PERCEIVED BARRIERS AND FACILITATORS TO OPTIMAL COVERAGE OF MASS DRUG ADMINISTRATION FOR THE TREATMENT OF LYMPHATIC FILARIASIS AND ONCHOCERCIASIS IN EKITI STATE, NIGERIA.

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DECLARATION

I, Peace Oluwatoyin Alabi hereby declare that this research report is my work. The same is being presented for the Degree of Master of Science Epidemiology in the field of Implementation Science at the University of the Witwatersrand, Johannesburg, South Africa. It has not been presented previously in any University for any degree or examination at any time.

---------- **October 2022.**

Signature Date

DEDICATION

I dedicate this research report to God the Father, Son and Holy Ghost; the Trinity that bears records on heaven, Alpha and Omega, for the grace I have received from Him over this work. To my dear loving husband Pastor Tunde Alabi, who has given me every necessary support and encouragement to ensure I have this degree. To my wonderful children Joshua and Blessing.

ABSTRACT

Background

Mass Drug Administration (MDA) has been found by several studies to be a vital tool for the eradication of lymphatic filariasis and onchocerciasis in all endemic communities. MDA optimal coverage entails both the therapeutical and geographical coverage of all people in the endemic population. The report of Ekiti State in the year 2020 shows 67.2% therapeutic coverage compared to the minimum requirement of 80% recommended by WHO and there are many people and some communities that are yet to be covered. Hence, there is a need to study the factors that pose as barriers and facilitators to optimal coverage of MDA in Ekiti State, Nigeria.

This study aims to explore actors' and stakeholders' perceived barriers and facilitators of optimal coverage of MDA for the treatment of lymphatic filariasis and onchocerciasis in Ekiti State, Nigeria.

Methods

A qualitative research design was used to explore the perceived barriers and facilitators to optimal coverage of MDA through in-depth and key informant interviews with frontline health workers who are Community Health Extension Workers (CHEW), community people and state officers in the Neglected Tropical Diseases (NTDs) unit of Primary Health Care Development Agency of Ekiti State, Nigeria. Thematic analysis was done and the interview transcripts were inductively coded. The Consolidated Framework for Implementation Research was used to describe the themes that emerged from the study.

Results

Fifteen participants were proposed for the study including both males and females, consisting of six frontline health workers, six community people and three state officers. They all willingly participated in the study. Some factors emerged as barriers and facilitators to optimal coverage of MDA in Ekiti State, Nigeria. Six main themes with other sub-themes related to barriers and facilitators were found to emerge from the study. The key barriers that emerged are based on beliefs

in the community; adverse drug reactions (both real and imagined); problems around the working conditions of the Community-Directed Distributors (CDDs) and the consequent attrition of CDDs; lack of infrastructure and logistical support; the need for improved record-keeping. These barriers are the factors posing challenges to optimal coverage of MDA in Ekiti State. The major facilitators that emerged are good communication and education of community members and health personnel on MDA; interpersonal relationship and cooperation between health workers, CDDs and community people; supervision and provision by the state government; availability of drugs at all health facilities for those who missed MDA; and integration of the MDA into the NTDs programs. These facilitators are good factors that can promote and enhance optimal coverage of the MDA in Ekiti State.

Conclusion

The barriers and facilitators to MDA in Ekiti State Nigeria cover every level of stakeholders who are involved in the program such as government, sponsors, health workers and CDDs. It is recommended in the short term that government and sponsors could give adequate financial support and provide security that will enhance free movement to the actors in those dangerous zones of Ekiti State. Health workers and CDDs could give continuous health education, campaigns and awareness creation about MDA in the community. While in the long term, it is recommended that government could make provisions for those who missed the drug during mass distributions at the health facilities and also conduct a new census that can give viable population figures for those who are eligible for proper planning. Government and sponsors could provide take-home small cards for drug users that indicate the dosage, given date and next appointment for easy identification of the users, to avoid overdosage and as a reminder of the next appointment for the users. The government could assign implementation science professionals to work with all the institutions and organizations where evidence-based interventions are carried out for monitoring and supervision. In order to improve the coverage of MDA, factors at each level need to be taken into account.

Key words: Mass Drug Administration; lymphatic filariasis; onchocerciasis; barriers; facilitators; Neglected Tropical Diseases; Primary Health Care Development Agency; Ekiti State; Nigeria.

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ABBREVIATIONS

APOC	African Program for Onchocerciasis Control
CDDs	Community Directed Distributors
CDTI	Community-directed Treatment with ivermectin
CFIR	Consolidated Framework for Implementation Research
CHEW	Community Health Extension Workers
DEC	Diethylcarbamazine citrate
FLHWs	Frontline Health Workers
GPELF	Global Program to Eliminate Lymphatic Filariasis
IDIs	In-depth interviews
IVM	Ivermectin
KIIs	Key informant interviews
LF	Lymphatic filariasis
MDA	Mass Drug Administration
Mf	Microfilariae
NGO	Non-governmental Organization
NTDs	Neglected Tropical Diseases
OCP	Onchocerciasis Control Program
Oncho	Onchocerciasis
WHA	World Health Assembly
WHO	World Health Organization

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DEFINITION OF TERMS

Actors and Stakeholders: People responsible for ensuring the effective distribution of medicine in the community, such as frontline health workers at the community level and Ministry of Health officials in the NTDs unit.

Barriers: Obstacles or hindrances to achieving a set goal of any intervention.

Community-directed distributors: Community members selected for the distribution of medicine to people in the community.

Community Health Extension Workers: Trained health caregivers at the grassroots (community) level.

Facilitators: Factors that can enhance the effectiveness of a program or intervention.

Mass Drug Administration: Mass distribution of medicine in a target population.

Optimal Coverage: When an intervention or program reaches out to the desired target population.

Treatment: Medical care that is given to cure illness.

CHAPTER ONE: INTRODUCTION

Introduction

This chapter reviews the background of the study (lymphatic filariasis, onchocerciasis, Mass Drug Administration (MDA) and MDA coverage) and gives the problem statement, justification, research question, aim and objectives of the study and the Consolidated Framework for Implementation Research (CFIR).

1.1 Background

1.1.1 Lymphatic filariasis (LF) is a disease caused by infection from mosquito-borne parasites that can cause disfiguration and disability in humans [1]. This disease is caused by Nematode worms of which there are three species namely, *Wuchereria bancrofti*, *Brugiamalayi,* and *Brugiatimori* that can infect humans [1]. LF has been a public health problem in tropical and sub-tropical regions of Africa and Asia where more than 120 million people have been affected in about 80 countries [1, 2]. *Wuchereria bancrofti* is the causative agent in rural settings such as the Ekiti State of Nigeria and is transmitted through the bite of Anopheles mosquitoes [1, 2].

The various manifestations of LF are fever and painful enlarged testicular, inguinal, axillary and lymph nodes (lymphadenopathy), skin exfoliation, lymphoedema that leads to chronic swelling and damage of the lymph nodes, elephantiasis of the legs and arms which affects over 14 million people, hydrocele (swollen genital organs like scrotum and vulva) and swelling of the breast [3].

1.1.2 Onchocerciasis, which is popularly known as river blindness, is a disease of the eye and skin caused by infection of the filarial worm known as Onchocerca volvulus and transmitted through the bite of female black flies of genus Simulium [4, 5]. Globally, 67.88 million people are infected, of whom 36 million are disfigured and disabled [3]. The vector breeds in fast-moving rivers which makes the disease common in riverine and bushy places [5]. The typical breeding habitat of these

black fly vectors is the very climactic description of every tropical community in Ekiti State. There is no community in Ekiti without fast-flowing rivers surrounded by rocks, hence making onchocerciasis a public health problem.

Some signs and symptoms of Onchocerciasis are severe itching (dermatitis), skin rashes, skin dryness or inelasticity, skin bumps or nodules, scarred and saggy skin, patchy, leopard-like skin, inflammation of the lymphatic node (lymphadenitis), itching of the eyes, and visual impairment which is called river blindness [5, 6]. Most of the signs and symptoms are mistaken to be just allergic reaction because it affects mostly the skin. This makes it difficult for many infected people to believe it could be an onchocerciasis infection.

1.1.3 Mass Drug Administration (MDA) is a community-directed intervention used to treat LF and onchocerciasis in many places including Ekiti State, Nigeria. It involves the distribution of drugs across the state once a year. Over the years, it has been a vital tool in the elimination of LF and onchocerciasis as well as several other neglected tropical diseases (NTDs) [7]. Mass treatment of LF and onchocerciasis is carried out once a year and involves giving a single dose of diethylcarbamazine citrate (DEC) or ivermectin (popularly known as Mectizan or IVM) and albendazole (ALB) [1].

In Ekiti State, ivermectin and albendazole are given jointly to all individuals aged 5 years and older, except for pregnant women, sick individuals, and mothers who are nursing a baby aged less than 8 days. It is given after the individual's height is measured with a calibrated stick (dose pole) to determine the number of tablets of ivermectin that should be given (from one to four), while all individuals receive a single dose of albendazole 400mg [1, 8, 9]. Treatment is carried out from house to house in every community by trained community-directed distributors, also known as CDDs [8]. However, there are barriers to its optimal coverage in Ekiti State, and this has made it

difficult to achieve the elimination of these diseases even though MDA has been applied for over a decade in the state.

1.1.4 MDA Coverage

MDA coverage gives details of how many individuals who are eligible for treatment swallowed the drugs in each community where the program is carried out and one fundamental step for evaluating the success of any NTD program is to know the coverage of the drug distribution [9, 10]. To achieve optimum coverage, adequate monitoring is essential. Routine monitoring and research studies help to identify barriers to be eliminated and facilitators to be enhanced.

1.2. Problem Statement

LF and onchocerciasis are endemic in Ekiti, Nigeria. Recent statistics on MDA coverage from the Ekiti State Ministry of Health show 67.2% therapeutic coverage for both diseases whereas a minimum requirement of 80% therapeutic coverage and 100% geographical coverage of communities at risk for a consecutive 12-15 years of treatment is recommended by WHO [11]. This shows that there is a problem with the MDA coverage. Many people in Ekiti State presently live with signs and symptoms of these diseases which indicate that there are problems with the coverage of MDA meant for their treatment. Consequently, there are many people both with and without symptoms in the communities that are yet to be covered due to some implementation problems that have acted as barriers to MDA in the state over the last 10 years. This makes the elimination of these diseases very difficult.

1.3. Justification

Despite the fact that MDA has been implemented for several years, both LF and onchocerciasis are still endemic in Ekiti state. However, there is no published research to ascertain the exact situation in Ekiti State. Hence it is necessary to study the barriers to MDA coverage for the treatment of these diseases in different communities (rural and urban) in Ekiti State in Nigeria

where such a study has, to our knowledge, never been done. This will help to achieve effective coverage of MDA for these diseases in Ekiti State. LF and Onchocerciasis are twin diseases usually treated together at the same time with MDA (using ivermectin & albendazole) in Ekiti State. The study will also propose recommendations to overcome the identified barriers to facilitate the total elimination of both diseases in Ekiti state and other communities with similar challenges in Africa and beyond.

1.4. Research Question

What are the perceived barriers and facilitators to optimal coverage of MDA for the treatment of lymphatic filariasis and onchocerciasis in Ekiti State, Nigeria?

1.5. Aim

This study aims to explore actors' and stakeholders' perceived barriers and facilitators of optimal coverage of MDA in the treatment of lymphatic filariasis and onchocerciasis in Ekiti State, Nigeria.

1.6. Objectives

- To explore actors' and stakeholders' perceived barriers to optimal coverage of MDA in the treatment of lymphatic filariasis and onchocerciasis in Ekiti State, Nigeria.
- To explore actors' and stakeholders' perceived facilitators of optimal coverage of MDA in the treatment of lymphatic filariasis and onchocerciasis in Ekiti State, Nigeria.

1.7. The Consolidated Framework For Implementation Research (CFIR)

According to Damschroder *et al*, the CFIR is effective in the study of barriers and facilitators of the implementation of any evidence-based intervention [12]. CFIR can be used at any level of implementation including pre-, during, or post-implementation, thus making it useful in the

exploration of barriers that may occur at various levels of healthcare delivery such as individual patient level, healthcare team or provider level, organizational or policymaker level [12]. This framework can be used in qualitative research to develop an interview guide and codebook for data collection, analysis, interpretation, explanation of findings and presentation [13]. CFIR has five (5) major domains as shown in figure 1 below: (1) intervention characteristics (2) outer setting (3) inner setting (4) characteristics of individuals and (5) implementation process [14].

- **Intervention characteristic** is the first domain mentioned in the CFIR [12]. This domain describes a construct not relevant to the optimal coverage of MDA in Ekiti State.
- **The outer setting** is the second domain mentioned in the CFIR, and it describes the economic, political and social setting from external causes in which an intervention is carried out [12]. The outer setting explores the impact of patients' needs and resources on implementation [12].
- **Inner setting** is the third domain outlined by the CFIR. This domain has a dynamic connection with the outer setting [12]. It describes the structural, political, and cultural settings that exist within and among the implementation teams through which implementation occurs [15]. It also explores how optimal MDA coverage is influenced by culture as well as implementation climates such as tension for change and organizational incentive and reward, readiness for implementation such as available resources and access to information and knowledge.
- **Characteristics of individuals** are the fourth domain in this CFIR [12]. This describes the individual knowledge and beliefs about the intervention and other personal attributes from the community people that can affect optimal MDA coverage in Ekiti state.
- **The process of implementation** is the fifth domain considered in this framework [12]. This last domain describes four (4) activities involved in the implementation process, namely planning, engaging, executing, and reflecting/evaluating. To discharge this

domain, at the planning stage, there is a need to consider the various aspects of the intervention and the different levels at which they occur [16]. It will also consider how all relevant stakeholders will be engaged [12].

While the five domains described above include thirty-nine (39) constructs, there are only seven constructs and four sub-constructs that are relevant and included in a CFIR adapted for MDA, which are described below.

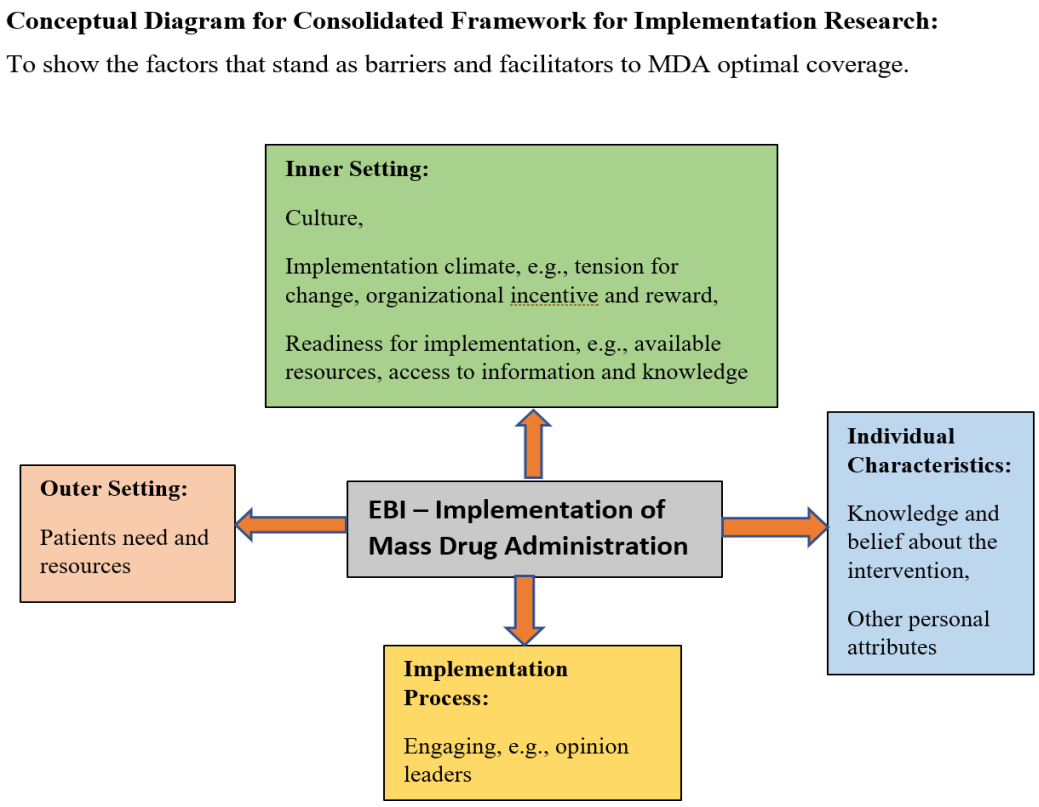


Figure 1. Adapted Consolidated Framework for Implementation Research (CFIR)

This study will describe the application of CFIR to the analytical findings from actors' and stakeholders' perceived barriers and facilitators of optimal coverage of MDA in the treatment of lymphatic filariasis and onchocerciasis in Ekiti State, Nigeria.

