



Non Acceptance of Indoor Residual Spraying, IRS, in Mangochi District – An Evaluation Study to Ascertain the Causes.

Kassan Kaselema, Melia Kilowe.

DMI-St. John the Baptist University

ABSTRACT

This research project aims to identify and examine the factors contributing to the nonacceptance of indoor residual spraying. The study employs a mixed-methods approach, combining both qualitative and quantitative data collection techniques. The primary data sources include semi-structured interviews with community members, household surveys, and focus group discussions. Additionally, secondary data from existing literature, reports, and documents related to indoor residual spraying and malaria control in Malawi are utilized. The findings reveal multiple factors that contribute to the non-acceptance of indoor residual spraying in Traditional Authority Jalasi. Firstly, the lack of awareness and knowledge about the benefits and effectiveness of IRS among community members is identified as a significant barrier. Secondly, social and cultural factors play a crucial role in non-acceptance. Furthermore, community members express concerns about the disruption of their daily activities during the spraying process and the perceived violation of privacy. Lack of effective communication, community involvement, and participation in decision-making processes regarding IRS activities contribute to the non-acceptance. The absence of trust between the community and the implementing authorities is also identified as a significant challenge. Based on the research findings, recommendations are provided to enhance the acceptance of indoor residual spraying in Traditional Authority Jalasi and similar contexts. These recommendations include tailored community sensitization and awareness campaigns, targeting misconceptions and addressing concerns related to health risks and privacy.

Key word: *Environmental concerns, Non Acceptance, Perceived ineffectiveness, Privacy and inconvenience, Sensitization.*

1.0 Introduction and Background Information

Malaria is one of the leading causes of mortality, particularly in Africa, with approximately 90% of the 528,000 malaria deaths estimated all over the world occurring in Africa (World Health Organization., 2006). Malaria transmission control in endemic areas is dependent on both individual and community level protective measures. Indoor residual spray (IRS) campaigns work to reduce transmission of malaria illness by covering the walls of houses in areas at risk with an insecticide that kills mosquitoes landing there. The World Health Organization recommends IRS campaigns successfully spray at least 80% of structures to maximize impact of the campaigns against malaria vectors.

1.1 Background of study

1.1.1 geographical location of Malawi.

Malawi is a sub-Saharan African country located south of the equator. It is bordered to the north and northeast by the United Republic of Tanzania; to the east, south, and southwest by the People's Republic of Mozambique; and to the west and northwest by the Republic of Zambia. The country is 901 kilometres long and 80 to 161 kilometres wide. The total area is approximately 118,484 square kilometres, of which 94,276 square kilometres are land. The remaining area consists mostly of Lake Malawi, which is about 475 kilometres long and delineates parts of Malawi's eastern boundary with Mozambique and Tanzania. Malawi's most striking topographic feature is the Rift Valley, which runs the entire length of the country, passing through Lake Malawi in the Northern and Central Regions to the Shire Valley in the south. To the west and south of Lake Malawi lay fertile plains and mountain ranges whose peaks range from 1,700 to 3,000 metres above sea level.

1.1.2 administrative demarcation of Malawi.

The country is divided into three regions: Northern, Central, and Southern Regions. There are 28 districts in the country: 6 districts in the Northern Region, 9 in the Central Region, and 13 in the Southern Region. Administratively, the districts are subdivided into traditional authorities (TAs), presided over by chiefs. Each TA is composed of villages, which are the smallest administrative units. The villages are presided over by village headmen. The study location is set in Traditional Authority Jalasi of Mangochi district, southern region.

1.1.3 malaria risk factor for the country

Malawi has a tropical continental climate with maritime influences. Rainfall and temperature vary depending on altitude and proximity to the lake. From May to August, the weather is cool and dry. In September and October, the weather becomes hot. The rainy season begins in October or November and continues until April. As such, Malaria is endemic throughout Malawi and continues to be a major public health problem due to many mosquito breeding sites. Malaria is the leading cause of morbidity and mortality in children under age 5 and among pregnant women especially in areas along lakeshore as breeding sites there are many breeding sites. It is estimated that Malawi experiences about 6 million episodes of malaria annually (*HMIS, 2011*). Indoor Residual Spraying (IRS) has proven to be a robust control measure against malaria, and until 2015 it was the primary vector control strategy under the Bioko Island Malaria Control Project (BIMCP). However, its effectiveness strongly depends on public acceptance by the targeted populations as its acceptability varied from location to location. Generally, the IRS Effectiveness processes requires household acceptance and is deeply associated with willingness of households to accept the spraying of residual insecticides, during the spraying campaign.

