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ASSESSMENT OF ADHERENCE TO THE TEST, TREAT AND TRACK (T3) MALARIA POLICY AT SELECTED HEALTH FACILITIES IN GHANA

BY

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DECLARATION

I, Charles Kyei, hereby declare that except for the references to the literature and works of other researchers which has been duly acknowledged, the work in this proposal is the result of my work put together and that I have never before submitted it to any other tertiary institution for a study.

CHARLES KYEI

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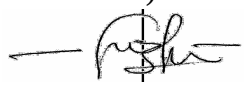

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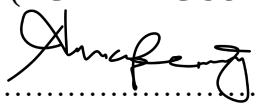

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DEDICATION

I wish to, first of all, dedicate this work to the Almighty God for his protection and guidance to undertake this study. Secondly, I also dedicate the work to my mother, Madam Akua Gyesiwaa for conceiving the idea of sending me to school, and finally my wife Madam Patricia Antwiwaa for the wonderful assistance throughout the programme.

May God richly bless them.

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List of Abbreviation

Abbreviation	Meaning
T3	Test, Treat and Track
WHO	World Health Organization
RDT	Rapid Diagnostic Test
GMIS	Ghana Malaria Indicator Survey
HDSS	Health and Demographic Surveillance System
ACT	Artemisinin Combination Therapy
CHPS	Community-Based Health Planning and Services
KHRC	Kintampo Health Research Centre
KHDSS	Kintampo Health Demographic Surveillance System
HDSS	Health Demographic Surveillance System
PPMV	Patent and Proprietary Medicine Vendor
OTCMS	Over the Counter Medicine Sellers
ERB	Ethical Review Board
UG	University of Ghana
ISSER	Institute of Statistical, Social and Economic Research
NMCP	National Malaria Control Programme
LCSA	Licensed Chemical Sellers Association
MoH/GHS	Ministry of Health/ Ghana Health Service
mRDTs	Malaria Rapid Diagnostic Tests

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ABSTRACT

Background: According to the World Health Organization (WHO) 2012 report, the African Region carries a disproportionately high share of the global malaria burden. The disease burden prompted the WHO Global Malaria Programme to initiate the Test, Treat and Track (T3) policy in 2012, which Ghana adopted to scale up malaria testing, increase treatment with antimalarials and strengthen the malaria surveillance system. Seven years after the adoption of the policy in Ghana, it is prudent to assess the adherence towards the T3 malaria policy at different health facility levels in Ghana.

Method: The study used secondary data from the Coffey International T3 Malaria evaluation for the analysis. This is a descriptive cross-sectional study using a quantitative method, conducted in six districts in three regions of Ghana's three malaria epidemiologic zones: the northern savannah, the tropical rainforest, and the coastal savannah/mangrove swamps. Data was collected using a standard questionnaire and analyzed using descriptive statistics and Pearson's chi-squared test to determine associations. Data from healthcare providers and client-exit interviews from 28 health facilities were used for the analysis.

Result: The study assessed 28 health facilities consisting of 16 (57.1%) CHPS, 5 (17.9%) Government Hospitals and 7 (17.9%) Health Centres. Also, 590 clients from various facilities, made up of 66.4% females and 33.6% males was interviewed. Overall, the study revealed 98.1% knowledge and 96.4% adherence levels among health facilities. However, the proportion of total recipients of T3 at the client's level was 28.0% due to a lower number of tracking clients to complete the policy guidelines process. The study found a significant association between age groups of clients and the level of compliance with the policy.

Conclusion: The research revealed higher knowledge and adherence level of the T3 policy at the facility levels during the survey. However, the study showed that though the percentage of testing and treating was found to be at a higher level, the number of clients who received the

three processes (Test, Treat and Tracked) was low (28%). This was due to the inability of a greater proportion of clients to complete the tracking component of the policy as stipulated in the implementation guideline. There was an association between the age of clients and compliance with the T3 policy.

Recommendations: The study recommends that the National Malaria Control Programme (NMCP) and the GHS undertake measures to train healthcare providers, increase monitoring and supervision. These two agencies should ensure regular supply of RDTs and Artemisinin Combination Therapies (ACTs) to promote adherence. Furthermore, there is the need to undertake further research on the policy implementation processes across the various cascade of care.

Key words: Adherence, Compliance, RDT, ACT, Malaria, Health facility, Clients.

CHAPTER ONE

INTRODUCTION

1.0 Background to the study

In 2017, there were an estimated 219 million cases of malaria in 87 countries. The estimated number of malaria deaths stood at 435 000 (WHO, 2018). The World Health Organization (WHO) indicated that the African Region alone carries a disproportionately high share of the global malaria burden. During the same year, the African region was home to 92% of malaria cases and 93% of malaria deaths (WHO, 2018). In addition to the malaria disease statistics, approximately 6 million children less than 5 years of age die annually worldwide, and half of these child deaths occur in Sub Saharan Africa. These deaths are mostly caused by preventable and treatable diseases like pneumonia, malaria, and diarrhea (Johansson, 2016).

According to Baiden et al, in a study that examines the shift from presumptive treatment to test-based showed that in Ghana and Kenya, the probability of fever that could be attributed to malaria was as high as 61% and 67% respectively (Baiden et al., 2014). It has also been reported that in Kenya, less than 40% of febrile children under five years were tested for malaria and in Ghana, 73% of children were presumptively diagnosed and treated for malaria (Baiden et al., 2014). In early 2010, WHO came out with a revised treatment guideline that demanded a shift from the presumptive diagnosis and treatment to the test-based method of managing diseases. The practicality of the process was for suspected cases of uncomplicated malaria to be confirmed with malaria Rapid Diagnostic Tests (mRDTs) or microscopy test before treatment is initiated with required antimalarial, and for the health care providers to keep surveillance of the reported cases. This modification was to bring to an end the era of presumptive practice that spanned several years (Baiden et al., 2014).

The modification has compelled the malaria-endemic countries, donors, and the global malaria community to scale up diagnostic testing, adhering to treatment measures using recommended

antimalarial drugs and disease surveillance on tracking malaria reported cases (WHO, 2012). According to Agandaa et al, 2016, studies have shown that public primary health care facilities lack diagnostic kits like microscopes and in situations where test kits are available, the personnel to use the kits are inadequate compared with the high volume of work. Based on this, in the past, fever from most endemic countries associated with malaria was diagnosed and treated presumptively as malaria (Agandaa et al, 2016). Besides, clinicians' adherence to negative RDT test result among patients was very poor with the claim among health staff that negative test does not rule out malaria, according to Bisoffi et al, 2011 from a study in Burkina Faso and Abdelgader 2012, in malaria case management study conducted in Sudan. The test provides an opportunity for improved diagnoses and better case management (Agandaa et al, 2016). Many countries in malaria-endemic areas have adopted the policy, however, focusing on the implementation thoroughly has become a challenge due to many factors. In Ghana, 21 percent of children age 6-59 months tested positive for malaria parasites according to microscopy results, whiles 28 percent of children age 6-59 months were positive for malaria antigens with RDTs (GMIS, 2016).

In 2012, the WHO initiated a project called T3: Test. Treat and Track, imploring malaria-endemic countries, donors, and the global malaria community to scale up diagnostic testing, treatment, and surveillance for malaria (Oteng, Kenu, Bandoh, Nortey, & Afari, 2020). The Global Initiative was established to provide a mechanism for endemic countries to improve these three main pillars of malaria prevention and elimination. The T3 strategy, which is one of the recommended WHO malaria control strategies, emphasizes the main policy messages of WHO guidelines on diagnostic testing, care, and surveillance, i.e., that every suspected malaria case should be tested, every confirmed case should be handled with a quality-assured antimalarial medication, and the disease should be monitored through consistent and accurate surveillance. In 2013, Ghana introduced this initiative and established guidance for

implementing the T3 policy by updating the guidance for malaria case management and educating health professionals on the implementation of the initiative (GMIS, 2016). The NMCP added to its objectives measures to provide a parasitological diagnosis to all suspected malaria cases and provide prompt and effective treatment to 100% of confirmed malaria cases by 2020.

1.1 Problem Statement

Malaria is a principal cause of death for children under five years of age in sub-Saharan Africa. The disease kills a child every 60 seconds and also poses a threat to pregnant women and their unborn babies (GMIS, 2016). The implementation of the test-based management of malaria cases also presented an additional responsibility for clinicians concerning the education of patients. These are mainly the parents or guardians living in areas where presumptive treatment was experienced for many years (Baiden et al., 2014). Global malaria treatment policy on presumptive treatment of malaria whenever there is fever has shifted to treatment with artemisinin-based combination therapy (ACT), the required antimalarial after a positive test with microscopy or RDT. A study by Faust et al, 2015 conducted in Senegal assessing drivers on T3 policy found out that antimalarial usage was not a complete indicator of effective implementation of the policy but reliance on diagnostic tests is the better measure (Faust et al., 2015). This is because antimalarial could be provided by a health care provider without a test, but by relying on physical condition or signs and symptoms of patients, leading to increase in antimalarial prescription (Rakotonandrasana, Tsukahara, & Yamamoto-Mitani, 2018). The transition involves shifting from long-standing behavior among health care providers and patients.

