

**EVALUATION OF IMPLEMENTATION DETERMINANTS SHAPING THE
APPROPRIATENESS OF A TRACHOMA MASS DRUG ADMINISTRATION
PROGRAM IN LIVINGSTONE DISTRICT, ZAMBIA**

By

Patricia Chemutai Maritim

A dissertation submitted in partial fulfilment of the requirements for the degree of Masters in
Public Health, Health Promotion with Implementation research

University of Zambia

Lusaka

November 2017

COPYRIGHT

All rights reserved. No part of this thesis may be reproduced or transmitted in any manner without permission in writing from the author or the University of Zambia.

© 2017 by Patricia Chemutai Maritim

DECLARATION

I, Patricia Chemutai Maritim, hereby declare that this research work being presented for the Master In Public Health in Health promotion with Implementation research, has not been previously submitted either wholly or in part for the same purpose, at this or any other University no is it being currently submitted for any other degree.

Signed.....

Date.....

CERTIFICATE OF APPROVAL

The University of Zambia has approved the dissertation by Patricia Chemutai Maritim as fulfilling the requirements of the award for the Master of Public Health in Health Promotion with Implementation research.

Examiner 1: Dr Oliver Mweemba

Signature.....

Date.....

Examiner 2: Dr Wilbroad Mutale

Signature.....

Date.....

Examiner 3: Ms. Kasapo Chibwe

Signature.....

Date.....

Supervisor: Dr Joseph Mumba Zulu

Signature.....

Date.....

Co- Supervisor: Dr Joseph Mumba Zulu

Signature.....

Date.....

ABSTRACT

Mass Drug Administration (MDA) is the most effective way of interrupting disease transmission in trachoma endemic countries including Zambia. Active community participation is necessary coverage goals and global trachoma elimination targets are to be met. This study was a retrospective assessment of the appropriateness of a MDA program conducted in Livingstone, Zambia and the multilevel factors affecting it. To better understand the suitability of the program to the local context and gauge the adequacy of the resources set aside for the implementation process.

This was a concurrent mixed methods study. Key informant interviews with district officials were conducted (n=4). Two cross-sectional surveys using structured questionnaires were done amongst community drug distributors (n=38) and community members (n=171). Interview guides and structured questionnaires were adopted from the 14 domain version of the Theoretical Domains Framework (TDF), Bowen et al, Orsmond and Cohn's guide to conducting feasibility studies. Quantitative data was analyzed to obtain means and proportions and general data trends with further analysis using regression equations. Whereas qualitative data was analyzed using thematic analysis.

Acceptability of the program at the community level was low due to exposure to similar programs MDA, prevailing political conditions and differing religious beliefs. There was an increased demand for the MDA at the organisational level to reduce the active infection rates in the district. Participation over the two year period was low; 32% in Nakatindi and 33% in Simoonga. Logistical issues, human wildlife conflict and inaccessibility of some parts of the districts affected the reach of the program. Eleven domains of the TDF were found to be determinants of feasibility of the MDA. Four were thought to be the most dominant: *Knowledge, Environmental Context and Resources, Social Influences* and *Belief about consequences*.

The creation of appropriate implementation conditions at higher levels of the health system affects how feasible and acceptable programs are at lower levels as shown by low participation rates. The TDF provided a useful framework for exploring how community and environmentally driven determinants could be used to explain the poor feasibility being observed.

Keywords : Implementation, Feasibility, Mass Drug Administration, Theoretical Domains Framework, Trachoma

DEDICATION

I would like dedicate this dissertation to my daughter Natalie, my parents S.J.N Maritim and Rose Rutto and my brothers Victor, Tony and Danson. For there are always others between the things that are, and again others between those, and so the things that are unlimited- Simplicius- *On Aristotle's Physics*, 140.29

ACKNOWLEDGEMENTS

I would like to thank my supervisors; Dr Joseph Zulu, Dr Hikabasa Halwindi and Mrs. Choolwe Jacobs without whose insight and guidance, I would have been incapable of developing this project and seen it to fruition.

I would like to express my gratitude towards the Special programme for Research and Training in Tropical Diseases (TDR) who provided me with the scholarship to conduct my studies in Implementation Research. Inclusive of the members of the team at the University of Zambia- Professor Charles Michelo, Dr. Gershom Chongwe, Mumbi Chola and Jessy Zyambo whose input has been of tremendous value.

I would like to acknowledge the assistance of Professor Ramaswamy Rohit, Mark Otiende and Josephine Malinga for the more technical aspects of the project.

TABLE OF CONTENTS

COPYRIGHT	ii
DECLARATION.....	iii
CERTIFICATE OF APPROVAL	iv
ABSTRACT	v
DEDICATION.....	vi
ACKNOWLEDGEMENTS.....	vii
LIST OF FIGURES	xi
LIST OF TABLES	xi
LIST OF APPENDICES.....	xi
LIST OF ABBREVIATIONS.....	xii
CHAPTER 1: INTRODUCTION.....	1
1.1 Background.....	1
1.1.1. Trachoma and the SAFE strategy.....	1
1.1.2 Preventive Chemotherapy for Trachoma	2
1.2 Statement of the Problem.	4
1.3 Significance of the study	5
1.4 Research Question.....	6
1.5 Objectives.....	6
1.5.1 General Objective.....	6
1.5.2 Specific objectives.....	6
CHAPTER 2: LITERATURE REVIEW.....	7
2.1 Defining an intervention’s appropriateness.....	7
2.1.1 Identifying determinants to appropriateness	8
2.2 Determinants to the implementation of the SAFE strategy.....	10

2.3 Summary	13
2.4 Conceptual Framework	13
CHAPTER 3: METHODOLOGY	15
3.1 Study Design	15
3.2 Study setting.....	15
3.3 Phase 1: Organisational determinants of appropriateness.....	15
3.3.1 Study Population	15
3.3.2 Sampling and sample size estimation.....	16
3.3.3 Data collection.....	16
3.3.4 Data Analysis	17
3.4 Phase 2: Individual Provider factors	17
3.4.1 Study population	17
3.4.2 Sampling and sample size estimation.....	18
3.4.3 Data collection.....	20
3.4.5 Data Analysis	20
3.5 Phase 3: Environmental relevance of the MDA program	21
3.5.1 Study Population	21
3.5.2 Sampling and sample size estimation.....	21
3.5.3 Data collection.....	22
3.5.4 Data Analysis	23
3.6 Data Synthesis	23
3.7 Data Quality and Instrument development.....	24
3.8 Ethical considerations	24
CHAPTER 4: RESULTS.....	26
4.1 Demographic characteristics of the study participants.....	26

4.2 Appropriateness of the MDA program	29
4.3 Factors affecting appropriateness of the MDA Program	34
4.4 Summary of findings	40
CHAPTER 5: DISCUSSION	41
5.1 Implications on Research, Theory and Practice	44
5.2 Strengths and weaknesses	46
CHAPTER 6: CONCLUSIONS.....	47
6.1 Recommendations	47
REFERENCES.....	49
APPENDICES.	54

LIST OF FIGURES

Figure 1:	Status on Elimination of Trachoma 2016.....	4
Figure 2:	Community members participation in the MDA	30
Figure 3:	Community member participation in two years.....	31
Figure 4:	Level of Skill of Health workers in Nakatindi and Simoonga.....	36

LIST OF TABLES

Table 1:	Summary of studies that evaluating the implementation of the SAFE strategy.....	9
Table 2:	Variables of interest at provider level.....	19
Table 3:	Socio-demographic characteristics of Health workers.....	27
Table 4:	Socio-demographic characteristics of Community members	28
Table 5:	Major MDA appropriateness themes.....	33
Table 6:	Weighted coverage of KAP indicators.....	35
Table 7:	Community mobilisation and sensitisation by health care workers	37

LIST OF APPENDICES

Appendix A:	Information Sheets.....	54
Appendix B:	Consent Forms.....	66
Appendix C:	Community member Questionnaire.....	70
Appendix D:	Health Worker Questionnaire.....	76
Appendix E:	Key Informant interview guide.....	82

LIST OF ABBREVIATIONS

TF	Trachomatous inflammation Follicular
TI	Trachomatous inflammation- Intense
TS	Trachomatous scarring
TT	Trachomatous trichiasis
CO	Corneal Opacity
SAFE strategy	Surgery for Trichiasis, Antibiotics for infection, Facial Cleanliness and Environmental sanitation
CFIR	Consolidated Framework for Implementation Research
TDF	Theoretical Domains Framework
LQAS	Lot Quality Assurance Sampling
WHO	World Health Organisation
MDA	Mass Drug Administration
EBI	Evidence Based Intervention.

CHAPTER 1: INTRODUCTION

1.1 Background

1.1.1. Trachoma and the SAFE strategy

Trachoma which is the leading infectious cause of blindness around the world is caused by recurring infection by the bacteria *Chlamydia trachomatis*. Active infection which is commonly observed in children initiates a conjunctival inflammatory process which over time leads to conjunctival scarring and blindness observed in older children and adults (Taylor et al., 2014). The disease is considered a public health concern in 42 countries globally with 1.9 million people suffering from blindness and visual impairments due to the disease and almost 200 million people living in endemic regions (World Health Organisation, 2016). District level Population based prevalence surveys indicate that active infection is prevalent in almost all the provinces in Zambia with up to ten million people estimated to be living in trachoma endemic regions (Smith et al., 2013).

A simplified trachoma grading system classifies the disease stages according to whether the symptoms are associated with i) active infection- Trachomatous inflammation Follicular (TF) and Trachomatous inflammation- Intense (TI) ii) or with corneal scarring- Trachomatous scarring (TS) and Trachomatous trichiasis (TT) and Corneal Opacity (CO) (Thylefors et al., 1987). The observation of the different disease stages within given populations is dependent on the duration, severity and number of infections that occur (West, 2003). The focal nature of the disease as shown by infection pooling at community and household levels suggests that regular contact is necessary for the transmission of infection directly from eye to eye, through fomites, eye seeking flies and infected ocular and nasal secretions on fingers (Hu et al., 2010).

The WHO through the Global Alliance for the Elimination of Trachoma by the year 2020 (GET 2020) advocates for the implementation of the full SAFE strategy in countries rolling out National Trachoma control Programmes (Kuper et al., 2003). The SAFE strategy which denotes Surgery for Trichiasis, Antibiotic distribution, Facial cleanliness and Environmental Sanitation is a multifaceted strategy that seeks to eliminate blindness caused by trachoma through i) offering surgical treatment to individuals suffering from Trachomatous Trichiasis who stand highest risk of falling blind ii) providing antibiotic treatment as a means removing reservoirs of Chlamydial

infection within communities iii) reducing the risk of conjunctival scarring and iv) interrupting the transmission of infection by encouraging facial cleanliness and environmental sanitation. (Kuper et al., 2003, Emerson et al., 2006). *Figure 1* is a representation of the status of elimination of blindness due to trachoma pointing towards the fact that a large majority of endemic countries still require continuous implementation of the SAFE interventions if elimination goals are to be met (World Health Organisation, 2016).

1.1.2 Preventive Chemotherapy for Trachoma

Although the effectiveness of the SAFE strategy has been shown to increase if all its components are fully implemented, Preventive Chemotherapy through Antibiotic distribution is the most active component in reducing the transmission of trachoma infection in high priority areas (Ngondi et al., 2006, Cumberland et al., 2008, Astle et al., 2006). Preventive chemotherapy is a WHO designated term referring to the strategic framework for treating communities in trachoma endemic regions who already have existing infection or run the risk of acquiring infection without establishing an initial individual diagnosis (Webster et al., 2014). The delivery system for Preventive chemotherapy is Mass Drug Administration programs which are conducted through a variety of distribution channels depending on the local context including i) community based distribution through schools and faith based institutions and ii) health service driven campaigns (Bockarie et al., 2013, Webster et al., 2014). Two antibiotics are recommended for mass distribution for trachoma control 1% Tetracycline administered twice a day for six weeks and a single dose of Azithromycin (Kuper et al., 2003). The number and duration of Mass drug administration rounds is dependent on the active infection rates usually in children between the ages of 1 and 9 living within a population. Where trachoma endemicity is high; antibiotics are distributed annually with continuous monitoring and assessment of infection rates until they fall below 10% requiring a more targeted approach (Kuper et al., 2003).

The Ministry of Health in Zambia in conjunction with different cooperating partners such as Sight Savers implements the SAFE strategy in endemic districts in line with the Trachoma Elimination Plans at district level which are part of the Integrated Trachoma Prevention and Control National Plan (Smith et al., 2013). Given that the implementation of Mass Drug Administration programs is often a concerted effort that includes training of health workers involved in the distribution exercise, proper supply chain organisation to ensure that the antibiotics are distributed on time,

social mobilization and community outreach to promote optimum coverage in affected populations as well adequate technical assistance from implementing partners (Kyelem et al., 2008, Linehan et al., 2011). Programmatic weaknesses exhibited by low coverage rates which is indicative of poor uptake could arise due to challenges during the implementation process resulting in a lack of fit with the local settings making the MDA inappropriate. Appropriateness is an implementation outcome that “measures an intervention’s perceived relevance, fit or compatibility to a particular setting, provider or consumer as well as its ability to address the public health issue at hand” (Proctor et al., 2011). Prior to the roll out of MDA programs implementing agencies have to conduct assessments into the goodness of fit between the program and the settings into which they are being introduced as a means of identifying where necessary adaptations have to be made (Meyers et al., 2012).

Thesis statement.

This study sought to conduct a retrospective evaluation of determinants shaping the appropriateness of a Mass Drug Distribution program conducted in Livingstone District, Zambia. Identifying determinants that shape the appropriateness of the MDA will provide information on facilitators and barriers to the adoption of the intervention, its suitability to particular settings, the receptivity of the intervention among different stakeholders, its sustainability and possible explanations to the outcomes being observed to direct ongoing implementation of the program and offering information necessary for the development of more successful implementation strategies (Hagedorn et al., 2014, Bauer et al., 2015, Kyelem et al., 2008) .

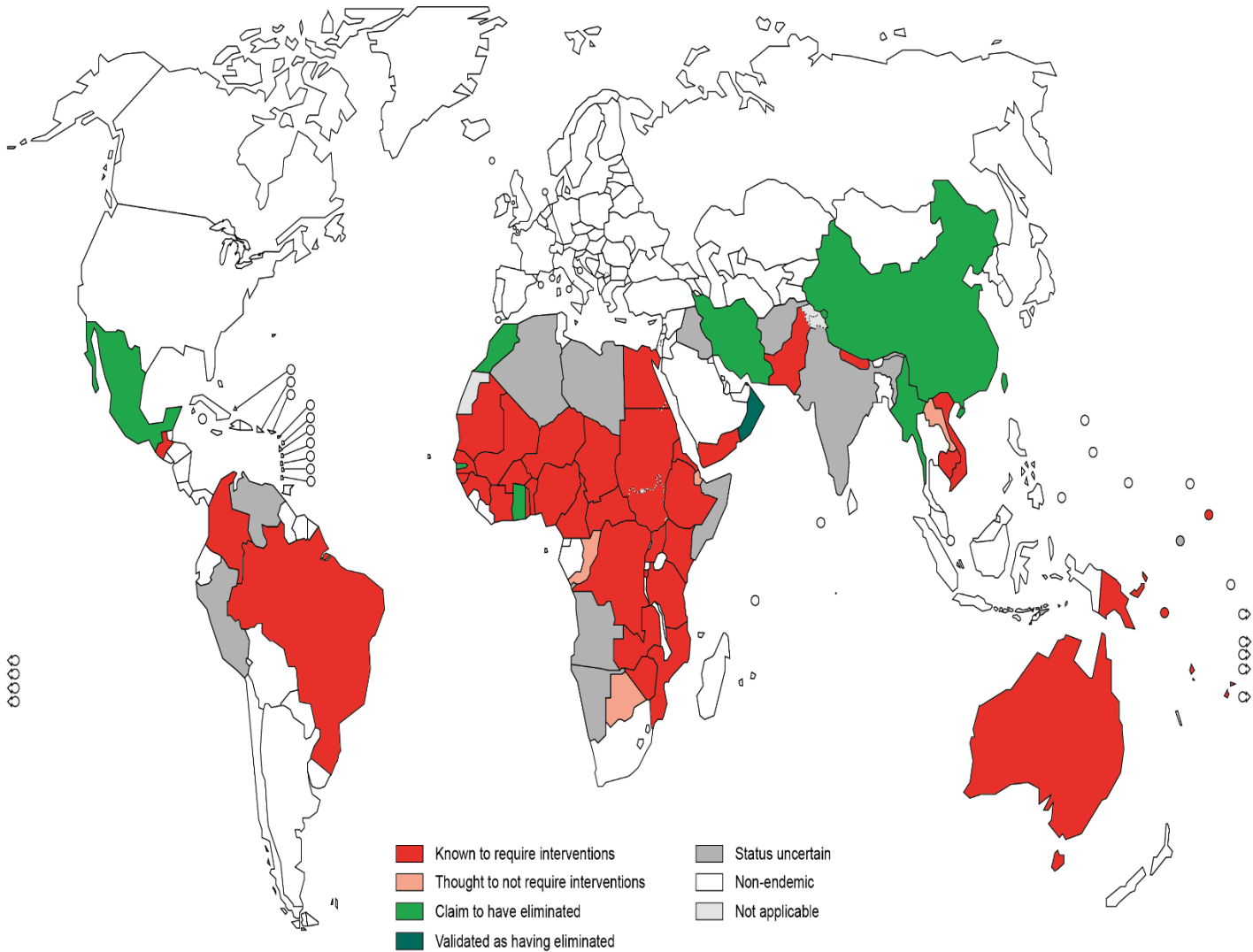


Figure 1. WHO, Department for Control of Neglected Tropical Diseases. Status on Elimination of Trachoma 2016.

