EVALUATION OF THE LYMPHATIC FILARIASIS ELIMINATION PROGRAM IN MKURANGA DISTRICT, COAST REGION

By

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A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science in Parasitology and Medical Entomology of Muhimbili University of Health and Allied Sciences

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CERTIFICATION

The undersigned certify that he has read and hereby recommends for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled ***"Evaluation of the lymphatic filariasis Elimination Program in Mkuranga District, Coast Region"*** in fulfillment of the requirements for the degree of Master of Science in Parasitology and Medical Entomology of Muhimbili University of Health and Allied Sciences.

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Prof Zul Premji

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Date: _____

DECLARATION
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I, **Vedasto John Bandi**, declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

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DEDICATION

This dissertation is dedicated to my wife Elizabeth and my sons Jonathan and Gabriel and my baby girl Pascalina

ABSTRACT

Title

Evaluation of the Lymphatic Filariasis Elimination Programme in Mkuranga District, Coast Region.

Background

Lymphatic filariasis is the leading mosquito transmitted parasitic disease responsible for morbidity in most developing tropical countries. The interruption of transmission through annual mass drug administration (MDA) and alleviation of suffering and morbidity through prevention and management of disease manifestations are two control strategies. The objective of MDA is to administer ant-filarial drugs once per year to all eligible individuals in the endemic area in order to reduce disease burden and interrupt transmission. The success of MDA depends on understanding of operational factors which contribute to transmission interruption outcome.

Objective

The main objective was to evaluate the impact of the Lymphatic filariasis elimination Programme in Mkuranga District.

Material and Methods

This descriptive cross sectional study was carried out in Mkuranga District during the period of April - May 2013. A total of 382 participants aged 5 years and above were involved in the study, of these 59 household leaders had an in depth interview. All 382 were diagnosed using ICT filariasis to ascertain *W.bancrofti* infection. Drug coverage and willingness to take the drugs in the coming round was also discerned. Parasitological diagnosis was done among CFA positive using the counting chamber. Additionally presence of Lymphoedema was physicallyassessed in all 382 participants.

Results

A total of 19 (5 %) out of 382 tested CFA positive,fifteen of these gave informed consent for night blood microfilaria testing whereby all tested negative. Prevalence of lymphoedema was found to be 0.8 % (3/382) and this finding was confirmed to the age group above 36 years whereby all tested CFA negative. Staging was done and all were staged 3 and 4.In the study population the MDA coverage for the year 2012 was 72.3 % (276/382).The acceptance to participate in the coming MDA was 96.9 %

(370/382).Regarding household leader knowledge on the cause and transmission of LF it was found to be 33.9% low and 40.7% medium and 25.4% high.

Conclusion

There has been a marked reduction in circulating filarial antigen from pre MDA data, presence of microfilaria and lymphoedema after eight rounds of MDA is low. The knowledge regarding the intervention is relatively high however knowledge about the disease or causation remains low.

TABLE OF CONTENTS

Page

LIST OF TABLES

ABBREVIATIONS

CFA----------Circulating Filarial Antigen

DEC----------Diethylcarbamazine

DED----------District Executive Director

EPB----------Expanded Polystyrene Beads

GPELF ----------Global Programme for Elimination of Lymphatic Filariasis

ICT ----------Immunochromatographic test

IU----------Implementation Unit

KAP ----------Knowledge, Attitude and Practices

LFEP----------Lymphatic Filariasis Elimination Programme

LF----------Lymphatic Filariasis

MDA----------Mass Drug Administration

MF ----------Microfilaria

MoHSW --------- Ministry of Health and Social Welfare

MUHAS----------Muhimbili University of Health and Allied Sciences

NLFEP----------National Lymphatic Filariasis Elimination Programme

TPE----------Tropical Pulmonary Eosinophilia

VEO ----------Village Executive Officer

WHO----------World Health Organization

DEFINITION OF KEY TERMS

Compliance is defined as the willingness to ingest drug in the coming MDA rounds or the proportion of number of individuals who had ingested sufficient dose of tablets to total people who had received the tablets

Drug coverage is the proportion of individuals, expressed as a percentage, in a targeted population who swallowed a drug or a combination of drugs.

Endemic area is an Implementation unit where the average resident population, or any subunit of population, has an antigenaemia or microfilaraemia positivity rate equal to or greaterthan 1%.

Epidemiological drug coverage (programme coverage) is the proportion of individuals in the implementation unit who have ingested the MDA drugs of the total population in the implementation unit.

Implementation unit (IU) is the administrative unit in a country which is used as the basis for making decisions about implementing MDA. The IU must be defined before mapping takes place.

Ineligible population is thegroup of individuals not qualified or entitled to receive anthelminthic treatmentin preventive chemotherapy interventions. Ineligibility is usually determined byexclusion criteria based on drug safety.

KAP survey is an assessment of the knowledge, attitudes and practices of a community or groupof individuals at one point in time, usually with respect to a health or health-relatedtopic.

Lymphatic filariasis is a parasitic infection of humans caused by nematodes (worms) of the Filariodideafamily. *Wuchereria bancrofti* cause the majority (90%) of human infections, whichare mostly acquired in childhood; *Brugia malayi* and *Brugia timori* cause the remainder. *Anopheles, Aedes* and *Culex* mosquitoes are the main vectors responsible for transmission. Mosquitoes serve as biological hosts that both develop and transmit the parasite during blood-feeding and establish the infection in humans.

Mass drug administration (MDA) is a modality of preventive chemotherapy in which anthelminthic medicines are administered to the entire population of an area (e.g. state, region, province, district, sub-district, and village) at regular intervals, irrespective of the individual infection status.

MDA round is the distribution of ant filarial medicines to the target population during a defined time period. Normally, MDA activities cannot be conducted simultaneously throughout a country, so a “round” may take one or two weeks or more before being completed ata national level.

Microfilariae are Microscopic larval stage of LF parasites that circulates in the blood and is transmittedby mosquitoes.

Microfilaraemia is the Presence of microfilariae in the blood.

Morbidity is the Clinical consequences of infections and diseases that adversely affect the health of individuals. Lymphatic filariasis causes chronic morbidity through damage to the lymphatic system, kidneys, arms, legs or genitals (especially in men).

Surveyed coverage is a method used to verify reported coverage through use of population-based cluster survey methods. It is calculated as the total number of individuals identified by household survey as having ingested the drugs of the total number of individuals residing in all the surveyed households about whom information on drug ingestion could be elicited.

CHAPTER ONE

1.1 Background

Parasite, vectors and Biology

Lymphatic filariasis is the leading mosquito transmitted parasitic disease responsible for morbidity in most developing tropical countries; India, Africa, as wellas Caribbean and Pacific Islands(Rica et al. 2006).Over 95% of the infections are due to *Wuchereria bancrofti* the rest is due to *Brugia malayi* and *Brugia timori*. The infections are acquired during early childhood and clinical manifestations occur at early adulthood(Witt & Ottesen 2001). The disease does not cause death like malaria but is responsible for acute filarial fevers, severe physical and psychological sufferings due to disfiguring of body parts mainly the limbs and genitals(Rica et al. 2006).Vectors are mosquitoes of genus *Culex*, *Anopheles*, *Aedes* and *Mansonia*.Lymphatic filariasis is transmitted by different types of mosquitoes for example by the *Culex* mosquito, widespread across urban and semi-urban areas; *Anopheles* mainly in rural areas, and Aedes, mainly in endemic islands in the Pacific (WHO, 2012) .The adult worms live in lymphatic channels and the female sheds sheathed microfilariae which are carried to the bloodstream in lymph. They circulate in the blood and are taken up by mosquito vectors of the genera *Culex, AnophelesAedes*and *Mansonia*.When a mosquito with infective stage larvae bites a person, the parasites are deposited on the person's skin from where they enter the body. The larvae then migrate to the lymphatic vessels where they developinto adult worms in the human lymphatic system. The infective larvae moult twice after they enter a human host through the mosquito bite. *W. bancrofti* exhibits periodicity of microfilaraemia, which circulate in the blood during the night hours, in close relation to their nocturnal feeding habits of the mosquito vectors.For subperiodic strains microfilariae circulate in blood throughout the 24-hour period (WHO, 2012).

Disease Burden

It was estimated in 1996 that 120 million were infected and about one billion were at risk of infection of which India and Africa account for 85% - 90% of the estimated burden(WHO, 2012andRica et al. 2006). In Africa it occurs in 39 states where 420 million are at risk representing 38% of the global burden,4.6 million cases of

lymphoedema and over 10 million cases of hydrocele(WHO, 2004).

Lymphatic filariasis is endemicthroughout the United Republicof Tanzania. The figures for Tanzaniamainland show that 34 millionpeople are at risk of infection andit is estimated that 6 million peoplehave debilitating manifestations of thedisease. The endemicity varies frombeing highly endemic along the coastwith antigenemia levels of 45–60%, tolow endemicity in the areas of WesternTanzania with endemicity of 2–4%,and varying endemicity in the regionsin between, i.e. central Tanzania, thesouthern Highlands and north andnorthwestern Tanzania(Mwaluko, 1991,Malecela et al. 2009 andWHO, 2004).

