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COMMUNITY FINANCING OF PRIMARY HEALTH CARE IN THE
REPUBLIC OF ZAIRE.

FINAL REPORT OF A PRICOR OPERATIONS RESEARCH PROJECT

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COMMUNITY FINANCING OF PRIMARY HEALTH CARE IN THE REPUBLIC OF ZAIRE

1. EXECUTIVE SUMMARY

1.1. INTRODUCTION

The operations research study on community financing of primary health care in Zaïre was conducted under a subordinate Agreement with the PRICOR project from October 1983 to March 1986 in ten rural health centers (HC) located in five rural health zones (RHZ) of The Republic of Zaïre. The five RHZ selected for study were ^{part of} the 50 RHZ receiving assistance from SANRU, a large primary health care project co-financed by USAID and the government of Zaire.

The purpose of the study is to provide decision-makers with data on the cost of primary health care services at the health center level and on the effect of alternative payment schemes on the utilization of services by the community. The study address the following objectives:

- to identify alternative payment schemes for PHC in the country
- to identify payment schemes in use at the health center level.
- to establish the effect of alternative payment schemes on the utilization of PHC services.
- to determine the cost of PHC services under different financing schemes.

The government of Zaïre promotes ideas of fee for service and self financing in PHC. At the present time a considerable variety of payment schemes are practiced at the HC level, without an established evidence of the superiority of a given payment payment scheme over others.

1.2. METHODOLOGY

The general operations research approach as recommended by PRICOR is largely followed as the methodological approach.

1.2.1. PROBLEM ANALYSIS:

A group of national PHC experts and decision-makers met several times to determine which portion of the broad national health system has the most significant impact on community health status. They agreed that a

high utilization rate of offered PHC services would improve community health status given that those services are of a good quality. The utilization of PHC services by a given community is influenced by factors such as morbidity patterns, services quality, service cost to consumers, the range of services, community socio-economic status and payment scheme used in the health center.

The relative importance of each of these factors on the utilization rate of PHC services, as well as other possible interactions between pairs of factors, were established by the consensus of investigators, decision-makers and experts, using inter-action matrix technique. Interactions between price and utilization of services, payment scheme and utilization of services, price and quality of service, range of services and economic status were assessed as "strong". Among these "strong" interactions, decision was made to study the interaction between utilization rate and payment scheme, which appeared the easiest to be modified by investigators and decision-makers.

1.2.2. SOLUTION DEVELOPMENT

The objective of the solution is to increase utilization of PHC services at the HC level. In this consideration the objective function appears as follows:

Utilization of service = Function of (Payment scheme, price of service, socio-economic status, health status).

Variables as community economic status, biologic environment and socio-cultural environment, each of which also influences utilization of service are considered as constraints. Payment scheme, price of services, quality of services and range of offered services could be changed. They are considered as decision variables. Among these variables, as said earlier, payment scheme is the more amenable to change at a given level of resources.

1.2.3. SOLUTION VALIDATION

From the various payment schemes in use at the HC level, "fixed fee per illness episode" and "fixed fee for consultation with variable fee for drugs", the most reported, were validated as proposed solutions to the operational problem. The field test, on a quasi-experimental model, was conducted in ten health centers of which five were considered as experimental, i.e. having to introduce a change in their payment scheme, and the other five as control i.e. having kept unchanged their payment scheme.

Service utilization rate was measured in all health centers before field test by a household survey and the review of HC records. In parallel, a cost analysis was also conducted. Shortly after this first survey, necessary changes were introduced in the payment scheme in the experimental health centers in order to allow a sufficient period of observation (one year) before the second round of data collection. In four HC, the payment scheme was changed from a fixed fee for consultation with a variable fee for drugs to a fee per illness episode. In one HC the reverse was done. The observation period between surveys was actually somewhat variable in the five rural health zones, due to delays in the introduction of desired changes. The second survey was implemented during the dry season in all rural health zones like the first one. In the catchment area corresponding to each HC four hundred household were sampled and the household head was interviewed to provide information on economic status, illness episodes during the last two-week period, use of health center services, and expenditures related to the illness episode. All completed questionnaires were processed in Kinshasa, at SANRU's office using a Wang micro-computer. Statistical analysis was performed with "Trajectories", a statistical package for micro-computers.

1.3. RESULTS

1.3.1. PAYMENT SCHEMES

The four payment schemes encountered in the country are: a fixed fee for illness episode, a fixed fee for consultation with varying fee for medication in relation with daily dosage and drug cost, fee for illness episode varying with severity of illness and cost of drugs required, fee for consultation and drugs with a sliding scale for necessary re-visits. Among these payment schemes the first two were in use in the five rural health zones participating in the study. Four of these rural health zones used a fixed fee for consultation with varying fee for medication and one of them used a fixed fee for illness episode. Since there were two HC selected by rural health zone, a change from one scheme to the other was introduced, after the first survey, in five HC, while the other five served as controls.

The level of fee was variable from one health zone to another. It was decided at the zone level according to cost of living, drug price and economic status of the population. There was no well established procedure for the objective calculation of the fee level. As a consequence, this level ^{was} sometimes either too high and thus decreasing the economic accessibility to health care for the community or too low and thus reducing HC auto-financing capability.

Reaction towards introduction of a new payment scheme depended on categories of individuals. In general the attitude of population, development committees and zone medical directors was in favor of a fixed fee for illness episode while the personnel in charge of HC was generally against it. The attitude of the personnel had an important influence on the utilization of HC services.

1.3.2. UTILIZATION OF HC SERVICES

1.3.2.1. Utilization of curative services

A general negative trend was observed in the utilization of curative services after the introduction of a new payment scheme. If this trend was the expectation when changing from a fixed fee for illness episode to a fixed fee for consultation with a variable fee for medication, as it was the case for one HC, it was mainly due to factors not controlled by the study

- 1.4.1.2. Field test failed to demonstrate an increase in the utilization of curative services. These results were influenced by a negative attitude of HC personnel towards introduction of a fixed fee for illness episode as well as a lack of a good procedure for the calculation of fee level. The short observation period (one year or less) could also have influenced the results.
- 1.4.1.3. In all health zones participating in the study, community leaders PHC authorities and population were in favor of a fixed fee for illness episode while the personnel of HC demonstrated hostility.
- 1.4.1.4. There is a direct correlation between payment scheme and visits per episode of illness scheme. Visits per episode were higher than in centers using a variable fee scheme.
- 1.4.1.5. Although zone offices operate on a fairly similar yearly budget (median of \$4,500), they supervise a number of health centers ranging from six to 47. Number has little influence on operating costs.
- 1.4.1.6. The thrust of zone activities is in the preventive with significant investments in personnel, training, and vehicles.
- 1.4.1.7. Differences in health center costs were determined by numbers of personnel and distance from the zone office, not by the payment scheme in effect.
- 1.4.1.8. The median health center operating cost has doubled from \$1,400 in 82-83 to \$3,000 in 84-85.
- 1.4.1.9. If patients contributed \$1.41 per episode of illness the following costs could be covered: personnel salaries, zonal supervisor and mobile team salaries in the time they spend in field activities, all in-service training, administrative and maintenance supplies, drugs, vaccines, and expendable medical materials, prenatal and preschool clinics, kerosene, minor building repairs, and transport (fuel) for personnel and materials including supervisors and the mobile team.
- 1.4.1.10 Health centers recovered an average of 69% of their in house costs and 23% of their in house and indirect, ie, zonal costs.
- 1.4.1.11 Close to 100% of in house curative costs were covered by curative

1.4.2. RECOMMENDATIONS

- 1.4.2.1. Before introducing a new payment scheme for PHC at the HC level a particular attention should be given to community preparation. HC personnel motivation and procedure of calculation of fee level.
- 1.4.2.2. The fixed fee for illness episode is often the payment method chosen for the following advantages:
 - a) Health care continuity: once payment is made, there is no major reason for patients to interrupt treatment.
 - b) Ease in HC management: since fee level is known to everyone in the health area, village development committees can easily monitor HC receipts.
 - c) Reinforcement of solidarity in the community: health care price is equally shared by all user. This alleviates charges for patients with severe diseases.
- 1.4.2.3. After the introduction of a new payment scheme, a close monitoring of the situation should be maintained in order to quickly make necessary adjustments with regard to HC auto-financing, community economic status and HC personnel motivation.
- 1.4.2.4. Small scale operations research studies should be conducted on payment schemes at the RHZ level to find better solutions in the very peripheral context.
- 1.4.2.5. It would be useful to collect further data on annual revenue per health center in order to determine what percentage or portion (operating investment, indirect) of health center costs could be covered. Further, a determination of how much revenue would have to increase to cover all costs could be made.
- 1.4.2.6. Many health providers are interested in using the fee per episode method of financing primary health care. The problem that blocks them is determining how to systematically set a fee that will cover desired costs taking into account utilization rates, inflation and competing centers. The determination of a basic formula would fill a crucial gap in attaining an effective and efficient delivery and expansion of primary health care.

