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**Outcomes of the Integrated Community Malaria Case Management (iCCM)
Programme by Community Health Workers in Ibenga Catchment Area, Mpongwe
District, Zambia: A Cross-Sectional Study**

BY

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**A Research Project Submitted to the University of Lusaka in Partial Fulfilment of the
Requirements of a Master's Degree in Public Health**

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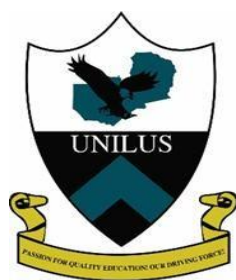
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ABSTRACT

Background

Malaria remains a major cause of morbidity and mortality among children under five years in Zambia, particularly in rural and hard-to-reach communities where access to health facilities is limited. Integrated Community Case Management (iCCM), delivered by trained Community Health Workers (CHWs), and brings malaria diagnosis and treatment closer to communities. This study assessed the coverage, reported adherence to malaria treatment guidelines, and factors influencing utilization of iCCM services in Ibenga Catchment Area, Mpongwe District, Zambia.

Methods

A quantitative cross-sectional study was conducted among 403 participants comprising 384 caregivers of children under five years and 19 CHWs. Data were collected using structured questionnaires and CHW assessment tools and analysed using IBM SPSS Statistics version 27. Descriptive statistics, chi-square tests and binary logistic regression were performed. Associations were reported using adjusted odds ratios (aORs) with 95% confidence intervals (CIs), with statistical significance set at $p < 0.05$.

Results

iCCM coverage was high, with 88.0% of households reporting previous use of CHW malaria services. Among caregivers reporting a child with recent fever, 75.9% first sought care from a CHW. Self-reported adherence to key malaria treatment practices was high, although only 15.8% of CHWs had received refresher training within the previous year. Overall, 88.6% of children recovered. Distance to the nearest CHW was strongly associated with utilization (aOR = 0.13, 95% CI: 0.07–0.25; $p < 0.001$), while caregiver education was also independently associated with utilization (aOR = 0.56, 95% CI: 0.32–0.98; $p = 0.043$).

Conclusion

The iCCM programme in Ibenga achieved high coverage and community uptake, with good reported treatment practices and clinical outcomes. However, geographic distance remains an important barrier to equitable utilization, while limited refresher training may affect programme sustainability.

Recommendations

Improving the geographic distribution of CHWs and outreach services, strengthening routine refresher training and CHW incentives, and independently verifying CHW adherence are recommended to improve equitable access and sustain the quality of iCCM services.

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ABBREVIATIONS

ACT:	Artemisinin-based Combination Therapy
CCM:	Community Case Management
CCM:	Community Case Management
CHW:	Community Health Workers
HBM:	Health Belief Model
ICCM:	Integrated Community Case Management
ITN:	Insecticide Treated Nets
NMEP:	National Malaria Elimination Programme
PHC:	Primary Health Care
RDT:	Rapid Diagnostic Testing
UHC:	Universal Health Coverage

CHAPTER ONE

1.0 Introduction

1.1 Background

1.1.1 Global Perspective

Malaria continues to pose significant public health problem globally, especially in malaria endemic countries and vulnerable population such as children under five years. In 2024 alone, the WHO (2025) reported that approximately 282 million cases of malaria and 610,000 deaths due to malaria were recorded globally from 80 malaria endemic countries. Despite intervention efforts against malaria, an estimated 2.3 billion cases of malaria and 14 million deaths from malaria have been prevented since 2000 but global efforts to reach elimination targets of malaria have faltered with an increase in approximately 9 million cases from 2023 to 2024 (WHO, 2025). Challenges in malaria elimination programs include lack of adequate access to health services of good quality, lack of adequate financing, climatic threats, resistance to insecticides and anti-malarial drugs and poor capacity in the health system.

Challenges mentioned above are especially relevant in rural and difficult to reach populations where distance to health facilities, difficulty in transport and low health worker availability make malaria treatment and diagnosis untimely. Therefore, community based case management of malaria is now increasingly being considered as means of bringing malaria services closer to households. Through community case management using trained Community Health Workers (CHWs), community based case management involves malaria diagnosis, management of uncomplicated malaria and referral of severe cases at community level. Studies have shown the success of such interventions in improving access to malaria services. For instance, Garchitorena et al. (2024) showed that strengthening community based case management in rural Madagascar improves access to malaria diagnosis and treatment, especially among those living farther away from health facilities. In Zambia, Ashton et al. (2023) showed that increased number of community malaria service points reduces severe malaria admission and malaria deaths by 19% and 23% respectively.

Nevertheless, the success of community malaria management is determined by proper CHW training, appropriate supervision, access to RDTs and antimalarial drugs, referrals, and proper program funding. All of these elements can affect not only the adherence to treatment guidelines but also service use by communities. The iCCM is the expansion of community case management where trained CHWs diagnose, treat, and refer cases of malaria along with other common childhood diseases. Therefore, improving iCCM can be seen as one of the key ways to overcome geographical and system barriers in malaria treatment.

1.1.3 African Perspective

The WHO African Region still faces the heaviest malaria burden globally, contributing about 94% of all malaria cases and 95% of malaria deaths in 2024 (WHO, 2025). Children under five continue to be disproportionately affected, as they are responsible for nearly three-quarters of all malaria deaths. Even though there has been a significant increase in the use of insecticide-treated nets, indoor residual spraying, rapid diagnostic tests, and proper treatment, progress in terms of lowering malaria morbidity and mortality rates is inadequate. Factors that continue to hinder efforts include poverty, geographic distance from facilities, limitations within the health system, climatic variations, and lack of equitable access to quality malaria care (WHO, 2025).

Access to malaria testing and treatment is especially difficult for rural and inaccessible communities. Community health workers (CHWs) can help to bridge the gap between households and health services by providing malaria testing, treatment, and referral. Through iCCM, community health workers can test malaria cases using rapid diagnostic tests, treat uncomplicated malaria cases appropriately, and refer children with complicated conditions. In fact, there are several examples where community-based case management has helped to increase access to malaria-related services. In one of the cluster-randomized studies in rural Madagascar, it was revealed that community case management interventions improved access to malaria services, especially for people who live far from health facilities (Garchitorena et al., 2024). In Zambia, there was a decrease in the number of severe malaria admissions and malaria deaths in children under five with increased availability of community malaria service points (Ashton et al., 2023).

However, effectiveness of community-based malaria services is subject to the quality and availability of the inputs for the program. Rapid diagnostic tests and antimalarial drugs out of stock, inadequate supportive supervision, lack of adequate refresher trainings, and heavy workload of CHWs and retention of motivated CHWs may affect service delivery. Such limitations may be additionally affected by insufficient incentives, difficult transportation and ineffective referral system, especially in remote areas. Thus, the expansion of iCCM coverage alone does not ensure effective service delivery, since it requires proper training, supervision, supplies and support of CHWs.

Caregiver's treatment-seeking behavior is another determinant of the effectiveness of community malaria services. The study conducted in several countries of sub-Saharan Africa demonstrated that the decision of caregivers to seek care for their children suffering from fever was affected by the distance to health facilities, perceived seriousness of illness, cost, presence of medicines, previous experience of visiting health facilities, caregivers' education level and perception of quality of care. Delayed appropriate seeking of care increases the risks of severe cases of malaria among children under five years old. Hence, community-based services reduce geographic and financial barriers and provide the first point of care for childhood fever.

Thus, the experience of Africa proves that the implementation of iCCM can enhance access to malaria diagnosis and treatment, but its effectiveness depends on both program-related and community factors. It is crucial to understand if CHWs are equipped with commodities, training and supervision and if the services of CHWs are utilized by caregivers. Such an understanding will help to assess the effectiveness and sustainability of the community-based malaria program.

1.1.4 Sub-Saharan Africa Perspective

However, rural communities in sub-Saharan Africa still experience obstacles in accessing timely malaria care due to long distances to health facilities, poor transportation means, insufficient health workforce and health system constraints (WHO, 2025). The iCCM strategy was put in place to bridge these inequities by allowing trained CHWs to offer malaria testing, treatment and referrals at household level (WHO & UNICEF, 2012).

Research suggests that community case management can lead to increased access to malaria diagnostics and treatments and thus improved outcomes. For instance, improving the capacity of the community case management in rural Madagascar has enhanced access to malaria diagnostics and treatments especially in populations distant to health facilities (Garchitorena et al., 2024). In Zambia, more community malaria service delivery points have been linked to decreased cases of severe malaria admissions and deaths from malaria in children aged less than five years (Ashton et al., 2023). Nevertheless, there are differences in the efficiency of the programme in various contexts because of commodity shortages, poor supervision, insufficient refresher trainings, CHWs retention problems and differences in caregivers' utilization of the services.

It is clear that presence of community services does not automatically ensure utilization of those services or their quality. Therefore, evaluating the coverage, adherence to treatment guidelines and factors that influence utilization of services is crucial for assessing the effectiveness of the iCCM strategy. This will enable an assessment of community-based malaria services performance in Ibenga Catchment Area, Mpongwe District, Zambia.

1.1.4 Zambian Perspective

The problem of malaria in Zambia continues to be a significant public health issue affecting mainly children aged less than five years and rural population. Zambia has adopted various strategies towards malaria control, namely vector control, RDT malaria diagnosis, ACT malaria treatment and community-based care provided by CHWs (Ministry of Health Zambia, 2022; WHO, 2025).

Still, there is still lack of prompt access to malaria services, which is evident from findings of the 2021 Zambia Malaria Indicator Survey (MIS). In particular, only around 57% of the children with fever aged below five years had prompt care, and almost 59% had malaria testing, indicating ongoing problems with timely diagnosis and treatment of the disease (Ministry of Health Zambia, 2022). The aforementioned gaps in the provision of malaria services are especially relevant for rural and remote areas where the distance between households and health facilities can be rather long.

Therefore, Zambia has improved its iCCM to deliver malaria diagnosis, treatment and referral services closer to the households. There is evidence from Zambia suggesting that community-based provision of malaria services can contribute to improved access and reductions in severe malaria and mortality among children aged less than five years (Ashton et al., 2023). However, certain problems associated with the CHW training, supervision, motivation, availability of commodities and geographic coverage could potentially affect the performance of the program (Wallender et al., 2024).

Thus, despite the progress made on the national level in malaria control, the assessment of iCCM on the local level would be vital to evaluate the accessibility of malaria services, adherence to the protocols and factors affecting their utilization.

1.1.5 Local Context: Ibenga Catchment Area, Mpongwe District

Mpongwe District is predominantly rural and located in Copperbelt Province, where agriculture is an important economic activity. Malaria remains a significant public health concern in the district, with the malaria incidence increasing from approximately 791 cases per 1,000 population in 2024 to 944 cases per 1,000 population in 2025 with Ibenga recording 431.35 cases per 1000 in 2024 and 531.03 cases per 1000 in 2025. This persistent burden highlights the continued need for accessible and effective malaria prevention, diagnosis and treatment services, particularly for rural communities where geographical barriers may delay access to facility-based care.

To improve access to essential health services, community-based malaria case management has been implemented through trained Community Health Workers (CHWs). In Mpongwe District, approximately 230 CHWs have been trained in iCCM, of whom 151 are currently active, with 19 active CHWs serving the Ibenga Catchment Area. These CHWs provide community-level malaria services, including health education, RDT-based diagnosis, and treatment of confirmed uncomplicated malaria with ACTs, identification of danger signs and referral of severe cases. By bringing these services closer to households, CHWs are expected to reduce delays and geographical barriers to malaria care.

Despite the availability of community-based services, limited empirical evidence exists on the extent to which households in Ibenga utilize iCCM services, the coverage of these services and the extent to which CHWs adhere to recommended malaria treatment guidelines. Furthermore, factors such as distance to CHWs, caregiver characteristics and socioeconomic circumstances may influence utilization, but their contribution in the Ibenga context has not been adequately documented.

Therefore, this study assessed the outcomes of the iCCM programme in Ibenga Catchment Area by determining household coverage of iCCM services, assessing CHW adherence to malaria treatment guidelines, and identifying factors influencing utilization of community-based malaria services. The findings

are intended to provide context-specific evidence to guide improvements in CHW deployment, supervision, training and community access to malaria services in Ibenga and inform wider malaria programme strengthening in Mpongwe District.