Though it is apparent that rapid diagnostic test for malaria allows improving care, diagnosis, and improved disease management, the process has not been strictly followed according to the guidelines by healthcare practitioners (Agandaa et al, 2016). Most of the women of

reproductive age with their children are currently not going through the test and treat process at the various facility levels and do not even know the policy which could motivate them to develop the attitude towards the practicality of the policy guidelines. Adherence to policy guidelines by both healthcare providers and the response from patients is essential for achieving the success of the policy, but this has remained a major setback to the policy implementation (Ezenduka, Okonta, & Esimone, 2014).

According to Agandaa (2016), in terms of health workers, though doctors had good compliance than the physician assistants or the medical assistants, compliance to the T3 guidelines by facilities was associated with many challenges that could hinder the smooth implementation of the policy. Adhering to the policy guidelines would contribute greatly to the achievement of SDG 3 by eliminating malaria by 2030. Eight years after the introduction of the policy, gathering data on the extent to which the health facilities adhere to the malaria policy would help the process of ensuring a successful implementation of the policy.

Seven (7) years after the T3 policy was launched, it is vital to examine and review the policy's effectiveness in malaria-affected communities. This study aims to play a role in developing target-focused policies and lobbying that will ensure the elimination of malaria through this policy. The goal of this study is to contribute to what is already known about the T3 policy and how health-care facilities comply to its components. It will add to the body of knowledge about the best practices used by health institutions to guarantee that patients who test positive for malaria are treated and followed up on to ensure that they do not recur after receiving malaria treatment.

The study, therefore, examined the adherence of the T3 malaria policy among different levels of health facilities in six districts in Ghana. Findings will enable policymakers to take decisions on the appropriate intervention that will ensure a high percentage of adherence to the T3 policy.

The study tested the hypothesis; different health facility levels adhere to the T3 policy implementation.

1.2 Research Questions

1. What is the knowledge of the T3 malaria policy among health care professionals at different health facility levels?

2. What is the level of adherence to T3 malaria policy among the different levels of health facilities?

3. What is the proportion of patients satisfy with the T3 malaria policy?

1.3 General Objective

The study aims to assess the level of adherence to the T3 malaria policy among the different levels of health facilities in Ghana.

1.4 Specific Objective

1. To assess the knowledge of the T3 malaria policy among health care professionals at the health facility level.
2. To examine the adherence of T3 malaria policy among District hospitals, Health Centres and CHPS compounds.
3. To find the proportion of community members (clients) satisfy with the T3 malaria policy.

1.5 Justification

Malaria has been identified as a major disease burden in the World with morbidity and mortality rates of countries in Sub-Saharan Africa being the highest. The WHO has been monitoring the prevalence of the disease and has initiated policy guidelines aimed at combating the disease burden. A review of literature indicates that the practice of the test and treat case management has not been strictly followed by health facilities. Currently, many countries have adopted the case management guidelines but the implementation at the various health care

facility levels concerning adherence or compliance has been a challenge to the successful implementation of the policy. According to the Ghana Malaria Indicator Survey, 2016, only 54% of women who reported experiencing malaria provided a blood sample for malaria testing to confirm the diagnosis (Prah, 2019).

There has been a mixed effect on the use of RDTs by health facilities and evidence has shown that consistently not using the test or ignoring the test results do not lead to effective targeting of ACTs. For effective results, evidence of proper diagnosis is required for the success of the T3 implementation (Burchett et al., 2017). Since the WHO initiated the T3 policy in 2012, there have been independent evaluations carried out in selected districts, however, this study seeks to comprehensively evaluate the T3 policy in selected districts in each of the three epidemiological zones in Ghana to assess the adherence to the guidelines which will support WHO effort to reduce the disease burden. The NMCP's recent strategic plan is to reduce malaria burden by 75% by 2020, however, data to establish the relationship of variables to support planning decisions and future assessments remains a challenge, due to inadequate research conducted in this area in Ghana (Awine, Malm, Bart-Plange, & Silal, 2017).

The main purpose of the study is to obtain information on the T3 strategy's effectiveness at health facilities; persuade stakeholders to overcome gaps in the T3 policy's implementation; and guarantee that authorities hold duty bearers accountable for the delivery of malaria services. Prioritizing the T3 policy of malaria case management at all facility levels especially the outlying community level is key to the attainment of the sustainable development goals. Although several studies have determined the adherence and compliance of the T3 policy, not much has been done in terms of assessing the T3 policy in general among health facilities levels and client perspective. The study is therefore designed to explore the adherence towards the implementation of the T3 policy usage among different health facilities and clients in six districts. The three regions where the six districts of the study are located and the NMCP can

use the outcomes of the study as a baseline to inform policy interventions relevant to enhance the process to increase adherence

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Malaria is the world's most dangerous and most common infectious disease found primarily on the continent of Africa. In 2016, 90% of malaria infection and 91% of disease-related deaths occurred in Africa (Sanofi, 2018). The WHO in an attempt to eradicate malaria targeted universal coverage with long-lasting insecticidal nets and other essential malaria control interventions by the end of 2010 (WHO, 2012). Distribution of more than 290 million nets in Africa between 2008 and 2010, made significant progress towards achieving the target of universal bed net coverage for at-risk population groups (WHO, 2012). Indoor residual spraying, another highly cost-effective control intervention, also contributed significantly and scaled up, helping to cut malaria cases and deaths in high-transmission areas (WHO, 2012). To achieve universal coverage with diagnostic testing and antimalarial treatment, as well as strengthen the malaria surveillance systems, the WHO recommended diagnostic testing, treatment, and surveillance, as well as updating existing malaria control and elimination strategies (WHO, 2012).

Malaria is one of the most proven fatal diseases in humans and some of the measures needed to combat the deadly disease are early detection and precise diagnoses which enhances the eradication process. The main aim for which the WHO provided the T3 treatment guidelines was to ensure that only actual malaria cases are treated with a required antimalarial drug to prevent misdiagnoses and overdiagnoses, and to further discourage the adherence to presumptive treatment. A cross-sectional study among Ghanaian prescribers by Prah et al seeking to evaluate the level of knowledge of prescribers on rapid diagnostic test revealed that about 73% of the participants had good knowledge on the diagnosis, 84% used malaria test kits in diagnosis, and only 9% relied on the test results for treatment (Prah, 2019). The study

concluded that though the project depicted high awareness from prescribers, significant numbers did not use the test results for all suspected cases.

The WHO recommended the testing and treatment of malaria cases as a strategy, by way of using RDT for all suspected cases to support the accurate diagnosis of malaria infections. However, prescribers continue to treat patients based on presumptive measures and clinical symptoms without confirmation and also issue antimalarial to patients without adequate tests to confirm cases before the treatment (Graz, 2011). The diagnostic test is relevant to help confirm and count the number of malaria cases in order to assess the percentage of the population being diagnosed with the disease. Therefore, in order to differentiate other diseases from malaria and subsequent treatment with the required antimalarial drugs, there is the need to adhere to the T3 guidelines.

2.1 Overview of Test, Treat and Track (T3) Malaria Policy Initiative

The WHO launched the malaria treatment guidelines for the management of malaria cases, by advising the disease-endemic countries, donor agencies, and the malaria community to enhance the testing, treatment, and surveillance of malaria. The process was to support the endemic communities to strengthen these three parameters of malaria control and prevention (WHO, 2012). The early diagnosis and accurate surveillance of malaria cases were acclaimed to be an important step towards the management of the disease. However, inaccurate diagnoses of malaria cases have a dire consequence on malaria morbidity and mortality.

It is evident that parasite based diagnostic testing enhance and improve the overall management of malaria cases, especially by identifying those who do not have the malaria disease and therefore would not need antimalarial drugs (WHO, 2018). According to WHO report 2012, investments in malaria prevention and control over the past decade have created unmatched

momentum and protected more than a million lives. Malaria mortality rates have been reduced by over a quarter globally and by one third in the WHO African Region (WHO, 2012).

A study reported that malaria diagnosis and treatment in the past years was based on clinical signs and symptoms. Most fevers were often diagnosed as malaria and treated with Chloroquine without pre-testing to confirm the diagnosis. As a result, there were inappropriate diagnoses and the treatment contributed to the malaria parasites building resistance to the Chloroquine drug which was the 'first-line drug' for the treatment of uncomplicated malaria and this further increased the economic burden contributed by the disease (Agandaa et al, 2016). Prescribers' motivation to patients resulted in high uptake of RDT especially in private facilities which were more of working for profit but also ensuring that they get sufficient clients (Burchett et al., 2017).

