
- * The management of the scheme by the district management team.

Finally, the basic elements of the concept of insurance were presented to the community representatives of each health centre. These expressed a preference for a scheme without co-payments, but the district management team thought it wise to have a 20% co-payment, as a financial security margin in a context of high inflation and could act as a deterrent to unnecessary hospital utilisation. At the specific request of the nurse in charge of the maternity department, an exception was made: no co-payment was charged for insured patients using the maternity services. The rationale of

this request was the concern to increase the work volume at the maternity unit for the training of the local midwifery students. Women who had not attended antenatal care during their pregnancy, however, were not covered by the insurance and had to pay the full fee.

Questions were also raised concerning the possible situation of families who joined the scheme but did not undergo any hospitalisation. Would they then get a refund? This concern is not surprising. The widespread local mutual help mechanisms (for instance traditional solidarity mechanisms within the extended family), and mutual aid associations (*tontines* in French speaking Africa, or ROSCAs* in the anglophone literature) are very often based on a principle of 'voluntary balanced reciprocity' (Dubuisson 1996).

Eventually, however, the majority of the community representatives agreed with the launch of this financing scheme. The first subscription period was the month of March 1986. During this one-time annual enrolment period, membership premiums were collected by the staff of each health centre, helped by representatives of the village committees. The level of the premium was set at 20 Zaire, which corresponded to approximately one-third of one U.S.\$ This amount was deemed affordable: it was less than half the flat fee charged for an outpatient consultation at health centre level. Twenty Zaire was also the equivalent of the price paid to Bwamanda farmers for 2 kg of soybeans, a common crop in the area. Co-payments for insured patients were set well below the fee levels for the non-insured (Table 2).

Table 2: Hospital fees in Bwamanda, September 1986

	Fee for non-insured patients	Fee for insured patients
Paediatrics	125 Z	25 Z
Internal medicine	500 Z	100 Z
Gynaecology	500 Z	100 Z
Maternity	500 Z	0 Z ^a
Surgery I	350 Z	70 Z
Surgery II	500 Z	100 Z
Surgery III	700 Z	140 Z
Surgery IV	900 Z	180 Z

NOTE: exchange rate 61 Zaire = U.S.\$1.

^a Maternity services were free of charge only if the mother had attended antenatal care

Proof of payment was provided by a stamp on the back of a family record held for each family at the health centre. A census of the district popu-

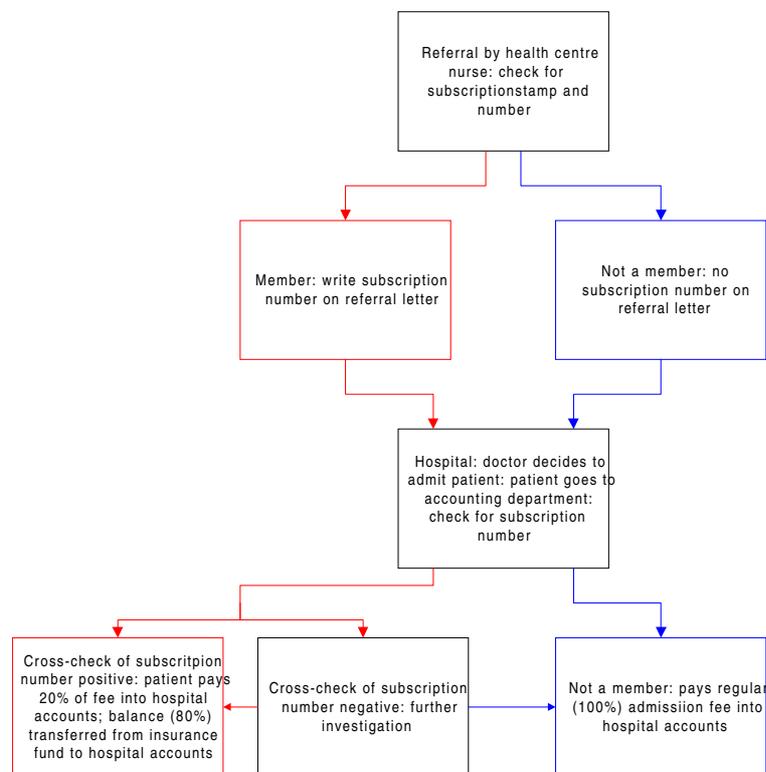
* ROSCA is the acronym for ROTating Savings and Credit Association.

lation had been carried out in 1985 and 1986, and on that occasion a family file had been opened for each household. A similar stamp was affixed to the individual 'census card', or, for children under five, their well baby clinic record. In addition a membership register was opened at each health centre. The nurses in charge of the health centres eventually handed in the membership register and the collected moneys to the district health services administrator, who deposited the funds in a separate health plan account. At the end of the subscription campaign, the health centre team received a sum equivalent to one percent of the funds collected in their area in compensation for the additional work involved.

The health insurance scheme was not run by a separate *third party* institution; it was managed by the district health authorities themselves, and can thus be described as a direct pattern of insurance. On the whole, the administrative costs incurred for the practical organisation and management of the insurance scheme remained relatively low. These costs concerned transport and stationery expenses, staff bonus payments, and salaries of the scheme's administrating and clerical staff. In the period 1987-1989 total administrative costs ranged between U.S.\$510 and U.S.\$1800, i.e. between 4 and 6% of the total expenses (Shepard *et al.* 1990). Recent data for 1990-1995 show that the yearly cost of administering the scheme ranged between approximately U.S.\$1000 and U.S.\$3500, i.e. between 5% and 10% of the total expenses. These costs have been calculated through a conversion of Zaire into U.S.\$ at the exchange rates of that time. The skyrocketing inflation rates, especially in the nineties, make cost estimates in foreign currency a perilous exercise. This may contribute to explain the fluctuation of administration costs in the period 1990-1995.

The routine functioning of the insurance plan can be summarised in a flow chart of the various administrative and managerial procedures (Figure 2). It is important to stress that members of the scheme who used the hospital outpatient department without being referred by their health centre could not benefit from the insurance, except in emergency conditions. Referral from health centre to hospital was mandatory if the insurance was to be effective.

Figure 2: Managerial flow-chart for referred and admitted patients



NOTES: adapted from Moens and Carrin, 1992. Each individual health centre team notifies names and subscription numbers of all people who joined the scheme in a register that is transferred to the hospital's accounting department at the end of the enrolment period.

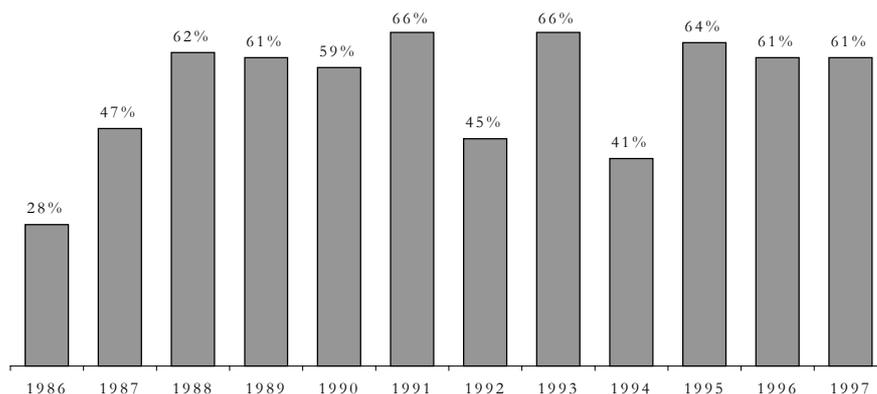
Results of the insurance scheme

The interest shown by the Bwamanda community in this voluntary insurance scheme for hospital care was overwhelming and beyond most expectations. In 1986, 32,600 people — i.e. 28% of the total district population — joined the scheme within four weeks. The financial balance after the first year of operation was positive, with a small surplus of approximately U.S.\$1300. Each year, the subscription charge was adjusted in line with inflation, but it remained approximately equivalent to the purchasing price of 2 kg of soybeans — approximately one-third of a U.S.\$ — though with small variations over the years.

In the following years, the membership rates steadily increased, indicating a high degree of social acceptance. In 1987, 60,000 people joined the scheme, and, in 1988, 80,000. The membership rate stabilised around approximately 60-65%. However, the membership dropped significantly from 66% in 1991 to about 40% in 1992 and from 66% in 1993 to 41% in 1994 (Figure 3). In 1992, severe ethnic tensions in the Bwamanda area, and a climate of social unrest were probably responsible for this fall in subscriptions. In 1994, the enrolment period was preceded by the nation-wide change in currency from *anciens* to *nouveaux* Zaire. Consequently, cash availability was a problem for many people.

But overall interest remained even in the period of dramatic social and political turmoil, which Zaire experienced from the beginning of the nineties onwards. This is *a priori* somewhat surprising, since one would expect expenditure for a hospital insurance scheme to drop on people's priority list in an environment where the daily search for food became a major challenge for very many people.

Figure 3: Subscription rates (%) to the Bwamanda hospital insurance scheme (period 1986-97)



The general performance of the health centre, as well as the quality of its interaction with the community in its area, were major factors for obtaining these relatively high subscription rates. A survey carried out in 1988 among 518 households living in the district shows that socio-economic characteristics of insured and non-insured households were very similar (Moens 1990). There was no difference in terms of housing, education

level, family size and religion. The same survey, however, indicated a difference in terms of monetary income. The very low income group (<U.S.\$20/month) and the high income group (>U.S.\$200/month) were more represented in the non-member population (14.9% very low income households among members versus 18.7% among non-members, 5.9% high income households among members versus 10.5% among non-members).

The size of the population joining the scheme made genuine risk-sharing arrangements possible. The high membership rates, together with the option to have the household as subscription unit, greatly reduced the risk of a preferential selection of high-risk cases (adverse selection).*

HOSPITAL REVENUE

The evolution and sources of the Bwamanda hospital revenue for the period 1985-1989 are presented in Table 3. The revenue raised from payments for hospital care (*internal* or locally generated revenue) doubled from U.S.\$21,180 in 1985, the year before the start of the insurance plan, to U.S.\$44,475 in 1989 (Figure 4). The internal revenue is made up of direct payments by non-insured patients, prepayment of employer-organised health care schemes (covering a few thousand of people), reimbursements to the hospital by the insurance fund, and co-payments by insured patients themselves. Between 1986 and 1989, revenue from the insurance scheme (reimbursements and co-payments) increased. The insurance ensures the hospital a stable source of income with less non-paying patients. Direct payments by non-insured persons halved from U.S.\$11,655 in 1986 (when 72% of the district population was not insured) to U.S.\$6,135 in 1989 (when only 39% of the population was not insured).

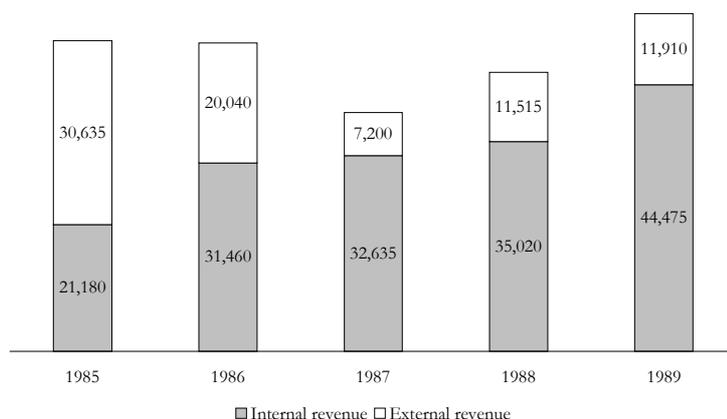
* These subscription rates are in fact a slight underestimate of the real subscription rates, since a sub-population of a few thousand people in the Bwamanda health district—most of them employees of the different CDI project services—are covered by mandatory employer-organised health insurance schemes. These provide them and their families with free health care, so they did not have an immediate incentive to join the scheme. If some of them did pay the insurance premium out of their own pocket, it was with the objective of being insured if they ever lost their job and thus the benefit of free care.

Table 3: Hospital revenue from 1986 to 1989, in U.S.\$

Source of hospital revenue	1985	1986	1987	1988	1989
<i>Internal revenue</i>					
Refunding by insurance fund for insured: i.e. 80% of regular hospital fees	0	10,670	8,620	14,700	19,630
Co-payment by insured: i.e. 20% of regular hospital fees	0	2,670	2,155	3,675	4,900
Prepayment by employers for employees and their families	0	6,465	10,990	9,635	13,810
Direct revenue from patients ^a	21,180	11,655	10,870	7,010	6,135
Total internal revenue (% of total hospital revenue)	21,180 (41%)	31,460 (61%)	32,635 (82%)	35,020 (75%)	44,475 (79%)
<i>Subsidies ^b and gifts (% of total hospital revenue)</i>	30,635 (59%)	20,040 (39%)	7,200 (18%)	11,515 (25%)	11,910 (21%)
<i>Total hospital revenue</i>	51,815	51,500	39,835	46,535	56,385

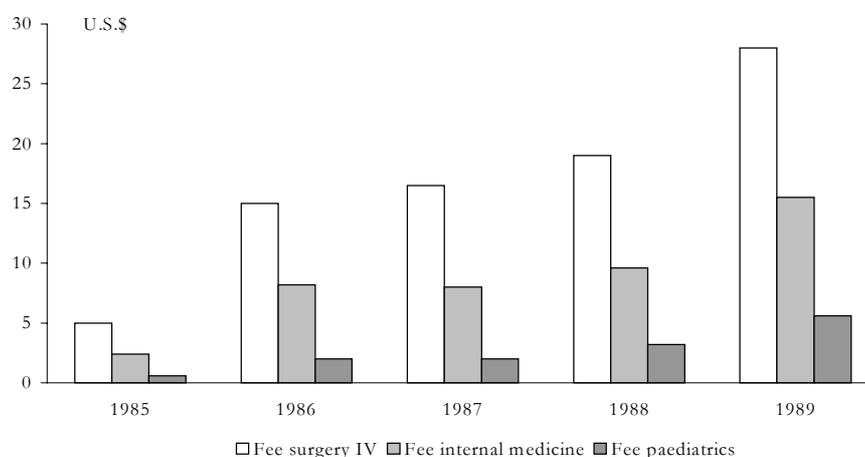
NOTES: Source of data (Tshinko 1992) and annual reports of the Bwamanda health district. Average annual exchange rates: U.S.\$1 for 50 Zaire in 1985, 61 Zaire in 1986, 128 Zaire in 1987, 187 Zaire in 1988, 400 Zaire in 1989. ^a Non-insured self-employed patients. ^b The last government subsidies for the Bwamanda hospital were in 1984. From then on all external hospital funding came through the CDI project.

Figure 4: Internal and external revenue in Bwamanda hospital



An *a posteriori* analysis of the evolution of hospital fees shows that the fees for non-insured persons—and the 20% co-payments for the insured—have dramatically increased over the same period. A Caesarean section, for instance, was charged at approximately U.S.\$5 in 1985, \$15 in 1986, \$14 in 1987, \$19 in 1988 and \$28 in 1989 (Figure 5).

Figure 5: Hospital fees 1985-89



On the other hand, hospital subsidies (*external* revenue) decreased in 1989 to about one-third of the 1985 level (from U.S.\$30,635 to \$11,910), whereas total hospital revenue increased from \$51,815 in 1985 to \$56,385 in 1989. Table 3 clearly shows that the relative proportion of internal revenue in total hospital income increased dramatically from 41% in 1985 to 79% in 1989.

HOSPITAL UTILISATION DATA

In 1986, hospital admission rates for the insured and non-insured population were 36.2 and 24.8‰ respectively. In 1988, these rates were 35.6 and 24.6‰ respectively (Table 4). These differences are statistically highly significant. In 1989 hospital admission rates* were between 1.9 and 6.7 times higher for insured than for non-insured patients (other than the ones covered by employer-organised schemes) (Shepard *et al.* 1990).

More recent data for the 12-month period April 1993 - March 1994 give admission rates of 49‰ for the insured and 24.9‰ for the non-insured. The latter figure can be split further into 17‰ for non-insured self-employed persons and an estimated 184‰ for people covered by an employer-organised scheme (Table 5).

* Based on a one in ten sample from the hospital register.

Table 4: Hospital admission rates of insured and non-insured populations

	Admissions/1000 insured population ^a	Admissions/1000 non-insured ^b population ^a	
1986	1,181/32,614 (36.2‰)	2,133/85,998 (24.8‰)	$\chi^2=113$; $P<0.001$
1988	2,863/80,495 (35.6‰)	1200/48,749 (24.6‰)	$\chi^2=119$; $P<0.001$

^a These ratios are considered true proportions although the numerator may contain several admissions for one individual.

^b Admissions for non-insured population includes admissions of patients covered by employer-organised schemes.

Table 5: Hospital admissions 1/4/93 - 31/3/94

	Insured pop=101,352	Non-insured pop=50,131	Employer- organised schemes pop=2,500 ^a	Admissions from outside district	Total
Paediatrics	1,267	168	221	132	1,788
Gynaecology	278	39	21	68	406
Internal medicine (M+F)	547	201	42	356	1,146
Surgery men	452	20	17	78	567
Surgery women	370	15	32	87	504
Maternity	1,119	82	29	35	1,265
Intensive care	939	326	99	322	1,686
Total admissions	4,972	851	461	1,078	7,362
Admission rate	49‰	17‰	184‰		

NOTES: Patients of the trypanosomiasis ward are not included; most of the patients admitted in intensive care are transferred to other wards after a few days: these admissions are thus counted twice and the real number of admissions is therefore lower. ^a estimate

During the latest three or four years of operation of the insurance plan, people from outside the district frequently claimed to live within the district boundaries so as to be eligible for subscription to the insurance plan during the enrolment period. They had their names added on the family file of a 'host' family (which was often composed of relatives). This happened mainly in the areas of the two Bwamanda town health centres, as well as in the areas of two health centres situated at the edges of the district. Hence the admission rate for insured persons from the district of 49‰ is probably a (slight) overestimate of the real figure. Table 5 also shows that in the period 1993-1994 about 15% of all admissions (1,078 out of 7,362) were patients living in neighbouring districts. This is not a new finding: Bwamanda hospital has always been a facility with a substantial proportion of users

from other districts. The annual hospital reports indicate that in 1987 17% of admissions (691 out of 4090) were patients from outside the district; in 1995 this figure increased to 20.4% (1599 out of 7843) (Ministry of Health 1987; Ministry of Health 1995).

This pattern of higher hospital admission rates for the insured population is probably due to a combination of moral hazard and better access for those who need it. Within the limits of these data, it is difficult to assess the relative importance of each single possible cause. The fact that insured patients can benefit only from the insurance scheme when referred by a health centre, and the system of co-payment at hospital level are factors which *a priori* tend to counteract any substantial degree of inappropriate hospital utilisation. It is important to acknowledge the fact that the increment of hospital utilisation by the insured population seems to be a highly variable phenomenon. The data in Table 6 indicate that excess use is particularly high for surgical services, both female and male, but that it is hardly apparent for internal medicine services. The very high admission rates for the (small) population covered by employer-organised pre-paid health care schemes are not surprising, for these patients—the majority of whom live in and around Bwamanda township—have no financial cost to bear in case of hospital admission.

