

**DECLARATION**

This dissertation is the original work of **CHOLA MUMBA**. It has been done in accordance with the guidelines for dissertations for the University of Zambia. It has not been submitted elsewhere for a degree at this or another University.

Signature.....

Date.....

**Copyright:** All rights reserved; no part of this dissertation may be produced, stored in a retrieval system or transmitted in any form or by other means, electronic, mechanical, photocopy or recoding without prior consent of author.

**CERTIFICATE OF COMPLETION OF DESERTATION**

I.....

Hereby certify that this dissertation is the product of my own work and, in submitting it for the Degree of Master of Science in Epidemiology programme, further attest that it has not been submitted to another University in part or whole for the award of any programme.

Signature.....

Date.....

**Supervisors**

I, .....

having supervised and read this dissertation is satisfied that this is the original work of the author under whose name it is being presented.

I confirm that the work has been completed satisfactorily and is ready for presentation to the examiners.

Supervisor's Name.....

Date.....

Department.....

Signature:.....

**CERTIFICATE OF APPROVAL**

The University of Zambia approves this dissertation of Chola Mumba in partial fulfillment of the requirements for the award of the degree in Master of Science in One Health Analytical Epidemiology.

Examiner's Name	Date	Signature
.....	.....	.....
.....	.....	.....
.....	.....	.....

## **ABSTRACT**

This study sought to analyze the effect of community sensitization on the outcome of indoor residual spraying program against mosquitoes in Mpika district of Zambia.

Indoor residual spray using carbamate insecticide was carried out in two phases: phase one March to April, phase two October to November 2012 in Mpika district. Two catchment areas were selected based on community sensitization on the IRS program. Boma area where sensitization took place was considered as cluster A and Mpumba area where community sensitization did not take place was considered as cluster B. The objectives of the study were comparing IRS outcome between cluster A and B, identify the best way to sensitize local community on IRS and identify perceived benefits of IRS by households exposed to IRS in the study areas. A retrospective cohort study design was used in this study which involved collection of 2012 data of households planned for IRS program, sample size of 369 and 345 households were randomly selected from cluster A and cluster B respectively. In order to achieve some of the objectives of the study such as the best way to sensitize local community in IRS and identify perceived benefits of IRS by households exposed to IRS, the focus group discussions were also conducted in the two study sites. However IRS program outcome was defined as a total number of households who had their structures sprayed.

The annual proportion of households who had their structures sprayed per phase were 74.6% and 40.8% in Cluster A (n= 369) and B (n= 345) respectively. The chances of improving IRS program outcome were 4.23 times higher for cluster A than cluster B with statistical significance of 95% C.I. (3.08, 5.81). Furthermore the results revealed that there was a statistically significant association between community sensitization and IRS program outcome ( $\chi^2 = 83.05$ ,  $df = 1$ ,  $p < 0.0001$ ). The results also revealed that the chance of getting positive responses to IRS program from case cluster A was 5 times larger than the chance of getting positive responses in cluster B. [ 95% C.I. (0.17, 0.33)]. Discussions revealed that the best way to sensitize community is to involve them in all stages of IRS program. Reduction of malaria incidence was seen as a benefit of IRS program.

This study revealed a higher proportion of households who had their structures sprayed where local people had been sensitized on the IRS program than where sensitization was not done. Community sensitization was the only factor associated with IRS program outcome. The responsiveness to IRS program was high in the area where sensitization was done; hence, local people need to be sensitized on all stages of IRS program.

## **DEDICATION**

To my beloved and cherished entire family, particularly for my mother Christine Mumba Malama in loving memory of my father Peter Mumba Chakopo.

## **ACKNOWLEDGEMENTS**

This dissertation would not have been possible without the concerted effort and support of many people.

First I wish to express my sincerest gratitude to my supervisors Dr. K. Choongo and Dr V. Zulu for their invaluable and unwavering advice, encouragement, patience and support throughout my studies. I have learnt much from them over the years.

I am deeply grateful to Dr. C. Hankanga for critical advice, inspiration and guidance. I am greatly indebted to Dr. M. Simunza, Course Coordinator, Dr. J. Muma, for their support.

Special thanks to Southern Africa Centre for Infectious Disease Surveillance (SACIDS) for lessening my academic burden by sponsoring my course and research work;

I would also like to thank Mpika District Medical Officer Dr. Kaunda, Malaria Focal Point Person Mr. I. Kalengo, District Health Information Officer Mr. M. Mwaba and their staff in all study areas for the support they rendered to me during data collection.

My heart-felt and profound appreciation is expressed to my family and friends. Particularly, to my wife and children who I owe a great deal of gratitude for their continued love, understanding and patience over the years. It is through their support that I managed.