1.2 Statement of the Problem.

Active stakeholder participation is necessary to achieve coverage goals and to promote the sustainability of MDA programs in attaining global trachoma elimination targets (Bowen et al., 2009, Lemoine et al., 2016). According to the Fourth WHO report on Neglected Tropical diseases, in 2015 of 192.1 million people at risk of infection in trachoma endemic regions, coverage by mass drug distribution programs was 29.2% (56.1 million people). Africa which has the largest number of endemic countries twenty six, had an overall coverage rate of 31.2% (54.2 of 171.9 million people) (World Health Organisation, 2016). In Livingstone district of Zambia where ongoing

implementation of MDA is expected to run annually for three years between 2015-2017 with continuous monitoring of active infection at district level (Hu et al., 2010). The 2015 Annual Trachoma Report indicated an overall MDA coverage rate of 87% but with great variation in coverage rates across the different health facility catchment areas. In which 40% of the catchment areas having coverage rates of less than 80% which increase the possibility of recurrence of infection in these regions. Low levels of participation as evidenced by coverage rates that fall below the 80% coverage goal for MDA programs could be due to the programs being inappropriate to the settings into which they are being introduced. As the implementation process is influenced by the introduction of personal, organisational and cultural interests and values have a bearing on its fit to that particular setting (Scott et al., 2008). Furthermore if the intervention is not appropriate in addressing the trachoma control needs of the setting it would require redistribution of resources to facilitate the intervention activities or necessitate changes in the adopting organisations structure that may result in implementation failure. Subsequently making the programs ineffective in increasing patient level participation.

1.3 Significance of the study

As the delivery system for Preventive chemotherapy, ensuring that Mass drug administration programs are implemented in an efficient manner would promote greater geographical and therapeutic coverage which is necessary for trachoma elimination goals to be met (Webster et al., 2014). Variation in coverage rates in the areas where MDA programs have been introduced such as those observed in Livingstone District could arise if such programs encourage knowledge, skills, attitudes and behavioural change that differs considerably from the values of its different stakeholders (Klein and Sorra, 1996). This is because the introduction and success of Mass Drug Administration programs as with any new intervention depends on the appropriateness of the programs with the characteristics of its adopting organisation, providers and targeted end users (Zazzali et al., 2008). Exploring the appropriateness of the Trachoma MDA program would give insight into whether or not the intervention was rendered suitable for this setting and whether in its new form was able to achieve its outcomes effectively. As well as whether it has a good ecological fit in the host setting within which it was introduced (Meyers et al., 2012). By identifying determinants which are modifiable or non-modifiable program implementers can use this information to develop implementation strategies that improve coverage within target population and increase compliance with drug distribution regimens (Kyelem et al., 2008).

Necessary adjustments to the modifiable determinants identified could be done to ensure compatibility with the organisation's structure, capacities and resources. Moreover understanding the influence of these factors could be used to guide future implementation and dissemination efforts in this and other settings. Granted that the field of implementation science is relatively new, and the manner by which to evaluate appropriateness shrouded by different approaches, this study proposes a comprehensive strategy that utilises well designed frameworks, validated methods from other behaviour change interventions to generate transferable methods and data.

1.4 Research Question

What are the implementation determinants shaping the appropriateness of the Trachoma Mass drug Administration program conducted in Livingstone District, Zambia?

1.5 Objectives

1.5.1 General Objective

The overall objective of this study was to evaluate the factors affecting the appropriateness of the Trachoma Mass Drug Administration program to the healthcare workers involved in drug distribution, the adopting organisation acting as the implementing agency and the external environment in which the organisation is found by using a multiphase mixed methods design.

1.5.2 Specific objectives

- i. To explore how different organisational contextual factors affect the compatibility of the Trachoma MDA to this particular setting.
- ii. To determine the effect of individual health worker characteristics of on the fit of the Trachoma MDA in Livingstone District.
- iii. To determine whether the Trachoma MDA fits into the wider external environment in which it has been introduced and in which the organisation is found.

CHAPTER 2: LITERATURE REVIEW

Sustainable elimination of trachoma through the SAFE strategy requires that control and prevention activities be integrated into the National Health Systems. Continued capacity development and training of health workers and involvement of community members in control and prevention efforts in endemic regions is one way through which this can be achieved (Zondervan et al., 2004). By helping them develop skills that are relevant, culturally suitable and in line with the general messages put forth by the SAFE strategy and existing national health promotion campaigns such as MDAs (Zondervan et al., 2004). The initial phase of implementing MDA programs in a given setting would require a balance between modifying the intervention to suit the setting, making structural adjustments to an organisations' processes to suit the intervention and trying to maintain a high degree of fidelity that would ensure the effectiveness of the intervention is realised (Hong and Kim, 2002). This means that intervention related activities should be tailored to ensure their compatibility and consistency with the mandates of the adopters and adopting organisations without necessitating any extreme modifications that may result in reduced effectiveness. To understand the relationship between the interventions, the inner setting into which it is introduced and the targeted users a suitable implementation outcome that could be evaluated is appropriateness (Proctor et al., 2011) .

2.1 Defining an intervention's appropriateness

Appropriateness is defined as a measure of the degree of fit between the intervention and the organisational context in which it has been introduced and the individuals who come into contact with the intervention (Nielsen and Randall, 2015, Proctor et al., 2011). The appropriateness or goodness of fit of an intervention can be said to have been achieved if a number of conditions are met. First the intervention should be compatible with the skills and competencies of the individuals who are involved in the implementation of the program (Nielsen and Randall, 2015). Secondly it should be compatible to the organisational context within which it has been introduced taking into consideration the facilitators and barriers of its implementation. The MDA program could be said to have a good degree of fit if the organisational context promotes the initial implementation efforts and that during the process of implementation the intervention is not distorted or disrupted (Nielsen and Randall, 2015). Finally it must relevantly address the public health issue within a given setting for which it was designed (Proctor et al., 2011). Appropriateness is based on the measure of

compatibility in Roger's theory of diffusion of innovation and is usually measured during the early to mid-stages of the implementation phase of any intervention (Proctor et al., 2011). When measured retrospectively it can provide insight into whether a program is utilising and is consistent with existing practices, needs, structures, skills and policies. The importance of assessing factors affecting appropriateness also makes it possible for implementing agencies to adapt and be responsive to the changing needs of their target audiences increasing potential effectiveness of programs.

2.1.1 Identifying determinants to appropriateness

Systematic Review of determinants to the implementation of the SAFE strategy

There is a paucity of primary studies reporting implementation data that focuses primarily on implementation effectiveness rather than intervention effectiveness of the SAFE strategy and MDA programs in particular. In trying to identify determinants that are thought to affect the different implementation outcomes (Acceptability, appropriateness, acceptability, sustainability, penetration, fidelity and implementation cost) we conducted a systematic review of facilitators and barriers to the implementation of the SAFE strategy as a proxy of the appropriateness of MDA programs which was the area of interest of this study.(Proctor et al., 2011). The systematic search was done on PUBMED, Google Scholar, CINAHL and Cochrane collaboration. From these searches relevant studies were identified and their results synthesised using the Consolidated Framework for Implementation Research (CFIR) which classifies implementation determinants into five categories (Damschroder et al., 2009). These are characteristics of the intervention, the inner setting, the outer setting, the individuals involved and the implementation process. *Table 1* provides a summary of these studies.

Table 1 Summary of studies that evaluating the implementation of the SAFE strategy.

Reference	Country	CFIR Domain of interest
1. Ajewole et al. (2001)	Gambia	Implementation process and Inner setting.
2. Astle et al. (2006)	Zambia	Inner setting. Implementation process. Outer setting and Characteristics of the intervention
3. Bamani et al. (2013)	Mali	Outer setting and Inner setting
4. Khandekar et al. (2004)	Vietnam	Implementation process, Outer setting and Inner setting.
5. Khandekar et al. (2006)	Vietnam	Characteristics of the intervention
6. Kuper et al. (2005)	Mali, Ethiopia, Ghana, Nepal, Morocco, Niger, Tanzania and Vietnam	Implementation process and inner setting
7. Lange et al. (2014)	Australia	Characteristics of individuals, inner setting and outer setting
8. Lewallen et al. (2008)	Tanzania	Inner setting and characteristics of individuals
9. Thompson et al. (2015)	Guinea Bissau	Characteristics of the intervention, inner setting and outer setting
10. Vinke et al (2011)	Ethiopia	Outer setting and inner setting

2.2 Determinants to the implementation of the SAFE strategy

Characteristics of the intervention

Intervention source. Adapting the SAFE strategy to local contexts was identified in all the studies and it was thought to increase the sense of ownership of control activities within the implementing agencies (Khandekar et al., 2006, Lange et al., 2014). One way through which this was achieved was by utilising local community members as part of active advocacy strategies which improved the uptake of SAFE interventions including MDAs (Astle et al., 2006, Khandekar et al., 2006).

Evidence or observability. In cases where there was sufficient observable evidence to support the aspects of implementation of control activities, this evidence was found to affect the manner with which individuals responsible for implementation adopted them. In Zambia the use of Roxithromycin instead of Azithromycin as the antibiotic of choice for Mass Drug Administration was based on the clinical experience of the investigators who had found that it was as effective in treating the infection (Astle et al., 2006). Additionally the inclusion of successful findings from other primary studies which had reported implementation data was shown to improve the sustainability of implementation efforts (Khandekar et al., 2006, Astle et al., 2006).

Adaptability. Utilising existing community structures through social marketing approaches was found to promote the sustainability of control efforts (Lange et al., 2014, Vinke and Lonergan, 2011, Ajewole et al., 2001, Khandekar et al., 2006).

Trialability. Astle et al conducted a small scale pilot to see whether full implementation of the SAFE strategy would be effective in reducing infection rates in a hyper endemic region. Based on their findings they were able to use their results to advocate for scale up of full implementation of SAFE within Zambia through the creation of a national trachoma eradication program (Astle et al., 2006).

The outer setting

Patients' needs and resources. Taking into consideration the communities' available resources in order to build upon them for the delivery of SAFE interventions was found to be improve their acceptability and adoption. In areas with inadequate water supply and sanitation drilling of wells and building of latrines alongside drug distribution encouraged longer lasting behaviour change (Khandekar et al., 2006, Astle et al., 2006). Capitalising on community members as local opinion

leaders and change agents was found to improve the reception of interventions within communities (Khandekar et al., 2004, Khandekar et al., 2006).

Cosmopolitanism. Existing collaborations between government agencies and Non- Governmental organisations which provided a framework for the provision of technical and financial resources which was found essential in ensuring the sustainability of trachoma control initiatives (Kuper et al., 2005). Different ways through which support was provided included; Provision of Azithromycin for Mass distribution by ITI (Kuper et al., 2005) , development of educational curriculum guides and health promotion kits in Tanzania and Australia (Lewallen et al., 2008, Lange et al., 2014), broadcasting trachoma awareness messages in Mali (Bamani et al., 2013), improvement of water supplies, drilling wells and building latrines in Zambia and Vietnam (Khandekar et al., 2006, Astle et al., 2006).

The inner setting

Structural characteristics. Trachoma endemic regions with poorly developed health systems had lack of continuity of care which affected service provision especially if the antibiotic delivery system was through health services/ facilities as this meant coverage targets could not be met (Thompson et al., 2015). Inadequate ongoing clinical training into ways of trachoma control and high labour turnovers resulted in health care staff who did not possess the skills necessary to conduct activities such as MDA within their communities (Lange et al., 2014). Since point of contact with healthcare staff are an avenue through which community members receive information about trachoma the recruitment of health workers from outside the communities who did not have a good command of local languages affected the acceptability of the MDA programs among community members (Ajewole et al., 2001, Thompson et al., 2015, Lange et al., 2014).

Characteristics of the individuals

Knowledge and belief about the intervention. Effective adoption and acceptability was affected by the knowledge and attitudes of the communities in which the interventions were being introduced. Unfavourable beliefs that were held included the belief that trachoma was not infectious and that trichiasis was a symptom of a different illness, the normalisation of poor hygiene practices including children having dirty faces and poor health seeking habits especially with regard to delay in getting lid surgery for trichiasis (Ajewole et al., 2001, Lange et al., 2014, Thompson et al.,

2015). However intervention's recipients who had received the interventions and observed the benefits acted as local champions (Ajewole et al., 2001).

Self-efficacy. Individuals who were more skilled and competent in trachoma control measures had better health seeking and promoting behaviour (Bamani et al., 2013). Where awareness of the chronic nature of Trachoma was poor one was likely to observe the adopt certain practices, such as face washing among older rather than younger members of the community, that went contrary to what was defined in the SAFE strategy (Ajewole et al., 2001).

Individual state of change. One's state of change can be assessed by analysis of the level of skill with which the individual is utilising the SAFE interventions was tracked by determining. In one of the studies after the distribution of tetracycline ointment within a population study participants stopped applying ointment for the prevention of active inflammatory infection as soon as they felt that their symptoms had improved increasing their chances of reinfection (Ajewole et al., 2001). This could point towards failure of understanding the importance of compliance to the treatment provided.

Implementation process

Engaging. Strategies that were designed to utilise the most instrumental individuals within community settings were found to influence how the SAFE interventions were implemented. Older women in Gambia who also acted as the custodians of community practices and had also received surgery for trichiasis were found to be mobilise younger mothers into adopting trachoma control activities such as Mass Drug Administration (Ajewole et al., 2001). Local opinion leaders within communities who possessed similar characteristics as the target population of these programs could either encourage or discourage community members from taking part in the programs which affected their effectiveness (Ajewole et al., 2001). The use of community based groups such as youth and women groups the in implementation improved community participation (Khandekar et al., 2006). Different media channels when used such as radio, drama performances and billboards was effective in spreading the key messages for trachoma control as well and promote community mobilization necessary for taking part in trachoma control initiatives such as MDAs (Bamani et al., 2013, Khandekar et al., 2004, Khandekar et al., 2006).

Reflection and Evaluation. Evaluation efforts conducted during and after implementation made it possible for adopting organisations to learn from their experiences while making progress made towards reaching the program goals. In some cases an insufficient understanding of trachoma, its spread and ways through which one could prevent themselves from infection could point towards incomplete understanding messaging whose design and packaging was not culturally competent to the setting within which it was delivered (Bamani et al., 2013, Thompson et al., 2015). Tailoring for particular audiences along religion,, age and profession greatly improved the effectiveness of these messages (Khandekar et al., 2004, Lewallen et al., 2008) The use of community directed drug distributors instead of health facility staff was one way through which the Mass Drug Administration could be made more cost effective (Kuper et al., 2005).

2.3 Summary

The main focus of most of the studies identified was the effectiveness of the SAFE interventions and not on the process and delivery of the interventions. Facilitators of implementation included use of appropriate engagement strategies, good intersectoral collaboration and commitment to which ensured readiness for implementation and adaptation of the interventions to suit local needs and resources such as using social marketing approaches. Barriers to implementation were poor implementation climate and implementing agencies' structural characteristics that may have impeded implementation and poor knowledge and understanding of the disease and the SAFE interventions which affected self-efficacy. This study proposed to use a systematic approach to evaluate appropriateness specifically for MDA programs and factors that shape it.

2.4 Conceptual Framework

The conceptual background of this study was to identify factors at individual, organisational and environmental levels that affect the degree of appropriateness of Mass Drug Administration programs in Livingstone district. As the first step to identifying these determinants was to explore whether or not the MDA was appropriate to Livingstone District. This was done using Bowen et al and Orsmond and Cohn's guide on feasibility studies which used several criteria to gauge how suitable the intervention was. These criteria included acceptability, demand, implementation, practicality, adaptation and integration. These measures would make it possible to evaluate the resources put in place for implementation, the stakeholder's ability to manage and implement the intervention as well as its suitability (Bowen et al., 2009, Orsmond and Cohn, 2015).