The treatment of malaria across the world has changed from just the signs and symptoms being mainly fever to a more specific treatment after a positive laboratory-based diagnosis (Faust et al., 2015). According to WHO, the focus is to get every suspected malaria case tested, treated, and using timely and accurate surveillance to track the disease to set forth a new approach to bring a near-zero malaria death in endemic countries (WHO, 2012). The WHO policy recommended diagnostic testing for every suspected malaria case, treatment for every confirmed case with quality-assured antimalarial medicine, and surveillance. For some time now, malaria prevention and control have seen massive investments which have saved millions of lives. Despite these, malaria still occurs in over 99 countries so governments need to prioritize the malaria issue (WHO, 2012). During these periods of malaria infections, if the necessary support for improving the T3 initiative is not forthcoming, there will be a gap in strengthening the T3 strategy to conquer malaria. Hence, if endemic countries get the needed support, they will be moving towards achieving the health-related Sustainable Development Goals.

2.2 Knowledge of the T3 malaria policy

Many people visit health facilities as well as licensed chemical sellers reporting fever with the mindset of acquiring malaria drugs for treatment without being tested but rather based on signs and symptoms. In Ghana, a study found that generally, people do not adopt a single treatment pattern for uncomplicated malaria. While some patients visit health facilities immediately they feel unwell, others visit drug stores to purchase any drug they deem appropriate for the disease suspected or mention their health condition to the vendor who then decides on which drug is most appropriate (Ansah, Gyapong, Narh-Bana, Bart-Plange, & Whitty, 2016).

A study conducted at HO showed that the level of adherence to the test of fever cases, negative test results, and tracking of malaria cases had major problems that need attention (Kankpetinge et al., 2016). From the study, general adherence to the T3 strategy was not encouraging so the study recommended that the Ministry of Health/ Ghana Health Service (MOH/GHS) ensure adequate and sustained supply of RDTs and ACTs to both public and private health facilities. The study by Kankpetinge et al, 2016 revealed that 58.8% of the observed cases of fever were tested and diagnosed for malaria before treatment, whiles 41. 5% of the cases were not tested for malaria parasites. The study also confirmed that clinicians are likely to overlook the malaria negative result after testing and continue to prescribe antimalarial drugs to cases that are not malaria illnesses. The WHO in collaboration with other agencies should develop diagnostic tools and guidelines for non-malarial fevers and incorporate them into malaria case management (Kankpetinge et al., 2016). The study recommended that the GHS and the Ho MHD sensitize clinicians on the relevance of the T3 strategy, especially mandatory testing and adherence to negative test results, tracking of malaria cases, and the use of antibiotics in malaria treatment. More research should be conducted to determine the sensitivity and specificity of RDTs especially after it has been stored for some time at the health facilities.

After the introduction and modification of the malaria prevention treatment policy, there is considerable compliance on the use of ACT, which are first-line treatment for malaria endemic countries (Ezenduka et al., 2014). However, malaria confirmation process is associated with limited use of laboratory diagnoses due to over-reliance on presumptive treatment other than diagnostic treatment, absence of routine evidence on malaria treatment, and co-medication to direct effective implementation of the guidelines. There is the risk of developing parasite resistance and unsuccessful treatment, thereby undermining the motive of the malaria treatment policy. A wide scope for improved diagnosis and treatment measures exist to promote the efficiency of malaria case management at some facilities (Ezenduka et al., 2014). From the research studied, treatment practices varied notably between the two public health facilities, in terms of patients' characteristics. The p-value shows significance in many of the variables, indicating differences in prescribing practices of doctors between the facilities. These differences highlight the variation in prescribing cultures between similar facilities across the country, suggesting differences in the dissemination of anti-malaria training information. The differences may also point to the levels of exposure to malaria treatment practices

The study showed a significant relationship in many variables depicting differences in practices of doctors between facilities. There were differences in variation in prescribing cultures in many similar facilities across the country, showing differences in training information on malaria treatment practices. The use of RDT by the Licensed Chemical Sellers Association (LCSA) is largely accurate and acceptable to community members. However, potential challenges associated with large-scale deployment need to be addressed.

According to Asibong et al. (2019), knowledge score during the survey indicated that knowledge of malaria amongst Primary healthcare workers was poor, while acceptance of RDTs amongst Primary healthcare workers was fair, this reflected in the overall knowledge score of RDTs which was also fair. The study recommended the need for regular training and

retraining of health workers at the PHC level and Government agencies and Donors to ensure the continuous availability of ITNs, RDTs, and ACTs in Public Health facilities to promote adherence in the implementation process of the policy.

In terms of knowledge on the test and treat policy, a study conducted on Healthcare providers in Ethiopia showed that 69.3% of the total prescribers had ever seen the diagnostic test for malaria infections, 55.2% knew how to read the test results after performing the test to clients (Argaw, 2015). In furtherance to this study was the highlights of health information to patients or caregivers which recorded 97% out of the 264 clients interviewed. The success of the T3 policy depends largely on the compliance to the policy at the facility level which is supposed to be implemented through knowledge and actualization of the practice. However, according to the study, 92% of the prescribers interviewed confirmed usage of microscopy diagnostic kids in confirming cases showing a higher level of patronage in line with the WHO guidelines, while only 15% resorted to the use of RDTs in confirming malaria infections. A study in West Kenya conducted among Healthcare providers and dispensers found 93% of higher knowledge levels exhibited, which indicated that they used RDTs and microscopy in confirmed malaria cases, and also described the signs and symptoms to affirm the national treatment guideline (Riley et al., 2018). Another study by Oladipo assessing knowledge among Patent Proprietary Medicine Vendors (PPMVs) on malaria testing and treatment showed that their knowledge on the antimalarial was very poor, below 20% knew the national antimalarial policy in 2011 and even less than 5% had seen the document (Oladepo et al., 2019). To increase participation for the universal adherence to the policy there is the need to involve all the various stakeholders in the process to achieve the set target.

2.3 Adherence of T3 malaria policy

The attitude of community members towards a policy determines the success or failure of the policy. A research conducted among primary health care workers using a self-administered

questionnaire showed that only 2.6% of them had a good rating when determining the acceptability rating of RDT using the acceptability score, however, none of the respondents had good knowledge of malaria RDT usage (Asibong et al., 2019). In another study conducted in the North-Eastern part of Tanzania among village health workers, it reported that most health workers thought that RDTs put unnecessary pressure on standard procedures and claimed that they needed more personnel to perform the tests (Mushi et al., 2016). In that survey, most respondents agreed that RDTs were often available at their workplace, and usage rates are high, but some health workers said the RDTs were unreliable. This is parallel to the suggestion in a study in Enugu, Nigeria which detailed that they do not trust the results despite the fact that RDTs have been found to have a sensitivity of 90.6% and a specificity of 95.9% in Nigeria (Uzochukwu et al, 2010). In a study conducted in the South-Eastern part of Nigeria, Health Care Providers and community members both recognized malaria RDTs as an important step to correct treatment, though, it was also reported that there were concerns as to the reliability of test results with symptoms being deemed more important than test results (Uzochukwu et al, 2010). It has been noted that health workers still treat for malaria even when RDT result is negative, due to reasons such as lack of finances to conduct microscopy by patients, which is supported by a study carried out in Zanzibar. In a prospective cohort trial in Uganda on malaria treatment restricted to confirmed laboratory cases, 0.8% of blood smear-negative patients who were not given antimalarial drugs developed clinical malaria over 7 days of follow-up and all 13 were detected by the health facility and treated (Njama-Meya et al., 2007). Similar findings were seen in Tanzania were 0.5% of RDT-negative patients developed malaria within 7 days (Asibong et al., 2019).

2.4 Proportion of malaria cases tested, treated, and tracked

Statistics from NMCP indicate that in Ghana, the percentage of positive malaria cases using microscopy reduced from 30 percent in 2015 to 26.4 percent in 2016 whiles RDTs also

increased from 33 percent in 2015 to 34.3 percent and an overall increase in malaria testing rate from 73.6 percent in 2015 to 77.3 percent in 2016 (NMCP, 2016). The availability of quality malaria RDTs has led to an improvement in access to testing increasing the proportion of cases tested across the world. Despite the advances made in the rate of testing for malaria cases due to the increase in RDTs, many children do not still receive the diagnostic test and by giving antimalarial drugs to these children will prolong their illnesses and increased the risk (UNICEF/WHO, 2015). It is therefore prudent to adhere to the test and treatment guidelines to enhance the success of fighting the menace. A compliance study among prescribers in both Ghana and Uganda also showed about 71.8% of the patients were recommended for malaria (laboratory) testing using RDT in public health facilities in Ghana, and 80% of patients in Uganda also testing for malaria cases (Ampadu et al., 2019).

A study by Ezenduka 2014 that assessed adherence to treatment guidelines for uncomplicated malaria at two public health facilities in Nigeria found that, out of the 2171 patients who had been treated for uncomplicated malaria, only 49% were sent for laboratory confirmation of malaria, out of which 45% tested positive. 51 percent of the prescriptions were based on presumptive treatment. 58 percent of negative slide results received antimalarial drugs (Ezenduka et al., 2014). Even when the results were negative, prescribers still presumed that the patients were having malaria based on the symptoms they presented and went ahead to give antimalarial medicines to them.