Control strategies

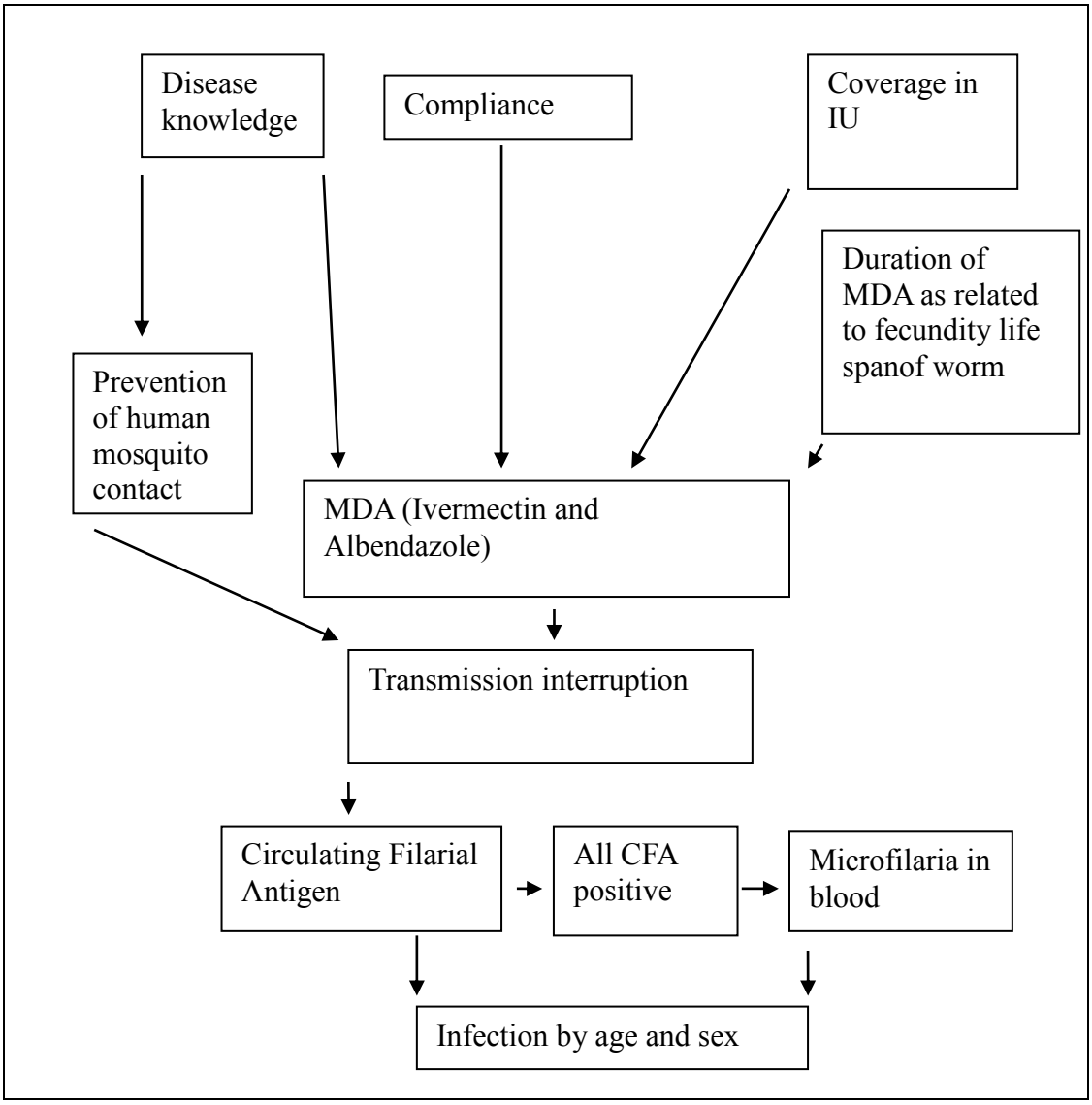
In a joint effort by the global research and public health communities and with the support of development partners and pharmaceutical industries, important research progress has been made. Elucidation of disease severity, economic impact at household,community andnationallevels,new diagnostic tools,and new treatment, management and control strategies have given impetus to LF elimination efforts. The International Task Force for Disease Eradication identified LF as one of the six eradicable or potentially eradicable, infectious disease (CDC, 1993). Consequently, the 50th World Health Assembly of 1997 launched an ambitious initiative to eliminate LF globally as a public health problem,namely a Global Programme for Elimination of Lymphatic Filariasis (GPELF).This has two initiatives;first is interruption of transmission through annual mass drug administration (MDA),second is alleviation ofsuffering and morbidity through prevention and management of disease manifestations. (Simonsen et al. 2008)

The objective of MDA is to administer ant-filarial drugs, once a year, to all eligible individuals in the endemic implementation unit (WHO, 2005). Certain population groups such as pregnant women, children under 2 years of age and the severely ill should be excluded from programmes of MDA that use co administration of DEC plus albendazole. Where co-administration of ivermectin plus albendazole is used, pregnant women, lactating women in the first week after birth, children less than 90 cm in height (approximately equivalent to a weight of 15 kg) and the severely ill should be excluded

from MDA (WHO, 2005**)**. The greater the number of people who ingest the drugs, the better the chance of successfully interrupting transmission(Kyelem et al. 2008 andWHO, 2005). World wide of 81 endemic countries 52(62.2%) countries have current active MDA programme of which 37 countries have completed over five rounds of MDA in at least some of their endemic areas(Addiss, 2010)**.**

Tanzania responded to the call with the formation of National Lymphatic Filariasis Control Programme (NLFEP) in 2000 followed by mapping the country with respect to LF infections. The whole country was endemic except Chunya and Babati,34 million are at risk and six million with infection or disease manifestations at any stage(Malecela et al. 2009; Rica et al. 2006). The MDA in Tanzania started first in the coastline administrative districts where there was high *Wuchereria Bancrofti* prevalence and LF related disability(Malecela et al. 2009). The control of the disease has currently received much attention since it is among the neglected tropical diseases. Regular prevalence determination is not often done due to nocturnal periodicity of *W.bancrofti* leading to difficulties in data collection at night as related to compliance and the unit cost of Immunochromatographic tests for *W.bancrofti* is also another limitation for field applications(Njenga et al. 2001). A better quantitative understanding of the operational factors essential for program success would be particularly valuable for improving program outcome. Specifically, these factors would include: 1) the levels of population compliance required during MDAs as related to LF education to achieve interruption of transmission (and the levels of non-compliance or systematic non-compliance that still permit LF elimination); 2) the levels of microfilaria (mf)-positivity or antigen-positivity at which the MDA component of programscan safely be stopped 3) the MDA coverage and number of rounds of MDA required for success in different epidemiologic situationsperhaps fewer in low endemicity areas and more, even with supplemental measuresincluding vector control and enhanced drug regimens, in other epidemiologic settings and health education related to LF(Kyelem et al. 2008).This study aimed at evaluating MDA and associated factors contributing to elimination of lymphatic filariasis in Mkuranga District.

1.2 Conceptual framework



13. Problem Statement

MDA was implemented in Tanzania for the first time in the year 2000 under National Lymphatic Filariasis Elimination Programme (NLFEP) as a response to World Health Assembly resolution of 1997.Tanzania mainland is LF endemic with mean prevalence of 42.84% range 4%-72% (WHO, 2004). The coastline districts in Tanzania have high *W.Bancrofti* prevalence (45%-60%) and western Tanzania 2%-4% (Malecela et al. 2009). Mkuranga is one of the coastline districts with pre MDA recorded CFA 34 % prevalence in 1998 (NLFEP,1998). The interruption of transmission through MDA in Mkuranga District has been done for more than six rounds since 2001 to 2012.Since MDA started in 2001there is no evaluation study that has beendone in Mkuranga District. It is important to know the prevalence in Mkuranga after more than six rounds of MDA. This will be useful for assessing the progress towards elimination of LF and to predict the future towards total transmission interruption by MDA in Mkuranga and Tanzania in general.

1.4Research question

What is the impact of the National Lymphatic Filariasis Elimination Programme using MDA as a strategy in Mkuranga District?

1. What is the CFA prevalence among individuals over five years in Mkuranga District?
2. What is the microfilaria prevalence among CFA positives in Mkuranga District?
3. What is thelevel of diseaseknowledge amonghousehold leaders in Mkuranga District?
4. How dohouseholds protect themselves from the diseasein Mkuranga District?
5. What is the community compliance to MDA in Mkuranga?
6. What is the proportion of the drug coverage among individuals of five years and above during MDA in Mkuranga?

1.5.0. Study objectives

1.5.1. Broad objective

To evaluate the impact of the Lymphatic Filariasis Elimination Programme in Mkuranga District.

1.5.2. Specific objectives

1) To determine the CFA prevalence in Mkuranga District.
2) To determine microfilariaprevalence among CFA positives in Mkuranga district.
3) To assess the knowledge of the disease in Mkuranga District.
4) To assess compliance to MDA in Mkuranga District.
5) To assess the drug coverage of MDA in Mkuranga District.

1.6. Rationale

There is missing knowledge on the CFA and Mf prevalence following MDA strategy for interruption of transmission in Mkuranga. We don't know whether transmission has been interrupted. The result of this study will provide information about LF in Mkuranga. The result of this study will have bearing on the future planning and implementation of MDA in Mkuranga. The results can also be extrapolated for National planning of MDA as strategy.

1.7 Literature review

LF control success

The control of lymphatic filariasis has shown success in North America, Japan and Australia and has decreased prevalence in some provinces in China by using tools much less efficient than the present (Ottesen & Duke 1997, Ottesen & Ramachandran 1993). The current control strategy uses the transmission interruption approach by reducing the parasite load in the population and killing the adult worm through MDA with subsequent reduction and elimination of lymphoedema in the future generation. In a study done in Bukina Faso following Onchocercasis control, eight villages treated (total individuals sampled was 1210) no W. bancrofti was detected by night blood film examination, whereas in eight comparable untreated villages 37 of 1251(2.9%) individuals were infected with W. bancrofti, the untreated villages were Onchocercasis non endemic (Kyelem et al. 2008).

LF treatment regimen

Diethylcarbamazine (DEC) is used, though 12 days' therapy is sufficient. Reactions due to death of worms do occur. Lymphoedema is best controlled by elevation of the affected limbs at night and pressure bandaging. Albendazole and ivermectin are also effective. Surgery to excise the lymphoedematous tissue is a final resort. Prophylactic penicillin V, 250 mg twice daily, is helpful in patients who have had repeated attacks of bacterial lymphangitis. Meticulous care of the feet, and particularly the skin between the toes is essential. Staphylococci and streptococci are the common causes of bacterial infection in the affected limbs. TPE responds to DEC in the same dosage regimen, though it may be necessary to give prednisolone as well to inhibit exacerbations of pulmonary symptoms.

Interruption of transmission strategy

A consolidated, evidence based strategy to interrupt transmission of filariasis in an endemic country is the administration of effective anti-filarial drugs to the entire population at risk. There are two possible kinds of MDA:

MDA using tablets: this consists of an annual single-dose of a combination of two drugs administered for at least five or six consecutive years to the entire eligible population

living in the endemic areas, or until the criteria for stopping MDA is reached(WHO, 2005).

MDA using diethylcarbamazine-citrate (DEC) fortified cooking salt: this involves the distribution of common salt fortified with DEC to the entire population of the endemic area for one or two years (WHO, 2005).

The decision about which type of MDA to implement depends on the local situation of the country in question (WHO, 2005).

The treatment regimen recommended for annual MDA is a combination of two drugs 400mg of Albendazole with either 150-200µg/kg Ivermectin or 6mg/kg of DEC in endemic areas (Mohammed et al. 2006). For almost half a century, the drug most commonly used has been DEC. DEC is a microfilaricidal agent also capable of killing a proportion of the adult *W. bancrofti, B.malayi* and *B. timori* (Simonsen, 2008). DEC exerts no direct lethal action on the microfilariae but apparently modifies them so that they are removed by the host's immune system. Ivermectin (Mectizan®) is a potent microfilaricide, but has no macrofilaricidal effect. The DEC has a microfilaricidal and macrofilaricidal effects while Ivermectin has microfilaricidal effect without directly observed effects to adult worm (Plaisier et al. 2000). The use of DEC has shown much success due to its microfilaricidal and macrofilaricidal effects but its side effects in *O.volvulus* and *Loa loa* endemic areas has blocked its use in MDA (Omura, 2008 and Mohammed et al. 2006). The major role of ivermectin in lymphatic filariasis is for treatment and control of infection in areas that are co-endemic for onchocerciasis and/or loiasis (i.e. many parts of Africa). Since it has no macrofilaricidal effect, repeated half-yearly or yearly treatments are needed to keep the microfilaraemia at a low level. Ivermectin also has an effect against Ascaris, hookworm and scabies infection (Simonsen, 2008).

