COMMUNITY PARTICIPATION IN SCHISTOSOMIASIS AND SOIL-TRANSMITTED HELMINTHS CONTROL AND RELATED RESEARCH IN KWALE COUNTY, COASTAL KENYA.

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Community participation in schistosomiasis and soil-transmitted helminths control and related research in Kwale county, coastal Kenya.

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A thesis submitted in partial fulfilment for the requirement of the degree of Master of Science in Public Health in the Jomo Kenyatta University of Agriculture and Technology

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DECLARATION

This thesis is my original work and has not been presented for a degree award in any other University.

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This thesis has been submitted for examination with our approval as University supervisors.

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DEDICATION

I dedicate this thesis to my parents Mr. and Mrs. Macharia and my brothers and sisters for their sacrifice of resources, love, support, and encouragement during this study.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of variance
CHW	Community Health Worker
FGD	Focus Group Discussion
IDI	In-Depth Interview
KEMRI	Kenya Medical Research Institute
KII	Key Informant Interview
NTD	Neglected Tropical Diseases
PZQ	Praziquantel
SPSS	Statistical Package for Social Sciences
SSC	Scientific Steering Committee
STH	Soil Transmitted Helminths
WHA	World Health Assembly
ERC	Ethical Review Committee
WHO	World Health Organization

ABSTRACT

Soil-transmitted helminths (STH) and schistosomiasis are neglected tropical diseases (NTDs) mostly prevalent in communities living in areas of poverty in developing tropical countries. Currently, control programmes are based on regular co-administration of praziquantel and albendazole or mebendazole focusing on school-age children because they bear the greatest burden of infection. However, adult population was found to have significant levels of both schistosomiasis and STH in areas of high endemicity such as coastal and western Kenya. An operational research study undertaken during a pilot control programme against STH and schistosomiasis in both school-aged children and adult populations was implemented in 2010 in 5 villages in Kwale County, coastal Kenya. Biological samples (urine, stool and blood) were regularly collected from both the adults and children for purposes of monitoring and evaluation of the programme. The current study, therefore, was conducted to evaluate factors associated with community participation in the STH and schistosomiasis pilot control programme in Kwale and related operational research. The study comprised of 220 households heads. Quantitative data were analysed using SPSS (version16) program. Qualitative data were analysed thematically. Response rate was 98.6%. About 157 (72.4%) were females while 60 (27.6%) were males, mean age was 38.7 years (SD 14.62). Among the social-economic factors, religion and levels of income weresignificantly (P =0.04 and P=0.026 respectively) associated with participation in the research and control programme, history of ever suffering from schistosomiasis and intestinal worms was found to be significantly (P=0.008) associated with participation in the research. The study established that 82% (178) of the respondents received treatment for urogenital schistosomiasis and hookworms during the pilot control programme and 67% (146) of the respondents had participated in the research. This information will be useful in promoting health, enhancing learning and behaviour changes which will lead to increased community participation in similar disease control programmes.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Helminthic infections caused by soil-transmitted helminths (STH) and schistosomes are among the most prevalent afflictions of humans who live in areas of poverty in the developing world including almost all countries of the Sub-Saharan Africa (Montresor *et al*., 1998; WHO, 2002). The occurrence of these helminthic infections is mainly associated with socioeconomic and environmental factors, which are behaviour, household clustering, occupation, poverty, sanitation and urbanization including others like, ignorance of simple health promoting factors, limited access to clean water and tropical climate (WHO, 2002). Soil-transmitted helminths are endemic in most parts of the developing world with around 1.4 billion individuals estimated to be infected with *Ascaris lumbricoides*, 1.0 billion with *Trichuris trichiura*, and 1.3 billion with hookworms while schistosomiasis infects around 200 million people worldwide and 600 million are at risk (Chitsulo, Montressor, & Savioli, 2007). In Kenya, more than six million people, or approximately 23% of the total population, are estimated to be infected with urogenital or intestinal schistosomiasis (Chitsulo, Montressor, & Savioli, 2000).

The geographic overlap of schistosomiasis and STH infections (Brooker *et al*., 2009) and their impact on children and adolescents has led to recommendation for integration of STH and schistosome control through periodic school-based targeted anthelminthic drug treatments (Crompton, 1999) by the World Health Organization (WHO). In 2001 a resolution was passed during the 54th World Health Assembly (WHA, 2001) with the target (for member states) to regularly administer anthelminthic drugs to at least 75% of all school-aged children (Hotez *et al*., 2007) who are at risk of morbidity due to schistosomiasis and STH by 2010. In the same year, the (WHO) assembled an expert committee to refine global strategy for prevention and control of schistosomiasis and STH infections. Since then millions of school-aged children have received anthelminthic

drugs but adult population involvement has not been emphasized although their inclusion will represent an effective way of preventing re-infection and a key factor for sustainable control. While the global strategy for prevention and control of schistosomiasis and STH infections has a direct impact on morbidity, it does not prevent reinfection (Utzinger *et al*., 2009).

Previous studies conducted in Matuga District in Kwale County, coastal Kenya revealed high prevalence of hookworm (41.7%) and schistosomiasis (18.2%) infections among adults which calls for designing of strategies for including adults in control programmes (Njenga *et al.*, 2011). This finding suggests that both individual and community participation in control and research for schistosomiasis and STH are important factors for successful control and prevention programmes. Therefore, studies are required to identify social, cultural and economic factors that may influence health behaviour, thus providing health planners with the knowledge necessary to develop effective disease control programs. Beliefs can also be the source of secular non-religious behaviors e.g eating habits, bathing in streams and are not likely to be dismissed since they are rooted within traditional cultures. Saudi Arabia is such an example, where there is permanent residual percentage of 1% of schistosomiasis prevalence associated to Muslim communities with peculiar customs. In these communities, the habit of having picnics is widespread and people usually wash themselves in flowing water after urination or defaecation near picnic sites which is mandatory for religious reasons (Farroq and Nallat, 1966). This way the water around such picnic sites remains contaminated with schistosomes.

The morbidity caused by STHs and schistosomes is commonly associated with high infection rate and school-age children typically have the highest intensity of worm infection. Chronic infections have an impact on the overall health status and fitness of children (Nwaorgu *et al*., 1998) affecting nutrition, cognitive development, learning, and educational access and achievement (World Bank, 2003).

1.2 Problem Statement

Soil-transmitted helminths and schistosomes continue to affect around 2 billion people worldwide (Van der werf *et al*., 2003). Although improvements have been made to reduce helmintic transmission, worm infections continue to be an issue of major public health and socio-economic concern contributing to health effects causing physical and mental growth impairment and hindering economic development. There is still lack of good understanding of community response and behaviour when presented with a disease control strategy or programme with which community members are expected to comply. Analysis of social, cultural and environmental factors affecting disease transmission requires substantial effort (Barbosa & Barbosa, 1998), but this approach is rarely adopted in tropical disease control strategies. Previous investigations examined local factors such as exposure (water contact behaviour), contamination (urination and defecation) and attitudes and knowledge bearing on transmission and illness behaviour, which draws the need to address broader issues including socioeconomic, and health utilization. A study conducted in Zimbabwe revealed that community participation is a complex process upon which a multiplicity of social and cultural determinants have an impact. If community participation becomes successful in disease control programmes it ought to be viewed as a mutual learning process where obstacles are identified and discussed and solutions shared among community members and staff (Ndekha *et al*., 2002). This study therefore sought to determine the factors that influence community participation in schistosomiasis and STH control and related operational research among communities living in Kwale County, Coastal Kenya.

1.3 Justification

Community participation and involvement with the target population are considered the most important prerequisite for the success of prevention and control programmes of any disease (Winch, Kendall, & Gubler, 1992). Good understanding of the local knowledge, practices, culturally and socially patterned behaviors, and the context within which they occur, and the reasons people give for their behavior provides important insights to the

policy making process such that better decisions which are more sustainable and appropriate are made during programme implementation.

The health and well being of individuals and populations across all age groups is influenced by a range of factors both within and outside the individual control. Research to plan and evaluate health programs must take cultural beliefs and behaviors into account if researchers expect to understand why programs are not working, and what to do about it. However, community health-promotion research has previously focused on the outcomes of capacity building interventions and not on barriers of interventions. This lack of attention results in poor understanding of community participation and other factors that may affect program implementation and their relationship to program outcomes (Butterfoss *et al.,* 1996). Clarifying these factors may help practitioners implement more effective community based interventions.

The present study sought to determine the various factors that may influence community participation in control schistosomiasis and STH control programme. This will go a long way in supporting implementation of meaningful similar interventions. The findings of the study will be useful in articulating guidelines on the control and elimination programs for schistosomiasis and STH. This will contribute to a better understanding and improvement of results of the ongoing control efforts particularly, influence the research and control and its complex interaction with many social factors. The findings will also provide an insight on areas that need to be addressed by program implementers in the planned scaling up of control programs for schistosomiasis and STH in many endemic areas.

1.4 Research Questions

1. What are the demographic factors that influence participation in the control and related operational research for schistosomiasis and STH in rural villages of Kwale County, coastal Kenya?

2. What are the socio-economic factors that influence community participation in control and related operational research for schistosomiasis and STH in rural villages of Kwale County?
3. What are the health related factors that influence community participation in control and related operational research for schistosomiasis and STH in rural villages of Kwale County?
4. What percentage of the adult population has been covered in the treatment process?

1.5 Objectives

1.4.1 General objective

To determine factors influencing community participation in the control and related operational research for schistosomiasis and soil-transmitted helminths in rural villages of Kwale County, coastal Kenya.

1.4.2 Specific objectives

1. To establish demographic factors that influence participation in schistosomiasis and STH control and related operational research in rural villages of Kwale County.
2. To determine socio-economic factors influencing community participation in schistosomiasis and STH control and related operational research in rural villages of Kwale County .
3. To determine health related factors influencing community participation in control and related operational research for schistosomiasis and STH in rural villages of Kwale County.
4. To determine treatment coverage for schistosomiasis and STH among the adult population of Kwale County .

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Epidemiology of Soil Transmitted Helminths Infections and Schistosomiasis

Human helminthic infections exhibit a highly aggregated (overdispersed) distribution so that most individuals harbor just a few worms, with a few hosts harboring large worm burdens. As a rule, about 20% of the host population harbors approximately 80 percent of the worm population (Anderson & May 1991). This overdispersion has many consequences, both with regard to the population biology of the helminths and the public health consequence for the host, because heavily infected individuals are simultaneously at highest risk of disease and the major source of environmental contamination, the severity of morbidity is determined by the intensity of infection (Cooper & Bundy, 1988). Infection with *Trichuris trichiura* and *Ascaris lumbricoides* typically reaches maximum intensity at 5-10 years of age, after which it declines to lower levels that then persist throughout adulthood. *Schistosoma* infections reach maximum intensity at a slightly later age, usually 10-14 years while for hookworm infections, maximum intensity is not attained until 20-25 years (Stephenson, 1987).

In helminthic infections adult worms usually survive between one and four years, whereas eggs can remain viable for several more years and larvae several weeks depending on prevailing environmental conditions (Anderson and May 1991). Therefore, reinfection rates will remain high until adults are eradicated with chemotherapy and until infective stages, through time, become uninfective. However, rapid infection of humans occurs after successful deworming, and therefore effective preventive measures are required to achieve public health goals with optimal efficiency and sustainability. People of all ages rapidly reacquire infection following treatment, but in schistosomiasis, older people reacquire infection at slower rates than younger ones (Kabatereine *et al*., 1999). The rate of reinfection is specific to certain species of helminths and depends on the life expectancy of that species, on intensity of

transmission within a given community, and on the treatment efficacy and coverage.

2.2 Schistosomiasis

Schistosomiasis is a chronic water-borne infection and it occurs into two main forms of the disease namely; urogenital and intestinal schistosomiasis. The major etiologic agents of the intestinal form are *Schistosoma mansoni* and *Schistosoma japonicum*. *S.mansoni* lives in the blood vessels surrounding the large bowel, the eggs which have a lateral spine are passed in stool and the intermediate host (snail) belongs to the genus *biomphalaria. S.japonicum* lives mainly in the blood vessels of the small intestine the eggs which have a rudimentary spine are passed with the stool and the intermediate host belongs to the genus *Oncomelania. S. haematobium* is the only known agent of urogenital schistosomiasis (WHO, 2012). *S.haematobium* lives in the blood vessels of the bladder and genitalia and the eggs characterised by a terminal spike are passed in urine, the intermediate host snail belongs to the genus *Bulinus.*

2.2.1 Transmission of schistosomiasis

Transmission of schistosomiasis occurs when a human's skin comes in contact with freshwater contaminated with schistosome-carrying snails (Ross *et al*., 2007) and schistosome parasites penetrate the skin. Although transmission is restricted to areas with contaminated water, it is difficult to stop at-risk populations from carrying out basic domestic tasks such as bathing or washing. Damp areas exhibit increased transmission in endemic areas and both STH and schistosome infections exhibit marked seasonality (Brooker & Michael, 2000). Lack of sanitation, poor water supply and unhygienic practices contribute to spread of schistosomiasis in the community (Molyneux, Marsha, & Peshu, 2005).

2.2.2 Life cycle of human schistosomiasis

Schistosome worms have got six life stages. These include egg, miracidia, sporocyst (mother and daughter), cercaria,schistosomulae and adult worm (Figure 2.1). Eggs from

the dwelling schistosome parasites are excreted in faeces or urine and when in freshwater hatch to release miracidia in response to temperature, light and diluting of urine/faeces with water. The miracidia actively swim in search for suitable freshwater intermediate host snails (Jordan, Gerald, & Robert, 1993:). The miracidia swims actively and is infective to snail for 8-12 hours and die if they do not locate appropriate host in time as they cannot feed and progressively exhaust their food stores at a rate determined by their activity (Cook, 1996). After infection miracidium transforms into primary (mother) sporocyst. Germ cells within the primary sporocyst then begin to divide to produce secondary (daughter) sporocysts, which migrate to the snail's hepatopancrease.

In snail, the germ cells within secondary sporocyst begin to divide again this time producing thousands of new parasites (cercariae) larvae capable of infecting mammals this process takes about 4 weeks. A single miracidium result to a few thousand cercariae, every one of which is capable of infecting man. The cercariae emerge from snail during daylight and propel themselves in water in aid of their biforcated tail, actively seeking their final host. Cercarial activity is particularly stimulated by water turbulence, shadows and by chemicals found on the human skin (Jordan, Gerald, & Robert, 1993); Utzinger & Fenwick, 2008). Cercariae penetration to human skin occurs after they have attached to and explored the skin. Cercariae attach the human host utilizing oral and ventral suckers (Utzinger & Fenwick, 2008). The penetrating cercaria migrates through intact human skin to dermal veins and over the next several days to pulmonary vasculature. During skin penetration, the cercariae metamorphoses into schistosomules shedding its tails and outer glycocalyx this takes (0-3hrs). Each schistosomule spends a few days in the skin and enters the circulation starting at dermal lymphatics and venules. Schistosome migrates into lungs 5-7 days post-penetration and then moves via circulation through the left side of the heart to the hepatoportal circulation (less than 15 days) where they feed on red blood cells.

Adult female worm resides within the adult male worm gnaecopheric canal, which is a modification of the ventral surface of the male forming a groove. The paired worms

move against the flow of blood to their final niche in the mesenteric circulation where they begin egg production in more than 32 days (Gerald & Larry, 2000). Each female lays approximately 300 eggs per day, which are deposited on the endothelial lining of the venous capillary walls. The female converts the equivalent of almost her own body dry weight into eggs each day. The eggs move into lumen of the intestines or in the bladder and are released into the environment with the faeces or urine.