2. BACKGROUND

The operations research study on community financing of primary health care in Zaïre was conducted from October 1983 to March 1986 in ten rural health centers (HC) located in five rural health zones (RHZ) of the Republic of Zaïre. These RHZ are: Song-Bata in the Bas-Zaïre Region, Kalonda in the Kasai-Occidental Region, Bibanga in the Kasai-Oriental Region, Kongolo and Kaniama both in the Shaba Region (see figure 1).

The selected RHZ are all in full operation, according to the 1982-1986 Health Plan (1) which aims at the establishment by 1990, of 300 health zones, both rural and urban. The five RHZ selected for the study are part of the 50 RHZ receiving assistance from SANRU (USAID/GOZ/ECZ/ 600-0086 project).

The health zone is the main peripheral component of the national health system (figure 2), especially for primary health care (PHC). Each of the nine administrative regions of the country is divided into several health zones, according to the size of its population. A typical health zone covers a population of about 100 thousand people in rural area or 150 thousand in urban area. It contains three basic elements: a reference hospital, fifteen to twenty satellite health centers and community based actions through village development committees (figure 3).

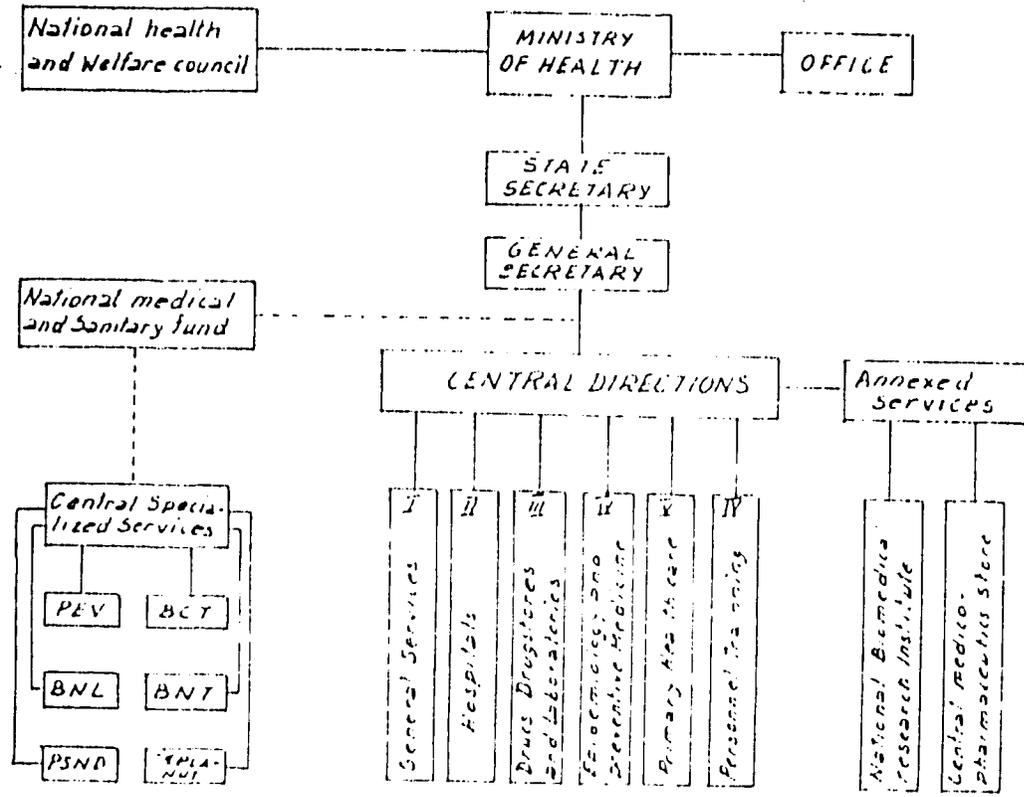
Primary health care is provided mainly at the level of health centers. However, between the different components of the health system there is a referral system and a supervision system as showed in figure 3.

The zone general reference hospital provides curative care for patients referred by satellite health centers. It also provides a reference laboratory for those health centers and often includes a school for the training of nurse-practionners. Epidemiologic and operations research as well as therapeutic trials are also in the range of the activities of the zone general reference hospital.

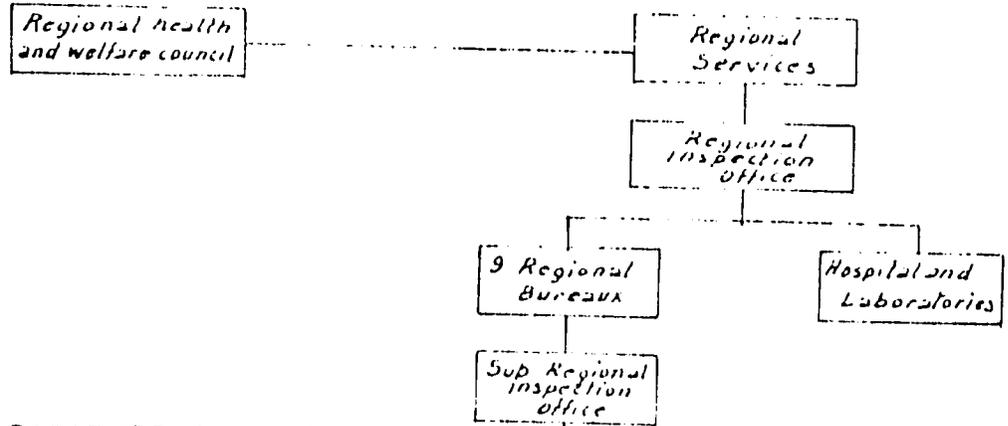
The minimal package of activities at the health center level includes curative care, pre-school clinics with imunizations, drinking water and sanitation, control of endemic diseases, nutrition and health education. The health center collects health and demographic data necessary for the evaluation of its activities.

Fig. 2 The Structure of the Health Department

CENTRAL LEVEL



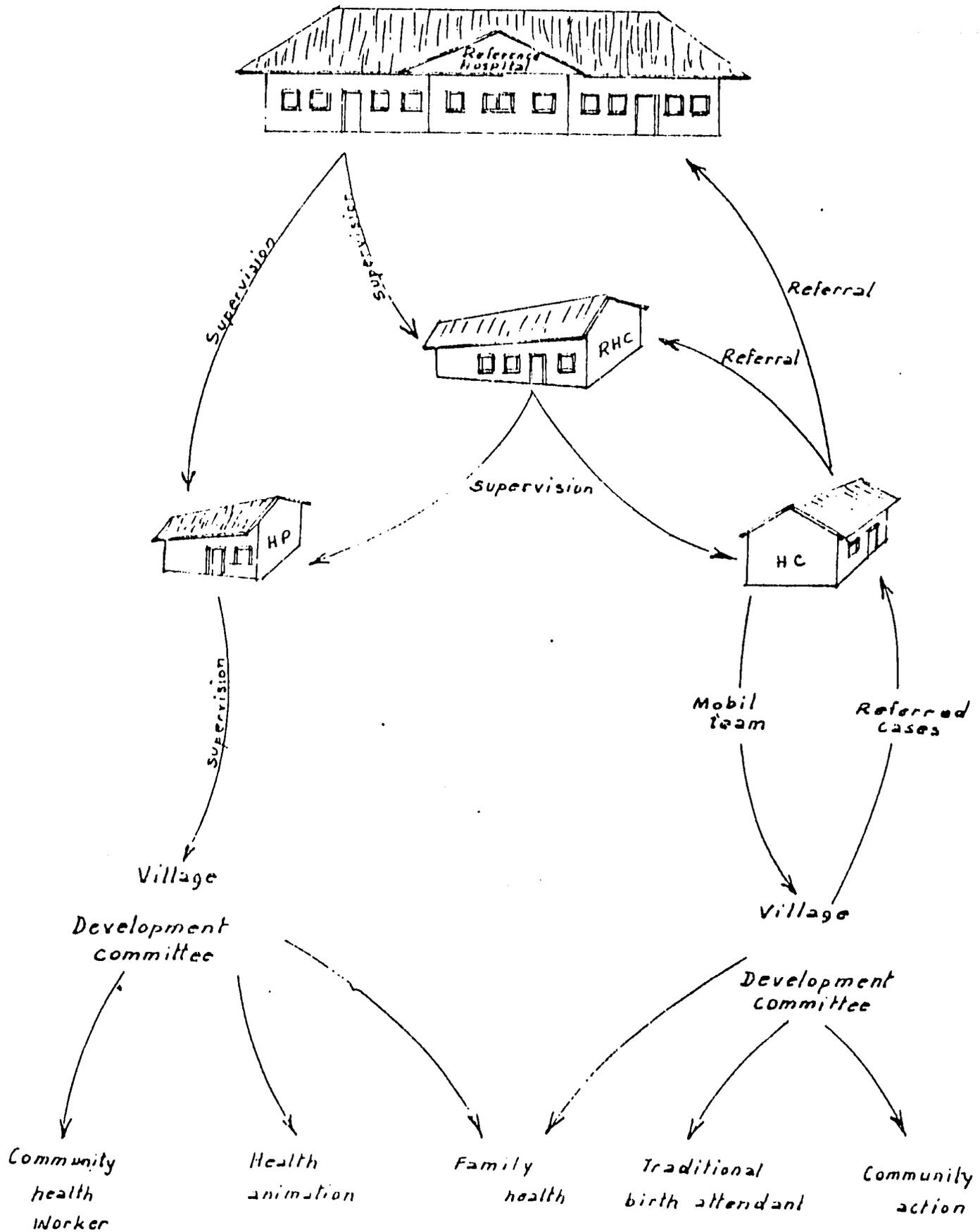
REGIONAL LEVEL



PERIPHERAL LEVEL



Fig.3 The components of a health zone



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At the community level, the village development committee includes a health component in its activities. This committee initiates such activities as the sensitization of the community concerning main health problems, drinking water and sanitation in the village, collection of basic demographic data (births, deaths, migrations). The members of the village development committee select the traditional birth attendants and community health workers to be trained by the health center or the reference hospital team in order to provide elementary care for common diseases, child-births and help the health center team in family planning, pre-school clinics and home visits in the village.