In evaluating the knowledge of the T3 policy, a study by Faust 2015 assessing the drivers of full adoption of the Test and Treat Policy revealed that though national policies in Senegal have already spread across the malaria-endemic areas, adherence to policy implementation is still limited (Faust et al., 2015). This study indicates that prescribers do not comply fully with all the components of the T3 policy strategy. There are two main components of the case management strategy: accurate case identification through testing and effective treatment with

ACTs (Hamer et al., 2007). Though effective drugs are available, thousands of people in high -risk areas still cannot have easy access to required treatment (WHO, 2012). This is an indication that people still do not have access to recommended drugs and there is the need to evaluate the implementation process to address the challenges confronting the operations of the guidelines.

In 2010, over 181 million ACT drugs were distributed throughout the world in the public sector, increasing from 158 million in 2009. ACT use was estimated to get to 287 million courses in 2011, which was an increase of 30 percent compared to 2010 due to discounted sales in the private sector (WHO, 2012). Active surveillance for malaria cases involves health workers searching for malaria infections at community and household levels in populations that are seen to be at high-risk. Improved reporting on malaria cases and deaths give an idea of people and places most affected to inform the decision as to where resources are needed most and also enable policymakers to take appropriate decisions in malaria prevention and control programs (WHO, 2012). From the case management policy, malaria cases must be documented properly so that age groups affected and the death cases from malaria ascertained. However, this process has not been very effective in most health facilities especially the licensed chemical sellers who are very close to the community and served as the first point of call, when one is not well.

Another study on the accuracy and perception of test-based malaria case management which used the mixed method on both clients and licensed chemical sellers found out that test-based management of suspected malaria cases at the licensed chemical shops was widely accepted as an effective method of improving diagnoses for malaria treatment though there are few challenges in the implementation. This finding adds to the rising evidence in the resource-constrained countries, including Ethiopia, Senegal, Sudan, and Uganda where the test-based management of malaria using RDT by non-health professionals has proven to be an innovative strategy in malaria diagnoses and treatment (Kwarteng et al, 2019)

2.5 Practice of T3 malaria policy

The NMCP in Ghana recommends strategically that all suspected malaria cases are confirmed in agreement with the T3 policy guidelines (GMIS, 2016). Diagnosing malaria in the early stage and applying the right treatment is very paramount in morbidity and mortality reduction. Several factors like accessibility, patient gender, attitude among others influence the health-seeking behavior of patients. Evaluating the attitude and practice of community members regarding the diagnosis and treatment of malaria contribute to the efficient control of the disease and supports the process of selecting an appropriate intervention, to obtain full participation from participants.

A cross-sectional study among Ghanaian prescribers in two different regions in Ghana (Western and Central) assessed the knowledge, attitude, and practice of 100 prescribers at four different facilities to know the various factors affecting prescribers' decisions on using RDTs in the process of prescription. From the study, respondents had good knowledge of about 73% of the total sample of 100 prescribers, and the routine use of malaria testing as 84 %, only 9 % relied completely on malaria test results for treatment (Prah, 2019). The study depicted that though about 90 percent of the participants were aware of the malaria test and diagnostic guidelines, and the only handful was using the feedback from the test results (Prah, 2019). The factors accounting for the barriers in the implementation of the WHO malaria treatment guidelines by prescribers were found to be coming from both the health worker level and the health systems-related, which could be potentially redressed.

A study found out that in practice some prescribers mostly do rely on symptoms relatively to RDT results and prescribe according to the patient symptoms. The study revealed that RDT has not been effectively used with regards to the dispensaries and identifying reasons accounting for acceptance and adherence by prescribers to the results may support to improve

the strategy aimed at effective implementation of cost-effective and accurate diagnostic tool (David, n.d.).

The test and the treatment of malaria infections using the recommended guideline is associated with implementation and adherence challenges. The major challenge at the CHPS compounds were frequent RDT stock-outs. The CHPS compounds were mostly affected because RDT was the only diagnostic tool available for testing. Health Centers also mentioned a lack of diagnostic facilities such as microscopy as a major challenge (Agandaa et al, 2016).

A study that looked at the challenges and the perception of the access to test and treat malaria policy acknowledged that some people did not participate in the Mass testing, treatment, and tracking (MTTT) activities because of misconceptions and rumors spread in the community (Ndong et al., 2019). One reason for their refusal to participate was the perception that health workers were infecting people. They believed that epilepsy was being introduced into the blood of the person through the needle prick and that some of the volunteers were spiritualists. From the study, some community members did not like the medicine because they experienced side effects such as stomach upset, dizziness, or headache after taking the medicine (Ndong et al., 2019).

The over-treatment of uncomplicated malaria using ACT as a prescription for patients under presumptive diagnoses was higher (30.6%) among patients who presented feverish conditions as signs of malaria, with those showing various symptoms other than fever going for 17.2%. Some of these invalid practices were found relative to other research on health professionals. Apart from malaria control progress made over the years, case management, and unsuitable treatment remains a challenge for health systems of many malaria-endemic countries (Kwarteng et al, 2019). This initiative of the WHO is obviously a positive attempt to improve case management by ensuring adherence to the T3 guidelines as per the treatment protocols of each WHO member state.

A study conducted in Bongo in the Upper East Region of Ghana revealed that frequent RDT stock-outs (39.3%) as the major challenge followed by lack of diagnostic (35.7%) with the least being frequent ACTs stock-outs (3.6%). RDT shortage was key at the CHPS level, lack of diagnostic facilities was a major challenge at the Health Centre level whilst the District Hospital, however, did not have any challenge (Agandaa et al, 2016). A study in Western Uganda reported that few prescribers raised concerns about RDT negative test that later proved to be smear-positive (Altaras et al., 2016). A study found out that the individual or caregiver confidence of the test may have influenced whether the individual who is sick and tested for malaria would adhere to the test result. In other words, there were several places of evidence from the study that suggested that the testing and the treatment decisions were made largely by the health worker. Additionally, regardless of the test status, the study reported that about 84 percent of individuals were given ACT at the health facility or pharmacy.

2.6 Conclusion

Chapter two summarized the literature examined to address the research questions. The literature reviewed included: a general description of the malaria test, treatment, and follow-up, T3 policy initiative; the proportion of malaria patients tested, treated, and monitored; compliance; awareness of the malaria test, treatment, and follow-up policy; attitudes towards the malaria test, treatment, and monitoring policy; implementation of the test, treatment, and follow-up of malaria policies and facility issues relating to adherence to the T3 programme.

CHAPTER THREE

METHODS

3.0 Study design

The study used secondary data from the Coffey International study "Ghana's implementation of the Test, Treat and Track Policy for Malaria" for the analysis. The parent study was a descriptive cross-sectional study using mixed methods. However, this study used the descriptive cross-sectional study data with quantitative methods. The quantitative method used surveys and other available service delivery data to provide quantitative estimates of the desired outcomes of the project. The method was used to collect information on T3 malaria policy implementation among service providers at the health facilities and clients exit interviews.

3.1 Study Area

The study was conducted in six districts: Nzema East Municipality, Mpohor District, Kintampo North Municipality, Kintampo South District, Jirapa Municipality, and Mamprusi Municipality across three Regions in Ghana – Western North Region, Bono East Region, and Upper East Region. Selected districts were those districts where malaria interventions funded by Comic Relief had its intervention programmes undertaken. Also, Ghana has 3 malaria epidemiologic zones: the northern savannah, the tropical rainforest, and the coastal savannah/mangrove swamps (Owusu, Brown, Grobusch, & Mens, 2017). The six districts were carefully selected to represent each of the 3 malaria epidemiologic zones.