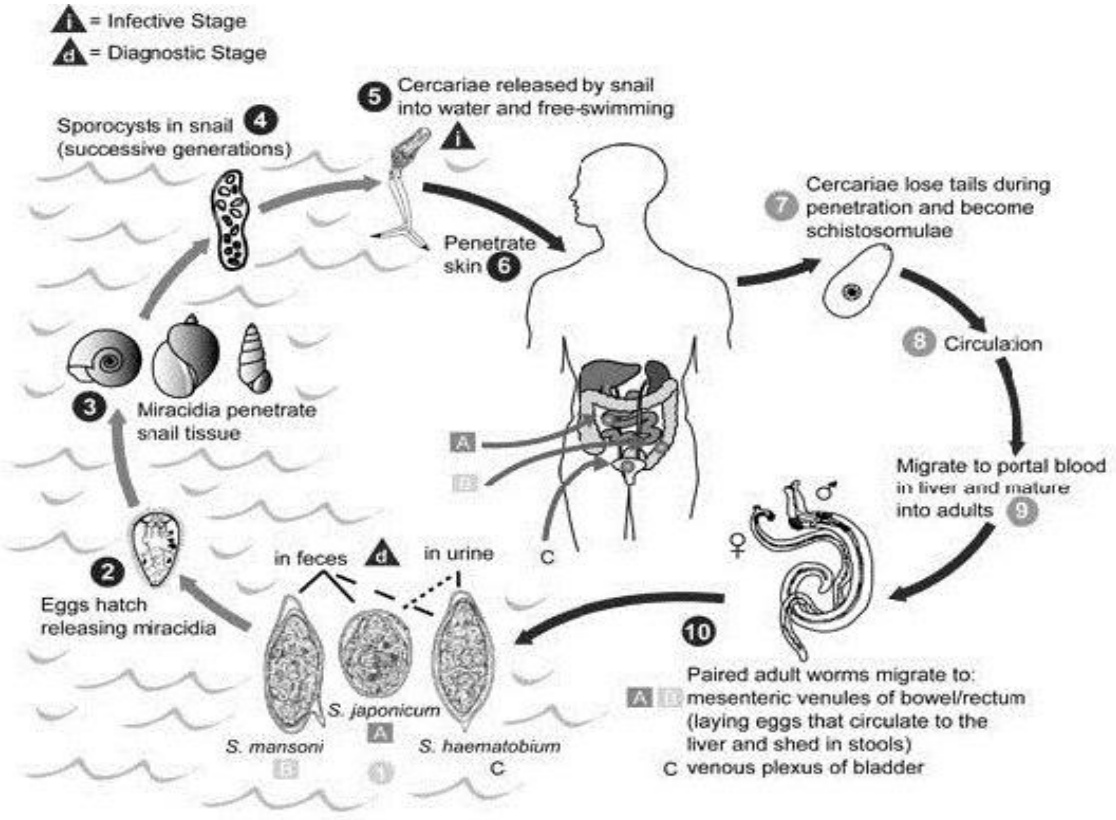


Figure 2-1: Life cycle of human schistosomes. Source: (CDC, 2000)

Stages 1-5: Schistosome stages in intermediate host (snail).

Stages 6-10: Schistosome stages in definitive host (man).

2.2.3 Symptoms of schistosomiasis

Symptoms of schistosomiasis are not caused by the worms themselves but by the body's reaction to the eggs. In both types of schistosomiasis (intestinal and urogenital schistosomiasis) only about a half of the eggs are excreted in the faeces (intestinal schistosomiasis) or in urine (urogenital schistosomiasis). The rest remain in the body damaging other vital organs, in addition to the bladder and intestine. It is the egg and not the worm itself that causes damage to the intestines, bladder and other organs (Utzinger & Fenwick, 2008). Although a few patients have minor skin irritations when the cercariae enter the skin, most people do not develop symptoms until the eggs develop (two months from initial skin penetration). Then, fever, chills, cough and muscle aches begins. A few develop acute schistosomiasis (kayatama fever) during this one to two months period, and their symptoms resemble those for serum sickness including fever, abdominal pain, bloody diarrhoea, cough, malaise, headache and rashes.

Majority of people who develop chronic schistosomiasis have symptoms developing months or years after initial exposure to the parasites, resulting from egg-induced immune responses, granuloma formation, and associated fibrotic changes. Eggs retention and granuloma formation in the bowel wall (*S. mansoni*) causes bloody diarrhoea, cramping, and, eventually colonic polypsis. Chronic intestinal schistosomiasis presents with acute complications of appendicitis (Badmos,Komolafe, & Rotini, 2006), perforation and bleeding long after travel-related (or endemic) exposure. Rectal perforation caused by *S. haematobium*has been described (Argemi, Camuset,&Abou-Bakar, 2009). Heavy infestations are likely to produce hepatic disease eventually severe periportal fibrosis resulting into pulmonary granulomatosis and fibrosis, which leads to pulmonary hypertension. A study conducted to determine the prevalence of pulmonary hypertension in schistosomiasis patients with the hepatosplenic form of the disease indicated that pulmonary hypertension was found in 18.5% of patients with known hepatosplenic schistosomiasis (Lapa *et al*., 2009). Egg retention and granuloma formation in the urogenital tract *(S. haematobium*) can lead to haematuria, dysuria,

bladder polyps and ulcers, and even obstructive uropathies.*S. haematobium* infection is also associated with an increased rate of bladder cancer usually squamous cell rather than transitional cell (Nmorsi *et al*., 2005).

2.3 Soil-transmitted Helminths

2.3.1 Transmission of STH

It is well established that indiscriminate disposal of human and animal faeces, poor personal hygiene, and inadequate water supply contribute to high levels of STH infections (Bundy & Booth, 1995). In areas with no latrine system, the soil (and water) around the village or community becomes contaminated with faeces containing worm eggs. In the soil, the eggs mature a process that takes between 2 and 4 weeks, depending on type of worm. The STH infect human in different ways; worm eggs stick to vegetables grown in areas which have been contaminated with faeces and if they are not carefully washed and cooked the eggs are ingested and they cause infection. People of all age groups become infected as a result of failing to observe personal hygiene in areas where sanitation is inadequate. Hookworm larvae can penetrate the skin if a person walks on the contaminated soil; the larvae usually penetrate the skin usually between the toes (Davies, Sakul, & Keystone, 1993).

Transmission is often through eating contaminated food or water since most geohelminth infections are essentially through the faecal oral route (Ukoli, 1984). There is no direct person-to-person transmission or infection from fresh faeces because eggs passed in faeces need about 3 weeks in the soil before they become infective.

2.3.2 Symptoms of soil-transmitted helminthes

The symptoms of infections are usually non-specific and subtle and only become evident when the infection is particularly intense. Non-specific symptoms include; nausea, tiredness, abdominal pain, loss of appetite and, in children, a cough or wheeze. Chronic

and intense STH infections can contribute to malnutrition and iron-deficiency anaemia, stunting (measure of chronic undernutrition), wasting (a measure of acute undernutrition), restlessness and abdominal pain (Van der werf, 2003; Bethony *et al*., 2006) and may negatively affect class attentiveness and thus educational performance.

2.4 Schisosomiasis and STH control interventions

Control of STH and schistosomiasis aims at prevent new infections by interruption of the parasites life cycle, however the ultimate success of any control programme is dependent upon appreciation by the community of the benefits of proposed measures in endemic areas. Improved sanitation facilities and water supply are important for control of schistosomiasis and STH infections, as most helminths eggs or larvae have to reach water or humid ground for further development. For sanitation to be effective it should cover a high percentage of the population and sometimes implementing the strategy is difficult particularly where resources are limited due to high costs involved (Asaolu & Ofoezie, 2003). Therefore, when used as the primary means of control it may take decades for sanitation to be effective (Brooker, Bethony, & Hotez, 2004). Specific sanitation and water interventions may include raising sanitation standards i.e. high quality latrines, maintenance of safe drinking water to lower prevalence rates; community installation of own water supply and cooperating with the health authorities in reducing contact with unsafe water bodies and contaminated water sources which assists in avoiding cercaria penetration.

In specific epidemiological conditions, environmental or chemical control of snails can be useful tools for reducing the transmission of schistosomiasis through environmental management measures, such as stream channelizing, seepage control, canal lining and canal relocation with deep burial of snails; use of biological agents and molluscicides, which helps in interfering with the biodiversity. Control of snails is important to support chemotherapy campaigns and to reduce re-infection. Although the draining of snail habitat is of value in transmission control, many more habitats for snails are being created by efforts to increase agricultural production (Gerald & Larry, 2000).

Health education is also important in control of schistosomiasis and STH and aims at reducing transmission and re-infection by encouraging healthy behavior. For STH infections and schistosomiasis, the aim is to reduce contamination of soil and water by promoting the use of latrines and hygienic behavior as without a change in defecation habits, periodic deworming cannot attain a stable reduction in transmission. Health education is also crucial in control of these infections as informed people are able to adapt control strategies on personal level, which should be based on a clear understanding of the people's perception of disease, and its relation to the environment and community participation promoted by an effective health education programme. This can be provided simply and economically, as it presents no contraindications. However, education is often exceedingly difficult depending ultimately on the intractable task of persuading masses of uneducated, poor people to change their customs and traditions (Gerald & Larry, 2000).

Periodic treatment of at risk population reduces intensity of infection and protects infected individuals from morbidity due to STH and schistosomiasis. Killing of parasites living in the body is possible, but it is impossible to repair the damage already done in the body for a person living in a high transmission area, however regular treatment will stop the infection from being able to develop into serious disease. Recommended drugs for use in public health programmes to control STH infection are benzimidazoles (albendazole and mebendazole) but older drugs including pyrantel and levamisole are occasionally used in developing countries (WHO, 2002; Utzinger and Keiser, 2004).

Schistosomiasis is readily treated using a single oral dose of praziquantel annually and the WHO has developed guidelines for the community treatment of schistosomiasis based on the impact the disease has on children in endemic villages; when a village reports more than 50% of children have blood in their urine, everyone in the village receives treatment, when 20 to 50% of children have bloody urine, only school-age

children are treated; when less than 20% of children have symptoms, mass treatment is not implemented (WHO, 2002). In areas where both STH and schistosomiasis infections co-occur, benzimidazoles are co-administered with praziquantel (Fenwick *et al*., 2003). Research to develop new tools for control is in progress, including vaccine development for hookworm infection and schistosomiasis that will prevent the parasite from completing its life cycle in human(Hotez *et al*.,2008).

2.5 Role of community participation in disease control programmes.

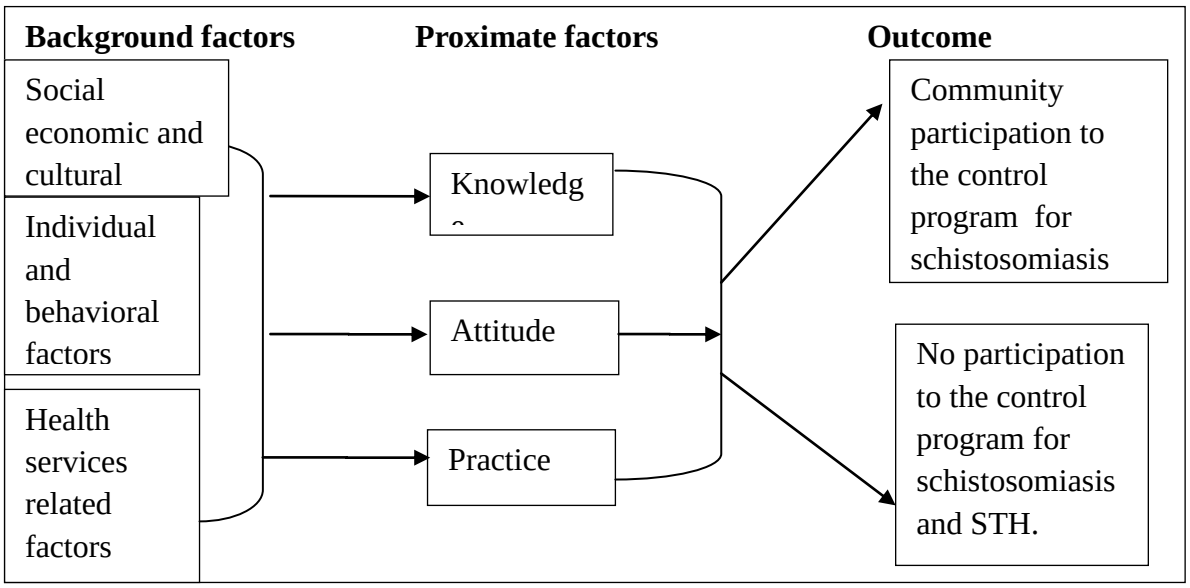
Since the Almata-Ata Conference (WHO, 1978), active community participation in the healtheducation processes and in programs for disease control have been encouraged by WHO. The role of community participation, as a programme component or an outcome of the intervention, is important for effective evaluation in community-controlled programmes. Community involvement is a key approach in control of helminthic infections and a way of ensuring that health development is maintained. Community engagement and participation has played a significant responsibility in success of communicable disease control and elimination campaigns such as the elimination of schistosomiasis in Guangxi Province, China (Sleigh *et al*., 1998) which invested in mass literacy classes with the aim of providing broader and long term benefits for health of communities.

Despite wide consensus about the importance of community participation in control of helmintic infections little attention has been given to community's interest in participating in such activities. There is lack of good understanding of programme staff working with communities in which programmes are being implemented which can lead to disagreements (Allotey, Reidpath, & Pokhrel, 2010). However, knowledge transfer through mutual sharing of experiences between communities and program staff has proven to be an effective mechanism in facilitating community participation (Cline & Hewlett, 1996) in these control programmes. Communities which are vulnerable to communicable diseases due to either biological or non-biological factors are less capable

of participating in disease control programmes and hence they become more vulnerable. If this community is empowered to participate the population takes actions to mitigate risk and reduce their vulnerability to disease (Toledo *et al.,* 2007). This enables individuals and communities to build their capacity against selective diseases and be able to advocate for their right to basic health services.

2.6 Conceptual Framework.

The conceptual framework below (Figure 2-2) is an assumption of factors which may influence community participation in control of schistosomiasis and soil-transmitted helminths. These include socio-economic, cultural, individual, behavioural factors and health service related factors. These background factors might have an influence on the knowledge, perception and behaviour of the community which shapes their involvement in the research and control programme.



Health Belief Model source: Self generated.

Figure 2-2. Conceptual framework of factors associated with community participation in schistosomiasis and soil-transmitted helminths control programme.

CHAPTER THREE

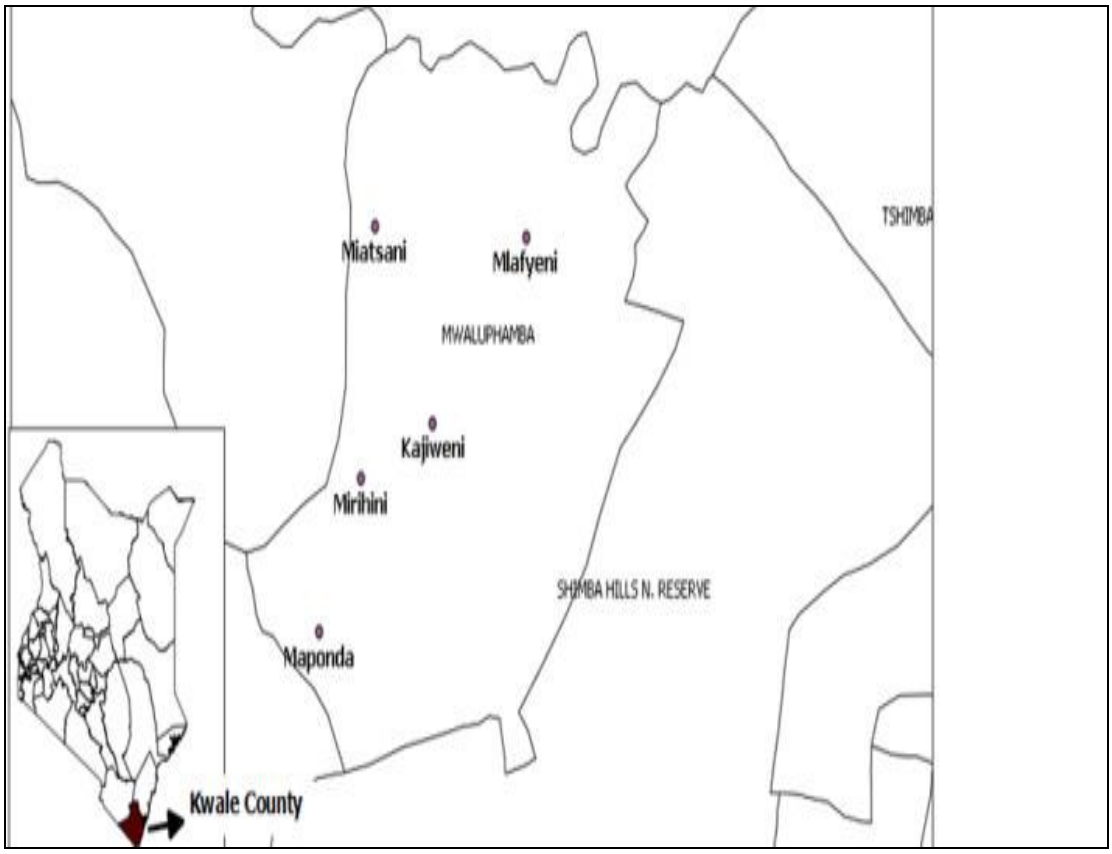
3.0 MATERIAL AND METHODS

3.1 Study Area

The study was carried out in two villages (Mirihini and Mlafyeni) in Mwaluphamba Location, Matuga District, Kwale County. A cross-sectional survey found the prevalence of urogenital schistosomiasis and hookworm infection among adult population in these rural villages to be 18.2% and 41.7%, respectively (Njenga *et al*., 2011). Kwale County is located south of Mombasa Island and borders Tanzania to the southwest and the Indian Ocean to the East (Fig 3-1). Kwale County covers an area of 1,043 square kilometers. The population of Kwale County based on 2009 census was estimated as to be 649,931 and 151,978 persons (KNBS, 2010). The district experiences hot and dry climate from January to March and a relatively cool climate from June to August. The communities in the two study villages practice subsistence farming of food crops for domestic consumption mainly maize, cowpeas and cassava. They also grow coconuts, oranges, mangoes and cashew nuts and keep livestock including cattle, goats, ducks and chickens.