CHAPTER TWO: LITERATURE REVIEW

2.0. Introduction

This chapter reviews the literature relevant to the study: prevalence, etiology, prevention and control of LF and onchocerciasis, MDA for the treatment of both diseases, as well as the barriers and facilitators to optimal coverage of MDA.

NTDs (such as LF, trachoma, onchocerciasis, buruli ulcer and schistosomiasis) are chronic diseases causing morbidity and mortality globally among the poorest populace [10]. Diseases in this group account for over 500,000 deaths yearly and its Disability Adjusted Life Years (DALYs) loss is greater than in malaria and tuberculosis [10].

2.1. Prevalence, etiology, prevention and control of Lymphatic filariasis

There are about 1.4 billion people who are at risk of LF worldwide and about 350 million are infected, of whom 40 million are disfigured and incapacitated [1, 3, 5]. It is reported that sub-Saharan Africa and South-East Asia jointly account for approximately 94% of the global burden of LF [3].

In sub-Saharan Africa, 512 million people are reported to be at risk of being infected with LF, while about 28 million are known to be infected [17]. Although the mortality from LF is low, the disease is the fourth leading cause of DALYs [17]. Consequently, the disease is linked to huge economic losses in sub-Saharan Africa: it affects economic activities adversely, accounting for productivity losses of nearly US$1 billion each year, mainly as a result of disability associated with hydrocele [3].

Statistics show that Nigeria is the third most endemic country in the world; LF is prevalent across the 36 states of the country, constituting a serious public health problem [17]. According to Adamu *et al*, there is no available data from LF studies in Ekiti state, but the highest prevalence in South-West Nigeria is 29% from Ondo state, a neighboring state to Ekiti State [17].

Over the years the WHO has responded to the elimination of LF in different endemic countries by adopting vector control, MDA and morbidity management [3, 18].

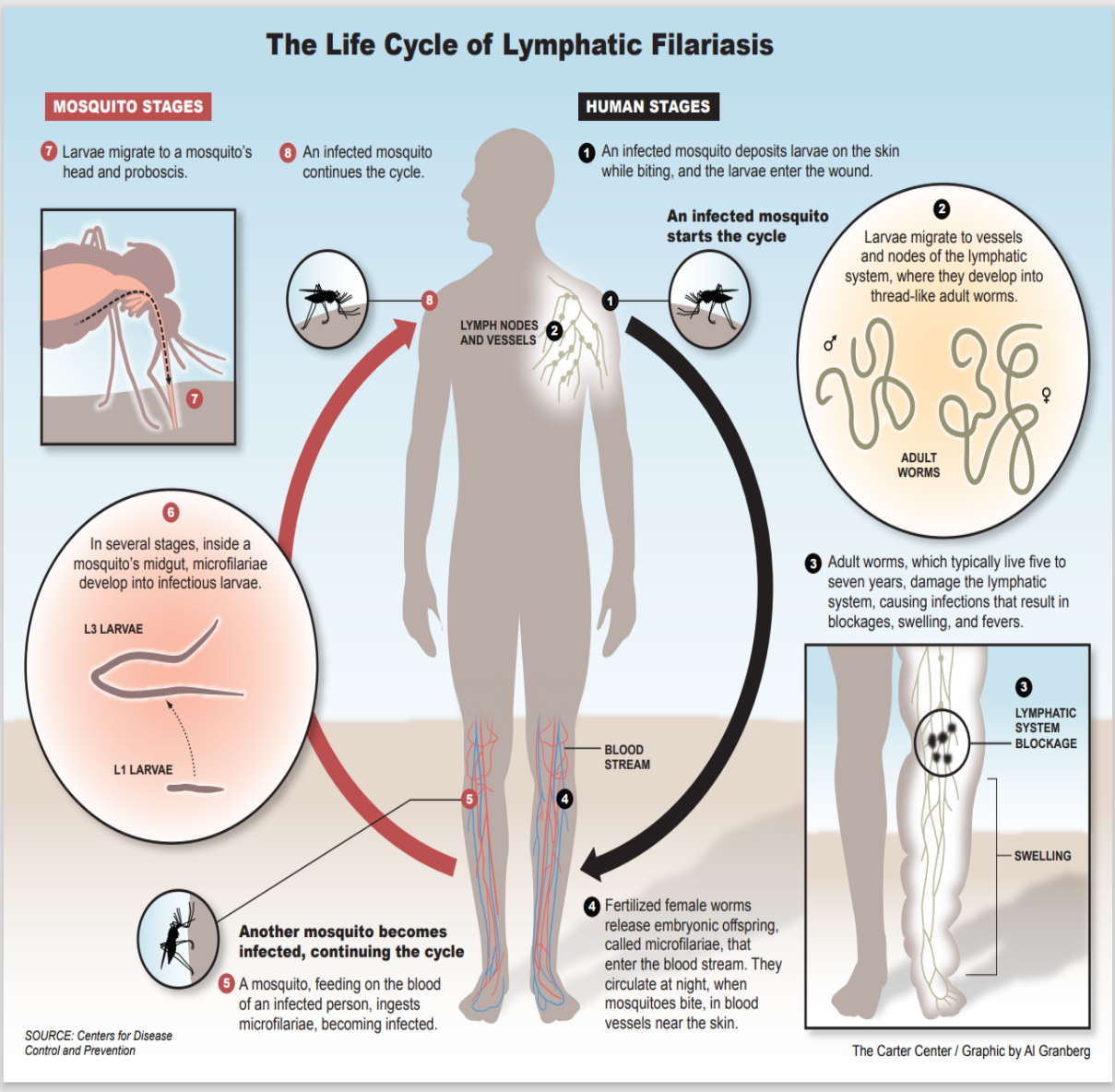


Figure 2: The Life Cycle of Lymphatic Filariasis

(Source: https://www.cartercenter.org/resources/pdfs/health/lf/lymphatic-filariasis-life-cycle.pdf)

The transmission of LF follows when an infected mosquito deposits larvae into the body of an individual through a bite [19]. The larvae then migrate to vessels and lymphatic nodes where they

develop into thread-like adult worms and live for about 7 years, causing damage to the lymphatic system and leading to blockages, swelling and fevers [19]. The female worms which are fertilized release about 10,000 microfilariae (embryonic offspring) which enter the bloodstream and circulate in the blood [19]. The microfilariae (mf) ingested by a mosquito during a blood meal will develop from the first-stage larvae to the third-stage infective larvae within 10 to 14 days [20]. These effective larvae migrate to the mosquito's proboscis and may subsequently be transmitted to another person through a bite when it takes a blood meal [20, 21].

In a bid to curb LF transmission in endemic countries, the WHO has promoted the use of insecticide-treated nets and indoor insecticide spraying as strategies to reduce the transmission of all mosquito-borne diseases [22]. These two approaches were initially adopted before the development and use of effective drugs. Today, vector control strategies for LF help to stop the transmission of the disease from infected to non-infected individuals in endemic communities [22]. Effective elimination of LF requires the development of dependable mosquito surveillance and control programs [22]. Proper management of mosquito populations using insecticides and other personal protective strategies such as maintenance of a clean environment and the use of mosquito repellant will help to break the transmission cycle of LF [22, 23]. Therefore, it is important to combine the use of drugs with vector control to achieve LF elimination.

2.2. Prevalence and etiology of Onchocerciasis

Onchocerciasis is one of the NTDs targeted by WHO for elimination by 2025. Globally, about 200 million people are at risk of onchocerciasis infection and over 99% of the global disease burden is present in the continent of Africa [24]. In Africa, onchocerciasis has variable epidemic-ecological settings and the millions of people infected harbor high to very high intensity of infection which is sustained by high vector-human contact at or near vector breeding sites [24].

It is estimated that 17 million Nigerians are at risk of the disease while 7-10 million are infected, hence Nigeria accounts for about 40% of the global onchocerciasis prevalence [25]. Ekiti state is endemic, but there is no access to data to show the statistics and estimates of the prevalence of the disease. The only available data is from Ise-Orun, a local government in the state which has the prevalence of onchocerciasis infection to be 48.9% in both males and females [26].

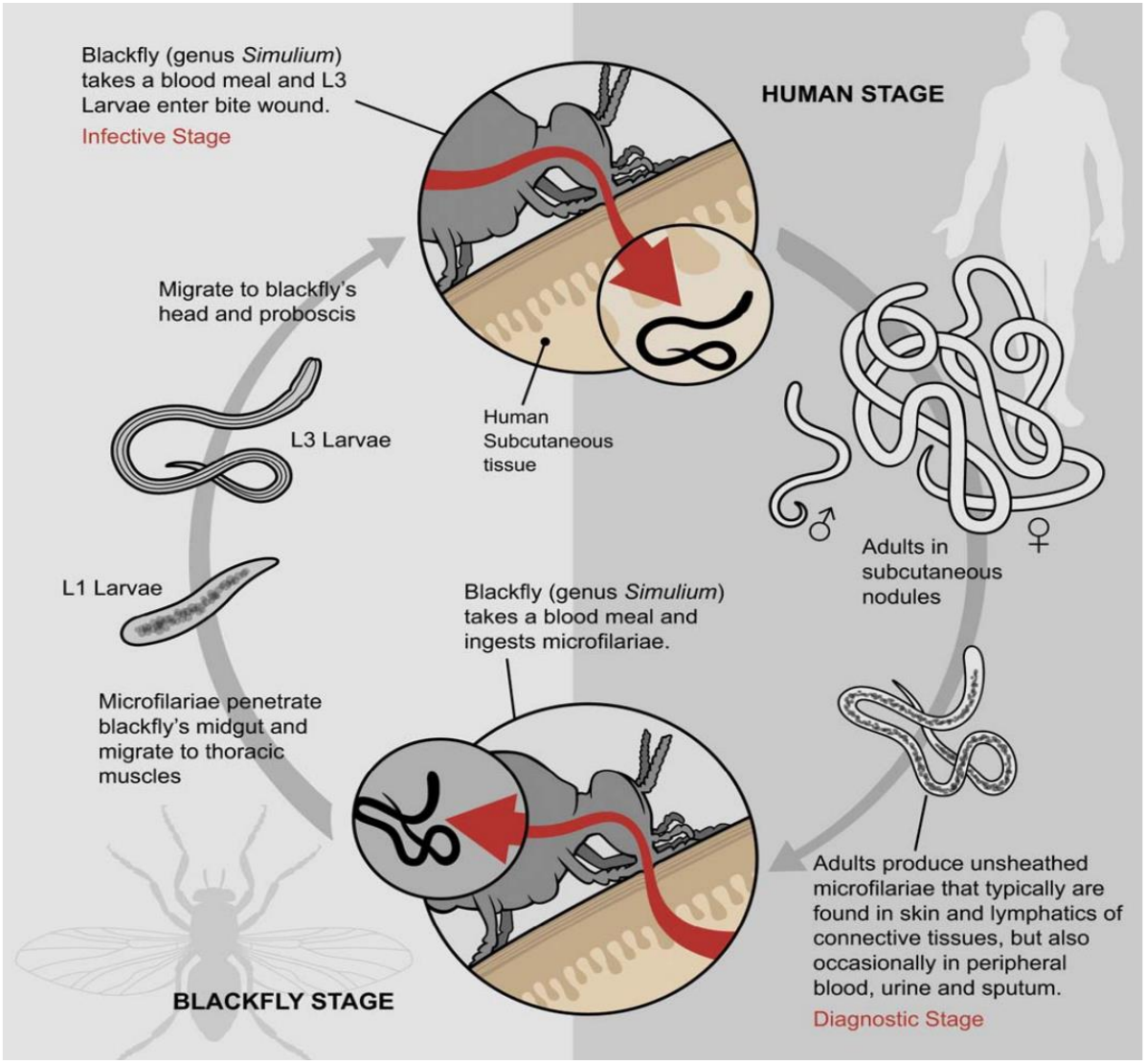


Figure 3. The *Onchocerca volvulus* Life Cycle.

(Source: https://doi.org/10.1371/journal.pmed.0030371.g001)

When an infected blackfly of the genus *simulius* bites a person during a blood meal, it injects third-stage infective larvae onto the skin of the victim [27, 28]. Thereafter, the larvae penetrate the subcutaneous tissues and develop into adult filariae which live for about fifteen (15) years in the nodules of the same tissues [27, 28]. The female worms, which reside in the subcutaneous connective tissues, can produce microfilariae (mf) for up to nine (9) years [27, 28]. The mf which have a life span of approximately two (2) years are mainly found in the skin and lymphatics of connective tissues and can be sometimes found in the blood, urine and sputum [27, 28].

The blackfly vector ingests the mf from an infected human host during a blood meal; the mf then migrate from the blackfly's midgut via the hemocoel to the thoracic muscles [27, 28]. In the thoracic muscles, the mf develop from the first stage to the third-stage infective larvae which move to the vector's proboscis and from there can easily infect an individual during another bite or blood meal [27, 28].

2.3. MDA for the treatment of lymphatic filariasis (LF) and Onchocerciasis

Over the decades, there has been a campaign for the use of MDA in the treatment of LF and onchocerciasis [29]. The International Task Force for Disease Eradication identified LF as one of the six "eradicable" or "potentially eradicable" infectious diseases [29]. Being eradicable, LF was targeted for elimination by the World Health Assembly in 1997 [30]. The World Health Organization (WHO), in response to the global disease burden of LF, established the Global Program to Eliminate Lymphatic Filariasis (GPELF) in 2000 [4, 31] with the strategy of promoting extensive MDA in affected communities using albendazole, ivermectin or diethylcarbamazine citrate (DEC) every year and providing relevant healthcare to any individual with chronic manifestations of the disease [31, 32].

The main aim of MDA for LF is to drastically reduce the levels of microfilariae (mf) in the blood of affected individuals in the population at risk, thereby breaking the cycle of transmission between the mosquito vector and humans [3, 33, 34]. For the elimination of LF, WHO recommended a minimum yearly MDA coverage of over 65% of the national population at risk and 80% of the eligible population at risk sustained for over 10 years, depending on the baseline prevalence of microfilariae and reducing the sustainability of infection transmission by the vector [1, 3, 22, 35]. Since the inception of the program in 2000, MDA campaigns for LF have been implemented, effectively reducing its prevalence in affected populations. In 2019, 858.3 million people required MDA of which 38 countries were reported to have treated 538.1 million individuals representing 62.7% [36]. The GPELF progress report for the same year shows that an aggregate treatment of over 8.2 billion has been achieved during MDA [36].

The formation of the Onchocerciasis Control Program (OCP) in West Africa in 1974 marked the beginning of mass control of the disease in the region [37]. The first control strategy for the disease was based on a periodic (weekly) spraying of insecticide at the breeding sites of the vectors (blackflies), and it was carried out for not less than 14 years to disrupt the lifecycle of the causative parasite [37]. This earliest effort recorded some level of success but encountered several challenges such as high cost of implementation and poor access due to topographical complexity which made the spraying of breeding sites very difficult.

The initial drug used for trials in human onchocerciasis was doxycycline, but presently ivermectin, which was registered in 1987 and found safe and effective against microfilaria [38], is used for its treatment and control either annually, bi-annually, or every 3 to 6 months for individual treatment according to case presentation [5]. The donation of ivermectin by the manufacturer led to the take-off of the African Program for Onchocerciasis Control (APOC); this program uses MDA with

ivermectin as its major intervention strategy, and the method applied is Community-Directed Treatment with ivermectin (CDTi) [39]. Ivermectin is not fully effective against adult worms and hence, needs to be used for more than a period of 15 to 17 years before the interruption of transmission [5, 40]. A study carried out in Kaduna, Northern Nigeria showed zero prevalence of infection after 17 years of ivermectin mass treatment [24, 40].