1.2 Statement of the Problem

Malaria still remains one of the leading public health challenges in Zambia, especially in under-five children living in remote and rural areas. Even though Zambia has adopted a comprehensive malaria control strategy with measures of vector control, diagnosis and treatment, and Integrated Community Case Management (iCCM), malaria prevalence is still high in some parts of the country. According to the World Health Organization (WHO, 2025), malaria still remained one of the health burdens in Zambia, suggesting that the current interventions have not attained their target yet.

It is especially true in Mpongwe District where malaria incidence increased from about 791 cases per 1,000 population in 2024 to 944 cases per 1,000 population in 2025. The reason for concern in this situation is the fact that such an increase happened even though there were malaria prevention and case management services available, including those at the community level. Even though increased incidence cannot always be considered as poor iCCM performance, there is still a question regarding the effectiveness of the current interventions that are being used. High incidence rates may show poor access to intervention services, late utilization of the available services, poor adherence to treatment protocols, or other factors.

In order to increase access to malaria services, Mpongwe District adopted community based malaria case management using CHWs. About 230 CHWs received iCCM training, out of which 151 were still working, with 19 CHWs working in the Ibenga Catchment Area. Their roles include educating people about malaria, diagnose using RDT, and provide treatment using ACT. Nevertheless, just the presence of CHWs in the community does not necessarily mean proper intervention delivery and its utilization. Distance from clinics, uneven distribution of CHWs, lack of refresher trainings, supervision issues, availability of commodities, CHWs' motivation and preferences of caregivers can influence access and utilization of these services.

There is therefore an important implementation outcome gap in Ibenga Catchment Area. Although iCCM has been established to improve access to malaria care, there is limited empirical evidence showing whether the programme is achieving adequate household coverage, whether CHWs consistently adhere to recommended malaria treatment guidelines, and which household or service-related factors influence utilization. Existing routine malaria statistics indicate the continuing burden of disease but do not adequately explain whether gaps in community-level service delivery or utilization contribute to persistent malaria incidence. Moreover, high reported availability or utilization of community services cannot by itself

demonstrate programme effectiveness if services are not equitably accessible or delivered according to recommended standards.

The lack of local evidence is particularly important because inadequate coverage or utilization can result in delayed diagnosis and treatment, while poor adherence to treatment guidelines can lead to inappropriate management of malaria cases. These failures may allow uncomplicated malaria to progress to severe disease and increase the likelihood of continued transmission and malaria-related morbidity. Conversely, effective community-level diagnosis, appropriate treatment and timely referral can reduce delays in care and contribute to better malaria outcomes. Understanding these relationships is therefore important for determining whether iCCM is functioning as intended within the local context.

Therefore, the actual challenge here is not just the fact that Mpongwe has a high burden of malaria but the fact that there is doubt about whether the delivery of community-based malaria services has enough access, is properly done, and well used to make an impact on malaria in Ibenga Catchment Area. Information is needed concerning coverage of iCCM, adherence by CHWs to malaria treatment protocols, and factors influencing usage to establish areas for improvement.

1.3 Justification of the Problem

Despite the significant progress made by Zambia in its fight against malaria, malaria remains a major public health problem in Zambia, especially in rural settings. In rural communities, geographical and health systems factors can cause delays in diagnosis and treatment of malaria due to the challenges in accessing malaria services. Despite the successful implementation of malaria interventions, including integrated community case management of malaria in Zambia, ongoing malaria transmission suggests the importance of improving the provision and uptake of malaria services at the community level. Universal access to malaria diagnosis and treatment form part of the strategic objectives in the national malaria elimination strategy 2022-2026 of Zambia (Ministry of Health Zambia, 2022).

The provision of community-based malaria services is essential due to CHWs' close proximity to households and hence ensuring that they can provide malaria diagnosis, treatment, and referral of malaria cases to health facilities. Successful iCCM can ensure the earlier testing of malaria cases, prompt treatment of malaria cases, and appropriate referral of severe cases, thus reducing the chances of uncomplicated malaria developing into severe malaria infections that could contribute to lowering malaria morbidity and mortality. This possibility is supported by evidence from Zambia where higher availability of community-based malaria service delivery points was found to be associated with lower severe malaria admissions and inpatient malaria deaths among children under the age of five (Ashton et al., 2023).

However, the role of iCCM in the fight against malaria will depend on whether there are adequate levels of service provision and delivery and utilization of the services by community members. There could be gaps in the provision of the services, CHW adherence to treatment guidelines, and caregiver utilization of the services.

The proposed study is justified because local evidence on the performance of iCCM in Ibenga Catchment Area is limited. By assessing service coverage, CHW adherence to malaria treatment guidelines and factors influencing utilization, the study will identify specific barriers and implementation gaps that can be addressed through improved CHW deployment, supervision, refresher training, commodity availability and community engagement.

The study results will offer context-specific evidence for improving access to malaria diagnosis and treatment on a timely basis in both Mpongwe District and the overall malaria control programme through improving iCCM. The above will help to decrease delays in seeking health care, proper case management of patients as well as early referral of complicated cases; thus contributing to reduced malaria burden in children under five years. Overall, the evidence will be helpful in efforts to improve community-based malaria services as part of the Zambian approach towards eliminating malaria in the country.

1.4 Main Objective

To assess the outcomes of the Integrated Community Malaria Case Management (CCM) Program by Community Health Workers (CHWs) in Ibenga Catchment Area, Mpongwe district, Zambia.

1.5 Specific Objectives

1. To determine the coverage of Integrated Community Case Management (iCCM) services among households with children under five years in Ibenga Catchment Area, Mpongwe District, Zambia.
2. To assess adherence to recommended malaria diagnosis, treatment and referral guidelines among Community Health Workers in Ibenga Catchment Area, Mpongwe District.
3. To identify factors influencing utilization of iCCM services in Ibenga Catchment Area, Mpongwe District.

1.6 Research Questions

1. What is the level of coverage of Integrated Community Case Management (iCCM) services among households in Ibenga Catchment Area, Mpongwe District?
2. To what extent do Community Health Workers adhere to national malaria diagnosis and treatment guidelines when implementing the iCCM program in Ibenga Catchment Area?

3. What factors influence the utilization of Integrated Community Case Management (iCCM) services among households in Ibenga community?

1.7 Scope of the Study

This study focused on Integrated Community Malaria Case Management services delivered by Community Health Workers in Ibenga Catchment Area, Mpongwe District. It assessed service coverage, adherence to guidelines, and utilization of CCM services. The study included CHWs and households who accessed malaria services within the past six (6) months.

The study did not assess the dynamics of malaria transmission, vector control measures like insecticide-treated nets (ITNs) or indoor residual spraying (IRS), or severe malaria management at the level of health facilities.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Global Perspective

Malaria continues to pose a substantial global health burden, particularly in low- and middle-income countries. The World Health Organization (WHO, 2025) estimated 282 million malaria cases and 610,000 deaths globally in 2024, with the greatest burden occurring in the WHO African Region. Although malaria interventions have prevented billions of cases and millions of deaths since 2000, progress towards global malaria targets remains off track. Persistent transmission is associated with challenges including inadequate access to health services, health-system weaknesses, insufficient financing, climate-related risks and antimalarial and insecticide resistance (WHO, 2025).

A significant answer to these problems is expanding community-based malaria management. Delivery of services through community delivery seeks to address geographical and health system limitations by ensuring that trained CHWs can deliver malaria testing, treatment and referral closer to households. Evidence continues to support the use of community health workers in reaching underserved communities. A systematic review in 2025 showed that malaria diagnosis and treatment were some of the most common malaria interventions delivered by village health workers especially in hard to reach populations. However, challenges still continue to be experienced in training, supervision, resources and integrating CHWs in broader malaria elimination initiatives.

Evidence in support of community based interventions is also shown by the fact that increased availability of community malaria services has been linked to better outcomes. For instance, Ashton et al. (2023) showed that an increase in the density of malaria service points including those of CHWs in Zambia was associated with a decline in cases of severe malaria admission and deaths in children under five years. While this evidence is country-specific, it shows how decentralization of malaria services can impact the population's outcomes.

However, global evidence also indicates that availability of community services does not guarantee effective utilization or provision of quality services. Performance of community programs is determined by factors such as training of the personnel, supervision, availability of RDTs and antimalarial, referral and community acceptance. Thus, there is global evidence that supports the iCCM program but stresses the need to evaluate its performance in terms of coverage and implementation.

2.2 African perspective

Malaria cases remain high in the WHO African Region, requiring malaria control strategies to be developed at the community level. Distance from health centers, inadequate transport, low health workforce density, and inability to afford health center services are some of the issues that rural African communities experience. These issues result in delayed health seeking, particularly with children presenting with fever.

There are a number of African studies that have shown the potential of CHWs in overcoming such barriers. In community-based malaria intervention programs, CHWs can diagnose and treat uncomplicated malaria with RDTs and refer severe cases for specialized services. However, the success of community-based malaria programs depends on the country or program context owing to differences in CHWs' density, supervision, commodity supply and community involvement.

One recent study in the Democratic Republic of Congo highlights the importance of quality of CHWs' case management. Ibrahim et al. (2025) examined adherence to national guidelines for malaria among 2,326 children aged below five years seeking iCCM services in 30 sites. Even though RDTs were widely used, there was still some gap between diagnostic tests and treatment. Some children were given antimalarials despite absence of malaria in the test result. This means that the provision of diagnostics is not enough for CHWs to adhere to treatment.

This study is relevant to the current one since it clearly shows why adherence to CHW case management should be measured using specific indicators and not just described in terms of compliance and non-compliance of CHWs. RDTs use, appropriate use of ACTs and referral of severe cases are the more specific measures of quality of community malaria services.

A number of operational barriers that have been identified for African CHW programs include insufficient supervision, inadequate refresher trainings, stock outs of medicines and diagnostics, poor remuneration or incentives, excessive workload, and retention of trained CHWs. Such barriers can influence the quality and sustainability of community-based malaria services.

Thus, based on the African literature, the effectiveness of iCCM cannot be achieved through placing CHWs in communities only. It depends on the interaction between availability of services, performance of CHWs and utilization of community members.

2.3 Sub-Saharan African perspective

Sub-Saharan Africa still remains the main area that is being exposed to malaria and, therefore, the implementation of malaria case management at the community level is widespread in this region. The emergence of iCCM was mainly triggered by the necessity to reduce the gap between the vulnerable population and the healthcare system.

Recent studies have shown that community case management increases access to malaria diagnosis and treatment. For instance, in 2024, a study was carried out in Madagascar (Garchitorena et al, 2024). According to the results of the study, the expansion of the community case management has improved access to malaria diagnosis and treatment, especially, for populations that live far from health facilities. The findings support the main justification of the community services, which is that the closer access to malaria care decreases geographic barriers to care.

At the same time, treatment-seeking behaviors still remain one of the major issues in several sub-Saharan African areas. Even if there are CHWs in the regions, caregivers might prefer treatment in the health facilities, pharmacies or somewhere else or may even avoid seeking care. Utilization factors might include the distance to CHWs, caregivers' education, socioeconomic status, the perception of the illness severity, trust in CHWs, medicine availability and previous experience with the health services.

CHW case management quality is another important determinant of the success of the program. The recent research conducted in the DRC has shown that an accurate diagnosis does not always mean an appropriate treatment, and thus, measuring adherence to the treatment guidelines becomes very important (Ibrahimi et al., 2025).

In addition, a 2024 systematic review of malaria case-management interventions in sub-Saharan Africa has found several evidence gaps related to the large-scale implementation of RDTs and iCCM. First, according to the review, while community-based malaria case management is helpful, the evidence base is heterogeneous and there is a lack of large-scale studies (Goodman et al., 2024).

The finding will be particularly useful for the current study, as it indicates that the evaluation of iCCM should consider not only the presence of CHWs in the communities but also household utilization of services, adherence of CHWs to the guidelines and the presence of program factors that influence the delivery of services.

2.4 Zambian perspective

Community malaria case management has progressively become more widespread in Zambia as part of a wider approach for the country's malaria elimination efforts. CHWs offer malaria health education, malaria diagnosis using RDTs, treatment of uncomplicated malaria, and referral of cases requiring more advanced care. Provision of community malaria services is especially crucial in rural settings where distance may hinder access to health facilities.