3.2 Study design

The study was a cross-sectional descriptive survey involving quantitative and qualitative research methods. The study was linked to an ongoing operational research study SSC No.1587. The protocol was reviewed and approved by the Scientific Steering Committee and the Ethical Review Committees of the Kenya Medical Research Institute.



Source: **Njenga *et al.*,2014**

Figure 3-1: Location of the study area (Map showing location of the five villages where programme was implemented in Mwaluphamba Location, Matuga District, Kwale County, Kenya.

3.3 Study population

The study population comprised of household heads from the two villages who had been residents of the area for more than one year. For qualitative study Key informants were selected, these included village elders, religious leaders, women and youth representatives, health teacher and a health worker who consented to participate.

3.3.1 Inclusion/Exclusion criteria

Inclusion criteria

- Adults who were18 years of age and above.
- Individuals who consented to participate in the study.
- Individuals who had been residents of the area for more than one year.

Exclusion criteria

- Individuals who did not consent to participate in the study.
- Individual who were below 18 years of age.
- Individuals who had been resident of the area for a period of less than one year during survey.

3.3.2 Sample size determination

Sample size required was determined as described by (Fisher*et al*., 1998). , P value was assumed to be 0.5.

Formula: $n = \frac{Z^2 P Q (1-P)}{d^2}$

n = minimum required sample size

Z= Confidence level at 95% (standard value of 1.96)

P = Proportion of the population having the characteristic being measured (if proportion is unknown p=0.5)

d =Level of precision at 7% (adjusted from 5%)

Q = level of significance (1-P)

$n = 1.96^2 (0.5) (0.5)$

0.07^2 =196

To allow for a non-response rate of 10% 221/RR

RR = Response rate (%) 196/1-0.1 =217.778

(n) =220 households

3.3.3 Sampling Procedure

An ongoing study SSC No 1587 (Njenga *et al.*, 2011) had selected five villages Kajiweni, Mlafyeni, Mirihini, Miatsani and Maponda. Two villages were selected from the list of the above five villages through simple random sampling. An updated list of the household heads from the selected villages was used to select 110 household heads from each village through systematic random sampling.

Key informants (Appendix 2) were purposively chosen for interviews, which included village elders, religious leaders, women, and youth representatives, teachers and a health workers. Interviews were conducted among one representative of each of the selected Key informants from each of the selected villages giving a total of twelve interviews.

Focus group discussion (FGD) (Appendix 3) participants were purposively selected so as to reflect the view of women, men and youth. Those who did not participate in the quantitative studies were selected on the basis of availability. Three FGDs were conducted from the selected villages consisting of 8-10 people; two for each gender and one among the youths.

3.4 Determination of Knowledge and Attitude on urogenital schistosomiasis and intestinal worms

3.4.1 Assessment of knowledge

To assess the respondent's level of knowledge for urogenital schistosomiasis and intestinal worms a 10 knowledge questions index was used. The 10 knowledge questions were assessed for correctness and graded. Respondent's responses were added to form a schistosomiasis and intestinal worms knowledge index which ranged from 0 to 10. If the participant answered more than 7 questions correctly (≥70%) the knowledge level was assessed as "Good". If the participant correctly answered 4 to 6 questions 40 %< 70%) the level of knowledge was "Fair" and if there were less than 4 correct answers (< 40%), the knowledge level was assessed as "Poor". Two questions had three correct choices and if they answered at least 2 choices, then their answer was considered to be correct.

3.4.2 Assessment of attitude towards urogenital schistosomiasis and intestinal worms

For the attitude determination, each variable was viewed individually and assessed whether it was negative or positive. Attitude was analyzed from two perspectives; a score of 3 was awarded to a positive attitude in any of the four questions. An overall score of 3 to 4 was considered positive attitude, otherwise negative.

3.5 Data collection tools

Quantitative data were collected by administering a questionnaire to the household heads after obtaining informed consent from the participants. Questionnaires were administered by trained field assistants and monitored by the author.

Structured questionnaires with closed and open ended questions were administered to household heads in the selected households in each village, but if the household head was absent, the spouse or an adult household member was interviewed.

Key informant interviews were also conducted to explore in-depth contextual data among specific personalities. These was done with the assistance of the Assistant Chief. The method was particularly valuable for rapidly gaining hidden information.

Focus group discussions (FGDs) were conducted to obtain in-depth information on the subject matter (Appendix 3) whereby the participants were invited to meet in a central place agreeable to the majority. The researcher developed themes and sub- themes on the subject of discussion. These themes and sub-themes were used to probe the members, as the research assistant took notes on the issues coming out. During this process one of the research assistants fluent with the local language and a resident of the area was chosen as a moderator. An evaluation was done at the end of the meeting by the researcher to validate the information collected. The validated information was later manually recorded, translated and typed into Ms Word and analysis done later.

3.6 Data Management and Analysis

Data captured in questionnaires were coded and entered in Ms Access and analysis was done using Statistical Package for Social Sciences . Data cleaning and validation was done prior to analysis. Data entry was done concurrently as the data collection continued in the field to minimize errors. To ensure confidentiality, computer access was restricted by password protection.

Descriptive statistics were used for analysis of demographic and socio-economic factors to give the measures of central tendency (means, median and mode) and parameters of dispersion (range, variance, and standard deviation) and their corresponding 95% confidence intervals. Proportions were used to determine the treatment coverage for schistosomiasis and STH among adult population.

Bivariate analysis was used to test association between different independent factors the socioeconomic, health related factors, demographic and behavioral factors and dependent factors (community participation).

Multivariate analysis was done using binary logistic regression to control for confounders and effect modification. Variables with $p<0.05$ in the logistic regression were considered to have a significant association with participation in the research. The predictors of participation in research were estimated by calculation of odds ratio (OR) and Confidence Intervals (CIs) and a $p<0.05$ was considered significant.

Quantitative data was presented in form of tables, charts and graphs. Data from IDIs and FGDs was transcribed, coded and analysed thematically. Information from the various data collection tools was collated using a method of triangulation in order to synthesize and interpret the results. Tape recorded data were transcribed, translated into English and analyzed using themes (thematic analysis).

3.7 Ethical Considerations

Permission to carry out the study was obtained from KEMRI Scientific Steering Committee (SSC) and Ethical Review Committee (ERC) as well as from the Board of Postgraduate Studies (BPS) in Jomo Kenyatta University of Agriculture and Technology.The Chief and Assistant Chief of the study area and health authorities were notified of the study. The aims and objectives of the study were well explained to all the participants. Those who consented to participate were requested to sign the consent form. Each informant was informed about their right to decline or withdraw any time from participating in the study without feeling constrained. It was made clear to the participants that there are no known harmful effects which were associated with their participation in this study.

3.8 Expected Application of Results

The results of this study are useful to the stakeholders involved in schistosomiasis and STH control programme and give further insight into the design and implementation of similar control programmes.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic characteristics

A total of 217 adults above 18 years took part in the study; 110 from Mirihini and 107 from Mlafyeni villages respectively both villages located in Mwaluphamba Location, Matuga Constituency in Kwale County.

4.1.1 Distribution of respondents by Age and Gender

The average age of the participants was 38.7 years (SD 14.62). The modal and median ages were 26 and 36 years, while the youngest and oldest participants were 19 and 71 years of age, respectively. The age with the highest frequency was between 20-29 years old with no significant difference by gender. The age-groups were also categorized as stated in (Table 4-1) for chi square analysis. Considering the distribution of the respondents by gender, about 157 (72.4%) were females while 60 (27.6%) were males. Age distribution was comparable between males and females although there was no significant association between age and gender (($\chi 2 = 8.305$, df =4, P=0.081).

4.1.2 Marital status of the participants from the two villages

As illustrated in Table 4-1, majority of the participants were married 194 (89.4%) while a few were single (5.9%), widowed (2.8%) or separated (1.84%). There was a significant relationship between age and marital status ($\chi 2 = 33.870$, df = 12, P =0.001) where older people were more likely to be married than their younger counterparts with the highest percentage of those who were single (76.9%) being aged between 20-29 years.

Table 4-1: Demographic and socio-economic characteristics of the surveyed household and relationship with participation in schistosomiasis and STH research and control programme

Variables	Response	Total N=217 n (%)	Participation in research n (%)	Non-participation in research n (%)	P value
Gender	Male	60 (27.6)	39 (26.7)	21(29.6)	0.658
	Female	157(72.4)	107(73.3)	50(70.4)	
Age	< 20	5(2.3)	4(2.7)	1(1.4)	0.949
	20-30	69 (31.8)	47(32.2)	22(30.9)	
	30-40	57(26.3)	38(26)	19(26.8)	
	40-50	36(16.6)	25(17.1)	11(15.5)	
	50 and above	50(23)	32(21.9)	18(25.4)	
Marital status	Married	194(89.4)	128(87.7)	66(92.9)	0.362
	Separated	4(18.4)	3(2.1)	1(1.4)	
	Single	13(5.9)	9(6.2)	4(5.6)	
	Widowed	6(2.8)	6(4.1)	0(0)	
Family size	2 -5	27(12.4)	18(12.3)	9(12.7)	0.364
	5- 8	93(42.9)	67(45.9)	26(36.6)	
	8 – 10	45(20.7)	31(21.2)	14(19.7)	
	10 and above	52(23.9)	30(20.5)	22(30.9)	
Education	Non formal education	102(47)	62(42.4)	40(56.3)	
	Primary complete	45(20.7)	35(23.9)	10(14.1)	0.331
	Primary incomplete	53(24.4)	37(25.3)	16(22.5)	
	Secondary	15(6.9)	10(6.8)	5(7)	
	Tertially	2(1)	2(1.4)	0(0)	
Religion	Christian	38(17.5)	20(13.6)	18(25.4)	
	Muslim	179(82.4)	126(86.3)	53(74.6)	0.041
	Traditional religion	0(0)	0(0)	0(0)	
Occupation	Self-employed	11(5.1)	7(4.8)	4(5.6)	0.740
	Formal employment	10(4.6)	8(5.5)	2(2.8)	
	Un-employed	41(18.9)	25(17.1)	16(22.5)	
	Farmer	153(70.5)	105(71.9)	48(67.6)	
	Others	2(0.92)	1(0.7)	1(1.4)	
Income	Below 11USD	11(5.1)	2(1.37)	9(12.7)	
	11-57 USD	195(89.9)	135(92.4)	60(84.5)	0.026
	57-114USD	5(2.3)	3(2.05)	2(2.8)	
	114-229 USD	5(2.3)	5(3.42)	0(0)	
	Above 229 USD	1(0.46)	1(0.68)	0(0)	

4.1.3 Family size

The mean household size of the study population was 8 +- 3, most of the households had 7 members and about 166 (76.5%) of the households had less than 9 persons in their families. There was no significant relationship between the size of the household of the respondents and participation in the research ($\chi 2 = 3.187$, df =3, p <0.364).

4.1.4 Distribution of respondents by level of education

Close to half of the respondents did not have formal education 102 (47.5%). About 45 (20.74%) of the respondents had obtained Primary school level education with 53 (24.4%) who never completed primary school education. Only 15 (6.5%) respondents had completed Secondary school education and less than (1%) 2 had tertially education (Table 4-1).

There was no significant relationship between the level of education of participants and their participation in the research ($\chi 2 = 4.597$, df =4, p <0.331). Sixty percent of respondents who did not have formal education participated in the research while 73% of those who had Primary school level education participated in the research. Seventy one percent of those who did not complete primary education participated in the research and a 64% of those who had Secondary school education also participated. The study found that there was 100% participation of those who had obtained tertially education despite being few in the community.

4.1.5 Distribution of respondents by religion

Of 217 respondents interviewed, 179 (82.5%) were Muslims while 38 (17.5%) were Christians**.** There was a significant relationship between religion and participation in research ($\chi 2 = 4.183$, df =1, P=0.041). Of the 38 (17.5%) Christians who participated in the study 20 (52%) participated in research whereas out of 179 (82.5%) muslims who were interviewed 126 (70%) participated in the research.

4.1.6 Distribution of respondents by main occupation

Most of the participants were farmers 153 (70.5%) while 41 (18.9%) were unemployed **(Table 4- 1).** A small proportion of 4.6%(10) had formal employment and 11 (5%) were self employed. There was no significant relationship between occupation of the respondents and their participation in the research ($\chi 2 = 3.743$, df =4, p=0.331).

4.1.7 Distribution of respondent by level of income.

More than half of the respondents 195 (89.9%) earned an average monthly income of KSh.1000(11USD) to KSh.5000(57USD), 5% earned less than KSh.1000, 2.3% earned between KSh.10,000(114USD) and KSh.20000(229USD) while less than 1% earned KSh.20,000. There was a significant relationship between the average monthly income earned by the respondents and their participation in the research ($\chi 2 = 11.013$, df =4, P = 0.026) with those earning higher income being likely to participate in the research compared to those who earned less.

4.2 Participants' knowledge on causes, symptoms and prevention measures of schistosomiasis and STHs

Whilst multiple responses were accepted, they were classified into incorrect or correct responses in relation to schistosomiasis and STH causes, symptoms, transmission and preventive measures. Of 217 respondents 216 (99%, 95% CI :) knew of schistosomiasis disease. Out of 216 respondents who knew of schistosomiasis only 186 (86.1%) were aware of the direct cause of urogenital schistosomiasis as walking in and drinking infected water whereas 30 (13.8%) respondents thought that urogenital schistosomiasis is caused by sexual immorality (Table 4-2). A majority of the participants 180 (83%) indicated that schistosomiasis can be transmitted through contact with the contaminated water. A total of 29 (13.4%) participants indicated that transmission of urogenital schistosomiasis is through sexual contact and less than 2% indicated other causes of transmission e.g. visiting latrines and animals contact. A total of 214 (99%) of the respondents indicated that the symptoms of schistosomiasis are abdominal pain and blood in urine. Eighty two percent (172) of the respondents new that schistosomiasis

could be prevented by avoiding contact with contaminated water and 13.4% (29) indicated that it can be prevented by avoiding sexual contact while less than 5% (9) indicated that it can be prevented through other means i.e. not visiting latrines and avoiding sun contact.