During MDA, a combination of 400mg albendazole (ALB) and 6 mg/kg diethylcarbamazine (DEC) citrate is administered to each eligible person for LF treatment; however, a combination of 400mg of ALB and 150–200 µg/kg of ivermectin (IVM) is administered in areas co-endemic for onchocerciasis [29, 36, 41, 42]. The required number of MDA programs for eliminating LF and onchocerciasis in any community depends on some factors such as drug efficacy, drug coverage and the level of endemicity [29, 43, 44].

MDA is an evidence-based intervention adopted for treating all eligible individuals in the communities where LF and onchocerciasis are prevalent [1, 3]. However, to achieve optimum coverage of MDA, all perceived barriers must be explored and addressed while facilitators must be leveraged.

2.4. Barriers to optimal coverage of MDA

Despite some successes in treatment provision across the world, several challenges continue to confront MDA for LF and onchocerciasis programs, hampering optimum coverage levels in communities [4, 22, 37, 45]. These challenges pose barriers to the actualization of set goals for the elimination of both diseases. Some of them are categorized below:

i. Barriers related to Sponsors/Government

A study showed that the problems of low compliance to MDA are related more to provider initiation than to the perceptions and practices of recipients [46]. These include:

(a) Poor pre-distribution mobilization and media sensitization: The absence of community mobilization of both members and stakeholders will affect their participation in any MDA program and this will, in turn, reduce the coverage [3]. Lack of pre-distribution mobilization and health education constitute barriers to MDA coverage because ignorance often breeds fear in people about what could be the adverse effect of drugs which could lead to rejection of the MDA program by such uninformed individuals [47].

(b) Poor supply chain system (unavailability/shortage of drugs): According to Adamu (2017), Nigeria is one of the countries whose MDA coverage is negatively affected by the poor supply of drugs by the national medicine store [11, 47].

(c) Poor finance/logistics problem: Poor financing and insufficient funding of MDA programs is a major factor that poses a barrier to the overall success; money is required for mobilization, sensitization, transportation, monetary incentives to CDDs and monitoring/supervision of the work at all levels [11, 48].

(d) Attrition of Community Directed Distributors (CDDs): Attrition of CDDs is due to the low monetary incentives given to the CDDs and this reduced the number of CDDs available for both geographical areas and therapeutical coverage of MDA [3, 11, 47].

(e) Poor transportation and community penetration due to bad road network: Poor transportation and bad road network affect the supply of drugs to people living in remote and hard-to-reach endemic areas [11].

ii. Barriers related to Health Workers and CDDs

(a) Poor monitoring and supervision of CDDs at work: Supervision is very important in achieving any target coverage for MDA, therefore poor monitoring and supervision of CDDs at work could affect the level of coverage of MDA [4].

(b) Record falsification: The need to meet targets and deadlines often leads to the falsification of treatment records by some unscrupulous CDDs [3].

iii. Barriers related to Community People

(a) Lack of commitment from community leaders: The level of participation of the community members will be affected if their leaders show no sign of commitment to the MDA program which will affect the uptake of drugs and coverage of the program [47].

(b) Poor geographical demarcation: Poor or lack of geographical demarcation of communities will affect the geographical coverage of MDA because many communities at the boundaries may not be covered [3].

(c) Unregistered migrations: Unregistered migration before and during MDA will affect the population covered during MDA. When there is no accurate figure for the population, it will affect the level of planning and preparation that is to be made in ensuring that there are adequate drugs for the population [3].

(d) Culture, religious beliefs and myths: Certain negative beliefs and cultural sentiments may arise due to previous experiences; as an example, during the Ebola virus outbreak in West Africa people believed that both CDDs and MDA could spread the Ebola virus. Adverse reactions to drugs are also taken to be a problem that could lead to death, thus affecting the attitudes of some community people towards MDA [3, 4]. A study in Togo revealed that it is a cultural taboo for a pregnant woman to declare that she is pregnant,

so women may choose not to be treated or reject the drug rather than disclose their pregnancy [8]. The rate of drug uptake and acceptability may not be the same across religions due to their different beliefs [46].

2.5. Facilitators of optimal coverage of MDA

The CDDs are individuals who are selected by the community leaders to be responsible for drug distribution to the eligible members of the community where they live.

Some factors that facilitate the implementation of MDA for LF and onchocerciasis programs are (i) Advocacy visits to stakeholders and gatekeepers in communities (including political leaders, kings, opinion leaders, youth leaders, chairmen of various associations and religious leaders) [3], (ii) creation of awareness and education in religious places, markets, house to house and on social media to get people informed about the MDA program in all endemic communities [3, 49]; (iii) training of frontline health workers [3]; (iv) incentives and training for CDDs [4]; (v) partnerships and collaborations with other health-related programs and (vi) proper management of morbidity and adverse effects [3, 49].

CHAPTER THREE: RESEARCH METHODOLOGY

3.0. Introduction

This chapter describes the research methodology used to achieve the objectives of the study. It includes areas such as the study design, site of study, ethics, study population, sampling, data collection and pilot study. The chapter also explains the data management approach and analysis of the study.

3.1. Study design

A case study explanatory qualitative study design was used to explore the perceived barriers to and facilitators of optimal coverage of MDA in the treatment of LF and onchocerciasis according to Health Care Workers and stakeholders in Ekiti State, Nigeria. Explanatory study designs can explore the barriers to and facilitators of health interventions and give helpful suggestions for improvements. Primary data were obtained from frontline health workers and representatives of the community using in-depth interviews and from policymakers at the NTDs unit in Ekiti Primary Health Care Development Agency using key informant interviews.

3.2. Study site

The study site is Ekiti State. The State, which is one of the 36 states in Nigeria, is in the southwest with a total population of about 3,285,800 in 2019 and a total landmass of 6353 km^2.

There are three geo-political zones (senatorial districts) that together comprise 16 Local Government Areas and 422 communities. The three districts are shown on the map below (Ekiti north in red, Ekiti central in green and Ekiti South in purple). The three districts share a common culture, topography and language.

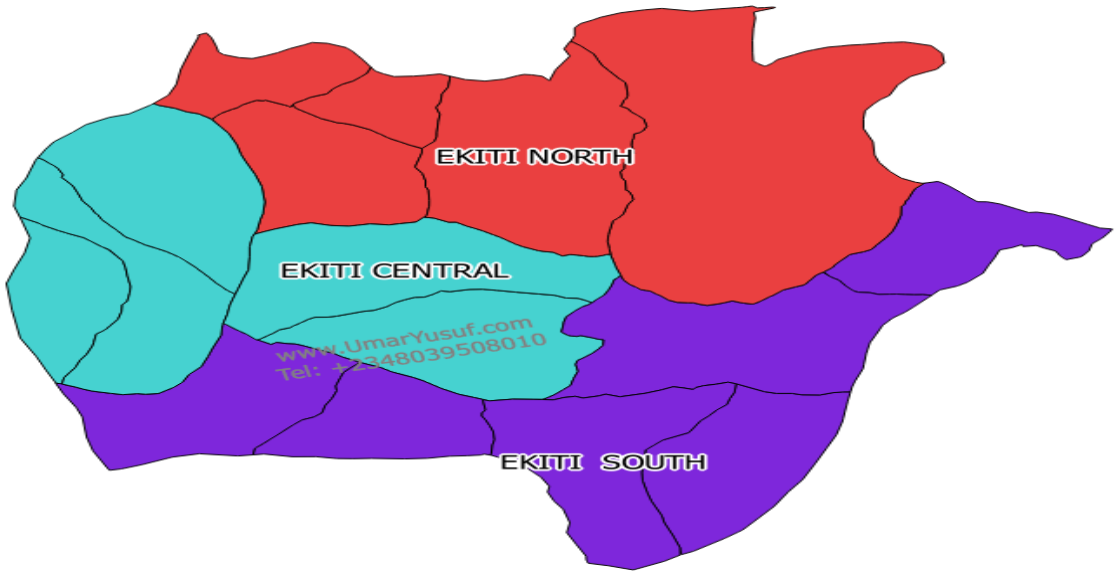


Figure 4. The Map of Ekiti State Senatorial Districts

(**Source:** https://umar-yusuf.blogspot.com/2017/10/map-of-nigeria-senatorial-districts-by.html)

3.3. Study population

The study population consists of residents of Ekiti State, Nigeria who are Neglected Tropical Diseases Frontline Health Workers as well as community people from the three senatorial districts (geo-political zones) which are Ekiti Central, North and South Senatorial Districts as well as the key informants at the state level. Frontline health workers who participated in the study were Community Health Extension Workers (CHEW) who have spent more than five years on the job; similarly, the community representatives have all lived for more than three years in their respective communities. The policymakers were principal officers in the NTDs unit at the Primary Health Care Development Agency responsible for formulating health and MDA-related policies. These key informants have spent more than six years in their field. The study was conducted in August 2021.

3.4. Study sampling

Two (2) Local Government Headquarters were chosen from each of the three senatorial districts using simple random sampling. One (1) frontline health worker (Community Health Extension Worker) was purposively selected from each of the two local government headquarters in each senatorial district. This was made possible with the help of the program coordinator who provided the health workers' phone contacts to the researcher at the State Office, hence they were called and an appointment was scheduled with them in their various offices. One (1) community person (resident in Ekiti State) from each of the two selected local government headquarters in each district was chosen using convenience sampling for the in-depth interview. The researcher went out to interview community people found in front of their homes, this was done to pick a common man on the street who would not give biased information about MDA so that the level of awareness and knowledge about MDA could be explored and thus suggest the coverage of the program in the community; three (3) policymakers at the state level were purposively selected for the key informant interviews. Hence, a total of fifteen (15) participants were selected which is a good size for a qualitative study and it represents all districts in the study population. The justification for using purposive sampling for this qualitative study is to be able to choose participants who were not only accessible but also relevant to the study. Ekiti state has been chosen because it is where the researcher lives, which made carrying out the study including recruiting participants more feasible.

Inclusion criteria: Selected male and female health workers were those who work directly with MDA distribution in their Local Government Areas in Ekiti State.

Exclusion criteria: Health workers who work directly with the NTDs unit in their local government areas but have not been to the field for the MDA exercise were excluded because they were not likely to know the details about the MDA in their domain. The local government headquarters selected are presented in Table 1 below.

Table 1: Sampling Breakdown of Senatorial District, Number of People Sampled with their Designations.

S/N	Senatorial District/MOH	Local Government	CHEWs	Community People	State Officers
1	Ekiti Central Participants (n-4)	Irepodun/Ifelodun	1	1	
		Ado	1	1	
2	Ekiti North Participants (n-4)	Oye	1	1	
		Ido-Osi	1	1	
3	Ekiti South Participants (n-4)	Ikere	1	1	
		South-west	1	1	
4	Ministry of Health Participants (n-3)				3
5	Total Participants (n-15)		6	6	3

3.5. Ethical Consideration

The protocol was approved by the Human Research Ethics Committee of the University of the Witwatersrand on 25th June 2021 before the commencement of the research with clearance certificate number M210634 (Appendix VI). Ethical approval was also obtained from the Ethics Committee of Ekiti State Ministry of Health and Human Services (Appendix VII). Permission was also obtained from the Primary Health Care Development Agency to carry out interviews with

their staff before going to the field (Appendix VIII). Confidentiality of participants' information was strictly maintained. All physical data materials such as recorded tapes, notes-taken, computer files and printed transcripts were kept on a shelf that was accessible by the researcher only. Records were preserved and data was made accessible to the investigator and supervisors.

Children and respondents under the age of eighteen (18) were not included in the study. All the participants chosen for the study were adults, and their consent was sought before the interview sessions. Information sheets (Appendix IX, X and XI) were given to all participants. These information sheets explained the purpose, nature and requirements of the research in terms of data collection, usage and storage; information gathered will be preserved securely for two (2) years if there will be a scientific publication and six (6) years if there is no publication from the study, after which it will be discarded; the information sheets also include contact details to be used if any participant had questions or concerns about the research. Two separate consent forms were given to all participants in the study. The first (Appendix XII) is for participation and the other (Appendix XIII) is for audio recording. All the recipients of the information sheets and the two consent forms participated voluntarily in the study without any objection. The researcher ensured the anonymity of participants while transcribing the interviews by removing names or any other means of personal identification to maintain confidentiality. This was replaced with titles of their portfolios and communities such as frontline/Ado, community/Oye, and KII/1.

3.6. Data collection

In-depth interviews and key informant interviews were solely carried out by the researcher on frontline health workers who are Community Health Extension Workers (CHEW), community people and key informants at the respective NTDs state offices in Ekiti State, Nigeria. No data collection team was engaged. Face-to-face interviews were conducted in health facilities where

the frontline health workers work, various homes of community people and offices of key informants using different interview guides for the three categories.

Three (3) semi-structured and open-ended interview guides in line with research questions were adapted from existing literature [4, 8, 12, 24, 33] discussing the implementation of MDA for LF and onchocerciasis in Africa. Different interview guides (Appendix III, IV, V) were used for health workers, NTDs state officials and community people. The guide used for frontline health workers was structured in order to ascertain what they perceived to be strengths of MDA, challenges/barriers during MDA, reasons for these challenges and what could enhance optimal coverage of MDA. Questions posed to community people were based on coverage to know if the program has its optimal reach among the community people by asking if they have ever received the drug in their various homes. Interview guides for NTDs state officials were structured based on what had been perceived to be barriers and facilitators to the MDA from NGOs, federal, state and local government. All the interview guides focused on demographic information, barriers or challenges and facilitators to optimal coverage of MDA in Ekiti State. Interviews were carried out solely by the researcher starting from 4th August to 30th August 2021.

3.6.1. Pilot Study

A pilot study for this qualitative research project was carried out using participants who were similar to the ones used in this study. One frontline health worker, one community person and staff from the NTDs unit from the state who were not participants in the study were used. It was conducted by the researcher in a day (3rd August 2020), this was made possible because the three categories of people selected for the test were in the same city. The pilot study was necessary for testing whether the IDIs and KIIs, sample recruitment strategies, the structure of the interview guides and suggested methods of qualitative analysis would work for the study. At the end of the pilot study, it was discovered that the interview guide structure worked and fitted into the study

and relevant responses were obtained from the participants. The findings from the pilot study did not influence the study results but allowed some small modifications to the interview guides by adding the choice of words that are familiar to the participants, while probes were included based on the replies and recommendations of the respondents to enhance the feasibility of the study. Thereafter, the interviews were conducted with the various participants.

The longest interview took 47 minutes, while others with frontline health workers and key informants ranged between 20 to 43 minutes. Only the interviews with the community people took less than 15 minutes because some of them have limited or no knowledge about the MDA intervention and this shows that MDA does not have optimal coverage among the community people.

All the participants showed their willingness to partake in the study, and they expressed themselves enthusiastically. The duration of the interviews varied from one participant to the other because the choice of words, manner of response and details of information given by each participant affected the number of probing questions raised by the researcher.

The interviews were conducted in English, apart from one community participant who preferred to use the Yoruba language for the interview. An interpreter was used for the transcription of the audio record to English.

3.7. Data Management

Recorded interviews were sorted daily and transferred from the audio recorder into the computer and saved in a password-protected folder of the researcher for backup during data collection. The recording materials such as the recorder and notes taken were kept in a safe place. The data gathered through interviews were later transcribed and entered into a computer for safety. Research assistants were used for transcribing the audio records of frontline health workers and community people, while the key informant interviews were transcribed by the researcher herself. All the

transcripts were double-checked with the audio records and notes taken during the interviews by the researcher to ensure there were no omissions and grammatical errors. Notes taken were compared with transcription to ensure data quality. The transcription is stored in computer files based on respondents' ID codes, locations and categories of respondents to make the identification and categorization of data easier. Data cleaning was done by the researcher and a qualitative analyst who is a Ph.D. holder.

3.8. Data Analysis

The interviews were analyzed using thematic analysis [50, 51]. Thematic analysis is a process of finding, analyzing and interpreting patterns of meaning in qualitative data [50]. There are six steps of thematic analysis that the researcher followed in the study: familiarization, coding, generating themes, reviewing themes, defining and labeling themes, and writing up [51].