Disease burden and Transmission interruption

Endemic area is recognized after mapping where out of 100 if one is found with microfilaria or circulating filarial antigen the area is declared endemic (WHO, 2005). The early stage infections are not easily detected; difficulty to recognize and clinical manifestations are associated with long term, hence not evident in early childhood (Witt

et al. 2001). The study done in Rufiji district showed recorded ADL episodes of 33 per 1000 population, chronic filariasis 3.1%(141) of 4576 individuals (Gasarasi et al. 2000) The study done in primary schools in Tanga among 2291 children (1120 boys, 1171 girls) between 6 and 18 years. Of these, 1829 (879 boys, 950 girls, mean age of 10.7 years) were examined for mf, CFA and signs of chronic filarial disease before treatment. School mf prevalence ranged between 12.9% and 27.7% (overall 17.3% for the 6 schools), and school CFA prevalence ranged between 36.9% and 63.8% (overall 43.7% for the 6 schools). Four boys aged 8–17 years had hydrocele and three boys and two girls aged 9–15 years had leg lymphoedema (Simonsen et al. 2003).

Effectiveness of DEC and Ivermectin

The study conducted in South India had the baseline survey of the hydrocele prevalence of 20.5%, 23.9% and 20.4% in the DEC, ivermectin and the placebo arms, respectively. After seven rounds of MDA, it declined to 5.1%, 10.4% and 10.9%, accounting for 75.3%, 56.6% and 46.6% reduction in the respective arms. The decline was statistically significant in all the three arms ($P < 0.05$). While the relative decline in hydrocele prevalence between DEC and placebo arms were significant. It was not so between ivermectin and placebo arms ($P > 0.05$). Age-specific hydrocele prevalence fell significantly ($P < 0.05$) in all age classes after seven rounds of MDA in DEC arm and in all except the younger age group of 0–20 years in ivermectin and placebo arms. The reduction was greater in most of the age classes in DEC arm than that observed in ivermectin arm. All sampled individuals younger than 20 years in the DEC arm were completely free from hydrocele and it was not so in ivermectin and placebo arms (Yuvaraj et al. 2008).

The study conducted in Colombo, Sri Lanka which compared effectiveness of ivermectin, DEC and placebo showed that Multiple 400 µg/kg doses of ivermectin caused a rapid and total clearance of mf from the peripheral blood and this was sustained in 13 of 14 patients (93%) for 38 weeks (minimum period for reinfection), in 9 of 14 patients (64%) for 74 weeks, and in 5 of 12 patients (42%) for 129 weeks (nearly 2.5 years) after the last dose. DEC showed a marked decrease of microfilaria after first dose followed by more gradual decline. Total clearance of microfilaraemia was observed only

at the 8th week (after the initial dose plus 4 biweekly 10 mg/kg doses of DEC). Thereafter, more patients became amicrofilaraemic, 8 of 12 (67%) at 38 weeks, 6 of 12 (50%) at 74 weeks, and 2/10 (20%) at 129 weeks after the last dose. Differences in mf clearance between the ivermectin and DEC groups were not statistically after the fourth week.Microfilaria recurred fairly soon in the Low Dose Ivermectin Control group (treated with 20, ug/kg ivermectin on day 1 and at 22 weeks): relative mf levels in this group were significantly higher than in the ivermectin and DEC groups at all times after 4 weeks except 24 weeks (Ismaill et al. 1996).

Ivermectin and Albendazole

In a study done in Tanga among CFA and mf positives showed that examination of 1829 children from 6 primary schools in coastal Tanzania revealed overall Wuchereria bancrofti microfilaria (mf) and circulating filarial antigen (CFA) prevalences of 17.3% and 43.7%, respectively. A randomized double-blind field trial with a single dose of ivermectin (150–200 μg/kg body weight) alone or in combination with albendazole (400 mg) was subsequently carried out among these children. Both treatment regimens resulted in a considerable decrease in mean mf intensities, with overall reductions being slightly but statistically significantly higher for the combination than for ivermectin alone. The difference in effect between the two treatment regimens was most pronounced at 6 months, whereas it was minor at 12 months after treatment. The relative effect of treatment on mean CFA units was less pronounced than on mf. For both treatment regimens, reductions in CFA intensity appeared to be higher in children who were both CFA and mf positive before treatment, which may suggest that treatment mainly affected the survival and/or production of mf, rather than the survival of adult worms. New cases of infection appeared after treatment with both regimens among the pre-treatment mf and CFA negative children (Simonsen et al. 2003).

The study conducted in Tanga has shown significant interruption of transmission after fourth MDA (2004 to 2009) among standard one school children 25.2% to 6.4% with a lag period of two years (Simonsen et al. 2011).This shows a significant decrease in new infections in the community. The follow up study conducted in Tanga showed relationship between age-group and frequency of loss or gain of microfilaria. Overall, 49

individuals (with a mean age of 41.8 years) lost and 56 individuals (with a mean age of 24.0 years) gained microfilaraemia between 1991 and 2001, giving overall loss and gain frequencies of 39.2% (49/125) and 12.9% (56/435) for the 10-year period, respectively. Almost all (93.9%) of the individuals who were found microfilaraemic in 1991 but amicrofilaremic in 2001 (but only 29.3% of those who appeared amicrofilaremic at both surveys) were CFA positive in 2001. There was no significant relationship between age group and frequency of loss (P>0.05).The frequency of gaining microfilaraemia, however, differ significantly with age-group (P=0.039), being relatively high among the younger individuals (Meyrowitsch et al. 2004). The transmission survey assessment criteria for interrupted transmission are less than 1% for microfilaria and less than 2% for circulating filarial antigen where *Anopheles* and/or *Culex* are the principal vector (WHO, 2011and Meyrowitsch et al. 2004).

Compliance

The compliance to MDA is an important factor to consider for effective transmission interruption (Kyelem et al. 2008 and Cantey et al. 2010a). Individual compliance is defined as the willingness to ingest drug more than once (Joseph et al. 2010). Individual who has ingested drug once and never repeated and not willing to ingest drug in any of the extra rounds are considered as non compliant (Joseph et al. 2010). It is also defined as the proportion of number of people who had ingested sufficient dose of tablets to total people who had received the tablets (Lahariya and Mishra 2008).

The study done in Samoa showed that of 153 participants in this group, 69% (n=105) were from villages in areas with high Mf prevalence and of these the majority (88%) were from villages in areas with high CFA prevalence. Comparing areas with high prevalence to areas with low prevalence, for both Mf and CFA, there was no statistically significant difference between the proportions of males and females (P=0.129 and P=0.546 respectively). The average age of participants when defining the groups by high or low Mf prevalence was also similar (35 years and 38 years respectively) (t=0.74; P=0.459). However, the average age of participants in the high CFA prevalence group (35 years) was less than the average age in areas with low CFA prevalence (46 years) (t=2.47; P=0.015).Among the 153 CFA positive participants, 67% (n=103) reported

MDA compliance and 56% (n=86) had heard of LF. In uni-variable analyses, those who reported that they had heard of LF were around three times more likely to report MDA compliance than those who had not heard of LF (P=0.005). Furthermore, there was a similarly strong association between self reported MDA compliance and whether the participant had heard of the national LF program (P=0.003). However, among those who stated that they had not heard of LF, 37% reported they had heard about the national LF program, while just 14% of those who had heard of LF said they had not heard about the national program. Those previously CFA positive were more likely to report MDA compliance (84% =27/32; P=0.026). The data also appear to indicate that women tended to be less likely than men to report MDA compliance (P=0.076) (Joseph et al. 2010).

The study done in India to assess the effectiveness of community-based LF education and Community-based lymphoedema management education in increasing compliance with the MDA program and to validate the importance of predictors of and barriers to adherence to the DEC regimen identified in the previous evaluation showed that participants who complied with the MDA program were asked why they took DEC. The most common reasons given were as follows: 1) to prevent LF (463, 48.0%), 2) because the MDA distributor told me to take DEC (344, 32.9%), and 3) because a family member told me to take DEC (211, 22.6%). Participants who did not take DEC were asked to specify why and what they would need to be told to change their minds. The top five reasons given were as follows: 1) fear of side effects (80, 30.3%), 2) lack of trust of DEC (45, 16.9%), 3) sick at the time of the MDA (29, 9.5%), 4) not at home when DEC was distributed (25, 9.2%), and 5) not sick and therefore DEC was not needed (25, 9%). They reported they would comply if convinced that taking DEC would help them (151, 52.3%), if convinced that taking DEC would help their family (53, 17.3%), or if taught to manage side effects (22, 9.8%) (Cantey et al. 2010b).

Coverage

The drug coverage in total population reflects the proportion of at risk population covered by MDA and has epidemiological value (Kyelem et al. 2008 and WHO 2005). The drug coverage in eligible population gives the picture of effectiveness of the MDA in implementation unit (Kyelem et al. 2008,WHO, 2005and Ranganath, 2010).

In the study conducted in Tanga, the treatment coverage during the four MDAs, as assessed separately by the NLFEP ('reported coverage') in the wards of surveyed schools was 88.6% (2004), 94.5% (2006), 87.7% (2007), 88.8% (2009) and the study ('surveyed coverage') are 80% (2004), 68.2% (2006), 61.2% (2007), 32.9% (2009). The 'Reported coverage' were high and fairly uniform for all four MDAs, both when assessed for the six wards containing the 10 examined schools and when assessed for all 24 wards in Tanga Municipality (overall range 80.0–96.6%). In contrast, the 'surveyed coverages' showed a clear trend of decrease from 80.0% in MDA 1 to only 32.9% in MDA 4. It should be noted that whereas the 'reported coverage's' are based on all eligible individuals in the wards (from five years and above), the 'surveyed coverage's' are based on the Standard 1 pupils only (Simonsen et al. 2011).

Health education

The knowledge about the disease is an important factor for its control; the MDA is accompanied with educating community on the disease, transmission and prevention (Kyelem et al. 2008, Rath et al. 2006, Cantey et al. 2010bandJoseph et al. 2010). The study done in Samoa showed that of the 86 participants who had heard of LF, 57% (n=49) said they knew how it is transmitted with most of these (94%=46/49) reporting they believed mosquitoes transmitted it. Although there was no statistically significant association between MDA compliance and self-reported use of any mosquito protection (P=0.818), the majority of the sample (79%=121/153) reported they used some form of mosquito protection and most of these (84%=102/121) said they used a bed net. Thirty two participants reported testing positive for CFA in previous years. Of these, 53% (n=17) reported they had heard of LF, 69% (n=22) had heard about the national program and 59% (n=19) reported they initially tested positive during the years from 2005 to 2007 (Joseph et al. 2010).

