



CHAPTER 3

RESEARCH FRAMEWORK

This chapter of research framework is comprised of three parts, (i) the conceptual framework of the study, (ii) the operational definitions of certain key terms used in the thesis and (iii) the general assumptions underlying this economic analysis of the community health workers' performance in malaria control at the village level in Bénin.

3.1 Conceptual Framework of the Study

This study has to answer two secondary questions: (i) how to analyze the performance of CHWs in malaria control at the village level in Bénin and (ii) how to design the analysis of the cost and the outcomes (benefit and effectiveness) of the contribution of CHWs in malaria control at the village level.

The conceptual framework of the study is comprised of two complementarily frameworks:

- the framework of the overall research which attempts to highlight the link between the two majors questions of the study;
- the framework of the second part of the study dealing with the costs and the outcomes (in terms of benefit and effectiveness) analysis of the CHWs performance in malaria control at the village level.

3.1.1 Framework of the overall research

The CHWs are the key actors in this research which will analyze first their performance through the number of malaria patients treated during the last 12 months and the factors affecting it and secondly the cost and the outcomes of their contribution in malaria control at the village level.

The number of malaria patients treated per year by the CHWs, which is used as proxy to measure their performance, can be affected by some characteristics of the CHWs, grouped into two sets of factors, the quantitative factors and the qualitative ones. The quantitative factors which can have an influence on CHWs' performance are the age, the number of years of schooling, the number of years of experience as CHW, the amount of his or her household income per year, the number of dependents, the value of informal gift received from villagers per year, the number of supervision by the personnel of the health centre per year, the number of sessions of retraining, the number of hours of daily availability for the function of CHW and the amount of formal rewards per year.

The qualitative factors which can have any influence on CHWs' performance are the sex, the marital status, the quality of care, the occupation, the competence, the moral support from the community, the support from the hierarchy and the practice of healing service before becoming CHW.

Among these factors, the amount of formal rewards for the CHW per year is expected to be an important factor affecting the number of malaria patients treated per year. In other words, the CHWs who get some formal rewards are hypothesized (or expected) to treat more patients per year than those who get no formal rewards for that job. That hypothesis deserves to be tested. And if the amount of formal rewards to the CHW per year is shown to be positively correlated to the number of patients treated per year, this should be considered by the policy makers to be added to the cost of the CHWs.

On the other side, the cost, the benefit and the effectiveness of the CHWs' contribution in malaria control at the village level will be analyzed. The different components of costs, expected benefits (direct and indirect) and final outcomes as measures of effectiveness, will be considered in the paragraph below (see 3.1.2). Figure 3.1 summarizes the components of the economic analysis of CHWs' performance for malaria control at the village level in Bénin.

3.1.2 Framework for cost and outcomes analysis

To design a model for analyzing costs and outcomes of malaria control by CHWs at the village level in the experimental communes in Bénin, this study will (i) identify some indicators for modelling the analysis of costs and outcomes; (ii) identify and cost the additional inputs needed to implement the CHWs programme at the village level; (iii) identify the expected outcomes in relation to the objectives of the programme; (iv) differentiate the benefits from the health effects; (v) value the expected benefits in monetary term; (v) determine the elements of the model establishing mathematical relationships between costs and benefits, and then between costs and effectiveness, for analysis.

The indicators for modelling the analysis of costs and outcomes of the contribution of CHWs in malaria control at the village level includes the quantifiable elements of costs (C_i) and outcomes in terms of benefits (B_i) and effectiveness (E_i). The modelling equation of the analysis of costs and outcomes can therefore be B_i/C_i for cost-benefit analysis and E_i/C_i for cost-effectiveness analysis. The higher the ratio B_i/C_i (as they are in the same unit), the better.

The additional resources consumed to implement the programme of CHWs at the village level are the inputs. The share of these resources for malaria control by CHWs, as the latter are not only for malaria control at the village level, will be considered in terms of direct costs and indirect costs for institutions (Government and Community Financing, as provider) and for CHWs in terms of opportunity cost.

As the contribution of CHWs in some the control of simple diseases at the village level is expected to increase the geographical accessibility of villagers to simple health care, the following outcomes (intermediate and final) are expected:

- the increase in the number of malaria patients treated in the overall commune with CHWs,
- the reduction of the flow of simple malaria cases from villages to health centres and district hospitals,
- the reduction of the number of severe cases of malaria at health centres and district hospitals by early diagnosis and prompt treatment by CHWs in villages,
- the reduction of cost and time for treating simple malaria cases for the villagers,
- the reduction of the morbidity and consequently the mortality from malaria in households in villages with CHWs.

