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A methodology for the calculation of health care costs and their recovery

Guinea

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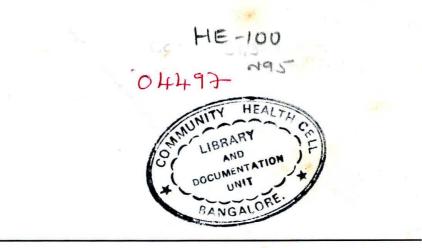   Paper – WHO/ICO/MESD.1

A methodology for the calculation of health care costs and their recovery

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EXECUTIVE SUMMARY

1.   Introduction

The Government of Guinea is undertaking a reform of the state-run prefectural and regional hospitals and the university teaching hospitals.   In order to ensure that the reform programme is financially viable, the Government has decided to establish a system of cost recovery to help it to recover the recurrent costs other than salaries incurred in the delivery of health care at these health facilities.   The cost recovery system to be adopted needs to take account of the socioeconomic constraints on the population as well as the structure of costs.   Above all, it must meet the specific criteria (economic efficiency, equity and administrative efficiency) on which the quality and relevance of a cost recovery system can be judged.

The Government's immediate objective is to introduce a system of charges which must be applied nationwide but may vary depending on the level of care.   In order to introduce charges for health care activities, it is not only necessary to know what they cost but also to understand the effects the fee system used may have on the Government's declared objective of improving the health conditions of the population.

2.   Objective of the Study

This study has two objectives: (i) to develop a practical methodology for the analysis of costs; (ii) to make a critical analysis of systems of cost recovery and an overview of the cost recovery systems used by the national EPI/PHC/ED programme and by different nongovernmental organizations.   The study concludes with recommendations to the Government of Guinea on the development of a system of cost recovery.

3.   Methodology

A model was constructed to calculate costs and identify the contribution of different sources to the financing of the different types of costs incurred in the delivery of health care at the health facilities in question.   This model, developed using LOTUS (R) software, is of a general nature and can be applied to any health facility.   To test the model in practice, the authors made field visits to the Maneah Health Centre, run by the National EPI/PHC/ED Programme, and the prefectural hospital at Dalaba, run by the Health Care Development Programme (PDSS), to collect data.   Three activities were analysed: childbirth and the treatment of uncomplicated malaria in children at the Maneah Health Centre, and hospitalization in the surgery department at the Dalaba Hospital.   Simulations were made to assess the effects that certain macroeconomic, demographic and health parameters may have on costs and on their structure and financing.

4. Conclusions and Recommendations

In view of the present condition of the public sector hospitals, the reform on which the Government has now embarked is welcome and needs to be continued. But the Government is well aware that hospital reform requires time and a great deal of energy and financial resources. A system of cost recovery that is to be fair and effective as well as capable of nationwide implementation requires adequate knowledge of the characteristics of the supply and demand for health services. The results of this study constitute the first step in this direction.

We recommend that the methodology developed in this study should be used in at least fifteen health centres and hospitals so as to enable deciders to arrive at results that approximate to real conditions. Once it has a clear idea of costs and cost structure, the Government will have some important elements to help it decide on a system of cost recovery and to set charges.

1. Introduction

1.1 Institutional Background

Guinea has adopted a policy of primary health care and is trying to introduce a number of measures to help to improve access to health care for all the country's people. In 1988, the National Programme, comprising the expanded programme on immunization, primary health care and essential drugs (EPI/PHC/ED), was set up on the basis of the principles of the Bamako Initiative and with the assistance of donors. This programme, which initiated its activities in a certain number of health centres in 1988, is now to some extent regarded as successful, both in the provision of services and financially.

Meanwhile, the situation is deteriorating continuously in the public sector hospitals in the prefectures and regions and at the university teaching hospitals. This means that these hospitals are not able to ensure effective provision of the referral and technical support services they are supposed to offer to the basic health services. This is hampering the progress of primary health care and is detrimental to the development of the health services in general.

To remedy this situation, the Government has decided to undertake reforms in the hospitals at all three levels, the prefectural, regional and university teaching hospitals. These reforms are based in essence on the recommendations of the Seminar on National Hospital Policy that took place in Conakry from 28 to 30 April 1990. These reforms are supported technically and financially by donors and can benefit from the experience of the National EPI/PHC/ED Programme, the Health Care Development Programme (PDSS) and the projects of certain nongovernmental organizations (NGOs) which run hospitals in different regions of the country.

The problems of financing have not been overlooked in the reform programme. In the brochure produced after the hospital policy seminar, the Government not only stated its intention of introducing a cost recovery system in the hospitals but also indicated the types of costs it wished to see recovered. Thus it is now looking for an appropriate system of recovery that takes account of the structure of costs in the health facilities in question, along with the socioeconomic constraints of the population and political and administrative constraints.

Together with constraints relating to the supply of services, the socioeconomic, administrative and political constraints make it extremely complex and difficult to define a national policy on charges for health services in the hospitals. It is also essential that the charges that are introduced should be dynamic in character, i.e. structured in such a way that they can be changed as time goes on in the light of the evolution of certain socioeconomic parameters.

It is nevertheless true to say that the recovery of certain types of costs is already possible in the public sector hospitals, for at least two reasons:

(i)   the evident willingness of the population to pay, as seen from experience with the National EPI/PHC/ED Programme and the projects of certain NGOs. Moreover, patients in the university hospitals are not only paying the official charges, which are modest, but also pay the relatively steep fees discreetly charged in parallel by the medical personnel;

(ii)   the Government is strongly motivated to recover costs. It does not in practice have many other options in its present financial situation. Not only does the structural adjustment programme (SAP) it has adopted impose budget restrictions and encourage privatization of anything that can be privatized, but many of the donors who contribute to the sector also stipulate the introduction of a system of cost recovery as one of their conditions.

The issue is thus no longer to decide whether costs can be recovered but to determine how to charge for services.

In order to set charges for services it is necessary to know what they cost. Since the Government wishes to assume responsibility for certain specific categories of costs, such as salaries, it is necessary to know the structure of the costs of each service or department in detail in order to determine who should or can pay what. Once the costs are known, the Government will then have to choose the cost recovery system it considers appropriate and set the charges needed to attain the objectives that have been determined.

1.2   Objective of the Study

This study has two objectives. First, the study sets out to develop a practical methodology for the identification, calculation and analysis of the costs of health care activities in the public sector health facilities. This methodology is a tool that can be used by the Ministry of Public Health and Population to elaborate a cost recovery strategy, and is flexible, general and capable of application to all types of public sector hospitals.

Secondly, a review of methods of cost recovery has been undertaken. The advantages and drawbacks of each method are analysed and recommendations are made on the methods that are considered most appropriate for the country.

What is the role of this study in cost recovery strategy? As a rule, such a strategy will comprise the following stages:

I. Analysis of the costs of health care

    (i)   development of a method to calculate short- and medium-term costs;

    (ii)   application of this method to a sample of health facilities;

    (iii)   study of the structure and variance of the costs of activities;

II. Choice of modalities of financing and a system of fees

    (i)   policy of cost sharing by the Government, the prefectures, donors and households;

    (ii)   determination of the modalities of charging fees, in particular whether fees should be of a national or regional character;

    (iii)   establishment of an administration for the management and implementation of the cost recovery system;

    (iv)   development of tools of management;

    (v)   how to introduce the cost recovery system: immediately throughout the country or in certain pilot health facilities;

III. Evaluation of the cost recovery system

    (i)   evaluation of the system after it has been in operation for three years;

    (ii)   adjustment of the modalities of financing and the fee system if needed.

This study covers point (i) of the first stage and touches briefly on point (ii) of the second stage. Obviously the points that have not been covered are also important and need to be considered and decided upon at a later stage.

1.3 Methodology of the Study

A model was developed to serve as the analytical framework for this study; calculations for this model can be made using the LOTUS software programme. Costs have been classified in two categories, direct costs and indirect or common costs.

Field visits were made to collect data and to test the model. Two health facilities were visited: the Maneah Health Centre (EPI/PHC/ED) and the Dalaba Prefectural Hospital (PDSS). These visits were not sufficient, however, to obtain all the information that was needed. In some instances, estimations were made after discussions with the national authorities, donors and experts in the field. In other cases, extrapolations were made from the data at certain NGO hospitals, in particular the hospital at N'Zérékoré, co-managed by Médecins sans Frontières (MSF) Belgium, and the hospital at Koundara, co-managed by MSF France.

1.4   Plan of the Study

The methodology is outlined in the next section.   The basic principles are described and concrete examples are given.   In section 3 the different theoretical methods of cost recovery are reviewed and a succinct comparative analysis is made of the methods currently in use in the country, notably those used by the National EPI/PHC/ED Programme, MSF Belgium and MSF France, and Entraide Medicale Internationale (EMI).   In section 4, the methodology is used to analyse the possibilities for cost recovery in health facilities.   It is used in particular to analyse the costs of certain services or activities, and can help to determine the level of contribution to financing that should be made by the different sources of funding in different scenarios and with different methods of cost recovery.

2.   Analysis of the Costs of Health Care Activities in Hospitals

Health care activities, like any other socioeconomic activity, engender costs since they consume human, financial and material resources.   To facilitate analysis, costs must be classified in certain categories.   But it would first of all be useful to explain the concept of costs.

2.1   Definition of Costs

The cost of goods or services is the value of the resources spent for the acquisition of those goods or services, which may be expressed as a monetary or non-monetary value.   Conceptually, several definitions of the notion of cost are possible; economists often distinguish between accounting cost and opportunity or social cost.   The latter definition is mostly used in cost-benefit analysis of projects.   In the context of this study, it is preferable to use the first definition[1].

The accounting cost of goods or services may be defined as the monetary value of actual expenditure for the acquisition of those goods or services. Example 1: if the stethoscope used by a technical health worker (THW) is purchased at a market price of 15 000 GF, its accounting cost is effectively 15 000 GF.   Example 2: if the salary of the hospital guard is 30 000 GF per month, the employment of that guard therefore incurs an accounting cost of 30 000 GF per month for the hospital.

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[1] For a general overview of cost analysis, see A. Creese and D. Parker (1990).

2.2 Classification of Costs

2.2.1 Recurrent costs and investment costs

Expenditure by a health facility may be classified in two major economic categories: recurrent expenses and investment expenses. Recurrent expenses comprise expenditure on goods and services that do not last for more than one year, while investment expenditure is for the acquisition of goods and services that usually last for more than a year.

Recurrent costs comprise *inter alia*:

- personnel costs;
- the costs of maintaining infrastructure, technical equipment and rolling stock;
- the cost of drugs and consumables;
- the cost of supervision;
- the cost of tools of management;
- the annual depreciation of infrastructure, equipment and rolling stock.

Investment costs generally concern:

- infrastructure;
- major technical equipment;
- rolling stock; and
- (long-term) staff training.

Although they last for a long time, these types of equipment and material facilities suffer continual wear and tear and any activity that makes use of them contributes to this. As a result of this wear and tear, the lifetime of this equipment is finite and it must then be renewed. It is therefore necessary to determine the rate at which this wear occurs annually, i.e. the rate of depreciation or amortization, in order to know how much needs to be set aside annually to be able to ensure renewal. To calculate the investment cost of an asset, the following need to be known:

- the lifetime of the asset;
- the domestic rate of inflation if the asset has been purchased in the national currency;
- the interest rate at which the money saved annually is invested in the bank;
- the behaviour of the exchange rate between the national currency and the currency of the country of origin and that country's rate of inflation if the asset has been imported.

Let us assume that an item of equipment produced locally and purchased this year by a hospital costs C_o Guinean francs and has a lifetime of n years. If the inflation rate is i per year and remains unchanged through the next n years, the value of the equipment at the end of the nth year will be:

$$C_n = C_o \times (1 + i)^n \quad (1).$$

By the end of the nth year the hospital needs to have saved an amount equivalent to C_n in order to be able to replace the equipment. The hospital must not wait until the end of the nth year to do this but should spread the amount C_n (at the year n price) over the n years of the lifetime of the equipment. This means that each year it should save an amount P_i whose total over the n years should add up to C_n at the end of the nth year. Thus:

$$P_1 + P_2 + ... + P_{n-1} + P_n = C_n \quad (2).$$

We know that the amount P_1 saved at the end of the first year is invested in the bank at an annual rate of interest r; it will thus be worth:

$P_1 (1 + r)$ at the end of the second year;
$P_1 (1 + r)^2$ at the end of the third year;
...
...

$P_1 (1 + r)^{n-1}$ at the end of the nth year.

If the future cost C_n is to be distributed equally over the n years, the amount P_i to be saved by the end of each year i will give C_n/n at the end of the nth year (if it is invested in the bank at interest rate r per year). As the amount P_n saved at the end of the last year will not have generated any interest, we shall thus have:

$$
\begin{aligned}
P_n &= C_n/n; \\
P_{n-1} &= C_n/n(1+r); \\
P_{n-2} &= C_n/n(1+r)^2; \qquad\qquad ... \qquad\qquad (3) \\
... \\
P_2 &= C_n/n(1+r)^{n-2}; \\
P_1 &= C_n/n(1+r)^{n-1}.
\end{aligned}
$$

Example: annual amount to be set aside for amortization of a hospital bed at the end of the first year.

$$C_0 = 100\ 000\ GF; \quad i = 0.1; \quad n = 10; \quad r = 0.1$$

This gives:

$$C_{10} = 100\ 000 \times (1 + 0.1)^{10}$$
$$C_{10} = 259\ 374\ GF$$
$$P_1 = 259\ 374/(10 \times (1.1)^9)$$
$$= 11\ 000\ GF$$

If the equipment is imported, it is not the domestic rate of inflation but the rate of depreciation of the national currency against the currency of the country from which the equipment is imported and the inflation rate in that country that determine the future value of the equipment in the national currency.

If d is the rate of depreciation assumed to be constant for the n years of the equipment's lifetime, and if i* is the rate of inflation of the country exporting the equipment, the value in local currency of the equipment at the end of the nth year will be:

$$C_{n*} = C_0 \times (1+d)^n (i+i*)^n \qquad (4)$$

and the amount to be set aside annually in national currency for amortization of this equipment at the end of the year i will be:

$$P_{i*} = C_{n*}/n(1+r)^{n-i} \qquad (5)$$

Example: amortization of a refrigerator

$$C_0 = 600\ 000\ GF;$$
$$d = 0.05;$$
$$i* = 0.05\ ;$$
$$n = 15$$

If the other parameters remain the same as in the previous example, this will give:

$$C_{15*} = 600\ 000 \times (1.05)^{15} \times (1.05)^{15} = 2\ 593\ 165\ GF$$

and

$$P_{1*} = 2\ 593\ 165/(15 \times (1.1)^{14}) = 45\ 524\ GF$$

It should be noted that these results are based on the assumption that the parameters will remain constant during the n years. Such an assumption does not necessarily reflect reality and has merely been adopted to simplify analysis and facilitate calculation.