The health care system is mainly supported by three types of health care providers: the government, the churches, and private or government owned companies. Since 1984, the government started to carry into effect the country sanitary map that indicates the boundaries of all health zones. Having defined these boundaries, the government then delegates the management of a given health zone to one of the above mentioned health care providers. At the time this report was written, out of the 306 health zones identified in the country, 56% were directly managed by the government itself, 20% by the catholic church, 14% by protestant churches, 0% by the kimbanguist church 8% by governmental or private companies and 1.2% by bilateral cooperation agencies. A given health zone may be assisted by one or several organizations.

The total population in Zaïre was estimated, in 1984 to be around 30,000,000 people (2). It is a young population. About 46 percent of people are less than 15 year old. Table 1 reports population figures for the health zones and health centers selected to participate in the study.

Throughout the country the main health problems are those of infectious diseases and nutrition. Malaria, schistosomiasis, trypanosomiasis, tuberculosis, measles, diarrheal diseases, pulmonary infections and protein - energy malnutrition are endemic (3). Table 2 presents main health problems as perceived by participating health zone directors answering a questionnaire distributed by SANRU in 1984. These problems were not mentioned in a priority order. Several of them are common to all health zones.

Besides these health problems there exist important economic, geographic and cultural constraints which prevent people from fully utilizing primary health care services.

For example, distances between different localities are quite important.

Indeed, Zaïre, covering a total area of 2,345,000 km², is a fairly large country. The road network is insufficient especially during rainy seasons. The road situation has many economic implications especially on the transportation of several products, agricultural and mineral. The purchasing power of the population is quite low. A range of traditional beliefs discourage the utilization of PHC services: very often, causes of diseases are thought to be supernatural. Injections are preferred to pills. In some ethnic groups a woman should not deliver her baby in presence of a male nurse.

Table 1. Population served by Health Centers and Health Zones selected for study, 1983

Health Zone	Selected Health Center	Population Served by Health Center	Total Population in the Health Zone
Sona-Bata	1. Kindamba	1,915	79,886
	2. Lukunga	2,877	
BIBANGA	1. Tshileo	45,000	152,032
	2. Katanda	38,959	
KALONDA	1. Kabambaie	6,252	180,000
	2. Mabu	8,403	
KONGOLO	1. Kangoy	13,358	173,944
	2. Keba	11,304	
KANIAMA	1. Kaniama	9,937	74,011
	2. Mwadi-Kayembe	12,924	

Table 2. : Priority Health Problems as perceived by directors of the RHZ participating in the study, 1984.

BIBANGA	KALONDA	KANIAMA	KONGOLO	SONA-BATA
Worms	Worms	Malaria	Worms	Malaria
Sterility	Malaria	Respiratory infections	Malaria	Worms
Malaria	Measles	Diarrhoea	Schistosomiasis	Anemia
Urinary infections	Drinking Water	Measles	Diarrhoea	Water/Sanitation
Tuberculosis	Family Planning	Worms	Tuberculosis	Malnutrition
Diarrhoea	Veneral diseases	Protein-energy malnutrition	Leprosis	Imunization
Anemia	Tuberculosis	Veneral diseases	Sanitation	Diarrhoea
Malnutrition	diarrhoea			
Measles	Bottle-feeding			

3. STUDY PURPOSE

The purpose of the study is to provide decision-makers with data on the cost of primary health care service at the health center level, on the cost of alternative financing schemes ^{and} on the utilization of services by the community.

The government of Zaïre promotes ideas of fee for service and self financing in its health plan (1). At the present time, a considerable variety of payment schemes exists in rural and urban health zone throughout the country

The operational problem is one of choice among these several payment schemes. Indeed at this time, none of them has been proved the best in order to assure PHC sustainability at the health center level.

The objectives of the study are:

- to identify alternative payment schemes in the country;
- to identify payment schemes in use at the health center level;
- to establish the effect of alternative payment schemes on the utilization of PHC services;
- to determine the cost of PHC services under different financing schemes.

In relation with the health situation of the country, an underlying assumption has been made in this study: it is expected that the adoption of a given payment scheme could increase the access to health care services and thus bring an improvement in the health status of the community (perceived as a long-term decrease in morbidity and mortality rates).

It should be mentioned here that, at the stage of problem analysis, it was first thought to investigate the ways to motivate community health workers (CHW's) in order to improve the utilization of offered services by their action. Afterwards, it became evident that CHW's where they existed, they did not represent the most important determinant of PHC services utilization by the community.

4. METHODOLOGY

For the purpose of this study the general approach recommended by PRICOR has been largely followed. This approach includes the three following phases: phase I or problem analysis; phase II or solution development and phase III or solution validation (4).

In phase I the operational problem is defined and divided into smaller units on which research priorities are decided. Phase II describes the proposed solution (s), the main variables and constraints in the system as well as an analytic model for solution development. Phase III is concerned with the field evaluation of the proposed solution by a carefully designed field test.

4.1. PROBLEM ANALYSIS.

4.1.1. Definition of the operational problem

The PHC service delivery and utilization, in order to improve the health status of the population, was described as a subsystem as shown in Fig. 4. The main concern of investigators and decision-makers was to propose a model that could both guarantee good quality PHC services to the population and a certain degree of auto-financing and sustainability.

A group of national PHC experts and decision-makers met several times to determine which portion of the broad national health system had the most significant impact on community health status at the peripheral level. As the community health status itself requires the use of a range of indicators for its measure, the investigators chose to study the utilization of PHC services. The assumption was made that high utilization rate of offered - and presumed good quality - PHC services would improve community health status. Then, using interaction matrix technique, factors influencing utilization of PHC were assessed.

4.1.2. Analysing the problem and dividing it into smaller units

Given the approach used by national policy-makers to improve community health status by PHC strategies in application at the peripheral level, the management of the subsystem is quite decentralized. The health status of a given community appears then as the result of the interaction of several factors intervening both at the local level and the national level. The utilization of PHC services by a given community is directly influenced by the need of these services (or otherwise, morbidity patterns), the quality, the cost to consumers, the range of offered services, the payment scheme in use in health facilities, and the socio-economic status of the community.

4.1.3. Establishing research priorities

Through the use of the interaction matrix technique (5) the importance

According to the consensus of investigators, decision-makers and experts on the strength of those interactions on a zero to five scale (0 = non interaction; 5 = strong inter-action) interactions were divided into categories; strong (4-5), average (3), weak (0-2).

Table 3: Self-interaction matrix of variables in the PHC service delivery and utilization subsystem.

	Utilization of Services.	Price of services	Payment Schemes	Quality of Services	Range of Services	Community Health Worker	Economic Status	Biological Environment	Social and Cultural Environment.
Utilization of Services	X	4	4	3	2	3	4	3	2
Cost of Services	4	X	3	4	2	1	1	0	1
Payment Scheme	4	3	X	2	1	1	2	0	2
Quality of Services	3	4	2	X	0	1	1	0	0
Range of Services	2	2	1	0	X	1	4	3	3
Community Health Worker	3	1	1	1	1	X	0	0	3
Economic Status	4	1	2	1	4	0	X	0	1
Biological Environment	3	0	0	0	3	0	0	X	0
Social and Cultural Environment	2	1	2	0	3	3	1	0	X

Among "strong" interactions were found price and utilization of services; payment scheme and utilization of services, economic status of utilization of service; price of service and payment scheme; range of services and biologic environment and CHW and socio-cultural environment.

All other interactions were assessed as "weak". Decision was made to concentrate on "strong interactions". It was clear at this stage of the study that the interaction between utilization rate and payment scheme was the most appropriate to study, given the research purpose and the constraints in the subsystem. The other variables which produce strong interactions were not amenable to an easy change within the context of the study.

Indeed, the variable "price" which interacts with utilization and quality of service, could not easily change its value without endangering the level of autofinancing reached by the health center. On the other hand the variable "economic status" interacting with utilization and range of services is to be considered as a constraint.