1.2 Problem Statement

1.2.1. Indoor Residual Spraying in Mangochi

Mangochi District is located in the Southern Region of Malawi, lies in the rift valley and is one of the lakeshore districts in the country. It borders with Machinga in the southeast, Balaka, Ntcheu and Dedza in the west, Salima in the north and internationally with Mozambique in the eastern part. The district has a total land area of 6,273 square kilometres, thirteen Traditional Authorities, with an estimated population of 1,305,435 and 221,923 underfives (NSO, 2022 projection). It has six hospitals, thirty-seven health centres, nine dispensaries and 248 outreach clinics.

Malaria is one of the leading causes of morbidity and mortality in Mangochi district and contributed to 31% of all outpatient visits and 12 % of all inpatient admission in 2021-2022. Malaria incidence rate increased from 183/1000 to 238/1000 population and the mortality rate increased from 14/100000 to 20/100000 population (MoH, DHIS2, 2021-2022). In view of this, Ministry of Health (MoH) and other partners continue to support the district with a number of interventions in order to reduce malaria burden that includes; case management, vector control (routine distribution of LLINs to pregnant women and new-born babies), intermittent preventive treatment therapy for pregnant women, Social and Behaviour Change Communication (SBCC), administration of malaria vaccine and monitoring and evaluation.

In 2019, Global Fund supported The Malawi Government through the MoH in partnership with World Vision International (WVI) to implement IRS project in the district as one way of reducing malaria through vector control strategy. IRS involves application of residual insecticide to internal walls, ceilings and eaves of dwelling structures that serves as the resting places for malaria vector (female *Anopheles* Mosquito). WHO recommends that for effective implementation of IRS, it requires well-trained personnel, right insecticides, equipment and spraying at least 80% of the structures. (*World Vision Malawi and Ministry of Health-*

***National Malaria Control Program: A Report On 2022 Indoor Residual Spray*)**

Spraying of structures commenced on 25th October, 2022 in six operation sites (Chimwala, Malombe, Mthiramanja, Namiyasi, Namkumba and Nansenga) while the remaining started on 26th October. Two types of insecticides were used, Sumishied 50WG in Chimwala, Mthiramanja, Chilipa and Namkumba which was left-over from Nkhatabay district in 2021 IRS campaign and the remaining operation sites used Actellic 300cs. Daily routine operation site activities were; morning mobilization, spraying of structures, end of day clean-up and daily reporting. The district sprayed for a total of thirty- nine days against the planned thirty-six days due to delayed procurement of key IRS materials and National fuel crisis.

Spray day started at 5am with physical checkups, addressing previous day field supervision and data management issues, assessing equipment functionality, collection of insecticides, PPE and data collection forms, planning for the day and code of conduct (*World Vision Malawi and Ministry of Health-National Malaria Control Program: A Report On 2022 Indoor Residual Spray*).

Indoor residual spraying (IRS) is a key tool for controlling and eliminating malaria by targeting vectors. To support the development of effective intervention strategies it is important to understand the impact of vector control tools on malaria incidence and on the spread of insecticide resistance. Most of the targeted households seem not to accept their house to be sprayed with chemicals because most of the houses have not been covered during the spraying period.

The purpose of this study is to investigate the factors that contribute to the non-acceptance of the Mpopela program, specifically focusing on the indoor residual spraying intervention, in Mangochi District. The non-acceptance of IRS poses a significant challenge to the effective implementation of malaria control strategies, as it hampers the achievement of high coverage and impact of the intervention. Understanding the underlying reasons behind the nonacceptance is crucial for designing effective strategies to address this issue and improve the acceptance and uptake of IRS in the region.

1.3 Objectives of the study

1.2.1. General objective

The main objective of this study was to uncover the factors that are contributing to none acceptance for Indoor Residual Spraying in communities.

1.2.2. Specific Objectives

Specific objectives of the study were to:

- Ascertain the cause for non-acceptance for indoor residual spraying in the T/A Jalasi Mangochi District.
- To investigate the team involved if they follow proper guidelines and respect the values of the targeted communities.
- Find out strategies that could be employed to promote acceptance for IRS in Mangochi.