2.2.2 Costs by activity

The total cost of the activities of a health facility is the sum of the costs incurred by all the departments of the health facility. In order to analyse the share of each department, service or activity in the total costs of the health facility, a distinction must be made between direct and indirect costs.

Direct costs

Direct costs may be defined in relation to a given activity, a medical service or a hospital department. The direct costs of a medical service are the costs relating to the provision of that service alone. Example: the drugs consumed by a patient are a direct cost in the treatment of that patient's disease. The cost of radiology equipment is a direct cost of the radiology department and has nothing to do with the laboratory department, for instance. Direct costs are easy to identify and relatively straightforward to calculate.

Indirect costs

Indirect costs are more difficult to identify. These are the costs of goods and services used jointly for several activities or by several departments of the health facility, and which cannot therefore be attributed in their totality to one department, service or activity. Example: the hospital guard does service for the entire hospital. His employment therefore incurs a cost for the hospital as a whole. But this common cost can be distributed between the different departments or services on the basis of well-defined criteria:

(i) It can be examined whether the guard's services are used more by some departments than others. For example, if the guard spends 50% of his time keeping guard over the equipment of the surgery department, then 50% of the cost of his service can be attributed to that department.

(ii) It can be decided to spread the common cost in question evenly between the different services. For instance, if a hospital has five technical departments, 20% of the common cost can be charged to each of these departments.

(iii) The common cost can be distributed in proportion to the volume of activity of the departments. If it is determined that the volume of activity of the surgery department represents 30% of the total work of all the hospital's technical departments, 30% of the common costs can be charged to that department on this ground. But the problem is that the concept of volume of activity may have several definitions. A

department's volume of activity may be defined in terms of:

- the volume of work of the personnel;
- the number of patients admitted by the department;
- the size of the departments revenue from payments;
- the amount of its direct costs;
- other criteria.

In this study, the common costs have been distributed on the basis of the volume of activity of the departments, this being defined in terms of the volume of work of the personnel. The following categories of costs have been recognized as indirect costs in this methodology:

- all the costs relating to administrative services;
- the cost of water, electricity and gas;
- the cost of buildings and fixed installations;
- the cost of rolling stock [except for the means of transport reserved for specific activities (such as the moped reserved for the advance immunization strategy at health centres)].

3. Methods of Cost Recovery

3.1 Criteria for the evaluation of cost recovery systems

In this paper we propose three main criteria: economic efficiency, administrative efficiency and equity.

3.1.1 Economic efficiency

Cost-effectiveness analysis is able to show the extent to which a given system of financing is economically efficient. One way of applying this method of analysis to the study of a health project or intervention is to try to minimize costs once the objective has been determined. In an expanded programme of immunization (EPI), for example, the number of children to be immunized must first be decided so that the minimum cost of the project can then be determined. In the case of a simple act of medical care, it will first be necessary to find the least expensive method of treatment.

The aim is obviously to economise on the use of resources in attaining the set objective. The savings thus achieved can then be used for other interventions. It is therefore clear that cost-effectiveness analysis will need to look at possibilities for the substitution of inputs in any intervention: it should be considered, for example, whether the cheapest drugs should be used; whether the best combination of categories of personnel has been found to minimize salary costs, etc.

3.1.2 Administrative efficiency

The administration of funds accruing from payments by patients, international aid, etc., and the use of these funds must also be governed by the rule of economic efficiency. This means that resources for administration (personnel, equipment, etc.) must be used judiciously. Following the rules of cost-effectiveness, the costs of administration must therefore be minimized while the objective of producing adequate health services must be still be achieved.

There are several factors that make for efficient administration. **Firstly**, the manager of the system must be allowed a certain measure of flexibility and freedom. Imposing too many restrictions may hamper the efficiency of the system. For instance, strict rules on the distribution of funds for expenditure on drugs can result in the rationing of drugs. **Secondly**, another important factor for administrative efficiency is the stability of sources of financing. For example, a system of fees per episode of illness will only be effective if families are continuously able to pay the charges. If they are not, it will be very difficult to keep the chosen system of cost recovery going. **Thirdly**, the use of too many management tools can add unreasonably to administrative costs. The number and types of management tools must be decided in the light of whether they contribute to an adequate system of health care provision. It should be noted that even the simplest systems of cost recovery that cover only a limited population still require a certain amount of administration. Even for a system confined to selling a limited range of drugs, some competence in accounting and stock management is indispensable.

The administrative implications of changing from one system to another must also be taken into consideration. Suppose, for example, that a flat rate system is to be adopted instead of itemized charging. It is not certain whether the administrative costs will be any lower in this case. It is true that accounting for revenue from payments will take less administrative work, but the setting and monitoring of flat rate charges may prove to be more difficult. In order to decide on a flat rate charge for a simple consultation, for example, the manager will need a good projection of the volume of consultations, the reasons for them and the drugs prescribed. If the projections are bad, the rate may well fall short of the average cost of consultations. A shortfall in revenue may then arise and this could lead to rationing of drugs.

The introduction of a prepayment system will require a higher level of administrative competence: (i) familiarity with actuarial principles to be able to set premium levels: (ii) ability to manage sometimes considerable volumes of capital (derived from premiums): (iii) introduction of mechanisms for the collection of premiums.

3.1.3 Equity

A system of cost recovery is said to be equitable when patients with similar needs for medical care are effectively able to obtain the same treatment. The advantage of this definition of equity is that it is not too difficult to monitor its application in practice. It is obvious that the charges patients must pay influence the extent to which they seek care. Indirect charges, such as the cost of transport may also affect the use of services. It is essential to have a good knowledge of these effects if the objective of equity is to be pursued.

In practice, it is not easy to incorporate the concept of equity into cost recovery systems. Much of the population concerned is not always prepared to accept a system that would from the outset impose a large measure of solidarity between families. The advantages and disadvantages of this kind of solidarity need to be discussed with the population before a method of financing that attempts to meet criteria of equity is introduced.

Equity is often said to conflict with efficiency. It is important to note that greater equity is often likely to be achieved at the price of higher administrative costs. Suppose, for example, that it is wished to make a system of itemized charges more equitable by exempting the poorer part of the population from payment for care. There will inevitably be additional administrative costs because it will be necessary to identify those who are poor and to monitor their poverty status at regular intervals. Administrative costs are also likely to increase if considerations of equity are incorporated into flat rate or prepayment systems: exemptions from payment or the determination of special rates or premiums for the poor will require extra monitoring and accountancy work.

3.2   Overview of the different methods of fee setting

3.2.1 Itemized fees

We will start from the principle that the salaries of the personnel employed at the health centres are paid by the Government. The costs of drugs, incentive bonuses and other running costs must be financed from other sources (families, the prefecture, donors, etc.). To simplify

the discussion, we shall assume that families will have to pay the charges other than those financed by the State.

As explained above, establishing an itemized charging system at a **health centre** means that the different types of diseases and the treatment they require must first be identified. The cost of the drugs needed to treat each type of illness (direct costs) and the overhead costs (indirect costs) relating to treatment must then be determined. These two types of costs (cost of drugs and overhead costs) will thus determine the rate to be charged.

The itemized fee system is at present being used in the National EPI/PHC Programme. It differs from the method described above in that a "coefficient or multiplier" is applied to the cost of the drugs to cover the other overhead costs. However, we would recommend that the method of cost calculation set out in section 2 should be used to find the costs and set the charges.

At the **hospital** level, the calculations needed to establish a fee system by activity will be more complex. The different departments and services of the hopitals must first be distinguished (e.g. general medicine, surgery, maternity/obstetrics, radiology, dentistry, laboratory, pharmacy, etc.). The different activities and/or interventions carried out by each department must next be identified. For each intervention, the direct costs (drugs, laboratory tests, radiology tests, etc.) and the indirect costs (overheads relating to that particular intervention) must then be determined. The fee system by activity is at present being used at the hospital in N'Zérékoré, where there are different charges for consultations, hospital stay (depending on the length), surgical operations, intensive care and drugs. It should be noted that the patients buy their drugs from the hospital pharmacy when they attend outpatient consultations or are admitted as inpatients (other than the drugs used in surgical operations, intensive care and obstetric care).

This method of charging can be said to be **economically efficient** if it enables costs to be kept to the minimum while still ensuring provision of services of a certain quality. The questions to be asked will mainly relate to whether the drugs that are cheapest are being used to the best advantage and whether the current level of overhead costs is justified. The use of prescribing guides at health centres and therapeutic protocols in the hospitals may also help to keep cost increases down. It is obvious that reducing costs to the minimum should result in lower charges. As explained above, the level of charges must be carefully controlled in order to encourage demand for health care.

With regard to **administrative efficiency**, it should be noted that systems of itemized charging usually involve a considerable amount of administrative work. Strict accounts of the revenue from the different charges must be kept, in particular. The regular updating of the rates to be charged also requires substantial administrative skills.

What degree of **equity** can be achieved with a system of itemized charges? If charges are set to match the total costs of an activity, it is to be expected that certain treatments or interventions will not be accessible to certain strata of the population. In primary health care these are mostly long-term types of treatment or treatment requiring relatively expensive drugs. In hospitals intensive care and special types of care would also be more expensive and less accessible to the population.

It is always possible to depart from the "rate equals total cost" rule in order to increase utilization of health care by the poor. One possibility would be internal subsidization of the types of care that ought to be more widely consumed. The charges for these types of care should be set below their actual cost in order to encourage greater demand from families and the deficit resulting from these subsidies could be financed by additional charges for other items of care.

3.2.2 Flat fees

The main difference between this and the previous method is that certain categories of care are grouped together. The direct and indirect costs of care in each category are then determined in order to calculate a mean cost. At health centres, for example, consultations may be divided into consultations for children and consultations by adults, so as to calculate the cost of "children's consultations" and the rate to be charged for "adult consultations". In a hospital, activities can be grouped by department. In the surgery department, for example, the direct costs (drugs used, laboratory tests, radiology tests, etc.) and the indirect costs of all surgical operations can be calculated. Once the costs are known, the mean cost per surgical operation can be calculated.

Once again, it is important that the principle of cost-effectivness should be respected. In terms of administrative efficiency, it must be acknowledged that revenue accounting makes considerably less work than in a system of itemized charging. But the flat rate system nevertheless requires rigour in the calculation of the costs of different categories of care and the setting of charges, as well as flexibility to permit the periodic adjustment of charges. With regard to equity, it can be said that this method enables financial risk to be better distributed among the population. In the case of surgical operations, the charge will be

identical for all operations. For some operations, the cost will exceed the charge. It is therefore clear that these operations will be more accessible to the population than they would be under a system of itemized charges.

In Guinea, flat rate charging systems are operated by the hospitals that are co-managed by Médecins sans Frontières (France) and by Entraide Médicale Internationale.

3.2.3 Health insurance (health cooperative systems)

In the health insurance system, health care is basically financed by advance or premium payment by the population. The premium may be set for individuals or for families. In principle, the premium reflects the average total cost (per person or per family) of the health care covered by the insurance. In developing countries, health insurance is usually organized by local mutual associations. These associations insure the cost of the health care provided at specific health facilities (e.g. a health centre, a hospital or health centres and hospitals forming part of an integrated system of primary and referral care).

This system is cost-effective to the extent that efforts are made to keep costs to the minimum while still offering adequate health care. In mutual schemes in which patients only have to pay a premium, there is definitely a risk of overconsumption of care by those who are insured. This is because the patients no longer bear the true cost of the care they consume. This overconsumption and the resulting lack of cost-effectiveness can be attenuated if the collection of premiums is combined with partial payment for the care received by the patient. This co-payment is generally only a fraction of the real costs, and is sometimes known as the "ticket modérateur".

A mutual scheme is fairly complex to administer. First of all, the level of the premium and of the "ticket modérateur" where applicable must be set. Determination of these parameters requires good projections of the volume of the different categories of care and the population covered. Secondly, these premiums must effectively be collected from the population and this demands considerable administrative effort. Thirdly, the evolution of health care costs and variations in the volume of care mean that premiums must be regularly adjusted.

Health insurance measures up well to the criterion of equity. The financial risks are spread among the population covered. Every insured person or family pays the same premium in principle and same "ticket modérateur" is then paid by the patient. In other words, the risk that a

family will have to pay a lot for medical care is diminished. It follows as a rule that access to care is increased.

One specific problem to which attention must be drawn is the compulsory nature of health insurance. This obligation to join is necessary in order to distribute the risk to the greatest possible number of people and improve access to care. If membership of a mutual scheme is voluntary, the risks will be distributed among a relatively small number of individuals. Let us suppose that some of the families at low risk decide not to insure themselves. This would have the effect of increasing the mean cost of the medical care insured by the mutual association and thus raising the premium. This increase is likely to have an adverse effect on access to care. It may therefore be concluded that voluntary participation goes against the objective of equity.

3.3 The basic principles of the fee systems adopted for cost recovery in Guinea

3.3.1 Itemized fees

3.3.1.1 The EPI/PHC/ED system

In this system, which covers primary health care, charges have been established for about thirty diseases or conditions. The principle for the calculation of charges is as follows. First, the cost of treatment is estimated (engendered by the purchase of drugs, medical supplies, etc.); this cost is then multiplied by a mean factor of 2.5, known as the "coefficient multiplicateur" [multiplier]. It should be noted that different charges have been set for children and for adults for each disease or condition. There are also rates for the "continuation" of treatment. It should also be noted that none of these charges exceed 2000 GF. The revenue from these charges in principle covers the costs of drugs and the other overhead costs (except salaries). It has nevertheless been found that some health centres have extreme difficulty in financing all their costs (Waty, 1989; Waty and Brudon-Jacobowicz, 1990). These centres do not manage to produce sufficient revenue because of their low level of activity.

With regard to cost-effectiveness, it should be noted in particular that generic drugs that are affordable in price are used in the EPI/PHC system, which enables the cost of drugs to be kept to the minimum. Another important point is the fact that prescribing guides are used at the health centres and this helps to keep down the volume and hence the total cost of prescriptions. As far as administrative efficiency is concerned, it will be noted that although only a limited number of diseases are treated, there is a significant number of management tools. It follows that the amount of time spent on administrative tasks by the medical personnel is often considerable.

For the time being, however, no definitive judgement can be made about the system as a whole as there is not sufficient information on access to care and the equity of the system.

3.3.1.2 N'Zérékoré hospital

The system of charges here is highly elaborate.   There are charges for all types of consultations (simple consultation, consultation with referral, follow-up consultations).   Patients admitted to hospital pay a flat rate related to the length of their hospital stay.   This flat rate covers laundry, medical acts and medical care.   Drugs, however, must be bought by the patients at the hospital pharmacy.   For intensive care, the charge is based on the duration of hospitalization and the patient's age.   In the surgery, maternity and ophthalmology departments, there are charges for 33, 14 and 10 different acts respectively.   The drugs required in the course of interventions in these departments are included in the charges.   Then there are charges for three types of dental care and 27 types of laboratory tests.