In the study conducted in India to determine Issues of knowledge about different manifestation and elimination programme of LF which were, Knowledge about the accurate cause of lymphoedema, knowledge about the cause of lymphoedema, the accurate knowledge regarding transmission of lymphoedema, any knowledge regarding transmission of lymphoedema, Feeling that they are at risk of getting lymphoedema,

knowledge about the accurate cause of hydrocele, awareness of filariasis elimination programme. The risk perception with regard to the disease was very low in this community. Only about 29% of respondents during pre-MDA period and 33% of respondent during post MDA survey revealed that they were at risk of getting lymphoedema. The KAP data indicated that only 14% respondents were aware of MDA before MDA. After the implementation of MDA, a significant increase was noticed regarding the awareness of programme among the people from all strata. More than 95% people in the study area became aware of MDA. There was significant difference between pre and post MDA values ($p<0.05$) (Rath et al. 2006) .

The study done in India to assess community knowledge in group with MDA and LF management education and the group with MDA only showed that the proportion of participants who knew that MDA was for LF as follows 439(98.8%) in areas received community-based pre-MDA LF education and a community-based lymphedema management program (Com-MDA+LM). 386(91.8%) in areas received community-based pre-MDA LF education(Com-MDA). 368(92.4%) in areas received the Indian Ministry of Health MDA campaign(MDA only). P-value of less than 0.0001 for the comparison between Com-MDA+LM and Com-MDA and P-value of 0.82 for the comparison between Com-MDA and MDA-only (Cantey et al. 2010b).

Fecundity life span

The study done in India to estimate the fecundity of the female W.bancrofti showed the overall analyses is that the mean expected fecund life span in an endemic area with continuing transmission is of the order of five years, and that the duration of control programmes might be correspondingly abbreviated (Vanamail et al. 1996) and each treatment reduces the female fecundity lifespan by on average 77% (200µg of ivermectin) to 92% (400µg of ivermectin).While its life span is estimated to be over ten years (Plaisier et al. 2000).

The study done in northern Tanzania showed that when grouping the study individuals according to CFA status in 1996, CFA negative individuals responded with significantly higher IgG3 and IgE absorbance values (Mann–Whitney, $p < 0.05$ for both antibody subclasses and for both antigens) and significantly lower IgG4 absorbance values

(Mann–Whitney, $p < 0.001$ for both antigens) than CFA positive individuals.

Moreover, the IgG4/IgE ratios were significantly higher for CFA positive individuals compared with CFA negative individuals (Mann–Whitney, $p < 0.001$ for both antigens). No statistically significant differences in IgG1 and IgG2 responses were observed between CFA positive and CFA negative individuals (Bloch et al. 2011).

Interestingly, 61 (85.9%) of the study individuals had the same infection status in 1975 and 1996. Most of these individuals, namely 41 (67.2%), were infection positive in both past and present despite many of them receiving treatment with DEC in 1975 and 1992. Only 10 individuals had a different infection status, namely four who changed from being infection positive to negative and six who changed from being infection negative to positive. There is high probability of re infection since individuals with previous infection have immunological tolerance to the parasite (Bloch et al. 2011) (Meyrowitsch et al. 2004).

Mosquito control and LF

Wherever malaria and LF are co-endemic, *Anopheles* control practices tend to have greater impact mainly on LF transmission, to the point that LF has sometimes been eliminated as a side-effect of malaria vector control (WHO, 2002).

Post MDA LF control

In a study of application of Expanded Polystyrene Beads (EPB) resulted in a large decrease of *Culex* mosquitoes (19.6% relative to pre-intervention). The decrease in the mosquito population was maintained over 3 months, which would lower human exposure to filariasis transmission. Following polystyrene beads Mf prevalence among household members decreased by 64.3% consequent to supplementing MDA with the application of EPBs (Al-kubati et al. 2011).

Clinical symptoms: Many infected people have no symptoms related to the disease. The earliest feature is often generalized painless swelling of the leg. There is no rash, and inguinal glands may be normal. The swelling is worst in the evening and declines while the patient is sleeping overnight. This occurs within months of infection, before microfilariae are shed, which indicates a response to adult worms. Without treatment this swelling may progress to the chronic lymphoedema of filariasis. Filarial lymphangitis is

another presentation of filariasis. Lymphatics are red and tender, and inguinal glands are swollen and painful. The lymphangitis may spread distally in a limb, which is the opposite of spread in bacterial lymphangitis. Epididymitis, which may or may not relapse, is another manifestation of the same process. The end stage is non-pitting lymphoedema with thickened, lichenified skin. The penis, scrotum or labia may be involved. The breast is sometimes involved. Infection with Brugia species tends only to affect the lower limbs. Filarial abscesses can develop along the line of lymphatic channels, more often proximally in the limb. These rupture and discharge, and the ulcerated area heals well. W. bancrofti infection may cause intermittent chyluria, in which anastomoses between intestinal and renal lymphatic channels are open; these are due to more proximal obstruction in main lymphatics leading to the cisternachylae and thoracic duct. An uncommon presentation of filariasis is referred to as tropical pulmonary eosinophilia (TPE). It occurs with both bancroftian filariasis and with *Brugiamalayi* infections. It takes 6 months before TPE develops with bancroftian infections, but only 3 months with Brugia. The manifestations of this condition are almost entirely pulmonary. Dyspnoea with cough, predominantly nocturnal, is the major symptom. Wheeze is not a usual feature. Chest X-rays may show a fibro nodular pattern and peripheral blood eosinophil counts are markedly raised (6.0 x 10^9/L is not uncommon), with strongly positive filarial serology. Day and night bloods are free of microfilariae. It is thought that this is a manifestation of hypersensitivity on the part of the host's immune system to the microfilariae, resulting in retention and destruction of the nocturnally released larvae within the pulmonary vasculature (Simonsen, 2008).

Drug mechanism of action

Albendazole is a drug of choice for intestinal nematodes with better spectrum of activity. It binds to beta tubulin thus preventing microtubule assembly; it also inhibits fumarase reductase thus decreasing levels of NADH and degradation of endoplasmic reticulum and mitochondria hence affecting ATP production. Diethylcarbamazine paralyses nematode muscles on neuro muscular junctions. Ivermectin is the drug which blocks neurotransmission by interfering with neuromuscular synapses. It acts on glutamate gated chloride channels which are common in nematodes, insects and ticks

thus paralyising pharyngeal and somatic muscles.

CHAPTER TWO

2.0. Material and Methods

2.1. Type of study

A cross sectional study wasconducted where a structured questionnaire was used to obtain information from the households about disease knowledge, drug uptake and compliance. A blood sample was collected to determine CFA prevalence and microfilaria among CFA positive.

2.2. Study area description

Location

The study was conducted in Mkuranga District. Mkuranga is one of the six districts of the Coast Region. It has a total of 2432sq km, of which 447 square kilometers are covered by water (The Indian Ocean); 52 square kilometers are forest reserve area and 1034 square kilometers of land suitable for cultivation. It lies between latitude $6^{o}35'$ S and 7^{o} 30′ S and between longitudes 38^{0} 45′ E and 39^{0} 30′ E. The District is adjacent to; Dar es Salaam Region in the North, the Indian Ocean in the East, Rufiji District in the south and Kisarawe district in the West.

Climate

The district experiences rainfall twice a year. The shorter rains start in October to December, and long rains from March to June. The average rainfall is between 800-1000 mm per annum. The rainfall is not reliable within the seasons. The short season experiences more variation than the long rain season. It is hot throughout the year with the average temperature of 28˚ centigrade.

Population

According to 2002 census report, the total population is 218,259 of whom 111,610 (52%) are females and 106,649 (48%) are malesThe people of Mkuranga primarily belong to four ethnic groups — the Zaramo, Ndengereko, Matumbi and the Makonde. Most people live in thatched houses with mud walls and earth floors. Fire wood is the major source of energy for cooking. The district has one district hospital providing necessary services. There are two government health centers, 32 dispensaries of which 20 are government-owned, 2 voluntary agencies owned and 10 private owned

dispensaries.

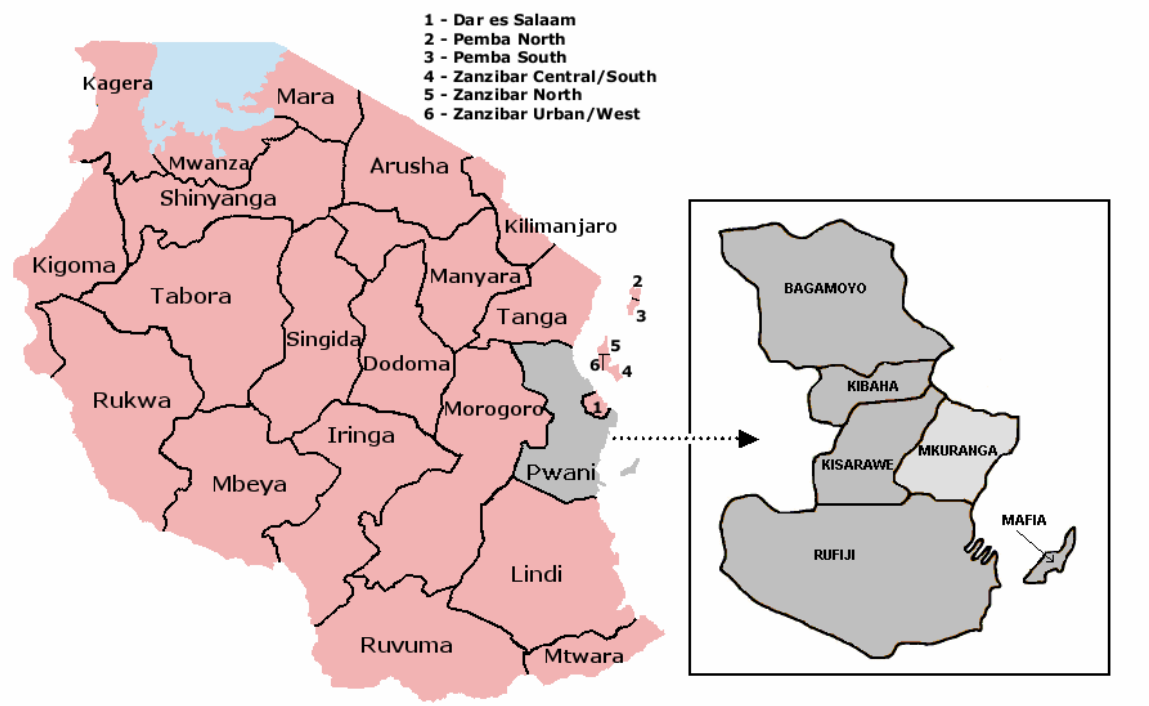
Geographical Features

The district is divided into two major agro ecological zones which differ due to land form as well as soil classification. The zones include the coast belt which includes Shungubweni Division, a part of Mkuranga and Kisiju divisions, it is a sandy area. Upland area is another zone that includes Mkamba and part of Mkuranga division. It has loam soil suitable for cultivation.

Administratively, the district is divided into 4 divisions which are Shungubweni, Kisiju,Mkamba and Mkuranga.There are 18 wards, 101 registered villages and 401 hamlets. The district has a total of 595 km of road network for transport and communication.