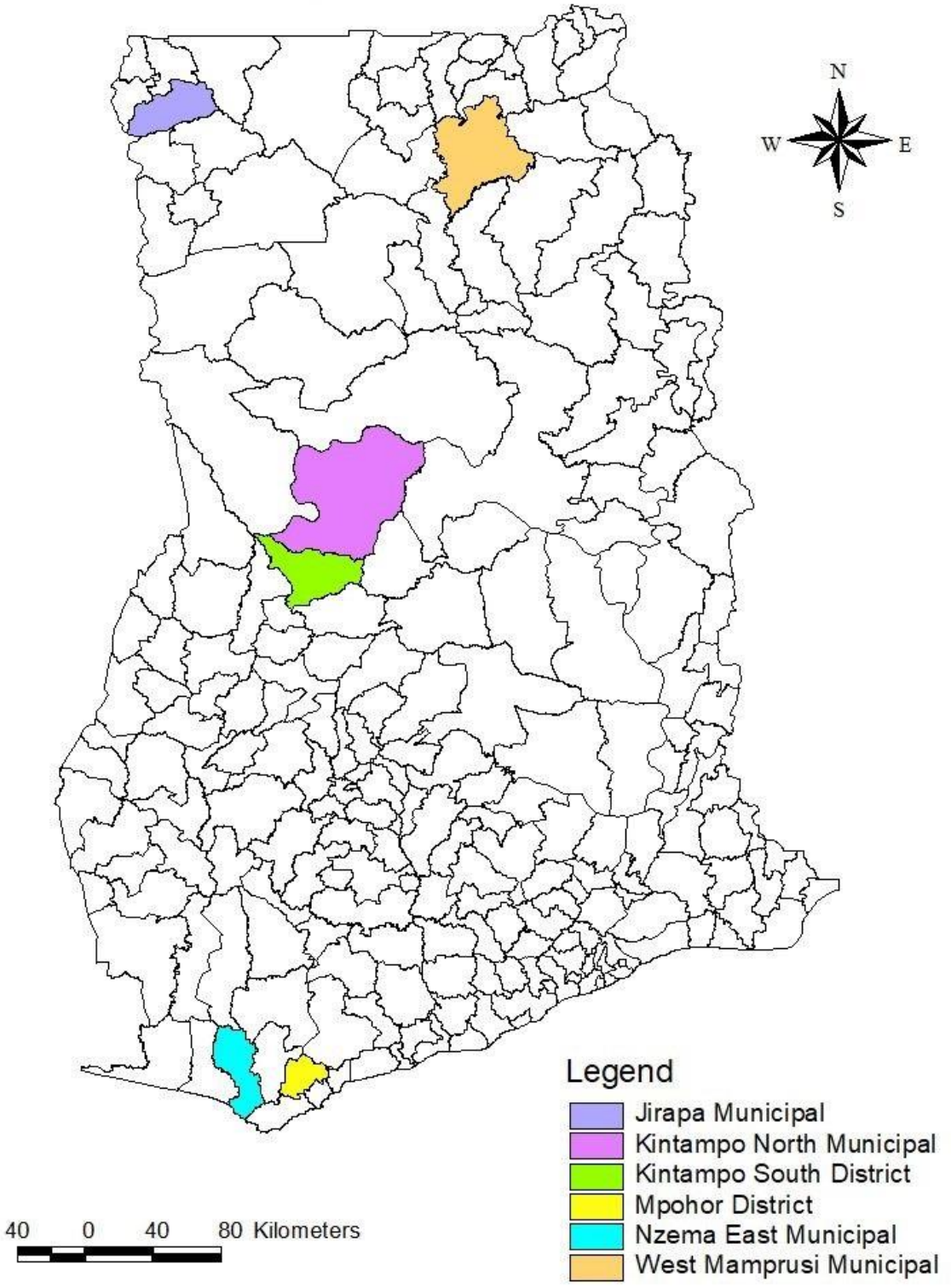
Mpohor District and Nzema East Municipal are both located in the Western North region. The two largely rural districts have a total population of about 130,000, the majority of whom engage in fishing, agro-processing, and mining. The area which is highly endemic in malaria has a doctor-patient ratio of 1:21461 has 2 district hospitals, 5 health Centres, and 9 CHPS compounds by way of public health facilities. Key issues or challenges of the districts include poor road network, poor health infrastructure, inadequate potable water, poor drainage system,

inadequate educational infrastructure, inadequate market structure, inadequate services the high number of poor and vulnerable groups, and low agricultural production.

The Kintampo north municipality and Kintampo south district are located within the forest-savannah transitional ecological zone in the Bono East region of Ghana. The 2 districts cover an area of 7162km2, which is largely rural with a resident population of approximately 160, 000 who are predominantly practicing subsistence farming. Public health facilities in the 2 districts include 2 hospitals, 12 health centres/clinics, and 30 Community-based Health Planning and Services (CHPS) compounds; whilst the privately-owned health facilities included 4 clinics, 2 maternity homes, 4 pharmacies, and 86 Over the OTCMS (Afari-Asiedu et al., 2018).

Jirapa and West Mamprusi Municipalities are located in the northwestern part of the Upper West region and North East regions respectively. The vegetation of the 2 municipalities is Guinea Savanna woodland with light undergrowth and scattered trees. The major economic trees are shea, dawadawa, and baobab species. The population for the 2010 population census is approximately 138,000 (GSS, 2012). The main economic activities engaged in by the people are farming, livestock rearing, and fishing. Malaria ranks tops as a major health problem. Public health facilities in the 2 districts include 2 hospitals, 1 polyclinic, 11 health centres/clinics, and 35 CHPS compounds.

Figure 1 Map of Ghana showing the T3 study districts



Source: Coffey International T3 malaria evaluation, 2019.

3.2 Target Population

The study was conducted using health facilities. Specifically, health care providers working in government health facilities were interviewed to determine their knowledge and adherence to the T3 policy. Also, community members (client) exit interviews were conducted and gathered evidence on client perspectives on the malaria T3 policy. The focus was on clients who have had an episode of malaria and have received treatment at different health facility level i.e., Hospitals, Health Centres and CHPS.

3.3 Sample size for the survey

Thirty (30) health facilities were assessed across the three regions. In each of the selected districts, the government hospital, a health Centre and three (3) CHPS compounds providing malaria services were visited, and readiness to provide malaria services and their adherence to the T3 policy were assessed. Twenty (20) client-exit interviews were conducted in each of the five facilities per district, thus in total, in each district, 100 client-exit interviews were to be undertaken. The total for six districts was 600 client-based interviews. However, in all 590 out of the targeted 600 clients were actually interviewed for the study.

3.4 Quantitative data collection

In each district, five health facilities were studied. The five health facilities comprised of 3 CHPS compounds, 1 health Centre, and 1 district hospital. The data collection period was spanned for over two weeks. Face to face interviews using structured questionnaire was used to collect information on knowledge and adherence to the T3 policy among service providers and clients. The clients were interviewed as they exited the facility after treatment. The proportion of client interviews per district was 100. The data collectors and supervisors were trained on the objectives of the study, data collection tool, and mode of data collection. To ensure the quality of data, three days of training were given to both the data collectors and supervisors on the objectives of the study, data collection tool and mode of data collection.

3.5 Inclusion and exclusion criteria

3.5.1 Inclusion criteria

1. Eligible patients willing to be consented into the study
2. All health care providers working in facilities in the selected districts.
3. Clients who have had an episode of malaria and have received treatment at the selected health facility.

3.5.2 Exclusion criteria

1. Excluded from the analysis all non-health workers
2. Clients from non-selected health facilities.
3. Clients without an episode of malaria during the survey.

3.6 Quality Control

To ensure the quality of data, the questionnaire was pre-tested on 10% of the sample size at different health facilities across the same district and their respective clients. The result of the pre-test was analyzed and necessary modifications were made before the actual data collection. The completed questionnaires were submitted to the data managers. The data managers kept the questionnaires and transcribed materials in a cabinet under lock and key. The site investigators, data managers were responsible for the safety of the questionnaires to avoid a third party from having access to it.

3.7 Data collection and management

Data were collected electronically using Cosmos Version 1.6 data collecting App. This was a platform for data collection, analysis, mapping, and reports. It works on Windows and Android mobile phones. Electronic data files were stored on a cloud-based secured platform hosted by Coffey International. In addition to this, individual sites also hosted their respective site data on their local servers. The data stored on this secured server were encrypted so it can only be

accessed by those with the correct encryption key. The encryption key was only available to members of the immediate research team who analyzed the data. All hard copies of data sheets were kept in a locked file cabinet that was accessed by the programme managers. For the purposes of this study, data collected for variables like facility approach to malaria services, awareness of T3 policy, access to training on T3 policy, client's treatment information and tracking records were extracted for the analysis.