The researcher familiarized herself with the data collected by reading and rereading it all over again to gain insight and understand the concept of the data. After a thorough transcript review and studying the research design, including the objectives of the study, the researcher considered using the inductive approach to coding. As its name indicates, the inductive coding technique is an approach, in which relevant themes, subjects, or patterns emerge gradually from the raw data via repeated study and comparison without a preconception of the codebook [50]. It meant that every coded assumption and observation would have to come from the researcher while critically studying the piece of data. The inductive approach to coding has helped the researcher to study the transcripts and derived observed variables for coding.

Data coding was carried out by the researcher with an expert in qualitative analysis (a Ph.D. holder) for inter-coder agreement. Coding was done independently and the two analysts later came together to review and compare the codes after which an agreement was reached on the set of codes to be used and a code list was made. After observing the transcripts and categories of

respondents, generated codes were used to conduct a variable assessment which helped as a guide in generating the final themes for the study.

This process aided the identification of the barriers and facilitators which are the main objectives of the study. The CFIR does not fit into the analytical process because coding was inductive which means an established theory was not used. A code list that included the broad themes in line with the study objectives was created and imported to MAXQDA after which the assignment of preliminary codes to the data collected was conducted. Patterns of themes in the interview data were searched for and identified respectively and themes for meaningful identifiable distinctions were reviewed. MAXQDA is a software tool used in research institutions and organizations for qualitative data, text and multimedia analysis, it was developed and distributed by Verbi GmbH/Berlin, Germany for qualitative and mixed data analysis [52,53].

CHAPTER FOUR: RESULTS

4.0. Introduction

This chapter outlines the results from the study about the perceived barriers to and facilitators of the optimal coverage of MDA for the treatment of LF and onchocerciasis in Ekiti State, Nigeria. The later part of this chapter discusses the application of the CFIR to the analytical findings of the study.

4.1. Socio-demographic information of the study participants

Table 2: Socio-Demographic Characteristic of Study Participants

Variables		FHWs	Community people	Key-informants	Total
Sex	Male	1	4	2	7
	Female	5	2	1	8
Highest level of education	Primary	-	-	-	-
	Secondary	-	1	-	1
	Tertiary	6	5	3	14
Years at MDA work	5-10	3	-	2	5
	11-15	3	-	1	4
	None	-	6	-	6
Religion	Christianity	5	6	1	12
	Islam	1	-	2	3
Ethnic Background	Igbo	-	1	-	1
	Yoruba	6	5	3	14

Source: Field Survey, 2021

The total number of study participants was fifteen (15), comprised of six (6) frontline health workers, six (6) community people and three (3) Ekiti state NTDs officials namely a program coordinator, an assistant coordinator and a logistic officer respectively. Nobody refused to be part of the study. The work experience of the participants (excluding the community members) ranged from five to fifteen years. There were eight females and seven males in the study. Most participants had tertiary education (n=14). Most of the participants were of the Christian religion (n=12), and the overwhelming majority were of Yoruba Ethnic background (n=14). The researcher decided not to ask for age during interviews since the years of experience were asked which she felt were more relevant than age. The fieldwork went well without any problems between the researcher and the participants.

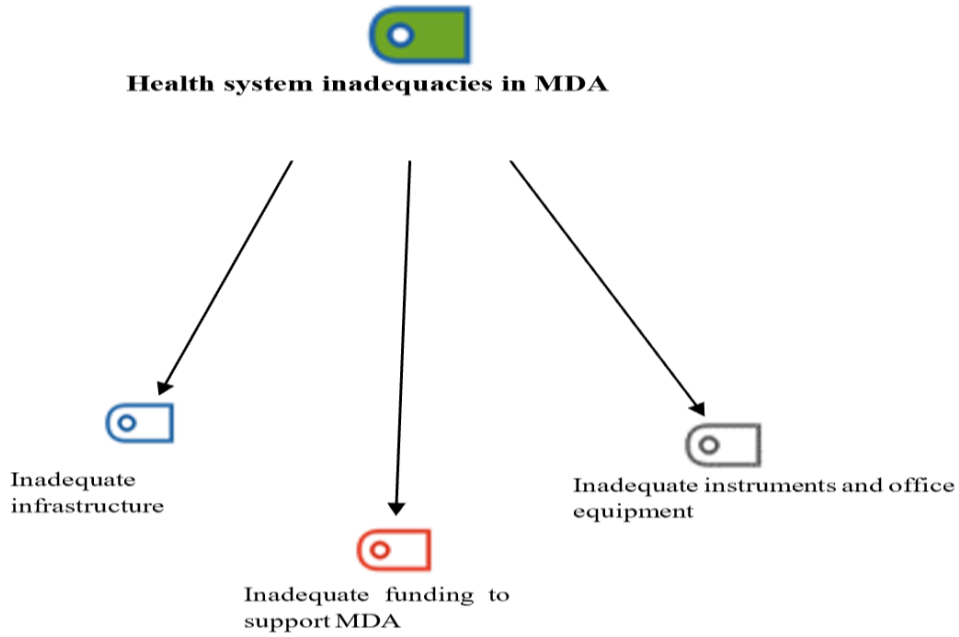
The themes that emerged from the study are health system inadequacies in MDA; health information system challenges; human resources problems; ignorance, fear and stigma about MDA; provider accountability; collaborations and partnerships with stakeholders and the community. The themes were connected and speak to the two objectives of the study which are actors' and stakeholders' perceived barriers to and facilitators of optimal coverage of MDA for the treatment of LF and onchocerciasis in Ekiti State, Nigeria.

Table 3 below shows the analytical framework that consists of six themes and their sub-themes.

Table 3. Key themes from the study

THEMES	SUB-THEMES
1. Health system inadequacies in MDA	• Inadequate infrastructure • Inadequate funding to support MDA • Inadequate instruments and office equipment
2. Health information system challenges	• Statistics • Challenges with monitoring, coverage and evaluation of drug distribution – transportation
3. Human resources problems	• Attrition of CDDs due to low pay • Lack of understanding and professionalism • Security issues
4. Ignorance, fear and stigma about MDA	• Individual barriers preventing uptake • Lack of trust, knowledge and education about the drug • Religious beliefs and attitudes • Alcoholism or the use of other medication
5. Provider accountability	• Actors' perceptions about MDA
6. Collaborations and partnerships with stakeholders and community	• Advocacy visits with stakeholders and the community • Training and information dissemination • Integration of NTDs program

4.2. Health system inadequacies in MDA



Health system inadequacies in MDA were discovered in this study which includes the sub-themes of inadequate infrastructure, inadequate funding to support the MDA program and inadequate instruments and office equipment as seen in the diagram above and narrated below. These inadequacies pose barriers to optimal coverage of MDA in Ekiti State.

4.2.1. Inadequate infrastructure

Inadequate infrastructure in terms of poor road access is a major challenge to MDA coverage. During the MDA program, there are areas and settlements in the rural areas of the state that are difficult to gain access to, given the nature of the terrain and the road network. To deal with this the program staff devise methods of reaching those areas that are still challenging to access. Frontline workers from Ado, Igede and one of the key informants complained about poor access roads to some of their communities.

> *"The road is too bad, too bad, those that are working there do sustain injury and accident on the road. Because the road is bad and not good at all"* [Frontline IDI\ADO]

"After the Mater Christi place cannot be accessible, even during the rainy season you cannot go there without removing your shoe because the road is as bad as that" [Frontline IDI\IGEDE]

Key informant 1 commented on the lack of storage facilities as part of the challenges facing MDA.

"a whole lot of others challenges like lack of storage facility at the facility to store our NTDs commodities during MDA" [KII\KI-1]

4.2.2. Inadequate funding to support MDA

Funding is an important factor in any health program. Frontline workers from Ido-Osi, Ado and one key informant commented on the issue of money for transport and suggested that counterpart funds from the state government should be released for the program.

"During the distribution, as far as I am concerned, we have the challenges of money for transport fare, there is no money for the work. There is no money for logistics during the program, which is a big challenge for this program. We need funds for transportation, to take a bike from one place to the other because trekking is very hard, maybe we are working from house-to-house but after our work, we need transport fare to go back to our destination, but there is nothing like that" [Frontline IDI\ADO]

"Some of the challenges we are still facing are those places that are very far from our place or settlement, I will say that they should give us transport money so that it can be easy for us to reach all these places. It takes time for us to move down to those places and for the settlements to be covered" [Frontline IDI\IKERE]

"some of the partners and state hardly release any counterpart fund to support the program" [KII\KI-1]

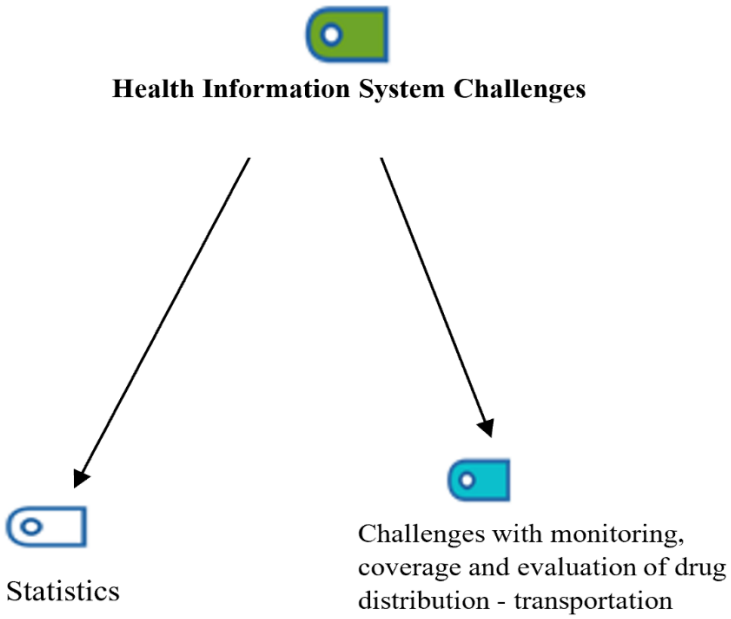
4.2.3 Inadequate instruments and office equipment

According to the frontline worker from Ado, drug dispensing instruments, such as spoons and envelopes for easy counting and sharing of drugs, are needed for drug distribution to avoid wastage. Key informant 1 suggested the need for improving office equipment that is obsolete and inadequate for the effective performance of the MDA program.

> *"We need rubber spoons or something else to distribute that drug so that it will not get wasted. We are just using nylon to share the drugs during the exercise which is not normal, it can drop down and this will lead to wastage and we need to guard against such"* [Frontline IDI\ADO]

> *"And also, office equipment, where most of the office equipment made use of is obsolete, so the supply of office equipment for efficiencies, for optimum performance of a unit member is essential"* [KII\KI-1]

4.3 Health Information System Challenges



The study examined some of the identified challenges of the MDA during the distribution phase across several communities. The challenges of the MDA are those events, actions and conditions that threaten the success of the program throughout the state. As given in the diagram above, it was discovered that there are challenges with the health information system such as statistics like outdated census figures and incomplete/ incorrect records sometimes submitted by the CDDs. Monitoring, coverage and evaluation of drug distribution are challenges due to transportation problems.

4.3.1. Statistics

One key informant felt that a barrier to MDA could be that the last census in Nigeria was held in 2006 and that estimated figures have been used for the target population in every state in Nigeria including Ekiti since then, despite the urban migration in the state. Below is what he had to say about getting more recent information on the community.

> *"One of the challenges is that the actual census figure for each community is a challenge. The last one that was done in Nigeria was 2006 and that was 15 years ago we usually have urban migration inflow and outflow of people from time to time, and we are now depending on the census that was done 15 years ago. This census should be a recurring program so that we can be having actual census figures. We will know that this is exactly the number of people in a community. So this one will help us to say this is a true number we have this year. It will assist in terms of logistics, finances and overall implementation. So, I think that should be put into consideration"* [KII\KI-2]

At some point, recorded data from the field may not correspond with other similar records or sometimes, records could be falsified either intentionally or unintentionally. Such a situation could undermine the very essence of the program leading to a waste of time, scarce resources and wrong assumption of coverage areas and population. To deal with such a situation, most

respondents revealed that they would follow up and if necessary, correct the error. According to two of the frontline health workers from Igede and Ikere, they have on some occasions seen incorrect records with their CDDs as given in their responses below.

> *"Whenever there is anything like that because we normally go to the houses to check the number of the people in those houses if they have been recorded in their register. If the register is wrongly recorded, we clean it up and do the right thing and we do correct them not to do that again"* [Frontline IDI\IGEDE]

> *"When I see something like that, like the one we did last, I went to power-line to go and work and to monitor what they are doing, as I got to the place, I discover that they did not even go to the place (power-line) to distribute drugs as shown in their records, I and the second frontline were together, we moved down to the place and did it by ourselves. I later told the CDD she has not done the work and she told me that she did not know where I was referring to, and later she did her work to cover the place accordingly"* [Frontline IDI\IKERE]

4.3.2. Challenges with monitoring, coverage and evaluation of drug distribution

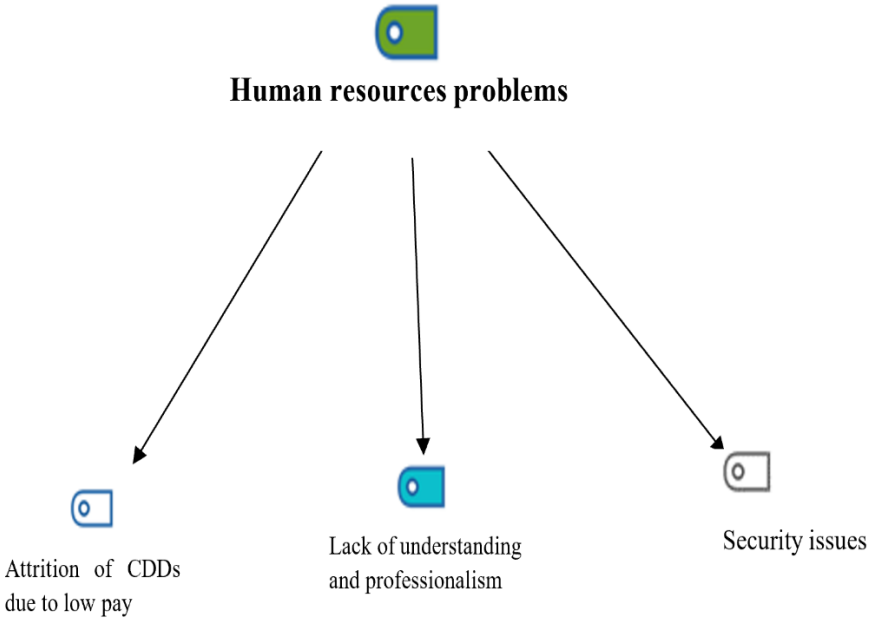
There are challenges to drug distribution, monitoring, coverage and evaluation of the MDA program due to transportation problems. Three of the frontline health workers from Ido-Osi, Ado and Igede commented as shown below.

> *"The major problem is money for transportation and others, at times there may be a need to revisit some locations more than two times before getting everyone there treated. So, we need money to provide adequate transportation and for the CDDs. We spent money on transport fares and the CDDs do complain that the money given to them is too small for the stress they passed through"* [Frontline IDI\IDO-OSI]

> *"We need logistics for a bike to take us from one place to another"* [Frontline IDI\ADO]

"In that aspect, we need logistics for transportation, they can give us little money to take transport to those hard-to-reach areas and if they can provide vehicle or motorcycle during that program, it will assist us too" [Frontline IDI\IGEDE]

4.4. Human resources problems



The study examined human resource problems and the sub-themes that emerged were attrition of CDDs, poor motivation and absenteeism, lack of professionalism and security issues as revealed in the diagram above and narrated below.

4.4.1. Attrition of CDDs due to low pay

The CDDs who help with the MDA in a given year consist of many new members and a few old members. The majority of those who participated in previous years absconded after administering one round of treatment and this could be a barrier to optimal coverage of the MDA. There is a new set of CDDs every year who will need to be trained and retrained for them to understand the work and once they get to know the amount they will be given, they will also run away. Two key

informants and the frontline worker from Ilawe also said the same thing about the attrition of CDDs.