Economic activities, Ninety five percent of people depend on agriculture; few people own some animals and others depend on fishing. The district has trade centers, 20 secondary schools, 75 nursery school and 101 primary schools. Almost 190,000 persons live in the 15 wards (three coastal) and 101 villages (10 coastal) in the Mkuranga District. Dependency on natural resources is high, with over 90% of households dependent on natural resources for medicinal plants, fuel wood and building poles. Agriculture is the principal economic activity, with over 90% of the households engaged in farming. The most common food crops are cassava, rice and beans. Major cash crops are cashew nuts, coconuts, pineapples and oranges. (Torell etal. 2006).

Figure 1: Map of Tanzania showing Mkuranga District.



2.3. Studypopulation

Residents in Mkuranga District aged five years and above formed a study population.

2.4. Sampling method

Multi stage sampling method was used to obtain wards, villages and households.

2.5.Sample size estimation

The following formula was used to obtain sample size.

$$n = \left(\frac{1.96}{d}\right)^2 \pi (1-\pi)$$

Where:

n = required sample size

d = marginal error which is 0.05

π = proportion/prevalence which is 0.34 (1998 data from NLFEP- oral communication)

A sample size was adjusted by adding 10% of the required number.

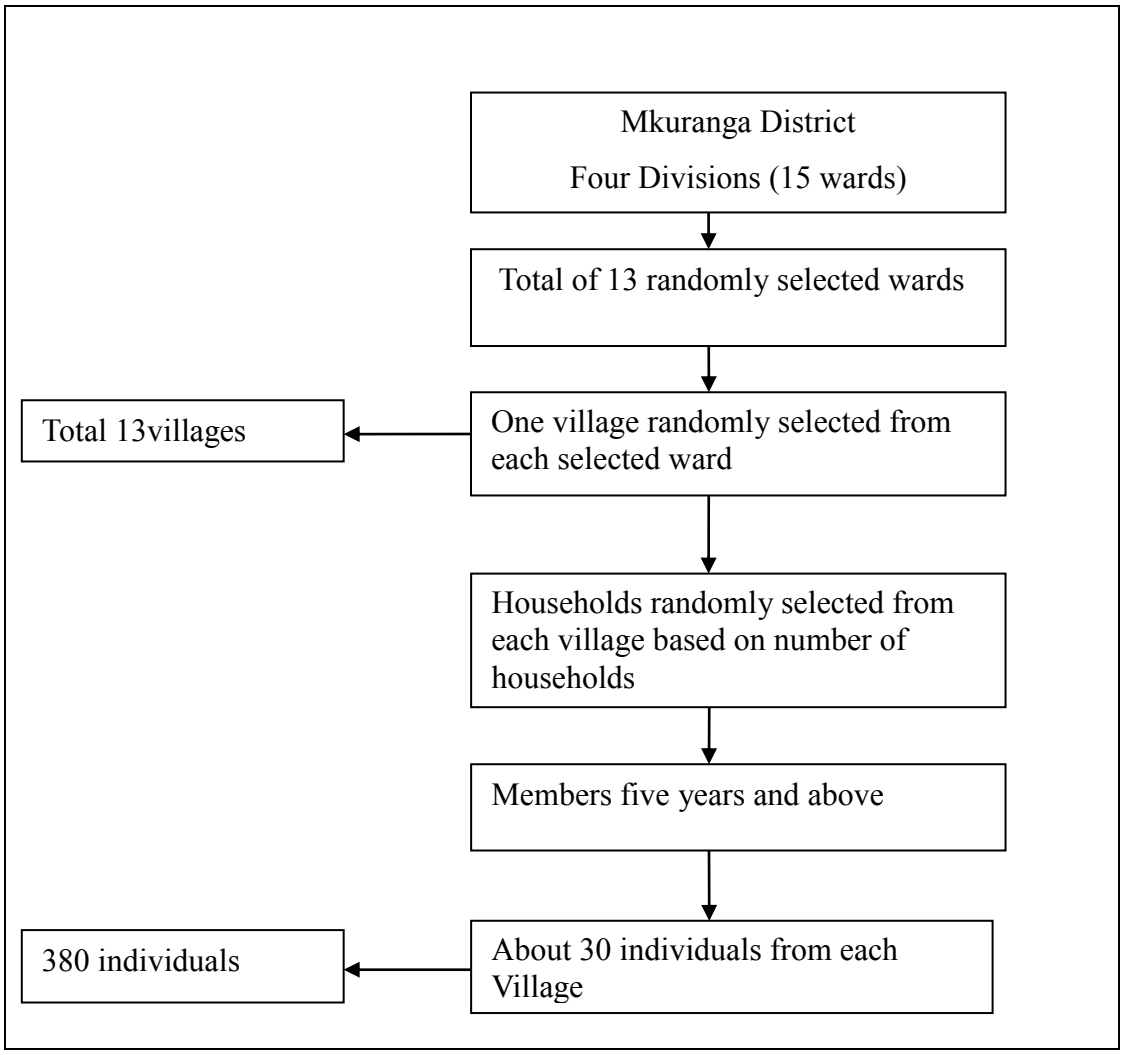
$$n = \left(\frac{1.96}{0.05}\right)^2 0.34\ (1-0.34) = 344$$

Adjusted sample size = 344 + 34.4 =378.4

A sample size of 380 from all four Divisions of Mkuranga District was studied.

2.6. Sampling procedure

Sampling frame showing sample size selection procedure



2.7. Inclusion criteria

All households of Mkuranga established in the past five years and household members five years of age and above who have been resident for five or more years were included in study.

2.8. Exclusion criteria

Children below five years and severely ill individuals, households andindividualsnot resident for five years in Mkurangawere not included in the study.

2.9. Study variables

Independent variables are MDA coverage, knowledge of disease and compliance with treatment over time, fecundity life span of worm in relation to MDA duration, prevention of human mosquito contact, age and sex.Dependent variables are *Wuchereria bancrofti* antigenaemia and microfilaraemia in human.

2.10.0. Data collection procedure

2.10.1.Immunochromatographic test

The detection of circulating filarial antigen by using ICT, this is a rapid card test manufactured by Binax (Scarborough, USA) which is specific for *W.bancrofti* CFA. 100µl of finger prick blood is taken using a capillary tube and then added to the sample pad of the card. The starting time was recorded on the card when it is closed and the results were read exactly after expiry of ten minutes as instructed by the manufacturer leaflet manual. All positives were circled at the positive mark on the pad after a pink line appears next to the control for all valid cards. For negatives only one pink line at control appeared and results recorded by circling negative at exactly expiry of ten minutes(Simonsen et al. 2011).

2.10.2.The counting chamber method

The counting chamber methodwas used for testing all tested positive with ICT card, to take 100µl of finger prick night blood 2100-0200 hrs using a capillary tube wastransferred to a tube containing900µl of 3% acetic acid(Simonsen et al. 2003and Simonsen et al. 2010) and mixed gently for preserving the parasite and Lysis of red blood cells. The specimens collected were transferred to the Muhimbili University of

Health and Allied Sciences Parasitology laboratoryfor identification and quantification of microfilaria.

2.10.3. Questionnaires

Questionnaires were used to obtain information on the drug uptake and compliance, knowledge about the disease and how they protect themselves from the disease.

2.10.4. Observation

Observationwas done to individuals with lymphoedema and staging was done(Dreyer et al 2002).

2.11. Pre testing of the questionnaire

Questionnaire was pre tested at Kiparang'anda A, a selected village for adjustment prior to data collection.

2.12. Data analysis

Data were entered in Microsoft excel and SPSS statistics 17.0 was used

1. The CFA positive proportion was grouped by age groupsand sex.
2. Alsomicrofilaria positives were grouped by age and sex.
3. The age group MDA coverage proportionswasshown.
4. The disease knowledge was assessed from head of household.
5. The age group with CFA positives but microfilaria negatives proportionswasshown.
6. The proportion of lymphoedemawas determined among CFA tested individuals.

2.13. Ethical consideration

Ethical approval was obtained from the Research and Publication Committee of Muhimbili University of Health and Allied Science (MUHAS). The permission to conduct the study in the study area was obtained from the District Executive Director of Mkuranga district. All villages and wards leaders in areas where this study wasconducted were informed and consent wasobtained. Informed consent was obtained from family heads and each participating individual prior to conducting the study and

those not wishing to participate were allowed to withdraw from the study. All CFA positiveswere treated.

2.14. Limitation of the study

a. Night blood collection among CFA positives was difficult because some participants didn't give a consent.
b. Expected recall bias on type of drug and numberof times individual swallowed was overcome by showing the types of drugs.
c. Data collection done during rainy season some sampled villages were reached with difficulty.

CHAPTER THREE

3.0. Results

This work was conducted in Mkuranga District from 9th April to22nd May 2013. During this period there was heavy rainfall.

3.1 Social-demographic characteristics of study sample

A total of 382 individuals were tested for CFA, of these 19 (5%) were CFA positive among those who were CFA positives 15 gave informed consent for night blood microfilaria microscopic testing. However all 382 were physically examined for lymphoedema and were interviewed with respect to drug uptake during the last MDA (2012) and willingness to take drug during the coming MDA round.

The social demographic characteristic of the study population is shown in table 1.The 5-15 age group accounts for 48.7 %(186/382) which is important for determining transmission interruption to new generation. The 36 and above age group accounts for 27.2%(104/382) which represent the age group which were 24 years of age and above in 2001 when the time MDA started in Mkuranga.

Table 1: Social demographic characteristics of the study sample

		Age group				
Gender		5-15	16-25	26-35	36+	Total
	Male	80(20.9%)	21(5.5%)	8(2.1%)	43(11.3%)	152(39.8%)
	Female	106(27.8%)	33(8.6%)	30(7.9%)	61(15.9%)	230(60.2%)
	Total	186(48.7%)	54(14.1%)	38(10.0%)	104(27.2%)	382(100.0%)
Division						
Kisiju		59(15.4%)	13(3.4%)	7(1.8%)	41(10.7%)	120(31.4%)
Shungubweni		20(5.2%)	5(1.3%)	4(1.0%)	2(0.5%)	31(8.1%)
Mkamba		72(18.8%)	19(5.0%)	14(3.7%)	36(9.4%)	141(36.9%)
Mkuranga		35(9.2%)	17(4.5%)	13(3.4%)	25(6.5%)	90(23.6%)
Total		186(48.7%)	54(14.1%)	38(10.0%)	104(27.2%)	382(100.0%)

3.2. Prevalence ofcirculating filarial antigen

The CFA results indicated 5% (19/382) prevalence and 95% (363/382) tested negative. The 36 years and above age group are more infected compared to other age groups 2.6% (10/382) of all tested whereby 5-15 age group was 1.3%(5/382). When CFA results were computed by sex (X^2=4.4557, p value=0.033, df = 1), the observed differences of CFA results by sex are statistically significant, males63.2 %(12/19) were more infected than females36.8 %(7/19)When CFA results were analyzed by administrative Divisions there was no statistical difference between the Divisions, (X^2=1.833, P value=0.608, df =3). The positivity by gender and Division is shown in table 2.