The Theoretical Domains Framework (TDF) which is based on social cognitive theories was used to help identify individual experiences, values and beliefs as they shape the implementation process and how they bring about compatibility that is necessary for an intervention to be considered appropriate. The selection of the Theoretical Domains Framework for use in this study was hinged upon the broad nature of the domains that make up the framework and its resultant ability to comprehensively identify potential determinants in this setting. Furthermore previous studies have shown how the framework can be applied into evaluations of determinants across different levels of the health care continuum (Phillips et al., 2015, Patey et al., 2017). The specific domains of the TDF that were used were Knowledge, Skills, Environmental context and resources, Social/Professional role, Reinforcements, Belief about capabilities, social influences, Intention, Goals and Belief about Consequences (Cane et al., 2012). Three domains were excluded from the data collection tools; emotion, memory, attention and decision process and optimism as they were felt to be inappropriate as this program which is rolled out once annually. Facilitators and barriers to the implementation would thereafter be classified into organisational, provider, community and environmental determinants.

CHAPTER 3: METHODOLOGY

3.1 Study Design.

A Concurrent Mixed methods design was used to evaluate the determinants to the appropriateness of a Trachoma related Continuing Medical Education intervention in Livingstone District in Zambia (Palinkas et al., 2011). Quantitative data was collected through the use of surveys targeting healthcare providers and members of the community enabling examination into factors that facilitate or act as barriers to the compatibility of the intervention with the setting. Qualitative data was collected through key informant interviews to explore how process and context related factors contribute to the fit of the intervention.

3.2 Study setting

The study was conducted in Livingstone District in the Southern province of Zambia where the SAFE strategy has been fully implemented and prevalence rates are estimated to range between 10-29.9%. In regions with this prevalence range Mass Drug administrations are conducted annually for three years with continuous monitoring at district level (Hu et al., 2010). Implementation began in October 2015 and is expected to run until December 2017 but this is hinged on active infection rates in the district. Livingstone district has 20 health facility catchment areas all of which were sites for Mass Drug distribution. These health facility catchment areas formed the sampling frames for the selection of the healthcare providers and the community members. The duration of the study was between November 2016 and January 2017.

3.3 Phase 1: Organisational determinants of appropriateness

3.3.1 Study Population

This was a qualitative case study that sought to look at the implementation experience of the district officials who were involved in the MDA program implementation as such the study participants were the key informants and stakeholders who are responsible for the successful planning, implementation and evaluation of the programme within the District Medical Office who made up the District Trachoma Core team. They were informed of the study and its scope through an initial telephone conversation and a follow up face to face meeting before the interviews were conducted.

3.3.2 Sampling and sample size estimation

This was a qualitative case study that sought to look at the implementation experience of the district officials who were involved in the MDA program implementation as such the study participants were the key informants and stakeholders who are responsible for the successful planning, implementation and evaluation of the programme within the District Medical Office who made up the District Trachoma Core team. They were informed of the study and its scope through an initial telephone conversation and a follow up face to face meeting before the interviews were conducted.

The study participants were purposively selected to provide information on the implementation process. As are the main drivers of change within the implementing agency they are responsible for monitoring the progress of the intervention and ensuring that intervention activities are being fully implemented.

Inclusion criteria

All the members of the Trachoma Core team based at the District Medical office were invited to take part in the study (n=4). They were invited to take part in the study as they are responsible for the provision of resources, facilitation and support necessary for the successful implementation of the MDA program.

3.3.3 Data collection

Key Informant Interviews were conducted using the aid of an interview guide adopted from questions validated from the Theoretical domains framework (Cane et al., 2012). The interviews were conducted at the District Medical Office and at two clinics where the participants were working from and lasted for between 30-40 minutes. The interviews were tape recorded and accompanying field notes taken on the responses and non-verbal behaviour, setting and general behaviour during the interviews. Checklists were used where necessary to extract administrative data that was necessary for understanding the implementation strategy and defining its distinct components. Adequate details about the intervention would provide an opportunity for the exploration of the functional relationship between the intervention's components and their outcomes (Michie et al., 2009).

3.3.4 Data Analysis

Each interview form and audio file was given a unique registration numbers for the different study participants. Audio recordings and notes from the interviews were listened to carefully and transcribed verbatim into Microsoft Word and then exported to Nvivo version 11 for coding and analysis. A standardised data extraction form was used for all transcripts to allow for comparison during analysis stage. The transcripts were proof read against the audio files to ensure accuracy and validity. A thematic analysis approach was used to identify and analyse patterns within the data that was collected. A coding list was generated based on the key questions that were asked and the theoretical knowledge on appropriateness of innovation introduced within an organisation, the determinants identified during the systematic review and the implementation strategies defined by Powell et al (Powell et al., 2012, Damschroder et al., 2009, Proctor et al., 2011). The process of theme development was both inductive and deductive based on the nature of the response given. A code manual was generated by the lead investigator and research team with input from the relevant supervisors to ensure the manual's consistency and representativeness. The coded data was then organised into initial themes which were evaluated against the data set to ensure compatibility. Final themes were then be generated and summarised as seen in *Table 2* and *3*.

3.4 Phase 2: Individual Provider factors

3.4.1 Study population

The study participants were the healthcare providers who underwent the training for Mass drug distribution and were part of the service delivery teams who conducted the Mass Drug Administration rounds in their respective catchment areas. The twenty health facilities who sent their representatives formed the sampling frame which was stratified based on the percentage coverage levels reported by the Livingstone District Trachoma report for the end of 2015 into high, low and medium performing strata. Two health facilities and their respective health facility catchment areas were selected from the highest performing and the lowest performing strata using simple random sampling within the two selected strata. These were Nakatindi and Simoonga health facilities.

3.4.2 Sampling and sample size estimation

Nakatindi and Simoonga health facilities both had service delivery teams made up of health facility staff and community health workers. The number of teams trained for each health facility catchment areas was dependent on its catchment population. All the service delivery teams who were responsible for the implementation of the Mass Drug Administration campaign and as such received training as part of the MDA were invited to participate in the study from the two selected health facilities. This was based the study conducted by Lange et al which was done in a similar setting (High Trachoma endemicity) and in a similar population (Health workers) (Lange et al., 2014). Participation by the staff in this teams though requested through the Director at the District Medical Office and was not mandatory. Inviting all the members of the teams sought to increase response rates while at the same time giving the study more power.

Inclusion and Exclusion Criteria

All the members of the service delivery teams in these two health facility catchment areas were invited to take part in the study. For the two selected health facilities thirty nine healthcare workers were invited (21 from Hillcrest and 18 from Simoonga.) Health workers who were trained but did not take part in the actual MDA campaign were excluded from the study.

Variables of interest

The questions used for the questionnaires have been adopted from the Theoretical domains framework and other studies that have evaluated trachoma health literacy in different settings (Cane et al., 2012, Ajewole et al., 2001, Lange et al., 2014, Shrestha et al., 2014, Thompson et al., 2015). The 36 item questionnaire had both dichotomous and Likert scale responses. Table 2 provides a summary of the key domains that were measured and examples of the constructs under each.

Table 2. Variables of interest at provider level based on Cane et al 2012.

Independent Variables of interest	Variable type	Examples of measures/constructs
Demographic characteristics. Age Gender Educational Background.	Continuous Binary Ordinal	Courtesy of the Demographic characteristics questions at the beginning of the survey
Years of experience	Continuous	How long they have been in their position
Practice setting	Nominal	Which of the two study settings are they based in. Each will be given a code.
Knowledge	Continuous	Scientific Knowledge, Procedural Knowledge, Knowledge of task environment
Skill	Continuous	Development of skills, Level of competence, Interpersonal skills and competence, Regular practice and assessment of skills.
Social/Professional Role	Continuous	Professional identity and roles
Belief about capabilities	Continuous	Perceived competence, Self-confidence, Self- efficacy and Confidence
Belief about consequences	Continuous	Outcome expectancies
Reinforcements	Continuous	Rewards, Incentives
Intention	Continuous	Stability of intention
Goals	Continuous	Goal priority, Target setting, Action plans
Environmental context and resources	Continuous	Resources, Materials, Organisational culture/ climate, Barriers and facilitators
Social influences	Continuous	Social and group norms, Social support
Behavioural Regulation	Continuous	Self-monitoring, Breaking habits

3.4.3 Data collection

Interviewer administered structured questionnaires were used to collect data from the selected healthcare providers. The questions used for the questionnaires had been adopted from the Theoretical domains framework and other studies that have evaluated trachoma health literacy in different settings (Cane et al., 2012, Ajewole et al., 2001, Khandekar et al., 2004, Lange et al., 2014, Shrestha et al., 2014, Thompson et al., 2015). The 36 item questionnaire had both dichotomous and Likert scale responses.

3.4.5 Data Analysis

A data entry interface was generated for the quantitative data in Microsoft Excel using the unique identification codes for the study participants. The data was double entered, checked for consistency and then exported to STATA version 13 for analysis. Descriptive statistics from the healthcare provider questionnaires was used to identify general patterns in means, standard deviations and variances of the responses and they were be reported as percentages. Before performing linear regression on the main outcome of interest appropriateness, a diagnostic to test the assumption that the outcomes should be normally distributed was run on STATA and the data was found to be highly skewed. As such the variable was converted into a binary outcome according to the nature of the results that were being observed. This would make it possible to conduct logistic regression with the predictor variables of interest. In one category all the study participants who gave a consistent high score in each of the individual constructs were grouped together they were classified as Appropriate. The second category was made of all those who had differing responses to the individual constructs that made variable and was classified as not appropriate. Two variables belief about capabilities and belief about consequences had no variability and similarly were not fit into the logistic model. Univariate analysis was done with the remaining three predictor variables – Environmental context and resources, Knowledge and Skills.

To explore whether Environmental context and resources had any effect on Knowledge and skill as is suggested by the literature. We run separate models with and without the variable environmental context and resources to test whether this variable would have a bearing on the fit of the regression model. Log likelihood ratio tests were done for both knowledge and skill and they had p values of 0.2977 and 0.300 respectively which meant that the variable had no bearing on the fit of the two logistic models and therefore there would be no need for multivariate analysis.

3.5 Phase 3: Environmental relevance of the MDA program

3.5.1 Study Population

The study population was drawn from the community members who live in the two selected health facilities' catchment areas; Nakatindi and Simoonga and are served by the service delivery teams. They were selected because they can be used to gauge whether the MDA was able to bring about some level of change in trachoma related outcomes.

3.5.2 Sampling and sample size estimation

Lot Quality Assurance Sampling (LQAS) was applied to select community level study participants whose self-reported trachoma health literacy and behaviour was used to assess goodness of fit. Three factors were considered necessary for LQAS to be applied: Target coverage for indicators to be used for evaluation of appropriateness, percentage coverage below which the low would have been consider to be poor performing and an acceptable alpha and beta errors, a combination of which set the decision rule. A two stage probability sampling approach were applied to first divide the health facility catchment area into smaller units and then to select households from which study participants were drawn. Based on the principles of LQAS each of the health facility catchment areas was be divided into supervision areas to increase the precision of the measures that will be obtained. The supervision areas was chosen based on zones defined by the MDA program implementers in each health facility catchment area. There were four zones in Simoonga and five zones in Nakatindi Once supervision area had been defined, a community health worker based in each of the zones was tasked with mapping their respective zones using landmarks into segments which were of roughly the same size. 19 individuals were selected from each supervision area. Selection of 19 individuals would ensure that 90% sensitivity and specificity was upheld for the indicators that were being studied as the alpha and beta errors are less than 10% using the formula shown below (Robertson and Valadez, 2006).

$$\begin{aligned}P(X > d \mid p = p_l) &\leq \beta \\P(X \leq d \mid p = p_u) &\leq \alpha\end{aligned}$$

Studies have shown that regions that have received 80% coverage rates by drug distribution programs are less likely to have a recurrence before the next round of Mass drug administration (Hu et al., 2010). As such an upper threshold was set at 80% and lower threshold at 60% for all

indicators to ensure consistency. To retain the statistical power of the study a decision rule of 14 was set with an alpha of 0.163 and beta of 0.163. This means that the goodness of fit to the intervention was assumed if 14 of the 19 study participants in each supervision area had the desired behaviour or practice. A total of 171 respondents were drawn from Hillcrest and Simoonga health facility catchment area. To identify the households from which to draw the 190 respondents, LQAS was thought to be the most appropriate method of collecting data from the community members as it would make it possible to collect data that was in line with programmatic work highlighting particular regions that were performing either well or poorly.

Random number tables were used to select the first house from a segment of the Zone selected at random and subsequent houses were chosen if their doors faced the preceding houses. Residents of the household who fit the inclusion criteria were invited to take part in the study.

Inclusion criteria

For inclusion in the study, respondents had to be primary care givers above the age of eighteen. This group of individuals was chosen because they are thought to have information men and women in the community should know about trachoma such as washing their faces and clothes to prevent transmission of infection. They must also have children who are between 1- 9 years because children within this age bracket are the main carriers of active disease infection. The primary care givers must have been able to provide information on daily practices that form part of prevention and control activities of trachoma within their households (Hu et al., 2010).

Exclusion Criteria

Residents who had moved into the region after January 2015 which is the period of time during which the program was rolled out were excluded from the study.

3.5.3 Data collection

Interviewer administered structured questionnaires were used to collect data from the selected communities. The questions used for the questionnaires had been adopted from studies that evaluated trachoma related in different settings (Cane et al., 2012, Ajewole et al., 2001, Lange et al., 2014, Shrestha et al., 2014, Thompson et al., 2015, Khandekar et al., 2004). The 28 item questionnaire had both dichotomous and Likert scale responses collecting information on their

trachoma health literacy, coverage by the program, their attitudes towards the health workers who took part in the campaign and attitudes on the MDA itself.

3.5.4 Data Analysis

The data generated was used to calculate estimates for each individual supervision area and a cumulative estimate for the entire catchment area and give a measure of the appropriateness of the programme as a whole and for the specific health facility catchment area. The questionnaire responses were consolidated into survey indicators which were analysed as the percentage of people who know of and practice a recommended health behaviour or who have received a particular service for each indicator. For questions were asked to all study participants irrespective of whether or not they were covered by the program or came into contact with the healthcare providers a weighted average was calculated using the direct adjustment method that takes into account differences in size of the different supervision areas. Questions that were specific to a subgroup were aggregated for the whole catchment area instead of individual supervision areas. First of all we wanted to establish how many people had received Azithromycin which is the antibiotic distributed during the MDA. During the piloting of the instrument most of the study participants could not remember the exact timing of the MDA rounds but they could remember how many times they had received Azithromycin for trachoma in the two years in which the program had been running. As such coverage was defined as whether an individual had received the antibiotic at least once. Two zones in Nakatindi: Indeco and Nakatindi fell below the decision rule of 14 and could be classified as priority zones. To test whether these indicators had any association with individual community member participation Fischer's exact test and chi square tests were performed. The outcome of interest was defined as community members who had received azithromycin or tetracycline at least once during the 2015 and 2016 rounds.

3.6 Data Synthesis

The qualitative and quantitative data after being analysed separately were integrated and synthesised to gain a more comprehensive view of the findings. Merging the findings from each method strands allowed us to compare and see if there was convergence, complementarity or dissonance in the data (Palinkas et al., 2011). . Where appropriate the findings were presented side by side.

3.7 Data Quality and Instrument development

All the data collection tools were pilot tested at the DALICE health facility catchment area for comprehensibility and suitability before use in the field. Standard operating procedures were used for all stages of the study from recruitment to data collection and analysis. All members of the research team were trained using these protocols and with regular reviews of the different data collection forms to ensure that data collection was being done in an appropriate and consistent manner

3.8 Ethical considerations

Independent review approval was given by the University of Zambia Biomedical Research Ethics Committee (UNZABREC) indicating that the study protocol was compliant to the code of ethics according to both international standards and Zambia's National Health Research Act (REF.NO.021-06-16). Permission letter was provided by the Director of the District Medical Office. Selection of study participants was done randomly and representatively. Participant information sheets were provided giving the full details of the study. Study participants were given opportunities to ask questions to clarify their participation and address any emerging issues. The information was read to participants who were illiterate or had visual problems. Consent was sought to confirm their voluntary participation. Refusals and withdrawals were accepted and coercion dissuaded. Participants were provided with contact details through which they could raise any concerns they had from the study. The Healthcare providers were asked to travel to the District Medical Office for which their transport costs were reimbursed according to the Government rate of 75 ZMK.

A multilingual research team was assembled to cater for study participants who did not speak or understand English. The research team received training prior to conducting the actual study on data collection and how to handle issues of privacy and confidentiality. The research team signed forms that prevented them from disclosing any of the information they collected. In the field unique study registration numbers were used instead of names and contact information. All notes, forms and audio files were kept on the person of the individual collecting the data. At the end of the day they were transferred to the lead investigator where they were stored in a locked cabinet and the audio files transferred to a lead investigator's password protected computer. The electronic data and the forms were accessible only to the research team. Study participants and others not involved

in the study were allowed to access the contents of the questionnaire and the interviews. All the study records were kept safely by the principal investigator for a period of one year after the study and destroyed thereafter.