4.2. SOLUTION DEVELOPMENT

4.2.1. Solution objective

The objective of the solution is to increase the utilization of PHC services offered at the HC level in order to improve the health status of the community. Taking into account the variables with the very strongest interactions as shown in Fig. 4 the objective function appears to have the following form:

Utilization of services = function of (payment scheme, price of services, socio-economic status, health status).

4.2.2. Decision variables and constraints on the solution

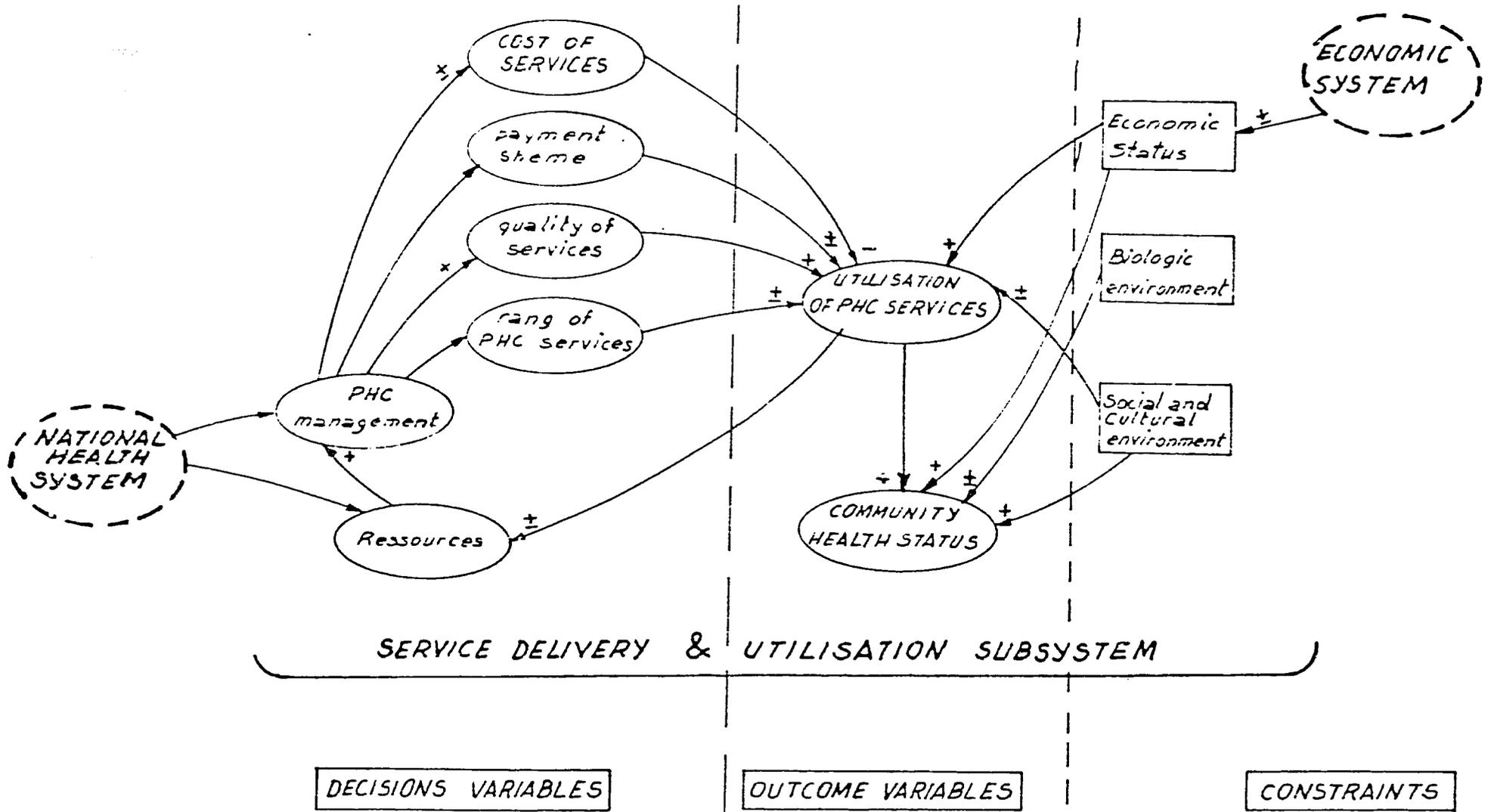
In the PHC service delivery subsystem, as depicted in Fig. 4 several variables influence utilization of PHC services. Among these variables community economic status, biologic environment and socio-cultural environment are considered as constraints. Indeed, it is beyond the control of investigators decision-makers and even the community itself to modify the value of each of these variables in a short term period.

Conversely, payment scheme, price of services, the quality of services and the range of services could be changed and are thus considered as decision variables. Among all decision variables of course, payment scheme is the easiest to modify at a given level of resources.

4.2.3. Model for solution development

The objective function defined earlier offers a model for the development of solutions to the operational problem, with the assumption that all other variables but payment scheme have fixed values. The model for solution development then appears as follows:

Figure 4. PHC SERVICE DELIVERY AND UTILISATION SUBSYSTEM



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Utilization status rate = f (payment scheme) at a given cost of services, for a given socio-economic status, for a given community health status and at a given level of service quality.

Different solutions to increase service utilization rate correspond to different schemes.

4.2.4. Required data

In order to propose the best solution(s) to the operational problem, information was necessary on the different payment schemes in use in RHZ throughout the country and their respective advantages and disadvantages. It was quite easy to build a list of payment schemes by a short questionnaire addressed to the 35 medecins chefs de zone participating at the SANRU 1983 annual conference (Table 4). However, data on advantages of different payment was not available.

Table 4: Payment schemes for PHC services in 37 health centers

Payment Scheme	HC using the scheme	
	Number	Percentage
Fixed fee per illness episode irrespective of illness.	4	10,8
Fixed fee per visit	5	13,5
Fixed fee for consultation with variable fee for drugs.	27	73,0
Other scheme	1	2,7
T O T A L	37	100,0

4.3. SOLUTION VALIDATION

4.3.1. Field test

From the various payment schemes in use at the HC level, two payment schemes, i.e. "fixed fee per illness episode" and "fixed fee for consultation with variable fee for drugs" were the most reported. Indeed, all the other payment schemes, including fixed fee per visit could be assimilated to the first or the second previous alternatives as was found during the preliminary visit of RHZ selected for the study.

Therefore these two alternatives were validated as proposed solutions to the operational problem. The field test was designed as a quasi-experimental variant, conducted in each of participant health zones as shown in fig. 5 (6).

The hypothesis to be tested was that introducing a fixed fee per illness episode at the health center level would be followed by an increase in the utilization rate of services offered by the HC and an increase in the receipts of the HC.

Five rural health zones were selected to participate in the study based on the willingness to participate and geographic location. In each of these RHZ two HC were selected among those presenting similarities in relation with their population, the cost of services to users, the cost of living, the duration, the health center has been in operation. One of the two HC was considered as experimental, the other as a control. In the experimental HC the payment scheme was changed while it was maintained the same in the control HC.

4.3.2. Data collection

Service utilization rate was measured in both HC before field test by a household survey and the review of HC records. In parallel a cost analysis was also conducted.

4.3.3. Household survey

For the household survey a questionnaire was designed to gather information on economic status, illness episodes during the last two-week period, the use of health center services, the cost expenditures for health care during the illness episode, the use of preventive services offered by the HC (immunization, pre-school and pre-natal clinics) etc.

At the planning stage of the study a period of one year was scheduled between the two surveys in all participating RHZ. However, when the study was carried out, due to delays on the part of most of zonal medical directors in the introduction of new payment schemes in the experimental HC the actual duration of the observation period was quite variable. The following table shows the duration of that period in the five RHZ.

RHZ	HC	Introduction of change in financing scheme	Second Survey
Kalonda	Mbau Kabambaie	- October 1984	June 1985
Kaniama	Kaniama I Mwadi-Kayembe	- July 1984	June 16-July 7 1985
Kongolo	Kangoy Keba	- October 1984	July 1985
Bibanga	Katanda Tshileo	September 1984 -	July 19-Aug.16 1985
Sona-Bata	Kindam'la Lukunga	February 1985 -	August 1985

If differences in the duration of the observation period might affect study results, seasonability would not play any role because both surveys were carried out during the dry season in all five RHZ.

4.3.4. Sampling

In the "health area" corresponding to each HC four hundred households were selected by the following sampling technique: A list of villages in the area with population figures was obtained; a sampling proportion was calculated for the total population in the area. Within each village, the selection of households was done from the center of the village. The first household was selected randomly. The others by choosing the house whose door was the nearest to the previous one. The process was continued until the total number of households for the village was reached. For each selected household the respondent to the questionnaire was the head of the household.

4.3.5. Data collection

In each of the ten "health areas" a team of five interviewers was hired and trained in interview technique and use of questionnaire. The questionnaire had been translated into three different languages spoken in the study RHZ. The best of the five interviewers was given the responsibility to lead the team on the field. He had to make all necessary arrangements before interviews, distribute questionnaires collect and review completed questionnaires before transmitting them to the survey supervisor for the RHZ.

4.3.6. Data processing and analysis

The first level of quality control for the household survey data was in the field.

