

UNIVERSITY OF CAPE TOWN
DEPARTMENT OF PSYCHOLOGY

By
Chiwoza R. Bandawe

Thesis Presented for the Degree of

DOCTOR OF PHILOSOPHY

In the Department of Psychology

UNIVERSITY OF CAPE TOWN

August 2000

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

A SCHISTOSOMIASIS HEALTH EDUCATION INTERVENTION AMONG RURAL MALAWIAN SCHOOL CHILDREN: LESSONS LEARNED.

Chiwoza R. Bandawe

ABSTRACT

This thesis is the product of a two-year intervention aimed at controlling the prevalence of schistosomiasis (Bilharzia), a parasitic disease, among school children in a rural area of Mangochi District, Malawi between 1996 and 1998. The question this thesis addresses as its focus is, which degree of health education input is the most efficient in controlling schistosomiasis? Guided by the empirically supported social psychology theories of reasoned action (Ajzen & Fishbein, 1980) and planned behaviour (Ajzen, 1991), three varying degrees of health education input were provided to three primary schools, in the Koche catchment area of Mangochi. Each school was randomly assigned a different input. One school received “minimum” input consisting of basic information provision through a brief talk given by a health professional. Another school was given the “medium” condition which was similar but had the addition of multimedia input to the school through peers in the form of clubs and the third school deemed the “maximum” condition had the addition of pupil interaction with the local community. The framework that guided the intervention was Green’s PRECEDE-PROCEED model (Green & Kreuter, 1991). It was used to guide the planning, implementation and evaluation of the intervention. Qualitative and quantitative research methods were employed to assess the three schools pre and post intervention. Comparisons were made across the schools as well as within two of the schools, comparing members of Bilharzia clubs established with non members. No significant differences were observed across the input conditions. However, a subsection of the participants, the school club members experienced the most positive shifts in knowledge, attitude, behavioural intention and practice. Reduction of the prevalence of the disease was dependent on ongoing medication. It is concluded that

the most efficient health education input was intense weekly input through the formation of clubs otherwise a brief lecture has the same effect on knowledge and practice as multimedia campaigns. Intentions of the sample were predominantly under normative control prompting recommendations for further culturally based research using discursive approaches.

ACKNOWLEDGEMENTS

A thesis of this nature is inevitably a personal journey. Without the following people the journey would have been incomplete or not as rewarding or enriching. I therefore wish to thank:

Professor Don Foster my supervisor who provided me the space to explore and question and was there to guide and support the course of this thesis.

For help with statistical analysis: Frank Bokhorst and Colin Tredoux of the Psychology department at the University of Cape Town, Deborah Bradshaw of the Medical Research Council and Francesca Little of Statistics Department of the University of Cape Town.

For their assistance and support whilst in South Africa: Dr. Jane Kvalsvig of the Medical Research Council in Durban. Fellow PhD travellers in Cape Town: Rendell Day, Millicent Kachieng'a and Mark Tunbridge. My brother, Gama Bandawe provided much support as did Amy & Helena Thornton, Deborah Klein, Pauline, Warren & Terence Lapidus.

In Malawi there are many to thank: My colleagues in the department of Community Health, Professors Timothy Cullinan (who initiated this journey) and Godfrey Lule, Drs. Peter Cuppen and Maija Rummukainen. For help in the field: Dr. Patrick Noah, Mabvuto A. Zuze, Simon Sikwese, Dan Namarika and Dumisani Kamwana. Also the Headmasters, teachers and pupils of the schools concerned. Special mention needs to be made of patrons, Messrs Gambuleni, Kamoja, Swaleyi, Gama and Magasa.

An undertaking such as this one requires funding. Thanks are due to the College of Medicine, Malawi for funding my studies. Special thanks in this regard go to the Principal Professor John Chipangwi, Vice Principal Professor Boniface Msamati, the Registrar Benedicto Wokomaatani Malunga, the Finance Officer Emerson Kachala and the Dean, Professor Robin Broadhead. The University of Cape Town Foreign Students Postgraduate Scholarship Fund was of tremendous assistance and my thanks go to the University of Cape Town.

God has sustained me through this journey and acknowledgements are made to the Master, Jesus Christ.

This thesis is dedicated to the memory of my late uncle Byron Hove and my late aunts Hettie Kapfumvuti and Esther Phiri.

TABLE OF CONTENTS

LIST OF FIGURES	vi
LIST OF TABLES	vii

PART I

THEORETICAL & METHODOLOGICAL FOUNDATIONS

CHAPTER 1: INTRODUCTION	1
1.1 Introduction	1
1.2 Summary of Thesis	4
1.3 Background to the Study	6
1.4 Schistosomiasis	13
1.5 Control Measures Attempted	21
1.6 Summary and Conclusion	31
CHAPTER 2: REVIEW OF THE LITERATURE	32
2.1 Introduction	32
2.2 Health Education	32
2.3 Social Psychology and Health	41
2.4 From Theory to Intervention	59
2.5 Conclusion	67
CHAPTER 3: METHODOLOGY	69
3.1 Qualitative and Quantitative Methods	69
3.2 Study Design	75
3.3 Ethical Issues	82
3.4 Demarcations of the Thesis	82

PART II
PLANNING & IMPLEMENTATION

CHAPTER 4: SOCIAL, EPIDEMIOLOGICAL, BEHAVIOURAL AND ENVIRONMENTAL DIAGNOSES	84
4.1 Introduction	84
4.2 Social Diagnosis	84
4.3 The Epidemiological Diagnosis	96
4.4 Behavioural and Environmental Diagnosis	109
4.5 Conclusion	112
 CHAPTER 5: EDUCATIONAL AND ORGANISATIONAL DIAGNOSIS	 113
5.1 Introduction	113
5.2 Knowledge and Attitudes	113
5.3 Assessing Intention and Perceived Behavioural Control	120
5.4 Intervention Plan	141
 CHAPTER 6: IMPLEMENTATION: HOW THE HEALTH EDUCATION WAS CARRIED OUT IN THE FIELD	 143
6.1 Organisational and Policy Diagnosis	143
6.2 The Health Education Curriculum	149
6.3 The Bilharzia Clubs in the Schools	152
6.4 Conclusion	161

PART III

EVALUATION

CHAPTER 7: EVALUATION OF THE PROCESS	162
7.1 Introduction	162
7.2 Specific Key Events	163
7.3 Club Reports	168
7.4 Themes Emerging from the FGDs	172
7.5 Discussion	181
7.6 Conclusion	184
 CHAPTER 8: IMPACT EVALUATION	 186
8.1 Shifts in Knowledge, Attitude and Practice	186
8.2 Shifts in Intention Following Health Education	198
8.3 Discussion	222
8.4 Conclusion	223
 CHAPTER 9: OUTCOME EVALUATION	 224
9.1 Introduction	224
9.2 Time II (October 1997)	225
9.3 Time III (May 1998)	231
9.4 Time IV (October 1998)	236
9.5 Discussion	242
 CHAPTER 10: CONCLUSION AND RECOMMENDATIONS: THE LESSONS LEARNED	 244
 REFERENCES	 260
 APPENDICES	

LIST OF APPENDICES

- Appendix 1: Photographs
- Appendix 2: Diagram of the Life Cycle
- Appendix 3: Distribution of *S.haematobium* in Malawi
- Appendix 4: Translated Village Health Survey
- Appendix 5: The K-A-P Questionnaire
- Appendix 6: Reasoned Action/Planned Behaviour Questionnaire 1
- Appendix 7: Reasoned Action/Planned Behaviour Questionnaire 2
- Appendix 8: Minutes of Community Meeting of February 1997.

LIST OF FIGURES

2.1	Schematic representation of the theories of reasoned action and planned behaviour	51
2.2	Schematic representation of the PRECEDE-PROCEED model	64
3.1	The health education ‘exposure’ package for each school	78
5.1	Intentions to get out of the water to urinate	126
5.2	Intentions to use pit latrine	130
9.1	Comparison of Bilharzia Club members with the rest of the school	239
9.2	Prevalence rate patterns throughout the study	240

LIST OF TABLES

3.1	Qualitative and quantitative methods employed	70
3.2	Evaluation goals	80
4.1	Diseases in the community	98
4.2	Water source and activities (%)	98
4.3	Gender and lake activities (%)	99
4.4	Site of urination (%)	100
4.5	Percentage of responses to schistosomiasis questions	101
4.6	Characteristics of all pupils receiving treatment in the three schools	103
4.7	Overall prevalence of urinary schistosomiasis at Koche, Makawa and Lwangwa	105
4.8	Risk factors for schistosomiasis	108
4.9	Inventory of schistosomiasis behaviours	110
5.1	K-A-P 1 Knowledge Scores	117
5.2	K-A-P 1 Mean Attitude Scores	118
5.3	Ranked “don’t know” responses reflecting percentage response for each item	120
5.4	Alpha coefficients of the questionnaire	125
5.5	Intercorrelation between measured variables for getting out of the water to urinate	127
5.6	Main characteristics of sample results	128
5.7	Intercorrelations between measured variables for intention to utilise a pit latrine	129
5.8	Results of model components	131
5.9	Behavioural belief items	132
5.10	Normative beliefs	134
5.11	Ranked motivation to comply means	135
5.12	Intention to get out to urinate by past behaviour	137
5.13	Beta weights of regression using subjects with history of urinating in the water	138

5.14	Beta weights of regression using subjects with no history of urinating in the water	139
5.15	Reasons for urinating in the water	139
8.1	Knowledge changes K-A-P 1 and K-A-P 2 using single knowledge score	188
8.2	Attitude changes K-A-P 1 and K-A-P 2. Comparison of single attitude score	189
8.3	Practice changes K-A-P 1 and K-A-P 2. Comparison of single practice score	191
8.4	Comparison of “don’t know” responses	192
8.5	K-A-P 2 Club versus non-club knowledge in all 3 schools	193
8.6	K-A-P 2 knowledge of club members versus rest of the school where there was a club	194
8.7	K-A-P 2 attitude of club members versus rest of pupils in all three schools	194
8.8	K-A-P 2 attitude of club members versus rest of the pupils in the schools where there was a club	195
8.9	K-A-P 2 practice of club members versus other pupils in all three schools	195
8.10	K-A-P 2 practice of club members versus rest of the school where there was a club	196
8.11	Comparison of Bilharzia Club “don’t know” responses	196
8.12	Alpha Coefficients of the TRA 2 questionnaire	202
8.13	TRA 2 means of key model components	203
8.14	Comparison of means of the schools’ overall intention to get out of water to urinate at TRA 2	204
8.15	Comparison of means of intention to get out of the water to urinate, TRA 1 and TRA 2	205
8.16	Comparison of means of Bilharzia Club members’ intention to get out of the water and urinate versus non club member responses TRA 2	206
8.17	Comparison of means of the schools’ overall intention to urinate immediately prior to entering water, TRA 2	207

8.18	Comparison of means of Bilharzia Club members' intention to urinate immediately prior to water contact versus non-club members responses TRA 2	207
8.19	Intercorrelations between measured variables for intention to urinate immediately prior to entering the water	208
8.20	Regression of sample by characteristics	209
8.21	Regression of TRA 2 whole sample	211
8.22	Intercorrelations between measured variables	211
8.23	Correlations between model variables for intention to urinate immediately prior to entering the water	212
8.24	Correlations between variables for intention to get out of the water to urinate	212
8.25	Regression using other variables school, age, sex	213
8.26	Regression of Planned behaviour and other variables TRA 2	213
8.27	Regression using variables of school, age and subjective norm	214
8.28	Behavioural beliefs and outcome evaluations	215
8.29	Normative beliefs and Motivation to comply	216
8.30	Reasons for not urinating immediately prior to entering the water	219
8.31	Reasons for not getting out of the water to urinate	221
9.1	Time II Characteristics of all pupils receiving treatment in the three schools	225
9.2	Time II overall prevalence of urinary schistosomiasis at Koche, Makawa and Lwangwa	227
9.3	Time II schistosomiasis prevalence per group at Koche, Makawa and Lwangwa	228

9.4	Comparative overall prevalence and intensity rates at Koche, Makawa and Lwangwa. Times I and II.	230
9.5	Time III prevalence and intensity rates	233
9.6	Time III schistosomiasis prevalence rate per group at Koche, Makawa and Lwangwa	234
9.7	Times I-III Overall prevalence of urinary schistosomiasis at Koche, Makawa and Lwangwa	235
9.8	Time IV overall prevalence of urinary schistosomiasis at Koche, Makawa and Lwangwa	237
9.9	Time IV schistosomiasis prevalence per group at Koche, Makawa and Lwangwa	238
9.10	Summary of prevalence rates	240
9.11	Summary of Time 1 and Time 4	242

PART I

THEORETICAL

AND

METHODOLOGICAL

FOUNDATIONS

CHAPTER 1

INTRODUCTION

1.1 Introduction

This thesis is the product of a two-year intervention aimed at controlling the prevalence of schistosomiasis (Bilharzia), a parasitic disease, among school children in a rural area of the Southern African nation of Malawi, between 1996 and 1998. In the fight against tropical disease, health education has often been advocated as an essential and effective part of the weaponry (e.g. Bomba, 1981; Tones *et al.*, 1991; WHO, 1997). Given figures that indicate high prevalence rates of tropical disease in the developing world, there is a constant need to assess the efficiency of health education intervention strategies. The framework that guided this action research was Green's PRECEDE-PROCEED model (Green & Kreuter, 1991)¹. It was used to guide the planning, implementation and evaluation of the intervention. The theoretical base of this intervention was housed in social psychology, being the subject in which the dominant health education approaches are grounded (Freudenberg *et al.*, 1995). Social psychology theory was utilised to inform the behaviour change component of the health education as well as to furnish explanations of the process of the programme.

In the process of seeking to practically control the disease, a key question that emerges in terms of the utility of this study is, what lessons can be drawn to serve as valuable information for future planned health education interventions on a wider scale? This study broke new ground in that it was among the first full time large- scale interventions that were employed in rural Malawi to tackle the problem of schistosomiasis. In searching for lessons that can be learned from a health education intervention, one key

¹ Subsequent to the completion of the field work of this thesis, a third edition of Green & Kreuter's book entitled *Health Promotion Planning: An Educational and Ecological Approach* was published in 1999. All efforts to obtain the book to incorporate into this thesis proved futile. It is noted however that in the third edition, the basic format of the PRECEDE-PROCEED model remains the same as that followed in this thesis.

question that arises is, given the limited resources available for disease control, how much health education exposure is adequate to control the disease? Will the use of medication alone coupled with a brief talk suffice, or does a wide scale community-based programme with leaflets and health clubs have to be employed? In other words, what amount of health education input will lead to the most efficient health education intervention? In the study the different measures of health education input were informed by social psychology theory. To address the main question adequately, this thesis employed different degrees of health education input in the programme. It is argued that the most efficient degrees of health education input have not been systematically established in the local context wherein this thesis originates. Furthermore, through the lessons learned in this study, we seek to establish the conditions that need to be in place for any reduction in prevalence of the disease, which is the eventual desired outcome of the intervention.

The background to the practical problem this thesis attempts to address is as follows. In the early 1990s, the prevalence rate of a debilitating water borne parasitic disease called schistosomiasis (Bilharzia) was reported to have been on the increase along the shores of Lake Malawi (Kumwenda *et al.*, 1993). On average 200,000 Malawians sought health care because of schistosomiasis each year (Chitsulo, 1994). International attention was drawn to the presence of schistosomiasis in Lake Malawi when, in 1992, two United States peace corps volunteers working in Malawi were evacuated for medical treatment following neurological complications (Wolfe *et al.*, 1993). The origin of their illness was traced to schistosomiasis contracted in Lake Malawi, which had always been considered free of the disease (Evans, 1975; Russell *et al.*, 1993). This discovery brought about a wave of research investigations (for example Russell *et al.*, 1993; Cetron *et al.*, 1996; Potasman *et al.*, 1996) which all pointed to the existence of the disease in the lake. In 1994 the University of Malawi, College of Medicine conducted studies on the eastern shores of the Lake among school children of the local population and found a very high prevalence rate of 78% (Ashorn & Ashorn, 1995). Following an intensive health education intervention coupled with medication to the school children, the prevalence rate of the disease declined to 47% but re-infection appeared to have occurred within six

months as seen by the increase in schistosomiasis eggs in the urine of those previously treated (Ashorn & Ashorn, 1995).

Since Lake Malawi is a major tourist attraction and source of government revenue, news of the disease published in international travel journals led to fears of a marked decline in tourists visiting Malawi. This prompted immediate joint action from the government and local hotels to fight the disease. In 1995 the Lake Malawi Bilharzia Control Programme involving concerned parties was established and I was called in as social psychologist to give my input to the team that would focus on the western shoreline of the Lake. It was recognised that input from a behavioural scientist would be important in fighting the disease. The disease is contracted through water contact and maintained when infected persons urinate into the water. A primary behavioural objective therefore would be to get people along the lake to stop urinating in the water. Since children are the most infected with the disease (Kumwenda *et al.*, 1993; Evans & Stephenson, 1995), they would be the primary targets of any behaviour change health education programme. The 1994 study along the Eastern shore saw that whilst medication helped control the prevalence, the behaviour (urination in water) did not change. There was thus a need to deal directly with the behaviour. Health education is seen as the vehicle for bringing about change and has been put forward as an important component of any intervention programme. Rarely in Malawi, however has enough attention been given to evaluating the health education input itself. It has always been assumed that health education is a necessary accessory to behaviour change, but the most effective and efficient measures of health education input in bringing this about are not always assessed. The challenge I therefore had was to bring social psychology to bear on this health problem in a rural Malawi setting by planning, implementing and evaluating a health education programme. Such a task is reflective of the challenge for the discipline of social psychology itself to be relevant and practical in issues of national development.

1.2 Summary of Thesis

This thesis attempts to answer the following questions: Firstly, do different measures of health education input impact upon the fight against a target disease? Secondly, if so, how? The thesis is divided into three parts. Part I contains three chapters (1 to 3) and sets the background and theoretical tone of the thesis. Chapter 1 is the introduction chapter. A more detailed background to the problem of schistosomiasis along Lake Malawi is given. It includes a look at the key players of the control programme and general information about the location of the study. Information about the disease itself is outlined so as to give a clearer picture of the lifecycle and the role behaviour plays in maintaining the disease. Strategies used to control the disease are highlighted to enable an appreciation of the centrality of health education in schistosomiasis intervention programmes. This thesis argues that a gap in the schistosomiasis literature is one of failure to evaluate the health education input itself.

Chapter 2 reviews the literature around the theoretical basis of the thesis. Given the context of the thesis (addressing a practical health problem of national significance), the debates surrounding the relevance of social psychology to national development and practical issues shall be highlighted. Current and new social psychology modes of operation (e.g. Carr *et al.*, 1998) shall be outlined. The action research of this thesis utilised some of these positions of current social psychology to evaluate the process and impact of the health education input. The issue at hand in this thesis is a health problem. Social psychology has contributed to health improvement and an outline of the main issues around the role of psychology and health behaviours shall be explored.

Given that the primary aim of the thesis is an evaluation of the health education programme set up to fight schistosomiasis, the health education literature is also reviewed to set the context. In particular the links between health education and psychology are outlined. Issues pertaining to behaviour and behaviour change are also outlined since this is what the health education seeks to change. Issues pertaining to health education

intervention are highlighted and the PRECEDE-PROCEED model (Green & Kreuter, 1991) is outlined. Theoretical constructs embraced by the model are presented.

Chapter 3 outlines the methodological approach of the study. Here the overall picture of the methods and strategy of the action research is given so that the subsequent chapters can be seen in their correct perspective.

Part II of the thesis traces the planning stages of the action research. This closely follows the stages of the PRECEDE model. Chapter 4 outlines the social, epidemiological, behavioural and environmental factors that need to be considered within the idiosyncrasies of the communities involved in this study. Goals are set based on feedback from the community itself. Chapter 5 continues in this vein and looks at the educational and organisational diagnoses that influence the predisposing, enabling and reinforcing factors of the behaviours determined in chapter 4. Chapter 6 is the administrative diagnoses and tackles budget issues. It also describes in detail the health education intervention itself and what happened in the field during the action research intervention.

Part III is designated to the evaluation phase of the thesis. Chapters 7, 8 and 9 are the evaluation chapters addressing process, impact and outcome respectively. Chapter 10 is the concluding chapter. Here I attempt to tie the whole thesis together and draw my conclusions as well as outline the lessons learned from this intervention. Of prime interest would be to answer the guiding question of this thesis, which is aimed at assessing the most efficient health education input in controlling the prevalence of the disease. Recommendations for future research are also addressed here.

We begin this journey by setting the overall context of the background that prompted my involvement in this action research. In order to enable an appreciation of the national context in which this thesis occurred, a brief word about the country of Malawi is given now in section 1.3.1 followed in 1.3.2 by the background of events leading to my entering the scene.

1.3 Background to the Study

1.3.1 Malawi

Malawi is a small African country occupying the southern part of the East African Rift Valley. It lies between 9 and 17 degrees south of the equator. It has an area of 119,140 square kilometres of which 20 percent is water (Republic of Malawi, 1986). It is landlocked and borders Mozambique, Tanzania and Zambia. Its topography is varied, ranging from the Rift Valley floor at sea level to the majestic Mulanje Mountain at 3000 metres.

Malawi attained its independence from Britain in 1964 and was ruled by a one party dictatorship until 1993 when internal and external pressure ushered in a multiparty system of government. Elections were held in 1994 and a new democratically elected government came into power.

Malawi has a national population of 9.7 million people (Malawi National Statistical Office, 1998). It has been described as one of the poorest countries in the world with a macro economy of US\$ 70 with 60% of the population living below the absolute poverty line (Ministry of Health & Population, 1999). The country is predominantly agricultural based with 85% of the population living in rural areas. Agriculture accounts for 40% of gross domestic product and is responsible for 93% of the country's export earnings and 80% of employment. Manufacturing industry accounts for only 13-14% of gross domestic product. The Malawi economy depends on economic assistance from the international monetary fund (IMF), the World Bank and individual donor nations such as Japan and Denmark. The gross national product per capita income is US\$ 600. In 1998 GDP grew by 3.1%, which was smaller than the previous estimation of 4.1% (Reserve Bank of Malawi, 1998). The main agricultural export has been tobacco, but this has in more recent years been adversely affected by the growth of the anti smoking lobby in its traditional markets. This pre-empted a devaluation of the country's currency, the

Kwacha, by 60% in August 1998 and the prices of commodities skyrocketed. Inflation was measured at 30% by the end of 1998 (Reserve Bank of Malawi, 1998). Malawi has one of the lowest rates of literacy in the world. 80% of rural women can neither read nor write. Only 4% of the country's overall population have had access to secondary school education. In 1994 the teacher/ pupil ratio was 1:70 (Ministry of Health & population, 1999). Malawi's health indicators are dire. They are among the poorest in the world. Malawi has a live birth infant mortality rate of 134/1000. 50% of the children under the age of five are chronically malnourished. The reasons given for this are household food insufficiency due to poverty, poor weaning and feeding practices and frequent infections. 56% of the women attending antenatal clinics are anaemic (Ministry of Health & Population, 1999).

The Malawi government's recurrent budget was estimated at MK 14.4 billion (US\$ 320 million) for the 1999/2000 fiscal year, a 35.4% increase from the 1998/99 fiscal year (Government of Malawi, 1999). The Ministry of Health & population's budget was MK 1.403 billion (US\$ 32 million). Of this sum, about US\$ 9 million was earmarked for the procurement of drugs and pharmaceuticals. By the end of this study, the economic situation on the ground for most Malawians was affected by the country "undergoing a period of economic crisis with a huge fiscal deficit... rapid inflation... and little prospect of substantial growth" (Ministry of Health & Population, 1999, p.3). A 1995 survey indicated that only 36.8% of Malawians had access to safe drinking water within a distance of 1 Km. 72% had access to sanitation with a pit latrine. HIV/AIDS was the leading cause of death among the productive 20-48 year age group (Ministry of Health & Population, 1999). An estimated 1 million Malawians are said to be carrying the HIV virus with over 200,000 deaths attributed to AIDS so far (Chipwete, 1997). The third national health plan was implemented from 1986-1995. By 1999 the plan had still not been evaluated (Ministry of Health & Population, 1999). Primary health care is the main approach of health service delivery with three main foci aimed at the most vulnerable groups, maternal and child health, water and sanitation and encouragement of early treatment of disease. The Primary health care approach is believed to be a "cost effective

package for essential health services with the involvement of beneficiaries as the main service delivery stake holders” (Ministry of Health & Population, 1999, p.6).

1.3.2 The “Scare”

Lake Malawi has been described as “a valuable national asset, as a source of food and fresh water, as a means of communication, as a tourist attraction, and as the home of the most diverse fish fauna of any lake in the world” (Republic of Malawi, 1986, p.1). An important attraction of Lake Malawi as a tourist resort was that it was considered one of the only lakes in Africa that was free of schistosomiasis. Its clear crystal waters enabling under-water visibility of 20 metres was another major attraction to tourists who saw it as a snorkelling haven (Gondwe, 1995). The Lake Malawi National Park became the first fresh water National Park in the world and became a world heritage site in 1994 (Gondwe, 1995; Malawi Environment Management Programme, 1997). Its major attraction was the presence of over 1000 species of fish unique to the lake. It received up to 11,000 foreign visitors per annum (Gondwe, 1995).

From the beginning of 1993 articles began appearing in international travel journals issuing health warnings about Lake Malawi. An article in the *Journal of Travel Medicine*, for example, concluded “every traveller returning from Lake Malawi should be screened for the possibility of schistosomiasis at monthly intervals” (Potasman *et al.*, 1996, p. 35). Whitworth (1993) cited two cases of neuro schistosomiasis in patients who had swam in Lake Malawi. Given the widely held belief that Lake Malawi was the only lake in Africa free of schistosomiasis (Russell *et al.*, 1993), Whitworth concluded his letter to the *British Medical Journal*, “it is time that this myth was exploded” (p.936).

A flux of research to establish the prevalence of schistosomiasis in the lake was published. Each gave case examples of foreign nationals who had been into Lake Malawi. For example, Potasman and colleagues (1996) presented 22 patients who had been diagnosed positive with schistosomiasis in two travel clinics in Israel during 1993-1994. They had all recently been in Lake Malawi. Another example, the Centre for

Disease control in the United States carried out a survey among 955 expatriates in Malawi. Published by Cetron and colleagues (1996), they reported that 32% of the expatriates tested positive for schistosomiasis.

What had led to this increase in the disease along the shores of Lake Malawi? The presence of the vector snail for schistosomiasis had been noted along the shores since 1993 (Cetron *et al.*, 1996). Attribution of this hinges on two main factors. The first factor being the result of ecological changes such as heavy rainfall resulting in vegetation and grass being washed into the open lake area. Some of the grassy islands are more visible in the lake (Cetron *et al.*, 1996). The second factor for the increase in vector snail was said to be that the snail may have always been present in the lake but was controlled by snail eating fish of the *Tematocranus plachydon* species. Recently, over fishing has resulted in a 96% decline in density of shallow water fish between 1978 and 1994 (Stauffer *et al.*, 1997). Between the years 1977 and 1987 none of the divers of the Department of Fisheries contracted schistosomiasis. However starting from 1988 and increasing sharply 1993-1994, the rate at which divers were contracting schistosomiasis increased dramatically. This coincided with a sharp increase of prevalence among the local population especially children living along the shores of the southern part of Lake Malawi (Kumwenda *et al.*, 1993; Stauffer *et al.*, 1997).

Prevalence rate studies among the local population were also carried out. Kumwenda and colleagues (1993) found the disease had reached epidemic proportions by 1992. Of 607 school children, 83% had haematuria (blood in the urine) determined by dipstick and 75% had schistosomiasis eggs in their urine. When examined by age stratification, 87% of those infected were observed among the 5-15 year age group (Kumwenda *et al.*, 1993) compared with a prevalence of 46-57% in 1981 (Teesdale & Chitsulo, 1985).

The University of Malawi, College of Medicine also conducted research in Mangochi that lies on the southern tip of Lake Malawi. Three studies among school children along the Eastern shores of Lake Malawi were conducted in 1994 and 1995. Prevalence rates for school going children were high (78%) in May and November 1994. Following

treatment with the drug Praziquantel and health education input, there was a decline in the prevalence rate to 47% (Ashorn & Ashorn, 1995). The programme though partially successful, was deemed to have limited effectiveness for the following reasons: there was no outreach to non-school going children (who make up a high proportion of the children's population). Secondly there was a failure to provide alternative water sources; thirdly there was no general community awareness about the facts of the disease. The fourth reason was the lack of available resources to tackle the ecological sites of the snail host and, lastly, the fact that behaviour of the children urinating in the water had not changed (Cullinan, 1996). These findings led to the programme in which the author of this thesis played an active role.

1.3.3 The key players

In view of the reported concerns over the increase of schistosomiasis in Mangochi, there was a coming together of concerned parties to try and combat the problem. The overall project was a joint venture between the University of Malawi's Department of Community Health at the College of Medicine, the Malawi Government Ministry of Health & Population in Mangochi district, the Malawi Government Ministry of Parks, Tourism & Wildlife, three hotels in the area and three of the primary schools. Each of these sectors played an important role in the overall study that was called the Lake Malawi Bilharzia Control Programme (LMBC Programme). The author of this thesis acted as co-ordinator of the study and was responsible for the social psychology research aspects of the programme. The College of Medicine funded all his personal expenses for the study. The Ministry of Health & Population helped provide funding for the health education in terms of buying materials. Their staff in the community known as Health Surveillance Assistants (HSAs) played an invaluable role in terms of arranging the village meetings; speaking to the children and providing insights into community based health-related issues.

The Ministry of Tourism, Parks and Wildlife had a vested interest in the study in that tourism would be greatly affected by the prevalence of schistosomiasis. They also provided funding for various components of the study, such as allowances for the patrons

of the health clubs we established and some health education material. The holiday resorts in the area were primarily involved through funding. One of the resorts, Club Makokola, for example funded the Health educator in the first year and provided a venue for training of the local band to spread the message among the school children. They also assisted with money that was used for the purchasing of drugs for the treatment component of the study. Another resort, Nkopola Lodge, provided their resident band as well as their venue for meetings with the villages' leaders. They also gave funding for the chemotherapy intervention, as did Boadzulu Holiday Resort. The study was not funded by any outside or international agency but was completely funded by those with a vested interest in doing something about the schistosomiasis situation affecting children along Lake Malawi. Being dependent on international aid was seen as a negative as it sets us up to having to comply with the funders' own agenda (La Font, 1995).

The LMBC Programme worked in conjunction with other parties involved in controlling schistosomiasis. A schistosomiasis control steering committee was established to ensure that there was no replication of work being conducted. We would meet frequently, once every two months. This steering committee composed the LMBC Programme; Ministries of Health, Tourism, non governmental organisations such as Save the Children (who were involved in sanitation research) and the Danish Aid agency (DANIDA) which wanted to run a schistosomiasis control programme at Cape Maclear, about 50 kilometres north west of the LMBC Programme area. At our meeting on the 25th July 1997, it was agreed that in order to prevent replication as well as contamination of data, research projects or activities in the area would have to be cleared by the Steering Committee. The LMBC programme was seen as an important pilot for the control of schistosomiasis countrywide through the use of health education and medication.

1.3.4. The location

Mangochi district where the study was carried out is located in the Southern region of Malawi and on the southern tip of Lake Malawi, which is 360 Kilometres (Kms) long and 80 Kms wide. Mangochi has a total land area of 6272 square Kilometres exclusive of the waters of Lakes Malawi and Malombe. It comprises 7% of the country's total land area.

Mangochi experiences a warm tropical climate with annual temperatures of 18-40 degrees Celsius. The highest temperatures are experienced in October and November and can be as high as 40 degrees Celsius (Mangochi District Health Office, 1998). Average rainfall ranges from 800mm along the lakeshore valley plains to over 1000mm over the highlands on the eastern side of the lake. The rainfall period is December to March. The landscape is relatively flat though the eastern lakeshore is fairly hilly. Many perennial streams drain the eastern escarpment. The vegetation in the area of the study, which is about 20 kilometres north of Mangochi Boma (town centre), is shrubby with baobab trees and palm trees along the shores of the lake. In the rainy season the vegetation is greener and there are numerous pools that form from the rain, which the children use to swim in (See photographs in Appendix 1).

Mangochi has a population of 600,000 with an annual growth rate of 1.7% (Malawi National Statistical Office, 1998). The number of people living per square kilometre (population density) is 96. This is lower than the Malawi average of 105 people. The 1998 population sex ratios (number of males per 100 females), is 92. Children below the age of five make up 17.4% of the population of Mangochi. Children under the age of 18 comprise 50.2% of the population (Malawi National Statistical Office, 1998). People aggregate along the lake shorelines for their livelihood. At village level, settlements are scattered and the customary land between the villages is rarely cultivated. Houses are clustered (Mangochi District Health Office, 1998).

Most of the population is Moslem and most families earn their living through fishing and subsistence farming (Kumwenda *et al.*, 1993). There are about 113 primary schools in the district. Only 47% of children attend school (Kumwenda *et al.*, 1993). The most common diseases in Mangochi are Malaria and diarrhoeal diseases (Mangochi District Health Office, 1998). Schistosomiasis is the eighth leading cause of attendance at outpatient health facilities in Mangochi (Kumwenda *et al.*, 1993). In 1998 53% of the population lived less than 5 kilometres from a health facility (Ministry of Health & population, 1999).

At this point it would be worthwhile looking in more detail at the disease schistosomiasis (section 1.4). The first subsection 1.4.1 explores the background to schistosomiasis followed by an exposition of its lifecycle (1.4.2). Such an exposition is necessary in order to appreciate the later section on attempts at control of the disease, which have tried to tackle the disease at each stage of its lifecycle. To demonstrate that schistosomiasis is an important health concern requiring intervention I shall outline both its physical and economic effects in subsection 1.4.3. Since this thesis involves attempting to control the disease in Malawi, a brief history of the disease in Malawi shall be given in subsection 1.4.4. This shall then lead us onto section 1.5 of this introductory chapter that shall deal with universal attempts to control the disease.

1.4 Schistosomiasis

1.4.1 Background

Schistosomiasis (Bilharzia) is one of the greatest threats to health within Africa today. It has been described as one of the most destructive diseases in tropical areas next to malaria (Watts *et al.*, 1998). Over 200 million people world-wide are believed to be infected with Schistosomiasis (WHO, 1993; Dunne *et al.*, 1995; Red Urine Study Group, 1995) and 600 million people world-wide are at risk of infection (WHO, 1993). The disease is endemic in 74 countries and territories. There are two main types of schistosomiasis infection determined by different species of flatworms: urinary and intestinal schistosomiasis. The urinary schistosomiasis (*S. haematobium*) is endemic in 54 countries, mainly in Africa and the eastern Mediterranean whilst the intestinal schistosomiasis (*S. mansoni*) is endemic in 52 countries and territories mainly in South America, the Caribbean, Africa and Eastern Mediterranean. In 41 countries of Africa and Eastern Mediterranean, both urinary and intestinal parasites are present. Other types of schistosomiasis such as *S. Japonicum* are reported in 7 Southeast Asian and Western Pacific countries (WHO, 1993).

WHO (1993) reports that schistosomiasis has been eradicated in two countries, namely Japan and Montserrat. Within a given country, the distribution of schistosomiasis can

vary widely. In Egypt, for example, the whole country is exposed to infection whilst in Zimbabwe only people living near irrigated schemes in the South are at risk of infection (Ndhlovu *et al.*, 1992). Transmission to the population occurs only where the fresh water snail vector is present. The distribution of the disease is very focal (Red Urine Study Group, 1995; Traore *et al.*, 1998).

Schistosomiasis is a disease that has a long history worldwide. It has been shown to be present in Egyptian mummies over 4000 years old. The disease is believed to have originated in the great lakes of Central Africa and to have spread in two directions: northwards down the Nile, and south via Bantu migrations (Malawi National Bilharzia Control Programme, 1986). Theodor Bilharz, a German working in Egypt, identified the causative fluke in 1851, hence the other name for schistosomiasis, Bilharzia (King & King, 1992). In 1915 Leiper demonstrated the two distinct species *S. haematobium* and *S. mansoni* which are present in humans. He demonstrated that infection is acquired through the skin (Malawi National Bilharzia Control Programme, 1986).

1.4.2 Life Cycle

Schistosomiasis is a parasitic infection caused by trematodes (flukes or flatworms) (Dunne *et al.*, 1995). Infection is acquired by exposure to the schistomes, which penetrate the skin of persons in contact with the water containing the infected snails. Once inside the infected person, the parasites take on worm-like appearances called schistosomules. They penetrate the lymphatic and venous systems and are carried by the blood stream through the heart to the lungs. The schistosomules then make their way to the liver where they grow to maturity. The male and female pair up permanently at this stage. Once sexually mature they leave the liver and migrate to either the blood vessels near the bladder or large intestine depending on their species. There they lay eggs that are then expelled from the body through the urine or faeces. If the excretion occurs in water, the eggs hatch as soon as they reach the water. The hatched eggs (called *Miracidium*) then seek to find a snail host within hours, otherwise death occurs. The snail vector of *S. haematobium* in Malawi is of the *Bulinus globosus* species (Gray, 1981; Cetron *et al.*, 1996). Once inside the snail host, the *miracidium* grows and becomes a parasite called

cercaria. After five weeks the *cercaria* leave the snail and swim in the water until they penetrate into the skin of a person. They must do so within 48 hours otherwise they die. The cycle is thus repeated. (See diagrammatic description of the life cycle in Appendix 2).

1.4.3 Effects

The disease has several effects. We shall focus on two prominent ones, physical effects on the infected person and economic effects. First, physical: some infected persons demonstrate no symptoms (Stauffer *et al.*, 1997). Those who develop symptoms of the infection, typically have the symptoms appear four to six weeks after infection (Gondwe, 1995). The sufferer is weakened and feels lethargic and debilitated making it difficult to carry out physical labour. The infected person's activity levels are also affected in that such persons tend to be more lethargic (Kvalsvig, 1986; Kvalsvig & Becker, 1988). Recent studies have also shown that schistosomiasis infection affects cognitive functioning of the infected persons as well as their emotional state and patterns of social interactions (Nokes *et al.*, 1992; Connolly & Kvalsvig, 1993). Most of the people infected are not aware they carry the disease, or if aware, do not act to treat it. This has been attributed to infected persons accepting the disease as a part of life as well as ignorance about the disease and life cycle (Malawi National Bilharzia Control Programme, 1986). The debilitating symptoms of disease are not confined to chronic morbidity as seen in the reported cases of those who had recently been in Lake Malawi (e.g. Potasman *et al.*, 1996).

The highest prevalence and intensity of infection in most endemic countries occurs among children aged between 5 and 15 years of age (WHO, 1993; Evans & Stephenson, 1995).

Chronic morbidity develops later among some of these infected children! Susceptibility to subsequent severe disease varies between individuals and is determined more by intensity of infection than immunogenetic factors (WHO, 1993). Schistosomiasis haematobium is characterized by terminally spined eggs that pass out of the host primarily in the urine. The worms are located in the vesical plexus, which are blood vessels near the urinary

bladder. The female worm lays up to 300 eggs per day. The *Bulinus* (Physopsis) type of snail is the intermediate host. Man is said to be the only definitive significant host (Malawi National Bilharzia Control Programme, 1986). The effects of *S. haematobium* infection in the short term are, blood in the urine due to the spikes of the eggs breaking through the bladder wall into the urine. This results in loss of blood. The spikes of the eggs also damage the wall of the urethra during passage. The sores produced become infected with bacteria and cause pain on urination (Malawi National Bilharzia Control Programme, 1986; Patwari & Aneja, 1988). Long term infection can lead to renal damage with subsequent kidney failure and even possible death. This arises from damage to the urinary tract caused by fibrosis (scarred tissue which stiffens the bladder wall), hydroureter (which is pressure built up between the urethra because the urine is not being emptied) and hydronephrosis (pressure in the kidneys due to urine not being emptied). Bladder cancer is also associated with urinary schistosomiasis (WHO, 1993; Muthami *et al.*, 1995) and so too is anaemia and iron loss (Prual *et al.*, 1992; Stephenson, 1993; Clark, 1994) due to the haematobium (blood loss). Hence treatment of urinary schistosomiasis is an important measure for preventing bladder cancer. Epigastric symptoms (stomach) have also been associated with *S. haematobium* usually with symptoms mimicking peptic ulcers (Patwari & Aneja, 1988). Some of the eggs find their way into the sexual organs resulting in infertility through the blockage of tubes necessary for reproduction as in the case of female genital schistosomiasis (Wright *et al.*, 1982; Leutscher *et al.*, 1998). A study in Madagascar found that women with schistosomiasis eggs in the genital area reported more spontaneous abortions, irregular menstruation and vaginal discharge (Leutscher *et al.*, 1998). Some of the schisto eggs enter the central nervous system (CNS) and can be found in the spinal cord (Blunt *et al.*, 1993). Neuroschistosomiasis (as the US Peace Corps volunteers mentioned at the beginning had) can lead to paraplegia and persistent impotence if the eggs are deposited in the CNS (Blanchard *et al.*, 1993). Lesions of the conus medullaris in the brain are also known to be attributed to schistosomiasis (Whitworth, 1993).

S. mansoni manifests itself through intestinal signs and symptoms such as abdominal pain, diarrhoea and bloody stools. The eggs of this species are particularly large as

compared to haematobium. They are laterally spined. The parasite is located in the veins called the inferior mesenteric, which is located near the large intestine. The eggs leave through the stools. The worms can live for up to 20 years in their hosts. The female worms produce 100 – 300 eggs daily. The snail type in the fresh water once expelled is called the Biomphalaria (Malawi National Bilharzia Control Programme, 1986). The long-term effects are enlargement of the liver and spleen resulting from scarring and fibrosis (Muthami *et al.*, 1995). This can lead to death from massive haematemesis from oesophageal varices.

S. Japonicum long-term infection is similar to that of *S. Mansoni* but is far more severe. Blood loss from ruptured oesophageal varices leads to death. Another consequence of long term *S. Japonicum* infection is disease of the central nervous system with seizures (WHO, 1993). Studies have also shown that infection not only causes the above symptoms but also affects the reproductive tract of women resulting in symptoms such as irregular menstruation, pelvic pain and vaginal discharge not related to sexually transmitted disease (Leutscher *et al.*, 1998). There are other species of schistosomiasis that primarily affect animals. They are thus outside the domain of this study.

As can be seen, schistosomiasis affects those with the disease in various ways. It is not a disease to be taken lightly (Watts *et al.*, 1998; Malawi National Schistosomiasis Control Programme, 1991). Ndhlovu *et al.* (1992) argue that schistosomiasis is the most important helminth infection of man in terms of combined morbidity and prevalence. Another effect of the parasitic infection is its economic impact. Evans & Jamison (1994) state that parasitic diseases impose an economic burden on communities. There are two costs involved, direct (for example diagnosis and treatment) and indirect (morbidity that reduces productive time). A person's daily life is affected by the illness. In addition there are inconspicuous effects that schistosomiasis has on a person in the long term by affecting general well being resulting in lethargy and negative cognitive effects. Another subtle effect is that the incidence of parasitic infection is highest among the poorest people. Parasitic diseases therefore exacerbate existing inequalities by restricting economic potential (Evans & Jamison, 1994). WHO (1993) cited some studies that

showed that there is an impact on the economy of those affected by schistosomiasis. In Ghana 4.4 working days were lost per year, per infected person, according to the Ghana Health Assessment Team. In the Philippines *S. Japonicum* results in the loss of 40 working days per year per infected person (WHO, 1993). In Zimbabwe it is one of the top ten causes of attendance at health facilities, especially for children (Ndhlovu *et al.*, 1992). In Malawi the disease is believed to have significant impact on the socio-economic production of farming and fishing communities (Malawi National Schistosomiasis Control Programme, 1991). The money the government spends on treatment is also a cost. In Malawi, Praziquantel is the most expensive drug available in the government's central medical stores. There is growing research on the application of cost effective analysis with regard to schistosomiasis (Guyatt & Tanner, 1996; Kirigia, 1997, 1998). These are specialised analyses and are beyond the scope of this study.

1.4.4 Schistosomiasis in Malawi

The disease is believed to have been carried to Central Africa by immigrant Hamites (Malawi Environmental Management Programme, 1997). Ransford (1966) noted that towards the end of the seventeenth century the Amaravi tribe, the once great tribe from whence the name Malawi originates, who lived along the shore of Lake Malawi, was greatly affected by it. The great British explorer of the nineteenth century, David Livingstone, was reported to have noticed blood in the urine of his porters as he travelled throughout Malawi (Nyasaland at the time) (King & King, 1992). King & King in their book on the story of medicine and disease in Malawi, write that a certain Dr. Howard in the early 1900s, estimated that 50% of the lakeshore population was infected. The first formal study conducted in Malawi was said to be that of Dr. Gopsill who in 1929 found 70% of 100 men in good health carrying the urinary schistosomiasis eggs in their urine. This study was conducted in the lower shire valley in Southern Malawi (King & King, 1992). There are however, no details of exactly how the study was carried out. Chitsulo (1994) writes that schistosomiasis was first documented in 1924 in Northern Malawi. The treatment that was commonly given out in the early twentieth century was Antimony Tartrate, which was given intravenously. This was first given in 1918 (King & King, 1992). Along the shores of the lake in Central Malawi, a study by Ransford found 53%

haematobium in the urine of hospital patients in 1935 (Kamwendo *et al.*, 1987). In 1940, during the Second World War, 41% of the soldiers of the King's African Rifles were found to be infected. Writing in 1946, Ransford (1966) noted that:

The real rulers of KotaKota [largest town along the lake at that time] were the bloodflukes that gave its inhabitants the disease we call Bilharzia. These microscopical worms like all parasites are very logical organisms. Their own survival depends on keeping their human hosts alive and yet they continue to reduce them to such depths of apathy as to be physically incapable of throwing off their parasitic yoke. We were horrified to find that the natives were weighed down by an incredible load of parasites. (P.6)

In 1961, 24,825 cases were treated throughout Malawi (King & King, 1992). The disease was described as the most incapacitating in the lower shire valley. The need for agricultural development following Malawi's independence in 1964, led to the introduction of irrigation schemes (Chitsulo, 1994). The construction of irrigation schemes for sugar plantations in the Shire Valley helped increase the prevalence of schistosomiasis in the local population. This occurrence is consistent with findings elsewhere where irrigation schemes attract the snails (e.g. Ndhlovu *et al.* (1992) in Zimbabwe; Watts *et al.* (1998) in Morocco and Egypt, and Bradley (1994) citing examples from Ghana and Gambia). Msukwa (1981) reported that schistosomiasis had increased 300% in Malawi between 1960 and 1970. He quoted Schumer as claiming that 70% of all children in Malawi suffered from the disease.

The Malawi National Schistosomiasis Control Programme has its roots in the establishment of a pilot project in Malawi in 1976. At the time the aim of the project geared at improving the approach to controlling the disease in the irrigation schemes. However as the years went by it became clearer through the collection of data on prevalence rates and distribution of snail hosts that schistosomiasis was a serious problem throughout Malawi (Teesdale & Chitsulo, 1985). As a result of this increased knowledge, a second phase was planned to commence in 1986 by the government of Malawi. The

aim of the second phase was to reach areas outside irrigation schemes where the disease was a major threat. Schistosomiasis was now to be seen as a major public health problem (Malawi National Bilharzia Control Programme, 1986). However this second phase was not adopted because the costs of its implementation were not included in the plan. The plan that was eventually adopted to deal with the spread of schistosomiasis in Malawi was community based (Malawi National Schistosomiasis Control Programme, 1991). Errors reported in hindsight with regard to the way schistosomiasis control activities were carried out before the 1990s were: the monitoring and the evaluation of activities were not built into the programme. This resulted in constant changes in the goals and objectives without justification. Secondly, data collected was never analysed or used to determine maximal strategies for control. The training of the environmental health personnel was never evaluated and no follow-ups were done. Finally, there was no input from local staff with regard to decisions about equipment needed (Malawi National Schistosomiasis Control Programme, 1991).

Half the Malawi population is believed to be infected (Malawi National Bilharzia Control Programme, 1986; Wolff & Malewezi, 1989). Most of those infected live in the rural areas where 86% of the Malawi population resides (Malawi National Statistical Office, 1998). Since transmission occurs in settled parts of the country, Wolff & Malewezi (1989) estimated 80% of the population as being at risk of infection. (Please see Appendix 3 for a map of the distribution of schistosomiasis haematobium in Malawi). In 1996, 350,000 Malawians were diagnosed in government hospitals and clinics with urinary schistosomiasis (Republic of Malawi Health Statistics, 1999). The rate of prevalence of the disease amongst children and adolescents is far greater than among adults (Msukwa, 1981). Among children in some areas, prevalence rates of 80-100% are not uncommon (Malawi National Schistosomiasis Control Programme, 1991). The prevalence rates for the whole country were estimated at between 40 and 50% in the 1990s. Children under the age of 14 constitute 44% of the total Malawi population. To prevent long term disease, treatment should be concentrated on young children and teenagers where the heaviest worm loads are usually experienced (Malawi National Bilharzia Control Programme, 1986).

1.5 Control Measures Attempted

World-wide there have been five main methods that have formed the basis of the fight against schistosomiasis (WHO, 1993). These have fallen into the categories of (i) controlling the snail, (ii) improved sanitation, (iii) chemotherapy, (iv) health education and more recently, (v) behaviour and psychosocial approaches.

1.5.1 Control of the snail

There are three main documented ways of controlling schistosomiasis by breaking the cycle at the level of the snail host. Worldwide the snail hosts include the following species: *Biomphalaria*, *Bulinus*, *Oncomelania* and *Tricula* (Stauffer *et al.*, 1997). In Malawi the *Bulinus globosus* species has been identified (Gray, 1981). The first method of breaking the cycle at the level of the snail host, is environmental control. Environmental control aims at attacking the environment in which the snails thrive. This is usually done by straightening or deepening the water channels to increase the flow. Such conditions are hostile to the snail. The removal of weeds from water sources as well as the clearing of grass has been advocated as another effective method as it deprives the snail host of food.

The second method is biological control. This is achieved through the use of living plants and animals to destroy the snail host. For example, in Malawi, Ransford (1966) writing in 1946 described the discovery of a natural snail poison occurring in a freely growing shrub *Tephrosia vogdii*. This poison was crushed and the powder sprinkled over water where the snail population lived. Within 24 hours the entire affected snail population was floating dead in the water. As mentioned above, predatory fish have been used to regulate the population of disease vectors (Stauffer, *et al.*, 1997; Kolberg, 1994). Stauffer and colleagues (1997) argue that the use of snail eating fishes (*sic*) to control the disease should be developed. The *T. Placodon* species is cited as being effective in controlling the schistosomiasis snail host. They recommend the breeding of this particular indigenous fish. Lake Malawi is said to be unique in that it has over 20 other indigenous snail eating

fish species that could be bred to help fight the disease. Apart from fish, species of snails could also be introduced. Tanzania was reported as recently introducing another species of snails, for example the species *Marisa Cornuarietis*, which ate the egg masses of the intermediate host snail and compete more successfully for food thus starving the schistosomiasis carrying snails (Malawi National Bilharzia Control Programme, 1986).

The final method of snail control is chemical control. Mollusciciding is the term that is given to the chemical eradication of the intermediate snail host. The Malawi National Bilharzia Control Programme (1986) says that this should be the “frontline” in the attack against schistosomiasis. Snails are said to be the “weakest” point in the schistosomiasis transmission cycle and mollusciciding has devastating effects. The use of molluscicides such as Bayluscide (Niclosamide) is said to have an immediate blanket eradication effect on the snail host. In Zimbabwe, for example, mollusciciding and devegetation used in conjunction with safe water and sanitation provision, has kept the prevalence between 0 and 4.5% as opposed to 45% in areas where there are no control schemes (Ndhlovu *et al.*, 1992). However the use of mollusciciding is dependent on ecological and epidemiological circumstances as well as the financial and human resources available. Determination of appropriate sites and timing of molluscicide application is difficult. Following focal mollusciciding, rapid reinvasion by the snail hosts of the area occurs. Hence regular application is necessary (WHO, 1993). However the use of chemicals to eradicate the snail host does have disadvantages. The chemicals are very expensive, especially if they are to be used on a large scale. Their effect is not permanent, the application of the chemicals has to be ongoing and, finally, they can be dangerous to other organisms living in the water (Malawi National Bilharzia Control Programme, 1986; Stauffer *et al.*, 1997).

1.5.2 Improved sanitation

Another method of control that has been attempted has been the improvement of facilities for human excreta disposal and provision of safe drinking water to rural villages through taps so as to avoid water-contact patterns with infected water. WHO (1993) stated that this method is effective and should be incorporated into control programmes. Since

schistosomiasis alone has not been seen to provide sufficient motivation for investment in water supply and sanitation, such programmes would be more effective if linked to ongoing activities for the provision of safe drinking water (WHO, 1993). A comprehensive approach incorporating water supply, excreta disposal and bathing and laundry facilities is required (WHO, 1993). In Mangochi, southern Malawi, one of the hotels along the lakeshore built such a facility. However within six months of construction, it had to be locked because it was badly soiled with human excrement. The village chief at that site attributed the soiling not to lack of education or ignorance of use but to the people in the vicinity making a clear statement to the hotel authorities that the lake was a part and parcel of their lives. They refused to be deterred from going to it by such modern facilities. Bomba (1981) outlined how difficult it was to motivate a given community to dig pit latrines for themselves, as the digging of pit latrines had been associated with colonial oppression. Apart from piped water there has also been the suggestion of the provision of boreholes to the area concerned.

Kamwendo et al. (1987) further stressed that improved technology in itself cannot solve the problem. They gave the example of the area of Chiradzulu in Southern Malawi which had no access to piped water yet had a lower prevalence rate (46.5%) than an adjoining plain (64%) where piped water had been available for three years. Washing and bathing continued to be carried out in the rivers despite the availability of piped water. It can therefore be seen that reliance on improved technology in itself will not solve the rate of transmission since the human factor has to be taken into account. The technological element is also practically limited by the financial constraints that accompany the implementation of any projects. There are, for example, thousands of villages that would require piped water, and to supply each village with water would be far too costly.

1.5.3 Chemotherapy

The medical approach has been to rely on the provision of drugs. This seeks to deal with the disease whilst the parasite is in the definitive host, the person. The emphasis in schistosomiasis control has more recently shifted from transmission control at the level of the snail host to the control of morbidity in the infected human (Red Urine Study Group,

1995; Kloos, 1995; Chitsulo, 1994). This shift has been brought about by the new emphasis on Primary Health Care and the availability of safe and more effective single dose medication such as Praziquantel (Chitsulo, 1994). The proliferation of these new drugs means that all forms of schistosomiasis can now be treated orally and usually with a single dose. More attention is now directed at identifying infected persons and treating them. Results of such action are associated with significant increases in children's growth rates, mental and physical energy levels and declining morbidity (Evans & Stephenson, 1995). Subsequently, numerous chemotherapy programmes have been set up. Teesdale and Pugh (1981) in an article entitled "Renewed hope for Bilharzia control" advocated the introduction of a system of control called "Targeted Mass treatment" (TMT) which they believed was the solution to the schistosomiasis problem in Malawi. They lamented that the methods used so far to try and control the disease (sanitation, mollusciciding, water provision and health education) had had limited effect. TMT involves the concentration of the control effort on those groups or individuals with the heaviest worm loads.

They cited the example of Kenya where it was reported that the country experienced an 80% decrease in schistosome community egg output as a result of TMT. In Malawi the target would be 30% of those infected, about 600,000. This was a daring and ambitious attempt at controlling the spread of schistosomiasis by attacking the disease in the human directly through drugs. This approach failed to address behavioural issues and ten years on after its implementation and despite hopeful statements like "this could turn the advancing tide of Bilharzia on this continent" [p.21], the situation has hardly improved. Reliance on medication alone therefore can be said to be ineffective. This has shown the difficulty of trying to erase the disease from whole communities. The other aim of mass treatment has been to change heavy disease-associated infections into light non-disease ones. Another value of medication has been that in the reduction of the human reservoir of infection, the individual experiences symptomatic relief.

In his 1992 paper entitled "Where are we now?" Southgate highlights the fact that there is an "affordable drug which can treat all forms of human schistosomiasis effectively!"

(p.86). The US Department of Health and Human Services (1993) echoes these sentiments. Studies point to cure rates of 80-90%. A study in the Nile delta of Egypt for example demonstrated reductions in prevalence and intensity of schistosomiasis by more than 90% after a year of treatment (El Malatawy *et al.*, 1992). Sukwa (1993) pointed out a reduction rate of 99% in intensity of infection in Zambia following administration of Praziquantel. In Tanzania a 90.4% drop in infection was seen among school children after a single dose of Praziquantel (Kitange *et al.*, 1993).

Whilst this is a safe and efficient way of controlling the disease, the costs of medication as mentioned above is expensive for Malawi. A unit of 1000 tablets including the 12.5% service charge from the Malawi Government Central Medical Stores cost MK 4,600.00 which at January 1999 exchange rates of the Malawi Kwacha to the US \$ was \$102. This translates to MK 4.60 per tablet. With a per capita income of US\$ 600 many of the Malawians who live on subsistence farming would not be able to afford the drug at a private hospital. Then there is the issue of re-infection. Many studies highlight the high re-infection rates (Red Urine Study Group, 1995). A recent study conducted by the Department of Community Health of the Malawi College of Medicine found 76% prevalence among pupils in two primary schools in rural Malawi (Ashorn & Ashorn, 1995). Following three interventions with the drug Praziquantel and health education, it was found that the prevalence of schistosomiasis was reduced for a period of time but re-infection was quick to occur. Re-infection is expected to occur in areas with high rates of transmission (WHO, 1993). Re-infection is more frequent and intense among children than adults who acquire levels of immunity as well as have less exposure to the parasite due to different water contact patterns. A 1995 study in Mwea irrigation scheme in Kenya saw a 50% re-infection rate among children aged 5-19 years in a twelve month follow up study and 75% after two years (Muthami *et al.*, 1995). Re-infection has been attributed to non-effectivity of Praziquantel 2-4 weeks after infection and failure to treat non-school going children who might be infected, population movement and inappropriate health education (Muthami *et al.*, 1995). It can be seen that relying on medication alone is not strong enough to change the infection causing habits of the children, which is urinating in

water. Treatment alone is not enough especially in poor communities where there is malnutrition (Evans & Stephenson, 1995).

Furthermore it needs to be mentioned that whilst medication reduces morbidity and egg output, some of those who have been treated with medication may still excrete a small number of eggs. Such persons would be difficult to distinguish from those who have been re-infected.

“The impact of re-treatment on morbidity lasts longer than its impact on the prevalence and intensity of infection; thus, intervals between re-treatment may also be longer than re-infection rates might imply” (WHO, 1993, p.10). What is therefore needed is something that will control re-infection. Wilkins (1989) wrote that patterns of prevalence and intensity of infection vary with time in children. Patterns of water contact also vary and, so too do population dynamics of the snail host. Re-infection is thus dependent on these factors. A constant water source leads to higher re-infection. Studies also show that re-infection is slower among older subjects due to reduced water contact and higher immunity. Few control programmes based on mass chemotherapy have interrupted transmission.

Chemotherapy has been advocated to run in conjunction with health education. It is to health education as a measure of controlling the spread of infection that we now turn our attention.

1.5.4 Health education

Apart from changing the behavioural component there is also a need for effectively targeted health education input. Studies on schistosomiasis in Malawi have tended to show that many people are largely ignorant of the causes and symptoms of the disease. In one study 44% of adults interviewed were unaware that Schistosomiasis was transmitted through exposure to water. Instead the causative factors were said to be heavy work, malnutrition and heat (Kamwendo *et al.*, 1987; Rée, 1982). In view of this therefore, a health educational programme that is effective and can be evaluated needs to be implemented in any ongoing intervention of schistosomiasis control.

The aims of health education interventions in schistosomiasis have been to promote and reinforce “healthy behaviour with full participation of both the individual and the community” (WHO, 1993, p. 19). Health education is said to be important in the changing of human behaviour that could prevent schistosomiasis. The Malawi National Bilharzia Control Programme (1986) stated that if the target community were given insight into their contribution in the schistosomiasis cycle, the control of the disease would be greatly speeded up. They did however acknowledge the difficulty in convincing a given community of the role it can play. The Malawi National Bilharzia Control Programme therefore recommended five key elements of a health education message. These should be to: first, get the community to think about the long-term danger to their health. Second, to highlight the fact that the disease is spread by anti social behaviour (urinating in the lake). Third, highlight the role the disease plays in retarding development and, lastly, incorporate into the message that schistosomiasis is easy to treat. They suggest that the key phrases of any given health education message should be to tell the people never to urinate or defecate in water. Parents should be the ones to communicate such messages to their children. The focus should be on creating public awareness. Health education therefore seeks to help people understand that their own behaviour is a key component in the transmission of the disease with its effects. WHO (1993) state that the health education programme would succeed if it had clearly defined, quantifiable and attainable objectives; was designed for a specific community and involved the community actively in the control programme. In addition, the community must take responsibility for parts of the programme. Health education strategies will be addressed in greater detail in the literature review.

Despite the expenditure of large sums of money and numerous attempts at controlling the disease, schistosomiasis is very much still on the increase and most of these methods have generally been marginally successful. There is need for the development of a strategy in Malawi that is both sustainable and cost-effective (Chitsulo, 1994). Upon a closer examination of these methods there is one element that is missing and that is the human behavioural element. A person can take medication but if there is no

corresponding behaviour change then he or she can become re-infected. Even if piped water is brought into the vicinity there is need for the technology to be effectively utilised and this requires an element of behaviour change. Health education can be given and knowledge can be held, but without the accompanying change in behaviour, the disease rages on. A tremendous amount of research has been carried out on schistosomiasis such that the parasites, intermediate hosts and factors that limit or encourage the snails is known (Malawi National Bilharzia Control Programme, 1986). However, it is only more recently that attention has had to be directed at human behavioural factors contributing to the disease.

1.5.5 Behavioural and psychosocial factors

Local beliefs about illnesses are generally very important determinants of subsequent health-related behaviours and would inevitably provide clues as to why some people behave the way they do. The study by Kamwendo and colleagues (1987) showed that in the villages sampled, belief about causation of the disease were embedded in the belief system of the culture which emphasised the role of the breaking of taboos and witchcraft as important in the transmission of schistosomiasis. It was believed that the observation of taboos was the surest way of preventing the contraction of the disease. An understanding of the behavioural aspects of practices surrounding schistosomiasis leading to a practical and sustainable intervention programme is therefore essential in helping reduce the prevalence of the disease. There are certain behavioural patterns and lifestyles that would influence the prevalence of schistosomiasis. Certain water-contact patterns make a person more vulnerable to the disease. A study of three villages in Malawi found that people tended to spend most of their time at the river engaging in various activities such as washing clothes, gardening, fishing, bathing and fetching water for domestic use (Kamwendo *et al.*, 1987). Furthermore, whilst adults expose only parts of their bodies to the water, children were found to expose the whole body when swimming. This explains the higher prevalence rate among children. Apart from water-contact, people's hygienic patterns can foster a Schistosomiasis-active environment. Lack of toilets can result in the passing of urine and defecation into the water from the edges of a river - in so doing enabling infected persons to transmit the disease. It should be borne in mind that in many

areas people have no choice but to engage in water-contact behaviours since some of these activities would inevitably involve the maintenance of economic well-being. The most important aspect in this respect would be to try and reduce transmission rates through urinating or defecating in the lake. This is where social psychology comes in. It would help us establish the underlying factors that influence behaviour.

In understanding the vast complexity of behaviour there is the need to understand that behaviour occurs within a framework of a complex web of ideas and meanings that are all interrelated. Hence an understanding of the perspectives of health and illness in the given locale is important so as to ensure an effective health education message as well as community mobilisation in dealing with the reduction of the disease. El Katsha & Watts (1997) described an anthropological study of schistosomiasis infection in two Nile delta villages in Egypt. They concluded that a holistic view of the social and environmental setting of the disease is required. Koss-Chioino (1997) argues that there is a need to understand how the disease is seen and perceived by the local community. This is all the more important when it is considered that indigenous terms or categories of an illness do not directly translate into the Western biomedical classifications of disease. This has ramifications for the aetiology and approaches to treatment of the disease in question. Hence there is need for an "insider view" of the disease if one seeks to introduce a health education or disease control programme in a given community (Koss-Chioino, 1997). If, for example, a given community sees a particular illness as "part of life" not warranting a control programme, then the uptake of the control programme is going to be severely compromised. In certain cultures, schistosomiasis is seen as "male menstruation" not requiring special intervention (Huang & Manderson, 1992; Kloos, 1995). The trend in the literature has been more towards recognition of anthropological factors and more such studies in various countries are being published, for example Hewlett & Kline (1997) in Cameroon.

In Malawi, the first psychology study looking at perceptions held of schistosomiasis was undertaken by Ager (1992). A sample of 120 individuals was interviewed to ascertain their judgements of level, seriousness, predictability and controllability of the disease.

Participants reported that schistosomiasis was seen as unpredictable and uncontrollable. Ager (1992) compared schistosomiasis with another tropical disease (malaria) and found that there were differences in what determined people's adherence to preventative guidelines. For schistosomiasis, adherence to these guidelines was influenced by personal perceptions of risk, as opposed to social factors, which was the case for malaria. In 1996 Ager and colleagues conducted a study in which they reported differences between perceptions held by people in terms of cause, prevention strategies and treatment of malaria and schistosomiasis. They drew up belief profiles that were influenced by the age of the respondents. They found that most of the respondents identified prevention practices that were consistent with recommended practices. Young children in the 5- 10 years old group were unable to do so. They recommended health education investment in early school-age children. MacLachlan & Namangale (1997) extended the disease belief profiles further to find that gender differences existed in belief profiles when four diseases were compared with each other: schistosomiasis, malaria, AIDS and the "common cold".

1.5.6 Multi-level approaches

It can be seen therefore that in order to bring about effective intervention in controlling schistosomiasis, there is need for the accommodation of human factors in the implementation of a viable programme. Ndhlovu et al (1992) summarise the multi-level approach to disease control by stating that there is need for "interdisciplinary collaboration, constant community participation and, unfortunately, a major financial commitment from the already limited health budget" (p.319). Given the success seen in Zimbabwe where prevalence declined by 50%, Zimbabwe's strategy is now multi-component. There is the use of snail control, safe water supply and adequate sanitation within a primary health care system. In the schistosomiasis literature, many authors now emphasise community based programmes to improve health care, living conditions, water supplies, sanitation and health education in conjunction with treatment programmes (Evans & Stephenson, 1995).