Table 6: Hospital admissions 1/4/93 - 31/3/94

	Insured population	Non-insured population	Population covered by employer's pre-paid schemes	Ratio admission rate insured / admission rate non-insured
Paediatrics	12.5‰	3.3‰	88.4‰	3.8
Gynaecology	2.7‰	0.8‰	8.4‰	3.4
Internal medicine	5.4‰	4.0‰	16.8‰	1.35
Surgery men	4.4‰	0.4‰	6.8‰	11.0
Surgery female	3.6‰	0.3‰	12.8‰	12.0
Maternity	11.0‰	1.6‰	11.6‰	6.9
Maternity, per 100 expected deliveries	27.6%	4.1%	29%	6.7

Is the Bwamanda insurance scheme a success?

With such high subscription rates it would be difficult not to call the Bwamanda scheme a success in terms of social acceptability. This, however, is not the only aspect to consider. In the case of the Bwamanda hospital in-

insurance scheme, the initial objectives set forth by the district managers were as follows. On the one hand, there was the need for a stable source of local revenue allowing the hospital to function properly in a context where government funding was virtually absent; and where the future level of external subsidies was uncertain. On the other hand, there was the concern to keep hospital fees affordable for the population of the district so that financial accessibility and equity were maintained.

FINANCIAL PERFORMANCE: ATTRACTION OF ADDITIONAL RESOURCES?

The Bwamanda scheme evidently succeeded in generating reliable and stable resources for the functioning of the hospital. Locally raised revenue virtually doubled between 1985 and 1989, even though total revenue remained more or less the same around approximately U.S.\$50,000 a year. The precise amount of subsidies allocated to the hospital was in fact never decided on a pre-determined basis—at the start of every new budgetary year for instance. The hospital thus had no real budget. The policy of the CDI project was to systematically cover the hospital's deficit so long as the project had the necessary financial room for manoeuvre to do so, and so long as this deficit remained within reasonable limits. It is clear that the room for manoeuvre had continuously shrunk in the second half of the eighties and the first half of the nineties. This was due to the steep deterioration in the socio-economic situation (for instance the decrease in prices paid for locally grown coffee, traded on the international market, meant a serious reduction in income for the project), and to the reluctance of donors to fund operating costs. Nevertheless it seems possible that the Bwamanda insurance scheme actually *relieved* the CDI project from subsidising the hospital to a same extent as it had in the past. This may have led to displacement effects: other activities within the CDI project, more in need of financial resources, could have benefited from higher financial support. But as Zschock argues, displacement is not necessarily a negative feature (Zschock 1979).

The financial data presented above support the conclusion that the Bwamanda hospital has become less dependent on external funding sources. This trend is clear, even though there probably are problems in the accuracy and completeness of the financial data because of the complex accounting procedures and mingling of funds within the Bwamanda district, and because of the difficulty to convert local currency values into foreign currency values. It is reasonable to assume that this trend was maintained in the early nineties, since many fund-providers and aid organisations decided in the period 1990-1991, for political reasons, to reduce, or even to stop altogether, any further aid to Zaire.

A hospital recurrent expenditure of U.S.\$50,000 a year, i.e. a mean expenditure of U.S.\$370 per inpatient bed, is very low compared to data of similar hospitals in sub-Saharan Africa. In Kasongo the cost per bed was of U.S.\$1,177 for a reasonably functional 180 bed rural hospital (Van Lerberghe and De Brouwere 1989). In the 130-bed hospital in the Hoima district in Uganda, the mean expenditure per inpatient bed was U.S.\$830 (unpublished data), and the Medicus Mundi International survey of 59 non-governmental organisation hospitals in sub-Saharan Africa indicated a average figure of approximately U.S.\$1,000 (Van Lerberghe *et al.* 1992). One explanation for the low expenditure in Bwamanda may be the extreme level of rationalisation of resource use in the hospital. For example, the trainees of the local nursing school were involved in routine hospital work from the very beginning of their 4-year training curriculum, thereby decreasing the number of established staff needed.

In the nineties, the administrative costs of the scheme were between 5% and 10%, suggesting a relatively satisfactory level of administrative efficiency. It is not surprising to find the highest proportion of administrative costs (about 10%) in the years 1992 and 1994, when subscription rates were lowest. These costs are far below the operating costs of social insurance funds in other African countries (Gruat 1990; Shaw and Griffin 1995). The hospital insurance scheme of South Borgou in Benin, which started in 1994 and which covers about 10,000 people, has administrative costs of nearly 20% (Debaig 1997). Accounts for the Nkoranza scheme in Ghana suggest that in 1994, 17% of scheme revenue went on administration (Somkang *et al.* 1994).

SYSTEM EFFECTS OF THE SCHEME: DOES IT FACILITATE ACCESS TO THE HOSPITAL FOR THOSE PATIENTS WHO NEED IT?

Insured persons have used the hospital services at a significantly higher rate than the non-insured. The admission rates in the insured population increased from 35.6‰ in 1988 to 49‰ in the period April 1993-March 1994 ($\chi^2=198$; $P<0.001$). These rates hardly changed for non-insured persons: 24.6‰ in 1988 and 24.9‰ in 1993-1994 ($\chi^2=0.1$, $P=0.75$). In 1988, the ratio of hospital admission rates for insured patients compared with non-insured patients was almost 1.5; in 1993-1994, this figure increased to a ratio of about 2. This ratio was 2.9 in the period 1993-1994 when non-insured admissions, excluding patients covered by employer-organised insurance schemes, are concerned.

If higher admission rates are considered as an indicator of better accessibility to the hospital, then the answer seems straightforward, even though

the scheme may have selected precisely those families who were already the higher hospital users even before the insurance scheme was implemented. Hospital utilisation is not, however, a goal in itself: an increase in hospital utilisation is a positive phenomenon if it reflects the treatment of problems where the hospital's know-how and technology are needed.

To what extent is this excess in hospital utilisation explained by an increase in *useful* hospital utilisation? Some of the arguments supporting the hypothesis that this is not due to a phenomenon of moral hazard have already been pointed out. Firstly, there is the mandatory referral of the patient by his health centre (except for emergency situations), and, secondly, there is the system of small co-payments. It is possible that health centre nurses may now and then have been put under pressure by the patient to be referred. If this did occur, however, there was a further control: on arrival at the hospital, the patient would first be seen by the medical officer at the referral consultation, who would decide whether admission was appropriate or not. However, the fact that the excess in hospital utilisation by the insured population varies considerably from one hospital department to the other indicates that moral hazard, if any, is not by any means a homogenous phenomenon. The exact impact of the insurance scheme on hospital utilisation patterns will be explored in much more detail later. It constitutes the purpose of the next chapter.

EQUITY EFFECTS

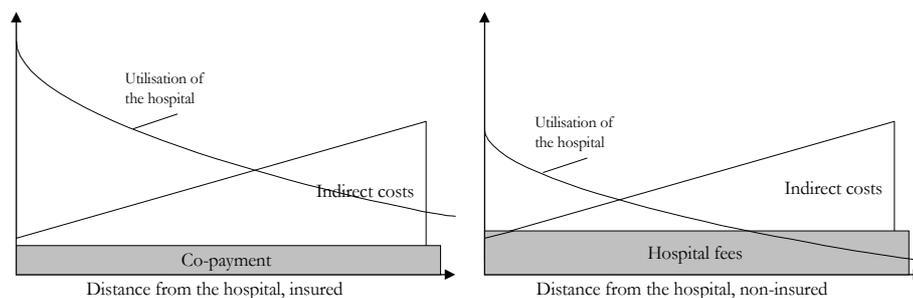
In the Bwamanda insurance scheme, everyone pays the same premium per household member. All enjoy the same benefits in the event of hospital admission (with a same co-payment) independently of the family's socio-economic status and of the other costs to the family in the case of an admission. These other costs are often substantial. The *indirect* costs of hospital utilisation—such as transport expenses, expenses for food, expenses for the lodging of family members in Bwamanda town, etc.—are often higher than the *direct* costs* (Figure 6).

Two facts need to be acknowledged at this stage. First, in a rural environment like Bwamanda the farther people live from the hospital, the higher the indirect costs and the opportunity cost of an admission. Second, the farther people live from the hospital, the lower their hospital utilisation. Hence members of the insurance scheme who live far from the hospital, but who pay the same premium as members living close to it, actually subsidise the scheme. The premiums in the Bwamanda scheme are *de facto* regressive.

* The full hospital fee for the non-insured and the co-payment for the insured.

Whilst flat rate insurance premiums are likely to be less regressive than user fees (as they are currently implemented in most African countries), they are more regressive than general tax revenue financing.

Figure 6: Relationship between direct & indirect costs of hospital use and size of premiums & co-payments



There is a need to develop systems that can increase the solidarity basis of such schemes. Such systems must only be technically feasible, they must also be affordable and socially acceptable (Gilson *et al.* 1995). In order to tackle this problem a system of sliding scales according to distance from health centre to hospital was tried out in 1988. It was designed to channel benefits to a well-defined target population, in this case people living far from the hospital*. In Bwamanda, the district team divided the network of health centres into three subgroups: a first group of health centres ($N=7$) located less than 25 km from the hospital, a second group ($N=8$) between 25 and 45 km from the hospital, and a third group ($N=7$) more than 45 km from the hospital. The greater the distance from health centre to hospital, the lower was the co-payment to be paid by the members when admitted to hospital (

* Characteristic targeting (Glewwe and van der Gaag, 1988).

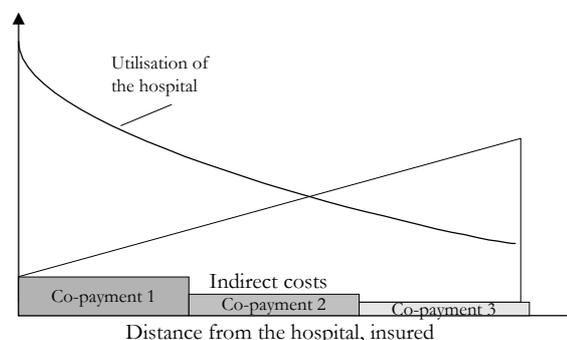
Table 7 and Figure 7).

Table 7: Hospital fees in 1988: Sliding scales according to distance.

	Fee for non-insured patients	Co-payment for insured patients in catchment areas of health centres at		
		< 25 km	25-45 km	>45 km
Paediatrics	600 Z	120 Z	60 Z	30 Z
Internal medicine	1800 Z	350 Z	180 Z	100 Z
Gynaecology	1800 Z	350 Z	180 Z	100 Z
Maternity	1800 Z	-	-	-
Surgery I	1000 Z	200 Z	100 Z	50 Z
Surgery II	2500 Z	500 Z	250 Z	120 Z
Surgery III	3000 Z	600 Z	300 Z	150 Z
Surgery IV	3500 Z	700 Z	350 Z	180 Z

NOTE: exchange rate 187 Zaire = U.S.\$1.

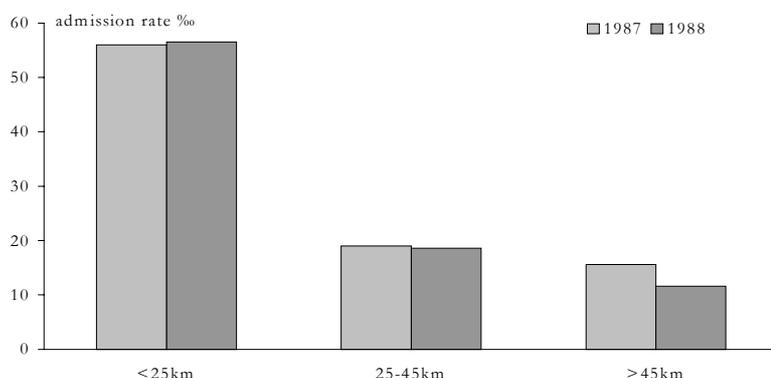
Figure 7: Sliding scale of co-payments



This system of characteristic targeting did not increase the hospital admission rates of the more remote insured populations. The rates remained similar for groups 1 and 2, and the rate for group 3 actually fell in 1988 (with targeting) (Figure 8) as compared with 1987 (without targeting). In the following year, it was decided to discontinue this experiment with sliding scales because of the absence of an effect in terms of equity and because of the more complex management and control procedures required (for instance, the origin of the admitted patients had to be checked systematically). However, some members of the district management team argued that the considerable social acceptability of the proposal constituted a strong enough case for continuing the experiment. Moreover, the available

data did not allow for a breakdown of the number of admissions according to the nature and the severity of the health problems for which people were admitted.

Figure 8: Sliding scale of co-payments and hospital admission rates



The main problem, in terms of equity, nevertheless stems from the fact that the membership rate never exceeded two thirds of the total district population. The 1987 socio-economic survey indicated that the very poor were more represented in the non-member population (Moens 1990). Differential premiums and fees for the poor, perhaps even exemption of payment could be considered. Such a policy is called *direct targeting*, i.e. a system where the provision of benefits is limited to individuals or households identified as belonging to the target group (Glewwe and van der Gaag 1988). Direct targeting, in contrast to characteristic targeting, requires means testing i.e. a process where specific individuals are classified as eligible or ineligible for benefits (Willis and Leighton 1995).

The conditions of success

The relatively successful development of the Bwamanda scheme, as well as its viability, was possible because it took place in a specific environment. A proper understanding of this environment is necessary if the Bwamanda scheme is to be of help and guidance to health planners considering similar financing schemes. However, the various constitutive features of the Bwamanda environment in which the scheme was conceived, and in which it thrived, cannot, strictly speaking, be considered as *conditions*. The identification of conditions for a successful development would imply a more for-

mal research perspective in which different conditions, or a set of conditions, were tested with the object of assessing whether, and to what extent, they were necessary for a satisfactory development. This was not done in Bwamanda. Hence caution is needed in the interpretation of the relative importance of each factor in the development of the Bwamanda scheme. The various features of the Bwamanda environment are tentatively classified in four categories:

ORGANISATIONAL/MANAGERIAL FACTORS: The insurance scheme was launched in a context in which the district health service system had reached a relatively high level of operational efficiency. The Bwamanda district in the mid-eighties was considered amongst the best functioning health districts in the country. A strong district management team composed of medical doctors, senior nursing staff and health service administrators, headed it. From the early seventies on, it had enjoyed continuous external support, especially from Belgian bilateral aid. On average, two expatriate Belgian doctors and two Dutch nurses (sisters of the Medical Mission) were working in the Bwamanda hospital in the period 1970-1990. In 1986, the district health system functioned as an integrated two-tier system, i.e. a system in which health centres and hospital fulfil their specific roles in a complementary way (Unger and Criel 1995). The use of resources was highly rationalised. The referral and counter-referral system functioned well and contributed to the effective and efficient functioning of the health services. Mechanisms of control to secure rational utilisation of the health services were in place. The network of health centres covered the whole of the district area and direct hospital utilisation—bypassing the first line—was virtually non-existent. The hospital doctor decided on hospital admission after the patient's referral by the health centre nurse. In such circumstances it was *a priori* feasible to keep moral hazard within reasonable proportions. The hospital offered relatively high standards of care and there were no major cultural barriers to its utilisation. Moreover, the Bwamanda hospital, the only one in the district occupied a virtual monopoly position for most people in the district. Hence people's willingness to subscribe to a hospital insurance scheme was high.

The scheme's design represented a direct pattern of insurance: the insurers were also the health care providers. In an environment in which rational resource use was a strong tradition such a direct insurance system fostered efficiency.

The preparation of the scheme took more than a year and both health centre staff and community representatives were closely involved in the

initial process of planning and in the implementation of the scheme. There was a huge effort of communication and mobilisation every year during the weeks before the enrolment period. Staff from other sectors (for instance rural development and agriculture) also contributed to the effort.

ECONOMIC/FINANCIAL FACTORS: The district management team received substantial support from the CDI's general infrastructure and administration facilities. For example, value-maintaining mechanisms for the collected funds were developed in a context of high inflation. Initially, the premiums collected were deposited in a special fund at the CDI, which then paid interest rates of 3% per month. Later the collected premiums were invested in the purchase of drugs by the CDI-supported inter-diocesan pharmacy. In the nineties, when inflation became very high, the revenue from the insurance plan was immediately introduced into the local and regional economic circuit via the CDI's economic activities.

From the start of the scheme the CDI agreed to act as financial guarantor. This back up was of crucial importance in case the scheme turned out not to be financially viable. This financial viability was unpredictable at the time when the scheme was launched in 1986. The CDI committed itself, if necessary, to cover a financial deficit, which could, in the absence of such support, jeopardise the credibility of the insurance scheme. In the period 1990-1995, for instance, a deficit occurred on two occasions: on the first occasion the deficit was met by a gift from a donor, and on the second the CDI lent the necessary funds.

SOCIAL FACTORS: The CDI project initiated its economic and social activities in the economically much disadvantaged Bwamanda area around 1969-1970. Initially, the Catholic mission in Bwamanda was the structure around which the project's activities were organised and expanded. Gradually, a certain number of social services were developed in a spirit of integrated development. The health infrastructure was upgraded and extended, the health care delivery system in the district was rationalised, the local primary and secondary education systems received support; activities in the field of rural development were launched, local communications and transport infrastructures were rehabilitated, etc. A relationship of trust grew between the CDI and the population in general and between the health services and the population in particular. This confidence certainly influenced the community representatives in their decision in 1985-1986 to join in a hospital insurance scheme, even though not all the issues involved were clearly understood at the time. There was also faith in the district

management team's ability and trustworthiness to manage the financial aspects of the insurance scheme efficiently.

POLITICAL FACTORS: Under the Zairian decentralisation policy, health districts were to be largely self-financed. Consequently, the Bwamanda district management team had sufficient autonomy to allow them to experiment with innovative financing schemes. The overall environment in which the initiative took place was characterised by the virtually total absence of the state, both in terms of resource allocation and in terms of planning, regulation, control, etc. This *de facto* vacuum left district teams with almost total autonomy to manage (or not to manage) the health systems for which they were and are responsible.

IS THE BWAMANDA SCHEME REPLICABLE?

As argued above, the Bwamanda experiment was launched at a time when the overall performance of the district health services system had reached a high standard, and local managerial capacity was strong. These features were not, however, specific to the Bwamanda setting alone. During the seventies and eighties, many other districts in Zaire developed, often with substantial donor support, highly effective district health services. What was specific to Bwamanda was the existence of the CDI project and its financial, logistical, technical and institutional support. The CDI increasingly took over some of the basic responsibilities that would normally fall on the state. Indeed, the project's activities partly filled the vacuum created by the virtually complete withdrawal of the Zairian State from the public service arena. The reproducibility of the Bwamanda scheme in other parts of the country—and perhaps in other parts of the region—seems therefore largely dependent on the presence of support by a public-interest-oriented body or institution. In the Zaire of the early 90s, the state had completely collapsed and was not capable of performing this supportive role; it is probable, in the Congo of today, that such an enabling environment can be found only where there are effective and sustained NGO-supported development projects in operation.