At the end of a typical working day, the team leader had to check all completed questionnaires for mistakes or omissions. Incorrectly completed questionnaires were back to interviewers. The same operation was repeated by the survey supervisor in each health zone.

All completed questionnaires were brought back to Kinshasa at SANRU's office. Data entry was performed on Wang microcomputer, using multiplan. A coherence test was run before data analysis.

Analysis was also done on SANRU's Wang microcomputer using "Trajectories", a statistical package for microcomputers. Results were tested for frequencies and t-test for means. ^{by Chi-square}

Data processing and analysis for the cost analysis is described in part II.

5. RESULTS OF HOUSEHOLD SURVEY

5.1. DEMOGRAPHIC DATA

Information gathered through the two household surveys allows description of the study population according to age structure and mortality. Demographic data reported here concern only a subpopulation including all individuals with one or more of the following characteristics: child under five years of age, person sick during the two-week period preceding the survey, woman being pregnant or having given birth during a reference period of 12 months before the survey and all deaths having occurred within the household during the same reference period.

5.1.2. Age

Age distribution of the population as presented in table 5 is in agreement with national trends. In general, for the ten health centers the proportion of children less than one year old is around 10 percent. The population is young. Indeed half of its members are under 15 years of age. There are some variations among individual health centers. According to first survey,

the proportion of population under 15 years is the lowest in Tshileo (44,5%) and the highest in Kaniama (60,6%). In the second survey, Tshileo still has the lowest proportion (45,3%) while the highest is found in Kabambaie (57,7%).

Table 5 : Age distribution of population in participating health area for the two household surveys (percentages)

Health zone and health area	AGE GROUP (Years)										Total (n)	
	0		1 - 4		5 - 14		15 - 29		30 +			
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
<u>Bibanga</u>												
Katanda*	8.4	9.2	27.7	30.2	13.2	12.6	14.7	15.8	35.9	32.1	855	784
Tshileo	7.2	9.6	22.5	25.8	14.8	9.9	20.2	20.1	35.3	34.6	950	852
<u>Kalonda</u>												
Kabambaie*	10.5	8.2	27.4	37.1	14.5	12.4	21.6	24.7	26.0	17.7	978	957
Mbau	12.5	10.4	29.0	37.0	7.6	8.6	25.0	22.3	26.0	21.7	728	825
<u>Kaniama</u>												
Kaniama	10.4	11.4	34.2	25.5	16.0	15.2	21.4	20.3	17.9	27.6	1194	1072
M. Kayembe*	12.2	11.5	28.2	27.3	12.2	12.6	24.5	21.8	22.9	26.8	1079	991
<u>Kongolo</u>												
Kangoy	10.3	11.6	32.3	32.4	10.0	7.5	24.7	26.6	22.7	21.9	926	800
Keba*	10.9	12.9	34.1	34.4	9.9	5.7	23.3	28.5	21.8	22.5	977	925
<u>Sona-Bata</u>												
Kindamba*	9.9	15.3	35.3	29.5	6.4	4.7	19.1	18.7	30.3	31.9	770	706
Lukunga	9.9	10.5	26.9	34.2	13.2	4.2	25.3	15.2	24.7	36.1	911	746

* Payment scheme changed after first survey

(1) First survey

(2) Second survey

(n) Children less than 5 years old + persons sick during a 2 week-period before survey + currently pregnant women + women having given birth during a 12-month period before survey.

5.1.2. Mortality

As for mortality pattern, available information provides data useful for the estimation of infant mortality rate. Table 6 presents infant mortality rate estimates in surveyed "health area" over the two household surveys.

Table 6: Infant Mortality rates (per thousand) by "health area" over First and Second household surveys.

RURAL HEALTH ZONE	BIBANGA		KALONDA		KANIAMA		KONGOLO		SONA-BATA	
	Kate-nda*	Tshileo	Kaba- * mbaie	Mbau	M.Ka- * yembe	Kania ma	Keba*	Ka-ngooy	Kinda mba	Luku-nga
Infant mortality (1)	48.8	25.0	115.7	221.2	250.0	45.7	166.7	31.8	14.1	75.5
Rate (%) (2)	72.5	132.5	23.3	62.1	122.9	85.3	49.7	64.5	9.2	86.4

(1): First survey

(2): Second survey

* : Payment scheme changed after first survey.

Important variations are noted both among health areas and within individual health areas over first and second surveys. Rates are more than twice the national figure (115) in Mbau and Kaniama for first survey. They are strikingly low in Kindamba for first and second surveys. In general, rates are lower in second survey when compared to first survey in health area where payment scheme changed. They increase at second survey where payment scheme remained unchanged. Katanda and Mbau are exceptions to this rule.

The overall infant mortality rate for all "health area" remains lower than national figure over time. It is respectively 90,4 and 70,8 for first and second surveys.

5.2. PAYMENT SCHEMES

Alternative payment schemes at the HC level are summarized in table 7. In the HC participating in the study only two of these alternative schemes were found. The situation before and during field test is presented in table 8.

Table 7: Alternative payment schemes for PHC at HC level

Scheme	Remarks
1. Fixed fee for illness episode irrespective of illness. (*)	Fee adjustment to be made depending on the the rate of inflation. The fee is calculated to provide for drugs, laboratory examinations, salary of HC auxillary and HC maintenance.
2. Fixed fee for consultation with varying fee for medication in relation with daily dosage and drug cost.	Consultation fee provides for salary of HC auxillary and HC maintenance.
3. Fee for illness episode varying with severity of illness and cost of drugs required.	
4. Fee for consultation and drugs but sliding down for necessary re-visits.	First visit fee is fixed and includes all drugs.

** Some variations were noted in this payment scheme: The fee level was generally lower for children. Chronic conditions, for example tuberculosis, had a different fee.

Table 8: Payment schemes in HC selected for study before and during field test.

Health Zone	Health Center	Payment scheme before field test	Payment scheme during field test
SONA-BATA	1. Kindamba.	Fixed fee for consultation and variable fee for medication according to daily dosage and drug cost.	Fixed fee for illness episode irrespective of illness.
	2. Lukunga	Fixed fee for consultation and variable fee for medication according to daily dosage and drug cost.	No change
BIBANGA	1. Kata-nda	The same as Kindamba.	The same as Kindamba
	2. Tshileo	The same as Lukunga.	The same as Lukunga.
KALONDA	1. Kaba-mbaie	The same as Kindamba.	The same as Kindamba
	2. Mbau	The same as Lukunga.	The same as Lukunga.
KANIAMA	1. Kania-na	The same as Lukunga	The same as Lukunga
	2. M.Ka-yembe	The same as Kindamba	The same as Kindamba
KONGOLO	1. Keba	Fixed fee for illness episode irrespective of illness.	Fixed fee for consultation and variable fee for medication according to daily dosage and drug cost.
	2. Kangoy	Fixed fee for illness episode irrespective of	No change.

From the four alternative payment schemes found in the country, only two were in use in the ten HC participating in the study. Furthermore eight HC were practicing a fixed fee for consultation with a varying fee for medication. The two HC of Kongolo were practicing a fixed fee for illness episode.

The level of fee was variable from one RHZ to another for both payment schemes. It was decided at the RHZ level according to cost of living, drug price and economic status of the population. In most of these RHZ, there was not an established procedure for the objective calculation of the fee level. As a consequence, very often, fee level was either too high and thus decreasing the economic accessibility to health care for the community, or too low and thus reducing HC auto-financing capability. Efforts were made during support visits to health zones and during meetings in Kinshasa to help the medecins-chefs des zones find a better procedure for the calculation of fee level especially in the fixed fee for illness episode payment scheme.

Most of the zonal medical directors, village development committee members and other influential community members were enthusiastic to introduce a fixed fee for illness episode payment scheme in their HC. They expected many advantages from this alternatives: Community solidarity is reinforced by sharing somehow equally the cost of health care; a one-time payment favors health care continuity during an illness episode; the control of drug consumption and receipts in the HC is made easier for the village development committee and the medecin chef de zone.

On the other hand the auxiliaries in charge of health centers were in general very reluctant to adopt a fixed fee for illness episode scheme. The most reported reason was that this scheme does not guarantee health center auto-financing. However, the actual reason is probably in relation with a more effective control of drug consumption and receipts in the HC.

5.3. UTILIZATION OF HC SERVICES

Variation of utilization rate of services offered by HC according to payment scheme is the cornerstone of the study.

Services are offered under two main types : curative service and preventive services.

5.3.1. Utilization of curative service

An important indicator of curative service utilization is the proportion of people seeking for care at H.C. when sick. This proportion is presented in table 9 for first and second household surveys.

Table 9 : Percentage of Patients using Health Center for curative care during a two-week period before survey.

SURVEY	HEALTH AREA										AVERAGE PERCENT	
	KATAN- DA*	TSHI- LEO	KINDAM- BA*	LUKUN- GA	KABAM- BAIE*	MBAU	KAN- GOY	KEBA	KANIA- MA	M.KA- YEMBE	A	B
First	11.0	31.1	77.4	75.3	44.7	39.5	45.4	23.1	25.9	22.5	35.7	43
Second	1.4	31.3	50.7	83.2	47.1	45.5	48.8	17.1	15.1	18.5	27.0	44
Ratio : First Second	7.9	1.0	1.5	0.9	0.9	0.9	0.9	1.4	1.7	1.2	1.3	1

*Payment scheme changed after first survey

A : experimental H.C.