3.8 Study Variables

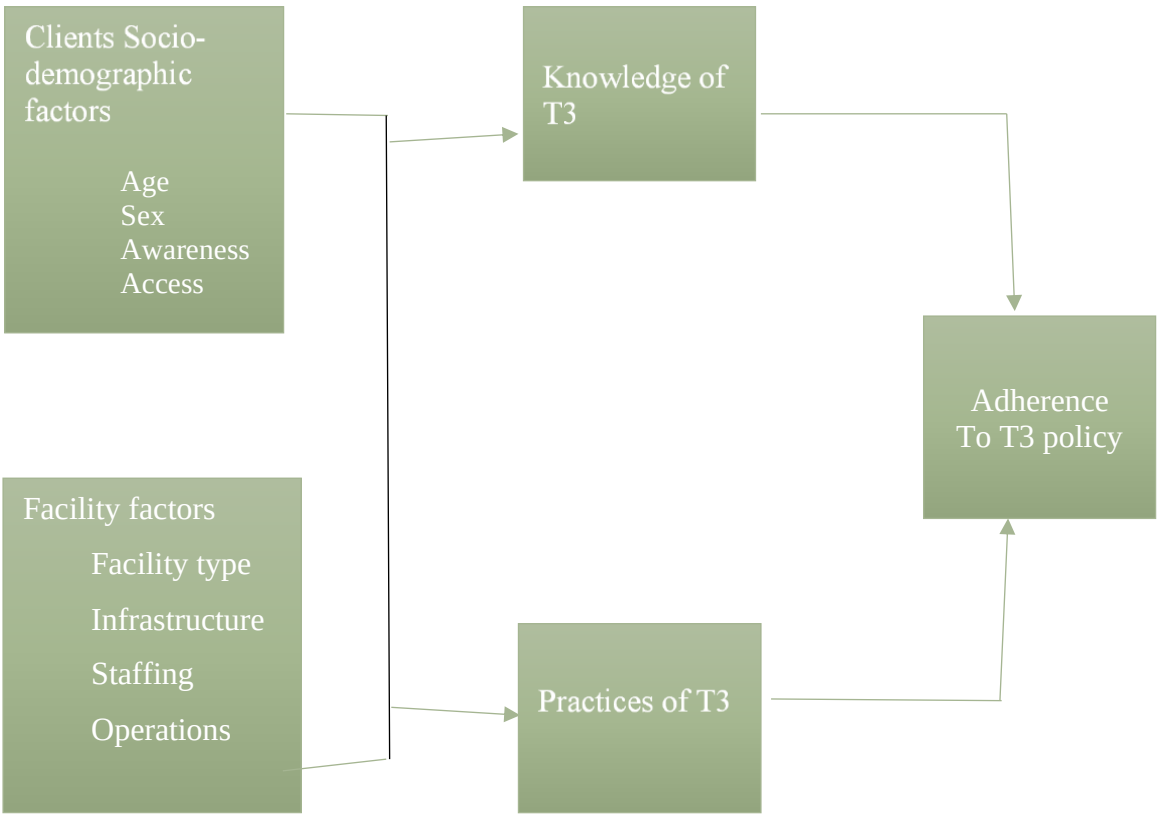
3.8.1 Outcome variable

The specific outcome of interest is the adherence to the T3 policy. Adherence to the policy in the study refers to accepting and using the three processes of testing, treating, and an indication of tracking of cases treated at the facilities.

3.8.2 Exposure variable

The key exposure variables are the indicators of adherence, comprising of different facility level characteristics with regards Hospitals, Health Centres and CHPS, infrastructure and approach to malaria services and the background of clients, including age and sex, and the availability and access to RDTs and awareness of malaria T3 policy as well as the interplay of follow-up and practice.

Figure 2 Conceptual framework of the T3 malaria policy



Source: Adapted from Boadu et al, 2016

3.9 Explanation to the Conceptual framework

Several factors influence the decision of a health facility and community members to adhere to a policy, by testing before treatment of feverish conditions as provided by the WHO T3 policy guidelines. For this study, the factors influencing health facility and client's adherence to the T3 policy have been grouped into health facility level factors and patients' or client's factors. Health facility factors comprised of facility infrastructures like access to water and toilet facilities and designated phone and availability of services which includes the availability of RDTs or microscopy, while the patient factor includes access, awareness, knowledge. The study dwells on the concept of the effect of inadequate facility resources on service provision which can influence the outcome of an intervention programme (Amoakoh-Coleman et al., 2016).

Demographic variables like sex, age, level of the facility, location of the facility whether urban or rural also play a major role in ensuring the success of a particular policy. Other factors such as mode of operation of services for testing with RDTs and other services to support a particular intervention could also influence the process. Beyond these factors, the adherence to the policy may largely depend on whether the beneficiaries of the policy know, a positive attitude, and are willing to practice during policy implementation. According to Abor et al. (2011), the utilization of maternal health services and intensity of use of antenatal services was influenced by several variables including the age of mother, education of mother, ethnicity, economic status, geographic location, and religious affiliation. Also, according to Ansah et al. (2016), demographic characteristics and socio-economic status are among the factors influencing the choice of health-seeking for acute fever in Ghana. Malaria diagnosis and treatment encompasses an interplay of factors from both clients and health facility levels. Availability of guidelines and the level of care at the primary health care is significantly associated with the adherence to the T3 malaria policy (Sciences, 2018).

Table 1. Study variable of interest and definition

TERM	DEFINITION
Study participant	A person selected as part of the study
Healthcare provider	Health worker delivering service by prescription at the facility
Compliance	Patient who has been tested, treated and given information for review
Client	Patient who has had episode of malaria and had visited health facility
Challenges	Factors hindering opportunity to access the T3 policy at the facility
Knowledge	Being aware and responsive to the test, treat and track policy
Practice	Received test, treat and tracked
T3 policy	Testing, treating and tracking of suspected malaria cases
Adherence	Compliance to the T3 malaria policy processes

Table 2: Objective and Outcome measurement

Objective	Outcome	Measure	How to measure
To assess the knowledge of the T3 malaria policy among health facilities.	Knowledge of testing before treatment	Estimating the percentage of facilities having knowledge on T3	Fraction of Health facilities with knowledge on testing, treating and tracking for malaria cases Use Fishers exact test to determine the relationship between Knowledge and T3 policy.
To assess the adherence of T3 malaria policy among facility levels.	Adherence of T3 policy among facilities	Calculating the percentage of facilities adhering to the T3 policy	Fraction the proportion of Health facilities adhering to testing, treating and tracking of malaria cases. Use Fishers exact test to determine the relationship between Adherence and T3 policy
To find out the percentage of clients who were satisfied with the T3 malaria policy process.	Practice of testing before treating malaria case	Calculating the proportion of Clients went through the T3 policy steps	Proportion of respondents who are tested, treated and tracked were computed. Use Pearson's chi2 to determine an association between clients demographic and the proportion of clients received T3

3.11 Data analysis

Data were analyzed using Stata version 14.0. Tabulations were done to evaluate the characteristics of the health facilities and the clients who visited the facilities. Descriptive statistics were used in explaining all the indicators relating to the outcome of the study Categorical variables were expressed as frequencies and percentages. The health facility levels, the facility type, the operation of the facility, and other variables were presented using tables and graphs. Fisher's exact test was used to determine the relationship between knowledge, adherence, and T3 policy. Similarly, Pearson's chi-squared test was also run to determine the association between clients' demographics, facility type, and compliance to T3 policy.

3.12 Ethical consideration

The protocol for the parent study was assessed within the Kintampo Health Research Centre's Scientific Review Committee (KHRC SRC). Ethical approval was obtained from the Kintampo Health Research Centre Institutional Ethics Committee (KHRC-IEC), Kintampo. The study protocol, data collection tools, and consent forms were presented to these bodies for review and approval. Data collection tools included structured questionnaire. A list of all participants and identifier codes were securely stored on a cloud-based platform hosted by Coffey International in the UK. On completion of the research, all data were secured on a central server hosted by Coffey International for a minimum of 10 years. Data access was limited to authorized team members only. Levels of access to the study data were established before data collection to minimize version control challenges.

3.12.1 Benefit and risk

The study was reported to have had minimal risk; the questionnaires completed by participants were not sensitive. There were no direct benefits, however, the findings were expected to contribute to understanding the level of adherence to the T3 policy by study participants. No compensation was to be paid to participants.

3.12.2 Privacy

The researchers ensured that the interviews were conducted in a secured place free from the interaction of other ongoing activities and privacy. The participation in the interviews was made voluntary with a free will to participants. Participants were given the additional option to opt-out at any point of the interview without any implications of their decision.

3.12.3 Informed Consent

Participants who agreed to be part of the study were made to sign or thumbprint a consent form as an indication of their willingness to participate. The consent forms were read and explained to participants who cannot read, in the presence of an impartial witness. In situations where the respondent was not physically present, interviews were conducted via telephone. The purpose of the study, the benefits, and rights of the participants, and the procedure involved were explained to all participants.

3.12.4 Voluntary participation

Participating in the study was entirely voluntary and participants were also at liberty to withdraw from the study at any stage of the participation. Participants were assured of confidentiality and voluntary informed consent was obtained from all participants, by signing a consent form, except in situations where the respondent was not physically present and was interviewed via phone.

3.12.5 Conflict of Interest

Study participants were informed that the principal investigators do not have any commercial interest in the outcome of the study.

3.12.6 Anonymity and confidentiality

All information provided by the respondents was kept confidential and data were locked in a cabinet and on computers protected by passwords. The name and identity of the respondent was not recorded for the purposes of the study. The information provided was only to be identified by a code number and treated with strict confidentiality. Respondents' name was not to be mentioned in any part of the report of this study.

3.13 Dissemination

The findings of the study would be communicated to the GHS and the communities within the study area. Findings of this study will be publicized through stakeholder engagement, publication in scientific journals (of international repute), policy briefs and presentations at national conferences.

