



CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

The effects of poor health go far beyond physical pain and suffering, to the extent that learning is compromised, and returns to human capital diminishes. Shaw and Elmendorf (1993).

Thus, human capital is vital for economic development, as poor health imposes economic costs on individuals, households, and the community at large. Household surveys in Ghana and Mauritania have showed that the economic costs of adult illness equaled almost 14% of per capita GNP, Shaw and Elmendorf (1993).

The indirect costs of illness are also substantial as 250 tenant families in Sudan who became sick due to Schistosomiasis and Malaria, affected family members took time from other activities to perform the work function of the ill in order to maintain production, El Takir and others (1986).

Schistosomiasis (also known as "bilharzia") results from a heavy infection with Schistosome trematode worms and in particular from the eggs laid in the human body by the female. The disease affects 74 countries, in which according to 1984 estimates some 200 million people are infected. Of these, some 20 million suffer clinical morbidity or disability. The disease kills few people but its sapping chronic effects, very high prevalence, and association with agricultural and economic water projects, make it a problem of great public health importance. Some 90% of all Schistosomiasis is found in Africa, but it is also of major socioeconomic importance in Brazil, China and Egypt.

In highly endemic regions, three out of four of children may be infected and in terms of consequent disability adjusted life years (DALYs) lost, among TDR diseases it comes second to Malaria.

There are at least 19 varieties of schistosome, of which five seriously affect people. They are transmitted through one of several species of water associated snail which can host the sporocyst intermediate stage of the parasite. This multiplies asexually, and develops into free swimming cercariae, which are released into the water and can penetrate human skin. An infected snail typically produces 1500 Schistosome cercariae each day.

The transfer from snail to human requires humans to discharge mature eggs in their urine or faeces into water; and to complete the cycle people must play in or use snail infested waters, when the cercariae break out from the snail ready to infect a human host. Each return to such water, represents a new chance of infection, so even when people receive treatment for a current infection, reinfection rate can be high.

Once in the human body, female worms produce eggs continuously and can live for up to 35 years, though they usually last no more than three to five years. Depending on the species and other factors, each female worm produces between 40 to 3500 eggs a day. Around half of them are expelled through urine or in faeces. However, other get trapped around the bladder or in the liver, where they are attacked and destroyed by the body's immune system. But, this attack comes at the price of granuloma - which destroys neighboring host cells. In heavy infections, over long period of time, these granulomas may produce extensive fibrosis of the liver and obstructive kidney damage. Hepatic enlargement, portal hypertension, kidney failure, blood in the urine (haematuria), anaemia and cancer of the bladder are all associated with Schistosomiasis.

A study conducted at Lake Victoria area in Tanzania exploring the morbidity of *Schistosoma mansoni* revealed a prevalence rate of over 80% among primary school pupils aged 6 - 16 years having the highest stool egg count of 400 eggs/g of stool. and among adults was over 45%, Gabone (1987).

Thus, high reinfection rate and recurrent morbidity may affect labour productivity as well as school performance for the children.

1.2 RATIONALE

Schistosomiasis disease as compared to other diseases such as malaria, tuberculosis, or cancer it

seems to have less public health importance as a result, even governments have been directing little efforts on strengthening or initiating control programmes. Lake Victoria zone in Tanzania, is declared as an endemic area but, it is not surprising that no control programme has been initiated for many years. The major reason for government failure to tackle the problem has been associated with scarce resources.

One of the criteria which influences health planners to give priority on initiating a certain disease control programme is the economic burden of the disease to the community. In Tanzania, Schistosomiasis is among the top ten country health problems, MCH (1985), yet the country has no control programme initiated so far. This is true even to highly endemic areas such as lake Victoria zone. Thus, the results of this study will serve as an important source of information to health planners on priority setting hence to initiate control programme on this area, which is currently neglected.

On the other hand, a recent published report by the WHO expert committee on the control of Schistosomiasis, highlights that usually, the public health significance of Schistosomiasis is under estimated due to the uneven distribution of the worms, as a result few people have heavy infections and many have lighter infections as well as fewer symptoms. But, severe disease follows after many years of silent or mildly symptomatic infections. In this way Schistosomiasis has been linked with cancer, nutrition diseases, intercurrent infections and the immune response, WHO (1993). This study intends to explore the economic impact of such underestimation of the disease.

Absence of control programme and the current drug distribution system, contributes to an increase of medical care costs of households, as Schistosomiasis drugs are not included in the essential drugs kit sent to health centres, instead is obtained at District hospital which is located far from endemic communities.