1.6 Summary & Conclusion

Schistosomiasis is a debilitating disease affecting over 600 million people world-wide. In Malawi, increased prevalence rates have been noted from about 1992 along the shores of Lake Malawi, which had always been considered free of the disease. To fight the disease, a locally run programme involving all interested parties was set up along the shores of Lake Malawi with health education and behaviour change among school children as its main focus. This thesis is the result of the action research in the local community. It was argued in this chapter that schistosomiasis is a serious parasitic disease that needs to be addressed. There have been several methods employed world-wide as well as in Malawi to try and control the disease. These have included control of the snail host, improved sanitation, chemotherapy and health education. What is generally agreed upon by strategists fighting the disease is that a single prevention or control measure will rarely work (Kolberg, 1994). Health education is seen as an important tool that can bind the different preventative measures together. However, the most efficient degrees of health education input need to be established, and this is what this thesis deals with on a practical level.

Kloos (1995) argues for the need to examine the design, administration and outcomes of schistosomiasis health education programmes. Although health education has been given high priority, issues about its actual effectiveness in schistosomiasis control programmes have received scant attention. Steckler *et al.* (1995) argue for the development of studies that assess the effectiveness of health education interventions directed at multiple ecological levels. Since the dominant health education principles are grounded in social psychology, we bring this field in to assess the efficiency of the intervention at two levels. One, appraising factors that influence behaviour change by way of social cognitive models and two, to furnish explanations of the process of the programme itself.

CHAPTER 2

REVIEW OF THE LITERATURE

2.1 Introduction

This thesis is about a practical problem in a third world rural setting. To address the objectives of the study raised in the previous chapter, we shall, in this chapter, first explore briefly the theoretical dimensions of health education, looking at its definitions, history, current approaches and its application in school settings generally and in Malawi specifically. Since the focus of the study is a health-related issue, the contribution social psychology has made to health is briefly outlined. This is done in the context of the debates about the practical relevance and application of social psychology. It is argued that social psychology's contribution to health education operates at two main levels. First, at the level of social cognitive models where explanations for the underlying determinants and cognitive processes leading to behavioural change operate. The second level is the "modes" of explanation to account for the dynamics that occur in the process of an intervention. Both levels complement each other and were used in this intervention. Finally in this chapter, the PRECEDE-PROCEED model that acts as a general framework is introduced. The chapter shall conclude with an attempt at pulling the theoretical components raised together to inform the methodology which follows in Chapter 3.

2.2 Health Education

2.2.1 Health education theory

Definitions of health education abound. Our working definition is "any combination of learning experiences designed to facilitate voluntary actions conducive to health" (Green & Kreuter, 1991, p.17). This definition clarifies precisely what our objectives in the intervention were. This is made more explicit if we take the key phrases in the definition and look at them more closely. *Combination* acknowledges that there are several factors that come together to influence health. The combination is primed on "matching multiple

determinants of behaviour with multiple learning experiences or educational interventions” (Green & Kreuter, 1991, p.17). *Designed*: indicates that the learning experience is systematically planned. *Facilitate* refers to factors leading up to the behaviour (predisposing), enabling and reinforcing or strengthening the behaviour. *Action* refers to behavioural steps taken. Health education is subsumed under the broader term “health promotion” which itself is said to be “a combination of educational and environmental supports for actions and conditions of living conducive to health” (Green & Kreuter, 1991, p.17). This definition is broader and encompasses social, economic, political and environmental factors that come into play in influencing health behaviour. Hence laws and regulations to influence behaviour such as smoking bans come under the umbrella of health promotion. Health promotion seeks to “build a system conducive to health through the development of policy at local and national levels” (Tones *et al.*, 1991, p.4). They argue that the relationship between health promotion and health education is symbiotic. In order to achieve the overall health promotion objective of facilitating health and prevention of disease through policy, economic, social, cultural and environmental factors, health education is a crucial component of influencing these goals. Downie *et al.* (1996) combine the two terms when defining health promotion as comprising “efforts to enhance positive health and reduce the risk of ill-health, through the overlapping spheres of health education, prevention, and health protection” (p.2). Nonetheless a distinction remains because “some aspects of health behaviour require interventions that are not entirely consistent with the educational philosophy and methodology” (Green, 1984, p. 191). The wider spectrum of health promotion therefore call for more authority and skill than the health educator alone can mobilise. The focus in this thesis is on examining the most effective learning combinations to ensure positive health behaviour with regard to schistosomiasis. In view of this, our intervention is best embraced by the definition of health education. Policy issues, the socio-economic and environmental dimensions shall only concern us with regard to recommendations to government and policy makers. To invoke these factors as part of the intervention at this stage is beyond the scope of this study. This study is therefore a health education study, obviously with ramifications for the broader health promotion in the long term. In the discussion to follow some of the

cited literature will focus on principles of health promotion. Since health education is a part of health promotion, some of these same principles apply.

Goals and objectives

From the definitions above it is clear that the goals and objectives of health education are to improve the health status of people. However there are certain core values which underlie and influence health education delivery (Freudenberg *et al.*, 1995). These values frequently mentioned in the health education literature include democracy, social equity, regard for cultural differences and respect for individual autonomy. There is no uniform health education ideology therefore there may be differing emphases on the part of the health educators. Overall however the focus is on social action for health. In developing countries health promotion is both interdisciplinary and multi-sectoral (WHO: working group on health promotion in developing countries, 1991). The field therefore operates across the whole spectrum of health and health services and seeks to reach out and mobilise the diversity of groups and incorporate them as allies. Such groups include teachers, women, students and youth groups for example (WHO: working group on health promotion in developing countries, 1991). Decentralisation and community partnerships are seen as key to health promotion with constant interaction through feedback and evaluation between planners and recipients of programmes. Health promotion and subsequently health education are integral elements of the primary health care strategy, which aims to reach people at the grassroots (WHO: working group on health promotion in developing countries, 1991). More shall be said about community participation later in this chapter.

2.2.2 Brief history of the development of health education

The field of health education is said to have been primarily a practice-based discipline throughout its history. Its origins can be traced to three traditions defined by the settings in which they operated. These settings were schools, communities and hospitals (Green, 1984). One theme that has characterised the development of the field has been the search for an identity. School health education for example "struggled for a professional identity separate from physical education" (Green, 1984, p.182). More recently within the last

two decades health educators have attempted to borrow, develop and apply social and behavioural theories to guide practice. Freudenberg *et al.* (1995) point out that four trends have changed the practice of public health in recent years. First the distinctions among chronic, infectious and “social” diseases have become blurred. Health is now seen in a more holistic perspective rather than as categories each requiring a different focus, they all relate to one another. The second change that has impacted public health is the gap in health status between the rich and the poor. Third, the increased multiethnic environments in which health education practitioners work in the west. This has meant that the increased plethora of cultural values related to health has led to the recognition of the need to appreciate variety in approach to dealing with health education related issues.

History of the field in Malawi

The origins of health education in Malawi are grounded in efforts to address the practical problem of sanitation (Bomba, 1981). The colonial government in 1933 passed a Native Authorities Ordinance giving the traditional chiefs the mandate to order hygiene and sanitary measures on their people. The chiefs imposed the construction of pit latrines on the people who dug without using them. No explanation or rationale behind the orders was ever given to the people. The same thing is reported to have also happened in Botswana (Matiting, 1981). Since this approach did not involve consultation with the people, the latrines were associated with colonial oppression and not seen as a means of improving their health. Bomba (1981) cites the Nyasaland Medical Department of 1948 as lamenting: “latrines tend to be regarded as objects to show rather than conveniences to use”. After Malawi gained independence in 1964, government removed the legislative approach and instead put an educational approach with maximum community participation. Three education strategies were adopted, with the first being to educate on germ theory, second, promotion of pit latrine usage as a status symbol and third, bush clearance.

In 1964, Malawi government came up with the first of its Five year plans (1964-1969) which focussed on the development of health manpower. Not much was given to health education. The only health educator was trained in 1973. Another was trained in 1981 (Lewis, 1981). In 1982 in line with the ethos of primary health care, the mobile health

education unit was established in Malawi. This comprised the production of material and a reservoir of visual aids. Outreach in the form of vans going into rural areas and personnel performing a variety of health education activities was another component of the unit (Lewis *et al.*, 1981).

Primary health care is the major philosophy that underpins the Malawi health services delivery system. Chowa (1995) asserts that health education in Malawi cannot be carried out in isolation of other health programmes. Health education is therefore “a support service which catalyses other components so that action is taken by individuals, families and communities... behaviour change is the end product” (Bomba, 1990, p.1). Currently the Malawi government information, education and communication activities are guided by health education strategies. It is believed that increased public awareness “facilitates involvement and participation, and promote activities which will foster health and encourage people to want to be healthy, know how to stay healthy and do what they can individually or collectively to maintain health and seek help when needed” (Bomba, 1990, p.4). Because of material and financial resource limitations, government has had to focus on activities that directly impact vulnerable groups especially women and children (Chowa, 1995).

Health education in Malawi is co-ordinated by the government and is central level based. Under the Ministry of Health and Population there is a Health education and social mobilisation unit. Its aim is to “strengthen the health education component of health services so that it is capable of promoting health behaviour which will make positive maximum impact on the major health problems of the country” (Chowa, 1995, p. 35). The main focus of these activities is the community level. Ultimately all health care delivery systems of all programmes, be they immunisation, targeted specific diseases or dealing with an outbreak, are aimed at the community. The function of health education activities in Malawi is the synthesis and translation of the various health messages “into meaningful packages” in the areas of health targeted at the vulnerable groups (Chowa, 1995, p.36). In terms of the goals and overall objectives of health education, Chowa (1995) sees no difference between Malawi and industrial countries.

2.2.3 The field presently

Health education is a planned activity, it is not haphazardly done (Kok, 1997). There are goals and means. Planning is the best predictor of success and “planning mistakes are the best predictor of failure” (Kok, 1997, p.217). Health education plays a key role in a variety of non-governmental organisations (NGOs) activities in developing countries. These activities range from child survival, reproductive health, nutrition, safe motherhood, diarrhoea and AIDS prevention programmes (Stetson & Davis, 1999). More recently there has been an “ecological” slant to health education in which it is seen in a wider context as including various facets of a person’s environment, such as social support systems and community factors as well as public policy (McLeroy *et al.*, 1988; Richard *et al.*, 1996; Green *et al.*, 1996; Stetson & Davis, 1999). Robertson & Minkler (1994) describe this wider approach as a revolution for the field. They refer to it as a new health promotion movement and list four characteristics:

1. There has been a broadening of the definition of health to embrace social and economic environments that influence health.
2. There has been a move from individual emphases on intervention to encompass wider social and political strategies.
3. The concept of empowerment has been included as central to health education intervention.
4. Community participation as part of the intervention in which the community is involved in the identification and planning of health interventions.

Richard *et al.* (1996) point out that this broader framework has been utilised in research across the disciplines. In public health they point out that three models widely utilised to give human environment a central role are the PRECEDE-PROCEED model (Green & Kreuter, 1991), McLeroy *et al.*’s framework (1988) and the MATCH (Multilevel approaches toward community health). The influence of the ecological approach on health education profession is such that multiple approaches in dealing with target behaviours is more the norm than the rarity (Green, 1984).

There are several current approaches to health education and as such inherent tensions exist between these approaches. These approaches are grounded in theoretical and underlying philosophical assumptions. Stetson & Davis (1999) (echoed by Robertson & Minkler, 1994) list three main health education approaches. These are first, *conventional* health education, which emphasises knowledge acquisition. Second, *health communication*, which seeks to modify human behaviour and environmental factors. Hence they seek to market changes in health-related practices and subsequently, health status. Under this is the social marketing approach, which attempts to influence a socially beneficial idea or use of certain products such as condoms. The key method of delivery is through strong persuasive messages or communication (Stroebe & Stroebe, 1995). Also under health communication approaches fall the models of behaviour change. These shall be outlined in more detail below. The third approach is *health education for empowerment* which aims at empowering the target population.

2.2.4 Health education in the school setting

Settings are channels for reaching defined populations. The most common settings are schools, the workplace and medical care facilities (Mullen *et al.*, 1995). Vast numbers of health education interventions have been conducted in institutional settings. Since this thesis concerns itself with a school based intervention, we shall limit the discussion to settings in the school. WHO (1997) asserts that schools are “one of the most organised and powerful systems in society to influence the health and well being of those who come into contact with it” (p.20). More children than ever are attending school. In the west the focus of school health has shifted from contagious hygiene related diseases to “chronic, degenerative, developmental and violent or accidental causes of death and disability” (Green & Iverson, 1982, p. 323). In developing countries however, the focus remains on contagious infectious diseases (Taylor *et al.*, 1999). Despite advances in child survival, the threats to health experienced by school-aged children can retard most of these advances (WHO, 1997; Bundy & Guyatt, 1996). Parasitic infections, malnourishment and other diseases mediated by poor sanitation, lack of access to safe water remain prevalent among school children (Kvalsvig & Connolly, 1994; Taylor *et al.*, 1999). Schools are the

primary institutions that exist to socialise children (WHO, 1997). Since formative years occur during the school years, health-promoting schools are seen as being strategically placed to address the numerous health challenges in the world. Such schools can co-ordinate the delivery of both education and health services in so doing can provide the arena for improvements in humankind globally (WHO, 1997). Over one billion students can be reached world-wide, and through them their communities and immediate families. Schools are thus the “developing world’s broadest and deepest channel for putting information at the disposal of its citizens” (WHO, 1997, p.14). However, resources required to take advantage of this strategic place of the school to address health related hurdles are not in place. Reality lags behind the potential. There is usually a shortage of money, time and qualified personnel (WHO, 1997). In Malawi, as we shall see, lack of resources includes few teachers, classrooms, limited safe water, books and desks.

There is evidence of the effectiveness of school-based programmes. WHO (1997) gives an example of an 80% reduction in intestinal helminths among school children in South Korea over a 30 year period as a result of school community chemotherapy programme combined with health education and sanitation development. Rusakaniko *et al.* (1997) demonstrated that health education in schools does have an impact on knowledge and positive trends of reproductive health behaviour in Zimbabwe. Furthermore health habits learned during the formative years is likely to be applied during adult life, so school based health education is also a long-term health investment.

The educational system in Malawi operates on three levels: primary, secondary and tertiary. Primary education lasts for eight years at the end of which pupils sit for a primary school leaving certificate national examination. Places at secondary school are limited and very competitive (Medi, 1981). There are limited secondary school places. In 1998 for example, 77,000 primary school pupils sat the primary school leaving examinations and competed for 10,000 secondary places. There is a high dropout rate and limited places at secondary school hence most Malawians do not go past primary school. Primary schools therefore are very strategic places to reach many Malawians with health education messages.

Teachers play an important role in the dissemination of school health education (Ekeh & Adeniyi, 1986). Stage theories of innovations point to the importance of targeting teachers. Green (1985) argues that models from mainstream health services cannot be imposed wholesale on school health as this can lead to “misplaced emphasis” (p.793). Schools are not medical institutions nor public health agencies (Kolbe *et al.*, 1986) given that their primary role in society is more to provide education and academic development (Green, 1985; Green & Kreuter, 1991). Although schools can influence predispositions to health behaviour (increasing knowledge, shifting attitudes), they are dependent on community health promotion interventions for the reinforcing and enabling of behaviours. The community is therefore crucial (Kolbe *et al.*, 1986). There is greater chance of success if interventions are simultaneously implemented through schools and their communities (Bundy & Guyatt, 1996). School based delivery of interventions is assumed to be cost-effective given the ready accessibility of school children (Bundy & Guyatt, 1996).

The most effective ways of disseminating health information among school children has been the use of peer education. As a concept however, peer education has no clear-cut theory accompanying it. It is “a method in search of a theory rather than the application of theory to practice” (Turner & Shepherd, 1999, p.235). The concept has been applied in smoking reduction exercises and substance misuse in the west and is currently being used for HIV transmission control in Africa (Turner & Shepherd, 1999). The rationale for the employment of peer education concept includes its cost-effectiveness, the credibility of peers as a source of information, its empowering those involved, positive role models, use of already existing networks of sharing information and its ability to reach a wide range of people (Turner & Shepherd, 1999; Jiyani, 2000). One peer education philosophy is the Child-to-Child approach (Bailey *et al.*, 1982a,b). It was established in the U.K in 1978 and is now used in health education programmes in over 70 countries around the world. The main thrust of this child to child strategy is that children are able to take responsibility for themselves, their families and contribute to their communities. The philosophy behind it is guided by the notion of the empowerment of children. Children

are therefore to be seen as partners in promoting health. In chapter 6 of this thesis we shall look at this approach in more detail.

The design, delivery and effectiveness of health education intervention will be increased if they are guided by theory (Dawes & Donald, 2000). In addressing health issues pertaining to young children, recognition of the developmental stages or epochs needs to be made (Dawes & Donald, 2000). These epochs may have ramifications for the reception of the message and methods of health education delivery. Epochs are associated with influencers of the child. From ages 7 to 11 for example (when Malawian children begin primary education), wider contacts with peers are made and other adults (teachers) now enter the child's spectrum of influence (Dawes & Donald, 2000). An ecological approach is therefore required since there is a complex set of interactions between the child and his or her family, school and wider community. Many school programmes lack systematic monitoring or evaluation. Measurement of immediate changes such as knowledge as well as more long term changes such as health status need to be made (Bundy & Guyatt, 1996). The most efficient ways of organising delivery need to be evaluated in the school setting.

A primary objective in school health education delivery – whether as a specific curriculum-based subject on its own or as part of a community-wide intervention targeting a specific disease – is to influence behaviour leading to the adoption of health conducive behaviours. Behaviour is a critical component of such programmes and one of the fields that has sought to understand behaviour is psychology. We turn now to look at social psychology and health.

2.3 Social Psychology and Health

Social psychology has been defined (by McGarty & Haslam, 1997) as “a branch of psychology that is concerned with those aspects of mental life which relate to social interaction and social phenomena in general” (P.5). Hewstone (1997) defines it thus: “the scientific study of how personal, situational and societal factors influence the cognition,

motivation and behaviour of individuals and (members of) social groups.” (P.168). Jahoda (1983) lamented that many textbook definitions of social psychology were “pretentious and utterly futile” because they were so “grossly over-inclusive that they could encompass a whole range of social and biological disciplines” (p.21). What emerges clearly is that social psychology is seen as having the central task of explaining how the ways in which we think and behave is affected by interaction between people (McGarty & Haslam, 1997). It is in this context that we define social psychology for the purposes of this study.

2.3.2 Search for relevance

The history of social psychology has been dogged by crises based on different approaches to understanding human behaviour. A part of this “crisis” has been the “cry” for the field to be more relevant. This need is more pronounced in developing countries. Social psychology is accused of being dominated by issues that are trivial and full of banalities (Fishbein, 1997; McGuire, 1997). This has been attributed to the field’s reliance on few traditional criteria of research such as internal consistency at the expense of other areas such as novelty and pragmatic value (McGuire, 1997). Indeed, many writers have pointed out that the very usefulness and survival of the subject rests on its relevancy and practical application to the target population of study (e.g. Fishbein, 1997). It has been argued that given the limited resources, social psychology can hardly afford engaging in studies and explanations that do not address concerns and issues in a very real and practically translatable relevant manner. This becomes more pressing in third world countries where issues such as poverty, reduced life expectancy and disease are very much in evidence (Omari, 1983). Much of the history of social psychology has been considered intellectual self interest at the expense of addressing real needs. Hence with poverty so rampant, issues so pressing, we can hardly afford the luxury of engaging in intellectual debate without addressing real issues. In many ways the standards by which social psychology as a subject shall be evaluated is increasingly moving towards assessing its practical usefulness. What has added to the frustration of the lack of social psychology’s contribution to real world issues, is the belief that as a field, social psychology does have something to offer. Its very nature, being the study of individuals

and social processes can add immensely to knowledge about real world issues and problems (Blacker, 1983). Given the growing philosophical emphasis on “human development”, psychology has a unique opportunity to have an impact (Moghaddam *et al.*, 1999).

2.3.3 Social psychology in Africa

Writing a decade ago, Akin-Ogundeji (1991) argued that the history of psychology in Africa is synonymous with the history of colonialism. The colonial era did not do much for the development of psychology with the result that psychology in Africa is not moving in keeping with the changes Africa is going through. He maintains that

“[P]sychologists outside academia have little impact, especially in areas of national development like social mobilisation, family planning, youth development, manpower planning, primary health care, rural development, and environmental hygiene and design, where they should be playing major roles” (Akin-Ogundeji, 1991, p.3).

He argued that psychologists still had to justify the existence of the discipline and was confined to academia. There was the need “to change and refocus psychology in a pulsating society of sporadic social and economic changes” (Akin-Ogundeji, 1991, p.3). The empiricist approach to psychology was still largely practiced in Africa. Hence the “essence of psychology which is relating meaningfully to human values, social realities and whole-life issues” (Akin-Ogundeji, 1991, p.4) has been bypassed by the experimental approach contributing to making psychology in Africa sterile. The result has been that the output of research remains impotent in the face of complex social and economic problems (Akin-Ogundeji, 1991, p.4). He spiced his argument with adjectives describing the role of research as being “dry, artificial, irrelevant or meaningless”.

Some of the research approaches were said to be packaged or imported without direct relevance. There is need to draw on approaches attuned to Africa’s social realities and avoid “ivory towerism”. The emphasis must lie with the applicability of the research. Psychology must offer explanations of social change (Moghaddam *et al.*, 1999).

“Changes are taking place in Africa which demand new thinking, new methods, and new areas of specialisation”. He cites social psychology as one area where competencies have been developed but these have made “little or no impact in our societies” (p.4)

In response to this Raubenheimer (1993) suggested that academic and professional psychology flourish in South Africa. He showed how psychology flourishes in universities, research, journals, numerous professional associations, that the field enjoys statutory recognition and graduates enjoy large occupational prospects. Foster *et al.* (1993) however pointed out that the existence of apartheid symbolised the most significant difference between South Africa and the rest of Africa. The field of mental health has been racially segregated and facilities for blacks (e.g. mental handicap) were almost non-existent. Psychologists, they argued had also played an influential role in developing apartheid.

Carr & MacLachlan (1993) argued that psychology is relevant to developing countries and presented Malawi as a case in point. They pointed to positive changes in teaching (by realigning academic introductory courses towards African experiences), marketing, consultancy and research where psychology was relevant and flourishing within Malawi. Research was targeted towards applied relevance. Ager (1993) pointed out that the development of the relevance of the field of psychology should not just be product oriented but needed to take cognisance of the process involved in the development of the field. The search for relevance includes the process of transformation and not just the outcome. In line with this Carr & MacLachlan (1998) point out that several commentators seem to have indicated three stages in the progress of psychology in developing countries. These stages were said to be “reminiscent of Henri Tajfel’s (1978) inter-group account of how social minorities find a ‘positively distinctive social identity’” (Carr & MacLachlan, 1998, p.12). The stages are:

Stage One: Attempts to assimilate into the main stream. For example replicating western studies in developing countries. This approach is particularly unhelpful since American psychology is said to be based on norms of local middle class U.S culture (Moghaddam *et al.*, 1999).

Stage Two: Emphasis on the positive aspects of cultural attributes although western psychology is the criterion by which this is judged. Hence, psychology is seen through the spectacles of western psychology. Implicit in all this is a “tinge of negative self image” (Carr & MacLachlan, 1998, p.13).

Stage Three: Assessment of social reality independent of “apologetics” or comparison with the west. The focus is on effective and relevant psychology that explains and operates within the idiosyncracies of the local environment. Hence this reflects the call for indigenous psychology (Moghaddam *et al.*, 1999).

In assessing whether psychology had an impact on developing societies from 1985-1994, Carr & MacLachlan (1998) evaluated journal publications appearing in the Psychlit database. They identified three categories of research that had evidence of practical outcome and had satisfactory reliability and validity. These areas were social/organisational, health/welfare and educational/developmental. They concluded that psychology has had an impact especially in the health domain which comprised 71% of the 142 articles reviewed. Examples of impact include papers identifying psychology factors that influence community practice. There has also been a growth in papers advocating a pluralistic approach to healthcare. They concluded “psychology appears to be impacting on a broad spectrum of human health and welfare in the developing world” (Carr & MacLachlan, 1998, p.9). In the conclusion of their article, Carr & MacLachlan (1998) state: “psychology may finally, therefore, be contributing meaningfully to development”. (p.13).

2.3.4 Role of social psychology in health education

Psychology is said to be the discipline that has informed the field of health education and health promotion the most (Bennet & Murphy, 1994; Freudenberg *et al.*, 1995). As such psychology has been called upon to help health educators locate and alter environmental conditions that maintain behaviour in need of change (Green, 1984). The objective of the use of health education strategies is to persuade people to change their behaviours.

interventions aimed at rectifying health-impairing behaviour patterns, is the need for an understanding of the psychological factors that determine and maintain the behaviours. Insight into the underlying processes that fuel the behaviour is essential. Over the years social psychology has put forward several models to account for behaviour. The social psychology models have in common the central role of attitudes and beliefs as determinants of health behaviours. Attitudes are seen to be related to the attributes associated with the attitude object and how these attributes are evaluated. This in turn influences behaviour. However the relationship between behaviour and attitudes is not straightforward. It has been argued that behaviours do not necessarily lead to attitudes. Ajzen & Fishbein (1980) sought to address the failure of attitude studies to predict behaviour by providing a framework through which the predictive value of attitudes could be strengthened. To strengthen the attitude-behaviour link, Fishbein (1997), Ajzen & Fishbein (1980), have argued that there is a distinction between specific behaviours and behavioural goals and categories. Attitude measurement therefore must be compatible. Assessment of attitude and behaviour must be at the same level of generality. Kraus (1995) conducted a meta-analysis of 88 attitude-behaviour studies. He concluded that attitudes predicted behaviour significantly and substantially citing a probability value greater than .000000000001.

There are many causes of a health behaviour. There is therefore need for multi-dimensional approaches that will lead to behaviour change. No disease occurs in isolation. There are always mediating factors. It is widely recognised that everyday actions and behaviours contribute towards a general state of health (Hubley, 1993). Behaviour therefore is key in determining whether a person remains healthy or becomes ill, and if ill, the speed of recovery (Desjarlais *et al.*, 1995). Hence whilst the specific infectious agents such as parasites are known, it is human behaviour that determines the exposure to these agents. It is also human behaviour that determines whether a person shall seek relief from the disease or not. Desjarlais *et al.* (1995) point out that one third of the burden of illness in the world could be prevented if there was systematic behavioural change. They list some of the changes in behaviour such as better nutrition, improved sanitation, uptake of immunisation, precautions during sexual intercourse, stopping

smoking and driving cautiously as having a direct bearing on health. All these behaviours they argue are constrained by "poverty, powerlessness and beliefs" (Desjarlais *et al.*, 1995, p. 229). Jahoda (1983) argued that behaviour governed by social norms or mediated by social comparison mechanisms (such as wanting to do what everyone else is doing), is highly resistant to change. It is precisely this kind of behaviour that the social psychologist is called upon to address as opposed to behaviours independent of the social system.

Behaviour Change

There has been much debate as to whether knowledge alone leads to a change in behaviour. Green & Kreuter (1991) point out that an increase in knowledge by itself does not lead to behaviour change. They do point out however that knowledge serves the function of a precursor to behaviour change. If there is present a sufficient amount of knowledge, when a powerful enough cue trigger is presented, a person shall then be motivated to act on the knowledge. Knowledge therefore is more a base for action. The premise of Green & Kreuter's (1991) argument is that behaviour change operates on the principle of combinations of factors. It is the bringing together of various combinations that will ultimately influence behaviour. Following on from this, it can be argued that part of the challenge of health education efficiency is to determine the most effective combination that will lead to the required behaviour change. Part of the challenge then would be to assess which combination is the best for behaviour change to occur. Whilst behaviour may not change immediately due to knowledge, Green & Kreuter (1991) point out that the knowledge that is available impacts the prevailing beliefs, attitudes, intentions and perceived control leading to behaviour.

Fishbein (1997) points out that behaviour is a complex construct that is defined by four elements, action, target, context and time. He points out that variations in any one of the four elements can change the definition of the behaviour under consideration. Hence the definition used and the way in which the behaviour is investigated defines the behaviour being studied. Along these lines argued by Fishbein, it can be said that with regard to behaviour and schistosomiasis control, there is need for clear-cut definition of the

behaviour in question which the study seeks to change. Urinating in a pit latrine is quite a different behaviour to urinating in the bushes prior to going into the lake. Hence if one seeks to reduce urinating in the water then one would observe urinating (which is the action) in a bush (target) prior to swimming in the lake (time and context). Hence it would not suffice to say the study seeks to reduce the incidence of urinating in the lake. There is need to be specific about which behaviour is targeted for change so as to assess a behavioural criterion to enable us to know if there has been any behavioural change.

2.3.5 Social cognition models

This study is one of those that has been part of the shift from interventions relying on information giving to those that are theory based (Abraham *et al.*, 1998). Effective interventions are those that are characterised by being conceptually based (Fisher & Fisher, 1992). Kirby *et al.* (1994) maintained that the application of social cognitive theory in the design of an intervention, distinguishes between successful and unsuccessful interventions. There is much evidence derived from the literature to illustrate the superiority of a social cognitive theory based intervention as opposed to one generically based on learning theory. Schaalma *et al.* (1996) found that the application of a social cognitive model had a distinct impact on sexual risk taking behaviour among Dutch pupils compared with pupils exposed to standard Dutch sex education. Bryan *et al.* (1996) found in their study that women given a condom use intervention based on a social cognitive model, reported significantly greater subsequent use of condom during last intercourse than a control group after only a single session intervention. Other condom promotion studies using social cognitive models report similar results albeit with an intervention over a longer time frame e.g. DiClemente & Wingwood (1995).

The literature is laced with evidence of the contribution social cognitive models have made towards the fight against disease, and in particular HIV/AIDS (Godin & Kok, 1996; Sheeran & Orbell, 1998; Sutton, 1997; Bandawe & Foster, 1996; Fisher *et al.*, 1995; Reinecke *et al.*, 1997). The implications emanating from these studies is that interventions that specifically targeted cognitions specified by these models would lead to an increase in behaviours that prevent the contracting of HIV/AIDS. Abraham *et al.*

(1998) assert that an intervention based on the theory of planned behaviour could change potential condom usage from 20-30% in a control sample to 70-80% in an intervention sample. Meta-analyses studies demonstrate the augmentation of social cognitive models to health related behaviours. Examples include Kalichman *et al.* (1996), Zimmerman & Vernberg (1994) and Godin & Kok (1996). Social cognitive models have therefore been found to be successful in predicting a range of health behaviours. They are able to account for 20-45 percent of the variance (Abraham *et al.*, 1998; Sutton, 1998). There is thus the need for the development of interventions guided by these theories which specifically target the antecedents of health related behaviours. There is no reason why such models that have focused on HIV/AIDS, cannot also provide useful insights into schistosomiasis. There is a dearth of information on the application of these models to schistosomiasis in the literature. Since these models appear to be “the most valuable theoretical tools available to health promotion” (Abraham *et al.*, 1998, p.307) and since medicine is evidence-based, the development of and further testing of the models is necessary.

What is required in health education interventions is clear theoretical specification of the underlying determinants of behaviour to see the “what, how and when” of the influences of behaviour. What relational rules guide behavioural decision-making? (Fife-Schaw, 1997). The theory needs therefore to be grounded on clear factors that allow for measures to explain some of the variance. These theories operate on the assumption that we can understand the process of behaviour and it is predictable to some degree. Such knowledge may equip an intervention that influences behaviour change. The usefulness of a theory is seen in its ability to offer practitioners some guidelines about what to do in the field to influence people and events (Fife-Schaw, 1997). The interventionist is given an idea of the impact of the intervention and of the attitudes and beliefs that are in need of changing and who the most likely persons to be brought into the programme are.

Social psychology has put forward numerous models of health behaviour and they shall be listed briefly here. They share in common the expectancy-value approach theory. These are based on the cognitions that certain actions lead to particular outcomes, and the

evaluation of those outcomes as being favourable or unfavourable. The Health Belief Model (HBM) was originally developed by United States public health social psychologists to gain insight into people's failure to utilise disease prevention or screening tests for early intervention of disease (Stroebe & Stroebe, 1995). The central tenet of the model was that persons would comply with a health preventive regimen if the following four factors were in place. One, the person believed s/he was susceptible to the particular disease. Second, the severity of the consequences of getting the disease, thirdly, believes that specific measures undertaken shall reduce the risk of the behaviour undertaken and lastly, believes that the health measures of engaging in the behaviour exceed the cost of engaging in the behaviours. The Protection Motivation theory explores motivation to protect oneself from health danger. It states that protection is a linear function of the following four beliefs: the threat is severe, one is personally vulnerable, one has the self efficacy to perform the coping response and fourth, the coping response is effective in reducing the threat. (Stroebe & Stroebe, 1995). Behaviour is dependent on the perceived threat. Pitts (1996) lists several other models:

1. Illness representation model
2. Transtheoretical model
3. Precaution adoption process.

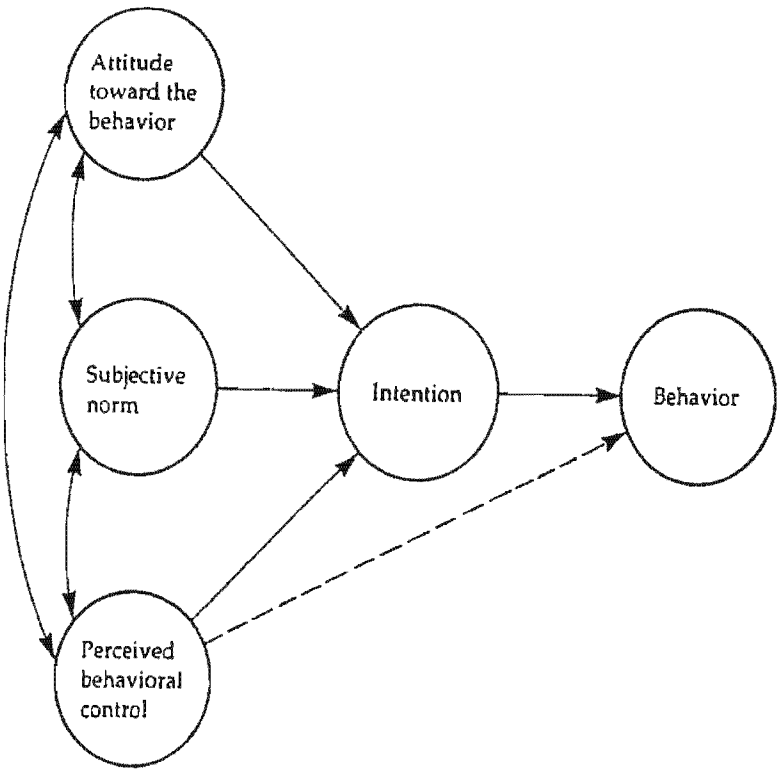
There is also the Health action model (HAM) of Tones *et al.* (1991).

2.3.6 Reasoned Action/ Planned Behaviour Theories

Of the many models and theories, the one that was utilised in this study was the theory of reasoned action and its updated complement the theory of planned behaviour. Ajzen and Fishbein (1980) have put forward a systematic, empirically supported social psychological theory of behaviour that provides a framework for understanding and analysing the factors underlying the performance or non performance of any given behaviour. They argue that the more that is known about the determinants of the behaviour, the greater the probability for successful intervention to be developed to influence the behaviour.

The theory of Reasoned Action is a cognitive based theory and deals with the relations among beliefs, attitudes, intentions and behaviours (Ajzen & Fishbein,1980). The theory posits that volitional behaviour, for example, urinating in the lake is predicted by one's intention to perform the behaviour ("I intend to urinate in the lake") (Fishbein, 1997). Behavioural intention itself is a function of attitude towards the performance of the behaviour (in this case urinating in the lake would either be seen as good, bad, wise, foolish) and subjective norms (the extent to which the person perceives important others not wanting him or her to urinate in the lake). Attitude is a function of the belief that the behaviour leads to certain outcomes weighted with the evaluations of these outcomes. The subjective norms are a function of the belief that salient referents think the person should or should not perform the behaviour weighted with the person's motivation to comply with those referents.

Figure 2.1: Schematic representation of the theories of reasoned action and planned behaviour



Consequently, the theory of reasoned action is useful in giving direction about health education messages and whether these should be targeted towards normative or personal beliefs. This is a strength of the theory that is invaluable at the practical level. Fishbein (1990) argues that many programmes and interventions have been unsuccessful because they misdirect their messages. They may focus on broad issues rather than specifically on attitudes and/or subjective norms that correspond directly with the behaviour one wishes to change. They may also target attitudinal components instead of the relevant normative components and vice versa. The first published study reporting the application of the theory of reasoned action in Malawi was Bandawe & Foster's 1996 study. In that HIV-related study we assessed intention of 191 students in three secondary schools to engage in sex with the same partner and intention to utilise a condom during each sexual encounter. The findings significantly demonstrated the utility of the theory of reasoned action to the Malawian sample being able to account for 50% of the variance. For both behaviours intentions were predominantly under attitudinal control. In the second such study of this social cognitive model, Chipwete (1997) applied the theory of reasoned action to primary school children in Mangochi, Malawi. This was the first time the theory had been applied to this age group. He compared rural and urban children with regard to intention to abstain from sexual intercourse until marriage, stick to the one same sexual partner and use or have their partners use a condom. His multiple linear regression equations to predict intention were all significant with over 25% of the variance accounted for in all the behaviours investigated. Chipwete also found that intentions of the primary school children were predominantly under attitudinal control except for intention to stick to one partner, which was predominantly under normative influence. Both these studies (i.e. Bandawe & Foster, 1996 and Chipwete, 1997) demonstrated that the theory of reasoned action can be applied to a Malawian sample and that there are no inherent cultural difficulties with applying this theory to Malawi.

The theory of planned behaviour

The theory of reasoned action (TRA) operates on the premise that behaviours that can be predicted are under volitional control. However, Ajzen argued that some behaviours are beyond volitional control (Ajzen & Madden, 1986; Ajzen, 1991). He therefore added the

concept of perceived behavioural control to the attitude and subjective norm prediction equations of the TRA. This new addition became known as the theory of planned behaviour (TPB). The conceptual roots of perceived control emanate from self-efficacy. Bandura (1977, 1986) used self-efficacy to refer to people's expectations about their self mastery over a situation. Clark & Dodge (1999) point out that self-efficacy is behaviour specific and is not a general state of being as is self esteem. Terry and O'Leary (1995) point out that although the concepts of self-efficacy and perceived behavioural control are closely related, there are differences. The key differences are said to be that with perceived behavioural control, both external and internal factors are perceived as likely to interfere with goal attainment whilst self-efficacy is confined to internal factors such as lack of will power. Madden *et al.* (1992) surmised that TPB predicts two possible consequences of perceived behavioural control. Firstly, motivational factors that are mediated through intentions affect behaviour, whereas secondly, planned behaviour does reflect actual control and affects behaviour directly.

In comparing the TRA and TPB, several writers report finding that the TPB has superior predictive utility over the TRA (Ajzen & Madden, 1986; Ajzen, 1991; Manstead and Parker, 1995; Madden *et al.*, 1992). However Sutton *et al.* (1999) reported in their study that the TPB did not perform significantly better than the TRA when assessing condom use intention. In their study, past behaviour was the best predictor of intentions and weakened the contribution of attitude and subjective norm. Fifty-six studies that utilised the TPB were analysed by Godin & Kok (1996) who found that on average the studies predicted 41% of the variance. Attitude and perceived behaviour control were said to be the main predictors of intention. With regard to health-related behaviours, perceived behavioural control ranked as importantly as attitude.

Conner & Armitage (1998) put forward evidence for the extension of the theory of planned behaviour. They argue that empirical evidence points to six variables that could be added to the theory. These are belief salience measures, past behaviour/habit, moral norms, self-identity, affective beliefs and self-efficacy. Manstead & Parker (1995) found that if the variables of moral norm and anticipated regret were added to the TPB, the predictive performance of the model was substantially enhanced. Godin & Kok (1996)

echoed these sentiments. See Conner & Armitage (1998) for detailed discussion of these, space does not permit a detailed coverage here. The theories of reasoned action and planned behaviour are the most validated and extensively researched of social cognitive models (Sutton, 1997; Conner & Sparks, 1996). Numerous meta analyses have been conducted on these models. Taken together these theories have tremendous empirical backing to show their effectiveness in predicting a wide range of behaviours. These include family planning (Fishbein *et al.*, 1980), alcohol abuse (Fishbein, Ajzen & McCardle, 1980; Trafimow, 1996), weight loss (Sejwacz, *et al.*, 1980), moral behaviour (Vallerand *et al.*, 1992), general health behaviours (Finlay *et al.*, 1997), AIDS-related sexual behaviour (Goldenberg & Laschinger, 1991; Bandawe & Foster, 1996), organizational behaviour (Elliot *et al.*, 1995), driving behaviour (Parker *et al.*, 1996, Parker *et al.*, 1995), exercise (Terry & O'Leary, 1995), blood donation (Giles & Cairns, 1995) and use of oral rehydration therapy in rural areas (Hounsa *et al.*, 1993). There is ample evidence to demonstrate applicability across different cultures (Godin *et al.*, 1996; Albarracin *et al.*, 1998).

2.3.7 Limitations of social cognition models

Limitations of social cognitive models are presented in this thesis in two categories. First the methodological or operational criticisms of the TRA and TPB shall be outlined and second, the conceptual criticisms levelled at social cognition models more generally. The theory of reasoned action and planned behaviours have been subject to numerous criticisms (e.g. Liska, 1984). Eiser (1997) argues that the TRA is restricted in its behavioural intentions in that it predicts intentions at only one point in time and does not account for stability of intention over time. This raises questions about whether long-standing behaviours are amenable to TRA influenced change in the first place. There is ample evidence in the literature that speaks of the mediating role of past behaviour as a significant predictor of intention (Sutton, 1998; Boyd & Wanderman, 1991; Bagozzi & Kimmel, 1995; Gallois *et al.*, 1994; Ouellette & Wood, 1998; Sheeran *et al.*, 1999; Klepp *et al.*, 1996). Sutton (1998) lists several factors that may account for the low predictability of the TRA/TPB theories. These include the fact that intentions may be provisional. The filling in of the questionnaire is not confronting a real situation requiring

decision making, it is hypothetical. Another reason advanced is the instability of intentions. Sheeran *et al.* (1999) found that stable intentions were more likely to be carried out than unstable ones. See Sutton (1998) for more criticisms.

The main criticisms levelled against social cognitive models are that they have a limited focus in making the individual the central focus or determinant of behaviour (Pitts, 1996; Bunton *et al.*, 1991; Marteau, 1989; Choi, 1998). Their tendency has been to present “a simplified picture of social structure and process whilst focussing mainly on individual aspects of change” (Bunton *et al.*, 1991, p.155). Another criticism is that the social cognitive theories have tended to ignore routine or non-cognitively mediated health behaviours such as health habits (Pitts, 1996). The central assumption on which the theories operate is that all persons make deliberate conscious choices before they act. However critical psychologists argue that personality is seen as a “dynamic construction essentially embedded in historical, political, cultural, social, and interpersonal contexts rather than as an inner configuration, which explains certain individual differences in behaviour and is definable apart from wider realities” (Gillett, 1995, p.114). Bunton *et al.* (1991) call for specific analyses and accounts of social dynamics of the groups and social structures in a given community. This calls for the application of contemporary sociology and is beyond the scope of this psychology-based study. Social cognitive models contain several assumptions that may not hold true in developing countries. The first assumption is that individual decision is driven by careful rational thought incorporating the costs and benefit of the behaviour to be taken (Joffe, 1996). The implication is that the self concept and achievement is primarily individually defined and individuals act mainly in their own interest (Stetson & Davis, 1999). Second, the assumption is that beliefs held by the individuals as articulated to the interviewers determine the behaviour under investigation. Third, the applicators of social cognitive models define the elements they consider relevant to a problem situation. Joffe (1996) questions the individual decision maker assumption of the models and maintains that unconscious forces cannot be ignored, “the non-conscious level includes tacit cultural assumptions which emanate from the macro-social context and conventionize behaviour without individuals realising this” (p.172). By ignoring this, the social cognitive models “fail to tap the dynamic interaction between the

social context and lay thinking” (Joffe, 1996, p.185). As such only “atomized” sections of people’s thought content are garnered and incorporated into predictive models that are predominantly “surveillance tools” but fail to “map the complexity of thought and action” (Joffe, 1996, p.185). In response to Joffe’s assertions, Fife-Schaw (1997) conceded that social cognitive models did have methodological and conceptual limitations. For example, the measurement of actual behaviour was a difficult construct given the plethora of situational factors that can occur in between an intention and actual behaviour. However he points out that the models do have predictive utility which create the opportunity for influencing change. Thus they can be used as a “springboard” for effective interventions. In sum, it can be said that social cognitive models are incomplete and there is need for the addition of other social psychology variables (Bagozzi, 1992; Bagozzi & Kimmel, 1995; Ashing-Giwa, 1999).

2.3.8 New approaches

The social cognitive models discussed above are the one level of social psychology and health education. We turn now to examine the other level. Arguing that the application of psychology to problems in Africa is not a luxury, but essential to national development, MacLachlan & Carr (1994) make an attempt to provide a “blueprint, a framework, a conceptual thrust” (p.22). Psychology in Malawi has been described as dynamic and not confined to “mainstream” western post modernism (Carr, 1996, p.179). Carr and colleagues (1996; Carr *et al.*, 1998) argue that psychology is relevant in developing countries and present a developmental view of social psychology that is neither “historicist” nor “universalist” as the dominant theories are classified. They outline five “discernible modes of social psychology in the Malawian context” (Carr, 1996, p.179). These modes are also reported in Carr *et al.*, 1996 and Carr *et al.*, 1998.

The first one is **rejuvenation**, which refers to the “rejuvenation” of social psychology theories that fell out of vogue. This rejuvenation is due to socio-political changes in the 1990s in Malawi.

The second mode is **refutation**, which is the refuting of social psychology constructs for example Festinger’s cognitive dissonance theory. Under this comes the notion of cognitive tolerance (MacLachlan & Carr, 1994), which asserts that several local studies

have demonstrated that most Malawians are comfortable holding two belief systems about a disease without any sense of conflict or contradiction. In other words, Malawians understand the causes of diseases both by western scientific explanations as well as by traditional explanations which draw more on mysticism and the role of spirits and ancestors in the cause of disease (MacLachlan & Carr, 1994; Shaba *et al.*, 1993; Ager *et al.*, 1996). They can do so without seeking cognitive “dissonance”.

The third mode is **realisation**, which refers to a realisation of inconsistencies in the guiding philosophy of equity in donor agencies development project delivery. This manifests in the “pay me” situation where recipients of donor aid demand payment for any contribution they make to the programme even if it is said to be in the interests of the local community.

Fourthly, there is the mode of **reconstitution**. Under this comes the double demotivation theory where, due to the large salary differences between expatriates and locals, both parties in this disparity experienced internal conflicts with equity principles, with the result that the sustainability of the development project is compromised. Another factor is that aid projects which threaten cultural identity may be less sustainable especially since cultural identity always reasserts itself.

Fifthly, there is **restatement** where the social psychology assumption of the self promoting upward drive, needs to be restated to allow for the costs of individual advancement. The authors have termed this the “pull-down” syndrome, where those who are advancing are pulled down by jealous colleagues and relatives to maintain a level of “let us all be poor together”.

Carr *et al.* (1998) added another mode which they termed **reflection** which is concerned with the reflective and evaluative process through which a common principle or thread is seen through all the various events and observations. This touches the essence of the investigation. It is this thread that points out the lessons learned through the process and dynamics of the investigation. What common themes emerged?

Applying this last mode immediately, we can ask what is the common thread that weaves its way through social psychology in Malawi? Carr (1996) asserts it is social influence. It cannot be imposed and has to be allowed to happen at its own pace. As Carr puts it “the more one constrains, the less one can sustain” (p.191).

The Malawi psychology literature has reported attempts at testing whether psychological constructs developed in the West, such as the health locus of control measure do have validity in Malawi given the varied cultural, political and economic environment (MacLachlan, 1998). MacLachlan *et al.* (1996) applied the health locus of control questionnaire (HLOCQ) which assesses subjects' understanding of determinants of health to Malawian university students to assess its cross cultural validity. They investigated malaria, schistosomiasis and AIDS. Their findings did not support the HLOCQ as a valid measure of understanding health risk in the Malawian sample. However using the same sample they applied the Coping Strategy Indicator questionnaire and found close "factorial structure of responses" to the original questionnaire administered in the United States (Ager & MacLachlan, 1998). They attribute the HLOCQ's failure to account for variations in health belief of the Malawian sample to the questionnaire's structure in the composition of its sub-scales.

2.3.9 Summary

We have explored in fair detail the contribution of social psychology to health education. The provision of a framework to explain human behaviour through the use of models has been the main contribution of psychology in health education. Earlier models were more "hypodermic" (Bennet & Murphy, 1994). The assumption was that if adequate knowledge was provided to the target population from appropriate sources, this would lead to attitude change which would in effect produce behaviour change. This approach has since been challenged by much empirical research (Bennet & Murphy, 1994). Frustrated with this ineffectiveness, more social oriented cognitive models were developed. These try to account for the role of social factors in influencing behaviour. This chapter outlined in detail the most widely applied social cognitive models, the theories of reasoned action (Ajzen & Fishbein, 1980) and planned behaviour (Ajzen, 1991). Theory has the role of providing general pointers for action. Hence numerous fields bring their various contributions to bear on a particular problem and social psychology would give its input especially in mediating the relationship between social structural and individual factors in a given community (Sinha, 1983).

2.4 From Theory to Intervention

2.4.1 Applying theory to intervention

In commenting on the factors that constitute a good theory, Freudenberg and his colleagues argue that for health education the usefulness of theory is evaluated in the extent to which it is able to guide practice. The theory should contribute to a more effective and efficient use of available resources in leading to interventions that improve public health. Freudenberg *et al.* (1995) have summarised the main criticisms of theories used in health education as being first, that the theories are not always accessible to the practitioners partly because their practical experiences are not always incorporated in theoretical frameworks. Second, most of the theories focus on change at the individual level at the expense of social structural change. The role that sociocultural and environmental factors play in influencing the individual is not recognised. Third, most theories are static “and unidirectional, while the forces that influence health are dynamic and interactive” (p.295). The fourth criticism levelled at health education theories is their focus on the health educator bringing about change without highlighting the roles of the individuals or the communities that would effect the change.

2.4.2 Health education intervention strategies

Health education interventions occur within an environmental framework. Steckler *et al.* (1995) argue that there is need for recognition of the comprehensive nature of health education. There is need to recognize that a problem requiring health education intervention manifests itself in the individual, the social and physical environment as well as at the policy level. The community is the “most appropriate center of gravity for health promotion” (L.W. Green, 1999, p.81). There has been a shift in health promotion in the last quarter of the twentieth century from medical institutions being seen as the determinants of health and well being to an environment more immediate to people – individuals, families, schools and the work place (L.W Green, 1999; WHO, 1991). This makes community participation a critical factor in any intervention programme. Chizenga (1981) described community participation as “the process by which individuals and

families assume responsibility for their own health and welfare and develop the capacity to contribute to their own development and that of the community” (p.90). Community leaders should be involved at every stage of the intervention. The community is involved in the planning, implementation and evaluation of the programme. Involvement should aim at invoking feelings of concern or ownership. The people should feel in a position to solve the problem utilising local resources. These sentiments reflect the concept of empowerment which affords people the opportunity to understand and gain control over personal, social and economic forces so as to improve their well being in these areas (Israel *et al.*, 1994).

The advantages of participation are that first, the coverage of projects are greatly extended with participation and more people are reached. Second, coordination and efficiency of the programme is increased. Mbere (1981b) supports this by asserting that it is more cost effective. Third, equity is promoted and finally self reliance is increased. Despite much emphasis on community participation, the evidence suggests a legion of programme failures involving community participation (Woelk, 1992; Service, 1993). Munyimbili (1981b) comments that as a result of these failures, rural communities in Malawi have become cautious of innovations until they prove themselves to be appropriate. WHO (1991) lists the following as the reasons for community participation failure around the world:

1. Failure to allow local initiative and creation of dependency on external sources.
2. Failure to ensure sustainability. There is usually inadequate training and the lack of local resources and knowledge.
3. Failure to involve people in early stages of the design of the programme. Programmes usually bear little relation to local needs.
4. Medical directed needs are the focus as opposed to other needs which the people may have.

Stone (1992) argues that another reason for the failure of these programmes may be the reliance on structural as opposed to cultural factors being seen as the determinants of successful community participation programmes. Madan (1987) warns that the concept of

community participation can become a clichéd term that describes in practice the manipulation of people by bureaucrats and is conceived in a manner that infantilizes people. Brownlea (1987) questions the logic of the community participation principle. It involves “people who have less skills, or knowledge tha[n] those responsible for decision making” (p.605). Freudenberg *et al.*, 1995) point out that there is a rift between theory and practice in the field of health education. They call for a bridging of the two. They point out that those who “build theories are dancing to one orchestra- the intellectual discourse within the social science academy-while those who build programmes dance to another-the funders, communities and public agencies that set program agendas”. Attempts to put on both shoes by health education faculty are wittingly described as efforts to “waltz and break dance at the same time [which create] some odd contortions and rhythms” (p.299). One way of attempting to bridge this gap is to try and assess which health education strategies are more efficient. Clearly, health education models are more synthetic than just theory. Green (1984) describes the encompassing nature of health education theory as predominantly practical in nature combining a variety of social science subjects. Their practical nature means that the essence of health education interventions means that principles and experience come into the equation in addition to theory on its own (Green, 1984).

2.4.3 Barriers to effective health education

What factors limit or hinder health education from being realised or the objectives from being met? Hubley (1986) argues that there are four factors at play. These are: failures in the planning process of the health education intervention. These are due to basic mistakes in the decisions pertaining to what to change and who should be the targets of the interventions. There is need for a full understanding of the epidemiology of the disease. Such an understanding would ensure that the program would be targeted perfectly. By way of example, in the control of the waterborne disease schistosomiasis, targeting a message solely on encouraging the use of the pit latrine for excretal purposes, would not be effective given that it would only take one person not to use the latrine to spread the disease to the whole community. A more useful message may be the encouraging of people to urinate or defecate outside the water. There is need for the recognition of

enabling factors that would determine the carrying out of a given behaviour. Enabling factors in health education include things such as time to carry out the behaviour, the money and material resources, skills and appropriate services to enable the desired behaviour to be carried out effectively. In the construction of the pit latrine for example, the persons may have the knowledge and interest to do so but some of the resources may not be available. An innovation is more likely to be taken up if it is “simple to carry out; is compatible with the community’s existing situation; can be tried out by the local community; produces results that are observable in the short term and provides perceived advantages over existing methods” (Hubley, 1996,p.234).

A community intervention in Malawi

MacLachlan (1998) writes that most health projects in Malawi are set up by donors but once they have left, the programme collapses. McAuliffe (1998) reports an evaluation of a UNICEF social mobilisation programme aimed at involving communities in health education. Following Rogers’ (1983) “diffusion” model, the intervention targeted opinion leaders with a series of messages to take into their communities. The health education messages initially focussed on immunisation before focussing on AIDS. The effectiveness of the programme was evaluated at three levels, in the communities, with opinion leaders and with drama group patrons. Three separate degrees of health education input by UNICEF were provided to the communities. Twelve villages in three districts of Southern Malawi formed the intervention. Six villages received a high and medium level input. They were exposed to UNICEF’s social mobilisation programme for six months in varying degrees. Six other villages received a low or control intervention. They had not been exposed to the social mobilisation programme. No differences in knowledge of AIDS and immunisation were noted between the intervention and control communities. The process evaluation appears to have been poorly co-ordinated not allowing for feedback during the course of the intervention. Community involvement in the initial phases of the intervention appears to have been poor. Not much consultation was done in the selection of the opinion leaders because villagers subsequently reported they were not getting information from these opinion leaders and their preference was for health personnel (consistent with an earlier Malawi finding of Tembo, 1991). McAuliffe (1998)

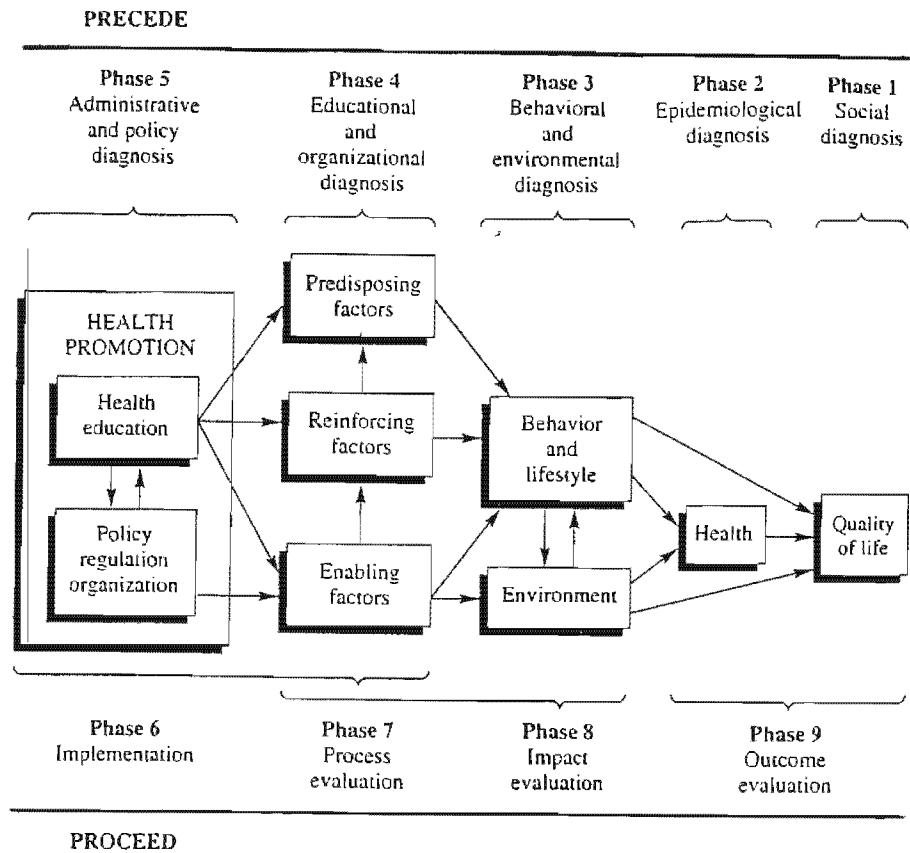
concluded that the social mobilisation programme lacked cohesion, had a low activity level and demotivated facilitators who had little impact on the villagers' knowledge of health related issues.

2.4.4 The PRECEDE-PROCEED framework

Throughout the literature review so far, the need for planning and a community involved intervention is clear as a prerequisite for an efficient health education programme. It can be seen that strategic planning is vital (WHO, 1997). Green and his associates have put forward an empirically supported framework for the planning, implementation and evaluation of a health education intervention. The operational framework that was used to guide the action research of this thesis was the PRECEDE-PROCEED model that has been widely used in health education programme planning. There are two components to the framework. First, PRECEDE (the diagnostic assessment that informs the planning) is an acronym for predisposing, reinforcing, and enabling constructs in educational diagnosis and evaluation. Second, the implementation and evaluation phase known as PROCEED, which is an acronym for policy, regulatory, and organisational constructs in educational and environmental development (Green & Kreuter, 1991, p.1). The model is largely a heuristic framework and has not been formally presented as a theory. It is used for health education and health promotion planning. The framework was originally developed by Green as a way of classifying objectives for the evaluation of health education programmes (Mullen *et al.*, 1987). Hence PRECEDE addresses the need for comprehensive planning of health promotion and education (Green & Kreuter, 1991). It is claimed "working through PRECEDE is like solving a mystery. One is led to think deductively, to start with the final consequences and work back to the original causes" (Green & Kreuter, 1991, p.26). The authors argue that effective planning is dependent on the factors important to an outcome being diagnosed before designing the intervention. This prevents the mere use of an intervention based on guesswork with the possible consequences of misdirection and ineffectivity. Thus the model assists the programme planner in setting priorities among the types of interventions most likely to succeed in resolving the problem (Dabbagh *et al.*, 1992). The PRECEDE model is seen to be helpful in locations where there is scarcity of information and the need for good assessment. It

provides specific insights into intervention and evaluation as well as enabling the acquisition of detailed information on social and health problems before planning intervention strategies (Kloos, 1995).

Figure 2.2 Schematic representation of the PRECEDE-PROCEED model.



PRECEDE-PROCEED provides systematic procedures to assess the factors influencing health. The model starts with the ultimate outcomes of health status and systematically works itself through various stages of the planning process enabling clear identification of causes and the setting of goals and objectives (Richard *et al.*, 1996). The interaction of behaviour and the environment with their determinants classified as predisposing, enabling and reinforcing factors is the central feature of the model (Richard *et al.*, 1996). The model has been applied successfully to the planing of various health programmes (Taylor, 1999; Kloos, 1995; Ekeh & Adeniyi, 1988; Monsky *et al.*, 1983).

PRECEDE-PROCEED has been used to investigate the risk factors (predisposing, enabling and reinforcing) for schistosomiasis (Taylor *et al.*, 1999). With the use of focus group discussions and questionnaires, Taylor and colleagues (1999) surveyed 9 schools in the KwaZulu-Natal province of South Africa. They concluded that the provision of adequate sanitation and clean water does not ensure usage. From the use of PRECEDE-PROCEED, they concluded that a comprehensive approach to health promotion was required. I am therefore satisfied that PRECEDE-PROCEED is well placed to address all the issues and concerns raised in this literature review. It has considerable empirical backing with over 800 related studies or articles listed on its websites (www.lgreen.net and www.ihpr.ubc.ca/preapps.html) . This study therefore utilised PRECEDE-PROCEED as its guiding framework.

2.4.5 Phases of PRECEDE-PROCEED

Green & Kreuter list six basic phases of the PRECEDE procedure. This shall be briefly outlined here, with more details to be presented in the chapters that go through these phases.

Phase 1: Social Diagnoses. This addresses the quality of life of the concerned community and involves assessing some of the general hopes or problems of concern of the subject population. This is primarily done by involving the subjects in a self-study of their aspirations and needs by reflecting on their social problems.

Phase 2: Epidemiological diagnoses. The focus is on health problems in the study population. Health problems are ranked with the use of data and investigations as well epidemiological and medical findings.

Phase 3: Behavioural and Environmental diagnoses. This phase involves identifying the specific environmental and behavioural factors linked to the health problems ranked in phase 2. These health problems must be carefully identified and specifically ranked. The five steps in the behavioural diagnoses are:

- i) Separation of the behavioural and non behavioural causes of the health problem.
- ii) Developing an inventory of preventative and actual behaviours
- iii) Rating behaviours in term of importance
- iv) Rating behaviours in terms of changeability
- v) Choosing behavioural targets.

Phase 4: Educational and organisational diagnoses: is concerned with the factors that influence a given health behaviour. The model posits that if there is to be any improvement in health education outcome, there is need for the identification of factors that contribute towards the status quo. The resulting intervention should therefore target these factors. In the model there are three categories of prebehavioural factors. These are:

- i) Predisposing factors or personal preference or prior motives that people bring to an educational experience. These include their levels of knowledge, attitudes, beliefs, values, intentions and perceptions that would either support or reduce their motivation for change.

- ii) Enabling Factors which are the skills, resources or barriers that would permit or hinder the desired behaviour from occurring. These are the objective characteristics of a community, and environment that facilitate action. With regard to Bilharzia this would include for example the non availability of safe water supplies and health services.

- iii) The reinforcing factors which are the factors that permit desirable acquired behaviours to be maintained. This may occur by way of rewards or punishments, including social support. Lack of concern about Bilharzia from parents, family members and community leaders would therefore be key elements of this.

Phase 5: Administrative diagnosis: This stage addresses the "assessment of organisational and administrative capabilities and resources for the development and implementation of a programme" Green & Kreuter, 1991, p.29). The budget is outlined and so too are possible obstacles to the intervention.

Phase 6: Is the implementation of the process. Here PRECEDE becomes PROCEED.

Phases 7 – 9: are the evaluation phases of the intervention. They address the process, impact and outcome evaluation of the intervention.

2.5 Conclusion

This literature review provides the following rationale for the study. Schistosomiasis is a serious health concern predominantly affecting children. It was seen that schools are strategic and important settings to impact the well being of children. Hence this intervention was school based. It was also seen that application of theory is important. It should equip health educators to conceptualise a problem and work for specific measurable changes in a given community, should enable researchers to help individuals change behaviour whilst seeking to help the community to improve its conditions. We therefore drew on theory to inform the intervention and in particular on social psychology theory, which has greatly influenced health education. We have applied the most widely applied social cognitive models, reasoned action and planned behaviour to this study to assess their contribution as well as to acquire valuable information about intervention. We drew on the most widely utilised framework model to guide the planning, implementation and evaluation of the study (PRECEDE-PROCEED). Through this we have seen that community participation is a key component of health education community delivery. We therefore wanted to assess whether community participation leads to efficient health education with outcomes on prevalence rates reduction our eventual planned outcome. We therefore designed an intervention that was also an empirical study that enables us to ascertain the most efficient health education exposure. Is community participation an important cost effective exposure or would it be adequate to provide minimum exposure by an input comprising a brief lecture? This thesis seeks to address these issues as well.

Throughout this literature review several key themes weave their way through. Like Carr *et al.*'s (1998) mode of social psychology "reflection", we need to look at the common principles that swim through the literature. One stands out. It is the issue of efficiency.

The underlying question is how can we get the best out of the situation given the limited resources? Efficiency is usually the goal of any intervention, be it cost effectiveness, community participation or behaviour change. The use of models is applied to ensure efficiency (which is the most efficient manner of ensuring behaviour change?). Given the dominant western economic philosophy, health education is under pressure to prove itself economically as an influence in preventing unhealthy behaviour which would in turn reduce health service costs (Tones *et al.*, 1991). Effectiveness is not the key issue because there is much evidence to suggest that health education is effective. Hence as Tones *et al.*, 1991 put it, “we need to know not merely whether health education has been successful but rather how successful it has been” (p.x). Efficiency therefore concerns itself with the “extent to which health education has achieved a given outcome by comparison with some alternative intervention” (Tones *et al.*, 1991, p.x). An understanding of psycho-social factors that determine decision making and behaviour that are mediated by different amounts of health education input, shall enable the designation of successful interventions. This intervention also sought to practically control the disease. In addition to this, we sought to extract lessons that could be learned from this intervention. The present study was therefore motivated by the question which is the most efficient degree of health education input that shall lead to the control of schistosomiasis?