"One of the major challenges we usually face is attrition of CDDs. Usually, this is because of the compensation given to them, which has been the major challenge and a call has been made to community leaders that they should always support their CDDs. Which are the strategies from the national level, that have been the major challenges from the CDDs" [KII\KI-2]

"The community implementers which are CDDS are poorly paid in terms of remuneration, this constantly led to attrition every year, giving us a lot of stress in training and training of new individuals for medicine distribution" [KII\KI-1]

"We used to have 10 CDDs in each community, when the work is now going on, they will be asking this work they are doing how much is their pay? If I tell them the amount, at times they can drop my booklet and say they cannot follow me, they cannot do this kind of work because the money is too small. Though we still have few that are working for us, the reason for those that ran away is nothing other than the complaining of too small money given to them" [Frontline IDI\ILAWE]

Poor motivation and remuneration accounted for the recorded reason for absenteeism or attrition among CDDs of MDA. One key informant and two frontline health workers from Ado and Ikere stressed the low stipends and poor motivation given to CDDs.

"That is another challenge for us on finance because we have some older people who are interested in this work but because of the money, N1,500, this is bad, the remuneration is too

poor. If they agree to work in this round, at another round they will refuse to work due to the money being too small" [Frontline IDI\ADO]

"So, they have known me and with the little amount being given, I do buy some things like snacks to give them to encourage them. At times when they come to submit their register, I will give them transport fare. I do all those because the amount being given to them is too small compared to the work that they are doing" [Frontline IDI\IKERE]

4.4.2. Lack of understanding and professionalism

One key informant and the frontline health worker from Oye said that the barriers to MDA coverage were lack of professionalism and incompetence of personnel.

"A lot of issues do crop up during mass administration of medicine that could affect coverage, ranging from logistics to personnel to the data collation and completion of report generally, incompetency of frontline health workers at the LGA background is an issue during training and data computation" [KII\KI-1]

Lack of understanding during training has contributed to their lack of professionalism which affects the manner of approach of the CDDs during their engagement with the community people as discussed by the Oye frontline health worker.

"At times, I used to correct my CDDs. You know some people would come for training, but they may not understand the register very well. Years ago, my CDDs registers were bad because some can't write, but the community leaders do choose them for us. Sometimes, we make use of their children who are educated, when we trained them" [Frontline IDI\OYE]

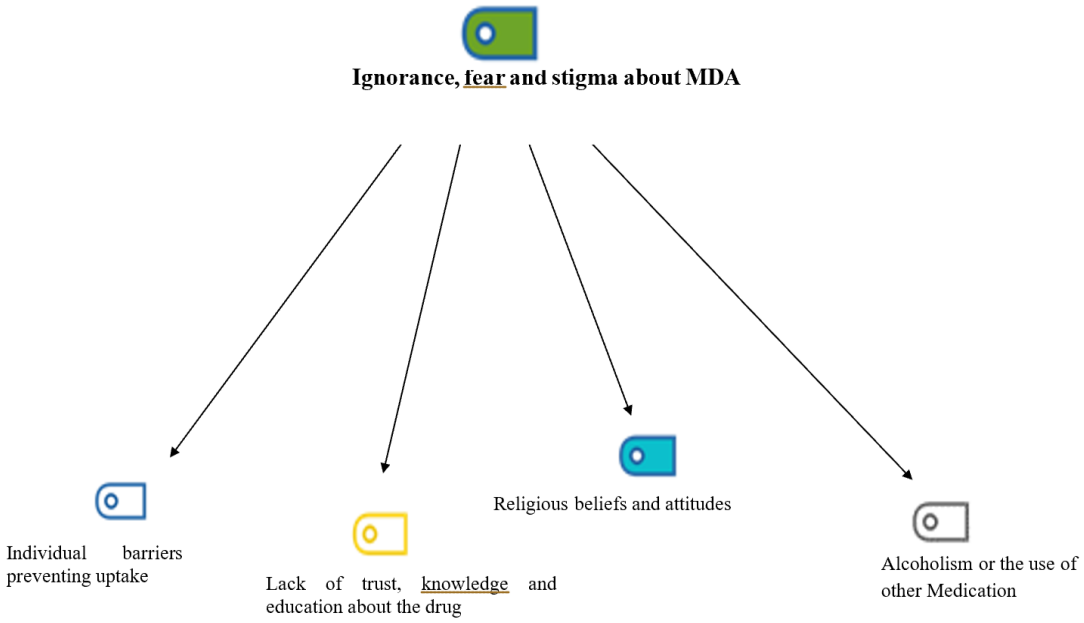
"The manner of approach by the CDDs to community people during treatment is not encouraging, is bad. They don't even know how to carry out the job effectively" [Frontline IDI\OYE]

4.4.3. Security issues

Lack of security in some parts of Ekiti currently is one of the barriers to optimal coverage of MDA in those places. The frontline worker from Oye described certain places as being kidnappers' dens. To get optimal coverage of MDA, the security of those places needs urgent attention.

"Insecurity is also part of it, the last one we did in Isan and Omoga side, we can't even go to those places because the community people themselves even said that they have not seen two of their children for the past three days, they were kidnapped. Those people that are going there, are not safe because of kidnapping. And we have remote areas that we cannot touch due to inadequate provisions to get to those places. And there's one Aba (farm settlement), we cannot get to that place too, one of us that went there last year said what they saw there was not palatable at all, and so it's giving us the problem" [Frontline IDI\OYE]

4.5. Ignorance, fear and stigma about MDA



Participants were asked about their opinion and the perceptions of others in their communities concerning the reasons for rejecting the drugs. Several reasons were provided relating to various myths, ignorance, stigma and theories which influenced the social acceptability and coverage of the program by the people it was designed for. These include individual barriers preventing uptake, lack of trust, knowledge and education about the drug, cultural beliefs and attitudes, and alcoholism as shown in the diagram above and explained below.

4.5.1. Individual barriers preventing uptake

There are a variety of barriers to the uptake of drugs which can be classified together as individual barriers. The first of these is political differences, in particular, if an individual dislikes the ruling party he or she would not want to follow a policy of that party. The second relates to beliefs around medical treatment, with some individuals believing that if they are not sick or if they have no symptoms then there is no need to take a drug for prevention, while others prefer alternative treatments such as injections or herbal medicines to swallowing drugs. Finally, some individuals

feel that poverty is a problem and therefore they would prefer food to drugs. The frontline health worker from Ado and a community member from Ikere gave their responses which are shown below.

"It is true, the reason also is political party differences. For example, in Ekiti we are under the APC government presently, some will tell you they belong to the PDP party and so they cannot take APC or Fayemi's (Governor) drugs" [Frontline IDI\ADO]

"It depends, you know, when someone is not sick and he is not having any feeling of sickness, there is no need of taking the drug. But if someone is seeing some symptoms of diseases or sickness, he may need the drug. I don't take the drug; I prefer injection or herbal cure to taking drugs, it has been up to eight years now that I stopped taking drugs" [IDI for Community\IKERE]

"What I can say is that people are rejecting drugs because of poverty, people are clamoring for food, they will say we don't give them food, do we expect them to take drugs without food. This is what they say mostly, their language is food, trying to say if you want to give us anything, give us food. To eat is very hard for people in rural areas when they see us, they will ask if we bring money or food" [Frontline IDI\ADO]

4.5.2. Lack of trust, knowledge and education about the drug

This study revealed a lack of trust and also a lack of knowledge and the need for education about the drug amongst community members. The community member from Igede expressed his fear about the Nigerian health system. The community members from Ikere and the frontline health worker from Ilawe expressed what they perceived about the thought of people concerning the drug. It was said that people's knowledge about the drug is poor and this contributes to the rejection of

the drug. A frontline worker from Igede told the researcher about a woman who believed that the drug causes infertility so women will not give birth. Some rejected the drug because they believe that the drug aims to reduce the population by causing infertility.

> *"No, I don't usually collect drugs. We are in Nigeria, we don't know who and what is true. But if I'm sick I prefer going to the hospital because a doctor will carry out a test on me and give me the actual treatment"* [IDI for Community\IGEDE]

> *"Some are saying that they don't know the kind of drug that is given to them. You know, someone that is not educated about the drugs may not want to use them"* [IDI for Community\IKERE]

> *"And when we are distributing those drugs, for example, I could remember a woman here, she is from Kogi State, who said that these drugs are like family planning for them, that they don't want it. So, we told our coordinator who went there to educate her that it does not cause infertility, we have a woman from Kogi who helped us to explain in their local dialect to her, so she later took the drug, some are still there who rejected the drug, but we do persuade them"* [Frontline IDI\IGEDE]

4.5.3. Religious beliefs and attitudes

Religious beliefs and attitudes are habits seen in a particular community or a set of people that influence the acceptability of MDA. The study revealed some religious beliefs that hinder the uptake of drugs. Two frontline health workers from Ido-Osi and Oye explained their experiences with some religious people.

> *"Well, some people are traditional worshippers i.e the oloro (idol worshippers) during their festival, they don't take drugs, but after their festival, they will come for it. But should in case*

we finish MDA before the end of their festival, they will have to wait till another round which is another year" [Frontline IDI\IDO-OSI]

"They believe that only the church can heal. There was a pastor that when we got to his church, said they don't take these drugs. We told him, pastor, it works. I said that black flies that are biting everybody, it's the one that causes the disease. Some do reject the drug because of religion, but we do convince them" [Frontline IDI\OYE]

4.5.4. Alcoholism or the use of other Medication

Guidelines for MDA are that drinkers should not take alcohol on the day of MDA and those who are on other medication should not be given MDA. This study confirmed that some of the community members would not consider the distributed drugs because of their social lifestyle, they are addicted to alcohol intake and other substances that cannot be taken alongside drugs of the MDA programs. One key informant, a frontline health worker from Ido-OSI and a community person from Oye confirmed that those who cannot skip alcohol or their medications do reject the MDA drugs.

"Some give some flimsy excuses like they cannot but drink or smoke or take any alcohol daily, this one will prevent them from taking the medicine as they were addicted to drugs and medicine they cannot hold or leave that, articulated in the guideline during medicine administration these are the other reasons behind rejection by a few households" [KII\KI-1]

"Some of them take palm wine and some on other drugs, and these MDA drugs cannot be taken with palm wine" [Frontline IDI\IDO-OSI]

"There are some people that don't like to take it because they say if you take it, throughout that day, you will not have access to alcoholic drink and they say, they cannot do without a

such drink. So, that is their complaint, and they feel that they should not just take it" [IDI for Community\Oye-IDI]

4.6. Provider accountability

Some factors emerged as facilitators of optimal coverage of MDA in the study as perceived by the participants.

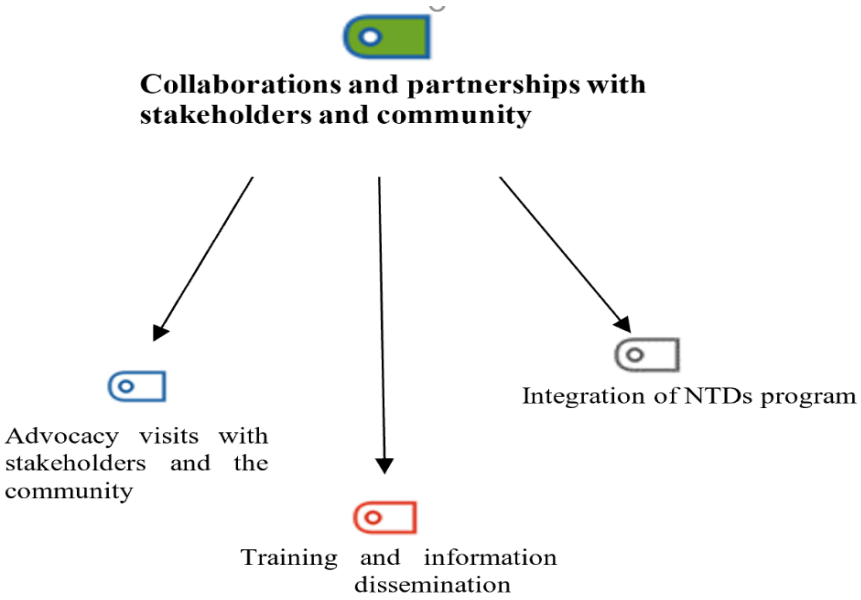
4.6.1. Actors' perceptions about MDA

MDA workers (key informants and frontline health workers) who are participants in the study gave their perceived factors that could facilitate optimal coverage of MDA in Ekiti State which include encouraging return visits to the absentees at the first visit, provision of motorbikes to reach remote areas and keeping drugs in health facilities for those who missed MDA. One key informant and the frontline health worker from Ado explained this as shown below.

"We do have some settlements that are usually not within the same areas, I mean, isolated places, that is why the CDDs may not be there and whenever we identified such an area we call them back to go there. Sometimes we do have absentees when community-directed distributors go to those houses and they were not met, what we usually tell them is that they should do the revisit, to go back to such houses to treat those settlements" [KII\KI-1]

"The LGA (local government area) team are the ones going to very hard-to-reach areas. In Ado, we have Temidire, like Ilamuo, we have CDDs in that settlement that we pick in that place working there but during the program, we have an LGA team who used to take a bike to the place to ensure the CDDs there are working. We distribute ourselves ward by ward, like Ago-Aduloju place where we have Temidire-Esumo, is not easy for frontline workers to get there, so the LGA team has to provide a bike or motor vehicle to convey the frontline worker to the place" [Frontline IDI\ADO]

4.7. Collaborations and partnerships with stakeholders and community



Collaborations and partnerships with stakeholders and community people are good facilitators to determine the success of any health program. The study observed that the MDA staff share a healthy and progressive relationship with the various communities they had contact with and this was made possible through advocacy visits with stakeholders and the community, training and information dissemination and integration of the NTDs program as shown in the diagram above.

4.7.1. Advocacy visits with stakeholders and the community

It was revealed by two key informants that there was a visitation to the stakeholders and the community. The frontline health worker from Ado said they get interpreters in the community for those who speak other languages than their community language as reported below.

> *"We are with the stakeholders in Ekiti State, we have a cordial relationship, there is a forum referred to as Ekiti state Advisory committee NTDs (EKSACOM) the committee comprises of religious leaders, Islamic leaders, both for Christians and Muslim bodies, PTA chairman, youth leader, information ministries, environmental ministry, the RUWASA people, people from academia that do gather research work on NTDs, with these, every*

necessary stakeholder are usually carried along and keep informed about updating NTDs in Ekiti State" [KII\KI-1]

"For the community leaders, we normally visited the community leaders to sensitize them about this MDA" [KII\KI-3]

"Apart from this MDA program, in other health programs too, we have people from all the tribes including Hausa, Ibira, Igbo and Nope, we pick one person who can talk to the people in their language" [Frontline IDI\ADO]

4.7.2. Training and information dissemination

Training and information dissemination are perceived to be good facilitators of optimal coverage of MDA especially when it is done with evidence that testifies to the effectiveness of the drug. Frontline health workers from Ado and Ido gave their responses below.

"We go directly to the community to do mobilization, to create awareness and educate them before the program. Secondly, we need to do sensitization, continuous jingles, many people don't listen to the radio anymore but if they can put it online, any social media and any other means of getting it to the people" [Frontline IDI\ADO]

"The people in this community like the program, some people testified that the drug is good for their health with positive changes in their body" [Frontline IDI\IDO-OSI]

4.7.3 Integration of NTDs program

Integration of NTDs program with other health programs is perceived to be a facilitator to the optimal coverage of MDA. Key informant 3 explained their experiences below.

"The effect that it may have, like today now, we went for integration. So, we normally do integration with other programs, as we talked about guinea worm in the DSNO meeting

today. So that they can help us to carry out the reporting and documentation of any NTDs cases in their LGA" [KII\KI-3]

4.8. Application of the CFIR to the analytical findings.

The themes that emerged are not perfectly matched with the constructs in domains of CFIR but only seven suitable constructs and four sub-constructs for barriers and facilitators to optimal coverage of MDA in Ekiti State were selected across all the domains to describe the themes that emerged in the analysis of this study. The seven constructs and four sub-constructs are patients' needs and resources; culture; implementation climate i.e. tension for change and organizational incentive and reward; readiness for implementation i.e. available resources and access to information and knowledge; knowledge and belief about the intervention; personal attributes; engaging opinion leaders.

4.8.1. Outer settings

One construct is relevant to the perceived barrier to MDA in this domain. It explored patients' needs and resource constructs, the sub-theme that emerged is the abject poverty of individuals in the community.