Table 4-2 Responses of respondents regarding their knowledge of urogenital schistosomiasis

Variable/Response	Frequency	Percentage
Knowledge of urogenital schistosomiasis		
Yes	216	99.5
No	1	0.5
Cause of urogenital schistosomiasis		
Heredity	0	0
Witchcraft & sorcery	0	0
Sexual immorality	30	13.8
Walking&drinking infectedwater	186	86.1
Animals	0	0
Don't know	0	0
Others (specify)	0	0
Transmission of urogenital schistosomiasis		
Contact with contaminated water	180	83.3
Visiting latrines	1	0.46
Drinking water	0	0
Swimming in water	3	1.38
Contact with an infected person	1	0.46
Sexual contact	29	13.4
Don't know	2	0.92
Symptoms of urogenital schistosomiasis		
Abdominal pain	2	0.92
Vomiting	0	0
Passing blood in urine	140	64.8
Abdominal pain&blood in urine	74	34.2
Poor health	0	0
Don't know	0	
Prevention of urogenital schistosomiasis		
Avoid contact with contaminated water	178	82
Not swimming through water	7	3.2
Avoid sexual contact	29	13.4
Avoid contact with infected person	1	0.5
Not visiting latrines	0	0
Don't know	1	0.5

Table 4-3 shows the response of the respondent's knowledge of intestinal worms cause, symptoms and prevention. Of 217 respondents interviewed 98.6% (214) knew of intestinal worms disease. Out of 214 respondents who knew of intestinal worms 97.7% (212) indicated that the intestinal worms can be caused by walking, drinking & contact with contaminated soil or water while less than 1% (2) indicated the cause of intestinal worms as other causes.58.5% (127) of the participants had adequate knowledge on symptoms of intestinal worms as they knew all the three symptoms while 37.8% (82) only indicated loss of appetite as the symptom of intestinal worms infection whereas less than 3% (7) indicated others symptoms.

Table 4-3: Responses of the participants regarding their knowledge of intestinal worms.

Variable/Response	Frequency	Percentage
Knowledge of STH		
No	3	1.4
Yes	214	98.6
Cause of intestinal worms infections		
Heredity	0	0
Witchcraft and sorcery	0	0
Walking,drinking&contact with contaminated soil or water.	212	97.7
Sexual immorality	1	0.46
Don't know	1	0.46
Symptoms of intestinal worms infection		
Loss of appetite	82	37.8
Swollen abdomen	1	0.9
Blood in urine	1	0.5
Abdominal pain	3	1.4
Lossof appetite, swollen abdomen and abdominal pain	127	58.5
Don't know	2	0.9
Prevention of intestinal worms		
Avoid contact with infected person	0	0
Avoid sexual contact	0	0
Maintain personnel hygiene	0	0
Avoid contact with contaminated soil/water	10	46
Hygiene/avoid contact contaminated soil/water	204	95.4
Importance of treating schistosomiasis & STH		
Can cause paralysis	6	28
Can result in growth retardation	131	60.4
Contagious infections	77	35.5
Don't know	3	1.4

Majority of the 60.4% (131) indicated that it is important to treat schistosomiasis and intestinal worms because they can result in growth retardation while 35.5% (77) of the participants indicated that they are contagious infections and about 2.8% (6) indicated that they can cause paralysis while the rest about 1.4% indicated that they didn't know why it was important to treat schistosomiasis and intestinal worms.

4.2.1 Level of knowledge among the respondents on urogenital schistosomiasis and intestinal worms infections

More than half 185 (85.3 %) of the respondents had good knowledge, about 13.8% (30) were fairly knowledgeable while less than 1% (2) had poor knowledge of urogenital schistosomiasis and intestinal worms.

On further analysis (Table 4-4) it was revealed that there was significant relationship between the level of knowledge of the respondents for urogenital schistosomiasis and intestinal worms and their participation in research ($\chi 2 = 7.920$, df =2, P = 0.019) with 121 (65%) of those who had good knowledge of schistosomiasis and STH participating in research, while 100% of those who had poor knowledge never participated in the research. Qualitative analysis revealed similar results whereby during a focus group discussion a youth explained that "*schistosomiasis is caused by eating sugarcane and STH is as a result of eating a lot of cassavas so if you don't want to get these infections do not consume these two types of food."*

From qualitative analysis seven Key informants revealed that most of the community members did not have good knowledge of schistosomiasis as they related it with an infection "Tego" which is gonorrhoea and a sexually transmitted infection which is the reason why they do not seek treatment as they believe it can only be cured through witchcraft.

Table 4-4: Participation in research for schistosomiasis and STH by the respondent's level of knowledge.

Knowledge of participants	Participation in research N=217	%	Non participation in research N=217	%	P Value
Level of knowledge of participants					
Good	121	65.4	64	34.6	0.019
Fair	25	83.3	5	16.7	
Poor	0	0	2	100	

4.2.2 Attitude of respondents towards urogenital schistosomiasis and intestinal worms.

4.2.2.1 Attitude assessment

Attitude towards schistosomiasis and STH was analyzed from four themes which are urogenital schistosomiasis and STH being part of life; as infections of children; as sexually transmitted infections and schistosomiasis and STH being cured using pharmaceutical drugs.

The respondents held different attitudes towards schistosomiasis and intestinal worm's infection. A majority 77.4% (168) disagreed that schistosomiasis and STH are sexually transmitted infections while 17.1% (37) agreed that schistosomiasis and STH are sexually transmitted infections and 5.5% (12) didn't know. A majority 98 (45.2 %) perceived schistosomiasis and STH as infections which are part of life while 119 (54.2%) disagreed that the schistosomiasis and STH are part of life. 155(71.4 %) considered schistosomiasis and STH infections as infections of children while 62 (28.6%) disagreed that these are infections of children. This was supported by qualitative analysis where a typical sense was captured in the expression of one of the village elders from Mirihini village, who thinks it is an infection of children. According to him, "*They are infections of children as they play and swim in dirty water and they do not take care of their cleanliness. What I know about these infections is that they do not infect adults,*

but sometimes through sexual contact the adults are able to get schistosomiasis." Qualitative analysis also revealed that there is a link between intestinal worms and soil contact by children where a youth during an a focus group discussion said that *"children between one to five years old contract worm infections from licking soil (geophagy)".*(Table 4-5)100% of the participants interviewed agreed that urogenital schistosomiasis and STH are treatable with pharmaceutical drugs.

Table 4-5: Respondents beliefs on schistosomiasis and intestinal worms (% in parenthesis).

Attitude question	Count	Per cent
Soil transmitted helminths and urogenital schistosomiasis are sexually transmitted infections.	N =217	
Agree	37	17.1
Disagree	168	77.4
Dont know	12	5.5
Soil transmitted helminth's and urogenital schistosomiasis are part of life		
Agree	98	45.2
Disagree	119	54.2
Don't know	0	0
Soil transmitted helminth's and urogenital schistosomiasis are infections of children		
Agree	155	71.4
Disagree	62	28.6
Don't know	0	0
Soil transmitted helminth's and urogenital Schistosomiasis can be treated with pharmaceutical drugs		
Agree	217	100
Disagree	0	0
Don't know	0	0

The four themes on Table 4-5 above were used and those who answered 3 to 4 of them correctly were considered to have a positive attitude, otherwise negative. A score was determined by giving the correct answer in each theme.

4.2.2.2 Attitude assessment

Out of 217 respondents 47.9% (104) had positive attitude and 52.1% (113) had a negative attitude.

Table 4-6: Respondents participation in research for schistosomiasis and STH by their attitude.

Attitude of participants	Participation in research		Non participation in research		P Value
	N=217	%	N=217	%	
Attitude of respondents					
Positive attitude	67	64.4	37	35.6	0.389
Negative attitude	79	69.9	34	30.1	

On further analysis (Table 4-6) it was revealed that there was no significant relationship between the attitude of the respondents on urogenital schistosomiasis and intestinal worms infections and their participation in research ($\chi 2 = 0.741$, df = 1, P = 0.389).

Multivariate analysis

In multivariate model religion (Table 4-7) was significantly associated with participation in research for schistosomiasis and STH (P = 0.041), with Muslims being 0.485 (95% CI= 0.236-0.997) less likely to participate in the research compared to Christians which would be due to the reason of more muslims in the area than christians. Income was also significantly associated with the respondents participation in the research (P= 0.004). Average monthly income of 57 USD to 114 USD also revealed an association (P= 0.048), with a majority of those who had earned average monthly income of 57 USD-114 USD being 5.7 [95% CI= 1.467-2.23] times more likely to participate in the research compared to those who earned above 114 USD and below 57 USD.

Table 4-7: Logistic regression analysis showing relationship between respondent's participation in the research and control programme and socio-economic and demographic factors.

	Participation in research		Non participation in research		O.R	95% C I of O.R		P Value
Variables	N	%	N	%		Lower	Upper	
Gender								
Female	106	67.5	51	32.5	ref			
Male	39	65	24	35	1.119	0.598	2.095	0.725
Age								
>20 yrs	1	20	4	80	ref			0.937
20-29 yrs	24	34.8	45	65.2	2.250	0.233	21.69	0.483
30-39yrs	18	31.6	39	68.4	1.055	0.493	2.257	0.891
40-49yrs	11	30.6	25	69.4	1.219	0.346	2.721	0.629
50 and above	18	36	32	64	1.278	0.512	3.190	0.599
Family size								
2-5	13	26.5	36	73.5	ref			0.432
6-8	28	32.1	59	67.8	2.005	0.860	4.678	0.107
9-11	10	32.3	21	67.7	1.526	0.743	3.133	0.250
11 and above	21	42	29	58	1.521	0.594	3.891	0.382
Marital status								
Married	67	34.5	127	65.5	0.00			0.973
Separated	1	25	3	75	0.00			0.999
Single	4	30.8	9	69	0.00			0.999
Widowed	0	0	6	100	0.00			0.999
Religion								0.999
Christian	18	47.4	20	52.6	ref			
Muslim	126	69.8	53	30.2	0.485	0.236	0.997	0.041
Education								
Non Formal Education	41	39.8	62	60.2	0.00			0.471
Primary Complete	12	26.7	33	73.3	0.00			0.999
Primary Incomplete	15	28.3	38	71.7	0.00			0.999
Secondary	4	28.6	10	71.4	0.00			0.999
Tertially	0		2	100	0.00			
Occupation								
Farmer	48	31.4	105	68.6	ref			0.331
Formal employment	2	20	8	80	1.237	0.597	2.564	0.049
Self-employed	1	50	1	50	0.497	0.029	8.581	0.386
unemployed	6	54.5	5	45.5	0.501	0.128	1.955	0.705
others	15	36.6	26	63.4	2.355	0.435	12.759	0.297
Income								
Below 11USD	8	72.7	3	27.3	ref			0.004
11USD-57USD	62	31.8	133	68.2	4.308	0.000		0.115
57USD-114USD	2	40	3	60	5.722	1.467	22.3	0.048
114USD-229USD	0	0	5	100	4.300	0.000	37.108	0.726
Above 229USD	0	0	1	100	4.000	0.431		0.485

4.3 Health related factors

4.3.1 History of having suffered from urogenital schistosomiasis and intestinal worms

The respondents experience and treatment seeking behavior for schistosomiasis and STH were investigated to be able to determine whether they had an impact on their participation in research and control programme. Distribution of respondent's history of suffering from urogenital schistosomiasis and intestinal worms is shown in Table 4-8. Of the 217 respondents interviewed 124 (57.1%) said they had suffered from urogenital schistosomiasis and about 93 (42.9%) said they had never suffered urogenital schistosomiasis and STH. A chi square analysis revealed a strongly significant relationship between participation in research and the history of suffering from schistosomiasis and STH ($\chi 2 = 7.095$, df =1, P=0.008).

This study clearly indicates that children were the most vulnerable to these infections 98.2% (213) respondents and less that 2% indicating that (males, females, adults) were the most vulnerable.

Majority of the respondents (91.2%) had knowledge on where they should seek treatment in the face of schistosomiasis and STH with 198 (91.2%) of the respondents indicated that they could get treatment from hospital, 13 (6%) respondents said they could wait and be treated during the school deworming programme while 6 (2.8%) of the respondents said they could seek treatment from herbalists i.e. a concoction of pawpaw roots is known to treat urogenital schistosomiasis.

An investigation to gather information whether the adults sought treatment for schistosomiasis and STH revealed that 42.9% (93) of the respondents had never sought treatment while 57.1 % (124) had sought treatment. There was a significant relationship between participation of the respondents in the research and having ever sought for treatment of schistosomiasis and STH ($\chi^2 = 5.628$, df=1 P< 0.05) with 73.3% (65) of those who had ever sought treatment participating in the research. 54.8% (68) of the respondents had sought treatment indicated that the cost of treatment was cheap, 12.9%

(16) of the participants got the treatment free of charge, and 29.8% (37) of the respondents indicated that it was moderately expensive the rest less than 2% (3) said it was very expensive.

A further investigation on why the respondents would not visit a health facility in the face of schistosomiasis and STH infections revealed that 193 (88.9%) of the respondents indicated that the health facility was too far away from home and there were no means of transport, (Table 4-9) 13 (6.9%) indicated that it was expensive to seek treatment from a health facility and the others totaling to 9 (4.2%) indicated (they didn't have a reason, others did not trust the health workers and others feared to find out that they had schistosomiasis and intestinal worms).

Table 4-8 Distribution of respondents history of suffering from urogenital schistosomiasis and STH and place of seeking treatment by the respondents.

Characteristic	N=217	%
History of ever suffering from schistosomiasis and STH		
Yes	124	57.1
No	93	42.9
Where the respondents sought treatment		
Clinic	13	10.5
Hospital	94	75.8
Herbalist	3	2.4
Health staff at home	13	10.4
Most vulnerable group to urogenital schistosomiasis and STH		
Children	213	98.2
Females	1	0.45
Males	2	0.9
Adults	1	0.45

From the analysis (Table 4-9), 98 (45.2%) of the respondents said that the treatment was given free of charge while 85 (39.2%) reported that it was reasonably priced. A total of 28 (12.9%) participants indicated that treatment was moderately priced and 5 (2.3%)

said that the cost of treatment was very expensive. There was a significant relationship between the knowledge of the cost of treatment of urogenital schistosomiasis and STH and participation in research ($\chi 2 = 74.920$, df =4, P = 0.00) with 94.5% of those who knew that the treatment was free of charge participating in the research.This was also supported by a focus group discussion which revealed that the fact that program gave drugs for free was a motivational factor for their participation in the research as a woman at Mirihini narrated during an FGD " *I know if they test me and find out that am infected they will give me drugs for free instead of waiting and walk for a long distance to Kinango District Hospital and be charged to buy the drugs".* This showed that despite their awareness that they should seek treatment for these infections lack of money contributed widely to their health seeking behavior.

Table 4-9 Distribution of respondents by reasons why they should not visit a health facility to seek treatment of urogenital schistosomiasis and intestinal worms / cost of treatment.