CHAPTER 3

METHODOLOGY

"The effectiveness of an intervention is the impact an intervention achieves in the real world, under resource constraints, in entire populations, or in specified subgroups of a population. It is the improvement in a health outcome achieved in a typical community setting" (Aral & Peterman, 1998, p.33).

3.1 Qualitative and Quantitative Methods

This thesis is about an actual intervention designed to control schistosomiasis among school children in rural Malawi, and in the process to assess the most efficient health education input that would lead to the control of the disease. Given its health education focus, the thesis is an evaluative study of the impact that different degrees of exposure to a health education message has on the targeted population with regard to prevalence rates, knowledge attitude and behaviour change. The degrees of input are guided by social psychology theory. Since efficiency is a theme running through the literature, and resources are scarce, this study seeks to assess which degree of health education input is the most efficient in leading to prevalence reduction and behaviour change. The study has multiple components. It employed a combination of qualitative and quantitative methods. There have been many debates about the utility of quantitative methods versus qualitative methods in the literature (e.g. Morgan, 1996, 1998; Sherrard, 1997, 1998; Mullen *et al.*, 1986). A combination of both methods is now regularly advocated as a way of getting richer information (Helitzer-Allen & Kendall, 1992; Dockrell & Joffe, 1992; Green & Tones, 1999). A combination of the two approaches leads to a synergetic effect emanating from the interaction of both procedures. Steckler *et al.* (1992) argued, "the outcome of the two used together is greater than the effects of either used separately" (p.102).

It was for this reason that it was felt the study should draw on both approaches. Further support for a combination of these approaches comes from within Malawi itself. Helitzer-

Allen & Kendall (1992) demonstrated how use of both qualitative and quantitative methods were integrated in a study to assess how to increase the use of prophylaxis in a population of pregnant women in Malawi. They found that the reported use of prophylaxis assessed qualitatively differed from laboratory findings to measure actual usage. This discrepancy was attributed to courtesy bias, cultural reinterpretation, incomplete results and unexplained variability. The researchers concluded that use of multiple methods protected them from inappropriate conclusions whilst at the same time providing them with explanations for these diverse responses. Steckler *et al.* (1992) argued that both qualitative and quantitative data have weaknesses compensated by the strengths of the other. The strengths of quantitative data is said to be that they produce factual, reliable data that is repeatable and can be generalised to a larger population. Qualitative data has the strengths of generating rich, detailed process data that embraces the perspectives of the target population. Each qualitative study is unique, hence the analytic approach is unique (Patton, 1990).

This chapter outlines the research methods used to address the question this thesis attempts to tackle, which is to assess the most efficient health education strategies in terms of input. The following are the specific qualitative and quantitative methods employed in this study:

Table 3.1: Qualitative and quantitative methods employed

Qualitative methods	Quantitative methods
1. Focus Group Discussions 2. Interviews	1. Surveys 2. K-A-P questionnaire 3. Social Cognitive questionnaires 4. Egg counts for prevalence rates

Qualitative methods

As can be seen, the qualitative methods employed were focus group discussions (FGDs) and interviews. The rationale for their use in this thesis is presented below.

Focus Group Discussions

In this study focus group discussions (FGDs) were employed for the following reasons. They are a quick, effective and inexpensive means of interviewing a homogenous group of people at the same time (O'Brien, 1993; Helitzer-Allen *et al.*, 1994). They produce rich data on new topics and require little structure on the part of the interviewer. There is much empirical backing to support the uses of FGDs. They have been applied in numerous settings – for example to assess AIDS-related behaviours in Uganda (Konde-Lule *et al.*, 1993) and elsewhere (O'Brien, 1993), acceptability of childhood immunisation among mothers in Togo (Eng *et al.*, 1991), reproductive health issues in Malawi (Helitzer-Allen *et al.*, 1994). Focus groups have been used in Malawi for a wide range of studies especially with regard to HIV-related behaviours. McAuliffe (1998) reports a study conducted to investigate the barriers to sexual behaviour change. Thirty-four FGDs were conducted with commercial sex workers, STD clinic clients, secondary and out of school youth, civil servants, polygamous married men and women among others. From the findings of the study McAuliffe was able to recommend strategies that would highlight the relative risk associated with the different routes of transmission of the disease.

FGDs have several advantages (Green & Kreuter, 1991; Stewart & Shamdasani, 1994; Kreuger, 1990) that can be drawn on in this study. They are quick and reach many people. We could thus interview a group of students or community representatives at one single sitting. Secondly, the FGDs enabled us to have direct interaction with the target population. FGDs are a “socially oriented” procedure (Kreuger, 1994, p.34), which makes them very effective in that people live in real life social interactive situations, not in laboratories. The data we obtain from FGDs are in the own words of respondents. Probing is possible in FGDs enabling follow up. FGDs also facilitate easy and accessible results. FGDs can also be used at any point in the research programme (Stewart &

Shamdasani, 1994). In this study FGDs enable the acquisition of baseline information especially where quantitative information about the community was lacking.

Criticisms typically levelled at FGDs include, that they are not “scientific” in the quantitative sense; are not representative of large populations and that the moderator may bias responses. They are also criticised for being dependent on people’s personality, one person may dominate the group. In a similar vein, sensitive topics may not be discussed in public. It is not possible to draw firm conclusions from the data. Helitzer-Allen *et al.* (1994) argued that in rural Malawi, reliance on information obtained by FGDs alone is inadequate to enable insight into the cultural context and social norms of traditional female sexual health matters. They conducted 120 in-depth interviews and 32 FGDs with 60 girls and members of their social networks in two villages. It was found that different responses were given to identical questions asked to the same person during an FGD and a separate in-depth interview. They concluded that knowledge or actual experience determines information in interviews, whilst FGDs are furnished by rules and “socially correct” answers. FGDs were therefore more restrictive than interviews. They recommended that in-depth interviews be conducted prior to FGDs.

In the present study, all recorded material emerging from the FGDs were transcribed onto paper with the assistance of a transcription clerk. The scripts were then read through and the common themes emerging from these were grouped together to get a sense of the participant’s perceptions about the issues raised. These are presented in chapter four under the social diagnosis and in chapter seven, the process evaluation of the study.

Interviews

This study employed a semi-structured interview approach (Russell-Bernard, 1994). For all our interviews there was a clear plan of the process in which the interviewer had a guide or written list of questions and topics which were covered in a particular order. Having a written guide ensured that the questions asked were systematically followed and provided the interviewee an opportunity to express him or herself. In this study we interviewed key individuals such as health surveillance assistants, the district

environmental officer and headmasters for the purpose of providing additional data. The data obtained from the interviews were utilised as follows. First, to provide information, for example headmasters would inform on enrolment numbers. Second, the interviews supplemented information obtained from focus group discussions for example, the aspirations of the schools and problems encountered supplemented FGD information. Health Surveillance Assistants clarified some of the responses of the FGDs held at the chief's compound. As such, interviews served to verify and check the findings emerging from FGDs. Interviews were used twice, in the baseline as well as in the process evaluation to assess the implementation of the programme and provide feedback on the intervention. We recorded all our interviews on a micro recorder as well as through note taking. The material was transcribed and classified according to what I considered salient themes emerging from the interview.

It is noted that there are other qualitative method approaches such as case study approach (Smith, 1995) which provide detailed studies of individuals, grounded theory (Henwood & Pidgeon, 1995) and verbal protocol analysis (A. Green, 1995) which concentrates on the analysis of verbal reports as a source of data. These approaches were not used in this study since we did not have the time it would require to employ these methods satisfactorily.

Quantitative methods

The quantitative methods employed in this study were K-A-P surveys, social cognitive models and egg counts to assess prevalence rates. The rationale for employing each of these methods is discussed below:

K-A-P surveys

Knowledge, attitude and practice (K-A-P) surveys (sometimes also known as KABP surveys where the "B" represents beliefs) are part of the survey method systematic research tool. They have a long history of usage (Manderson & Aaby, 1992; Schopper *et al.*, 1993). K-A-P surveys have been widely applied to a large number of medical related conditions (e.g. Tanimowo, 1999 with Tuberculosis in Uganda) with much emphasis on

HIV infection (e.g. Lule *et al.*, 1997 in Malawi; Ndubani, 1997 in Zambia; Chikovore & Mbizvo, 1999 in Zimbabwe). They have generally been used to improve planning, implementation and the evaluation of HIV prevention programmes (Schopper *et al.*, 1993). The underlying theory of the K-A-P is that an individual's health behaviour is influenced by their knowledge of the disease and their attitudes and beliefs towards the disease. The equation is thus *knowledge + attitude = practice* (Aboud, 1998). K-A-P surveys describe demographic and sociological characteristics of a given population in relation to a particular disease.

This tool has strengths that can be drawn on for our purposes. The gathering of demographic and sociological variables such as family income, education, family size and water sources are effectively and appropriately collected using the K-A-P. Furthermore, the K-A-P gives us an indication of the levels of knowledge in a population with regard to a specific disease. Where an evaluation is being undertaken as in our case, a baseline and post intervention comparison may give us insights as to whether there has been change in knowledge, attitude and reported practice or not. It was for this reason that we felt the K-A-P would be a valuable tool in helping us assess the impact that different degrees of health education input has on the Mangochi school children.

It is noted that several criticisms have been levelled at the K-A-P (Katzenellenbogen *et al.*, 1997). Chief among them is the K-AP gap (the discrepancy between knowledge and positive action based on the knowledge). Knowledge, attitude and belief are said to be inadequate predictors of behaviour. The K-A-P therefore requires verification by other methods (Manderson & Aaby, 1992; Schopper *et al.*, 1993) not only to address the issues of its simplistic approach to understanding behaviour, but also those of reliability and validity. Hence, the K-A-P was supported in this study by the theory of reasoned action and planned behaviour questionnaires since they have empirically been seen to be more predictive of behaviour.

Social cognitive models

The theories of reasoned action and planned behaviour questionnaires were utilised as quantitative data to capture attitudes, intentions, subjective norms and perceived behavioural control held by the school children. The procedure for these as well as analysis, findings and interpretation is presented in Chapters 5 (the baseline TRA and TPB) and 8 (the impact evaluation). These procedures are presented later, rather than here because, given their complex technical nature, there is a better flow to understanding their process if they are presented together and told as one story.

Prevalence rates

These were assessed by the counting of schistosomiasis eggs in a 10ml sample of urine voluntarily given by a representative sample of school children in the three schools. Assessment was made at baseline, during the intervention (impact evaluation) and outcome evaluation. The procedure, analysis and results are presented together in chapters four (baseline) and nine (impact and outcome evaluation).

3.2 Study Design

The Study design is a pre-/post-intervention comparison of the schools. Comparisons were made to assess how the different degrees of health education input affected knowledge, attitude, practice, intention and prevalence rates of the pupils. This set the ground work for both impact and outcome evaluation of this intervention. The main unit of analysis used in this study were the schools. Although we used individual pupils, they were not always the same individuals who were assessed over the duration of the intervention. Evaluation of outcome involved comparing the prevalence of schistosomiasis in the three schools before the intervention was introduced (the pre-intervention), with the rates in the same schools during the intervention (mid-intervention) and after they had received the intervention (post-intervention). The prevalence data of the study involved parasitic egg counts to determine intensity of infection. This was first measured early in the programme during May 1997. The mid-interventions were carried out in November 1997 and May 1998. The post-intervention

investigation was carried out in November 1998. To rule out for other variables that may have influenced prevalence and health outcome factors (Kirkwood *et al.*, 1997) mid-intervention assessments were conducted to see if there were any patterns that could be attributed to secular trends that are independent of our intervention.

The levels of knowledge and attitude of the students before and after the intervention were also used as part of the pre-/post intervention comparison design of the study. The Knowledge, attitude and practice questionnaire was administered twice: In November 1996 (pre), and July 1998 (post). The results of the findings were then compared using the t-test to see if there were any significant differences. All the three schools were assessed. To help account and measure more effectively any changes in prevalence, knowledge, attitude, practice and intention (hereafter variables of the study) as a result of our intervention, the study also employed the intervention vs. control comparison. This addition was considered important to see if there would be any significant differences between the schools since they were each exposed to different degrees of input. Such differences if significant would add strong support to the argument that the intervention has impacted the variables of the intervention. There is need however to ensure that the groups chosen are relatively similar to ensure that the comparison to be made is justified. There may be certain factors that are different in all the schools that would influence the results and these could not necessarily be attributed to the intervention. More shall be said on this in the following chapters.

A third type of comparison applied in this intervention was the Adopters vs. non-adopters comparison. This method has been applied in relation to uptake of health care service delivery interventions at the community level. Kirkwood *et al.* (1997) point out that individuals who adopt the intervention are compared with those who do not adopt the intervention. Hence in a strict sense such a comparison, they maintain, is really a risk factor study rather than an impact study given that it measures the benefit to an individual who adopts the intervention rather than the effect of the intervention on public health. In utilising this method there is need for great care to rule out confounding factors. It could well be that adopters and non-adopters differ in their exposure to infection. The adopters

and non-adopters in the maximum and medium schools were compared with each other. Focus groups and interviews were used with the adopters to see if there were any significant differences in their life style. Since we could not reach out to all the school students the members of the Bilharzia Clubs we established were taken to be adopters. They were the key people through whom the message of the need to engage in behaviours that reduce the acquisition of schistosomiasis infection would be concentrated. Hence if there were no significant differences among the adopters (Bilharzia club members) and the non-adopters (rest of the school) then it would have serious ramifications for the use of clubs as an efficient mechanism for the control of schistosomiasis in a rural Malawian setting.

The different measures of health education input in this study were informed predominantly by social psychology theory. Five levels of analysis were employed to answer the empirical question of this intervention, which was, which measure of health education input is the most efficient for the control of schistosomiasis? The first level of analysis was a physical intervention that was aimed at treatment of the disease. For ethical reasons given the history of high prevalence in the area, we treated all the children with medication. We used the opportunity of treatment to assess prevalence rates by getting a sample of the children to provide urine samples for the microscopic examination of schisto eggs. The physical intervention was used to assess prevalence rates and was conducted once every six months in all the schools. The second level of analysis employed social psychology theory more directly. In the literature of social psychology and health interventions (e.g. Stroebe & Stroebe, 1995), social cognitive models are employed to influence the cognitive structure of the individual. Such influences, it is assumed would lead to behaviour change. Since this study is about efficiency, we wanted to know for example, whether information on its own would be adequate to effect change for the sample under study? We therefore randomly assigned one school to receive a “minimum” intervention, based on information input alone. This input would comprise a once off brief fifteen-minute talk once every six months, given at the time of medication. The talk would provide basic information of the disease, its life cycle, how it is contracted, spread and what could be done to control it. The third level of analysis took

this further. We drew on the structures of the theories of reasoned action and planned behaviour to provide the divisions of health education input. Hence, in addition to mere information provision, we wanted to see whether peer influences or normative factors would make the intervention more efficient. This level therefore involved exposure to the health education message through a variety of media given once a term (every three months) in the form of an outreach display comprising drama, poetry, music and lectures. This therefore measured the normative component of the theories. This was to be given in addition to the fifteen-minute talk every six months which primarily relied on the attitudinal component of the theories. The fourth level of analysis was a more intense weekly input through a variety of activities aimed at a small group of volunteers. This would occur through the formation of a Bilharzia Club. The club would get the children to be active participants of the activities rather than being passive recipients of the message. It could well be that active involvement of the children themselves would be a more efficient way of controlling the disease. This aspect in addition to addressing the attitudinal and normative components of the theory therefore embraced the perceived control component. These levels of analysis were randomly assigned to a “medium” intervention and Makawa School was given this level of intervention.

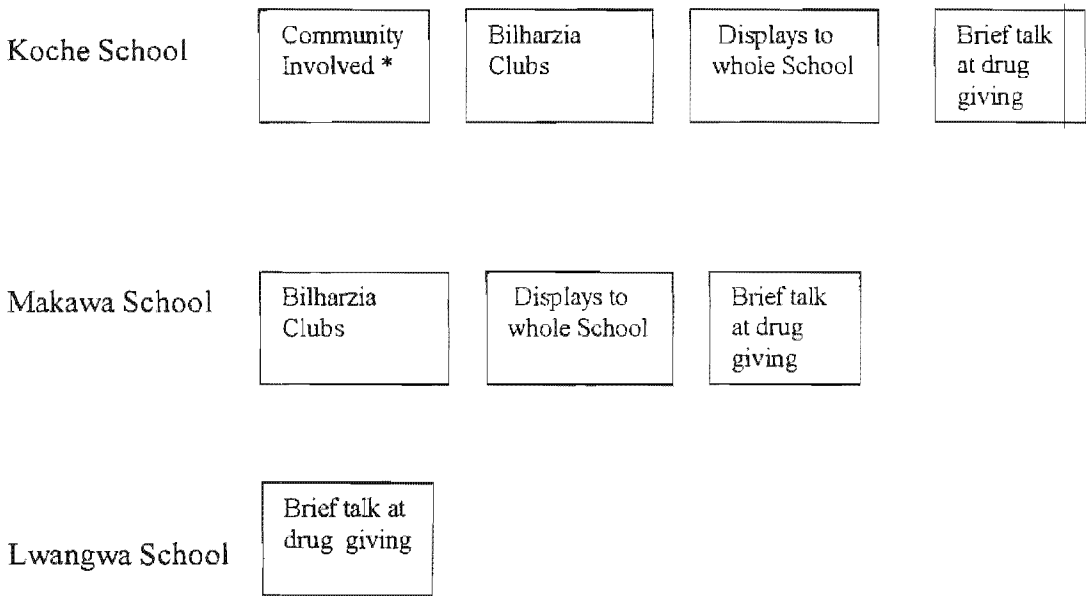
To leave our investigation there would be to bypass another important factor that influences behaviour. We saw in the literature review, that one weakness of the social cognitive models is that they focus too much on the individual. Social factors are also important determinants of behaviour, so these have to be incorporated into the investigation as well. The theories of reasoned action and planned behaviour had a normative component to them in which these social factors could be addressed: parochially held significant others whom the children would most want to emulate. Since a school does not exist in a vacuum, the fifth level of analysis involved an exchange between the community and the school. The children reached out to the community and the community reached out by having health community leaders talk to the children in the clubs. Such an intervention comprising all the previously mentioned levels of analysis and including the aspect of community interaction was termed the “maximum” condition. Koche School was randomly assigned to this condition. Its club members went out into

the community to spread the message of schistosomiasis reduction through displays and football and netball outreaches. This is consistent with action research principles (Stringer, 1996). Hence the stakeholders (those whose lives are affected by the problem under study, in this case schistosomiasis) were involved in all aspects of the research process: data collection, intervention and evaluation.

We wanted input leading to efficient intervention to draw on these levels of analysis influenced by the structures of the theory of reasoned action and planned behaviour. Assessing which level of analysis is the most efficient can act as a necessary spring-board for further investigation into how one can maximise a particular input strategy.

Figure 3.1 summarises the health education input provided to each school in terms of “exposure” to the message as below:

Figure 3.1: The health education “exposure” package for each school



- * Community Involved
1. Outreach to the village
 2. Football and netball teams outreach
 3. Health Surveillance Assistance input

The success or measurement of the intervention was assessed during the evaluation of the programme. Evaluation requires a combination of outcomes, process and impact indicators defined by the goals. For this study they are presented in the table below: They can be summarised as follows:

Table 3.2 Evaluation goals

Immediate	Long Term
1. Changes in knowledge, attitude and practice.	Reduction and maintenance of prevalence rate at 15% by end of programme.
2. Shifts in intention.	
3. Reduction in prevalence.	

The effects of the health education input was measured and assessed during the three stages of the study (Baseline, intervention and evaluation). The data collected between October 1996 and May 1997 formed the baseline against which efficient health education input would be evaluated by comparing all three schools. The baseline comparability of the three schools used in this study is believed to be adequate. The three schools used in this study were similar. All were government full primary schools in the same geographical area. All had about the same number of pupils. Whilst the children all came from different villages, the proximity of the schools and villages to the lake, hence to exposure and infection could be argued to be the same. Particularly we would want to assess shifts in intention across the schools, operating on the hypothesis that the maximum school would witness the greatest shift in intention towards schistosomiasis reducing behaviours followed by the medium school and finally the minimum school. Similarly it is hypothesised that knowledge, attitude and practice would change according to the level of health education input. Given that the Bilharzia Clubs established in two schools received intense exposure to schistosomiasis reduction messages, we hypothesised that the club members would be significantly different from non-club members with regard to knowledge, attitude, practice, intention and prevalence. Since a reduction in the prevalence rate is the ultimate outcome, it was hypothesised that

prevalence rate would reduce according to health education input for both club members and across the schools with the maximum school experiencing the lowest prevalence rate and the minimum school the highest. Focus group discussions and interviews were utilised to account for the process of the intervention itself. There may be certain factors about the action research that would interfere with the health education input delivery. As such we needed to ascertain what these interfering factors might be. The PRECEDE-PROCEED model was the guiding framework of this intervention. The data collection methods in some of the phases of the model were as follows:

Phase 1: Social Diagnoses.

- Focus group discussions
- Interviews

Phase 2: Epidemiological diagnoses.

- FGDs
- K-A-P
- Surveys
- Urine Egg Counts

Phase 3: Behavioural and Environmental diagnoses.

- Interviews

Phase 4: Educational and organisational diagnoses:

- K-A-P Time 1
- TRA/TPB Time 1

Phase 6: Process Evaluation.

- FGDs
- Interviews
- Club Reports

Phase 7: Impact Evaluation

- K-A-P Time 2
- TRA/TPB Time 2

Phase 8: Outcome Evaluation

- Urine egg counts to assess prevalence.

3.3 Ethical Issues

Ethical issues in this thesis were taken seriously (McLeroy *et al.*, 1987, 1993; Yeo, 1993). To begin with, all children in all schools were treated with the drug Praziquantel. No one, whether in the minimum school or non-club members were deprived of access to medication. In Time III of the prevalence assessment, no mass treatment was given out to tease out the influence of medication. We took urine samples from a representational section of the students to determine prevalence. However for those whom we found to be infected, we treated. Secondly, participation in all activities such as clubs, the receiving of medication and displays were voluntary. No one was to be forced to engage in any activity. Full consent was important. Parents were informed of the mass treatment plan in the schools and if they did not wish their children to be treated, they were able to inform the school authorities or advise the children to that effect. Signed, written consent forms were not practical given the high illiteracy rates. Club members were free to join and leave at any time and there was no coercion. Participation in data collection activities such as FGDs, questionnaire administration and interviews were all voluntary. What we discovered was the enthusiasm and willingness to participate on the part of the community and school children.

3.4 Demarcations of the Thesis

The thesis does not concern itself with investigating the methods or tools of health education delivery – tools such as role-plays, drama and didactic talks. We are not investigating specific methods of health education delivery but are concerned with the

effectiveness and efficiency of health education input at a strategic macro level. We want to evaluate the overall combination not the components of health education methods derived from learning theory. Some recent Southern African sources that tackle various strategies include Ewles & Simnett (1999) and Coulson *et al.* (1998). Nevertheless the health education delivery methods we utilised are described in Chapter 6 to give a picture of what happened during the intervention. These methods or tools utilised shall not be analysed in any detail, as they are a means to an end, the end being evaluating the impact, process and outcome of different degrees of health education input.

The thesis does not explore or tackle the indigenous theories and beliefs held towards schistosomiasis. This in itself is a huge and important area requiring a separate study (E. Green, 1999). Whilst such anthropological knowledge would give us insights into the way the disease is seen, we have confined perceptions of disease to “knowledge” of the disease from a Western scientific viewpoint to be able to quantify such information for evaluative purposes in comparing the different degrees of health education input. As shall be seen, the beliefs held towards the disease fit neatly into western scientific biomedical explanations of schistosomiasis, which is the framework being utilised in this study.

The social group processes that influence normative factors affecting schistosomiasis behaviour is also not explored. Exactly how this process occurs is an area of much study in and of itself. Whilst it would contribute tremendously to an understanding of the processes of reinforcing factors, it is beyond the scope of the study in that we focus our attention on evaluating the extent to which health education input itself affects the reinforcing as well as predisposing and enabling factors. Where reinforcing factors come into play, they shall be mentioned and brought into the equation but how that impacts the self-concept and group processes is not the focus here. For such in-depth studies the reader is referred to Palmonari *et al.* (1992), Levine & Moreland (1994) and two special issues of the *British Journal of Social Psychology* which is devoted to social processes in small groups (Moreland & Hogg, 1993; Hogg & Moreland, 1993).

PART II

PLANNING

AND

IMPLEMENTATION

CHAPTER 4

SOCIAL, EPIDEMIOLOGICAL, BEHAVIOURAL AND ENVIRONMENTAL DIAGNOSES

4.1 Introduction

In seeking to establish the most efficient health education input, a health education intervention had to be planned and implemented. To be as thorough as possible, the PRECEDE-PROCEED model (Green & Kreuter, 1991) was followed as the guiding framework. According to this framework, the planning phases of the health education intervention takes the form of a series of “diagnostic” steps, each one leading to the other in building a comprehensive picture of the situation on the ground and setting intervention objectives. This chapter describes the first three steps: the social, epidemiological and behavioural and environmental diagnoses. I shall take you through each stage describing how the health education was planned and developed.

4.2. Social Diagnosis

According to Green & Kreuter (1991), the first step in any planned health education intervention is to start with an assessment of the social needs of the target population. This comprises their concerns, needs and aspirations. Social diagnosis according to Green & Kreuter (1991) is defined as

[T]he process of determining people's perceptions of their own needs or quality of life, and their aspirations for the common good, through broad participation and the application of multiple information-gathering activities designed to expand understanding of the community. (p.45)

Behaviour occurs in a social context. The people in the social context have their own goals and concerns and there needs to be a correlation between the objectives of the intervention programme being introduced and the people's needs and goals. The stronger

the correlation between the community's goals and the intervention's goals, the better the chance of co-operation and sustainability of the intervention after external participants have pulled out. Social diagnosis reflects the heartbeat of the community, the day to day issues that are part and parcel of their lives. These have to be absorbed into the planned intervention otherwise interventions that do not incorporate these are not part and parcel of the community (Green & Kreuter, 1991). It could be that schistosomiasis is not perceived as a disease of concern to the local population. Introducing such a programme may be counter productive since the local community may not be so motivated to tackle the problem.

There is also a strategic element to an understanding of the community's goals. There is an awareness of where the community is at and such insight could be made available to other sectors involved in the study. In the LMBC Programme for example, awareness of a community's goals would be invaluable information for the Ministries of Health, Tourism and the local hotels sponsoring the study. The sharing of goals and objectives of researchers and the local community is an integral part of the principle of community participation discussed in the literature review.

Gay (1983) cautions that there is no one typical villager. Thus there is need for prudence in the social needs assessment because different components of the community may have different goals from within and these may clash with each other. For example, a goal of a primary school may be to provide quality education to the pupils whilst for some adults in the community the goal of the community may be geared towards commercial success in the fishing business for example. Such a goal may require children to be removed from school to meet that goal. Another example pertains to marriage. In some parts of Malawi marrying off the daughter at a young age would clash with the goal of the eradication of illiteracy. PRECEDE is not so explicit in addressing these potential conflicting intra-community goals and objectives. There would therefore be the need to interview a cross section of the community and then come up with some composite goals and objectives of a given community.

4.2.2 Background of study

The Western lake shore hotel resort area where the LMBC Programme was concentrated covers approximately 30 square kilometres. This area is where most of the tourist resorts in Mangochi are based. The area has a total of 16 villages served by one health clinic (Koche) and two primary schools (Makawa and Koche schools). There are over 15,000 inhabitants of whom 6500 are children aged between 5 and 18 years. Children thus comprise 43% of the local population. This percentage is similar to the overall population situation in Malawi where children aged 5 and 19 years make up 39.8 % of the Malawian population (Malawi National Statistical Office & Macro International, 1997).

4.2.3 Steps in social diagnosis

Social diagnosis recommends the assessment of “quality of life”. Green & Kreuter (1991) suggest objective measurement of “quality of life” indicators such as “social indicators like unemployment rates, ... housing density and air quality” (p.48). In third world rural Malawi, such data simply does not exist. The closest one comes to it is population density, but the translation of this into a “quality of life” measurement is extremely difficult. We therefore had to rely on the more subjective qualitative assessments of “quality of life”. Translation of such a concept into the local language with its diverse meanings was difficult. The “quality of life” therefore had to be inferred from the focus group discussions and interviews with persons on the ground. This called for creativity and imagination to be able to put together some sense of “quality of life”.

Following guidelines of procedure laid down by Green & Kreuter (1991), I proceeded as follows.

First, I identified an entry point into the communities concerned. All the village structures were informed of our planned intervention in the last quarter of 1996. A personal visit was made first to the traditional authority who is a chief who oversees other chiefs and covers a fairly wide range of villages according to the local Malawi government structure. He was briefed on the planned objectives of the study. He was informed that our objective was schistosomiasis control. I can testify to the fact that “entry at this level

helps open doors to at all levels and in all sectors” (Green & Kreuter, 1991, p.65-66). The Traditional authority subsequently briefed the other chiefs in whose villages we were directly involved. We also visited all the chiefs or village headmen in the villages surrounding the schools of the study. Each village has a village health committee that looks into health-related village concerns. We sat down with several such committees and shared with them the planned intervention. We also solicited their opinions. In September and October 1996, we conducted field interviews and village meetings. A total of 12 village meetings were held to create an awareness of schistosomiasis and inform the communities about our intervention. The meetings formed part of the social and epidemiological diagnoses in that we sought information on sanitation habits as well as an assessment of the problems the population experienced in their area. Entry into the schools was done through the headmasters. The planned intervention was discussed with them through interviews and focus group discussions (FGDs).

Green & Kreuter (1991) describe the second step as consisting of the identification of local cosponsors. In many ways this was carried out first in this study because it was the concern over the increase of schistosomiasis that led us into action. As explained in the background to the study outlined in section 1.4 of the introductory chapter, a steering committee comprising concerned parties was established. To recap, its mandate was to co-ordinate all research activities in the lakeshore area to avoid replication and contamination of data. As a consequence of the establishment of the steering committee, in February 1997 at the commencement of the intervention, we called together all the chiefs and concerned parties and had a meeting at one of the hotels in Mangochi. The purpose was to hear the concerns of the chiefs as a collective body. (The minutes of this meeting can be found in Appendix 8).

The third step according to Green & Kreuter (1991) is the development of research and briefing materials. Time and funding did not allow us to do this. However the findings of the baseline demographic study (outlined below) were made available in the programme’s annual report.

Next in this study, in January 1997 we identified leaders and representatives from the schools and the village communities. We approached the headmasters in the three schools identified and asked them to select teachers whom they felt were best able to involve themselves. Since the headmasters knew more about their staff we left the selection in their hands.

4.2.4 Assessment of social needs

To get an overall picture of the aspirations and social needs and concerns of the population around the schools where we would be setting up the intervention, we held interviews and focus group discussions (FGDs) with a wide range of community representatives. In early 1997 we conducted FGDs with chiefs, their counsellors, village representatives, teachers and selected pupils. FGDs were conducted with the village chiefs of Chipoka and Michesi, which are the main villages where the maximum intervention school (Koche) is located. These FGDs were held in the open air in the compounds of the chiefs' homes. This was a common meeting place for discussing village matters. During the FGD, protocol dictated that women did not mix with men and that the chief had to be some distance away from his subjects. As such we were unable to use a tape recorder to record the sessions. Instead we relied on note taking by one of the facilitators. At the home of Chief Michesi, the focus group was conducted in two languages, Chichewa the national language and Yao, the local language of the area. One of the chief's counsellors acted as translator so that whatever was said would be expressed in both languages for the benefit of all. The next day a focus group discussion was conducted with 4 traditional healers and 7 villagers all selected by the chief. Protocol dictated that the chief chose for us who became members of the focus group discussions.

Since our intervention focussed on the schools, relevant information was collected from the three schools. This included the total number of pupils in the school, class sizes, and dates of school sessions and⁵ public holidays. At Koche and Makawa we held FGDS comprising 8 teachers at each school, equally divided along gender lines. The participants were selected by the headmasters. We also held focus groups with the pupils. At Koche we held two focus groups with pupils. Each group was from the two highest

classes (Std 7 & 8). There were eight pupils in each group, comprised of both males and females. At Makawa school we held a focus group discussion with one group (n=8). No one pitched for the other group we had set, as the pupils were eager to go home for lunch straight after classes. At both schools, teachers selected the pupil respondents. The only criteria we had requested in making the selection was to ensure that these were pupils who were seen by their teachers as being articulate.

Our focus group meetings in the schools were held in a classroom or the school library, which was a single room. All the focus groups followed the same format. We introduced ourselves. The facilitator would then give a brief introduction to the subject to be discussed emphasising that we had come to learn from them, not to impose our ideas. We then agreed on a set of rules saying that it was important that all participants respected the views of what one person was saying and there would be no interruptions or criticisms. At the schools we tape-recorded the discussion after permission was solicited from participants. We provided drinks and biscuits to all our subjects as an exchange to them for giving us their time. At school and in the village we tried to engage participants as much as possible. The facilitator would ensure that the more silent subjects were prompted. Where need be we probed responses further. As we wound up each focus group meeting, we went through the group asking each subject to give a final word. When the focus group was over we thanked the subjects.

4.2.5 Results: Aspirations of the population

The “quality of life” aspirations of the chiefs and their counsellors were predominantly in the health domain. They sought health for their subjects. Development such as the introduction of piped water to the village was seen as closely linked to health status of the community. They said that schistosomiasis was a major health concern, pointing out that only piped water was the best long term solution to control the disease. One of the counsellors mentioned that the chief could talk to the people to change their behaviour but “if there is no piped water, there is no point in holding village meetings”. All subjects present concurred with his sentiments. It was seen as the government’s responsibility to

provide the piped water. The focus group with the chief and village members revealed that the community would be willing to participate through the digging of trenches for the pipes.

The role medication would play in controlling schistosomiasis was acknowledged. Subjects felt that our planned chemotherapeutic intervention should not be confined to the schools only. The consistent high infection rate was recognised. Schistosomiasis was said to be a health threat in the community such that many women complained about the problem. FGDs showed that most people commence treatment by going to the traditional healer, failing which they then seek “modern” medicine at the health centre or hospital.

Interviews were also conducted with the Health Surveillance Assistants (HSAs) who are in the area and work with the rural community in ensuring the maintenance of sanitary standards. The HSAs reported that in their experience most people did not perceive the disease as a problem because infection was not terminal. The HSAs supported the importance of the introduction of piped water as a controlling mechanism for the disease. They also pointed out that the dependency people have on the government to end their problems needed to be minimised with the focus being on community education and participation in order to empower the community to feel they could do something about the disease.

4.2.6 The schools

The two schools closest to the Holiday resorts were randomly assigned the maximum and medium conditions even before the baseline information of the schools was solicited. This was done for practical reasons so that the programme could proceed. It was felt that what practically matters is that prevalence rates can be assessed subsequently following intervention. We did not want the baseline to influence the random assigning of the schools to the various conditions.

The three schools in this intervention were full primary or elementary schools, with Standards 1 to 8 according to the education system in Malawi. The distances between the schools were as follows. Koche and Makawa the maximum and medium schools respectively, were three kilometres apart whilst Lwangwa, the minimum intervention school was 6 kilometres away from Koche. The distance between Koche and Makawa may not necessarily compromise the findings. The three schools draw their pupils from different villages and as such there is not much interaction between them. Transport is by bicycle and there does not appear to be much overt trade with each other. A study by Hewlett & Cline (1997) into schistosomiasis control in Northern Cameroon found that the prevalence of schistosomiasis had dropped to 7% in a village that had received health education whilst in an omitted community, just two (2) kilometres away, the prevalence was 71%.

4.2.6.1 Koche, the maximum intervention school

i). Basic data

At the outset of our programme in January 1997 there were a total of 2,337 pupils attending Koche. The lowest classes (Standards 1 to 3) catered for 63% of the total student population. There were 40 teachers. This gave the school a teacher student ratio of 1 teacher for every 58 pupils.

ii). Concerns

An interview with the headmaster revealed concerns the school had at the time. Firstly, parents did not see the benefit of sending their children to school. Many standard one pupils did not enrol in time. The fish industry was a major distraction from school. It was seen as a lucrative alternative to full time schooling since its rewards were more immediate to those engaged in the business. Secondly, the lack of facilities at the school was a concern. There were only 8 classrooms for over 2000 pupils. There was need for an additional 28 classrooms. Most classes took place in the open air under the shade of trees. The shortage became more noticeable during the rainy season. There were only 6 teachers' houses. The headmaster was using a teacher's house.

iii). Goals and aspirations of the school

There were two main goals. The first was to address the lack of resources by building more teachers' houses and classrooms as well as providing textbooks for standards 3 and 4 who were experiencing desperate shortages of books. The second goal was the need to improve discipline among the children especially with regard to their dressing. Most dressed in T-shirts and shorts and arrived late.

iv). Health concerns

Cholera outbreaks during rainy seasons were common. The school was constantly at risk of an outbreak since classrooms were usually overcrowded. The shortage of water was another area of concern. The borehole water was salty and therefore unappealing. Most people opted for the lake as a source of their drinking water instead. The most common diseases affecting the pupils were malaria and schistosomiasis. Sanitation needs were yet another concern. There was the need to dig more pit latrines, as the present ones were becoming full. There were only 12 boys' and 12 girls' latrines.

One criterion used in Malawi for measuring the success of a school programme was the number of pupils who were selected to pursue secondary school education. In view of the very limited secondary schools available, the Ministry of education selects pupils who obtain good grades in the Primary School Leaving Certificate and place them in various secondary schools throughout Malawi. At Koche, in 1996, 15 out of 40 pupils who sat the exams were selected.

4.2.6.2 *Makawa, the Medium intervention school*

i) Basic data

At the outset of our programme there were a total of 1650 pupils with 52% of the pupils being boys. There were 29 teachers, which gave the school a staff student ratio of 1:56.

ii) Concerns

There were very few classrooms at the school. The buildings had cracks and there was fear of an accident. I noticed that the buildings were bat infested. The headmaster's office was full of bats hanging from the ceiling. They remained there during the duration of the study. Each time we held an FGD or interview I was mindful of the bats swooping down on us. They never did. The second concern centred on the resources of the school. There were very few textbooks for the higher classes (Standards 6-8). The headmaster lamented that there was no money to run the school especially with the introduction of free education in 1997, which mushroomed enrolment numbers. Another concern was the fact that there were too many temporary teachers on the staff who were not fully or appropriately trained, mainly due to a national teacher's shortage. There were only 8 teachers' houses, which were not enough for the needs of the school.

A major concern evolved around parents not sending their children to school. "They are not serious about school and do not see the value of it" said the headmaster. The headmaster's attribution for this included the fact that most of the parents were said to be illiterate. Another attribution was that as a main fishing area, fishing was seen as an immediate breadwinner. Hence the school experienced many pupils dropping out so as to go into the fishing trade. With poverty so rampant survival was seen as more important and fishing was considered a more immediate practical option. Parents were said to hold the perception that the benefits of schooling took too long to be enjoyed. Absenteeism was therefore a related problem along with late arrival. As many as 25% of the pupils were estimated to attend voluntarily because their friends were at school.

The relationship the school had with the local community was mentioned as another concern of the school. The school boundaries were encroached by villagers as chiefs sold land to make ends meet. This deprived the school of a garden and possible future development and expansion. The school also experienced thefts. Doors and desks were often stolen at night. Damage to property occurred when thieves tried to break into the headmaster's office, which was the only room remaining with a door and lock. Some of the villagers or destitutes slept in the classrooms for lack of a place to sleep. The problem

of encroaching had been tackled through speaking to the villagers and chiefs. However there was little collaboration between the school and the community.

iii) Goals and aspirations

The primary goal of the school was, in the headmaster's own words, to "ensure that the pupils receive quality education under good learning situation with availability of good books and a conducive learning environment". The second goal was the need to instil and sensitise teachers to the need for co-operation between parents and teachers as well as general co-operation between the school and the community. A third goal was to help teachers continue with their own education.

Health Issues:

The school needed urinals and no latrines were available. The school had tried to tackle these difficulties by soliciting funds from donor agencies for the building of toilets. In the course of the study 8 boys and 8 girls latrines were under construction. The school had had temporary makeshift pit latrines. A major health hazard was that the community would come in and spoil classrooms, defecating inside and urinating all over in the classrooms since there were no doors and no windows. Malaria was reported as the major health concern followed by colds, flu and schistosomiasis.

The annual selection of pupils was reported to be poor. From a pass rate of 50-55%, only 3% are selected each year to go to secondary school. In 1996, five were selected. In the course of the study, 35 out of 69 passed and only 1 was selected in 1997.

4.2.6.3 Lwangwa School, the minimum intervention school

i) Basic data

In February 1997, there were a total of 1784 pupils who had been attending classes though 1800 were officially registered. There were 28 teachers, which gave the school the teacher pupil ratio of 1:63. Seventy percent of the pupils were in the junior classes (Standards 1-3).

ii) Concerns

The primary concern was that chairs and desks were in very short supply. Most of the pupils sat on the floor for their lessons. Only the higher classes (standards 7 and 8) had desks. The supply of water at the school was insufficient. The school relied on a single tap, which piped water in from the Agriculture Department. Another concern was that exercise books were in short supply as provision from the Ministry of Education was erratic.

iii) Goals and objectives of the school

The headmaster listed the primary goal as being “to let pupils pass, to enable them to go on with their education and move to the next level”. In 1996 only 4 out of 60 pupils were selected to secondary level.

Health concerns

Cholera during the rainy season was the main health problem reported by the headmaster. Schistosomiasis was also said to be a problem. Sanitation concerns centred on the lack of toilets. There were only 8 pit latrines, 4 for boys and 4 for girls. The headmaster lamented that this was not enough.

4.2.7 Conclusion

In sum then, it can be said that the primary concerns of the community and schools arose from a lack of basic resources. The community lacked piped water; the schools lacked basic facilities to carry out their goals of providing quality education. The community and school do however see schistosomiasis as a disease that requires intervention. Health is a predominant theme that emerges from the social needs assessment. Piped water provision was seen as leading to improved health status, as was the digging of more pit latrines in the schools. A pit latrine is a hole dug about 8 feet (2.1 metres) into the ground covered with either a squatting plate, or slab with a toilet seat. A structure is then built around it (Munyimbili, 1981a). It can be concluded that an intervention targeted at health would be received with support from the community. Our proposed intervention therefore had to be seen to be linked to improving the lack of resources in the community. More clarity on

the health concerns was obtained from the next PRECEDE phase which is the epidemiological diagnosis.

4.3 The Epidemiological Diagnosis

4.3.1 Baseline Village surveys

A village survey of the sanitation and health habits of the local population was conducted for the baseline of the Lake Malawi Bilharzia Control (LMBC) Programme. A total of 293 persons were interviewed in 8 of the 16 villages of the area. Of these, 123 were school children (59 males and 64 females), 150 were adults found at home (42 males and 108 females) and 20 were adults interviewed randomly around the villages (11 males and 9 females). With the help of local health surveillance assistants in the areas concerned, a surveillance checklist (see Appendix 4) was drawn up. The checklist solicited data based on sources of water collection for drinking, laundry and bathing. Venue of elimination for both urination and defecation were also solicited. Visits were made to randomly selected houses in all the villages in the area.

The findings were as follows: the lake plays a central role in the lives of the villagers. 80% of the people collect their drinking water from the lake, 98% wash their clothes in the lake and 65% bathe in the lake. For 23% of the people, the lake is the commonest place where they urinate and 15% of the people defecate in the lake.

i) Water Sources

The surveys and the village meetings solicited numerous problems with the water sources. Boreholes and protected (cemented wells) were few and rarely used because the people in the villages complained that the water was salty. In some villages the boreholes were not functioning properly. Hence most chores requiring the use of water were carried out at the lake or surrounding rivers. Three of the villages drew piped water from Maldeco Fisheries the large fish processing factory in the area. However these taps were not adequate for the population size. Michesi village, for example, had one communal tap and three boreholes for a population of 2,589 people.

ii) Sanitation

Due to the sandy soils in the area, residents reported the problem of collapsing pit latrines during the rainy season (November to March). The result was that most of the people gave up toilet sinking and construction. The bush and the lake were thus the alternative places of convenience. Of the households surveyed, 72.5% had pit latrines. However these were not being fully used by the inhabitants. Some villages were found to harbour a large number of migrant fishermen who built temporary living huts along the lakeshore without any pit latrines. Subsequently these fishermen used the lake to relieve themselves. Chief Kela, for example, pointed out that the lakeshore near his village was littered with human excrement.

4.3.2 Common diseases in the area

In the three schools we administered a knowledge, attitude and practice (K-A-P) questionnaire. The questionnaire was administered to 898 pupils with representatives from each grade. The instrument covered a wide range of areas. First we sought demographic and general health-related information. Demographic information covered areas such as age, sex, class, family size, religion and village. Then a series of questions pertaining to knowledge about diseases in general followed. Examples include: “what are some of the common illnesses in your area?” In this question we sought the rankings placed on diseases in compliance with PRECEDE-PROCEED phase 2 (the epidemiological diagnosis). Since schistosomiasis infection is promoted through unsanitary behaviour, a series of questions pertaining to sanitation facilities and practices were asked. Examples include: “Do you have a latrine at school/ at home?”, “where do you get your water for drinking from?” and “How many times each day do you go to the lake?” Questions on schistosomiasis measured basic knowledge about the disease in terms of acquisition, aetiology, signs and symptoms as well as treatment. The questions then took on a more personal nature, asking specifically whether any of the children had ever suffered from the disease. We further sought information on action taken such as “who did you tell?” and “what steps did you take to treat the disease?”

From the K-A-P the most common diseases in the area mentioned by the respondents (N=898) are listed in Table 6.1 below. They were asked to free-list as many diseases as possible and the first three were incorporated into the analysis. Of these diseases the respondents were also asked to write the one disease they considered the most important in terms of the disease needing most urgent attention in the community.

Table 4.1: Diseases in the community

Disease	% Frequency	Most Important
Malaria	29.4	No. 3
Schistosomiasis	21.6	No. 2
AIDS	11.5	No. 1
Abdominal pains	9.1	No. 4
Respiratory ailments	8.8	No. 8

Although the majority of respondents cited Malaria as the most common disease in the area, AIDS was considered most important. This is consistent with findings elsewhere that show that acute, disabling diseases that impinge on daily activities are perceived as more serious than insidious chronic conditions (Richards et al, 1991). Schistosomiasis ranked highly in both categories. This sample therefore considered schistosomiasis a health problem in their area.

4.3.3 Sanitation and practice background

Among the pupils, water sources for washing utensils, bathing, drinking and washing clothes were reported as follows:

Table 4.2: Water source & activities (%)

Activity	Lake	Water tap	Borehole
Bathing	72.7	17.5	6.2
Washing utensils	64.9	16.5	10.4
Washing clothes	87.6	5.6	-
Drinking water	18.1	66.3	11.0

The average number of times the children went to the lake per day was 2 although this ranged from none to six times per day. Some of the children went once a week on the weekend but these were few.

Activities at the lake varied. They are presented by gender in Table 4.3 below:

Table 4.3: Gender and lake activities (%)

Activity	Males	Females
Bathing	52.8	19.0
Washing *	32.6	71.5
Fishing	9.1	2.9
Collecting water	1.7	4.1

* Washing refers to the domestic chores of washing utensils and clothes

Each activity requires different water contact patterns. Washing for example requires only the feet and legs to be in the water whilst bathing requires full immersion. From on site observation by the researcher, it was also noted that males have their side of the beach to engage in activities and females have theirs.

On the K-A-P, in response to the sanitation question asking whether respondents have a latrine at school, 83.1% indicated “yes”. Further analysis by school asking the same question brought up an interesting issue. Koche, the school with the most toilets scored 98.5% “yes” response, followed by Makawa (which had only one at the time of the questionnaire) with 74%. Lwangwa scored 67.7% “yes” responses and 32.3% “no” responses. The difference in responses to such a basic question suggests that the definitions of what a toilet is varied among pupils. When we probed this further later through informal interviews, most respondents told us that whilst the latrines may have been present at school some of them were so full and therefore not in use. Furthermore, the availability of a pit latrine does not necessarily mean the particular respondent is using it.

97% of all respondents answered “yes” to the question “Do you have a latrine at home?” It became clear however that this particular response needed to be treated with some caution. When feedback of these K-A-P findings were later given to the teachers in all the schools, they responded that it was an exaggeration for 97% of respondents to report pit latrines at home. This response may have been due to “courtesy bias” in which students wanted to please the respondent. Another reason for this discrepancy may be “ideological

bias” (Mitchell, 1993) whereby the respondent feels that a certain response should be provided by a person of their status. A “no” response for example may have been an embarrassing reflection on their parents especially if the father held a respectable position in the community and would be expected to set an example. Since, as mentioned earlier, availability of pit latrine may not necessarily translate to actual use by the respondents, we asked a specific question as to where the pupils urinate most often when they are at home, at school and at the lake. This basic sanitary behaviour question was considered important, as it would give the study an idea of where urination occurs. The results in terms of percentage frequency for all subjects (N = 898) are presented below:

Table 4.4: Site of urination (%)

	At Home	At School	At the Lake
Latrine	88.4	77.5	-
Bath*	6.4	-	-
Bush	4.0	19.6	45.0
On the beach	-	-	34.3
In the water	-	-	11.9

* Bath. The bathroom is an enclosure built with dry grass and is used for bathing. It is also used as a toilet for urination.

Only 11.9% of respondents indicated that they urinate in the water when they are at the lake. The others indicated they urinate in the bush (45%) away from the lake and on the beach (34.3%). Once again caution is needed in interpreting these findings. During feedback, teachers voiced scepticism at these figures saying that all the children urinate in the water when they are at the lake. Since the time factor was not addressed in this question, it could be that at different times some urinate on the beach and at other times some urinate in the water. This could be a possible weakness of this instrument. The time factor issue was explored in greater depth in the theory of reasoned action questionnaire (discussed in Chapter 5) which addressed these shortcomings.

4.3.4 Schistosomiasis background information

General background data pertaining to schistosomiasis infection were solicited from the K-A-P respondents. Among the whole sample, 22.4% reported that they had first heard of the disease at school. 15% said their first source of knowledge was from parents and

17.2% from others including friends and relatives. Health services such as clinics and health surveillance assistants accounted for 17.2%. Just over ten percent (10.4%) identified the radio as being their first source of knowledge about schistosomiasis.

For the whole sample, the mean number of friends whom pupils said they knew had the disease was 3. This however ranged from 0 to 10 friends. Asked whether anyone in his or her family had ever suffered from the disease, 53.2% of the whole sample responded in the affirmative with a mean of only one (SD 1.22). 71.5% of the whole sample said they themselves had suffered from the disease with most (31.5%) indicating that they had suffered from the disease as recently as a month prior to the K-A-P administration. Several wrote on the questionnaire that they were currently suffering from it although that specific question was not asked. Of those who reported a history of having suffered from the disease, 50.1% indicated that they had received medication. When asked where, 45.4% of these mentioned the hospital, 3.7% mentioned a traditional healer and 50.8% could not remember or did not know. Analysis of this question by school is summarised in Table 4.5 below:

Table 4.5 Percentage responses to schistosomiasis questions

School	Ever had schistosomiasis?		Were you treated?	
	Yes	No	Yes	No
Koche	77.1	22.9	60	39.4
Makawa	63.7	36.3	40.7	58.8
Lwangwa	69.5	30.5	44.8	55

It can be seen that the vast majority of respondents in the schools answered “yes” to whether they had a history of schistosomiasis. Most of these were at Koche. Of those answering “yes”, the greater number of the respondents at Makawa (58.8%) indicated that they had not been treated.

4.3.5 Prevalence

Assessment of efficient health education intervention shall in part be measured by prevalence rate. Subsequently we set out to establish a baseline of the study population.

Prior to our study we had obtained data on prevalence rates from Ashorn & Ashorn (1995) who had conducted a school based intervention on the Eastern shores of Lake Malawi in Mangochi district. In November 1994, prevalence was found to be 75%. Following some limited health education intervention and medication, in May 1995 when follow up was done, prevalence had fallen to 48%. However, by November 1995 it had risen to 62%. In another school on the eastern shores of the lake, prevalence had been as high as 90% among the representative sample of students selected. We therefore also relied on this data to inform the epidemiological diagnosis in the sense that although across the waters and 30-Km distance by road over the bridge at the southern tip of the lake, a lakeshore school had registered such high prevalence.

The baseline prevalence rates for infection of schistosomiasis in the three schools would serve as a starting point for any evaluation on the impact health education may have on the prevalence rates. Prevalence rates were defined as “ a measure of the number of persons infected at a point in time, and is usually expressed as a percentage. Its measurement involves the examination for infection of a representative section of the community before and after control has been introduced” (Malawi National Bilharzia Control Programme, 1986, p.52).

Four assessments in six monthly periods over two years were carried out to check for fluctuations in prevalence rates across the three input levels (maximum, medium and minimum). The baseline parasitological prevalence rate investigation occurred in May 1997. At the same time we treated all the pupils with Praziquantel a drug that clears the parasite out of the body.

Overall, 3688 pupils were treated in the three schools in May 1997. Table 4.6 describes some characteristics of the pupils who we treated in the three schools.

Table 4.6 : Characteristics of all pupils receiving treatment in the three schools.

SCHOOL	NUMBER TREATED	% OF SCHOOL	MEAN AGE	MEAN WEIGHT	TABLETS DISPERSE
Koche	1447	62	11.4	32.5 Kg	2500
Makawa	1170	71	11.0	29.5 Kg	2200
Lwangwa	1071	60	11.2	29.7 Kg	2200
All subjects	3688	63	11.2	30.6 Kg	6900

Of the pupils described above, 53% were males whilst 47% were females. Those treated accounted for 63% of all registered pupils. Since medication was administered to all pupils present during the treatment days this figure indicates high absenteeism as well as possible fears some of the pupils may have had about receiving medication. We observed some pupils running away as soon as they saw our car arriving at the school. Apparently, they at first believed we had come to draw some of their blood.

Of the pupils treated, a total of 368 pupils in the three schools had their urine tested for eggs. This figure accounts for 10.02% of the total number of those treated in the schools. Only 363 samples however were examined as they had sufficient quantities of urine to enable analysis. The mean age of pupils who had their urine tested was 11.48 years (standard deviation 3.25) with the youngest being 4 years old and the oldest 18 years old. Males accounted for 56.4% of the sample with females making up 43.6%. The mean weight of the pupils tested was 30.75 kilograms, ranging from 12 to 60 Kgs.

4.3.5.2 Procedure

In compliance with guidelines on methods of urine sample collection used by Ashorn & Ashorn (1995) in Lungwena, along the eastern shores of Lake Malawi, the data collection proceeded in all the three schools as follows.

First, all the children were given a 15 minute health talk about schistosomiasis by a Health Surveillance Assistant or the research assistant of the study. This was done in groups to one classroom at a time. The talk comprised basic information about schistosomiasis: its transmission cycle, symptoms, prevention and treatment. The

children were always availed the opportunity of asking questions. Following the talk, the children formed lines based on their age groups. The pupils were then counted and every tenth person was asked to stand in another queue and was given a small plastic container. The remaining children, who were not given the containers, received instead a small piece of paper (ticket) with questions soliciting the following information: their age, sex, class, weight and history of schistosomiasis infection. They then proceeded one standard at a time, to visit a series of stations where the information on the tickets was obtained. At the first station, biographical details were acquired by verbal response from the children. Older pupils acting as data recording clerks noted the children's information on the tickets. The pupils then proceeded to the next station where their weight was recorded on portable bathroom scales. From there they proceeded to the final station where they were given medication according to their weight (see photo in Appendix 1). The swallowing of the tablets was supervised and closely monitored to ensure that the children actually swallowed the drugs. The tickets with their information were then collected for analysis.

Those who had been given the containers proceeded to another set of stations. They were first instructed to go and urinate into the containers and then present themselves at a table where their basic demographic data and weight was recorded. They then left their urine samples, which were labelled, and proceeded to receive medication according to body weight. They were then given sweets as a token of appreciation for having provided us with their specimen.

4.3.5.3 Analysis method

The method used in this study for the diagnosis of *S.haematobium* the urinary schistosomiasis present in Mangochi, was the one recommended by the Malawi Government Ministry of Health (Malawi National Bilharzia Control Programme, 1986). The ministry seeks to standardise the techniques used so as to allow comparisons across different parts of the country. The Ministry argues that the technique used in this study is sensitive and reliable. It is also quick and simple and can be carried out in the field without the added burden of costly and expensive apparatus.

The analysis of the urine proceeded as follows for every sample. The urine was filled into a syringe by a lab technician. The syringe was filled and emptied several times to agitate the urine. This was important because it ensured the eggs were quite well spread throughout the urine sample rather than settling in one area. 10 ml of urine was then drawn into the syringe and attached to the top of a filter unit. The urine was then expelled from the syringe into the filter unit over a bucket. A sample of the urine was then stained with iodine on the filter after which it was observed under a microscope. The iodine enabled the schistosome eggs to be clearly seen as they stain the eggs orange. The eggs were then counted under the microscope.

4.3.5.6 Results

Prevalence rates of schistosomiasis for the overall tested sample was high, 78.0%. This ranged from 71.4% at Koche to 85.4% at Lwangwa. Mean number of schistosome eggs per pupil tested was 48.16, only two eggs below what would be considered a heavy infection. This ranged from 25.45 eggs at Koche to 64.34 eggs at Lwangwa. The maximum number of eggs in one sample of urine was 411 eggs in 10mls. The results are summarised in Table 4.7 below.

Table 4.7 : Overall prevalence of urinary schistosomiasis at Koche, Makawa and Lwangwa.

SCHOOL	SAMPLE SIZE	EGG POSITIVE	PREVAL RATE	HEAVILY INFECTED RATE *	CONFIDENCE INTERVALS (95%)
Koche	126	90	71.4%	15.1%	63.48 – 79.32
Makawa	134	105	78.4%	28.2%	71.41 – 85.39
Lwangwa	103	88	85.4%	38.8%	78.55 – 92.25
All subjects	363	283	78.0%	27.4%	73.73 – 82.27

*The heavy infection rate is expressed as a percentage of the whole sample being described. Another method would be to express it as a percentage of those who are infected, in which case the percentage would be higher.

Further analysis using Mantel Haenszel test of stratified analysis indicated that the overall differences between the schools were statistically significant (Chi 8.34, $p=.004$). However the prevalence rates between Koche and Makawa Schools and Makawa and Lwangwa schools were not significant. The difference between the maximum school (Koche) and the minimum intervention school (Lwangwa) was statistically significant (Chi 6.42, $p=.011$).

Confidence intervals are an estimated range of values that address the sampling error and have a known high probability of covering the true population value (Hays, 1994). They can therefore be usefully applied as an indicator of statistical significance of the samples under investigation.

Overall it can be seen that Lwangwa School had the highest schistosomiasis prevalence rate. Makawa followed this with a prevalence rate of 78.4%.

Time 1 therefore formed the baseline of the study. It is obvious we were dealing with a population that had a high prevalence rate. This in itself gave value to the study in that we were dealing with an area that needed intervention to control the disease. The study is thus a worthwhile effort. It is very difficult to speculate on the differences in prevalence rate between the schools especially when no snail site studies were carried out by colleagues in the LMBC Programme who were exploring ecological issues affecting the wider community. It could be that the areas frequented by pupils of Lwangwa School were areas of high transmission sites. In the overall programme, areas where most of Lwangwa's lake activities occurred would have to receive special attention by mollusciciding and clearance of vegetation as these may be sites of high infection. During the course of this study this was unfortunately not done due to unavailability of funding.

4.3.6 Conclusion and epidemiological steps

Epidemiological diagnosis of PRECEDE requires the selecting of health problems from a selection of diseases. In our case, we were primarily concerned with schistosomiasis, which had a high prevalence rate in the area. Subsequently we proceeded with the epidemiological assessment of schistosomiasis using Ashorn & Ashorn (1995) as well as our own findings from the village health surveys we carried out earlier as well as the

knowledge, attitude and practice questionnaire among school children in which most pupils indicated a history of the disease. From the literature and the findings on the eastern lakeshore, therefore, it was clear that children were at the highest risk for infection. We had seen from the social diagnosis that no prior schistosomiasis intervention programme had occurred along the Western lakeshore, which was to be the focus of our investigation. Clearly, we had a political agenda, that being to woo tourists back by reducing the prevalence of schistosomiasis. However there were added benefits for the local population: good health and well being free from the debilitating symptoms of the disease and for those involved in the tourism industry, sustained livelihood which was now threatened by the tourism “scare”.

Clearly from this epidemiological diagnosis, our health education intervention would have to be curative and preventative. Curative because with such high prevalence rates, mass treatment of school children was required. Preventative because, as was seen on the eastern shores, re-infection rates are high. We therefore needed an intervention that tackled the life cycle of the disease at a strategic place, the human action of urinating into the lake and treat those already infected. Prevention shall be the primary focus of the intervention, because if we can influence children from becoming reinfected then that would go a long way in controlling prevalence.

The second aspect of the epidemiological diagnosis is the identification of risk factors. Clearly from the lifecycle of schistosomiasis there are several risk factors. One is an infected person urinating into the water, second, an environment conducive to the snails which acts as the intermediate hosts of the parasite. You may recall that areas of slow moving water with grass and still water are conducive to the disease. Our focus was to try to influence behaviour change among the school children. For schistosomiasis the health factors that needed to be tackled in the intervention were drawn up and are as follows:

Table 4.8: Risk factors for schistosomiasis

Non Behavioural	Behavioural	Related to behaviour
Age (esp. children)	Urinating in water	Morbidity
Snail habitat	Water contact	High prevalence
Lack of pit latrine	Treatment delay	

From this list of factors it is clear that what is to be included in the health education intervention programme is a message aimed at children, that tackles the snail habitat and addresses sanitation issues. The behaviour that maintains the lifecycle, which is to be targeted for intervention, is urinating in water. Delay in seeking treatment would also need to be addressed. Practically, preventing water contact would be difficult.

In the epidemiological diagnosis the third step is to develop the intervention objectives. This step is the translation of “diagnostic data into program direction” (Green & Kreuter, 1991, p.118). As a result of this, the objectives can be summed as follows:

1. School going children shall receive the programme. Logistical issues make us focus on children in the school as opposed to non-school going children. Attempts to reach the non-school going children would be made through some of the activities. We would also ask the chiefs to inform parents of the days medication was being distributed.

The programme’s life from the sponsors was set at two years. However contingency plans were made later to extend the programme beyond two years.

2. The initial purpose was to reduce the prevalence rate of schistosomiasis among the school children to fifteen percent, in the two years of the programme, and maintain the prevalence at that rate. The fifteen- percent figure was arbitrarily set after discussion among LMBC Programme members after reviewing the literature. The monitoring of the programme in terms of reduction of prevalence would be every six months when a full parasitological investigation would be carried out to determine prevalence rates and to monitor whether the objectives of maintaining prevalence rates would continue. Egg count as described above was the most reliable method utilised.

3. Along the eastern shores, the rise in prevalence rate that had previously gone down was attributed to re-infection. In this study attempts would be made to control the behaviour and treat the snails by clearing the bushes and hopefully apply chemicals to kill them.

4.4 Behavioural and Environmental Diagnosis

The third phase of the PRECEDE planning process addresses the analysis of individual and social behaviour that plays a critical role in the health issue under investigation (Green & Kreuter, 1991). It is at this stage that the relationship between behaviour and the social goals as well as the epidemiological objectives outlined in the earlier steps are clearly seen. As was seen in the literature review, behaviour is the key to most intervention programmes and is the defining element of health status for most populations. The behavioural diagnosis therefore systematically analyses behavioural factors that come into play in the control of the disease. These are also linked up with the environmental analysis, which is an:

“analysis of factors in the social and physical environment, other than specific actions, that could be causally linked to the behaviour that was identified in the behaviour diagnosis” (Green & Kreuter, 1991, p.126).

First, I shall take you through our behavioural diagnosis. Green & Kreuter (1991) list five steps in behaviour diagnosis. Applied to schistosomiasis, they are

1. Separating behaviour and non-behaviour causes of schistosomiasis.
2. Developing an inventory of schistosomiasis behaviours.
3. Rating the behaviours in 2 in terms of importance.
4. Rating the behaviours in 2 in terms of changeability.
5. Choosing behavioural targets.

One very useful aspect of following these guidelines is that when the social cognitive models are brought into the intervention, the background and factors determining which behaviours to focus on have been well thought through and systematically determined beforehand. Most of the models such as the theory of reasoned action operate with the

target behaviour decided upon by the researcher without having provided steps to ensure that the behaviour under investigation is indeed a relevant key behaviour addressing tangible issues of the problem under investigation. The marriage of social cognitive models with the health education planning model such as PRECEDE-PROCEED does in this instance yield great benefits by strengthening the investigation in a systematic manner to maximise effectiveness as much as possible. Back to the steps. Recall that epidemiological diagnosis objective was to target the intervention on school going children. From there we move to the behavioural diagnosis steps

Step 1. Separation of behavioural and non-behavioural causes of schistosomiasis.

From table 4.8 above it can be seen that urination in water and water contact and activity are behavioural causes of the disease. Age of the respondents is a non-behavioural determinant.

Step 2. Inventory of behaviours. Following guidelines set by Kloos (1995) who drew up a schistosomiasis-behaviour model, we identified the following behaviours presented in the table 4.9 below:

Table 4.9: Inventory of schistosomiasis behaviours

Health enhancing and maintaining behaviours 1. Efficient water management. Most chores and activities occur at wells, boreholes or places of piped water. 2. Active involvement in schistosomiasis control programmes. Attending meetings, helping spread the message. 3. Health seeking behaviour. Early treatment. 4. Proper use of pit latrine and alternative sanitation sites for urination and defecation. Health lowering behaviours 1. Urination in water. 2. Contact with infected water due to unavailability of alternative water sources. 3. Low priority given to schistosomiasis due to competing health needs and lack of resources. 4. Fear of receiving chemotherapy among children due to culturally based misconceptions about the drawing of blood. 5. Failure to seek immediate treatment. 6. Belief that changes can only come about at the instigation of the government without the community taking action itself.

Steps 3 and 4. Rating of behaviours and environmental factors according to importance and changeability. We found this quite straightforward to do. We simply listed the behaviours as it is clear which ones occurred frequently and were linked to the health problem (Green & Kreuter, 1991). The most important behaviours needing our attention were:

1. Urination in the water.
2. Failure to use pit latrines.

The K-A-P had shown that many children urinate in the water. Feedback from teachers indicated that pit latrines were not utilised. In terms of changeability, behaviours connected to strong family patterns or routines are very resistant to change (Green & Kreuter, 1991; Ouellette & Wood, 1998). Although urinating out in the water may be habitual, the community told us through FGDs that it is amenable to change over time.