2. The Impact of the Bwamanda scheme on hospital utilisation patterns

Introduction

This chapter looks at the impact of the Bwamanda insurance scheme on hospital use*. Hospital utilisation in Bwamanda is significantly higher among insured. In terms of system-efficiency, it is important to know whether the increased hospitalisation rates affect all hospital services homogeneously. They could also be related to health problems that absolutely require hospital-based inpatient care, or to hospitalisation for problems that could be cared for adequately at lower levels of the district health services system. In terms of equity it is important to know how the utilisation differentials are distributed over the various insured communities throughout the district. To a large extent such questions can be answered using data generated by the routine information system.

Methods and sources of data

A large part of the information presented in this chapter comes from data originating from the routine information system of the Bwamanda hospital.

The insurance status of all admissions for the 12 month period April 1993-March 1994 was checked through a retrospective study of the existing routine hospital registers of each hospital department† (paediatrics, maternity, gynaecology, internal medicine, surgery and intensive care). These registers also record the health centre area of origin for each admission. The existing system of family files, opened after a complete district census carried out in 1985-1986, provides a denominator for each health centre area. This figure was adapted every year so as to account for population growth. In addition, yearly activity reports of the Bwamanda hospital provided detailed information on the number of people in each health centre area that subscribed to the hospital insurance scheme. Hence, health centre area spe-

* This chapter is based on the paper *The Bwamanda hospital insurance scheme: effective for whom? A study of its impact on hospital utilisation patterns* (Criel et al. 1999, in press).

† Patients from the trypanosomiasis ward were not included in this analysis because most of them come from surrounding districts. Most of the patients admitted in the intensive care ward are in fact transferred to other wards after a few days: these admissions are thus counted twice and the real number of admissions is therefore somewhat less.

cific admission rates, per ward, could be calculated for insured and non-insured patients respectively, allowing for a spatial analysis of utilisation. Statistical significance can be assessed using the Wilcoxon signed ranks test since the differences observed between admission rates in insured and non-insured populations can be meaningfully ranked.

This spatial analysis was carried out for 17 health centres areas out of the 22 in the district. Five health centres areas were not considered in this analysis: the two health centres located in Bwamanda township with very mobile populations, and three health centres situated at the very edges of the district along a major communication axis. In these areas, people living outside the district often claim to live in that health centre area in order to be eligible to subscribe to the scheme. Hence, substantial contamination of the numerators of the admission rates was very likely.

The average length of stay was checked in both insured and non-insured inpatient-population admitted in the 4-month period January to April 1996 (departments of internal medicine, surgery, gynaecology and paediatrics). This data may indicate possible inefficiencies in hospital use by the insured, i.e. a phenomenon of moral hazard.

In addition to this spatial analysis per hospital department, the analysis distinguishes two types of hospital utilisation: *justified priority* hospital utilisation and *justified non-priority* hospital utilisation, using a set of specific health problems as *tracers*. The tracer concept was borrowed from the formal sciences (i.e. endocrinology) and has been developed into a method to evaluate the strengths and weaknesses of a health service network (Kessner and Kalk 1973). This methodology leads directly to conclusions about unmet needs for care and services (Carr and Wolfe 1976), and has been used to evaluate the performance of health care programmes in both industrialised (Buekens 1984) and developing countries (Amonoo-Lartson and De Vries 1981; Carr *et al.* 1989; Pangu 1988). Tracers need to fit the following criteria: they should be sufficiently prevalent; their diagnosis should be relatively easy; they should have a significant functional impact which can be influenced by patient care (i.e. the health problem is vulnerable to a technical intervention by the health services system). In this case the tracers should make it possible to test whether the distribution of hospital utilisation corresponds to the distribution of needs within the district.

Patients who underwent surgery for uncomplicated hernias were used as tracers for justified non-priority hospital utilisation. Patients (male and female) who underwent surgery for strangulated abdominal hernias (mainly indirect inguinal hernias), and women who had a caesarean section or a symphysiotomy, were identified as tracers of justified priority hospital utili-

sation. In addition, the indication for intervention was systematically checked for all women (whatever their origin) who underwent a caesarean section/symphysiotomy in the period 1993-1996. A distinction was made between interventions done for *absolute* maternal indications and interventions done for *non-absolute* maternal indications. This distinction gives an indication on the extent, if any, of supply-induced over-intervention (De Brouwere *et al.* 1996). The following situations were classified under the heading absolute maternal indications: brow presentation, ante-partum haemorrhage, transverse lie and shoulder presentation, foeto-pelvic disproportion, ruptured uterus and postpartum haemorrhage that led to hysterectomy.

The data on the different tracers do not all cover the same time periods. In order to have sufficiently large figures, hospital use for hernias was analysed over a 3-year period (April 1993 - March 1996) and caesarean sections/symphysiotomies over a 5-year period (April 1991- March 1996). This is not considered a problem because of two reasons. First, the fact that except for the years 1992 and 1994, the yearly subscription rates to the scheme were remained relatively constant in the period 1988-1996. Second, because it was established that the cohort of people who joined the scheme in 1988 remained almost identical in the 9 subsequent years (unpublished data).

The health centre area specific admission rates were also used to calculate *coefficients of localisation (CL)* and *location quotients (LQ)* which both provide a measure of spatial concentration of the utilisation of the hospital (Joseph and Phillips 1984). A coefficient of localisation measures the concentration across regions of a given phenomenon (in this case, hospital admissions), relative to that of a base line. They were calculated for each hospital department, as well as for the three tracer conditions. A *CL* is calculated as follows:

$$CL = 1/2 \sum |Adm^i / \sum Adm^i - P^i / \sum P^i|$$

where *CL* is the coefficient of localisation; Adm^i the number of admissions from area *i*, and P^i the population of area *i*. Values between 0 and 1 reflect increasing levels of localisation. In the present case, the lower the coefficient of localisation, the more it indicates that admissions coming from a given health centre area are distributed in the same way as the population in the district. A polar value of zero would imply a perfectly equal admission distribution, meaning that the admission-population ratio is the same for all health centre areas (Brown 1994). *CL* are however sta-

tistically not testable (Joseph 1982).

A location quotient facilitates easier and more accurate assessment of inter-area differences in hospital admission. It was assessed for the admissions concerning the three tracer conditions. A LQ is calculated as follows:

$$LQ^i = (Adm^i / P^i) / (\Sigma Adm^i / \Sigma P^i)$$

where LQ^i is the location quotient for area i ; Adm^i the number of admissions from area i and P^i the population of area i . A value greater than 1,0 means that a health centre area has more admissions than could be expected, that is relative to its share of total population. Conversely, a value less than 1,0 means that an area has been under-served. A value of 1,0 means that a health centre area has exactly the number of admissions warranted by its share of total population. The comparison of location quotients has to be interpreted in the light of the average admission rate upon which individual LQ^i values are based. The range of LQ^i will be presented in the form of box-plots indicating lowest and highest values, median values, and 25th and 75th centiles.

The comparative advantages of LQ^i over CL are twofold. First, LQ^i measure inter-area differences in admissions—in this case, differences between health centre areas—whereas CL measures the concentration of admissions across the entire district. Second, LQ^i allow for statistical testing of medians of the different health centre area admission rates.

Other data, not coming from the routine information system, were collected especially for the purpose of this investigation.

In order to further appreciate the importance of non-justified hospital use, if any, by insured and non-insured patients in the different wards, a bed-census was carried out on March 23rd, 1996. A bed-census, in essence, is a cross-sectional snap-shot of the utilisation of hospital beds on one particular day (Buvé and Foster 1995; Pannarunothai 1995). This technique was used in order to assess the proportion of beds that were inappropriately occupied, i.e. bed occupation by patients who could have been treated at lower levels of the health system, and to appreciate whether there was in that respect a difference between insured and non-insured patients. A locally adapted *Appropriateness Evaluation Protocol* (Gertman and Restuccia 1981) was applied to all 218 patients present in the hospital that very day. The protocol was redesigned with the Bwamanda district health team, based on the format used in a study conducted in Oxford in 1986 (Anderson *et al.* 1988). A list of criteria was established related to medical, nursing and life-support services (Box 1). The patient was considered to

have a positive reason to be in the hospital if any criterion was met. A second list consisted of criteria determining why the patient was not at home if none of the positive criteria was applied. The physician in charge of the hospital ward, the head of nursing and an external research person administered this instrument, blind to the insurance status of the admitted patients examined.

Finally, the team filling in the questionnaire during the bed census exercise also addressed the question whether the admission could be considered justified, given the level of functioning of the first line health centres. The objective was to appreciate a difference, if any, between insured and non-insured admissions. This assessment is based on a methodology tested elsewhere in Congo (Kasongo Project Team 1982), and provides an indication of the efficiency of hospital use. For that purpose, admissions were classified in four categories: (i) the hospital admission was justified; (ii) the patient could have been cared for at health centre level under certain conditions (e.g. introduction of new equipment, drugs, case-management guidelines, etc.); (iii) the patient could have been cared for at health centre level as it functions presently; or (iv) the patient's situation is not clear-cut and doubts remain.

Box 1. The Appropriateness evaluation form

Hospital Department:		Hospital File n° :	
Patient's residence:		Insurance status:	
District area <input type="checkbox"/>		insured <input type="checkbox"/>	Employer schemes <input type="checkbox"/>
Health centre:		non-insured <input type="checkbox"/>	
Out of district <input type="checkbox"/>			

Positive reasons to be in the hospital

- treatment requiring medical attention at least once a day
- treatment requiring intravenous therapy
- treatment requiring an orthopaedic traction/pelvis suspension
- treatment requiring intramuscular therapy at least twice a day
- medical care requiring monitoring of vital signs at least trice a day
- medical care requiring minor nursing care at least twice a day
- medical care requiring major nursing care (bedsores, burns, gastric intubation...)
- immobilised patient as a result of a surgical intervention in the previous days or on the same day
- major surgical intervention planned the same day or the day after
- blood transfusion planned for the same day
- others: please specify

Reasons for not being home / for not being cared for on an ambulatory basis

- waiting to be taken home
- inadequate social support at home
- waiting for the family's approval of therapeutic/diagnostic intervention(s)
- waiting for a blood donor among the family members
- doubts on the possibility to return to the hospital in case of complications
- doubts on the patient's compliance to treatment
- waiting for elective surgery on the next day or on subsequent days
- waiting for a blood transfusion on the next day or on subsequent days (blood donor is available)
- waiting for a second (medical) opinion
- doubts on the quality of follow-up care at health centre level and/or at home
- others : please specify

Summary assessment of justification of hospitalisation

HOP = hospital admission justified
 CSC = could have been cared for at health centre level under certain conditions. Please comment briefly.....
 CSA = could have been cared for at health centre level under its present (actual) level of functioning
 DOU = doubtful situation

Results

DISTRIBUTION OF THE HIGHER HOSPITAL UTILISATION AMONG INSURED OVER THE DIFFERENT WARDS

These data were already presented in the previous chapter (Table 5 and Table 6). In the period April 1993 - March 1994, 7,362 hospital admissions took place. Fifteen per cent (1,078/7,362) of all admissions occurred for people living outside the district. The overall admission rate, for the entire district population, is 39.2‰ (6,284/160,267). The admission rate for insured was nearly 3 times higher than for non-insured. The ward specific ratios of insured : non-insured admission rates were highest for surgery (where the admission rate for insured is more than 10 times the one for non-insured) and for the maternity (a sevenfold admission rate for insured). These ratios were of a same order of magnitude in paediatrics and gynaecology (respectively 3.8 and 3.4), but much smaller in the departments of intensive care and internal medicine (respectively 1.43 and 1.35).

SPATIAL ANALYSIS

Figure 9 shows the total admission rates per health centre area, broken down by insurance status. In all health centre areas, the utilisation is higher for insured than for non-insured (Wilcoxon signed ranks test significant, $P < 0.001$). Both for insured and for non-insured there is a clear distance decay, although more pronounced for the insured.

The higher utilisation by insured appears to be concentrated mainly in the populations living in a health centre area within a range of about 35 km from the hospital. Figure 10 suggests the existence of two clusters. A first is made up by 5 of the 17 health centre areas, where the utilisation differentials (the difference between the rates for the insured and non-insured) range between 18 and 35‰ admissions per year. These areas are less than 35 km from the hospital.

A second cluster concerns 12 health centre areas where the differential is between less than 1 to about 17 admissions per 1000 inhabitants (with a majority at approximately 5 or 6 admissions per 1000 inhabitants). These centres are located between 35 and 100 km from the hospital.

Figure 9: Admission rates per health centre area

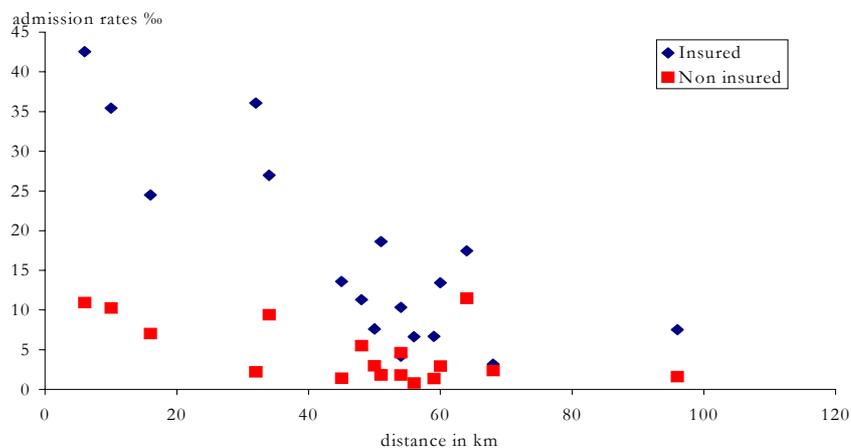
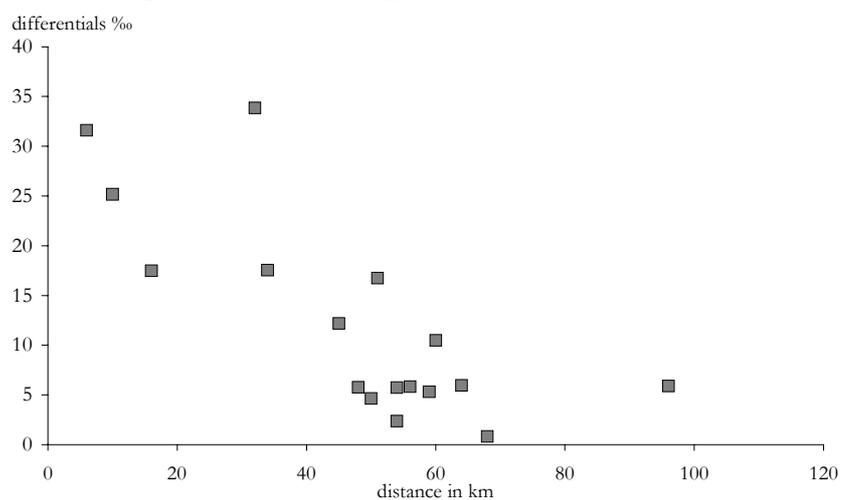


Figure 10: Utilisation differentials insured / non-insured



In 15 of the 17 health centre areas insurance is associated with higher hospital admission rates (Figure 11), with little influence of distance. For the health centres within a range of 35 km from the hospital, the average ratio admission rate insured : non-insured is 6; for the 12 at more than 35 km from the hospital, the ratio is 4.5. When the four outliers with individ-

ual ratios above 8 are excluded, these ratios are respectively 3.5 and 2.9.

Figure 11: Ratios per health centre of admission rate insured / non-insured

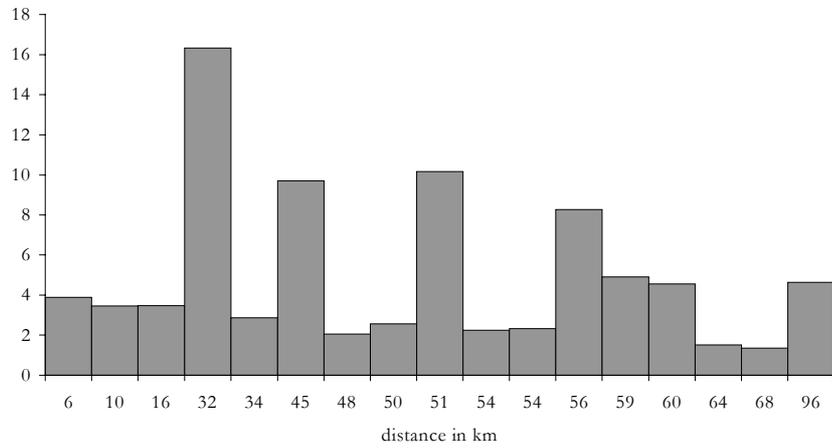
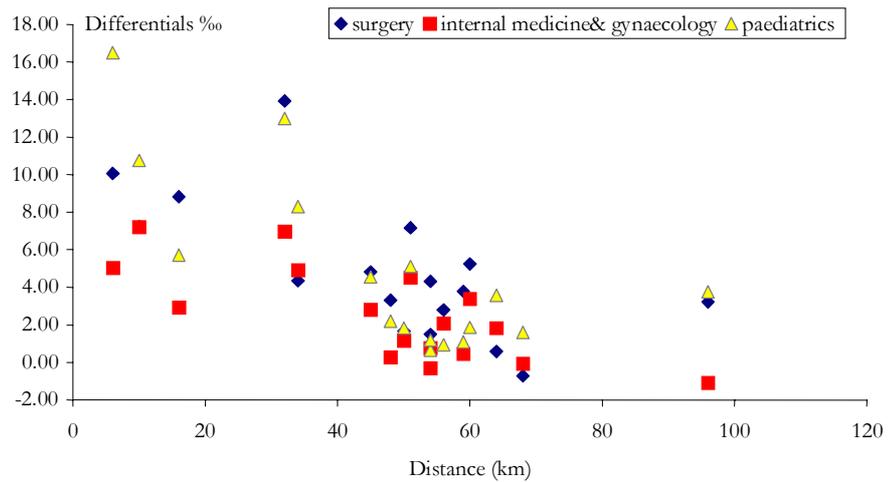


Figure 12: Utilisation differentials per hospital department



These differences remain after dis aggregation of the data for surgery, internal medicine/gynaecology, and paediatric departments (Figure 12). Utilisation is significantly higher for insured than for non-insured (Wil-

coxon signed ranks test significant at the level 0.001 for surgery and paediatrics, and at the level 0.05 for internal medicine/gynaecology).

Table 8. Caesarean section and symphysiotomy rates in insured and non-insured populations for 5-year period April 1991 - March 1996.

Health centres	N expected pregnancies among insured	N of interventions	Rate per 100 insured	N expected pregnancies non-insured	N of interventions	Rate per 100 non-insured
Botuzu	1048	24	2.29	487	3	0.62
Kada	1002	24	2.40	549	9	1.64
Botela	1462	26	1.78	901	9	1.00
Bombese	414	5	1.21	688	3	0.44
Bongbada	1255	19	1.51	692	3	0.43
Boto	699	18	2.57	1337	9	0.67
Bowazi	641	9	1.40	215	6	2.79
Bodeme	1372	29	2.11	1275	9	0.71
Kasongo	267	6	2.25	1018	5	0.49
Bowara	862	24	2.78	590	6	1.02
Bogbase	571	5	0.88	309	4	1.30
Bobisi	506	5	0.99	305	2	0.66
Bobandu	310	6	1.93	1178	2	0.17
Bolumba	422	11	2.61	636	8	1.26
Bombisa	927	22	2.37	355	4	1.13
Bowakara	250	5	2.00	455	0	0.00
Bokoza	56	0	0.00	361	2	0.55
Total	12,064	238	1.97	11,351	84	0.74

NOTES: health centres are listed according to increasing distance from the hospital; expected births are calculated assuming a birth rate of 40 per 1000.