The study would be beneficial as the data obtained from the study is useful in formulating more comprehensive implementation of MDA during future rounds of the program. One of the potential risks to the study participants was the fact that some of the data collected especially as pertains the organisational structure if traced back to the healthcare providers could jeopardise their positions if it puts the senior and middle level managers in bad light.

CHAPTER 4: RESULTS

This study found that the MDA program had a good level of appropriateness to the implementing agency (District Medical Office) and to the individual providers who were involved in the drug distribution but a low level of appropriateness to the community. This finding was arrived at by identifying implementation strategies that had been used during the program. The data synthesis approach used in this section was complementarity for mixed methods research that combines qualitative and quantitative data for multilevel comparisons (Palinkas et al., 2011). Thematic analysis was used for qualitative data and the major themes and categories are summarised in *Table 2 and 3*. Whereas statistical analysis was done for the quantitative data. This section details implementation strategies used, determinants which are believed to have affected the compatibility and fit of these strategies and whether they had a bearing on the relevance of the program at community level. The factors are herein described in the following categories- organisational, provider, community and environmental factors within each domain of the Theoretical domains Framework.

4.1 Demographic characteristics of the study participants

District Officials

Four key informant interviews were conducted with District officials involved in MDA program planning and the implementation. Two of the interviewees were male and two were female.

Health workers

The age of the health care workers who took part in the study ranged between 20-67 years with a mean of 42.29 years (95% CI 38.29-46.29). Most of them were female 74%. The number of Healthcare workers who had attained Secondary school level of education was highest that both primary and tertiary level education at 58%. The largest health worker category were the community health workers who made up 71% of the study population. Slightly more than half of the study participants 56% had worked between 1-5 years in their respective health facility catchment areas.

Table 3. Socio-demographic characteristics of Health workers in Nakatindi and Simoonga involved in the MDA.

Variable	Profile	Study Sites					
		Nakatindi		Simoonga		Total	
		n	%	n	%	n	%
Age	20-29	5	23.81	1	5.88	6	15.79
	30-39	3	14.29	6	35.29	9	23.68
	40-49	6	28.57	6	35.29	12	31.58
	>50	7	33.33	4	23.53	11	28.95
Sex	Male	5	23.81	5	29.41	10	26.32
	Female	16	76.19	12	42.86	28	73.68
Level of Education	Primary	3	14.29	6	35.29	9	23.68
	Secondary	12	57.14	10	58.82	22	57.89
	Tertiary	6	28.57	1	5.88	7	18.42
Health Worker Categories	CHW/ NHC	11	52.38	16	94.12	27	71.05
	Health facility staff	10	47.62	1	5.88	11	28.95
Experience	<1 year	8	38.1	8	47.06	16	42.11
	1-5 years	11	52.38	9	52.94	20	52.63
	> 5 years	2	9.52	0	0	2	5.26

Community members

The age of the community members who took part in the study ranged between 18 and 78 years with a mean of 33.16 years (95% CI, 31.37- 34.94). 91% of the study participants who were primary care givers were female. 61% of them had received trachoma related information from Community Health Worker.

Table 4. Socio-demographic characteristics of Community members in Nakatindi and Simoonga targeted by MDA.

Variable	Profile	Nakatindi		Simoonga		Total	
		n	%	n	%	n	%
Age	≤ 19	2	2.11	4	5.26	6	3.51
	20-29	38	40	34	44.74	72	42.11
	30-39	28	29.47	26	34.21	54	31.58
	40-49	17	17.89	6	7.89	23	13.45
	>50	10	10.53	6	7.89	16	9.36
Sex	Male	7	7.37	9	11.64	16	9.36
	Female	88	92.63	67	88.16	155	90.64
Level of Education	No schooling	1	1.05	1	1.32	2	1.17
	Primary	27	28.42	40	52.63	67	39.18
	Secondary	58	61.05	32	42.11	90	52.63
	Tertiary	9	9.47	3	3.95	12	7.02
Source of water	Council	84	88.42	40	32.26	124	72.51
	Borehole	9	9.47	36	47.37	45	26.32
	Both	2	2.11	0	0	2	1.17
Time spent cleaning	30 minutes	33	34.74	24	31.58	57	33.33
	1 hour	38	40	22	28.95	60	31.58
	More than 1 hour	24	25.26	30	39.47	54	31.58
Source of Trachoma information	None	7	7.37	3	3.95	10.00	5.85
	Family	4	4.21	1	1.32	5.00	2.92
	Friends	7	7.37	3	3.95	10.00	5.85
	Doctor	1	1.05	1	1.32	2.00	1.17
	CHW	52	54.74	53	69.74	105	61.40
	Media	3	3.16	0	0	3	1.75
	Multiple sources	21	22.11	15	19.74	36	21.05

4.2 Appropriateness of the MDA program

i) Evaluating the acceptability and suitability of the MDA program

Acceptability

There was minimal resistance to the implementation of the MDA campaign in the organisation as there was a clear understanding of the importance of the MDA in reducing the trachoma infection rate within the community. The community drug distribution teams had been involved in a previous MDA for Lymphatic Filariasis (LF) whose approach and activities were similar. Their experience was thought to improve the implementation climate for the trachoma MDA. There was some resistance to the campaign within the community because Mass Drug Administration programs were new in the district and community members did not understand their importance or it did not match their religious beliefs. Having come after the MDA for LF there was a feeling within the community of being overwhelmed by all the drugs they were being asked to take. As a way of motivating the community members to take part in the incentives such as caps, T-shirts, posters and brochures such as were given.

“At the time the only challenge we noticed was that we had just come from another campaign which was elephantiasis. So that sort of brought a lot of questions in the community because people were asking why are they taking drugs all the time so it became a bit of a challenge. So we had to convince them that these are two different diseases and both of them needed treatment.”(P2)

All the health workers interviewed felt that the program would lead to positive change in trachoma related health outcomes within the communities in which they lived. Specifically they believed that the community saw value in the program that was being implemented and that the program would result in changes in knowledge and practice among the community members

Demand

Trachoma had for a long time been considered to be of low public health priority within the implementing agency. Availability of reliable epidemiological data from a population based survey in the district on the prevalence of active trachoma infection increased the focus on trachoma control efforts within the organisation. It was felt that the high infection rates of between

10-29% might lead to greater spread of the disease and increased burden on those already affected by it needing intervention.

“Looking at the situation it became a priority but initially before the survey it was not a priority. Because when you look at 10%, ten percent of the population is not too much but then when you look at how many people get infected and affected it becomes a priority for the district.” (P1).

Weighted coverage for study participants who participated at least once during the two year period in Nakatindi was 76.84% while that in Simoonga was 86.84%. Two zones in Nakatindi- Indeco and Nakatindi were found to be below the expected threshold (Decision rule of 14) and were classified as high priority zones requiring more resources for implementation as shown in *Figure 2*.

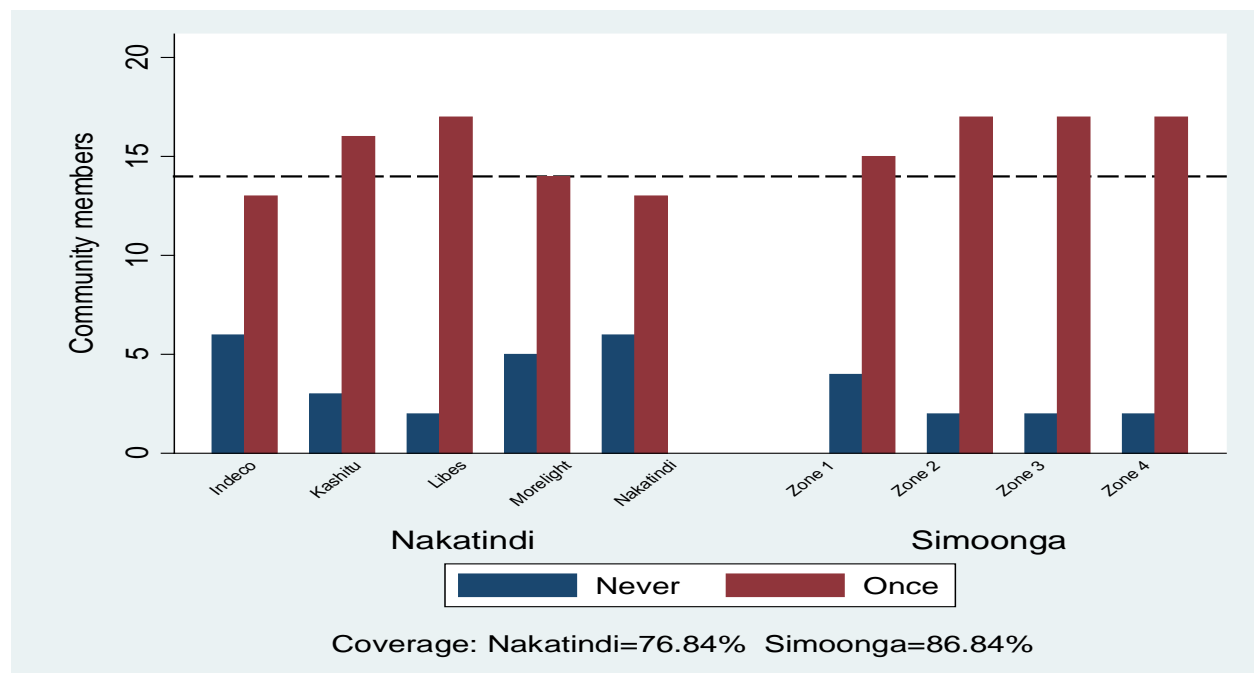


Figure 2. Community members who participated in the MDA program at least once between 2015 and 2016

The participation rate over the two year period was 32% in Nakatindi while in Simoonga it was 33%. None of the zones in the two health facility catchment areas could be said to have attained the decision rule and were classified as priority zones as is seen on *Figure 3*.

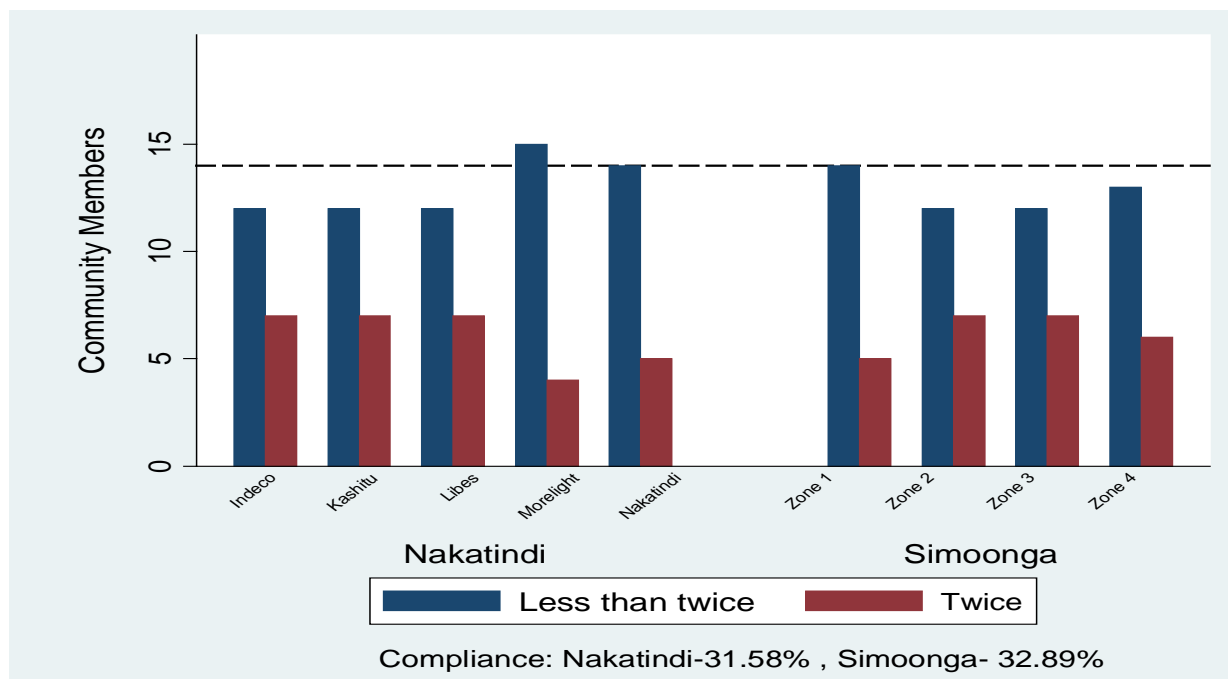


Figure 3. Community member participation in the first two years of the program 2015 and 2016

ii) Evaluation of the resources and ability to manage and implement the MDA program

Implementation

Prior to conducting the MDA the health workers had been trained. The quality of the training materials and equipment that were used for the exercise were felt to be adequate and of good quality. However it was found that in some regions the drug distribution teams were not dispensing the drugs correctly as was expected of them. Being the first time such a program for trachoma was being provided to the community members. Community sensitisation, mobilisation and health education was also carried out through health centre meetings, community meetings, public announcements, radio programs and drama performances to familiarise them with the disease and the Mass Drug Administration campaign that was being introduced and mobilise community members into taking part in the program.

“In every health activity that is going on in the community I carry out an activity called social mobilisation and sensitisation to alert the people, to inform the people so that they are aware of the activities that is coming before them and even the people targeted and so

we did a good number of sensitisation activities that included health centre meeting, community meetings, public announcements where you go around with the vehicle announcing.” (P3)

The implementation of the campaign was an iterative process building on information collected through monitoring and supervision. The district officials used the lessons and mistakes they had made in the first round of the campaign to improve on the subsequent rounds. The use of multiple engagement strategies including the use of local opinion leaders, external change agents and implementation leaders and key stakeholders within the organisation made the process easier. All the involved stakeholders were appraised on the progress of the campaign.

“It was not easy because it was a new thing so there were hiccups like trying to put things in place but I think by the time we were doing our second MDA things were in place. Those who were to do the taskforce meeting, we learnt from the first one the mistakes and where we need to improve and the third MDA I think will be done.” (P1).

Practicality

Resources which had been specifically allocated for the drug distribution were available. However they were not always disbursed in time or adequate for the teams that were doing the community drug distribution. Logistical issues affected the provision of transport necessary to reach communities in far flung parts of the district. Some areas were hard to reach either due human wildlife conflict or the absence of transportation to the remoter parts of Livingstone such as Simoonga.

“The barriers were issues to deal with human wildlife conflict in some areas like in Simoonga of course this was beyond us. And also challenges with transport to some distant areas because when you look at the composition of the team. Maybe more than five teams from the catchment area and certain zones are further away and with challenges of transport we find that certain areas could not be reached.” (P1).

Adaptation

Program implementers used different drug delivery systems in the two rounds of the MDA program. The first round was predominantly health service based while the second round was community based. The use of health facility staff during the first round of the campaign, disrupted

their work at the clinics as they had to go into the community specifically for drug distribution and administration. The use of the community distributors was felt to be necessary in preventing the disruption of the work flow patterns within the health facility and improving the reach of the program.

“Of course there were the routine activities where we pulled out a lot of the staff from the facilities in the first campaign, in the next one we tried to involve other community members....so that it does not disturb ongoing activities which are in the clinics.” (P2)

Integration

In order to increase sustainability and integrate drug administration into routine practice other NGOs were invited to partner with the District Medical Office to provide MDA rounds over time.

“Then the other thing is that we also have other NGOs coming in and also as District we also allocate funds so that in case the project owners’ move out we are able to supplement and these become part and parcel of your daily routines the way child health week is being conducted.”(P1)

Table 5. Major themes relating to MDA appropriateness identified from the key informant interview.

Theme	Category	Example of codes.
Acceptability	Implementation Readiness	Very little resistance by organisational members to the implementation effort
	Organisational climate	Involvement in other MDA programs
	Implementation Climate	Presence of other MDA programs in the region.
Demand	Priority of trachoma control	Increased attention to trachoma due to availability of baseline data
Practicality	Drug delivery system	Not always done in good time. Sometimes inadequate for the distribution teams
	Accessibility	Transport problems, Human wildlife conflict
Adaptation	Drug Delivery system	Switch from health service to community based.
Integration	Multisectoral collaboration	Involvement of different partners in the implementation of the program
Implementation	Trained Workforce	Provision of training prior to the MDA
		Good quality and adequate training materials

4.3 Factors affecting appropriateness of the MDA Program

Intention

Trachoma had for a long time been considered to be of low public health priority within the implementing agency. However a survey conducted by the Ministry of Health and other private partners in the district provided reliable epidemiological data on the prevalence of active trachoma infection. The severity of the active infection rates increased the focus on trachoma control efforts within the organisation as it was felt that the infection rates having between 10-29% prevalence rates of active infection might lead to greater spread of the disease and increased burden on those already affected by it. As such this needed addressing.