	N =217	%
Reason for not visiting a health facility		
It is expensive	13	6.9
Too far away from home	193	88.9
Do not trust the health worker	1	0.5
Do not want to find out sickness	1	0.5
Don't know	7	3.2
Cost of treatment		
It is free of charge	98	45.2
It is reasonably priced	85	39.2
It's somewhat/moderately priced	28	12.9
It is very expensive	5	2.3
Don't know	1	0.5

4.3.2 Availability of latrines in the respondents homestead

Most of the respondents households 142(65.4%) did not have a latrine (Figure 4-1). Although there was no significant relationship between having a latrine and having ever suffered from urogenital schistosomiasis and STH, a higher proportion of respondents who did not possess a latrine indicated they had suffered from STH and schistosomiasis than those who had a latrine (χ^2=0.287, p > 0.05). Out of 142 respondents who did not have a latrine in their homestead 7(4.6%) indicated that they could not use a latrine because it had fallen down, 62.2% (125) indicated that they have never dug a latrine in their homestead 7 (3.2%) indicated that their culture do not allow them this was still revealed in qualitative data analysis in a focus group discussion where a young woman said; "*I cannot be allowed to visit the same latrine with my father in law so I have no other option than visiting the bush even if there is a latrine in our compound".*

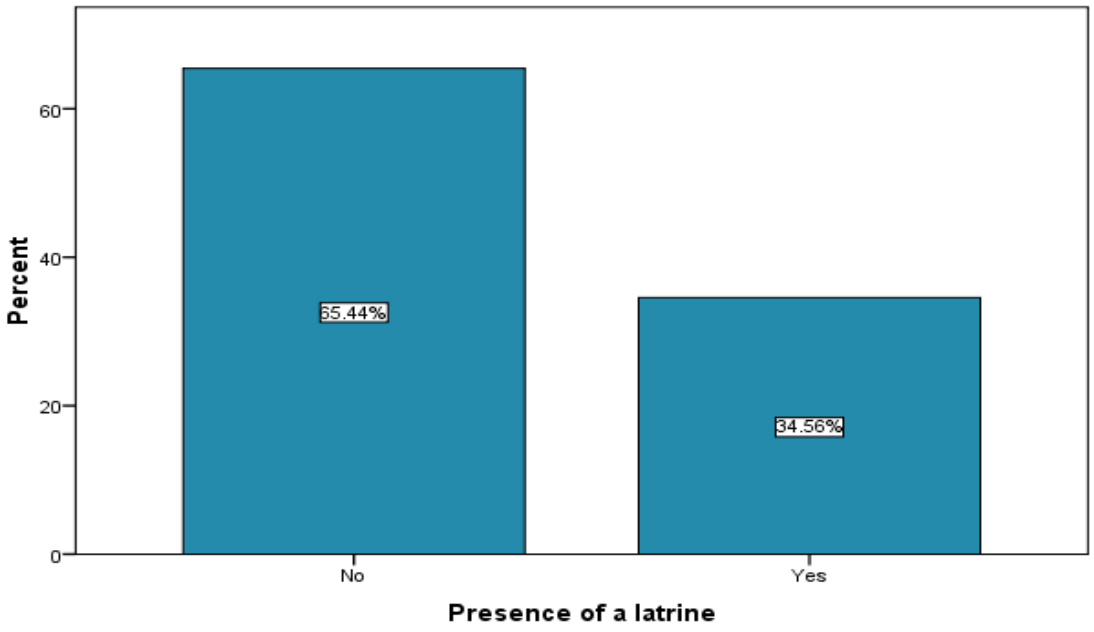


Figure 4-1 Distribution of respondents from the selected households by presence of latrines.

4.3.3 Respondent's Source of water for household, occupational and recreational use.

Streams and rivers were reported by 112 (51.6%) of the respondents as the most frequently used sources of water in this community for household, occupational and recreational activities, followed by tap water as reported by 55 (25%) of the respondents (Figure 4-2), dams were used by 48 (22.1%) respondents and 2 (less than 1%) of the respondents used rain water. The respondents mentioned that the streams and rivers were most commonly used for washing clothes and children bathing which could lead to contamination due to defecation in these streams.

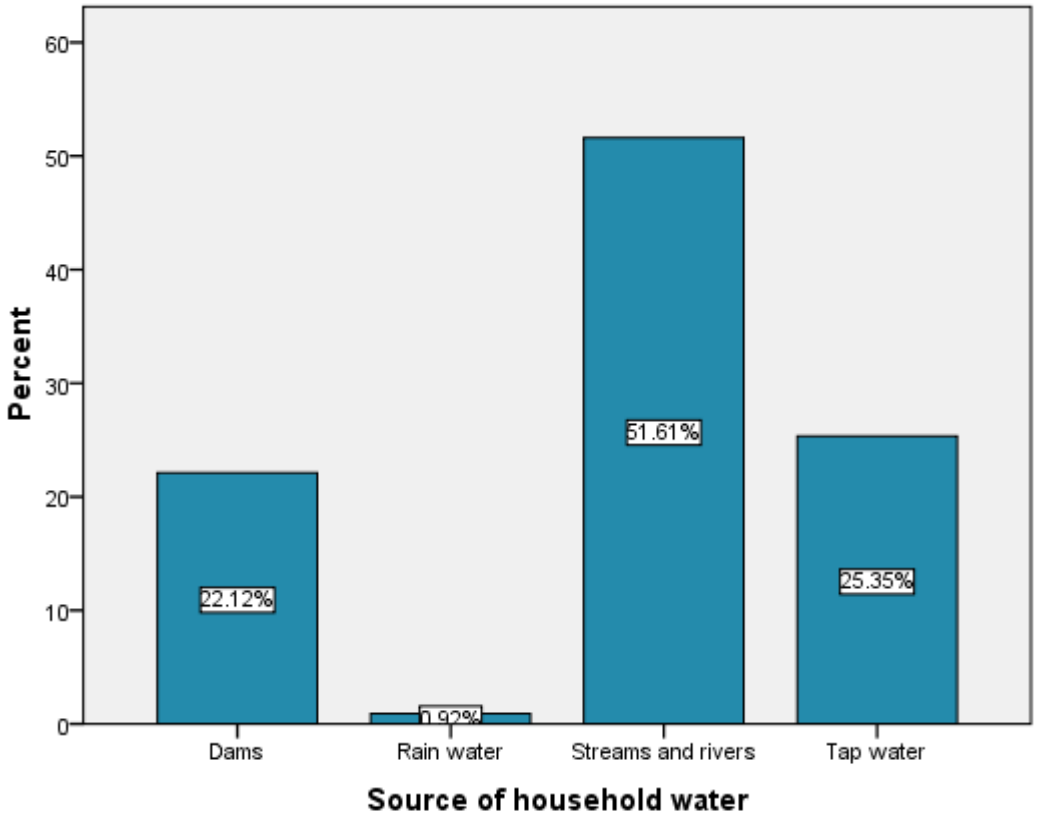


Figure 4-2 Distribution of respondents from the selected households by source of water they used.

4.4 Respondents participation in the research and control programme for schistosomiasis and STH.

4.4.1 Assessment of treatment coverage of urogenital schistosomiasis and intestinal worms.

Assessment of household survey showed that 178 (82%) of the respondents received treatment with albendazole and praziquantel for intestinal worms and schistosomiasis while 39 (18 %) did not receive treatment. There was a significant association between having received treatment and participation in the research ($\chi 2 = 27.811$, df = 1, P > 0.05). Majority of those who received treatment133 (74.7%) participated in the research while 45 (25.2%) did not participate in the research. 26 (66.7%) respondents who never received treatment did not participate in the research while only 13 (33.3%) of those who never received treatment participated in the research. This was also confirmed during qualitative data analysis from in-depth interviews. One of the key informants reported; "*I usually contribute samples for research because I received the treatment and I have seen those KEMRI people here severally so I think it is important*". This could be one of the reasons why many of the participants who had participated in the treatment programme also participated in research.

Out of 82% of the respondents who received treatment, 124 (69.7%) were given the drugs by community health workers, 50 (28.1%) received the drugs from a teacher and about 3 (2.2 %) got treatment from a doctor. The respondents were aware of a few who refused to swallow the medicine after being given as they thought they were family planning drugs and some could not swallow as their church beliefs do not allow them to take any type of medicine (Table 5-0).

Table 5-0 Distribution of respondents who received treatment for urogenital schistosomiasis and category of people who administered the treatment.

Treatment of urogenital schistosomiasis and intestinal worms	N=217	%	P value
Respondent received treatment in January 2012			
Yes	178	82	P=0.00
No	39	18	
Those who administered the drugs			
Community health worker	124	69.7	
Doctor	4	2.2	
Teacher	50	28.1	
Reason for not receiving treatment			
It was for school children	4	10.3	
Thought they were family planning drugs	1	2.6	
Was never given	17	43.6	
Was not involved	14	35.9	
Was pregnant	3	7.7	

Most of these volunteers (Community health workers and village elders) who distributed drugs were less confident because they were not from this area and they did not possess enough information on control of urogenital schistosomiasis and intestinal worms in relation to the programme. Thus they were challenged by the community with questions concerning the programme but they could not answer. One of the CHW during an indepth interview stated that "*there are still gaps on community acceptance of such programme as the community is not fully reached and the CHWs and village elders are also challenged by the community especially during the mobilization of the community to give samples for research.* This is because they have not been trained well on issues of concern on schistosomiasis and STH. Table 5.0 above shows percentage of respondent who accepted treatment against schistosomiasis and STH and the different sources of the drugs. Majority of respondents 17 (43.6%) who did not receive treatment said they were never given the tablets 14 (35.9%) said they were not involved meaning they were not aware of the treatment process and they never had the information that drugs are being given for schistosomiasis and STH, 4(10.3%) did not take the drugs as they thought they were meant for the school children only, 1(2.6%) had the perception that the drugs were for family planning and about 3(7.7)% did not take the drugs because they were pregnant during that time.

4.4.2 Awareness and participation of the respondents in the research and control programme for schistosomiasis and STH.

More than half of the respondents 169 (77.9%) were aware of the operational research on schistosomiasis and STH being conducted in the area while 48 (22.1%) of the respondents were not aware that there was research on urogenital schistosomiasis and intestinal worms in the area.

Majority of the respondents146 (67%) participated in the contribution of samples required for the research of schistosomiasis and soil transmitted helminths. There was a significant relationship between awareness of research and respondents participation in research ($\chi 2$= 1.115, df = 1, p = 0.001) with majority (85.2%) of those who were aware of the research having participated. Those who participated in the research gave biological samples (urine, blood and stool) which were necessary for the investigations.

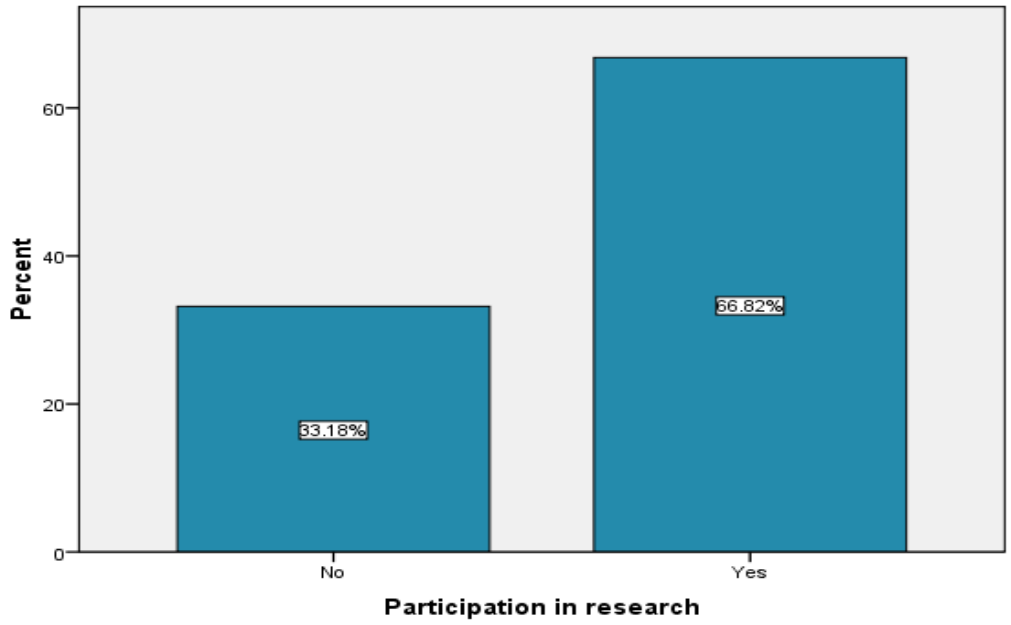


Figure 4-3: Distribution of respondents by participation in research for schistosomiasis and STH.

The respondents indicated that the treatment programme was of great help to them because since it started the morbidity especially in school children had greatly reduced as evidenced by their attendance in school compared to earlier times when most of the children missed school classes. Qualitative data analysis confirmed that the programme has been of great importance to the community with almost all the participants who participated in the indepth interview stating that many people who were infected had been cured through treatment obtained from the programme. A health teacher during indepth interview reported that "*sleeping of children while in school has greatly reduced. Many people have gotten cured and no many deaths related to these infections compared to earlier days when the programme had not started. On the other hand, before the programme started you could not move two steps in the field without seeing bloody faeces which is not the case nowdays though there are still few cases".*

Multivariate analysis was carried out using binary logistic regression to model participation in research. Five health related factors associated with participation in research $P<0.05$ during bivariate analysis were considered. Upon fitting the factors and specifying "backward conditional method"with removal at $P<0.05$, only three factors were retained in the final model i.e. knowledge of cost of treatment of schistosomiasis and STHwith those who didn't know the cost of treatment being likely to participate in the research ($P = 0.001$, $df = 4$), those who knew the cost of treatment was moderately priced being less than 1 times likely to participate in the research ($P = 0.001$, $df = 1$, CI = 0.03-0.219) and those who knew that the cost is reasonably priced were 5.99 ($P = 0.009$, $df = 1$, CI= 1.558 – 23.023) times likely to participate in the research; awareness of research ($P = 0.00$, $df = 71.1$, CI = 11.828 – 42.81) and having received treatment ($P = 0.001$, $df = 1$, O.R = 46.16, CI = 4.656 – 457.6).

CHAPTER FIVE

5.0 DISCUSSION

Community characteristics; demography, socio-economic, health seeking behaviour and priorities may affect the role any community might play in a disease control programme and there is need for an assessment before a control programme is implemented as this may vary across the communities. In order to realize full community participation in a programme there is need for continued interaction and communication with the beneficiaries.

5.1 Demographic and socio-economic factors and community participation.

This study indicates that community's socio-economic situation and understanding of the disease has an influence in the search for treatment and participation in research. Gender, age and family size did not have a significant association with the community's participation though there are existing studies which have shown influence of gender participation in treatment programmes. In a study of community perceptions of intestinal schistosomiasis it was noted that the disadvantaged socio-economic status of women in rural communities of Uganda prevented them from participating in health programmes and accessing information on control or preventive measures for the disease (Anguzu *et al.*, 2007). Socio-economic factors may have a reflective effect in participation in the research, this study indicates a clear association between religion, income and participation of the respondents in the research for schistosomiasis and STH, in the multivariate model those who earned an income of 57 USD to 114 USD were 5.7 times likely to participate in the research than those who earned more than this amount or less.

This could be attributed to the fact that there are very few people in this community who earned more than 11 USD per month as revealed by the

quantitative analysis. More than half of the respondents earned an average monthly income of 11 USD to 57 USD which is a clear indication that neglected tropical diseases mostly affects poor communities. Although the association between income and health is stronger at lower incomes, consequences of income may persist above the poverty level (Brooker & Michael, 2000).

Level of education of the respondents had no significant association with participation in the research this could be attributed to the fact that educated people tend to have more of other responsibilities and have less time to participate, they also have access to treatment from private practitioners. However, education determines other factors of livelihood like occupation that determines income, which also determines health outcomes (Badmos, Komolafe, & Rotimi, 2006). Education is also a major social determinant of health, with educational attainment related to health outcomes improvement, due to its effect on income, employment, and living conditions. This study found that there was 100% participation in the research of those who had obtained tertially education despite being few in the community. There are no previous studies which has shown an association between the education status and participation in research and control programme for schistosomiasis and intestinal worms. However, there are contradicting findings on association of educational status and schistosomiasis, a study which was conducted in Cote d'Ivoire and Nigeria, showed that high education level of the head of family was a protective factor against *S.haematobium* infection (Ugbomoiko *et al.*, 2010; Matthys *et al.*, 2007). This is likely to have similar influence on community participation in research related to the same infections. Another previous study showed no significant association between the prevalence of schistosomiasis and participants education status in a study conducted in rural communities in Yemen (Raja'a *et* al., 2000).

The findings from this study could be explained by the fact that an increase in education level corresponds and comes with increased behavior change and

increased awareness. More education means not only better jobs, more comfort, and a greater sense of control over one's life. People with more education have more choices in health, careers, confidence and other areas that affect the quality of their lives. Muslims were more likely to participate in the research compared to Christians despite the fact that more than 80% of the respondents were muslims religious beliefs are known to have the potential of diluting community perceptions and decisions which have profound effects on both health and development issues. Religious leaders can also be used as a channel for mass distribution of the drugs. Religion can have deep effects on both health and development matters.