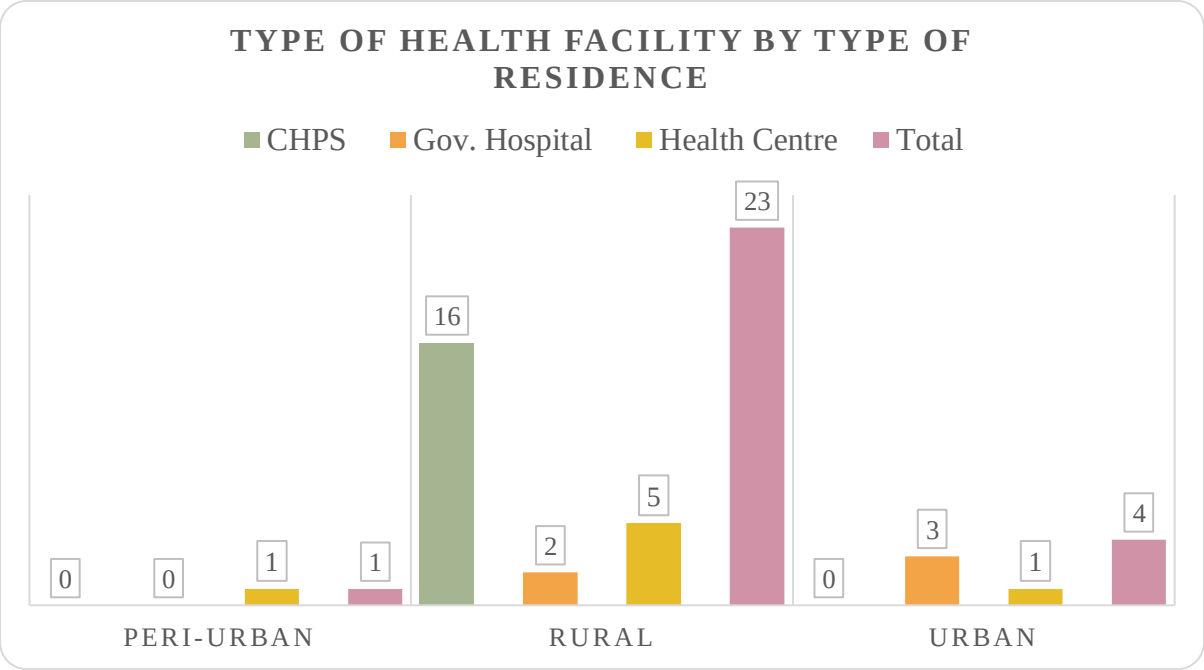
CHAPTER FOUR

RESULTS

4.0 Introduction

This section presents an analysis of the study outcomes. The descriptive statistics presented are in line with the study objectives and outcome.

Figure 3 Distribution of Health Facilities by location



The above figure shows that all the CHPS compounds (100.0%) were in the rural area, whiles the Government Hospital had 3 out of 5 facilities in the urban areas.

4.1 Basic characteristics of different health facility levels

The study examined the availability of basic health facility infrastructure that supports the delivery of effective service to clients. Among them was access to designated phones, availability of water, and access to toilet facilities.

Table 3 Description of basic health facility infrastructure at different levels

Indicator	CHPS n (%)	Gov. Hospital n (%)	Health Centre n (%)	Total n (%)
Number of Facilities	16 (57.1)	5 (17.9)	7 (25.0)	28 (100)
Designated Phone				
No	11 (68.7)	1 (20.0)	5 (71.4)	17 (60.7)
Yes	5 (31.3)	4 (80.0)	2 (28.6)	11 (39.3)
Total	**16 (100.0)**	**5 (100.0)**	**7 (100.0)**	**28 (100.0)**
Water Availability				
No	6 (37.50)	0 (0.0)	0 (0.00)	6 (21.4)
Yes	10 (62.50)	5 **(100.0)**	7 (100.0)	22 (78.6)
Total	**16 (100.0)**	**5 (100.0)**	**7 (100.0)**	**28 (100.0)**
Toilet Facility				
No	4 (25.0)	0 (0.0)	1 (14.3)	5 (17.9)
Yes	12 (75.0)	5 (100.0)	6 (85.7)	23 (82.1)
Total	**16 (100.0)**	**5 (100.0)**	**7 (100.0)**	**28 (100.0)**

A total of 28 health facilities were examined at three different levels. The CHPS compound constituted the majority with a total number of 16 (57.14%), whiles Government Hospital was the least with a total number of 5 (17.86%) facilities in addition to 7 Health Centres representing 17.86% of the total facilities examined. Table 3 above depicts various amenities of the three levels of facilities. Most of the health facilities assessed had basic amenities such as phones and water. Apart from phones, more than 50% of facilities had basic amenities such as water and toilet facilities. The Government Hospitals had higher, 80.0% designated phones with only 20.0% not having a phone assigned for service delivery. With the Health Centres, the number of facilities without designated phones was high with 71.4% not having access to phones. On availability of water at the various facility levels, 6 out of the 16 CHPS compound facilities did not have access to water. Both the Government Hospitals and the Health Centres had water available, to enhance service delivery. With the availability of toilet facilities, CHPS

compounds had 4 (25%) of the facilities not having access to toilet, but Health Centres and Government Hospitals had higher accessibility to water with 85.71% and 100% respectively.

4.2 Facility approach to malaria services

The study assessed the mode of service delivery at the various health facilities in terms of the availability of flyers for displaying malaria messages, availability of guidelines and protocol for malaria care, the presence of functional laboratory for microscopy and mRDT, performing checks for hemoglobin, and finally whether facilities perform microscopy services.

Table 4 Description of different facility level approach to malaria services

Indicators	CHPS n (%)	Gov. Hospital n (%)	Health Centre n (%)	Total N (%)
Does health facility display availability of malaria services?				
No	0 (0.0)	0 (0.0)	1 (14.3)	1 (3.6)
Yes	16 (100.0)	5 (100.0)	6 (85.7)	27 (96.4)
Availability of guidelines and protocol for malaria care				
No	1 (6.3)	0 (0.0)	0 (0.0)	1 (3.6)
Yes	15 (93.7)	5 (100.0)	7 (100.0)	27 (96.4)
Functioning laboratory for malaria microscopy				
No	16 (100.0)	0 (0.0)	6 (85.7)	22 (78.6)
Yes	0 (0.0)	5 (100.0)	1 (14.3)	6 (21.4)
Availability of kits for malaria testing				
No	1 (6.3)	0 (0.0)	0 (0.0)	1 (3.6)
Yes	15 (93.7)	5 (100.0)	7 (100.0)	27 (96.4)
Check for hemoglobin for patients				
No	10 (62.5)	0 (0.0)	2 (28.6)	12 (42.9)
Yes	6 (37.5)	5 (100.0)	5 (71.4)	16 (57.1)
Facility performs microscopy services for malaria				
No	16 (100.0)	0 (0.0)	6 (85.7)	22 (78.6)
Yes	0 (0.0)	5 (100.0)	1 (14.3)	6 (21.4)
Total	**16 (100.0)**	**5 (100.0)**	**7 (100.0)**	**28 (100.0)**

The analysis of the approach to malaria services of the various facilities with regards to the three different health facility levels is shown in Table 4 above. It would be seen that all of the 16 CHPS and the 5 Government Hospitals surveyed displayed the availability of malaria services. However, there was only 1 out of the 7 Health Centres that did not display the information at the facility. In asking for the availability of guidelines and protocol for malaria care, the study found that all (100%) of both the Government Hospitals and Health Centres guidelines and protocol for malaria services, whiles only 6.3% of the CHPS had no guideline and protocol for malaria care. Apart from the Government Hospitals which had all 5 functioning laboratories to test for malaria cases, the table 4 shows that all the 16 CHPS compounds did not have functioning laboratory and so do not perform any microscopy test and about 6 of the Health Centres do not also have laboratory and therefore do not also perform microscopy test. Government Hospital showed 100% available functional laboratories for testing and confirming cases. In all, less than 30% of the facilities had a functional laboratory for microscopy testing services and actually, none were found at the CHPS level. The study enquired about staff with RDT training in the participating facilities, out of which only 37.5% out of the 16 CHPS compound facilities confirmed having no RDT training, with the Government Hospital and the Health Centres having 100% training on RDTs. In all, 96.4% of the facilities had available kits for malaria testing and 62.5% of CHPS compounds do not check for hemoglobin in the process of care. However, all 5 Government Hospitals surveyed, and 5 out of the 7 Health Centres checked for hemoglobin. The Health Centres had only 28.6% using microscopy for testing malaria cases.

4.3 Knowledge of T3 policy among different health facility levels

To assess the knowledge of facilities on the T3 malaria policy, participating facility professionals were asked whether they are aware of the policy implementation, whether they have received training on the policy and how they confirm malaria cases.