Most of these charges are higher than in other systems of cost revovery in hospitals. One of the reasons is that the financial support to the system from the NGO involved is very small. The charges have also been calculated so as to include substantial incentive bonuses for the staff.

The N'Zerekore system is characterized by a good cost-effectiveness ratio.   The purchase of generic drugs at affordable prices and the use of treatment protocols contribute substantially to this cost-effectiveness. With regard to administrative efficiency, we nevertheless feel that the introduction of this fee system and the accountancy involved in billing and collecting payment could require substantial administrative resources. We do not have enough data on this question to be able to judge whether or not the burden of administration is too great.   For the same reason of lack of sufficient information it is difficult to assess the degree of equity that is achieved.

3.3.2 Flat fees

A straightforward fee system is operated at the hospital in Koundara, which co-managed by Entraide Médicale Internationale.   Five flat rate charges have been set for hospitalization in the different departments.   Charges have also been set for emergency cases, outpatient consultations, laboratory tests and dental treatment.   At the hospitals in Kouroussa and Mandiana, which are co-managed by MSF (France), there is only one flat rate charge for hospitalization with intervention.   There are three rates for hospitalization without intervention and two rates for day care at the hospitals.   The fee system at the hospitals that are part of the health care development programme (PDSS) comprises seven flat

rate charges for care in the different departments of the hospital. In principle, drugs are included in these flat rate charges.

The level of charges is lower than those at the N'Zerekore hospital. The main reason is that the NGOs (in the case of Kouroussa, Mandiana and Koundara) and the PDSS (co-financed by the World Bank) finance a substantial proportion of the overhead costs.

As these systems also use cheap generic drugs, the criterion of cost-effectiveness is met. The administrative cost would also appear to be lower than it would be with a system of itemized charges. However, there are not sufficient data to permit any definitive judgement of the degree of administrative efficiency and equity of these systems.

It can nevertheless be stated that these flat rate systems make for a better distribution of risks among the population, and hence better access to health care.

3.4   Conclusion

It is obvious that every country or community will have a different conception of the system to be adopted for the recovery of costs. One country or community may favour a system of itemized charges on account of its cost-effectiveness and not be so much concerned with access to care by the different strata of the population. Another option would be a flat rate system if some importance is attached to the distribution of financial risks among the different patients, thus offering better chances of access to care to the poor. The health insurance option may be chosen if importance is attached to equity and if there is already the administrative capacity in existence.

It is too early to judge whether the cost recovery system at present in use for primary health care needs to be substantially altered. If the results of the socioeconomic survey (of November 1990) reveal problems of access to specific types of treatment, it will obviously be necessary to make some adjustments to the rates in question. But this will not necessarily mean switching to a flat rate system (e.g. by type of consultation) if there is no clear evidence that this will bring savings in administrative costs or guarantee better access.

In choosing an appropriate system for cost recovery in hospitals, it seems to us that the adoption of a system of flat rates for each category of care fits with the stated objectives of the Government of Guinea, which wants to promote access to hospital care for the population. For the moment, the hospitals would appear to have adequate administrative resources to manage a system of this kind. It should be noted, however, that this method will not significantly increase demand for medical care if it is not cost-effective. It is therefore essential to minimize the costs of the various inputs, such as drugs, vaccines,

medical supplies and other overhead costs, while still ensuring that adequate services are provided. In principle, this rule could be applied to the inputs that are directly financed by the State, such as the salaries of the personnel. In this perspective, salaries paid to superfluous personnel or those with very little productivity constitute a "loss" for the health system.

4. Use of the Methodology to Analyse Costs at Two Health Facilities

<u>The Maneah Health Centre and the Dalaba Prefectural Hospital</u>

The methodolgy was used to calculate the costs of the health services and analyse the possibilities for cost recovery at two health facilities at different levels, the Maneah Health Centre and the Dalaba Prefectural Hospital. The cost calculations were based on the data gathered in the course of field visits and information provided by the national authorities, donors and NGOs, and on national macroeconomic and demographic parameters. The results of these calculations were used to analyse the level of cost recovery attained by these two health facilities and to assess the extent to which the charges applied there are appropriate and effective.

4.1 Parameters

Although the costs of care depend in the first place on the costs of the inputs used in the provision of these services, there are several macroeconomic, health and demographic parameters that must be taken into account in the calculation of these costs.

Cost analysis needs to be dynamic in nature. It is therefore necessary that the analytical tool developed in this study should be able to be adjusted where relevant to take account of the socioeconomic, demographic and health changes that the country may experience. This will prevent the charges that are ultimately set by the Government on the basis of the results of the study from being too static and quickly becoming obsolete. It is for this reason that certain macroeconomic parameters, such as the rate of inflation, the interest rate and the rate of depreciation of the national currency, and certain sociodemographic parameters play an important part in this study.

While the macroeconomic and demographic parameters are national in scope, certain health parameters (such as the number of consultations per year, the number of hospital admissions, etc.) relate to the volume of activity at the health facility in question. In either case, the parameters are factors that are not within the control of the health facility. When the parameters change, however, the level and structure of costs will change as well. A whole range of scenarios can therefore be contemplated by changing the parameters. The results of analysis are sensitive to changes in the values of parameters. The quality of the results of analysis thus reflects the quality of the data available in respect of

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these parameters.

In order to facilitate calculation, most of the macroeconomic parameters have been assumed to be constant for several years. The rate of inflation has thus been taken as constant for twenty years, the entire lifetime of certain parts of the health infrastructure.

4.1.1 Macroeconomic parameters

The economic parameters used have been estimated at the following levels:

(i)   the domestic rate of inflation

In 1990, the predicted rate of inflation was 16%. Because of pressures on the labour market, however, certain analysts consider that the true rate of inflation for that year was more than 20% (Economist Intelligence Unit, 1990a, 1990b). It is this rate that we have adopted for the baseline scenario in this study.

(ii)   rate of inflation in the country of origin of imported products

This rate - 5% - is based on the mean of rates of inflation predicted (by The Economist, 1990) for the year 1991 in 13 member states of the Organization for Economic Cooperation and Development (OECD).

(iii)   domestic interest rate

This rate is assumed to be equal to the domestic inflation assumed, i.e. 20%. This assumption is reasonable in view of the interest rates observed in Conakry in November 1990 (on savings accounts, 14%; with notice of withdrawal, 16%: at term, 21%).

(iv)   rate of depreciation of the national currency

The rate of depreciation in relation to the currency of the country of origin of imported goods is estimated at 15%. It is assumed to be equal to the difference between the domestic rate of inflation and the rate of inflation in the countries of origin of imported goods, in accordance with the principle of "purchasing power partity" (PPP). (This principle assumes at least that the money and foreign exchange markets are functioning normally and freely and are in balance. The PPP assumption has been adopted in spite of the fact that the Guinean franc is overvalued. Even though it is rather difficult to accept in the current economic conditions in which the foreign exchange market cannot be said to be in a state of equilibrium, the PPP hypothesis is reasonable, particularly in the long term as structural adjustment programmes aim at a certain liberalization of the financial markets.)

(v)   *rate of salary increase*

This is estimated at 15%.   It has been assumed that the Government will pursue a policy of salary indexation, setting the rate of salary increase at 75% of the domestic inflation rate.

(vi)   *rate of increase in overhead costs*

For the overhead costs to be paid in the national currency, the rate of increase has been taken as equal to the domestic rate of inflation.

4.1.2   Demographic parameters

(i)   *rate of population growth*

This rate has been estimated at 2.6%, in accordance with UNDP forecasts (1990).

(ii)   *rate of increase in the demand for health care*

This rate has been assumed to be equal to the rate of natural population growth, i.e. 2.6%.   For the Maneah Health Centre, however, a zero increase in the volume of health activities has been assumed for 1991 as this health centre will be losing some of its patients - those who come from Coyah - to the newly opened health centre at Coyah.   Since demand for health services does not depend only on the size of the population, the assumption that the rate of increase in demand is equal to the rate of natural population growth may prove to be inadequate.   It can be complemented by information on all the factors that affect demand: charges, purchasing power, distance and other costs, quality of service, health conditions of the environment in which the population lives, etc.

4.1.3   Parameters relating to the health facility

See Annex 1

4.1.4   Parameters relating to the financing of expenditure

The salary costs of health personnel will be paid 100% by the Government.   It has been assumed that donors will finance 50% of the amortization costs of the infrastructure, rolling stock and technical equipment. At the Dalaba Hospital, it should eb noted that the donor also pays the freight and insurance charges as well as the logistic costs.

4.2   The baseline scenario for the year 1991

The detailed calculations are given in annex.   They show us to what extent the recurrent costs of health care activities are being recovered through the charging systems in use at the two health facilities studied, the Maneah Health Centre (Annex 1) and the Dalaba Hospital (Annex 2).   As explained in section

3, there are cost recovery systems at both these health facilities, which are part respectively of the National EPI/PHC/ED Programme and the PDSS. The charges applied in the two systems are different as the objectives pursued by them are not exactly the same. Consequently, the results achieved by the two systems are very different. At Maneah the present charges permit recovery of all recurrent costs other than salaries and produce a certain margin of profit, whereas the present PDSS charges result in substantial deficits at Dalaba Hospital. But it is important to realise that even at Maneah, where the system as a whole runs at a profit, some activities, such as the treatment of malaria, still run at a loss, and that, unlike Maneah, there are also some health centres in the EPI/PHC/ED system which are in deficit on account of their very low volume of activity.

4.2.1 The costs of health care activities and their financing at the Maneah Health Centre

The costs of two activities, childbirth and the treatment of malaria, were studied at the Maneah Health Centre.

4.2.1.1 Childbirth

As shown in Table B2 (see Annex 1), the cost of childbirth amounts to 1 067 Guinean francs and can be broken down as follows:

- salaries: 415;
- bonuses: 22;
- drugs: 446;
- logistics: 9;
- amortization: 123;
- other overhead costs: 51.

The objective of the cost recovery strategy is to cover the non-salary costs which amount to 652 GF. Under the EPI/PHC/ED system, these costs must be recovered through the sale of drugs. The charge for every drug is equal to the product of the cost price multiplied by a coefficient. Here, since the cost of the drugs is 455 GF (including logistic costs), to recover the exact amount of the recurrent non-salary costs, i.e. 652 GF, a coefficient of 1.43 is needed, i.e. 652/455. With the current charge of 1 000 GF per delivery (which corresponds to a coefficient of 2.20), the centre makes a gross profit of 348 GF per childbirth. If the assumption of the baseline scenario that the donors will finance 50% of amortization costs is also taken into account, the present charge will generate a gross profit margin of 410 GF per childbirth for the centre.

4.2.1.2 Treatment of uncomplicated malaria in children

As shown in table C2, the cost of treating a child with uncomplicated malaria amounts to 668 GF, with the following breakdown:

- salaries: 472;
- bonuses: 25;
- drugs: 15;
- amortization: 96;
- other overhead costs: 60.

As salaries are paid by the Government, a difference of 196 GF remains to be covered by other sources of financing. Retaining the assumption that donors will finance 50% of amortization costs plus freight and insurance and logistic costs, the sum of 148 GF remains to be financed, either by the local authorities or by households. But the present charge is only 50 GF per course of treatment. So the health centre faces a deficit of 98 Gf per case treated. In other words, if the health centre wants to recover the recurrent non-salary costs of treating children with uncomplicated malaria exclusively through itemized charging, the charge needs to be:

- 196 GF if the donors and local government do not intervene;
- 148 GF if the donors finance 50% of the amortization costs.

4.2.1.3 Summary

Data on the costs to be recovered, the charges and the financing required for these two activities are summarised in Table 4.1.

Table 4.1

Maneah Health Centre - Year 1991
Comparison of itemized fees and costs to be recovered
with (without) the contributions of donors

Activity	Cost to be recovered	Current fee	Financing required (-profit; + loss)
Childbirth	590 (652)	1,000 1,000	-410 (-348
Uncomplicated malaria in children	148 (196)	50 50	+98 (+146)

4.2.2 The costs of hospitalization at the Dalaba Hospital and their financing

The activity studied here is hospitalization in the surgery department. The costs of this activity are set out in Table B2 (Annex 2). For the year 1991, these costs amounted to 86 029 Guinean francs, comprising 20 656 GF for salaries, 19 046 GF paid by the central Government and 1 610 GF paid by the Prefecture. The costs to be recovered per hospital case amount to 65 373 GF. As the present charge is 7 150 GF (including the cost of the patient's personal record of treatment (carnet de soins) which is 150 GF), an amount of 58 223 GF is needed to finance each hospital case. Retaining the assumption that donors will finance 50% of amortization costs, the final deficit per hospital case will be 36 836 GF. These results are set out in Table 4.2.

Table 4.2

Dalaba Hospital - Year 1991
Comparison of itemized fees and costs to be recovered
with (without) the contributions of donors

Activity	Cost to be recovered	Current fee	Financing required (-profit; + loss)
Hospitalization for surgery	65,373 (43.986)	7,150 7,150	+58,223 (+36,836)

4.3 Extension of Analysis to subsequent years

Projections can be made for subsequent years on the basis of the assumptions used for the parameters described in sub-section 4.1. In actual practice, most of the elements that must be taken into account in the calculation of costs - the quantities and prices of the goods and services consumed in the activities in question, factors affecting demand, etc. - vary from year to year. It is therefore essential to make the necessary adjustments to update costs so that they accurately reflect the realities of each year. If charges are being set on the basis of the actual costs of activities, this aspect of the problem must also be taken properly into account.

From the standpoint of economic efficiency, the ideal solution would be to adjust charges annually in line with the annual rate of cost increase. But regular annual adjustment of charges might not be very well received by the population which is not accustomed to this practice. More importantly, it would be administratively costly to alter the charges every year. One solution would be to set charges for a certain number of years, e.g. three years. This would make it possible to adopt a charge corresponding to the costs in the third year or

be to set charges for a certain number of years, e.g. three years. This would make it possible to adopt a charge corresponding to the costs in the third year or the mean level of costs over the three years.

4.3.1 Parameters

The main parameters used in the projections are the rate of inflation, the annual rate of depreciation of the national currency, the annual rate of growth in the demand for health care and the interest rate. The volume of activity (number of consultations, hospitalizations, etc.) is also of some importance in the calculation of mean costs. Mean variable costs may not always go down in line with the volume of activity in a health facility, but mean fixed costs are inversely proportional to the volume of activity. Hence it is possible that the mean costs of care may decrease when the volume of activity rises.

4.3.2 Results for the year 1992

For 1992 we shall only present the tables summarising the costs and the financing required.

4.3.2.1 Costs of activities and their financing at the Maneah Health Centre

Childbirth

As shown in Table B2, projection of the cost of childbirth is estimated at 1 258 Guinean francs in 1992. As the Government will bear the cost of salaries which is estimated at 477 GF, a difference of 781 GF remains to be financed from other sources. If the present rate of 1000 GF per delivery is maintained, the centre will make a gross profit of 219 GF per childbirth. If the assumption that donors will continue to finance 50% of amortization costs is also maintained, the gross profit will amount to 293 GF. In 1992 the centre will thus make an overall profit but the margin will be smaller than in 1991 as costs will have risen between 1991 and 1992.