3.3. Prevalence of Microfilaria

Out of 19 circulating filarial antigen 15 who were positive tested for microfilaria. All the 15 tested were negative for microfilaria; this indicates zero prevalence of microfilaria. This implies that mosquitoes are less likely to be infected during night blood meal.

3.4. Physical examination

All 382 were physically examined, only three in the age group of 36 years and above were found to have lymphoedema stage three and four no other age group was having lymphoedema. The result shows that 0.8 % (3/382) had lymphoedema and all tested CFA negative. When the results were analyzed by age groups there was a statistically significant difference between those aged 36 years and above were with lymphoedema compared to other age groups(X^2=8.083, P value = 0.044, df =3). The lymphoedema status is corresponding to circulating filarial antigen position, where there were 10 positives out of 19 in the 36 and above age group.

Table 2: Circulating filarial antigen results

	Age group				
	5-15	16-25	26-35	36+	Total
CFA					
+	5(1.3%)	3(0.8%)	1(0.3%)	10(2.6%)	19(5.0%)
-	181(47.4%)	51(13.3%)	37(9.7%)	94(24.6%)	363(95.0%)
Total					382(100%)
Sex	5-15	26-35	25-35	36+	Total
Male +	3(15.8%)	3(15.8%)	1(5.3%)	5(26.3%)	12(63.2%)
Female +	2(10.5%)	0(0.0%)	0(0.0%)	5(26.3%)	7(36.8%)
Total	5(26.3%)	3(15.8%)	1(5.3)	10(52.6%)	19(100%)
Division	5-15	26-35	25-35	36+	Total
Kisiju	2(10.5%)	1(5.3%)	0(0.0%)	3(15.8%)	6(31.6%)
Shungubweni	0(0.0)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
Mkamba	1(5.3%)	1(5.3%)	1(5.3%)	5(26.3%)	8(42.1%)
Mkuranga	2(10.5%)	1(5.3%)	0(0.0%)	2(10.5%)	5(26.3%)
Total	5(26.3%)	3(15.8%)	1(5.3%)	10(52.6%)	19(100%)

3.5. Coverage of MDA in 2012

Through the household interview it was found that 72.3% (276/382) had participated in the last MDA round of 2012.The results shows no significant difference in coverage when age groups are analyzed bysex for males and females. There is a difference in coverage by administrative division where Shungubweni andMkuranga showsmedium coverage during 2012 MDA51.6 %(16/31) and 57.8 %(52/90) respectively.The social demographic details are shown in the table 3.

Table 3: Surveyed Mass Drug Administration coverage 2012

		Age groups				
Gender		5-15	16-25	26-35	36+	Total
Male	Yes	56(14.6%)	14(3.7%)	4(1.0%)	34(8.9%)	108(28.3%)
	No	24(6.3%)	7(1.8%)	4(1.0%)	9(2.4%)	44(11.5%)
Female	Yes	74(19.4%)	26(6.8%)	19(5.0%)	49(12.8%)	168(44.0%)
	No	32(8.45)	7(1.8%)	11(2.9%)	12(3.1%)	62(16.2%)
Total						382(100%)
Division		5-15	16-25	26-35	36+	Total
Kisiju	Yes	44(36.7%)	11(9.2%)	5(4.2%)	33(27.5%)	93(77.5%)
	No	15(12.5%)	2(1.7%)	2(1.7%)	8(6.7%)	27(22.5%)
						120(100%)
Shungubweni	Yes	7(22.6%)	5(16.1%)	2(6.4%)	2(6.4%)	16(51.6%)
	No	13(41.9%)	0(0.0%)	2(6.4%)	0(0.0%)	15(48.4%)
						31(100%)
Mkamba	Yes	58(41.1%)	15(10.6%)	12(8.5%)	30(21.3%)	115(81.6%)
	No	14(9.9%)	4(2.8%)	2(1.4%)	6(4.2%)	26(18.4%)
						141(100%)
Mkuranga	Yes	21(23.3%)	9(10.0%)	4(4.4%)	18(20%)	52(57.8%)
	No	14(15.6%)	8(8.9%)	9(10.0%)	7(1.4%)	38(42.2%)
						90(100%)

Out of those who didn't swallow drug during the 2012 MDA their reasons are shown in the table 4. Where 75.7 % (81/107) were not at home by the time drug distributers came.

Table 4. Responses to not swallowing drugs2012 MDA as obtained from Mkuranga

Reason	5-15	16-25	26-35	36+	Total
Absent	40(37.4%)	11(10.3%)	12(11.2%)	18(16.8%)	81(75.7%)
Didn't like	1(0.9%)	1(0.9%)	1(0.9%)	1(0.9%)	4(3.7%)
Was pregnant	0(0.0%)	2(1.9%)	2(1.9%)	1(0.9%)	5(4.7%)
Under 5 years	16(15.0%)	0(0.0%)	0(0.0%)	0(0.0%)	16(15.0%)
Was sick	0(0.0%)	0(0.0%)	0(0.0%)	1(0.9%)	1(0.9%)
	57(53.3%)	14(13.1%)	15(14%)	21(19.6%)	107(100%)

The reported MDA coverage was obtained from NLFEP HQ and Mkuranga District are shown in table 4.

Table 5: Reported MDA coverage in Mkuranga District

Year	Total population	Eligible population	Treated	Percentage coverage	
2001	187428	-	100,109	53.41%	
2002	187428	-	102034	54.43%	
2003	187428	-	127,577	68.06%	
2004	196777	-	119020	60.48%	
2006	193,469	163,099	133,665	69.09%	
2007	193,469	-	117,822	60.9%	
2011	227,990	177,215	133,336	75.24%	
2012	227,990	-	183,046	80.29%	

3.6. Compliance to Mass drug administration

The proportion of eligible individuals ready to take drug in coming round of MDA is 96.9% (370/382) table6. When the willingness to participate in MDAare analyzed by sex and age groups, the results are statistically insignificant,(X^2, p value=0.642df =1) and(X^2, p value=0.274,df =3) respectively. When analyzed by division there is no significant difference between divisions all are equally ready for the coming MDA.

Table 6: Compliance to MDA for coming rounds by gender

Gender	5-15	15-25	26-35	36+	Total
Male Yes	79(20.6%)	18(4.7%)	8(2.1%)	43(11.2%)	148(38.7%)
No	1(0.3%)	3(0.8%)	0(0.0%)	0(0.0%)	4(1.0%)
Female Yes	103(27.0)	32(8.4%)	29(7.6%)	58(15.2%)	222(58.1%)
No	3(0.8%)	1(0.3%)	1(0.3%)	3(0.8%)	8(2.1%)
Total	186	54	38	104	382(100%)

Table 7: Compliance to MDA for coming rounds by Division

	5-15	16-25	26-35	36+	Total
Division					
Kisiju					
Yes	59(49.2%)	13(%10.8)	7(5.8%)	41(34.2%)	120(100%)
No	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
					120(100%)
Shungubweni					
Yes	18(58.0%)	5(16.1%)	4(12.9%)	2(6.5%)	29(93.5%)
No	2(6.5%)	0(0.0%)	0(0.0%)	0(0.0%)	2(6.5%)
					31(100%)
Mkamba					
Yes	71(50.4%)	16(11.3%)	14(9.9%)	33(23.4%)	134(95.0%)
No	1(0.7%)	3(2.1%)	0(0.0%)	3(2.1%)	7(5.0%)
					141(100%)
Mkuranga					
Yes	34(24.1%)	16(11.3%)	12(8.5%)	25(17.7%)	87(96.7%)
No	1(1.1%)	1(1.1%)	1(1.1%)	0(0.0%)	3(3.3%)
					90(100%)

3.7. Disease knowledge

The disease knowledge was assessed through questionnaire to the household leader where correct responses were ranked and graded as shown in the table 8. The results show that larger proportions of house hold leaders have low and medium knowledge 33.9% and 40.7% respectively as compared to high knowledge 25.4%.

Through questionnaire we assessed the disease familiarity among household leaders where 100 % (59/59) know the disease. Out of the interviewed household leaders 84.7% (50/59) have heard about the National Lymphatic Filariasis Elimination Program andall household leaders 100 %(59/59) have heard about Lymphatic filariasis drug distributionwhich is one of the activities of NLFEP.They also indicated that they were ready ready for their family to take the drugs the coming rounds.

Table.8. Level of disease knowledge

Score	Frequency	Percent	level
0 - 4	20	33.9	Low 33.9%
5 - 6	24	40.7	Medium 40.7%
7 +	15	25.4	High 25.4%
Total	59	100.0	
Mean = 5.0508 Median =5.0000			

3.8 Comparison with pre intervention data in Mkuranga

A similar pre intervention study conducted in Mkuranga District showed CFA prevalence to be 34% in 1998. Intervention started in 2001 with Mass Drug Administration (Ivermectin + Albendazole) on annual basis. The present study shows 5% prevalence of CFA, a reduction of 29%.

CHAPTER FOUR

4.1. Discussion

Demographic results

This study aimed at assessing the impact of MDA intervention in Mkuranga District.

The study population demographic showed that more females were recruited than males.The unit of randomization was the household and not individuals.During the time of the study there were agricultural activities and these possibly could be the reason for males staying in farms and were not available during the study.

CFA prevalence

A total of 19 out of 382 tested CFA positive with a prevalence of 5% CFA prevalence.The current rate of CFA is reducedby 29% after eight roundsfrom the pre-MDA prevalence of 34% (NLFEP, 1998).The low CFA positive rate in younger age group 2.7% (5/186) than older age group 9.6% (10/104) is most probably due to reduced transmission by the MDA intervention done for eight rounds in Mkuranga District. The community study done in Papua NewGuineain 2011 found a significant reduction in CFA following MDA. The analysis of data from all villages shows a significant decrease in circulating filarial antigenemia (CFA) over this period from a mean prevalence of 18% to 4% which is a 14% reduction after five MDA rounds(Mitjà et al. 2011). A similar CFA reduction following MDA at Tanga among standard one primary school children from 2004 to 2009 had shown a significant decrease in CFA from 25.2% of 2004 to 6.4% of 2009 with a 18.8% CFA reduction but no significant difference between male and female during pre-MDA (24.3% v/s 25.2%) and post- MDA 2009 (6.7% v/s 6.4%)(Simonsen et al. 2011).This study had 7.9%(12/152) male infected as compared to 3.0%(7/230) females although few males participated in the study compared to females.

Microfilaria

The zero prevalence of microfilaria among all who tested positive with ICT filariasisfollowing the eighth MDA round suggestsa continued transmission interruption due to interventions, although more vector studies are needed to confirm the results. The study done in Tanga since pre MDA 2004 has shown a decrease in microfilaria prevalence from 24.5% to 10.1% in 2007 five months after the third MDA which was a

15% reduction accompanied with decrease microfilaria intensity by 17.0 % of pre MDA value(Simonsen et al. 2010).

