CHAPTER 3

RESEARCH METHODOLOGY

3.1 STUDY DESIGN

This study has been designed as a cross sectional descriptive study focusing on rural area, whereby Schistosomiasis endemicity is usually common due to poor sanitation and other infrastructural inadequacies. Though the focus is on measuring economic impact of the disease, epidemiological aspects concerning Schistosomiasis are raised and analyzed.

Each household is interviewed two times in a year, this means first interview will be in January and the second one in July. However, the former will be during the rainy time and the later in dry season. The rationale of conducting interview in these seasons is to accommodate the change of weather, since during the rainy period there is an increase of inland water bodies especially ponds, which also became among the sources of schistosomiasis infection. Also, at this time agricultural activities are more dominant. During the rain season harvesting, fishing, and wood cutting becomes dominant economic activities. Thus, conducting an interview at two time periods, it is expected that community's perception about the disease will be explored.

3.2 THEORETICAL DESIGN:

3.2.1 ASSESSMENT OF PRODUCTIVITY LOSS

This study is designed to assess productivity loss by considering both age differentials and health status of household members. It is assumed that, household members in the potential working age are more productive than others. In order to make sure that, each age group is assigned an appropriate productivity fraction, five age groups are considered namely:

00 - 06
07 - 10
11 - 14
15 - 60
> 60

However, productivity fractions are not assigned arbitrary, instead they have to be derived from an interview which will entail each household member to reveal ability to work under different health status. It is also considered that, there are three levels of health status of household members if the impact of schistosomiasis morbidity has to be critically analyzed, these are; healthy, infection and morbidity. When a member is healthy, his/her productivity is greater, but differs among other members depending on the age group.

In case a member is infected with cercariae (schistosomiasis worm) its productivity declines due to feeling unwell. However, if the situation persists without treatment, then the member develops morbidity. As defined earlier Schistosomiasis morbidity includes portal hypertension, gastro intestinal bleeding, kidney failure and others. In this case productivity is considered to be almost zero, since members at this stage of illness can no longer afford to perform economic activities.

3.2.2 ASSESSMENT OF SCHOOL PERFORMANCE

Two indicators namely, school attendance and class grades are used to analyze the performance of the children who are living in the schistosomiasis endemic area. Those who attend classes regularly are either termed to have good or average attendance, all depends on the criteria set. Likewise, those who get higher class grades are considered to have either good or average grades. The rest, who do not qualify to the two categories are considered to have either poor school performance, or class grades.

As the unit of analysis for the study is at household level, then household structured questionnaire as well as school children questionnaire are the major tools relied upon for information gathering. However, this study presents only methodological approach on how the economic impact of this parasitic diseases can be measured by applying health economics tools.

3.3 EMPIRICAL DESIGN:

TIME:

The duration of the study will be one year, whereby interview is conducted two times at an interium of six months. One interview will be during the rain

season and the second during the dry season. This is important so as to incorporate changes of weather in a year. During rain time inland water bodies increases schisto infection sites.

AREA:

The study is being conducted in endemic area of lake Victoria, whereby Schistosomiasis is highly prevalent and no control programme exists. However, for the purpose of analyzing school performance of children, another school sample will be drawn in a schistosomiasis free area so as to enable comparison. The schisto free area will be chosen considering both socio economic characteristics and homogeneity in school standards.

3.3.1 SAMPLE SIZE

For the case of empirical research, sample size is determined from the study population, which is the households exists in the endemic area. However, in order to prevent confounders some exclusion criteria are set these includes: (i) Households beyond 10 kms from the lake were excluded. This is important on defining the endemic area boundary. According to WHO (1993) Schistosomiasis endemic area is defined to be an area with more than 50% prevalence rate. Thus, as far as one moves away from the lake off shore the prevalence rate decreases after a certain distance (approximately 10 kilometers). If this boundary is not defined, there is a possibility of selecting subjects outside the endemic area. (ii) Only permanent household members were included in the study (i.e. visitors of households are excluded). Permanent household members were identified during household interview, that all members who have lived with the particular household not less than one year before interview meets the inclusion criteria.

This study has only one group and the data collected are counted ones, thus sample size calculation was based on the following formula.

$$n = \frac{z^2 \times P \times Q}{d^2}$$

n = desired sample size
z = degree of confidence
p = the maximum prevalence rate of Schistosomiasis
p = 1 - p

d = precision level
The following values are substituted :

$$Z = 1.96$$
$$P = 0.5$$
$$Q = 0.5$$
$$d = 0.05$$

$$\text{Thus, } n = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2} = 384$$

3.3.2 SAMPLING PROCEDURE

For the purpose of this research, the calculated sample size is obtained by applying probability sampling method. This means all households in the endemic area had equal chances of being selected. Give that, the desired sample size (n) has been calculated as 384 households, then this sample is drawn from a population of 3000 households(N) exists in the endemic area.