The evidence gathered from Zambia suggests very clearly the effectiveness of community malaria services. The authors Ashton et al. (2023) prove that increased density of malaria service points was linked to decreased severe malaria admissions and malaria mortality rates in inpatients among under-fives. Such evidence clearly shows how increased availability of community-level diagnosis and treatment might contribute to better malaria outcomes.

However, recent findings show that there is still significant room for improvement when it comes to community malaria services. According to Wallender et al. (2024), malaria care-seeking behavior and quality of malaria care in 2,357 households including 11,030 individuals in Chadiza District showed 19.1% prevalence of malaria parasites, with school-aged children having the greatest prevalence rate. Strategies like CHW home visits were shown to potentially decrease barriers to health services, especially poor households.

This research is especially relevant for the present research since it demonstrates that availability and use of community services do not always go hand-in-hand even in a situation when community programme is well established.

2. 4.1 CHW adherence and quality of malaria care in Zambia

Adherence to malaria treatment guidelines is another key aspect of iCCM effectiveness. CHWs should be able to correctly conduct malaria tests, understand the results and administer ACT for positive cases of malaria and refer severe cases.

Findings from previous community malaria programs in Zambia have shown that CHWs can be adherent to test results of malaria, which includes not treating malaria using antimalarials when RDTs are negative. However, there are new studies that show continued surveillance is required since the performance of CHWs can be impacted by many factors such as training, supervision, workload, and availability of commodities.

According to Ndalama et al. (2025), in studying the role of CHWs in malaria interventions in Western Zambia, they found out that comprehensive training, incentives, supportive supervision, and community support are important aspects of effective CHWs performance. Some of the challenges included inadequate supervision, low motivation and compensation, logistical issues, workload, and having other duties.

This is relevant to the present study since it shows that good CHW performance should not just be expected on the basis of previous training.

2.4.2 CHW implementation challenges in Zambia

Despite the important role played by CHWs in delivering malaria services in the community, there could be some operational difficulties that could undermine the efficacy of the workers. According to Ndalama et al. (2025), inadequate supervision, poor motivation, inadequate incentives, logistical problems, heavy workloads, and multifaceted duties have been some of the challenges facing CHWs in Zambia.

These challenges have an impact not only on coverage but also on quality. Poorly supervised CHWs and unmotivated CHWs are likely not to participate regularly in community-based activities. In addition, any stock-outs of RDTs or ACTs will mean that the CHWs are unable to apply the test-and-treat strategy despite having the right skills and knowledge.

Supervision is especially critical in cases where adherence is self-reported. This is because it might happen that the CHW reports adherence to the guidelines while in reality, this has not happened. Therefore, the findings on adherence need to be taken with caution.

2.5 Recent evidence from Chadiza and its relevance to Ibenga

In particular, the recent evidence from Chadiza District is highly relevant to the present study since Chadiza and Ibenga districts are alike with regards to being rural areas in Zambia where community malaria services are provided.

Wallender et al. (2024) have shown that malaria burden and use of healthcare services differed among population groups even though there were community malaria services. According to the authors, the household socio-economic status and the frequency of CHWs' visitations play an important role in accessing malaria care.

Rutagwera et al. (2025) have investigated proactive CCM in Chadiza. It has been established that over 80% of malaria cases were identified through community malaria services in both intervention and control arms, while proactive visits of CHWs resulted in identification of 30% of cases in the intervention arm. Incidence of confirmed malaria was 8% lower in the proactive intervention arm compared to other forms of CCM, even though routine CCM was still the primary source of case detection.

Thus, these papers confirm the usefulness of community malaria services as well as show the dependence of effectiveness of CCM from the way the services are delivered. However, it should not be stated that findings from Chadiza can be generalized to Ibenga district.

2.6 Evidence gap

From the reviewed literature, it appears that community based malaria management could increase access to diagnosis and treatment and potentially result in lower incidences of severe malaria and deaths.

Nevertheless, there are several limitations.

Firstly, evidence at the national level might hide considerable differences across districts and catchment areas. The evidence from Chadiza highlights large variations in malaria burden and utilization even within a community based malaria management program.

Secondly, there is a lack of recent studies investigating household coverage, adherence of CHWs to malaria diagnosis, treatment and referral indicators and factors affecting utilization simultaneously.

Thirdly, evidence on CHW adherence to the program is not consistent. In recent research from the DRC high RDT usage has been found together with the inappropriate antimalarial drug prescription, which proves that the assessment of CHW adherence should include practice indicators and not the perception of their performance only. (Ibrahimi et al., 2025).

Lastly, despite the fact that there were reductions in severe malaria and mortality rates due to community malaria programs in Zambia, high malaria burden still persists and shows that access to service, utilization and quality of implementation should continue being evaluated.

Therefore, there is scarce empirical evidence specifically regarding whether households in the Ibenga Catchment Area are sufficiently covered with iCCM services, CHWs' adherence to malaria diagnosis, treatment and referral recommendations and what factors affect utilization.

The present study addresses the gap and investigates three interrelated indicators of program effectiveness.

2.7 Summary of literature

The literature clearly identifies the link from global malaria burden to the necessity of malaria management through the community. Malaria is still one of the major causes of morbidity and mortality globally, despite significant advances in its prevention and treatment. In Africa, the predominance of malaria cases among rural population necessitates the involvement of CHWs in efforts to increase access to diagnostic services and treatments.

Sub-Saharan Africa evidence indicates that iCCM increases access to malaria services, but the effectiveness depends on geographical accessibility, caregiver attributes, commodity availability, training, supervision, and CHW motivation. Moreover, recent research shows that increased RDT usage does not necessarily imply adequate treatment, highlighting the need to track adherence to the program through certain indicators.

Community malaria case management became an integral part of malaria control in Zambia. The evidence suggests that more service availability in the community is associated with lower incidence of severe malaria and mortality. Nevertheless, according to recent findings in Chadiza, treatment-seeking gaps and socioeconomic barriers remain despite CCM programs.

For this reason, the evaluation of iCCM at the local catchment area level is still very relevant. In Ibenga, such evaluation will reveal if the program is effective in covering the households, how CHWs adhere to malaria diagnosis, treatment and referral protocol, and what affects usage.

2.2 Conceptual and Theoretical Framework

This study is grounded in established public health theories and health systems models that explain how community-based interventions influence access, utilization, and health outcomes.

2.2.1 Theoretical Framework

This study was guided by the **Health Belief Model**, which was developed by Godfrey Hochbaum, Irwin Rosenstock, and Stephen Kegels in the 1950s to explain and predict health-related behaviors, particularly the utilization of preventive health services (Rosenstock, 1974).

The Health Belief Model proposes that an individual's decision to engage in health-seeking behavior depends on several perceptions about a disease and the available interventions. The model consists of six key constructs: **perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy.**

In the context of malaria control, caregivers' decisions to use Integrated Community Case Management (iCCM) services provided by Community Health Workers (CHWs) may be impacted by their evaluation of the severity of malaria illness, the perceived benefits of receiving treatment from CHWs, and the risk of childhood malaria infection.

Perceived susceptibility refers to caregivers' beliefs about the likelihood of their children contracting malaria. In malaria-endemic communities such as Mpongwe District, caregivers who perceive their children to be at high risk of malaria are more likely to seek prompt diagnosis and treatment.

Perceived severity refers to the caregiver's understanding of the seriousness of malaria and its potential complications, including severe illness or death in children under five years. When caregivers recognize malaria as a serious health condition, they may be more likely to seek treatment from available healthcare providers such as CHWs.

Perceived benefits refer to caregivers' beliefs that seeking care from Community Health Workers will result in effective diagnosis and treatment of malaria. When communities trust the competence of CHWs and the availability of diagnostic tests and medicines, utilization of iCCM services is likely to increase.

Perceived barriers include factors that discourage caregivers from using community malaria services. These may include lack of awareness of CHW services, distance, lack of malaria commodities such as Rapid Diagnostic Tests and Artemisinin-based Combination Therapies, or mistrust in community health services.

In this study, the Health Belief Model helps explain **factors influencing the utilization of iCCM services in Ibenga Catchment Area** and how these factors may influence the outcomes of the CCM program. Understanding these perceptions is important in identifying barriers to community utilization of CHW services and informing recommendations for strengthening malaria case management at community level.

2.2.2 Conceptual Framework

The conceptual framework integrates health system factors, community determinants, and implementation processes to assess CCM outcomes with focus on independent variables, mediating variables and dependent variables:

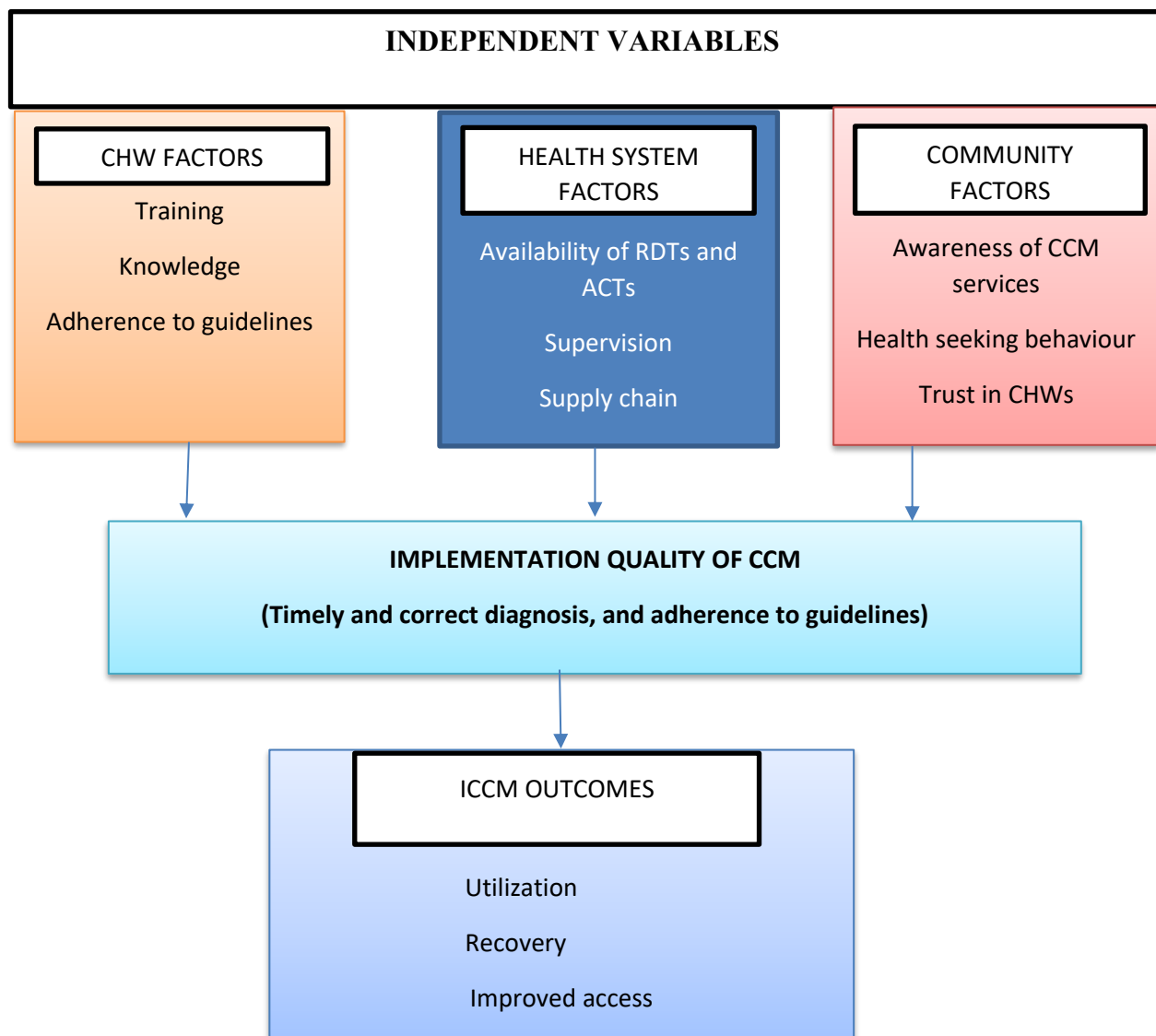


Figure 2.0 Conceptual framework of variable relationships: Source Kakubo E 2026

The framework acknowledges that CCM outcomes are not determined solely by CHW presence but by a combination of system readiness and caregiver behavior.