Treatment of children with uncomplicated malaria

As shown in Table C2, the cost of treating a child with uncomplicated malaria will be 777 Guinean francs in 1992. If the Government continues to pay the cost of salaries, which will be 542 GF, and if the present charge of 50 GF per treatment is maintained, a deficit of 185 GF will remain. If donors finance 50% of the amortization costs, there will still be a net deficit of 127 GF per treatment. It is obvious that this deficit will persist and that it will have increased by 29 GF as compared with 1991 because costs will have increased.

4.3.2.2 Costs of activities and their financing at the Dalaba Hospital

At the Dalaba Hospital too, costs will evolve in accordance with the same scenario as at the Maneah Health Centre. As shown in Table B2, the cost of hospitalization in the surgery department is estimated at 99 991 Guinean francs for the year 1992. The financial deficit would be 44 593 GF if the donors contributed to financing and 69 689 GF if they did not intervene. The reasons for the increased net deficit that would result are the same as in the case of the Maneah Health Centre.

4.3.3 Results for the year 1993

For 1993 we shall again present only the summary tables of costs and financing required. Costs will rise in 1993 in accordance with the same scenario as described above. The results of the projections are presented in tables B2 for childbirth at the Maneah Health Centre, C2 for the treatment of uncomplicated malaria in children at the Maneah Health Centre, and B2 for hospitalization in the surgery department of the Dalaba Hospital. The increase in costs in 1993 as compared with 1992 has reduced the gross margin of profit for childbirth at the Maneah Health Centre and increased the financial deficit for the treatment of uncomplicated malaria in children at the Maneah Health Centre and for hospitalization at the Dalaba Hospital.

5. The Influence of the Parameters on Costs

5.1 Introduction

In the preceding section we set out the results of a baseline scenario. It is important to note that there is only a certain level of probability that this scenario will actually be realised. In practice, important parameters such as inflation, the growth of demand for care and the exchange rate may be subject to changes. It therefore follows that deciders must have a minimum of information on the effects that any changes in the parameters may have on the volume and structure of the costs of health care. This information will facilitate discussion of the distribution of future charges among the different partners (Government, prefecture, households and donors).

5.2 Simulations after partial variations of parameters

The simulations that follow are partial in character. In each simulation, one parameter only will be changed, the others being maintained at their baseline scenario values:

(a)　　variation in the rate of inflation
　　　　(i) 10%;　　(ii) 30%

(b)　　variation in the rate of growth in demand for health care
　　　　(i) 0.2%;　　(ii) 4%

(c)　　variation in the rate of depreciation of the national currency
　　　　(i) 10%;　　(ii) 20%.

In a simulation, we look at the impact of variation of the parameter on the total cost of the health service in question and its impact on the financing required. Each simulation has been carried out in respect of the activities studied at the Maneah Health Centre and the Dalaba Hospital. A comparison is also made with the baseline scenario.

It can be seen from tables 5.1 to 5.3 and figures 1 to 18 in Annex 3 that the costs and the financing required increase with the rate of inflation. A margin of profit is achieved in the case of childbirth at the Maneah Health Centre, but this almost completely disappears when the inflation rate is 30%. The increase in the rate of growth of demand has a negative effect on unit costs. Thus the financing required decreases as this rate rises. In the case of childbirth the margin of profit is increased. The rate of depreciation of the national currency also has a significant effect on the level of costs and the financing required. Depreciation in excess of purchasing power parity (PPP) increases the cost of care and financing required.

Table 5.1

Maneah Health Centre
Simulations of the cost of childbirtth
and the financing required (in GF 1991-1993)

Type of simulation	Cost of childbirth			Financing required		
	1991	1992	1993	1991	1992	1993
a) Variation in the rate of inflation						
10%	1,056	1,135	1,219	-415	-361	-302
20%	**1,067**	**1,240**	**1,443**	**-410**	**-297**	**-163**
30%	1,077	1,347	1,689	-405	-233	- 10
b) Variation in the rate of growth of demand						
0.2%	1,067	1,257	1,481	-410	-294	-54
2.6%	**1,067**	**1,240**	**1,443**	**-410**	**-297**	**-163**
4%	1,067	1,231	1,422	-410	-299	-168
c) Variation in the rate of depreciation of the national currency						
10%	1,028	1,172	1,337	-429	-343	-243
15%	**1,067**	**1,240**	**1,443**	**-410**	**-297**	**-163**
20%	1,142	1,351	1,603	-372	-230	- 55

N.B.   The figures in bold type represent the baseline scenario.

Table 5.2

Maneah Health Centre
Simulations of the cost of treating uncomplicated malaria
in children and financing required (in GF 1991-1993)

Type of simulation	Cost of malaria treatment			Financing required		
	1991	1992	1993	1991	1992	1993
a) Variation in the rate of inflation						
10%	660	696	734	94	105	116
20%	**668**	**758**	**859**	**98**	**123**	**151**
30%	676	821	997	102	142	192
b) Variation in the rate of growth of demand						
0.2%	668	774	900	98	127	160
2.6%	**668**	**758**	**859**	**98**	**123**	**151**
4%	668	748	837	98	121	147
c) Variation in the rate of depreciation of the national currency						
10%	643	728	823	86	107	132
15%	**668**	**758**	**859**	**98**	**123**	**151**
20%	722	821	935	125	155	190

N.B.   The figures in bold type represent the baseline scenario.

Table 5.3

Dalaba Hospital
Simulations of the cost of hospitalization
in the surgery department and financing required
(in GF 1991-1993)

Type of simulation	Cost of hospitalization			Financing required		
	1991	1992	1993	1991	1992	1993
a) Variation in the rate of inflation						
10%	80,714	86,385	92,479	33,303	35,505	39,969
20%	**86,029**	**99,991**	**116,286**	**36,836**	**44,593**	**53,736**
30%	91,345	114,640	144,011	40,369	53,376	69.973
b) Variation in the rate of growth of demand						
0.2%	87,713	103,924	123,179	37,577	46,343	56,837
2.6%	**86,029**	**99,991**	**116,286**	**36,836**	**44,593**	**53,736**
4%	85,083	87,822	112,553	36,420	43,628	52,057
c) Variation in the rate of depreciation of the national currency						
10%	69,962	80,432	92,503	28,499	34,207	40,838
15%	**86,029**	**99,991**	**116,286**	**36,836**	**44,593**	**53,736**
20%	115,385	135,158	158,480	51,834	62,823	75,938

N.B.   The figures in bold type represent the baseline scenario.

5.3   Simulations with Simultaneous Variation of Parameters

It is obvious that it is also possible to vary the levels of the different parameters simultaneously.   We have thus defined three scenarios, as shown in Table 5.4.

Table 5.4

Scenarios with simultaneous variation of parameters

	Rate of inflation	Rate of growth of demand	Rate of depreciation of national currency
Optimistic scenario	10%	2.6%	5% (PPP)
Semi-optimistic scenario	**20%**	**2.6%**	**15% (PPP)**
Pessimistic scenario	20%	0.2%	20%

N.B.   **The figures in bold type represent the baseline scenario.**

Once again it must be remembered that there is only a certain degree of probability that any of the scenarios described above will actually materialise. The scenario ultimately adopted will depend on how the Ministry of Finance, the Ministry of the Plan and the Ministry of Health and Population judge the projections made for parameters such as the anticipated rate of inflation, the anticipated rate of depreciation of the national currency and parameters relating to the evolution of demand.

The results of the three scenarios are given in Table 5.5 and in figures 19 to 24 in Annex 3.   They confirm that costs and financing requirements are sensitive to changes in the values of parameters, as we have explained in section 4.   More important still, these results underscore the need for adequate forecasting of the socioeconomic environment for cost analysis.

Table 5.5

**Simulations of costs and financing required
with simultaneous variation of parameters
(in GF 1991-1993)**

Type of simulation	Cost			Financing required		
	1991	1992	1993	1991	1992	1993
Childbirth						
a) Optimistic scenario	1,056	1,135	1,219	-415	-361	-302
b) Semi-optimistic scenario	**1,067**	**1,240**	**1,443**	**-410**	**-297**	**-163**
c) Pessimistic scenario	1,142	1,370	1,646	-372	-227	-44
Uncomplicated malaria in children						
a) Optimistic scenario	660	696	734	94	105	116
b) Semi-optimistic scenario	**668**	**758**	**859**	**98**	**123**	**151**
c) Pessimistic scenario	722	841	979	125	160	201
Hospitalization for surgery						
a) Optimistic scenario	80,714	86,385	92,479	33,303	36,505	39,939
b) Semi-optimistic scenario	**86,029**	**99,991**	**116,286**	**36,836**	**44,593**	**53,736**
c) Pessimistic scenario	117,756	140,718	168,264	52,921	65,393	80,495

N.B.   The figures in bold type represent the baseline scenario.

6. Conclusions and Recommendations

This study has enabled us to better understand the problems of financing health care in Guinea. The results of the study have led us to formulate conclusions and recommendations on a certain number of stages to be followed in establishing a strategy for cost recovery.

6.1 Analysis of the costs of health care

6.1.1 Development of the methodology for cost calculation

(i) It was first of all necessary to obtain the most accurate data possible on the different categories of costs observed in 1991. For the moment, lacking sufficient data, we have had to make assumptions about the size of the infrastructure and the costs of the acquisition and amortization of the buildings at the Maneah Health Centre and the Dalaba Hospital.

(ii) With regard to the equipment at the Dalaba Hospital, we have used the list of equipment proposed for prefectural hospitals by the Ministry of Public Health and Population (1989). The prices of the equipment are based on information from UNIPAC (1990). It remains to be seen whether this list of equipment proposed in the context of the PDSS will actually be adopted.

(iii) Although we have information on the total cost of the drugs used at the Dalaba hospital, we have no reliable data on the cost of the drugs prescribed in the different departments of the hospital. In order to calculate the cost per case hospitalized in the surgery department, we have assumed that the surgery department's share of overall drug costs is the same at the Dalaba Hospital as at the hospital in Koundara. A more detailed system of accounting by department is needed in order to be able to calculate charges per episode of hospitalization.

(iv) Detailed information on the volume of activity in each hospital department are also needed to calculate the rates to be charged in a system of itemized charging by activity. To calculate the charge for appendectomy, for example, it will be necessary to know the number of appendectomies carried out, as well as the costs assumed directly by the patient, i.e. the cost of the drugs prescribed and the medical materials used.

(v) In section 5, we have mentioned the importance of being well aware of the way in which macroeconomic parameters, such as the domestic rate of inflation, the rate of inflation in the

countries from which equipment and drugs are imported, and the rate of depreciation of the national currency are likely to evolve. This information is needed in order to avoid underestimating future costs to the extent possible. If they really wish to reduce this risk to the minimum, deciders can use the most pessimistic scenario to calculate costs and determine the structure of the financing of these costs.

6.1.2 Application of the methodology to other health facilities

The calculations set out in this study are only part of the first stage in the development of a system of cost recovery. These calculations need to be repeated for other health centres and prefectural hospitals. We recommend that about fifteen health centres and hospitals should be studied in an exercise of this kind. The sample chosen should be representative of the different levels and sizes of health facilities and the different types of activities carried within them. The results of the calculation of the cost of activities at these different health facilities will provide us with information on the variance of these costs among health facilities of a similar level. This information will be essential for the establishment of a viable system of cost recovery and charges.

6.1.3 Study of the structure and variance of costs

This stage is necessary to ensure that differences between health facilities and between regions are properly taken into account. Such differences may arise for several reasons, including efficiency in the provision of services and factors affecting demand for care. This variance needs to be known in order to know whether a differential system of financing is reasonable.

6.2 Choice of modalities of financing and a system of fees

6.2.1 Cost sharing

The methodology proposed in this study will also enable deciders to define a strategy for cost sharing. The readiness of donors to contribute to the financing of care will obviously affect the relative level of the charges that will have to be financed from national sources. Another important question is not just the willingness but the ability of the Government and the prefectures to co-finance activities. It is important to know, for example, whether the contributions envisaged from the State are compatible with the constraints on the Government's budget. Another question is whether the promised financing may run into problems of the

availability of foreign exchange[2].

Finally, any decision by the Government defining the contribution of households to the financing of costs may have effects on the objective of equity and access to services.

6.2.2 Modalities of fee setting

(i)   In section 3 we have outlined the most important criteria for the evaluation of a cost recovery system, in particular the criteria of cost efficiency, equity and administrative efficiency. Economic efficiency or minimization of the costs of care (given the quantity and quality of services) will increase the purchasing power of households and thereby stimulate access to care. Administrative efficiency is another important criterion and means that a system must be compatible with existing administrative capacities. If this is not so, administration will absorb an excess of resources that could be more effectively used elsewhere. The third criterion, equity, requires that all patients with the same need should have the same access to care. We have observed that flat rate and prepayment systems of charging go further towards meeting the objective of equity than a system of itemized charges.

In the case of Guinea, a flat rate sytem would be the most appropriate, especially for the health centres and prefectural hospitals. This would be the system best able to satisfy all three of these criteria. Substantial alteration of the method of cost recovery used in the EPI/PHC system currently in force at many health centres is not immediately needed. The results of the socioeconomic survey carried out in November 1990 will give deciders information on access to care and will provide food for discussion of a possible revision of the system of cost recovery for primary health care.

(ii)   As we have already pointed out in section 4, both the quantities and prices of the goods and services consumed by health activities and factors affecting demand fluctuate over time. Regular updating of costs and charges is therefore necessary. But regular annual adjustments would be costly, particularly in terms of administrative efficiency. We therefore recommend that charges should be set for a certain number of years, e.g. three years. It would then be possible to adopt rates corresponding to the costs in

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[2] For a better understanding of the links between the public health sector and the rest of the economy, see Camen and Carrin (1991).

the third year or to the mean level of costs over the three years.

(iii)   Socioeconomic conditions, the standard of living and access to care may vary so widely between the different regions of the country that the introduction of a nationwide fee system must be contemplated with great caution. A national system could well run counter to the objective of equity, with households in the least economically developed regions having more difficulty with access than those in the regions that are more well off. A system of charges differentiated by region will then need to be considered.

A system of this kind can carry important implications that must be pointed out here.   In practice, reduction of the rates charged in some regions below the national level must be financed by the system as a whole.   In the first place, a review of the roles of the Government, the prefectures and the donors in the financing of care in the different regions will be necessary.   Secondly, it will also be necessary to know to what extent the prefectures and the population of the more well off regions are able to contribute to the financing of health care services in the deprived regions.   The establishment of an equalization fund might be considered, for example.   It should be noted that the method of cost calculation proposed in this study includes the possibility of contributing an amount equivalent to a certain percentage of a health facility's volume of activity to this fund.