B : control H.C.

Utilization of H.C. is relatively lower in second survey for all experimental H.C. but Kabambaie. Conversely, Lukunga, Mbau, Kangoy, all control H.C., experience higher utilization. The situation seems to be stable at Tshileo.

While looking at the utilization of H.C. during an illness episode interest is also aroused about other places where people seek for health care. The full range of alternatives is described for each of study health zones in tables 10, 11, 12, 13 and 14.

Table 10 : Percentage of Patients attending different Health Sources during a two-week period before surveys, Bi-banga

Health care source	KATANDA *		TSHILEO	
	First survey	Second survey	First survey	Second survey
Health center	11.0	1.4	31.1	31.2
CHW/TBA	6.4	0.0	3.4	0.2
Hospital	15.0	12.2	20.6	19.3
Drugstore/Market	2.6	0.3	0.7	1.6
Traditional healer	4.2	0.7	5.7	1.4
Private dispensary	13.6	28.5	15.8	7.2
Other	47.0	56.7	22.6	38.9
n	453	287	530	416

CHW : Community Health Worker

TBA : Traditional Birth attendant

* : Payment scheme changed from a variable fee to a fixed for disease episode
Statistical significance : after first survey.

Katanda : $\chi^2 = 79,8$
 $p < 0,005$

Tshileo : $\chi^2 = 59,6$
 $p < 0,005$

Table 10 shows a drastic drop in the utilization of H.C. at Katanda during second survey while such sources as private dispensaries and "other" are better off. At Tshileo, H.C. utilization remains constant ; private dispensaries utilization decreases. In the two "health area" hospital utilization drops as well as drugstore and traditional healer attendance. However reports of other sources increase during second survey.

Table 11 : Percentage of People attending different Health Care sources during a two-week period before surveys, Kalonda

Health Care source	KABAMBAIE		M B A U	
	First survey	Second survey	First survey	Second survey
Health center	44.7	47.1	39.5	45.5
CHW/TBA	0.2	0.9	0.0	8.5
Hospital	6.1	3.0	18.6	9.4
Drugstore/Market	0.6	0.0	5.2	0.0
Traditional Healer	1.2	3.0	3.8	2.8
Private dispensary	29.5	19.4	24.8	27.6
Other	17.7	26.4	6.2	6.1
n	492	329	210	246

* Payment scheme changed from a variable fee to a fixed fee per disease episode after first survey.

Statistical significance

Kabambaie : $\chi^2 = 44,2$

$P < 0.005$

Mbau : $\chi^2 = 26,3$

$F < 0.005$

Table 11 shows, for both health area of Kalonda, a relative increase in the utilization of H.C. during second survey. Hospital utilization decreases as well as drugstore and market utilization. Results are divergent concerning traditional healers, private dispensaries and other sources of health care.

In table 12 is reported utilization of different sources of health care in the two health area selected in the health zone of Sona-Bata. There are striking differences between Kindamba and Lukunga. While utilization of health center, CHW/TBA and traditional healers decreases during second survey in Kindamba, there is an opposite trend in Lukunga, at least concerning utilization of health center and traditional healers.

Private dispensaries have much more users in Lukunga.

Table 12 : Percentages of People attending different Health Care sources during a two - week period before surveys, Sona-Bata

Health care source	KINDAMBA "		LUKUNGA	
	First survey	Second survey	First survey	Second survey
Health center	77.4	50.7	75.3	83.2
CHW/TBA	1.6	0.0	0.4	0.4
Hospital	7.4	10.9	3.2	0.0
Drugstore/Market	0.5	2.1	0.8	1.6
Traditional healer	11.0	0.7	0.4	0.8
Private dispensary	2.1	33.3	14.2	5.3
Other	0.0	2.1	5.8	8.6
n	190	138	500	244

* Payment scheme changed from a variable fee to a fixed fee per disease episode.

Statistical significance

Kindamba : $\chi^2 = 81,6$
P < 0.005

Lukunga : $\chi^2 = 24,1$
P < 0.005

Table 13 : Percentages of People attending different Health Care sources during a two - week period before surveys, Kongolo

Health Care source	K E B A *		KANGOY	
	First survey	Second survey	First survey	Second survey
Health Center	23.1	17.1	45.4	49.8
CHW/TBA	0.5	1.9	0.0	1.3
Hospital	8.2	9.5	17.6	15.4
Drugstore/Market	6.2	4.4	6.3	3.5
Traditional healer	25.9	7.6	12.7	2.2
Private dispensary	24.5	27.9	10.7	16.3
Other	11.0	31.6	7.3	11.4
n	208	158	205	227

Statistical significance

Keba : $\chi^2 = 40,5$
 $P < 0,005$

Kangoy : $\chi^2 = 27,3$
 $P < 0,005$

Table 13 shows, in the health zone of Kongolo, a relative increase of the utilization of health center during second survey for Kangoy and an opposite trend for Keba. In both health area, drugstores and markets as well as traditional healers are less attended during second survey while private dispensaries are more attended. There is a striking increase in the utilization of "other" health care sources in Keba when compared to Kangoy.

Table 14 : Percentages of People attending different Health Care Sources during a two-week period before surveys, Kaniama.

Health care source	KANIAMA		MWADI - KAYEMBE *	
	First survey	Second survey	First survey	Second survey
Health Center	25.9	15.1	22.5	18.5
CHW/TBA	0.0	3.7	0.5	0.2
Hospital	36.7	26.6	6.6	4.14
Drugstore/Market	1.8	11.3	2.9	15.9
Traditional healer	1.6	0.5	1.9	3.7
Private dispensary	10.6	9.6	29.9	18.2
Other	23.5	33.3	36.2	39.5
n	499	628	622	628

*Payment scheme changed from a variable fee to a fixed fee for disease episode after first survey.

Kaniama : $\chi^2 = 94,8$
 $P < 0,005$

Mwadi-Kayembe : $\chi^2 = 95,3$
 $P < 0,005$

In the health zone of Kaniama, both health area experience a decrease in the utilization of health center during second survey. Hospital utilization shows a similar trend. Conversely, drugstores and markets have more users, as well as "other" health care

5.3.2. Utilization of Preventive services

Under preventive services are grouped pre-school clinics, prenatal and natal care.

5.3.2.1. Pre-school clinics (PSC)

Table 15 reports percentages of children attending PSC by health area and by survey. Children under five years of age in possession of a growth chart card at the time surveys were conducted are considered as attending PSC.

Table 15 : Percentages of children attending PSC by Health Area and by survey

HEALTH AREA	FIRST SURVEY		SECOND SURVEY		R A T I O First survey Second survey
	Total number of children	% attending PSC	Total number of children	% attending PSC	
Katanda*	453	46.4	287	43.7	1.1
Pshileo	530	39.3	416	31.6	1.2
Kindamba*	345	48.4	316	62.0	0.8**
Lukunga	335	57.0	334	44.6	1.3**
Kabambaie*	492	23.4	329	20.7	1.1**
Mbau	210	52.0	246	20.0	2.6**
Keba*	395	3.3	349	26.1	0.1**
Kangoy	441	0.7	437	9.8	0.1**
M. Kayembe*	437	30.1	383	37.6	0.8
Kaniama	534	55.9	393	29.8	1.9**

* Payment scheme changed after first survey for curative care.

** Significant difference between first and second surveys.

Utilization of PSC decreased significantly at Lukunga, Kabambaie, Mbau and Kaniama during survey. There was an significant increase at Kindamba, Keba and Kangoy. The overall trend is relatively positive (i.e. utilization increased) in experimental health area and negative in control area.

Table 16 presents average frequentation (number of times child attended the clinic) of PSC for the last six months.

Table 16 : Frequentation of Pre-school Clinic for last six months by Health Area

HEALTH AREA	AVERAGE FREQUENTATION		VALUE OF T-TEST
	First survey	Second survey	
Kaniama	2.75	4.09	6.803**
M. Kayembe *	4.07	3.39	3.18 **
Kabambaie*	1.54	1.67	1.18
Mbau	1.62	1.37	2.28 **
Katanda*	2.47	3.17	3.66 **
Tshileo	3.09	3.18	0.42
Keba*	2.97	3.71	2.67 **
Kangoy	2.10	3.97	9.55 **
Kindamba*	1.78	4.38	13.32 **
Lukunga	3.29	3.76	2.76 **

* Payment scheme for curative care changed after first survey
 ** Statistically significant difference

A significant increase in the average frequentation of PSC during second survey was observed at Kaniama, Katanda, Keba, Kindamba and Lukunga. All these H.C. but Lukunga were experimental. A significant drop was observed in Mwadi-Kayembe and Mbau.

5.3.2.2. Pre-natal Clinics (PNC)

From table 17 interest for PNC among women still pregnant during survey of having delivered within a 12 months period before survey can be derived.