The study done in Haiti in2000had baselinemicrofilaraemia prevalence rates of 0.8%, 7%, 12%, and 16% in four sentinel sites. Microfilaraemia prevalence decreased significantly in each of the sentinel sites after 2004 MDA (one site, $p = 0.0291$; each of the other sites, $p<0.0001$ (Grady et al. 2007).Samoa was one of the first countries to initiate MDA in1999. Surveys following the fifth round of countrywide MDA carried out in 2003 found an overall microfilaraemia prevalence of 0.4% and 1.1% antigenaemia. Out of 16 sampling units, 7 had an antigenaemia prevalence of >1% while 2 had a microfilaraemia prevalence of >1%(Rica et al. 2006).

Lymphoedema

The older age group had lymphoedema0.8% (3/382). In the young age group there was no lymphoedema.This is expected since interruption of transmission has positive impact on the younger age group hence no lymphoedema in this age group. A study done in an adjacent area,Rufiji in 1990's before MDA started showprevalence of lymphoedema 3.1%(141) of 4576 individuals (Gasarasi et al. 2000).Another study done in the Coast of Ghana to determine the prevalence of clinical manifestation found that lymphoedema affected 5.6% to 6.6% of adults 20 years and above in the community(Dunyo et al. 1996).

Coverage

This study found a high reported MDA coverage of Mkuranga District of 80.3% and a 72.3% of the surveyed coverage among study population is promising for transmission interruption. Coverage and compliance to MDA are the twin factors contributing to transmission interruption(Simonsen et al. 2011).

The study done in Mkuranga 2004 to determine the reasons for non compliance found 64.1 % (161/251) were compliant to anti filarial treatment (Nanjenu, 2004). Another study done in India on evaluation survey on MDA for Lymphatic filariasis, the coverage rate was 32.7% which was much lower than the reported coverage of 89.05% by District authority(Ranganath 2010).In Sri Lanka 2005 MDA coverage was between 84% and 91% of eligible population was achieved(Rica et al. 2006).

Egypt was one of the first countries to target the entire at-risk population with MDA beginning in 2000. By 2004, one hundred sixty one (161) villages had completed fiveMDA rounds and 153 villageshad satisfied the criteria for stopping MDA. During 2005, 40 endemic villages with a total population of 0.8 million continued to receive MDA, with reported drug coverage ratesbetween 97% and 99.8% and 100% geographical coverage(Rica et al. 2006).

This study showsthe 2012 MDA coverage of 72.3% (276/382)whereby out of those who didn't take drugsthe main reasonwas absent by thetime drug distributers came the proportion was75.7%(81/107)and 5-15 age group accounted for 37.4%(40/107) of those missed drug by not being at home by the time drug distributers came. The 36 and above age group accounted 16.8 %(18/107) of those who missed drugs by being absent at home by the time drug distributers came which is a larger proportion as linked to CFA results where 36and above age group had 52.6%(10/19) this is likely to reduce the impact of transmission interruption through MDA.

Compliance

In the current study the willingness of the study population to take drugs in the next MDA roundwas97 %(370/382).In the study done in India to determine compliance in communities treated with different programs showed differences in compliance to MDA the community under community based pre MDA and lymphoedema management education had 90.2% adherence to DEC, community based pre- MDA education had 75.0% and pre-MDA Ministry of Health campaign only 52.9%(Cantey et al. 2010b) The communitybased education has power to increase compliance to drug and related coverage.

The study done in Orissa state, India to assess performance of educational campaign on compliance came with the following findings. Publicity for MDA should begin 1 month in advance of the date of drug distribution. Educational messages should be concise, clear, and simple and should address the purpose of the MDA medication is to prevent LF, LF is transmitted by mosquitoes, Everyone is at risk for LF, One may be infected with the parasite that causes LF and still feel well , Side effects of the MDA medication

are mild and easily treated without leaving one's village, Side effects often occur because the medication, is killing the parasites, and side effects are less likely with each year that one complies with the MDA programme. It is important to evaluate population compliance with the MDA programme. Tools of programme evaluation can be used to improve the impact of health education programmes(Cantey et al. 2010).From this study the mostaffected age group is 36 years and above with compliance of 97.1%(101/104) which is high and promising for interrupting transmission because it is the age group with high infection proportion 52.6%(10/19).The 5-15 age group has 97.8% (182/186) compliance to MDA, this is promising that the coming MDA coverage will be high if proper arrangements and campaigns are done so as to reduce the proportion of those who didn't take drug by being absent at home when drug distributors came 75.7%(81/107).

The study has revealed that population has adequate sensitization and if this trend of coverage and compliance continues perhaps a bigger reduction in prevalence can be achieved.

Disease knowledge

The disease is well known to residents, but actual cause is not known although majority of families are using long lasting insecticide treated nets due to malaria control program. Few have high knowledge about cause and transmission of the disease 25.4 % (15/59) although 100 %(59/59) know the chronic manifestation of the disease and are willing to take drugs the coning MDA rounds.This shows the community has adequate sensitization on MDA. The study done in Orissa state, India to assess performance of educational campaign on two communities with different access to social actions came with the following findings. Church auxiliary social action 91% knew MDA was to prevent LF, 65% knew LF transmitted by mosquitoes and 41.3% knew that everyone is at risk of LF. In the non-Church auxiliary social action 75% knew MDA was to prevent LF, 29.6% knew LF is transmitted by mosquito and 41.3% knew everyone is at risk of LF(Cantey et al. 2010b)

CHAPTER FIVE

5.1. Conclusion

There has been a marked reduction in circulating filarial antigen, presence of microfilaria and lymphoedema after eight rounds of MDA. The knowledge regarding the intervention is relatively high however knowledge about the disease and causation remain low. The coverage is about 70% but compliance to Drugs is very high about 96%.

5.1. Recommendation

1. The annual Mass drug administration should continue.
2. Improve coverage especially to the younger age group. May be there is reason to extend from household to even cover primary and secondary schools.
3. There is a need to create more awareness and increase health education activities so as to increase and maintain high coverage and compliance.
4. Maintain accurate records of household and individual who take drugs at village level.
5. There is a need to do evaluation on regular basis and include vectors.

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APPENDICES

Appendix A: Informed Consent form, English Version

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCIES
DIRECTORATE OF RESEARCH AND PUBLICATIONS, (MUHAS)
INFORMED CONSENT FORM FOR PARENTS OR GUARDIANS

Form No……..

I am **Vedasto Bandi,** a student from MUHAS doing a study on lymphatic filariasis among villagers in Mkuranga District. I have passed to your district leaders and they have allowed me to proceed with this study. I have also met with your community leaders and local leaders in this village and they have given me the permission to proceed with my study.

You all understand that diseases have problems, like the disease I want to study in your area. Problems associated with lymphatic filariasis include, acute filarial fever, adenolymphangitis, disfiguring of body part limbs, genitals and breasts.

Purpose of this study

This study aims to evaluate the impact of the lymphatic Filariasis Elimination Programme in Mkuranga.

Participation involved

If you agree to join the study, you will be required to give some blood specimen and answer some questions.

Benefits and Risks

First participating in this study allows understanding the prevalence in your area following MDA and it will also identify factors associated with it, all this allows health authorities to plan for better control intervention.

No harm for those who will voluntary participated in the study and for those who will be found positive with the disease will be referred for treatment into nearby health facility and be treated under LF programme.

Confidentiality

All issues pertaining to participation will be kept confidentially and no any unauthorized person will have access to the data. Findings will be provided to your District Medical officer on request they will be available.

Address

If you have any enquires or reservation you may contact me by sending a letter using this address: **Vedasto Bandi, MUHAS, P .O. BOX 65015 Dar es Salaam**. Or if you have serious question about your child's rights as a participant you may contact my supervisor **Prof. Mainen J. Moshi, Chairman of the Senate Research and Publications Committee, P.O. BOX 65001, Dar es Salaam.** Tel 2150302-6, 2152489.

Agreement part

I therefore request you and your child to participate in this study, participation in this study will involve asking some questions and a blood sample taking for *W.bancrofti* detection and if positive for night blood finger prick for examination of microfilaria.

Now **DO YOU AGREE** **YES: …… NO: ……** (Put tick for appropriate response)

If you agree, sign it below

Parent/Guardian sign: …….. Date ……..

Data collector sign: ……. Date ……

***Appendix B*: Informed Consent form, Swahili Version**

CHUO KIKUU CHA SAYANSI YA AFYA NA TIBA SANIFU CHA MUHIMBILI
Fomu ya Makubaliano na Walezi au Wazazi wa Watoto

Namba ya Fomu……..

Mimi naitwa **Vedasto Bandi**ni mwanafunzi wa Chuo Kikuu MuhimbiliI nikisomea shahada ya udhamili katika fani ya wadudu wasababishao magonjwa. Nipo hapa Mkuranga katika utafiti wa ugonjwa wa matende kwa wakazi wa vijiji vya wilaya ya Mkuranga, nimetoa taarifa za kuwepokwangu katika wilaya hii kwa viongozi wa wilaya na wameniruhusu kuendelea na utafiti wangu. Pia nimefika katika ofisi za viongozi wa kijiji kutoa taarifa ya kuwepo kwangu nao pia wameniruhusu..

Wote tunafahamu kuwa magonjwa mbalimbaili huathili afya na utendaji kazi mbalimbali na mara nyingine hufanya mgonjwa kukosa amani kutokana na ugonjwa alionao, matende ni sehemu ya magonjwa hayo. Moja ya matatizo yanayoambatana na matende ni homa za mara kwa mara zinazoambatana na mtoke na kuvimba miguu,mikono,matiti na sehemu za siri.

Dhumuni kuu

Kufanya utafiti juu ya ukubwa wa tatizo la vimelea vya matende katika wilaya ya Mkuranga baada ya kugawiwa dawa kwa muda wa miaka mingi na kujua mambo husishi na ugawaji wa dawa ili hatua thabiti zaidi za kupunguza vimelea kuenea wilayani kuchukuliwa.

Ushiriki

Endapo utakubali utatakiwa kutoa damu mchana/usiku kwa ajili yakuchunguza vimelea vya matende na kujibu maswali mbalimbali.

Faida na hasara

Kuelewa ukubwa wa tatizo baada ya kugawa dawa kwa miaka mingi katika wilaya yenu

na kufahamu pia mambo yaambatanayo na ugawaji dawa.

Zoezi hili halina tatizo kwa mshiriki na pia ushiriki ni wa hiyali na wale wote watakaopatikana kuwa na ugonjwa watapatiwa matibabu.

Usiri

Taarifa zote za mshiriki ni siri na hakuna wa kuziingilia isipokuwa mimi mwenyewe.

Mawasiliano

Kwa yeyote mwenye kutaka kujua zaidi anaweza kuwasiliana na mimi kwa barua akiandika **Vedasto Bandi, MUHAS, S.L.P 65015 Dar es Salaam**. Au kufanya mawasiliano na msimamizi wangu kwa kumwandikia **Prof. Mainen J. Moshi, Chairman of the Senate Research and Publications Committee, P.O. BOX 65001, Dar es Salaam.** Tel 2150302-6, 2152489

Kipengele cha Makubaliano

Baada ya maelezo hapo juu, nakuomba sasa umuruhusu motto aweze kushiriki katika utafiti wangu, ataulizo maswali na nitaomba anipatie damu kwa utafiti wa kimaabara.