Step 5 Behavioural and environmental targets

Two behaviours were chosen for focus. These were urinating out of the water and utilising a pit latrine. We could not stop children having water contact. Subsequently the aim was to target the children's behaviour when they were in the water. This selection was done with some of the teachers in the schools.

Our environmental objective was as follows:

Since behaviour is not the only determinant of prevalence reduction, we also set up environmental objectives. All schools would have pit latrines built by the end of the study. The grass would be cleared on a regular basis in the community. All villages would have access to safe water through a protected well. It was envisaged that these objectives would bear fruit through a reduction of prevalence of school children by the end of the programme. Prevalence reduction of schistosomiasis became therefore the key determinant factor of the effectiveness of the study.

4.5 Conclusion

In conclusion it can be said that in the search for the most efficient health education input strategy, we had to run as coherent and as well planned an intervention as possible. To do this we utilised the PRECEDE model as a framework which helps ensure adequate planning. We involved the community through the stages of social diagnosis, ensuring that we were aware of the needs and aspirations of the population concerned. We then looked more specifically at schistosomiasis. Through the epidemiological diagnosis we were able to establish that in the target schools prevalence was high and was seen by the community as important. Through the behavioural and environmental diagnosis, the target behaviours for intervention were identified. We were also able to ascertain factors in the environment that needed specific addressing. The final stage of the planning phase is the ascertaining of factors that predispose, enable and reinforce the behaviours identified. We explore these in the following chapter.

CHAPTER 5

EDUCATIONAL AND ORGANISATIONAL DIAGNOSIS

5.1 Introduction

In the search for the most efficient health education input, we turn now in the planning to the educational and social diagnosis of the PRECEDE model. So far we have established the behavioural goals and now there is the need to establish the underlying causes. Phase four, the educational and organisational diagnosis “identifies factors that must be changed to initiate and sustain the process of behavioural and environmental change” (Green & Kreuter, 1991, p.150). It is these factors that become the focus of the intervention. It is in this phase that the “complex forces shaping health-related behaviour” (p.150) are clearly spelt out and explored. Green & Kreuter (1991) listed three categories of factors that affect behaviour. Each one has its own unique influence on behaviour. The factors are first, predisposing factors. The antecedents that provide the motivation or “rationale” for the behaviour. Second, the enabling factors. These are those factors that are in the environment that enable the behaviour to occur or to prevent it from occurring. Third, reinforcing factors, those factors that are incentives for the behaviour to continue or stop. As pointed out in the literature review, it is the combination of these factors that influence and determine the occurrence or maintenance of behaviour. To establish the predisposing and reinforcing factors K-A-P surveys were used to determine the baseline of knowledge, attitude and practice. Theory of reasoned action and planned behaviour was used to determine intention, attitude, normative factors and perceived behavioural control. These were done to provide the baseline that would enable us to determine the most efficient health education input measures.

5.2 Knowledge and Attitudes

5.2.1 K-A-P

A Knowledge, Attitude and Practice questionnaire (K-A-P) was administered in the three programme primary schools (Koche, Makawa and Lwangwa) in October 1996. This was done before the programme began in 1997. The findings of the K-A-P were to serve two main purposes. First, in line with the objectives of the study the findings of this first K-A-P (from now on K-A-P 1) were to be a baseline of the knowledge, attitude and practice

that characterised the pupils on the issue of schistosomiasis. For an assessment of the extent to which different degrees of health education input affect these variables, we then used the same questionnaire (known as K-A-P 2) in July 1998. K-A-P 2 is discussed in the impact evaluation chapter. The second purpose of the K-A-P and in particular, K-A-P 1, was to highlight the gaps of knowledge the pupils had so as to give direction on the areas the health education intervention needed to concentrate.

The K-A-P (see Appendix 5) was designed to capture specific information about our study population. The items on the questionnaire were written in both English and Chichewa the vernacular. For each question, the Chichewa translation was in larger font size than the English translation, which was located beneath the Chichewa question. This did not seem to pose any difficulties as was seen in the pre-test of the questionnaire. As was the case with Schopper *et al.* (1993), the questionnaire was written in English, translated into Chichewa and then independently back translated to minimise loss of item meaning during translation. To minimise for order response effects, the items on our K-A-P questionnaire were presented in an order such that description of practices was not influenced by having been through the knowledge items first (Aboud, 1998). See page 97 for explication of order of the items of the K-A-P.

As seen in chapter 4, the K-A-P covered a wide range of areas. Knowledge questions captured basic information on cause, spread and prevention of schistosomiasis. Questions requiring an evaluative response such as “Is passing red bloody urine, good or bad, Why?” assessed attitude. Other examples included “if you passed red blood urine should you be concerned? Why” With such questions pupils had “Yes/No” options to circle with regard to the first part of the question and a blank space to enable them to write down the reasons for their response. Such qualitative type responses were later encoded based on the most frequently given responses and a numerical figure attached to them. Since the study sought to capture a wide age range, it was felt the closed questions would suffice in capturing attitude instead of employing the commonly used Likert scales that give a wider response option. We were of the opinion that young children may struggle in conceptualising various degrees of measuring a certain construct.

5.2.2 Subjects

In the three schools a total of 898 questionnaires were filled in adequately to enable analysis. Of these 44.8% (N=401) were from Koche school, 30% from Lwangwa school (N=270) and 25% (N=227) from Makawa.

5.2.3 Procedure

The questionnaire was administered as follows: A random sample of students in one of the non-programme schools in Mangochi district was first asked to fill in the pilot questionnaire. This was done to see if there would be any areas that may have been omitted or any issues that needed to be addressed that would affect the quality of the questionnaire. Once satisfied to proceed to a larger sample, we did so. Since we wanted samples representative of all the classes (Standards 1 to 8), we solicited the assistance of the teachers and HSAs to interview the pupils in standards one to four. These pupils were unable to fill in the questionnaire appropriately, as they were too young to read and write on the instrument. Standard one has pupils aged five or six. For such subjects, the teachers and HSAs interviewed the pupils using the questions as they appeared on the instrument and then recorded their responses directly onto it.

For the older pupils who could write we developed a systematic method to ensure there were no omissions. Each pupil in the randomly selected classes was given a questionnaire. We then explained to the pupils that the questionnaire was a general health questionnaire. We had previously ensured that we were introduced to the pupils in all the three schools as from the College of Medicine, interested in general health. At no time was it mentioned that schistosomiasis was our primary focus as this may lead to desirability effects. We then went through the questionnaire with the pupils, reading out the questions and giving them time to fill in the responses together as we went along. At no time were the students left to “just fill the questionnaire” at their own leisure. Students sat in fairly cramped conditions in most of the classrooms, for example in some schools two or three pupils would share a single desk or three shared a desk designed for two. We therefore discouraged copying having emphasised that there are no right or wrong answers, and we were primarily interested in the overall responses. They had been assured of confidentiality and their names were not recorded. To avoid mere copying

which would compromise the data being collected, a close eye was kept on the respondents to ensure no communication among them. Where communication among pupils was seen to occur, the pupils concerned were separated and moved to another location in the classroom.

Following administration, the questionnaires were numbered and then each response on every instrument was encoded to quantify the questionnaire and ensure uniformity. A qualified data entry clerk then entered the data into a computer programme Epi info 6 and the results were then analysed using the Epi info 6 statistical package (Dean et al., 1995). The frequency scores from the analysis were utilised to inform the findings.

5.2.4 Health knowledge about schistosomiasis

Overall the pupils demonstrated sound knowledge of facts about the disease. In order to come up with a single knowledge score for each respondent, we selected the following six items from the questionnaire.

“What does it mean when one passes out red bloody urine?”

“How does a person know that s/he has Bilharzia?”

“What causes Bilharzia?”

“How is Bilharzia spread?”

“What can you do to prevent the spread of Bilharzia?”

“What are the effects of Bilharzia?”

A correct response to each of the questions was given a score of “1”. The scores for each pupil were collected to provide a knowledge score out of a total of 6 maximum scores. We were therefore able to obtain a total score for each school divided by the number of respondents in order to come up with a single mean knowledge score for the school. The mean knowledge scores for each school are presented in Table 5.1 on the next page:

Table 5.1 K-A-P 1 Knowledge Scores

School	N=	Mean	Standard Deviation	95% Confidence Interval
Koche	401	4.08	1.17	3.97 – 4.20
Makawa	227	4.15	1.17	3.99 – 4.30
Lwangwa	270	4.15	1.52	3.95 – 4.35
Population	898	4.12	1.28	4.03 – 4.21

Table 5.1 demonstrates a good knowledge base at baseline. The whole population had a mean score of 4.12 out of a maximum total of 6.00. Confidence intervals demonstrate that there were no significant differences between the schools. Further analysis of the “knowledge” items revealed the following. 67.1% of the overall sample knew that the passing of red bloody urine was a symptom of schistosomiasis. 25 % attributed the presence of red urine to disease in general whilst 6% expressly indicated that they did not know what caused it. Analysis by schools demonstrated similar response patterns with Makawa reflecting the most knowledge (73.5%). When asked for the most common symptom of schistosomiasis, 78% of the total sample mentioned red bloody urine. Dysuria (pain when urinating) was correctly identified by 12.5% of the total sample.

In relation to the cause of schistosomiasis, half the total sample (50%) was able to correctly identify urination in water (36%) and snails (14%) as causative agents. 13% of the sample expressly indicated that they did not know the cause. Lwangwa School had the highest “don’t know” answers (27.3%) whilst the other two schools’ similar response fell well below the 10% mark. In reply to questions about behaviours that spread the disease, 59% mentioned urinating in the water whilst 6% said “bathing in the lake”. 16.6% indicated they did not know how the disease was spread. Responses in the individual schools showed that as many as 38.5% of respondents at Lwangwa did not know how the disease is spread whilst the “don’t know” responses were 10.2% and 6.8% at Makawa and Koche schools respectively.

Knowledge regarding personal action that can prevent the spread of the disease was good. In response to “what can you do to prevent the spread of the schistosomiasis?” 60%

responded, “not urinating in water” whilst 13% said taking medication would check the spread. Seven percent said they did not know what they could do. The effects of suffering from schistosomiasis were said to be “blood loss” 44.8%, followed by death at 19.7%, wasting at 10.8% and pain at 8.2%. Ten percent responded that they did not know. Responses in the schools reflected similar trends.

5.2.5 Attitudes towards the disease

On the whole, respondents indicated a positive attitude towards avoidance of schistosomiasis signs and symptoms and towards action that would prevent the disease from spreading. As was the case with knowledge, we selected some questions from the K-A-P that would give us an “attitude” score for each pupil. The following three questions were selected and used to assess attitude:

“Is passing red bloody urine good or bad?”

“If you passed red bloody urine, should you be concerned?”

“Is Bilharzia a big problem in your area?”

The last question was considered “attitude” from the perspective of the disease being seen as a matter of concern by the respondents. A positive attitude was given a score of “1”. To illustrate, for the question: “Is passing red bloody urine good or bad?” a “bad” response was taken to be a positive attitude towards the reduction of the disease and given a score of “1”. The mean score for the three ‘attitude’ items were calculated for each pupil. The mean “attitude” score for each school was obtained by adding the total scores for each pupil in that school and dividing that total by the number of pupils in the school. The results are summarised in the Table 5.2 below:

Table 5.2 K-A-P 1 Mean Attitude Score

School	N=	Mean	Standard Deviation	95% Confidence Interval
Koche	401	2.81	0.41	2.77 – 2.86
Makawa	227	2.79	0.44	2.74 – 2.86
Lwangwa	270	2.76	0.49	2.70 – 2.82
Population	898	2.80	0.44	2.77 – 2.83

Attitude was favourable towards the control of the disease. The maximum attitude score was 3.00. The higher the score the more positive the attitude. There were no statistically significant differences between the schools. Further analysis of the composition of the attitudinal and related items revealed the following results. 96.7% said one should be concerned if they passed red bloody urine with 98.5% responding that passing red bloody urine was “bad”. This rules out the possibility of passing red bloody urine being seen as “normal” male menstruation (Huang & Manderson, 1992) by this population. The disease was considered “bad” because it was said to be an indication of disease (34%), there is loss of blood (24.7%) and it is an indication of schistosomiasis (13%). Although seen in a negative light, 16.4% of respondents indicated that they did not know why it was bad to pass red bloody urine.

The disease was not seen as something to be ashamed of. 96.2% said they would tell somebody if they passed out red bloody urine. When further asked whom they would tell, parents scored the highest (80.3%), followed by hospital or clinic staff with 5.5%. Friends were rated third at only 4.8%. The role parents play in the health of their children is therefore quite clearly seen. In response to the direct question “Is schistosomiasis a big problem in your area?” 83% responded in the positive.

5.2.6 Implications

Apart from giving us a baseline that would permit post intervention comparison of the effects of health education input, the results of K-A-P 1 also served to inform the content of the health education input. The knowledge “gaps” helped formulate the syllabus of the education programme. The content of the health education programme would thus address the highest “don’t know” responses. The areas requiring special attention based on the highest-ranking “don’t know” responses are listed in Table 5.3 below:

Table 5.3: Ranked “don’t know” responses reflecting percentage response for each item

Ranked Response		Percentage
1. How got schistosomiasis		29.1
2. Why some infected and not others?		20.0
3. Why red urine is bad		16.4
4. Effects of schistosomiasis		10.0
5. How to prevent spread		7.0
6. Signs and symptoms		6.0
7. Meaning of red urine		5.3

The health education programme would therefore aim to ensure that pupils have enough information on the above items as part of the health education input.

5.3 Assessing Intention and Perceived Behavioural Control

During the behavioural and environmental diagnosis, it was established that the behaviours to be targeted were getting out of the water to urinate and utilising a pit latrine. We therefore sought to establish the predisposing factors of these behaviours through the use of social cognitive models, and in particular through the theories of reasoned action and planned behaviour.

5.3.1 Pilot Survey

In compliance with the procedures of the reasoned action theory (Ajzen & Fishbein, 1980), a preliminary study was carried out in early 1997. About 20 Std 7s and 8s from a school outside the study area (but within close proximity of the lake) formed the sample that was asked to list what they considered to be the advantages and disadvantages of their getting out of the water to urinate and their using a pit latrine. A list of the salient outcomes was produced and the most frequently mentioned outcomes were incorporated into the final questionnaire under both the behavioural belief and the outcome evaluation sections. The same procedure was applied to the normative component of the

questionnaire. The most salient referents with regard to “my getting out of the water to urinate” and “my utilising a pit latrine whenever I want to urinate” were put into the normative belief and motivation to comply sections of the final questionnaire.

5.3.2. Questionnaire of the main study

The questionnaire was written in Chichewa the vernacular language. As the written expression of English is very much a problem at primary school level, it was felt that elicitation of information would be more effective if conducted in Chichewa. This meant having to translate the reasoned action vocabulary (“intentions”; “very good/very bad”) into Chichewa. As these concepts have corresponding Chichewa words, this proved not to be difficult. It is believed that the same meanings were retained and communicated to the respondents. To ensure this I asked two people not in any way related to the study to back translate key aspects of the Chichewa questionnaire so as to see whether the same meaning comes across. The contents of the questionnaire covered a wide range of areas (See English translation in Appendix 6). Demographic questions covered age, sex and level or standard of schooling the respondent was in at the time of administration. The main content area was based on the theories of reasoned action and planned behaviour. These are expounded on below in the subsection entitled “measures”. The items in this section were derived from the responses in the pilot survey.

5.3.3 Procedure of the main study

The theory of reasoned action & planned behaviour questionnaire was administered to the Std 7s and 8s in the maximum and medium schools in April 1997 to assess intention to perform or not perform the schistosomiasis-related behaviours mentioned above as well as inform on normative, attitudinal and control determinants of behaviour. The Std 7s and 8s were chosen because they are the most senior and would be better able to give responses on the Likert-type differential scale. 202 students in the two maximum and medium intervention schools filled in the questionnaire. The minimum intervention school was left out at this stage primarily because we wanted to minimise any influence that we might inadvertently have on the school by constantly appearing there with questionnaires. Furthermore since we planned very limited intervention in the school,

whatever findings we came across from reasoned action and planned behaviour would not have had any practical translation to the school.

The questionnaire was administered under classroom conditions. To ensure that all respondents answered truthfully and reflected their own responses, they were assured of confidentiality. It was pointed out to them that this was not a test or exam with “right” or “wrong” answers. To minimise on response item omissions, I went through the questionnaire with them and they responded as I read out item by item. This was preferable to letting them work at their own pace for fear that some may feel they were holding the class up and rush through their responses.

5.3.4 Respondents

A total of 202 respondents from two schools completed the questionnaire. Their mean age was 15.07 years (SD = 1.63). The age range was from 12 to 19 years. 66 % of respondents were males (N = 113) and 44% were females (N = 89). Of the total sample, 102 respondents were from Koche School with the remaining 100 from Makawa.

5.3.5 Measures

Responses were elicited on a five-point bipolar semantic-differential type scale. The convention in reasoned action theory research is a seven-point scale. However we felt that for use at primary school level, a five point scale(-2 to +2) would be more tangibly understood whereas a 7 point scale may be too abstract (Godin & Kok, 1996). A five-point scale would be easier in assisting respondents give a specific response along the continuum of the scale. Other reasoned action studies have used five-point scales with no apparent disadvantages (e.g. Klepp et al., 1996; Albaraccin et al., 1998). For most of the items in this study, subjects were asked to respond to a statement by selecting one response from a range comprised of: Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. Throughout this study higher scores (maximum +2) indicate positive (low infection risk) subjective states or actions, that is, positive from a schistosomiasis reducing perspective, whereas lower scores (minimum -2) indicate higher risk behaviours and states. Therefore some of the items were reverse scored to ensure consistency.

The measures used to assess intention to get out of the water to urinate as well as intention to use a pit latrine were as follows:

Intention:

To assess intention subjects responded to the question

“I intend to get out of the water each time I want to urinate” on a Strongly Agree (+2) to Strongly Disagree (-2) continuum. The other question pertaining to pit latrine usage was “I intend to urinate in a pit latrine” also on a Strongly Agree (+2) to Strongly Disagree continuum (-2).

Attitude:

This was measured directly. It was assessed in terms of a three item bipolar scale, separately for not urinating in the water and utilising a pit latrine as follows:

Q. “My getting out of the water to urinate is something:

Very good... Very bad

Very pleasant... Very unpleasant

Important to me.... Not important to me”.

Q. “My urinating in a pit latrine is something:

Very good... Very bad

Very pleasant... Very unpleasant

Important to me.... Not important to me”.

Behavioural Beliefs and Outcome evaluations:

These were assessed by means of a six-item scale based on the most frequently mentioned beliefs in the pilot survey. They were assessed separately for getting out to urinate and utilising a pit latrine. The list of salient beliefs is shown below in the results section. This belief-based measure of attitudes was computed as the sum of the products of scores on the measures of behavioural beliefs multiplied by outcome evaluation. This was later correlated with the sum of the directly measured attitude item. To assess behavioural belief, subjects indicated the extent to which they agreed or disagreed with the consequences of the given behaviour under consideration (i.e. not urinating in the

water or utilising a pit latrine). For example: "When we make use of a pit latrine, we do not spread diseases", followed by the response continuum: Strongly Agree (+2) to Strongly Disagree (-2). The items of the outcome evaluation questions were exactly the same as the behavioural beliefs ones except that the question asked (as in the above example) "Not spreading diseases is something that is.." Very Good (+2) to Very Bad (-2).

Subjective Norm:

One item was used to obtain the measure of subjective norm. Respondents were asked to respond to "People who are most important to me think I should get out of the water to urinate / use a pit latrine". Since subjective norms are determined by normative beliefs and motivation to comply, these measures were multiplied with each other and the sum of this product became the belief-based measure of subjective norm. This was later correlated with the directly measured subjective norm item.

Normative beliefs and motivation to comply:

These were assessed by means of a 9-item scale based on the most frequently mentioned salient referents for both urinating out of the water and utilising a pit latrine in the pilot survey. Respondents in the final questionnaire were asked, for example "My mother thinks I should get out of the water to urinate". The response scales were "Strongly Agree (+2) to Strongly Disagree (-2)". Subjects' motivation to comply was assessed by the question: "Generally speaking, how much do you want to do what your (specified salient referent) says you should do?" Respondents answered on a "Very Much (+2) to Not at All (-2)" continuum.

Perceived control:

There are two main ways of measuring the concept of perceived control (Ajzen & Madden, 1986; Manstead & Parker, 1995). However as the construct is fairly recently developed, the two ways to measure the concept are directly and by a belief-based method. Studies show that the direct measures are more effective than belief-based measures. As such we opted for the direct measure. The debate as to which method is indeed the most effective is beyond the scope of the study and so one method was

chosen. We incorporated four questions assessing control into the questionnaire. These were standard questions used in most perceived control studies (e.g. Ajzen & Madden, 1986; Conner & Sparks, 1996). The questions on a semantic differential scale were:

“I have the power that if I really wanted to I can get out of the water to urinate”

“To get out of the water to urinate is a difficult thing”

“If I really wanted, to get out of the water to urinate would be something easy to do” and

“I really want to get out of the water to urinate but am unable to do so”

Respondents then scored their responses along a five-point “Strongly Agree/Strongly Disagree” continuum. The mean of the four responses was what was computed as the measure of perceived control for subsequent analysis.

Past Behaviour:

As a measure of past behaviour, subjects were asked “Have you ever urinated in the water?” They indicated either “Yes” or “No”. The responses were then tallied into frequency tables.

The reliability of the questionnaire was assessed by use of the Cronbach alpha coefficients for each section. The results were as follows:

Table 5.4 Alpha coefficients of the questionnaire

Getting out of the water to urinate

Attitude	.301
Behavioural belief	.479
Outcome evaluation	.593
Normative Belief	.935
Motivation to Comply	.892
Perceived control	.462

Utilising pit latrine

Attitude	.606
Behavioural belief	.545
Outcome evaluation	.618
Normative Belief	.929
Motivation to Comply	.918

The table indicates reasonable correlation of questionnaire test items giving credibility to the results emanating from the questionnaire. It is noted that the attitude score for getting

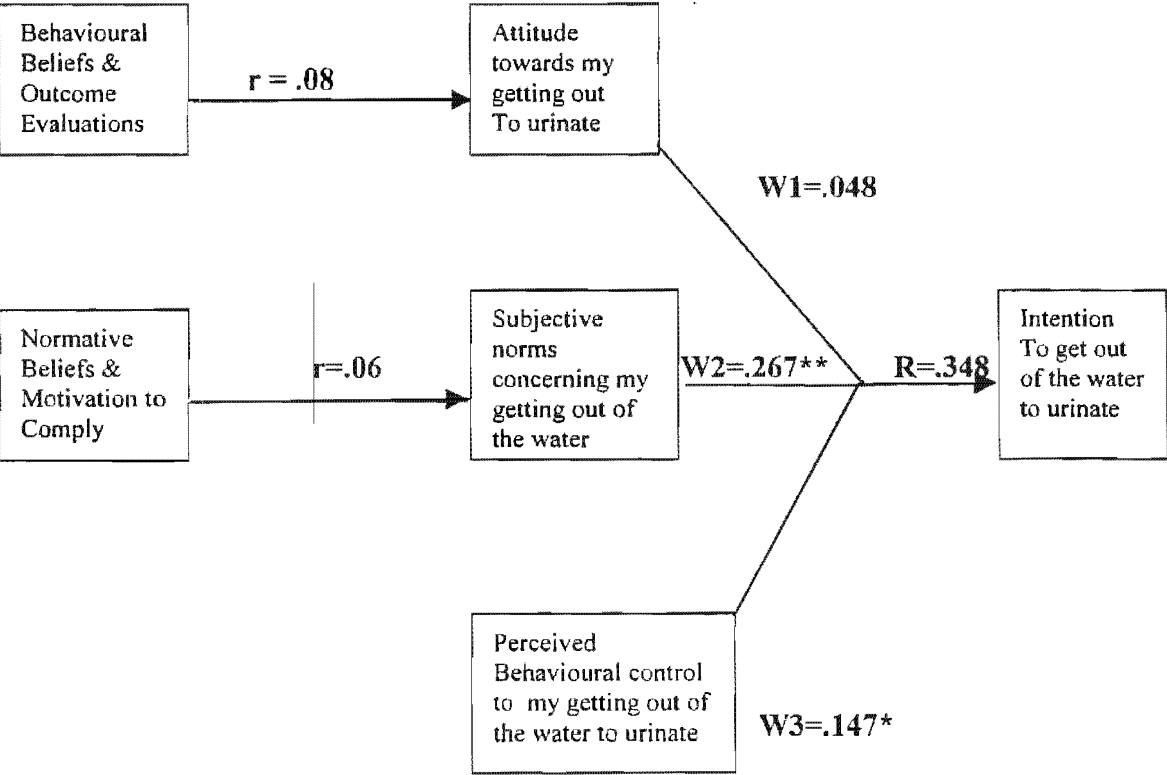
out of the water to urinate is low. However there were few items for this variable. The fewer the items, the lower the coefficient score.

5.3.6 Results

Following the use of reasoned action and planned behaviour questionnaire with regard to getting out of the water to urinate and using a pit latrine, the findings indicated that the intentions of both behaviours were under normative control.

The whole sample (n=202) was analysed. We regressed the intention to get out of the water to urinate against attitude, subjective norm and perceived control. The findings are demonstrated in Figure 5.1 below:

Figure 5.1: Intention to get out of the water to urinate



* = $p < .05$ ** = $p < .001$

Intention was significantly predicted by the theory of reasoned action/planned behaviour $F(3,198)= 9.087, p<.0005$. Beta weight analysis of measures contributing to intention indicated that subjective norm was the greatest contributor at a statistically significant .267 followed by perceived control at .147. This was also statistically significant. Attitudes did not significantly contribute towards intention to urinate outside the water (.048). For the whole sample therefore, intention to urinate outside the water is predominantly under normative control. Intention is also influenced by the extent to which subjects perceive that the decision to urinate in the water or not is something which they can personally control.

In terms of the inter relationships between the different components of the theory of reasoned action, the results indicate weak correlation between them. Ajzen & Fishbein (1980) argue that a correlation of .30 or greater is sufficient to confirm the links between the components. With regard to urinating outside the water, the correlations between the belief-based items and directly measured items are below .1

Table 5.5: Intercorrelations between measured variables for getting out of the water to urinate

Variables	1	2	3
1. Intention			
2. Subjective Norm	.31*		
3. Attitude	.10	.10	
4. Perceived Control	.23*	.27*	.16*

On the whole intercorrelations of the variables are weak. Only intention and subjective norm are reasonably correlated (.31) at the $p<.05$ level. Attitude has the lowest correlation with all the variables indicating that the measure of attitude was difficult to access. Such low correlations of attitude concur with the low reliability alpha coefficient of alpha mentioned above. Hence caution is required in the interpretations of findings with attitude. The weak predictive capacity of attitude may also be a reflection of its reliability in this instrument.

Preliminary analyses to test the predictive power of the model were undertaken using the main characteristics of the sample. This was done to see whether these variables were

significantly different and would affect the overall predictive power of intentions to urinate outside the water and intentions to use a pit latrine. The sample was thus subdivided by school (Koche and Makawa) and by gender. The results are shown in Table 5.6 below

Table 5.6 : Main characteristics of sample results

	Beta Att	Beta SN	Beta PvC	R2	F	P value
Urinate Out						
Koche	.003	.288**	.148	.143	5.432	P<.002
Makawa	.126	.260**	.102	.111	4.007	P<.009
Males	.128	.141	.078	.055	2.109	P<.103
Females	-.040	.436***	.149	.249	9.260	P<.000
Pit latrine						
Koche	.012	.736***		.548	59.94	P<.000
Makawa	.164	.374***		.210	12.87	P<.000
Males	.206**	.346***		.191	12.87	P<.000
Females	-.03	.690***		.446	35.96	P<.000

*p<.05 **p<.01 ***p<.001

Att = attitude; SN = subjective norm; PvC = Perceived control.

In all the sub-samples, both urinating outside the water and utilising a pit latrine, intention was predominantly under normative control. All sub samples with one exception (males' intention to get out to urinate) demonstrated significant predictive utility and power of the planned behaviour theory.

In the Koche School sub-sample for getting out to urinate, although not significant, the beta weights of the perceived control measures demonstrated that this construct contributed more to intention than the attitudinal component. The role of subjective norms in predicting intention to utilise a pit latrine was significant for all sub samples in the model. All sub samples showed subjective norm as significant above the $p<.001$ level. For the female sample as well as that of Koche, the variables predicting intention to use a pit latrine were able to account for 45 and 55% of the variance respectively. Closer examination of the results along gender lines (Michelson, 1993; Parker, 1993; Rathgeber & Vlassoff, 1993) reflected some marked differences. The male sample contrasted quite significantly with the female sample as far as getting out of the water to urinate was

concerned. Whilst the males failed to demonstrate significant predictive power of the theory of planned behaviour, the predictive power of the model was significantly demonstrated among females. It was thus clear that in the regression of all subjects, the female sample contributed substantially to the prediction of intention to urinate outside the lake. With regard to intention to use a pit latrine, males and females were both predominantly under normative influence, but males were also influenced by personal factors such as attitudes, which were also significant. Females on the other hand had a negative attitudinal beta score indicating that personal factors may not play any role, if anything the results lean towards suggesting that attitudes reduce their contribution to intention, the more they come into the equation. What may account for the females being so dependent on normative influence, may be the prescribed subservient roles females have to play in the patriarchal society of Mangochi.

During the actual intervention, it would be impractical to split the males and females as we planned to target all the children in the two schools. Hence since these results indicated predictive power of the model we felt confident enough to utilise the model in the schools as a guide to the direction that the health education should take.

The study then assessed intention to utilise a pit latrine for urinary purposes. This was done to explore whether use of pit latrine could be a viable alternative in schistosomiasis control.

Table 5.7: Intercorrelations between measured variables for intention to utilise a pit latrine.

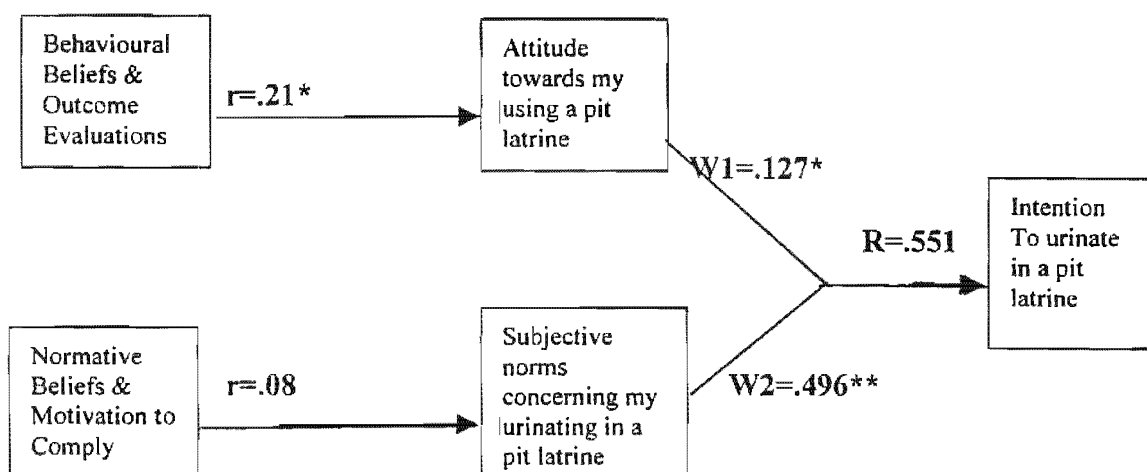
Variables	1	2
1. Intention		
2. Subjective Norm	.54*	
3. Attitude	.29*	.32*

* = $p < .05$

Intercorrelations for the measured variables of intention to utilise a pit latrine were satisfactory, giving good support to the theory of reasoned action. We then regressed intention to use a pit latrine with attitude and subjective norm only. Perceived control was omitted because during the K-A-P most respondents had indicated they had a pit latrine

which they used. We therefore felt that urinating in a pit latrine was a volitional behaviour. The relative contributions of the two variables were as follows:

Fig. 5.2: Use of pit latrine



* = $p < .05$ ** = $p < .001$

The findings of the regression analysis in the case of intention to utilise a pit latrine demonstrate sound predictive power of the theory of reasoned action. Both beta weights of the attitude (.127) and normative (.496) were statistically significant $F(2, 199) = 43.29$, $p < .0000$. It can be said that although both attitudinal and normative factors contribute significantly to intention to utilise a pit latrine, the intention is predominantly under normative control. Weak correlations were observed between the belief based measures of both attitude and subjective norms. Although low, the correlation of the directly measured attitude items and those of behavioural belief and outcome evaluation, were significant.

Since the utilisation of the theories of reasoned action and planned behaviour are for the purposes of designing an effective health education programme, the mean results of the various model components are presented in Tables 5.8 – 5.9 below.

Table 5.8 : Results of model components**Key model component results**

	Mean	SD	95% C. I
Intention to get out to urinate	1.41	1.13	1.26 – 1.57
Intention to urinate in pit latrine	1.57	0.96	1.45 – 1.70
Attitude towards getting out to urinate*	1.84	0.33	1.80 – 1.89
Attitude towards urinating in pit latrine*	1.68	0.67	1.59 – 1.77
Subjective Norm get out to urinate	1.51	0.94	1.38 – 1.64
Subjective Norm pit latrine	1.61	0.78	1.50 – 1.72
Perceived control: not urinating in water**	0.91	0.85	0.35 – 1.03

* Mean of three 5-point scales ** Mean of four 5-point scales

By use of the 95% confidence intervals it can be seen that there are no statistically significant differences between the means of intentions and subjective norm when comparing the two behaviours under investigation. Attitude towards getting out of the water to urinate was significantly higher than attitude towards urinating in a pit latrine. Statistical significance throughout this analysis is done by comparing the 95% confidence intervals, which can be used in place of an independent t-test (Hays, 1994). Confidence intervals enable us to get a fuller picture of the scores by seeing the range of error variance that a p value does not give. Overall intention was high for both behaviours indicating favourable intention to comply with behaviours under investigation.

Behavioural belief

The means for the behavioural belief items are presented in the Table 5.9 below.

Table 5.9: Behavioural belief items

		Mean	SD	95% C.I
<i>Get out to urinate</i>				
Delays relief	Belief	0.02	1.61	-.20 - .24
	Evaluation	-0.55	1.43	-.75 - -.36
It is very inconvenient	Belief	0.23	1.63	0.01 - 0.46
	Evaluation	-1	1.22	-1.17 - -.84
You physically cleanse yourself	Belief	1.08	1.33	0.90 – 1.27
	Evaluation	-1.57	0.86	-1.69 - -1.45
You do not spread diseases	Belief	1.48	1.05	1.33 – 1.63
	Evaluation	1.79	0.65	1.70 – 1.88
You avoid spreading cholera	Belief	-0.01	1.60	-0.23 – 0.21
	Evaluation	1.76	0.61	1.67 – 1.84
You avoid spreading diarrhoea	Belief	-0.04	1.60	-0.26 – 0.18
	Evaluation	1.78	0.62	1.70 – 1.87
You avoid spreading dysentery	Belief	-0.02	1.58	-0.24 – 0.20
	Evaluation	1.84	0.52	1.76 – 1.91
You avoid spreading schistosomiasis	Belief	1.53	0.99	1.40 – 1.67
	Evaluation	1.77	0.58	1.69 – 1.85
You avoid spoiling the water	Belief	1.16	1.24	0.99 – 1.33
	Evaluation	1.74	0.61	1.66 – 1.83
<i>Urinate in pit latrine</i>				
You do not spread diseases	Belief	1.43	1.1	1.28 – 1.58
	Evaluation	1.49	1.03	1.34 – 1.63
Shows good hygienic practice	Belief	1.64	0.89	1.51 – 1.76
	Evaluation	1.78	0.51	1.71 – 1.85
Brings bad smell	Belief	0.01	1.69	-0.22 - 0.24
	Evaluation	1.69	0.58	1.61 – 1.77
Delays the process of relief	Belief	1.09	1.26	0.92 – 1.27
	Evaluation	1.68	0.83	1.56 – 1.79

The strongest behavioural belief in favour of getting out to urinate is the belief that getting out to urinate would avoid spreading schistosomiasis. This was followed by the

belief that one prevents the spread of diseases. The evaluation of these outcomes supports the behaviour of getting out of the water to urinate. However, at the other end of the scale and working against reducing infective schistosomiasis behaviours, is the belief that getting out to urinate is very inconvenient and would delay relief.

With regard to the use of a pit latrine, beliefs that utilising a pit latrine demonstrated good hygienic practice and prevents the spread of diseases, augur well for the uptake of pit latrine usage. Using a pit latrine is further not seen as delaying the process of relief.

Normative Belief

The list of salient beliefs for the whole sample is shown in Table 5.10 below. These are the people who are salient referents of the school children in the community. The mean normative beliefs for “people who are most important to me think I should/ should not” engage in the behaviours under investigation are listed in Table 5.10. Overall the sample perceived that significant others wanted them to engage in the schistosomiasis reducing behaviours under investigation. With regard to getting out of the water to urinate, subjects perceived “other relatives” as wanting them to get out the most ($M= 1.61$, $SD=0.85$). Mother and teacher followed them. At the end of the scale were the fishermen, younger children and friends. The mean for normative belief of friends was significantly lower than those of relatives, mother and teacher who were at the top end of the scale. Friends scored the lowest mean although it leaned towards positive action. The subjects are telling us therefore that of all the key people in their lives, they believe that their friends “least” want them to get out of the water to urinate. We shall get a glimpse of the influence and power of friends in their lives in the “motivation to comply” section below. For any health education intervention therefore, it is noted that friends are the ones who are perceived as “least” wanting them to get out.

Table 5.10: Normative beliefs

		Means	SD	95% C.I
Normative Beliefs				
Friends	Get out to urinate	1.06	1.22	0.89 – 1.23
	Pit Latrine use	1.54	0.91	1.42 – 1.67
Grandparents	Get out to urinate	1.26	1.11	1.10 – 1.41
	Pit Latrine use	1.68	1.67	1.45 – 1.92
Fishermen	Get out to urinate	1.13	1.27	0.95 – 1.30
Younger children	Get out to urinate	1.09	1.23	0.92 – 1.26
Father	Get out to urinate	1.33	1.14	1.17 – 1.49
	Pit Latrine use	1.6	0.88	1.48 – 1.73
Mother	Get out to urinate	1.39	1.03	1.24 – 1.53
	Pit Latrine use	1.57	0.93	1.44 – 1.70
Brother	Get out to urinate	1.35	1.1	1.20 – 1.50
	Pit Latrine use	1.62	0.89	1.50 – 1.74
Teacher	Get out to urinate	1.39	1.08	1.24 – 1.54
	Pit Latrine use	1.59	0.9	1.47 – 1.72
Health personnel	Get out to urinate	1.37	1.14	1.21 – 1.53
	Pit Latrine use	1.56	0.98	1.43 – 1.70
Maternal Uncle	Get out to urinate	1.34	1.14	1.18 – 1.49
	Pit Latrine use	1.64	0.81	1.53 – 1.76
Other relatives	Get out to urinate	1.61	0.85	1.49 – 1.73
Sister	Pit Latrine use	1.62	0.87	1.50 – 1.74

It can be seen that in relation to use of pit latrine, respondents' normative belief means were generally higher than those of "get out" to urinate. There were significant differences in normative belief of the same referents when both behaviours were compared, for example among friends, grandparents, maternal uncle and brother. Overall for use of pit latrine, the scores leaned in the 1.6 region with no significant differences between the means of salient referents. Friends again scored the lowest mean but the

differences in means with the other referents were meagre. Grandparents who were at the lower end of the means for get out to urinate had the highest means for use of pit latrine.

It would be interesting to explore precisely what determines normative belief. There are some clues from this sample. Focus group discussions indicated that most persons did not believe that their friends urinate outside the water. Furthermore, the fishermen were seen as the ones who were the most unhygienic in the lake, hence their lower scores for getting out of the water to urinate. It appears therefore that personal observation of the actual behaviours of salient referents leads the respondents to believe that the referents would most want the respondents to do what they themselves (the referents) are doing. This being the case, the question remains, to what extent do the respondents want to comply with these salient referents. The model provides opportunity for exploring this issue.

Motivation to Comply

The components of the motivation to comply section of the questionnaire are hierarchically summarised in Table 5.11 below.

Table 5.11: Ranked motivation to comply means

Motivation to Comply	Mean	SD	95% C.I
Health Personnel	1.28	1.4	1.10 – 1.46
Teacher	1.12	1.37	0.93 – 1.31
Mother	0.87	1.5	0.66 – 1.08
Maternal Uncle	0.78	1.41	0.59 – 0.98
Sister *	0.76	1.42	0.56 – 0.95
Father	0.69	1.59	0.47 – 0.91
Other relatives*	0.59	1.54	0.37 – 0.80
Brother	0.41	1.54	0.19 – 0.62
Grandparent	0.34	1.62	0.11 – 0.56
Friends	0.13	1.55	-0.08 – 0.35
Fishermen	-0.65	1.45	-0.65 - -0.85
Younger children	-0.8	1.43	-0.85 - -0.45

* Pit latrine use only

It can be seen that health personnel ranked the highest as the persons the subjects would most want to comply with. This confirms a finding by Tembo (1991) where Malawian students indicated that they considered medical personnel as the most trustworthy of information. Teachers with a mean of 1.12 follow this. The mother and maternal uncle

are next, followed by sister. The subjects clearly have no intention of complying with fishermen (specifically migrant fishermen who are seen as largely responsible for the unkempt beaches) and younger children. There are statistical significant differences between various salient referents as far as motivation to comply is concerned. Fathers are significantly different from teachers. It would appear that the children are more willing to comply with their teachers and health personnel than their own fathers. This suggests that level of education is seen as generally important in the eyes of the children. Most parents in the rural areas are not very literate. Grandparents are considered even more illiterate and are further down the scale of those whom the children most want to comply with. Grandparents are significantly different to the mother who may be considered more “educated” perhaps in a practical sense. Migrant fishermen and younger children who are the least on the scale are seen to be very ignorant. There appears in this scale to be some hierarchy of education with health professionals seen as more educated than teachers. Children are considered the most ignorant. If this feeling is how the sampled children perceive things, then it does not take too much to imagine how parents and adults also look down on those who are younger than them. This makes outreach of the message by children very difficult to older persons and was experienced by the Bilharzia Club members in their outreach. The very low motivation to comply with friends does not augur well for peer based education. Friends are ranked third as “least” wanting to comply with after the younger children and migrant fishermen.

Perceived Control

Subjects on the whole perceived the ability to get out of the water to urinate to be under their control ($M=0.91$, $SD\ 0.85$) although this perception was not as high as attitude, subjective norm or intention. The mean for the question “I always desire to get out of the water to urinate, but I fail” was the lowest ($M=0.25$, SD) of the other sub-components of the perceived control items. This indicates a desire on their part to comply with schistosomiasis prevention behaviours but an acknowledgement of inability to do so. On the other hand subjects very much felt they have the power to get out to urinate especially if they “really wanted to”. Subjects indicated that they felt determination was under their control and if evoked could produce the desired behaviour.

The components of the perceived control construct fell into two distinct groups. Half the components (“power to get out to urinate if I really wanted to” M=1.35 (SD1.21) and “It is easy to get out to urinate if I really wanted to”, M=1.34 (SD=1.15) were statistically different from “I want to but I fail” M= 0.25 (SD 1.57)and “It is difficult to get out to urinate” M=0.70, SD 1.48. It can be argued that these two latter items do not really tap into perceived power the individual has – they seem more reflective of facts or statements of what has been. “It is difficult to get out to urinate” and “I want to but I fail” may draw more on the past history than “if I really wanted to” which is more in line with perceptions held regarding the future. To assess this I regressed perceived control into the equation using only these two “if I really wanted to” constructs to see whether the overall picture changes or there is a difference in the weighting of perceived control contribution to the intention. Such a regression made no difference in the contribution of perceived control in predicting intention.

Past Behaviour Dimension

The role of past behaviour in influencing intention has received much attention in the literature e.g. Baggozzi, (1992) and Ouellette & Wood (1998). This study therefore incorporated the dimension of past behaviour to see whether there is indeed any difference in intention between subjects who reported having urinated in the lake and those who had not. To the question “Have you ever urinated in the lake?”, frequency scores indicated 59% (N= 118) “Yes” response and a 41% (N=82) “No” response. Two respondents did not answer this question. Means of the two groups for “intention to get out of the water to urinate” are presented in the Table 5.12 below:

Table 5.12: Intention to get out to urinate by past behaviour

School	N=	Mean (SD)	95% Confidence
Have urinated	118	1.34 (1.25)	1.12 – 1.58
Not urinated	82	1.50 (0.95)	1.29 – 1.71

The means for intention to urinate out of the water was not significantly higher for those reporting a history of not urinating in the water. Although there were no differences in

means of intention, we wanted to assess whether past history influences the prediction of intention to get out to urinate given that past behaviour has been an issue in the literature. We confined this further analysis to intention to get out of the water to urinate. Two regressions were therefore carried out. The first was only with those who reported having urinated in the lake (N=118). The findings for regression of intention against subjective norm, attitude and perceived control indicated that intention could be predicted by those with a history of urinating in the lake $R = .380$, $F(3,114) = 6.40$ $p < .001$. The analysis predicted 14% of the variance. Beta weights are summarised in Table 5.13 below:

Table 5.13: Beta weights of regression using subjects with history of urinating in the water

	N =	BETA	P value
BB Attitude	118	.292	.0014
Subjective N	118	.232	.0094
Perceived C	118	-.039	.6639

For those with a history of having urinated in the water, intention to get out of the water to urinate was significantly under both attitudinal and normative control ($p < .01$). The beta weighting and p value of belief based attitudes was higher than subjective norm indicating that attitudes contributed more to the weighting of intention than did subjective norm. Personal factors therefore are more immediate determinants of intention to get out than are normative factors. Perceived control does not contribute towards intention for those reporting a history of having urinated in the water.

Multiple regression of subjects who reported never having urinated in the lake (N= 82) was also carried out. The regression was able to account for 35% of the variance. Intention was significantly predicted, $R = .595$, $F(3,78) = 14.22$ $p < .0000$. Intention regressed against subjective norm, perceived control and the direct measure of attitude showed that all three variables were significant as indicated in the Table 5.14 below:

Table 5.14: Beta weights of regression using subjects with no history of urinating in the water

	N =	BETA	P value
Perceived control	82	.393	.0002
Subjective Norm	82	.246	.0162
Direct Attitude	82	.195	.0361

Perceived control, which was not a significant contributor to intention among those with a history of urinating in the lake, is the leading predictor of intention among those reporting a history of having not urinated in the lake. Those who report not urinating in the lake attribute it more to the perception that they have of their own control over the behaviour. This was the strongest and most significant predictor with $p < .001$. It is the only time in the study that perceived control is the leading predictor. Both subjective norm and attitudes (directly measured) are significant at the $p < .05$ level. The belief-based measure of attitude is not significant when brought into the equation and regressed with the other variables.

Our reasoned action questionnaire solicited supplementary information on the history of urinating in the lake. Subjects were asked to mention factors that prevented them from urinating out of the lake water. The most mentioned factors are tabulated below in order of frequency:

Table 5.15: Reasons for urinating in the water

No latrine at the lake	19.8%
Inability to contain urine	17.0%
Lack of hygienic lifestyle	11.3%
Habit	9.4%
Ignorance	7.5%
Lack of determination	5.3%
It delays relief	3.2%
No consideration	3.2%
Wanting to infect others	3.2%

The lack of latrine at the lake led to some respondents commenting on the lack of privacy when it comes to urinating. One wrote: “I get embarrassed as I don’t want people to know I need to urinate”. Some respondents cited deliberately wanting to infect others (3 respondents). One wrote: “Could not care less, it shall be someone else who shall suffer”. These were however the minority. Closer interpretation of these responses show that most of the attributions for failure to urinate out of the water lie with the individual him or herself. Although it was the most mentioned, the lack of a facility such as a pit latrine to urinate was the only non-personal attribute mentioned. One questions whether a conspicuous pit latrine at the lake would be utilised especially since urinating is considered a private event. The water hides the fact that the elimination is occurring. Several respondents mentioned they would be embarrassed to be seen urinating.

5.3.7 Implications

Intention to engage in behaviours that would minimise the acquisition of schistosomiasis infection is predominantly under normative control. This reflects the value attached to community or societal influence in the rural Malawi setting. The health education programme to be introduced had to bear this in mind. For the intervention programme, we drew on the health personnel and teachers as promoting the schistosomiasis reduction messages given their high “motivation to comply” scoring. Since the belief that urinating in the water would spread diseases, we focused extensively on this aspect in the messages we presented. We emphasised that water is a source of life and polluting it would be polluting the community’s life source. The greatest attitude in need of change was the belief that urinating in water expedites relief and is convenient. Its outcome evaluation was the highest negative mean score (-1).

The use of a pit latrine (where it is available) as a viable alternative was also encouraged since the most important belief about its usage emanating from the respondents was that it checked the spread of disease. This belief corresponded with the spreading disease item in the “get out of the water to urinate” section of the questionnaire.

5.4 Intervention Plan

In the planning of the health intervention, the next step is to bring all these factors together under predisposing, reinforcing and enabling factors and design the intervention from that perspective. All the key factors determining behaviour change in the intervention are presented below under positive and negative predisposing, reinforcing and enabling factors. They are drawn from the FGDs, interviews, K-A-P and TRA/TPB questionnaire in all the planning phases of PRECEDE.

Predisposing factors

Positive:

Knowledge about the disease is generally good.

Attitudes: these are pro disease reduction.

Beliefs: The disease can be overcome

Values: Pro good health

Intentions to get out to urinate high

Intentions to utilise pit latrine high

Negative:

Knowledge: High “don’t know” responses in many K-A-P questionnaire items.

Beliefs: Urinating out of water delays relief

Perceived behavioural control limited

Disease can only be controlled with government intervention.

Reinforcing factors

Positive:

Schools’ administration are cooperative.

Medical personnel actively involved in community

Chiefs are enthusiastic

Negative:

Some persons in the community are stubborn in behavioural ways

Most children's peers urinate in the water

Enabling factors*Positive:*

Hotels' support for pit latrine construction

Negative:

Few pit latrines at the schools

Lack of piped water to villages

Alternative water sources in short supply

Environment supports snail habitat

Drug treatment very expensive

These factors enabled us to come up with a clear programme intervention plan and goal for each of the factors mentioned above. As a result our intervention objective was outlined as follows:

Programme objectives:

By the end of the programme each "Don't know" knowledge response should be reduced by 50%.

Knowledge, attitude and practice scores should significantly increase.

There should be a statistically significant shift in intention to get out to urinate by the end of the programme.

Prevalence rate of schistosomiasis should reduce and be maintained at 15%. The literature (see p.25) clearly demonstrates that this is possible.

Target group for the intervention are the children in the schools, focussing on the Bilharzia Club members.

The empirical aspect of the intervention would continue with the three schools receiving the different degrees of health education input to determine which is the most efficient.

CHAPTER 6

IMPLEMENTATION: HOW THE HEALTH EDUCATION WAS CARRIED OUT IN THE FIELD

6.1 Organisational & Policy Diagnosis

The administration and policy diagnosis is the fifth step of the PRECEDE-PROCEED model. What is involved here is an assessment of the following: First, the resources the intervention shall require. Second, the available resources in the local community that can be utilised, and third, the barriers to programme implementation (Green & Kreuter, 1991). This is closely followed by the Policy diagnosis, which explores the political and organisational environment that needs to be changed to support the programme (Green & Kreuter, 1991). It should be stated that although presented here, it was more practical for funding purposes and given the restricted time frame, to draw up the assessment of resources needed before we went out into the field to conduct the planning phases of PRECEDE. The planning itself required extensive funding and we had to draw up a thorough plan when soliciting funds.

6.1.1 Assessment of resources needed

6.1.1.1 Time

Green & Kreuter (1991) suggest that time is the most important resource. For practical and financial reasons the life of this programme was limited to two full academic years. Hence our objectives and time frame is summarised below.

TIME SCHEDULE (28 MONTHS)

PHASE I (PLANNING)

1996

JULY - SEPTEMBER

Negotiation with traditional authority
Negotiation with village elders, school authorities
Village surveys
Village meetings

OCTOBER KAP study of school children
Recruit health educator

1997

PHASE II (IMPLEMENTATION)

JANUARY Health educator commences work. Is introduced to village and local health authorities.

FEBRUARY Health educator visits Koche, Makawa and Lwangwa schools. Meets headmasters and teachers. Discussion with staff. Explores possibilities of Bilharzia Clubs at Koche and Makawa.

Administration of TRA and TPB questionnaires

MARCH Release of findings of KAP to schools
Drawing up materials to address KAP gaps
Release of TRA/TPB findings to schools
Commence school Bilharzia Clubs
Child—to—Child approach information workshop

APRIL - JUNE Mass treatment and assessment of prevalence through egg counts (Time I).
Club display to schools.

SEPTEMBER-NOVEMBER Mass treatment and assessment of prevalence through egg counts (Time II).
Club displays to schools.
Maximum school outreach to village.
Construction of latrines and protected wells to begin.
Feedback to hotels, sponsors and community.

1998

JANUARY Clubs resume in the schools
APRIL - JUNE Mass treatment Time III

PHASE III (EVALUATION)

JULY Evaluation of programme

NOVEMBER Conclusion of programme
Final feedback to community, schools and sponsors.

6.1.1.2 Personnel

To effectively carry out the intervention, key personnel would be required on a full time, part time and voluntary basis. Since the programme was to be a health education intervention, it was decided to employ a full time health educator to work in the primary schools and the local community. He/she was to liaise with religious groups, political leaders, the hotels, community leaders and the schools. He/she was to organise the bands, drama groups, posters and co-ordinate other aspects of the message dissemination. His/her duties were to commence in January 1997.

Since our focus was the schools, we decided that some of the teachers were to be involved as patrons of the clubs we were planning to establish. Teachers would also assist during the days of drug administration. Health Surveillance Assistants were to be utilised on a part time basis in two ways. First, as part of the maximum condition, they would be involved in regular message dissemination to the maximum school club. Second, they would also assist with the mass treatment to the schools. Other personnel would be drawn on from the organisations involved in the programme to act as support staff. These would include secretarial support for correspondence, drivers, data entry clerks for the K-A-P and laboratory technicians to help with prevalence assessments when urine samples were utilised.

6.1.1.3 Budget

Actual budget proposals from this intervention are given here in Malawi Kwacha, which varied when compared to the US\$ in the course of the intervention. It fluctuated from MK 15 to \$ 1 at the start of the programme to MK 23 and ending up at MK 45 due to the Kwacha's depreciation. However to give an indication of costs influenced by the degrees of health education input a budget summary for the duration of the programme is presented on the following page:

A. Overall costs

Personnel

Health educator salary and rent	32000.00
Support staff allowances	5000.00
Laboratory Technicians salary	9000.00
Data entry clerks allowance	<u>3000.00</u>
Sub total	49000.00

B. Programme costs

Training programmes

Band training allowances.	13960.00
Child-to-Child workshop allowances.	2000.00

Evaluation costs

Independent evaluator allowance	4000.00
Evaluation overheads (Tapes, transport)	<u>1000.00</u>

Sub total 20960.00

C. Maximum School Costs

i) Club Activities

Stationery for children	3000.00
Display day costs (Band, drinks, prizes)	2600.00

ii) Outreach to community

Football, netballs, drama costumes, Stationery	2550.00

iii) Medication

Praziquantel (the drug): + 12% charges	46000.00
Iodine, bathroom scales etc	1000.00
Sweets for children	500.00
Allowances for teachers who helped	<u>9000.00</u>
Maximum school Sub total	64650.00

D. Medium intervention school Costs

Club activities	5600.00
Medication	<u>46000.00</u>
Medium school Sub total	51600.00

E. Minimum intervention school

Medication costs only.	46000.00

F. Community Costs

Construction of pit latrines.	15000.00
Construction of protected wells	<u>35000.00</u>
Sub total	50000.00

G. Totals

5% contingency	14110.50
GRAND TOTAL	296320.50

The sources of our funding:

The hotels in the area assisted with costs involved in the mass treatment. They also paid the salary of the health educator and constructed pit latrines at the medium school.

The Ministry of Health and Population met the costs of the club activities.

The Ministry of Tourism paid for the evaluation.

The College of medicine met my transport costs, data analysis costs and support staff costs.

The European Union in Malawi paid for the construction of protected wells in the villages.

Clearly the costs for the maximum school are much higher than the other schools. The evaluation of the programme will alert us as to whether this higher input is worth it.

6.1.2 Assessment of available resources

The resources we would utilise for the health education material were derived from the Child-to-Child approach. The Child-to-Child approach to health education was set up in 1978 in preparation for the 1979 International Year of the Child. It is now used in health education programmes in over 70 countries around the world (Bailey *et al.*, 1992a). The main thrust of this strategy is that children are able to take responsibility for themselves, their families and contribute to their communities. The philosophy behind it is guided by the notion of the empowerment of children. Children are therefore to be seen as partners in promoting health and not merely "loudspeakers passing on adult messages" (Bailey *et al.*, 1992a, p.15). A resource book and activity sheets (Bailey *et al.*, 1992b) were essential parts of the material describing a specific approach to empowering children to engage with a health intervention. This is outlined in more detail below. We thus did not make our own education materials.

In terms of personnel, these were most readily available. We would involve teachers and members of the community as outlined above. Our objective was community participation (especially in the maximum condition). For the community based projects in the villages, the community came together to provide the labour for the digging of protected wells and the making of the bricks.

6.1.3 Assessment of Barriers to intervention

There was one main barrier to the intervention that became clearer to us as the programme developed. There were clues at the outset. This had to do with the issue of money. Some background information is important. It was the policy of the LMBC Programme that money or allowances should not be paid to the participants of the programme and that involvement would be done on a voluntary basis. In early 1997 a meeting was held bringing together all interested parties including the chiefs who shared their concerns. After the meeting, tea, coffee and biscuits were provided and the chiefs were transported back to their respective villages. Later when the health educator visited the villages to follow up, he was castigated by all the chiefs he went to see. The chiefs were very angry that they had not been financially remunerated for their time in attending the meeting. They felt cheated and were furious to the point of threatening not to co-operate with the programme. This reaction prompted a sharp response from one of the directors of the LMBC Programme. He wrote to the traditional authority Mponda lamenting these demands for pay. He said “it is becoming increasingly difficult to gain the co-operation of the village headmen who say they will not attend meetings unless they are paid to do so. This is quite out of the question. The programme will not work, and certainly will not last, unless the people themselves are prepared to make it do so.” This became an underlying rule of the LMBC Programme and, as shall be seen later on, a significant factor in the process of the intervention in the schools. The rationale behind this approach was that if the community is involved in a project that it benefits from, then without a financial incentive, the programme stands a better chance of being maintained without depending on the financial incentives.

The issue of remuneration has been hotly debated in Malawi. Donnelly (1997) argued that money “creates dependency, a culture of paternalism, is unsustainable and hinders proper participation. These things are the antithesis of development” (p.4) Donnelly argued that there was no need to give villagers an allowance for attending training that benefit the villagers as it does not cost the villagers anything. The main problem of this seemingly misallocation of valuable funds is that it leads to what he terms a culture of entitlement. Allowances now have become “a bribe” to ensure people attend the training.

Donnelly (1997) reasons that “if it is necessary to bribe people to attend a meeting then we must seriously ask the question whether the meeting is worth holding.” (p.4). More importantly, he asserts that “if people must be paid to participate in a project then the project is probably not important to them and is destined to fail” (p.4). He calls for a fight against allowances and aim for a culture based on “service, volunteerism, commitment and participation in activities based on their merit, not their allowance” (p.4). We thus were aware that the financial situation would be a barrier to effective implementation. This was clarified by the fact that numerous non-governmental organisations ran projects in the Mangochi area and provided remuneration. It thus became the norm for people living in Mangochi to expect generous remuneration for any community involvement.

6.1.4 Policy diagnosis

Given the limited time constraints as well as the focus on the schools, not much time was given towards policy diagnosis. Suffice it to say that the objectives of the intervention in the schools were in line with the Malawi government health policy of primary health care.

At this stage, the intervention has a sound plan, adequate budget and conditions in place for adequate training and supervision of staff. These are important conditions to ensure good implementation of any intervention (Green & Kreuter, 1991).

6.2 The Health Education Curriculum

6.2.1 The health educator

As mentioned above we appointed a full time health educator to co-ordinate and facilitate the health education programme in two of the three schools. His terms of reference included liaising with community leaders, health personnel and with the local resort hotels. He was responsible for the running of Bilharzia Clubs and drama groups that spread the message in the schools. He lived full time in the community and felt accepted as part of them. One of the major tasks of the health educator was to ensure that there was ample opportunity for training in the area of health education with regard to schistosomiasis. This comprised co-ordinating the training of teachers, and local music bands. Under my supervision we drew up a training programme for the teachers who

were involved in the Bilharzia Clubs. Our *modus operandi* was the Child-to-Child material provided during a Child-to-Child training workshop held in Mangochi. In training the teachers, we followed the Child-to-Child format outlined below. We held weekly briefing sessions with the teachers involved in the Bilharzia clubs prior to the weekly club meetings with the pupils. We also held a two-day training workshop for the local bands in the community so as to involve them in the dissemination of the message. They were also taught the basic facts of the disease so as to prevent misinformation in the songs they later composed. The local bands were later to be used during outreach displays to the schools.

6.2.2 Health education content

Following the input from the community (outlined in Chapter 4), the knowledge, attitude and practice questionnaire and theory of reasoned action and planned behaviour questionnaire (outlined in chapter 5), we finally drew up the health education curriculum for the control of schistosomiasis in the schools. The essence of the message was not to stop the children from going to the lake so as to ensure decreased water contact. We knew that such an option was not possible since Mangochi's climate is very hot and the lake is very much a part and parcel of the people's daily life for washing, bathing and recreation especially for the children. Similar studies have recognised this and avoided water contact reduction messages (for example Hewlett & Cline, 1997). The health education message was thus to break the schistosomiasis cycle at the point of human contamination, that is encouraging people to urinate out of the lake and other water sources that are present in the rainy season. Broadly speaking the content of the message fell into four categories: the facts of the disease, the control of the disease, reasons for controlling the disease and action that can be taken to reduce the prevalence. We drew up a curriculum that would characterise the key information we felt was necessary for the school children in the Bilharzia club.

The facts of the disease:

We made sure that pupils were taught the schistosomiasis life cycle. Our focus was on how urinating in the water can spread the disease to others. We highlighted the responsibility each person has for the health of others by not urinating in the water. (This we drew from the findings of the theory of reasoned action since spreading diseases was

a main negative belief about the disease). We also made sure we included information on the signs and symptoms of the disease and what can be done about them. We encapsulated the main “don’t know” findings of the K-A-P to ensure that the main knowledge gaps of the pupils were brought into the curriculum.

Control of the disease:

We further ensured that alternatives to urinating in the water were incorporated into the content of the message. From our reasoned action research we highlighted the advantages of utilising a pit latrine, emphasising how such behaviour would check the spread of the disease. Other alternatives were mentioned such as minimising water contact patterns for example by drawing water from the lake and washing clothes on the shore with feet out of the water. In the course of the intervention as we continued interacting with the club members and realised that getting out of the water to urinate would be very difficult, we introduced the idea of urinating immediately prior to entering the water. We started teaching this extensively and incorporated it into all our messages.

Reasons for control:

We outlined the consequences of the disease. Emphasis in the message was placed on blood loss and decreased fertility since these are central to life and were frequently mentioned by local pupils in the K-A-P. Bladder cancer although included in the message was not emphasised as much since cancer is rarely diagnosed in the area according to information derived from the health clinic. The message would emphasise that they, the local community, are the ones suffering with the disease. We also mentioned that tourism in the area would suffer. The decline in tourism would affect the livelihood of the community. In presenting this in the message, we sought to provide pupils with a broader perspective of the disease, that a simple habitual act like urinating in the water has far greater consequences and ramifications for themselves, the community and the nation at large.

Having drawn up a curriculum of content, the next task was to identify disseminators of the messages. For the intervention programme, we identified the health educator as the key person as well as the students themselves who would diffuse the information through the Bilharzia club. We also drew on the health personnel and teachers as promoting the

schistosomiasis reduction messages as they were rated highest by the pupils in the reasoned action questionnaire. However, health personnel were only used at Koche, since Makawa's input was to be devoid of external community involvement in keeping with our study objectives.

6.3 The Bilharzia Clubs in the Schools

6.3.1 Establishment of the clubs

One of the main responsibilities of the health educator was to set up Bilharzia clubs in two of the schools. Other already established clubs in the schools included the Wildlife club and the AIDS club. These clubs had the common feature of having three or four staff members headed by a patron on its committee. These staff members worked hand in hand with the sponsoring outside agency. The headmaster arbitrarily chose staff members or asked for interested volunteers during staff meetings. The Bilharzia clubs were set up so as to concentrate the message more intensely on a handful of the pupils. This was done under my supervision and with the permission and co-operation of the headmasters in the two schools involving the maximum and medium intervention. The headmasters had been involved in attending schistosomiasis - related activities such as the meetings of interested parties that the LMBC programme organised. We sought to inform them as much as possible about the LMBC Programme so that they could give us their input as well as co-operation.

By April 1997, the Bilharzia clubs at Koche and Makawa schools were established. The health educator (Simon) during morning school assembly introduced the club to the pupils. Simon then invited interested pupils to enrol and a date and time was set. Koche School met after classes (1p.m) on Wednesdays and Makawa on Thursdays. The different days were set up to ensure that Simon was able to visit both schools and give the required input. The meeting days were also convenient to the schools as other clubs met on the other days. Membership was voluntary and open to all pupils. The first intake at Koche was 36 members and 21 at Makawa School. These numbers fluctuated during the life of the clubs in the two years the programme ran.

6.3.2 Operational framework: Child-to-Child

The clubs operated on the Child-to-Child framework described above. There are five main health-related principles of Child-to-Child. They are:

1. Health is fundamental to a child's education and determines the quality of life and education.
2. Children are not passive when it comes to health issues, they are responsible for their health as well as in helping others maintain good health.
3. Prevention is better than cure. Even during illness children can actively contribute towards their own well being. Children need to be taught important signs to recognise when ill.
4. Health is a state of well being that not only encompasses the body but also the mind and personal happiness.
5. Sound knowledge about health is important. Children are expected to be well informed about the diseases in their communities so that they can help themselves as well as their friends.