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Working Tool for Analysis of the Costs of Health Care and their Recovery in Guinea

Calculation of costs at the Maneah Health Centre

Table	Cell	
A1	A51	Year of operation and type of simulation
A2	A81	Parameters relating to demand for care
A3	A101	Parameters relating to the structure of costs
A4	A121	Parameters relating to the evolution of prices
A5	A141	Parameters relating to contribution to the financing of care
A6	A161	General data on the health centre
A7	A181	Epidemiological data
A8	A241	Distribution of personnel by percentage of working time
A9	A261	Distribution of personnel by hours per week
A10	A281	Monthly salaries and bonuses of personnel
A11	A301	Distribution of annual salaries of personnel
A12	A321	Distribution of annual bonuses of personnel
A13	A341	Total annual salaries and bonuses
A14	A361	Cost and amortization of infrastructure
A15	A381	Cost and amortization of medical equipment
A16	A401	Distribution of medical equipment by activity
A17	A421	Amortization of medical equipment by activity
A18	A441	Annual expenditure excluding salaries
A19	A521	Annual expenditure of the health centre
A20	A541	Distribution of working time by medical activity
A21	A561	Coefficients of indirect cost distribution for the calculation of the cost of curative care
B1	A621	Costs of childbirth
B2	A701	Financing of the costs of childbirth
B3	A721	Financing required
C1	A741	Costs of treating uncomplicated malaria in children
C2	A821	Financing of the costs of treating uncomplicated malaria in children
C3	A841	Financing required

Table A1   YEAR OF OPERATION AND TYPE OF SIMULATION

Year > 1991

Type of simulation > baseline simulation

Table A2   PARAMETERS RELATING TO DEMAND FOR CARE

rate of population growth	>	2.6%
birth rate	>	4.6%
rate of increase in demand for general care	>	0.0%
rate of increase in childbirth	>	0.0%
rate of increase in EPI activities	>	0.0%

Table A3   PARAMETERS RELATING TO THE STRUCTURE OF COSTS

freight/insurance rate	>	0.0%
logistic rate	>	2.0%
rate of contribution to equalization fund	>	0.0%

Table A4   PARAMETERS RELATING TO THE EVOLUTION OF PRICES

rate of inflation in countries of origin of equipment and drugs	>	5.0%	rate of increase in salaries and bonuses	15.0%
domestic rate of inflation	>	20.0%	rate of increase in overhead costs (local origin)	20.0%
interest rate	>	20.0%		
rate of depreciation of the national currency	>	15.0%		

Table A5   PARAMETERS RELATING TO CONTRIBUTION TO THE FINANCING OF CARE

rate of participation of donors to financing of amortization	>	50.0%
rate of increase in charges for households	>	0.0%

Table A6   GENERAL DATA ON THE MANEAH HEALTH CENTRE

	No. observed 1990	No. anticipated 1991
consultations 1st contact	9707	9707
consultations follow-up	426	426
antenatal consultations (1st contact)	967	967
childbirths	598	598
immunizations	-	-

	Population observed 1990	Population anticipated 1991
population of sub-prefecture	9021	9256
population at < 5 km from health centre	6671	6844

Table A7   EPIDEMIOLOGICAL DATA ON THE MANEAH HEALTH CENTRE
Baseline year 1990

disease	<15 yrs	>15 yrs	total	relative %<15 yrs	frequency %>15 yrs
tetanus					
polio					
measles					
whooping cough					
diphtheria					
suspected tb					
uncomplic. malaria	1173	767	1940	15.5%	10.1%
pernic malaria					
dracunculiasis					
jaundice					
vomiting					
abdom pain					
hernias					
non-spec diarrhoea					
diarrh + dehydr					
spec diarrhoea					
diarrh + dehydr					
int helminth					
headache					
meningitis					
chest pain					
respir dis					
respir inf ATB					
oedemas					
dyspnea					
anaemia					
malnutrition					
gonorrhoea					
urinary infects					
gyn disorders					
joint pain					
eye disease					
onchocerciasis					
ear diseases					
toothache					
skin diseases					
susp leprosy					
wound/burn					
fracture					
other					
Total	5238	2320	7558		

Table A8   DISTRIBUTION OF PERSONNEL BY PERCENTAGE OF WORKING TIME

category	curative consult.	MCH	minor med. care	childbirth	administration
chief medical officer	80.0%				20.0%
deputy cmo	80.0%	1.0%			19.0%
midwife		80.0%		17.5%	2.5%
thw 1					100.0%
thw 2			90.0%		10.0%
thw 3	90.0%				10.0%
thw 4		90.0%			10.0%
thw 5					
thw 6					
nurse	45.0%	45.0%	10.0%		0.0%
guard	2.5%	2.5%	2.5%	2.5%	90.0%

Table A9   DISTRIBUTION OF PERSONNEL BY HOURS PER WEEK

category	curative consult.	MCH	minor med. care	childbirth	administration
chief medical officer	32	0	0	0	8
deputy cmo	32	0	0	0	8
midwife	0	32	0	7	1
thw 1	0	0	0	0	40
thw 2	0	0	36	0	4
thw 3	36	0	0	0	4
thw 4	0	36	0	0	4
thw 5					
thw 6					
nurse	18	18	4	0	0
guard	1	1	1	1	36
total	119	87	41	8	105

Table A10 MONTHLY SALARIES AND BONUSES OF PERSONNEL IN GF

category	monthly salary	monthly bonus
chief medical officer	95240	7500
deputy cmo	91450	5000
midwife	88655	5000
thw 1	62872	5000
thw 2	62872	
thw 3	62872	
thw 4	62872	
thw 5		
thw 6		
nurse	51918	5000
guard	26250	

Table A11 DISTRIBUTION OF ANNUAL SALARIES OF PERSONNEL

category	curative consult.	MCH	minor med. care	childbirth	administration
chief medical officer	914304				228576
deputy cmo	877920	10974			208506
midwife		851088		186176	26597
thw 1					754464
thw 2			679018		75446
thw 3	679018				75446
thw 4		679018			75446
thw 5					
thw 6					
nurse	280357	280357	62302		
guard	7875	7875	7875	7875	283500
	2759474	1829312	749194	19405	1727982

Table A12 — DISTRIBUTION OF ANNUAL BONUSES OF PERSONNEL

category	curative consult.	MCH	minor med. care	childbirth	administration
chief medical officer	72000				18000
deputy cmo	48000	600			11400
midwife		48000		10500	1500
thw 1					60000
thw 2					
thw 3					
thw 4					
thw 5					
thw 6					
nurse	27000	27000	6000		
guard					
	147000	75600	6000	10500	90900

Table A13 — TOTAL ANNUAL SALARIES AND BONUSES IN GF

Salaries	7260012
Bonuses	330000
Total	7590012

Table A14 — COST AND AMORTIZATION OF INFRASTRUCTURE IN GF

category	quantity	initial cost	lifetime	fut value infrastr	amortiz year 1
m² building	150	150000	20	862595998	1350000
share local currency:	0.50				
beds	5	50000	10	1547934	30000
office furniture	3	20000	10	371504	7200
total				864515437	1387200

Table A15 COST AND AMORTIZATION OF MEDICAL EQUIPMENT IN GF

category	initial cost	lifetime	fut value equipment	amortization year 1
refrigerator	1000000	10	6191736	120000
moped	1200000	5	2985984	288000
sphygmo- manometer	15000	2	21600	9000
stethoscope	10000	2	14400	6000
adult scales	20000	8	85996	3000
thermometer	2000	0.5	2191	4800
baby scales	15000	3	25920	6000
delivery table	263840	15	4064989	21107
				457907

Table A16 DISTRIBUTION OF MEDICAL EQUIPMENT BY ACTIVITY

category	curative consult.	MCH	minor med. care	childbirth	all activs
refrigerator	1				
moped	1				
sphygmo- manometer	2			1	1
stethoscope	4	2	1		1
adult scales					1
thermometer	4	2	1		1
baby scales	1				
delivery table				1	

Table A17   AMORTIZATION OF MEDICAL EQUIPMENT BY ACTIVITY IN GF

category	curative consult.	MCH	minor med. care	childbirth	all activs
refrigerator		120000			
moped		288000			
sphygmo-manometer	18000			9000	9000
stethoscope	24000	12000	6000		6000
adult scales					3000
thermometer	19200	9600	4800		4800
baby scales	6000				
delivery table				21107	
total	67200	429600	10800	30107	22800

Table A18   ANNUAL EXPENDITURE EXCLUDING SALARIES IN GF

Category:

essential drugs	2355172
freight/insurance logistics	47103
management tools	544444
fuel cold chain	198000
advance activities	26400
maintenance moped	180000
bonuses	330000
amortization fund	1845107

Other expenditure:

office supplies	96200
maintenance materials	56000
maintenance premises	10000
packaging of small medical supplies	84600
miscellaneous materials	200000
repairs premises	300000
transport bank payments	24000
unforeseen	200000

sub-total	6497027
special equalization fund	-
total	**6497027**
of which share of other overhead costs	970800

Table A19   ANNUAL EXPENDITURE OF THE HEALTH CENTRE

A.	Expenditure excluding equalization fund	13757039
B.	Expenditure excluding salaries	6497027
C.	Expenditure for essential drugs and management tools	2946720
D.	Multiplier coefficient (B/C)	2.20

Table A20   DISTRIBUTION OF WORKING TIME BY MEDICAL ACTIVITY

medical activity	hours	%
curative consultations	119	46.6%
MCH	87	34.2%
minor medical care	41	16.1%
childbirth	8	3.1%
total	255	100%

Table A21   COEFFICIENTS OF INDIRECT COST DISTRIBUTION
                    FOR THE CALCULATION OF THE COST OF CURATIVE CARE

disease	%<15 yrs	%>15 yrs
tetanus		
polio		
measles		
whooping cough		
diphtheria		
suspected tb		
uncomplic malaria	7.2%	4.7%
pernic malaria		
dracunculiasis		
jaundice		
vomiting		
abdom pain		
hernias		
non-spec diarrhoea		
diarrh + dehydr		
spec diarrhoea		
diarrh + dehydr		
int helminth		
headache		
meningitis		
chest pain		
respir dis		
respir inf ATP		
oedemas		
dyspnea		
anaemia		
malnutrition		
gonorrhoea		
urinary infects		
gyn disorders		
joint pain		
eye disease		
onchocerciasis		
ear diseases		
toothache		
skin diseases		
susp leprosy		
wound/burn		
fracture		
other		
total		

Table B1   COSTS OF CHILDBIRTH IN GF

1. Drugs:

drug	unit	cost of drugs GF/unit	cost
aas	18.00	1.28	23.04
tetracycline ointment	1.00	135.00	135.00
ligature thread	1.00	5.00	5.00
razor blade	1.00	25.00	25.00
soap	1.00	200.00	200.00
dressing	1.00	5.00	5.00
ergometrine	1.00	53.00	53.00
	sub-total		446.04
freight/insurance			-
logistics			8.92
	total drugs		454.96

2. Annual direct remuneration:

salaries	194050.50	per childbirth	324
bonuses	10500.00	per childbirth	18

3. Annual indirect remuneration:

salaries	1727982	per childbirth	91
bonuses	90900	per childbirth	5
coefficient of distribution	3.1%		

4. Annual direct amortization: 30107   per childbirth   50

5. Annual indirect amortization:

	1410000	per childbirth	73
coefficient of distribution	3.1%		

6. Other overhead costs:

	970800	per childbirth	51
coefficient of distribution	3.1%		

total cost per childbirth	1067
total cost per childbirth excluding salaries	652
multiplier coefficient	1.43

Table B2   FINANCING OF THE COSTS OF CHILDBIRTH

category of costs	GF per childbirth	Government	source of financing Prefecture	households	donors
salariea	415	415			
bonuses	22				
drugs	446				1000
freight/insur					
logistics	9				
dir amortization	50				25
indir amortiz 73					37
other					
overheads	51				
total	1067	415		1000	62

Table B3   FINANCING REQUIRED

source of financing	contribution per childb in GF	financing required in GF per childbirth	total
Government	415		
Prefecture	0 >>>	-410	-396614
Households	1000		
Donors	62		
Total financing	1477		

Table C1   COSTS OF TREATING UNCOMPLICATED MALARIA IN CHILDREN IN GF

1. Drugs:

drug	unit	cost of treatment GF/unit	cost
aas	6.00	1.28	7.68
chloroquine	2.00	3.83	7.66
		sub-total	15.34
freight/insurance logistics			0.31
		total drugs	15.65

2. Annual direct remuneration:

salaries	2759474	per treatment	365
bonuses	147000	per treatment	19
relative frequency	15.5%		

3. Annual indirect renumeration:

salaries	1727982	per treatment	107
bonuses	90900	per treatment	6
coefficient of distribution	7.2%		

4. Annual direct amortization:

4. Annual direct amortization:	67200	per treatment	9
relative frequency	15.5%		

5. Annual indirect amortiz:

5. Annual indirect amortiz:	1410000	per treatment	87
coefficient of distribution	7.2%		

6. Other overhead costs:

6. Other overhead costs:	970800	per treatment	60
coefficient of distribution	7.2%		

total cost per treatment	668
total cost per treatment excluding salaries	196
multiplier coefficient	13

Table C2 FINANCING OF THE COSTS OF TREATING UNCOMPLICATED MALARIA IN CHILDREN

category of costs	GF per treatment	Government	source of financing Prefecture	households	donors
salariea	472	472			
bonuses	25				
drugs	15			50	
freight/insur					
logistics					
dir amortization	9				4
indir amortiz	87				43
other					
overheads	60				
total	668	472		50	48

Table C3 FINANCING REQUIRED

source of financing	contribution per treatment in GF	financing required in GF per treatment	total
Government	472		
Prefecture	0 >>>	98	115488
Households	50		
Donors	48		
total financing	570		

Table A1   YEAR OF OPERATION AND TYPE OF SIMULATION

Year > 1992

Type of simulation > baseline simulation

Table B2   FINANCING OF THE COSTS OF CHILDBIRTH

category of costs	GF per childbirth	Government	source of financing Prefecture	households	donors
salariea	465	465			
bonuses	25				
drugs	535			1000	
freight/insur					
logistics	11				
dir amortization	59				29
indir amortiz	85				43
other					
overheads	59				
total	1240	465	0	1000	72

Table B3   FINANCING REQUIRED

source of financing	contribution per childb in GF	financing required in GF per childbirth	total
Government	465		
Prefecture	0 >>>	- 297	-287555
Households	1000		
Donors	72		
total financing	1537		

60

Table C2   FINANCING OF THE COSTS OF TREATING UNCOMPLICATED MALARIA IN CHILDREN

category of costs	GF per treatment	Government	source of financing Prefecture	households	donors
salariea	529	529			
bonuses	28				
drugs	18	50			
freight/insur					
logistics					
dir amortization	10	5			
indir amortiz	102	51			
other					
overheads	70				
total	758	529	0	50	56