“Looking at the situation it became a priority but initially before the survey it was not a priority. Because when you look at 10%, ten percent of the population is not too much but then when you look at how many people get infected and affected it becomes a priority for the district.” (P1).

Knowledge

The district officials thought that the levels of knowledge of trachoma in the community were low. This was because during the screening that was conducted during the survey for the epidemiological profile of the district there were a lot of community members who were found to have active infection but who did not know their disease status.

“I would say because the community sometimes for these conditions unless you sensitise them it doesn't come out as a public problem but if you go to the community you find people have this problem so we just had to sensitise them so I think it wasn't like there was a need from the community. Sometimes the community do not have the health seeking behaviours so you find people going on with life and yet they have trachoma...” (P2)

A majority of the community drug distributors had moderate (87%) to high (3%) levels of knowledge with regards to trachoma and its control. In comparison at the patient level, 94% of the study participants were aware of trachoma was but only 5% claimed to have seen an actual case before. Most of the community members interviewed knew that trachoma could be prevented and causes blindness. However relatively fewer members knew at least one means through which the disease is spread. Awareness (Fischer's exact statistic of 0.034), Knowledge that trachoma causes

blindness (Pearson chi square p value 0.008), the disease is preventable (Pearson chi square p value 0.034) and infectious (Pearson chi square p value 0.003) were found to be significantly associated with whether study participants received the antibiotics administered during the program. The knowledge levels in two catchment areas was comparable as shown on *Table 6*.

Table 6. Weighted coverage of Knowledge, Attitude and Practice indicators associated with MDA program.

Knowledge/Attitude /Practice Indicators (Decision Rule=14)	Study sites	Supervision Areas					Weighted Coverage (%)
		1	2	3	4	5	
Awareness of Trachoma	Nakatindi	18	19	19	16	16	92.63
	Simoonga	19	18	17	18	-	94.74
Took antibiotic at least once	Nakatindi	13	16	17	14	13	76.84
	Simoonga	15	17	17	17		86.84
Compliance over the two year period	Nakatindi	7	7	7	4	5	31.58
	Simoonga	5	7	7	6		32.89
Trachoma causes blindness	Nakatindi	18	18	19	19	14	92.63
	Simoonga	19	14	18	19	-	92.11
Trachoma is preventable	Nakatindi	16	18	19	18	14	89.47
	Simoonga	16	13	17	17	-	82.89
Disease is infectious	Nakatindi	9	11	15	11	8	54.00
	Simoonga	9	12	15	14	-	65.79
Children having dirty faces	Nakatindi	19	17	18	12	19	89.47
	Simoonga	18	18	19	18	-	96.05
Importance of washing faces	Nakatindi	19	19	16	18	19	93.68
	Simoonga	18	19	19	19	-	98.68

Skills

Prior to conducting the MDA the health workers were trained to ensure that they were implementing the program as per the guidelines. The quality of the training materials and equipment that were used for the exercise were felt to be adequate and of good quality. We found that 97% of the health workers were highly skilled in Trachoma control and MDA activities as shown on *Figure 4*. However district officials reported that in some regions the drug distribution teams were not dispensing the drugs correctly as was expected of them.

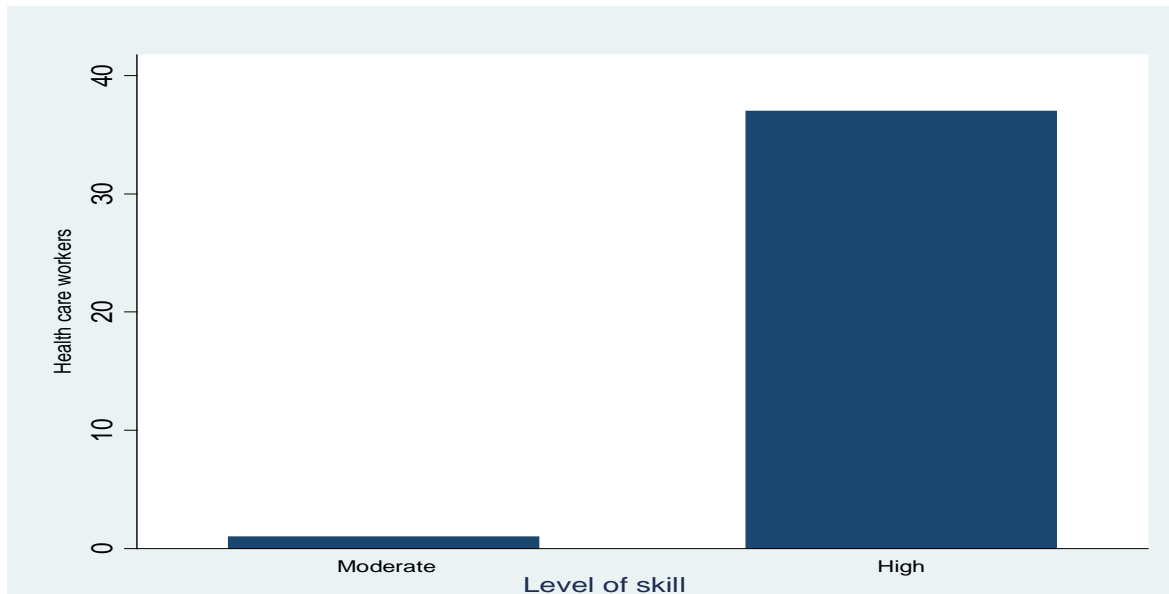


Figure 4. Level of Skill of Health workers in Nakatindi and Simoonga involved in the MDA.

Belief about capabilities

All the community drug distributors interviewed had a strong belief in their capabilities to perform their tasks and were confident in their professional capacity to conduct the MDA within the community. Given that Mass Drug Administration rounds are an avenue through which health information are spread to community members to improve their likelihood of taking part in the program and also as equipping with information to prevent future infections. 31% of the community members who had participated in the MDA rounds at least once stated that they were taught to identify symptom of the disease. 41% of them were taught ways through which they could protect themselves or avoid getting infected. 39% of them felt that the encounter had given them confidence in their ability to protect themselves from infection through everyday actions as shown in *Table 7*.

Table 7. Quality of Community mobilisation and Information, Education and Communication provided by health care workers during the MDA program.

Variable	Nakatindi (N=73)	Simoonga (N=66)	Total (N=139)
Information about trachoma was provided	41%	83%	61%
Explanation given on why MDA is being done	84%	89%	86%
Information given easy to understand.	58%	80%	68%
H. Worker Made sure you understood information.	33%	65%	48%
H. Worker taught you how to protect yourself	26%	58%	41%
H. Worker taught you to identify symptoms of infection	19%	44%	31%
Made you confident in your ability to protect yourself through every day actions.	30%	48%	39%

Belief about consequences

District officials were confident that the MDA program would help reduce the prevalence of the disease within Livingstone district. They believed that the 10% prevalence rate of active trachoma infection might lead to greater spread of the disease and burden on those already affected by it and therefore the MDA was necessary. All the health workers interviewed felt that the program would lead to positive change in trachoma related health outcomes within the communities in which they lived. Specifically they believed that the community saw value in the program that was being implemented and that the program would result in changes in knowledge and practice among the community members.

Goals

Trachoma had for a long time been considered to be of low public health priority within the implementing agency. Awareness of the severity of the active infection rates found to be between 10-29%, increased the focus on trachoma control efforts within the organisation as it felt that they may lead to greater spread of the disease and increased burden on those already affected by it. The implementation of the MDA program was guided by the Zambian National guidelines for

Trachoma control. Formulation of District level Trachoma Action Plans provided a rubric through which the MDA could be conducted efficiently and appropriately for districts within Livingstone.

Environmental Context and Resources

The Ministry of Health disbursed funds through the District medical office as per its national schedule and the local action plans. Sightsavers also provided funds for the roll out of the campaign. Non-monetary support was also provided by the other local stakeholders in the form of transport and time for conducting community sensitisation. Additional funding was directed into sanitation activities to reinforce the importance of trachoma control and further reduce the spread of infection within the community.

Well defined channels of communication were established prior to the implementation of the campaign to ensure that there was easy flow of information between the community drug distributing teams, the District Medical office, the Provincial Medical Office and the Ministry of Health. To ensure that the different components of the program would be implemented as desired and thereby increase the likelihood of implementation success, multiple departments within the District medical Office came together to form a multidisciplinary team.

“Under clinical care department and environmental health department because as you know this clinical and trachoma also has a lot to do with the environmental department so you bring this three departments together and you facilitate them.” (P2).

The existing human resource structures at the health facilities made it easier to monitor and supervise the drug distribution activities. This health facility staff had to increase their level of supervision to reinforce the training had been received. Organisational incentives were provided to the members of the drug distribution teams in form of transport reimbursements to enable them to carry out door to door community sensitisation and lunch allowances as they had to be out of their stations.

“You know before implementation we trained them and in a few places you found people not doing the right things so supervision became very critical for instance maybe you may find some communities members not measuring the dose to be given let’s say to the child in the right way so that became a bit of a problem because there was breakdown during the training which meant that they had to reinforce the training.”(P2).

Implementation efforts in neighbouring districts where similar MDAs had been conducted successfully created the perception amongst the community that similar efforts in Livingstone would result in the intervention's desired effects. The prevailing political conditions also affected the acceptability of the campaign among the community members who thought that it was a part campaign strategy for one of the local political parties whose initials are similar to those on the packaging of the antibiotics.

For every unit increase in the score for the level of resources dedicated to the program ascribed by the health workers there was a 30% increase in the odds of them finding the MDA program appropriate (0.293, 95% CI 0.7991- 2.1026).

Social Influences

A District Taskforce comprising of Governmental, Non-Governmental organisations as well as community representatives was formed under the leadership of the District Commissioner. Multiple engagement strategies including the use of local opinion leaders such as the District Commissioner, external change agents and implementation leaders, key stakeholders within the organisation and groups within the community was done to improve the community buy in and support to the program. Stakeholder meetings were held meetings to discuss the severity of trachoma as shown by the baseline survey as well as the need to choose the MDA program as an adequate solution for the problem. Community representatives were instrumental in the sensitisation for the campaign. Different community settings such as schools, market places and public gatherings were used as points to sensitise the community about the importance of taking part.

Community practices thought to have an effect on the feasibility of the MDA were evaluated. Most of the community members interviewed did not think it was normal for children to have dirty faces (92%), thought that washing their faces was a way of improving their eye health and protecting themselves from trachoma (96%) and that blindness was not limited to the old (96%). Which points towards an understanding of the different trachoma disease stages. However these practices; children with dirty faces (Fisher's exact statistic 0.712), washing faces (Fisher's exact statistic 1.000) and bad vision being limited to the old (Fisher's exact statistic, 0.313) were not significantly associated with community members participating in the MDA.

Behavioural regulation

The implementation of the campaign was an iterative process building on information collected through monitoring and supervision. The district officials used the lessons and mistakes they had made in the first round of the campaign to improve on the subsequent rounds. All the involved stakeholders were appraised on the progress of the campaign. The existing human resource structures at the health facilities made it easier to monitor and supervise the drug distribution activities. The health facility staff had to increase their level of supervision to reinforce the training had been received.

Reinforcements

Organisational incentives were provided to the members of the drug distribution teams in form transport reimbursements to enable them to carry out door to door community sensitisation and lunch allowances as they had to be out of their stations.

4.4 Summary of findings

The MDA program was found to have a good degree of appropriateness to this context. However this varied as one moved from the organisational and provider levels to the community level. This was seen in high levels of acceptability but poor feasibility shown by the low participation rates over the two year period that the program had been running. All domains of the TDF included in this study were found to describe the factors that affect the appropriateness of the MDA program. Belief about consequences, Skills, Social Influences, Reinforcements, Social/Professional Role and Identity, Intention, Goals and Behavioural regulation were the least described domains. The dominant domains were Knowledge, Environmental Context and Resources, Belief about capabilities and Social influences.

CHAPTER 5: DISCUSSION

The implementation of Mass Drug Administration programs like that of any Evidence Based Intervention (EBI) is an iterative process that is influenced by a variety of factors. This study sought to evaluate the different factors that were thought to affect the appropriateness of the MDA to Livingstone district as a means of identifying ways to improve the efficiency of the strategy as the delivery system for preventive chemotherapy for Trachoma control. District officials used different implementation strategies to take into account the local settings including holding stakeholder meetings, allocation of resources for the program, formation of a District taskforce, conducting training and community educational meetings. Despite these strategies being in place the compliance rates were low in both Nakatindi and Simoonga health facility catchment areas. Factors acting as facilitators to the appropriateness of the intervention included presence of a good implementation climate within the District Medical office were prioritisation of trachoma control, suitable organisational implementation climate, readiness for implementation, suitable drug delivery systems, community participation and community mobilisation. Determinants that acted as barriers to the appropriateness of the campaign were political conditions, poor community implementation climate, poor drug supply chain, knowledge of trachoma and trachoma MDA activities.

The prioritisation of trachoma as a public health concern as a result of the availability of epidemiological data served two purposes in Livingstone. First it increased the profile of the disease within the implementing agency (District Medical Office.) which has been associated with increased attention and allocation of resources to trachoma control efforts in other settings (Wright et al., 2010). Secondly it formed the basis of choosing the best SAFE intervention to reduce prevalence rates which was the MDA program with National guidelines and district level trachoma action plans acted as guides for the implementation process. The existence of a favourable policy environment such as that in this setting, has been shown to provide a conducive environment and a framework for MDA implementation in Mali and Australia (Bamani et al., 2013, Wright et al., 2010).

Implementation climate at the organisational level is essential if the implementation of the MDA program is to be successful. Compatibility of the program within the District Medical Office was found to be better due to different preparatory measures that had been put in place prior to the roll

out of the MDA program. These included the creation of well-defined communication channels, presence of adequate equipment and incentives to motivate the drug distribution teams as well as the allocation of resources specific for the implementation of the MDA program. In our study district officials acknowledged a sense of organisational readiness for implementation on account of the perceived benefits of the program to the community. Furthermore organisational readiness would have further contributed to the creation of a favourable implementation climate through past exposure to the other drug distribution programs. The Community drug distribution teams in Livingstone had been involved in MDAs for Lymphatic Filariasis and Soil transmitted helminths which use the same underlying principle for preventive chemotherapy. Their experience with these programs could be seen as making them more receptive to implementing the program. Monitoring of program implementation efforts to find the most effective ways of service delivery provided useful information for the selection of the most appropriate drug delivery system that was in line with the available human resources for the programs and to improve the accessibility of the services.

High levels of knowledge and skill seen among the drug distributors could be due to the training that is provided prior to conducting the campaign and having been engaged in several drug distribution programs (Wright et al., 2010). This could also be said to have contributed to the strong perception in their capabilities to conduct the program and that the program would result in its expected outcomes. Despite the association between appropriateness and the level of knowledge and skills not being significant, it was interesting to find that more knowledgeable and skilled health workers felt that the program was not a good fit. This was contrary to what has been described in the literature (Lange et al., 2014). Though also not significant the perception that the better the drug distributors thought the environmental context within which they were working in was conducive to implementation the more likely they were to find it appropriate. This is in line with studies that have shown that well equipped motivated drug distributors are better at implementing drug distribution programs (Bockarie et al., 2013, Wright et al., 2010). A combination of the high levels of knowledge, skills and the great sense of confidence in their capabilities could point toward the capacity of the organisation to support the continuous implementation of the program (Alexander and Hearld, 2012).

Community awareness and knowledge of trachoma and trachoma MDA programs has been shown to affect how well MDA programs are received (Ajewole et al., 2001, Lange et al., 2014, Thompson et al., 2015). Awareness and knowledge indicators were found to be significantly associated with the decision to receive the antibiotic treatment. The disparity in knowledge levels reported by the program implementers and those observed at community level in our study could be indicative of recent health education and sensitisation activities in the region or the presence of well-trained community drug distribution teams who provided health information to the community (Khandekar et al., 2004, Wright et al., 2010). However the relatively poor understanding of the infectious nature of the disease on which the rationale for Mass Drug Administration programs is based upon could jeopardise community acceptance and the need for compliance with drug treatments over time (Lemoine et al., 2016). This has been observed in Guinea where participation in programs is high but most of those who take part in these programs do not understand their importance (Thompson et al., 2015). Health education activities should thus be modified to include information on disease spread, identifying symptoms of active infection and ways in which community members can avoid infection.

The formation of a district taskforce for the implementation of the program that brought together not only public and private organisations but also different community representatives provided a good model for encouraging community participation and ownership of the program. The use of local champions such as the District Commissioner, heads of schools and religious institutions in community mobilisation and sensitisation within Livingstone district was seen as necessary for gearing the community to support programs and has been found to improve advocacy for involvement in the implementation of the SAFE strategy as a whole (Ajewole et al., 2001, Khandekar et al., 2006). Furthermore multisectoral collaboration between different stakeholders has been shown to be vital in providing technical support for implementation efforts and ensuring that control efforts are sustainable over time (Kuper et al., 2005).