2.1. Review of related literature

The Malawi Government through Ministry of Health (MoH) in partnership with World Vision International with funding from Global fund has been implementing Indoor Residual Spraying (IRS) campaign for four years (2019-2022) in Mangochi district. The objective of the campaign is to reduce malaria incidence and mortality rate by 50% (NMCP strategic plan, 2017-2022). During the 2022 IRS campaign the district implemented the following major activities; Planning, procurement, recruitment, capacity building, social and community mobilization, environmental compliance, warehousing, Actual Spraying, and entomological monitoring. The key stakeholders were; DEC, CSOs, ADCs, Ward Councillors, chiefs, faith-based organizations who took part in the process.

The district target in 2022 IRS campaign was to reach 90% of sprayable structures in all the thirteen Traditional Authorities (TAs). A total of 332,182 out of 341,792 (97.2% spray progress) targeted dwelling structures were sprayed and 349,018 structures found (95.2% spray coverage), surpassing the WHO recommended target of at least 80%. Two types of insecticides, Atelic 300CS and Sumishield 50WG were used in thirteen and four operational sites respectively.

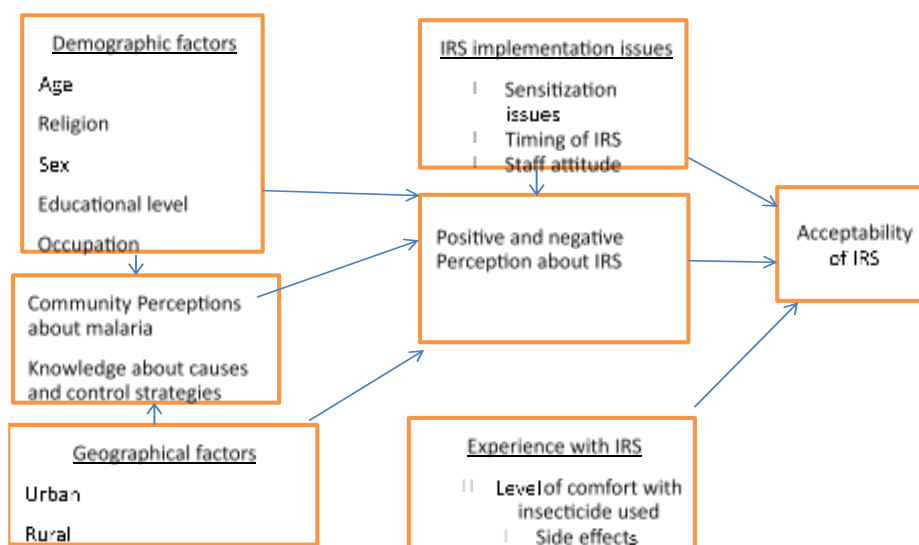
The 2022 campaign was successful having surpassed the targets, likely protecting a total population of 1,197,119 people of which 31,435 are pregnant women and 202,711 are under five children. (*World Vision Malawi and Ministry of Health-National Malaria Control Program: A Report On 2022 Indoor Residual Spray*)

2.2 THEORETICAL FRAMEWORK

Perceptions and misperceptions about the benefits and risks associated with IRS, the ability of the insecticide to reduce mosquito densities, residual effect of the chemical, the health consequences of having one's household sprayed as well as the intended purpose of mass spraying exercises are influenced by several factors. These factors include; demographic, geographical and social as well as implementation issues. An individual's experience with the insecticide can also affect his or her perceptions and acceptance of the IRS intervention. Dwelling status can also influence people's perceptions regarding IRS as a vector control intervention and subsequently influence the level of acceptability of the strategy.

2.3 Conceptual framework on IRS

Figure 1: conceptual framework on IRS acceptability



conceptual framework Source: (Ediau et al. 2013)

3.1. RESEARCH APPROACH

The research approach for studying the factors contributing to non-acceptance of indoor residual spraying (IRS) in Mangochi district can involve a combination of qualitative and quantitative methods. This mixed-methods approach allows for a comprehensive understanding of the various factors at play.

3.2. AREA OF STUDY

The specific area of study for factors contributing to non-acceptance of indoor residual spraying (IRS) in Mangochi district, focusing on the case study of Traditional Authority Jalasi, narrows down the investigation to a specific geographic area within Mangochi.