The outputs may be measured in terms of benefits and effectiveness. The benefit will be considered in terms of associated economic consequences of the programme (in the local currency unit, Franc CFA), whereas the effectiveness will be considered in terms of health effects (in natural units). Figure 3.2 summarizes the components of the cost, the benefit and the effectiveness analysis of malaria control by CHWs at the village level in Bénin.

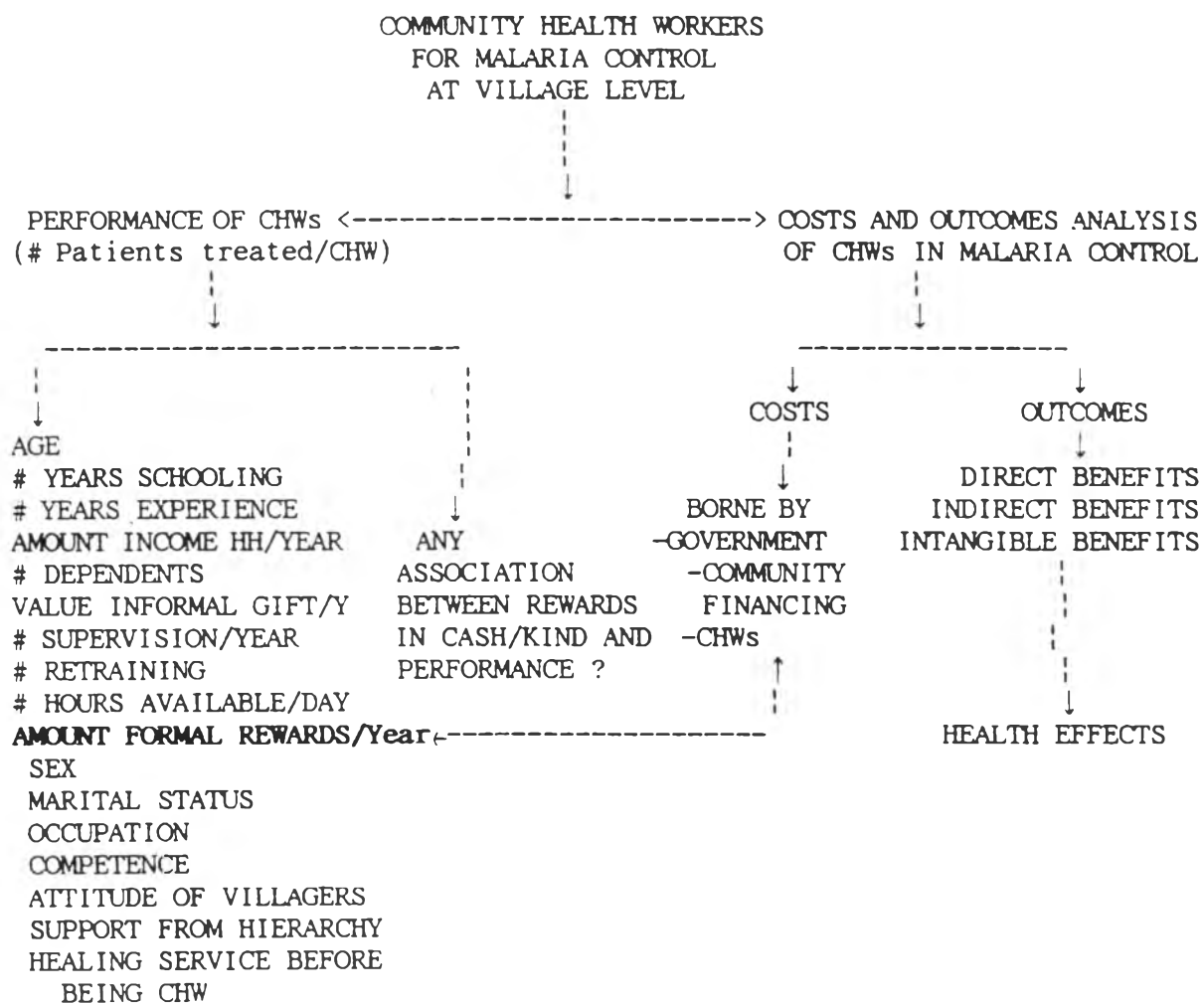


Figure 3.1: Conceptual Framework of the Economic Analysis of CHWs' Performance in Malaria Control at the Village Level in Bénin.