Table C3   FINANCING REQUIRED

source of financing	contribution per treatment in GF	financing required in GF per treatment	total
Government	529		
Prefecture	0 >>>	123	147894
households	50		
Donors	56		
total financing	635		

Table A1 YEAR OF OPERATION AND TYPE OF SIMULATION

Year > 1993

Type of simulation > baseline simulation

Table B2 FINANCING OF THE COSTS OF CHILDBIRTH

category of costs	GF per childbirth	Government	source of financing Prefecture	households	donors
salariea	521	521			
bonuses	28				
drugs	642			1000	
freight/insur					
logistics	13				
dir amortization	69				34
indir amortiz	100				50
other					
overheads	70				
total	1443	521	0	1000	84

Table B3 FINANCING REQUIRED

source of financing	contribution per childb in GF		financing required in GF per childbirth	total
Government	521			
Prefecture	0	>>>	- 163	-157452
Households	1000			
Donors	84			
total	1606			

Table C2 **FINANCING OF THE COSTS OF TREATING UNCOMPLICATED MALARIA IN CHILDREN**

category of costs	GF per treatment	source of financing			
		Government	Prefecture	households	donors
salariea	593	593			
bonuses	31				
drugs	22	50			
freight/insur					
logistics					
dir amortization	12	6			
indir amortiz	119	59			
other					
overheads	82				
total	859	593	0	50	66

Table C3 **FINANCING REQUIRED**

source of financing	contribution per treatment in GF		financing required in GF per treatment	total
Government	593			
Prefecture	0	>>>	151	186959
Households	50			
Donors	66			
total financing	708			

Working tool for analysis of the costs of health care and their recovery in Guinea

Calculation of costs at the Dalaba Prefectural Hospital

Table	Cell	
A1	A81	Year of operation and type of simulation
A2	a101	Parameters relating to demand for care
A3	A121	Parameters relating to the structure of costs
A4	A141	Parameters relating to the evolution of prices
A5	A161	Parameters relating to contribution to the financing of care
A6	A181	General data on the Dalaba Hospital
A7	A201	Distribution of personnel by percentage of working time
A8	A281	Distribution of personnel by hours of work per week
A9	A361	Monthly salaries and bonuses of personnel
A10	A401	Distribution of total monthly salaries by department
A11	A481	Distribution of total monthly bonuses by department
A12	A561	Monthly salaries and bonuses of personnel
A13	A581	Costs of infrastructure
A14	A601	Costs of rolling stock
A15	A621	Costs of technical equipment
A16	A981	Annual expenditure excluding salaries and amortization
A17	A1021	Annual expenditure
A18	A1041	Distribution of hours of work

Calculation of the cost of hospitalization in the surgery department

B1	A1061	Costs of hospitalization in the surgery department
B2	A1141	Financing of costs of hospitalization in the surgery department
B3	A1161	Financing required

Table A1   YEAR OF OPERATION AND TYPE OF SIMULATION

Year > 1991

Type of simulation > baseline simulation

Table A2   PARAMETERS RELATING TO DEMAND FOR CARE

rate of population growth	>	2.6%
birth rate	>	4.6%
rate of increase in demand for general care	>	2.6%
rate of increase in hospitalization	>	2.6%

Table A3   PARAMETERS RELATING TO THE STRUCTURE OF COSTS

freight/insurance rate	>	25.0%
logistic rate	>	2.0%
rate of contribution to equalization fund	>	0.0%

Table A4   PARAMETERS RELATING TO THE EVOLUTION OF PRICES

rate of inflation in countries of origin of equipment and drugs	>	5.0%	rate of increase in salaries and bonuses		15.0%
domestic rate of inflation	>	20.0%	rate of increase in overhead costs (local origin)		20.0%
interest rate	>	20.0%			
rate of depreciation of the national currency	>	15.0%			
exchange rate GF/$ October 1991		680.00			

Table A5   PARAMETERS RELATING TO CONTRIBUTION
TO THE FINANCING OF CARE

rate of participation of donors to financing of amortization	>	50.0%
rate of increase in charges for households	>	0.0%

Table A6   GENERAL DATA ON THE DALABA HOSPITAL
BASELINE YEAR > 1990

	number of hospitalizations	
	actual 1990	anticipated 1991
general surgery	218	224
gynaecology/obstetrics	339	348
general medicine and paediatrics	273	280
total	830	852

Table A7   DISTRIBUTION OF PERSONNEL BY PERCENTAGE OF WORKING TIME

category	general surgery	gynaeco-obstetric	gen med paediatric	dental surgery	labora-tory
director	80%				
physician 2	100%				
physician 3		100%			
midwife 1		100%			
midwife 2		100%			
thw 1	100%				
thw 2	100%				
thw 3			100%		
thw 4			100%		
thw 5			100%		
thw 6			100%		
thw 7				100%	
orderly 1	100%				
orderly 2		100%			
orderly 3			100%		
nurse 1		100%			
nurse 2		100%			
health asst 1			100%		
health asst 2				100%	
pharmacist					
biologist				100%	
lab technician					100%
radiog technician					
admin manager					
driver					
director			20%		
physician 2					
physician 3					
midwife 1					
midwife 2					
thw 1					
thw 2					
thw 3					
thw 4					
thw 5					
thw 6					
thw 7					
orderly 1					
orderly 2					
orderly 3					
nurse 1					
nurse 2					
health asst 1					
health asst 2					
pharmacist	100%				
biologist					
lab technician					
radiog technician		100%			
admin manager			100%		
driver			100%		

Table A8   DISTRIBUTION OF PERSONNEL BY HOURS PER WEEK

category	general surgery	gynaeco-obstetric	gen med paediatric	dental surgery	labora-tory
director			32		
physician 2	40				
physician 3		40			
midwife 1		40			
midwife 2		40			
thw 1	40				
thw 2	40				
thw 3			40		
thw 4			40		
thw 5			40		
thw 6			40		
thw 7				40	
orderly 1	40				
orderly 2		40			
orderly 3			40		
nurse 1		40			
nurse 2		40			
health asst 1			40		
health asst 2				40	
pharmacist					
biologist					40
lab technician					40
radiog technician					
admin manager					
driver					
sub-total	160	240	272	80	80

Table A8 (contd)   DISTRIBUTION OF PERSONNEL BY HOURS PER WEEK

category	pharmacy	radiology	administration
director			8
physician 2			
physician 3			
midwife 1			
midwife 2			
thw 1			
thw 2			
thw 3			
thw 4			
thw 5			
thw 6			
thw 7			
orderly 1			
orderly 2			
orderly 3			
nurse 1			
nurse 2			
health asst 1			
health asst 2			
pharmacist	40		
biologist			
lab technician			
radiog technician			40
admin manager			40
driver			40
sub-total	40		128

Table A9   MONTHLY SALARIES AND BONUSES OF PERSONNEL

category	factor: 1	salary 1991	bonus 1991	salary 1991	bonus 1991
director		143903	10000	143903	10000
physician 2		113468	5000	113468	5000
physician 3		113389	5000	111389	5000
midwife 1		92308	5000	92308	5000
midwife 2		92158	5000	92158	5000
thw 1		69502	5000	99502	5000
thw 2		68809	5000	68809	5000
thw 3		71085	5000	71085	5000
thw 4		73164	5000	73164	5000
thw 5		73764	5000	73764	5000
thw 6		66880	5000	66880	5000
thw 7		91280	5000	91280	5000
orderly 1		30000	5000	30000	5000
orderly 2		30000	5000	30000	5000
orderly 3		30000	5000	30000	5000
nurse 1		66319	5000	66319	5000
nurse 2		66319	5000	66319	5000
health asst 1		104806	5000	104806	5000
health asst 2		96939	5000	96939	5000
pharmacist		108224	7500	108224	7500
biologist		111839	5000	111839	5000
lab technician		86337	5000	86337	5000
radiog technician					
admin manager		101535	7500	101535	7500
driver		48426	5000	48426	5000

Table A10   DISTRIBUTION OF TOTAL MONTHLY SALARIES BY DEPARTMENT

category	general surgery	gynaeco-obstetric	gen med paediatric	dental surgery	labora-tory
director			115122		
physician 2	113468				
physician 3		111389			
midwife 1		92308			
midwife 2		92158			
thw 1	69502				
thw 2	68809				
thw 3			71085		
thw 4			73164		
thw 5			73764		
thw 6			66880		
thw 7				91280	
orderly 1	30000				
orderly 2		30000			
orderly 3			30000		
nurse 1		66319			
nurse 2		66319			
health asst 1			104806		
health asst 2				96939	
pharmacist					
biologist					111839
lab technician					86337
radiog technician					
admin manager					
driver					
sub-total	281779	458493	534821	188219	198176

Table A10 (contd)   DISTRIBUTION OF TOTAL MONTHLY SALARIES BY DEPARTMENT

category	pharmacy	radiology	administration
director			28781
physician 2			
physician 3			
midwife 1			
midwife 2			
thw 1			
thw 2			
thw 3			
thw 4			
thw 5			
thw 6			
thw 7			
orderly 1			
orderly 2			
orderly 3			
nurse 1			
nurse 2			
health asst 1			
health asst 2			
pharmacist	108224		
biologist			
lab technician			
radiog technician			
admin manager			101535
driver			48426
sub-total	108224		1178742

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Table A11   DISTRIBUTION OF TOTAL MONTHLY BONUSES BY DEPARTMENT

category	general surgery	gynaeco-obstetric	gen med paediatric	dental surgery	labora-tory
director			8000		
physician 2	5000				
physician 3		5000			
midwife 1		5000			
midwife 2		5000			
thw 1	5000				
thw 2	5000				
thw 3			5000		
thw 4			·5000		
thw 5			5000		
thw 6			5000		
thw 7				5000	
orderly 1	5000				
orderly 2		5000			
orderly 3			5000		
nurse 1		5000			
nurse 2		5000			
health asst 1			5000		
health asst 2				5000	
pharmacist					
biologist					5000
lab technician					5000
radiog technician					
admin manager					
driver					
sub-total	20000	30000	38000	10000	10000

Table A11 (contd)   DISTRIBUTION OF TOTAL MONTHLY BONUSES BY DEPARTMENT

category	pharmacy	radiology	administration
director			2000
physician 2			
physician 3			
midwife 1			
midwife 2			
thw 1			
thw 2			
thw 3			
thw 4			
thw 5			
thw 6			
thw 7			
orderly 1			
orderly 2			
orderly 3			
nurse 1			
nurse 2			
health asst 1			
health asst 2			
pharmacist	7500		
biologist			
lab technician			
radiog technician			
admin manager			7500
driver			5000
sub-total	7500		14500

Table A12   MONTHLY SALARIES AND BONUSES OF PERSONNEL

salaries 1948454

bonuses 130000

total 2078454

Table A13   COST OF INFRASTRUCTURE IN GF

category	initial unit cost	quantity	fut value	lifetime	annual amortiz year 1
building m^2 local share: 0.50	150000	1200	69007667986	20	10800000
beds	100000	40	24766946	10	480000
office furniture		5			
			6925534932		11280000

Table A14   COST OF ROLLING STOCK IN GF

category	initial cost	lifetime	future value	annual amortiz year 1
ambulance other	24000000	5	59719680	5760000
vehicle(s)	16000000	5	39813120	3840000
moped	1200000	5	2985984	288000
	41200000		102518784	9888000

Table A15   COSTS OF TECHNICAL EQUIPMENT

category	initial cost US $	lifetime	quantity	annual amortiz year 1
medical stethoscope	5.10	5	2	1665
obstetrical stethoscope	8.31	15	2	904
scales	31.45	15	1	1711
examination table	388.20	15	1	21118
knee hammer	4.95	15	2	539
laryngeal mirror	2.96	15	2	3222
set of nasal specula	23.40	15	3	3819
set of ear specula	23.40	15	3	3819
vaginal speculum	8.20	15	3	1338
ophthalmoscope-otoscope	136.00	15	1	7398
sphygmomanometer	36.60	5	1	5973
tongue depressor	2.30	15	4	500
thermometer	1.00	1	5	4080
pelvimeter	8.79	15	1	478
baby scales	151.80	15	1	8258
gloves	0.83	1	200	135456
Consultation Room			**sub-total**	**197378**
examination table	388.20	15	1	21118
20 cc glass syringes	0.11	1	10	898
10 cc glass syringes	0.07	1	10	571
3 cc glass syringes	0.05	1	100	4080
2.5 cc glass syringes	0.04	1	100	3264
intramuscular needles	0.02	1	500	8160
intravenous needles	0.02	1	500	8160
dental forceps (front teeth)	5.24	15	5	1425
dental forceps (back teeth)	5.24	15	5	1425
ampoule files	1.00	1	20	16320
Kocher forceps	2.44	15	20	2655
curved scissors	1.34	15	5	364
crimping scissors	1.34	15	5	364
kidney dish	7.87	15	2	856
24 cm drum	25.30	15	2	2753
Treatment Room - Injections and Immunization			**sub-total**	**72414**
table for minor surgery	314.00	15	1	17082
kit for minor surgery	240.00	15	1	13056
box of dressings	32.00	15	5	8704
curved scissors	1.40	15	2	152
straight scissors	1.40	15	5	381
series of gloves Nos 6-8	0.83	1	200	135456
instrument tray	10.69	15	2	1163
instrument sterilizer	308.94	15	1	16806
circumscr forceps	2.50	15	10	1360
Kocher forceps	2.44	15	20	2655

kidney dish	7.89	15	2	858
anatomical forceps	2.50	15	10	1360
scalpel handle	1.42	15	100	7725
scalpel blade	0.30	1	1000	244800
suture kit	42.00	15	2	4570
kidney dish	7.87	15	5	2141

Minor Surgery Ward   sub-total   **458268**

distillation kit	460.00	15	1	24480
methylene blue powder	11.40	1	2	18605
4-tube centrifuge	274.20	15	3	44749
staining box for	23.85	15	3	3892
microscope slides	1.32	1	2	2154
staining dish for	8.50	15	2	925
30 slides				
polyethylene funnel	0.46	5	5	375
polyethylene funnel, 200 ml	0.46	5	5	375
test tube, 100 ml	1.36	1	10	11098
test tube, 25 ml	4.70	1	10	38352
test tube, 500 ml	10.00	1	5	40800
50 ml plastic bottle	0.50	5	50	4080
10 ml dropper bottle	2.40	1	50	97920
round-necked narrow cork				
60 ml bottle	3.20	1	50	130560
round-necked wide cork				
60 ml bottle	3.30	1	50	134640
urine test bottle	0.10	1	5	408
Giemsa powder 10 g	0.50	1	2	816
complete haemacytometer	10.53	15	2	1146
complete haemoglobinometer	5.30	15	2	577
microscope oil, 25 ml	1.45	1	2	2366
microscope slides				
22 x 22 mm, box of 50	0.80	1	10	6528
microscope slides, box of 72	1.32	1	20	21542
alcohol lamp	3.30	15	3	539
lancets, box of 1000	36.00	1	5	146880
binocular microscope (PZO)	1810.00	15	1	98464
timer, 60 min x 1 min	20.40	5	2	6659
kit for urinary				
albumin test	2.59	1	10	21134
immersion lens for PZO				
lens paper, packet of 50	0.31	1	5	1265
forceps for blades				
Kirkbride 125	1.00	15	2	109
stainless steel				
125 mm forceps	0.65	15	5	177
urinary test set				
rack for 6 test tubes	4.80	15	5	1306
rack for Westergren				
sedimentation kit				
rack for test tubes				
test tubes 100 x 13 mm	0.21	1	50	8568
test tubes 150 x 25 mm	0.23	1	50	9384

test tubes 75 x 12 mm	0.25	1	50	10200
centrifuge tubes 15 ml, graduated	0.30	1	20	4896
centrifuge tubes 15 ml, non-graduated	0.28	1	50	11424
heater	13.10	15	2	1425
urine analysis kit laboratory thermometer	14.41	5	4	9407
vaccinostyles	1.00	1	2	1632
electric centrifuge	225.00	15	1	12240
haematoleucometer	10.53	15	2	1146
glass funnel	0.05	1	5	204
bain-marie incubator	577.52	15	1	31417
precision balance	652.11	15	1	35475
weights for balance, series	94.23	15	1	5126
balance for centrifuge tubes ordinary table	60.00	15	1	3264
chair	22.05	5	2	7197