3.3. Sample Size

The researcher involved the sample size of about 42 households.

Calculation of sample size $n = N (1 + N (e) x^2) / Z n = 51 (1 + 51 (0.05)^2) / 1.96$ $n = 51(1.6375) / 1.96$ $n = 51 * 1.6375 / 1.96$ $n = 451 * 0.83545918367$ $n = 41.7729591836$ $n = 42$ (to the nearest whole number)

3.4. DATA VALIDITY AND RELIABILITY

3.4.1. Data Validity

Research Design: the researcher used an appropriate research design that aligns with the objectives of the study and allows for the collection of relevant data on non-acceptance factors. **Measurement Tools:** the researcher employed well-designed and validated measurement tools such as surveys, questionnaires, interviews, or focus groups to accurately capture the factors contributing to non-acceptance.

Sampling Techniques: The researcher utilized appropriate sampling techniques to ensure that the selected sample is representative of the population in Mangochi, increasing the generalizability of the findings.

3.9.2. Data Reliability

Consistency: The researcher maintains consistency in data collection by following standardized procedures and protocols, treating all participants similarly, and minimizing biases or variations in the data collection process.

Data Collection Training: The researcher provided comprehensive training to data collectors to ensure consistency in data collection procedures and interpretations, reducing potential errors or discrepancies.

Data Analysis: The researcher employs reliable data analysis techniques, using transparent and replicable methods, to ensure consistency and accuracy in analyzing the collected data.

4. DATA ANALYSIS AND PRESENTATION

4.1. RESEARCH RESPONSE RATE

4.1.1 DEMOGRAPHIC DATA

The targeted sample size was 42 and 42 questionnaires were distributed, out of the 42 questionnaires only 30 were filled and returned to the principal investigator. Hence, the number of respondents now comes to 30. Analysis of data focused on the 30 respondents.

Table 1: showing marital status of respondents

Marital status	Frequency	Percent
Single	6	20.0
Married	18	60.0
Widow	6	20.0
Total	30	100.0

Source: researcher compilation

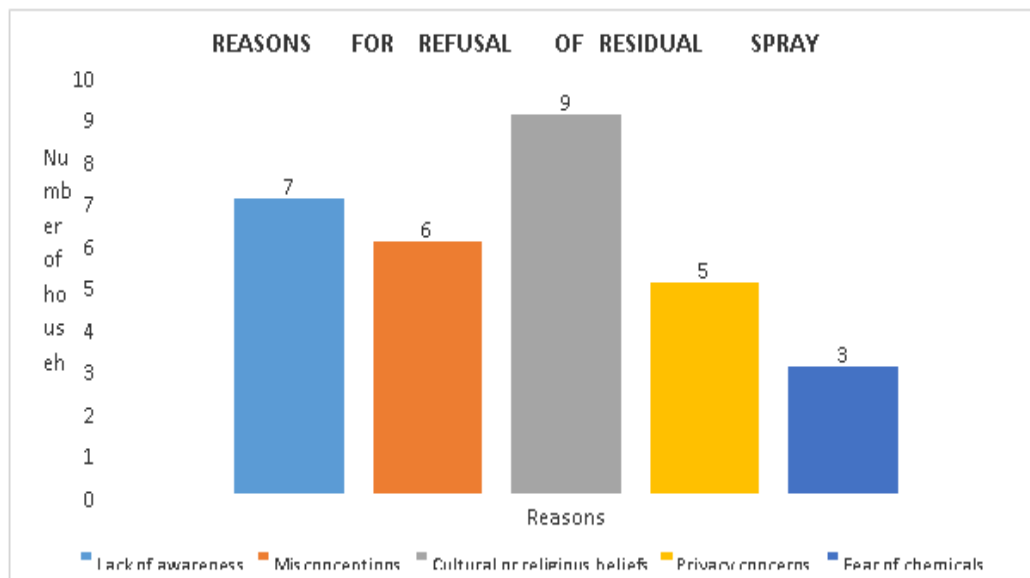
Most of the respondents were married few were single but had their own household and same number were widow.