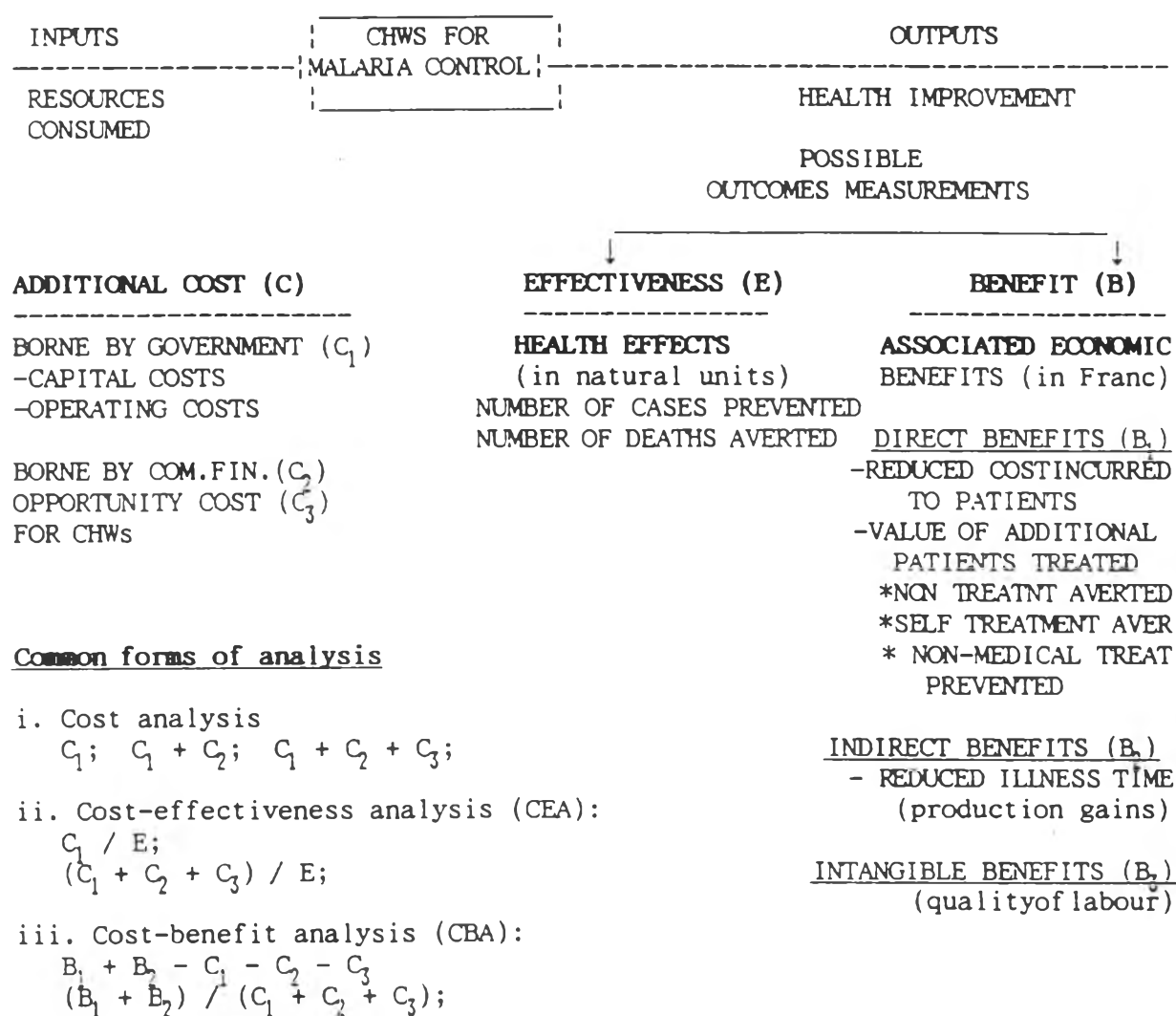


Figure 3.2: Components of Costs, Benefit and Effectiveness Analysis of Malaria Control by CHWs at the Village Level (Source: Adapted from Drummond and Mills, 1987).