Table 8 shows the rates of caesarean sections and symphysiotomies per 100 expected deliveries in the 1991-1996. In this five-year period, 238 caesarean sections/symphysiotomies* were carried out in the insured population out of 12,064 expected deliveries (1.97%), and 84 out of 11,351 expected deliveries in the non-insured population (0.74%). In 14 of the 17 health centre areas the caesarean section rate is higher in the insured population. In the 3-year period 1993-1996, the proportion of interventions carried out for absolute maternal indications in both insured and non-insured populations was identical (93%).

The caesarean section rate in the insured population appears to be relatively independent of distance, whereas these rates decrease significantly with distance in the non-insured population (Wilcoxon signed ranks

* Approximately one symphysiotomy for every ten caesarean sections.

test, $P < 0.001$) (Figure 13).

In the 3-year period 1993-1996, 119 insured patients (80% males) underwent surgery for a strangulated hernia (6.41 per 10,000 inhabitants per year). In 2 out of the 17 health centres areas under investigation, no admissions for strangulated hernias took place in the insured population in the three-year time-span. In the non-insured population, this annual rate was 2 per 10,000 inhabitants (35 patients of which 74% males), with no admissions coming from 5 of the 17 health centre areas. The difference between these two rates is significant (Wilcoxon signed ranks test, $P = 0.01$).

The average utilisation differentials for strangulated hernias are roughly similar for the two groups of health centres located at less than 35 km from the hospital and beyond 35 km (Figure 14). In the first case, the average differential is 4.3/10,000, and in the second case, it is 3.1/10,000.

The data for uncomplicated hernias indicate that a total of 597 insured patients (68% male patients), coming from all of the 17 health centre areas, had surgery in the period 1993-1996 (32.1 per 10,000 per year). There were 50 non-insured patients (74% male patients) coming from 16 out of 17 health centre areas (2.9 per 10,000 per year). The difference between insured and non-insured is statistically significant (Wilcoxon signed ranks test: $P = 0.001$). The average utilisation differential is however more pronounced for the nearby communities than for the more remote ones (respectively 40/10,000 and 24/10,000).

Figure 13: Admission rates caesarean sections and symphysiotomies

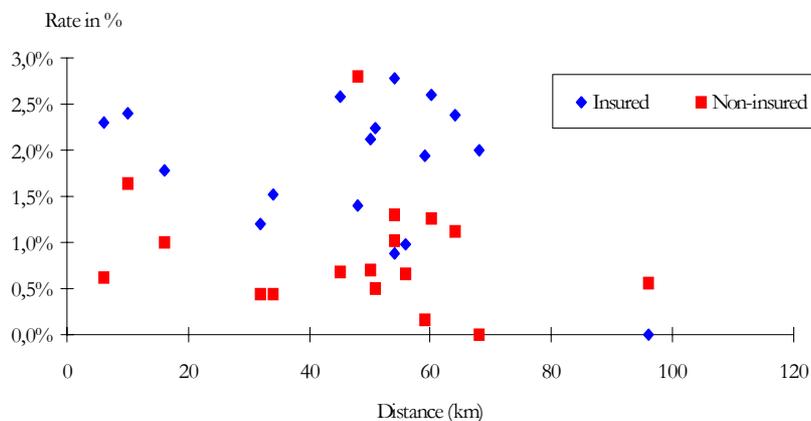
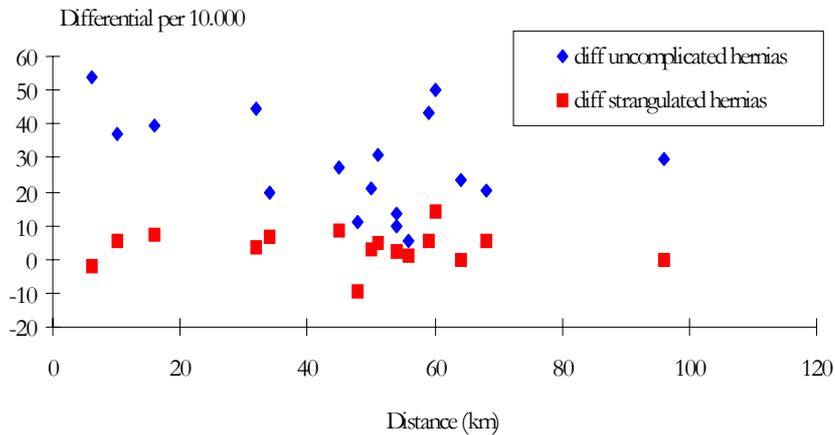


Figure 14: Utilisation differentials hernias



SPATIAL CONCENTRATION: COEFFICIENTS OF LOCALISATION AND LOCATION QUOTIENTS

Coefficients of localisation, for insured and non-insured, were calculated for the hospital admissions in the paediatric, internal medicine/gynaecology and surgery wards; as well as for the admissions that took place for uncomplicated hernias, strangulated hernias and caesarean sections & symphysiotomies. The results are presented in Table 9. These coefficients of localisation are systematically higher among the non-insured patient populations. The ratios of coefficients of localisation non-insured : insured are highest for caesarean sections & symphysiotomies and strangulated hernias, and lowest for paediatrics and internal medicine/gynaecology.

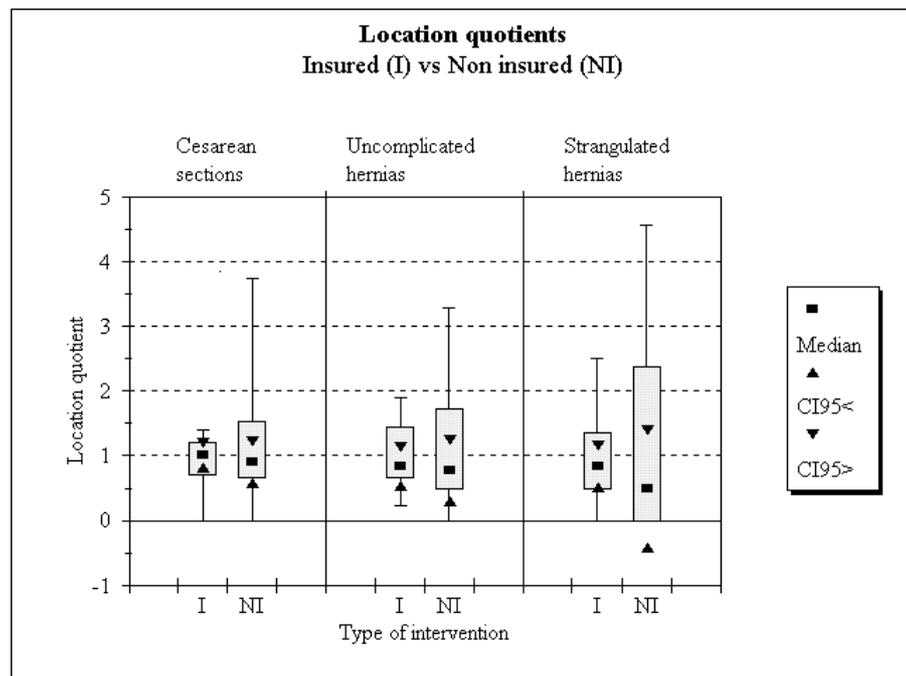
The location quotients for insured and non-insured were calculated for the admissions for caesarean sections and symphysiotomies, uncomplicated hernias, and strangulated hernias, coming from each of the 17 health centre areas. There are no significant differences between insured and non-insured, but Figure 15 clearly shows that the spread of LQ^i is systematically more narrow for the insured populations.

Table 9: Coefficients of localisation

	CL insured	CL non-insured	Ratio CL non-insured/insured
Paediatrics ^a	0.32	0.37	1.2
Internal medicine and gynaecology ^a	0.27	0.39	1.4
Surgery (M&F, including hernias) ^a	0.23	0.33	1.4
Uncomplicated hernias (M&F) ^b	0.23	0.4	1.7
Strangulated hernias (M&F) ^b	0.23	0.43	1.9
Caesarean sections/ symphysiotomies ^c	0.12	0.23	1.9

^a data for 1993-1994; ^b data for 1993-1996; ^c data for 1991-1996

Figure 15: Location quotients for insured (I) and non-insured (NI) admissions



AVERAGE LENGTHS OF STAY

Insured patients stay an average of 10.5 days (1,417 admissions/14,885 hospital days), the uninsured 9 days (168 admissions/1,509 hospital days) (Wilcoxon rank sum test not significant).

THE BED CENSUS

The bed census results were analysed for the inpatients living in the district: 170 out of the total of 218 patients present at the moment of the census. Bed occupation was deemed not appropriate in 58/139 insured patients (42%), in 3/9 self-employed non-insured patients (33%), and in 12/22 patients covered by employer-organised schemes (55%). For the total population of 170 inpatients, this proportion is 43% (73/170). In half of these cases, the reason was that '*patients were waiting to be taken home*'. The results of the subjective evaluation of the justification of the admission indicate a very high proportion of justified admissions in both insured and non-insured. In 133 out of 139 insured cases (96%) and in 8/9 of the non-insured self-employed cases (89%), the admission was categorised as justified or as avoidable only on condition of substantial changes at health centre level. It is however not possible to draw any statistical inference from any of these data, given the small sample of non-insured in the inpatient population.

Discussion

IMPACT OF THE INSURANCE SCHEME ON EFFECTIVENESS, EQUITY AND EFFICIENCY OF HOSPITAL USE

The overall admission rate in Bwamanda hospital (39.2‰ district inhabitants) is in line with rates observed in other African rural hospitals (Petit and Van Ginneken 1995; Van Lerberghe *et al.* 1992). On average the admission rate for the insured is three times higher than for the non-insured. The incremental utilisation of hospital inpatient services by the insured, however, is by no means a homogenous phenomenon: it is substantial for patients admitted to surgery and maternity, and rather marginal for patients in internal medicine.

The utilisation differentials between insured and non-insured admission rates for the different hospital departments analysed (surgery, internal medicine/gynaecology, paediatrics) are the most substantial for the insured communities located within a range of about 35 km from the hospital. Overall, the reduction of financial barriers to hospital utilisation the insur-

ance scheme does not seem to be a strong enough boost to overcome geographical barriers. However, the ratios of admission rates insured : non-insured indicate that the relative increase is only slightly influenced by distance. Hence, in relative terms, the higher hospital utilisation among insured is distributed in a grossly similar extent in both nearby and remote communities.

The analysis of distance decays in hospital admissions for the tracers of justified utilisation gives a different picture. For this type of problems the insurance scheme helped to overcome geographical barriers to hospital utilisation to the point of little residual influence of distance, and certainly far less than was observed in the spatial analysis of all admissions confounded. This effect is particularly pronounced in the case of caesarean sections and strangulated hernias. These indicators of justified high priority hospital use are both life-threatening conditions in the event of no treatment. The same phenomenon is also observed, but to a far lesser extent, for uncomplicated hernias—the tracer for justified but non-priority hospital use.

These findings suggest that the Bwamanda scheme succeeded in increasing hospital use among the insured for these sub-populations of patients considered in high need of hospital-based care, which provides an indication of the effectiveness of the scheme. Conversely, unmet need is likely to remain in the populations that did not subscribe to the scheme. These findings also indicate that the higher justified priority hospital use is not confined only to the communities living nearby to the hospital, which constitutes an indicator of the equity level of the scheme.

The pattern of hospital utilisation for caesarean sections/symphysioto-mies makes it possible to quantify the effect of the insurance scheme. It can be reasonably assumed that both populations of respectively insured and non-insured have a similar need for caesarean sections. If that is correct, the data show there remains substantial unmet need in the non-insured population, and especially in the more remote non-insured communities. The marked difference observed between average caesarean section rates, in respectively insured and non-insured population, gains further significance in a context where indications for caesarean section are very stringent and where it is essentially performed on maternal indications. These findings suggest that the observed deficit in caesarean sections has led to a number of obstetrical disasters in the non-insured population. Similar conclusions were found in studies measuring the coverage of obstetric interventions need in another district in Congo (Van Lerberghe *et al.* 1988; Van Den Broek *et al.* 1989) and in Morocco (De Brouwere *et al.* 1996).

The deficit in caesarean sections among non-insured in the period 1991-1996 can be estimated by multiplying the number of expected pregnancies in the non-insured population ($N=11,351$) with the difference between the caesarean section rate among the insured ($CR_{ins} = 1.97\%$) and the non-insured ($CR_{nins} = 0.74\%$). This gives a deficit—caesarean sections that should have been done but were not—of about 140 caesarean sections in the five-year period 1991-1996: an average of 28 per year.

It is interesting to compare the data on abdominal hernia surgery with data collected in non-government organisations (NGO) supported district hospitals in East Africa (Nordberg 1984). These institutions are indeed fairly comparable to the Bwamanda hospital. The Bwamanda data for uncomplicated and strangulated hernias in the total population (i.e. insured *and* non-insured) are roughly similar to the minimum needs estimated in East Africa, whereas the data for the insured population largely exceed the estimated needs (see Table 10). Indeed, in this population, the rate of surgery for strangulated hernias (justified priority hospital utilisation) is 2.1 times higher than the minimum need estimated by Nordberg, and the rate of surgery for uncomplicated hernias (justified non-priority hospital utilisation) is 1.8 times higher. These findings suggest either that the need for this type of surgery would be much higher in Bwamanda than in East Africa, or that the estimates for East Africa are too conservative.

Table 10: Comparison of data on uncomplicated and strangulated hernias

	Uncomplicated hernias	Strangulated hernias
Bwamanda		
Insured population	320/100,000	64/100,000
Non-insured population	29/100,000	20/100,000
Total population	180/100,000	43/100,000
Range in 5 NGO supported hospitals in East Africa, according to Nordberg, 1984	35-100/100,000	4-14/100,000
Estimated minimum need according to Nordberg, 1984	175/100,000	30/100,000

The analysis of spatial concentration of admissions through the coefficients of localisation and location quotients, is coherent with the findings above. The systematically lower *CL* for the insured populations suggest that the insurance has decreased localisation and led to a more homogenous distribution of hospital admissions across health centre areas. Northcott qualifies such an effect as “*an equalising trend in distribution pattern*”

(Northcott 1980). The ratios of coefficients of localisation non-insured : insured indicate that this equalising trend is most pronounced for surgical-obstetrical problems and lowest for internal medicine, gynaecology and paediatrics. The pattern of spread in LQ^i , which is systematically more narrow for the insured patient populations, especially where caesarean sections are concerned, indicates a more equal distribution of admissions over the 17 health centre areas. If equal hospital utilisation for equal need is considered as a proxy for equity, then it is possible to conclude that the insurance scheme has improved equity in the district.

The health problems for which the equalising trend is most pronounced are those that are tracers of priority justified care. Why is this so? Part of the explanation is that the hospital is the only institution in the district that can offer a reasonably effective technical solution (i.e. surgery) for these, often urgent, problems, and people are aware of that. Moreover, abdominal hernia repair and interventions related to motherhood generally score quite high on the Bwamanda community's own priority list. Yet another explanation may be the fact that for some health problems it is easier to anticipate future utilisation of health services. This is the case, for instance, for deliveries and for many of the surgical problems. The insurance scheme may thus have preferentially attracted people whose present or future health status is such that health service utilisation in the nearby future becomes reasonably 'foreseeable' or 'predictable'. Such a phenomenon of adverse selection of women in childbearing age has been clearly documented in the case of the Masisi hospital insurance scheme in eastern Congo (former Zaire) which will be discussed later in greater detail. Adverse selection may thus, at least theoretically, have contributed to the high impact of insurance on hospital utilisation for obstetrical and surgical problems. In Bwamanda however, membership can only take place on a household-, and not on an individual basis. This has probably reduced the occurrence of adverse selection and kept it within reasonable limits.

The equalising trend decreases when it comes to health problems that are less predicable, less urgent, less life-threatening, more ill-defined, and for which the hospital's answer often is of relatively limited effectiveness*.

The length of stay is only slightly (and not significantly) longer for the insured inpatient population. This finding may indicate that the insurance scheme has not been a cause of inefficiency in hospital use. However, the data do not allow to discard the possibility that non-insured leave the hospital at too early a stage. It would be wise to assess average lengths over

* At least compared to what can be done at health centre level or to what is available in the community itself.

much longer periods, and for each ward separately, before jumping to hasty conclusions. In addition, it would be appropriate to systematically appreciate the outcome of hospital stays for the same patient population in order to know whether non-insured leave the hospital prematurely or not.

The bed census* was yet another instrument to measure whether the insurance scheme affected efficiency of hospital use. The data from the Bwamanda bed-census unfortunately do not allow to establish whether there is a significant difference in inappropriate bed occupation between insured and non-insured self-employed inpatients. The results of the subjective hospital justification assessments, on the other hand, indicate that virtually all admissions were considered appropriate by local staff criteria both in insured as in non-insured inpatients.

* An interesting finding of the bed-census data was the indication of a substantial proportion of inappropriate bed occupation in the overall inpatient population: 43% of the inpatients investigated did not match any of the positive criteria justifying bed occupation on the day of the census. This proportion is much higher than the ones observed in similar studies carried out in Zambia (Buvé and Foster, 1995) and South Africa (Henley *et al.* 1991, Zwarenstein *et al.* 1990). The proportion of inappropriate bed occupation was 13% in the Monze district hospital (Zambia), and 20% and 29% respectively in two different teaching hospitals of the Republic of South Africa. This result is surprising given the strong tradition of rational and efficient use of resources in Bwamanda which has been reported to be amongst the best performing districts in Zaire (USAID/Kinshasa, 1987).

3. *The Social perception of the Bwamanda scheme*

Introduction

The two previous chapters indicated that the Bwamanda hospital insurance scheme, locally known as the *mutuelle*, has reached a satisfactory level in terms of financial and technical performance, and has achieved the objectives set by the managers of the district health care system when introducing the scheme in 1986. On the one hand, it has made it possible to generate stable financial resources to ensure the functioning of the hospital, doubling the volume of available resources, so that the Bwamanda hospital has become less dependent on external sources of finance. On the other hand, this system of financing has significantly improved access to hospital care for patients whose state of health justifies the use of the hospital without compromising the efficiency of its operation. From this technical point of view the Bwamanda system of health insurance is a success, and experience of this scheme supports Ahrin's view that in certain conditions health insurance is a feasible option in sub-Saharan Africa (Arhin 1995).

But health insurance, whether compulsory or voluntary, is not a socially neutral phenomenon. The introduction of such mechanisms may lead to qualitative transformations in terms of social relationships. It may thus exert considerable influence, either positive or negative, on social cohesion and integration in a society (Rushing 1986). As a rule, there has been little study of these social repercussions. Health planners tend to consider the financing of health care in general, and the mechanisms of health insurance in particular, from a strictly technical viewpoint, frequently limiting themselves to the study of the financial results of these systems, and their consequences on the pattern of use of health services.