Table 17 : Percentage of Women attending PNC during last Pregnancy

HEALTH AREA	n		Proportion attending PNC (%)	
	(1)	(2)	(1)	(2)
<u>BIBANGA</u>				
Katanda*	111	123	69.4	63.4
Tshileo	153	133	64.1	72.2
<u>KALONDA</u>				
Kabambaie*	199	126	41.2	80.2 **
Mbau	170	94	76.5	95.8 **
<u>KANIAMA</u>				
Kaniama	260	190	76.5	83.7
M. Kayembe*	251	181	70.9	64.6
<u>KONGOLO</u>				
Kangoy	239	190	58.6	60.0 **
Keba*	208	219	38.9	49.8 **
<u>SOBA-BATA</u>				
Kindamba*	121	149	70.3	78.5
Lukungu	149	126	87.3	84.9

n : Total number of women pregnant or having delivered within a 12 - month period before survey

(1): First survey

(2): Second survey

* : Payment scheme for curative care changed after first survey

** : Statistically significant difference between first and second survey.

Health area of Kalonda and Kongolo were the only ones to experience a significant increase in the attendance of PNC during second survey.

5.3.2.3. Natal Care

In general the proportion of women delivering at H.C. increased during second survey. However this increase in the utilization of H.C. was significant only at Katanda, Kabambaie, Mwadi-Kayembe and Mbau. All these H.C. but Mbau were experimental (table 18).

Table 18 : Proportion of Women delivering at H.C.

HEALTH AREA	n		Deliveries at HC (%)	
	(1)	(2)	(1)	(2)
<u>BIBANGA</u>				
Katanda*	78	72	14.10	38.89 **
Tshileo	88	85	6.82	10.59
<u>KALONDA</u>				
Kabambaie*	120	126	2.50	58.73 **
Mbau	114	94	40.35	88.30 **
<u>KANIAMA</u>				
Kaniama	147	126	0.00	0.00
M. Kayembe	160	120	14.38	16.67
<u>KONGOLO</u>				
Kanjoy	129	124	0	0,81
Keba*	133	156	0.75	1.28
<u>SONA-BATA</u>				
Kindamba*	70	110	54.28	69.09 **
Lukungu	101	83	87.13	90.36

n : all women having delivered within a 12 - month period before survey

* : Payment scheme for curative care changed after first survey

** : Statistically significant difference between first and second survey.

6. DISCUSSION

6.1. Payment schemes

From all alternatives presented in table 7, only two were investigated : a fixed fee for illness episode, irrespective of illness and a fixed fee for consultation with variable fee for medication according to drug cost and daily dosage. Four H.C. changed from the second alternative to the first one. In one H.C., change was in opposite direction. The two investigated alternatives represent the most widely used payment scheme in RHZ's supported BY SANRU.

The change in payment scheme for curative care did not affect preventive care payment (pre-school clinics and pre-natal clinics). Therefore changes observed in the utilization of preventive care should not entirely ^{be} attributed to change in payment scheme. However it cannot be excluded that a change in payment scheme for a given service could affect other services utilization.

Another important factor to take into consideration is the fee level. Beside the payment scheme itself, the level of fee will certainly affect utilization of service. In general there was a lack of established procedure for the calculation of fee level, especially when introducing fixed fee for episode illness.

Reactions towards introduction of a new payment scheme depended on categories of individuals. In general, the attitude of population, development committees zone medical directors was in favor of fixed fee for illness episode. The personnel in charge of H.C. was generally against fixed fee for illness episode. A vigorous negative reaction was noted in the community when Keba, where fixed fee for illness episode was already practiced, adopted the other payment scheme. Beside the payment scheme itself, beside fee level, the attitude of H.C. personnel plays an important role in H.C., they certainly can alter H.C. success in various ways : they can offer parallel health care services in private dispensaries; they can quit H.C., leaving it closed for a less or more long period, they can still stay and work at the H.C. with less productivity and offering lower quality care etc...

The study protocol did not guarantee to control for such factors as personnel attitude towards change or level of fee for service.

6.2. Utilization of H.C. services

The effect of payment scheme on the utilization of H.C. services cannot be appraised by any single indicator. Attempt is made to group some indicators in table 19.

Table 19 : Variation of some Indicators of H.C. service utilization over the two Household Surveys

HEALTH ARE	OBSERVED VARIATION IN PERCENTAGE				
	Curative service	PSC overall attendance	PSC Attendance for children less than 1 year	PNC Attendance	Deliveries at H.C.
<u>BIBANGA</u>					
Katanda*	- 87.40	- 5.86	+ 10.26	- 8.59	+ 175.81
Tshileo	0.70	- 19.67	+ 4.77	+12.69	+ 55.28
<u>KALONDA</u>					
Kabambaie*	+ 5.34	+122.66	+ 3.23	+94.51	+2224.20
Mbau	+ 15.21	- 3.14	+ 13.34	+25.21	+ 118.83
<u>KANIAMA</u>					
Kanlana	- 41.47	- 46.83	+ 11.77	+ 9.33	-
M. Kayembe*	- 17.91	+ 10.26	0	- 8.85	+ 15.92
<u>KONGOLO</u>					
Kangoy	+ 9.72	+1347.06	- 2.17	+ 2.42	-
Keba *	- 25.95	+6924.01	-	+27.81	-
<u>SONA-BATA</u>					
KIndamba*	- 34.43	+ 28.13	+ 8.00	+11.77	+ 27.28
Lukunga	+ 10.64	- 21.75	+ 4.61	- 2.67	+ 3.71

* *Payment scheme for curative care changed after first survey*

If a positive percentage is considered as an increase in service utilization and a negative percentage as a decrease it clearly appears that the introduction of a new payment scheme, be it fixed fee for illness episode or variable fee to drugs cost, was generally followed by a drop in the utilization of H.C. curative services. Notwithstanding Kaniama data, which was questioned by the medecin chef de zone, there were obvious reasons to that situation. A few weeks after introduction of a new payment scheme at Katanda H.C., the auxiliary in charge of H.C. was dismissed given his hostile attitude toward the change. Furthermore, this person, who had much prestige in the community, opened a private dispensary in the health area, half a mile distant from the H.C.

The decrease observed at Keba for the utilization of H.C. services is attributed to the negative reaction of the community when payment scheme changed from fixed fee for illness episode into variable fee according to disease and drug cost.

This situation is in agreement with study hypothesis.

Kindamba hosted an open conflict between village development committee members and the auxiliary nurse in charge of H.C., very hostile to fixed fee for illness episode. The Health Zone unilaterally set the fee level too low. As a consequence, the H.C. receipts could not insure auto-financing. The nurse in charge very often closed the H.C. in profit of his own occupations.

As observed earlier, data from Kaniama health area, showing a decrease in the utilization of H.C. curative service, were questioned by the médecin chef de zone who promised a report correctly describing the situation.

Should changes observed in preventive services utilization be attributed, at least partially, to change in payment scheme for curative care? In general payment for preventive care in all RHZ is made on an "episode"-type basis: mothers pay once for the five year period of pre-school clinics, women pay once for the whole period of pre-natal care, there is a unique fee for delivery. This situation did not change during the study period. Notwithstanding this consideration a general increase trend is observed in experimental health area in utilization of preventive services during second survey. Even if a similar trend is also observed in control health area, it is more marked in experimental health area. Kaniama is still the usual exception to the rule. Why are preventive services relatively spared by the negative trend observed in the utilization of curative service? A possible explanation lies in the fact that, given that their cost to consumer is rather low, receipts generated by them for H.C. remain lower than those from curative services and are thus less affected by changes occurring in the H.C. auto-financing system. The case of deliveries at H.C. should be considered separately, given that generally the only other alternative, beside H.C., is represented by traditional birth attendants, and not by private dispensaries. We consider that the most important factor of change in the utilization of preventive services is without doubt the expansion of these services through personnel training and other support from organizations such as SANRU.

8. STUDY MANAGEMENT8.1. Study timetable

T A S K	Original time schedule	Actual time schedule
1. Inventory of facilities, Activities and financing schemes in Zone	March 1983	March 1983
2. Final identification of alternatives	March 1983	March 1983
3. Selection of participating Rural Health Zones	March 1983	March 1983

Approval of Reasearch Projet by PRICOR/ USAID plus contract	June 1983	October 1983
4. Selection of Health Centers and securing SANRU 86 supplies to arrive by end of october 1983	June 1983	October 1983
5. Development of survey instrument, translations and testing	July 1983	Sept-Nov. 1983
6. Development of Cost-Analysis design and procedures for financial and activity accounting	2nd half of July 1983	July 1983
7. Conduct of Cost Analysis and introduction of accounting procedures	August 1983	August 1983 October 1983
8. Training of interviewers and supervisors	August 1983	April - May 1984

T A S K	Original time schedule	Actual time schedule
9. Conduct of first survey.	September and October 1983	May-August 1984
10. Start new community payment schemes.	Nov. 1983	July 1984
11. Conduct of follow up cost analysis		September 1984-Feb. 1985
12. Data processing and data analysis of first survey.	January 1984	January - April 1985
13. Supporting visits	December 1983 to October 1984.	February - March 1985.
14. Conduct of 2nd survey.	November 1984	June-August 1985
15. Data processing and analysis of 2nd survey results and cost analysis with report.	January 1985 February 1985 March 1985	September 1985 March 1986.