Total Laboratory			sub-total	**1015925**

adult scales, 140 kg	30.85	15	3	5035
autoclavable poly-propylene bed pan	7.85	15	2	854
dressing dish, 1 litre with stainless steel cover	27.30	15	5	7426
stainless steel 140 mm Mayo straight dissecting scissors	1.39	15	5	378
140 mm Braun curved episiotomy scissors	1.39	15	5	378
vinyl 910 x 1920 mm mattress cover	5.00	5	20	16320
type 1, 280 mm Thomas blunt uterine curette	2.62	15	2	285
type 3, 280 mm Thomas blunt uterine curette	2.70	15	2	294
type 5, 280 mm Thomas blunt uterine curette	2.62	15	2	285
type 1, 280 mm Sims cutting uterine curette	2.70	15	2	294
type 3, 280 mm Sims cutting uterine curette	2.70	15	2	294
type 5, 280 mm Sims cutting uterine curette	2.75	15	2	299
complete Malmstrom vacuum extractor surgical gloves	0.83	1	100	67728
height measuring instrument, 2 m	8.52	5	5	6952

1.5 litre stainless steel irrigator obstetrical bed with 2-piece mattress	520.00	15	1	28288
tape measure, 1.5 m	1.00	1	10	8160
Collyer external pelvimeter	6.07	15	2	660
Deler internal pelvimeter	8.79	15	2	956
clinical infant scales, 15.5 kg	116.50	15	3	19013
stainless steel 300 mm Kelly placenta forceps	2.50	15	3	408
300 mm graduated Simpson uterine sound	2.73	1	2	4455
medium stainless steel Graves bivalve vaginal speculum	3.36	15	5	914
large stainless steel Graves bivalve vaginal speculum	3.48	15	5	947
Pinard fetal stethoscope	8.31	15	6	2712
stainless steel instrument tray	4.28	15	5	1164
3-section examination table	314.00	15	2	34163

Total Obstetrics, MCH and FP			**sub-total**	**208663**
examination table	388.20	15	1	21118
stool delivery table	1010.00	15	1	54944
obstetrical vacuum extractor	560.00	15	1	30464
tape measure	1.00		1	816
mechanical aspirator	47.40	15	1	2579
29 cm drum	23.87	15	2	2579
fetal stethoscope	8.31	15	2	904
reanimation apparatus	189.20	15	2	20585
jar for forceps	3.78	1	2	6169
hygienic bucket	3.07	5	2	1002
pelvimeter	8.79	15	1	478
series of gloves Nos 6-8	0.83	1	200	135456
gynaecological box	480.00	15	2	52224
suture kit	42.00	15	2	4570
height measurer	8.52	15	2	927
sphygmomanometer	36.60	5	2	11946
baby sheet	1.00	1	3	2448
sheet for delivery table	1.50	1	3	3672

sheet for bed	1.50	1	3	3762
screen	2.65	15	2	288
enema kit	1.50	2	3	1836

Delivery room | | | sub-total | 358695

stainless steel instrument box	4.28	15	5	1164
stainless steel 144 mm curved Mayo dissecting scissors	0.87	15	5	237
stainless steel 144 mm straight Mayo dissecting scissors	1.04	15	5	283
nail brush	0.51	5	5	416
surgical gloves 6-1/2	0.83	1	100	67728
surgical gloves 7	0.85	1	100	69360
surgical gloves 7-1/2	0.87	1	100	70992
scalpel blade No. 10 packet of 5	1.50	1	10	12240
razor blades packet of 5	0.16	1	20	2611
sharpening stone	12.00	5	1	1958
stainless steel 140 mm straight haemostatic forceps	1.69	15	6	552
stainless steel 140 mm Kelly straight haemostatic forceps	1.47	15	6	480
125 mm straight mosquito haemostatic forceps				
assortment of suture needles, 6 of each type	1.28	1	5	5222
stainless steel 125 mm straight needle forceps	0.90	15	5	245
stainless steel 150 mm straight needle forceps	1.00	15	5	272
stainless steel 225 mm straight swab forceps	1.25	15	5	340
280 mm Duplay retractor	0.65	15	2	71
stainless steel 200 mm flat forceps	0.75	15	6	245
stainless steel instrument tray 390x195x63 mm	4.28	15	5	1164
scalpel handle	1.42	15	3	232
operating table	1100.00	15	2	119680
anaesthesia trolley without drawers	85.58	15	4	18622
revolving stool	60.19	15	4	13097
cylindrical dressing drum 290 mm diameter	27.20	15	5	7398
set of 6 stainless steel Hank dilating bougies	10.88	15	2	1184
3-piece metal razor	4.60	2	5	9384
urinal	7.00	15	3	1142

all-purpose operating table 0188100	8000.00	15	1	435200
EMO anaesthesia apparatus for ether 01002001	2200.00	15	1	119680
pressure steam sterilizer 0156500	6000.00	15	1	326400
kerosene heater 174000.00	14.99	15	1	815
electric hot air sterilizer 0164800	700.00	15	1	38080
220 v. electric water sterilizer 0166500	110.00	15	1	5984
sterilizer drum 0107700	70.00	15	3	11424
surgical instrument kit 9962000	8000.00	15	3	1305600
instrument tray 0270000	10.60	15	3	1730
instrument trolley 0187004	242.18	15	1	13175
electric aspirating pump	740.00	15	1	40256
scialytic lamp	3060.00	15	1	166464
Total surgery			sub-total	**2871128**
X-ray machine	60000.00	15	1	3264000
developing equipment	7000.00	15	1	380800
Radiology equipment			sub-total	**3644800**
TOTAL EQUIPMENT			**TOTAL**	**8827271**
including common equipment (laboratory, radiology)				**4660725**

Table A16   ANNUAL EXPENDITURE EXCLUDING SALARIES AND AMORTIZATION

category:

essential drugs	5171040
freight/insurance	1292760
logistics	103421
office supplies	295488
fuel	2829975
maintenance materials	108000
maintenance of eqipment	8400000
maintenance and repair of vehicles	988800
indemnities and benefits	1836000
bonuses	1560000

	sub-total	**22585484**
equalization fund		-

	TOTAL	**22585484**
	Total excluding bonuses	**21025484**

Table A17   ANNUAL EXPENDITURE

Annual expenditure excluding salaries, amortization and equalization fund	22585484
Amortization:	
infrastructure	11280000
rolling stock	9888000
technical equipment	8827271

	sub-total	**52580755**
salary expenses		23381448

TOTAL (excluding equalization fund)	**75962203**

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Table A18   DISTRIBUTION OF HOURS OF WORK

department:	hours	%
surgery	160	21.3
gynaecology/obstetrics	240	31.9
general medicine/paediatrics	272	36.2
dental surgery	80	10.6
sub-total	752	
laboratory	80	
pharmacy	40	
radiology	-	
administration	128	
Total	**1000**	

Table B1   COSTS OF HOSPITALIZATION IN THE SURGERY DEPARTMENT

1. Drugs

	drug	consumption of drugs tablets/month	no. months	GF/tablet	cost
total consumption: 5171040					9941
coefficient of distribution: 0.43					
freight/insurance					2485
logistics					199

2. Health Record Book					150
2. Surgery Department					
annual salaries	3381348.00		per hospitalization		15118
annual bonuses	240000.00		per hospitalization		1073

3. Intermediate services (administration, laboratory, pharmacy, radiology)

salaries	5821699		per hospitalization		5538
bonuses	384000		per hospitalization		365
coefficient of distribution	21.3%				

4. Overhead costs

total	14458263				
coefficient of distribution	21.3%				
distributed costs	3076226		per hospitalization		13754

5. Direct amortization	2871128		per hospitalization		12837

6. Amortization of common equipment

total	25828725				
coefficient of distribution	21.3%				
distributed costs	5495473		per hospitalization		24570

OVERALL TOTAL PER HOSPITALIZATION		>>>		**86029**

Table B2 FINANCING OF COSTS OF HOSPITALIZATION IN THE SURGERY DEPARTMENT

category of costs	GF per hospitaliz	source of financing			
		Government	Prefecture	households	donors
salaries	20656	19046	1610		
bonuses	1438				
hlth record book	150			150	
drugs	9941			7000	
freight/insur	2485				2485
logistics	199				199
overhead costs	13754				
dir amortiz	12837				6418
common amortiz	24570				12265
total	86029	19046	1610	7150	21387

Table B3 FINANCING REQUIRED

source of financing	contribution per hospitalization		financing required	
			per hospitalization	total
Government	19046			
Prefecture	1610	>>>	36836	10056308
households	7150			
donors	21387			
sub-total	49193			

Table A1   YEAR OF OPERATION AND TYPE OF SIMULATION

Year > 1992

Type of simulation > baseline simulation

Table B2   FINANCING OF COSTS OF HOSPITALIZATION IN THE SURGERY DEPARTMENT

category of costs	GF per hospitaliz	source of financing			
		Government	Prefecture	households	donors
salaries	23152	21077	2075		
bonuses	1612				
hlth record book	150			150	
drugs	11930			7000	
freight/insur	2982				2982
logistics	239				239
overhead costs	16176				
dir amortiz	15014				7507
common amortiz	28737				14368
total	99991	21077	2075	7150	25096

Table B3   FINANCING REQUIRED

source of financing	contribution per hospitalization		financing required per hospitalization	total
Government	21077			
Prefecture	2075	>>>	44593	12173928
households	7150			
donors	25096			
sub-total	55398			

Table A1   YEAR OF OPERATION AND TYPE OF SIMULATION

Year > 1993

Type of simulation > baseline simulation

Table B2   FINANCING OF COSTS OF HOSPITALIZATION IN THE SURGERY DEPARTMENT

category of costs	GF per hospitaliz	Government	source of financing Prefecture	households	donors
salaries	25950	23276	2674		
bonuses	1870				
hlth record book	150			150	
drugs	14315			7000	
freight/insur	3579				3579
logistics	286				286
overhead costs	19028				
dir amortiz	17560				8780
common amortiz	33610				16805
total	116286	23276	2674	7150	29450

Table B3   FINANCING REQUIRED

source of financing	contribution per hospitalization		financing required per hospitalization	total
Government	23276			
Prefecture	2674	>>>	537361	4669807
households	7150			
donors	29450			
sub-total	62550			

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FIGURES

Figure 1   COST OF CHILDBIRTH BY RATE OF INFLATION
AT THE MANEAH HEALTH CENTRE

........•.... Inflation 10%   ....+ Baseline scenario   ....* Inflation 30 %
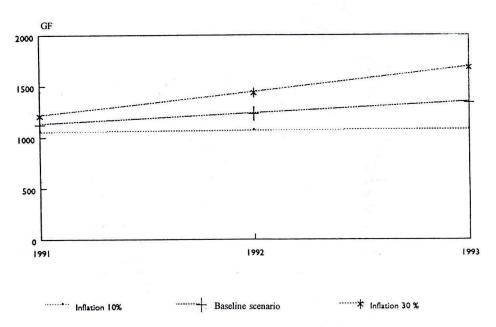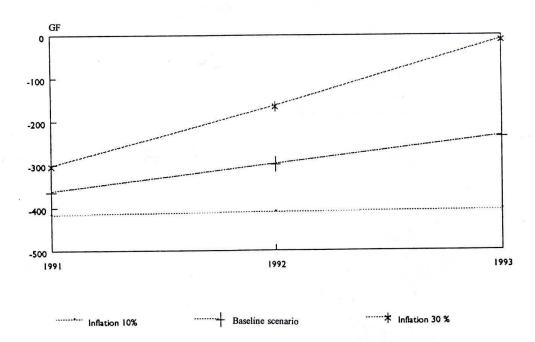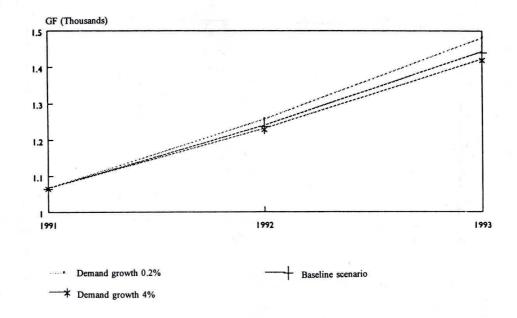
Figure 2   FINANCING REQUIRED (CHILDBIRTH) BY RATE OF
INFLATION AT THE MANEAH HEALTH CENTRE

........•.... Inflation 10%   ....+ Baseline scenario   ....* Inflation 30 %

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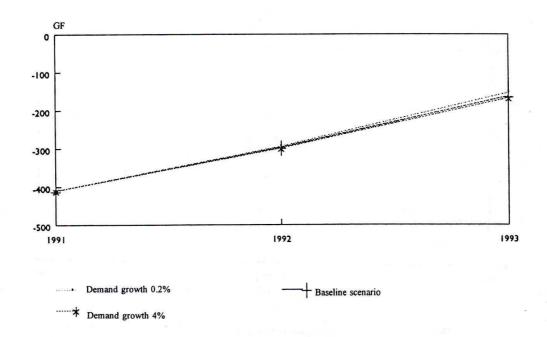
Figure 3   COST OF CHILDBIRTH BY DEMAND AT
THE MANEAH HEALTH CENTRE

GF (Thousands)