3.2 Framework for the Analysis

From the conceptual framework above, this research attempts to answer two questions, each with a specific analytical technique (see figure 3.3):

- the first question will be answered using the multiple regression technique for the quantitative variables affecting the performance of the CHWs; the qualitative factors will be studied by the binary model analysis including linear probability model, probit model and logit model;
- the second question will be answered by using economic evaluation tools, cost benefit analysis as well as cost effectiveness analysis.

For the sample multiple regression equation of each CHW's performance, we will consider all the quantitative variables. Also, all the qualitative variables will be included. But the selection of the quantitative and qualitative variables which will be included in the final multiple regression model will depend on the data collected during the survey.

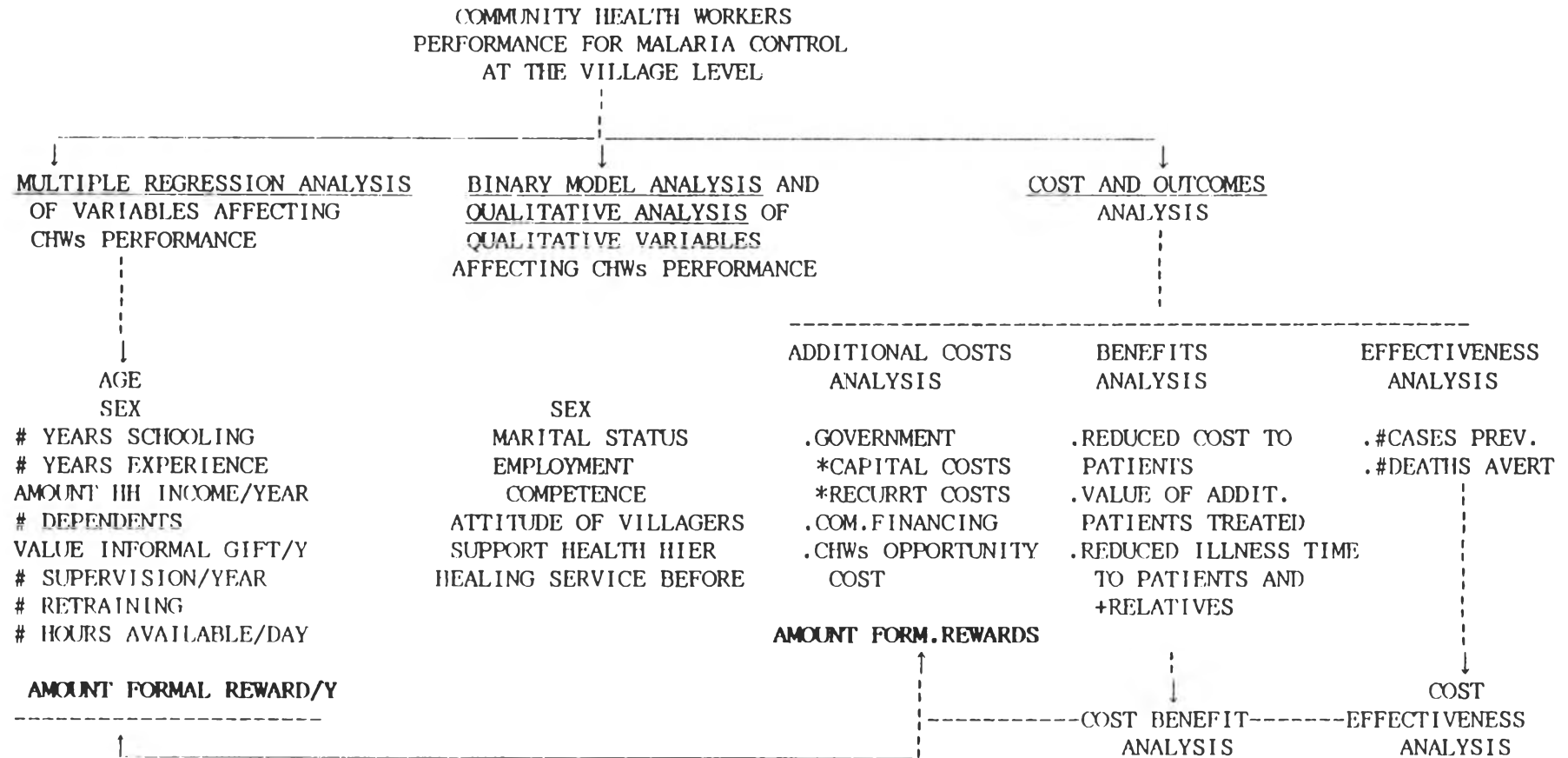


Figure 3.3: Framework of the Analysis of the Study

3.3 Operational Definitions

3.3.1 Malaria

Malaria cases diagnosed by CHWs at the village level in Bénin are presumptive cases of malaria. There is no lab test at the village level to confirm the diagnosis, unless the patient is referred to the commune health centre or to the district hospital. This happens in the case of non-improvement of his or her health status after 3 days of treatment. The presumptive diagnosis of malaria is based on a decision chart called "ordinogramme" in figure 3.4 on the following page.