4.8.2. Inner settings

Three constructs and four subconstructs are relevant to the perceived barriers and facilitators in this domain:

a. **Culture**: socio-cultural beliefs emerged as barriers to optimal coverage of the MDA program.
b. **Implementation climate:** Two sub-constructs are relevant to the barriers and facilitators in this construct.

i) **Tension for change;** There is tension for change in terms of updated census figures to get the accurate population target used for an MDA program. There is a need for improving security in the communities where kidnapping poses a threat to the MDA implementers.

ii) **Organizational incentive and reward:** Incentive and reward for the CDDs, community leaders that are involved and health workers are themes that emerged to be the barriers and facilitators to the optimal coverage of the MDA program.

c. **Readiness for implementation:** Two sub-constructs are relevant to the barriers and facilitators for MDA in this construct.

i) **Available resources:** Some themes emerged here as barriers and facilitators to the MDA program and they include logistics, equipment, access road and continuous training of CDDs and Health workers involved.

ii) **Access to information and knowledge:** Awareness and public education on the benefits of the drug emerged as perceived facilitators to the optimal coverage of MDA.

4.8.3. Characteristics of Individual

Individuals' characteristics are the perceived barriers that have to do with individual myths and fears that cause the rejection of the drugs. The themes that emerged are discussed below under two constructs in this domain.

a. **Knowledge and belief about the intervention:** Lack of awareness and poor knowledge of the MDA drugs.

4.8.4. Other personal attributes

Other perceived personal attributes that pose as barriers to the optimal coverage of the MDA are drug adverse reactions, political differences, drinkers not being able to take alcohol on the day of MDA

4.8.5. Implementation Process

One theme that emerged here is the construct of engaging opinion leaders. The need for different community leaders' engagement is one of the barriers to the optimal coverage of MDA in Ekiti state.

CHAPTER FIVE: DISCUSSION

5.0. Introduction

This study explored the barriers to and facilitators of optimal coverage of MDA for the treatment of LF and onchocerciasis as perceived by the actors and stakeholders in Ekiti State, Nigeria. Two objectives were considered namely: 1) To explore the barriers to optimal coverage of MDA in the treatment of LF and onchocerciasis in the opinion of the actors and stakeholders and 2) to explore the facilitators of optimal coverage of MDA in the treatment of LF and onchocerciasis in Ekiti State, Nigeria. The participants were frontline health workers in NTDs who are the Community Health Extension Workers (CHEW), community people and State Officers in the NTDs units of the Primary Health Care Development Agency of Ekiti State. They all shared their experiences on what they perceived could be the barriers and facilitators to the optimal coverage of MDA in Ekiti State. The results section has a total number of six themes with sub-themes that are discussed according to the objectives of the study.

Study limitations are also discussed in the latter part of this chapter.

5.1. First objective: Barriers to MDA optimal coverage in Ekiti State

Many factors were found to be barriers to the optimal coverage of MDA for the treatment of LF and onchocerciasis in Ekiti. These barriers are that the health system is inadequate for MDA; health information system challenges; human resources problems; ignorance, fear and stigma about MDA.

5.1.1 Health system inadequate in MDA

Frontline workers from Ado, Igede and one of the key informants' participants noted that there are hard-to-reach communities in their domains. Taking drugs to those areas during MDA is usually difficult due to bad roads and long distances. The situation is made worse by the lack of vehicles

and motorcycles for frontline health workers to access those rural communities, so they must walk on foot to reach those remote areas.

Frontline workers from Ido-Osi, Ado and one key informant participant expressed their concern about the inadequate funding as the major factor that poses a barrier to optimal coverage of the MDA program in Ekiti State. They perceived that some stakeholders such as state government, sponsors and community leaders are not giving total support to the finance of this program. Provision of logistics such as transportation to reach far places and some other basic needs like office equipment depend mainly on finance for the optimal performance and success of the overall program. This is in line with the findings of Gebrezgabiher *et al* on onchocerciasis who revealed that financial challenge is one of the main challenges to accelerating the elimination of onchocerciasis in endemic countries of Africa (such as Nigeria, Cameroon, Equatoria Guinea, Congo, Chad) [11].

Participants noted their perception of the need for working tools which could be a barrier to optimal coverage of the MDA program. There was an inadequate provision of working tools such as dose poles for height measurement, registers, pens, dispensing spoons and envelopes (to avoid wastage of drugs while sharing) during MDA. This hindered the distributors in carrying out their work within the given time without delay to cover each of their jurisdictions. This was also revealed by Gebrezgabiher *et al* that some governments of the endemic countries in Africa were not capable of providing enough tools for their onchocerciasis programs, an example is the high cost of laboratory procedures and tools in Uganda which is USD 35,000 to 40,000 yearly [11].

5.1.2 Health information system challenges

Outdated census figures are one of the perceived barriers noted by one of the key informant participants. The last census conducted in Nigeria was in 2006, the figure given as the target population for MDA in Ekiti since then is by statistical estimation. People migrate from one state

to the other in search of greener pastures or mobility of labor without a record of their movement, it was discovered in a study in sub-Sahara Africa by Silumbwe *et al* that those unrecorded migrations could affect the implementation of MDA because it will be difficult planning for an unknown number of people [4]. Hence, there is a possibility of over and underestimation of the population during the planning of the MDA program if census data is too old and this, in turn, could affect the optimal coverage of the MDA program in Ekiti State and any other endemic communities. This was revealed in a previous study by Gyapong *et al* on current perspectives on MDA in the elimination of LF in Papua New Guinea and Indonesia, it was stated that not updated census data resulted in estimation of different treatment coverage in the same community because different population figures were given to work with [29]. Silumbwe *et al* also stated that migrations may affect the disease epidemiology which in turn can hinder MDA for LF treatment and thus suggested that population dynamics should be monitored when planning the MDA program in sub-Saharan Africa [4].

Incorrect records submitted by CDDs sometimes can give the wrong assumption of coverage areas. This was noted by two of the frontline health workers from Igede and Ikere. If households or places that were not covered are registered as having been treated, this will affect the optimal coverage of MDA. So, incorrect records either intentionally or unintentionally are a perceived barrier to MDA coverage. This finding agrees with that of a study by Gyapong *et al* on the elimination of LF in Papua New Guinea and Indonesia which found that inaccurate data were reported in some of the endemic communities [29].

5.1.3 Human resources problems

All the participants from key informants and frontline workers emphasized the attrition of CDDs which leads to insufficient CDDs to cover communities and a lack of volunteers, to be a barrier to optimal coverage of MDA in Ekiti State. It was noted that the package of remuneration and

incentives that are given to these actors from the community leaders, sponsors or NGOs and governments is too poor, and thus discourages the participation of volunteers to aid drug distribution during the MDA program. This view is supported by Gyapong *et al* and Gebrezgabiher *et al* who in their separate research showed that the lack of incentives, remuneration and low motivation have been identified to be causes of the high rate of CDDs attrition in some of the endemic countries in Africa [11, 29].

The frontline health worker from Oye and one of the key informants perceived the poor attitude, manner of approach and lack of professionalism of CDDs to the people as a barrier to effective coverage of MDA in their community. Due to this, they fail to convince them to use the drugs. This could be because of the limited knowledge of the CDDs which adversely affects the level of interaction, manner, and overall participation of community people as discussed in a previous study in sub-Sahara Africa by Silumbwe *et al* that workshops and training do not only give the CDDs knowledge but also inspire them to work confidently [4]. The health provider-patient relationship is one of the major factors that determine patients' utilization of health facilities or uptake of drugs during health campaigns/programs.

Lack of security is a major challenge in Ekiti state presently. Some rural communities in the state are not safe to visit. The frontline health worker from Oye reported that the spate of kidnapping in the state (especially in some communities in Oye local government) is a barrier to optimal coverage of the MDA. Frontline workers in those places are calling for the government to improve security by assigning security men to accompany the team working in these communities during the MDA to ensure the safety of the team. This agreed with a previous study by Okoli *et al* who revealed the number of kidnappings in Nigeria between 2005-2009 to be 2,184 [54].

5.1.4 Ignorance, fear and stigma about MDA

Some people believe that the ruling party is the organizer and owner of any program done by the government officials and they ascribed it to the government of the day, and since they do not belong to or support the ruling party, they will reject any program presented by the government. This situation seems to be peculiar to some individuals as reported by the frontline health worker from Ado.

A community person from Igede stated his reason for not taking the drug as not having trust in Nigeria's health system. He prefers doctor diagnoses and prescriptions to just taking a drug from anybody on the streets. This lack of trust is perceived to be a barrier to the uptake of the drug, hence hindering the optimal coverage of MDA. A study in the Amazon of Peru by Westgard *et al* stated that embarrassment, fear and trust have major effects on the health-seekers [55].

The abject level of poverty of some individuals was perceived to be one of the reasons for the rejection of drugs during MDA. It was gathered from the frontline health worker from Ado that these poor individuals believe that hunger is a more challenging problem, so they ask for money and food instead of drugs from the distributors during the MDA program. The hunger which is a product of poverty is one of the banes of healthcare utilization in some low-income countries and communities in line with the understanding that the diseases under review affect mostly poor individuals as reported by Silumbwe *et al* [4]. Poverty negatively influences people's perception of health campaigns and other health-related programs intended to promote people's health status. This is in line with a previous study from Amazon of Peru by Westgard *et al* who revealed that poverty could make people susceptible to diseases and death [55].

There are perceived personal myths, rumors and misunderstandings about MDA due to the socio-cultural belief of some individuals in some of the communities in Ekiti State as reported by frontline health workers from Ido-Osi and Oye. Examples are that traditional worshippers forbid

taking drugs during their festive periods, so if MDA happened during their festival, they would not take it; a set of believers hold the view that only God can heal, therefore, they don't take drugs; to a large extent in Africa a dual healthcare system (modern and traditional) is operated in which the belief of people tends to be more on the traditional than the modern; some believe that MDA drugs cause infertility, which thus influences the uptake of drugs. Myths and rumors are commonly believed in African countries which is similar to Ekiti. It was noted in previous research carried out in some sub-Saharan African countries that MDA can be interrupted by cultural myths and rumors such as the belief that CDDs and MDA could spread the Ebola virus [4].

A community member from Ikere believes that there is no need for people to take the drug when they are not ill, they claim that the drug is meant for those who are sick. This orientation is perceived to pose a barrier to the uptake of MDA drugs and thus hinders optimal coverage of MDA. Some are skeptical about the western medical approach and give preference to herbal medicine as revealed in a previous study [56]. The view that the drugs given impede alcohol intake is another personal myth for rejection of the MDA program by individuals who are addicted to alcoholic drinks. According to the report from one key informant and frontline health workers from Ido-Osi and Oye, it was perceived that these individuals who are addicted to alcohol do not participate in the MDA program knowing that alcohol must not be taken within 24 hours of taking the drugs. Consequently, they reject any drug administered to them, thus reducing the optimal coverage of the program.

5.2. Second objective: Facilitators of MDA optimal coverage in Ekiti State

Factors that emerged as facilitators of optimal coverage of MDA in the treatment of LF and onchocerciasis in Ekiti State, Nigeria are grouped under two themes as perceived facilitators of optimal coverage of the MDA program in Ekiti which are provider accountability and collaborations and partnerships with stakeholders and the community.

5.2.1 Provider accountability

Health workers supervise the CDDs and encourage a return visit to the households in which the occupants were not at home during MDA at the first visit to facilitate optimal coverage of MDA as reported by one of the key informants. This agrees with a study in Ghana by Manyeh *et al* who revealed that CDDs revisiting the homes where members were not available at the first visit will facilitate the uptake of drugs [57].

The frontline health worker from Ado said they used motorbikes in **s**ome areas that are not accessible by car due to bad roads. The provision of motorbikes as a means of transportation to reach those hard-to-reach places is perceived to be a facilitator of optimal coverage of MDA in those places to motivate the actors as discovered in a previous study [4].

The frontline health worker from Ikere suggested that keeping drugs in health facilities for those who did not receive the drugs during MDA would facilitate optimal coverage of MDA.

5.2.2 Collaborations and partnerships with stakeholders and the community

Awareness creation is perceived to be a facilitator of MDA in Ekiti State. Awareness campaigns and sensitization in all the communities including the remote areas, religious houses, marketplaces, street publicity, house to house and social media about the MDA program in all endemic communities is carried out by the health workers in Ekiti as reported by frontline health workers in the interviews. This was stated in previous studies conducted in sub-Saharan Africa and Ghana, Silumbwe et al and Manyeh et al stated that one of the facilitators for implementation of MDA is awareness creation [4, 57].

Participants perceived that sensitization and telling people about the beneficial effect of the drugs is one of the facilitators of optimal coverage of MDA as many community people testified that they would take the drug again and again because of the health benefits and positive effects on

their bodies. This information about the drug could be used to campaign for MDA during awareness creation. This was established in a previous study conducted in rural and urban Tanzania, Kisoka *et al* stated that those who have previously experienced health benefits of the drugs such as passing out the worm in the excreta are more encouraged to take the drug again during the next MDA [46].

There is a need for training and retraining personnel in the administration of drugs for proper service delivery. Health workers and drug distributors should be trained in aspects of a relationship with community members, updated on relevant drugs that should be administered to people and organized programs to sensitize and educate community members to enhance their awareness and knowledge of the MDA program as revealed in the previous studies [4, 57].

A good relationship between health workers, relevant stakeholders and the community people is perceived by two key informants and the frontline health worker from Ado to be a facilitator to optimal coverage of MDA in Ekiti State. This can be achieved by community partnership via the formation and involvement of a health committee that comprises community representatives from all categories of people in the community [4]. Frontline health workers working together with CDDs to ensure complete coverage and correction of records is perceived to be a facilitator to optimal coverage of MDA in Ekiti State. Health workers getting help from the community for interpreters in the communities where the language barrier would have been a major challenge to free communication about MDA is perceived to be a good facilitator of optimal MDA coverage in those communities in Ekiti State.

Integration of NTDs and other existing health care interventions is perceived by one of the key informants to be a facilitator of the MDA program. This was noted in a previous study in sub-Saharan Africa, Silumbwe *et al* stated the benefits of integration with other NTDs as an opportunity

to coordinate and share resources, it has the effect of cutting the cost of implementation and ensures wide coverage of the MDA program [4].

5.3. Limitations

There was likely bias introduced since some of the frontline health workers thought that the purpose of the study was to expose them or to report them to the higher authority, especially because of the phone call from the State Program Officer that they should give attention to the researcher for the interview. When this was noticed, the researcher was able to convince them that the purpose of the study was not to report them to their superior officer but for a degree award from the University and that in no way would the study have any negative effect on them. Also, the State Program Officer was just calling them to help the researcher get their attention for the interviews and nothing more. Meanwhile, some of them saw it as an opportunity for them to reveal the challenges of MDA in the hope that this would bring about improvements.

The limitation posed by covid-19 was minimal because the interviews were conducted when the covid-19 lockdown was relaxed in Nigeria, while social distancing had a small effect on the quality of the audio recording in terms of volume but this did not affect the note-taking by the researcher. After the transcription, note-taking was used to compare with the audio transcriptions and necessary adjustments were carried out to those parts of the recording which were not clear. This was done easily because the interviews were conducted by the researcher who understood the content of the interviews.

This study was constrained by financial limitations since it was a self-funded study. Though the Faculty of Health Science approved an FRC individual grant of R6,000 and R4,705.06 only was paid to cover transcriptions of the audio records and stationeries used for the study, it was not enough to fund the study.

CHAPTER SIX: RECOMMENDATIONS AND CONCLUSION

6.0. Introduction

This chapter reviews recommendations for achieving optimal coverage of MDA for the treatment of LF and onchocerciasis in Ekiti State, Nigeria and any endemic communities in sub-Saharan Africa. There are four short-term recommendations while long-term recommendations are five, making the total number nine. The later part of this chapter discusses the conclusion.

6.1. Recommendations

Based on the study results, recommendations were made for the short term and long term.

For the short term, policymakers, stakeholders and actors in MDA could consider the following:

1. There is a need for financial support from all concerned stakeholders according to all frontline health workers and the three key informants. Funds should be raised from philanthropists and more NGO sponsors should be sought. Federal, state, and local governments should contribute to the implementation of the MDA program for remuneration of CDDs, more human resources, vehicles, office equipment, MDA tools such as dose poles, record books, drug dispensing spoons and envelopes, information education and communication (IEC) materials such as flyers, posters, handbills, billboards and leaflets, and improvement of infrastructure. The program should not depend solely on NGOs for sponsorship. When there is adequate provision for all these, it will aid optimal coverage of the MDA program in Ekiti State and beyond.