CHAPTER THREE

METHODOLOGY

3.1 Study Design

This study employed a **cross-sectional analytical study design**. The design allowed the researcher to assess the outcomes of the Community Malaria Case Management (CCM) program and examine associations between selected independent variables (e.g.; CHW performance, availability of commodities, household characteristics) and outcome variables at a single point in time.

3.2 Study Approach

The study used a **quantitative research approach**. Quantitative methods are appropriate because the study aims to measure:

- Utilization rates of CCM services
- Timeliness of malaria diagnosis and treatment
- Associations between health system and community-level factors

Structured questionnaires and record review were used to collect numerical data for statistical analysis.

3.3 Research Setting

The study was conducted in **Ibenga Catchment Area**, located in Mpongwe District on the Copperbelt Province, Zambia. Mpongwe is predominantly rural, with agriculture as the main economic activity. Malaria remains a major public health concern in the district.

The catchment area included the neighboring communities and health facilities that Community Health Workers (CHWs) carry out the Community Malaria Case Management (CCM) program. The National Malaria Elimination Program of Zambia's Ministry of Health, the Mpongwe District Health Office and Lyobeka Health Post supervise and monitor these CHWs through the monthly reports and routine Data quality assurance programs, conducted on a quarterly basis. In order to increase access to high-quality malaria care, CHWs were in charge of offering community-based malaria diagnosis, treatment, health education, and referral services.

3.4 Study Population

The study population included:

1. **Community Health Workers (CHWs)** implementing CCM in Ibenga Catchment Area.

2. **Caregivers/household members** of children under five years and other patients who have received malaria services from CHWs within the study period.

These groups were selected because they provide essential information on program implementation, utilization, and outcomes since they are actively involved in the provision and use of Community Malaria Case Management (CCM) services.

3.5 Study Sample

The study sample consisted of:

- CHWs actively providing CCM services.
- Selected caregivers/households who have utilized CCM services within the last three months prior to the study.

Inclusion criteria:

- CHWs formally trained in CCM and currently active.
- Caregivers residing in Ibenga Catchment Area who consent to participate.

Exclusion criteria:

- Caregivers who did not utilize CCM services.
- CHWs not active during the study period.

3.6 Sample Size

The sample size for caregivers was calculated using the Cochran's formula:

$$n = \frac{Z^2 p(1-P)}{e^2}$$

Where:

- **n** = required sample size
- **Z** = standard normal deviate corresponding to a 95% confidence level (1.96)

- **p** = estimated proportion of the population with the characteristic of interest. Since no previous study had established the proportion of caregivers utilizing Community Malaria Case Management services in the study area, **p = 0.50 (50%)** was used to obtain the maximum sample size.
- **e** = margin of error (0.05)

Substituting the values into the formula:

$$n = \frac{(1.96)^2 \times 0.50(1 - 0.50)}{(0.05)^2}$$

$$(0.05)^2$$

$$n = \frac{3.8416 \times 0.25}{0.0025}$$

$$0.0025$$

$$n = 0.9604/0.0025$$

$$\mathbf{n = 384.16}$$

The minimum required sample size was therefore **384 caregivers**.

To account for an anticipated **10% non-response rate**, the sample size was adjusted as follows:

$$n^{(\text{adjusted})} = 384 + (0.10 \times 384)$$

$$n^{(\text{adjusted})} = 384 + 38.4 = \mathbf{422.4}$$

A minimum of 384 caregivers were needed for the sample, while a maximum of 422 was determined. The sample size was expanded to 400 caregivers to account for potential non-response and incomplete questionnaires.

Due to the minimal number of eligible Community Health Workers (CHWs) in the Ibenga Catchment Area, no sample size calculation was done for the CHWs. All 19 Community Health Workers assigned to the catchment area were included in the study (a census technique) to offer a comprehensive assessment of program implementation and adherence to malaria treatment criteria. Depending on their quantity, all CHWs in the catchment region who were eligible and available were included (census approach).

The study therefore targeted a total of 419 participants, comprising 400 caregivers and all 19 Community Health Workers. Of these, 403 participants were successfully interviewed, consisting of 384 caregivers and all

19 Community Health Workers, yielding an overall response rate of 96.2% from the caregivers, and a 100% response rate among CHWs.

3.7 Sampling Strategy

A **snowball sampling strategy** was used for caregivers:

1. **Stage 1:** Selection of communities within Ibenga Catchment Area.
2. **Stage 2:** identification of 20 participants who later on helped identify more participants and those again identified other people until a required sample size of 384 was attained.
3. **CHWs:** Total population sampling (census) of all eligible CHWs.

This approach helped ensure representation and reduce selection bias.

3.8 Data Collection Techniques

Data was collected using:

- **Structured questionnaires** administered to caregivers.
- **Structured interviewer-administered questionnaires** for CHWs.
- **Record review checklist** to assess CHW registers (timeliness, RDT use, ACT prescription).

Data collection tools were pre-tested in a similar setting to ensure clarity and feasibility.

3.9 Data Analysis

Data was entered and analyzed using statistical software Statistical Package for Social Sciences SPSS version 27.

Descriptive Statistics:

- Frequencies and percentages
- Means and standard deviations

Inferential Statistics:

- Chi-square tests to assess associations between categorical variables
- Logistic regression to identify predictors of good treatment outcomes
- Odds ratios (OR) with 95% confidence intervals
- Statistical significance set at $p < 0.05$

3.10 Validity and Reliability (Scientific Rigor)

To ensure scientific rigor, the following measures used to minimize measurement error and improve consistency:

- **Content validity** was ensured by developing tools based on national malaria guidelines and CCM indicators.
- **Training of data collectors** was conducted and pre-test done in a similar area.
- **Standardized data collection procedures** were used.
- **Reliability testing** was performed where applicable.

3.11 Ethical Considerations

Ethical approval was sought from a recognized Research Ethics Committee in Zambia (recommended by the school) and authorization obtained from the District Health Office in Mpongwe before accessing health facility records.

Ethical principles observed included:

- **Informed consent:** Written consent was obtained from all participants.
- **Confidentiality:** Participant identifiers were not included in data files.
- **Voluntary participation and Withdrawal:** The respondents were free to participate or withdraw from the study anytime they so wished.
- **Beneficence:** No harm was caused to participants.
- **Data security:** Data was securely stored on password-protected system.
- **Respect:** Local customs and traditions were observed and respected.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter presents the results of the study on the coverage and implementation of iCCM services in Ibenga Catchment Area of Mpongwe District. The results will be presented in accordance with the three research objectives that is, coverage of iCCM services among households with children aged less than five years, adherence of CHWs to malaria treatment protocol and factors affecting usage of CHW malaria services. Descriptive statistics have been presented using frequencies, percentages, means and standard deviations, while inferential statistics have been done using Chi-square test and Binary Logistic Regression. Statistical significance has been determined at 5% level.

In total, 403 respondents have participated in the study, with 384 household respondents and 19 CHWs forming the sample size. The household respondents are representative of the accessible population for the study during the survey period; however, since households have been selected from the identified study area and the study employed cross-sectional design, the results can only be generalized to households in the Ibenga Area.

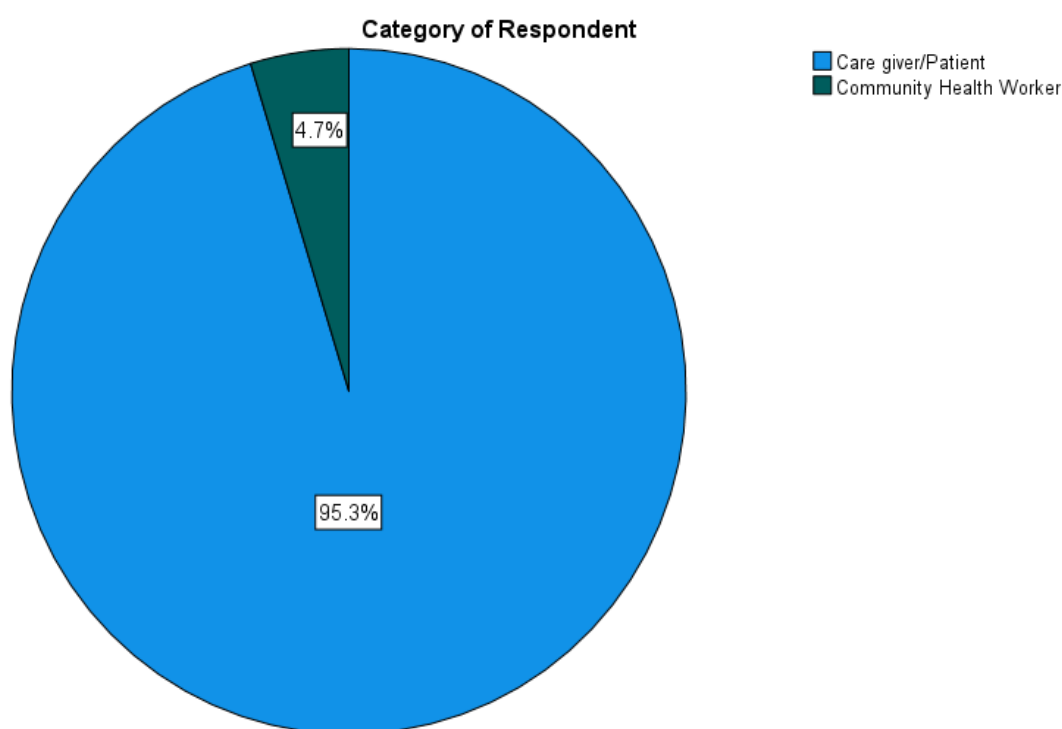


Figure 4.1 Category of participants in the study. A total of 403 took part in the study

4.2 Descriptive Statistics

4.2.1 Socio-demographic characteristics of caregivers/patients

The socio-demographic characteristics are summarized in Table 4.1.below:

Table 4. 2 Socio-demographic characteristics of caregivers/patients (n=384)

Variable	n	Percentage%
Age (years), mean $\pm$ SD	384	42.3 $\pm$ 14.6
Age range (years)	384	18 - 88
Gender		
Female	270	70.3
Male	114	29.7
Marital status		
Married	291	75.8
Single	33	8.6
Divorced	31	8.1
Widowed	29	7.6
Education level		
None	44	11.5
Primary	218	56.8
Secondary	113	29.4
Tertiary	9	2.3
Occupation		
Farming	287	74.7

Business	61	15.9
Housewife	28	7.3
Other (pupil/teacher/civic leader/none)	8	2.1
Household monthly income		
<K500	48	12.5
K500–K1000	218	56.8
K1001–K3000	112	29.2
>K3000	6	1.6
Distance to nearest CHW		
<1 km	119	31.0
1–5 km	227	59.1
>5 km	38	9.9

Of the total 384 caregivers or patients, the average age was 42.3 (SD = 14.6), ranging from 18 to 88 years. Out of these, 70.3% (n=270) were females while 29.7% (n=114) were males. The majority of the respondents were married (75.8%), had primary level of education (56.8%), were engaged in farming (74.7%), and were earning between K500-K1000 per month (56.8%). Most households (59.1%) were located 1–5 km from the nearest CHW.

OBJECTIVE ONE: Assessing the Coverage of iCCM services among households

Integrated Community Case Management (iCCM) coverage for the study was operationally defined as the percentage of eligible households with children under five years of age in the study setting which accessed or had used the malaria services offered by the CHWs. iCCM coverage was determined using reported utilization of CHWs' malaria services and treatment seeking for childhood fever. The main measures of iCCM coverage were ever utilization of CHWs' malaria services, initial treatment source for a feverish child, geographical accessibility of the closest CHWs, and prompt treatment seeking for a fever.

4.2.2 Coverage Indicators

Households with adequate iCCM coverage were those households that stated there was availability of CHWs in their catchment area and had accessed malaria services of CHWs during febrile episodes of their children.