The main justification for embracing this approach in the rural Malawi setting is that in most Malawian families (averaging 6 children) older siblings are very influential and spend much time raising their younger siblings whilst mother is nursing her little baby. The Child-to-Child principle is therefore not new to Malawi. The advantage of using this approach is the utilisation of something that is already part and parcel of the Malawi heritage. We were simply attempting to translate this to a specific disease. We were thus utilising existing peer socialisation agents. Children learn from each other by doing things together. School going children are not only limited to influencing their age mates or juniors but can also influence the family when they return from school. Many Malawian parents have not had much formal schooling and as such their school going children could share health-related lessons learned in school. Child-to-Child argue that

whilst it is true that its approach is embraced in the way many families help each other, their activities "go beyond the traditions of the past" (Bailey *et al.*, 1992a, p.2). The Child-to-Child input does this in 3 main ways:

1. Children are given new knowledge and skills. They are equipped with a better understanding of what they do. This is said to make learning "more interesting and more fun" (p.2).
2. It is asserted that Child-to-Child gives health education a "new look". Hence children are more actively involved in pursuing the well being of their friends rather than just being confined to learning facts about their own health. The benefit of this is that it "links school learning with home and community needs" and in so doing sets the groundwork for adult responsibility (p.2).
3. The natural outcome of this early responsibility in working for the good of others is self-worth and growing self-respect, as it is a community effort. Each child feels that he or she can contribute to the community. Subsequently it is asserted that adults are encouraged to value and trust their children more. Children are highly valued and appreciated in Malawi (Bandawe & Louw, 1997).

Child-to-Child list five practical steps that can be followed to obtain its objectives (Bailey *et al.*, 1992b).

The five steps are as follows. Step 1: Choosing the right health idea and understanding it well. This involves selecting a disease or health problem that is relevant to the environment in which the children live. After having understood the basics of the disease or health situation the children could move to step 2 which is finding out more about the disease by way of mini research to ascertain the impact the disease has on the given community. Step 3 involves discussing the findings from step 2 and planning action. The fourth step is the taking of action such as cleaning the school premises or asking for better sanitation. The fifth step is discussing results of the action taken. This usually involves a review of the action and asking questions such as, who received it? How were

the ideas taken up? What difficulties were encountered? Our health education input utilised these steps.

The literature has revealed that some schools universally have become known as Child-to-Child schools. It is common practice for links to be established between different schools in different countries employing the child-to-child approach. In our study we were able to establish links with two schools in the U.K. These schools sent items such as pencils and coloured paper. The children were able to write letters to each other to share their lives and what they were doing in their schools. In countries such as Ghana and Zambia, Child-to-Child has been adopted into the national primary school health education curriculum. This is not the case in Malawi. This study was the first time the approach had been tried in Malawi with regard to a specific tropical disease.

6.3.3 Bilharzia club activities

With the establishment of the Bilharzia clubs by April 1997, a programme of activities was drawn up for the weekly meetings in both schools. The activities followed the Child-to-Child steps mentioned above. The first step was to teach the children the basic facts of the disease. This involved several weeks input in which the children were made aware of the lifecycle of the disease. We sought to ensure that the children knew the basic facts about the transmission, spread, signs and symptoms of the disease as well as ways of preventing the spread. Pupils were frequently asked to draw the life cycle on the chalkboard and explain it from memory. Each week there was a quiz on the basics of the disease. The teaching style was deliberately creative, active and lively as opposed to straightforward didactic input. The creative methods used included games, music, drama and posters drawn to describe the schistosomiasis life cycle. The games were usually “ice breakers” and had a purposeful message such as whispering in each other’s ears to see how messages become distorted by the time it reaches the last person on the line. There was always time given over to questions and answers to enable the pupils to ask as many questions about the disease as possible to ensure that they had optimal knowledge of the disease. We ensured that all knowledge gaps observed during the baseline phase were

incorporated into this step. Simon facilitated the meetings with some of the Bilharzia club staff members present.

After several weeks input, we felt confident enough to move to Step 2: "Finding out more". This required systematic investigation on the part of the children at the two schools. For Koche the maximum school, they went into the community to find out more information about schistosomiasis in their area. They conducted their own research by asking people about their knowledge and perceptions of schistosomiasis. They also went to see which areas had the most water contact activities and whilst there asked people about their water-related habits. They enquired where people fetched their drinking water. At Makawa, the medium school, this interaction was limited to fellow pupils. The members of the Bilharzia clubs were divided into three groups. Each group was responsible for a different aspect of finding out more. One group used the interview method, another the observation method and another the questionnaire method. Each group was named after an aspect of the schistosomiasis life cycle. At Makawa for example, the observation group was called the Eggs (after the urinary eggs), the interview group was called the Snails ("Nkhono" in Chichewa the local language) and the questionnaire group was named the Flukes. Each group had a leader who co-ordinated the group's activities in the field. They were mandated to collect as much information as they wished from as many sources as possible. This process took two club meeting sessions. They were encouraged to collect data in their spare time.

Following their field work, the children then met and gave feedback of their findings. This was step 3. By way of example, the Koche observation group (the "Eggs") reported the following findings: On the day they visited the lake they counted 21 women engaged in washing and bathing along the shores of the lake. Most of them were also washing cooking utensils and had their feet in the water. 18 men were observed mostly bathing and washing their clothes. Most were naked whilst in the water. On the day of the observation no one was seen fishing as it was the afternoon and most fishing is done in the mornings. 17 children were observed by the pupils to be playing games in the water. During their observation they saw one boy being hit with sand on his back at his request. When they enquired as to why this occurred they were told that the boy had urinated in the water and had requested his friend to throw some sand on his back in the superstitious

belief that he would be protected from contracting schistosomiasis. Following reported feedback, there was discussion about what could actively be done to contain the problem. The drawing up of an action plan then ensued.

Step 4 involves taking action. The observation group in the above example did more than just observing. They tried to educate the community about the dangers of schistosomiasis. They went and spoke with the mother of the boy who had urinated, telling her of the dangers of the urination in the lake. They also spoke with some of the people engaged in the various activities along the lakeshore. They reported that the people they spoke to were very defensive and started rebuking the pupils with comments such as:

"There is no schistosomiasis in the lake, if there was then the fish would have it too and yet we eat the fish"

"We have lived here long and yet we do not have schistosomiasis, so what are you talking about?"

"Do you know of anyone who died from schistosomiasis? So what is the problem?"

"You are children what can you tell us?"

"Schistosomiasis is contracted from eating burnt fruit, don't come here with your new ideas".

Step 5 involved a discussion of the results of the action taken. The actions were reviewed and difficulties encountered were discussed. It became clear that the pupils were fearful of asking people questions and shunned receiving negative comments. Our response was to decide to incorporate some sessions on interviewing skills and assertiveness training into the curriculum. Other programme activities included a walk along the beach to see the high-risk infection areas and see water contact activity. This was done with all the club members. Towards the end of each term several of the club meetings were devoted to rehearsals for the displays to the whole school.

The displays were an important part of the Bilharzia club activities. It was during the display, held at the end of each term, that the message was more systematically disseminated to the rest of the school. Normally, most of the Bilharzia club members disseminated the health education message to their peer groups in their day to day interactions. The majority of the members were in the older group, standards 6-8. We had very few from classes lower than that. The display therefore provided an opportunity to reach the whole school. The health educator, myself and patrons played as minimal a role as possible. It was up to the children to come up with the songs, poems and drama. They were guided where need be, for example to ensure that the disseminated facts about the disease were accurate. A typical programme of a display day at both intervention schools ran as follows:

The entire school would be present. This would include the headmaster, all teachers and all pupils. The activity would take place during school hours and children would be excused from class that day or would stop early depending on the time of the display. A member of the club was chosen to act as master of ceremonies. He or she would then welcome everybody and the programme would begin with some songs composed and sang by the Bilharzia club choir. This would be followed by some poetry recitals, then by a comedy piece and then a play. A common theme that emerged in the plays throughout the years was how a family would first go to the traditional healer when the signs and symptoms of schistosomiasis presented themselves. Upon failing to get help from them, they then proceeded to the clinic where assistance was always available. The health worker at the clinic would then give advice on disease prevention strategies. In some of the displays we were able to have traditional dances whose songs carried a schistosomiasis message. In all the messages children were discouraged from urinating in the water. After more music, sketches and some songs by the visiting local band (trained to deliver schistosomiasis messages), there would be speeches of thanks from the headmaster, a health surveillance assistance in the case of the maximum school Koche, and myself. We all drew together what the participants had communicated through song and drama and reinforced the message. After the display the children who had participated were invited for a drink and biscuits. Congratulations were in order and the spirits and unity of the club were enhanced and encouraged (See photographs in Appendix 1).

During the second year the Bilharzia club programme followed the same Child-to-Child activity steps format as the year before by starting off with a review of the basics of the disease. This was important to do, as there were now new members who wanted to join and replace those who had left school. Once these basic steps were mastered, we moved on to the more practical applications. In 1998, the design of the programme of activities was as far as possible left in the hands of the patrons who would draw up a programme in conjunction with the children. I as co-ordinator gave guided input, for example making suggestions such as the need to involve the HSA in communication skills. The transition to the patrons running the clubs on their own was not so easy as they would wait for me to come and tell them what should go into the programme. I would hear comments from the teachers like “we were waiting for you to tell us what to do this term, sir”. I made it clear to them that they were to draw up the programme and I would only advise if asked to do so. I helped them draw up the programme to give them some confidence. By the final term they were all quite confident in drawing up the programme by themselves.

When we resumed in January 1998 a programme was drawn up that would run the Bilharzia club activities for each term. By way of example for Term 2 in 1998, at Koche School, the programme was:

Week 1 (April 29): Review of the life cycle. Time spent in the T-shirt design competition.

Week 2 (May 6): Recap the life cycle. Focus on communication skills. The Health surveillance assistant was to give input on communication skills. Children to go out and spread the message during the week.

Week 3 (May 13): The children were to report back on their experiences. Discussion based on the feedback about the experience.

Week 4 (May 20): Assertiveness training. Dealing with problems encountered in the field. Second outing to spread the message.

Week 5 (May 27): Discussion and feedback of second outing.

Week 6 (June 3): Review of the progress so far. Where do we go from here?

Week 7 (June 10): A walk along the beach.

Weeks 8 & 9 (June 17 & 24): Preparing for the display.

Week 10 (July 1): Display to the entire school.

We held several competitions in the course of the two years as part of the Bilharzia Club activities. These included the design a poster competition, composition of games to play contest, drama, poem and song competitions. The prizes were to be presented at the end of each display for the best poems, play or song. This sought to encourage the children to be as creative as possible and utilise that creativity for the purposes of the clubs. The prizes were usually something of practical value, such as a backpack to enable the children to carry their books to school. The rationale behind it all was for the prize to be a symbol of pride as well as to act as an encouragement to the other children to perform better next time. The displays were held in both years of the programme. In total each school had about six displays.

6.3.4 Principles

Throughout the programme, we followed Hubley's (1988) characteristics that are necessary for the promotion of effective health education. We noted these characteristics (which are italicised below) and made sure our style and approach of delivery incorporated all the following:

1. *Promotion of actions that were realistic and feasible within the constraints faced by the community.* We sought simplicity and as far as possible and made use of resources that were locally available. For example we utilised a local band and the props for the drama during displays were all locally available equipment.

2. Our education built on *ideas, concepts and practices that the people already had*. Hence the programme had to fit in with the existing lifestyle and culture by avoiding conflict with the local belief structure. We therefore avoided ridiculing or criticising those who sought assistance from traditional healing to cure schistosomiasis. We would commend people seeking their help for taking action to find a cure and in the plays suggested alternative avenues of treatment. We then suggested Praziquantel as a possibility to be considered and asked those who had benefited from the medication in the past to give testimonies to that effect.

3. The messages were *repeated and reinforced over time using different methods and were also adaptable, using existing channels of communication - for example, songs, drama and story telling*. In so doing the messages were entertaining and attracted the pupils' attention. Our displays at the end of each term were geared towards coming across in a light hearted manner.

4. We used *clear simple language with local expressions* and emphasised the short-term benefits of not urinating in the lake.

5. Throughout we provided an *opportunity for dialogue and discussion to allow learner participation and feedback on understanding and implementation*. The pupils constantly participated in discussions and were actively involved in asking questions. Dyadic teaching was kept to a minimum and full participation by all club members was encouraged. (Hubley, 1984). Even during the displays opportunity was given for the audience to ask questions.

6.4 Conclusion

This chapter has attempted to paint a picture of the actual intervention, its costs, what the syllabus involved and how it was carried out. This sets the stage for the evaluation of the intervention which follows in the following chapters. The actual programme itself is evaluated as well as the impact and outcome that the different degrees of health education input had on the efficiency of the programme.

PART III

EVALUATION

AND

CONCLUSION

CHAPTER 7

EVALUATION OF THE PROCESS

7.1 Introduction

Programme evaluation is the systematic assessment of the programme's results as well as a systematic assessment of the extent to which those results were caused by the programme itself (Rossi *et al.*, 1999). Green & Kreuter (1991) define evaluation in the context of health education as the "comparison of an object of interest against a standard of acceptability" (p.217). These are determined by the objectives of each stage of the PRECEDE process. At evaluation we thus compare how much change has occurred in the time period set out in the epidemiological, behavioural and environmental objectives. Having implemented the programme, in mid 1998 we began evaluating it. There are three categories of evaluation advocated in the literature (Israel *et al.*, 1995; Rossi *et al.*, 1999; Louw, 2000). These are process, impact and outcome. In the evaluation literature, the impact and outcome evaluation is sometimes reversed so that the immediate consequences are referred to as the outcome and the long-term influence of the programme is the impact. In this study we follow the established use of the terms in biomedical and health services research in which impact refers to the immediate effect the programme has on the objectives. Outcome evaluation is the long-term ultimate effect we hope the intervention has (in our case the prevalence rate which is the indicator of health status).

This chapter tackles the process evaluation of the study. As indicated in chapter 2, evaluation is best done as the intervention is in progress to ensure optimum feedback that enables continuous realignment to meet the objectives of the intervention. Process evaluation is about the monitoring of the implementation of the intervention. Process evaluation informs on the process of the programme itself. It is therefore the first information on the programme to be available. It serves to describe the extent of participant exposure and elucidate the dynamics of programme operations (Israel *et al.*, 1995). In this study the evaluation of the process of the intervention occurred at two

levels. One level was the formal evaluative level, which comprised focus group discussions, monitoring the programme through reports and field notes during the duration of the intervention. The other level was the more informal one in which the process of the programme was manifested through specific events that occurred in the life of the programme. The analysis and follow up of these specific events informed the informal process evaluation. The material garnered from this level was equally important and essential, if not more informative of the community's response to the process of this study. These events had the potential of disrupting the delivery of the programme and thus had to be noted. It is at the process evaluation that a closer more introspective look is taken at the researcher and the community. Process evaluation enabled me to observe closer, my part in affecting the dynamics that arose as a result of bringing an intervention to bear on the community. It enabled me to fine-tune the programme to be more in line with our objectives. This chapter will begin with an evaluation of the process through specific events that occurred. This will be followed by more formal evaluation elicited through FGDs and interviews. Finally, the chapter will tie this all together and draw on social psychology to furnish explanations of these processes.

7.2 Specific Key Events

In the course of the two years of the implementation stage of the intervention, there were certain specific events that were not planned for but had an important bearing on the health education programme. By taking a closer look at these selected key events (for there were so many), we were able to make changes and adjustments to the intervention as well as the orientation of the programme. These events are first, the resignation of Simon the health educator, second the absence of one of the patrons, Ken, third the second last display at Makawa school and finally the final display at Koche school.

Key event 1. Simon's resignation

In September 1997, the health educator, Simon S, resigned from the job as he had received a more lucrative offer with another project in a different district. The LMBC Programme had previously decided that it could not afford to renew his contract for

another year at the end of 1997 when his present contract terminated. It was sad to see him go prior to his completing the first year. However his departure now meant that for the remainder of the first year as well as the final year of the programme, the teachers in the schools who performed the role of patrons, would now take over the running of the clubs. It was felt that this would be a good transition that would ensure sustainability of the programme after the programme formally ended at the end of 1998. Simon had been leading all the health club meetings and as such after he had left, his absence was strongly felt. It transpired through individual interviews with the four teachers who were part of the Bilharzia Club committee, that in both schools where the clubs were running, the teachers felt totally inadequate and unable to run the club on their own as they had been dependent on Simon. Whilst Simon made every effort under my supervision to train the teachers in running the clubs, they seemed somewhat reluctant to do so, feeling that since Simon was there he should do the work. To them, Simon was seen as a specialist health educator. The teachers thus did not make an extra effort to learn the material confidently enough to run the clubs on their own. We tried to give them opportunities to lead meetings, which they happily did, provided it was under supervision. The teachers were keen to do things the “right” way and felt Simon was best suited to do this. Perhaps the very presence of a full time health educator interfered with the sustainability objective of the teachers eventually taking over the running of the clubs. After Simon had left, the clubs stopped running for several weeks, as there was reluctance on the part of the teachers to run the clubs. It was decided to start the clubs again with the Child-to-Child steps in January 1998 when the new academic year began. However only one teacher, Ken M, was keen to continue when the academic year began in January 1998. The others refused to continue citing pressing commitments elsewhere.

Key event 2. Ken's absence

To add to the “staffing” difficulties of the intervention, Ken M, left the school in February 1998, soon after the start of the new academic year, for a three month absence to undergo further teacher training in Blantyre the commercial city. His departure meant that none of the teachers involved in the clubs the previous year remained. Mr. G. stepped in saying that he would run the club. He had not received any of the training

from Simon and was thus a novice to the field. I spent a fair amount of time training him on the basics of the Child-to-Child steps. Despite his best efforts the club floundered and struggled and the meetings were somewhat intermittent. When I was away from Mangochi the meetings would hardly take place at all. No other teacher was willing to come forward and Mr. G. put in his best effort. It was after the second term, in May 1998 that the Bilharzia Club at Koche picked up again following the return of Ken. He came with a zeal and momentum that quickly re-established the club on sound footing. The most powerful lesson garnered from this was the importance and in many ways dependence that interventions such as this one, have on the character of the individuals concerned. One may provide adequate training but if there is no zeal on the part of the individuals, then regardless of how meticulously an intervention is planned, there shall be difficulties. The wider implication of this is that if a programme is to be implemented, it would work if there is an enthusiastic person. Any programme therefore needs to be robust enough to handle the variability of characters. This dependence on character created another dilemma for the intervention. In one of the schools outside the study area there was a zealous teacher who started a Bilharzia Club there. He wanted interaction with all schools in the intervention for the children to encourage and support one another. However such interaction would have polluted my scientific investigation. Whilst on the one hand, it may have been very beneficial to the children (whose health we were concerned with in the first place), it would have polluted the data. The question I had to face at some stage was, was this study using the children's health status to meet a scientific requirement or was the scientific requirement the means through which I would address the health of the children? Which was the end and which was the means?

Key event 3: The sports teams

One of the suggestions put forward by Ken upon his return, was the need to buy footballs and netballs for the club to have a more effective outreach. We were to also get skipping ropes for the girls. This was duly done in May 1998 and the balls and a skipping rope were presented to the club members. These were displayed to the rest of the school at morning assembly as an incentive to encourage others to join. The Koche Bilharzia Club now had a football and netball team. The teams sought to primarily create awareness in

the school and in the local community by participating in football and netball matches with various local teams as well as by organising various friendly social football matches after school hours for the pupils. The strategy was to give a brief talk at the end of the game where basic knowledge about schistosomiasis would be disseminated. An additional strength of this approach was that it provided a continuation of the outreach during school holidays as the Bilharzia Club football and netball teams continued to have matches and disseminate the basic information outside the formal school setting. A very important strength of the establishment of the teams was their outreach to children who do not normally go to school. They were able to hear the message about the disease under the baobab tree, many for the first time.

After a period of several months I began receiving complaints from some of the other teachers that the footballs were being kept at Ken's house and that they were not accessible to the rest of the school. It was as though Ken had personalised the footballs. When I enquired further on the matter it transpired that the school authorities had felt bypassed in my having presented footballs to the Bilharzia Club when the school did not have a single football for the rest of the pupils. The authority structures felt bypassed by our "good" intentions to provide the club with sporting equipment. As a result whenever we wanted to bring in new equipment to the schools we ensured that that was cleared with the school authority structures first and was presented through the headmaster to the whole school. We wanted to avoid the club being seen as a separate entity from the school.

Key event 4: The prize giving at the displays

Towards the end of term 2 in 1998, a display was held as usual at Makawa School. The function went off very well and the students performed amicably. During the course of the display, when it came to my turn to make speeches, I took the opportunity to award the best male and female participants with a backpack as a prize for their efforts. This was to be followed by the usual drinks and biscuit celebration after the display was over. I chose the recipients of the prizes and, to the applause of the crowd, they came forward to receive their prizes. It was soon after the ceremony was over that I noticed that several

of the female club members were very upset and angry over the awarding of the prize. This included the chairperson of the club. They came over to me after the ceremony and complained very bitterly that they had worked extremely hard in the displays and had expected to receive the prize. I informed them that only one male and female could get the prize and it was not done at all to denigrate any of the other participants. Its main objective was in fact to encourage the club members. They expressed outrage and threatened to quit the club altogether. They boycotted the after-display party. One of the teachers at the school having observed what transpired called me aside and advised that in future, I should not select certain individuals from the group. If I wanted to give out a prize it should be done to the whole group. The presenting of ball pens or something which every one could feel inclusive would be more effective than giving out special prizes. This was a lesson I did not forget in a hurry and ensured that for the following displays there would be no special prizes to a select few. If I wanted to give out a prize it should be done to the whole group. The presenting of ball pens or something which every one could feel inclusive would be more effective than giving out special prizes. Fortunately all amends were made and the members who were upset continued active participation in the Club.

Key event 5: The Koche final display sabotage

In November 1998, a final display was held at Koche School. The headmaster had told all the pupils and teachers that classes would be cancelled. The school was to gather by the big tree under the hill from whence everyone would watch the display. The pupils all came. However I noted that instead of the usual turnout of many teachers, there were only two in addition to the patrons of the club. The display programme started. After a few songs and poetry recitals there was suddenly a mass exodus of the pupils in the middle of the programme. Shocked and embarrassed the headmaster tried to find out what was happening. The programme was put on hold. What had happened was that some of the teachers had sent a few pupils to come to the meeting and tell the rest that they would be writing mock exams and that any pupil who did not come right away would fail the year. The pupils thus all heeded the call and rushed to their classrooms. It was not even exam time yet, and the date of the programme had been clearly selected to

ensure minimal disruption to the school programme. With half the audience there we continued with the programme. The headmaster was apologetic and said he would deal with the situation. When I followed the issue up later it emerged that some of the teachers felt resentful towards the Bilharzia Club because it was perceived to be giving money to the patrons only and depriving other teachers from receiving money.

I experienced other attempts to frustrate the Bilharzia Club during the course of the final year. It was commonplace, for example, for some of the teachers to deliberately detain some of the pupils during time for the club meetings under the apparent pretext of pressing work. Another teacher at Koche who was patron of another club, which met on different days, deliberately shifted his club's meeting day to coincide with ours so that there was a clash of interest among the members. The issue of money was again the underlying reason for these acts. The "money" issue is discussed in detail in section 7.4 below.

We turn now to look at more formal aspects of the process evaluation, the club reports and focus group discussions. The formal aspects of the monitoring were put in place to ensure that the programme was in fact doing what it was supposed to be doing.

7.3 Club Reports

During the first year, Simon wrote the reports about the activities of the Bilharzia club meetings. Koche School had about 45 club members whilst Makawa School had slightly over 20. The club reports served as a means of verification of the meetings and for monitoring the health education delivery. After Simon departed, the responsibility of writing the reports of the weekly meetings was left in the hands of the patrons of the clubs. I spent time with them describing what should make up the contents of the reports. It was important that the reports not only state the facts but also describe the process of the meetings as well as the impressions the patrons had of the meetings. They were told to ensure that the numbers of those who attended as well as the questions asked were

recorded. One of the patrons was to act as secretary. Despite this, the initial reports were somewhat vague as can be seen from the brief report of the meeting held on 5th February 1998 at Koche School:

We did step one of our programme which involves the understanding of bilharzia. Therefore we discussed that bilharzia or schistosomiasis is a water-borne disease caused by a germ called liver fluke which lives in snails. It is very common in swampy areas and Nigeria is the best example where this disease is found very common and other tropical countries. The germ of this disease attacks the bladder of an infected person and it has the following signs and symptoms: blood in urine, pain in low down in the stomach and sometimes kidneys are damaged. Pupils who were present on this day were twenty and asked the following questions:

- 1. Why a person infected by bilharzia urinates bloody urine?*
- 2. How can bilharzia be controlled?*
- 3. How long does a liver fluke live in a snail?*

Evaluation

I was really impressed by the activeness of the pupils because they all participated fully during the whole period of one hour.

I personally reviewed the reports when they were handed in at the end of the month. I then asked more specific questions. For example I would ask how the patrons responded to the questions asked by the pupils and whether there were any further questions asked. Ice breaking activities were encouraged. These occurred but were not initially recorded in the reports. Further probing and cross checking indicated that at times the reports were written several days after the meeting or done for the purpose of ensuring they were submitted prior to my arrival. This contributed to the patrons forgetting some of the events and crucial aspects of the process that could have been captured were lost. However I can confidently report that the meetings occurred. This was ascertained by independent corroboration with the children and by spot visits.

By the time the study was drawing to an end the quality of reports was higher, as indicated in this example from Makawa school report of 3rd September 1998. I have selected this example because it demonstrates how the reports were able to contribute towards evaluating the process of the intervention.

Time: 1.00 – 2.00pm

Venue: Standard 6 [Classroom]

Patrons: 2

Pupils: 12.

Topic: Review on the second term's failures and achievements

During this term we discussed the above mentioned topic. The meeting started with a song titled "Likodzo lachabe" ["Bilharzia is bad"].

Mr. Gambuleni [one of the Patrons] made a welcoming speech. After this he asked some of the pupils to state some of the problems they faced during the second term. The problems raised by the pupils were as follows:

- 1. Lack of control of pupils by members of staff during the displays.*
- 2. Some teachers in other classes release the pupils in their classes late i.e. after 12.50 p.m. which makes it difficult for the pupils to be punctual for the club meetings.*
- 3. The club lacks materials such as charts and pens which were also needed for the smooth running of the club.*
- 4. The prizes presented during the day for the displays were not enough.*
- 5. The tokens given to the pupils should be items relevant to their education rather than sweets i.e. during the time when they are helping with the presentation of medicine (drugs) and weighing the pupils.*
- 6. The pupils said that if possible remember them with what they were promised i.e. balls, T-shirts etc.*

The patron Mr. Gambuleni assured the members that their problems will be presented to Mr. Chiwoza Bandawe.

Mr. P. Kamoja [another patron] took the floor after the first patron had discussed with the pupils the failures during the second term. He discussed with the pupils the achievements of the club's activities during the second term. The following were some of the achievements made:

The members assisted during the different campaigns i.e. weighing and sampling urine.

The members were involved in a major display day at which the patron invited visitors from the U.K. This was also appreciated by the members including the patrons.

There is co-operation among the headmaster, teachers, the patrons and pupils. This has been brought about due to the club's activities.

The most important of all the achievements was that the patron's latest release of the results of Bilharzia made the members very happy because with the 29% out of 78% result showed that the club too had on the other part contributed a lot apart from Mr. Chiwoza Bandawe who work tooth and nail to assist with the eradication of bilharzia among the pupils.

At the end of our meeting the members discussed about the future plans for the club. The following were the contributions from both the patrons and pupils:

- 1. There is need to work more seriously with the clubs activities in order that Bilharzia should be reduced or even the message should reach everyone in the area.*
- 2. There is need to create and formulate different approaches to the community.*
[Further probing of this statement indicated that what was meant was the active involvement of the health club members in involving the community. This was not particularly encouraged as Makawa was the medium intervention school]

Signed Mr. Gambuleni and Mr. Kamoja [Patrons of the club]

Reports such as these were followed up immediately. I would hold a debriefing meeting with the patrons and go through the issues raised in the reports. With the above report for

example, efforts were made to provide the necessary materials to ensure the programme continued to run smoothly.

7.4 Themes Emerging From The FGDs

The focus group discussions (FGDs) were conducted to inform us of the people's concerns about the programme. The findings were generally not used to modify the programme since they came towards the end of the life of the programme. A second series of FGDs were held in the schools and communities during the evaluation phase of the intervention in July 1998. To ensure objectivity since I had been actively involved, one of the final year students at the College of Medicine conducted the FGDs. I was not present during the FGD sessions but joined him later for debriefing sessions and write up of the FGDs. The procedure followed the same format as the FGDs conducted in the social diagnosis.

7.4.1 Subjects

Ten FGDs were held with the following persons in the schools:

Koche School

1. Bilharzia Club members (n=8)
2. A group of "neutral" students who were not members of the club (n=8)
3. Teachers and the headmaster (n=7)
4. The School Committee (n=8)

Makawa School

1. Bilharzia Club members (n=8)
2. A group of "neutral" non-club members (n=8)
3. Teachers and the headmaster (n=7)

Lwangwa School

1. Teachers and headmaster (n=6)
2. Students at the school (n=8)
3. School committee (n=10)

In addition, interviews were conducted with the patrons of the Bilharzia Clubs at Koche and Makawa Schools; some of the local band members; a “neutral” Health Surveillance Assistant who had not been involved in the programme, and a teacher at Lwangwa who was involved in teaching schistosomiasis to the children in class. The District Environmental Officer was also interviewed and so too the pharmacist at the local district hospital.

7.4.2 Emerging themes

From the interviews and focus groups with those described above, the following themes and issues emerged:

1. That the intervention was seen as having been initiated with the primary objective of assisting tourism in the area and not necessarily for the primary benefit of the population.
2. Incentives in the form of money should be made accessible to all involved in the programme. Club members felt T-shirts to give them a distinct identity would be important.
3. The intervention would have been more effective if it reached out to the villages beyond the schools.
4. Sustainability is dependent on ongoing supervision and support.

We shall examine each of these themes in more detail, because these findings have ramifications for the process of the intervention.

i) *Programme started out to help tourists:*

There was a sense among the adult participants of the FGDs that the programme was initiated to improve tourism that would enrich the country without improving the economic situation of the locals in the area. In virtually all the groups, when asked what they saw the objective of the programme to have been, they mentioned the reduction of schistosomiasis with a view to bringing back tourists. Salient quotes include:

“This programme has come to wash away the bad picture of the lake” (Male teacher at Koche School)

“As Malawians we should help the government, especially since the government finds a lot of money through the tourists. Therefore those of us who live in this area have a responsibility to the government to help them contain the spread of the disease so that we can get many tourists. If many of us get ill then the tourists will not come here” (Bilharzia Club Patron, Makawa School)

Participants felt that the benefits they would get from the study were secondary or offshoots of the real objectives which was to lure back tourists. The political agenda of the study was immediately apparent to the adult participants in the focus group discussions. They assessed that this study was for the benefit of the government and they wanted a share of the benefit. They were attuned to the agenda of the project and were able to respond to it at that level immediately. Whilst I wanted them to focus on the “study” as I saw it, the adults in the FGDs homed in on the broader picture and background perspective. Who was to be the real beneficiary of the project? The community felt that it was being “used”. This response is consistent with findings elsewhere with regard to assistance from aid agencies and power relationships in community participation (Carr, 1996; Carr *et al.*, 1996).

The different degrees of health education input were reflected in the qualitative evaluation responses of the communities interviewed. A local chief around the area of

the minimum intervention school, Lwangwa, voiced concern about the study focussing primarily on improving tourists as opposed to helping the children:

“We do not know the objective of the programme. Is it to take care of the children who have the disease or is it to take care of the tourists?”

Such a comment on the objectives of the study reflects more the minimum intervention school because people in the areas of the maximum and medium schools knew what the objectives were because we were constantly seen in the area. At the beginning of the LMBC Programme, we had as a courtesy visited some of the chiefs around the minimum school area to inform them of our activities in the schools. However because we restricted our visits to Lwangwa to feedback sessions to staff and to the times we gave out medication, the local community were not kept abreast of the programme until the evaluation. The responses of the surrounding communities to the question “what do you think were the objectives of the study?” served to confirm the levels of input. This was reflected by the responses. Paradoxically the fact that focus group members at Lwangwa School were not so aware of the programme is an indication of the integrity of the programme, which was guided by different levels of health education input. It verifies that Lwangwa was indeed a minimum input school. This is further confirmed by an interview with the headmaster at Lwangwa who complained that at times they felt the programme was not paying them enough attention.

ii). Incentives and the money issue

Whenever the need arose, an allowance was given to teachers for assisting in the programme. The need arose in the instances for example where teachers who assisted with the parasitological investigation, by helping organise the children and the dispensing of the drugs, were given a lunch allowance of MK 25 per day. This amounted to US\$1.00 per day at the exchange rates of the time. Whenever the teachers would be paid, first Simon and then I, would constantly receive complaints from teachers that the money given was not enough. Some felt it was an insultingly insignificant amount. At that time, I did not control the dispersion of the funds as it was in the hands of my expatriate colleague attached to an NGO. When she left at the end of 1997, the financial aspects of the programme were left in my care. Some teachers and health personnel made

same with your project, if you take care of us, we shall see to it that it continues. But as it is now [without a “package”] we just sit and observe that those who are benefiting are the owners.

For the school children, incentives took on a slightly different focus. Makawa School Bilharzia Club members spoke of incentives centring around “gifts” in the form of T-shirts, something to serve as a memento their club experiences. This centred to a large extent around the issues of identity (Levine & Moreland, 1994) in order to stand out distinctly from the other clubs and pupils. Some salient comments:

“When I joined this club I was looking forward to getting gifts as mementos so that when we are at secondary school we can be saying we got this gift from the Bilharzia Club. At present we are working for free, we are not being given anything” (female member).

Another participant said: *“all we get is a drink after the display and we just pass it out in urine, nothing to remind us of the event, even the bottles will be forgotten”.*

iii) Programme should reach out to others

The major weakness of the intervention according to all participants was that it focussed exclusively on the schools and did not reach out into the neighbouring communities where the disease was widespread:

“You only reach the school. This is not good enough. You should come to the chief’s house so we can get all the children to come and receive treatment, not just at the school. Our water comes from the lake. The government should look towards treating all the people because if you treat children only, then those adults who have it will re-infect them. Reach out to adults as well”. (Community leader around Lwangwa School)

Many respondents felt that the number of children who did not go to school in the area was greater than those who did, and it would be crucial to reach out to the non-school going children.

“If we do it only here then how about the other areas? We need to reach them. Like the AIDS club, they just concentrated on this place. It therefore became a problem. There is need to reach out. Hence people shall get bored if we just focus on the school. It becomes monotonous.” Lwangwa female teacher.

Bilharzia Club members at Koche School said they felt it was important for the club to be left money to be able to travel to spread the message further:

“The programme can go well and end, but without reaching into the community we would have achieved very little” said a Patron at Makawa School.

One very interesting sub theme that emerged was the suggestion of competitions between the intervention schools. Carrying out this suggestion would go against the experimental aspect of the study. There were frequent suggestions for interactions between the various members of the different schools to learn from each other and “work together” to deal with the problem. These requests were all politely refused as it interfered with my research agenda.

Respondents therefore did not see the intervention as a specialised homed in, narrow-focussed study, but as something that should reach out and affect all areas of their lives. Given the prevalent normative ethos and community spirit, participants wanted everyone in the community to benefit from the intervention and not just the schools. This reaffirms the normative findings of the theory of reasoned action application described in chapter 5.

iv) There is the need for sustained ongoing support

The final theme to emerge from the FGDs centred around issues of sustainability. Participants were aware that I was about to leave and were therefore asked about sustainability of the programme in my absence. Most participants felt that the programme would continue but would need constant external input to maintain it. Salient quotes:

“We need someone who shall assist us, we shall do better if there was someone from around who would work with the local leaders” (Koche School teacher)

*Participant : We are not encouraged and we therefore
cannot run the programme on our own*

Facilitator: What can be done to encourage you?

Participant: Supervision.

“You know more therefore we rely on you to assist us”

“Without it [supervision], this programme shall die”

Some non-club members at Makawa School held a different view concerning my departure:

“If he goes then the club collapses. People were encouraged by his presence”(Female participant). However not everyone held this view, in the same FGD a male participant conceded that “if someone were to be found to lead the clubs, the programme would continue.”

Participants felt strongly the need for a workshop or seminar that would give them the basic skills in health education of schistosomiasis. Some felt that in addition, they should be given medication to distribute:

“There is no use in giving us the message without giving us medication” (Koche School Bilharzia Club member).

At Koche and Makawa Schools, there was also an implication emerging from the FGDs that the problem of schistosomiasis was the sole responsibility of the Bilharzia Clubs.

“I plead with the Bilharzia Club to be determined, if they are then the disease will die. They should not give up” one non-club participant at Makawa said. Another said:

“I see that if the Bilharzia Club members really put in an effort, the disease would be brought under control”.

A female teacher at Makawa School reflected the same sentiments, highlighting that the teaching of schistosomiasis was the responsibility of the Bilharzia Club:

“I feel it is not my work [to teach about schistosomiasis], I’m not involved and it is for those people who are involved to teach the little ones or everybody here at school”.

The instituting of clubs therefore seems to give the non-club members an absolution from being actively involved. It is as though the problem is now left to “specialists” such as club members and patrons and is no longer seen as the whole school’s effort. This line of thinking is confirmed by the absence of such sentiments among the pupils in the Lwangwa FGD. They were more accepting of personal involvement in combating schistosomiasis. It seemed as though they did not have someone to pass the responsibility on to.

7.5 Discussion

Specific events that occur in the course of an intervention have received scant attention in the literature as a valuable evaluation tool. I learnt so much from these unplanned events that occurred in the course of the intervention. The events (such as Ken’s absence and the final display sabotage) very much informed and guided the evaluation in addition to the formal evaluative procedures such as club reports and FGDs. We tend to want to formalise process evaluation. We can also learn from events and incidents that are not planned for. These events need however to be interpreted within the cultural context in which they occur. Social psychology can also be called upon to furnish explanations:

Funding was never discussed with the community. When the budget was drawn up, it was the co-ordinators of the LMBC Programme who determined what the remuneration would be. There was thus a clear inequality that went against the ethos of community participation, which was an important framework in the guiding of this intervention. The community made it clear that these differences were important. An explanation of this dynamic is contained in social psychology when seen in the context of one of the five

modes of social psychology as “development” (Carr, 1996). Carr (1996) argues that this “pay me!” culture as witnessed in this very intervention, represents “an attempt to remove the imbalance between a ‘powerful’ and yet ‘removed’ donor and a ‘dependent recipient’.” (p.189). In essence he argues, the money issue experienced in the process evaluation of this intervention could be an assertion of human dignity and social identity on the part of adult participants. Hence there has been a “realisation” (which is a mode of conducting social psychology in Malawi) that development practices and policies have a tendency to be distorted. The “pay me!” culture is an attempt to rectify this distortion or “donor tyranny” (Carr *et al.*, 1998). Viewed from this social psychology perspective, some of the dynamics witnessed in the process evaluation can be accounted for. Such an approach concurs with Ager’s (1993) assertion that the processes of psychology needs to be taken into consideration as opposed to relying only on the meeting of set goals. We entered this programme with a political agenda, to tackle the perceived threat of a decline in tourism. Mangochi is also an area that has been at the brunt of much donor agency involvement. Carr asserts that empirical findings indicate that such areas have a significantly “pay me!” reaction (Carr, 1996). As Green & Kreuter (1991) point out, schools have different objectives and missions from health educators. Most of the teachers in the three schools wanted to be paid more than the meagre US\$ 2.00 we were giving them for assisting with the treatment of the children. They thus wanted remuneration for their time and effort especially since we were asking them to go beyond their job description, which was to teach. People have other needs apart from what the programme could bring them (Carr *et al.*, 1998). The concept of reciprocity forwarded by Carr *et al.* (1998) was clearly seen in this intervention as highlighted in the extensive quote on remuneration above. At one level, aid or assistance is perceived by recipients to be an undermining experience in which something is taken away by the aid providers (time, self-respect, pride, dignity and collective autonomy). Hence, in line with the norm of reciprocity, the thing taken away from recipients must be repaid somehow. In the quote above, the “package” was seen as compensation for extra time the teachers put into this programme. The demand for payment therefore was an attempt to be paid for what was lost.

The prize-giving event taught me that if I wanted to give out a prize it should be done to the whole group. The presenting of ball pens or something to which every one could feel included would be more effective than giving out special prizes. This event can be understood in the context of the “pull-down” motive in social psychology, which explains the social costs of individual achievement (Carr *et al.*, 1995). There is growing empirical evidence from Malawi that whenever someone excels at work or in business, he or she is more likely to receive discouragement rather than praise. Reasons for these reactions have been attributed to a desire for equity and group coherence. Hence when one succeeds they “leave” the group (An Afrocentric Alliance, 1998).

The process evaluation of this study therefore supports these social psychology interpretations of events (Carr *et al.*, 1998) which undoubtedly have implications for health education delivery. In hindsight, whilst we sought to get the community to voluntarily take responsibility, a more tangible approach that may not have offset such strong dynamics was “negotiation and bargaining” (Carr, 1996) or “incremental hypothesis” (MacLachlan, 1997; Ager, 1991). Programme designers tend to forget that psychological change takes longer than technological change (Fishbein, 1997; Carr *et al.*, 1998). Usually intervention programmes have limited time scales (two years in our case) and these usually are not enough to see lasting change effected. Hence the temptation is to effect immediate and major changes without working on creating the necessary environment. The more aid agencies try to change the less they can sustain (Carr *et al.*, 1998). Ager (1991) suggested that behavioural change is more likely to gradually occur if there is an element of consistency in the programme. We thus tried to ensure that the programme delivery was as consistent as possible, ensuring that the club meetings took place each week during school time.

The issue of specialisation is a theme that came through the process evaluation. At the outset we saw how having a specialised health educator impeded teachers from being keen to run the health clubs. The instituting of clubs at one level also appears to have made communities or schools where the clubs were in place dissolve all their own individual responsibilities to the clubs. When you take a select group of persons from the

communities and home in on them they become seen as the “specialists” who need to deal with the issue or problem without much “interference” from the rest of the community. The schistosomiasis problem thus became a Bilharzia Club problem in the schools where the clubs were in place. Furthermore it is clear that the scientific agenda of the intervention clashed with the ethos of community. Subsequently, where it was suggested as necessary to reach beyond the schools or to get the schools to come together, such positive developments would “hinder” my scientific research base. Through the ongoing process evaluation, the community made it clear as “partners” that were in this together, that we needed to broaden our horizons and improve or rectify our intervention to become more effective. Because I had entered the programme with a scientific agenda however, those useful community-based contributions could not be incorporated. Having a pre-set agenda therefore interfered with the process evaluation because there were certain things I was not prepared to realign to fit in with the overall objectives of the study which was a reduction in prevalence and an assessment of the different degrees of health education input.

7.6 Conclusion

When an intervention is implemented in a given community, a chain of reactions and counter reactions to the programme is set off. These reactions and counter reactions may have important bearings on the uptake of the health education message and the extent to which it can effectively impact the given community. Process evaluation helps inform this. The process evaluation of this intervention helped explain or make adjustments for unexpected dynamics that arose in the implementation of the health education. We are, after all, dealing with a social world that is

“ not static and mechanistic, but dynamic and changing, encapsulated by and redefined continuously by the symbolic systems of thought and language through which human beings fashion their physical and social universe ” (Stringer, 1996, p.8).

It is difficult to assess exactly what effects the dynamics witnessed in the process evaluation had on the impact or outcome of the evaluation. However one very important aspect of this investigation is to evaluate the extent to which different degrees of health education input impacted on knowledge, attitude and practice as well as intentions and subsequently behaviour of the children under investigation. We turn now to impact evaluation.

CHAPTER 8

IMPACT EVALUATION

Impact evaluation was used to assess the immediate effects that the intervention had on the target behaviours (Green & Kreuter, 1991). In this study we sought the immediate indicators of knowledge, attitude, practice, intention, normative perceptions, perceived behavioural control and immediate reduction in prevalence, which is discussed in the following chapter. This chapter begins with a quantitative assessment of shifts in knowledge, attitude and practice. This is followed by an exploration of shifts in intention.

8.1 Shifts in Knowledge, Attitude and Practice

8.1.1 Introduction

The second Knowledge, attitude and practice (K-A-P 2) was administered in July 1998 towards the end of the programme, to see how the different degrees of health education input had influenced any changes in knowledge, attitude and practice in the schools.

8.1.2 Participants

There were two categories of participants who were analysed separately. The first category comprised pupils who were not members of the Bilharzia Clubs in the schools. This was done to enable fair comparison with the first K-A-P when no Bilharzia Clubs were in place. The second category contained pupils who were members of the Bilharzia Clubs. They would be compared with the rest of the pupils in the schools where Bilharzia clubs were established.

Category 1: A total of 940 pupils completed the questionnaire. Of these 312 were from Koche, 311 from Makawa and 317 from Lwangwa. Similarly to K-A-P 1, 46.4% of the respondents were females with males comprising 53.6%.

Category 2: Since the health education was focussed on members of the Bilharzia Clubs, it was necessary to separate them and compare them with non-club pupils. Club members' level of knowledge, attitude and practice should be different from the others if

the concentrated health education input they received is to be seen to have been effective. We therefore asked all club members to fill in the questionnaire. Those who were present on the day of administration and completed the questionnaire satisfactorily to enable analysis were 27 at Koche and 18 at Makawa School making a total of 45 pupils. Girls made for 64% of the respondents (N=29) and boys 36%(N=16).

8.1.3 Procedure

Data collection methods were similar to those described in chapter 5. The very same questionnaire as K-A-P 1 was utilised. It had not been modified in any way.

8.1.4 Results

K-A-P 2 results were similar to K-A-P 1 findings for demographic and sanitation variables of the subjects. A similar pattern existed with regard to gender of respondents, head of family's occupation, number of siblings and religion. This suggests that during the two-year intervening period, there were no major demographic shifts in the Mangochi population. Sanitation background findings in K-A-P 2 were also similar to K-A-P 1. The same percentages were noted in response to the question "Do you have a latrine at home? / At school?" Students reported the same number of times they went to the lake in a day and the same activities they engaged in whilst at the lake. These similarities help add credence to any comparisons between K-A-P 1 and K-A-P 2.

Category 1:

The increased importance now attached to schistosomiasis was noticeable in the results. When asked to list some of the diseases in their village, pupils ranked schistosomiasis the highest (35.3%), followed by cholera (33.4%) and malaria (18.6%). During K-A-P 1, malaria had the highest rank. At K-A-P 2, in response to "which disease do you consider the most important?" pupils rated schistosomiasis the highest (27.1%), followed by cholera (22.7%) and malaria (11.1%). 24.8% of the respondents refused to specify one particular disease as "important" saying that all diseases needed to be addressed.

8.1.5 Category 1 Knowledge changes

Knowledge was assessed at K-A-P 2 using the same single score procedure as was the case at K-A-P 1. Results are presented in Table 8.1 below, which includes the K-A-P 1 knowledge score to enable comparisons with K-A-P 2. To recap, there were six knowledge items each with a score of 1. The closer the scores to the maximum of 6, the more knowledgeable the sample.

Table 8.1: Knowledge Changes K-A-P 1 and K-A-P 2 using single knowledge score

School	K-A-P 1 Mean (SD)	K-A-P 1 95% Confidence Intervals	K-A-P 2 Mean (SD)	K-A-P 2 95% Confidence Intervals
Koche	4.08 (1.17)	3.97 – 4.20	4.36 (1.37)	4.21 – 4.52
Makawa	4.15 (1.17)	3.99 – 4.30	4.04 (1.42)	3.88 – 4.19
Lwangwa	4.15 (1.52)	3.95 – 4.35	4.10 (1.33)	3.96 – 4.25
Population	4.12 (1.28)	4.03 – 4.21	4.17 (1.38)	4.08 – 4.26

No significant shifts in overall knowledge for the whole sample were observed between K-A-P 1 and K-A-P 2. The school manifesting the largest mean increase was Koche the maximum school whose knowledge score increase from 4.08 to 4.36. This increase was statistically significant, as the confidence intervals of the two means do not overlap. The lowest point of Koche’s K-A-P 2 confidence interval is greater than the highest interval point of K-A-P 1. The other schools however witnessed no significant changes in knowledge. These results would seem to suggest that a maximum input leads to a significant increase in knowledge levels of a disease. By K-A-P 2, Koche, which previously had the lowest knowledge, mean score, now had the highest of the schools. Koche’s mean score was significantly higher than that of Makawa the medium intervention score. Makawa, the medium school’s mean score was the lowest though not statistically different from Lwangwa. As far as knowledge levels is concerned therefore, it would seem that a maximum intervention drawing on community participatory, normative and individual information input has a greater impact than an intervention that

focuses only on individual or normative information input that excludes outside community participation.

8.1.6 Category 1 Attitude scores

We turn now to compare whether changes in attitude result from different degrees of health education input. To recap, there were three attitude items. Hence, the higher the mean score to the possible maximum of three the more favourable the attitude towards factors or behaviours that reduce schistosomiasis.

Table 8.2: Attitude changes K-A-P1 and K-A-P2. Comparison of single attitude score

School	K-A-P 1 Mean (SD)	K-A-P 1 95% Confidence Intervals	K-A-P 2 Mean (SD)	K-A-P 2 95% Confidence Intervals
Koche	2.81 (0.41)	2.77 – 2.86	2.76 (0.47)	2.72 – 2.82
Makawa	2.79 (0.44)	2.74 – 2.86	2.77 (0.45)	2.72 – 2.82
Lwangwa	2.76 (0.49)	2.70 – 2.82	2.75 (0.49)	2.70 – 2.81
Population	2.80 (0.44)	2.77 – 2.83	2.77 (0.47)	2.74 – 2.80

No significant changes were observed in means between K-A-P 1 and K-A-P 2 and across the schools receiving different levels of health education input. In fact the means of the population declined between the two K-A-Ps. Koche School’s mean was no longer the highest at K-A-P 2. However the differences between the means is so exiguous that it would be fair to say that no changes in attitude towards the disease have occurred between K-A-P 1 and K-A-P 2. What we need to ascertain is the cause of this apparent similarity. Is it due to the measuring construct itself not being adequate to assess attitude or is it that health education input has not affected attitude? As mentioned earlier the conventional use of Likert scales to assess attitude was not utilised. In this study the attitude items were really “either/ or” constructs to which respondents had to choose which group they placed themselves in. There thus really could not be much opportunity for shifts or change since the question response scoring was very limited. The K-A-P

questionnaire itself therefore has to take the brunt of the blame for the similarity of the responses. People could not place themselves at positions along a continuum that would have more clearly showed shifts in attitude towards the object being measured. As indicated earlier, it was felt impracticable to assess attitude of the children using conventional means as young children might struggle to place themselves on an abstract continuum. Furthermore attitude construct writers (e.g. Likert, 1967) call for neutral statements that give direction of “intensity” of the individual’s attitude towards the object. Attitude statements should typically be expressions of desired behaviour and not statements of fact. By stating that an aspect of the disease is either “good” or “bad” is placing a judgement on the situation and is drawing on facts. To assess attitude more adequately therefore, another measure would have to be used. Thus, we cannot conclude that attitude is not affected by different degrees of health education input because of the concerns raised above pertaining to our attitude measuring instrument.

8.1.7 Category 1 Practice

We turn now to an assessment of practice. Does the input of different degrees of health education, lead to any significant changes in practice? Practice was assessed by two items. The first was, “Where do you urinate when you are at the lake?” All responses apart from “in the water” were given a score of “1” because urinating out of the water was considered a positive practice. Like the knowledge and attitude scores a “1” score indicated positive states or action from a schistosomiasis reduction perspective. The other practice question pertained to action taken if or when infected with the disease: “What would you do if you had Bilharzia?” Table 8.3 below summarises the means of practice scores both for K-A-P 1 and K-A-P 2. The closer the mean is to the maximum score of two, the greater the behaviour that complies with schistosomiasis reducing action.

Table 8.3: Practice changes K-A-P1 and K-A-P2. Comparison of single practice score

School	K-A-P 1 Mean (SD)	K-A-P 1 95% Confidence Intervals	K-A-P 2 Mean (SD)	K-A-P 2 95% Confidence Intervals
Koche	1.87 (0.36)	1.83 – 1.90	1.71 (0.49)	1.66 – 1.77
Makawa	1.85 (0.36)	1.80 – 1.89	1.61 (0.51)	1.56 – 1.67
Lwangwa	1.76 (0.46)	1.69 – 1.82	1.62 (0.52)	1.56 – 1.68
Population	1.83 (0.38)	1.81 – 1.86	1.65 (0.51)	1.62 – 1.68

Table 8.3 appears to suggest that practice (behaviour) actually deteriorated for the school samples over the two years the programme was in place. Overall means (population) significantly declined from 1.83 to 1.65. Since the same procedures were used to work out the scores and the same scoring criteria were in place, the changes cannot be attributed to the analysis itself. Although experiencing statistically significant decline, the maximum school's mean was the highest when compared to the other schools. The minimum school's decline was the lowest (0.14) followed by the maximum school. Interpretation of this is difficult. Taken by itself, the K-A-P 2 findings would seem to suggest that practice actually declined in the course of the intervention. Should this then be taken as a yardstick of the effectiveness of the intervention? Urinating in the water is the behaviour we were addressing and this result actually shows us that there was an increase in reported behaviour. Having seen the problems that arose during feedback when teachers doubted the sincerity of the respondents who said they had not urinated in the water, it could be that subjects this time round were being more honest. Furthermore the specific time element is not catered for in this question. The question asked, "Where do you urinate when you are at the lake?" It could well be that sometimes children urinate in the water, at other times in the bushes and at other times on the beach. There should however be a difference between K-A-P 1 and K-A-P 2 with regard to urinating in the water and taking action as a result of the intervention. Perhaps there are other factors that make urinating out of the water difficult. The K-A-P by its nature is a brief questionnaire and could not go into soliciting more detailed information. There would thus be need to draw on other approaches or tools that would help furnish explanations for this. Before

it fairly clear to me that they were not going to co-operate in 1998 if I continued with the trend and gave them the meagre allowance. In 1997, none of the teachers who assisted with the club received any allowance. During the parasitological survey Time III one of the HSAs whom we had gone to collect, refused to assist because he felt the money would not be enough. Most of the teachers and HSAs said that they were glad that I would be taking over the project because they felt that as a fellow Malawian I would be more sympathetic to their financial situation and would thus be more generous in giving allowances. I was faced with an uncomfortable dilemma. For I knew that to continue in the no allowance vein would be to render the project doomed. I therefore made the decision to give the staff members who were involved in the club a small allowance for each meeting of the Bilharzia Club as a token of recognition of the time and effort they put into the club outside school hours. It was agreed that they would write reports of the activities of the club. The money was therefore to be seen as remuneration for their time. They were to each receive MK 50 (US\$2.00) per meeting. In addition all staff who assisted with parasitological surveys were to receive double the allowance previously given. I requested the additional funds from the Ministry of Tourism. These were made available.

Remuneration to club patrons was done only after the reports were handed in. The patrons were very pleased to receive the allowance for their efforts and participated enthusiastically. In mid June, the two patrons at Makawa School came to ask me for an increase in their allowance saying that financially they were struggling. I informed them that the budget had been made and it was not possible, but they should carry on with the good work. They did not present any more requests after that.

The major theme therefore in the FGDs concerned that of remuneration. The following dialogue at Lwangwa, the minimum intervention school summarises the feelings of all the comments made in the focus group discussions in all the schools:

Participant 1: The running of the programme was not all that good. Because we as Malawians nowadays, for a project to go with it there must be something

Facilitator: Be out with it.....

Participant 1: Yah, a packet must be there (laughter). A programme will not run smoothly because there is no package (more laughter).

Facilitator: Yes these comments are welcome. These are things I shall be recommending at the end of this evaluation.

Participant 1: There must be a package, both to the teachers as well as the pupils, those who were trying to assist, who were recording the urine of the children, they have to be given a little something, to buy soap so they can wash their clothes which have been stained with urine. We as teachers too, yes it is part of our duty, but it is extra. A packet must be there.

Facilitator: Be open, we are all Malawians. Any other comments?

Participant 2: I think the main weakness of the programme has been the same issue of the package.

Participant 3: Yes, tell them that for the programme to go smoothly there must be a package.

Facilitator: Will you do this without any token, as (interrupted)

Participant 1: As Malawians, as you have said, we are volunteers, we do work, and we are working, for we are working without receiving a token, but now we are being discouraged, seeing that the owners of the programme, when they come in, they have a little something, they have a package. Now they want me as a Malawian we should just work er for er for the good of them. Now, if you made sure that a token was there during the programme and it [the programme] came to an end, and we have experienced the benefits of it, we cannot just remain volunteers, no we are volunteers indeed, we give of ourselves but the beginning of this, what should start us off is the package. If things start off well, then the project goes on well and when the people have left us and the project is over we can say to ourselves, these people have left, so now what can we do to carry on this project? It is just like the coming of the missionaries – they were helping us. When they left, we carried on in their denominations because they looked after us. It is the

turning to one such method that addresses many of the gaps of the K-A-P, an aspect of the K-A-P worth comparing is the “Don’t know” responses.

8.1.8 Category 1 “Don’t know” scores

Having used “don’t know” results to guide the health education syllabus at K-A-P 1, they were used purely in a comparative capacity at K-A-P 2. Reduction in “Don’t know” responses does not necessarily mean an increase in knowledge. It could well be that those who did not indicate “don’t know” may have actually given a wrong response instead. However a comparison of those reporting don’t know was nevertheless carried out.

Table 8.4: Comparison of “don’t know” responses

	K-A-P1 (%)	K-A-P2 (%)	Chi square (p value)
Ranked Response			
1. How got schistosomiasis	29.1	11.9	5.38 (p=.020)
2. Why only some infected?	20.0	13.1	15.77 (p=.000)
3. How is it spread?	16.6	12.0	7.61 (p=.006)
4. Why red urine is bad	16.4	20.0	1.62 (p=.203)
5. What causes schistosomiasis?	13.2	9.3	7.26 (p=.007)
6. Effects of schistosomiasis	10.0	10.5	0.07 (p=.785)
7. How to prevent spread	7.0	9.8	4.54 (p=.033)
8. Signs and symptoms	6.0	8.3	3.50 (p=.062)
9. Meaning of red urine	5.3	8.5	7.49 (p=.006)

Mantel-Haenszel summary of stratified chi square for all the 9 main “don’t know” items was Chi 3.14, p=.0761. The differences were therefore not significant when taken together. There were some significant differences in the individual items however. The change in proportions of those responding “don’t know” to the questions 1,2,3,5,7 and 9 in Table 8.4 above, were statistically significant. There were significant reductions to the

questions on how one acquired schistosomiasis, why only some were infected and not others as well as questions on how the disease is spread. “Don’t know” responses to the causes of schistosomiasis also declined significantly at K-A-P 2. Conversely, there were significant increases in “don’t know” responses on questions pertaining to what is “bad” about red urine, what it means and how to prevent the spread of the disease. In sum therefore, of the nine “Don’t know” items, five increased and four decreased between K-A-P 1 and K-A-P 2.

8.1.9 Category 2 Knowledge changes

Perhaps a closer look at comparisons between club members who received a full intervention and non members who received a reduced intervention of a display once a term in the two schools where there were clubs and a brief talk in the minimum school, might help shed more light on the effects of degrees of intervention input. Table 8.5 below compares mean knowledge scores out of a possible maximum score of six.

Table 8.5: K-A-P 2 Club versus non-club Knowledge in all three schools

School	N=	Mean	Standard Deviation	95% Confidence Interval
Total Non-club	940	4.17	1.38	4.08 – 4.26
All B-Club	45	5.36	0.68	5.15 – 5.56

The results in Table 8.5 above are very clear with regard to knowledge levels. Club members’ level of knowledge is much higher than non-members. The total mean knowledge score for club members when compared with all the non-club members sample in all three schools is statistically significant as indicated by comparing the 95% confidence intervals which can be used in place of an independent t-test (Hays, 1994). Used in this way one can get a fuller picture of the differences as opposed to relying only on a p value. Combining the two schools’ Bilharzia Club members for the analysis is justified by the fact that when we analysed the results separately for each group, there were no statistically significant differences between them. When comparisons were made

between club members and other pupils only in the schools where the clubs were present, the results were as follows:

Table 8.6: K-A-P2 Knowledge of Club members versus rest of the school where there was a club.

School	N=	Mean	Standard Deviation	95% Confidence Interval
Koche School Non-club	312	4.37	1.37	4.21 – 4.52
Makawa School Non-club	311	4.04	1.42	3.88 – 4.19
B-Club (Koche & Makawa)	45	5.36	0.68	5.15 – 5.56

Club members' knowledge means are much higher than the non-club members for both Koche and Makawa Schools. Confidence intervals clearly demonstrate that an intense input to a group of pupils, results in superior knowledge. Koche's knowledge score for non-members is statistically significantly higher than that of Makawa. This may reflect the "diffusion" of knowledge. It also shows that a maximum intervention has higher knowledge impact even on non-club members. How about changes in attitude?

8.1.10 Category 2 attitude changes

Table 8.7: K-A-P2 Attitude of Club members versus rest of the pupils in all three schools

School	N=	Mean	Standard Deviation	95% Confidence Interval
Total Non-club	940	2.77	0.47	2.74 – 2.80
All B-Club	45	2.93	0.25	2.86 – 3.01

Attitude towards reduction of the disease was significantly different between club and non-club members. Table 8.7 shows that Club members had a significantly positive attitude in favour of reducing schistosomiasis.

Table 8.8: K-A-P 2 Attitude of Club members versus rest of the school where there was a club.

School	N=	Mean	Standard Deviation	95% Confidence Interval
Koche School Non-Club	312	2.77	0.47	2.72 – 2.82
Makawa School Non-club	311	2.77	0.45	2.72 – 2.82
B-Club (Koche & Makawa)	45	2.93	0.25	2.86 – 3.01

Again, Table 8.8 shows that club members demonstrated statistically significant positive attitudes towards schistosomiasis reduction.

8.1.11 Category 2 changes in practice

Table 8.9: K-A-P 2 Practice of Club members versus other pupils in all three schools

School	N=	Mean	Standard Deviation	95% Confidence Interval
Total Non-club	940	1.65	0.51	1.62 – 1.68
All B-Club	45	1.84	0.37	1.71 – 1.96

From Table 8.9 it is clear that club members were statistically different from the whole sample that did not belong to the club. Their total mean practice score was significantly higher than non-members meaning that their reported behaviour was significantly more favourable towards avoiding urination in the lake water. We can safely conclude that a health education intervention that has the creation of clubs as an essential part of the input shall lead to changes in practice among the club members. The results point strongly in favour of the creation of clubs leading to changes in practice. This is supported further in table 8.10 below when the individual school non-club members are compared with club members.

Table 8.10: K-A-P 2 Practice, Club members versus rest of the school where there was a club.

School	N=	Mean	Standard Deviation	95% Confidence Interval
Koche School Non-club	312	1.71	0.49	1.66 – 1.77
Makawa School Non-club	311	1.61	0.51	1.56 – 1.67
B-Club (Koche & Makawa)	45	1.84	0.37	1.71 – 1.96

Overall it can be argued that the presence of a club as part of the health education input, does have significant differences when compared with non-club members. The K-A-Ps have shown that a maximum input targeted at a few individuals results in significant differences with regard to knowledge, attitude and practice. The K-A-P has thus shown that targeting the programme on a few individuals is powerful.

8.1.12 Category 2 “Don’t know” responses

The “don’t know” responses of the Bilharzia Club members are listed in Table 8.11 below and compared with those of K-A-P2 non-club members in the two schools where a Bilharzia Club was established. Hence Table 8.11 below excludes Lwangwa School.

Table 8.11: Comparison of Bilharzia Club “don’t know” responses

	K-A-P2 (%)	B-Club (%)	Chi Square	P=
Ranked Response				
1. How got schistosomiasis	10.1	4.4	1.53	.215
2. Why some infected and not others?	12.0	2.2	4.01	.045
3. How is it spread?	8.7	2.2	2.31	.129
4. Why red urine is bad	17.5	9.0	2.21	.137
5. What causes schistosomiasis?	8.8	6.7	0.25	.619
6. Effects of schistosomiasis	10.6	11.1	0.01	.913
7. How to prevent spread	10.4	0.0	5.20	.023
8. Signs and symptoms	8.7	0.0	4.24	.039
9. Meaning of red urine	9.3	2.2	2.62	.106

Overall club members’ “don’t know” responses were lower than non-club subjects except for the item pertaining to the effects of the disease. Stratified Chi square analysis

summarising the overall differences between club members and non members in the nine areas listed above, indicated that the differences between the two groups were statistically significant (Mantel-Haenszel Chi = 16.67, $p=0.0000$). In Table 8.11 above it can be seen that three of the nine items were statistically significant at the $p<0.05$ level. These were for items 2, 7 and 8. These cover key knowledge questions and such significant differences augur well for the argument that an effective and efficient health education programme that establishes a club, may yield more informed persons than if the input was geared towards just a general population.

In response to the question “what can you do to prevent the spread of Bilharzia?” 17.8% of club members indicated “educate others”, a response that was not found among the non-club members. The impact of the health education intervention in the maximum and medium school may have been reflected in the question “where did you first hear about Bilharzia?” with Lwangwa respondents indicating 35.3% “at school” compared with Koche’s 46.5% and Makawa’s 57.2% “at school” response.

8.1.13 Concluding comments on K-A-P 2

As pointed out in the literature review, the K-A-P gap has shown that knowledge may increase but may not necessarily translate into or predict behaviour. There is therefore need for a closer exploration of predictors of behaviour itself that address some of the shortcomings of the K-A-P. Schopper *et al.* (1993) point out that as far as the K-A-P is concerned, validity checks shall always be through proxy measures and thus incomplete. It is difficult to assess for example how reporting is biased by social norms and pressures as well as to see how the bias could be accounted for and corrected (Schopper *et al.*, 1993). Such shortcomings reflect the need to look at behaviour in more specific terms, terms such as specificity of time, action and context of the behaviour (Fishbein, 1997) as these may predict behaviour better. There is need to therefore to draw on social cognitive models that identify the antecedents underlying the behaviour since knowledge alone does not lead to behaviour change (Abraham *et al.*, 1998). Whilst the K-A-P has shed some light and an increase in knowledge has occurred, the picture remains incomplete. To address this incompleteness, social psychology has come up with a plethora of models

to try and account for behaviour change. Given that the K-A-P gap is well established, there was need to specifically explore factors that influence behaviour as laid down by social psychology theory. We now turn to the use of social cognitive models.