Socioeconomic status has an influence on treatment seeking behaviour and participation in the research as those who had low income, less educated and no occupation were less likely to have good knowledge of urogenital schistosomiasis and STH, less likely to seek treatment, not likely to have a latrine or use it and less likely to participate in the research. Therefore, the use of education strategies which aims at providing skills and resources such as helping in construction of latrines and health risks attributed to these infections.

5.2 Knowledge of respondents on schistosomiasis and STH.

Prior to engaging a community in control and operational research programmes for schistosomiasis and STH it is important to understand its knowledge, beliefs and health seeking behaviour. Still in situations where the community is deemed to be aware of the schistosomiasis and STH there is need to create more awareness to back their participation in the programmes.

However, despite the community being aware of schistosomiasis and STH infections and taking preventive measures as depicted in the study, they still hold inaccurate beliefs which led them not to participate fully in the research and control programmes. Some people were still visiting the witchdoctors for treatment

of schistosomiasis and intestinal worms especially those who relate schistomiasis with “Tego” which is transmitted through sexual intercourse and it is not treatable through the use of medical treatment but they sought treatment from herbalists and witchdoctors. A similar study in Cameroon revealed similar findings where people from rural areas used to relate hematuria to excessive sunlight and sexual intercourse, dismissing medical treatment in local hospitals as a result of such beliefs (Robert, Bouver, & Rougemont, 1989). There are also church beliefs in this community which do not allow their followers to take any medication. It will therefore, be useful to include such beliefs in health trainings and develop explanations with the community for high acceptance with inclusion of the religious leaders who are seen to have great influence and make decisions for their followers.

The study indicates that the respondent’s good knowledge of schistosomiasis and intestinal worms did not fully guarantee their participation in the research although the overall knowledge of the participants was significantly associated with their participation. Despite quantitative studies also revealing good knowledge of the community regarding schistosomiasis and intestinal worms by the participants there were a number of contradicting responses during the survey showing distort and lack of understanding of the causal connections. For example, a youth in a FGD said *“‘‘Eating chicken can also lead to transmission of schistosomiasis as they pick food materials contaminated with bloody urine in that if the chicken is not well cooked people can also be infected and sexual immorality can also be a cause ” intestinal worms infections are due to lack of some minerals”.* This shows that there is still the need to fill knowledge gaps through increased health education to the community.

5.3 Attitude towards schistosomiasis and STH

The attitude of community members towards schistosomiasis and STH may create problems with research and control programmes related to the infections

particularly if the community is not willing to benefit from the programme. Despite this study revealing that the overall attitude of the participants on urogenital schistosomiasis and intestinal worms did not have an association with participation in research. Majority of the respondents 98 (45%) perceived these infections as part of life while 155(71.4%) considered schistosomiasis and STH as infections of children, this could be due to the fact that children are the most vulnerable group as depicted in the analysis . To add on, the fact that previous control programmes directed towards schistosomiasis and STH especially the school treatment programmes had been targeting the ongoing school children could have influenced the community way of thinking. These perceptions need to be dealt with through inclusion of the adult population in such control programmes and encouraging their participation with a continuous health education targeting their attitude in order to overcome some of these misconceptions. In regard to seeking treatment for schistosomiasis and intestinal worms this study revealed that majority of the adults regards these infections as part of life and since the ancestors had the same they also do not need to treat.

Most people in this community have neglected these infections failing to seek treatment in view that the researchers are just wasting their time and money because schistosomiasis and intestinal worms are not harmful infections and therefore should not be treated. In a focus group discussion eight among ten participants reported that schistosomiasis and intestinal worms are part of life and they could not see why the researchers are so committed on infections which are part of life. To them they are wasting their resources as it is not possible to eliminate schistosomiasis and STH. This may have contributed to their failure to accept treatment and participating in the research. Such deep-rooted perceptions call for a critical need of awareness, strategized health education and support to the community with emphasis on the need of treatment if change has to occur.

5.4 Health seeking behaviour and related factors

This study revealed that 57.1% of the respondents had previously suffered from schistosomiasis and STH this is an indication that the infection rates are high among the adult population and the need for more resources to be directed to the control of schistosomiasis and STH in highly endemic areas. More than half of the respondents (88.9%) 193 reported that health facilities are far from them and travelling long distances usually on foot to reach a facility may encourage them to use herbalists, traditional medical sources including the witchdoctors. As depicted in the study the community heavily relies on drug supply given during the school deworming programmes even for their children. This is consistent with findings from a study conducted in Egypt, where traditional medication was frequently used because modern treatments were either not available due to high cost and lack of supply (Kloos *et al*., 1982). To overcome this situation there is need of increasing community based directed services on control, prevention and treatment of schistosomiasis and intestinal worms through engagement of the community directly. However the community's socio-economic situation, cultural beliefs and their understanding of these diseases has great influence to their search of treatment in the face of disease. Health seeking behaviour is partly linked to people's beliefs and practices such that most of them end up seeking treatment from the herbalists (use of pawpaw roots concoction) as reported by one of the village elders during an indepth interview. The findings concur with a study conducted in Tanzania where different ethnic groups tend to favour treatment at home by using various medicinal plants to treat cases of haematuria *(S. haematobium*) and thus do not result to medical treatment (Kloos *et al.,* 1987). Many people has prioritized witchcraft in the community and they associate the symptoms of many infections with witchcraft e.g painful urination and when the child has intestinal worms they seek treatment from the witchdoctors in search of a reverse of the child's condition as depicted in qualitative analysis where a youth said *"if a child gets sick it means all his strength and power has been taken away*

by the witchdoctor". Majority of the respondents had enough knowledge on where they should seek treatment in the face of schistosomiasis and STH though this did not gurantee their behaviour in seeking treatment. It was revealed from the study that despite the good knowledge long distances, lack of money and time contributed widely to their behavior of failing to seek treatment in the face of disease. It was depicted in the qualitative analysis the fact that the programme gave the drugs free of charge it was a motivational factor for participation of the community members in the treatment programme.

Most households used unprotected surface water, streams and dams as sources of household water. Latrines were only available in 34.5% households according to the respondents but its presence did not gurantee its usage as about 14% of people who were in possession of a latrine did not use them some giving reasons that their culture do not allow the household head to visit the same latrine with the rest of the family members and some latrines fell down owing to the fact that they did not know how to dig and build latrines. Qualitative data revealed that defecation in open space "bush" in close proximity was common in the community and that young children were allowed to defaecate anywhere within the compound. Thus people tend to defaecate where convenient this was also observed around the school compounds. Such practices are risky as helminth eggs produced by one adult female worm are so large that a single contaminated stool passed in the soil is sufficient to infect an entire village (Stephenson, 1993). This could lead to increased transmission of helminthic infection in the area which is supporting the fact that a higher proportion of respondents (66.9%) 83 of those who did not possess a latrine indicated they had suffered from STH and Schistosomiasis compared to those who had a latrine.

5.5 Participation in the research and control programme for schistosomiasis and STH.

The treatment coverage was high with 82.2% of the interviewed respondents having received the treatment. This might have a significant impact on the level of

intensities of urogenital schistosomiasis and STH among the adult population of this community. This may also provide a cost-effective treatment strategy for similar national control programmes in resource poor settings and endemic areas. A similar strategy was successfully used to control urogenital schistosomiasis in Burkina Faso (*Seydou et al., 2008*). The high treatment coverage of urogenital schistosomiasis and STH was likely due to opportunities by those who distributed the drugs to make frequent home visits in the households where they could not have such opportunities and time to go and get the treatment if they were invited in a central place. The study gives similar findings on treatment coverage of a study by Ndyomugyenyi and (Ndyomugyenyi & Kabatereine 2003) which showed that treatment community directed interventions achieved higher treatment coverage (85%) for praziquantel and albendazole when the other risk groups in the community was involved. However, there are a number of factors which were identified in the study as a hinderance to acceptance of the treatment by the community members which should be addressed by stakeholders planning to undertake similar programmes in other endemic areas in order to realize full coverage.

The findings of the current study revealed that a majority of respondents 17(43.6%) who did not receive treatment were never given the tablets this reveals that despite the treatment coverage was high above average the house-to-house distribution strategy was placing a burden as most community members were often unaware of the treatment programme and could not plan to stay at home and wait to be treated. Another important observation was that the distances between households are far which could have been a challenge to the drug distributors in reaching some of the households. These results suggest that strategies for drug distribution should be improved such that the chances of community members missing to take treatment are minimal.

The community also held rumours that the drugs paraziquantel and albendazole for schistosomiasis and intestinal worms respectively which were being given to the

community were for family planning , this was a way of opposing the programme though it was not quite pervasive among the majority of community members. This could have been fuelled by lack of health education as some of the community members failed to understand the intended purpose of the treatment programme. This was captured in an In-depth interview with a village elder who stated that "*Most of us failed to take treatment because we were not informed from the start but if you are informed and you understand the importance you cannot keep on opposing the treatment".* Health communication among the community members is the key in underpinning such perceptions, raising awareness of the health risks and importance of treatment. Majority of people who did not receive treatment were likely not to participate in the research. This could be as a result of influence of their religious beliefs and cultural beliefs as some community members still guard their cultures strongly. In this community we found that there is a church known as "miracle" which completely does not allow its followers to take any type of drugs or visit hospital. The use of religious leaders as channels of distribution of drugs, health education and involving them in programme implementation for information transfer to the community may be an effective strategy of enhancing effectiveness of the programme since they great influence to their followers behaviour and community at large. This perception is seen as a major obstacle to control actions by chemotherapy but their involvement and understanding on importance of the programme will go along way with increasing community acceptance.

Though there are Community Health Workers (CHWs) and village elders who volunteer to contribute to control of schistosomiasis and intestinal worms in the area, the CHWs sometimes are less confident and most of them do not come from these area. Therefore, the need of program officers to be deployed on the ground and educate the CHWs and village elders on reasons of collecting research samples and on issues of concern of urogenital schistosomiasis and intestinal worms. Community health workers should be selected from every village in the

area of implementation, trained on awareness, prevention of urogenital schistosomiasis and administration of praziquantel and mebendazole against schistosomiasis and soil-transmitted helminthiasis respectively in order to evercome this challenge and be deployed to distribute the drugs in the same villages they reside. In a focus group discussion it was revealed that the community posses negative attitude towards the researchers with a feeling that the researchers are doing business using their samples and thus the reason why they are so much concerned an old man narrated "*my neighbour once told me that the Kemri people collects blood from us they go and sell and they are given money in exchange I will not give them my samples"*. A study carried out in northern Senegal to assess low awareness of intestinal worms after seven years of health education as part of intense control and research activities (Sow *et al.,* 2003) demonstrated lower awareness of schistosomiasis among the population despite several years of health education, using a diversity of communicational outlets. This clearly indicates that community involvement and community based actions are important to increase awareness and for effectiveness of similar research and control programmes. In this study most respondents during qualitative study reported that they need to be involved fully during the programme implementation for full acceptance including involvement of their village elders to distribute the drugs in the community as reiterate during indepth interviews. A good number of participants argued that they were never involved although they generally accepted there were control measures in place, with suggestions that seminars should be organized for training people and creating awareness. The quantitative data analysis revealed that more than 90% of the respondents knew the existence of schistosomiasis and STH research and control programme in the area and those who did not know reiterated that community education and awareness should be enhanced greatly before onset of such programmes. A further strategy which can be useful in maintaining motivation of participation by the community in such a disease control programme will be provision of the community with regular

updates on the progress on elimination of schistosomiasis and intestinal worms especially after conducting monitoring and evaluation upon collection of samples. This feedback can be provided through the CHWs, village elders, barazas, schools or in churches.

Community based treatment may also be less successful than expected in case of low commitment by community leaders and low priority given to helminthes control by communities, or if there is the perception that intervention programmes should be the responsibility of the regulated health services rather than the responsibility of the community (Massa *et al*., 2009). This study reveals that the community has a huge responsibility in such intervention programmes and for such programmes to be fully successful there is need to prioritize on the local community members and involvement of the community leaders so that they can be part of the programme.

One of the key outcome of this study is that control programmes should be accompanied with health education important for change in behavior, clear identification of the target population and take local knowledge and perceptions into consideration (WHO, 1995). This has been supported by the recent studies where community perceptions and attitudes of parasitic worm infections has been revealed as important factors in their prevention and treatment (Pimenta *et al.*, 2000). In this context consultation is important for disease control programmes to be effective thus the need to involve the community from design and intiation of the programme. This study also reveals the local understanding of the community of Kwale on socio-economic and cultural factors. A previous study suggested that projects must be built on an understanding of social, cultural, economic and political factors and upon lay knowledge and perceptions for effectiveness (Huang & Manderson, 1992). Anticipating that the community participation in a programme as a paranormal piece is not an intelligent guess, as this is an interactive learning process for beneficiaries and the stakeholders which can be earned through the sharing of experiences by all the concerned actors.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

6.1 Conclusions

- Demographic factors did not have a significant association with the respondents participation in the research and control programme for schistosomiasis and soil transmitted helminthes
- Religion and income were the only socio-economic factors found to have a significant association with participation in the research and control programme
- Health related factors which were found to have significant association with participation in the research were history of ever suffering from schistosomiasis and STH,having ever sought treatment of schistosomiasis and STH,
- Assessment of treatment coverage revealed that there was 82% coverage among the adult population of kwale county.
- Channels chosen to convey information on the programme to the community were shown not to be effective as many respondents complained of not being aware of the programme resulting to non participation and some could not understand the reason as to why they should participate in the programme.
- Knowledge gap that exists need to be bridged through continuous health education this will serve the role of changing the socio-cultural beliefs and practices that may be predisposing the people in Kwale to these infections.
- The study provides information which is useful in promoting health, enhancing learning and behaviour changes which will lead to increased community participation in such programmes.

6.2 RECOMMENDATION

- There is need for continuous advocacy and dissemination of information to the communities in order to enhance community participation in similar control programmes.
- Community based education programmes on schistosomiasis and intestinal worms should be extended to churches, market places and group meetings i.e the use of religious leaders as channels of drug distribution and health education.
- Acceptability of such control programmes needs ongoing sensitization programmes such that any queries may be responded prior to commencement of the programme.
- There is need to include adult population in similar control programmes in other endemic areas.
- Further research needs to be conducted, the study relied on household heads as respondents of two villages from one county where the control programme for adult population was being implemented, there is need to carry out research at national level and other communities especially in other endemic areas in order to get a clear picture of peoples behavior, knowledge, perception and other factors which may influence such control programmes being targeted to include the adult population.

6.3 Limitations of the Study

- The study being a snapshot which did not take place at the actual time when the programme was being implemented it was likely to be subject to recall bias.
- The study assumed that the information given by the household participants was true and not biased.

- More than half of the respondents interviewed 72% were women, and women are found to be more accepting of disease control programmes and more willing to adhere and receive treatment thus the study was likey to be subject to information bias.
- Transport systems: Some areas had poor transport systems.

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APPENDICES

Appendix 1: INFORMED CONSENT

Title of Research:Evaluation of community participation in schistosomiasis and soil-transmitted helminthes control and related operational research in rural villages of Kwale district, Coastal Kenya.

Investigators	**Expertise role**
Jacinta Wairimu Macharia (principal)	Masters in Public Health, Jomo Kenyatta University of Agriculture and Technology ITROMID.
Prof Zipporah Ng'ang'a	Director ITROMID JKUAT and a co-investigator.
Dr Sammy Njenga	Principal researcher KEMRI/Director (ESACIPAC) and a co-investigator.

Introduction

My name is Jacinta Macharia, a student from the Institute of Tropical Medicine and Infectious Diseases department at JKUAT conducting the above named study. You are asked to participate in the above research study because you meet the inclusion criteria. Your participation is entirely voluntarily. If you do not want to participate, there will be no penalty. You may stop your participation any time. You should read the information below and ask questions about anything you do not understand before deciding whether or not to participate.

Purpose

The main objective of this study is to identify factors influencing your community's participation in control programme for bilharzia and intestinal worms and related operational research. The findings obtained from this study will be useful in implementation of similar programmes and provide further insight in identification of factors, which may be useful in guiding implementation of similar interventions.