Table 4.2 Coverage variables of iCCM services among households (n=384)

Variables	n	Percentage%
Ever used CHW malaria services		
Yes	338	88.0
No	46	12.0
Reason for CHW preference		
Short proximity to home	293	86.7
Short waiting time	30	8.9
Free service		
Trust in the CHW	11	3.3
	4	1.2
Distance to nearest CHW		
< 1 km	119	31.0
1 – 5 km	227	59.1
> 5 km	38	9.9
Child fever in past 3 months		
Yes	236	61.5
No	148	38.5
First place care sought (n = 236)		
CHW	179	75.8
Health facility	50	21.2
Pharmacy	7	3.0
Time taken to seek care (n = 236)		
Within 24 hours	94	39.8

2–3 days	132	55.9
After 3 days	10	4.2

Overall, 88.0% (n = 338) of caregivers reported having ever used CHW malaria services, while 12.0% (n = 46) had never used them. Distance to the nearest CHW was generally short: 31.0% of households were within 1 km, 59.1% were between 1 and 5 km, and 9.9% were more than 5 km away. Among the 236 households (61.5%) that reported a child with fever in the preceding three months, 75.9% first sought care from a CHW, 21.1% went directly to a health facility, and 3.0% to a pharmacy; no respondent reported first consulting a traditional healer. On average, households sought CHW services 1.18 times in the six months preceding the survey.

Regarding promptness of care-seeking after onset of fever, 39.8% of caregivers sought care within 24 hours, 55.9% within 2–3 days, and 4.2% delayed beyond 3 days. While total utilization of CHWs malaria services was high, timely care-seeking behavior was still low. Only 39.8% of caregivers reported seeking care within 24 hours of fever development, with 60.1% seeking care after 24 hours. This is a clear sign of poor performance in relation to the time frame required by the national malaria program. Table 4.2 summarises the coverage variables.

4.2.3 Reasons for Choosing CHW Services

Among caregivers who had used CHW services (n=338), the main reasons given were proximity to home 293 (86.7%), short waiting time 30 (8.9%), the service being free 11 (3.3%) and trust in the CHW 4 (1.2%).

Table 4.2.4 Reasons for non-utilization of CHW malaria services among non-users (n = 46)

Reason for not using CHW	n	%
CHW too far away	38	82.6
Preferred health facility	6	13
Lack of trust	2	4.4
No medicines	0	0
No RDTs	0	0
Total	46	100%

Of the 46 respondents who had never accessed the services of iCCM, distance to the CHW was the commonest problem experienced by 38 respondents (82.6%). The next common problem encountered by the respondents was preference to seek treatment from a health facility, which accounted for 6 (13.0%) respondents.

4.2.4 Health Education, Satisfaction and Acceptability

A large majority of caregivers (90.2%) reported having received malaria-related health education from a CHW. Satisfaction with CHW services was high: 31.8% were “very satisfied” and 59.1% were “satisfied”, with only 0.3% reporting dissatisfaction. Correspondingly, 97.4% of caregivers said they would recommend CHW services to others.

Table 4.2.5 Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
Received malaria education from CHW * Ever used CHW malaria services	384	95.3%	19	4.7%	403	100.0%

Of the 403 subjects who participated in the study, 384 caregivers (95.3%) provided full data regarding their exposure to malaria education from CHWs and use of CHW malaria services and hence were part of the analysis. The 19 representing 4.7% were CHWs who were not eligible for one or both variables.

Table 4.2.6: Received malaria education from CHW * Ever used CHW malaria services Cross-tabulation

Received malaria education	Used CHW	Did not use CHW	Total
Yes	316	11	327
No	21	36	57
Total	337	47	384

Table 4.2.6 demonstrates the association between CHWs' malaria education and the use of CHW malaria services. Out of the 327 participants who received CHWs' malaria education, 316 (96.6%) used CHW malaria services, whereas 11 (3.4%) did not use CHW malaria services. On the other hand, out of the 57 participants who did not receive CHWs' malaria education, 21 (36.8%) used CHW malaria services, while 36 (63.2%) did not use CHW malaria services. It can be concluded that the use of CHW malaria services was significantly higher among those who received CHWs' malaria education.

4.2.5 Community Knowledge and Perceptions

Knowledge score

Table 4.2.5a: Statistics

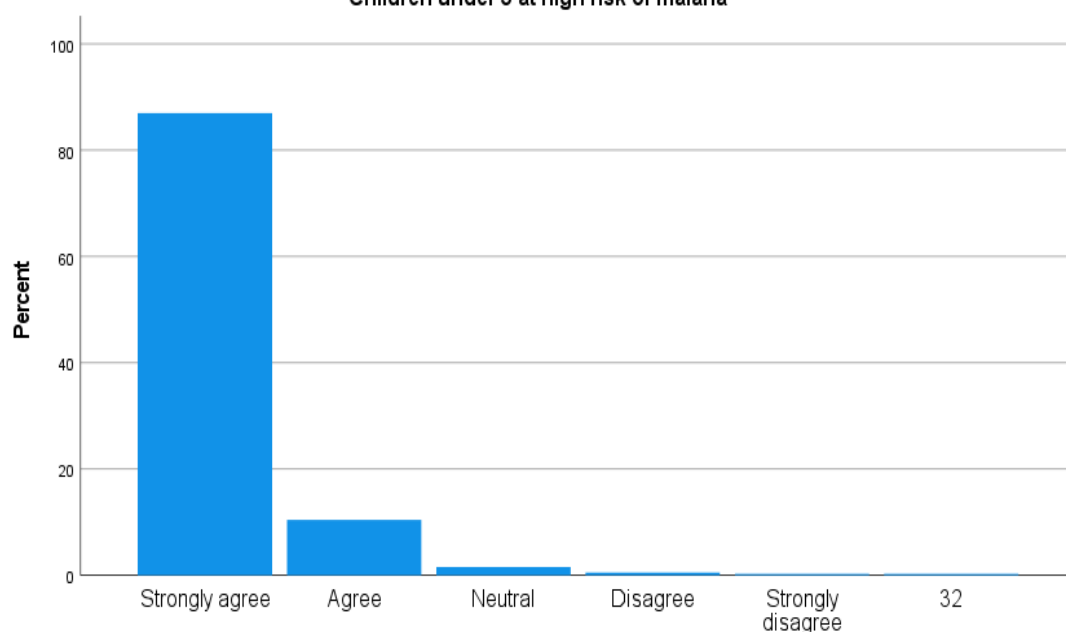
		Children under 5 at high risk of malaria	Malaria can cause death if untreated	Early treatment prevents complications
N	Valid	384	384	384
	Missing	19	19	19

Table 4.2.5a shows that all three malaria knowledge and perception variables had 384 valid responses, with 19 missing responses for each variable. The valid responses therefore represent the 384 caregivers included in the analysis, while the missing cases correspond to CHWs to whom responses were not eligible.

Table 4.2.5.b: Children under 5 at high risk of malaria

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	334	82.9	87.0	87.0
	Agree	40	9.9	10.4	97.4
	Neutral	6	1.5	1.6	99.0
	Disagree	2	.5	.5	99.5
	Strongly disagree	1	.2	.3	99.7
	32	1	.2	.3	100.0
	Total	384	95.3	100.0	
Missing	System	19	4.7		
Total		403	100.0		

Children under 5 at high risk of malaria

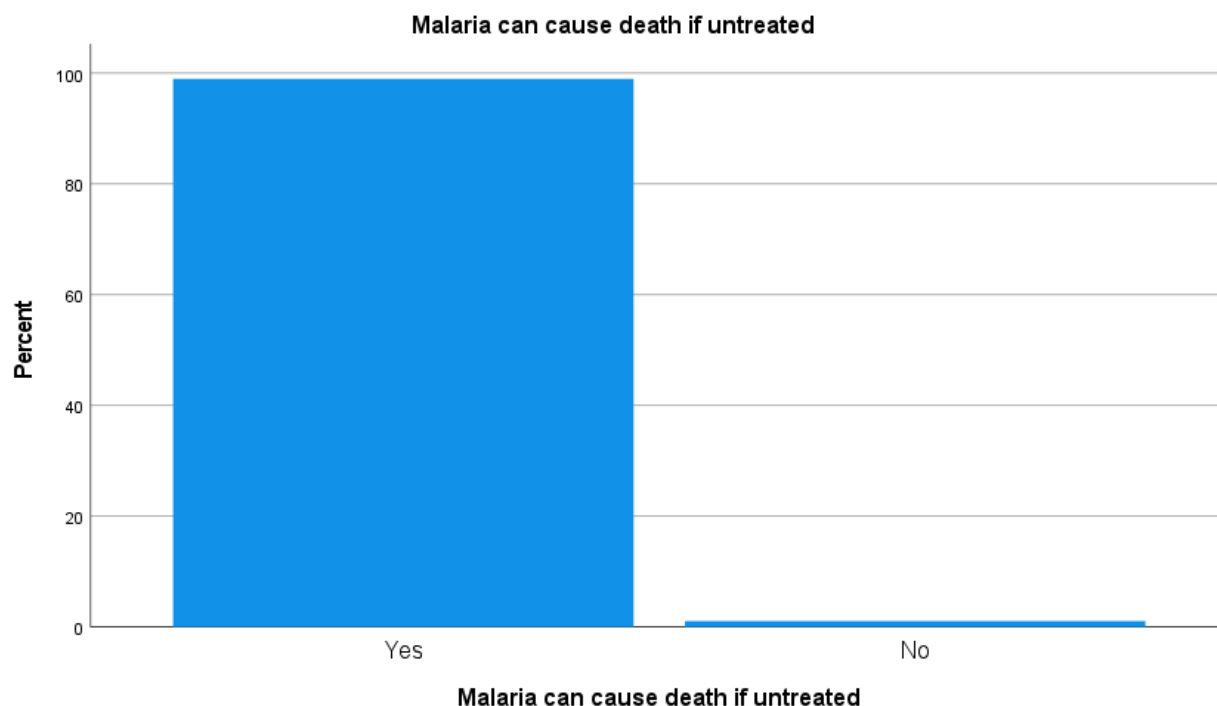


Children under 5 at high risk of malaria

According to the results in table 4.2.5b, there is a high awareness on the risk of malaria infection in young children below the age of five years. From the 384 valid responses, 334 respondents (87.0%) strongly agree, while 40 respondents (10.4%) agree that children below the age of five are highly at risk of contracting malaria. Six respondents (1.6%) were neutral, while only three respondents (0.8%) were either of the opinion that they disagreed or strongly disagreed.

Table 4.2.5c: Malaria can cause death if untreated

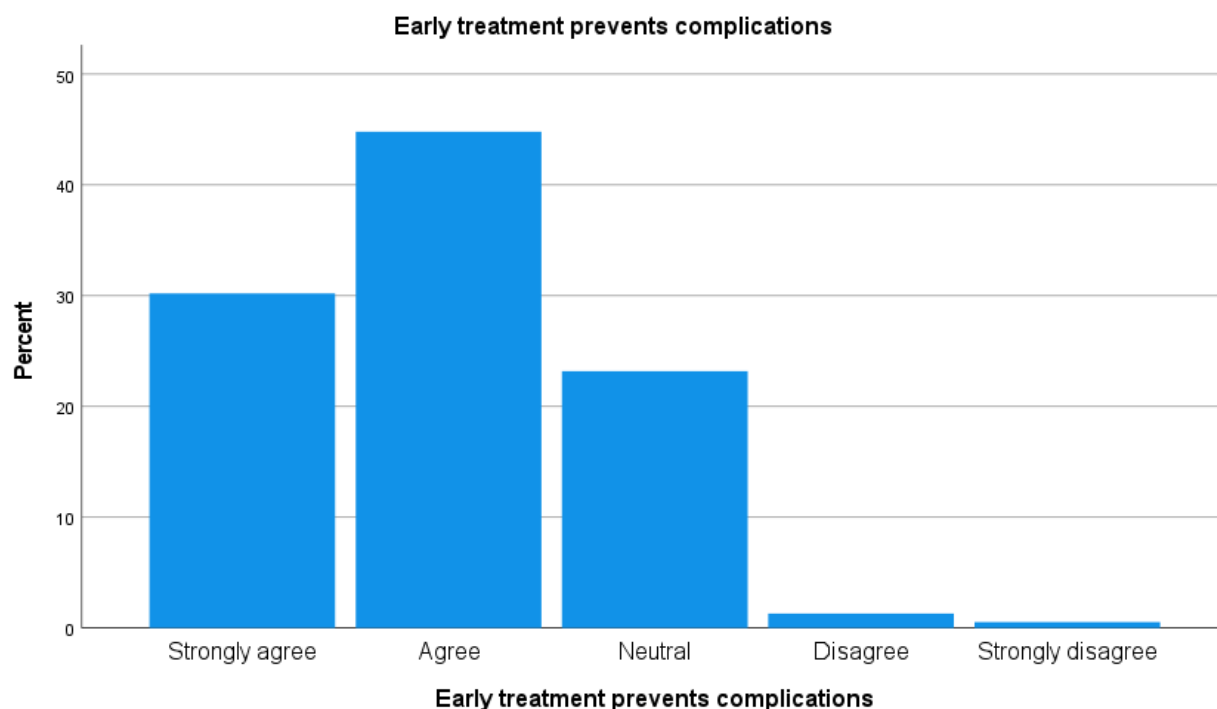
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	380	94.3	99.0	99.0
	No	4	1.0	1.0	100.0
	Total	384	95.3	100.0	
Missing	System	19	4.7		
Total		403	100.0		



The results in table 4.2.5c show that there is very high awareness about the seriousness of the malaria. Out of the 384 caregivers who responded to the survey, 380 caregivers (99.0%) mentioned that malaria can be fatal in case it is not treated, whereas 4 caregivers (1.0%) disagreed. This indicates that there is need to strengthen sensitization regarding the deadly consequences of malaria.