Studies looking at implementation climate before the implementation of Evidence Based Interventions have predominantly focused their attention on organisational level implementation climate. We found that the implementation climate within the community has a significant bearing on how appropriate the community members considered the MDA program to be. Having been exposed to different drug distribution exercises for a number of diseases including Lymphatic

Filariasis, the community members felt exhausted by implementation efforts within their region. When combined with a limited awareness of what MDA programs entail, we found that the climate was not conducive for the implementation of the trachoma MDA. One potential way through which this can be addressed is through the integration of trachoma drug distribution with the drug distribution channels of other diseases such as Lymphatic Filariasis and Soil transmitted helminths. The community members can then be asked to receive a single dose of treatment instead of multiple treatment packages. Such integration efforts have not only been found successful in other part of the world they are also cost effective as they rely on a similar strategic approach (Linehan et al., 2011). Another means through which readiness for implementation was enhanced through information on the success of program in other neighbouring regions. Program implementers could capitalise on mimetic pressure from successful implementation of similar programs in neighbouring districts to encourage more community members to take part in the program.

5.1 Implications on Research, Theory and Practice

Research and Theory

This study applied the Theoretical domains framework to extend the understanding of facilitators and barriers to the implementation of the SAFE strategy and the MDA aspect in particular. The questionnaire used was adopted as is tested in the setting. The domains of the TDF offer a comprehensive list of potential determinants that could potentially influence implementation. Its application in the study revealed that it is a robust tool that can be used in the context of Low and middle income countries. However it may be necessary to go beyond adopting the framework as is and to actually test its psychometric properties for these settings. As it would ensure that what is measured tallies with the operational definitions put forth. Certain overlaps observed during the analysis and interpretation of the data could point towards the need to measure the validity of the constructs and possibly adjust their face and construct measures.

Despite having used the TDF for qualitative enquiry at the Key stakeholder level it would be informative to apply it qualitatively at provider and community levels. Qualitative data would expound on domains such as social influences and environmental context and resources which were found to have a dominant effect at these levels. Data collected would complement the quantitative data that is observed especially low demand as shown by the poor participation rates over the two year period.

Policy and Health Promotion Practice.

For the successful implementation of Mass Drug Administration programs there has to be a balance between sustained community acceptance and participation and existence of suitable drug delivery systems (Lemoine et al., 2016). This study has shown through the effect of Social influences on the acceptability of the intervention. The presence of District Taskforce, the se of Local champions and change agents act facilitators that shape the appropriateness of the intervention. Nevertheless it may be necessary to further explore how the social diversity of the communities living within the district can be used to map extensive implementation networks that ensure a more active approach to the delivery of the interventions. Which would help promote higher levels of the participation over time. Given that other MDA programs are also conducted in the regions these networks that rely on existing social structures and capital can be useful for their delivery as well. Health promotion messages that are provided during the delivery of the program should also take into account the social conditions of the regions where implementation is happening. Refusals on grounds such as religious beliefs could be prevented if there is comprehensive targeting and development of culturally appropriate and compelling messages. Which would extoll the benefits of the campaign as a means through which community members can protect themselves from trachoma infection (Lange et al., 2014).

Policy makers and District officials responsible for the implementation of MDA programs are tasked with the responsibility of ensuring that the implementation climate is favourable. This could be achieved by ensuring all the necessary inputs such as human resources, adequate epidemiological data, adequate drug supplies and funding are put into place prior to the initial roll out (Lemoine et al., 2016). Despite the existences of good systems and collaborations as was seen in this study the reach of the program could be affected if the logistical issues related to drug supplies, transport and accessibility are not addressed. Ongoing clinical training of the teams involved in the distribution of the antibiotics may promote high levels of knowledge, skills and improved competencies when implementing overall SAFE activities in endemic regions (Lange et al., 2014). This will ensure that correct drug dispensation is being done and reduce on the need for additional supervision. In some cases it may be necessary to extend the duration of time that is set aside for the program to ensure that maximum coverage is achieved. Salient events such as

elections should also be factored into the implementation of the program to prevent community resistance.

5.2 Strengths and weaknesses

Though determinants for the implementation of control programs have been described for other Neglected Tropical diseases, there has been a paucity in comprehensive studies evaluating the same for Trachoma and this study seeks to examine them at different levels. The use of the Theoretical Domains framework provides a template through which providers' implementation behaviour can be analysed to reveal the determinant affecting the appropriateness of the MDA program. The information generated on organizational, environmental, provider and community factors that contribute to the relevance of the program to Livingstone District. Furthermore, the utilization of Lot quality Assurance Sampling to measure coverage and compliance levels as well as different knowledge, attitude and practice indicators made it possible to identify poor performing zones within the community that need action to improve appropriateness, which is necessary for the next round of the campaign to be conducted in late 2017.

One of the weaknesses of the study was the operationalisation of the Theoretical Domains framework. Despite the existence of clear operational definitions of the different domains and their constituent constructs, in some cases there was an overlap between multiple domains. For example, in this study the domains Goals and Intentions tended to overlap considerably during the coding process. This could point towards the interviewees' failure to separate such domains. Other studies using the TDF have also reported difficulties in operationalising it (Phillips et al., 2015, Patey et al., 2017). Additionally, the small sample size used for the health care workers who acted as community drug distributors meant that though associations were detected, the confidence intervals were wide and the p values insignificant. For determinants such as belief in capabilities and belief in consequences where there was no variation in response, it was thus difficult to gauge whether they had a positive or negative influence on the appropriateness of the MDA program. Additionally, it would be informative to conduct either Focus Group Discussions or individual in-depth interviews as a means of further exploring individual implementation behaviour among the drug distribution teams using the Theoretical Domains Framework. This would make it possible to see whether the determinants identified act as either determinants or facilitators to the implementation of the MDA program in Livingstone district.

CHAPTER 6: CONCLUSIONS

Quality implementation of Mass Drug administration programs in any setting begins with an assessment of the problem, organisational capacity and resources for running the program (Meyers et al., 2012). Appropriateness at the organisational level begins with the selection of implementation strategies that guide the implementation process. However our multilevel analysis indicates that creating appropriate conditions for the implementation of the program at higher levels of the health system affects how appropriate the program will be at lower levels and at the same time has a bearing on other implementation outcomes. In this case there was high degree of goodness of fit between the MDA program and the organisational members involved in its implementation but the low compliance rates observed could allude to low feasibility and acceptability of the program at community level driven by community and environmentally driven determinants. As such creating a receptive environment for the implementation of the program at community level and using active advocacy strategies, community mobilisation and sensitisation throughout the year rather than only during distribution, could increase knowledge and awareness of MDAs and their importance for trachoma control as well as create a good implementation climate. Alternately trachoma drug distribution could be integrated into other existing drug distribution programs as a way of improving the reception of the program.

6.1 Recommendations

Research

1. Conduct studies into the evaluation of the psychometric properties of the Theoretical Domains framework within the setting.
2. Use the TDF in qualitative interviews with community members and community drug distribution teams to generate data that can explain the quantitative observations that were made.

Health Promotion Practice within the district

1. During community sensitisation and mobilisation efforts more information should be provided to community members to improve the levels of knowledge in the following areas:- Nature of the disease, means of spread, identifying disease symptoms, ways of avoiding infection, importance of MDA and other control efforts.

2. Health messaging should also be structured to take into account those whose beliefs differ from those of the program. Especially religion based differences can be shown the value of participating in MDA programs.
3. Conduct ongoing sensitisation throughout the year rather than only during the drug distribution.
4. Community drug distributors from Nakatindi should be encouraged to implement the program with greater fidelity especially with regard to the provision of adequate information to community members.

Policy

1. Provide ongoing training for the teams that involved in the implementation of MDA programs in endemic regions to make it possible for them to dispense with their duties correctly.
2. They should ensure that all the necessary inputs are available prior to the implementation of the program to make sure that the program has maximum reach to ensure high coverage. This could be improved by inviting other partners to take in some of the responsibilities.
3. Mapping of existing community structures and local social diversity to identify potential social networks that could be used to promote community delivery beyond tha of the drug distribution teams.
4. Integration of trachoma MDA program in MDA programs for other Neglected Tropical Disease such as Lymphatic Filariasis which utilise a similar structural and strategic approach.

REFERENCES

- Ajewole, J. F., Faal, H., Johnson, G. & Hart, A. 2001. Understanding the community perspectives of trachoma: The Gambia as a case study. *Neuro-Ophthalmology*, 8, 163-180.
- Alexander, J. A. & Hearld, L. R. 2012. Methods and metrics challenges of delivery-system research. *Implementation Science*, 7, 15.
- Astle, W. F., Wiafe, B., Ingram, A. D., Mwanga, M. & Glassco, C. B. 2006. Trachoma control in Southern Zambia—an international team project employing the SAFE strategy. *Ophthalmic epidemiology*, 13, 227-236.
- Bamani, S., Toubali, E., Diarra, S., Goita, S., Berté, Z., Coulibaly, F., Sangaré, H., Tuinsma, M., Zhang, Y. & Dembelé, B. 2013. Enhancing community knowledge and health behaviors to eliminate blinding trachoma in Mali using radio messaging as a strategy. *Health education research*, 28, 360-370.
- Bauer, M. S., Damschroder, L., Hagedorn, H., Smith, J. & Kilbourne, A. M. 2015. An introduction to implementation science for the non-specialist. *BMC psychology*, 3, 1.
- Bockarie, M. J., Kelly-Hope, L. A., Rebollo, M. & Molyneux, D. H. 2013. Preventive chemotherapy as a strategy for elimination of neglected tropical parasitic diseases: endgame challenges. *Phil. Trans. R. Soc. B*, 368, 20120144.
- Bowen, D. J., Kreuter, M., Spring, B., Cofta-Woerpel, L., Linnan, L., Weiner, D., Bakken, S., Kaplan, C. P., Squiers, L., Fabrizio, C. & Fernandez, M. 2009. How We Design Feasibility Studies. *American journal of preventive medicine*, 36, 452-457.
- Cane, J., O'Connor, D. & Michie, S. 2012. Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implement Sci*, 7, 37.
- Cumberland, P., Edwards, T., Hailu, G., Harding-Esch, E., Andreasen, A., Mabey, D. & Todd, J. 2008. The impact of community level treatment and preventative interventions on trachoma prevalence in rural Ethiopia. *International journal of epidemiology*, 37, 549-558.
- Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A. & Lowery, J. C. 2009. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implementation science*, 4, 1.
- Emerson, P. M., Burton, M., Solomon, A. W., Bailey, R. & Mabey, D. 2006. The SAFE strategy for trachoma control: Using operational research for policy, planning and implementation. *Bull World Health Organ*, 84, 613-9.

- Hagedorn, H. J., Stetler, C. B., Bangerter, A., Noorbaloochi, S., Stitzer, M. L. & Kivlahan, D. 2014. An implementation-focused process evaluation of an incentive intervention effectiveness trial in substance use disorders clinics at two Veterans Health Administration medical centers. *Addiction science & clinical practice*, 9, 12.
- Hong, K.-K. & Kim, Y.-G. 2002. The critical success factors for ERP implementation: an organizational fit perspective. *Information & Management*, 40, 25-40.
- Hu, V. H., Harding-Esch, E. M., Burton, M. J., Bailey, R. L., Kadimpeul, J. & Mabey, D. C. 2010. Epidemiology and control of trachoma: systematic review. *Tropical Medicine & International Health*, 15, 673-691.
- Khandekar, R., Bullard, M., Thanh, T. T. K. & Binh, T. Q. 2004. Knowledge and practice related to trachoma among children in Vietnam: A cross-sectional study. *Journal of health communication*, 9, 77-83.
- Khandekar, R., Thanah, T. T. K. & Thi, P. D. 2006. Impact of face washing and environmental improvement on reduction of active trachoma in Vietnam—a public health intervention study. *Ophthalmic Epidemiology*, 13, 43-52.
- Klein, K. J. & Sorra, J. S. 1996. The challenge of innovation implementation. *Academy of management review*, 21, 1055-1080.
- Kuper, H., Solomon, A. W., Buchan, J., Zondervan, M., Foster, A. & Mabey, D. 2003. A critical review of the SAFE strategy for the prevention of blinding trachoma. *Lancet Infect Dis*, 3, 372-81.
- Kuper, H., Solomon, A. W., Buchan, J. C., Zondervan, M., Mabey, D. & Foster, A. 2005. Participatory evaluations of trachoma control programmes in eight countries. *Tropical Medicine & International Health*, 10, 764-772.
- Kyelem, D., Biswas, G., Bockarie, M. J., Bradley, M. H., El-Setouhy, M., Fischer, P. U., Henderson, R. H., Kazura, J. W., Lammie, P. J. & Njenga, S. M. 2008. Determinants of success in national programs to eliminate lymphatic filariasis: a perspective identifying essential elements and research needs. *The American journal of tropical medicine and hygiene*, 79, 480-484.
- Lange, F. D., Baunach, E., McKenzie, R. & Taylor, H. R. 2014. Trachoma elimination in remote Indigenous Northern Territory communities: baseline health-promotion study. *Aust J Prim Health*, 20, 34-40.

- Lemoine, J. F., Desormeaux, A. M., Monestime, F., Fayette, C. R., Desir, L., Direny, A. N., Carciunoiu, S., Miller, L., Knipes, A. & Lammie, P. 2016. Controlling Neglected Tropical Diseases (NTDs) in Haiti: implementation strategies and evidence of their success. *PLoS neglected tropical diseases*, 10, e0004954.
- Lewallen, S., Massae, P., Tharaney, M., Somba, M., Geneau, R., MacArthur, C. & Courtright, P. 2008. Evaluating a school-based trachoma curriculum in Tanzania. *Health education research*, 23, 1068-1073.
- Linehan, M., Hanson, C., Weaver, A., Baker, M., Kabore, A., Zoerhoff, K. L., Sankara, D., Torres, S. & Ottesen, E. A. 2011. Integrated implementation of programs targeting neglected tropical diseases through preventive chemotherapy: proving the feasibility at national scale. *The American journal of tropical medicine and hygiene*, 84, 5-14.
- Meyers, D. C., Durlak, J. A. & Wandersman, A. 2012. The quality implementation framework: A synthesis of critical steps in the implementation process. *American journal of community psychology*, 50, 462-480.
- Michie, S., Fixsen, D., Grimshaw, J. M. & Eccles, M. P. 2009. Specifying and reporting complex behaviour change interventions: the need for a scientific method. *Implementation Science*, 4, 40.
- Ngoni, J., Onsarigo, A., Matthews, F., Reacher, M., Brayne, C., Baba, S., Solomon, A. W., Zingesser, J. & Emerson, P. M. 2006. Effect of 3 years of SAFE (surgery, antibiotics, facial cleanliness, and environmental change) strategy for trachoma control in southern Sudan: a cross-sectional study. *The Lancet*, 368, 589-595.
- Nielsen, K. & Randall, R. 2015. Assessing and Addressing the Fit of Planned Interventions to the Organizational Context. *Derailed Organizational Interventions for Stress and Well-Being*. Springer.
- Orsmond, G. I. & Cohn, E. S. 2015. The Distinctive Features of a Feasibility Study: Objectives and Guiding Questions. *Health*, 1, 9.
- Palinkas, L. A., Aarons, G. A., Horwitz, S., Chamberlain, P., Hurlburt, M. & Landsverk, J. 2011. Mixed method designs in implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, 38, 44-53.
- Patey, A., O'Connor, D., Duncan, E. M., Colquhoun, H., Grimshaw, J. M., Francis, J., Atkins, L., Ivers, N., Islam, R. & Lawton, R. 2017. A guide to using the Theoretical Domains

- Framework of behaviour change to investigate implementation problems. *Implementation Science*, 12, 77.
- Phillips, C. J., Marshall, A. P., Chaves, N. J., Jankelowitz, S. K., Lin, I. B., Loy, C. T., Rees, G., Sakzewski, L., Thomas, S. & To, T.-P. 2015. Experiences of using the Theoretical Domains Framework across diverse clinical environments: a qualitative study. *Journal of multidisciplinary healthcare*, 8, 139.
- Powell, B. J., McMillen, J. C., Proctor, E. K., Carpenter, C. R., Griffey, R. T., Bunger, A. C., Glass, J. E. & York, J. L. 2012. A compilation of strategies for implementing clinical innovations in health and mental health. *Medical care research and review*, 69, 123-157.
- Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., Griffey, R. & Hensley, M. 2011. Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health and Mental Health Services Research*, 38, 65-76.
- Robertson, S. E. & Valadez, J. J. 2006. Global review of health care surveys using lot quality assurance sampling (LQAS), 1984–2004. *Social science & medicine*, 63, 1648-1660.
- Scott, S. D., Plotnikoff, R. C., Karunamuni, N., Bize, R. & Rodgers, W. 2008. Factors influencing the adoption of an innovation: An examination of the uptake of the Canadian Heart Health Kit (HHK). *Implementation Science*, 3, 41.
- Shrestha, M. K., Guo, C. W., Maharjan, N., Gurung, R. & Ruit, S. 2014. Health literacy of common ocular diseases in Nepal. *BMC Ophthalmol*, 14, 2.
- Smith, J. L., Flueckiger, R. M., Hooper, P. J., Polack, S., Cromwell, E. A., Palmer, S. L., Emerson, P. M., Mabey, D. C., Solomon, A. W., Haddad, D. & Brooker, S. J. 2013. The geographical distribution and burden of trachoma in Africa. *PLoS Negl Trop Dis*, 7, e2359.
- Taylor, H. R., Burton, M. J., Haddad, D., West, S. & Wright, H. 2014. Trachoma. *Lancet*, 384, 2142-52.
- Thompson, K., Hutchins, H., Baio, A., Cassama, E., Nabicassa, M., Bailey, R. & Last, A. R. 2015. Health beliefs and perceptions of trachoma in communities on the Bijagos Archipelago of Guinea Bissau. *Ophthalmic epidemiology*, 22, 190-199.
- Thylefors, B., Dawson, C. R., Jones, B. R., West, S. K. & Taylor, H. R. 1987. A simple system for the assessment of trachoma and its complications. *Bull World Health Organ*, 65, 477-83.