The inception of essential drugs kits to primary health care facilities in Tanzania, was a response to WHO's appeal for establishment of essential drugs programme. However, in this drug kit sent to health centres and dispensaries, Praziquantel an effective single oral drug for Schistosomiasis treatment is not included, Munishi (1991).

On the other hand, drugs sent to health centres and dispensaries are provided free of charge, then, it would have been wise to provide praziquantel to rural health centres even for a small fee especially in endemic areas.

This would have averted the transport cost, extra food cost and eventually minimize opportunity cost of time spent by household members to seek schistosomiasis treatment at district hospital. This also may serve to release congestion on outpatient services at the district hospital.

1.2.1 RATIONALE OF MEASURING ECONOMIC IMPACT FOCUSING ON LABOUR PRODUCTIVITY AND SCHOOL PERFORMANCE.

A number of studies have attempted to measure economic impact imposed by various diseases ranging from the deadly disease (HIV/AIDS), Malaria, tuberculosis, Onchocerciasis, Schistosomiasis and others. Wright (1968) defines economic consequence of a disease into three categories - viz., resource use, resource transfer and resource loss. Resource use represents costs that are a share of the nation's resources of manpower and materials for providing health services. Resource transfer includes costs represented by the transfer of income from the healthy to the sick in public and private efforts to mitigate the burdens of illness. Resource loss represents costs reflected in reduced national production of all goods and services.

For the case of this study, it tries to incorporate both resource use and resource loss under the patient perspective. However, the term economic impact has been described as broad, hence all analyses made depends on the focus of the study whether the impact to be investigated lies on microeconomic or macroeconomic level.

Ruiz and Kroeger (1994) on their study assessing the socioeconomic impact of Malaria in Ecuador and Columbia focused in microeconomic level, whereby rural households was their unit of analysis. Rural household direct expenditure on prevention and cure of Malaria as well as analyzing labour force units lost due to Malaria sickness were the major central issues raised in this research work.

The authors approached the economic loss problem by defining one day of work for an adult aged 15 - 59 years old having one unit of labour force. If an adult at this age range becomes sick, and forced to abandon his/her duties, then it was considered that this person will lose this unit of labour force. Likewise other age groups were assigned fractions of units of labour force per day.

Fenwick and Figenschou (1972) studied the economic impact of *Schistosoma mansoni* infection among cane cutters who were employed in a sugar estate. The focus was on their productivity, to cut sugar canes at the time they are infected and during the period they are free from infection.

However, this thesis has also adopted identical measurement variable i.e. labour productivity, but the analysis of Schistosomiasis focuses in endemic area where there is no control programme as a result there is higher reinfection rate, even if each new infection is treated promptly. This is because of the natural risk exposure of the community which necessitates them to come into contact with infested water on their daily activities.

Gabone (1987) in his study exploring Schistosomiasis morbidity at Lake Victoria found that prevalence rate was over 80% among primary school pupils. This brings us to the important point of exploring the possible effects of the disease on school performance given such a higher rate.

To sum up, natural exposure accompanied with high reinfection rate in endemic areas makes peoples' participation in economic activities on and off as they are compelled to seek treatment whenever they are infected. But, when they resume to work after some time they became reinfected thus go back to seek treatment, and this is a way of living. This being the case, it is reasonable to examine their labour productivity.

1.3 RESEARCH QUESTIONS

This research attempts to answer the following two questions:

- (a) How Schistosomiasis morbidity in endemic area affect labour productivity and school performance.
- (b) How direct and indirect costs of Schistosomiasis morbidity on households in endemic area can be

determined. The answers to these questions will be inputs on defining a model or approach how Schistosomiasis morbidity in endemic areas could be a factor of economic losses to the households.

The model will be useful to convey message to health planners who have not shown attention on initiating control programme of this disease.

Guyatt and Evans (1992) argues that, demonstrating economic losses of helminth diseases (Schistosomiasis inclusive) is far more complex than simply estimating the number of days affected by illness and multiplying this by an average wage rate. It is clear that part of the difficulty of demonstrating the economic impact of helminth infections relates to the complexity of the relationships involved. However, part might be due to the failure of economic research to account for the known epidemiology of the diseases, in particular the evidence that clinical symptoms are more likely to be associated with intense infections, and that the prevalence of intense infection varies widely between communities.

1.4 RESEARCH OBJECTIVES:

GENERAL OBJECTIVE:

To design a model which will be applicable in any endemic area, to measure the economic impact of Schistosomiasis morbidity at household level.

SPECIFIC OBJECTIVES:

- (1) To model the effects of Schistosomiasis morbidity in endemic area on labour productivity of households.
- (2) To model the effects of Schistosomiasis morbidity in endemic area on school performance.
- (3) To model the direct and indirect costs of schistosomiasis morbidity in endemic area.