Table 4.2.5d: Early treatment prevents complications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	116	28.8	30.2	30.2
	Agree	172	42.7	44.8	75.0
	Neutral	89	22.1	23.2	98.2
	Disagree	5	1.2	1.3	99.5
	Strongly disagree	2	.5	.5	100.0
	Total	384	95.3	100.0	
Missing	System	19	4.7		
Total		403	100.0		



From the results in table 4.2.5d, it is evident that most of the caregivers understood the significance of malaria treatment to prevent complications. From the total of 384 valid answers obtained, 116 (30.2%) answered strongly agree and 172 (44.8%) answered agree, making 75.0% agreeing. On the other hand, 89 (23.2%) caregivers were neutral, while only 7 (1.8%) disagreed and strongly disagreed. While the level of knowledge among most caregivers was quite high, the number of neutral responses recorded is rather significant.

OBJECTIVE TWO: Assessing adherence to recommended malaria diagnosis, treatment and referral guidelines among Community Health Workers in Ibenga Catchment Area, Mpongwe District.

4.3 Self-reported adherence to malaria treatment guidelines among CHWs

Adherence to practices was measured using predefined criteria based on the national guidelines for treatment of malaria. The criteria included RDT prior to treatment, proper use of ACT after RDT positive results, no use of ACT after RDT negative results, referral of severe malaria patients, maintenance of malaria registers, and timely reporting of data. Since the CHW checklist was based on self-reports, the results show reported adherence.

Table 4.3.1 Operational indicators for assessing CHW adherence

Adherence indicator	Definition
RDT use	Fever cases tested with RDT before antimalarial treatment
Appropriate ACT treatment	ACT given to clients with confirmed uncomplicated malaria
No ACT for RDT-negative cases	Antimalarial treatment withheld when RDT is negative
Severe malaria referral	Severe/suspected severe cases referred to a health facility
Register maintenance	Malaria cases documented in the appropriate register
Reporting completeness	Required monthly malaria reports submitted

Table 4.3.2 Community Health Worker training, Supervision and practice

Variable / Category	number	Percentage (%)
Years of experience, Mean	8.2	—
Received formal CCM training — Yes	18	94.7
Refresher training in past 12 months — Yes	3	15.8
Monthly supervision received	19	100.0
Receives feedback on reports	19	100.0
No RDT stock-out in past 3 months	19	100.0
No ACT stock-out in past 3 months	19	100.0
Always tests all fever cases before treatment	19	100.0

No ACT to RDT-negative cases	19	100.0
Always refers severe cases	19	100.0
Maintains malaria registers — Yes	18	94.7
Submits monthly reports consistently	18	94.7

The findings demonstrate 100% self-reported adherence, rather than independently verified adherence. Because only 19 CHWs participated and the adherence indicators were primarily self-reported, the findings should be interpreted cautiously. We therefore recommend independent verification through register review, direct observation or periodic quality audits.

From Table 4.3.2, among the 19 CHW respondents, the mean duration of experience as a CHW was 8.2 years. Nearly all (18, 94.7%) had received formal community case management (CCM) training, although only 3 (15.8%) had received a refresher training in the past 12 months. All 19 CHWs reported monthly supervision, receiving feedback on their reports, and no stock-outs of RDTs or ACT in the preceding 3 months. All CHWs reported always testing febrile cases before treatment and always referring severe cases, and the large majority maintained malaria registers (18, 94.7%) and submitted monthly reports consistently (18, 94.7%).

OBJECTIVE THREE: Factors Influencing Utilization of iCCM Services

4.4 Selection of variables for analysis

The factors that formed part of the bivariate analysis were chosen based on the conceptual framework of the study and from existing literature on use of community-based malaria services. The factors were geographical (distance to CHW), socioeconomic (household income and occupation), demographic (age and sex), and social factors (education and marital status). These factors were analyzed individually to establish their association with use of CHW malaria services.

Table 4.4.1 Chi-square tests of association between household characteristics and utilization of CHW malaria services.

Variable	χ^2	df	p-value
Distance to nearest CHW	84.94	2	< 0.001*
Household monthly income	9.19	3	0.027*
Education level	8.62	3	0.035*
Sex of caregiver	5.77	1	0.016*

Marital status	3.65	3	0.303
Occupation†	21.48	7	0.003*

*Significant at $p < 0.05$. †Several occupational categories had expected cell counts below 5

Chi-square tests of association were computed between household/caregiver characteristics and ever having used CHW malaria services (Table 4.4). Distance to the nearest CHW was significantly associated with utilization ($\chi^2 = 84.94$, $df = 2$, $p < 0.001$): utilization was 95.0% among households within 1 km and 92.1% among those 1–5 km away, but fell to 42.1% among households more than 5 km from a CHW. Household monthly income was also significantly associated with utilization ($\chi^2 = 9.19$, $df = 3$, $p = 0.027$), as was caregiver's education level ($\chi^2 = 8.62$, $df = 3$, $p = 0.035$) and sex of the caregiver ($\chi^2 = 5.77$, $df = 1$, $p = 0.016$), with utilization highest among female caregivers (90.8%) and among those with no formal or only primary education (88.6% and 91.3%, respectively) compared with tertiary-educated caregivers (66.7%). Marital status was not significantly associated with utilization ($\chi^2 = 3.65$, $df = 3$, $p = 0.303$), and caregiver age did not differ significantly between users and non-users of CHW services (independent-samples t-test, $t = -0.88$, $p = 0.385$).

4.4.2 Multivariable Logistic Regression: Predictors of Utilization

Table 4.4.2 Multivariate logistic regression predicting utilization of CHW malaria services ($n=384$)

Predictor	aOR	95% CI	p-value
Distance to CHW (per category increase)	0.13	0.07 – 0.25	< 0.001*
Education level (per category increase)	0.56	0.32 – 0.98	0.043*
Household income (per category increase)	0.86	0.51 – 1.47	0.587
Sex (Female vs Male)	1.34	0.65 – 2.76	0.429
Age (standardised)	0.83	0.57 – 1.20	0.329

*Significant at $p < 0.05$. Model: $\chi^2 = 55.9$, $df = 5$, $p < 0.001$; Nagelkerke $R^2 = 0.20$. Source: Field data, 2026

To determine the independent predictors of iCCM utilization while controlling for confounding, a multivariable binary logistic regression was fitted with “ever used CHW malaria services” as the outcome and

distance, income, education, sex and age as covariates ($n = 384$). The overall model was statistically significant ($\chi^2 = 55.9$, $p < 0.001$) and explained approximately 20% of the variance in utilization (Nagelkerke pseudo- $R^2 = 0.20$). As shown in Table 4.6, after adjustment, distance to the nearest CHW remained the strongest independent predictor of utilization: each one-category increase in distance (from < 1 km to $1-5$ km to > 5 km) was associated with an 87% reduction in the odds of using CHW services (aOR = 0.13, 95% CI: 0.07–0.25, $p < 0.001$). Higher caregiver education was independently associated with lower odds of utilization (aOR = 0.56, 95% CI: 0.32–0.98, $p = 0.043$), such that caregivers with more schooling were somewhat less likely to use CHW services after controlling for distance and income. Household income (aOR = 0.86, 95% CI: 0.51–1.47, $p = 0.587$), sex of caregiver (aOR = 1.34, 95% CI: 0.65–2.76, $p = 0.429$) and caregiver age (aOR = 0.83, 95% CI: 0.57–1.20, $p = 0.329$) were not independently significant predictors once distance and education were accounted for.

4.4.3 Predictors of Good Treatment Outcome

Table 4.4.3 Logistic regression predicting good treatment outcome (recovery) among children with fever ($n=229$)

Predictor	aOR	95% CI	p-value
Time taken to seek care	0.91	0.37 – 2.22	0.833
Distance to CHW	1.23	0.57 – 2.64	0.603
Household income	1.70	0.79 – 3.69	0.178
Education level	2.30	1.00 – 5.26	0.049*
Age (standardised)	1.14	0.71 – 1.83	0.582

*Significant at $p < 0.05$. Model: $\chi^2 = 8.90$, $df = 5$, $p = 0.113$ (not significant); Pseudo $R^2 = 0.07$.

A supplementary binary logistic regression was fitted to identify predictors of a good treatment outcome (recovery, coded 1) versus a poor outcome (worsening or referral, coded 0) among the 228 children with a definitive outcome recorded. The overall model was not statistically significant ($\chi^2 = 8.90$, $df = 5$, $p = 0.113$), and only caregiver education showed a significant, though modest, independent association with recovery (aOR = 2.30, 95% CI: 1.00–5.26, $p = 0.049$); time taken to seek care, distance, household income and caregiver age were not significant predictors (Table 4.5).

CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter analyses the results of the study in relation to the research objectives concerning coverage of iCCM services, CHWs' adherence to malaria treatment guidelines and the factors affecting use of community-based malaria services in Ibenga Catchment Area. The discussion will pay attention to the interpretation of the results, their practical implications, their consistency with existing evidence and the Health Belief Model. Special emphasis will be placed on the distinction between the service coverage and utilization and the limitations associated with the self-reported practices of CHWs.

5.2 Coverage and utilization of iCCM services

The study showed relatively high coverage of iCCM services with a majority of caregivers having previously accessed CHW malaria services and a fairly high proportion of caregivers with a febrile child visiting the CHW first as the source of care. These results show that CHWs have emerged as an important source of malaria care in Ibenga. It is worth noting that the prevalence of proximity as the leading reason for selecting CHW services demonstrates that accessibility of services to households is one of the key strengths of community-based malaria management.

Nevertheless, the findings revealed an important limitation when interpreting the high level of service coverage. The access to services was not equal and prompt. Many households did not seek care within 24 hours of the onset of fever and the utilization rate dropped significantly in those households that were situated farther away from CHWs. Therefore, it can be concluded that although iCCM has decreased the access barrier for some households, the geographical inequalities persist.

This result is especially important for malaria control efforts, as the efficiency of community case management depends on the promptness of access to diagnosis and treatment. Although the household has a CHW in the wide catchment area, it may have an access barrier if the CHW is located several kilometres away. Hence, the performance of the programme should be measured not only through the proportion of households having used iCCM services, but also timeliness and geographical access of utilization.

This finding can also be explained using the Health Belief Model. The caregivers are likely aware of the dangers associated with malaria and perceive early intervention as having benefits, but this perception does not necessarily lead to practice where there are barriers such as the distance involved. Here, the distance is an important perceived barrier and practical barrier to utilization.

High satisfaction levels with the CHW services indicate good acceptability in the community. It must be noted that satisfaction should not be considered a proxy for technical quality of service. The caregivers may simply appreciate CHWs because they offer nearby services, which are also convenient and cost-effective, without having independently assessed the clinical quality of their services.

Programme Implication

These findings provide clear evidence for the continuation of the CHW-based malaria services and improved geographic dispersion of CHWs. Programme managers must identify underserved settlements and plan to redistribute CHWs, conduct outreach or adopt some other strategy to ensure that remote households have access to these CHWs. The community education programme should stress the need for seeking medical help early on when they experience fever symptoms.