This third and final chapter on the Bwamanda experience investigates the way the Bwamanda health insurance system is perceived by the population*. For that we need to address different views of the health insurance system, the motivations of the population to subscribe or not, and the interactions with the common practice of mutual aid existing within social groups.

* This chapter is based on the paper *Voluntary Health Insurance in Bwamanda, Democratic Republic of Congo. An exploration of its meanings to the community* (Criel et al. 1998).

The primary logic of this investigation was managerial. It seemed obvious that the conception of 'egalitarian' and 'universalistic' solidarity—as viewed by the Belgian doctors who largely guided the conception and design of the scheme—was not necessarily shared by the local population and that the population interpreted the insurance scheme in the light of its own experience of traditional mutual aid systems. Managers feared this might have become a source of misunderstandings. The research aimed to get more insight into the meaning of the insurance scheme to the population in order to identify potential areas of misunderstandings and, eventually, suggest possible ways to overcome them to improve the insurance's functioning.

This concern was translated in a number of specific research questions. After ten years of operation of the hospital insurance scheme, to what extent do perceptions of this risk-sharing scheme by the organisers on the one hand and the population of the area on the other differ or converge? Do the traditional mechanisms of solidarity, usually limited to small population groups that are relatively homogeneous in terms of social characteristics, influence perceptions of the insurance scheme? What is the value of the *mutuelle* in the eyes of the population? What are the perceived limitations of this scheme? Why do two-thirds of the population of the district subscribe, in a context in which health care in general, and hospital-based care in particular, are only a relative priority? (see Box 2) Who within the family decides in favour of subscribing? And why does a third of the population of the district never subscribe? From a lack of interest and/or an inability to pay the premium?

Methods

These various questions were addressed during ten focus group discussions organised in Bwamanda district over a period of three weeks in March-April 1996. The focus group method was adopted because of its ability to generate full and detailed information by bringing together a large number of people over a relatively short period. The organisation of the focus groups was adapted to the practical constraints related to the specific environment of Bwamanda (poor communication and transport infrastructure, need to involve health personnel in the identification and choice of the participants, etc.).

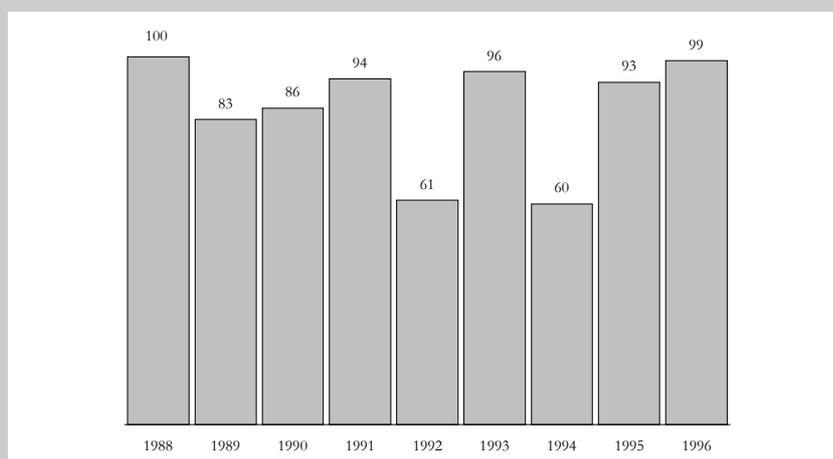
The focus groups were moderated by the head of one of the primary schools of the little town of Bwamanda, a native of the region. The discussions, which took place in the Ngbaka language, were recorded by a nurse

of the maternity department of the hospital whose mother tongue was also Ngbaka. He took no part in the discussions and was careful to remain in the background. The author was present as an observer at the various focus groups.

Box 2. Subscription is not a passing phenomenon

A small-scale investigation previously carried out at the Kada health centre in 1995, 10 kilometres from the hospital, indirectly illustrates the relevance of these questions. The cohort of subscribers to the insurance in this area had remained relatively unchanged over the period 1988-96. The families who subscribed in 1988 (when the subscription rate was about 65%) had continued to do so in the following years when similar subscription rates were achieved (except in 1992 and 1994). This suggests that subscription to the insurance is not a fortuitous event but is a continuing concern of a proportion of the population: the numbers of subscribers and non-subscribers in 1988 remained practically the same during the eight following years (Figure 16).

Figure 16: Proportion renewals of subscription (%) among the initial 1988 cohort, Kada health centre (1988-1996)



Initially, detailed discussions were held, first with the district executive team and with a sociologist working on the CDI project and then with the local investigators. The methodology of focus groups (Kitzinger 1995) was presented and explained. Guide questions to be discussed were prepared and translated into Ngbaka. There was a series of seven questions for the focus groups consisting of subscribers to the insurance in 1995 and a separate list of four questions for discussion with non-subscribers (Box 3 and

Box 4). One of the questions in each list specifically addressed the issue of traditional mutual aid systems. The first series of questions was pre-tested with a group of twelve women subscribers living in Bwamanda itself. These preparations took about one week.

Box 3. Subjects for discussion in focus groups of subscribers

1. Nowadays times are very difficult: health care is only one of people's many concerns (*finding food, paying school fees, paying for clothing, looking for water and wood, etc.*). And admission to hospital is only a potential risk and not a certainty. Yet many people subscribe to the *mutuelle* and do it freely. What do you think about this?
2. Who takes the decision on subscribing (*the mother, the father, the village headman, and one or more people*)? How is this decision taken? When? Can you tell us about this, please? We have also observed that people often subscribe only at the end of the period for subscribing. What do you think about this?
3. Sometimes families can't subscribe to the *mutuelle* because they haven't the money. What do you think about this? How do they manage?
4. Within the community there are mechanisms for mutual aid at the level of the family, the group, the clan. They operate on the occasion of catastrophic events either medical or non-medical (*for example a death or an accident*). In what way are these mechanisms different from the *mutuelle*? And are these mechanisms unable to cover the cost of hospital treatment? Why must there be a *mutuelle*?
5. If a subscriber to the *mutuelle* does not receive hospital treatment but someone else does, then the first subscriber is helping to pay for the hospital treatment of the other. The other person may belong to the same family or the same village, but he may also be from another part of Bwamanda health area. What do you think about this?
6. Anyone who subscribes to the *mutuelle*, whether rich or poor, pays the same premium, but not everyone can meet the cost equally well. When subscribers are admitted to hospital, they all have the same deduction from the hospital charge (paying only 20%). But some of them have greater expenses: for example people coming from a distance have to pay more for transport or food., and they won't always have relatives in Bwamanda. What do you think about this?
7. Some people who are subscribers to the *mutuelle* will perhaps go more readily to the hospital for health problems that could be dealt with at the health centre or even at home. What do you think about this? How can it be limited?

The population of Bwamanda district lies within two different local

government areas. Five focus groups were organised in a series of villages in the Lua area around Boto, in the West of the district. This region is more difficult to access and the subscription rate has traditionally been below the district average. The other five groups were in the Mbari area, in the villages of Isabe, Kada, Botela, Mbari and Botuzu (see Figure 1 in chapter 1).

Box 4. Subjects for discussion in focus groups of non-subscribers

1. Nowadays times are very difficult: health care is only one of people's many concerns (*finding food, paying school fees, paying for clothing, looking for water and wood, etc.*). And admission to hospital is only a potential risk and not a certainty. Yet many people subscribe to the *mutuelle* and do it freely. What do you think about this?
2. You have decided not to subscribe to the *mutuelle*. How is this decision taken? When? By whom (*the mother, the father, the village headman, one or more people*)? Can you tell us about this, please?
3. If some families don't subscribe, it is perhaps because they are short of money, or perhaps because they think the *mutuelle* is no use to them. What do you think about this? How do they manage if someone falls ill?
4. Within the community there are mechanisms for mutual aid at the level of the family, the group, the clan. They operate on the occasion of catastrophic events either medical or non-medical (*for example a death or an accident*). In what way are these mechanisms different from the *mutuelle*? And are these mechanisms unable to cover the cost of hospital treatment? Why must there be a *mutuelle*?

In each case groups of between seven to fourteen adults, relatively homogeneous in terms of age and socio-economic status, were formed. Three focus groups were held with non-subscribers. The health centre nurses were involved in the identification of the participants. They have good knowledge of which households in their community are member of the insurance and which are not. Altogether around a hundred people took part in the various focus groups. As far as possible people who did not know each other were selected. Half the groups consisted of women. The moderator and the health centre nurse identified the participants a few days before the date fixed for the conduct of the group. On average the discussions lasted between 1½ and 2 hours. They were held in a public building of some kind (a school classroom or the local church), while preserving a certain intimacy. Following the discussions a portion of rice was distributed to all the participants. After each session the organisers and researchers systematically discussed the record of the meeting. A preliminary analysis of the material was

presented to the district executive team a few days after the organisation of the last focus group.

Later, the material was further analysed in Antwerp. Three different researchers independently analysed the full transcripts of all ten focus groups in order to achieve analyst triangulation (Patton 1980). A cross-case analysis was conducted with a focus on the initial hypotheses, without however ignoring other issues that emerged from the discussions.

Results

In general, the participants showed great interest in this opportunity to discuss the insurance scheme. Their attitude to the functioning of this system of financing hospital care was critical; sometimes, indeed aggressive and demanding. The name of the CDI cropped up very frequently, since the population of the district identifies the health services in general and the insurance scheme in particular with the CDI project. Examples from other social services run by the CDI were sometimes used to support an argument in the discussion of the insurance scheme.

WHY DO PEOPLE SUBSCRIBE OR NOT SUBSCRIBE?

All the focus groups, both of subscribers and non-subscribers, brought out the fact that the insurance scheme is recognised and appreciated for its effectiveness and that it must continue to operate. The quasi-monopoly position of Bwamanda hospital in the region is also recognised, since for the majority of the inhabitants of the district there is no alternative: "*We must join the scheme: we have no choice.*"

The benefits of the insurance were expressed in most groups in terms of financial advantages: "*the mutuelle means that we need to pay less at the hospital,*" while the existing mechanisms of mutual aid at all levels of the Bwamanda community are there "*for happiness and enjoyment.*" The act of subscribing to the scheme is also expressed in terms of a financial transaction: *mi-futa* in Ngbaka, "*I have paid.*" People frequently think of the insurance as a 'pass' or 'travel warrant' giving access to cheaper health care.

The decision to subscribe is usually taken by the housewife—a fact frequently acknowledged in the groups composed of men—even if they sometimes apply to their husband to find the necessary money. The decision is largely influenced by earlier personal experience or by the experience of

* Documents of this kind are required for the purposes of travel and transport in the region, and the authorities were very ready to impose penalties, on an arbitrary basis, on people who could not produce them.

other local people. The period for subscribing is usually in February and March, so that this payment does not compete with another major item of expenditure—the school fees for children, which are due in September. Nevertheless, many groups had reservations about this choice of the subscribing period. A question about the respective importance of the health insurance premium and the school fees sometimes received the reply that *“health comes first, for if you are ill you cannot go to school.”*

A lack of money was the most frequent reason for non-subscribers not to join the insurance scheme. This did not, however, imply any rejection of the system: far from it. The non-subscribers would say, for example, *“We are not refusing to pay, but we can’t afford to,”* or *“The mutuelle must go on, if only for those who can afford to subscribe.”* On the other hand, non-subscribers were sometimes identified by subscribers as wealthy people who wanted to distinguish themselves from the rest of the population by showing that they could easily pay the full fee charged for hospital treatment. Some subscribers referred to the *“arrogance”* of this category of non-subscribers.

SOLIDARITY AMONG SUBSCRIBERS

The redistribution effect inherent to an insurance mechanism, in which the premiums are independent of such risk-related variables as age or sex, was not explicitly questioned by the participants. It is not certain, however, that the planners of the scheme and the population understood this redistribution effect between individuals and families living in different parts of the district in the same way. For the former it was a question of promoting social justice and mutual aid beyond existing personal relations within the community. It is interesting to note that in the focus groups this value was interpreted in essentially Christian terms: *“God will reward us one day,”* or *“If this money does not benefit us it is an offering to the community.”*

COMPLAINTS AND QUESTIONS

The discussions also provided an opportunity to the participants to express certain frustrations and questions about the insurance scheme. These focused on the organisation of the insurance scheme and on the relations between the scheme and the members.

THE PATTERN OF ORGANISATION OF THE INSURANCE: Criticisms of the subscribing arrangements and of the payment of individual premiums at a flat rate were expressed as: *“Why should it be the same premium for everyone, when there are different charges for adults and children at the health*

centre and the hospital?" The limitation of subscriptions to a particular period and the requirement to pay the whole premium at once (whereas school fees can be paid in instalments) were also criticised. Most people subscribe only at the end of the subscription period, because "the money has to be found first."

The limitation of the benefit package to hospital care, excluding health centre care, is perceived as arbitrary, indeed as an injustice: "Subscribers pay the same price at the health centre as non-subscribers," "We don't understand: the CDI exploits people," or "The alliance between the CDI and the population should not exclude care at the health centre." The fact that coverage is confined to the narrow field of health care was also mentioned: "Why cannot the body of a subscriber who has died in hospital be transported to the village?"

The reason for the co-payment of 20% at the time of hospitalisation, designed to discourage unjustified use of the hospital, is apparently not understood. Some consider it as a failure to meet the commitments of the health service. "We've paid the premium but they want more money at the hospital." "Even if you are a member of the mutuelle you still need money when you're ill, though you've used all your resources to subscribe to the mutuelle," or "If subscribers don't pay they are refused admission to hospital."

THE RELATIONSHIP BETWEEN THE INSURANCE SCHEME AND ITS MEMBERS: As regards the management of the scheme, the participants in the focus groups complained about their limited involvement in decisions on the premium to be paid by subscribers and the subscribing period, which were settled unilaterally by the health service. They also complained of a lack of information about the destination of the funds collected and of the lack of control over their use. During the first years of operation of the hospital insurance the funds were invested in the purchase of drugs in order to counter the effects of inflation. Thus when stocks of drugs at the primary level ran out—an event over which the insurance had no control—this was considered as unacceptable and unfair. These feelings of frustration were expressed in a variety of ways. "If the money disappears we can't know;" "We have never been shown the mutuelle's accounts;" "In the mutuelle we don't know one another: if the money is misappropriated the treasurer can't be punished;" "The CDI is having us on, because all the decisions have already been taken;" or "The alliance is unilateral and not bilateral." This feeling of resentment, however, was frequently accompanied by a positive appreciation of the scheme or by constructive suggestions for the operation of the insurance scheme. "If the mutuelle runs out of money we could always help," "The mutuelle is a good thing, but it does not belong to us, since we play no part in its

management,” or “*We can’t close down the mutuelle, but its method of operation needs to be changed.*”

The insurance scheme’s lack of clemency, for example in dealing with non-subscribers requiring hospital treatment and who in previous years subscribed regularly was mentioned several times. The groups also complained that the insurance did not extend credit. It was said, for example that “*the mutuelle is tough;*” or “*the mutuelle gives no presents: if someone dies on the day he joins the money is not paid back to his family.*” This lack of clemency is associated with a lack of confidence. “*When someone needs to be admitted to hospital urgently the hospital insists on seeing the census card which has been left at home, even though we know its number by heart.*” or “*After ten years of the alliance couldn’t the CDI allow a year’s grace for those who have subscribed regularly? If you don’t pay your premium for one year you are cut off.*”

The reception of non-subscribing (poor) patients by the nursing staff of health centres and the hospital and their general attitude, is known to be disagreeable or even humiliating. Health staff consider non-subscribers as being at fault, and make this felt: “*We are called ignorant or stubborn;*” “*They look down on us; we are ashamed to appear at the hospital;*” “*Subscribers are neglected in the hospital in favour of non-subscribers who have money;*” or “*We have an alliance with the health service, but subscribers are not warmly received.*” Many non-subscribers say that they put pressure on the nurse at their health centre to continue treatment at that level and postpone referral to hospital: “*We feel bad when we have to go to hospital.*”

RELATIONSHIPS BETWEEN THE INSURANCE SCHEME AND TRADITIONAL MUTUAL AID

Finally the focus groups made it possible to briefly consider the variety of existing systems of mutual aid within groups (ethnic, occupational, village, etc.) or within community movements. To designate this very diverse group of mutual aid schemes developed by the population—but excluding networks of family solidarity, which are much more binding and more codified—we will use the terms traditional or endogenous.

The health insurance scheme is commonly called the *mutuelle* by the population, who have apparently adopted this term introduced by the executive team when the system was launched in 1986. This denomination usually designates the agencies which run sickness and invalidity insurance in Belgium. Its transposition to the Bwamanda context reflects the frame of reference used by the (Belgian) doctors in the Bwamanda executive team when the insurance scheme was conceived. The endogenous mechanisms of mutual aid, however, have a local name: people call them *dea-na* and *dia-*

na, Ngbaka for “*make a family*” and “*good family*.”

The characteristics of these *endogenous* systems of mutual aid were described as follows:

* The levels of contribution to be paid to the mutual aid fund are settled in common. The contribution frequently takes the form of a fixed payment per family, varying according to ability to pay; sometimes payment can be made in kind.

* The amounts generated are modest, and are thus insufficient to cover high expenditures or expenditures concentrated in time: “*If ten members fall ill at the same time the fund will be unable to meet the expense.*”

* There is great flexibility in the operation of these systems, though the poorest people are excluded. Thus the participants in one group said that they were unable to pay the weekly subscription of 500 Zaire (then equivalent to U.S.\$0.02). Moral considerations may also come into play in the selection of people desiring to join the mutual aid fund: “*A prostitute can be accepted, because the group can make an effort to edify her.*”

* The organisation is on a small scale, with great emphasis on social control: “*In the mutual aid fund they all know each other, and if there is any misappropriation of funds the treasurer will be required to make it good and he will be deprived of his post. In the mutuelle the members do not know each other.*”

* Endogenous systems seldom cover the payment of the premium for the insurance: “*It will encourage laziness.*” If it does, it is only after a deliberation process in which the social behaviour of the potential beneficiary is examined: “*If a subscriber to the mutual aid is imprisoned for adultery he will not be helped; but a peasant whose fields have been burned will be.*”

* In a case of illness these mechanisms are activated very rarely and late. In the case of a death, on the other hand, the money is made available immediately: a person who gives financial aid in such circumstance gains prestige. In the Ngbaka language the following expressions are used: *fio kpa tulu*, “*The dead man finds his clothes,*” or *fio kpana*, “*The dead man finds his family*”. Several people expressed disapprobation with these practices: “*They are more concerned with the dead than with the living.*”

Some mutual aid associations require a new member to subscribe to the insurance scheme: “*Otherwise the mutual aid fund will have to pay out in the event of illness.*”

Discussion

INSURANCE AND MUTUAL AID: A DIFFERENT LOGIC?

Regarding the relationship between the population and the insurance scheme, a remarkable feature is the repeated use of the idea of 'alliance' (expressed by the Ngbaka word *de-nase*, literally "wish to form a family") to designate what, from the viewpoint of the service, is a form of contract.