⋯⋯• Demand growth 0.2%   ─┼─ Baseline scenario

─✳ Demand growth 4%

Figure 4   FINANCING REQUIRED (CHILDBIRTH) BY DEMAND AT
THE MANEAH HEALTH CENTRE

GF

⋯⋯• Demand growth 0.2%   ─┼─ Baseline scenario

⋯⋯✳ Demand growth 4%

Figure 5   COST OF CHILDBIRTH BY EXCHANGE RATE AT THE
MANEAH HEALTH CENTRE
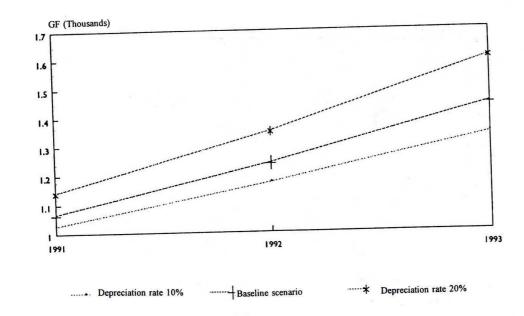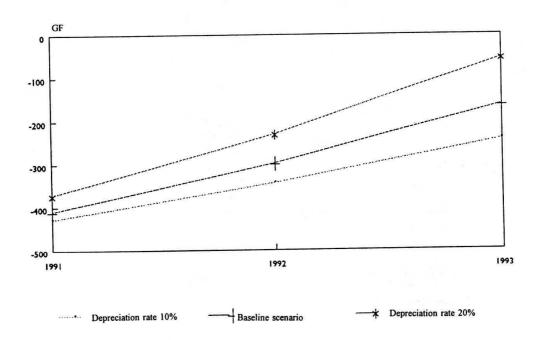
Figure 6   FINANCING REQUIRED (CHILDBIRTH) BY EXCHANGE
RATE AT THE MANEAH HEALTH CENTRE

Figure 7 COST OF TREATING UNCOMPLICATED MALARIA BY RATE OF
INFLATION AT THE MANEAH HEALTH CENTRE
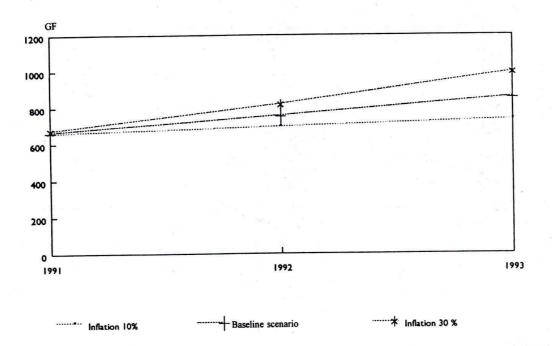
Figure 8 FINANCING REQUIRED (UNCOMPLICATED MALARIA) BY RATE OF
INFLATION AT THE MANEAH HEALTH CENTRE
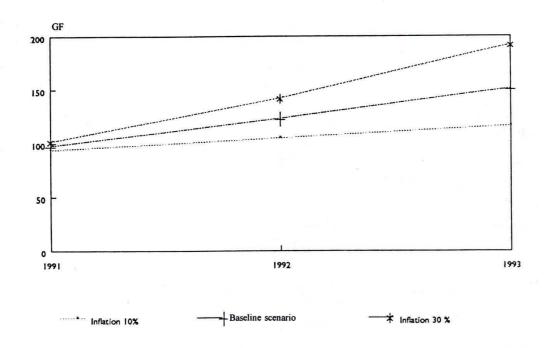
Figure 9 COST OF TREATING UNCOMPLICATED MALARIA BY DEMAND
AT THE MANEAH HEALTH CENTRE
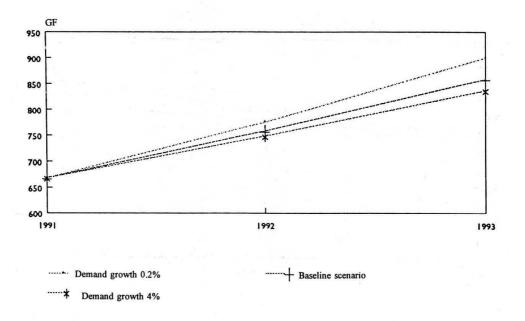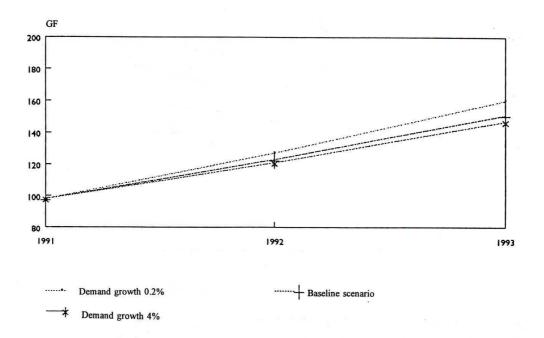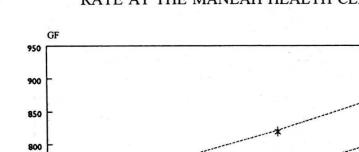
Figure 10 FINANCING REQUIRED (UNCOMPLICATED MALARIA) BY DEMAND
AT THE MANEAH HEALTH CENTRE
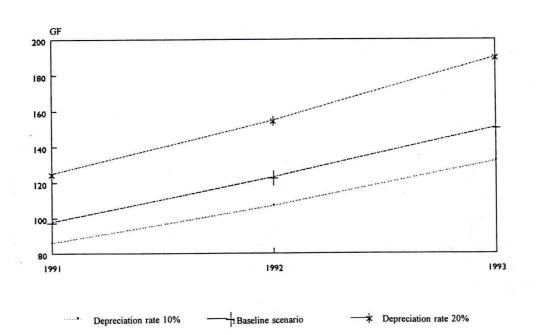
Figure 11 COST OF TREATING UNCOMPLICATED MALARIA BY EXCHANGE
RATE AT THE MANEAH HEALTH CENTRE

······•· Depreciation rate 10%   ·······⊥Baseline scenario   ······* ı Depreciation rate 20%

Figure 12 FINANCING   REQUIRED   (UNCOMPLICATED   MALARIA)   BY
EXCHANGE RATE AT THE MANEAH HEALTH CENTRE

······· Depreciation rate 10%   ⊥Baseline scenario   * Depreciation rate 20%

Figure 13   COST OF HOSPITALIZATION (SURGERY) BY RATE OF INFLATION AT THE DALABA HOSPITAL
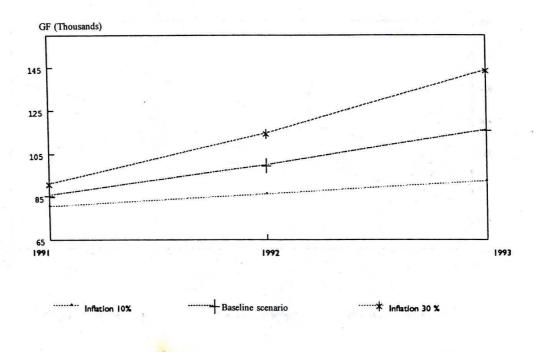
Figure 14   FINANCING REQUIRED (SURGERY) BY RATE OF INFLATION AT THE DALABA HOSPITAL

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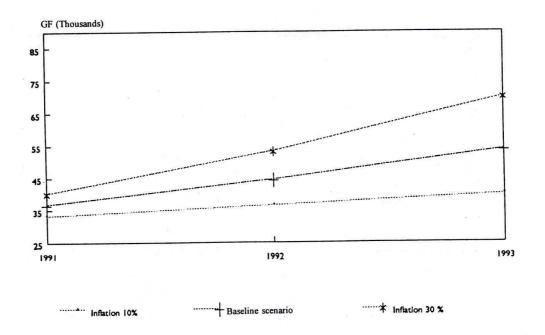
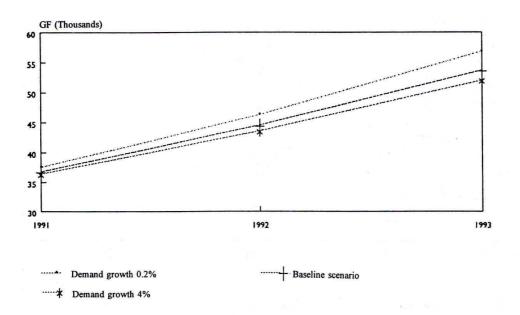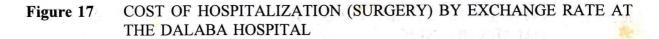**Figure 15**   COST OF HOSPITALIZATION (SURGERY) BY DEMAND AT THE DALABA HOSPITAL

GF (Thousands)

Demand growth 0.2%   Baseline scenario
Demand growth 4%
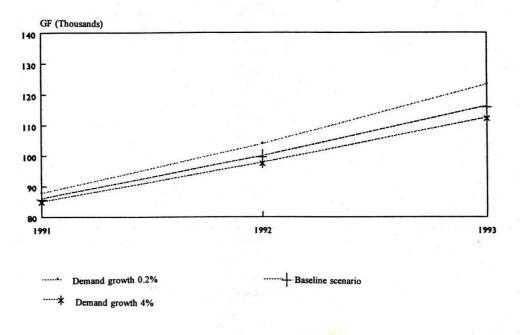
Figure 16   FINANCING REQUIRED (SURGERY) BY DEMAND AT THE DALABA HOSPITAL

GF (Thousands)

Demand growth 0.2%   Baseline scenario
Demand growth 4%

Figure 17 COST OF HOSPITALIZATION (SURGERY) BY EXCHANGE RATE AT
THE DALABA HOSPITAL

GF (Thousands)
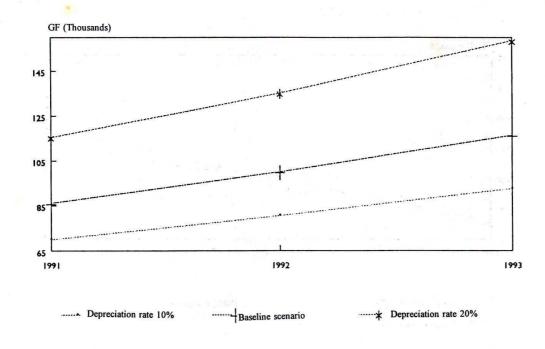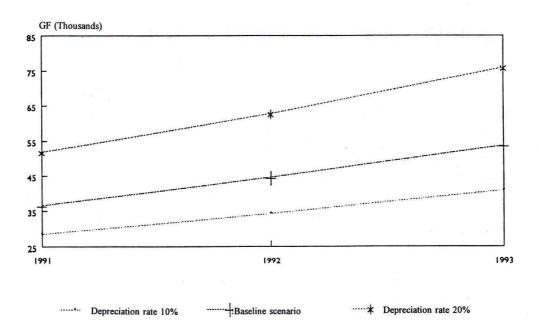
Figure 18 FINANCING REQUIRED (SURGERY) BY EXCHANGE RATE AT THE
DALABA HOSPITAL

GF (Thousands)

Figure 19   COST OF CHILDBIRTH - SIMULTANEIOUS CHANGE OF PARAMETERS
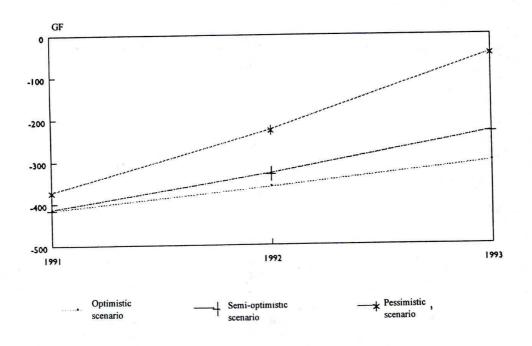AT THE DALABA HOSPITAL
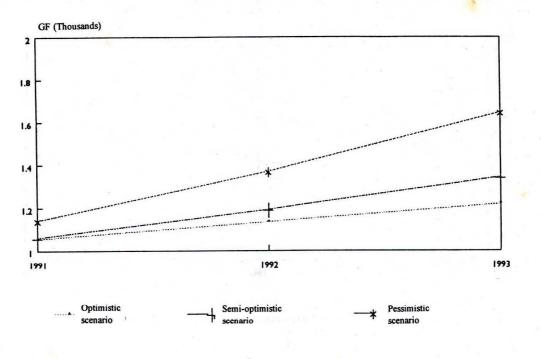
Figure 20   FINANCING REQUIRED FOR CHILDBIRTH - SIMULTANEOUS
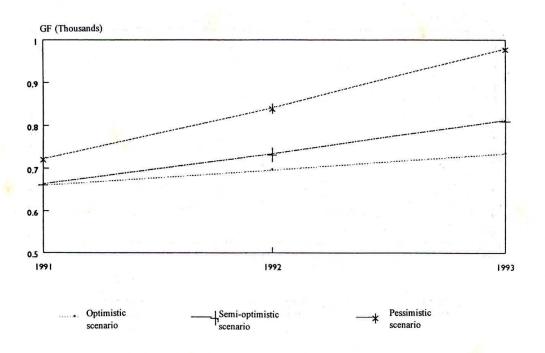CHANGE OF PARAMETERS AT THE DALABA HOSPITAL

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Figure 21   COST OF TREATING UNCOMPLICATED MALARIA - SIMULTANEOUS
CHANGE OF PARAMETERS AT THE DALABA HOSPITAL

GF (Thousands)

| Optimistic scenario | Semi-optimistic scenario | Pessimistic scenario |

Figure 22   FINANCING REQUIRED FOR UNCOMPLICATED MALARIA -
SIMULTANEOUS CHANGE OF PARAMETERS AT THE DALABA
HOSPITAL

GF

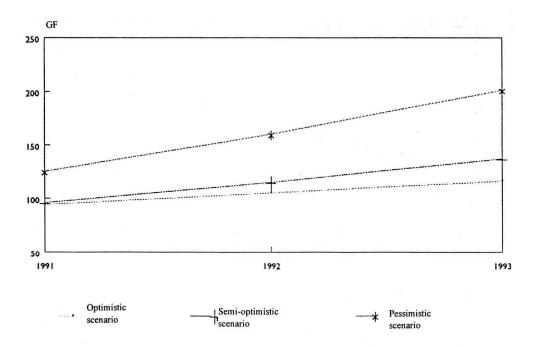| Optimistic scenario | Semi-optimistic scenario | Pessimistic scenario |

98

Figure 23 COST OF HOSPITALIZATION (SURGERY) - SIMULTANEOUS CHANGE OF PARAMETERS AT THE DALABA HOSPITAL
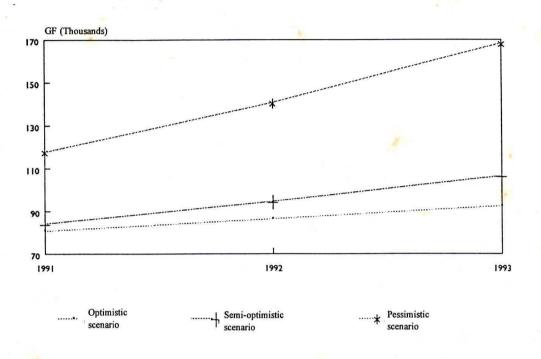

Figure 24 FINANCING REQUIRED (SURGERY) - SIMULTANEOUS CHANGE OF PARAMETERS AT THE DALABA HOSPITAL