Table 2: showing occupation of respondents

Occupation	Frequency	Percent
Farmer	17	56.7
Business person	13	43.3
Total	30	100.0

4.4. DISCUSSION OF FINDINGS

4.4.1 Causes for Non-Acceptance of Indoor Residual Spraying (IRS)

Figure 2: showing reasons for refusal of residual spray

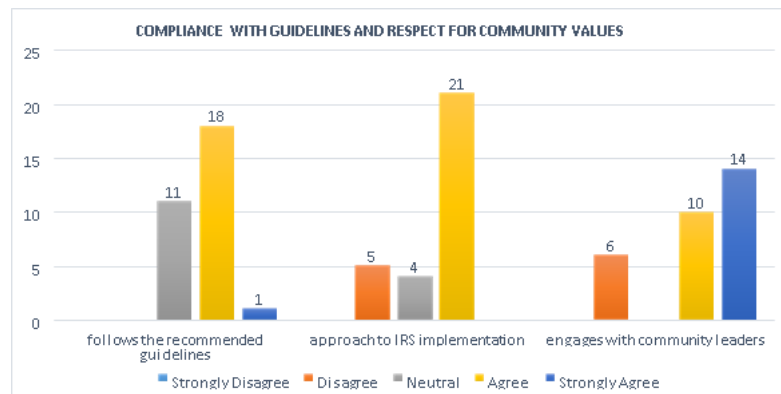
Other Reasons for Not Spraying

Table 3: showing other Reasons for Not Spraying

Reason	No of structures	% of Structures
<i>Denied</i>	6,815	40%
<i>Other</i>	2,781	17%
<i>Sick</i>	2,119	13%
<i>Locked</i>	1,827	11%
<i>No adult present</i>	1,729	10%
<i>Allergy</i>	1,178	7%
<i>Funeral</i>	387	2%
Total	16,836	

4.4.3 COMPLIANCE WITH GUIDELINES AND RESPECT FOR COMMUNITY VALUES

Figure 3: showing the IRS team compliance with guidelines and respect for community values



5. Summary of findings, discussion and recommendations

5.1. Factors Contributing to Non-Acceptance of IRS in Mangochi District

- Misconceptions and beliefs: Deep-rooted misconceptions and cultural beliefs about IRS, such as fears of adverse health effects or distrust in the effectiveness of the intervention, can contribute to non-acceptance.
- Lack of community engagement: Limited community engagement and involvement in decision-making processes regarding IRS implementation can lead to resistance and nonacceptance.
- Perceived ineffectiveness: If community members do not witness a noticeable reduction in malaria incidence or mosquito populations after IRS campaigns, they may question the effectiveness of the intervention, leading to non-acceptance.
- Environmental concerns: Some individuals may refuse IRS due to concerns about the environmental impact of the insecticides used, such as potential harm to beneficial insects or contamination of water sources.
- Privacy and inconvenience: Spraying activities may disrupt daily routines and invade privacy, leading to resistance from households that consider IRS inconvenient or intrusive.

5.2. Recommendations to Stakeholders

5.2.1. Government and Health Authorities:

- Conduct comprehensive community engagement campaigns to address misconceptions and promote understanding of IRS benefits.
- Involve community leaders and stakeholders in decision-making processes to ensure their voices are heard and their concerns are addressed.
- Strengthen monitoring and evaluation mechanisms to provide evidence of the impact of IRS interventions, and share this data with communities to demonstrate effectiveness.

5.3.2. Community Leaders and Influencers

- Act as advocates for IRS by promoting its benefits and dispelling misconceptions within their communities.
- Facilitate dialogue between community members, health authorities, and implementing organizations to address concerns and build trust.

5.3.3. Implementing Organizations and Health Workers:

- Provide accurate and culturally appropriate information about IRS, addressing concerns related to health, safety, and environmental impact.
- Sensitize IRS teams to ensure respectful and considerate behavior during spraying activities, minimizing privacy concerns and disruption to daily routines.

- Collaborate with local communities to tailor IRS activities to their specific needs and preferences.

5.3.4. Researchers and Academics:

- Conduct qualitative studies to explore in-depth the cultural beliefs, fears, and misconceptions surrounding IRS in Mangochi District.
 - Investigate community perceptions of the effectiveness and impact of IRS interventions to inform targeted interventions.
 - Assess the long-term impacts of IRS on malaria incidence and mosquito populations in Mangochi District to establish a stronger evidence base.

By implementing the recommendations and conducting further research, stakeholders can address the factors contributing to non-acceptance, enhance community engagement, improve communication, and promote the acceptance of IRS interventions in Mangochi District, ultimately contributing to the reduction of malaria prevalence.

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