A contract is an expression of modern organisations concerned to achieve precise objectives—in this case the stable financing of accessible hospital care—as rationally and efficiently as possible. The contract explicitly states the commitments of the insurance to its members and the objective conditions for becoming a member. The rules are uniform for all, and are applied in a framework involving relationships that are impersonal, almost anonymous.

An alliance, on the other hand, is based on a much wider social logic in which social relationships are more important than technical performance. Its main objective is to establish and strengthen privileged links between individuals and families, which are given material form by a reciprocal exchange of gifts. The voluntary grouping of people on the basis of social affinities which is characteristic of the alliance is also found in the *tontine* system (Rotating Savings and Credit Associations or ROSCAs in the English literature), based on attitudes of reciprocity (Lespes 1990).

The analysis of the tension between these two kinds of systems is not new. Anthropologists studied this confrontation when comparing the use of money in different types of medicine: on the one hand traditional medicine and on the other modern biomedicine (van der Geest 1985; van der Geest 1997; Benoist 1991). It appears that most of the frustrations expressed about the insurance scheme are associated with features which one is entitled to expect from an alliance but which are not guaranteed by a contract.

An alliance has wide scope, both in good times and in bad, while the contract is limited, in this case to illness, and indeed to hospitalisation. The privileged alliance of social bonds contrasts with the impersonal and anonymous character of modern organisational logic. These mutual aid associations are less as social insurance schemes than "*a place of meeting and exchange which promotes the crystallisation of friendly relationships which may one day be mobilised for the purpose of mutual aid*" (Fassin 1992). The alliance is prepared and negotiated, while the contract is presented on a 'take it or leave it' basis. The alliance leaves room for feelings which may allow more flexibility of decision (e.g. an appeal for clemency), in contrast to the rigidity and strict observance of regulations applying to all without exception

which is characteristic of the contract. Exchange and reciprocity are predominant features of the alliance, whereas in an insurance scheme the participant may receive nothing in return. In the alliance, an exchange is set up between families and other homogeneous social groups, while a contract is based on the individual as a unit.

Table 11 presents the main characteristics of these two systems. The limit of this comparative table is that it simplifies and dichotomises, probably excessively, the features of either logic. In reality, these systems obviously interact and adopt elements from each other. Lespès, in his analysis of *tontine* systems in Africa, considers that the quantitative extension and qualitative diversification of these systems give rise to new practices (Lespes 1990). He thus opposes a too strict dualist approach that sets traditional forms of organisation against modern ones. He notes, for example, that large *tontines* must necessarily adopt rules that go beyond the traditional form and make the *tontine* an institution of distinctive type. There also is “*inter-penetration between the two systems in the interaction of savers’ tontines with the official banking system, where there is a dialectic between informality and regulation*”. Thus a bank, in granting a loan to a member of a *tontine*, will sometimes ask for security from the other members as a whole. In Bwamanda a number of mutual aid associations have also adopted regulations which are then enshrined in written texts.

Table 11: Characteristics of ‘alliance’ and ‘contract’ logic

	<i>Mutual aid</i> (‘alliance’)	<i>Mutuelle</i> (‘contract’)
Origin	Endogenous	Exogenous
Predominant logic	Social	Technical
Values underlying the system	Reciprocity and exchange between members of social groups with similar social identity	Insurance and ‘universal’ solidarity (not chosen) between individuals regarded as having equal rights
Subscription basis	Voluntary/compulsory	Voluntary
Scale	Small	Large
Coverage of risks	Comprehensive: happiness and misfortune	Selective: only illness (hospitalisation) is covered
Nature of relationships between the actors involved	Privileged social links with personalised help (amounting to <i>alliance</i>)	Help is anonymous, strictly regulated and identical for all
Main actor in the management process	By the social group concerned	By the health services

Technical effectiveness	Non-priority	Of prime importance
Nature of exclusion	Deliberate, on basis of social norms of group	Anonymous on economic/financial criteria
Method of operation	Flexibility and heterogeneity between different systems	Rigorous management
Level of appropriation of the system by population	High	Limited

INTERACTION BETWEEN THE INSURANCE SCHEME AND MUTUAL AID SCHEMES

The establishment of health insurance schemes in Europe had its origins in the mutual aid associations which existed towards the end of the 19th century (Rushing 1986; de Swaan 1988). These structures were not confined to health but covered a whole series of risks, of which health care was by no means the most important. The associations were later incorporated into state-run programs. When they did not exist their formation was encouraged. Similarly, the first British national health insurance scheme of 1911 was based on existing mutual aid associations ("*friendly societies*"), which were integrated into the national system. At the same time this transformation into national programs led to qualitative changes in the social relationships previously characteristic of these associations. The relationships became more formal, taking on the character of contractual obligations. Increasingly the contributions were viewed as a premium to be paid to an anonymous institution rather than a conscious and voluntary contribution to a common project. The gain in effectiveness was accompanied by a loss in the quality of the relationships between the actors involved.

The Bwamanda hospital insurance scheme did not graft on the endogenous local dynamic of mutual aid. This view differs from the one suggested by other researchers who studied the Bwamanda insurance system (Thsinko *et al.* 1995). The Bwamanda scheme was indeed, from the very start, implemented on a large scale (i.e. the entire district). Its conception and design were guided by the health professional's (legitimate) technical concerns and were not based on a preliminary inquiry into the modalities of operation of existing traditional mutual aid systems. This, obviously, does not exclude the possibility that the population gradually appropriates various elements of the *mutuelle*. The two systems coexist and influence each other reciprocally. The notion of alliance, characteristic of the mutual aid logic, influences the population's perceptions of the insurance. Conversely, the

logic of mutual aid has adapted to the transformations of society. In many respects they too have integrated elements of the organisational logic of the contract (subscription in money terms, identical for all, even though it is negotiated in advance; adoption of regulations for the running of the scheme; prosecution for misappropriation of funds, etc.).

In Bwamanda the insurance scheme has introduced a new and important element into the logic of mutual aid: a number of mutual aid schemes only accept subscribers to the insurance as members. The costs of hospital treatment for a non-subscriber to the insurance are perceived as too high a risk for the financial viability of the endogenous system. This influence of one logic on the other, however, seems unidirectional: the method of operation of the insurance has not been influenced in the course of its brief history by any features of the much older logic of mutual aid—which implicitly is a cause for criticism.

THE INSURANCE AND SOCIAL INEQUALITIES

To what extent has the Bwamanda insurance scheme—which works well and is well managed and effective—aggravated social inequalities? Mutual aid schemes also imply exclusion, but based on social or moral grounds rather than on ability to pay. Exclusion from the insurance, on the other hand, is voluntary: no one is excluded on the basis of social characteristics or moral image. The Bwamanda insurance was founded on a view of a well-knit and homogeneous society—a conception that has turned out to be inexact. Economic disparities presently are, or are becoming, greater than was thought; though the results of socio-economic surveys carried out in Bwamanda in 1988 and 1990 (Moens 1990; Thsinko 1992) showed few differences between subscribers and non-subscribers.

In general, non-subscribers fall into two groups: the rich who are able to meet the cost of hospitalisation and the very poor who cannot pay either the insurance or the mutual aid fund. The present social fabric is not always or everywhere as solid as the health service thinks. Thus the elderly women who took part in the Botuzu focus group are both economically and socially excluded from community life and have apparently become genuinely destitute: the lack of economic resources is accompanied by exclusion from social relationships. As a (young) health centre nurse said: *“Is it still worthwhile helping old women? Isn’t it just throwing money away?”* There is a real danger, within the informal networks of solidarity found in most developing countries, that a situation develops in which the young abandon the old—that is apparently more likely than one in which old people neglect their obligations in terms of mutual aid for the young (Fafchamps 1992).

Thus, the very poor (and the very old) sometimes fall through the meshes of the local safety nets formed by traditional or endogenous mutual aid associations. The hospital insurance scheme has not eliminated this gulf between rich and poor.

4. *The Masisi health insurance scheme*

Introduction

In the Democratic Republic of Congo (former Zaire), the choice made by the government in favour of a decentralised and integrated approach of health care provision – as defined in Alma Ata – coincided with a severe socio-economic crisis. The effects of this crisis were, among others, dramatic cuts in national health expenditure, as well as in other social sectors. In Zaire, national expenditure for health care dropped from U.S.\$3 per inhabitant per year in 1978 to less than U.S.\$1 in 1988. At the same time, the purchasing power of the population steadily decreased; average income per inhabitant per year was only U.S.\$150 in 1988: it had been U.S.\$210 ten years earlier.

Nevertheless, in 1987, almost ten years after Alma Ata, basic health services actually functioned on part of Congo's huge territory. To a large extent this was made possible by investments made by international and bilateral aid organisations. This situation explains the uneven distribution of primary health care services throughout the country, as well as the difficulties these services encountered to cover their operating costs with government funding alone. This is one of the reasons why there was considerable latitude, at district level, for experimenting with innovative cost-recovery schemes. As the resources of the community are limited, it was crucial to choose methods of payment for health care which preserve an acceptable accessibility to these services, but which respond to the real needs of the community and which enable these services to cover their expenses.

It is in this context that in 1987, the district authorities of the Masisi district wanted to test the feasibility of a health insurance system*. They thought that such a system could be a solution to the huge problems in covering the operating expenses of the Masisi referral hospital.

Masisi health District

The Masisi Health District is situated in eastern Congo in the mountainous Kivu region (altitude ranging from 1,000 up to 2,000 meters). It has been operational since 1984 and counts a rural population of approximately 215,000 inhabitants on a territory of 3,500 km². By the end of 1990, only

* This chapter is based on the paper *A prepayment scheme for hospital care in the Masisi District in Zaire: a critical evaluation* (Noterman *et al.*, 1995).

87,600 inhabitants in the district had a reasonable access to basic health facilities offering comprehensive care. Services were provided through a network of ten health centres and one referral hospital of ninety beds. On the whole, among the population covered by the health service (i.e. 87,600 people), 80% lived within a range of 10 km from a health centre; the distance to the referral hospital was 50 km at the most. Populations not covered by health centre lived at up to 80 km from the hospital.

Access is not easy. Transport and communications infrastructures are poorly developed; health centres and hospital can only be reached walking. Almost half of the patients admitted in the hospital live within a range of ten kilometres around the hospital, while this range represents only 16% of the population having access to integrated care, and only 7% of the entire district population. The coverage of antenatal clinics and under-fives clinics, in 1989, was 63% and 50% respectively and the utilisation rate of the outpatient clinics was 0.22 new episodes/inhabitant/year. These data pertain to the 87,600 people with a reasonable access to a health centre.

The majority of the first line health services manage to recover their operating expenses through a system of fee-for-service payment for outpatients clinics, and a payment per episode of risk for preventive clinics (antenatal care and under-fives clinics).

The payment for hospital care was completely dissociated from the one at health centre level. At the referral hospital, there was a fee scale listing the charges for any medical act performed, or any treatment given, or drug prescribed. Inflation – at a level of 100% at the end of the eighties, ten times higher in 1991 – and the dramatic and increasing insufficiency of government funding made regular upgrading of these fees inevitable. This increase in fees was necessary not only to cover operating expenses (drug purchases, fuel, maintenance products etc.), but also to cover part of the fixed costs (wages of staff, depreciation costs etc.) that were supposed to be covered by national funding. In 1990, the intervention of the government was limited to financing (only) one third of the staff's salaries, which were grossly insufficient. In 1990, a medical doctor and an unskilled worker would receive the equivalent of U.S.\$60 and U.S.\$11 per month respectively.

This is one of the reasons why medical doctors working in government institutions were allowed by the Zairian Ministry of Health to keep part of the hospital revenue. The lack of funds at hospital level, together with the derisory wages, were an incentive for medical staff in many districts of the country to deliver, preferentially, profit-making activities. The problem of the very poor wages was perhaps partially solved, but it may have contrib-

uted to a lack of relevance and efficiency of the care dispensed. For example, more technical examinations could have been ordered in situations where the result of the investigation did not influence the therapeutic decision (e.g. an X-ray for a sputum-positive tuberculosis patient). In Masisi, this phenomenon was considered to be of only marginal importance even if there are no hard data to support this subjective impression. Indeed, the range of diagnostic and therapeutic choices in the Masisi hospital was relatively narrow. Also, the cost of the drugs prescribed to admitted patients was not included in the calculation of the doctor's fee (laboratory examinations on the other hand were included). Finally, a regular audit among the Masisi hospital doctors (one expatriate and one Zairian doctor) allowed for discussion of outliers in diagnostic and therapeutic behaviour.

Hospital occupation nevertheless remained more or less stable (a bed-occupancy rate of approximately 40%). However, the proportion of households experiencing difficulties in paying the fees increased. Families often had to sell their personal assets. Facing a situation where the financial balance of both hospital and household budgets was permanently threatened, the district executive considered an experiment with a paying system based on the principle of risk-sharing—an insurance scheme covering all costs of a hospital admission.

IMPLEMENTATION OF A HEALTH CARE INSURANCE SYSTEM

The idea was to propose people to join, on a voluntary basis, an insurance scheme that would guarantee all (direct) hospital admission costs to be covered. In order to test the feasibility of such a scheme, a first attempt was to be launched within the community living in the responsibility area of the (urban) health centre of Masisi town (population of approximately 12,000 inhabitants in an area of about 200 square kilometres). The referral hospital is located in Masisi town itself. The community was informed through its health committee about the initiative, and practical proceedings were discussed. The health committee members expressed their interest and curiosity for such an innovative payment scheme. Three parameters were considered when calculating the subscription fee: first, the average fee charged in case of hospital admission; second, an assessment of the risk of this event to occur; and third, the costs to run the scheme (administrative costs). Within the same area (i.e. the Masisi responsibility area) the subscription fee or premium did not vary according to health risk or occupation, i.e. a community rating system. The calculations were done using data for the year 1986:

Risk = number of admissions per year/population = 562/12,261 = 46‰.

Subscription fee = risk * average fee charged for an admission
= 46‰ * U.S.\$18
= U.S.\$0.83 per individual.

Eventually, this amount was set at U.S.\$1 per individual in order to cover the expenses of running the program. The entire target population was then informed, after agreement of the local authorities (administrative and traditional ones) on the subscription procedures. The latter were to be carried out by health committee members as well as by village health workers. The period of subscription was limited to one month (April 1987). Two district employees supervised the operation. The program was to cover the subscribers from April 1987 until April 1988 (i.e. a period of 13 months). There was no agreement that the government would cover the cost of an over-run of the prepayment scheme. An over-run, if any, would be covered initially by the Masisi district pharmacy itself and subsequently recovered through an increase of the drug prices for all the district health facilities with, ultimately, an increase of drug prices for the users.

In this first experiment, 846 individuals out of 12,629 joined the scheme (6.7%). The collected funds were managed by the district authorities, which decided to purchase drugs with these funds so as to offset the effects of inflation. These drugs were then introduced in the existing cycle of drug orders and supplies in the Masisi district. The hospital, on a monthly basis, calculated the amount due for in-patients who had joined the program and subsequently invoiced it to the district pharmacy. In May 1988 (i.e. after 13 months of functioning), the utilisation of the referral hospital by the subscribers to the scheme was analysed. It appeared that 144 individuals (out of the 846 who joined the scheme) had been admitted in the hospital's inpatient department; this corresponds to an annual hospital admission rate of 157‰, whereas it was only 46‰ in the absence of the program (a 3.4 increase). The experiment resulted in a financial deficit (Table 12). The cost of this over-run was picked-up by the district pharmacy.

The district executive attempted to draw the necessary lessons from this first experiment, and tried to assess which elements contributed to such a high admission rate. The conclusions were the following. An individual subscription is too selective, and a subscription for the entire household would be more appropriate. The most suitable period of subscription would be August or September rather than April, because the selling of crops (and consequently the availability of cash money) mainly occurs during these months.

A second experiment was then launched in the same community from

September 1988 till August 1989. The number of subscribers then increased to 3,531 individuals (878 households), i.e. 26.8% of the target population. The hospital admission rate of the subscribers was 93‰, which still is twice the one before insurance but far less than the one observed in the first experiment. Again the scheme's financial balance was negative.

Table 12: Income and expenditure of the insurance scheme (in 1988 U.S.\$).

	1987-88	1988-89
Income	846	3,531
Expenditure:		
Administration costs (10% of revenue)	85	353
Reimbursement to hospital	1,971	5,187
Balance	- 1,210	- 2,009

At the same time of this second test, a similar experience was launched in a community living within the responsibility area of a health centre located at 22 kilometres from the hospital. The hospital admission rate for that community was 4‰ in 1987; notwithstanding the lower risk, the same subscription fee was charged (i.e. U.S.\$1, whereas it should normally have been less if the formula was to be applied). Only 384 individuals out of 10,627 joined the scheme (95 households out of 2,170); i.e. only 3.6% of the target population. The annual hospital admission rate for the subscribers increased nearly ten times, to 36‰.

In 1990, the Masisi district authorities decided not to continue the program because of the very critical political and economical situation at that time, despite the fact that the Masisi population had expressed its wish for the program to be continued.

The following general comments can be made regarding these successive experiments. The assessment of the probability (the risk) of hospital admission was not appropriate. Indeed, it did not take into account the fact that the hospital admission rates were very likely to increase. The program was far less attractive to more remote communities, perhaps because other costs incurred in the event of an admission, except for the hospital fee, remained unchanged.

From these considerations, two questions arose:

First, what determinants lead to the occurrence of such high admission rates among people who joined the prepayment scheme?

Second, what was the real impact of the program on admission rates as a function of the distance between hospital and place of residence of individual households?

In order to answer these questions, the two experiments that took place

within the community of the Masisi health centre will be analysed in more detail. The experiment in the more remote community will not be considered, since only a minority participated in the program.

Hospital admissions under the Masisi insurance scheme

The variations in hospital admission rates of the Masisi health centre community can be studied retrospectively for the period from January 1987 until August 1990. Within this time-span, different payment systems alternated in Masisi. The successive periods cover a total period of three years and eight months that can be subdivided as follows: January 1987-March 1987: period prior to the first insurance experiment (3 months); April 1987-April 1988: first insurance experiment (13 months); May 1988-August 1988: period prior to the second insurance experiment (4 months); September 1988-August 1989: second insurance experiment (12 months); September 1989-August 1990: period after the second insurance experiment (12 months).

In addition to the data relating to the population living within the area of responsibility of the Masisi Health Centre, data concerning the population of three relatively well-functioning health centres can be compared over the same time-span (health centres of Loashi, Lushebere and Kibabi respectively). These populations, which did not have the opportunity to subscribe to an insurance scheme, can serve as control health centre areas. Table 13 shows the utilisation of the inpatient hospital services in the various areas over the 5 periods.

It is difficult to interpret these rates because the periods considered are of unequal length. Hence, seasonal variations in hospital utilisation may have contributed to the (relatively small) variations observed. In the case of Masisi health centre, the numerators and denominators of the monthly admission rates in period 2 and 4 are the combined insured and non-insured populations. It is therefore difficult to attribute the slight increase observed in the admission rates of period 2 and 4 to the effect of the insurance scheme. For that purpose, a separate calculation of admission rates of insured and non-insured sub-populations is more appropriate.