By using simple random sampling technique, a sample size of 384 (n) is drawn from a population N (3000) in such a way that every possible sample of size n has the same chance of being selected. This is being done by using a list of all 3000 households in endemic area, and then 384 households are drawn randomly using a table of random numbers. This will ensure that, each household in an endemic area has a 12.8% chance of being selected for the study. That is n/N = 384/3000.

For the case of school samples, which requires one sample from schisto endemic area, and the other one from schisto free area, the same simple random sampling technique is applied. In each area, one school is chosen and a sample of 300 pupils is randomly selected for school performance analysis. However, in order to avoid some bias the two areas whereby schools will be selected are identified in such a way that they are really possess identical socio economic characteristics. These characteristics includes poor sanitation, absence of tape water, and subsistence economy. Also, there should be identical study environment such as availability of teaching materials and availability of good teachers.

Therefore, when the two schools in each area have been identified, then a list of pupils which is

available at each school is used to select a sample size of 300 pupils by utilizing a table of random numbers.

3.4 OPERATIONAL DEFINITIONS

3.4.1 SCHISTOSOMIASIS MORBIDITY:

Is the degree of sickness as a result of ***s. mansoni*** infection whereby a household member is compelled to seek treatment. The illness includes portal hypertension, liver failure, gastro intestinal bleeding, high blood pressure and others.

3.4.2 ECONOMIC IMPACT:

Is the negative effects of Schistosomiasis morbidity imposed on households in terms of economic costs, labour productivity loss and poor school performance of the children.

3.4.3 HOUSEHOLD:

Rural households of developing countries are defined as units producing, consuming and supplying labour force. The sum of the labour force in a household is what defines productive capacity of that household. When disease occur the equilibrium in the stock of labour force used everyday for their survival is disturbed, Ruiz and Kroegger (1994).

3.4.4 SCHOOL PERFORMANCE:

This is an index which includes the following indicators; school attendance and class grades.

3.4.5 LABOUR PRODUCTIVITY:

Production(amount of work) per household member per day.

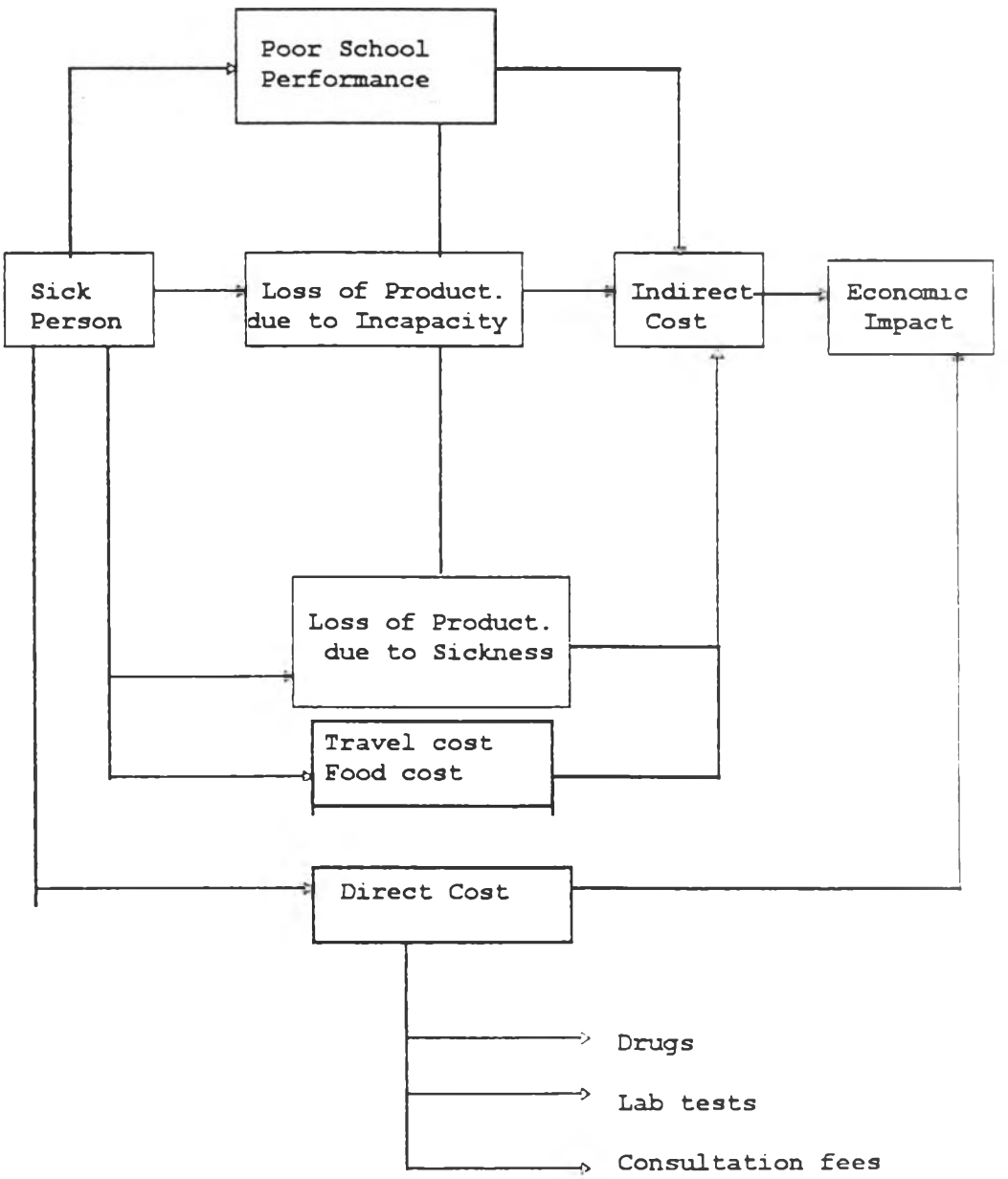
3.4.6 GENERAL ASSUMPTIONS OF THE STUDY:

(i)Total number of household members in each household reflects the actual labour input available. This implies that, there is no labour hiring to substitute the sick members. This assumption reflects the true picture of rural households labour force characteristics.(ii)Household members who became sick due to Schistosomiasis have the same infection intensity (i.e egg count per mg of stool examined.(iii)Household

members have different labour productivity, normally depends on their ages, however those in the same age group are assumed to have the same productivity under normal conditions.

3.5 CONCEPTUAL FRAMEWORK

Figure 3.1 Analytical model for the study



3.6 DEFINITION OF MODEL VARIABLES

3.5.1 SICK PERSON:

This variable in the model defines a sick person as a household member who suffers from Schistosomiasis disease. This is the starting point of tracing the economic impact of Schistosomiasis morbidity.

3.5.2 POOR SCHOOL PERFORMANCE:

This variable attempts to measure the effects of Schistosomiasis morbidity on household schooling children. This is being done by combining two indicators which are school attendance and class grades. More details are given in the school performance index section.

3.5.3 LOSS OF PRODUCTIVITY DUE TO INCAPACITY:

This variable attempts to measure the effects of Schistosomiasis morbidity on the working capacity of the infected person, who has not been absent from work. The variable goes further to impute the opportunity cost of time spent on seeking treatment for the infection instead of participating on income generating activities.

3.5.4 LOSS OF PRODUCTIVITY DUE TO SICKNESS:

This variable focus on estimating productivity loss of household members who have developed morbidity symptoms, hence lost completely some days to participate in economic activities.

3.5.5 INDIRECT COST:

This variable considers all consequences arises from Schistosomiasis morbidity , on school performance as well as household labour productivity. All these are regarded as indirect cost of illness.

3.5.6 DIRECT COST:

This model variable accommodates out of pocket payments made by households to treat schistosomiasis disease. These costs include drugs, laboratory test charges, and physician fees paid on consultations.

3.5.7 ECONOMIC IMPACT:

All variables included in the model (Number 3.5.1 - 3.5.7) explains the economic impact of the disease.

Table 3.1 Summary of Steps in Analyzing Economic Impact.

STEP	HOW	THEORETICAL TOOLS
1. Identification of health status of household members.	-Through interview, members will be classified as healthy, infected or had morbidity	. Household questionnaire
2. Identification of age groups and occupation of members.	-Although interviewed members are grouped in five age groups namely: 00 - 06 07 - 10 11 - 14 15 - 60 > 60 the occupation of members will be either in economic activities or schooling.	. Household questionnaire . Literatures
3. Determination of direct and indirect cost of treating Schisto morbidity.	- Identification and classification of economic costs associated with the treatment of the disease. - Formulation of cost equations to explain cost behavior.	. Household questionnaire
4. Assessing loss of productivity due to incapacity.	Using labour productivity index constructed from the survey.	household questionnaire
5. Assessing loss of productivity due to morbidity (absenteeism)	Using labour productivity index constructed from the survey.	. household questionnaire
6. Assessing school performance of household children5	-School performance index will be constructed. -Data gathered from school children interview and attendance registers is useful	.School questionnaire .School records
7. Evaluation	Using hypothetical data of households to assess labour productivity index, and school performance index how they can be used.	.Labour productivity index .School performance index