UNAKUBALI **Ndiyo: ……** **Hapana: ……** (weka tiki panapostahili)

Kama ni ndiyo weka sahihi hapo chini

Mzazi/Mlezi: …….. Tarehe ……..

Mtafiti: ……. Tarehe ……

***Appendix C*: Questionnaire English Version**

1. Name of the interviewee_____
2. Serial number_____
3. Sex _____
4. Age _____
5. Date of interview_____
6. Name of Interviewer _____
7. Name of village_____
8. Ward_____
9. Division_____
10. Name of the tenth leader_____

PART A: General information from the head of household

(The responses are filled by the researcher.)

1. **(*Tick appropriately*)**

	Knowledge assessment	**Yes**	**No**
1.	Have you heard of lymphatic filariasis		
2.	Have you heard of Lymphatic Filariasis Elimination programme?		
3.	Have you ever heard of LF MDA campaign?		
	1. Heard through radio		
	2. Announcements in the village		
	3. Hospital/health center information		
	4. School children informed me.		
	5. My friend, neighbor or family member informed me.		
4.	Do you know how lymphatic filariasis is transmitted?		
5.	Do you use bed net		

6.	Which type 1. ITN		
	2. LLITNs		
7.	If no why		
	1. Expensive		
	2. Not available		
	3. I don't like		
8.	Is drinking coconut fluid Contributes to Lymphatic filariasis		
9.	Does contaminated water transmit LF		
10.	Is lymphatic filariasis due to curse?		
11.	Is lymphatic filariasis due to be witched?		
12.	Is hydrocele due to sexual activity		
13.	Is hydrocele a sign of manhood		
14..	Other causes of lymphatic filariasis.		
	1. Hereditary		
	2. Living in Coastal Region		
	3. Having many partners		

2. Tick where appropriate

	MDA assessment	Yes	No
1.	Did you get information about the last MDA?		
2.	Did you take drug in the last MDA?		
3.	How many times have you taken LF drug during MDA?		
	1. Once		
	2. Twice		
	3. Three times		

	4. Many times		
4.	Are you ready to take drugs during the coming MDA?		
5.	If your family didn't take drugs, what was the reason?		
	1. Drug distributors didn't come to my house		
	2. My family was not here by the time of distribution		
	3. I am a new member of this village		
	4. Probably drugs were not enough because some of the houses like mine didn't get drugs.		
6.	If present and didn't take what was the reason		
	1. Due to allergy		
	2. Due to rumours related to drug		
	3. Don't like but no reason		
7.	If there were rumours which are they?		

3. Tick where appropriate

	Disease assessment	**Yes 1**	**No 2**
1.	Have you seen a person with hydrocele or lymphoedema?		
2.	Among family members		
3.	At the nearby family		
4.	At the health centers		
5.	In the nearby village		
6.	Don't remember where		

5. Did any of your family members experience any of the following in the past month? (***tick appropriate)***

	Symptoms	Tick
1.	Acute filarial fever	
2.	adenolymphangitis	
3.	Painless swelling of legs	
4.	Painless swelling of scrotum	
5.	Painless swelling of breasts	

6. What do you do if you see a situation like that? (***Tick appropriate***)

	Action	**tick**
1.	Report to the dispensary	
2.	Report to Tradition healers	
3.	Use Herbs	
4.	Nothing done till recovers itself	

Signature of interviewee _____

Signature of interviewer _____

PART B: Parasitological examination

Information of participants in the household

1. Age_____
2. Sex_____
3. Resident since _____year
4.

	Sample/disease	**Yes 1**	**No 2**
i.	Blood for CFA		
ii.	Blood for microfilaria		
iii.	Hydrocele/lymphoedema		
iv.	Have you taken LF drug during the last MDA		
v.	Are you ready to take drug in the coming MDA		

5. CFA and microfilaria examinationamong CFA positives (***Circle appropriate one***)

	Results	**positive**	**Negative**
a.	CFA		
b.	*W.bancrofti* microfilaria larvae count per 100µl of finger prick blood_____		

Signature of interviewee _____

Signature of interviewer _____

***Appendix D*: Questionnaire Swahili Version**

1. Jina la msailiwa_____
2. Namber ya fomu_____
3. Jinsia _____

4. Umri _____
5. Tarehe ya masailiano_____
6. Jina la msaili _____
7. Jina la kijiji_____
8. Kata_____
9. Tarafa_____
10. Jina la Balozi wa nyumba kumi_____
11. Mkazi wa Mkuranga tangu mwaka_____

Sehemu A: Taarifa za jumla toka kwa kiongozi wa familia

(majibu yajazwe na mtafiti)

1. (***weka tiki sehemu inayofaa*** **)**

	Tathmin ya welewa	**Ndiyo 1**	**Hapana 2**
1.	Umewahi sikia ugonjwa wa matende na mabusha?		
2.	Umewahisikia kuusu mradi wa kutokomeza matende na mabusha?		
3.	Umewahi sikia kampeni za kugawa dawa za matende namabusha?		
	1. Umesikia redioni?		
	2. Matangazo kijijini		
	3. Taharifa toka zahanati		
	4. Watoto wa shule wamekupa taharifa.		
	5. Marafiki,majirani mmoja katika familia alinijulisha.		
4	Unajua matende na mabusha yanaeneaje?		
5.	Mnatumia net ukilala usiku?		
6.	Aina gani? 1. Neti ya dawa		

	2. Neti ya dawa ya muda mrefu		
7.	Kama hutumii, ni kwa sababu ipi?		
	1. Gharama kubwa		
	2. Haipatikani		
	3. Sipendi		
8. .	Kunywa maji ya madafu kunaeneza matende?		
9.	Matende na mabusha yanatokana na laana?		
10.	Matende na mabusha yanatokana na kulogwa?		
11.	Je mabusha hutokana na kufanya ngono?		
12.	Je mabusha ni ishala ya kuwa mwnaume kweli?		
13.	Je maji machafu hueneza matende?		
14.	Sababu nyingine zisababishazo mabusha/matende.		
	1. kurithi		
	2. Kuishi pwani		
	3. Kuwa na wapenzi wengi		

2.Tick panapofaa

	Tathmini ya ugawaji wa dawa(MDA)	**Ndiyo 1**	**Hapana 1**
1.	Ulipata taarifa ya mgao wa dawa ya matende wa mara ya mwisho?		
2.	Mlikunywa dawa za matende na mabusha mara ya mwisho?		
3.	Mmekunywa dawa ya matende mara ngapi?		
	1. Once		
	2. Twice		
	3. Three times		
	4. Many times		

4.	Upo tayari kunywa dawa kwa awamu nyingine zijazo?		
5.	Kama familia yako haikunya dawa, sababu ilikuwa ni nini?		
	1. Wagawa dawa hawakufika nyumbani kwangu		
	2. Familia yangu haikuwepo wakati wa kugawa dawa		
	3. Mimi na familia yangu ni wahamiaji		
	4. Nadhani dawa hazikutosha kwani familia yangu na familia jirani hazikupata..		
6.	Kama mlikuwepo na hamkupata, sababu ni ipi?		
	1. Alegi ya dawa		
	2. Fununu kuhusu ubaya wa dawa		
	3. Sikupenda na sina sababu		
7.	Kama kulikuwa na rumours, ni zipi hizo?		

3. Umewahi kumuona mgonjwa wa matende na mabusha (***Tick appropriate***)

	Tathmini ya ugonjwa kufahamika	**Ndiyo 1**	**Hapana 2**
	Umewahi muona mgonjwa wa matende		
	Among family members		
	At the nearby family		
	At the health centers		
	In the nearby village		
	Don’t remember where		

4. Did any of your family members experience any of the following in the past month? (***Tick appropriate)***

1.	**Symptoms**	**Yes 1**	**No 2**
2.	Homa za marakwa mara		
3.	Homa za marakwa mara ziambatanazo na kuvimba mtoke		
4.	Kuvimba miguu kusikouma		
5.	Kuvimba kwa sehemu za siri za kiume		
6.	Kuvimba kwa matiti kusiko uma		

5. Unafanya nini unapoona hali kama hiyo katika familia yako? (***Tick appropriate***)

	hatua	**Yes 1**	**No 2**
1.	Naripoti zahanati		
2.	Naenda kwa waganga wa kienyeji		
3.	Natumia miti shamba		
4.	Sifanyi kitu mpaka inaisha yenyewe		

Signature of interviewee _____

Signature of interviewer _____

PART B: Dodoso na Uchunguzi wa mdudu

Taarifa za mshiriki katika familia

1. Umri_____

   Jinsia_____

2. Mkazi wa Mkuranga tangu mwaka_____

3.

	Utoaji damu, ugonjwa na dawa	**Ndiyo 1**	**Hapana 2**
1.	Damu CFA Imechukuliwa		
2.	Damu kwa ajili ya microfilaria imechukuliwa		
3.	Una Matende/ mabusha		
4.	Umekunywa dawa ya matende katika migao ya dawa iliyopita?		
5.	Upo tayari kunywa dawa katika migao ijayo?		

4. CFA and microfilaria examinationamong CFA positives (***Circle appropriate one***)

	Results	**positive**	**Negative**
i.	CFA		
ii.	*W.bancrofti* microfilaria larvae count per 100µl of finger prick blood_____		

Sahihi ya msailiwa _____

Sahihi ya msahili _____

AppendixE. Guideline for scoring knowledge

	Item	score
Causes/transmission	Transmission	1=1,2=0,0=0
	Coconut juice	1=0,2=1,0=0
	curse	1=0,2=1,0=0
	Bewitched	1=0,2=1,0=0
	Sexual intercourse	1=0,2=1,0=0
	Stepping in dirty water	1=0,2=1,0=0
	inheritance	1=0,2=1,0=0
	Living along the coast	1=0,2=1,0=0
	Having multiple partners	1=0,2=1,0=0
Total maximum score possible		9

1=1 True response to true statement

1=0 false response to true statement

2=0 false response to a true statement

2=1 true response to false statement

0=0 no response

*Appendix F:*Ethical clearance letter for the study

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Ref. No. MU/PGS/SAEC/Vol. VI/

22nd March, 2013

Mr. Vedasto J. Bandi,
MSc. in Parasitology Medical Entomology,
MUHAS.

RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED "EVALUATION OF THE LYMPHATIC FILARIASIS ELIMINATION PROGRAM IN MKURANGA DISTRICT, COAST REGION"

Reference is made to the above heading.

I am pleased to inform you that, the Chairman has on behalf of the Senate approved ethical clearance for the above-mentioned study.

Thus ethical clearance is granted and you may proceed with the planned study.

Please liaise with bursar's office to get your research fund.

Prof. O. Ngassapa
DIRECTOR, POSTGRADUATE STUDIES

/emm

cc Vice Chancellor, MUHAS
cc Deputy Vice Chancellor – ARC, MUHAS
cc Dean, School of Public Health and Social Sciences