The data presented in Table 14 and Table 15 show that the hospital admission rates in the insured population are much higher than in the non-insured. During the first experiment in 87-88, the hospital admission rate reached a peak of 254% for the population living in a range of less than 2 kilometer from the hospital. During the second experiment, the hospital admission rates amongst the subscribers are lower than in the first experiment, but still much higher than the rate used for the risk assessment. This relative decrease is very probably due to the higher subscription rate to the

1988-89 experiment. A decrease in hospital admission rates when distance increases is observed in both experiments, whether subscribers or non-subscribers are concerned. It is nevertheless interesting to notice that this gradient is less strong amongst the subscribers.

Table 13: admission rates ‰ per month (N=total number for period) under five consecutive payment arrangements

Health centres	No insurance 3 months	Insurance 13 months ^a	No insurance 4 months	Insurance 12 months ^a	No insurance 12 months
Masisi					
0-2 km	4.4 (36)	5.8 (208)	5.4 (59)	7 (231)	6.6 (217)
3-5 km	2.6 (40)	3.7 (251)	3.7 (76)	3.7 (232)	3.2 (201)
6-10 km	1.2 (17)	1.3 (82)	1.4 (27)	1.8 (103)	1.2 (68)
total Masisi	2.5 (93)	3.3 (541)	3.2 (162)	3.7 (566)	3.2 (486)
Loashi (8-16 km)	0.8 (25)	0.54 (74)	0.86 (36)	0.8 (100)	0.7 (89)
Lushebere (8-18 km)	0.5 (22)	0.34 (67)	0.45 (27)	0.43 (78)	0.47 (85)
Kibabi (29-38 km)	0.15 (8)	0.17 (39)	0.11 (8)	0.19 (42)	0.21 (46)

^a including both insured and non-insured admissions.

Table 14: Admission rates per year, distance and subscription status in 1987-88 (period 2)

	Population			Admissions (‰)		
	Insured	Non-insured	Total	Insured	Non-insured	Total
Masisi						
HC	182	2,569	2,751	50 (254‰)	158 (56‰)	208 (70‰)
0-2 km	437	4,749	5,186	73 (154‰)	178 (35‰)	251 (45‰)
3-5 km	227	4,465	4,692	21 (85‰)	61 (13‰)	82 (16‰)
6-10 km	846	11,783	12,629	144 (157‰)	397 (31‰)	541 (39.5‰)
Total						
Loashi (8-16km)			10,499			79 (7‰)
Lushebere (8-18km)			15,073			67 (4‰)
Kibabi (29-38km)			18,046			39 (2‰)

Table 15: Admission rates, distance and subscription status in 1988-89
(period 4)

	Population			Admissions (‰)		
	Insured	Non-insured	Total	Insured	Non-insured	Total
Masisi						
HC	814	2,064	2,878	117	114 (55‰)	231 (80‰)
0-2 km	1,745	3,668	5,413	(144‰)	78 (21‰)	232 (42‰)
3-5 km	972	3,911	4,883	154 (88‰)	44 (11‰)	103 (21‰)
6-10 km	3,531	9,643	13,174	59 (61‰)	236 (24‰)	566 (43‰)
Total				330 (93‰)		
Loashi (8-16 km)			10,814			100 (9‰)
Lushebere (8-18 km)			15,718			78 (5‰)
Kibabi (29-38 km)			18,772			42 (2‰)

The very high hospital utilisation amongst the subscribers is one of the causes that jeopardised the financial sustainability of the program. There are two possible – and not mutually exclusive – explanations for this phenomenon. First, the subscribers used the hospital for care that could have been provided at the level of the health centre or at the level of the family itself (i.e. a phenomenon of moral hazard). The lower levels of the system (with a fee for service payment at the health centre level) were bypassed in favour of a free of charge hospital admission. And second, the program has selected a population of high-risk individuals through a mechanism of adverse selection.

Unfortunately, no information is available concerning the extent to which hospital admissions were justified or not. It is therefore not possible to confirm or reject the hypothesis whether this high hospital utilisation among the subscribers is due to non-useful hospital use. However, the data available allow to assess whether the second explanation, related to the phenomenon of adverse selection, played an important role in this process of increased hospital use among the subscribers. For that purpose, the following analysis is proposed.

Within the set of health problems necessitating a hospital admission, a classification is made according the *predictability* level of the risk of admission. The perception of this predictability will influence people's decision to join or not to join an insurance scheme. Obviously, this perception is not a

uniform one and is strongly related to the local environment and to prevailing value judgments and priorities. Problems with a high predictability of risk of hospital admission – qualified here as predictable risk conditions – include chronic conditions like diabetes, leprosy, cardiac disease, etc., or health problems related to pregnancy. Problems with a low predictability for admission – qualified as unpredictable risk conditions – are more acute problems like for instance acute respiratory infections or diarrhoeal diseases.

Our null hypothesis can be formulated as follows: the increase in hospital utilisation in the insured population is attributable equally to predictable and to unpredictable risk conditions. In the present analysis, hospital deliveries were withheld as indicator of predictable risk conditions. On the other hand, a set of health problems were grouped and considered as indicators of unpredictable risk conditions: this group contained traumatic problems, malaria, acute lower respiratory tract infections, acute digestive tract infections, any other acute infections as well as all fevers of unknown origin.

In the period 1987-88, when only 6.7% of the target population joined the insurance scheme, the hospital admission rate for deliveries was almost 7 times higher in the insured population than in the non-insured population. This ratio was only 2.7 for unpredictable risk conditions. In the period 1988-89, when 26.8% of the target population joined the program, the ratios were 4.6 and 3.3 respectively (Table 16 and Figure 17).

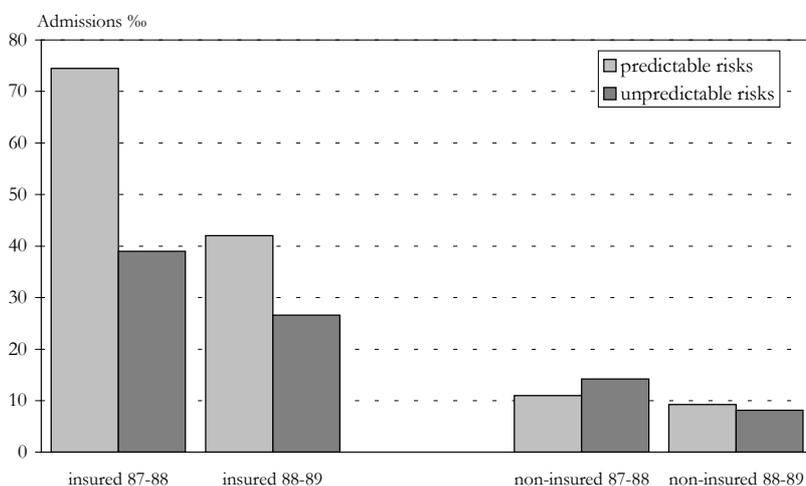
Table 16: Admission rates for predictable (hospital deliveries) and unpredictable risks

	Predictable risks (N)		Unpredictable risks (N)
		<i>period 1987-88</i>	
Insured population	74.5‰ (63)		39‰ (33)
Non-insured population	11‰ (129)		14.2‰ (167)
		<i>period 1988-89</i>	
Insured population	42‰ (149)		26.6‰ (94)
Non-insured population	9.2‰ (89)		8.1‰ (79)

The proportion of hospital deliveries in the insured population was 7.4% in the 1987-88 period (63/846), and decreased to 4.2% in the 1988-89 period (149/3531). The difference is highly significant ($\chi^2 = 15.4$, $P <$

0.001). In the insured population, during the first experiment, 69‰ hospital deliveries per year took place; only 10‰ per year in the non-insured population. The birth rate in the Kivu region is approximately 54‰. It seems that the first experiment selected women in their reproductive age, unless the Masisi township population would have a substantially higher than average proportion of women in that age group. This is very unlikely, even if there is no solid evidence to rule it out. In the second experiment, 42 hospital deliveries per year and per thousand subscribers took place (which approaches the average Kivu birth rate figure), and 9.2 per thousand among the non-subscribers.

Figure 17: Comparison of the admission rates in insured and non-insured populations for predictable and unpredictable risks in the two periods 1987-88 and 1988-89.

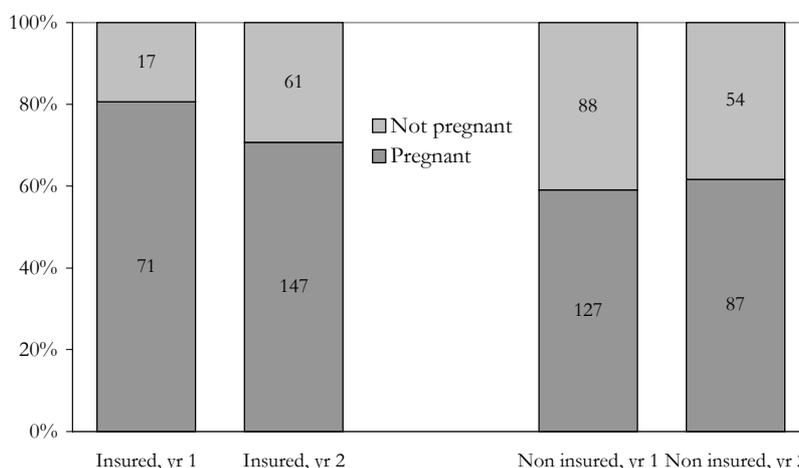


Upon these findings, the null hypothesis can be rejected. A phenomenon of selection of women in their reproductive age is very likely in the first experiment. At that time, subscriptions took place on an individual basis that indeed is an incentive for adverse selection to occur. During the second experiment, the subscription rate to the program substantially increased, but, more important is the fact that the subscriptions took place on a household basis and not on an individual basis. In addition, a short waiting period of one month was introduced in 1988-89: people who subscribed to

the scheme in the course of August (the period of enrolment) were only covered by the program from September onwards. A subscription on household basis excludes the occurrence of *intra-household* adverse selection*.

ADVERSE SELECTION OF PREGNANT WOMEN. The preferential selection of pregnant women in the first year is confirmed by the analysis of the proportion of pregnancy-related health problems among the female admissions in the 15-40 years age group (Figure 18). In 1987-88, 71/88 admissions (81%) took place for pregnancy-related problems in the insured population; this proportion was 71% (147/208) in 1988-89. The difference is very close to significance ($\chi^2=3.2$, $P=0.07$). In the non-insured populations of both years, these two proportions are similar: 59% in 1987-88, and 61% in 1988-89 ($\chi^2=0.25$, $P=0.6$).

Figure 18: Proportions of pregnancy-related problems among female admissions aged 14-40 years



Adverse selection contributed to the high hospital utilisation in the first period of women in their reproductive age. In the second period, the majority of insured women due to deliver in the period September 1988-August 1989 did so in the hospital maternity. But adverse selection was

* It does, however, not entirely exclude an *inter-household* one: for instance, a preferential selection of households with *several* women at reproductive age, versus lower selection of households with *less* or *no* women in that age group.

then reduced because of a different insurance design. Hence, the high hospital utilisation of women in this period is either the result of a better coverage of needs or the expression of moral hazard.

It is, *a priori*, not to be expected that all these deliveries really needed to take place in a hospital environment. In the absence of an insurance scheme covering hospital admissions costs (i.e. the case of non-insured), one woman out of five due to deliver did so in the hospital maternity. In the presence of such a scheme almost all of them did.

There is a final argument supporting the hypothesis of preferential selection of women in reproductive age. In the enrolment period, the perception of the risk of a hospital admission is more important for women pregnant *at that very time* than for women who are not. Women who will deliver within the next few months obviously are more willing to purchase insurance.

This hypothesis is confirmed by the analysis of the monthly hospital admission rates (all admissions confounded) for the two insurance years (Figure 19). In the first year*, the monthly hospital admission rates among insured are much higher in the first five months (April-August 1987) than in the remaining seven months (September 1987-March 1988)†. This phenomenon is much more pronounced in the first year – with a design favouring adverse selection – than in the second year. The monthly admission rates for the non-insured remain relatively constant in both years. But when admissions for pregnancy related problems are excluded, this initial peak in hospital admission rates almost disappears (Figure 20).

Adverse selection and moral hazard

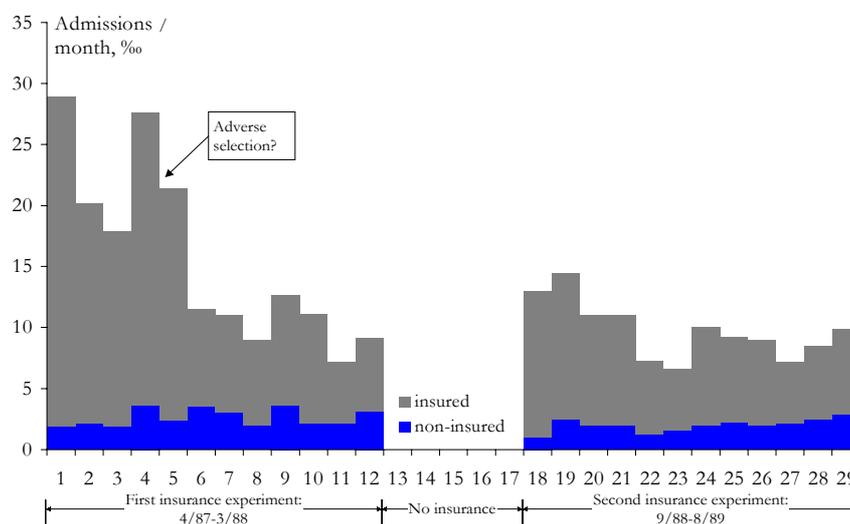
Two methods for the identification of adverse selection were developed in this analysis: the measurement of hospital utilisation for predictable and unpredictable health problems and the calculation of monthly admission rates. Masisi clearly illustrates the need for a sound design. Adverse selection decreased in the second experience when individual subscription was

* For the first year, the twelve monthly admission rates cover the period April 1987-March 1988. The admission rate for the month of April 1988 (the last month of the 13-month health insurance in 1987-88 was not considered here).

† This gradual decrease over time in hospital admissions for the insured triggered the attention of the District Health Team to the possibility of adverse selection. The monitoring of this evolution may be a detector device of the occurrence of adverse selection.

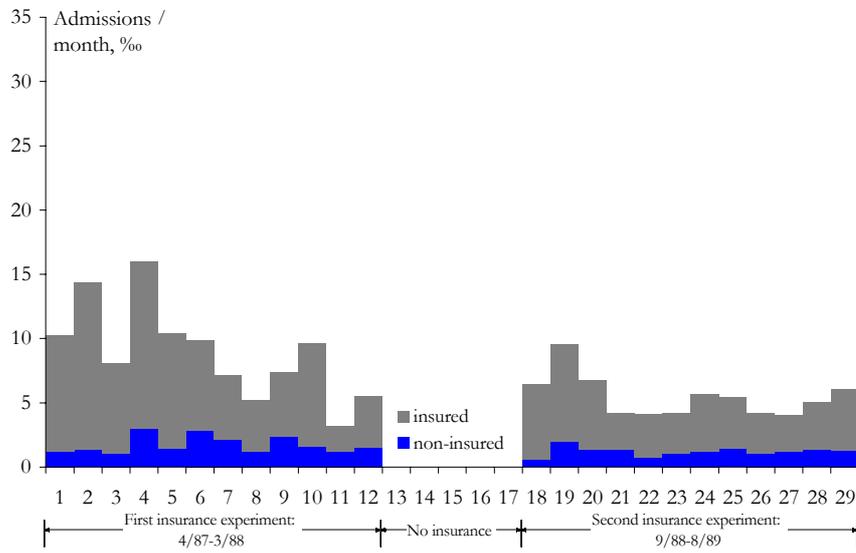
changed to household subscription and when the insured were only entitled to free hospital care once the enrolment period expired.

Figure 19: Monthly admission rates (all admissions)



Adverse selection is a problem in terms of financial sustainability of the insurance. It jeopardises the financial basis of the insurance scheme because the risk and premium calculations, in the event of community rating, are underestimated. Moral hazard, however, is a problem both from a financial and a public health perspective. Its identification requires a different, more complex, investigation. An approach where the *nature* and the *severity* of the health problems for which people use the hospital are measured is then appropriate. This was done in Bwamanda through the distinction between priority and non-priority hospital care. In Masisi, the issue of moral hazard remains uncertain.

Figure 20: Monthly admission rates (excluding pregnancy-related problems)



5. The Murunda hospital insurance scheme

Health services in Murunda

The *Mutualité du Kanage** is a health care insurance scheme that was established in 1988 to cover primary and referral level health care provided by Murunda Hospital, Rwanda. Murunda is a parish in western Rwanda, lying on the border between the prefectures of Kibuye and Gisenyi, in a region traditionally known as Kanage. Rwanda ranks among the poorest countries in the world, with a GNP per head of U.S.\$320 (Shepard *et al.* 1993).

In 1968, the population built a health centre on the initiative of an expatriate nurse. The hospitals nearest to Murunda (at Kibuye and Gisenyi) were around 60km away—a journey by car of between 4 and 5 hours on tracks of very poor quality. A dynamic developed that led to the creation of an integrated development co-operative in the mid-seventies. Its objectives were to create employment in the region in fields other than agriculture and, to contribute to the financing of the health centre. Almost all of the inhabitants of the five administrative areas around the hospital were involved in the co-operative. It was run by the nurse in charge of the health centre with the help of a local management committee of people working in the area.

In 1984 the Ministry of Health and the diocesan authorities asked the co-operative to support the building of a hospital financed with funds from abroad. The inhabitants contributed to the project by preparing the foundations and supplying bricks.

DISPENSARIES AND HEALTH CENTRES

By 1993 there were 2 dispensaries and 6 health centres in the hospital catchment area: although not officially delimited this stood for some 162,000 inhabitants. Each of these primary-level structures was responsible for a clearly defined health area, rarely extending beyond a radius of 5 km.

The package of activities available in the dispensaries included curative consultations and vaccination for under fives. The health centres also ran well baby clinics, antenatal clinics, a nutritional rehabilitation programme, and had a few beds. The institutional identity (government or non-government), the method of financing and the degree of self-financing, the availability of essential drugs, the quality of care provided, and the quality

* This chapter is based on the paper *La Mutualité du Kanage: leçons à tirer d'un échec* (Roenen and Criel, 1997).

of the communication between the health service and the population varied considerably across the different units. The training of health service staff in Rwanda stresses technical skills. The will and the ability to *listen*, so necessary if the health worker is to assume total responsibility for the care of the patient, was the exception rather than the rule. There was no systematic analysis of referrals from the health centres to the hospital, and no way to identify the history of treatment of patients admitted to hospital. Procedures for diagnosis and treatment, were not standardised.

There was no formal co-ordination between the various health structures in the area. The authorities organising the services were different, and each had its own system of financing. The health centres and the hospital were supervised at irregular intervals by the regional health authority. The health centres sent periodic reports on their work only to the regional authority, which did not pass the information on to the hospital. Although there were good informal contacts between the health centres and the hospital, there was no organised system of referral and counter-referral, nor supervision of the health centres by the hospital.