- Vinke, C. & Lonergan, S. 2011. Social and environmental risk factors for trachoma: a mixed methods approach in the Kembata Zone of southern Ethiopia. *Canadian Journal of Development Studies/Revue canadienne d'études du développement*, 32, 254-268.
- Webster, J. P., Molyneux, D. H., Hotez, P. J. & Fenwick, A. 2014. The contribution of mass drug administration to global health: past, present and future. *Phil. Trans. R. Soc. B*, 369, 20130434.
- West, S. K. 2003. Blinding trachoma: prevention with the safe strategy. *Am J Trop Med Hyg*, 69, 18-23.
- World Health Organisation 2016. Trachoma Fact Sheet.
- Wright, H. R., Keefe, J. E. & Taylor, H. R. 2010. Barriers to the implementation of the SAFE strategy to combat hyperendemic trachoma in Australia. *Ophthalmic epidemiology*, 17, 349-359.
- Zazzali, J. L., Sherbourne, C., Hoagwood, K. E., Greene, D., Bigley, M. F. & Sexton, T. L. 2008. The adoption and implementation of an evidence based practice in child and family mental health services organizations: A pilot study of functional family therapy in New York State. *Administration and Policy in Mental Health and Mental Health Services Research*, 35, 38-49.
- Zondervan, M., Kuper, H., Solomon, A. & Buchan, J. 2004. Health promotion for trachoma control. *Community Eye Health*, 17, 57.

APPENDICES.

Appendix A: Participant Information Sheets

Health Care Provider Survey

Title of the project: **Evaluation of implementation determinants shaping the Appropriateness of a Trachoma Mass Drug Administration Program in Livingstone District, Zambia.**

Principal Investigator: Ms Patricia Maritim

IRB NO: REF.NO.021-06-16

Introduction

Hello my name is Patricia Maritim and I am a student at the University of Zambia - School of Public Health. I am currently conducting my research project under the supervision of Dr Hakibasa Halwindi and Dr. Joseph Zulu where I will be evaluating the how well of a Mass Drug Administration program delivered as for the prevention and control of Trachoma is suitable for the people in your area.

Aims of the study

This study will evaluate how well the educational training you received as part of the Trachoma Mass drug administration campaign takes into account your individual abilities, knowledge, skills and cultural influence of the community and the organisation in which you work. Therefore you have been invited to take part in this study because you are in a good position to answer questions that relate to this.

Study procedures

If you agree to take part in this study, you will be first required to sign a consent form that shows you have given your permission. As a participant in this study you will be asked to complete one questionnaire about your personal information, information on your knowledge, beliefs and routine practices that are related to trachoma control and prevention activities. You will be invited to travel to the District Medical Office in Livingstone and you will be given 75 ZMK to cater for your travel expenses. An interview will be conducted where you will be asked questions and your answers filled into a questionnaire. If at any point you feel that some of the questions being asked are too

sensitive or personal you are free not to answer them. Your answers will be read back to you at the end of the interview for you to confirm that what has been written is true.

Length of the study

The questionnaire will take 20-30 minutes to complete.

Confidentiality of the study records

The information regarding participation in this study will be kept confidential and all the forms used in this study will be stored in a locked cabinet belonging to the Principal Investigator. All electronic data will be saved on the principal investigator's personal computer. The electronic data and the forms will only be accessible to the principal investigator, Patricia Maritim and her supervisors, DR. Halwindi and Dr, Zulu. All the study records will be kept safely by the principal for a period of one year (1) after the study and destroyed thereafter.

The results of this study may be published in scientific journals and presented at scientific and professional conferences. However they will not contain any names or identifiers of the study participants. The results of the study will be available to you upon request.

Risks.

We do not think that you will have any major problems from taking part in the study. However some of the questions that will be asked during the interview may be sensitive and may cause some emotional stress. In such a circumstance you are free to ask the interviewer to skip these questions. Additionally some of the information if traced back to you could affect your position at your work place. To prevent this from happening you will be assigned a unique identification number that will hide your true identity.

Benefits

By participating in this research, the information you provide will be used to improve the program for future rounds of the Mass drug administration so it is tailored towards your area and other similar settings.

Right to withdraw from the study

You are free to choose whether or not you would like to take part in the study. Participation is voluntary, if at any point of the interview you feel like withdrawing from the study you are free to do so without giving any reason. You will not be in any problems if you decide not to participate.

Questions regarding the study

If you have any questions about this study: please contact either

- i) The Principal Investigator, Patricia Maritim via post University of Zambia, Ridgeway Campus, P.O. Box 50110 Lusaka, Zambia, on telephone +260978379913 or via email (triciamarie20@gmail.com)
- ii) If you feel that Principal Investigator and her team conduct the study in a way that is illegal or likely to cause you harm you should contact the Chairperson of the Biomedical Research Ethics Committee at University of Zambia, Ridgeway Campus via post P.O. Box 50110 Lusaka, Zambia, on telephone at +260-1-256067 and email unzarec@zamtel.zm

Do you have any questions?

Thank you for your support

Ms. Patricia Maritim.

Lead Investigator.

.

Community Member Survey-English

Study Title: **Evaluation of Implementation Determinants to the Appropriateness of a Trachoma Mass Drug Administration Program in Livingstone District, Zambia.**

Principal Investigator: Ms Patricia Maritim

IRB NO: REF.NO.021-06-16

Aims of the study

Hello my name is Patricia Maritim and I am a student at the University of Zambia - School of Public Health. I am currently conducting my research project under the supervision of Dr Hakibasa Halwindi and Dr. Joseph Zulu where I will be evaluating the how well Mass Drug Administration for the prevention and control of Trachoma is suitable for the people in your area.

Why are you being asked to participate?

You have been invited to take part in this study because you are in a good position to answer questions on the Mass drug administration program that was conducted in this area, whether or not you took part and your reasons for participation.

Study procedures

If you agree to take part in this study, you will be first required to sign a consent form that shows you have given your permission. You will select a location you feel is comfortable for you to conduct an interview where you will be asked questions and your answers filled into a questionnaire. **If at any point of the interview you feel that some of the questions being asked are too sensitive or personal you are free not to answer them.** Your answers will be read back to you at the end of the interview for you to confirm that what has been written is true.

Length of the study

The questionnaire will take 20-30 minutes to complete.

Confidentiality of the study records

All the information that you provide will be kept private at all times and will only be used for the purposes of this study. The information will be stored in a locked cabinet belonging to the Principal

Investigator. All electronic data will be saved on the principal investigator's personal computer which is password protected. All the study records will be kept safely by the principal for a period of one year (1) after the study and destroyed thereafter. At no point of the study will your name be used or made public.

The results of this study may be published in scientific journals and presented at scientific and professional conferences. However they will not contain any names or identifiers of the study participants. The results of the study will be available to you upon request.

Risks.

We do not think that you will have any major problems from taking part in the study. However some of the questions that will be asked during the interview may be sensitive and may cause some emotional stress. In such a circumstance you are free to ask the interviewer to skip these questions.

Benefits

By participating in this research, the information you provide will be used to improve the program for future rounds of the Mass drug administration so it is tailored towards your area and other similar settings.

Right to withdraw from the study

You are free to choose whether or not you would like to take part in the study. Participation is voluntary, if at any point of the interview you feel like withdrawing from the study you are free to do so without giving any reason. You will not be in any problems if you decide not to participate.

Questions regarding the study

If you have any questions about this study: please contact either

- i) The Principal Investigator, Patricia Maritim via post University of Zambia, Ridgeway Campus, P.O. Box 50110 Lusaka, Zambia, on telephone +260978379913 or via email (triciamarie20@gmail.com)
- ii) If you feel that Principal Investigator and her team conduct the study in a way that is illegal or likely to cause you harm you should contact the Chairperson of the Biomedical Research Ethics Committee at University of Zambia, Ridgeway Campus

via post P.O. Box 50110 Lusaka, Zambia, on telephone at +260-1-256067 and email unzarec@zamtel.zm

Do you have any questions?

Thank you for your support

Ms. Patricia Maritim.

Lead Investigator.

PEPA LYA SIKUTOLA LUBAZU

Buvuntauzi Bwa Membala Wa Mu Bukale-Tonga

Mutwe wa buvuntauzi: **Evaluation of Implementation Determinants to the Appropriateness of a Trachoma Mass Drug Administration Program in Livingstone District, Zambia.**

Sikuvuntauzya Mupati: Ba Patricia Maritim

IRB NO: REF.NO.021-06-16

Muzezo wa bu vuntauzi

Kamwamba, izina lyangu ndime Patricia Maritim alimwi ndi sichikolo ku chikolo chisumpukide cha University of Zambia – Mulwiyo lwa nseba zyangantu. Lino ndicita buvuntauzi elyo ibendelezyi bangu mu bu vuntauzi obu mba sya bupampu ba Dr Hakibasa Halwindi aba Dr. Joseph Zulu, kwalo nkwendiyanda kulanganyana na ikuelanyika akubona kuti ino ibwendelezyi bujaticizya luiyo lwanseba mu muzezo wa ku apaula misamu mubunji mu cibaka cenu ikuti bantu batabi a bulwazi bwa Trachoma aku bu endelzya mu nzila i elede mu cibaka cenu.

Ino nkambo nzi nco mulombwa ikutola Lubazu?

Mwatambwa ikuti mutole Lubazu mu buvuntauzi obu nkambo muli mu ci imo cibotu caku ingula mibuzyo mu cililanwa i jatikizya kuapula musamu mu bunji na Mass drug administration iya ka citwa mu busena obuno,kunyina amakani kuti mwakatola lubazu na pe a mizezo yenu yaku tola Lubazu.

Study procedures Malailile A buvuntauzi

Kuti mulazumina ikutola Lubazu mu bu Vuntauzi obu, ikusanguna mu elede ku samba cizuminano eci cilaba citondezyo kuti mwazumina. Muya kulisalila ibusena kwalo nko muya kubuzigwa mibizyo elyo ibuinguzi bweenu buya ku lembwa mu bbuku ijisi mibuzyo. Kuti mu buvuntauzi obu kwaba imubuzyo yalo inga yaleta buyumuyumu bumwi, Mulijisi nguzu zya ku ta vwila. I bu inguzi bwenu buya kubalwa alimwi kumamanino ikutegwa mu zumine kuti izyalebwa zyamasimpe.

Ikulampa kwa buvuntauzi

Imibuzyo ilatola tuzuzu tusika ku makuumi obilo (20) na Makumi yo tatwe (30)

Maseseke a zya lembwa mu buvuntauzi

Ubuinguzi boonse mbomuya kupa buya kukwabililwa lyonse alimwi buya kubelesegewa biyo mu buvuntauzi obu. Ibuinguzi boonse buya kujalilwa mu ciyobwedo ca ba siki kuvuntauzya bapati. Imalembo onse aya kuyoboolwa mu computer ba siki kuvuntauzya bapati yalo i kwabililidwe. Imalembe onse aya ku bambwa aba siki kuvuntauzya bapati kwa mwaka omwe, bwa mana buvuntauzi, onse aya ku nyonyonwa. Kunyina ciindi izina lyenu no liya kuambwa mu ciindi ca buvuntauzi obu.

Zilijazyo

Tuyeya kuti kunyina cilijazyo mu ku tola Lubazu mu buvuntauzi obu, pesi imwi mibuzyo iya kubuzigwa inga kaili yeyo ileta kulimvwa kumwi kubyabi, kuti kacili boobo, mu li angulukide kulomba sikubuzya kuti ai sotoke mibuzyo ya mushobo oyo.

Bulumbu

Kuinda mu kutola lubazu mu buvuntauzi obu, ibuinguzi mbomuya kupa buya kubelesyegwa mu kusumpula buendelezyi mu ciindi cibola bwa kuapula misaim mubunji na Mass drug administration nkambo bu bambilidwe kubusena bwenu amasena ambi a kozyana.

Icielelo ca kuleka buvuntauzi

Muli angulukide ikusala kutola na pe mubuvuntauzi obu. Ikutola lubanzu nkulipa biyo, kuti na kufumbwa ciindi mu kubuzigwa mwalivwa mbulikuti tamuyandi kuzumanana, muliangulukide ku cita oboka kunyina a kupa kaambo nkomwalekela, kunyina ano muya kuba mu penzi iliyonse kuti na mwasala kutatola lubazu.

Imibuzyo kujatikizya Buvuntauzi

Kuti na mujisi mibuzyo kujatikizya buvuntauzi obu; inga mwakwaba ba

- i) Ba si kuvuntauzya ba Patricia Maritim kuinda mukubelsya keyala eyi P.O. Box 50110 Lusaka, Zambia, na kubatumina luwaile a +260978379913 na pe lugwalo lwa email a (triciamarie20@gmail.com)

- ii) kuti mwalivwa kuti si kuvuntauzya mupati a mbunga yakwe ba cita buvuntauzi munzali itali mu mulawo na pe inga ba mi bika mu ntenda inga mwa kwaba ba sichiuno ba mbunga ya Biomedical Research Ethics ku chikolo chisumpukide ca University of Zambia, cili ku Ridgeway kuinda mukubelesya keyala eyi P.O. Box 50110 Lusaka, Zambia, na luwaile a +260-1-256067 na pe lugwalo lwa email a unzarec@zamtel.zm

Sena mulijisi mibizyo ili yonse?

Key Informant Interview

Title of the project: **Evaluation of Implementation Determinants to the Appropriateness of a Trachoma Mass Drug Administration Program in Livingstone District, Zambia.**

Principal Investigator: Ms Patricia Maritim

IRB NO: REF.NO.021-06-16

Hello my name is Patricia Maritim and I am a student at the University of Zambia - School of Public Health. I am currently conducting my research project under the supervision of Dr Hakibasa Halwindi and Dr. Joseph Zulu where I will be evaluating the how well Mass Drug Administration for the prevention and control of Trachoma is suitable for the people in your area.

Aims of the study

This study will evaluate how well the educational training that was provided as part of the Trachoma Mass drug administration campaign took into account the unique features of your organisation. You have been invited to take part in this study because you are were instrumental in the rolling out of the campaign and are in a good position to offer insight on how the program was designed to take into consideration local needs.

Study procedures

If you agree to take part in this study, you will be first required to sign a consent form that shows you have given your permission. You will be invited to travel to the District Medical Office in Livingstone and you will be given 75 ZMK to cater for your travel expenses. An interview will be conducted where you will be asked questions, notes will be taken and your responses tape recorded. If at any point you feel that some of the questions being asked are too sensitive or personal you are free not to answer them. A transcript of your answers will be read back to you at the end of the interview for you to confirm that what has been written is true.

Length of the study

The interview will take 45 minutes to complete.

Confidentiality of the study records

All the information that you provide will be kept private at all times and will only be used for the purposes of this study. The information will be stored in a locked cabinet belonging to the Principal Investigator. All electronic data will be saved on the principal investigator's personal computer which is password protected. All the study records will be kept safely by the principal for a period of one year (1) after the study and destroyed thereafter. At no point of the study will your name be used or made public.

The results of this study may be published in scientific journals and presented at scientific and professional conferences. However they will not contain any names or identifiers of the study participants. The results of the study will be available to you upon request.

Risks.

We do not think that you will have any major problems from taking part in the study. However some of the questions that will be asked during the interview may be sensitive and may cause some emotional stress. In such a circumstance you are free to ask the interviewer to skip these questions. Additionally some of the information if traced back to you could affect your position at your work place. To prevent this from happening you will be assigned a unique identification number that will hide your true identity.