5.3 Adherence of CHWs to malaria treatment guidelines

This high adherence could be due to the availability of supplies and routine supervision of the CHWs, which can facilitate the correct implementation of practices through making sure CHWs have the supplies and diagnostic tools that enable them to follow the treatment guidelines.

This finding needs to be carefully considered. Adherence has been measured using self-reports of CHWs without an objective verification using register review and observations. Thus, the result reflects only the reported level of adherence rather than the objectively measured level of adherence. In addition, social desirability effect could have biased the result to the direction of giving uniform high scores especially for practices that CHWs know should be performed in accordance with the national guidelines.

Moreover, the small number of CHWs surveyed makes it difficult to generalize the result beyond the study area. Thus, the 100% adherence reported should not be generalized as being the level of adherence of all CHWs.

The low percentage of CHWs who received refresher training is another issue to be noted. Even though CHWs' reported performance was high, lack of regular training could be a sustainability issue because initial training might ensure the competency of CHWs while regular refresher training and supervision would maintain this.

Programme implication

The result indicates the need for supervision and supply availability but also shows the need for regular refresher training and quality assurance.

5.4 Factors influencing utilization of iCCM services

The distance to the closest CHW turned out to be the most important independent predictor of utilization. It gives the best possible explanation of why there was inequality in utilization found in the study. The people who lived farther away from the CHWs were less likely to use the community malaria services regardless of any other characteristic of the caregiver and household.

It proves once again that geographical accessibility is the primary determinant of iCCM utilization. It also allows for providing a deeper understanding of the high level of coverage that was observed in the study because the overall coverage may disguise pockets of poor access among geographically isolated households.

The results obtained confirm the Health Belief Model and the existence of such barriers that do not allow people to take action even if they have a certain health problem and realize the necessity of treatment. For instance, in Ibenga, caregivers may know about the danger of malaria, but they prefer to find an alternative source of care because it is difficult for them to reach the CHW.

Caregiver education appeared to be an independent predictor of utilization, where the higher education of caregivers was associated with the lower chances of using CHW services. The negative correlation may be connected either with their preference of hospitals or better perception of hospital care. Still, since the study was conducted using cross-sectional design, the causes of such correlation are unknown and need to be analyzed carefully.

Some of the variables that were associated with utilization during the bivariate analysis, such as income and caregiver sex, were no longer statistically significant after adjustment. It means that there were some differences in utilization that were caused by other factors, especially geographical access.

5.5 Treatment outcomes

The relatively high number of children who were declared to have recovered after the treatment is an indicator that the children receiving the assistance from CHWs had favorable treatment outcomes. However, the additional analysis showed that the overall regression model of recovery was not statistically significant. Thus, the relationship between education and recovery cannot be considered as an important predictor.

More significantly, the treatment outcome should be analysed with regards to the results on utilisation. The most significant challenge for the programme, according to the findings of this study, is experienced prior to treatment rather than after treatment. The children who receive the assistance from CHWs can possibly recover because of the timely diagnosis and treatment, while the households that are located farther away from CHWs are less likely to utilise their services.

Thus, the study indicates the programme strategy, when access affects the utilisation, utilisation affects the exposure to community case management and access provides an opportunity for the successful treatment outcomes. Thus, the importance of improving access becomes obvious.

5.6 Overall interpretation and implications for malaria control

Combining the results, one may conclude that although the findings are mixed, yet the picture of the implementation of the programme in Ibenga is generally encouraging. The programme reached a great amount of people and achieved high level of community support, while the practices used by CHWs correspond to the guidelines of malaria treatment. However, there are some constraints related to geographical access, late treatment seeking, insufficient refresher training and the lack of verification of adherence to the guidelines.

Thus, the most crucial result for the programme implementation is not only the high coverage, but the inequity in its distribution according to the distance from CHWs. This means that the maintenance of the high utilization rates will require special programmes targeting geographically underserved households.

Moreover, these results highlight the importance of the distinction between programme availability, utilization and effectiveness. It is clear that the presence of CHWs in the area does not necessarily provide the prompt access. Moreover, the high rate of adherence does not necessarily mean high quality of care.

Thus, from the policy-making perspective, the improvement of community malaria services in Ibenga should include three interrelated measures: improving the geographical distribution of CHWs or introducing outreach methods, reinforcing the supervision, training and motivation of CHWs and introducing the verification of adherence to the guidelines.

5.7 Limitations of the Study

Several limitations should be considered when interpreting the findings of this study. Although these limitations do not invalidate the results, they should be taken into account when drawing conclusions and applying the findings to other settings.

First, a cross-sectional design was used in the study, meaning that data were gathered all at a single point in time. Although this design was suitable for evaluating the coverage of Integrated Community Case Management (iCCM) services, Community Health Worker (CHW) adherence to treatment guidelines for malaria, and factors related to service utilization, it does not permit the establishment of causal relationships between the variables examined. Therefore, even though there were notable correlations found between variables like caregiver education, the distance to the closest CHW, and the use of CHW services, it is not

possible to draw the conclusion that these characteristics significantly contributed to the observed variations in service consumption. Similarly, rather than being proof of a cause-and-effect link, the connections between care-seeking behavior and treatment outcomes should be viewed as associations. Future longitudinal or cohort studies that follow participants over time would provide stronger evidence regarding the causal pathways influencing utilization and treatment outcomes.

Secondly, the study relied on self-reported data from Community Health Worker interviews as the main source of information used to evaluate CHW adherence to malaria treatment recommendations. Respondents reported very high levels of adherence to recommended practices, such as routinely using Rapid Diagnostic Tests (RDTs), appropriately prescribing Artemisinin-based Combination Therapy (ACT), and referring cases of severe malaria; however, these practices were not independently confirmed by thorough audits of treatment registers or direct observation of clinical consultations. As a result, the findings may have been influenced by social desirability bias, whereby respondents provide answers that they perceive to be acceptable or expected rather than accurately reflecting routine practice. Consequently, the actual level of adherence may be somewhat lower than reported. As a result, the stated level of adherence may be slightly higher than the real level. To verify self-reported adherence and offer a more impartial evaluation of CHW performance, future research should include direct observation, regular supervisory evaluations, or systematic checks of patient records.

Thirdly, there were very few Community Health Workers ($n = 19$) in the study. The small sample size decreased the statistical power to identify meaningful relationships between CHW characteristics and treatment adherence, even though all active CHWs offering Community Malaria Case Management services within the study area were included. Therefore, even if they may have an impact on performance, factors including years of experience, educational attainment, time since refresher training, workload, and frequency of supervision may not have shown statistically significant relationships.

Consequently, the CHW-level findings should be interpreted as indicative of programme performance within Ibenga Catchment Area rather than as definitive evidence applicable to all Community Health Workers. Greater statistical precision and a more thorough examination of the variables influencing CHW performance would be possible in studies with bigger samples taken from several districts.

Fourthly, self-reported memory was used to gather data from caregivers about prior childhood fever episodes, healthcare-seeking behavior, and CHW service utilization. Respondents may have encountered recall bias even when the recall duration was shortened to minimize memory-related errors, especially when describing the timing of fever onset, the amount of time before seeking treatment, or the order in which healthcare providers were consulted. Additionally, some respondents might have inadvertently left out or misremembered

specifics of disease episodes, which could lead to small errors in the data gathered. However, this constraint was lessened by limiting the recall span to recent occurrences.

Lastly, because the study was carried out in the Ibenga Catchment Area within Mpongwe District, the results may not be directly applicable to all Community Malaria Case Management programs operating in other districts or provinces of Zambia. Variations in malaria transmission intensity, geographical accessibility, health infrastructure, CHW deployment, commodity availability, supervision systems, socioeconomic conditions, and cultural practices may influence program implementation and utilization in different settings; therefore, care should be taken when extrapolating these findings to other contexts without taking into account the local health system and community characteristics. Multi-site studies involving a variety of geographical settings would improve the external validity of future research.

Despite these limitations, the study offers insightful information about the Community Malaria Case Management program's implementation and results in a rural Zambian context. A thorough evaluation of the program from the viewpoints of both service consumers and service providers was made possible by the engagement of both caregivers and community health workers. Additionally, by taking potential confounding variables into account, the use of multivariable statistical analyses enhanced the validity of the results. In order to better community-based malaria case management in Zambia, future research, program enhancement, and policy decisions can all benefit from the study's significant local evidence.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter draws together the conclusions of the study on the outcomes of the Integrated Community Malaria Case Management (iCCM) programme in Ibenga Catchment Area, Mpongwe District, and presents recommendations arising from the findings, organised according to the study's three specific objectives. The chapter closes with suggestions for further research.

6.2 Conclusion

OBJECTIVE ONE

6.2.1 Coverage of iCCM Services

The study concludes that the iCCM programme in Ibenga has achieved broad coverage and strong community acceptance. The large majority of households (88%) had used CHW malaria services, and CHWs were the first point of care for over three-quarters of febrile children, indicating that the programme has succeeded in its core aim of decentralising malaria case management closer to where children live. High satisfaction and near-universal willingness to recommend the service further confirm that, where households can reach a CHW, the programme is trusted and valued. However, coverage is not yet universal: a minority of households, particularly those living furthest from a CHW, continue to rely on more distant alternatives or to delay care, meaning that geographic access gaps persist alongside otherwise strong programme performance.

OBJECTIVE TWO

6.2.2 CHW Adherence to Malaria Treatment Guidelines

The study concludes that CHWs in Ibenga demonstrate a high level of adherence to core case-management guidelines, including consistent RDT testing before treatment, rational restriction of ACT to RDT-positive cases, and appropriate referral of severe illness. This performance appears closely linked to two supporting conditions that were consistently present: regular monthly supervision with feedback, and an uninterrupted supply of RDTs and ACT during the recall period. At the same time, the low coverage of refresher training and the CHWs' own identification of inadequate incentives as their principal challenge point to underlying vulnerabilities that could erode this performance over time if left unaddressed, particularly given that adherence was self-reported rather than independently verified.

OBJECTIVE THREE

6.2.3 Factors Influencing Utilization of iCCM Services

The study concludes that utilization of iCCM services in Ibenga is shaped primarily by geographic access and, to a lesser and less intuitive extent, by caregiver education, with distance to the nearest CHW standing out as

the single strongest independent predictor even after adjusting for income, sex and age. The finding that more educated caregivers were somewhat less likely to use CHW services suggests that utilization gaps are not confined to the poorest or least informed households, but may also reflect differing preferences for facility-based care among better-educated caregivers. Encouragingly, once a child did access iCCM services, treatment outcomes were good regardless of household characteristics, indicating that the quality of case management itself is not a major source of inequity in this catchment area; the more consequential inequity lies in whether care is accessed promptly in the first place.

6.2.4 Overall Conclusion

Taken together, the findings indicate that the iCCM programme in Ibenga Catchment Area is functioning well where it is accessible: coverage is high, CHWs are adhering closely to treatment protocols, and treatment outcomes are good. The programme's principal challenge is therefore not the quality of care delivered by trained CHWs, but ensuring that all households, regardless of distance from a CHW post or caregiver education level, are able to access that care promptly, and ensuring that the conditions currently supporting good CHW performance, supervision, supply, and now also training reinforcement and incentives, are sustained over time.

6.3 Recommendations

To the Ministry of Health and National Malaria Elimination Centre (NMEC)

- Conduct more trainings for Community Health Workers (CHWs) to service the underserved communities located more than 5 km from existing CHWs.
- Strengthen supportive supervision and ensure regular refresher training for CHWs to sustain adherence to national malaria treatment guidelines.
- Maintain uninterrupted supplies of Rapid Diagnostic Tests (RDTs) and Artemisinin-based Combination Therapy (ACT) medicines to health facilities who later supply at community level.

To Mpongwe District Health Office

- Intensify community health education on the importance of seeking malaria treatment within 24 hours of fever onset.
- Strengthen monitoring and evaluation of the Community Malaria Case Management (CCM) programme using routine data quality audits.
- Improve community awareness of CHW services in areas with low utilization.

To Community Health Workers

- Continue providing malaria health education during household visits, emphasizing early care-seeking for fever.

- Encourage prompt referral of severe malaria cases in accordance with national treatment guidelines.
- Maintain complete and accurate malaria registers and ensure timely submission of monthly reports.