THE SECOND LEVEL OF THE HEALTH CARE SYSTEM: THE MURUNDA HOSPITAL

The legal authority for the Murunda hospital rested with the diocesan authorities, though they took no part in the management or the financing of the hospital. The chief medical officer of the public health region (i.e. the provincial level in the Rwandan health care system) of Kibuye did not regard the Murunda hospital as falling within his authority. He supervised it only to a limited extent and at long intervals.

The day-to-day management of the hospital was in the hands of its medical director, who was appointed by the Ministry of Health with the agreement of the diocesan authorities. The officers responsible for running the hospital thus had a relatively free hand in its management. Between 1992 and 1994, there was only one doctor working in the hospital, which meant that he had difficulty in providing full-time coverage. Other staff included 4 medical assistants and 23 auxiliaries. Staff turnover was high: in a period of 5 years, there were 4 different doctors in charge of the Murunda hospital. Combined with the high degree of management independence, this made it difficult to maintain continuity in the running of services.

The hospital had most of the functions appropriate to a second-level structure: referral consultations, 82 beds, an operating theatre, a laboratory, a radiology department, a pharmacy, and administrative and accounting services. Access to referral consultations was limited to patients referred by

primary-level services. In 1993, the hospital's occupancy rate for all departments was 43%. No structured evaluation of the quality of hospital care is available.

The hospital was not adequately performing its role as a referral unit for the area. The limited availability of the doctor and his limited experience in surgery raised a question as to the efficient use of the hospital's technical resources. There were few referral consultations—only 3 or 4 per day. Half of the referred patients, and more than three-quarters of patients admitted to hospital, came from the area close by, where the hospital-'dispensary' was also responsible for primary-level treatment.

The dispensary provided the same package of activities as any peripheral health centre. Although officially intended only for the 25,000 inhabitants of the five administrative districts round the hospital, these services were available to all. The dispensary saw some 0.34 new cases per inhabitant per year in 1993.

Admission to the hospital was decided either by the doctor or by the medical assistant in the hospital dispensary or emergency department. In fact, the separation between primary-level and second-level hospital services was not always very clear, except at the level of consultations with the doctor. Thus all laboratory examinations and the full range of drugs available in the hospital pharmacy could be prescribed at the primary consultation in the dispensary as well as at the referral consultation. There was no clear distinction between primary-level beds (i.e. in the dispensary) and second-level beds (i.e. in the hospital). Patients using the dispensary had direct access to the doctor through their admission to hospital on the decision of the staff responsible for dispensary consultations. There was similar ambiguity in the distribution of the duties of hospital staff: some nurses and/or medical assistants worked both on the primary and on the second level.

Financing of health care

Fees for the various services were fixed by the Hospital Management Team. For drugs and other medical consumables, they were based on the purchase price with a mark-up of 10% to 50%, according to the degree of essentiality. The fees for outpatient consultations (a flat rate covering an episode lasting two weeks), laboratory examinations, treatment in hospital (at so much per day), and other technical services were based on customary practice rather than any real evaluation of costs. They were broadly in line with the fees of other hospitals in the region, but were higher than the rates in government hospitals.

The hospital had two other sources of finance: the State and *ad hoc* gifts from foreign sources.

In exchange for agreeing to participate in national health programmes, the hospital received State subsidies in the form of the wages of some of its staff and an annual allocation of drugs. In 1993, these subsidies represented less than 20% of the hospital's total income. Foreign gifts of drugs, spread over six years (1988-94), were intended to serve as working capital, which would put the hospital in a position to purchase drugs from its own resources. In practice, income from the sale of drugs was used to meet ordinary running costs and the wages of staff not paid by the State.

The Murunda Insurance Scheme

In 1988, the medical officer in charge of the hospital launched the health insurance scheme. It was called *Mutualité du Kanage*. Its main objective was to find a solution to the problem of the hospital's lack of financial resources, while preserving, and indeed improving, financial accessibility of health care at both the primary and the second level of care. The second objective was to pursue the dynamic of participation that initially led to the construction of the hospital. The Rwandan government, then following a policy of structural adjustment, was not able to increase the budgetary allocation for health services, and the health services could not, therefore, look for any increase in state subsidies. Indeed, the Ministry of Health was calling for an increase in the contribution made by the users of health services at all levels of care to the cost of these services. Some strengthening of the mechanisms for the recovery of costs was thus inevitable. There were, however, real problems of accessibility to care. An episode of illness dealt with at health centre level cost the patient the equivalent of four days wages of an unskilled agricultural worker (U.S.\$3), and hospital treatment almost nine (U.S.\$6.60). The introduction of a system of risk sharing, therefore, seemed an appropriate solution.

The *Mutualité du Kanage* functioned from 1988 to 1994. The most detailed information* available is for the years 1992 to 1994. Data on the period before before 1992 is limited and fragmentary, and comes mainly from non-written sources (interviews with staff members of the hospital and/or members of the community).

A number of changes were made in the operation of the scheme in the

* All the statistical data on the functioning of the *Mutualité* and the hospital presented here is taken from the hospital's monthly reports and the *Mutualité's* annual reports.

five years following its introduction. The evolution of these characteristics is summarised in Table 17.

Table 17: Evolution of the Murunda health insurance system

Coverage of risks	1988-91	1991-92	1992-94
Nature of risks covered:			
At primary level of hospital (dispensary)	Curative consultations, drugs and laboratory examinations	Curative consultations, drugs and laboratory examinations	Curative consultations, drugs and laboratory examinations
At second level of hospital	Referral consultations and inpatient treatment	Referral consultations and inpatient treatment	Drugs and 60-80% of fee for medical acts
Co-payments:			
At primary level of hospital (dispensary)	None	None	60 FR per 2-week illness
At second level of hospital	20 FR per night	20 FR per night	20-40% of fee for medical acts
<i>Organisational aspects</i>			
Subscription period	12 mo	5 mo (June-Oct.)	3 mo (June-Aug)
Unit of subscription	Household	Household	Household
Premium per household	700 FR	1000 FR	1010 FR
Waiting period:			
At primary level of hospital (dispensary)	None	1 week	1 week
At referral level of hospital	None	1 month	1 month
<i>Administrative & managerial aspects</i>			
Structure	Direct insurance	Indirect insurance	Indirect insurance
Management	Hospital	Appointed management committee	Elected management committee
Financial control	None	None	Auditors

SOURCE: annual reports of Murunda hospital. NOTE: the exchange rate of the Rwandan franc (FR) for U.S.\$1 averaged 76 francs in 1988, 80 in 1989, 83 in 1990, 130 in 1991, 133 in 1992, 144 in 1993 and 220 in 1994.

Although it is not known precisely what the hospital authorities had in mind, it is probable that the changes introduced in 1991 were motivated by

the hospital's increasing difficulties in paying the wages of its staff. The further changes in 1992 are better documented. They were introduced after a general meeting with the members of the *Mutualité*, on the following grounds:

- * A financial analysis of the system had shown that members' subscriptions were not covering expenditures;

- * The management committee of the *Mutualité* wanted better control of the management of funds and the use of drugs within the hospital;

- * An independent accountant (engaged to carry out an annual audit of the finances of the hospital and the *Mutualité*) had recommended a system of records and health care cards. This was to facilitate control on the use of services by members, on the registering of inscriptions by the staff of the *Mutualité*, and on the patient's membership of the *Mutualité*.

In 1993, the *Mutualité* operated on a non-profit basis, without legal status. It was managed by a management committee of 45 members (including 10 women), elected by the members of the *Mutualité*. One out of three members was teacher, the other two-thirds were influential peasants and small shopkeepers. Practically all the members of the committee came from the area served by the hospital dispensary. The officers of the committee negotiated the fees for treatment in the hospital with the hospital management. Every month, the audit staff checked the bills sent by the hospital to the *Mutualité*. The collaboration between the hospital and the *Mutualité* was given formal expression in an agreement signed at the beginning of the financial year. For the day-to-day administration of the scheme, the *Mutualité* employed one full-time officer who collected members' contributions, registered members during the inscription period, and recorded the use of hospital services by members with a system of record cards and health care vouchers.

The contributions collected were paid into an account with a local bank. The interest paid by the bank certainly did not compensate for the rate of inflation (about 15%), even without taking into account the recurring devaluation. In 1993, the annual pay of the employee engaged in this work was FR96,000 (U.S.\$667). Officially the *Mutualité* paid this salary; but in practice, because of the *Mutualité's* financial difficulties, it was paid by the hospital. The cost of record cards and membership cards was around U.S.\$420. Administrative costs thus amounted to around U.S.\$1,100: 12% of total receipts. In fact, this figure of administrative cost is an underestimate, since no charge was made for the use of some of the hospital accommodation.

Throughout its existence the Murunda health insurance system has al-

ways limited the benefit package to *curative* care offered at the Murunda hospital, either at the level of the hospital dispensary or at the second level (referral consultations, inpatient hospital treatment). The *Mutualité* did not cover care provided at the peripheral network of health centres and dispensaries, nor did it cover transfers from the hospital to other institutions. In 1992-94, for members using the hospital dispensary, the *Mutualité* covered the cost of drugs and laboratory examinations. Patients paid a fee of FR 60 (equivalent to U.S.\$0.45 in 1992, U.S.\$0.42 in 1993, and U.S.\$0.27 in 1994) for each two-week episode of illness. For members admitted to hospital, drugs were free and the *Mutualité* met 60-80% of the fee for medical acts.

Table 18: Membership of the *Mutualité*

	Number of households (HH) registered as members (%)					
	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
5,000 HH in area served by Hospital dispensary	1,204 (24%)	610 (12.2%)	303 (6.1%)	599 (12%)	1,130 (23%)	1,045 (21%)
27,400 HH in rest of Murunda area	784 (2.9%)	645 (2.3%)	701 (2.6%)	154 (0.6%)	374 (1.4%)	296 (1%)
32,400 HH in total Murunda area	1,988 (6.1%)	1,255 (3.9%)	1,004 (3.1%)	753 (2.3%)	1,504 (4.6%)	1,341 (4.1%)

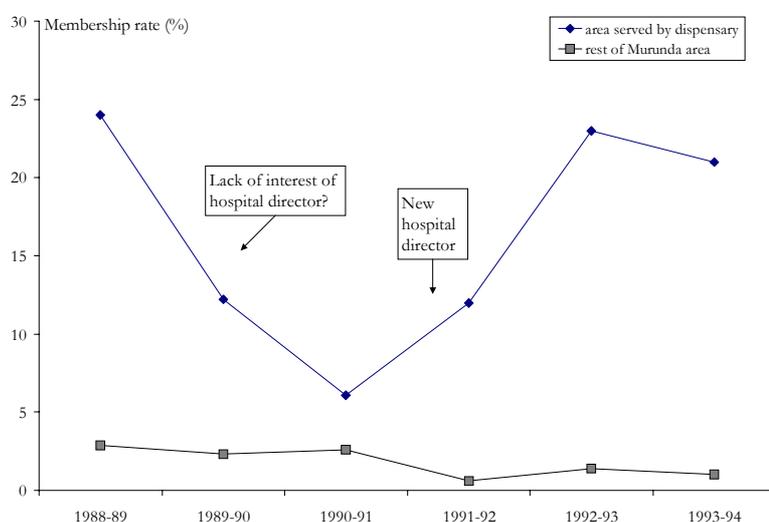
SOURCE: Annual Reports of Murunda Hospital

Membership of the *Mutualité* remained limited (Table 18 and Figure 21). The insurance scheme never covered more than a quarter of the population of the area served by the hospital dispensary, i.e. no more than one fifteenth of the total target population. The geographical distribution of members was very uneven: in 1993, for example, more than three-quarters (1,045 out of 1,341, or 78%) of the total number of members lived in the five administrative districts round the hospital, i.e. the area served by the hospital dispensary. The only explanation given by the hospital staff and the population of the area for the fall in membership between 1989 and 1991 was the lack of interest in the *Mutualité* shown by the previous medical director of the hospital during that period.

From 1992 onwards, the period of subscription was the period from June to August, the time of the coffee harvest. The population was informed of this by word of mouth. There were also campaigns to increase awareness of the scheme, with meetings between members of the management committee and the population of each administrative district. The

unit of enrolment was the household, which paid the same premium no matter how many people were living under the same roof. Admission to the *Mutualité* was open to all, irrespective of race, religion, or place of origin. The annual premium was set at FR1,010 (U.S.\$7.60 in 1992). The premium only entitled the husband, his wife and the children under 18. Single people over 18, as well as widows and widowers, paid a premium of FR510 (U.S.\$3.80 in 1992). For single mothers and their children, the rate was FR710 (U.S.\$5.30). The management committee also agreed that the *Mutualité* should enrol, free of charge, 83 destitute persons from the area served by the hospital dispensary nominated by the committee and approved by the hospital social worker.

Figure 21: Membership of the *Mutualité* (period 1988-94)



Effectiveness, efficiency and equity

A STRUCTURAL DEFICIT. Table 19 and Table 20 present the income and expenditure of the *Mutualité* in the financial years 1992-93 and 1993-94. A striking feature is that in both periods about $\frac{3}{4}$ of total expenditure is on outpatient care, and only $\frac{1}{4}$ on reimbursement of charges for hospital treatment. Total income from premiums covered only part of the expenditure on care for members of the *Mutualité*. The deficit was compensated by

the hospital but doubled between 1992-93 and 1993-94 although membership rates remained roughly identical.

The prime objective of this insurance system was to deal with the hospital's lack of financial resources. The *Mutualité* did not generate additional resources—on the contrary, it cost the hospital money. The hospital actually subsidised the *Mutualité* by clearing its deficit. The financial data available indicate that the deficit kept increasing, and that the dispensary consultations were responsible for most (70-75%) of the expenses.

Table 19: Income and expenditure of the *Mutualité* for the financial year 1992-93 (in U.S.\$, 1993)

	Income	Expenditure			Balance
		6/92- 9/92	10/92-5/93	Total	
Outpatient			6,503 (70.5%)		
Inpatient			2,726 (29.5%)		
Total	9,156	5,560	9,229 (100%)	14,789	- 5,633

SOURCE: annual reports of Murunda Hospital

Table 20: Income and expenditure of the *mutualité* for the financial year 1993-94 (in U.S.\$, 1993)

	Income	Expenditure	Balance
Outpatient		13,919 (75%)	
Inpatient		4,575 (25%)	
Total	8,231	18,575 (100%)	- 10,263

NOTE: extrapolated from data for 8 months (1/7/93 to 28/2/94). SOURCE: annual reports of Murunda Hospital

HEALTH SERVICES UTILISATION. Table 21 shows the curative care utilisation rates in the hospital dispensary and the hospital admission rates in 1993 (unfortunately, no data are available for earlier years). Three quarters of the patients treated in the dispensary, and half of the patients admitted were members of the *Mutualité*. In 1993, members of the *Mutualité* were by far the greatest users of hospital services.

Table 21: Use of hospital services in Murunda
by members and non-members of the Mutualité (year 1993)

	Members	Non-members	Ratio of rates for members / rates for non-members
Utilisation of the dispensary	0.94 new cases per inhabitant per year	0.11 new cases per inhabitant per year	8.5
Hospital admissions	141‰ per year	6‰ per year	23.5

NOTES: the denominators are the sub-populations of members and non-members among the 25,000 inhabitants of the area served by the hospital dispensary and the sub-populations of members and non-members among the 162,000 inhabitants of the area served by the hospital (i.e. the Murunda area). SOURCE: Annual Reports of Murunda Hospital.

The increase in the use of health services by members of the *Mutualité* is clear. In 1993, they used the hospital dispensary 8.5 times more than non-members did. This ratio was 23.5 for inpatient hospital care. It is possible that the sub-population of members was already the greater user *before* the existence of the *Mutualité*. Even if this was the case, it is unlikely that the utilisation differential would have been so strong without the *Mutualité*. This increase in the utilisation of health services can be explained by a combination of the following three factors:

* Justified use of the services by patients who previously faced financial barriers. In such cases, the *Mutualité* succeeded in promoting the accessibility of health care at the appropriate level for those who need it.

* Preferential selection of high-risk individuals (*adverse selection*) is likely, given the low subscription rates and the short waiting period for insurance cover at primary care level (only one week). The extent of adverse selection may have been reduced by the fact that the subscription period was limited in time (at least after 1991). Household-membership (as opposed to individual subscription) probably also contributed to limit adverse selection.

* Unjustified use of services at either the primary or the second level, without any real necessity—an attitude induced by the very fact of being insured and having an easier access to health services (*moral hazard*). The data available do not allow to assess the relative importance of these two phenomena. The data presented in Table 21 indicate that in 1993 the dispensary's utilisation rate was about 1 new case per inhabitant per year. This is a relatively high figure. *A priori*, it does not seem excessively high in the context of a developing country where geographical accessibility of health

services is, on the whole, reasonably good. On the other hand, an annual hospital admission rate of 140‰ indicates over-consumption*. *Moral hazard* can be induced both by patients and by providers. The latter may increase the number of medical acts, particularly the more costly ones, in order to maximise their income—at least in situations where staff income is function of the institution's revenue. In Murunda this was the case to some extent.

* Fraudulent use of the insurance scheme by non-members. This was actually investigated by the independent auditor. A sample of hospital records of members of the *Mutualité* was examined in order to check whether the patients' names appeared in the register of members. No case of abuse was identified. At dispensary level, only one case of abuse was identified in the course of one year. Nevertheless, hospital staff had the impression that members of the *Mutualité* encouraged their neighbours and friends to abuse the system.

EQUITY. The financial results indicate that the *Mutualité* was subsidised by general hospital revenue. Non-members thus contributed to finance health services utilisation by members. To the extent that the poor are more represented in the group of non-insured which was informally confirmed by the hospital staff—they actually subsidise the utilisation by the more wealthy insured population subgroup. This creates a flow of subsidies at odds with equity. The results of the Kongolo health centre insurance scheme in the Kasongo district (eastern Congo) pointed in exactly the same direction (Criel, 1993)

The size of premium was basically regressive. It was not modulated according to income or distance from the hospital, even if the system positively discriminated more disadvantaged population groups such as single mothers. The *Mutualité* attempted to promote social solidarity by exempting the premium payment for some hundred destitute individuals. This number is small, indicating rather restrictive criteria for the identification of destitute.

COMMUNITY PARTICIPATION. A second objective of the health insurance scheme was to capitalise on the dynamic of participation that originally led to the construction of the hospital. The *Mutualité* was not very

* An investigation into the occurrence of moral hazard requires more information on the *nature* of the health problems for which patients use the health services (be it outpatient or inpatient care), and on the *action* taken by the health services in dealing with these problems.

successful in that respect.

The management committee that was created was not really representative of the general population. Almost all of its members lived in the area surrounding Murunda town. The process of dialogue between health services and population was hampered by the high turnover of executive hospital staff. Health centre staff—interacting with the population on a daily basis—was hardly involved in the organisation of the *Mutualité*.

Participation in terms of decision-making was reduced by the limited availability of accurate and relevant information, not only for the management committee but even for the executive hospital staff. The health services position of strength was further increased by the scheme's dependency on hospital subsidies. A real transfer of power did not take place.

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