3.3.2 Malaria control

Malaria control at the village level by CHWs means:

- the treatment of all presumptive cases of malaria with chloroquine as shown in the figure 3.4 above mentioned;
- the prevention of malaria by health education to villagers.

3.3.3 Disease specific morbidity and mortality rate

The malaria specific morbidity rate is defined over a period of time as the number of malaria cases per population while malaria specific mortality rate is defined over a period of time as the number of deaths per population due to malaria (Pornchaiwisukul, 1993, 163).

3.3.4 Competence of CHWs

The competence of a CHW is related to the correct use of the decision chart or ordinogramme. This can be testified by the health centre workers (nurse and midwife) or by the observation of the CHW at work.

3.3.5 Availability of CHWs

This means that whenever the villagers need the services of CHW, he or she is available. Also, when the health personnel of the commune health centre need him or her for retraining, supervision or other reasons, he or she is available.

3.3.6 Severe malaria

Severe malaria refers to presumptive malaria with temperature greater than 39 °C, with or without unconsciousness or convulsions (especially in childhood).

3.4 General Assumptions

1. Households exposed to malaria are rational decision-making units.
2. They will seek an antimalarial commodity (malaria treatment) in case of malaria disease of any members of the household to optimize their welfare status.

3. The consumption by households of antimalarial commodities is subject to budget constraints.
4. Households have a large variety of choices in their consumption of antimalarial commodities.
5. Households are able to rank items and they are consistent in ranking their needs and wants so as to give priority to health problems resolution.
6. All other common factors are identical in the neighbouring communes and villages without CHWS, selected as controls.

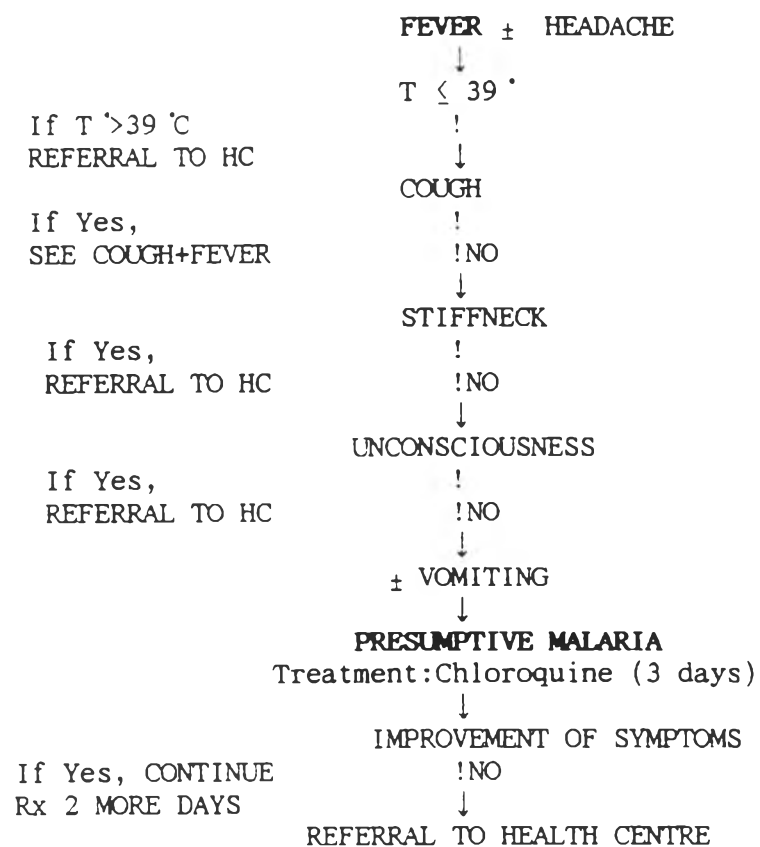


Figure 3.4: Decision Chart for Presumptive Diagnosis and Treatment of Malaria at the Village Level by CHWs.