8.2 Shifts in Intentions Following Health Education

8.2.1 Introduction

At the end of the study, a second reasoned action/planned behaviour questionnaire (TRA 2) was administered in all the three schools in December 1998. We wanted to assess whether the different measures of health education input resulted in corresponding shifts in intentions, attitudes, subjective norm and perceived control among the samples. Since urinating in the water was the main human behaviour that perpetuated the schistosomiasis life cycle, this second administration wanted to explore again intention to get out of the water to urinate. For TRA 2, we decided not to reassess intention to utilise a pit latrine. This decision arose due to one main factor. From the results of TRA 1 it was clear that availability of pit latrines was an essential determinant of whether children got out of the water to urinate or not. A brief observation over the period of the study indicated that there were no developments in availability of latrines by the end of the study. Although some were under construction in the schools, there were no latrines built by the lake. Exploring intention to utilise a pit latrine was therefore seen as being of low utility. Instead, since at TRA 1 we found that intention to get out to urinate was relatively high, we wanted to explore this time, intention to urinate out of the water immediately PRIOR to entering the water. Through ongoing discussions with the club members during the course of the health education input, urinating prior to entering the water was seen as a more realistic and practical solution to reducing micturation in the water. Urinating immediately prior to entering the water subsequently became the focus of our message and if it could become a viable option it would help reduce the transmission of the disease. A comparison of intention to urinate “prior” to and “during” activities in the water would also be helpful in guiding us in targeting the children’s urination behaviour at the most effective point. Since many children reported a reflexive urge to urinate once

they entered the water, it could be that if they urinated immediately prior to entering the water then that may reduce the chances of their micturating in the water due to this “reflexive” urge.

We emphasised the need to urinate “immediately” prior to entering the water. That is, the behaviour we sought was that whenever a child arrived at the lake and intended to get in, s/he would first urinate moments before entering the water. In terms of Fishbein’s (1997) guidelines for measuring behaviour, urinating out of the water immediately prior to entering it translates into action target time and context as follows. Urinating (is the action) out of the water (target) immediately prior to swimming each time (is the time) at the lake (is the context). As pointed out in chapter 5, the target is legion (the bushes by the lake; on the sand by the beach; by the rocks; behind the boats on the shore; by the reeds). The main thing we wanted to ascertain was urination out of the water, immediately prior to entering it. Furthermore since it had become clear to us over the intervention that the children spend hours (average 2-3) at the lake each day, we wanted to explore again the underlying cognitive structures determining whether they would get out of the water to urinate. We were keen to see whether the health education input had led to any shifts in intention to get out of the lake to urinate. Our findings of intention to urinate prior to entering the water and to get out of the water to urinate would be used to inform the sustainability of the health education programme. The following analyses incorporate all the three schools and distinguish between Bilharzia Club members and non-members. This section is outlined as follows, first an overall picture of the whole sample shall be given in relation to the theory of reasoned action /planned behaviour for the after intervention sample (TRA 2). In the process of giving this overall picture, comparisons between the two behaviours shall frequently be made to see whether urinating immediately prior to entering the water (abbreviated to “prior”) and intention to get out of the water to urinate (abbreviated to “get out”) differ in any strategic way. Then the study shall make comparisons with TRA 1. This shall be done to see whether there is any shift in intention following the health education intervention in the interim.

8.2.2 Pilot Survey

In compliance with the procedures of the Reasoned Action Theory (Ajzen & Fishbein, 1980), another preliminary study was carried out prior to the administration of the main TRA/PB2 questionnaire. About 20 Std 7s and 8s at Koche School formed the sample which was asked to list what they considered the advantages and disadvantages of their urinating immediately prior to entering the water and their getting out of the water to urinate. A list of the salient outcomes was produced and the most frequently mentioned outcomes were incorporated into the final questionnaire under both the behavioural belief and the outcome evaluation sections. The same procedure was applied to the normative component of the questionnaire. The most salient referents with regard to “my urinating immediately prior to entering the lake” and “my getting out of the water each time I have the urge to urinate” were put into the normative belief and motivation to comply sections of the questionnaire.

8.2.3. Questionnaire of main TRA 2 study

As was the case with the baseline questionnaire administration, the questionnaire was written in Chichewa the vernacular language. Demographic questions covered age, sex and level or standard of schooling the respondent was in at the time of administration. The main content area was based on the theories of Reasoned Action and Planned Behaviour. There were additional questions that supplemented the theory questions. These included questions pertaining to past behaviour such as “Have you ever urinated immediately prior to entering the water?” and “what factors prevent you from getting out of the water to urinate?” The former question solicited “Yes/No” responses whilst the latter was left open for written comments from the subjects. The most common responses were then encoded for analysis.

8.2.4 Participants

A total of 176 participants from the three schools of the study completed the questionnaire sufficiently to enable analysis. The mean age of these respondents was 14.9 years (SD = 1.77). The age range was from 11 to 19 years. 52% of the respondents were males (N = 92) and 48% were females (N = 84). Of the total sample, 72 respondents were

from Koche School, 47 from Makawa School and the remaining 57 from Lwangwa. There were a total of 31 Bilharzia Club members. Of these 21 were from Koche and 10 from Makawa. Participation was voluntary. All school children showed willingness to participate.

8.2.5 Procedure

The theory of reasoned action & planned behaviour Questionnaire was administered to 176 Std 7s and 8s in all the three schools to assess intention to perform or not perform the schistosomiasis-related behaviours mentioned above as well as inform on normative, attitudinal and control determinants of behaviour. The sample size was determined by the practical factor of the number of students who were available on the day of administration. No class members were omitted, as all were keen to participate.

The questionnaire was administered under classroom conditions. Subjects were assured of confidentiality. There was only one administration at each school so that the respondents were all present in one classroom. As was the case in the baseline administration, in order to minimise response item omissions, I went through the questionnaire with them and they responded as I read out item by item.

8.2.6 Measures

The same measures as the baseline phase (detailed in section 7.3.5 above) were utilised here. Responses were also elicited on a five-point bipolar semantic-differential type scale. Throughout this study higher scores (maximum +2) indicate positive (low infection risk) subjective states or actions, that is, positive from a schistosomiasis reducing perspective whereas lower scores (minimum -2) indicate higher risk behaviours and states. Hence for some of the items the responses were reverse scored to ensure consistency.

The reliability of the questionnaire was assessed by use of the Cronbach alpha coefficients for each section. The results were as follows:

Table 8.12: Alpha coefficients of the TRA/PB 2 questionnaire

<i>Urinating prior to entering the water</i>	
Attitude	.622
Behavioural belief	.515
Outcome evaluation	.567
Normative Belief	.758
Motivation to Comply	.711
Perceived control	.279
 <i>Getting out of the water to urinate</i>	
Attitude	.699
Behavioural belief	.565
Outcome evaluation	.493
Normative Belief	.823
Motivation to Comply	.777
Perceived Control	.478

The table indicates reasonably high correlation of questionnaire test items giving credibility to the results emanating from the questionnaire. The only item with low reliability is the item on perceived control of intention to urinate prior to entering the water.

Compared to TRA 1, the alpha coefficients of TRA 2 for getting out of the water to urinate, are generally higher, demonstrating that there was more consistency of scores in the TRA 2 questionnaire. The attitude items, which had a weak alpha coefficient at TRA 1 of .301, were now increased to .699. Behavioural belief also increased from .479 at TRA 1 to .565 at TRA 2. Perceived control also witnessed an increase although this was minimal. The other items declined in coefficient value but were still satisfactorily high above .5. On the whole the questionnaire is adequately reliable to enable satisfactory interpretations. Comparisons with TRA 1 especially for attitude still need to be treated with caution given the low TRA 1 alpha coefficient for attitude questions.

8.2.7 Results

For the whole sample (N=176), the means of the key components of the model are described and discussed below. We made comparisons between urinating immediately prior to entering the water and getting out of the water to micturate. Higher mean scores (closer to 2.00) indicate intentions towards schistosomiasis reduction behaviours.

Table 8.13: TRA 2 Means of model’s key components

Model variable results	Mean	SD	95% C.I
Intention to urinate prior to entering water	1.72	0.72	1.61 – 1.82
Intention to get out of water to urinate	1.72	0.66	1.62 – 1.82
Attitude towards urinating prior*	1.74	0.59	1.65 – 1.83
Attitude towards getting out *	1.72	0.63	1.63 – 1.82
Subjective Norm: urinating prior	1.71	0.68	1.61 – 1.81
Subjective Norm: getting out	1.70	0.69	1.60 – 1.80
Perceived control: urinating prior**	1.00	0.71	0.90 – 1.11
Perceived control: getting out**	0.94	0.79	0.82 – 1.06

* Mean of three 5-point scales ** Mean of four 5-point scales

It can be seen from the table above that as far as urinating prior to entering the water and getting out to urinate whilst in the water, intention was high ($M=1.72$, $SD\ 0.72$ & 0.66). Attitude and subjective norms for both behaviours under investigation supported control of the disease. Subjects on the whole perceived the ability to urinate prior to entering the water to be under their control ($M=1.00$, $SD\ 0.71$) although this perception was not as high as attitude, subjective norm or intention.

The table has demonstrated that for the whole of this sample there were no significant differences between intention to urinate “prior” and to “get out” to urinate subject responses. The other key model components of attitude, subjective norm and perceived control also reflected no differences. For the whole sample then, it would appear that the main components follow similar trends for both “prior” and “get out” samples. There are no marked differences. Even for perceived control means, which were markedly lower than the other items, for both behaviours, means were similar to each other. The lower perceived control means indicate that pupils felt markedly less in control of their ability to engage in these behaviours. The confidence intervals for the perceived control items are well below those of the other model components.

Comparing intention to get out to urinate with TRA 1, means for intention to get out to urinate significantly increased between TRA 1 and TRA 2. For the determinants of intention, attitude, subjective norm and perceived control, there were no significant differences in means between TRA 1 and TRA 2. These means however act as a general guideline to shifts in intention between TRA 1 and TRA 2 because the sample make up of the two groups were different. The conditions of TRA 2 varied from TRA 1 in several fundamental ways. TRA 2 was conducted at the end of a health education intervention and included data from Bilharzia Club members and the minimum intervention Lwangwa School. Therefore in order to do justice to a comparison of shift in intention between TRA 1 and TRA 2, the following was done. First a direct comparison was made based on the conditions that were present at TRA 1. Hence the TRA 2 population directly compared with TRA 1 were Koche and Makawa Schools' non-club members. This was done to see whether there were any effects on intention to get out and urinate in the absence of the clubs variable. Second, club members were compared with non-club members in the two club schools. The comparisons begin with a description of means of intention to get out of the water to urinate at TRA 1 and TRA 2.

Descriptive statistics for means of intention to get out of the water to urinate indicate that the means for the maximum school Koche were the lowest. Makawa and Lwangwa schools' means were higher though not statistically significant as 95% confidence intervals show in Table 8.14 below:

Table 8.14: Comparison of means of the schools' overall intention to get out of water to urinate at TRA 2

School	N=	Mean	Standard Deviation	95% Confidence Intervals
Koche	72	1.54	0.92	1.32 – 1.75
Makawa	47	1.85	0.36	1.74 – 1.96
Lwangwa	57	1.84	0.37	1.74 - 1.94

Since intention is the most immediate predictor of action, comparisons were then undertaken to see if there had been any shift in intention between TRA 1 and TRA 2 for intention to get out of the water to urinate. To enable a reasonably direct comparison, we

utilised the conditions that were in place at TRA 1, hence the TRA 2 sample below is composed of Koche and Makawa Schools’ non-club members. The results are presented in Table 8.15 below:

Table 8.15: Comparison of Means of intention to get out of the water to urinate, TRA 1 and TRA 2

	TRA 1 Mean (SD)	TRA 1 95% Confidence Intervals	TRA 2 Mean (SD)	TRA 2 95% Confidence Intervals
Whole sample	1.42 (1.13)	1.26 – 1.57	1.58 (0.85)	1.40 – 1.76
Koche	1.39 (1.25)	1.15 – 1.64	1.39 (1.04)	1.10 – 1.68
Makawa	1.44 (1.00)	1.24 – 1.64	1.83 (0.37)	1.71 – 1.96

For the all samples TRA 1 (N= 202) and TRA 2 Koche and Makawa Schools’ Non-Club members (N= 88), the intention to get out of the water to urinate was higher for TRA 2 than for TRA 1. Confidence intervals however indicate that this difference is not statistically significant, as there is much overlap of the range of confidence intervals. This makes it difficult to ascertain that overall for non-club members there has been a shift in intention. The responses of the TRA 2 were more uniform in that the standard deviation from the mean was not as wide as TRA 1. Closer examination of the sample is more revealing. The maximum intervention school Koche, experienced no shift in intention among non-club members. This differed markedly from the situation at Makawa School where there was a statistically significant difference between the means. Confidence intervals of the means at Makawa were markedly higher in TRA 2 than TRA 1 indicating a positive shift in intention following health education intervention. The reason for this dramatic change at Makawa the medium intervention school and not Koche School is not so clear. In depth further analysis of Makawa’s responses showed no significant differences in means of determinants of intention between TRA 1 and TRA 2. Multiple regression analysis revealed that subjective norm was the key predictor both times. It is difficult to account for this dramatic increase except to speculate that the message emanating through the Bilharzia Club at Makawa was having an impact in the normative

domain on non-club members. Teasing out what was unique about Makawa School Bilharzia Club, when compared to Koche is very difficult.

It is clear that for TRA 2 non-club subjects, Makawa School differed significantly from Koche non-club members. Intention to get out of the water to urinate at Makawa was significantly higher than that of Koche School. Further analysis also revealed no significant differences in the means of the immediate predictors of intention (i.e. attitude, subjective norm and perceived control). Multiple regression of both non-club samples followed similar trends thus not being able to give us account for the differences. A possible explanation for this difference shall be tabled below.

An important element of the intervention was the focus on a small group of pupils who were club members. To check for any impact such highly specialised input may have had on intention to get out and urinate, we compared club members with non-club members in the schools where clubs were in operation. The results are presented below in Table 8.16

Table 8.16: Comparison of Means of Bilharzia Club members’ intention to get out of the water and urinate Vs non-club member responses TRA 2

School	N=	Mean	Standard Deviation	95% Confidence Intervals
Bilharzia Club	31	1.90	0.30	1.79 – 2.01
Non-club	88	1.58	0.85	1.40 – 1.76

It can be seen from the above table that intention to get out of the water to urinate was significantly different between the two groups. Club members’ intention to comply with behaviours that minimise the acquisition and spread of schistosomiasis infection was higher than the non-club members. From the confidence intervals it emerges that the highest point of the non-club members is lower than the minimal confidence limit of the club members. This appears to be sufficient evidence to suggest that the instituting of Bilharzia Clubs played an important role in shifting this particular intention.

Turning now to the other behaviour under investigation, the descriptive statistic means for intention to urinate immediately prior to entering the water are presented in Table 8.17 below

Table 8.17: Comparison of means of the schools’ overall intention to urinate immediately prior to entering water at TRA 2

School	N=	Mean	Standard Deviation	95% Confidence Intervals
Koche	72	1.69	0.62	1.55 – 1.84
Makawa	47	1.46	1.08	1.15 – 1.78
Lwangwa	57	1.94	0.23	1.89 – 2.01

The minimum intervention school, Lwangwa, had the highest mean for intention to urinate immediately prior to entering the water. This mean was statistically significant from the maximum and medium intervention schools as can be seen from the confidence intervals displayed in the table (7.13) above. This would appear to suggest that a minimum intervention is adequate, in fact preferable, to a maximum and medium input intervention in influencing intention to urinate immediately prior to entering the water.

Since club members received an optimal and focussed health education input, we also compared them with non-members for intention to urinate immediately prior to entering the water. This comparison applied only to Koche and Makawa Schools where clubs were in place. This had been the other message to encourage the children to stop urinating in the lake water. Results are presented in Table 8.18 below

Table 8.18: Comparison of Means of Bilharzia Club members’ intention to urinate immediately prior to water contact Vs non-club member responses TRA 2

School	N=	Mean	Standard Deviation	95% Confidence Intervals
Bilharzia Club	31	1.87	0.34	1.74 – 2.00
Non-club	88	1.51	0.93	1.31 – 1.71

As was the case with intention to get out of the water to urinate, club members' intention to urinate prior to entering the water was significantly higher than non-club members' intention.

Table 8.19: Intercorrelations between measured variables for intention to urinate immediately prior to entering the water.

Variables	1	2	3
1. Intention			
2. Subjective Norm	.42*		
3. Attitude	.26*	.15*	
4. Perceived Control	.25*	.31*	.24*

*= $p < .05$

Intercorrelations of the variables used to measure intention to urinate immediately prior to entering the water were on the whole low, though higher than the getting out to urinate intention. Intention and subjective norm were well correlated (.42) at the $p < .05$ level. Subjective norm and perceived control were also well correlated.

We explored further the determinants of intention by use of multiple linear regression analysis and the regression results indicated that the intentions of both behaviours were under normative control. Preliminary analyses (applying the STATISTICA package) to test the predictive power of the model were undertaken using the main characteristics of the sample. This was done to see whether these variables were significantly different and would affect the overall predictive power of intentions of the behaviours under investigation. The sample was thus subdivided by school, Bilharzia Club membership and by sex. Multiple regression analyses were conducted for each sub-sample regressing intention to urinate immediately prior and get out to urinate against the three reasoned action/ planned behaviour variables of attitude, subjective norm and perceived behavioural control. Results are shown in Table 8.20 below:

Table 8.20: Regression of sample by characteristics

	Beta Att	Beta SN	Beta PvC	R2	F	N=
Urinate prior						
Koche	.187	.419**	.013	.238	7.064	72
Makawa	.633*	.238**	-.05	.535	16.517	47
Lwangwa	-.106	.140	.035	.034	.617	57
B-Club	-.080	-.12	.037	.026	.244	31
Non B-C	.208*	.361**	.06	.219	9.83	88
Males	.367*	.436**	-.02	.389	18.65	92
Females	.047	.188	.208	.098	2.91	84
Get out to urinate						
Koche	-.05	.539**	-.05	.272	8.45	72
Makawa	-.15	.434*	-.24	.184	3.24	47
Lwangwa	-.09	.340*	-.07	.108	2.13	57
B-Club	-.09	.612**	-.09	.375	5.40	31
Non B-C	-.08	.533**	-.10	.256	12.07	88
Males	-.11	.283**	-.17	.094	3.03	92
Females	-.06	.608**	-.03	.314	13.67	84

* $p < .05$ ** $p < .001$

Att = attitude; SN = subjective norm; PvC = Perceived control.

Intention was predicted to be predominantly under normative control for both behaviours. All the sub samples for intention to get out of the water to urinate demonstrated significant predictive utility and power of the planned behaviour theory. This suggests that the decision to get out of the water is influenced by what the others around the subjects do. For intention to urinate immediately prior to entering the water, only four of the seven sub samples demonstrated predictive utility of the theory. Of these, the intentions of three were under normative control whilst one (Makawa School)

demonstrated intention influenced by attitudinal factors. These were most likely to be the males in the sample because females demonstrated no significant beta weights towards intention. At Makawa School, the regression accounted for 53% of the variance demonstrating high predictability for intention to urinate immediately prior to entering the water. Lwangwa School and the Bilharzia Club members also reflected no significant weighted contribution to the prediction of intention.

The beta weights of the perceived control measures indicated that this construct did not contribute to the prediction of intention for both urinate immediately prior and get out of the water to urinate. Ajzen (1991) introduced intention to address “non volitional” behaviour. Perhaps the low perceived control reflects the lack of necessity for including it in the equation since it could be argued that getting out of the water to urinate is a volitional behaviour and the planned behaviour construct therefore does not apply. Closer comparison of the beta weights for perceived control and subjective norm, indicate in Table 6.8 that the stronger the weight of the subjective norm, the weaker that of perceived control. It is as though personal control is surrendered to the group. This appears to be further supported by the negative Beta weights of the attitudinal component for intention to get out of the water to urinate. Comparing Table 8.20 above with its TRA 1 counterpart (Table 5.6 in chapter 5), at a glance it can be seen that attitudinal factors have come to the fore at TRA 2 which means that subjects are thinking more about the issues rather than just responding to prescribed norms about micturition behaviours.

The whole TRA 2 sample (N=176) was then analysed. It is clear from Table 8.20 above that Koche and Makawa Schools, males and non-Bilharzia Club members would contribute to the relative weightings of the whole sample. The findings of the regression of both behaviours for the whole sample are demonstrated in Table 8.21 below:

Table 8.21: Regression of TRA 2 whole sample

	Beta Att	Beta SN	Beta PvC	R2	F	P =	N=
Urinate prior	.183**	.363**	.089	.221	16.30	.0015	176
Urinate out	-.07	.516**	-.09	.242	18.33	.0000	176

Intention was significantly predicted by the theory of Planned behaviour for both intention to urinate immediately prior to entering the water $F(3,172)=16.30$, $p<.0015$ and intention to get out of the water to urinate $F(3,172)=18.33$, $p<.0000$. Beta weight analysis of measures contributing to intention indicated that subjective norm was the greatest contributor at a statistically significant .363 followed by attitude at .183 which was also statistically significant. Perceived control did not significantly contribute towards intention for both behaviours. For the whole TRA 2 sample therefore, intention is predominantly under normative control. Intention is also influenced by the extent to which subjects personally feel that urinating immediately prior to entering the water is good or bad. They feel that they have no control over the decisions to urinate prior to entering the water and getting out to urinate.

In terms of the inter relationships between the different components of the theory of reasoned action, the results indicate some correlation between them. Ajzen & Fishbein (1980) argue that a correlation of .30 or greater is sufficient to confirm the links between two variables.

Table 8.22: Intercorrelations between measured variables.

Variables	1	2	3
1. Intention			
2. Subjective Norm	.48*		
3. Attitude	.09	.34*	
4. Perceived Control	-.03	.15	.13

Correlations for intention to urinate prior to entering the water are shown in Table 8.23.

Table 8.23: Correlations between model variables for intention to urinate immediately prior to entering the water.

	Attitude & BB x OE	SN & NB x MC
Whole sample	.34	.07
Koche School	.40*	.03
Makawa School	.27	.04
Lwangwa School	.17	.14
Bilharzia Club	-.06	.19
Non-club members	.39	.02
Males	.38*	.12
Females	.35*	-.03

BB = Behavioural belief; OE = outcome evaluation

SN = Subjective Norm; NB= Normative belief; MC = Motivation to comply

The above table indicates that the correlations between the attitudinal variables are higher than the normative variables. For Koche School the correlation between attitude and behavioural belief multiplied by outcome evaluation was significant. The breakdown of the sample by sex produced similar significant correlations. The whole sample's correlation was acceptably high for the attitudinal variables but not for the normative ones. The same is the case for the non-club members.

Table 8.24: Correlations between variables for intention to get out of the water to urinate.

	Attitude & BB x OE	SN & NB x MC
Whole sample	.28	.02
Koche School	.30	-.08
Makawa School	.26	.15
Lwangwa School	.18	.10
Bilharzia Club	.12	-.10
Non-club members	.33	-.02
Males	.35*	.09
Females	.22*	-.00

BB = Behavioural belief; OE = outcome evaluation

SN = Subjective Norm; NB= Normative belief; MC = Motivation to comply

Inter variable correlations were again stronger for the attitudinal variables than for the normative ones. Male and female variables again produced significant correlations in the attitudinal variables. Koche and non Bilharzia Club members also had high attitudinal variables although these were not statistically significant. Among normative variables Makawa School had the highest correlation(.15) whilst Bilharzia Club members had the lowest (-1).

Such weak correlations raise questions about the model itself. There may be other variables that account for intention to get out of the water to urinate. To account/ acknowledge these I did a series of regressions to see whether variables such as school, age and sex could be added into the equation and which variables contribute the most to the intention. To begin with I regressed the three variables of school, age and sex against intention to get out of the water to urinate excluding the theory of reasoned action variables. Regression using the three variables yielded the following results:

Table 8.25: Regression using other variables: School, age, sex

	Beta School	Beta Age	Beta Sex	R2	F	N=	P value
Get out to urinate	.205**	.159*	.002	.065	3.98	176	.008

Beta weights of the regression indicated that both school and age significantly contributed to intention $F(3, 172) = 3.98, p < .01$. This indicated that the age of the children as well as the school were important elements in the equation in predicting intention to get out to urinate. Having observed this important aspect, I then included age and sex in a regression with the reasoned action variables. The results are presented below:

Table 8.26: Regression of Planned behaviour and other variables TRA 2.

	Beta School	Beta Age	Beta SN	Beta Att	Beta PvC	R2	F	N=	P =
Urinate out of w	.136*	.141*	.491*	-.07	-.09	.280	13.13	176	.000

Intention to get out to urinate was predicted by the five variables, $F(5,170)=13.13$, $p<.000$. Subjective norm, age and school were significant contributors to the intention. The equation accounted for 28% of the variance. We proceeded to do another regression leaving behind the non-significant planned behaviour variables of attitude and perceived control.

Table 8.27: Regression using variables of school, age and subjective norm

	Beta School	Beta Age	Beta SN	R2	F	N=	P value
Get out to urinate	.132*	.148*	.453**	0.27	20.68	176	.0000

Intention of school children in Mangochi, Malawi, to get out of the water to urinate is determined by subjective norm ($p=.000$), followed by age ($p=.025$) and the school ($p=.048$). At TRA 1 these variables of age, sex and school were not significant and thus no further analysis was done.

Subjective norm, which is the key determinant, shall be expounded below. Age, which is a significant contributor to intention, was analysed further. I regressed intention to get out of the water to urinate using the planned behaviour variables by each age within the sample (range 11 – 19). The two ages which significantly predicted intention were the 13 and 16 year olds. The equation predicted 65% of 13 year olds’ variance, $F(3, 25) = 15.46$ $p<.000$ and 49% of the 15 year olds’ variance, $F(3, 20) = 6.45$ $p<.003$. Both samples were under normative influence.

Table 8.28 outlines the behavioural beliefs of subjects for both behaviours under investigation. The most striking thing about the behavioural beliefs is that the disease schistosomiasis is frequently mentioned as an important variable in the belief system. This contrasts with the first planned behaviour questionnaire described above. It reflects the intervention’s impact on the belief structure of the subjects because water contact behaviours are now associated with schistosomiasis.

Table 8.28: Behavioural beliefs and outcome evaluations

		Mean	SD	95% C.I
<i>Urinate prior to entering water</i>				
One does not get schistosomiasis	Belief	1.35	1.16	1.17 – 1.52
	Evaluation	1.63	0.83	1.50 – 1.75
One does not spread schistosomiasis	Belief	1.60	0.87	1.47 – 1.73
	Evaluation	1.69	0.87	1.56 – 1.82
One reduces prevalence of schistosomias	Belief	1.76	0.67	1.66 – 1.86
	Evaluation	1.64	0.78	1.53 – 1.76
One prevents spread of other diseases	Belief	1.34	1.16	1.17 – 1.51
	Evaluation	1.74	0.60	1.65 – 1.83
Creates unhygienic conditions if no toilet	Belief	1.31	1.22	1.13 – 1.49
	Evaluation	-1.26	1.24	-1.41 - -1.08
<i>Get out of water to urinate</i>				
Does not spread schistosomiasis	Belief	1.68	0.73	1.57 – 1.79
	Evaluation	1.76	0.65	1.66 – 1.85
Schistosomiasis prevalence is reduced	Belief	1.64	0.74	1.53 – 1.75
	Evaluation	1.69	0.62	1.60 – 1.79
Protects our friends from disease	Belief	1.57	0.85	1.44 – 1.69
	Evaluation	1.78	0.56	1.70 – 1.86
Keeps the lake water clean	Belief	1.61	0.89	1.47 – 1.74
	Evaluation	1.70	1.79	1.43 – 1.97
Delays the process of relief	Belief	0.41	1.62	0.16 – 0.65
	Evaluation	0.74	1.41	0.53 – 0.95

It can be seen from the table that the strongest behavioural belief in favour of urinating immediately prior to entering the water is the belief that this reduces the prevalence of schistosomiasis ($M=1.76$, SD 0.67). This was followed by the belief that this behaviour prevents the spread of the disease ($M=1.60$, SD 0.87) and prevents one from getting the disease ($M=1.35$, SD 1.16). The evaluation of these outcomes supported urination immediately prior to entering the water. The most valued belief was that the behaviour reduces the spread of other diseases ($M=1.74$, SD=0.6).

With regard to getting out of the water to urinate, beliefs that such behaviour prevents the spread of schistosomiasis ($M=1.68$, $SD=0.73$); reduces its prevalence ($M=1.64$, $SD=0.74$) and keeps the lake water clean ($M=1.61$, $SD=0.89$) augur well for the behaviour of getting out of the water to urinate. However, subjects believed that this behaviour would delay the process of relieving oneself and the evaluation of such leaned more towards the centre of the continuum than the other evaluations. Compared to TRA 1 where a similar belief was expressed, there appears to have been a reduction in this belief. Following health education intervention, it appears that “quick relief” is not regarded as highly as it was at TRA 1.

The key influential persons for the population ($N=176$) are listed below. Also listed is their motivation to comply with these salient referents. They are ranked by strength of the means of motivation to comply

Table 8.29: Normative beliefs and Motivation to comply

		Mean	SD	95% C.I
Mother	Urinate prior to entry	1.70	0.70	1.60 – 1.80
	Get out to urinate	1.70	0.76	1.59 – 1.82
	Motivation To	1.54	0.88	1.41 – 1.68
	Comply			
Father	Urinate prior to entry	1.60	0.89	1.47 – 1.74
	Get out to urinate	1.66	0.75	1.55 – 1.78
	Motivation To	1.51	1.04	1.35 – 1.66
	Comply			
Grandparent	Urinate prior to entry	1.59	0.84	1.47 – 1.72
	Get out to urinate	---	---	---
	Motivation To	1.51	1.87	1.23 – 1.78
	Comply			
Brother	Urinate prior to entry	1.57	0.88	1.44 – 1.71
	Get out to urinate	1.64	0.76	1.52 – 1.75
	Motivation To	1.34	1.02	1.19 – 1.49
	Comply			
Aunt	Urinate prior to entry	---	---	---
	Get out to urinate	1.59	0.86	1.46 – 1.71
	Motivation To	1.32	1.10	1.15 – 1.48
	Comply			

In-Law	Urinate prior to entry	---	---	---
	Get out to urinate	1.49	0.92	1.36 – 1.63
	Motivation To	1.18	1.14	1.01 – 1.35
	Comply			
Sister	Urinate prior to entry	1.64	0.79	1.52 – 1.76
	Get out to urinate	1.61	0.79	1.50 – 1.73
	Motivation To	1.18	1.16	1.00 – 1.35
	Comply			
Younger sibling	Urinate prior to entry	1.35	1.08	1.19 – 1.51
	Get out to urinate	---	--	---
	Motivation To	0.87	1.32	0.67 – 1.07
	Comply			
Friends	Urinate prior to entry	---	---	---
	Get out to urinate	1.41	0.98	1.27 – 1.56
	Motivation To	0.77	1.31	0.57 – 0.96
	Comply			
Fishermen	Urinate prior to entry	0.85	1.49	0.63 – 1.07
	Get out to urinate	---	---	---
	Motivation To	0.35	1.55	0.12 – 0.58
	Comply			

Subjects perceived that those who were important to them most wanted them to comply with the behaviours under investigation. Means for most salient referents were high. The most noticeable exception was the fishermen. However this group was the one the subjects least wanted to comply with. Most of the salient referents (80%) were family members clearly showing the important role that family ties plays in influencing children in Malawi. Subjects wanted to comply with their friends less than their younger siblings.

Teachers and health personnel who were key figures at TRA 1 were omitted altogether. It is not clear why this is the case, are they no longer important referents? It could indeed be, that teachers and health personnel are no longer important referents, that somehow there has been a shift in the way the students perceive teachers and parents relative to family members. Without having explored this further it is difficult to ascertain. One possible explanation is that the findings demonstrate that the timing of the questionnaire

is important. At that point in time, the pilot sample did not think of their teachers or health personnel. It may well be that had I asked them later to list “people who are important” to them, they may have done so. However I had to respect the responses given and omit teachers and health personnel from the list of salient referents. It was not possible to involve the family salient referents during the course of the intervention because they themselves needed input into the basic education about the disease. The preliminary LMBC Programme survey had demonstrated that many adult community members were ignorant about the facts of the disease.

Perceived control

The mean for the question “ I always desire to urinate prior to entering the water, but I fail” was the lowest ($\bar{M}=0.45$) of the other sub-components of the perceived control items. This indicates a desire on their part to comply with schistosomiasis prevention behaviours but an acknowledgement of inability to do so. On the other hand subjects very much felt they have the power to urinate prior to entering the water especially if they “really wanted to” ($\bar{M}=1.70$). Subjects indicated that they felt determination was under their control and if evoked could produce the desired behaviour.

Past Behaviour

The study sought to solicit past lake urinary behaviours as reported by the subjects. This information was designed to supplement the findings from the planned behaviour model. Asked whether they had ever urinated in the lake, 71.59% (N=126) answered “Yes” whilst 27.84% (N=49) gave a “No” response. To the question “Have you ever urinated immediately prior to entering the lake?” frequency scores indicated 77.84% (n=137) “Yes” response and a 22.16% (n= 39) “No” response. Table 7.19 below summarises the six major responses of subjects to the question “What are the factors that prevent you from urinating immediately prior to entering the water?”

Table 8.30: Reasons for not urinating immediately prior to entering the water

Reason	N=	% of sample
No urge to urinate	36	23.5
Delays you	24	15.7
Forgetfulness	20	13.1
Embarrassed	15	9.8
No privacy	6	3.9
Nothing prevents me	5	3.3

From the above table it can be seen that the predominant factor influencing urination prior to entering the water is whether at the time the children get to the lake they have the urge to urinate or not. Most wrote that it is usually after they are in the water that they feel the urge to urinate. This accounted for 23.5% of the 153 who responded to this question. The second most mentioned factor was that urinating prior to entering the water was seen as a delaying factor. Most said they got to the water and they just wanted to get in without wasting time or being delayed by urinating prior to entering the water. Others mentioned forgetfulness, which was third on the list. Almost 10% of respondents mentioned that the act of having to urinate prior to entering the water would be a source of embarrassment especially if they were in the company of their friends. One female respondent wrote, “you follow what your friends do”. The lack of privacy came up again as another factor preventing urination prior to entering the water. This accounted for almost 4% of responses. Among the plethora of responses also mentioned were laziness, simply not wanting to urinate prior to entering the water and attributing it to habit.

Since past behaviour was seen to be an important variable as in the literature and TRA 1 a multiple regression of the whole sample was done. Results of intention to urinate immediately prior to entering the water for those with a “No” response was significant $F(3, 45) = 4.16$ $p < .05$. Only subjective norm contributed towards the intention with a significance of $p < .05$. When the belief based attitude variable was regressed with subjective norm and perceived control, the results were interesting. By themselves the variables were not significant in their prediction of intention, but combined together a synergetic effect was observed $F(3, 45) = 5.48$ $p < .01$. There was high tolerance for each

variable (over .75 for each) which suggests that the unique combination of these predictor variables results in a significant prediction.

For the “Yes” responses, that is those who reported having urinated in the lake, both attitudinal and subjective norm were significant (subjective norm $p<.000$ and direct measure of attitudes $p<.01$) $F(3,122)=12.98$ $p<.0000$. This regression accounted for 24% of the variance. When the belief based attitude was regressed with the other predictor variables, only subjective norm was statistically significant ($p<.000$). In comparing the those with a history of urinating in the water with those reporting not doing so, it is clear that for those who have urinated in the water, attitude plays a more influential role in the decision to urinate immediately prior to entering the water than for those who have never urinated in the water. This suggests that when it comes to urinating prior to entering the water, there is a possibility that those who have a history of urinating are also going to be influenced by their own beliefs than those who have not urinated. This finding is admittedly, quite puzzling because one would have expected those who have not urinated in the water who are in the minority to have attitudinal factors playing a greater role. It is difficult to make sense of this. When I went into the variables and looked at the means of the components of the attitude measures (good/bad, pleasurable/not pleasurable, important to me/not important to me) no significant differences were observed between the two groups. Exploration of the means of the items making up the belief-based determinants of attitude (behavioural beliefs and outcome evaluations) yielded similar non-statistically significant differences. It can reasonably safely be concluded therefore that past history as far as having urinated in the water or not is not a significant factor in influencing intention to urinate immediately prior to entering the water.

With reference to getting out of the water to urinate, when asked what factors prevented them from doing so, the main responses are tabulated below:

Table 8.31: Reasons for not getting out of the water to urinate

Reason	N =	% of sample
Not answered	51	28.98
No Privacy	33	18.75
Carefree	25	14.20
Busy	22	12.50
Inconvenient	15	8.52
Urge too strong	11	6.25
Habit	10	5.68
Embarrassed	9	5.11

Most respondents did not answer the question. It is not clear why this was the case. Perhaps it was because having answered the “reasons for not urinating immediately prior” they felt that this question was a mere repetition. It may thus have not been so clear to respondents that the questions were addressing different behaviours. To the respondents it may have been seen as the same behaviour. Hence subjects who put forward similar reasons for not engaging in both behaviours felt no need to address the “getting out” question. The lack of privacy at the lake was the most mentioned reason for not getting out of the water to urinate. In the space provided for reasons, one female respondent wrote, “There are so many males around”. Within the water, privacy is guaranteed. Other respondents wrote of a “carefree” attitude prevailing where people did not allow the need to get out of the water to bother them. One respondent wrote “I just urinate anyway, after all whether I urinate or not is not of any significance”. Other responses frequently mentioned included being “busy” or finding the need to get out of the water inconvenient especially when engaged in enjoyable activity. One respondent wrote “If you are enjoying yourself in the water, you will not want to get out and urinate”. Another wrote “The water is very pleasant especially when it is hot. *Chipako* [“catch”] is pleasant therefore it is very difficult for me to get out of the water”. Other responses included “forgetting” to get out of the water, seeing the exercise as too time consuming, “the bushes are so far to get out and go and urinate” indicated one respondent. A few spoke of stubbornness on the part of the people as one of the reasons why people do not get out of the water to urinate.

Multiple regression equations for intention to get out and urinate were done, dividing the sample into those with a history of having urinated in the lake and those who have not. Subjective norm was significant for both with history “Yes” (N= 127) and without “No” N= 49 ($F(3,45) = 2.41$ $p=.07$ 14% of variance). For “Yes” the equation supported planned behaviour theory $F(3,122)=16.26$ $p<.0000$ variance = 29%. Subjective norm was very significant: .559 indicating that what others around them do greatly influences their decision, which indicates the influence of history in intention to get out of the water to urinate.

8.3 Discussion

At TRA 2 we were able to use the findings of the theories of reasoned action and planned behaviour to assess degrees of health education input. For both behaviours (urinating immediately prior to entering the water and getting out of the water to urinate), club members’ intention was significantly higher than non-club members’ intention. These findings suggest that focussing the message on a group of “adopters” such as the club members who are active participants in message dissemination, results in a marked difference in intention between the two groups following health education input.

One thing stands out clearly in the use of the models and that is the low correlations between the variables. Use of scatter plots indicated that the responses were not widely distributed throughout the questionnaire. The Pearson product correlation method assumes wide distribution of the variables. In this study, the range is restricted to uniform type of responses. This could be due to the model itself or due to the desirability effects of the students. The heterogeneity of responses pulled down the value of my correlation coefficients. Another explanation could be due more to the differences between the constructs. Bagozzi (1981) and Giles & Cairns (1995) point to the difficulties in trying to compare the direct-based measure of attitude with the belief based measure. There is suggestion that the indirect measure is multi dimensional and cannot therefore be compared with the direct measure. The same is said to be the case with the direct normative belief measure and the belief- based one comprising the sum of the product of

motivation to comply and normative belief. The latter measure of normative belief has been argued to be multidimensional (Grube *et al.*, 1986; Giles & Cairns, 1995). The low correlations between the belief based constructs and direct measured ones should therefore come as no surprise.

The fact that “school” is a significant predictor of intention to get out of the water to urinate when it had not been significant at TRA 1, is an indicator of the importance of health education input. Since each school received a different degree of input, the fact that school is now a significant predictor of intention points to the overall effects of applying different degrees of input. This factor therefore validates the impact differing degrees of input has on intention. In hindsight, however, it seems it was a mistake to have omitted the minimum school from the reasoned action / planned behaviour analysis at TRA 1. We were controlled by the dictates of practicality in that whatever Lwangwa findings we came up with would not have been applied to the school since it received a minimum intervention. However for comparative purposes to see how intention was affected by a minimum intervention, we nevertheless should have assessed intention at Lwangwa School at TRA 1.

8.4 Conclusion

Intention is predominantly under normative control and not attitudinal although during TRA 2, attitude seemed to make a stronger showing. This sample is clearly influenced by the social environment and any intervention would have to bring that factor in. Health education input should therefore be directed towards normative factors. The study indicates that personal control factors are more contingent on what others around them are doing, power is given over to the group. This reflects Malawi’s strong communal ethos (Peltzer, 1987; An Afrocentric Alliance, 1998) and has to be the focus of intervention if social cognitive models are to continue providing the useful service they render.

CHAPTER 9

OUTCOME EVALUATION

9.1 Introduction

Outcome evaluation as presented in this thesis refers to an evaluation of the health status that were determined in the early phases of the PRECEDE planning phases (Green & Kreuter, 1991). The health outcome we hoped to influence as a result of this intervention was a change in the prevalence rate. We had set a 15% prevalence rate as an outcome objective of this investigation because we believed this was a rate at which morbidity could be tolerated. Another objective of the study was to treat the children who were most at risk of infection. The prevalence could be brought down immediately by medication. We therefore provided medication at each parasitological assessment as a means of reducing prevalence. The ultimate question being addressed in the evaluation of the outcome of this study is, do different degrees of health education input lead to a decrease in the prevalence and intensity rate of schistosomiasis? In other words, as a result of this intervention, did prevalence and intensity rates decline to the extent we wanted (15%) as a measure of eventual long-term consequence of this intervention? To address this question, four parasitological investigations were carried out to determine prevalence rates. These were conducted over two years and conducted in six monthly intervals with the health education programme carrying on in the interim. The first urine count analysis (Time I) was conducted in May 1997 during the epidemiological diagnosis discussed in chapter 4. This formed the baseline.

The health education proceeded during the six months following baseline with Koche receiving the maximum input, Makawa School the medium and Lwangwa receiving minimum input.

9.2 Time II (October 1997)

9.2.1 Introduction

The second parasitological assessment and treatment occurred in October 1997 (Time II). The objective was to give a six month follow up treatment and assess the prevalence rate following medication and health education at the different degrees of input in the schools during the preceding six months.

9.2.2 Participants

In total, 3230 pupils received treatment in the three schools at Time II. Table 9.1 below describes some characteristics of all the participants who received medication in all the three schools at Time II.

Table 9.1: Time II Characteristics of all pupils receiving treatment in the three schools.

SCHOOL	NUMBER TREATED	MEAN AGE	MEAN WEIGHT
Koche	1224	11.3	34.9 Kg
Makawa	1001	11.0	32.5 Kg
Lwangwa	1005	11.2	33.0 Kg
All participants	3230	11.2	33.5 Kg

Of the pupils described above, 50.5% were males whilst 49.5 % were females. From the pupils treated, a sample of 550 pupils in the three schools had their urine tested for eggs. These figures account for 17% of the total number of those treated in the schools. The mean age of pupils tested was 11.9 years (standard deviation 3.04) with the youngest being 5 years old and the oldest 19 years old. The mode age was 12 years. Males accounted for 52.7% of the sample providing urine samples with females making the remaining 47.3%. The mean weight of the pupils tested was 36.1 kilograms, ranging from 15 to 70 Kgs.

9.2.3 Time II procedure

The procedure used to obtain the urine sample and record information was the same as that described in chapter 4 for the baseline intervention in May 1997. However this time

the participants who provided urine samples were divided into three groups to act as controls of the assessment. Those participants who were not present during the first assessment and treatment and reported having not received any schistosomiasis medication within the past twelve months, were put into Group “A”. As far as possible we wanted a sample of those who had not received medication anywhere else within the past twelve months. Group “A” was designated the control group of the whole sample. We therefore specifically asked the teachers to identify children who had recently arrived at the school. We wanted children who had not received medication within the past twelve months so as to see whether there may be any variables that influence the prevalence rate independent of medication. We verified their history by asking the children whether they had been treated for schistosomiasis – and when the last time was. Some of the children who qualified to be in this group were randomly selected to provide us with a urine sample.

The second group (“B”), comprised those who were treated during the first assessment and treatment but were not tested (that is, did not present us with a urine sample). Once such children were identified, some were randomly selected from their respective classes to give urine samples for screening. The third Group comprised those who were tested during the first treatment and assessment. These were put into Group “C”. We wanted to check any possible confounding variables that may have arisen from being in the testing group itself. Group “C” was therefore comprised of those who we recorded as having given urine samples at the baseline. All these participants were again requested to provide urine specimens.

For Koche and Makawa, the maximum and medium schools, a further important distinction was made. We specifically sought to test as many members of the Bilharzia clubs as possible. This transpired because the main recipients of our health education were the Bilharzia club members who could be said to have been the “adopters” of the intervention. These received the brunt of the health education input. The prevalence rate of those on whom we focussed our health education, would be an important indicator of the relationship between different degrees of health education input and the prevalence.

9.2.4 Results

The results for assessment of those tested at Time II are presented below.

Table 9.2: Time II overall prevalence of urinary schistosomiasis at Koche, Makawa and Lwangwa.

SCHOOL	SAMPLE SIZE	EGG POSITIVE	PREVAL RATE	95% Confidence Intervals	HEAVY INFECTION RATE
Koche	179	38	21.2 %	15.20 – 27.20	7.5 % *
Makawa	198	66	33.3 %	26.72 – 39.88	7.6%
Lwangwa	173	71	40.7%	33.46 – 48.14	14.0%
Population	550	175	31.8%	27.90 – 35.70	9.7%

Time II treatment and assessment indicated that the maximum intervention school Koche, had the lowest prevalence rate followed by Makawa and Lwangwa the minimum school. This finding followed the same patterns for the heavy infection rate. The confidence intervals of the proportions shown above clearly demonstrate the differences between the schools. Lwangwa’s prevalence rates’ population values are all outside those of Koche School indicating similar patterns as in Time I (baseline). There is no statistical significance overlap between Makawa and the other two schools. In Time II as explained above, the samples tested were categorised into various groups to control for a wide variety of effects. The results of prevalence and heavy infection rate per group is summarised in the table below:

Table 9.3: Time II Schistosomiasis prevalence per Group at Koche, Makawa, and Lwangwa.

School	Group	Sample size	Egg positives	Prevalence (%)	Heavy infection rate (%)
Koche	A	63	21	33.3	12.7
	B	50	11	22.0	10.0
	C	54	6	11.1	1.9
	B-Club members	12	0	0.0	0
Makawa	A	72	45	62.5	19.4
	B	56	11	19.6	1.7
	C	60	7	11.7	0
	B-Club members	10	3	30.0	10.0
Lwangwa	A	55	33	60.0	29.1
	B	78	23	29.5	5.2
	C	40	15	37.5	7.5

Prevalence rates of all Groups “A” in the schools remained consistently higher than the other groups. The prevalence rates of “A” were however lower than the baseline participants. Interestingly, Makawa and Lwangwa Groups “A” experienced prevalence rates that were over 60% whilst the prevalence rate of Koche “A” was only 33.3%. Prevalence rates for Groups “A” at Makawa and Lwangwa were more than double those of Groups “B” in these schools. Group “A” heavy infection rate was the highest of all the groups in all the schools.

To test for significance of results, Chi square comparisons were carried out to compare the treated (Groups “B” and “C”) with never treated (Group “A”). Comparisons were also made between the groups within the treated categories (i.e. groups “B” versus “C”).

Analysis was made using the Mantel-Haenszel test for stratified analysis. This test looks at associations between the Groups “A” adjusted for strata.

Overall Chi square of treated versus non treated (Groups “A” Versus B+C) yielded the following results:

Mantel-Haenszel Summary Chi square = 53.95 $p=.0000$

The findings in the individual schools indicated very significant differences between those treated and those never treated. Heavy infection rates between these two groups were also statistically significant (Chi square 34.44, $p=.000$).

For within treated participants (Groups “B” versus “C”), the overall differences were not significant: Mantel-Haenszel Summary Chi square = 0.48 $p=.4887$. This was also observed when the individual schools were analysed.

No statistically significant differences were noted when club members’ egg count were compared with the treated Groups “B” and “C” ($p=.963$). However the latter results need to be treated with some caution given the very small sample sizes of the Bilharzia Club members who were present at time of assessment. The Bilharzia Club members’ results at Koche and Makawa Schools were void of a consistent pattern. At Koche all 12 club members who gave urine samples were negative for schistosomiasis eggs. This was markedly different from the other groups. At Makawa however, out of 10 who provided urine samples, three were positive giving a mathematical prevalence of 30%. This makes the prevalence rate of this group higher than those of Groups “B” and “C” at the school. Only one of the three positive in the club group had a heavy infection giving an infection rate of 10%. When the treatment history of the sample from the Bilharzia Club was investigated, it transpired that they were a representative number of pupils who qualified for Groups “A” to “C”. At Koche School for example, six of the members qualified for Group “A”, five for Group “B” and one for Group “C”. At Makawa School, six qualified for Group “A”, and two each for Groups “B” and “C”. All the three positive samples came from each of the groups.

Group “A” results therefore indicated the control factor of the groups. This reflects the important role medication has played in controlling the prevalence since those who had not received medication had consistently higher prevalence rates. The main implication of the findings therefore is the suggestion that medication plays a role in prevalence rates.

The Groups “A”, who were acting as sample controls, had a significantly higher prevalence rate than those who had been treated. Furthermore, the condition of being asked to give a urine sample does not seem to have any distinguishing features associated with it as far as prevalence is concerned.

In summary, the six months following the first treatment and assessment yielded a significant drop in prevalence, and heavy infection rate for all the school samples. The two periods are summarised in the table below.

Table 9.4: Comparative overall prevalence and intensity rates at Koche, Makawa and Lwangwa. Times I and II

SCHOOL	MAY 1997	OCTOBER 1997 (Time II)	Percentage difference	Chi Square	P Value
Koche	71.4% (15.1%)	21.2% (7.5%)	50.2% (7.6%)	76.51	P< .0000
Makawa	78.4% (28.2%)	33.3% (7.6%)	45.1% (20.6%)	64.86	P< .0000
Lwangwa	85.4% (27.4%)	40.7% (14.0%)	44.7% (13.4%)	52.11	P< .0000
All tested participants	78.0% (27.4%)	31.8% (9.7%)	46.2% (17.7%)	186.24	P< .0000

(Note: Figures in brackets denote heavy infection rates)

Overall the differences in prevalence rates between Time I and Time II are statistically significant. Compared with the previous assessment and testing, the prevalence rates of the schools dropped by over 46% within six months. Koche School experienced the largest drop in prevalence, with its rate being halved. This was followed by Makawa and

Lwangwa at a close third. The prevalence percentage drops for Makawa and Lwangwa were similar, hovering around the 45% mark. Makawa experienced the greatest drop in heavy infection rates (20.6%).

To see if there was a consistent pattern to this decline, six months later we followed the same procedure and tested the pupils. The decline in prevalence from Time I to Time II and subsequently to Time III may have been purely because of the medication that was given during Times I and II. Hence to see the role health education would play without medication, it was decided not to provide medication during Time III. We would then assess the difference between Time III and Time IV and see if there is any increase in prevalence. If there were an increase we would see whether our divisions of the schools by way of health education input would affect or be reflected in the increase. In the interim period (October 1997 to May 1998), the health education programme followed the same format: Koche receiving maximum health education input, Makawa medium and Lwangwa minimum input.

9.3 Time III (May 1998)

Since no mass treatment was carried out at Time III, the results below pertain to those who gave urine specimen for the assessment.

9.3.1 Participants

A total of 523 participants were tested. Their mean age was 11.8 years with the youngest being 5 years old and the oldest 17 years old. Males accounted for 51% of the sample with females making 49%.

9.3.2 Procedure

Although we did not provide medication at Time III, it needs to be pointed out however, that for ethical reasons, those who were found to have heavy infections were treated. They would therefore not be incorporated as samples in Time IV. Their names were recorded.

As in Time II, the participants were divided into four groups to act as controls of the assessment. Those participants who were not present at any of the previous assessments and treatments and reported having not received any schistosomiasis medication within the past twelve months, were put into Group "A". As far as possible we wanted a sample of those who had not had medication anywhere else within the past twelve months.

The second group was composed of those who were treated during the second assessment and treatment in October 1997 (Time II) but were not present during the first intervention in May 1997. Those in this group were classified as belonging to Group "B". As far as possible preference was given to those whose names were recorded in our book as having given a urine sample and been present for the first time during assessment and treatment II (Group "A" of that time).

We specifically interviewed each child to ensure they were in the right group. Most of the children knew us and associated us with schistosomiasis treatment. This was verified when I would enter each class and ask them if they knew who I was. The class would usually boom "yes!" I would then ask them to tell me how they know me and the class would always respond that I was the one who dealt with Bilharzia. Some of them even called me Mr. Likodzo (Bilharzia). When the children were told whom we wanted, we would then select a sample from those who identified themselves as belonging to a particular group. Identification was done through the showing of hands. The selected group was then taken outside the classroom to ensure minimum disruption to classes. We would then verify that we had selected the right sample. Each child would be interviewed individually. We would ask for example, "have you ever received treatment from us?" If the answer was in the affirmative we would then ask "how many times?" If the answer was "once" we would then ask "which trip did you receive the medication, the first or the second?" If the child said the second we would co-opt him or her into Group "B". Through this method of cross checking we were able to eliminate some individuals who may have confounded the sample.

The third group comprised those who were present during the first and second assessments and received medication each time. They were an important group because

through them we were able to see the progression and gauge whether their prevalence rates had indeed declined. Those names written down as having given samples in Time I and Time II were co-opted. When the sample size of Group “C” was small as many were not present on the days we visited, we also co-opted those who did not give urine samples but were present and treated during both previous times. We saw no reason to make distinctions between those who gave their urine samples and those who did not, especially since no significant differences were observed at Time III between those who had provided urine samples and those who had not. This third group was labelled Group “C”. As in Time II, we also tested members of the Bilharzia club separately. They made up the fourth group. We tried however to incorporate as many club members as possible to supplement the numbers. Some were unwilling or too busy to give us urine samples. In the end we were able to get 12 out of the 30 members at Koche and 9 out of the 24 at Makawa. We were satisfied this was representative of the club members.

9.3.3 Results

The results of the Time III testing are summarised in Table 9.5 below:

Table 9.5: Time III prevalence and intensity rates

SCHOOL	SAMPLE SIZE	EGG POSITIVE	PREVAL RATE	CONFIDENCE INTERVALS	INTENSITY RATE
Koche	180	34	18.9%	13.16 - 24.64	5.1%
Makawa	168	47	28.0%	21.19 - 34.81	3.8%
Lwangwa	175	36	20.6%	14.59 - 26.61	6.3%
TOTALS	523	117	22.4%	18.82 - 25.98	5.1%

Koche School continued having the lowest prevalence rate but the significant differences between the schools observed in Times I and II were not there in Time III. It is as though medication has had an overall unifying effect. Confidence intervals in the various

schools indicate tremendous overlap showing uniformity in true population values of the prevalence rates across the three schools.

Overall prevalence rates at baseline and Time II indicated that Koche the maximum school maintained the lowest prevalence rate. The minimum intervention school, Lwangwa, now followed this. The prevalence rates of the two schools were extremely close, separated by only 1.7%. The medium school, Makawa had the highest prevalence rate, being 7.4% higher than Lwangwa. Of the whole sample however, Makawa School maintained the lowest heavy infection rate. The results of urine analysis within the four groups is presented in Table 9.6 below:

Table 9.6: Time III: Schistosomiasis prevalence per group at Koche, Makawa, and Lwangwa.

School	Group	Sample size	Egg positives	Prevalence (%)	Heavy infection rate
Koche	A	54	23	43.0	14.8%
	B	52	7	13.5	0%
	C	52	3	5.8	0%
	B-Club members	22	1	4.5	0%
Makawa	A	47	24	51.1	10.6%
	B	53	12	22.6	0%
	C	59	10	17.0	0%
	B-Club members	9	1	11.1	0%
Lwangwa	A	49	22	45.0	20.4%
	B	67	7	10.4	1.5%
	C	59	7	12.0	0%

As in Time II, statistical significance was assessed by chi square tests using the Mantel Haenszel stratified analysis that assesses whether the patterns are consistent across the different strata. Group “A” (never treated) was compared with Groups “B” and “C” (treated). This was done for the whole sample. The result indicated that the differences were very significant (Chi square = 60.63, $p=.0000$). Comparisons within the schools indicated a similar trend. Using the same statistical test, it was found that the results between Groups “B” and “C” (the treated) were not statistically significant ($p=.39$). There were also no statistically significant differences between club members and the rest of the school (treated). The results thus serve to confirm the earlier findings that medication is influential because those treated with medication have a statistically significant lower prevalence rate than those who have not had medication.

Table 9.7: Times I- III: Overall prevalence of urinary schistosomiasis at Koche, Makawa and Lwangwa.

SCHOOL	MAY 1997	OCTOBER 1997 (Time II)	MAY 1998 (Time III)	Percentage Changes between Times II – III	Chi Square (II-III)	P value (II-III)
Koche	71.4% (15.1%)	21.2% (7.5%)	18.9% (5.1%)	Decrease 2.3% (Decrease 2.4%)	0.31	$P<.580$
Makawa	78.4% (28.2%)	33.3% (7.6%)	28.0% (3.8%)	Decrease 5.3% (Decrease 3.8%)	1.22	$P<.270$
Lwangwa	85.4% (27.4%)	40.8% (14.0%)	20.6% (6.3%)	Decrease 20.1% (Decrease 7.7%)	17.12	$P<.000$
All tested participants	78.0% (27.4%)	31.8% (9.7%)	22.4% (5.1%)	Decrease 9.4% (Decrease 4.6%)	12.08	$P<.001$

Compared with the previous assessment and testing, the third intervention brought about a further decrease in the overall prevalence of the three schools. However the decrease rate was not as dramatic as the decrease from Time I to Time II. The maximum school (Koche) maintained its position as the school with the lowest prevalence rates experiencing a decrease of 2.3% in the prevalence rates between Times II and III. In the same period, the most dramatic decrease was that of Lwangwa (over 20%). Makawa school boasted the lowest heavy infection rate although Lwangwa experienced the largest heavy infection rate decrease (7.7%) between Times II and III.

Overall for all participants tested, significant differences in infection rates were noted between Times II and III. Analysis among the three schools revealed that only Lwangwa school had statistically significant differences between Times II and III, whilst the decreases observed at Koche and Makawa schools were not statistically significant.

9.4 Time IV (October 1998)

A final parasitological survey was conducted in October 1998 to assess prevalence rates in the schools. This was to be a follow up to Time III in May 1998 when no treatment was given out. Between May and October 1998, health education input continued in the schools with Koche receiving maximum, Makawa medium and Lwangwa minimum levels of input.

9.4.1 Participants

There were a total of 430 participants who provided a urine sample in all the three schools. Of these, 54% were males and the remaining 46% females. The average age of the participants was 13.2 years.

9.4.2 Procedure

Procedure followed that of Time III where no medication was given out. Participants were selected into four groups. Group "A" comprised those who reported not having received any treatment for schistosomiasis. Group "B" comprised those who were present and treated for the first time in Time II, Group "C" were those who were treated during

all our parasitological visits. Some of those in Group “C” had also given urine samples. As far as possible we recruited all those who had given us a urine sample in Time III. Their names had been recorded. Following Time IV, all participants who were found to be infected were treated a few days later once the results had been analysed and recorded.

9.4.3 Results

The results of the urine sample in Time IV overall prevalence is summarised in Table 9.8 below:

Table 9.8: Time IV overall prevalence rate of urinary schistosomiasis at Koche, Makawa , Lwangwa.

SCHOOL	SAMPLE SIZE	EGG POSITIVE	PREVAL RATE (%)	95% Confidence Intervals	HEAVILY INFECTED RATE (%)
Koche	157	57	36.3	28.75 – 43.85	5.0
Makawa	149	92	61.7	53.87 – 69.53	12.6
Lwangwa	124	70	56.5	47.74 – 65.26	15.3
TOTALS	430	219	50.9	46.17 – 55.63	10.6

Confidence intervals demonstrate statistically significant differences between the schools. Both Makawa and Lwangwa Schools’ true population values for prevalence range do not overlap with Koche’s. Koche the maximum school has maintained the lowest prevalence rate.

Overall results showed that Koche School had the lowest prevalence and heavy infection rates. Makawa School’s prevalence rate was the highest of the three schools, being nearly double that of Koche. The minimum intervention school (Lwangwa) had the second highest prevalence rate. This school also contained the highest heavy infection rate.

Results were then analysed according to the various groups within the different schools and are presented in Table 9.9 below.

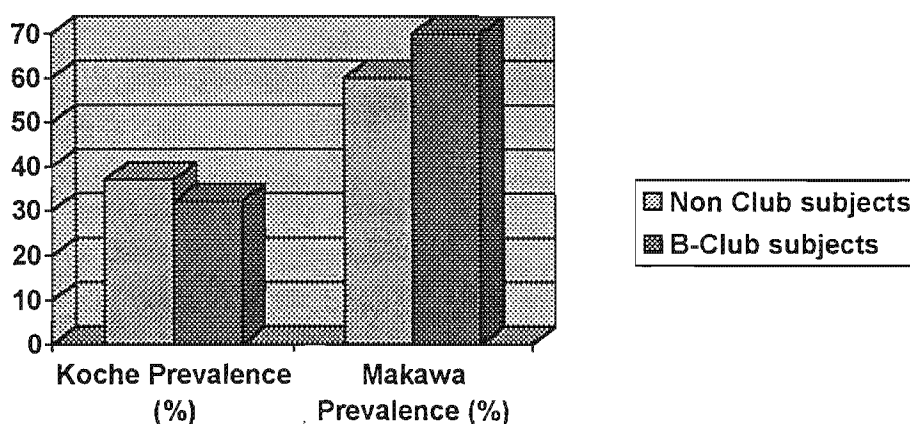
Table 9.9: Time IV: Schistosomiasis prevalence per group at Koche, Makawa, and Lwangwa.

School	Group	Sample size	Egg positives	Prevalence (%)	Heavy infection rate (%)
Koche	A	36	20	55	14
	B	47	17	36	4
	C	40	9	23	3
	B-Club members	34	11	32	0
Makawa	A	22	16	72	23
	B	43	23	53	9
	C	64	39	60	8
	B-Club members	20	14	70	25
Lwangwa	A	11	6	55	9
	B	72	43	60	16
	C	41	21	51	15

Group “A” pupils at both Koche and Makawa Schools had the highest prevalence rate of all the other groups. This finding is consistent with all the previous urine analyses. At Lwangwa however, Group “B” pupils had a higher prevalence rate than Group “A”. Heavy infection rates however demonstrated no consistent patterns. At Koche, Group “A” had the highest number of heavy infections (14%), compared to the other groups. At Makawa the Bilharzia Club members had the highest heavy infection rate followed by those in Group “A”. Lwangwa Group “A” had the lowest heavy infection rates.

Apart from Lwangwa, Group “B” prevalence in all the schools was lower than Group “A” by 19% both for Koche and Makawa Schools. Group “C” yielded no consistent patterns when analysed in comparison to the other groups. Group “C” at Koche and Lwangwa had the lowest prevalence rates of all the Groups but was third highest at Makawa. Chi square tests of significance in Time IV between those treated and those never treated (Group “A” compared with Groups “B” and C), showed significant differences only at Koche (Chi= 7.17, $p=0.0074$) and not at Makawa and Lwangwa schools (Chi=1.67, $p=0.196$ and Chi=0.02, $p=0.894$ respectively). No statistically significant differences were observed between the treated groups (B and C) in all the schools. The same was the case between club members and other treated participants.

Bilharzia Club members whom one would expect to have the lowest prevalence rate in the two Bilharzia Club schools, did not. This is clearly illustrated in the figure below. When all the non- club participants were combined, their prevalence rate compared with the club members is demonstrated in Figure 9.1 below.



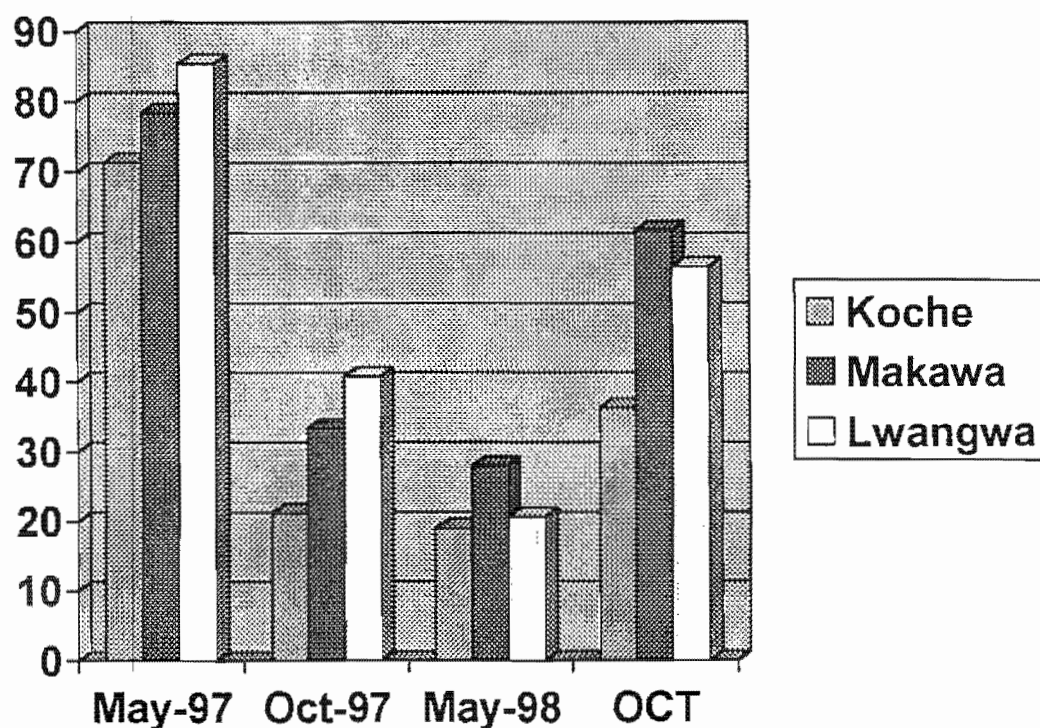
In comparing the Bilharzia Club participants with the rest of the participants, it can be seen that for Koche, the prevalence rates of the club members was slightly lower than that of the non club participants. However for Makawa School the situation was markedly different with the club members having a higher prevalence rate than the rest of the school participants.

Having analysed urine samples in three schools over four 6 month periods, a comparison of the prevalence rates in all the schools follows below. Table 9.10 below, summarises the prevalence and heavy infection rate patterns over the period of the duration of the study. Figure 9.2 below the table illustrates the data.