2. There should be increased and continuous health education and campaigns about MDA for the treatment of LF and onchocerciasis by the actors in the MDA program. This study shows that some of the community people are not knowledgeable about drugs and their functions. Health education should emphasize the importance of these drugs, their usage, and their adverse effects to avoid misinformation and eliminate the fears and myths that

can hinder the uptake of the drug. This recommendation is supported by a study in sub-Saharan Africa by Silumbwe *et al* that it is necessary to tackle negative information and sentiments about MDA through health education [4].

3. Campaign and awareness creation that include pamphlets, handbills, electronic boards, radio, television and all social media should be done for effective communication by the stakeholders and actors in the MDA program. This will enhance better understanding and acceptability of the MDA program in the community. This is in line with a study carried out in the Bole and Central Gonja districts in northern Ghana by Manyeh *et al* that the creation of awareness before and during the MDA program contributes to its successful and optimal coverage [57].

4. There should be security men that will move with health workers to distribute drugs during the MDA program by the State Government. This will enhance their free movement to reach out to people living along those threatening and dangerous zones like Oye Local Government Area.

In the long term, policymakers, stakeholders and actors in MDA could consider the following:

1. Provision should be made for those that missed the drug after MDA. All the individuals in the community need to be treated to ensure there is no reinfection of these diseases among the treated ones from those that missed the drug. Those who missed the drug can be taken care of by giving out drugs to the health facilities where people can access treatment if they miss the MDA. The policymakers could give attention to this.

2. There should be a provision of the patient's small card where the name of the patient, address, drugs given for ten years, dosage, the date given, and the next appointment will be recorded. The card should be given to only the individuals treated in the community

during MDA as evidence of taking the treatment; this will give details of the number of doses that they have been given. The card will aid the identification of those who have received and those who did not receive drugs during MDA to avoid overdosage and double treatment. The patient's card will prevent the falsification of the CDDs register book and other data collection forms because the information must be the same if the treatment is truly done, hence there will be accurate and real data that demonstrates the coverage of the MDA. Reference to this is a small card given out for tetanus-toxoid vaccines, covid-19 vaccines, and other vaccines for proper monitoring of the vaccine usage and this could also be achieved for the treatment of LF and onchocerciasis to monitor and ensure its optimal coverage for effective elimination of these diseases. Consideration could be given to this by policymakers and stakeholders.

3. There should be implementation science professionals and researchers who will be assigned to work with all the institutions or organizations that carry out evidence-based interventions such as MDA. They will supervise to ensure proper implementation of the programs in terms of acceptability, feasibility, and fidelity which will promote optimal coverage. Hence, the goal will be achieved and there will be total elimination of these diseases. Policymakers and stakeholders could consider this.

4. A new census that will provide viable population figures should be conducted by the federal government to ensure proper planning and preparation of healthcare services like the MDA program. This will enhance the adequate provision of drugs, funds and human resources for a targeted population.

5. Lastly, there is a need for further research to investigate the knowledge of LF and onchocerciasis among the people of Ekiti State, Nigeria using the qualitative explanatory cross-sectional method for better exploration. This study revealed that there are people in

Ekiti communities who are at risk and yet have little or no knowledge about these two diseases and their treatment. When this is explored, it will aid the plan for the MDA program in Ekiti State.

6.2. Conclusion

This study reviewed the actors' and stakeholders' perceived barriers to and facilitators of optimal coverage of MDA for the treatment of LF and onchocerciasis in Ekiti state, Nigeria. Some of the barriers and facilitators that emerged are new findings such as the need to keep drugs in the health facilities for those who missed the drug during MDA and the availability of small cards for monitoring drug usage, assigning implementation science professionals to work with organizations that carried out evidence-based interventions for its proper implementation, while many others have been discovered by other previous researchers such as financial support for MDA program, continuous health education, campaign and awareness creation, new census and provision of security to dangerous zones. All the themes, taken together, should be painstakingly considered by policymakers and stakeholders to ensure it has a positive effect on the optimal coverage of any MDA program. When there is optimal and wide coverage of MDA, the eradication of LF and onchocerciasis is achievable in Ekiti state and other endemic places in Africa.

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APPENDICES

APPENDIX I

Plagiarism declaration report

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

FACULTY OF HEALTH SCIENCES

I, **Alabi Oluwatoyin Peace** (Student number: **2365498**) am a student registered for the degree of **MSc Epidemiology in Implementation Science** in the academic year 2020.

I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.

- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.

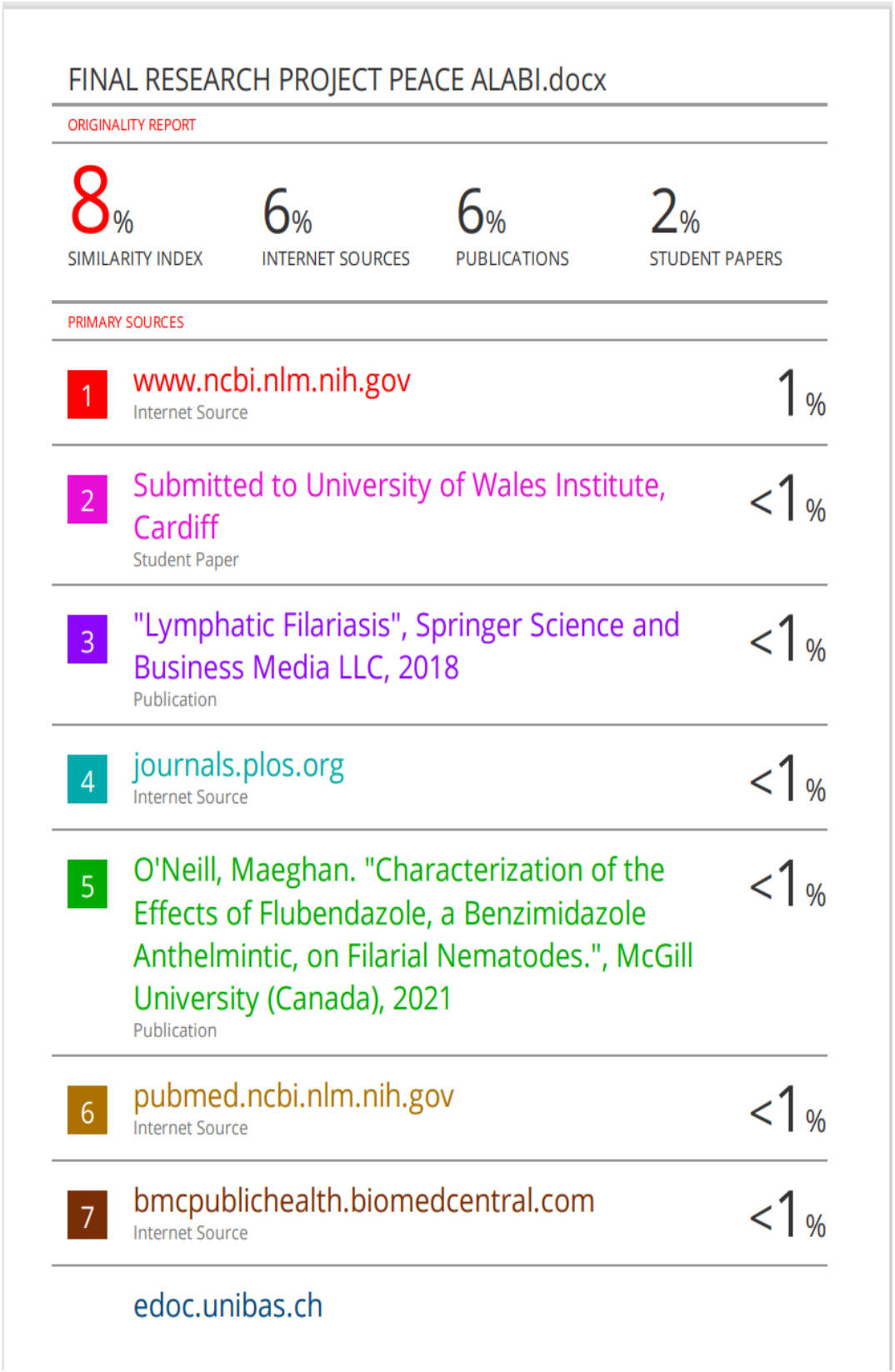
- I have followed the required conventions in referencing the thoughts and ideas of others.

- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.

- I have included as an appendix a report from "Turnitin" (or other approved plagiarism detection) software indicating the level of plagiarism in my research document

Signature:  Date: 3rd September 2022.

APPENDIX II



FINAL RESEARCH PROJECT PEACE ALABI.docx

ORIGINALITY REPORT

8%	6%	6%	2%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.ncbi.nlm.nih.gov Internet Source	1%
2	Submitted to University of Wales Institute, Cardiff Student Paper	<1%
3	"Lymphatic Filariasis", Springer Science and Business Media LLC, 2018 Publication	<1%
4	journals.plos.org Internet Source	<1%
5	O'Neill, Maeghan. "Characterization of the Effects of Flubendazole, a Benzimidazole Anthelmintic, on Filarial Nematodes.", McGill University (Canada), 2021 Publication	<1%
6	pubmed.ncbi.nlm.nih.gov Internet Source	<1%
7	bmcpublichealth.biomedcentral.com Internet Source	<1%
	edoc.unibas.ch	

APPENDIX III

INTERVIEW GUIDE FOR FRONTLINE HEALTH WORKERS

Warm-up Questions:

1. Can you tell me about yourself, your discipline, how many years you have spent in the MDA program?
    a. Probe: Years spend in MDA Program if it is over three years and above and personal experiences.
2. Tell me about how the MDA program works for LF and Onchocerciasis?

Core Questions:

1. Tell me about the strengths of the MDA program, what is working well?
2. What are some of the challenges in the MDA program?
3. How would you describe the relationship between the clinics/health workers and the community?
4. Community leaders no doubt have certain roles to play. From your experience, what can you say about their roles?
    a. Probe: what level of support received from them
5. How does the program evaluate the coverage of MDA in your local government area?
    a. Probe: what is your role?
6. What happens if there are differences in CDDs records and monitoring data and supervision?
    a. Probe: register falsification and proper recording?
7. What challenges have you encountered in the process of drugs distributions, if any?
8. Tell me about the retention of CDDs in the program?

a. Probe: if there is attrition; what do you think could be the reasons for CDDs attrition every year during MDA?

b. What are your challenges in getting new CDDs?

9. How do you manage to get to the hard-to-reach and very remote areas in your local government during MDA?
    a. Probe: Road accessibility, mobility, and distance
10. How do you get awareness campaigns to hard-to-reach members of the community?
11. What are some of the challenges working in some of the more remote areas? How are you addressing these challenges?
    a. Probe language barriers
12. What are the reasons for those who rejected taking drugs?
    a. Probe: how have you been handling them?
13. How do you manage the people who ask for drugs after MDA and those who miss out during MDA?

Probe: How they cater for those who are left out during MDA

Concluding Questions:

1. What do you think can enhance or aid the optimal coverage of the MDA for the treatment of LF and onchocerciasis?
2. Is there anything else about the MDA program that we have not covered?

APPENDIX IV

INTERVIEW GUIDE FOR KEY INFORMANTS

1. What are your experiences during the supervision of MDA intervention?
2. What do you do as a State Health Officer when you see those houses or communities not covered or reached by CDDs when you move around for monitoring and supervision during MDA intervention?
3. What do you think could be the reasons for those houses or communities not being covered?
4. How are you able to tackle these reasons and get the people treated?
5. What are your experiences with CDDs?
6. Tell me about your relationship with community people and stakeholders in Ekiti State as regards MDA?
    a. Probe: the roles and support of stakeholders to ensure optimal coverage?
    b. What is the role of the State Government in the MDA program?
7. What are the effects of other health programs on MDA?
    a. Probe: how other health programs can affect the coverage of MDA
8. What can be done to enhance optimal coverage of the MDA program in Ekiti State?

APPENDIX V

INTERVIEW GUIDE FOR COMMUNITY PEOPLE

Warm-up Questions:

1. Can you tell me about yourself, your community and how many years you have spent in this community?

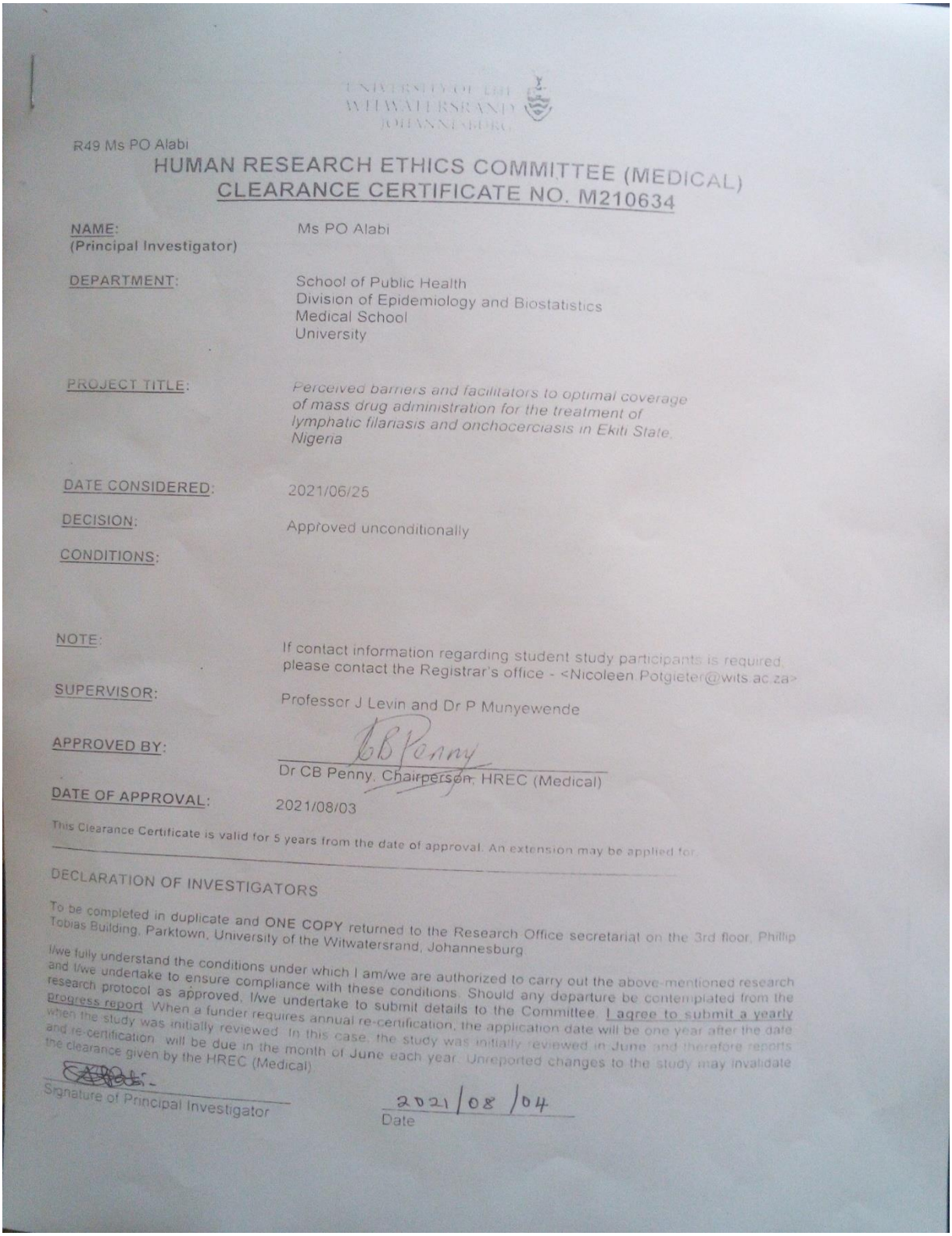
Core Questions:

1. Are you aware of the drugs given once in a year in your community for these diseases?
2. If you have been given, how and where did you receive the drug?
3. Would you take the drug again this year?
    a. What are the reasons why you may want to use these drugs again?
    b. What are the reasons why you may not want to use these drugs again?
4. What can you say about the distribution coverage in your community?
    a. Probe: Is everybody in your street or community getting these drugs?
5. How long have you been hearing about the MDA program?
    a. Probe: awareness coverage

Conclusion Questions:

What do you think can be done to enhance everybody getting these drugs in your community during the MDA program?