To Community Members

- Seek malaria diagnosis and treatment from CHWs immediately after the onset of fever, preferably within 24 hours.
- Continue supporting and utilizing Community Health Worker services for uncomplicated malaria.
- Participate actively in community malaria prevention and health education activities.

For Future Research

- Conduct longitudinal or cohort studies to evaluate the long-term impact of Community Malaria Case Management on malaria morbidity and mortality.
- Undertake qualitative studies to explore reasons for delayed care-seeking despite the high availability of CHW services.
- Assess the cost-effectiveness and sustainability of Community Malaria Case Management programmes in rural Zambia.

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APPENDICES

APPENDIX A: CONSENT FORM

1. Introduction

You are being invited to participate in a research study. Before you decide whether to take part, it is important that you understand why the research is being conducted and what your participation will involve. Please read the information carefully and feel free to ask questions.

2. Purpose of the Study

The purpose of this study is to assess the outcomes of the Community Malaria Case Management (CCM) program implemented by Community Health Workers in Ibenga Catchment Area. The study will evaluate service coverage, adherence to malaria treatment guidelines, and factors influencing community utilization.

3. Why You Have Been Selected

You are invited to participate because you are either a caregiver/household member who accessed malaria services from a CHW within the past three months, or a CHW providing CCM services in Ibenga Catchment Area.

4. Procedures

If you agree to participate, you will answer a structured questionnaire. The interview will take approximately 20–30 minutes. No biological samples will be collected. For CHWs, malaria registers may be reviewed without recording personal identifiers.

5. Voluntary Participation

Your participation is completely voluntary. You may refuse to participate or withdraw at any time without penalty. Your decision will not affect the health services you receive.

6. Risks and Discomforts

There are no anticipated physical risks. You may skip any question that makes you uncomfortable.

7. Benefits

There may be no direct personal benefit. However, findings may help improve malaria services and strengthen community health programs in Ibenga Catchment Area.

8. Confidentiality

All information collected will be kept strictly confidential. Names will not be recorded. Data will be coded and stored securely. Results will be reported in summary form only.

9. Compensation

There is no payment for participating in this study.

10. Contact Information

For questions about the study, contact:

Esther Linda Kakubo

Phone: 0978-815883

Email: estherkakubo@gmail.com

For concerns about participant rights, contact the relevant Research Ethics Committee through the University of Lusaka.

CONSENT STATEMENT

I have read (or had read to me) the information above. I have had the opportunity to ask questions, and my questions have been answered. I understand that my participation is voluntary and that I may withdraw at any time without penalty. By signing below, I voluntarily agree to participate in this study.

Participant Name: _____

Signature/Thumbprint: _____

Date: _____

Researcher/Interviewer Name: _____

Signature: _____

Date: _____

APPENDIX B: QUESTIONNAIRE

CAREGIVER / HOUSEHOLD QUESTIONNAIRE

SECTION A: Socio-Demographic Characteristics

1. Age of caregiver (years): _____

2. Sex of caregiver: ☐ Male ☐ Female

3. Marital status: ☐ Single ☐ Married ☐ Divorced ☐ Widowed

4. Highest level of education: ☐ None ☐ Primary ☐ Secondary ☐ Tertiary

5. Main occupation: _____

6. Estimated monthly household income: ☐ <K500 ☐ K500–K1000 ☐ K1001–K3000 ☐ >K3000

7. Distance to nearest CHW: ☐ <1km ☐ 1–5km ☐ >5km

SECTION B: Malaria Episode and Care-Seeking

8. Fever in past 3 months? ☐ Yes ☐ No (if “NO” skip to Q15)

9. First place care was sought: ☐ CHW ☐ Health Facility ☐ Pharmacy ☐ Traditional Healer ☐ None

10. Time taken to seek care: ☐ Within 24hrs ☐ 2–3 days ☐ After 3 days

11. Was RDT performed? ☐ Yes ☐ No ☐ Don’t know

12. If positive, was ACT given? ☐ Yes ☐ No

13. Was full ACT course completed? ☐ Yes ☐ No

14. Outcome after treatment: ☐ Recovered ☐ Referred ☐ Worsened ☐ Hospital admission

SECTION C: Utilization of CCM Services

15. Have you ever used CHW malaria services? ☐ Yes ☐ No (if “NO” skip to Q18)

16. How many times in past 6 months? _____

17. Reason for choosing CHW (tick one): ☐ Near home ☐ Free ☐ Trust CHW ☐ Short waiting time ☐ Facility far

18. Ever avoided CHW services? ☐ Yes ☐ No

If yes, why? ☐ No medicines ☐ No RDTs ☐ Lack of trust ☐ Prefer facility ☐ Distance

SECTION D: Perceptions (Health Belief Model)

19. Children under five are at high risk of malaria: ☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

20. Malaria can cause death if untreated: ☐ Yes ☐ No

21. Early treatment prevents complications: ☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

22. Barriers to early treatment: ☐ Distance ☐ No drugs ☐ Farming priorities ☐ Cultural beliefs ☐ Not applicable

23. Received malaria education from CHW? ☐ Yes ☐ No

SECTION E: CHW Service Satisfaction

24. Satisfaction level: ☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ Not applicable

25. Would recommend CHW services? ☐ Yes ☐ No

CLOSING

Thank you very much for your time and insights. Your perspective is invaluable to this research.

Do you have any questions for me?

COMMUNITY HEALTH WORKER (CHW) QUESTIONNAIRE

SECTION A: Training and Experience

1. Age: _____
2. Sex: ☐ Male ☐ Female
3. Received formal CCM training? ☐ Yes ☐ No
4. Year of last training: _____
5. Refresher training in past 12 months? ☐ Yes ☐ No
6. Years of experience as CHW: _____

SECTION B: Supervision and Support

7. Frequency of supervision: ☐ Monthly ☐ Quarterly ☐ Rarely ☐ Never
8. Receive feedback on reports? ☐ Yes ☐ No

SECTION C: Commodity Availability

9. Stock-out of RDTs in past 3 months? ☐ Yes ☐ No
10. Stock-out of ACTs in past 3 months? ☐ Yes ☐ No
11. Average duration of stock-out: ☐ <1 week ☐ 1–4 weeks ☐ >1 month

SECTION D: Adherence to Guidelines

12. Test all fever cases before treatment? ☐ Always ☐ Sometimes ☐ Never
13. Give ACT to RDT-negative cases? ☐ Yes ☐ No (check registers)
14. Refer severe cases? ☐ Always ☐ Sometimes ☐ Never

SECTION E: Reporting

15. Maintain malaria registers? ☐ Yes ☐ No (Observation)
16. Submit monthly reports? ☐ Yes ☐ No

SECTION F: Challenges

17. Main challenges: ☐ Stock-outs ☐ Lack of supervision ☐ Community resistance ☐ Transport ☐ Inadequate incentives ☐ None

CLOSING

Thank you very much for your time and insights. Your perspective is invaluable to this research.

Do you have any questions for me?

APPENDIX C: RESEARCH BUDGET

Item	Description	Quantity	Frequency	Unit Cost (ZMW)	Total Cost (ZMW)
Training of Data Collectors	Orientation and training for research assistants	1	1	1500	1500
Data Collection	Allowances for research assistants	2	5	150	1500
	Transport to and within Ibenga Catchment Area	1	5	350	1,750
Printing	Printing questionnaires and consent forms	200	1	3	600
Stationery	Pens, pencils, notebooks and clipboards	Lump sum	1	300	300
Communication Costs	Phone calls and internet for coordination	Lump sum	1	300	300
Data Entry and Analysis	Data entry assistance and statistical analysis	Lump sum	1	1500	1500

Ethical Approval Fees	Ethics committee review fees	1	1	1500	1500
Report Printing and Binding	Printing and binding final dissertation copies	5	1	300	1500
Miscellaneous/Contingency	Unexpected costs	1	1	500	500
TOTAL					10,750

APPENDIX D: RESEARCH GHANT CHART

ACTIVITY	FEBRUARY				MARCH				APRIL				MAY				JUNE				JULY			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
Proposal development																								
Supervisor review and revisions																								
Ethical approval process																								
Development and pre-testing of questionnaires																								
Training of research Assistants																								
Data collection																								
Data entry and cleaning																								
Data analysis and Report writing																								

APPENDIX F: ETHICS CLEARANCE



UNIVERSITY of LUSAKA

Passion for Quality Education: Our Driving Force

**UNIVERSITY OF LUSAKA RESEARCH ETHICS COMMITTEE
(UNILUS-REC)**

Plot No. 37413, Off Alick Nkhata Mass Media. P. O Box 36711, Lusaka.

Phone: +260211258505, 258409 Fax +260211233409; Cell +260976075850,961917862,

E-mail: unilus@zamnet.zm, ictar@zamnet.zm

UNILUS-RESEARCH ETHICS COMMITTEE

Ref no: FWA00033228-1755(08)/(08)/{2024}

Date: 17 June 2026

STUDENT NAME: **Ms. Esther Kakubo**

Outcomes of the Integrated Community Malaria Case Management (CCM) Programme by Community Health Workers

The above research was submitted to the research ethics committee for review. The study has no major ethical problems and is approved subject to the following:

1. The study cannot be changed without express permission of the UNILUS research ethics committee.
2. Approval from the necessary authority should be sought.



Professor Kasonde Bowa

MSc(Glasgow),M.Med(UNZA),FRCS(Glasgow),FACS,FCS,DPH(LSTMH),MPH(UCL)

Chairman- UNILUS REC

Professor of Urology and Consultant

Urologist Deputy Vice-Chancellor –

Research and Innovation

Executive Dean - School of Medicine and Health Sciences

APPENDIX G: NATIONAL HEALTH RESEARCH AUTHORITY CLEARANCE



NATIONAL HEALTH RESEARCH AUTHORITY

Lot No. 18961/M, off Kasama Road, Chalala, P.O. Box 30075, LUSAKA
Tell: +260211 250309 | Email: znhrasec@nhra.org.zm | www.nhra.org.zm

NHRA-3799/01/07/2026

20th July 2026

The Principal Investigator,
Ms. Esther Kakubo,
University of Lusaka,

Dear Ms. Esther Kakubo,

Re: Request for Authority to Conduct Research

The National Health Research Authority Is in Receipt of Your Request for Authority to Conduct Research Titled **“To assess the outcomes of the Integrated Community Malaria Case Management (CCM) Programme by Community Health Workers (CHWs) in Ibenga Catchment Area, Mpongwe District, Copperbelt Province, Zambia”**

I wish to inform you that following submission of your request to the Authority, our review of the same and in view of the ethical clearance, this study has been **approved** on condition that:

1. The relevant Provincial and District Medical Officers where the study is being conducted are fully appraised.
2. Progress updates are provided to NHRA bi-annually from the date of commencement of the study.
3. The final study report is cleared by the NHRA before any publication or dissemination within or outside the country.
4. After clearance for publication or dissemination by the NHRA, the final study report is shared with all relevant Provincial and District Directors of Health where the study was being conducted, University leadership, and all key respondents.

Yours sincerely,

National Health Research Authority

Prof Victor Chalwe,

Director and Chief Executive Officer

All correspondences should be addressed to the Director/CEO National Health Research Authority

APPENDIX H: MINISTRY OF HEALTH CLEARANCE

*All communication should be addressed to
District Health Director
Mobile: +26 0969-176-103
Email: mpongwedho55@gmail.com*

In reply please quote.....



REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH
MPONGWE DISTRICT HEALTH OFFICE

*Machiya Road
P.O. BOX 55,
MPONGWE*

18th June, 2026

The In- Charge
Lyobeka Health Post
Mpongwe

Subject: Authority to conduct Research in Ibenga Area, Mpongwe District

Dear Sir/Madam,

Authority is hereby given to **Esther Kakubo, NRC 127548/18/1** to conduct a research in Ibenga Community under the title: **Outcomes of the Integrated Community Malaria Case Management (CCM) Programme by Community Health Workers**

The activity is schedule to start on the 19th June to 30th August, 2026.

Kindly help her in any way possible

Thank you for your cooperation.

Yours faithfully,

MPONGWE DISTRICT HEALTH OFFICE

Mr Hilard Chinuka

For/ DISTRICT HEALTH DIRECTOR