Table 9.10: Summary of prevalence rates

SCHOOL	MAY 1997	OCTOBER 1997 (Time II)	MAY 1998 (Time III)	OCTOBER 1998 (Time IV)	Percentage Changes between Times III– IV Increase 17.4% (Decrease 0.5%)	Chi Square (p value) III - IV 12.91 (.0000)
Koche	71.4% (15.1%)	21.2% (7.5%)	18.9% (5.1%)	36.3% (5.0%)	Increase 33.7% (Increase 8.8%)	36.57 (.0000)
Makawa	78.4% (28.2%)	33.3% (7.6%)	28.0% (3.8%)	61.7% (12.6%)	Increase 35.9% (Increase 9%)	40.83 (.0000)
Lwangwa	85.4% (27.4%)	40.8% (14.0%)	20.6% (6.3%)	56.5% (15.3%)	Increase 28.5% (Increase 5.5%)	84.63 (.0000)
All tested Subjects	78.0% (27.4%)	31.8% (9.7%)	22.4% (5.1%)	50.9% (10.6%)		

(Bracketed items denote heavy infection rates)

**Figure 9.2: Illustration of prevalence rate patterns.**

The increases in prevalence rates are statistically significant in all the three schools between Time III and Time IV. The participants were treated as three independent groups. Matching would have been a more sensitive test but was not always practically possible due to absenteeism on days of assessment and pupil mobility to other schools. Nevertheless the findings strongly support the role of medication as the key factor in the control of prevalence rates.

From Table 9.10 above it can be said that in comparing Time III and IV, all schools experienced an increase in prevalence rates. Lwangwa School encountered the highest prevalence rate increase (35.9%) followed by Makawa (33.7%). Koche's increased prevalence rate was half that of Lwangwa (17.4%). Heavy egg infection remained consistent at Koche but increased by about 9% at both Makawa and Lwangwa Schools.

In looking at the prevalence rate over the four assessment periods spurning eighteen months, it can be said that from Times II and III, prevalence rates had dropped quite noticeably in all the schools. However from Time III (when no medication was given out), the following assessment (Time IV) reflected an increase in prevalence rate in all the schools. The heavy infection rate followed the exact same patterns over the period. The assumption we draw from this is that had we continued in the vein of assessing prevalence rates in the absence of medication, there would have been a continuous increase in prevalence over time in the absence of medication. Since there were two conditions that were not directly preceded by medication, we compared them. The results for Time I the baseline and Time IV are therefore summarised in the Table 9.11 below.

Table 9.11: Summary of Time 1 and Time 4

School	Time I Prevalence	Time I Confidence Intervals	Time IV Prevalence	Time IV Confidence Interval	Chi Square (Pvalue)
Koche	71.4	63.48 – 79.32	36.3	28.75 – 43.85	34.54 (.000)
Makawa	78.4	71.41 – 85.39	61.7	53.87 – 69.53	9.20 (.002)
Lwangwa	85.4	78.55 – 92.25	56.5	47.74 – 65.26	22.34 (.000)
All Treated	78.0	73.73 – 82.27	50.9	46.17 – 55.63	61.91 (.000)

Time I and IV were statistically different. However it needs to be pointed out that they were not subjected to the same level of no medication. The lower prevalence rate of Time IV could still be due to the effects of medication handed out at Times I and II.

9.5 Discussion

The Lake Malawi Bilharzia Control Programme objective of reducing the prevalence rate of children attending three primary schools along the western shores of Lake Malawi to 15%, was not achieved. A closer look at the factors that influenced this outcome evaluation might shed more light. The role that medication played in the control of the prevalence of schistosomiasis is clearly demonstrated by the results above. It would therefore be difficult to use these findings as an evaluation of influence of the different levels of health education input. The results do not fully support the hypothesis that different measures of health education input control the disease. The findings do not neatly fit into the desired categories we had set. This suggests that there are some gaps to our knowledge. However there are things we can garner from this information.

Effective schistosomiasis control is a composite of a range of ecological factors drawn together to fight the disease. As pointed out earlier in Chapter 1, these include health

education alongside medication and environmental intervention such as clearing of the grass by water sources to control the snail, as well as mollusciciding, and the development of sanitation facilities. The results of this investigation have in a sense confirmed the need for multiple strategies. No matter how much education input is given, if the source of contamination remains unchecked then all persons are at risk irrespective of health education input. Furthermore targeting only a small part of the population such as a school population when, in effect, there are other influences or transmission sources such as children who do not attend school and adults such as the migrant fishermen who are not exposed to the message, reduces the likelihood of an effective intervention. All community members living in the villages of the LMBC Programme area had to be reached, and not just the school children.

From this study, the contribution of health education input in reducing the prevalence rate is inconclusive. However, what is clear is that medication appears to be playing a leading role in prevalence rate reduction. It would be tempting to say or suggest that medication be utilised fairly exclusively especially since the literature outlined earlier in Chapter 1 suggests that medication can reduce prevalence rates by as much as 90% (e.g. Kitange, 1993; Sukwa, 1993). Why not conclude that the “solution” is the provision of medication at various intervals, and leave the issue at that? We cannot leave the situation there. As was suggested earlier, re-infection rates are high (WHO, 1993; Muthami *et al.*, 1995). Furthermore, since the promotion of health is a key factor, we want to avoid the debilitating aspect of the disease. It is a debilitating disease and the drug is expensive. In the list of available drugs in Malawi, Praziquantel is the most expensive drug purchased by the government and was the most expensive part of the LMBC Programme budget. The empirical approach that centres on prevalence as an outcome is not adequate to enable us to see whether health education input has anything tangible to offer in controlling prevalence rates of the debilitating disease. Clearly, there are many other factors at play.

CHAPTER 10

CONCLUSION AND RECOMMENDATIONS: THE LESSONS LEARNED.

We must in conclusion attempt to pull things together and tackle the fundamental questions that this thesis has attempted to address. The premise of this thesis has been that whilst health education has been advocated widely as an important factor in the fight against disease, the degrees of input have received scant attention in the literature. Furthermore, since resources are limited, an endeavour to establish the most efficient input of health education is required. Efficiency is concerned with assessing the achievement of a given intervention goal compared with an alternative intervention goal (Tones *et al.*, 1991). An understanding of psycho-social factors that determine decision-making and behaviour that are mediated by different amounts of health education input, hopefully would enable the designation of successful interventions. This study introduced a fairly wide-scale action research intervention in three primary schools in Mangochi district, Malawi. An intervention of this nature inevitably brings out experiences that are not planned for but nevertheless provide rich data that can inform the process of the intervention. There are therefore lessons that emanate from the study. Furthermore, through the lessons learned in this study, we seek to establish the conditions that need to be in place in order to achieve any reduction in prevalence of the disease, which is the eventual desired outcome. The lessons learned are both of a qualitative and quantitative nature.

Drawing on social psychology which itself has been under pressure to be more relevant and practical (e.g. Sinha, 1983; Fishbein, 1997), this study tackled a practical health problem in Africa. Using schistosomiasis as a case study and working in a school context, we sought to assess how different degrees of health education input affect the control of the disease. We further wanted to explore which measure of input was the most efficient in controlling the disease. We therefore provided input that was guided by social psychology theory and, in particular, the theories of reasoned action (Ajzen & Fishbein,

1980; Fishbein, 1997) as well as planned behaviour (Ajzen, 1991). We provided health education input that targeted individual factors of behavioural change, such as attitudes and perceived control on the one hand, and input that targeted these factors through normative influences on the other. Subsequently we gave each school a different measure of input: a maximum, medium and minimum intervention. These were then compared.

The study design used in this study was a pre/post intervention one with a series of mid interventions. The intervention addressed five levels or tiers of analysis to answer the question: which measure of health education input is the most efficient in the control of schistosomiasis? At the first level, we employed a physical intervention, which aimed at treatment of the disease. Ethical considerations ensured that all children in the schools were supplied with medication in the course of the intervention. We employed four assessments at this level of analysis: one at baseline, two in the course of the intervention and one at evaluation (post). Prevalence was established parasitologically by urine specimen from a randomly selected sample of school children. Significant reductions in prevalence rate were observed across all three schools following treatment at Times I and II. To establish what would happen if there was no medical input and to tease out the influence of medication alone on the prevalence rate, chemotherapy was not provided at Time III, and results were observed during Time IV. A resultant significant increase in prevalence was observed. What became clear was that medication is the determinant of prevalence rate. Therefore at the first tier of intervention (the physical), we cannot determine the most efficient measure of health education input. What can be concluded from this tier of intervention is that in any ongoing schistosomiasis control programme, medication is an essential part of the intervention. The eventual outcome of the intervention in terms of health status of the target population is going to be influenced by physical or medical factors.

Lesson number one therefore is that the effectiveness of the health education of this programme is dependent upon the environment of the community being targeted. The results of the egg count studies to determine prevalence demonstrated this clearly. For each dispersal of medication, the prevalence rate of our population declined. When we

divided the samples up into groups, those who had not received medication had a significantly higher prevalence rate than those who had. No significant differences were observed between the varying experimental manipulations of subjects who had received medication. When we stopped giving medication, the prevalence rate started to rise again. Prevalence was therefore dependent on medication to treat the disease directly. This shows that the source of infection also needs to be addressed in order to have an efficient health education programme. Our attempts to manipulate the prevalence rates by providing differing degrees of health education input proved impossible. If the source of contamination was not addressed, then, regardless of the levels of health education input, all persons in contact with the points of transmission were at risk for infection. Desjarlais *et al.* (1995) correctly point out that "local contexts make certain health options more available and others less so" (p.229). The success or failure of a public health programme therefore ultimately depends on the local context in which the behaviour occurs. This would include the environmental conditions such as sanitation and sewerage resources (Desjarlais *et al.*, 1995).

This being the case, the question arises, where does social psychology play a role if its input is to be subsumed by the local environment? Do we still have something to offer or is our contribution mainly dependent on ecological factors? It is at the other tiers or levels of intervention that social psychology's contributions become more pronounced. The second, third, fourth and fifth tiers of intervention were based on the assumption that if we put a health education programme in place, this would lead to changes in behaviour which would in turn lead to reduction in prevalence of the disease. We wanted to see which measure of health education input would be the most efficient in getting us towards our goal, which ultimately is prevalence reduction. The different measures employed to achieve the goal of behaviour change were grounded in social psychology literature. At level two of the intervention we wanted to address the purely individual and cognitive input that focuses primarily on information provision. Is the mere input of information adequate to effect behaviour change in this population? We wanted to know, is a minimum condition of health education input based merely on information sufficient for an efficient intervention? The findings would appear to suggest not. The minimum

school, which had basic information as its input, experienced no distinct changes in knowledge, attitude and practice when these behaviour changing variables were tested pre and post intervention. However intention to urinate immediately prior to entering the water was significantly higher than the medium and maximum schools. This suggests that for this behaviour, a minimum intervention based only on information is the most efficient health education input. Whilst intention for getting out to urinate was not significantly different from the maximum school, its mean was high. Lesson number two: It can therefore be argued that a minimum health education input based on information is efficient when compared with a maximum output because overall no significant differences were observed across the degrees of input. In effect, apart from establishing clubs, it makes no difference whether the input is minimum, maximum or medium. Since efficiency is what is sought and cost effectiveness is always a factor, input based on information alone is generally adequate for an intervention.

However, lesson number three is that the establishment of clubs is very much preferable. Club members were statistically significantly different from non-club members for all aspects tested except for the physical condition. Their level of knowledge, attitude, practice and intentions significantly leaned in the direction of action that would control the disease. The establishment of clubs therefore appears to lead to significant changes in behaviour change variables. However the ones who appear to benefit the most are only the club members. The diffusion of input from club members to the other pupils suggests that, whilst the schools observe changes in behavioural determinants, these changes are not different across the levels of maximum, medium or minimum inputs into the school. Hence, if there is to be an intervention, it should be organised in such a way that everyone is a “club member” with intense focussed weekly activities for the whole school, otherwise periodic basic information will suffice although the impact shall not be as effective.

Since a third lesson of this intervention advocates the importance of clubs, a closer analysis of this conclusion is necessitated. A limitation of this study immediately comes to the fore. The study had no baseline for intention, knowledge, attitude and practice of

the clubs. It could be argued that those who joined the clubs joined them because they already had intentions that predisposed them towards behaviours that would reduce schistosomiasis. A baseline assessment of club members would have resolved this argument and any doubts about health education input. No baseline was carried out primarily because the clubs were formed only after the baseline measures were conducted. For those who were joining the clubs, we were keen not to load them with a series of questionnaires because we did not want to give the impression that the club was comprised of a series of “tests”. We were keen to make the clubs entertaining and fun. Informal surveys through quizzes during the club activities for example, did however indicate that club members’ knowledge was inadequate in several areas. We therefore are satisfied that to some extent, focused input did have an impact, but the exact quantification of that impact is sadly lacking. As it is there is no concrete proof that club members have superior intention, knowledge, attitude and practice as a result of the health education input. We therefore cannot ascertain conclusively whether or not the differences between club members and the rest of the school are due to degrees of health education input or to the personality of members.

Green (1985) wrote that health education begins with a social goal or problem and then draws on the behavioural sciences to find solutions. On the other hand, he argues, behavioural science works the other way round; it has a theory or scientific hypothesis and then seeks a social problem or goal to test the theory. In this thesis an attempt has been made to marry the two approaches (health education and behavioural science). In this thesis we faced a health problem (schistosomiasis) that needed addressing. Health education provided an operational framework, but the behavioural sciences and in particular, social psychology were drawn upon to enhance understanding of factors that reinforced, enabled and predisposed behaviours that maintained the disease. In the process, the theory had to be tested and in this case we applied the theory of reasoned action and planned behaviour to inform cognitive processes. We also interpreted some of the events in the course of the intervention in terms of social psychological principles. We therefore also tested the theories and in so doing also attempted to contribute to their development. We are therefore faced with two questions. Have the social cognitive

models worked? Do they have utility in this particular population? Can we sift out answers in terms of efficiency of different measures of health education input?

Application of the theories of reasoned action and planned behaviour showed that normative factors were the overriding determinant of intention to engage in the various schistosomiasis-related behaviours addressed in this study.

The findings of the application of reasoned action and planned behaviour models to predict and explain intentions to engage in a variety of schistosomiasis-related behaviours indicated utility and predictive power of the models for the Malawian population under investigation. These social cognitive models were therefore used to set up, run and assess the health education input of the study. The baseline applications (TRA 1) provided a wealth of information, for example who the salient referents were, and which beliefs needed specific targeting. For example, the strongly held belief that getting out of the water to urinate prevents the spread of disease, was drafted into the health education intervention as an ally to reinforce that behaviour. Teachers and medical personnel were utilised in the maximum intervention school as the TRA 1 pilot questionnaire revealed that the subjects most wanted to comply with them. The behavioural and normative beliefs helped inform the content of the health education syllabus. Impact evaluation demonstrated some shifts in intention especially among those exposed to the medium condition. The models have confirmed that maximum input is not the most efficient. Hence at the fifth tier of intervention, interaction with the community around the school does not seem to have brought about significant shifts in intention to engage in schistosomiasis reducing behaviours. The maximum school's intention means were generally not different from the other schools.

The marriage of PRECEDE-PROCEED and the theory of reasoned action and planned behaviour in the evaluation of our intervention has been complementary. PRECEDE-PROCEED highlighted some of the reasons why things did not work out at the more ecological level. It was pointed out in the literature review that behaviour is shaped, changed and maintained by the social environment from whence people come. PRECEDE-PROCEED provided a systematic way of analysing the social context, whilst

the social cognitive models gave more substance to the intra-psychic mechanisms at work in the behaviour leading up to the acquisition of schistosomiasis infection. At this juncture, it is important to evaluate the operating framework of PRECEDE-PROCEED that was used to inform the planning, implementation and evaluation of the intervention. To do this adequately we shall need to draw it up against criteria set by other health educators. Generally we set to avoid pitfalls associated with poor planning and intervention. Overall we avoided the six pitfalls listed by Kok (1997) covering key stages of the intervention: problem identification, behaviour clarity, determinants of behaviour, intervention itself, implementation and evaluation. With regard to the first pitfall, developing an intervention for an irrelevant problem, the planning of the PRECEDE stages of this study ensured that this was not the case. The problem of schistosomiasis addressed by this thesis was a key and important health problem affecting the study population as was seen by the very high prevalence rates of over 70%. The disease is a debilitating parasitic infection with serious long-term health and economic consequences.

The second pitfall refers to that of developing a behavioural intervention that does not have a direct relationship with the problem. Again, in this study, the behavioural diagnosis of PRECEDE ensured that the behaviour we sought to change was directly related to the problem. In our case therefore, urinating in water is linked with schistosomiasis infection. The third pitfall listed by Kok (1997) refers to a lack of understanding of the determinants of the behaviour. The educational and organisational diagnosis of PRECEDE-PROCEED ensured that the predisposing, enabling and reinforcing factors of urinating in the water were fully explored. Social-cognitive models were drawn on to assess the underlying determinants of the behaviour, resulting in a clear picture of the underlying influences that lead up to action being predominantly in the normative domain for this sample.

The fourth pitfall was that of an inadequate intervention. This study ensured that the population concerned was brought into the picture in the early stages. Adequate resources were determined in the administrative and policy diagnosis of the study. The fifth pitfall mentioned by Kok (1997) is that of an implementation that does not address the problem,

i.e. a wrong implementation. The set goals and objectives of the various stages of PRECEDE-PROCEED ensures that implementation is relevant, applicable and focussed. In this intervention the health education was influenced by the goals set in the PRECEDE stages. We were able to target the predisposing, enabling and reinforcing factors. For example, the health education targeted specific cognitive structures such as the belief that urinating in the water is quick and convenient (predisposing), and utilised key health personnel to pass the correct message in the maximum condition (reinforcing factors).

Finally, Kok (1997) mentions the pitfall of inadequate evaluation of the programme. Following the PROCEED steps ensured that adequate and satisfactory attention was paid to an evaluation of the process, impact and outcome of the intervention. Social psychology explanations were furnished to inform the evaluation, especially the process of the study. Hence the use of the PRECEDE-PROCEED model (Green & Kreuter, 1991) enhanced and strengthened this intervention.

Social psychology also served to furnish explanations of the process of the intervention. It is here that other lessons from this intervention were obtained. Our entry into the programme with predetermined set objectives in wanting to control schistosomiasis, in effect meant that the real needs and requirements of the people were not fully addressed. In the social diagnosis (step one) of the planning of the intervention, it was made clear that development in the form of piped water to the people was the key perception held of the people's needs. For the community, social development and progress was tied to improved living conditions in the form of piped water. To the two chiefs who were part of our focus group discussions, our health education intervention would be meaningless if we did not provide piped water. The provision of piped water was neither within our budget nor within our objectives. To us, the control of the disease lay in getting the children to stop urinating in the lake. The community had told us at the outset that control lay in development and safe water provision. What they told us and what our political agenda was did not tally, and having gone into the community to solicit their support, and finding that it not parallel to our agenda, we basically ignored the community and went ahead. This was a major flaw and weakness of the overall LMBC Programme. Lesson

number four of this intervention therefore highlights how a preset agenda from outside interferes with the process evaluation of the population under study.

When I went back to revisit the community a year after the intervention had come to an end, one of the things that was constantly said to me was, “why only focus on schistosomiasis? There are other diseases like Malaria that need attention too. The Bilharzia Club should therefore become the ‘Health’ Club”. These comments reflect clearly the need for involving the community in the context of their daily lives as opposed to homing in on one particular disease. The social diagnosis stage of the intervention made it clear that the day-to-day life of the community and their concerns, goals and issues are in the health domain and therefore needed to be absorbed into the study. Part of the reason for the “obstacles” to the implementation of the programme (such as money issue and “sabotage” of Koche display) may have been due to the failure on our part to contain the goals of the community sufficiently.

This study has provided theoretical backing of the application of social cognitive models and in particular the theory of reasoned action, which was the mainly utilised model in this study. The findings of the application of the theory of reasoned action and planned behaviour were consistently normative. Furthermore the findings were statistically significant giving credence of the theory’s applicability to the Malawi situation. Since consistency is an important hallmark of a theory’s credibility, it can be said that this study has further supported the empirical nature of these theories.

It is equally important to examine what the application of the social cognitive models did not tell us in this investigation. Ironically the main findings of this study, that normative factors are key, act as the starting point in examining the gaps of this study. The normative findings of this study clearly demonstrate the need to explore further the social dynamics that determine behaviour. Such an exploration draws on different philosophical approaches to enquiry that may go beyond the empirical method of enquiry popularly used in social cognitive models. Social cognitive models have been criticised for failure to explain large proportions of the variance in behaviour (Joffe, 1996; Fife-Schaw, 1997).

Furthermore, generally speaking, access to attitudes, beliefs and intentions of individuals (the very things the linear models of behaviour attempt to measure) is indirect. Subsequently the measurement of these constructs is filled with some uncertainty (Fife-Schaw, 1997). Indeed, behaviour itself is a difficult construct to measure and thus remains a major hurdle of empirical applications of the social cognitive models. Behaviour is thus inferred. This is probably the weakest aspect of research methods reflecting perhaps more the inadequacies of the methods rather than the theoretical inadequacies of the models (Fife-Schaw, 1997).

No disease occurs in isolation. There are always mediating factors. It is widely recognised that everyday actions and behaviours contribute towards a general state of health (Hubley, 1993). Desjarlais *et al.* (1995) argue that behaviour "is so rooted in social contexts, so inflected by social differences, and so at the mercy of social resources that behaviours must be thought of as primarily social. They are subject to individual variations at the margins only" (p.229). The strong normative leanings of our findings would appear to support this contention.

This study has therefore brought me as investigator to an interesting place. An important lesson learned in the search for the most efficient degrees of health education input to control schistosomiasis was the need to go back to first principles and not rely solely on prescribed, technical or packaged interventions as I had assumed at the outset. An important lesson therefore was about what philosophical and theoretical framework guided my role as researcher. To use discursive psychology rhetoric, my own approach to entering the community is influenced by the scientific discourse. I learned that Malawi's deep and rich oral tradition had to be explored further to make sense of the cosmology of the people whose behaviour we were targeting. I further learnt that our perception of medicine in terms of the cause – effect linear approach to disease, may have to be run side by side or be superimposed by understanding disease from the perspective of the people. I subsequently learnt that qualitative approaches drawing on the "new" psychology (such as discourse analysis, social representations and cultural psychology) would provide useful insights into a possible way forward in the search for an efficient

health education intervention. I learned that in taking the understanding of the dynamics of behaviour and disease further, I would have to employ other research tools to capture the discourses of the community involved. It has been a humbling and eye-opening journey.

Much of my learning occurred from the participants' discourse. These were qualitative methods such as focus groups and the events that occurred in my interactions with key people in the action research. The events alluded to in chapter 6 (for example the issues surrounding the footballs, the sabotage of the final display and the money issue) all had idiosyncratic meanings that shed more light on the dynamics that were at play during the study. These dynamics may have impacted upon the efficiency of the intervention. Indeed social cognitive models alone could not explain this. My "search" for an efficient health education programme shifted from a proactive one in which I was directing the investigation, to one in which I sat down and listened to where people were. Social psychology provides such a framework through discourse. Whilst the use of models was a necessary and useful tool providing the framework for the study, discursive psychology pointed me to areas that needed further investigation. If I were to conduct another health education intervention, what would I do differently having been through this? I would probably draw more on the discursive turn in psychology. This would enable me to play a more "listening" role to establish people's perceptions. This may help explain the dynamics of reaction to the programme. The task of understanding human behaviour involves "interpretation and empathy" rather than "prediction or control" (Gillett, 1995, p.112). The researcher therefore needs to "enter into discourse with the subject and attempt to reveal the shape of the subject's cognitive world" (p.112). The mind is "a meeting point of a wide range of forces and structuring influences whose nature can only be painted on a broader canvas than that provided by the study of individual organisms" (p.113)

However the paradox is that to arrive at this conclusion, I had to go through the social cognitive models that the study used. In this respect, the theories applied here fulfilled their role. The discursive approach is a whole goldmine of information that would require

particular and meticulous investigation. There are debates about the lack of clarity of this research method making uniform investigation difficult (e.g. Fife-Schaw, 1997). Whilst the theories of reasoned action and planned behaviour are themselves questioned, reviewed and challenged, they nevertheless have clearly laid down and defined methodologies that are open to replication by another researcher. Given the time limits and the clear objectives of this particular study, it was necessary to draw on empirically tested health behaviour models such as TRA which provide a framework upon which health education programmes could be based (Bunton *et al.*, 1991). With discourse analysis, however, it is not so clear how one could conduct a pre and post intervention discursive survey. As the search for relevant and concise applications of critical psychology continues, I would certainly want my future investigations to contribute to the process of developing these critical theories and their applications in the health behaviour field. However, the clearly defined mandate of this present study did not allow for such a contribution at this time.

For others also on a similar quest, or planning to implement a health education programme, what would I specifically recommend that emerged from this pilot research? Can I answer the question: if someone wanted to become involved in a health education intervention programme to control a specific disease or health impairing behaviour patterns, what advice would this study be able to give them as far as how much input they should give to ensure maximal efficiency? This study has been about input ensuring efficiency. That was my mandate. The lessons learned and mentioned above would sufficiently help answer this question.

Further Study

Several areas shall warrant further investigation arising from this study.

The dissemination of information from club members to non-members, and how they influence their friends with the message and the reactions of the friends to the message would be an important aspect to investigate to see how messages get passed on among peers. It was beyond the scope of this study to assess and analyse precisely how this is done and what the factors of influence are (Foster, 1991). Since this thesis sought to

focus primarily on assessing different degrees of input, such a study on influence and diffusion of messages would be worth exploring later, especially as it can be clearly seen that there are differences between club members and non-members since club members receive a concentrated input. The dynamics influencing adopter decisions of successful programmes (Gingiss *et al.*, 1994; McCormick *et al.*, 1995) needs to be understood to ensure effective intervention and message strategies. Networks of influence exist to define the socially accepted and preferred behaviours. Identification of such networks and influence processes would therefore be essential (Mbere, 1981b).

Bennet & Murphy (1994) say there is a need for more process evaluation and phased or “episodic” research in order to understand “how” health education messages impact on the target population. There has been too much emphasis on intervention outcome effects (such as behaviour change or egg counts) with “the assumption that these have resulted directly from the intended intervention. Whilst such outcomes have obvious utility”(p.128), they occur without a clear understanding of how the message is received, interpreted and responded to by the target population. This emphasises a “top down” view of behaviour change, which deprives us of understanding the process. There is therefore need for an understanding of how

“cultural or sub-cultural processes influence the impact of any intervention, and [modify] initiatives accordingly. Such research may also prove a rich testing ground for psychological theory, and may be achieved through the use of both qualitative and quantitative research methods” (p.128 Bennet & Murphy 1994).

Given the strong normative emphasis of this sample, there is need to further explore how “image” held towards a person who engages in the urinary behaviour is seen by others (Gibbons *et al.*, 1998; Fishbein, 1997). How favourable an image do “water urinators” have in the social context of school going children in Mangochi? There is evidence to suggest that the more favourable the image, the more likely the intention to engage in the behaviour (Gibbons, *et al.*, 1998). People may first perceive the image, and the

consequences of the behaviour are perceived as secondary. It would be necessary to go back and explore this dimension in order to understand how image mediates in intention, an area in which social representations (Moscovici, 1988; Joffe, 1996) approach could be useful.

Since, for this sample, normative factors are overriding, what would be worth further exploration would be the extent to which social control in personal relationships plays a role in shaping health behaviour (Lewis & Rook, 1999). The interplay between social support and social control in defining health outcome is beginning to receive more attention (Lewis & Rook, 1999), and a study incorporating these dynamics would shed much light on the influence of health related behaviours. The dynamics and group socialisation processes of the Bilharzia Clubs would also be worth exploring. Since the club members had indicated that they wanted a separate identity through their own T-shirts, an examination of group culture and how it impacts health behaviour would be worth investigating (Levine & Moreland, 1994).

The “removal” of teachers and health personnel from the list of salient referents could be explored further through discourse analysis. It could be that they were seen as part of the “imposition” of this programme and were thus removed as salient referents. The obstacles referred to in earlier chapters (e.g. chapter 6), describing the health education process in the field such as the “sabotage” and money issue could be reflective of the community’s displeasure with the programme.

Application of critical psychology theory to the issues addressed in this thesis also warrants further investigation. For example, Harré & van Langenhove (1999) expand on “positioning theory” which refers to the analysis of people’s interaction in discourse with one another and their relative “positionings” through speech-acts in relation to the story line. Of interest would be to explore how such positionings can advance health-related behaviours. What social dynamics operate to position a person into such a place where they are more likely to urinate out of the lake or use a condom during sex for example? What discursive rules exist to allow for the actions that are conducive to health-related

behaviours? Carr *et al.* (1998) present a combination of transactional analysis and positioning theory that in essence is similar to Harré & van Langenhove's (1999) theory. Using Harré's language (Harré & Secord, 1972), one episode I came across in the qualitative focus group discussions, was that of the game children play whenever they want to urinate. To recap, a child will say "curse me" to his swimming companions whilst they are in the water. He or she is cursed and then proceeds to dive under the water and urinates in the process. Such an episode is one that has "some principal of unity" (Harré & van Langenhove, 1999, p.10) and has been passed down from generation to generation. Since episodes contain thoughts, intentions, plans etc of the individuals involved, they also shape what participants say and do (Harré & van Langenhove, 1999). There is therefore a need to understand how new episodes or "positions" are negotiated within the idiosyncrasies of the sample under investigation. The objective would then be to align such repositionings with behaviours that are conducive to optimising health from a health education perspective. To give a concrete example, a starting point for discursive analysis in the "curse me" speech-acts would be unpacking the implicit story lines (a social unconscious?) of this particular social ritual. The ritual will index story lines around the behaviour. This would give us a clue where to intervene. Unfortunately during the action research I did not have access to the conceptual and operational tools of discursive psychology. However I intend to explore this further in future now that I have this tool at hand. The role of cultural factors needs further exploration (Carr *et al.*, 1998). In particular the modes of social psychology advocated by Carr and colleagues (Carr *et al.*, 1996, 1998) would warrant further exploration and development both in methodology and in application.

Finally

Paradoxically, in order to arrive at the place described above, I had to go through the route of applying social cognitive models. I could not assume that this particular sample's intention was normative because an earlier study in Malawi using the theory of reasoned action in relation to AIDS-related behaviours found that intention of the adolescents surveyed was under attitudinal influence (Bandawe & Foster, 1996). The findings of this study have shown the need to invoke the wider scope of social psychology methodology,

to understand determinants of behaviour from a social psychology discursive perspective. Under the mandate of the current study (to come up with an efficient health education intervention) however, it has been argued that social cognitive theories and, in particular, the application of the theories of reasoned action and planned behaviour, were the most relevant approach given their empirically proven value. These theories enabled us to determine the underlying influences that guided behaviour among school children in Mangochi and set up an intervention. They also enabled us to assess health education input adequately in order to be able to make recommendations for future health education intervention delivery and point to areas for further research exploration. The study has therefore attempted to be an example of the contribution social psychology can bring to the control of disease.

REFERENCES

- Abdel-Salam, E., Fawzy, M., Abdel-Meguid, I.E., Kamel, S., Haurey, E.I. & Mahmoud, A.A.F. (1994). Impact of targeted long-term chemotherapy-based program on prevalence, intensity, and morbidity of schistosomiasis haematobium in Egyptian children. *International Child Health*, **5**, 91-102.
- Aboud, F.E. (1998). *Health Psychology in Global Perspective*. Thousand Oaks: Sage publications.
- Abraham, C., Sheeran, P., & Orbell, S. (1998). Can social cognitive models contribute to the effectiveness of HIV-preventive behavioral interventions? A brief review of the literature and a reply to Joffe (1996; 1997) and Fife-Schaw (1997). *British Journal of Medical Psychology*, **71**, 297-310.
- Ager, A. (1991). Effecting Sustainable change in client behaviour: The role of the behavioural analysis of service environments. In B. Remington (Ed.) *The Challenge of Severe Mental Handicap: A Behaviour Analytic Approach* (pp.343-368). Chichester: John Wiley & Sons.
- Ager, A. (1992). Perception of risk for malaria and schistosomiasis in rural Malawi. *Tropical Medicine & Parasitology*, **43**, 234-238.
- Ager, A. (1993). Psychology and Africa [Letter to the editor]. *The Psychologist: Bulletin of the British Psychological Society*, **6**, 490.
- Ager, A., & McLachlan, M. (1998). Psychometric properties of the Coping Strategies Indicator (CSI) in a study of coping behaviour amongst Malawian students. *Psychology and Health*, **13**, 399-409.
- Ager, A., Carr, S., MacLachlan, M., & Kaneka-Chilongo, B. (1996). Perceptions of tropical health risks in Mponda, Malawi: Attributions of cause, suggested means of risk reduction and preferred treatment. *Psychology and Health*, **12**, 23-31.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and Human Decision Processes*, **50**, 179-211.
- Ajzen, I., & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behaviour*. Englewood Cliffs, N.J: Prentice-Hall.
- Ajzen, I., & Madden, T.J. (1986). Prediction of goal-directed behavior: attitudes, intentions and perceived behavioural control. *Journal of Experimental Social Psychology*, **22**, 453-474.
- Akin-Ogundeji, O. (1991). Asserting psychology in Africa. *The Psychologist: Bulletin of the British Psychological Society*, **4**, 2-4.
- Albarracin, D., Fishbein, M., & Middlestadt, S. (1998). Generalising behavioral findings across times, samples, and measures: A study of condom use. *Journal of Applied Social Psychology*, **28**, 657-674.
- An Afrocentric Alliance. (1998). Groups at work in East and Central Africa. In M. MacLachlan & S.C Carr (Eds.) *Perspectives in Malawian Psychology: A Reader for Students* (pp.111-139). Dublin-Zomba-Darwin: Zikomo Press.

- Aral, S.O., & Peterman, T.A. (1998). Do we know the effectiveness of behavioural interventions? *The Lancet*, **351** (Suppl. III), 33-36.
- Ashing-Giwa, K. (1999). Health behavior change models and their socio-cultural relevance for breast cancer screening in African American women. *Women & Health*, **28**, 53-71.
- Ashorn, P., & Ashorn, U. (1995). Bilharzia screening and treatment at Lungwena Full Primary School, May, 1995. Unpublished report for the Bilharzia Research Team and Lungwena Full Primary School Health Club.
- Bagozzi, R.P. (1981). Attitudes, intentions and behavior: A test of some key hypothesis. *Journal of Personality and Social psychology*, **41**, 607-627.
- Bagozzi, R.P. (1992). The self-regulation of attitudes, intentions and behavior. *Social Psychology Quarterly*, **55**, 178-204.
- Bagozzi, R.P., & Kimmel, S.K. (1995). A comparison of leading theories for the prediction of goal-directed behaviours. *British Journal of Social Psychology*, **34**, 437-461.
- Bailey, D., Hawes, H., & Bonati, G. (Eds). (1992a). *Child-to-Child A Resource Book. Part 1: Implementing The Child-to-Child Approach*. London: Child-to-Child Trust.
- Bailey, D., Hawes, H., & Bonati, G. (Eds). (1992b). *Child-to-Child A resource Book. Part 2 Child-to-Child Activity Sheets*. London: Child-to-Child Trust.
- Bandawe, C.R., & Foster, D. (1996). Aids-related attitudes, beliefs and intentions among Malawian students in three secondary schools. *Aids Care*, **8**, 223-232.
- Bandawe, C.R., & Louw, J. (1997). The experience of foster care in Malawi: A preliminary investigation. *Child Welfare*, **LXXVI**, 535-547.
- Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs, N.J: Prentice Hall.
- Bandura, A. (1986). *Social Foundations of Thought and Action*. Englewood Cliffs, N.J: Prentice Hall.
- Barbie, E. (1995). *The Practice of Social Research* (7th ed.). Belmont: Wadsworth Publishing.
- Bennet, P & Murphy, S. (1994). Psychology and health promotion. *The Psychologist: Bulletin of the British Psychological Society*, **7**, 126-128.
- Blackler, F. (1983). Preface: The plan of the book. In F. Blackler (Ed.). *Social Psychology and Developing Countries* (pp.ix-xiv). London: John Wiley & Sons.
- Blanchard, T.J., Milne, L.M, Pollok, R., & Cook, G.L. (1993). Early chemotherapy of imported neuroschistosomiasis [Letter to the editor]. *The Lancet*, **341**, 959.
- Blunt, S.B, Boulton, J & Wise, R. (1993). MRI in schistosomiasis of conus medullaris and lumbar spinal cord [Letter to the editor]. *The Lancet*, **341**, 557.
- Bomba, W.G. (1981). The role of health education in sanitation programs. In *Sanitation in Developing Countries*. Proceedings of a workshop on training held in Lobotse, Botswana, 14-20 September, 1980. (pp.101-104). Ottawa: International Development Research Centre.
- Bomba, W.G. (1990). Strengthening of I.E.C & Social Mobilization Unit of Ministry of Health. Lilongwe: Ministry of Health.

- Boyd, B., & Wandersman, A. (1991). Predicting undergraduate condom use with the Fishbein and Ajzen and the Triandis attitude-behavior models: implications for public health interventions. *Journal of Applied Social Psychology*, **21**, 1810-1830.
- Bradley, D. (1994). Health, environment and tropical development. In B. Cartledge (Ed.) *Health and Environment* (pp.126-149). Oxford: Oxford University Press.
- Brownlea, A. (1987). Participation: myths, realities and prognosis. *Social Science and Medicine*, **25**, 605-614.
- Bryan, A.D., Aiken, L.S., & West, S.G. (1996). Increasing condom use: Evaluation of a theory-based intervention to prevent STDs in young women. *Health Psychology*, **15**, 371-382.
- Buchanan, D.R. (1992). An uneasy alliance: Combining qualitative and quantitative research methods. *Health Education Quarterly*, **19**, 117-135.
- Bundy, D.A.P., & Guyatt, H.L. (1996). Schools for health: Focus on health. education and the school-aged child. *Parasitology Today*, **12**, 1-14.
- Bunton, R., Murphy, S., & Bennett, P. (1991). Theories of behavioural change and their use in health promotion: some neglected areas. *Health Education Research: Theory and practice*, **6**, 153-162.
- Carr, S. & MacLachlan, M. (1993). Asserting psychology in Malawi. *The Psychologist: Bulletin of the British Psychological Society*, **6**, 408-413.
- Carr, S.C & MacLachlan, M. (1998). Psychology in *Developing Countries*: Reassessing its impact. *Psychology and Developing Societies*, **10**, 1-20.
- Carr, S.C. (1996). Social psychology in Malawi: Historical or Developmental? *Psychology and Developing Societies*, **8**, 177-197.
- Carr, S.C., Ehio buche, I., Rugimbana, R., & Munro, D. (1996). Expatriates' ethnicity and their effectiveness: "Similarity-attraction" or "inverse resonance"? *Psychology and Developing Societies*, **8**, 265-282.
- Carr, S.C., MacLachlan, M., Zimba, C.G., & Bowa, M. (1995). Managing motivational gravity in Malawi. *Journal of Social Psychology*, **135**, 659-662.
- Carr, S.C., McAuliffe, E., & MacLachlan, M. (1998). *Psychology of Aid*. London: Routledge.
- Cetron, M.S, Chitsulo, L., Sullivan, J.J, Pilcher, J., Wilson, M., Noh, J., Tsang, V.C., Hightower, A.W., & Addiss, D.G . (1996). Schistosomiasis in Lake Malawi. *The Lancet*, **348**, 1274-78.
- Cherns, A. (1983). Social Psychology and Development. In F. Blackler (Ed.) *Social Psychology and Developing Countries* (pp. 265-288). London: John Wiley & Sons.
- Chikovore, J., & Mbizvo, M.T. (1999). AIDS related knowledge and sexual behaviour among commercial farm residents in Zimbabwe. *Central African Journal of Medicine*, **45**, 7-10.
- Chipwete, J. (1997). Knowledge, beliefs, attitudes, intentions and practices of urban and rural Malawian primary school children to HIV infection. University of Malawi, College of Medicine final year project. Unpublished.
- Chitsulo, L. (1994). The challenges of schistosomiasis control in Africa: Focus on Malawi. *Public Health*, **11**, 44-49.

- Chizenga, S.H.D. (1981). Health education, an essential component in the promotion of health, with emphasis on rural sanitation. *Sanitation in Developing Countries*. Proceedings of a workshop on training held in Lobotse, Botswana, 14-20 September, 1980 (pp.88-93). Ottawa: International Development Research Centre.
- Choi, K-Y, Yep, G.A., & Kumekawa, E. (1998). HIV prevention among Asian and Pacific islander American men who have sex with men: A critical review of theoretical models and directions for future research. *AIDS Education and Prevention*, **10**, Supplement A, 19-30.
- Chowa, G.C. (1995). The potential use of mass media in health education in Malawi. M.Ed Dissertation in Education and Mass Media, Centre of Adult and Higher Education, University of Manchester, U.K
- Clark, N.M., & Dodge, J.A. (1999). Exploring self-efficacy as a predictor of disease management. *Health Education and Behavior*, **26**, 72-89.
- Clark, T. (1994). Plant molluscicides for snail control in the South African context. PhD Thesis submitted to the Dept of Zoology & Entomology, University of Natal, Pietermaritzburg, RSA. Unpublished.
- Cohen, C., & Cohen, E. (1978). Health education: Panacea, pernicious or pointless? *The New England Journal of Medicine*, **299**, 718-720.
- Conner, M., & Armitage, C.J. (1998). Extending the theory of planned behaviour: A review and avenues for further research. *Journal of Applied Social Psychology*, **28**, 1429-1464.
- Conner, M., & Norman, P. (1996). The role of social cognition in health behaviours. In M. Conner & P. Norman (Eds.) *Predicting Health Behaviour* (pp.1-22). Buckingham: Open University Press.
- Conner, M., & Sparks, P. (1996). The theory of planned behaviour and health beliefs. In M. Conner & P. Norman (Eds.) *Predicting Health Behaviour* (pp.121-162). Buckingham: Open University Press.
- Connolly, K., & Kvalsvig, J. (1993). Infection, nutrition and cognitive performance in children. *Parasitology*, **107**, S187-S200.
- Coulson, N., Goldstein, S., & Ntuli, A. (1998). *Promoting Health in South Africa: An Action Manual*. Cape Town: Heinemann
- Cullinan, T. (1996). Application to PHN. University of Malawi, Department of Community Health. Unpublished.
- Dabbagh, L., Green, L.W., & Walker, G.M. (1992). Case study: Application of PRECEDE and PROCEED as a framework for designing culturally sensitive diarrhea prevention programs and policy in Arab countries. *International Quarterly of Community Health Education*, **12**, 293-315.
- Dawes, A. & Donald, D. (2000). Improving children's chances: Developmental theory and effective interventions in community contexts. In D. Donald, A. Dawes & J. Louw (Eds.) *Addressing Childhood Adversity* (pp. 1-25). Cape Town: David Philip.
- De Vries, H., Weijts, W., Dijkstra, M., & Kok, G. (1992). The utilization of qualitative and quantitative data for health education program planning, implementation and evaluation: A spiral approach. *Health Education Quarterly*, **19**, 101-115.

- Dean, A.G., Dean, J.A., Coulombier, D. et al (1995). Epi Info, Version 6: a word-processing, Database, and Statistics program for Public Health on IBM- compatible microcomputers. Centers for Disease Control & Prevention. Atlanta, Georgia, USA.
- Desjarlais, R., Eisenberg, L., Good, B., & Kleinman, A. (1995). *World Mental Health: Problems and Priorities in Low-Income Countries*. New York: Oxford University Press.
- Dhamangaoukar, S.S. Shri. (1979). What is education and health education? In *Gandhi Memorial Leprosy Foundation Wardha*. Workshop in Health Education. Wardah: Guthran. March 12-25, 1979.
- DiClemente, R.J., & Wingwood, G.M. (1995). A randomized controlled trial of a HIV sexual risk reduction intervention for young African-American women. *Journal of the American Medical Association*, **274**, 1271-1276.
- Dockrell, J., & Joffe, H. (1992). Methodological issues involved in the study of young people and HIV/AIDS: A social psychological view. *Health Education Research: Theory & Practice*, **7**, 509-516.
- Donnelly, R. (1997, January-March). Allowances and the culture of entitlement. *The CURE Newsletter*, **3**, 4.
- Downie, R.S., Tannahill, C., & Tannahill, A. (1996). *Health Promotion Models and Values*. Oxford: Oxford University Press.
- Dunne, D.W., Hagan, P., & Abath, F.G.C. (1995). Prospects for immunological control of schistosomiasis. *The Lancet*, **345**, 1488-1492.
- Eiser, J.R. (1997). Attitudes and beliefs. In A. Baum, S. Newman, J. Weinman, R. West & C. McManus (Eds.). *Cambridge Handbook of Psychology, Health & Medicine* (pp. 3-7). Cambridge: Cambridge University Press.
- Ekeh, H., & Adeniyi, J. (1988). Health education strategies for tropical disease control in school children. *Journal of Tropical Medicine and Hygiene*, **91**, 55-59.
- Ekeh, H.E., & Adeniyi, J.D. (1986). Using teachers as change agents in the control of tropical diseases – an extra-curriculum approach. *International Quarterly of Community Health Education*, **6**, 323-333.
- El Katsha, S., & Watts, S. (1997). Schistosomiasis in two Nile delta villages: an anthropological perspective. *Tropical Medicine and International Health*, **2**, 846-854.
- El Malatawy, A., El Habashy, A., Lechine, N., Dixon, H., Davis, A., & Mott, K.E. (1992). Selective population chemotherapy among school children in Beheira governate: the UNICEF/ Arab Republic of Egypt/ WHO schistosomiasis control project. *Bulletin of the World Health Organisation*, **70**, 47-56.
- Elliot, R., Jobber, D., & Sharp, J. (1995). Using the theory of reasoned action to understand organizational behaviour: The role of belief salience. *British Journal of Social Psychology*, **34**, 161-172.
- Eng, E., Naimoli, J., Naimoli, G., Parker, K.A., & Lowenthal, N. (1991). The acceptance of childhood immunization to Togolese mothers: A sociobehavioral perspective. *Health Education Quarterly*, **18**, 97-110.

- Evans, A.C. (1975). Report to Ministry of Trade, Industry and Tourism, Malawi on Visit to Malawi 19th – 31st May 1975. Investigations into schistosomiasis potential in and around lake shore resorts and other tourist sites, with suggestions and recommendations. Unpublished report.
- Evans, A.C., & Stephenson, L.S. (1995). Not by drugs alone: The fight against parasitic helminths. *World Health Forum*, **16**, 258-261.
- Evans, D.B & Guyatt, H.L. (1997). Human behaviour, cost effectiveness analysis and research and development priorities: the case of a schistosomiasis vaccine. *Tropical Medicine and International Health*, **2**, Supplement A47- A 54.
- Evans, D.B., & Jamison, D.T. (1994, 24 June). Economics and the argument for parasitic disease control. *Science*, **264**, 1866-7.
- Ewles, L., & Simnett, I. (1999). *Promoting Health: A Practical Guide* (4th ed.). Edinburgh: Bailliere Tindall.
- Feagans, L.V. (1992). Intervention strategies to promote healthy children: Ecological perspectives and individual differences in development. In E.J. Susman, L.V. Feagans & W.J. Rays (Eds.) *Emotion, Cognition, Health and Development In Children and Adolescents* (pp. 165-169). Hillsdale, New Jersey: Laurence Erlbaum Associates.
- Fife-Schaw, C. (1997). Commentary on Joffe (1996) AIDS research and prevention: A social representation approach. *British Journal of Medical Psychology*, **70**, 65-73.
- Finlay, K.A, Trafimow, D., & Jones, D. (1997). Predicting health behaviours from attitudes and subjective norms: Between subjects and within-subjects analyses. *Journal of Applied Social Psychology*, **27**, 2015-2031.
- Fishbein, M. (1990). AIDS and behaviour change: An analysis based on the Theory of Reasoned Action. *Interamerican Journal of Psychology*, **24**, 37-56.
- Fishbein, M. (1997). Predicting, understanding, and changing socially relevant behaviours: Lessons learned. In C. McGarty & S.A. Haslam (Eds.), *The Message of Social Psychology* (pp.77-91). Oxford: Blackwell.
- Fishbein, M., Ajzen, I., & McArdle, J. (1980). Changing the behaviour of alcoholics: Effects of persuasive communication. In I. Ajzen & M. Fishbein, *Understanding Attitudes and Predicting Social Behavior* (pp.217-242). Englewood Cliffs, N.J: Prentice Hall.
- Fishbein, M., Jaccard, J., Davidson, A., Ajzen, I., & Loken, B. (1980). Predicting and understanding Family planning behaviours: Beliefs, Attitudes and Intentions. In I. Ajzen & M. Fishbein, *Understanding Attitudes and Predicting Social Behavior* (pp.130-147). Englewood Cliffs, N.J: Prentice Hall.
- Fisher, J.D., & Fisher, W.A. (1992). Changing AIDS risk behavior. *Psychological Bulletin*, **111**, 455-74.
- Fisher, W.A., Fisher, J.D., & Rye, B.J. (1995). Understanding and promoting AIDS-preventive behavior: Insights from the theory of reasoned action. *Health Psychology*, **14**, 255-264.
- Foster, D. (1991). Social influence I: Ideology. In D. Foster & J. Louw-Potgeiter (Eds.) *Social Psychology in South Africa* (pp.345-391). Johannesburg: Lexicon.
- Foster, D., Nicholas, L., & Dawes, A. (1993). A reply to Raubenheimer. *The Psychologist: Bulletin of the British Psychological Society*, **6**, 172-174.

- Freudenberg, N., Eng, E., Flay, B., Parcel, G., Rogers, T., & Wallerstein, N. (1995). Strengthening individual and community capacity to prevent disease and promote health: In search of relevant theories and principles. *Health Education Quarterly*, **22**, 290-306.
- Galbraith, J., Ricardo, I., Stanton, B., Black, M., Feigleman, S., & Kaljee, L. (1996). Challenges and rewards of involving community in research: An overview of the "Focus on Kids" HIV risk reduction program. *Health Education Quarterly*, **23**, 383-394.
- Gallois, C., Terry, D., Timmins, P., Kashima, Y., & McCamish, M. (1994). Safe sexual intentions and behaviour among heterosexuals and homosexual men: Testing the theory of reasoned action. *Psychology and Health*, **10**, 1-16.
- Gay, J. (1983). The uses of Social Psychology in agricultural development . In F. Blackler (Ed.) *Social Psychology and Developing Countries* (pp.207-227). London: John Wiley & Sons.
- Gibbons, F.X., Gerrard, M., Blanton, H., & Russell, D.W. (1998). Reasoned action and social reaction: Willingness and intention as independent predictors of health risk. *Journal of Personality and Social Psychology*, **74**, 1164-1180.
- Giles, M., & Cairns, E. (1995). Blood donation and Ajzen's theory of planned behaviour: An examination of perceived behavioural control. *British Journal of Social Psychology*, **34**, 173-188.
- Gillett, G. (1995). The philosophical foundations of qualitative psychology. *The Psychologist: Bulletin of the British Psychological Society*, **8**, 111-114.
- Gingiss, P.L., Gottlieb, N.H., & Brink, S.G. (1994). Measuring cognitive characteristics associated with adoption and implementation of health innovations in schools. *American Journal of Health Promotion*, **8**, 294-301.
- Godin, G., & Kok, G. (1996). The theory of planned behavior: A review of its applications to health-related behaviors. *American Journal of Health Promotion*, **11**, 87-97.
- Godin, G., Maticka-Tyndale, E., Adrien, A., Manson-Singer, S., Willms, D., & Cappon, P. (1996). Cross-cultural testing of three social cognitive theories: An application to condom use. *Journal of Applied Social Psychology*, **26**, 1556-1586.
- Goldenberg, D., & Laschinger, H. (1991). Attitudes and normative beliefs of nursing students as predictors of intended care behaviours with AIDS patients: A test of the Ajzen-Fishbein Theory of reasoned action. *Journal of Nursing Education*, **30**, 119-126.
- Gondwe, M.H.C. (1995). Schistosomiasis in Lake Malawi National Park. Unpublished position paper presented at the symposium on schistosomiasis in Lake Malawi, Boadzulu Holiday resort, 22-24 November 1995.
- Goodman, R.M., Speers, M.A., McLeroy, K., Fawcett, S., Kegler, M., Parker, E., Rathgeb Smith, S., Sterling, T.D., & Wallerstein, N. (1998). Identifying and defining the dimensions of community capacity to provide a basis for measurement. *Health Education and Behaviour*, **25**, 258-278.
- Government of Malawi. (1999). *Financial Statement 1999/2000. Budget Document No.5*. Lilongwe: Author.
- Gray, N.W. (1981). The Bilharzia transmitting snails, and their related species, in Malawi. *Nyala (Malawi Wildlife Magazine)*, **7**, 109-128.

- Green, A. (1995). Verbal protocol analysis. *The Psychologist: Bulletin of the British Psychological Society*, 8, 126-129.
- Green, E.C. (1999). *Indigenous Theories of Contagious Disease*. Walnut Creek: Alta Mira Press, Sage.
- Green, J., & Tones, K. (1999). Towards a secure evidence base for health promotion. *Journal of Public Health Medicine*, 21, 133-139.
- Green, L.W. & Kreuter, M.W. (1991). *Health Promotion Planning: An Educational and Environmental Approach*, (2nd ed.). Mountain View: Mayfield.
- Green, L.W. (1984). Health education models. In J.D. Matarazzo, S.M. Weiss, J. Allan Herd, N.E. Miller & S.M. Weiss (Eds.) *Behavioural health: A Handbook of Health Enhancement and Disease Prevention* (pp. 181-198). New York: John Wiley & Sons.
- Green, L.W. (1985). Some challenges to health services research on children and the elderly. *Health Services Research*, 19, 793-815.
- Green, L.W. (1999). Health education's contributions to public health in the twentieth century: A glimpse through health promotion's rear view mirror. *Annual Review of Public Health*, 20, 67-88.
- Green, L.W., Potvin, L., & Richard, L. (1996). Ecological foundations of health promotion. *American Journal of Health Promotion*, 10, 270-281.
- Green, L.W. (1988). Bridging the gap between Community Health and School Health. *American Journal of Public Health*, 78, 1149.
- Green, L.W., & Iverson, D.C. (1982). School health education. *Annual Review of Public Health*, 3, 321-338.
- Green, L.W., Cook, T., Doster, M.E., Fors, S.W., Hambleton, R., Smith, A., & Walberg, H.J. (1985). Thoughts from the school health education evaluation advisory panel. *Journal of School Health*, 55, 300.
- Grube, J.W., Morgan, M., & McGree, S.T. (1986). Attitudes and normative belief as predictors of smoking intentions and behaviours: A test of three models. *British Journal of Social Psychology*, 25, 81-93.
- Gubler, D.J. (1997). Human behaviour and cultural context in disease control. *Tropical Medicine and International Health*, 2, Supplement A1- A10.
- Guyatt, H.L., & Tanner, M. (1996). Different approaches to modeling the cost-effectiveness of schistosomiasis control. *American Journal of Tropical Medicine & Hygiene*, 55, 159-164.
- Harré, R. & Secord, P.F. (1972). *The Explanation of Social Behavior*. Oxford: Blackwell.
- Harré, R. & Van Langenhove, L. (1999). *Positioning Theory*. Oxford: Blackwell.
- Hauser, P.M. (1993). The limitations of KAP surveys. In M. Bulmer & D.P. Warwick (Eds). *Social Research in Developing Countries: Surveys and Censuses in The Third World* (pp. 146-165). London: University College London.
- Hawes, H., & Scotchmere, C. (Eds.). (1993). *Children for Health*. London : Child-to-Child Trust.
- Hays, W.L. (1994). *Statistics* (5th ed.). Forthworth, USA: Harcourt Brace Publishers.

- Helitzer-Allen, D., Makhambera, M., & Wangel, A-M. (1994). Obtaining sensitive information: The need for more than focus groups. *Reproductive Health Matters*, **3**, 75-82.
- Helitzer-Allen, D.L., & Kendall, K. (1992). Explaining differences between qualitative and quantitative data: A study of chemoprophylaxis during pregnancy. *Health Education Quarterly*, **19**, 41-54.
- Henwood, K., & Nicolson, P. (1995). Qualitative research. *The Psychologist: Bulletin of the British Psychological Society*, **8**, 109-110.
- Henwood, K., & Pidgeon, N. (1995). Grounded theory and psychological research. *The Psychologist: Bulletin of the British Psychological Society*, **8**, 115-118.
- Hewlett, B.S., & Cline, B.L. (1997). Anthropological contributions to a community-based schistosomiasis control project in northern Cameroon. *Tropical Medicine and International Health*, **2**, Supplement A25-A35.
- Hewstone, M. (1997). Three lessons from social psychology: multiple levels of analysis, methodological pluralism, and statistical sophistication. In C. McGarty & A. Haslam (Eds.) *The Message of Social Psychology* (pp. 166-181). Oxford: Blackwell.
- Hildebrandt, E. (1994). A model for community involvement in health (CIH) program development. *Social Science and Medicine*, **39**, 247-254.
- Hogg, M.A & Moreland, R.L. (1993). Studying social processes in small groups. *British Journal of Social Psychology*, **32**, 107-110.
- Hounsa, A.M., Godin, G., Alihonou, E., Valois, P., & Girard, J. (1993). An application of Ajzen's theory of planned behaviour to predict mother's intention to use oral rehydration therapy in a rural area of Benin. *Social Science and Medicine*, **37**, 253-261.
- Huang, Y., & Manderson, L. (1992). Schistosomiasis and the social patterning of infection. *Acta Tropica*, **51**, 175-194.
- Hubley, J. (1984) Principles of Health Education. *British Medical Journal*, **289**, 1054-1056.
- Hubley, J. (1988). Understanding behaviour: The key to successful health education. *Tropical Doctor*, **18**, 134-138.
- Hubley, J. (1993). *Communicating Health: An Action Guide to Health Education and Promotion*. London: Macmillan.
- Huysamen, G.K. (1997). Parallels between qualitative research and sequentially performed quantitative research. *South African Journal of Psychology*, **27**, 1-8.
- Israel, B.A., Checkoway, B., Schulz, A., & Zimmerman, M. (1994). Health education and community empowerment: conceptualising and measuring perceptions of individual, organisational and community control. *Health Education Quarterly*, **21**, 149-170.
- Israel, B.A., Cummings, K.M., Dignan, M.B., Heaney, C.A., Perales, D.P., Simons-Morton, B.G., & Zimmerman, M.A. (1995). Evaluation of health education programs: Current assessment and future directions. *Health Education Quarterly*, **22**, 364-389.
- Iverson, D.C. (1984). Issues relating to designing and conducting school health education research. *Journal of School Health*, **54**, 50-56.

- Jahoda, G. (1983). Has social psychology a distinctive contribution to make? In F. Blackler (Ed.), *Social Psychology and Developing Countries* (pp.21-31). London: John Wiley & Sons.
- Janz, N.K., & Becker, M.H. (1984). The Health belief model: A decade later. *Health Education Quarterly*, **11**, 1-47.
- Jiyani, E. (2000). Peer education concept paper. Paper presented at the peer education national development strategy workshop in Zomba, Malawi from 31st January to 1st February 2000. Lilongwe: Ministry of Gender Youth and Community Services.
- Joffe, H. (1996). AIDS research and prevention: A social representational approach. *British Journal of Medical Psychology*, **69**, 169-90.
- Kalichman, S.C, Carey, M.P., & Johnson, B.T. (1996). Prevention of sexually transmitted HIV infection: A meta-analytic review of the behavioral outcome literature. *American Behavioral Medicine*, **18**, 6-15.
- Kamwendo, A., Chiotha, S., & Kandawire, J. (1987). Socio-Cultural aspects of Schistosomiasis in Malawi. Report to the UNDP/ World Bank/ WHO Special program for Research and Training in Tropical Diseases. Unpublished.
- Katzenellenbogen, J.M, Joubert, G., & Abdool Karim, S.S. (1997). *Epidemiology: A Manual for South Africa*. Cape Town: Oxford University Press.
- King, M., & King, E. (1992). *The Story of Medicine and Disease in Malawi*. Blantyre: Author.
- Kirby, D., Short, L., Collins, J., Rugg, D., Kolbe, L., Howard, M., Miller, B., Sonenstein, F., & Zabin, L.S. (1994). School-based programs to reduce sexual risk behaviors: A review of effectiveness. *Public Health Reports*, **10**, 339-360.
- Kirigia, J.M. (1997). Economic evaluation in schistosomiasis: using the Delphi technique to assess effectiveness. *Acta Tropica*, **64**, 175-190.
- Kirigia, J.M. (1998). Cost-utility analysis of schistosomiasis intervention strategies in Kenya. *Environment and Development Economics*, **3**, 321-349.
- Kirkwood, B.R., Cousens, S.N., Victora, C.G., & De Zoysa, I. (1997). Issues in the design and interpretation of studies to evaluate the impact of community-based interventions. *Tropical Medicine and International Health*, **2**, 1022-1029.
- Kitange, H.M, Swai, A.B.M, McLarty, D.G & Alberti, K.G.M.M. (1993). Schistosomiasis prevalence after administration of praziquantel to school children in Melela village, Morogoro Region, Tanzania. *East African Medical Journal*, **70**, 782-786.
- Klepp, K.I., Ndeki, S.S., Thuen, F., Leshabari, M., & Seha, A.M. (1996). Predictors of intention to be sexually active among Tanzanian school children. *East African Medical Journal*, **73**, 218-224.
- Kloos, H. (1995). Human behaviour, health education and schistosomiasis control: A review. *Social Science and Medicine*, **40**, 1497-1511.
- Kok, G. (1997). Health Education. In A. Baum, S. Newman, J. Weinman, R. West & C. McManus (Eds.). *Cambridge Handbook of Psychology, Health & Medicine* (pp. 216-219). Cambridge: Cambridge University Press.

- Kolbe, L.J., Green, L., Foreyt, J., Darnell, L., Goodrick, K., Williams, H., Ward, D., Korton, A.S., Karacorn, I., Widmeyer, R., & Stainbrook, G. (1986). Appropriate functions of health education in schools: Improving health and cognitive performance. In N.A Krasnegor, J.D. Arsteh & M.F. Cataldo, (Eds.) *Child Health Behavior: A Behavioral Pediatrics Perspective* (pp.171-209). New York: John Wiley & Sons.
- Kolberg, R. (1994, 24 June). Finding "Sustainable" ways to prevent parasitic diseases. *Science*, **264**, 1859-1861.
- Konde-Lule, J.K., Musagara, M., & Musgrave, S. (1993). Focus group interviews about AIDS in Rakai District of Uganda. *Social Science and Medicine*, **37**, 679-684.
- Koss-Chioino, J.D. (1997). What anthropology can contribute to tropical medicine: overview of methods of control programmes. *Tropical Medicine and International Health*, **2**, Supplement A11- A24.
- Kraus, S.J. (1995). Attitudes and the prediction of behavior: A meta-analysis of the empirical literature. *Personality and Social Psychology Bulletin*, **21**, 58-75.
- Kreuger, R.A. (1994). *Focus Groups: A Practical Guide for Applied Research* (2nd ed.). Thousand Oaks: Sage.
- Kumwenda, N.I, Momba, D.D, Namasasu, J., & Chitsulo, L. (1993). Identification of high-risk communities for urinary schistosomiasis: A multi country study. Final Report to TDR/ Series ID 890622.
- Kvalsvig, J. (1986). The effects of schistosomiasis haematobium on the activity of school children. *Journal of Tropical Medicine and Hygiene*, **89**, 85-90.
- Kvalsvig, J., & Becker, P. (1988). Selective exposure of active and sociable children to schistosomiasis. *Annals of Tropical Medicine and Parasitology*, **82**, 471-474.
- Kvalsvig, J., & Connolly, K. (1994). Health and psychological development among children in poor communities. In A. Dawes & D. Donald (Eds.) *Childhood & Adversity* (pp. 92-106). Cape Town: David Philip.
- La Font, A. (1995). *Sustaining Primary Health Care*. London: Earthscan
- Leutscher, P., Ravaoalimalala, V.E., Raharisilo, C., Ramarokoto, C.E., Rasendramino, M., Raobelison, A., Vennervald, B., Estenne, P., & Feldmere, H. (1998). Clinical findings in female genital schistosomiasis in Madagascar. *Tropical Medicine and International Health*, **3**, 327-332.
- Levine, J.M., & Moreland, R.L. (1994). Group socialization: Theory and research. In W. Stroebe & M. Hewstone (Eds.) *European Review of Social Psychology, Volume 5* (pp.305-336). London: John Wiley & Sons.
- Lewis, M.A., & Rook, K.S. (1999). Social control in personal relationships: Impact on health behaviors and psychological distress. *Health Psychology*, **18**, 63 – 71.
- Lewis, S.J.K. (1981). An overview of health education activities and proposals for strengthening of health education services in Malawi. Lilongwe: Ministry of Health, Malawi.
- Lewis, S.J.K., Bomba, W.G., & Namanga, G.B. (1981). Health education curriculum for Primary health care worker: The process of health education. Lilongwe: Ministry of Health.