Procedures

Either my research assistant or I will identify himself to you after which you will be required to fill a detailed questionnaire through an interview. This is supposed to be a private and confidential exercise done in an enclosed area. You are supposed to fill the questionnaire only after you have accepted and signed a consent form. You will then be asked questions or given statement which you are expected to respond to afterwards. The questions will probe you on issues relating to the participation on the schistosomiasis and STH control and related operational research in this area. This will take about 25-30 minutes.

Benefits

There are no direct benefits to you from participating in this study. However, the information gathered from this study will be useful in improving planning for control programmes and operational research of these infections.

Risks

There are no known harmful effects associated with your participation in this research.

Confidentiality and Privacy

Information collected from you will be for research purposes only and strictly private and confidential. No information about you or provided by you during the research will be disclosed to others without your written permission, except to protect your rights or welfare, or if required by law. Names will not be used at any point and is of no purpose for this study and no information will be included that would reveal your identity on publications or in conferences. In case officials from the authorized institutions will need to review your records for the study, they will protect your privacy.

ContactInformation

If you have any questions regarding this study, please contact Jacinta Macharia, on phone number 0725337768 or email jcntmacharia@yahoo.com of P.0 BOX 267-

00232 Ruiru.

For any questions pertaining to rights to conduct this study please contact the Secretary KEMRI/National Ethics Committee, P.O BOX 54840-00200, Nairobi; Telephone number:020-2722541;0722205901,0733400003Email:erc@kemri.org.

Compensation

There will be no any reimbursement to be made for your participation in the study.

Consent and signature options

I confirm that I understand the information provided to me for the above study and that I have had the opportunity to ask questions. I have known the risks and they have been explained to my satisfaction. I understand that my participation is voluntary and that I am free to withdraw from the study at any time without any consequences**.**

Name of participant……

Signature…….or Thumb print…….Date…….

My signature as witness certifies that the subject signed this consent form in my presence as his or her voluntary act.

If participant illiterate **(witness**)……..Signature…….Date……

I certify that I have followed all the study specific procedures in the SOP for obtaining informed consent.

Name of investigator……Signature……Date……

□ Participant received a copy

Appendix 2 : QUESTIONNAIRE

EVALUATION OF COMMUNITY PARTICIPATION IN SCHISTOSOMIASIS(BILHARZIA) AND SOIL TRANSMITTED HELMINTHS CONTROL AND RELATED OPERATIONAL RESEARCH IN KWALE , COASTAL KENYA

Instructions:

Put a tick in the appropriate space or fill in the space provided.

Questionnaire

Section One: Socio economic and demographic characteristics of the respondents.

1. Name (optional).....

   Form No.....

2. Age.....

3. Gender

   1) Male 2) Female

4. Marital status

   1) Married 2) Single

   3) Divorced 4) Separated

   5) Cohabiting 6) Widowed

   7) Others (specify).....

5. Family/Size of the household

   What is the total number of people who live and eat together in your house?…….

6. What is your level of education?

   1) Primary complete 2) Primary incomplete

   3) Secondary 4) Tertially

   5) Non formal education

7. What is your religion?

   1) Christian 2) Muslim

3) Traditional religion 4) others (specify)

8. Which is your current occupation?

1) Self-employed 2) Formal employment

3) Un-employed 4) Farmer

5) Others (Specify).....

9) Income;

What is your average total monthly income (in Kshs)……

Section Two: Knowledge schistosomiasis and STH

1. Do you know a disease called urogenitalschistosomiasis (bilharzia)?

1) Yes (Go to question no. 2)

2) No (Go to question no. 6)

2) If yes, what do you think is the cause of urogenital schistosomiasis?		1) True	2) False
	1. Heredity	……..	……
	2. Witchcraft & sorcery	……..	……
	3. Sexual immorality	…	……
	4. Walking and drinking Contaminated water	……..	……
	5. Animals	……..	……
	6. Don't know	……..	……
	7. Others (specify).....		

3)How is urogenital schistosomiasis transmitted?	1.Contact with contaminated water	…….	……
	2. Visiting latrines	…….	…….
	3. Drinking water	…….	……...
	4. Swimming in water	……..	……
	5. Body contact with an infected person	……..	…….
	6. Sexual contact	…….	…….
	7. Don't know	……..	…….
	8. Others (specify).....		
4) Do you know of any symptoms of urogenital schistosomiasis?	1. Abdominal pain	……..	…….
	2. Vomiting	……..	…….
	3. Passing blood in urine	……..	…….
	4. Poor health	……..	…….
	5. Dont know	……..	…….
5) Do you know how urogenital schistosomiasis can be prevented?	1. Avoid contact with contaminated water	……..	…….
	2. Not swimming through water	……..	…….
	3. Avoid sexual contact	……..	…….
	4. Avoid contact with infected person	……..	…….
	5. Not visiting latrines	……..	…….
	6. Don't know	……..	…….
	7. Others (specify).....		
6) Do you know of intestinal worms?	1. Yes		
	2. No		

7) If yes, what do you think is the cause of intestinal worm infection?	1. Heredity	……..	…….
	2. Witchcraft and sorcery	……..	…….
	3. Walking ,drinking, contact with contaminated Soil or water.	……..	…….
	4. Sexual immorality	……..	…….
	5. Dont know	……..	…….
	6. Others (specify).....		
8) Do you know of any symptoms of intestinal worm infection?	1. Loss of appetite	……..	…….
	2. Swollen abdomen	……..	…….
	3. Blood in urine	……..	…….
	4. Abdominal pain	…….	…….
	5. Dont know	……..	…….
9) How can worm infection be prevented?	1. Avoid contact with infected person	……..	…….
	2. Avoid sexual contact	……..	…….
	3. Maintain personnel hygiene	……..	…….
	4.Avoid contact with contaminated soil/water	……..	…….
	5. Dont know	……..	…….
10) Why do you think it is important to treat schistosomiasis and STH?	1. Can cause paralysis	……..	…….
	2. Can result in growth retardation.	……..	…….
	3. Contagious Infections	……..	…….
	4. Don’t know	……..	…….
	5. Others (specify).....		

Section Three: Attitude related factors

1) What does the community feel about urogenital schistosomiasis/intestinal worms?

	A) Agree	B) Disagree	C) don't know
i) They are sexually transmitted diseases	….....	….....	….....
ii) Urogenital schistosomiasis and intestinal worms are part of life	….....	….....	….....
iii) They are infections of children	….....	….....	….....
iv) The infections can be treated with Pharmaceutical drugs	….....	….....	….....

Section Four: Health related factors

1) Have you ever suffered from urogenital schistosomiasis and/or intestinal worm infection?

1) Yes 2) No

(If no, go to question 3)

2) If yes where did you seek treatment?

1) Clinic 2) Hospital

3) Herbalist 4) Health staff at home

3) What problems does the community encounter due to schistosomiasis or worm infection?

1.

2.

4 a) According to you, who are most vulnerable to these infections?

1) Males 2) Females

3) Children 5) Adults

b) Why is this group vulnerable? ……..

5) Can these infections be treated?

1) Yes 2) No

(**If no go to question 8)**

6) If yes do you know of any type of treatment for urogenital schistosomiasis?

….....

7) How about treatment for intestinal worm infection?.....

….....**.....**

8) Have you ever sought treatment for urogenital schistosomiasis or for the worm infection?

1) Yes 2) No

9) If NO, why have you not sought treatment?

….....**.....**

10) If yes, where did you seek treatment?.....

a. What was the cost of treatment? .....

b. Did the treatment improve your condition?

1) Yes 2) No

c. If your condition improved, please explain? .....

d. If your condition became worse, please explain?.....

11) Why would you not visit a health facility if you suspect you have STH (intestinal worms) or schistosomiasis (bilharzia)?

1. Its expensive 2. Too far away from home

3. Do not trust the health worker 4. Do not want to find out sicknes

5. Cannot leave work 6. Don't know

7. Others (specify).....

12) How expensive do you think STH (intestinal worms) and schistosomiasis (bilharzia) treatment is in this community.

1. It is free of charge 2. It is reasonably priced

3. It is somewhat/moderately expensive 4. It is very expensive

5. Don't know.

13) Do you have a latrine in your home?

1) Yes 2) No

a) If yes, do you use the latrine?

1) Yes 2) No

b) If no, why……

14) What is the source of water for your household needs?

1) Dams 2) Tap water

3) Streams/rivers 4) Rain water

Section Five: participation in control and related operational research for schistosomiasis and STH.

1) Are you aware of any ways or methods for schistosomiasis (bilharzia) and intestinal worm control?

1) Yes 2) No

a. If yes, which ones.....……

2) Did you receive treatment for bilharzia (schistosomiasis) and STH (intestinal worms) in January 2012?

1) Yes 2) No

a) If no, why didn't you receive the medicines?.....

b) If yes, did you swallow the medicines……

1) Yes 2) No

c) If no, why?……..

d) Who gave you the medicines?…….

3) Do you know someone who refused to take the treatment?

1) Yes 2) No

If yes, do you know why?.....

4) Are you aware of the research activities being conducted on these infections in your area?

1) Yes 2) No

5) Have you ever participated in these research activities?

1) Yes 2) No

Ifno, why didn't you participate…….....

6) If yes, what research specimens were collected from you?

1. Urine collection for research?.....

2. Blood collection for research?.....

3. Stool collection for research?.....

4. No specimen collected ….....

If no specimen collected from you, why?.....

7) Do you think your participation is of assistance to the programme?

1) Yes 2) No

a. If yes, why?.....

b. If no, why?.....

We have come to the end of our interview and I wish to thank you so much for your cooperation and time

Appendix 3: IN-DEPTH INTERVIEW GUIDE

Date..... Venue.....

Time interview begins.....

Time interview ends.....

Key informant.....

1. What do you know about these infections? (Schistosomiasis and soil-transmitted helminthes)

2. What are your beliefs and attitude towards these infections?

3. What are the community practices that enhance the transmission of these infections?

4. Who is more vulnerable to these infections?

5. What are the treatment options available at the community level for these

infections?

6. Where do you seek treatment for these infections?

7. Are you aware about treatment that was offered in January 2012?

8.How did you participate in the treatment? Explain?.

9. What is your attitude to the treatment?

10. What advice do you have to improve treatment in future?

11. Are you aware of any research and control programme for these infections in your community? Explain?.

12. Are you willing to participate in such a research programme? (Urine, stool or blood samples collection).

13. What are the social, economic, cultural and other barrier factor that hinders the community participation in this control programme?

Appendix 4: FOCUS GROUP DISCUSIONS GUIDE

Introduction: I greet you all. My name is Jacinta Macharia and I am a student at Jkuat.

Purpose: I am working on a project to evaluate the community participation in control and research of schistosomiasis and STH.

Who, why and what: You have all been asked to come together here today because you live in this community, you understand the needs and because of your valuable insights and perspectives you can share. We plan to use your input to improve control of STH and schistosomiasis in endemic areas. We will be discussing your ideas about these infections, treatment seeking behaviour, treatment options, participation in control and research of these infections, improvements and any other related support service. Before you begin I would like to answer any intial questions you may have..

Respondent introductions:

Read to the participants the informed consent form

Complete participants' information form on socio-demographics

As expalined earlier, this FGD is confidential. Everything you say in this discussion will be kept private and no names will be used in my report. It is important that you give us your honest opinions.

Our discussion will last about one hour and we will have five-minute break about halfway through. Everyone will have an opportunity to speak. There is no right or wrong answers and we are interested in your opinions and you do not have to agree with one another- we are interested in hearing different opinions. Lets have each one of you introduce herself or himself. Please tell us your name, where you stay and what you do for a living.

1. What do you know about STH's (intestinal worms) and schistosomiasis (bilharzia)?
2. Who are the most affected by these infections?
3. What do you think is the cause of these infections?
4. What treatment options for these infections is available?
5. What do people feel about schistosomiais and soil transmitted helminthes
6. Do you any of any control program for schistosomiasis and intestinal worms being carried out in this area? Explain?.
7. What do people feel about the program?
8. What don’t you like about the control programe?
9. What should be done about the programe to enable more people to take part?
10. Are you aware of treatment that was offered in January 2012? Explain.
11.How did u participate in the treatment?
12. What made you take part in the treatment exercise?
13. Do you know anybody who did not take part?
14. Why do you think they did not take part in the exercise?
15. What do you think about the treatment exercise?Discuss

KIAMBATISHO 1: IDHINI YA KUSHIRIKI

Anwani ya utafiti: Tathmini ya ushiriki wa jamii katika kudhibiti na utafiti kwa ajili ya kichocho na minyoo katika mradi unaoendelea Kwale, pwani Kenya.

Wakuguzi

Mkuguzi	Jukumu ya utaalamu
Jacinta Wairimu Macharia (principal)	Masters in Public Health, Jomo Kenyatta University of Agriculture and Technology ITROMID.
Prof Zipporah Ng'ang'a	Mkurugenzi ITROMID JKUAT na mshirika mpelelezi .
Dr Sammy Njenga	Mtafiti mkuu KEMRI/Mkurugenzi (ESACIPAC) na mshirika mpelelezi.

Utangulizi

Jina langu niJacintaMacharia, mwanafunzi kutoka Taasisiya ITROMID - JKUATnafanya utafiti uliotajwa hapa.Umeulizwakushirikikatikautafitihuu kwa sababuumefikia vigezo vya kushiriki. Ushiriki wakoni kwa hiari kabisa.Kamahutakikushiriki,hakutakuwa naadhabu.Unawezakuachaushirikiwakowakati wowote.Unapaswa kusomahabari hapa chininakuuliza maswalikuhusu chochotehauelewikabla ya kuamua utashiriki au hutashiriki.

Lengo

Lengo la huu utafiti ni kuhakikivigezo vyajamii katika kushiriki kwa mradi wa kuzuia kuenea, utafiti wa kichocho na minyoo inayoambatanishwa na mchanga unaoendelea katika vijiji vya Kwale. Habari zozote zitokanazo na utafiti huu zitakuwa na umuhimu kwa wanaongoza miradi na kwa kutambua vipengele viinavyochangia wanajamii kutoshiriki kwa mradi huu na pia zitaweza kutumiwa kama kielelezo cha miradi mingine kama hii.

Taratibu

Msaidizi wangu au mimi atajitambulisha na wewe baadaye utatakiwa kujaza dodoso kwa njia ya mahojiano. Hii ni zoezi la kibinafsi na siri. Unatakiwa kujaza dodoso tu baada ya kukubaliwa na kuweka sahihi katika fomu ya idhini ya kushiriki. Utaulizwa maswali na kupewa taarifa ambayo wewe unatarajiwa kujibu baadaye. Maswali yatachunguza wewe juu ya maswala yanayohusiana na ushiriki kwenye utafiti na kudhibiti wa kichocho na STH na kuhusiana na uendeshaji wa utafiti katika eneo hili. Hii itachukua muda wa dakika 25-30.

Manufaa ya uchunguzi

Hakunafaidaya moja kwa mojakutokana na kushiriki katikautafiti huu.Ukikubali kushiriki, utaelezewa zaidi vipengele vya utafiti huu na utashiriki kwa hiari yako.Habari zitakazotokana na utafiti huu zitatumika kwa miradi mingine kuiwezesha kudhibiti mpango wa ufanisi wa mradi huu.

Hatari ya kushiriki kwa utafiti

Hakunamadharainayojulikanamadharayanayohusiana naushirikiwakokatikautafiti huu.Utaelezwa kuhusu utaratibu utakaofuatwa ili uelewe vizuri.

Usiri

Taarifa zitakazokusanywa kutoka kwako zitatumiwa kwa kusudi la utafiti na zitawekwa kwa siri kubwa na kuhifadhiwa.Majina yako hayatatumika kwenye ripoti ya utafiti huu, ama kwenye maonyesho au makala yeyote. Ikiwa maafisa wa taasisiwatahitaji kuyatumia majibu yako, watahifadhi siri yako.

Mawasiliano na maswali

Kama una maswaliyoyote kuhusuutafiti huu,tafadhaliwasiliana naJacintaMacharia,kwenye simunamba0725337768au barua pepejcntmacharia@yahoo.comyaP.0BOX267-00,232Ruiru.

Kwamaswali yoyoteyanayohusuhakiya kufanyautafiti huutafadhaliwasilianaKEMRIKatibu/ Kamati ya Maadiliya Taifa (ERC), PO BOX54,840-00,200, Nairobi; Namba ya simu:020-2,722,541; 0722205901,0733400003Email:erc@kemri.org.