Benefits

By participating in this research, the information you provide will be used to improve the program for future rounds of the Mass drug administration so it is tailored towards your area and other similar settings.

Right to withdraw from the study

You are free to choose whether or not you would like to take part in the study. **Participation is voluntary**, if at any point of the interview you feel like withdrawing from the study you are free to do so without giving any reason. You will not be in any problems if you decide not to participate.

Questions regarding the study

If you have any questions about this study: please contact either

- i) The Principal Investigator, Patricia Maritim via post University of Zambia, Ridgeway Campus, P.O. Box 50110 Lusaka, Zambia, on telephone +260978379913 or via email (triciamarie20@gmail.com)
- ii) If you feel that Principal Investigator and her team conduct the study in a way that is illegal or likely to cause you harm you should contact the Chairperson of the Biomedical Research Ethics Committee at University of Zambia, Ridgeway Campus via post P.O. Box 50110 Lusaka, Zambia, on telephone at +260-1-256067 and email unzarec@zamtel.zm

Do you have any questions?

Thank you for your support

Ms. Patricia Maritim.

Lead Investigator.

Appendix B: Consent forms

Consent Form-English

Title of the project: Evaluation of Implementation Determinants to the Appropriateness of a Trachoma Mass Drug Administration Program in Livingstone District, Zambia.

Principal investigator: Patricia Maritim.

What does your signature (or thumbprint/mark) on this consent form mean?.

That you have read and understood the subject of the information sheet dated for the above study, asked questions and all of your questions have been answered to your satisfaction.

You understand that taking part in this study is voluntary and you are free to withdraw at any time, without giving any reason and without your medical care or legal rights being affected. If you feel some of the questions are too sensitive or personal you can skip them without giving any reason.

You understand that the information you provide may be looked at by responsible individuals from University of Zambia and that you give permission for these individuals to access your records.

I agree to take part in the above study.

_____	_____	_____
Print name of Participant	Signature of Participant	Date

_____	_____	_____
Print name of witness	Signature of witness	Date

_____	_____	_____
Print name of Person Obtaining	Signature of Person Obtaining Consent	Date

Consent

Ask the participant to mark a “left thumb” impression in the box below if he/she is unable to sign.



For more information contact the Principal Investigator, Patricia Maritim on +260978379913 or via emtriciamarie20@gmail.com or the Chairperson of the Biomedical Research Ethics Committee at University of Zambia, Ridgeway Campus on +260-1-256067 or email unzarec@zamtel.zm

Pepa Lya Cizuminano-Tonga

Mutwe wa Mulimo: Evaluation of Implementation Determinants to the Appropriateness of a Trachoma Mass Drug Administration Program in Livingstone District, Zambia.

Sikuvuntauzya Mupati: Patricia Maritim.

Ino kusimba kwenu (na Kubelesya cinwe) caamba nzi?

Kuti mwabala a kutelela ciiyo kali mu pepa lwakalembwa mu buzuba bwa.....akambo ka ciiyo cili atala, nwabuzya mibuzyo elyo ya ingulwa mu nzila ikomanisya.

Mulatelela ikuti ikutola lubazu u buvuntauzi obu nkulipa akuti inga mwa sala kuleka kufumbwa ciindi kakunyina a kupa muzezo akuti i nseba zyenu a zyelelo zyenu ka zita tundululwi. Kuti mwalimvwa kuti imbi mibuzyo inga yaleta cilijazyo na ilamiguma ciligaminina,inga mwaisotoka ka kunyina akupa muzezo ulionse.

Mulatelela ikuti buinguzi mbo mwapa buya kulangwa abantu baelede ba ku chikolo chisumukide ca University of Zambia akuti mulazumizya bantu aba kuti ba kalange buinguzi bwenu.

Ndazumina ikotola Lubazu mu buvuntauzi obu

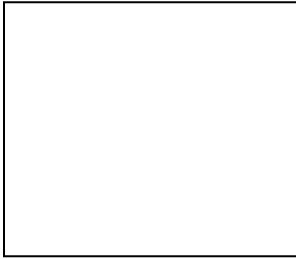
Lemba zina lya sikutola Lubazu	Kusimba kwa sikutola Lubazu	Buzuba
--------------------------------	-----------------------------	--------

Lemba zina lya Kamboni	Kusimba kwa Kamboni	Buzuba
------------------------	---------------------	--------

Lemba zina lya Sikuendelezya	Kusimba kwa sikuendelezya	Buzuba
------------------------------	---------------------------	--------

Kuzumizya

Lomba sikutola Lubazu kuti a simbe cinwe cipati mu ka box ansi kuti na inga ta simba buelede



Kuti ka muyanda kuziba zinji, amu kwabe ba vuntauzi ba pati ba For more information Patricia Maritim a luwaile olu +260978379913 na lugwalo lwa emil a triciamarie20@gmail.com na pe ba sichiuno ba mbunga ya Biomedical Research Ethics kuchikolo ca University of Zambia, ku Ridgeway Campus a luwaile olu +260-1-256067 na lugwalo lwa email a unzarec@zamtel.zm

Appendix C: Community member questionnaire

EVALUATION OF IMPLEMENTATION DETERMINANTS SHAPING THE APPROPRIATENESS A TRACHOMA EDUCATIONAL INTERVENTION ADMINISTERED IN LIVINGSTONE DISTRICT, ZAMBIA.

IDENTIFICATION DATA

1. QUESTIONNAIRE IDENTIFICATION NUMBER
2. TYPE OF LOCATION URBAN
RURAL
3. HEALTH FACILITY CATCHMENT AREA
4. SUPERVISION AREA
5. HOUSEHOLD NUMBER

INTERVIEW LOG

	VISIT 1	VISIT 2	VISIT 3
DATE			
INTERVIEWER'S COMMENTS			

(Interview comments codes: Interview completed 1; interview scheduled for later today 2: Appointment made for another day 3; Refused to continue and no appointments made 4: other 5.)

6. INTERVIEWER CODE	NAME
---------------------	------

7 DATE INTERVIEW COMPLETED

COMMENTS

Please answer/choose the most appropriate response:

1. *How old are you?*

2. *What gender are you?*
 - a) Male
 - b) Female

3. *What is the highest level of school you have completed?*
 - a) Postgraduate education
 - b) College degree
 - c) Diploma
 - d) Secondary school
 - e) Primary school

4. *Where do you normally obtain water from?*
 - a) Council water
 - b) Borehole
 - c) Rivers

5. *Have you ever heard of trachoma before?*
 - a) Yes
 - b) No

6. *Where did you hear about the disease from?*
 - a) Family
 - b) Friends
 - c) Doctor
 - d) Community health worker
 - e) Through the media e.g TV or Radio
 - f) Other (please specify: _____)

7. *Is Trachoma common in this area?*
- a) Yes
 - b) No
8. *Can trachoma be spread from one to the other through?*
- a) Shaking each other's hands
 - b) Sharing towels and clothes
 - c) Through flies
 - d) Being in congested places
 - e) None of the above
9. *Do you think that Trachoma can cause blindness?*
- a) Yes
 - b) No
10. *Do you think that trachoma can be prevented?*
- a) Yes
 - b) No
11. *Are old people the only ones who can develop poor vision?*
- a) Yes
 - b) No
12. *Is it normal for children to have dirty faces?*
- a) Yes
 - b) No
13. *Do you think washing the faces of your child/children has any impact on their eye health?*
- a) Yes
 - b) No
14. *Is maintaining a clean living environment beneficial for your eye health?*
- a) Yes
 - b) No

15. Do you clean your homestead and its environs regularly?

- a) Yes
- b) No

16. How much time do you set aside for cleaning your living area in a day?

- a) 30 minutes
- b) 1 hour
- c) More than 1 hour

(This section is to filled out by participants who have taken part in the Mass Drug Administration.)

17. How many times have you taken part in the Mass drug Administration for trachoma?

- a) Once
- b) Twice
- c) More than twice

18. Did the health workers who came to give you the antibiotic give you any information about the disease?

- a) Yes
- b) No

19. Did the health worker explain why they were carrying out the mass drug administration?

- a) Yes
- b) No

Questions

	Always	Often	Sometimes	Occasionally	Never
20. Was the information provided by the health workers to you easy to understand?	1	2	3	4	5

21. Did the health workers use words that you did not understand? 1 2 3 4 5
22. Did the health workers make sure that you understood the information they provided about the disease?? 1 2 3 4 5
23. How often did the health worker explain why they were carrying out th? 1 2 3 4 5
24. How often did the health worker explain why they were carrying out the mass drug administration? 1 2 3 4 5
25. *Did the Health workers tell you how you could protect yourself and your family from trachoma from home?*
a) Yes
b) No
26. *Did the health workers tell you how to identify symptoms of infection in your children?*
a) Yes
b) No
27. *Did the health workers make you feel like performing the protective actions would prevent you and your child/ children from infection?*
a) Yes
b) No
c) unsure
28. *Did the health worker make you feel like your every day actions could help prevent you from trachoma infection ?*
a) Yes
b) No
c) unsure

Appendix D: Health worker questionnaire

EVALUATION OF IMPLEMENTATION DETERMINANTS SHAPING THE APPROPRIATENESS A TRACHOMA EDUCATIONAL INTERVENTION ADMINISTERED IN LIVINGSTONE DISTRICT, ZAMBIA.

IDENTIFICATION DATA

1. QUESTIONNAIRE IDENTIFICATION NUMBER
2. TYPE OF LOCATION URBAN
RURAL
3. HEALTH FACILITY CATCHMENT AREA
4. SUPERVISION AREA
5. HOUSEHOLD NUMBER

INTERVIEW LOG

	VISIT 1	VISIT 2	VISIT 3
DATE			
INTERVIEWER'S			
COMMENTS			

(Interview comments codes: Interview completed 1; interview scheduled for later today 2: Appointment made for another day 3; Refused to continue and no appointments made 4: other 5.)

6. INTERVIEWER CODE NAME
7. DATE INTERVIEW COMPLETED

COMMENTS

Please answer/choose the most appropriate response:

1. How old were you on our last birthday?
2. What gender are you?
 - a) Male
 - b) Female
3. What is the highest level of school you have completed?
 - a) Postgraduate education
 - b) College degree
 - c) Diploma
 - d) Secondary school
 - e) Primary school
4. How long have you been working in your current position?
 - a) Male
 - b) Female

5. What bacteria causes trachoma?
 - a) *Chlamydia trachomatis*
 - b) *Other*

6. How many stages of trachoma are there?
 - a) 5
 - b) 4
 - c) 3
 - d) 2

7. What stage of trachoma is marked by the eyelashes rubbing against the eye balls?
 - a) Trachomatous Follicular
 - b) Trachomatous Scarring
 - c) Trachomatous Trichiasis

8. Which of the following represents the means through which trachoma could be spread?
 - a) Sharing clothes and personal belongings
 - b) Through discharge from the eyes
 - c) Through flies
 - d) Through none of the above

9. Do you think it is normal for kids in this region to have dirty faces?
 - a) Yes
 - b) No

10. Would you be able to tell if one of your patients has trachoma?
 - a) Yes
 - b) No
 - c) Unsure

11. How would you confirm that they have trachoma?
 - a) By upturning their eyelids
 - b) By using an ophthalmoscopes
 - c) I do not know

12. Are you able to detect trichiasis?
 - a) Yes
 - b) No

13. What do you use to determine the amount of Azithromycin to give children between the

- ages of 5 and 15?
- a) Height
 - b) Weight
 - c) Age
14. Who among the following should receive Tetracycline eye ointment?
- a) Pregnant woman
 - b) A two month old baby
 - c) An immunocompromised individual
 - d) Patients who have come to the hospital for a regular checkup
15. Do you think that the training that you received for the Mass drug administration was important?
- a) Yes
 - b) No
16. Do you think that the training you received was based on evidence from other settings?
- a) Yes
 - b) No
 - c) Unsure
17. Is there consensus within your team that the intervention and the campaign is applicable in this setting??
- a) Yes
 - b) No
18. Were the lessons you received in line with your professional training and practice?
- a) Yes
 - b) No
19. What avenue did you use to conduct health education within the community?
- a) Meet key community members
 - b) Door to door
 - c) Public gatherings
 - d) Religious assemblies
 - e) Loudspeakers
 - f) Schools
 - g) Health facilities
20. Do you feel capable of conducting the trachoma Mass drug administration campaign after the campaign?
- a) Yes
 - b) No
21. Are you confident in talking about prevention and control actions especially those

relating to hygiene promotion?

- a) Yes
- b) No

22. Did you feel capable of teaching others about trachoma prevention?

- a) Yes
- b) No

Questions	Always	Often	Sometimes	Occasionally	Never
21. How easy was it to conduct the community wide Health education?	1	2	3	4	5
22. Did you provide the drug before or after conducting the Health education?	1	2	3	4	5
23. Did you ensure that they understood the information you provided them?	1	2	3	4	5
24. Was it common for different individuals to react differently to the campaign?	1	2	3	4	5
25. Do the patient see the value of what is being taught as affecting their everyday lives?	1	2	3	4	5
26. Do you think that those who received the health education will be able to protect themselves from trachoma? a) Yes b) No					
27. Are you confident that the training provided to the community will result in a change in knowledge and practice?					

- a) Yes
 - b) No
28. Do you think that the targeted changes are appropriate to your professional role?
- a) Yes
 - b) No
29. Do you think that you were well equipped to carry out the health education and by extent the whole the campaign?
- a) Yes
 - b) No
30. Was it easy to communicate with others about the campaign you were conducting?
- a) Yes
 - b) No
31. Did you receive any support in terms of resources, incentives and rewards for your participation in this campaign?
- a) Yes
 - b) No
32. Do you think that the campaign fits in with the current priorities of the organization?
- a) Yes
 - b) No
33. Were different stakeholders involved in this campaign?
- a) Yes
 - b) No
34. Were there open communication channels between the different stakeholders
And 9the leaders?
- a) Yes
 - b) No
36. Have you noticed any changes in patient outcomes sine conducting the campaign
at the health facility ?
- a) Yes
 - b) No

Appendix E: Key Informant Interview guide

EVALUATION OF THE APPROPRIATENESS A TRACHOMA EDUCATIONAL INTERVENTION ADMINISTERED IN LIVINGSTONE DISTRICT, ZAMBIA.

IDENTIFICATION DATA

1. INTERVIEW IDENTIFICATION NUMBER
2. HEALTH FACILITY CATCHMENT AREA

INTERVIEW LOG

	VISIT 1	VISIT 2	VISIT 3
DATE			
INTERVIEWER'S COMMENTS			

(Interview comments codes: Interview completed 1; interview scheduled for later today 2: Appointment made for another day 3; Refused to continue and no appointments made 4: other 5.)

6. INTERVIEWER CODE NAME
- 7 DATE INTERVIEW COMPLETED
- COMMENTS

INSTRUCTIONS

(For the Interviewer)

Participants must read through, understand and sign the consent form provided before they participate in the interview. Remember to probe and get concrete examples. Let the informant speak at length and make sure that you use this only as a true guide in the interview process, and not as a list of questions to be covered one after the other.

(For the Interviewee)

I would like to ask you some questions about your experiences as the program implementer of the Trachoma Mass drug Administration campaign and in particular the educational intervention aspect. There are no right or wrong answers in this discussion. Please feel free to be open and share your point of view. It is very important that we hear your opinion. In case you feel there is anything that is important that has not been highlighted feel free to bring it up during the interview.

Domain	Topic and probes
Organisational Structure	<p>Was there an existing need to conduct the campaign?</p> <p>At the organisational level was it important to conduct the campaigns</p> <p>Were there any preparatory measures taken before the initiation of the implementation process?</p> <p>Were there procedures put up to facilitate the implementation process?</p> <p>Are there other organisational commitments that may clash with the campaign?</p> <p>Does this campaign conflict with other routine practices within the organisation</p> <p>Were there any incentives to conduct the campaign?</p> <p>Were there open channels of communication between the leader and other stakeholders involved in the implementation of the program?</p> <p>Were adequate resources in terms of time, access to stakeholders, spaces and personnel provided to the appropriate team?</p> <p>Were there any barriers identified?</p> <p>Have any measures been put in place to address them?</p>
Barriers	<p>What organisational components acted as barriers when implementing the Trachoma Continuing Medical Education Intervention?</p>

Facilitators	What organisational components facilitated the implementation of the Trachoma Continuing Medical Education Intervention?
Organisational Culture	<p>Is the organisation capable of enforcing the new intervention?</p> <ul style="list-style-type: none"> • Are there systems in place for maintaining long term change?
Implementation Process	<p>How hard was it to implement the educational intervention?</p> <ul style="list-style-type: none"> • How easy or difficult was it to adapt the internal structures and processes of the organisation to enable the implementation of the intervention? • Was the quality of the training materials, equipment and support adequate? • Was the dose delivered sufficient?
External factors	Where there any external factors that influenced the implementation of the Trachoma Continuing Medical Education Intervention?