- Likert, R. (1967). The method of constructing an attitude scale. In M. Fishbein (Ed.) *Attitude Theory and Measurement* (pp.90-95). New York: John Wiley.
- Liska, A.E. (1984). A critical examination of the causal structure of the Fishbein/Ajzen attitude behavior model. *Social Psychology Quarterly*, **47**, 61-74.
- Louw, J. (2000). Improving practice through evaluation. In D. Donald, A. Dawes & J. Louw (Eds.) *Addressing Childhood Adversity* (pp. 60-73). Cape Town: David Philip.
- Luhanga, H.M. (1989, October). The importance of evaluation in community based health education programmes. *MOYO*, **XXI**, 12-14.
- Lule, G.S., Moses, A., & Bandawe, C. (1997). Characteristics and sexual behaviour of individuals attending the sexually transmitted diseases clinic at Queen Elizabeth Central Hospital Blantyre, Malawi. *The Central African Journal of Medicine*, **43**, 6-11.
- Macaulay, A.C., Commanda, L.E., Freeman, W.L., Gibson, N., McCabe, M.L., Robbins, C.M., & Twohig, P.L. (1999). Participatory research maximises community and lay involvement. *British Medical Journal*, **319**, 774-8.
- MacLachlan, M. (1997). *Culture and Health*. Chichester: John Wiley & Sons.
- MacLachlan, M. (1998). Health and welfare in Malawi. In M. MacLachlan & S.C Carr (Eds.) *Perspectives in Malawian Psychology: A Reader for Students* (pp.75-95.). Dublin-Zomba-Darwin: Zikomo Press.
- MacLachlan, M., & Carr, S.C. (1994). From dissonance to tolerance: Towards managing health in tropical countries. *Psychology and Developing Societies*, **6**, 119-129.
- MacLachlan, M., & Namangale, J. (1997). Tropical illness profiles: The psychology of illness perception in Malawi. *Public Health*, **111**, 211-213.
- MacLachlan, M., Ager, A., & Brown, J. (1996). Health locus of control in Malawi: A failure to support the cross-cultural validity of the HLOCQ. *Psychology and Health*, **12**, 33-38.
- MacPhail, C., & Campbell, C. (1999). Evaluating HIV/STD interventions in *Developing Countries*: Do current indicators do justice to advances in intervention approaches? *South African Journal of Psychology*, **29**, 149-165.
- Madan, T.N. (1987). Community involvement in health policy: socio-structural and dynamic aspects of health beliefs. *Social Science and Medicine*, **25**, 615-620.
- Madden, T.J., Ellen, P.S., & Ajzen, I. (1992). A comparison of the theory of planned behavior and the theory of reasoned action. *Personality and Social Psychology Bulletin*, **18**, 3-9.
- Magnussen, P., Muchiri, E., Mungai, P., Ndzovu, M., Ouma, J., & Tosha, S. (1997). A school-based approach to the control of urinary schistosomiasis and intestinal helminth infections in children in Matuga, Kenya: impact of a two year chemotherapy programme on prevalence and intensity of infections *Tropical Medicine and International Health*, **2**, 825-831.
- Malawi Environment Management Project. (1997). Lake Malawi Bilharzia Control programme. Cape Maclear National Park Project. Unpublished project proposal to Malawi Government Research Council.
- Malawi National Bilharzia Control Programme. (1986). *Bilharzia: A Manual for Health Workers in Malawi*. Lilongwe: Malawi Government Ministry of Health.

- Malawi National Schistosomiasis Control Programme. (1991). *Ten-Year Plan of Action 1991-2000*. Lilongwe: Republic of Malawi, Ministry of Health.
- Malawi National Statistical Office. (1998). *1998 Population and Housing Census: Report of Preliminary Results*. Zomba: Malawi Government.
- Malawi National Statistical Office & Macro International. (1997). *Malawi Knowledge, Attitudes and Practices in Health Survey 1996*. Zomba, Malawi & Maryland, USA: Author.
- Manderson, L., & Aaby, P. (1992). An epidemic in the field? Rapid assessment procedures and health research. *Social Science and Medicine*, **35**, 839-850.
- Mangochi District Health Office. (1998). *Mangochi District Health Profile: Situation Analysis, December 1998*. Lilongwe: Ministry of Health and Population.
- Manstead, A. (1997). Situations, belongingness, attitudes, and culture: Four lessons learned from Social Psychology. In C. McGarty & S.A. Haslam (Eds.), *The Message of Social Psychology* (pp.238-251). Oxford: Blackwell.
- Manstead, A. S. R., & Parker, D. (1995). Evaluating & extending the theory of planned behaviour. In W. Stroebe & M. Hewstone (Eds.), *European Review of Social Psychology, Volume 6* (pp.69- 95). London: John Wiley & Sons.
- Manstead, A.S.R., & van der Pligt, J. (1998). Should we expect more from expectancy-value models of attitude and behavior? *Journal of Applied Social Psychology*, **28**, 1313-1316.
- Marin, G. (1983). The Latin American experience in applying social psychology to community change. In F. Blackler (Ed.) *Social Psychology and Developing Countries* (pp.229-243). London: John Wiley & Sons.
- Marteau, T.M. (1989). Health beliefs and attributions. In A.K. Broome (Ed.) *Health Psychology: Processes and Application* (pp. 1-23). New York: Chapman & Hall.
- Matiting, P.M. (1981). Problems of acceptability of low-cost sanitation programs. *Sanitation in Developing Countries*. Proceedings of a workshop on training held in Lobotse, Botswana, 14-20 September, 1980 (pp.111-114). Ottawa: International Development Research Centre.
- Mbere, N. (1981a). Some sociological aspects of sanitation provision (with particular reference to Botswana). *Sanitation in Developing Countries*. Proceedings of a workshop on training held in Lobotse, Botswana, 14-20 September, 1980 (pp.105-110). Ottawa: International Development Research Centre.
- Mbere, N. (1981b). Applied community participation in sanitation provision. *Sanitation in Developing Countries*. Proceedings of a workshop on training held in Lobotse, Botswana, 14-20 September, 1980 (pp.118-122). Ottawa: International Development Research Centre.
- McAuliffe, E. (1998). Psychosocial research on AIDS/HIV. In M. MacLachlan & S.C Carr (Eds.), *Perspectives in Malawian Psychology: A reader for students* (pp.39-50). Dublin-Zomba-Darwin: Zikomo Press.
- McCormick, L.K., Steckler, A.B., & McLeroy, K. (1995). Diffusion of innovations in schools: A study of adoption and implementation of school-based tobacco prevention curricula. *American Journal of Health Promotion*, **9**, 210-219.

- McGarty, C., & Haslam, S.A. (1997). Introduction and a short history of social psychology. In C. McGarty & S.A. Haslam (Eds.), *The Message of Social Psychology* (pp. 1-19). Oxford: Blackwell.
- McGuire, W.J. (1997). Going beyond the banalities of Bubbapsychology: A perspectivist social psychology. In C. McGarty & S.A. Haslam (Eds.), *The Message of Social Psychology* (pp. 221-237). Oxford: Blackwell.
- McLeroy, K.R., Gottlieb, N.H., & Burdine, J.N. (1987). The business of health promotion: Ethical issues and professional responsibilities. *Health Education Quarterly*, **14**, 91-109.
- McLeroy, K.R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly*, **15**, 351-377.
- McLeroy, K.R., McCann, K., Smith, D., & Goodman, R.M. (1989). The role of summer institute in the diffusion of comprehensive school health. *Family and Community Health*, **12**, 26-39.
- McLeroy, K.R., Bibeau, D.L., & McConnell, T.C. (1993). Ethical issues in health education and health promotion: Challenges for the profession. *Journal of Health Education*, **24**, 313-318.
- Medi, I.K. (1981). Health education in primary schools in Malawi. *Sanitation in Developing Countries*. Proceedings of a workshop on training held in Lobotse, Botswana, 14-20 September, 1980 (pp.79-80). Ottawa: International Development Research Centre.
- Mehanna, S., Winch, P.J., Rizkalla, N.H., El-Sayed, H.F., & Abaza, S.M. (1997). Factors affecting knowledge of the symptoms of schistosomiasis in two rural areas near Ismailia, Egypt. *Tropical Medicine and International Health*, **2**, Supplement A36- A 47.
- Michelson, E.H. (1993). Adam's rib awry? Women and schistosomiasis. *Social Science and Medicine*, **37**, 493 - 501.
- Michielutte, R., & Beal, P. (1990). Identification of community leadership in the development of public health education programs. *Journal of Community Health*, **15**, 59-68.
- Ministry of Health & Population. (1999). *Malawi National Health Plan 1999-2004*. Lilongwe: Author.
- Mitchell, R.E. (1993). Survey materials collected in the *Developing Countries*: sampling, measurement and interviewing obstacles to intranational and international comparisons. In M. Bulmer & D.P. Warwick (Eds), *Social Research in Developing Countries: Surveys and Censuses in The Third World* (pp.219 - 239). London: University College London.
- Moghaddam, F.M., Bianchi, C., Daniels, K., & Apter, M.J., & Harré, R. (1999). Psychology and national development. *Psychology and Developing Societies*, **11**, 121-141.
- Monsky, D., Levine, D., Green, L., Shapiro, S., Russell, P., & Smith, C. (1983). Five year blood pressure control and mortality following health education for hypertensive patients. *American Journal of Public Health*, **73**, 153-162.
- Moreland, R.L., & Hogg, M.A. (1993). Theoretical perspectives on social processes in small groups. *British Journal of Social Psychology*, **32**, 1-4.
- Morgan, M. (1996). Qualitative research: A package deal? *The Psychologist: Bulletin of the British Psychological Society*, **9**, 31-32.
- Morgan, M. (1998). Postscript. *The Psychologist: Bulletin of the British Psychological Society*, **11**, 488.

- Moscovici, S. (1988). Notes towards a description of social representations. *European Journal of Social Psychology*, **18**, 211-250.
- Msukwa, L.A.H. (1981). Meeting the basic health needs of rural Malawi: An alternative strategy. Monograph XII. Center for Development Studies, University College of Swansea.
- Mullen, P., Hersey, J., & Iverson, D. (1987). Health behaviour models compared. *Social Science and Medicine*, **24**, 973-981.
- Mullen, P.D., Evans, D., Forster, J., Gottlieb, N.H., Kreuter, M., Moon, R., O'Rourke, T., & Strecher, V.J. (1995). Settings as an important dimensions in health education/promotion policy, programs, and research. *Health Education Quarterly*, **22**, 329-345.
- Mullen, P.D., McCuan, R.A., & Iverson, D.C. (1986). Evaluation of health education and promotion programs: A review of qualitative approaches. *Advances in Health Education and Promotion*, **1**, 467-498.
- Munyimbili, A.W.C. (1981a). Pit latrines in Malawi. *Sanitation in Developing Countries*. Proceedings of a workshop on training held in Lobotse, Botswana, 14-20 September, 1980 (pp.16-20). Ottawa: International Development Research Centre.
- Munyimbili, A.W.C. (1981b). Community household participation. *Sanitation in Developing Countries*. Proceedings of a workshop on training held in Lobotse, Botswana, 14-20 September, 1980 (pp.113-117). Ottawa: International Development Research Centre.
- Muthami, L.N., Katsivo, M.N., Kiruti, S.N., Omondi, O., Kerumba, P., Kingori, F & Kimani, S. (1995). Patterns of Schistosomiasis Mansonii infection after intervention in Mwea irrigation scheme in Kenya. *East African Medical Journal*, **72**, 94-100.
- Ndhlovu, P., Chandiwana, S.K., & Makura, O. (1992). Progress in the control of schistosomiasis in Zimbabwe since 1984. *The Central African Journal of Medicine*, **38**, 316-321.
- Ndubani, P. (1997). Knowledge about and herbal treatment of sexually transmitted diseases among the Goba of Chirowa, Zambia. *The Central African Journal of Medicine*, **43**, 283-287.
- Nokes, C., Grantham-McGregor, S., Sawyer, A., Cooper, E., & Bundy, D. (1992). Parasitic helminth infection and cognitive function in school children. *Proceedings of the Royal Society Series B*, **247**, 77-81.
- Norman, P., & Conner, M. (1996). The role of social cognition models in predicting health behaviours. In M. Conner & P. Norman (Eds.) *Predicting Health Behaviour* (pp.1-22). Buckingham: Open University Press.
- O'Brien, K. (1993). Using focus groups to develop health surveys: An example from research on social relationships and AIDS-preventive behavior. *Health Education Quarterly*, **20**, 361-372.
- Omari, I.M. (1983). Some oriental issues in the application of social psychology in *Developing Countries*. In F. Blackler (Ed.) *Social Psychology and Developing Countries* (pp.33-43). London: John Wiley & Sons.
- Ouellette, J.A., & Wood, W. (1998). Habit and intention in everyday life: The multiple process by which past behavior predicts future behavior. *Psychological Bulletin*, **124**, 54 - 74.

- Palmonari, A., Pombeni, M.L., & Kirchler, E. (1992). Evolution of the self concept in adolescence and social categorization processes. In W. Stroebe & M. Hewstone (Eds.) *European Review of Social Psychology, Volume 3* (pp.285-308). London: John Wiley & Sons.
- Parker, D., Manstead, A., & Stradling, S. (1995). Extending the theory of planned behaviour: The role of the personal norm. *British Journal of Social Psychology*, **34**, 127-137.
- Parker, D., Stradling, S.G., & Manstead, A.S.R. (1996). Modifying beliefs and attitudes to exceeding the speed limit: An intervention study based on the theory of planned behavior. *Journal of Applied Social Psychology*, **26**, 1-19.
- Parker, M. (1993). Bilharzia and the boys: Questioning common assumptions. *Social Science and Medicine*, **37**, 481-492.
- Patton, M.Q. (1990). *Qualitative Evaluation and Research Methods* (2nd ed.). Newbury Park: Sage.
- Patwari, A.K., & Aneja, S. (1988). Urinary schistosomiasis in school children. *Tropical Doctor*, **18**, 1-4.
- Pearce, F. (1996, 1 June). Squatters take control. *New Scientist*. Pp. 39-42.
- Peltzer, K. (1987). *Some Contributions of Traditional Healing Practices Towards Psychological Health Care in Malawi*. Heidelberg: Asanger.
- Pepitone, A. (1997). Nonmaterial beliefs: Theory and research in cultural social psychology. In C. McGarty & S.A. Haslam (Eds.), *The Message of Social Psychology* (pp.252-267). Oxford: Blackwell.
- Pitts, M. (1996). *The Psychology of Preventative Health*. London: Routledge.
- Potasman, I., Pick, N., Abel, A., & Dan, M. (1996). Schistosomiasis acquired in Lake Malawi. *Journal of Travel Medicine*, **3**, 32-36.
- Prual, A., Daouda, H., Develoux, M., Sellin, B., Galon, P., & Herberg, S. (1992). Consequences of schistosomiasis haematobium infection on the iron status of school children in Niger. *American Journal of Tropical Medicine and Hygiene*, **47**, 291-297.
- Ransford, O. (1966). *Livingstone's Lake: The Drama of Nyasa*. London: Murray.
- Rathgeber, E.M., & Vlassoff, C. (1993). Gender and tropical diseases: A new research focus. *Social Science and Medicine*, **37**, 513-520.
- Raubenheimer, I. VanW. (1993). Psychology in South Africa. *The Psychologist: Bulletin of the British Psychological Society*, **6**, 169-171.
- Red Urine Study Group. (1995). *Identification of High-Risk Communities for Schistosomiasis in Africa: A Multi Country Study*. Geneva: WHO TDR/SER Report Series No.15.
- Rée, G.H. (1982). Schistosomiasis and Human Behaviour. *Ecology of Disease*, **1**, 131-133.
- Reinecke, J., Schmidt, P., & Ajzen, I. (1997). Birth control versus AIDS prevention: A hierarchical model of condom use among young people. *Journal of Applied Social Psychology*, **27**, 743-759.
- Republic of Malawi. (1986). *Statement of Development Policies 1987-1996*. Lilongwe: Office of the President & Cabinet and Department of Economic Planning & Development.
- Republic of Malawi. (1999). *Basic Health Statistics 1996*. Lilongwe: Ministry of Health & Population Health Planning Division.

- Reserve Bank of Malawi. (1998). Third Quarter Review, 1998. *Financial & Economic Review*, **XXX**. Lilongwe: Author.
- Richard, L., Potvin, L., Kishuk, N., Prlic, H., & Green, L.W. (1996). Assessment of the integration of the ecological approach in health promotion programs. *American Journal of Health Promotion*, **10**, 318-328.
- Richards, F., Klein, R.E, Gonzales-Peralta, C., Flores, R.Z., Flores, G.Z., & Ramirez, J.C. (1991). Knowledge, attitudes and perceptions (KAP) of onchocerciasis: A survey among residents in an endemic area in Guatemala targetted for mass chemotherapy with ivermectin. *Social Science and Medicine*, **32**, 1275 – 1281.
- Robertson, A., & Minkler, M. (1994). New health promotion movement: A critical examination. *Health Education Quarterly*, **21**, 295-312.
- Rogers, E.M. (1983). *Diffusion of Innovations*, (3rd ed.). New York: Free Press.
- Rossi, P.H., Freeman, H.E., & Lipsey, M.W. (1999). *Evaluation: A systematic approach* (6th ed.). Thousand Oakes: Sage.
- Rossi, P.H., Freeman, H.E., & Lipsey, M.W. (1999). *Evaluation: A Systematic Approach* (6th ed.). Thousand Oakes, California: Sage.
- Rusakaniko, S., Mbizvo, M.T., Kasule, J., Gupta, V., Kinoti, S.N., Mpanju-Shumbushu, W., sebina-Zziwa, J., Mwateba, R., & Padayachy, J. (1997). Trends in reproductive health knowledge following a health education intervention among adolescents in Zimbabwe. *The Central African Journal of Medicine*, **43**, 1-6.
- Russell, J.M., MacMichael, C & Evans, B.A. (1993). Contrary to popular belief [Letter to the editor]. *British Medical Journal*, **307**, 937.
- Russell-Bernard, H. (1994). *Research Methods in Anthropology*. Thousand Oakes, California: Sage.
- Schaalma, H.P., Kok, G., Bosker, R.J., Parcel, G.S., Peters, L., Poelman, J., & Reinders, J. (1996). Planned development and evaluation of AIDS/STD education for secondary school students in the Netherlands: Short-term effects. *Health Education Quarterly*, **23**, 469-487.
- Schopper, D., Doussantousse, S.& Orav, J. (1993). Sexual behaviors relevant to HIV transmission in a rural African population: How much can a KAP survey tell us? *Social Science and Medicine*, **37**, 401-412.
- Sejwacz, D., Ajzen, I., & Fishbein, M. (1980). Predicting and understanding weight loss: Intentions, Behaviours, and outcomes. In I. Ajzen & M. Fishbein, *Understanding Attitudes and Predicting Social Behaviour* (pp.101-147). Englewood Cliffs, N.J: Prentice Hall.
- Service, M.W. (1993). Community participation in vector-borne disease control. *Annals of Tropical Medicine and Parasitology*, **87**, 223-234.
- Shaba, B., MacLachlan, M., Carr, S.C., & Ager, A. (1993). Palliative versus curative beliefs regarding tropical epilepsy as a function of traditional and medical attributions. *The Central African Journal of Medicine*, **39**, 165-167.
- Sheeran, P., & Orbell, S. (1998). Do intentions predict condom use? Meta-analysis and examination of six moderator variables. *British Journal of Social Psychology*, **37**, 231-250.

- Sheeran, P., Orbell, S., & Trafimow, D. (1999). Does the temporal stability of behavioural intentions moderate intention-behavior and past behavior-future behavior relations? *Personality and Social Psychology Bulletin*, **25**, 721-730.
- Sherrard, C. (1997). Qualitative research. *The Psychologist: Bulletin of the British Psychological Society*, **10**, 161-162.
- Sherrard, C. (1998). Social dimensions of research. *The Psychologist: Bulletin of the British Psychological Society*, **11**, 486-487.
- Sinha, D. (1983). Applied social psychology and problems of national development. In F. Blackler (Ed.) *Social Psychology and Developing Countries* (pp.7-19). London: John Wiley & Sons.
- Smith, J.A. (1995). Qualitative methods, identity and transition to motherhood. *The Psychologist: Bulletin of the British Psychological Society*, **8**, 122-125.
- Southgate, B.A. (1992). Ten best readings in schistosomiasis. *Health Policy and Planning*, **7**, 82-85.
- Stauffer, J.R., Arnegard, M.E., Cetron, M., Sullivan, J.J., Chitsulo, L.A., Turner, G.F., Chiotha, S & McKaye, K.R. (1997). Controlling vectors and hosts of parasitic diseases using fishes: A case history of schistosomiasis in Lake Malawi. *Bioscience*, **47**, 41-49.
- Steckler, A., Allegrante, J.P., Altman, D., Brown, R., Burdine, J.N., Goodman, R.M., & Jorgensen, C. (1995). Health education intervention strategies: Recommendations for future research. *Health Education Quarterly*, **22**, 307-328.
- Steckler, A., McLeroy, K.R., Goodman, R.M., Bird, S.T., & McCormick, L. (1992). Towards integrating qualitative and quantitative methods: An introduction. *Health Education Quarterly*, **19**, 1-8.
- Stephenson, L. (1993). The impact of schistosomiasis on human nutrition. *Parasitology*, **107**, S107-S123.
- Stetson, V. & Davis, R. (1999). Health education in primary health care projects: A critical review of the various approaches. Washington: CORE Group.
- Stevenson, C., & Cooper, N. (1997). Qualitative and quantitative research. *The Psychologist: Bulletin of the British Psychological Society*, **10**, 159-160.
- Stewart, D.W., & Shamdasani, P.N. (1990). *Focus Groups: Theory and Practice*. Newbury Park: Sage.
- Stone, L. (1992). Cultural influences in community participation in health. *Social Science and Medicine*, **35**, 409-417.
- Stringer, E.T. (1996). *Action Research: A Handbook for Practitioners*. Thousand Oakes, California: Sage.
- Stroebe, W., & Stroebe, M. (1995). *Social Psychology and Health*. Buckingham: Open University Press.
- Sukwa, T.Y. (1993). A community-based randomized trial of praziquantel to control schistosomiasis morbidity in school children in Zambia. *Annals of Tropical Medicine & Parasitology*, **87**, 185-194.

- Sutton, S. (1997). Theory of planned behaviour. In A. Baum, S. Newman, J. Weinman, R. West & C. McManus (Eds.). *Cambridge Handbook of psychology, health & medicine* (pp. 177-180). Cambridge: Cambridge University Press.
- Sutton, S. (1998). Predicting and explaining intentions and behavior: How well are we doing? *Journal of Applied Social Psychology*, **28**, 1317-1338.
- Sutton, S. , McVey, D., & Glanz, A. (1999). A comparative test of the theory of reasoned action and the theory of planned behavior in the prediction of condom use intentions in a national sample of English young people. *Health Psychology*, **18**, 72-81.
- Tajfel, H. (1978). *Differentiation Between Social Groups*. London: Academic Press.
- Tanimowo, M.O. (1999). Knowledge, attitudes and practices regarding TB among senior secondary school students. *East African Medical Journal*, **76**, 47-50.
- Taylor, M., Coovadia, H.M., Kvalsvig, J.D., Jinabhai, C.C., & Reddy, P. (1999). Helminth control as an entry point for health-promoting schools in Kwazulu-Natal. *South African Medical Journal*, **89**, 273-279.
- Teesdale C.H., & Pugh, N.H. (1981). Renewed hope for Bilharzia control. *Medical Quarterly (Malawi)*, **8**, 21-24.
- Teesdale, C.H., & Chitsulo, L. (1985). Schistosomiasis in Malawi – A review. *Tropical Medicine & Parasitology*, **36**, 1-6.
- Tembo. K.C. (1991). Evaluation of source of messages on AIDS by college students. *Malawi Medical Journal*, **7**, 117-118.
- Terry, D.J., & O’Leary, J.E. (1995). The theory of planned behaviour: The effects of perceived behavioural control and self-efficacy. *British Journal of Social Psychology*, **34**, 199-220.
- Terry, D.J., Galligan, R.F., & Conway, V.J. (1993). The prediction of safe sex behaviour: The role of intentions, attitudes, norms and control beliefs. *Psychology and Health*, **8**, 355-368.
- Tones, K., Tilford, S., & Robinson, Y. (1991). *Health Education: Effectiveness and Efficiency*. London: Chapman Hall.
- Trafimow, D. (1996). The importance of attitudes in the prediction of college students’ intentions to drink. *Journal of Applied Social Psychology*, **26**, 2167-2188.
- Traoré, M., Mande, G.H., & Bradley, D.J. (1998). Schistosomiasis haematobium in Mali: Prevalence rates in school-age children as index of endemicity in the community. *Tropical Medicine and International Health*, **3**, 214-221.
- Trochim, W.M.K. (1999). *Research Methods Knowledge Base*, 2nd edition [On line]. Available: <http://trochim.human.cornell.edu>
- Turner, G., & Shepherd, J. (1999). A method in search of a theory: Peer education and health promotion. *Health Education Research: Theory and Practice*, **14**, 235-247.
- United States Department of Health & Human Services. (1993). Schistosomiasis in US Peace Corps Volunteers – Malawi, 1992 (Editorial note section). *Morbidity & Mortality Weekly Report*, **42**, 567-570.

- Valente, T.W., Paredes, P., & Poppe, P.R. (1998). Matching the message to the process: The relative ordering of knowledge, attitudes and practices in behavior change research. *Human Communication Research*, **24**, 366-385.
- Vallerand, R., Deshaies, P., Cuerrier, J.-P., Pelletier, L., Mongeau, C. (1992). Ajzen and Fishbein's Theory of Reasoned Action as applied to moral behaviour: A confirmatory analysis. *Journal of Personality and Social Psychology*, **62**, 98-109.
- Wallerstein, N. (1992). Powerlessness, empowerment and health: Implications for health promotion programs. *American Journal of Health Promotion*, **6**, 197-205.
- Wallerstein, N., & Bernstein, E. (1994). Introduction to community empowerment, participatory education, and health. *Health Education Quarterly*, **21**, 141-148.
- Wang, V., Terry, P., Flynn, B., Williamson, J., Green, L., & Farden, R. (1979). Evaluation of continuing medical education for chronic obstructive pulmonary diseases. *Journal of Medical Education*, **54**, 803-811.
- Warwick, D.P. (1993). The KAP survey: dictates of mission versus demands of science. In M. Bulmer & D.P. Warwick (Eds). *Social Research in Developing Countries: Surveys and Censuses in The Third World* (pp.349 - 363). London: University College London.
- Watts, S., Khallaayoune, K., Bensefia, R., Laamrani, H., & Gryseels, B. (1998). The study of human behaviour and schistosomiasis in an irrigated area in Morocco. *Social Science and Medicine*, **46**, 755-765.
- Weisenfeld, E. (1998). Paradigms of community social psychology in six Latin American nations. *Journal of Community Psychology*, **26**, 229-242.
- Whitworth, J.A.G. (1993). Schistosomiasis may be contracted through swimming in Lake Malawi [Letter to the editor]. *British Medical Journal*, **307**, 936.
- WHO. (1991). *Community Involvement in Health Development: Challenging Health Services*. WHO Technical Report Series, No. 809. Geneva: World Health Organisation.
- WHO. (1993). *The Control of Schistosomiasis. Second Report of The WHO Expert Committee*. WHO Technical Report Series, No. 830. Geneva: World Health Organisation.
- WHO. (1997). *Promoting Health Through Schools: Report of A WHO Expert Committee in Comprehensive School Health Education and Promotion*. WHO Technical Report Series, No. 870. Geneva: World Health Organisation.
- WHO: Working group on health promotion in *Developing Countries*. (1991). A call for action: Promoting health in *Developing Countries*. *Health Education Quarterly*, **18**, 5-15.
- Wilkins, H.A. (1989). Reinfection after treatment of schistosome infections. *Parasitology Today*, **5**, 83-88.
- Wisner, B. (1989). *Power and Need in Africa*. Trenton, New Jersey: Africa World Press, Inc.
- Woelk, G.B. (1992). Cultural and structural influences on the creation of and participation in community health programs. *Social Science and Medicine*, **35**, 419-424.
- Wolfe, M., Parenti, D., Pollner, J., Kobrine, A., & Schwartz, A. (1993). Schistosomiasis in US Peace Corps Volunteers – Malawi, 1992. *Morbidity and Mortality Weekly Report*, **42**, 565-567.

- Wolff, T., & Malewezi, J.G. (1989). Organization and decentralisation of the Malawi National Bilharzia Control Programme. *Tropical Medicine, Parasitology*, **40**, 201-204.
- Wright, E.D., Chipangwi, J., & Hutt, M.S.R. (1982). Schistosomiasis in the female genital tract. A histopathological study of 176 cases from Malawi. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **76**, 822-829.
- Yeo, M. (1993). Toward an ethic of empowerment for health promotion. *Health Promotion International*, **8**, 225-235.
- Zimmerman, R.S. & Vernberg, D. (1994). Models of preventive health behaviour: Comparison, critiques and meta analysis. *Advances in Medical Sociology*, **4**, 45-67.

APPENDIX 1: PHOTOGRAPHS



Photo 1: Children in the area of study engaging in water activity.



Photo 2: Under the tree. Scene of the display at Makawa School.



Photo 3: Swimming and washing in a pond near Lwangwa School.



Photo 4: Lake Malawi: The livelihood of people in the area is centred on the lake.



Photo 5: Children swallowing medication during treatment.



Photo 6: Koche Bilharzia Club participants and the author (left) enjoy an after display party.



Photo 7: Koche, the maximum intervention school.



Photo 8: Makawa Bilharzia Club choir spread the message during a display.



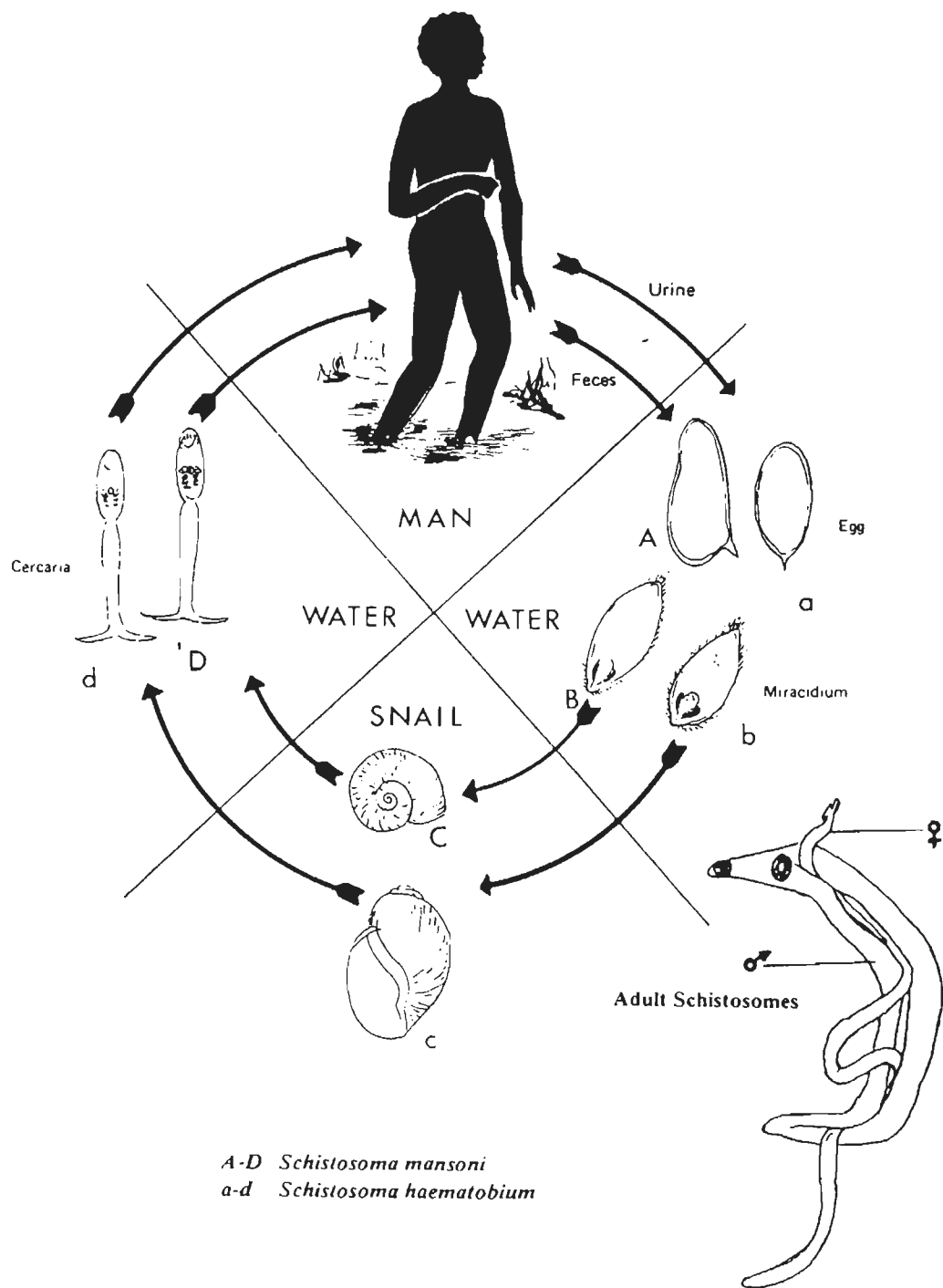
Photo 9: Reaching out to the community: Drama during Koche village outreach.



Photo 10: Filling in a TRA/TPB questionnaire at Lwangwa School.

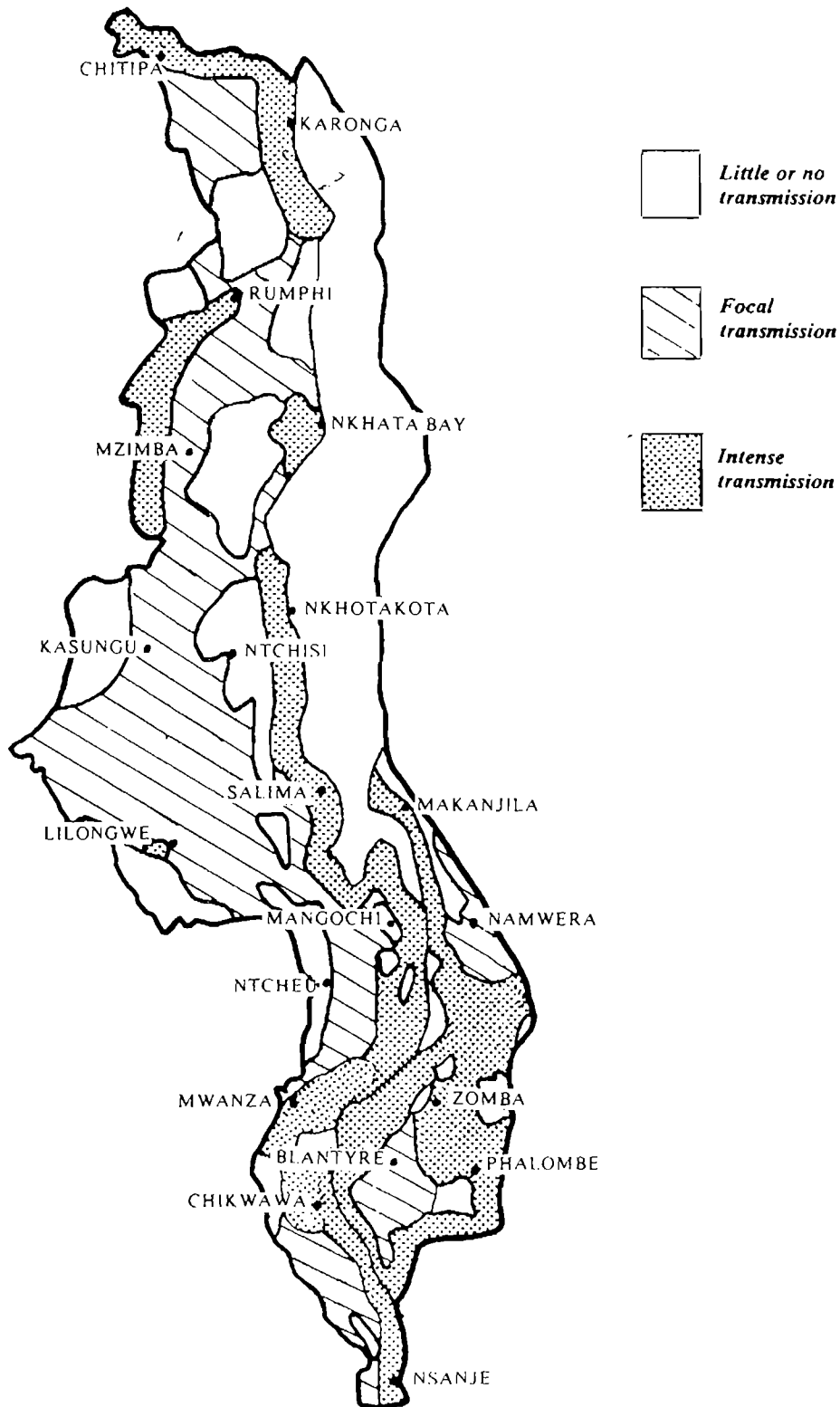
APPENDIX 2

LIFE CYCLE OF SCHISTOSOMES



APPENDIX 3

DISTRIBUTION OF *S. HAEMATOBIIUM*



APPENDIX 4: VILLAGE WATER USE SURVEY

BILHARZIA CONTROL PROGRAMME INVESTIGATION INTO WATER USAGE

TODAY'S DATE

VILLAGE

AGE

SEX: M F

WHOLE FAMILY

SINGLE RESPONDENT

WHERE DO YOU USUALLY GO TO COLLECT YOUR DRINKING WATER?

1. BORE HOLE

2. PROTECTED WELL

3. RIVER

4. TAP

5. LAKE

6. OTHER PLACE

WHERE DO YOU USUALLY GO TO WASH YOUR CLOTHES?

1. BORE HOLE

2. PROTECTED WELL

3. RIVER

4. TAP

5. LAKE

6. OTHER PLACE

WHERE DO YOU USUALLY BATHE?

1. AT HOME

2. LAKE

3. RIVER

4. OTHER PLACE

WHERE DO YOU OFTEN URINATE?

1. BATHROOM	2. PIT LATRINE
3. RIVER	4. BUSH
5. LAKE	6. OTHER PLACE

WHERE DO YOU OFTEN DEFECATE?

1. BORE HOLE	2. PIT LATRINE
3. RIVER	4. BUSH
5. LAKE	6. OTHER PLACE

THANK YOU VERY MUCH

APPENDIX 5

LAKESHORE SCHOOLS K-A-P SURVEY

1. Zaka age _____ 2. Mtsikana girl 3. Kalasi Standard
Mnyamata boy
4. Chipembezo Religion 5. Mudzi village
6. Kodi makolo ako amagwira ntchito yanji?
Head of Family's Occupation
7. Kodi m'banja lanu muli anyamata ndi atsikana angati?
How Many brothers and sisters do you have?
- 8.a) Kodi ndi matenda ati ali m'mudzi mwanu?
What are some of the diseases in your village?
- b) Nanga mwamatendawa ndi ati ali ofunika kwambiri?
Which of the above do you consider the most important?
9. Kodi muli ndi chimbudzi Do you have a latrine
a: Ku sukulu at school?
b Kunyumba at home?
- 10.Ndi kuti kumene mumakazithandiza Where do you urinate
a)muli kumudzi at home
b)muli kusukulu at school
c)muli kunyanja at the lake
11. Kodi kunyanja mumapita kangati patsiku?
How many times each day do you go to the lake?
12. Kodi kunyanja mumachita chiyani?What do you do at the lake?
- 13.Kodi madzi mumapeza kuti where do get water for
a)osamba bathing
b)ochapira ziwiya washing utensils
c)okumwa drinking
d)ochapira zovala washing clothes
14. Mungapeze kuti madzi abwino m'mudzi mwanu?
Where can you get the best water in your village?
15. Kodi kukodza mkodzo wofiira ndibwino kapena ayi?
Chifukwa chiyani? Is passing red bloody urine good or bad? Why?
- 16.Zimatanthauza chiyani munthu akamakodza mkozo wofiira?
What does it mean when one passes out red bloody urine?
17. Kodi munthu angadziwe bwanji kuti ali ndi likodzo?
How does a person know that s/he has Bilharzia?
18. Mukudziwa anzanu angati amene amakodza mkozo wofiira?
How many of your friends pass out red bloody urine?

19a) Kodi munthu uzidandaula ukamakodza mkozo ofira wamagazi? Chifukwa? If you passed red bloody urine should you be concerned? Why?

b) Nanga inu mungamuuze aliyense ngati mukukodza mkozowu, mungamuuze ndani? Would you tell anybody else if you did? Who?

20. Chimayambitsa likodzo ndi chiyani? What causes bilharzia?

21. Munadwalapo likodzo? Have you ever suffered from Bilharzia?

b) Nanga ndi liti mwadwala kotsiriza? When was the last time?

c) Munalandira mankhwala? Kuti? Were you treated? Where?

d) Munalitenga bwanji likodzolo? How did you get it?

22. Kodi alipo wina m'banja lanu amene ali ndi likodzo? Nanga ndi angati? Has any one in you family had Bilharzia? How many?

23. Kodi likodzo limafalitsidwa bwanji? How is Bilharzia spread?

24. Mungachite chiani kuti likodzo lisafalikire kwa ena? What can you do to prevent the spread of Bilharzia?

25. Mungachite chiani mutakhala ndi likodzo? What would you do if you had Bilharzia?

26. Makolo ako angachite chiani utawauza kuti uli ndi likodzo? What would your parents most likely do if you told them you had Bilharzia?

27. Mankhwala alikodzo amapezeka mosabvuta kwanu? Mankhwala ake otani? Are drugs for Bilharzia readily available? What type?

28. Unamva kuti za likodzo poyamba? Where did you first hear about Bilharzia?

29. Kodi kuopsya kwalikodzo ndi chiani? What are the dangers of Bilharzia?

30. Kodi mukudziwa wina aliyense amene anamwalirapo ndi likodzo mudzi mwanu? Do you know anyone who has died of Bilharzia in your village?

31. Kodi likodzo ndi bvuto lalikulu m'dela mwanu? Is Bilharzia a big problem in your area?

32. N'chifukwa chiani anthu ena amadwala likodzo ena ayi? How is it that some people get Bilharzia and not others?

APPENDIX 6: TRA/PB 1 TRANSLATED QUESTIONNAIRE

ATTITUDES, INTENTIONS & PERCEIVED CONTROLLABILITY OF PRIMARY SCHOOL CHILDREN TOWARDS BILHARZIA-RELATED BEHAVIOURS (1997)

In this questionnaire we seek to know your thoughts concerning urinating in water and the use of a pit latrine.

Please answer all the questions honestly. Do not omit any of the questions.

Feel free in answering the questions without fear and honestly because all your responses will be treated with the strictest confidence. Do not write your name on the paper.

Example:

It gets hot in Mangochi

If you agree with the above statement that Mangochi is hot, then circle answer A = Agree

If you strongly agree with the statement that Mangochi is hot then circle response SA = Strongly Agree

If you do not agree with the response or your thoughts are otherwise then circle response D = Disagree

If you do not agree at all or strongly disagree with the statement then circle response SD = Strongly Disagree.

If you are undecided or not sure of your response to the statement presented then circle response U/N = Undecided/Neutral.

Name of the school _____ Class: St _____

Your age _____ years

Boy Girl

A: INTENTIONS

1. I intend to get out of the water each time I want to urinate

SA : A : U/N : D : SD

2. I intend to urinate in a pit latrine

SA : A : U/N : D : SD

B: ATTITUDES

1. My getting out of the water to urinate is something:

i) Very good

Good

U/N

Bad

Very Bad

- ii) Very pleasant
 - Pleasant
 - U/N
 - Unpleasant
 - Very unpleasant

Getting out of the water to urinate is something:

- iii) Very important to me
 - Important to me
 - U/N
 - Unimportant to me
 - Very unimportant to me

2. My urinating in a pit latrine is something:

- i) Very good
 - Good
 - U/N
 - Bad
 - Very Bad

- ii) Very pleasant
 - Pleasant
 - U/N
 - Unpleasant
 - Very unpleasant

- iii) Very important to me
 - Important to me
 - U/N
 - Unimportant to me
 - Very unimportant to me

C: SUBJECTIVE NORMS

1. People who are important to me think I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

2. People who are important to me think that I should use a pit latrine whenever I want to urinate

SA : A : U/N : D : SD

D: PERCEIVED CONTROL

1. Have you ever urinated in water? Yes
No

2. I have the power that if I really wanted to I can get out of the water to urinate

SA : A : U/N : D : SD

3. To get out of the water to urinate is a difficult thing

SA : A : U/N : D : SD

4. If I really wanted, to get out of the water to urinate would be something easy to do

SA : A : U/N : D : SD

5. I really want to get out of the water to urinate but am unable to do so

SA : A : U/N : D : SD

6. The things that prevent you from getting out of the water to urinate are:

E: BEHAVIOURAL BELIEF

1. When urinating in the water:

a) A person relieves him/herself quickly

SA : A : U/N : D : SD

b) A person relieves him/herself without much inconvenience

SA : A : U/N : D : SD

c) All harmful substances in the body is excreted

SA : A : U/N : D : SD

d) We spread diseases

SA : A : U/N : D : SD

e) We spread Bilharzia

SA : A : U/N : D : SD

f) We spread Cholera

SA : A : U/N : D : SD

g) We spread Diarrhoea

SA : A : U/N : D : SD

h) We pollute the water

SA : A : U/N : D : SD

i) We spread Dysentery

SA : A : U/N : D : SD

2. When we make use of a pit latrine:

a) We do not spread diseases

SA : A : U/N : D : SD

b) We control diseases

SA : A : U/N : D : SD

c) It is an indication of healthy and hygienic behaviour

SA : A : U/N : D : SD

d) In a careless way we spread diseases

SA : A : U/N : D : SD

e) Brings a bad smell

SA : A : U/N : D : SD

f) Delays us if we want to relieve ourselves

SA : A : U/N : D : SD

F: OUTCOME EVALUATIONS

VG = Very good

G = Good

B = Bad

VB = Very Bad

U/N = Undecided/Neutral

1. Urinating in water is something that is:

VG : G : U/N : B : VB

2. Relieving oneself quickly is something that is:

VG : G : U/N : B : VB

3. Relieving oneself without much inconvenience is something that is:

VG : G : U/N : B : VB

4. Excreting all harmful substances from the body is something that is:

VG : G : U/N : B : VB

5. Spreading diseases is something that is:

VG : G : U/N : B : VB

6. Spreading Bilharzia is something that is:

VG : G : U/N : B : VB

7. Spreading Cholera is something that is:

VG : G : U/N : B : VB

8. Spreading Diarrhoea is something that is:

VG : G : U/N : B : VB

9. Polluting the water is something that is:

VG : G : U/N : B : VB

10. Spreading Dysentery is something that is:

VG : G : U/N : B : VB

11. Making use of a pit latrine is something that is:

VG : G : U/N : B : VB

12. Not spreading diseases is something that is:

VG : G : U/N : B : VB

13. Preventing diseases is something that is:

VG : G : U/N : B : VB

14. A healthy and hygienic life is something that is:

VG : G : U/N : B : VB

15. Careless use of a pit latrine is something that is:

VG : G : U/N : B : VB

16. A bad smell is something that is:

VG : G : U/N : B : VB

17. Relieving oneself just anywhere is something that is:

VG : G : U/N : B : VB

G: NORMATIVE BELIEFS

1. My friends think I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

2. My grandparent thinks I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

3. Fishermen think I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

4. Young children think I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

5. My father thinks I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

6. My mother thinks I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

7. My elder brother thinks I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

8. My teacher thinks I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

9. Health personnel think I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

10. My uncle thinks I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

11. My father thinks I should use a pit latrine

SA : A : U/N : D : SD

12. My mother thinks I should use a pit latrine

SA : A : U/N : D : SD

13. My teacher thinks I should use a pit latrine

SA : A : U/N : D : SD

14. Health personnel think I should use a pit latrine

SA : A : U/N : D : SD

15. My elder brother thinks I should use a pit latrine

SA : A : U/N : D : SD

16. My grand parent thinks I should use a pit latrine

SA : A : U/N : D : SD

17. My relatives think I should use a pit latrine

SA : A : U/N : D : SD

18. My uncle thinks I should use a pit latrine

SA : A : U/N : D : SD

19. My sister thinks I should use a pit latrine

SA : A : U/N : D : SD

20. My friends think I should use a pit latrine

SA : A : U/N : D : SD

H: MOTIVATION TO COMPLY

VM = Very much

M = Much

L = A little

NA = Not at all

U/N= Undecided/Neutral

1. Generally speaking, how much do you want to do what your grand parent says you should do?

VM : M : U/N : L : NA

2. Generally speaking, how much do you want to do what fishermen say you should do?

VM : M : U/N : L : NA

3. Generally speaking, how much do you want to do what young children say you should do?

VM : M : U/N : L : NA

4. Generally speaking, how much do you want to do what your father says you should do?

VM : M : U/N : L : NA

5. Generally speaking, how much do you want to do what your mother says you should do?

VM : M : U/N : L : NA

6. Generally speaking, how much do you want to do what your elder brother says you should do?

VM : M : U/N : L : NA

7. Generally speaking, how much do you want to do what your teacher says you should do?

VM : M : U/N : L : NA

8. Generally speaking, how much do you want to do what health personnel say you should do?

VM : M : U/N : L : NA

9. Generally speaking, how much do you want to do what your uncle says you should do?

VM : M : U/N : L : NA

10. Generally speaking, how much do you want to do what your relatives say you should do?

VM : M : U/N : L : NA

11. Generally speaking, how much do you want to do what your sister says you should do?

VM : M : U/N : L : NA

12. Generally speaking, how much do you want to do what your friends say you should do?

VM : M : U/N : L : NA

THANK YOU VERY MUCH

APPENDIX 7

ATTITUDES, INTENTIONS & PERCEIVED CONTROLLABILITY OF PRIMARY SCHOOL CHILDREN TOWARDS BILHARZIA-RELATED BEHAVIOURS (1998) Time II.

In this questionnaire we seek to know your thoughts concerning urinating in water and the use of a pit latrine. Please answer all the questions honestly. Do not omit any of the questions.

Feel free in answering the questions without fear and honestly because all your responses will be treated with the strictest confidence. Do not write your name on the paper.

Example:

It gets hot in Mangochi

If you agree with the above statement that Mangochi is hot, then circle answer A = Agree

If you strongly agree with the statement that Mangochi is hot then circle response SA = Strongly Agree

If you do not agree with the response or your thoughts are otherwise then circle response D = Disagree

If you do not agree at all or strongly disagree with the statement then circle response SD = Strongly Disagree.

If you are undecided or not sure of your response to the statement presented then circle response U/N = Undecided/Neutral.

Name of the school _____ Class: Std _____

Your age _____ years. Club member: Yes No

Boy Girl

A: INTENTIONS

1. I intend to get out of the water each time I want to urinate

SA : A : U/N : D : SD

2. I intend to urinate immediately prior to entering the water

SA : A : U/N : D : SD

B: ATTITUDES

1. Getting out of the water to urinate is something:

- i) Very good
- Good
- U/N
- Bad
- Very Bad

- ii) Very pleasant
 - Pleasant
 - U/N
 - Unpleasant
 - Very unpleasant

Getting out of the water to urinate is something:

- iii) Very important to me
 - Important to me
 - U/N
 - Unimportant to me
 - Very unimportant to me

2. Urinating immediately prior to entering the water is something:

- i) Very good
 - Good
 - U/N
 - Bad
 - Very Bad

- ii) Very pleasant
 - Pleasant
 - U/N
 - Unpleasant
 - Very unpleasant

- iii) Very important to me
 - Important to me
 - U/N
 - Unimportant to me
 - Very unimportant to me

C: SUBJECTIVE NORMS

1. People who are important to me think I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

2. People who are important to me think that I should urinate immediately prior to entering the water

SA : A : U/N : D : SD

D: PERCEIVED CONTROL

- 1. Have you ever urinated in water? Yes
 - No

2. I have the power that if I really wanted to I can get out of the water to urinate

SA : A : U/N : D : SD

3. To get out of the water to urinate is a difficult thing

SA : A : U/N : D : SD

4. If I really wanted, to get out of the water to urinate would be something easy to do

SA : A : U/N : D : SD

5. I really want to get out of the water to urinate but am unable to do so

SA : A : U/N : D : SD

6. The things that prevent you from getting out of the water to urinate are:

7. Have you ever urinated immediately prior to entering the water?

Yes No

8. I have the power that if I really wanted to I can urinate immediately prior to entering the water

SA : A : U/N : D : SD

9. To urinate immediately prior to entering the water is a difficult thing

SA : A : U/N : D : SD

10. If I really wanted, to urinate immediately prior to entering the water would be something easy to do

SA : A : U/N : D : SD

11. I really want to urinate immediately prior to entering the water but am unable to do so

SA : A : U/N : D : SD

12. The things that prevent you from urinating immediately prior to entering the water are:

E: BEHAVIOURAL BELIEF

1. When you urinate immediately prior to entering the water:

a) A person does not get schistosomiasis

SA : A : U/N : D : SD

b) You do not spread schistosomiasis

SA : A : U/N : D : SD

c) You reduce the prevalence of schistosomiasis

SA : A : U/N : D : SD

d) You prevent the spread of diseases

SA : A : U/N : D : SD

e) You prevent people from contracting schistosomiasis

SA : A : U/N : D : SD

f) There are unhygienic conditions if a latrine is not used

SA : A : U/N : D : SD

2. When we get out of the water to urinate:

a) We do not spread diseases

SA : A : U/N : D : SD

b) We control schistosomiasis

SA : A : U/N : D : SD

c) schistosomiasis is reduced

SA : A : U/N : D : SD

d) We protect our friends from disease

SA : A : U/N : D : SD

e) The water remains clean

SA : A : U/N : D : SD

f) Delays us if we want to relieve ourselves

SA : A : U/N : D : SD

F: OUTCOME EVALUATIONS

VG = Very good

G = Good

B = Bad

VB = Very Bad

U/N = Undecided/Neutral

1. Urinating immediately prior to entering the water is something that is:

VG : G : U/N : B : VB

2. Not getting schistosomiasis is something that is:

VG : G : U/N : B : VB

3. Not spreading schistosomiasis is something that is:

VG : G : U/N : B : VB

4. Reducing the prevalence of schistosomiasis is something that is:

VG : G : U/N : B : VB

5. Not spreading diseases is something that is:

VG : G : U/N : B : VB

6. Preventing people from contracting disease is something that is:

VG : G : U/N : B : VB

7. Unhygienic conditions is something that is:

VG : G : U/N : B : VB

8. Getting out of the water to urinate is something that is:

VG : G : U/N : B : VB

9. Not spreading schistosomiasis is something that is:

VG : G : U/N : B : VB

10. Reducing schistosomiasis is something that is:

VG : G : U/N : B : VB

11. A reduction in the prevalence of schistosomiasis is something that is:

VG : G : U/N : B : VB

12. Protecting our friends is something that is:

VG : G : U/N : B : VB

13. Unpolluted water is something that is:

VG : G : U/N : B : VB

14. Delay in relieving one's self is something that is:

VG : G : U/N : B : VB

G: NORMATIVE BELIEFS

1. My sister thinks I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

2. My brother thinks I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

3. Father thinks I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

4. My mother thinks I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

5. My friends think I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

6. My aunt thinks I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

7. My in-law thinks I should get out of the water each time I want to urinate

SA : A : U/N : D : SD

8. My mother thinks I should always urinate immediately prior to entering the water

SA : A : U/N : D : SD

9. My father thinks I should always urinate immediately prior to entering the water

SA : A : U/N : D : SD

10. My brother thinks I should always urinate immediately prior to entering the water

SA : A : U/N : D : SD

11. My sister thinks I should always urinate immediately prior to entering the water

SA : A : U/N : D : SD

12. My grandparent thinks I should always urinate immediately prior to entering the water

SA : A : U/N : D : SD

13. My younger siblings think I should always urinate immediately prior to entering the water

SA : A : U/N : D : SD

14. Fishermen think I should always urinate immediately prior to entering the water

SA : A : U/N : D : SD

H: MOTIVATION TO COMPLY

VM = Very much

M = Much

L = A little

NA = Not at all

U/N= Undecided/Neutral

1. Generally speaking, how much do you want to do what your grand parent says you should do?

VM : M : U/N : L : NA

2. Generally speaking, how much do you want to do what fishermen say you should do?

VM : M : U/N : L : NA

3. Generally speaking, how much do you want to do what younger siblings say you should do?

VM : M : U/N : L : NA

4. Generally speaking, how much do you want to do what your father says you should do?

VM : M : U/N : L : NA

5. Generally speaking, how much do you want to do what your mother says you should do?

VM : M : U/N : L : NA

6. Generally speaking, how much do you want to do what your elder brother says you should do?

VM : M : U/N : L : NA

7. Generally speaking, how much do you want to do what your in-law says you should do?

VM : M : U/N : L : NA

8. Generally speaking, how much do you want to do what your aunt says you should do?

VM : M : U/N : L : NA

9. Generally speaking, how much do you want to do what your friends say you should do?

VM : M : U/N : L : NA

10. Generally speaking, how much do you want to do what your sister says you should do?

VM : M : U/N : L : NA

THANK YOU VERY MUCH

LAKE MALAWI BILHARZIA CONTROL PROGRAMME

INAUGURAL COMMUNITY MEETING
NKOPOLA LODGE 1 FEBRUARY 1997

PRESENT:

CHIEFS/REPRESENTATIVES FROM THE VILLAGES OF:

MICHESI, CHIPALA, CHIPOKA, CHINKUNDO, CHISIGELE, MTIMBUKA,
NTHYALA, MPALE, MAUDZU, MATUWI, KERA, MAKAWA, MPEMBA,
MAKOKOLA

MR B SHABA, MINISTRY OF HEALTH & POPULATION, CHSU

MR M MAGOMBO, MINISTRY OF HEALTH & POPULATION, HQ

DR D MATHANGA, DISTRICT HEALTH OFFICER, MANGOCHI

MR MSAPATO, DISTRICT ENVIRONMENTAL HEALTH OFFICER, MANGOCHI

MR CHAVINDA, DISTRICT HEALTH EDUCATION OFFICER, MANGOCHI

MR KANYINJI, DEPARTMENT OF TOURISM

MR I MUSYANI, DEPARTMENT OF TOURISM

MS C CHIRWA, DEPARTMENT OF TOURISM

MR B KUITER, EUROPEAN UNION

MR S KHALID, EUROPEAN UNION

MR A NAMACHAPA, DISTRICT EDUCATION OFFICER, MANGOCHI

MR A PHIRI, HEADMASTER MTONDA PRIMARY SCHOOL

MR A STAMBULI, HEADMASTER MAKAWA PRIMARY SCHOOL

MR A KIKA, HEADMASTER KOCHÉ PRIMARY SCHOOL

MR P CHALIRA, MEDICAL ASSISTANT, KOCHÉ HEALTH CLINIC

MR C NYALO, MULANGENI HOLIDAY RESORT

MISS S BIZZARO, CLUB MAKOKOLA

MR KALINGA, SUN 'N SAND HOLIDAY RESORT

MR KHUPE, NKOPOLA LODGE

MRS A ASHANI, LAKESHORE RESORT

MRS R MANDERE, WORLD VISION INTERNATIONAL

MR SWALEYI, HEALTH SURVEILLANCE ASSISTANT

MRS KWIZOMBE, HEALTH SURVEILLANCE ASSISTANT

MR MANJOLO, HEALTH SURVEILLANCE ASSISTANT

✓ MR C BANDawe, DEPT. OF COMMUNITY HEALTH, COLLEGE OF MEDICINE

MR S SIKWESE, HEALTH EDUCATOR, BILHARZIA CONTROL PROGRAMME

DR M RUMMUKAINEN, DEPT. OF COMMUNITY HEALTH

DR P CUPPEN, DEPT. OF COMMUNITY HEALTH

PROFESSOR T CULLINAN, DEPT. OF COMMUNITY HEALTH

1 WELCOME - WHY ARE WE HERE ?

Dr MATHANGA (the District Health Officer) welcomed all participants and expressed delight that so many had come, thus emphasising their commitment to the problem of bilharzia in Lake Malawi. He traced the outline of the disease, its impact on the inhabitants of the lakeshore villages and the fishermen. Following adverse publicity the tourist industry was now badly affected. He stressed the importance of all concerned working together as partners, informing each other on activities and consulting with each other regularly. He expressed delight to see representatives of the community at the meeting, since they were the essential component of any programme, but were not usually consulted.

2 WHAT IS THE COUNTRY DOING ABOUT IT ?

MR SHABA (for Schistosomiasis Control Programme, CHSU) thanked the District Health authority and the College of Medicine for their efforts to control schistosomiasis, and reiterated the Ministry's commitment to eradicate the disease, and to preventive as well as curative medicine. He described how the Ministry programme, which was set up in 1995, held a symposium to identify strategic proposals to put to donors. Educational leaflets and posters explaining schistosomiasis were designed but these were not printed since no funding had been available. He described the survey/treatment carried out in Cape Maclear, where 75% of children had been infected. He joined the DHO in asking for full cooperation among all parties.

Mr Kuiter asked why 25% did not have bilharzia. Professor Cullinan replied that nowhere in the world has prevalence been higher than 85% since tests were not so sensitive or specific. Mrs Ashani asked what tourist hotels could tell their guests and Mr Shaba replied that generally wave washed shores were safe. Professor Cullinan said the present control programme aimed to be able to answer those questions precisely within two years. It should be possible to say that here the risks are minimal, but not here as the programme has not extended to this place. Since to include the whole lake was beyond resources and logic, the programme was patch-based.

Chief Chinkundo said much had been heard in their community about bilharzia but they were not sure how it could be eliminated. Mr Shaba described the conditions that fostered bilharzia.

To a question from Mr Kuiter, the village representatives replied that they did recognise the symptoms of bilharzia and sought help from health facilities if they had blood in their urine or pain on micturition.

3 WHAT ARE WE DOING LOCALLY ?

MR MSAPATO (for District Health authority) described the consultative meetings organised at district level with various departments given different tasks. Health had demarcated the areas where health surveillance assistants (HSA) were stationed. An IEC proposal had been granted money from PHN and World Vision International were backing the Chembe project. HSAs were concerned with the provision of safe water, but there was no specific funding to support their efforts.

DR RUMMUKAINEN (for Department of Community Health) explained that the programme would be patch-based, and 'bottom-up'; together with the community all will learn how to control the disease. The community will take charge of the situation. The programme is a pilot programme, embracing 14 villages, with 16,000 inhabitants and will last for 2 years from January 1997. Already village meetings and surveys concerning water contact and water use have been made. These had revealed that almost all activities occurred in the lake. The first intervention of the

programme would be to test every tenth and treat all school-aged children, since they were the ones with the heaviest infection load, who shed a lot of eggs. This will be repeated twice a year, and it is hoped that prevalence will drop to around 20%. It would be good to treat the whole community, but that is not feasible with present funds. So far Club Makokola has donated cement to protect a well at Chisegele, and the salary to pay a full time health educator for one year to live in the community. Experience has proved that treatment alone does not work - the most vital part of the programme is to change behaviour. By the end of the programme it is hoped to be able to say if this approach works.

Chief Nthyala asked what villagers should do since they have no other source of water. Dr Rummukainen explained that the provision of safe water was an integral component of the programme and funds were being sought to back villagers efforts to protect wells, drill boreholes and dig pit latrines.

Miss Bizzaro said private enterprise would help, but it was essential that maintenance was carried out and care taken to look after the facilities provided. This was echoed by Mr Khupe.

4 RECRUITING THE SCHOOLS

MR CHIWOZA BANDAWE described the KAP surveys already done in three primary schools which highlighted where to begin health education, which would include health clubs, child to child transfer of knowledge. He then introduced:

MR SIMON SIKWESE said his work would focus on children between 5 and 18 years to reduce their dangerous behaviour in the lake, this would benefit all.

5 A WALK ALONG THE BEACH

PROFESSOR CULLINAN (for College of Medicine) felt the logistics of taking such a large meeting along the beach were too difficult. In this programme, he said in our programme the snail should not be forgotten and passed round a specimen. He described where it lived and how a beach was infected; how it was possible to clean a beach, and to keep it so. We should seek to cut down the snail population at the same time as changing the behaviour of the population.

6 WHAT ADOES THE COMMUNITY THINK ?

CHIEF MICHESE (for the Village Headmen) shared with the meeting how the villages felt. They were forced to use the lake, since other sources of water either did not exist or were too salty for use. He pleaded that safe water sources could be provided and said that people would rather not use the lake, since they knew of its dangers. He promised cooperation from the chiefs and asked for a health facility for treatment be opened.

Mr Magombo said that the lake provided good water, but we ourselves had spoilt it - people must be persuaded not to use it as a lavatory. He pointed out that people who were prone to

vandalism were well known to the chiefs, and villagers should be encouraged to look after anything that was given to them. Professor Cullinan replied that providing treatment regularly was not sustainable and too expensive and never gets rid of the disease. The way forward was treatment + behavioural change. Mr Kuitert asked how villagers ranked bilharzia as a disease. He was answered that it was not considered very serious but it had folk associations with infertility.

7 WHAT DO THE HOTELS THINK ?

MISS BIZZARO (for the hotel owners) described the dire effect of the recent publicity about bilharzia in the lake and asked all hotels to cooperate with the programme. Hotel staff should be educated to take the messages back to their families. She promised to continue Club Makokola's efforts and offered help to Chief Nthyala. She begged the Department of Tourism to contact the mass media and correct misinformation and asked anyone reading such should pass it to the department.

8 THE ROLE OF THE EUROPEAN UNION

MR KUITERT (for European Union) announced that there were 250,000 ecu available, divided over a number of sectors, of which Health should receive about MK3,000,000. This money would be available by the end of 1997, half being reserved for drugs, water and sanitation improvement, and public and community education campaigns.

Mrs Mandere asked if NGOs could tap into this money and was advised that she should go through MOHP planning department.

9 THE ROLE OF THE TOURIST INDUSTRY

MR KANYINJI (for Department of Tourism) said tourism had for a long time been based on the lake and regional visitors used the recognised resorts. Recently backpackers had arrived and strayed from these areas and thus become infected. Both BA and Thomsons had removed Malawi from their brochures. Money must be spent to persuade tourists to return and the problem tackled by all concerned, including religious leaders.

Professor Cullinan was sceptical about efforts being made since he could find no mention of Malawi as a tourist destination in either South African nor British travel agents. Were the ministries talking to each other, since MOHP did not have money to print their leaflets? We should tell the truth about the situation and what we are doing about it. Mr Kanyinji described a meeting with SA tour operators, with a campaign to bring travel journalists to Malawi, and a budget allocated for advertising. Mrs Mandere suggested there could be notices showing where beaches were safe. Miss Bizzaro felt that Malawi was Cape Maclear in tourist terms, and this misconception should be corrected by Tourism. The Headmaster of Mtonda school said fishermen from other areas who came just to fish, would camp on the beaches and not have any pit latrines; they should be included in any campaign. This statement was applauded by all community representatives.

In response to a question from Mr Kuiter, the chiefs felt that tourism was important for their community, in supplying employment and a market for curios, and would cooperate in every way with the programme.

10 WHERE DO WE GO FROM HERE ?

MR RUMMUKAINEN praised the unique experience of discussing a local problem with the community directly involved, and not imposing on them a solution formed elsewhere. She asked for help with two important steps:

- 1 All future bilharzia control should involve joint planning so that whoever is doing, whatever and wherever, plans, programmes and solutions would be shared. Resources are scarce, the problem is large and all should feel free to share whatever is going on.
- 2 Without community participation, the programme cannot succeed. The community's voice must be heard.

DR MATHANGA closed the meeting by thanking Nkopola Lodge for their hospitality, Club Makokola for the support always provided, the other hotels for their presence, and urged the Ministry of Tourism to provide the much needed leadership in the country.