APPENDIX VI



UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

R49 Ms PO Alabi

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M210634

NAME: (Principal Investigator)	Ms PO Alabi
DEPARTMENT:	School of Public Health Division of Epidemiology and Biostatistics Medical School University
PROJECT TITLE:	*Perceived barriers and facilitators to optimal coverage of mass drug administration for the treatment of lymphatic filariasis and onchocerciasis in Ekiti State, Nigeria*
DATE CONSIDERED:	2021/06/25
DECISION:	Approved unconditionally
CONDITIONS:	
NOTE:	If contact information regarding student study participants is required, please contact the Registrar's office - <Nicoleen.Potgieter@wits.ac.za>
SUPERVISOR:	Professor J Levin and Dr P Munyewende
APPROVED BY:	CB Penny Dr CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	2021/08/03

This Clearance Certificate is valid for 5 years from the date of approval. An extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office secretariat on the 3rd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to submit details to the Committee. I agree to submit a yearly progress report. When a funder requires annual re-certification, the application date will be one year after the date when the study was initially reviewed. In this case, the study was initially reviewed in June and therefore reports and re-certification will be due in the month of June each year. Unreported changes to the study may invalidate the clearance given by the HREC (Medical).

Signature of Principal Investigator

2021/08/04
Date

APPENDIX VII

Ethics approval from Ekiti State Ministry of Health and Human Services

MINISTRY OF HEALTH *AND HUMAN SERVICES*

Ile Iyi, Ile Eye

New Secretariat Complex, Ado-Ekiti, Ekiti State, Nigeria.

All communications should be addressed **Date: 14th July 2021**

to the Permanent Secretary quoting:

Our Ref. NO: MOH/PRS/040

Alabi Oluwatoyin Peace
School of Public Health,
University of the Witwatersrand,
Johannesburg, South Africa.

Dear Ma,

RE: Application for Ethical Approval

Your application for ethical approval on the topic '**Perceived Barriers and Facilitators to Optimal Coverage of Mass Drug Administration for the Treatment of Lymphatic filariasis and Onchocerciasis in Ekiti State, Nigeria**' is hereby granted.

Your approval number is **MOH/EKHREC/EA/P/18** and can be quoted in future correspondence.

You are strongly implored to abide by the basic health research principles of respect of persons, beneficence and justice, and also protecting all data obtained from the study participants.

I wish you success in your investigation.

OFFICE OF THE
PERMANENT SECRETARY
MINISTRY OF HEALTH, ADO EKITI
14 SEP 2020
Dr. O. O. Alabi
SIGN Por: Permanent Secretary

APPENDIX VIII

Permission Letter from Primary Health Care Development Agency

PRIMARY HEALTH CARE DEVELOPMENT AGENCY

No 79, Basiri, Iyin Road, Ado-Ekiti, Ekiti State.

All communications should be addressed to the Permanent Secretary quoting
Our Ref. EK/PHCDA/ADM /499/63 Date: 19th July 2021

Alabi Oluwatoyin Peace
School of Public Health,
University of the Witwatersrand,
Johannesburg, South Africa.

Dear Madam,

RE: PERMISSION TO COLLECT DATA

Your request for permission to collect data from the NTDs unit and communities in Ekiti State on the topic **"Perceived Barriers and Facilitators to Optimal Coverage of Mass Drug Administration for the Treatment of Lymphatic filariasis and Onchocerciasis in Ekiti State, Nigeria"** is granted.

2. Knowing that approval to carry out this research has been given to you from the Health Research Ethics Committee of the Ekiti State Ministry of Health Ado-Ekiti Nigeria with the approval number **MOH/EKHREC/EA/P/18,** you may now continue with your research.

3. I wish you a successful interaction with your participants.

Regards

19/07/2021

Mr. Kayode Harbert Ojo

For: **Director of Community & Family Health.**

APPENDIX IX

STUDY INFORMATION DOCUMENT: In-depth interview (frontline health workers)

Study title: Perceived Barriers and Facilitators to Optimal Coverage of Mass Drug Administration for the Treatment of Lymphatic filariasis and Onchocerciasis in Ekiti State, Nigeria.

Name of Investigator: Mrs. Alabi Oluwatoyin Peace

Dept: School of Public Health

Phone Number: +2348062831490

Dear Sir/ Madam,

Introduction

My name is Peace Alabi, a master's student at the University of the Witwatersrand, Johannesburg, South Africa. I am researching Perceived Barriers and Facilitators to Optimal Coverage of Mass Drug Administration for the Treatment of Lymphatic filariasis and Onchocerciasis in Ekiti State, Nigeria. Research is a process to seek knowledge, and in this research, I want to learn about the barriers and facilitators to optimal coverage of Mass Drug Administration for lymphatic filariasis and onchocerciasis in Ekiti State. I would also like to make recommendations as to how optimal coverage of the Mass Drug Administration could be achieved for the elimination of these diseases.

Invitation to Participate

I am inviting you to participate in this research study. You are being invited because you are a frontline health worker in charge of the Mass Drug Administration for lymphatic filariasis and onchocerciasis in Ekiti State.

Involvement in the Study

If you agree to participate in this study, you will be interviewed face-to-face for forty-five (45) minutes about your experiences in Mass Drug Administration coverage in your communities. The interview will be recorded to ensure that the information is accurately taken, and this will take place in your place of work.

Risks of being involved in the study

There is no risk involved in your participation in this study to the best of my knowledge.

Benefits of being in the study

There is no direct benefit to the participant in this study, but your contribution will be of help to achieve optimal coverage of Mass Drug Administration in Ekiti State.

Participation is voluntary

You are free to decide whether to participate or not. Refusal to participate will not cause you any penalty, loss of benefits or affect your relationship with the researcher. You have the right to withdraw at any point or decide not to answer a particular question during the interview without asking you to provide the reason for doing that.

Payment

There will be no payment for participants of this study.

Confidentiality

Confidentiality of participants' information will be strictly maintained. Data will be made accessible to the investigator and supervisor. Data will be coded and de-identified during the analysis of this study. In no way would anybody recognize or associate you with the information in the report we may publish. Information collected will be kept securely for two (2) years if there will be a scientific publication from the study and six (6) years if there is no publication. Thereafter it will be destroyed accordingly.

Contact details of researcher/s

You have the right to ask me questions about this research study at any time before, during and after the study. Feel free to contact me, Peace Alabi at 2365498@students.wits.ac.za or by telephone at 08062831490. And my supervisors, Prof. Levin at Jonatha.Levin@wits.ac.za and Pascalia.munyewende@wits.ac.za.

Outputs

The output will be the recommendation for how optimal coverage for the Mass Drug Administration could be achieved and the summary of the outcome of this study will be made available in the Ministry of Health.

Contact details of HREC administrator and chair

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research.

If you have any concerns over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za

Thank you for reading this Study Information Sheet.

Date: August 2021.

APPENDIX X

STUDY INFORMATION DOCUMENT: Key Informant Interview (State Officers in NTDs)

Study title: Perceived Barriers and Facilitators to Optimal Coverage of Mass Drug Administration for the Treatment of Lymphatic filariasis and Onchocerciasis in Ekiti State, Nigeria.

Name of Investigator: Mrs. Alabi Oluwatoyin Peace

Dept: School of Public Health

Phone Number: +2348062831490

Dear Sir/ Madam,

Introduction

My name is Peace Alabi, a master's student at the University of the Witwatersrand, Johannesburg, South Africa. I am researching Perceived Barriers and Facilitators to Optimal Coverage of Mass Drug Administration for the Treatment of Lymphatic filariasis and Onchocerciasis in Ekiti State, Nigeria. Research is a process to seek knowledge, and in this research, I want to learn about the barriers and facilitators to optimal coverage of Mass Drug Administration for lymphatic filariasis and onchocerciasis in Ekiti State. Also, to make a recommendation to how optimal coverage of Mass Drug Administration could be achieved for the elimination of these diseases.

Invitation to Participate

I am inviting you to participate in this research study. You are being invited because you are in charge of the Mass Drug Administration for lymphatic filariasis and onchocerciasis at the Ministry of Health and Human Services/PHCDA of Ekiti State, Nigeria.

Involvement in the Study

If you agree to participate in this study, you will be interviewed face-to-face for forty-five (45) minutes about your experiences in Mass Drug Administration coverage in Ekiti State. The interview will be recorded to ensure that the information is accurately taken, and this will take place in your office.

Risks of being involved in the study

There is no risk involved in your participation in this study to the best of my knowledge.

Benefits of being in the study

There is no direct benefit to the participant in this study, but your contribution will be of help to achieve optimal coverage of Mass Drug Administration in Ekiti State.

Participation is voluntary

You are free to decide whether to participate or not. Refusal to participate will not cause you any penalty, loss of benefits or affect your relationship with the researcher. You have the right to withdraw at any point or decide not to answer a particular question during the interview without asking you to provide the reason for doing that.

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There will be no payment for participants of this study.

Confidentiality

Confidentiality of participants' information will be maintained strictly. Data will be made accessible to the investigator and supervisor. Data will be coded and de-identified during the analysis of this study. In no way would anybody recognize or associate you with the information in the report we may publish. Information collected will be kept securely for two (2) years if there will be a scientific publication from the study and six (6) years if there is no publication. Thereafter it will be destroyed accordingly.

Contact details of researcher/s

You have the right to ask me questions about this research study at any time before, during and after the study. Feel free to contact me, Peace Alabi at 2365498@students.wits.ac.za or by telephone at 08062831490. And my supervisors, Prof. Levin at Jonatha.Levin@wits.ac.za and pascalia.munyewende@wits.ac.za.

Outputs

The output will be the recommendation for how optimal coverage for the Mass Drug Administration could be achieved and the summary of the outcome of this study will be made available in the Ministry of Health.

Contact details of HREC administrator and chair

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research.

If you have any concerns over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za

Thank you for reading this Study Information Sheet.

Date: August 2021.

APPENDIX XI

STUDY INFORMATION DOCUMENT: In-depth interview (Community People)

Study title: Perceived Barriers and Facilitators to Optimal Coverage of Mass Drug Administration for the Treatment of Lymphatic filariasis and Onchocerciasis in Ekiti State, Nigeria.

Name of Investigator: Mrs. Alabi Oluwatoyin Peace

Dept: School of Public Health

Phone Number: +2348062831490

Dear Sir/ Madam,

Introduction

My name is Peace Alabi, a master's student at the University of the Witwatersrand, Johannesburg, South Africa. I am researching Perceived Barriers and Facilitators to Optimal Coverage of Mass Drug Administration for the Treatment of Lymphatic filariasis and Onchocerciasis in Ekiti State, Nigeria. Research is a process to seek knowledge, and in this research, I want to learn about the barriers and facilitators to optimal coverage of Mass Drug Administration for lymphatic filariasis and onchocerciasis in Ekiti State. Also, to make a recommendation on how optimal coverage of Mass Drug Administration could be achieved for the elimination of these diseases.

Invitation to Participate

I am inviting you to participate in this research study. You are being invited because you are one of the people in this community who are eligible to receive drugs during a health program called Mass Drug Administration for the treatment of lymphatic filariasis and onchocerciasis.

Involvement in the Study

If you agree to participate in this study, you will be interviewed face-to-face for forty-five (45) minutes about your experiences in Mass Drug Administration coverage in Ekiti State. The interview will be recorded to ensure that the information is accurately taken, and this will take place in your home.

Risks of being involved in the study

There is no risk involved in your participation in this study to the best of my knowledge.

Benefits of being in the study

There is no direct benefit to the participant in this study, but your contribution will be of help to achieve optimal coverage of Mass Drug Administration in Ekiti State.

Participation is voluntary

You are free to decide whether to participate or not. Refusal to participate will not cause you any penalty, loss of benefits or affect your relationship with the researcher. You have the right to

withdraw at any point or decide not to answer a particular question during the interview without asking you to provide the reason for doing that.

Payment

There will be no payment for participants of this study.

Confidentiality

Confidentiality of participants' information will be maintained strictly. Data will be made accessible to the investigator and supervisor. Data will be coded and de-identified during the analysis of this study. In no way would anybody recognize or associate you with the information in the report we may publish. Information collected will be kept securely for two (2) years if there will be a scientific publication from the study and six (6) years if there is no publication. Thereafter it will be destroyed accordingly.

Contact details of researcher/s

You have the right to ask me questions about this research study at any time before, during and after the study. Feel free to contact me, Peace Alabi at 2365498@students.wits.ac.za or by telephone at 08062831490. And my supervisors, Prof. Levin at Jonatha.Levin@wits.ac.za and pascalia.munyewende@wits.ac.za.

Outputs

The output will be the recommendation for how optimal coverage for the Mass Drug Administration could be achieved and the summary of the outcome of this study will be made available in the Ministry of Health.

Contact details of HREC administrator and chair

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research.

If you have any concerns over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za

Thank you for reading this Study Information Sheet.

Date: August 2021.

APPENDIX XII

PARTICIPANT CONSENT SHEET

Project Title: Perceived Barriers and Facilitators to Optimal Coverage of Mass Drug Administration for the Treatment of Lymphatic filariasis and Onchocerciasis in Ekiti State, Nigeria.

1. I have been given a Participant Information Sheet that explains the nature and processes involved in this study, which is attached hereto.
2. I was given time to read it, or had it read to me, in the language I best understand.
3. I was given time to ask any questions I wanted to and was satisfied with the answers which I was given.
4. I believe I fully understand why the study is being conducted and what the intended outcomes will be.
5. I understand that there will be no immediate benefit to me, should I agree to participate, nor will I receive any payment; conversely, participation will not cost me anything but my time.
6. I understand that, even if I initially consent to take part in the study, I may subsequently withdraw at any time and would not be required to give any reasons; if that happened, any data collected about me for the study would immediately be destroyed, unless I give consent for it to be retained
7. I have been given a range of contact details, listed below. If I require further information or become concerned about any aspect of this study, I am free to speak to any of these contacts.

Contact details:

Peace Alabi, Principal Investigator, telephone number 08062831490, or by e-mail at 2365498@students.wits.ac.za.

Prof. Jonathan Levin, Supervisor, telephone no: +27739069255, or by e-mail at Jonathan.levin@wits.ac.za.

Dr. Pascalia Munyewende, Supervisor, e-mail at pascalia.munyewende@wits.ac.za.

Professor CB Penny, Chairperson of the Human Research Ethics Committee (Medical) at the University of Witwatersrand, on telephone no. 011 717 2301, or by e-mail at Clement.Penny@wits.ac.za.
Ms. Z Ndlovu or Mr Rhulani Mkansi, Committee Secretariat, telephone nos.: 011 717 2700 or 1234, or by e-mail at: Zanele.Ndlovu@wits.ac.za or Rhulani.Mkansi@wits.ac.za

Name of Participant: _____
Date: _____
Place: _____
Signature or mark _____

Witnessed by:

Name of Witness: _____
Signature: _____
Date: _____

APPENDIX XIII

CONSENT FORM FOR AUDIO RECORDING OF STUDY PARTICIPATION

Project Title: Perceived Barriers and Facilitators to Optimal Coverage of Mass Drug Administration for the Treatment of Lymphatic filariasis and Onchocerciasis in Ekiti State, Nigeria.

I hereby consent to an audio recording of the interview.

.

I understand that:

- The recording will be stored in a secure location (a locked cupboard or password-protected computer) with restricted access to the researcher and the research supervisor.
- The recording will be transcribed and any information that could identify me will be removed,
- The recordings will be erased within either (a) two (2) years of the publication of the research findings, or (b) six (6) years if no publications arise from this research
- Anyone wishing to access this information in the future will first have to obtain the approval of the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg
- Direct quotes from my interview, without any information that could identify me, may be cited in the research report or other write-ups of research.

Name of Participant: _____

Date: _____

Place: _____

Signature or mark _____

Witnessed by:

Name of Witness: _____

Signature: _____

Date: _____