CHAPTER 3

RESEARCH METHODOLOGY

3.1 Research design

It is a simulation study based on available or hypothetical data and empirical work. The cost model to be established will be used to estimate the unit cost of different control approaches. Based on the available or hypothetical unit cost estimation, the estimation of the resource requirement will be calculated. Sensitivity analysis will be performed by changing the cost components of different approaches and policy implications for financing will be derived.

3.2 Technical definitions

1. Chemotherapy:

In the case of China where schistosomiasis japonica is endemic, praziquantel is the only drug currently used for treatment.

Mass chemotherapy: Treatment is given to the entire population without prior individual diagnosis, including to domestic animals.

Selected population chemotherapy: Treatment is offered to infected persons identified by a diagnostic survey of the whole population.

Selective group chemotherapy: Treatment is given to all or of infected members of a high-risk age or occupational group.

Chemoprophylaxis: Drug is delivered to the persons with high possibility of getting infection, such as those people involved in flood fighting campaigns.

2. Snail control:

Focused molluscicide: Snail control through using molluscicides in the high transmission sites.

Slow-release molluscicide: Snail killing through the using of slow-release formulae of molluscicides.

Environmental modification: Eliminating the vector snails through changing the environment of the snail habitat (single purpose of environmental modification for snail control is seldom used in the control program at present).

Snail control combined with agricultural development: To eliminate the snails through the activities of agriculture development such as fishing or forestation projects on the snail infested beaches

which will also bring economic benefit to the investors. It is actually a subtype of snail control through environmental modification.

3. Sanitation and water supply:

Provide and/or teach the residents to use necessary sanitation and water supply facilities, which could reduce the endemic water contact by the local residents.

4. Health education

Change the risk-taking behavior of the people by providing the knowledge and raising the awareness of prevention and treatment through different means/channels.

3.3 Operational definitions

1. Resource and resource gap: In this study, resource is focused on the financial resources, i.e., the financial inputs from different government levels and departments, and the resource gap is the difference between financial requirement and finance availability. But when financing and sustainability are discussed, the economic resources will be referred to, which are all the resources input for the program including community contributions and volunteer work.

2. Sustainability: This refers to the likelihood of continued implementation of the schistosomiasis control program to the provider under different scenarios, which implies an element of planning for the future, but also requires considering current real levels of resource availability.

3. Financing: This is the resource flow from within and outside the schistosomiasis control program. In the discussions of this study, attentions will be focused on the policy implications of community financing for the sustainability of the program.

4. Control approach: In this study, the control approaches mainly refer to chemotherapy and snail control options currently being utilized in the control program. As water supply, sanitation and health education are composite measures which could not be solely the responsibility of the health sector alone, their cost and financing are not under the discussion in this study.

3.4 Research methodology

This work is primarily a simulation study using the available and hypothetical data to simulate resources required and resources available for the schistosomiasis control program in China, using Hunan Province as an example for demonstration where is one of the most severe endemic areas of the disease in China. And further, policy implications for financing schistosomiasis control will be derived.

1. Setting up the cost model

a. Internal Cost Model: (provider cost)

Principles:

The internal cost model can be expressed in relation to short-run or long-run time scales. Short-run assumes the budget is constant over the time period. In the long-run model, the budget changes over time, although some components of the cost (e.g., office building) would be fixed over the time period.

Components of costs: (varies in different control options)

Capital costs: Buildings
Vehicles
Equipment
Training (long-term)
Social mobilization (long-term)

Recurrent costs: Personnel
Drugs
Molluscicides
Maintenance
Materials & Supplies
Training (short-term)
Social Mobilization (Short-term)

b. External cost Model

Principles:

The external costs, in the case of schistosomiasis control program in China, are composed of community costs and consumer costs. It is especially true when some of the control activities, such as snail control by environmental modifications, involve a quite large proportion of community contributions such as the volunteer labor and material contributions. The consumers. on the other hand, have to incur some of the cost items, such as the direct medical cost, transportation and the consumer time cost. The external costs are also very important for the economic consideration of the program. First, aggregate costs are the total cost incurred by the society as a whole. Second, the schistosomiasis control program is dealing with only one disease. Services provided should therefore stimulate an early response by the consumers and the community as a whole. Third, the external cost is an important factor affecting the sustainability of the program. All those require the consideration of the effect of services on the community and consumer.