Fidia

Hakutakuwa na malipo yoyote juu ya kushiriki kwako katika huuutafiti.

Idhini ya kushiriki na sahihi

Nathibitishakwamba mimi nimeelwataarifa zinazotolewana mimikwa ajili ya utafiti huu na kwambanina nafasiya kuuliza maswali. Nimeelewa hatari ambazo zinaweza tokana na huu utafiti na nimeridhika.Ninaelewa kwambaushiriki wanguni wa hiarinakwambaniko hurukuondoka kutoka kwautafitiwakati wowotebilamadharayoyote.

Nimetoa idhini ya kushiriki Kwa utafiti huu kwa hiari yangu.

Jina la mshiriki.....

Sahihi.....sahihi ya dole ghumba .....Tarehe.....

Kama hajasoma (**shahidi**)……..Tarehe……..

Nathibitisha kuwa nimefuata taratibu zote za utafiti maalum katika taratibu za uendeshaji kwa ajili ya kupata taarifa idhini.

Jina la mchunguzi…….

Sahihi…….Tarehe……

……

☐Mshiriki amepokea nalaka

KIAMBATISHO 2: DODOSO

VIGEZO VYA USHIRIKI WA JAMII JUU YA KUDHIBITI NA MRADI WA UTAFITI WA KICHOCHO NA MINYOO KWALE, PWANI KENYA.

Maelekezo:

Weka alama ( ) au ujaze nafasi iliyotolewa.

DODOSO

Sehemu ya kwanza : Habari za kibinafsi

1. Jina la mhojiwa (ukipenda).....

Namba ya fomu.....

2. Umri/Miaka ya mhojiwa.....

3. Jinsia Mke Mme

4. Hadhi ya ndoa

1) Nimeoa 2) Sijaolewa au kuoa

3) Tumetalikiana 4) Tumetengana

5) Nyingine (Taja).....

5. Familia yako

Nambari ya watu mnaoishi pamoja na kula pamoja kama familia?.....

6. Kiwango chako cha elimu ni gani ?

1) Kiwango ya chini cha shule ya msingi 2) Kiwango cha juu cha shule ya upili

2) Shule ya upili 3) kikuu/Chuo

4) Sijawahi kuenda shule

7) Uko dini gani ?

1) mkristo 2) Mwislamu

3) Dini ya kienyenji 4) Nyingine (taja)

8) Ajira yako ni gani ?

1) Kazi ya binafsi 2) Ajira rasmi

3) Bila ajira 4) Mkulima

5) Nyingine (taja).....

9) Nini kiwango cha jumla ya wastaniya mapatoyako kila mwezi.....

Sehemu ya pili: Maarifa ya kichocho na minyoo.

1. Je unajua ugonjwa wa kichocho ?	1)Ndio	2)La	
		1)) Ndio	2)La
2. Kama ndio unadhani ni nini chanzo cha kichocho?	1) Kupitishwa kutoka kwa wazazi ……..	…….	
	2) Uchawi na ushirikina ……..	…….	
	3) Ngono ……..	…….	
	4) kutembelea/kuyanywa maji yaliyo na viini vya kichocho ……..	…….	
	5) Sijui ……..	…….	
	6) Mengine (taja) ……..	…….	
3) Maradhi ya kichocho husambaa kwa njia ipi?	1) kutembelea/kuyanywa maji yanayo viini vya ugonjwa huu		
	2) kunywa maji		
	3) kwenda msalani		
	4) kuogelea kwa maji		
	5) kugusana na mgonjwa wa kichocho		
	6) Ngono		
	7) Sijui		
3. Dalili za mtu anayeugua ugonjwa wa kichocho ni gani?	1) Maumivu ya tumbo		
	2) Kutapika		
	3) Mkojo kuwa na damu		
	4) Kudhoofika kwa afya		
	5) Sijui		
	6) Zingine		

4. Unafahamu ni vipi unaweza zuia kuambukizwa Marathi yak kichocho?	1) Kutogusana na maji yaliyo na viini vya ugonjwa huu 2) kutoogelea kwa maji 3) Kuzuia ngono 4) Kuzuia kugusana na mgonjwa wa kichocho 5) Kutoenda msalani 6) Sijui 7) Zingine.....
5) Je unaijua minyoo inayosambazwa na viini vilivyo kwa mchanga?	1) Ndio 2) La
6) Kama ndio, unadhani ni nini chanzo cha maradhi ya minyoo ?	1) kupitishwa kutoka kwa wazazi 2) Uchawi na ushirikina. 3) ngono 4) kutembelea/kuyanywa maji au mchanga uliyo na viini vya minyoo 5) Sijui 6) Zingine (taja)……
7) Dalili za maradhi ya minyoo ni zipi ?	1) Kutoweza kula vizuri 2) maumivu ya tumbo 3) Damu kwa mkojo 4) Kufura tumbo 5) Sijui 6) zingine.....
8) Maradhi ya minyoo yaweza zuiwa vipi?	1) Kutogusana na mgonjwa wa minyoo 2) Kuzuia ngono

	3) Kutekeleza usafi wa kibinafsi 4) Kutoyanywa au kuyatembelea maji machafu 5)Sijui 6)vingine.....
9) Kwa njia ipi unaweza zuia kupata minyoo	1) Kugusana na mtu anayeugua minyoo 2) Kuzuia kuonana kimwili 3) Kutekeleza usafi wa kibinafsi 4) Kuzuia kutogusana na maji/mchanga unayo na viini vya minyoo 5) Sijui
10)Kwa nini unadhani ni muhimu kutibu kichocho na minyoo	1) Inaweza kupooza binadamu 2) Inaweza fubaza binadamu 3) Inasambaa kwa kugusana 4) Sijui 5) Zingine

Sehemu ya tatu: Sababu zinazohusiana na Tabia

1) Jamii inachukuliaje ugonjwa wa kichocho na minyoo?

1) Inasambazwa kwa ngono (chagua moja) a) ndio b) la c) sijui

2) Ni magonjwa ya kawaida katika maisha a) ndio b) la c) sijui

3) Ni magonjwa ya watoto a) ndio b) la c) sijui

4) Yanaweza tibiwa kwa kutumia dawa a) ndio b) la c) sijui

Sehemu ya nne: Sababu zinazohusiana na afya

1) Je, umeshawahi kuugua kichocho ama maradhi ya minyoo?

1) Ndio 2) La

(Kama la jibu 3)

2) Kama ndio ulipata matibabu wapi?

1) Hospitali ya kibinafsi 2) hospitali

3) madawa ya kienyenji 4) matibabu ya kupatiwa nyumbani

3) Ni matatizo gani wanajamii wa kwale wanapata kutokana na magonjwa haya?

1.

2.

4) Je, ni akina nani wanayapata magonjwa haya kwa rahisi ?

a) 1) Wanaume 2) wanawake

3) watoto 4) watu wazima

b) Kwa nini?……..

5) Magonjwa ya kichocho na minyoo yanaweza tibiwa?

1) Ndio 2) La.

(Kama la jibu 8)

6) Kama ndio, unajua njia moja ya tiba ya kichocho?.....

7) Je, na tiba ya minyoo ? .....

8) Je, umewahi tafuta tiba ya kichocho ama ya minyoo ?

1) Ndio 2) La

9)Kama la, kwa nini hujatafuta tiba?….....

10) Kama ndio, uliyapata matibabu wapi?.....

a.Gharama ya matibabu ilikuwaje ? .....

b. Je tiba hiyo iliimarisha afya yako?

1) Ndio 2) La

c.Kama afya yako iliimarika, tafadhali eleza vipi?.....

d.Kama afya yako ilidhoofika eleza vipi ?.....

11) Kwa nini wewehuwezitembeleakituo cha afya kamawewemtuhumiwa unaSTH au kichocho

1) Bei ya tiba ni ghali. 2) Ni mbali na nyumbani

3) Sina imani na wafanyakazi wa afya ya jamii 4) Hofu ya kutafuta ugonjwa.

5)Siwezi wacha kazi yangu

12) Unadhani jinsi ya kutibu minyoo na kichocho katika jamii ni ghali vipi?

1) Tiba yake ni ya bure bila malipo 2) Malipo yake ni ya kuridhisha

3) Tiba ni ghali kiasi 4) Tiba ni ghali sana

13) Kuna choo hapa nyumbani kwako

1)Ndio 2)La

a) Unatima hii choo

1)Ndio 2)La

b)Kama la, kwa nini hutumii?.....

14) Maji unayoyatumia hapa nyumbani kwako wayatoa wapi?

1) Mtsara 2) Mfereji

3) Mtoni/kisima 4) Maji ya mvua

Sehemu ya tano: Ushiriki katika udhibiti wa kichocho na minyoo

1) Je unafahamu yakwamba kuna mkakati wa udhibiti wa ugonjwa wa kichocho na minyoo unaendelea katika eneo lako ?

1) Ndio 2) La

a. Kama ndio mkakati gani?.....

2) Ulipata matibabu kwa ajili ya kichocho au minyoo mwanzo wa 2012 ?

1) Ndio 2) La

a) Kama la kwa nini hukukubali upewe hizi dawa?.....

b) Kama ndio, ulimeza hizo dawa?

1) Ndio 2) La

c) Kama la, kwa nini hukumeza……..

d) Nani alikupatia hizo dawa……

3) Unajua mtu ambaye hakukubali matibabu?

1) Ndio 2) La

a. Kama ndio unafahamu kwa nini?..... .

4) Je, unahabari ya kwamba kuna utafiti unaendelea katika jamii yako kwa ajili ya maambukizi haya?

1) Ndio 2) La

5) Je, umewahi shiriki katika tafiti hizi ?

1) Ndio 2) La

Kama la, kwa nini hukushiriki?..... …..... ……

6) Kama ndio, sampuli gani za utafiti zilikusanywa kutoka kwako ?

a). Ukusanyanji wa mkojo kwa ajili ya utafiti?

b).Ukusanyanji wa damu kwa ajili ya utafiti?

c).ukusanyanji wa kinyesi kwa ajili ya utafiti

d).Hakuna sampuli zilizokusanya kutoka kwangu

Kama hakuna sampuli zilikusanywa kutoka kwako kwa nini?.....

7) Je, unadhani ushiriki wako ni wa msaada kwa huu mradi?

1) Ndio 2) La

a .Kama ndio kwa nini?.....

b.Kama la kwa nini?.....

Tumeweza kutamatisha maswala yetu na nashukuru sana kwa kunipa muda wako

KIAMBATISHO3: MWONGOZO WA MAHOJIANO YA HABARI MUHIMU.

Tarehe..... Mahala.....

Saa ya kuanza mahojiano.....

Saa ya kumaliza mahojiano.....

Mjulishaji muhimu.....

1. Ni yapi unayofahamu kuhusiana na kichocho au minyoo ?
2. Ni nini mwelekeo wako na imani kuhusu maambukizi haya ?
3. Ni mazoea gani ya jamii yanayoongeza kuenea kwa magonjwa haya ?
4. Ni nani wanapata maambukizi haya kwa rahisi
5. Ni chaguo gani ya matibabu inapatikana katika jamii kwa ajili ya maambukizi

haya ?

6. Unatafuta matibabu ya maambukizi haya wapi ?

7. Unafahamu tibabu ya maambukizi haya iliyotolewa Januari 2012 ?

8. Ulishiriki katika matibabu haya ?

9. Ni nini mtazamo wako wa hii tiba ?

10. Ni ushauiri gani unayo ili kuboresha matibabu katika siku sijazo ?

11. Unafahamu utafiti wowote na mpango wa udhibiti kwa ajili ya maambukizi haya katika jamii yako ?

12. Uko tayari kushiriki katika katika mpango kama huu wa namna ya utafiti ? (ukusanyaji wa damu, mkojo na kinyesi).

13.Ni nini ya kiuchumi, kitamaduni na kijamii sababu ya kuwa na ushawishi wa jamii yako kushiriki kwa programu ya kudhibiti na utafiti wa kichocho na minyoo?

KIAMBATISHO 4. MWONGOZO WA KUNDI LA MAJADILIANO

1. Ni yapi unayofahamu kuhusiana na kichocho au minyoo ?

2. Ni nani wanapata maambukizi haya kwa rahisi

3. Unafahamu ni nini chanzo cha kichocho na minyoo ?

4. Ni chaguo gani ya matibabu inapatikana katika jamii kwa ajili ya maambukizi haya ?

5. Ni nini mwelekeo wako na imani kuhusu maambukizi haya ?

6. Unafahamu utafiti wowote na mpango wa udhibiti kwa ajili ya maambukizi haya katika jamii yako ?

7. Ni nini mtazamo wako kwa huu mpango ?

8. Ni nini halikupendezi kuhusu huu mpango ?

9. Ni nini kinachohitajika kufanyiwa kwa huu mpango ili wanajamii washiriki kwa wingi ?

10. Unafahamu tibabu ya maambukizi haya iliyotolewa Januari 2012 ?

11. Ulishiriki katika matibabu haya

12. Nini kilichokufanya ushiriki kwa hii tiba ?

13. Unajua ni nani hakushiriki kwa hii tiba ?
14. Unafikiri kwa nini hawakushiriki kwa huu mpango wa tiba ?
15. Una maono gani ya huu mpango ?

KENYA MEDICAL RESEARCH INSTITUTE

P.O. Box 54840-00200, NAIROBI, Kenya
Tel (254) (020) 2722541, 2713349, 0722-205901, 0733-400003; Fax: (254) (020) 2720030
E-mail: director@kemri.org info@kemri.org Website:www.kemri.org

ESACIPAC/SSC/100827 **5th September, 2012**

Jacinta Macharia

Thro'
Director, ESACIPAC
NAIROBI

forwarded 5/9/12

REF: SSC No. 2362 (Revised) – Evaluation of community participation in schistosomiasis and soil-transmitted helminthes control and related operational research in Kwale District, Coastal Kenya.

Thank you for your letter dated 3rd September, 2012 responding to the comments raised by the KEMRI SSC.

I am pleased to inform you that your protocol now has formal scientific approval from SSC.

The SSC however, advises that work on the proposed study can only start after ERC approval

Sammy Njenga, PhD
SECRETARY, SSC

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KEMRI/RES/7/3/1 **March 8, 2013**

TO: **Ms. JACINTA WAIRIMU MACHARIA (PRINCIPAL INVESTIGATOR)**
STUDENT NUMBER: TM310 - 1141/2011

THROUGH: **DR. SAMMY NJENGA,**
THE DIRECTOR, ESACIPAC,
NAIROBI

forwarded 12-03-2013

Dear Madam,

RE: **SSC PROTOCOL No. 2362 – REVISION 2 *(RE-SUBMISSION 3)*: EVALUATION OF COMMUNITY PARTICIPATION IN SCHISTOSOMIASIS AND SOIL-TRANSMITTED HELMINTHS CONTROL AND RELATED OPERATIONAL RESEARCH IN KWALE DISTRICT, COASTAL KENYA (*VERSION 2.2 DATED 2/01/2013*)**

Reference is made to your letter dated February 4, 2013. The ERC Secretariat acknowledges receipt of the revised proposal on February 8, 2013.

This is to inform you that the Committee determines that the issues raised at the 208th meeting of 9th October 2012 and on 25th January 2013 are adequately addressed. Consequently, the study is granted approval for implementation effective this **8th day of February 2013** for a period of one year.

Please note that authorization to conduct this study will automatically expire on **7th February, 2014**. If you plan to continue data collection or analysis beyond this date, please submit an application for continuation approval to the ERC Secretariat by **December 20, 2013**. The regulations require continuing review even though the research activity may not have begun until sometime after the ERC approval.

You are required to submit any proposed changes to this study to the SSC and ERC for review and the changes should not be initiated until written approval from the ERC is received.

Please note that any unanticipated problems resulting from the implementation of this study should be brought to the attention of the ERC and you should advise the ERC when the study is completed or discontinued.

Work on this project may begin.

Sincerely,

RAB

DR. ELIZABETH BUKUSI,
ACTING SECRETARY,
KEMRI ETHICS REVIEW COMMITTEE