I also wish to thank my colleagues, course mates, friends and relatives; I wish to thank them for the roles they played towards the completion of this dissertation.

Finally but not the least, I wish to thank the study participants from all study areas for their cooperation during focus group discussion and data collection.

## TABLE OF CONTENTS

DECLARATION .....	i
CERTIFICATE OF COMPLETION OF DESERTATION .....	ii
CERTIFICATE OF APPROVAL.....	iii
ABSTRACT.....	iv
DEDICATION .....	v
ACKNOWLEDGEMENTS .....	vi
Table of content .....	vii
List of tables .....	viii
List of figures .....	ix
List of appendices .....	xi
List of abbreviations .....	xii
CHAPTER ONE.....	1
1.0 INTRODUCTION .....	1
1.1 Justification of the study .....	2
1.2 Objectives of the Study .....	3
1.3 Main objectives .....	3
1.4 Specific objectives.....	3
1.5 Null hypothesis.....	3
CHAPTER TWO .....	4

2.0 LITERATURE REVIEW .....	4
2.1 Malaria control methods.....	4
2.2 Indoor residual spraying (IRS).....	4
2.3 Indoor residual spraying innovations .....	5
2.4 Factors that make IRS implementation easy .....	6
2.5 Community Sensitization in IRS Program .....	7
2.6 Indoor residual spraying program in Zambia .....	8
2.7 Statement of the problem .....	10
2.8 Conceptual frame for IRS program outcome .....	10
CHAPTER THREE .....	12
3.0 MATERIALS AND METHODS.....	12
3.1 Materials.....	12
3.2 Composition / information on the ingredients.....	12
3.3 Key concepts of the methodology.....	12
3.4 Study area.....	13
3.5 Study design .....	14
3.6 Sample size.....	14
3.7 Sampling technique .....	15
3.8 Study population .....	15
3.9 Inclusion Criteria.....	15
3.10 Exclusion criteria.....	15
3.11 Data collection methods .....	16
3.12 Check list.....	16

3.13 Focus group discussions.....	16
3.14 Data analysis .....	16
3.15 Ethical consideration .....	17
CHAPTER FOUR.....	18
4.0 RESULTS .....	18
4.1 Comparing IRS outcome between sensitized and non sensitized communities.....	18
4.2 Proportion of spraying per cluster .....	18
4.3 Effect of community sensitization on IRS outcome.....	19
4.4 Association of IRS program outcome with community sensitization.....	20
4.5 Comparing responses to IRS program between Clusters .....	21
4.6 Best way to sensitize local community on IRS program .....	21
4.7 Perceived benefits of IRS by household exposed to IRS in the study area.....	22
CHAPTER FIVE .....	24
5.0 DISCUSSION.....	24
5.1 Conclusion.....	28
5.2 Recommendations .....	29
References.....	30

## List of Tables

<b>Table</b>	<b>Page No.</b>
Table 1: Proportion of spraying phases per cluster.....	18
Table 2: The average number of households sprayed per phase in all clusters .....	20
Table 3: Association of IRS program outcome with community sensitization .....	20
Table 4: Average proportion of households sprayed per phase .....	21

## List of Figures

<b>Figure</b>	<b>Page No.</b>
Figure 1: Conceptual framework .....	10
Figure 2: Average proportion of households sprayed and not sprayed per phase .....	19
Figure 3: Proportion of people in favour of community sensitization in IRS program.....	22
Figure 4: The trend of malaria incidence rate in the study areas .....	23

## List of Appendices

<b>Appendix No.</b>	<b>Title</b>	<b>Page No.</b>
Appendix A:	Budget .....	34
Appendix B:	Work Plan.....	35
Appendix C:	Question guide for focus group discussion .....	36
Appendix D:	Check List .....	39
Appendix E:	Ethical clearance letter.....	40
Appendix F:	Board of graduate studies approval letter .....	41

## **LIST OF ABBREVIATIONS**

CHW	Community Health Worker
CSO	Central Statistics Office
HH	Household
HF	Health Facility
HMIS	Health Management Information System
HSA	Health Surveillance Assistant
IEC	Information, Education, and Communication
ITN	Insecticide Treated Nets
IRS	Indoor Residual Spraying
IRCSZ	Indoor Residual Communication Strategy for Zambia
RTI	Research Triangle Institute.
LLINs	Long-Lasting Insecticidal Nets
MCAs	Malaria Control Agents
NHC	Neighbourhood Health Committee
NMCP	National Malaria Control Program
PMI	President's Malaria Initiative
RHS	Residual Households Spraying
SAMC	Southern African Malaria Control
SP	Sulphadoxine Pyrimethamine
WHO	World Health Organization
ZNMCC	Zambia National Malaria Control Centre