Components of cost:

Consumer cost: Medical cost (direct)
Transport cost (direct)

Time cost (indirect)
Community cost: Contribution (direct)
Time cost (indirect)

c. Costing Principles:

- The capital cost should be calculated based on the expected life years and annualizing factor to allocate the cost of the cost items.

- Discount factors should be taken into account for the calculation of the cost of different years.

- Development, training and supervision cost should be included in the cost item.

- An itemized cost menu will be developed for each of the control approaches.

2. Assessing costs and simulating resource adequacy

Cost analysis and resource adequacy simulation are the basis for understanding the resource adequacy and resource utilization and for probing financing the program.

a. Cost analysis:

Principles:

(a) Examine the cost behavior of different control options; Make clear whether the cost concerned is labor intensive or capital intensive.

(b) Study and identify controllable and uncontrollable cost variables of different control options.

(c) Study the implications of cost analysis for resource allocation.

b. Simulation of resource adequacy:

(a) Use hypothetical or available unit costs for different control options, together with current understanding of epidemiological situations, to simulate the resource required under different scenarios, for example, the changes of the endemic situation before and after the World Bank Loan Program; the adoptions of different control approaches, etc.

(b) Project the resource availability in the next five years using the data of the past financial input (estimated or hypothesized), together with the prediction for the financial input changes in the near future. In this case, community financing will not be under estimating according to the scope of study.

(c) Simulate the difference of "resource gap" (financial gap) under different scenarios (e.g., before and after the end of the World Bank Loan Program; the changes of the endemic scenarios, etc.,).

(d) Sensitivity analysis: Examine the variations of outcome by changing the input components (cost components) and the control options.

3. Assessing Program Financing

Generally speaking, financing to address resource inadequacy gives rise to three questions for probing: the resource adequacy; resource utilization and sustainability. As has been mentioned in Chapter 2, resource utilization refers to the efficiency of resource use, which is not going to be studied in this study which assumes that the resources are utilized efficiently. The other two issues are to be dealt with.

a. Central Government Financing:

Resource adequacy: Based on the results of simulation, the resource adequacy could be understood.

Sustainability: Central government funding also has the concern of sustainability, as it might be influenced by inflation, currency depreciation and structural adjustment programs which may reduce the real amount of resources available.

b. Local government financing:

Resource adequacy: The impact of economic reform and decentralization of economic responsibility on the program will be examined.

Sustainability: Implications are similarly derived from the analysis of the macroeconomic environment as above.

c. External source of financing:

Resource adequacy: External financing has never been a principal source for the schistosomiasis control program. The Significance of the World Bank Loan Program will be discussed.

Sustainability: The sustainability of the World Bank Loan Program will be examined.

d. Community Financing:

It is worthwhile to emphasize the potential of community financing in the schistosomiasis control program in China. Currently, there are some attempts trying to integrate schistosomiasis control (snail control) activities into aquatic production or agricultural

production projects.

4. Policy Implications

Based on the cost analysis, simulation of resource adequacy and assessment of financing the program, policy implications of financing the resource inadequacy will be derived for the schistosomiasis control program in China.

a. Different combinations of control approaches.

The optimal combination of control approaches will be discussed from the economic point of view.

b. Delivery structures:

Different delivery structure for the chemotherapy options may have different economic implications for solving the resource inadequacy.

c. Drug policy:

The drug production policy will be examined in the sense of home production vs import.

d. Community participation:

The financing implications of community participation will be further examined and its relevance and significance for the implementation and sustainability of the schistosomiasis control program will be probed.