There was an important discrepancy between planned schedule and actual time schedule for the two household surveys. Subagreement was signed in October 1983 and not in June as planned. Even after subagreement was signed there were some administrative difficulties (money flow, lack of cash in banks). Therefore, field test was delayed. After first survey all RHZ did not introduce a new payment scheme at the same period. Second survey was therefore delayed to allow for a sufficient observation time.

8.2. Study Personnel

8.2.1. Permanent Staff

- 8.2.1.1. Franklin C. Baer, MHS, Dr.PH, principal investigator : devoted 10% of his time to help in the overall research design and the coordination of inputs from SANRU. He played an important role in tasks 1, 2, 3, 4, 5, 8, 9, 11, 12, 13, 14.
- 8.2.1.2. Lusamba N. Dikassa, MD, MPH, principal co-investigator : devoted 40% of his time on the study. Participated in tasks 1, 2, 3, 4, 5, 8, 9, 11, 12, 13, 14.
- 8.2.1.3. Munkatu Mpese, Anthropologist and Demographer : Devoted 65% of his time as a research assistant in the study. He actively participated in tasks 4, 5, 8, 9, 11, 12, 13 and 14.
- 8.2.1.4. Lokangu batwachengane, Health Administrator. Devoted 35% of his time as the second research assistant, especially for administrative tasks. Participated in tasks 4, 6, 7, 9, 12, 13, 14.
- 8.2.1.5. Lufwakasi Diansola, Secretary. Devoted 40% of his time to type and make photocopies of studies documents (reports, survey instruments letters etc...).

8.2.2. Consultants

- 8.2.2.1. Kashala Tumba Diong, Dr.PH. Helped in research design, inventory of payment schemes and interpretation of study results. Will help in results dissemination in the country.
- 8.2.2.2. Miatudila Malonga, MD, MPH. Helped in the study protocol, in selection of participating RHZ and in the development of questionnaire. Will also help in the decision-making process at the national level concerning utilization of study results.

- 8.2.2.3. J.L. Lamboray, MD, MPH. Helped during study protocol, questionnaire development, identification of payment schemes and results discussion. Will play a similar role with Kashala and Miatudila in the dissemination of study results at the national level.
- 8.2.2.4. Marty Pipp, BA, MPH, helped as a PRICOR Consultant during study design, questionnaire design and cost-analysis design. She actually conducted the first round of cost-analysis.
- 8.2.2.5. Lauren Greenberger, BA, MHS, helped as a PRICOR Consultant in the conduct of the second round of cost - analysis.

8.2.3. Others

The five médecins chefs de zones of the RHZ selected for study helped during field test in the selection of Health area, in the conduct of household surveys and in the introduction of a new payment scheme in H.C. Two physicians, Drs. Mapatano and Kiyombo and a statistician, Kakwaka, were requested from the University of Kinshasa to help in the supervision of field operations during household surveys.

Five interviewers were hired in each health area to administer questionnaire during household surveys.

DETAILED BUDGET FOR YEAR ONE

CATEGORY	APPROVED	ACTUAL	BALANCE
A. PERSONNEL	849,630	478,017	371,613
B. FRINGE BENEFITS	37,680	-	37,680
C. CONSULTANTS	445,170	128,790	316,380
D. OTHER DIRECT COSTS	216,000	94,343	121,657
E. TRAVEL & PER DIEM	1,178,400	774,567	403,833
TOTAL	2,726,880	1,475,717	1,251,163

Study budget was entirely provided by PRICOR. Details are as follows:

DETAILED BUDGET FOR YEAR TWO

CATEGORY	APPROVED	ACTUAL	BALANCE
A. PERSONNEL	465,075	567,768	102,693
D. CONSULTANTS	321,240	190,760	121,480
E. <u>OTHER DIRECT COSTS</u>			
1. Office supplies	27,060	17,189	9,873
2. Printing survey	44,000	44,000	-
3. Telex, etc.	12,000	4,750	7,250
4. Data processing	108,000	108,000	-
5. Computer diskettes	60,000	26,261	33,739
6. Analysis(SANRU Computer)	70,000	70,000	-
7. Travel per diem	1,145,510	786,463	359,047
TOTAL	2,243,885	1,815,191	428,694

DETAILED BUDGET FOR YEAR III.

CATEGORY	APPROVED	ACTUAL	BALANCE
A. PERSONNEL	290,052	352,655	- 62,603
D. CONSULTANTS	45,000	58,452	- 13,452
E. <u>OTHER DIRECT COSTS</u>			
1. Office supplies	16,914	4,972	11,942
2. Data processing	33,750	500	33,250
3. Data analysis	18,750	18,701	49
4. Postage, telex	7,500	5,050	2,450
F. TRAVEL & PER DIEM	319,750	189,010	130,740
TOTAL	731,716	629,340	102,376

9. CONCLUSIONS AND RECOMMENDATIONS

9.1. Conclusions

9.1.1. At the phase of solution development four alternative payment schemes were found in RHZ supported by SANRU. These scheme are as follows :

- a) Fixed fee per illness episode, irrespective of illness
- b) Fixed fee for consultation with varying fee for medication in relation with daily dosage and drug cost
- c) Fee for illness episode varying with severity of illness and cost of drugs required
- d) Fee for consultation and druges but sliding down for necessary re-visits.

9.1.2. In the H.C. participating in the study two of these alternatives (payment schemes (a) and (b), found to be the most used, were explored.

The study hypothesis was that introduction of fixed fee for illness episode as the payment scheme would be followed by an increase in H.C. service utilization.

9.1.3. Field test showed an increase in the utilization of preventive care services in experimental health area. It failed to demonstrate a similar increase in the utilization of curative care services. The main reasons for failure are a negative attitude of HC personnel toward introduction of fixed fee for illness episode and a lack of a good procedure for the calculation of fee level. In all health area, community, community leaders and PHC authorities at the RHZ level were in favor of payment using fix'd fee for illness episode. On the other hand, health center personnel was generally hostile to this payment schemes.

- 9.1.4. There is a direct correlation between payment scheme and visits per episode of illness. In those centers using a fee per episode of illness scheme visits per episode were higher than in centers using a variable fee scheme.
- 9.1.5. Although zone offices operate on a fairly similar yearly budget (median of \$ 4,500), they supervise a number of health centers ranging from six to 47. Number has little influence on operating costs.
- 9.1.6. The thrust of zone activities is in the preventive with significant investments in personnel, training, and vehicles.
- 9.1.7. Differences in health center costs were determined by numbers of personnel and distance from the zone office, not by the payment scheme in effect.
- 9.1.8. The median health center operating cost has doubled from \$ 1.400 in 82-83 to \$ 3.000 in 84-85.
- 9.1.9. If patients contributed \$1.41 per episode of illness the following costs could be covered: personnel salaries, zonal supervisor and mobile team salaries for the time they spend in field activities, all in-service training, administrative and maintenance supplies, drugs, vaccines and expandable medical materials, prenatal and preschool clinics, kerosene, minor building repairs and transport (fuel) for personnel and materials including supervisors and mobile team.
- 9.1.10 Health centers recovered an average of 69% of their in house costs and 23% of their in house and indirect, ie, zonal costs.
- 9.1.11 Close to 100% of in house curative costs were covered by curative revenues. Preventive revenues covered between one and 10% of preventive costs.

9. 2. Recommendations

From the results of this study and repeated discussions with decision-makers at the RHZ and community leaders the following recommendations can be made :

- 9.2.1. Before introducing a new payment scheme for PHC at the H.C. level particular attention should be paid to community preparation, H.C. personnel motivation and level of fee fixation.
- 9.2.2. Fixed fee for illness episode is recommended, with above precautions for the following advantages :
 - a) Health care continuity : once payment is made , there is no major reason for patients to interrupt treatment.
 - b) ease in H.C. management : fee level is know to everyone in the health area, village development comittee can easily monitor H.C. receipts.
 - c) reinforcement of solidarity in the community : health care cost is equally shared by all users. This alleviates charges for patients with severe diseases
- 9.2.3. After introduction of a new payment scheme a close monitoring of the situation should be maintained in order to make necessary readjustments with regard to H.C. auto-financing, community economic status and H.C. personnel motivation.
- 9.2.4. Small-scale operations studies should be conducted on payment schemes at the RHZ level to find better solutions in the very peripheral context.
- 9.2.5. It would be useful to collect further data on annual revenue per health center in order to determine what percentage or portion (operating investment, indirect) of health center costs could be covered. Further, a determination of how much revenue would have to increase to cover all costs could be made.
- 9.2.6. Many health providers are interested in using the fee per episode method of financing primary health care. The problem that blocks them is determining how to systematically set a fee that will cover desired costs taking into account utilization rates, inflation and competing centers. The determination of a basic formula would fill a crucial gap

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