Table 5 Indicators for assessing knowledge of T3 malaria policy

Indicator	CHPS n (%)	Gov. Hospital n (%)	Health Centre n (%)	Total N (%)
Awareness of the T3 policy				
No	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Yes	16 (100.0)	5 (100.0)	7 (100.0)	28 (100.0)
Have you received training on T3 policy				
No	6 (37.5)	0 (0.0)	0 (0.0)	6 (21.4)
Yes	10 (62.5)	5 (100.0)	7 (100.0)	22 (78.6)
How facility confirm malaria cases				
Microscopy	0 (0.0)	1 (20.0)	0 (0.0)	1 (3.6)
RDTs	16 (100.0)	4 (80.0)	7 (100.0)	27 (96.4)
Total	**16 (100.0)**	**5 (100.0)**	**7 (100.0)**	**28 (100.0)**

In testing and confirming results for malaria cases, the facilities showed a good knowledge of the policy by all the three facilities, as depicted in table 5. The facility respondents were asked if they were aware of the T3 malaria policy, to which all 16 CHPS, 5 Government Hospital, and the 7 Health Centres confirmed awareness, indicating a higher rate of awareness in all the facilities. It is significant to note that almost all three facilities indicated that they were aware of the T3 malaria policy guidelines. On the question of whether the health workers have received training on T3 malaria, 6 out of 16 CHPS compounds indicated they have not received training, while higher percentages were recorded at 100% Government Hospitals and 100% Health Centres for having been trained on the T3 policy. A higher number of facilities indicated using RDTs when asked on how facilities confirm malaria cases. Both the CHPS and the Health Centre confirmed 100% usage of RDTs, while 20.0% of the Government Hospitals use microscopy to test and confirm the case. The outcome of the assessment showed a higher proportion of knowledge among all facilities based on the indicators measured.

4.4 Adherence to treatment of malaria cases among different health facility levels

The various health facility level adherence to the treatment using T3 guidelines was measured using the availability of medications and indication of whether the facility had had stock-outs for more than 72 hours, which might influence service delivery with regards to treatment.

Table 6 . Indicators for treatment among different health facility levels

Indicators	CHPS n (%)	Gov. Hospital n (%)	Health Centre n (%)	Total N (%)
Availability of medicines				
Artemether Lumefantrine	3 (20.0)	3 (60.0)	0 (0.0)	6 (22.2)
Artesunate Amodiaquine	11 (73.3)	0 (00.0)	6 (85.7)	17 (63.0)
Quinine	1 (6.7)	2 ((40.0)	1 (14.3)	4 (14.8)
Total	**15 (100.0)**	**5 (100.0)**	**7 (100.0)**	**27 (100.0)**
Has the HF had any stock out for more than 72 hours				
No	10 (62.5)	4 (80.0)	6 (65.7)	20 (71.4)
Yes	6 (37.5)	1 (20.0)	1 (14.3)	8 (28.6)
Total	**16 (100.0)**	**5 (100.0)**	**7 (100.0)**	**28(100.0)**

Table 6. above shows that CHPS compounds had higher usage (73.3%) of Artesunate-Amodiaquine as preferred medication, and 60.0% of the Government Hospital also used Artemether Lumefantrine. From the study, though artesunate-amodiaquine was the highest ACT used among the total facilities, there was none available at the Government hospitals at the time of assessment. The study further revealed that all three facilities had some usage of quinine which is recommended for the second line of treatment aside from the ACTs, with Government Hospital having the highest use of 40.0% of the facilities. As shown in table 6, except for one CHPS compound, the rest of the 27 facilities used some type of antimalarial for the treatment of malaria cases. The analysis showed that 6 CHPS compounds had stock out for

more than 72 hours and in all the facilities, 8 out of the total 28 facilities had stock out for more than 72 hours.

4.5 Adherence to tracking of malaria cases among different health facility levels

In measuring the adherence to tracking of malaria cases by various facilities, the study looked at the type of emergency transport which could be used to facilitate the tracking process and staff responsible for tracking malaria cases.

Table 7 Indicators of tracking malaria cases among different health facility levels

Indicators	CHPS n (%)	Gov. Hospital n (%)	Health Centre n (%)	Total N (%)
Types of emergency transport				
Ambulance	0 (0.0)	3 (60.0)	0 (0.0)	3 (10.7)
Motorbikes	5 (31.3)	1 (20.0)	2 (28.6)	8 (28.6)
Other	0 (0.0)	1 (20.0)	0 (0.0)	1 (3.6)
Private vehicle	2 (12.5)	0 (0.0)	0 (0.0)	2 (7.1)
Taxis	9 (56.3)	0 (0.0)	5 (71.4)	14 (50.0)
Total	**16 (100.0)**	**5 (100.0)**	**7 (100.0)**	**28 (100.0)**
Responsibility for tracking cases				
Community Health nurse	9 (56.3)	1 (20.0)	3 (42.9)	13 (46.4)
Doctor	0 (0.0)	1 (20.0)	0 (0.0)	1 (3.6)
Health Assistant Clinical	1 (6.3)	0 (0.0)	2 (28.6)	3 (10.7)
Medical Physician Assistant	0 (0.0)	2 (20.0)	1 (14.2)	3 (10.7)
Midwife	3 (18.8)	0 (0.0)	0 (0.0)	3 (10.7)
Nurse RGN	2 (12.5)	1 (20.0)	1 (14.3)	4 (14.3)
Other	1 (6.23)	0 (0.0)	0 (0.0)	1 (3.6)
Total	**16 (100.0)**	**5 (100.0)**	**7 (100.0)**	**28 (100.0)**

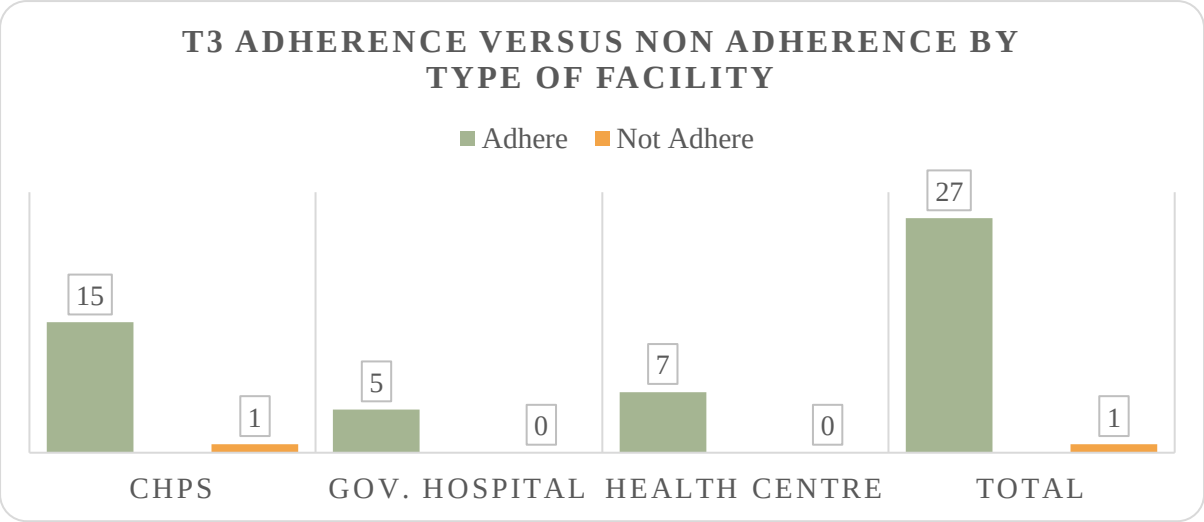
Considering the transportation system that can be relied on to support tracking of malaria cases by facilities, more than half of the CHPS compounds (9 out of 16) and Health Centres (5 out of 7) representing 56.3% and 71.4% respectively use taxis as emergency transport. In terms of ambulance service, the Government Hospitals were the only health facilities with access to this service with 3 out of the 5 government hospitals surveyed. In all cases, various facilities had

some option of emergency transportation for service delivery, with the CHPS and the Health Centres relying on motorbikes as the second option with 31.3% and 28.6% respectively, while 12.5% of CHPS facilities also use private vehicles as the third option. Table 7 showed that responsibility for tracking cases relying on community health nurses were higher 9 out of the 16 CHPS, with Health Centres also relying mostly on the same category of staff with 3 out of 7 facilities. Apart from the community health nurses, CHPS depended on the Registered Nurses, whiles the Health Centres also depended on the Health Assistants as the second category of staff responsible for the tracking of cases. In the Government hospitals, the data showed that Medical Physician Assistants dominated with 2 out of 5 facilities studied. Doctors, Registered Nurses, and Physician Assistants were not much involved with the responsibility for tracking cases with low percentages from the various facilities with 3.6%, 14.3%, and 10.7 respectively.

4.6 General adherence to T3 policy among different health facility levels

After assessing the various indicators influencing adherence of health facility professionals to implement the T3 policy, the data gathered revealed that almost all the facilities adhered to the T3 policy with a higher proportion.

Figure 4 Different Health Facility Adherence level



The general adherence level from the facility perspective as shown in figure 5 above revealed a high adherence of 100% each from both the Government Hospitals and the Health Centres respectively. This was based on indicators, awareness, and access to training of health professionals. Apart from one CHPS compounds, the rest of the facilities surveyed representing 27 (96.4%) out of the 28 facilities, showed a high level of adherence from all the indicators measured.

4.7 Health professionals' knowledge, adherence and the T3 policy

Table 8 Relationship between facility adherence and T3 policy

Variable	Facility adherence to T3 policy		Fisher's exact	p-value
	Not Adhere (%)	Adhere (%)		
Facility type				1.000
CHPS	1 (100.0)	15 (55.6)		
Gov. Hospital	0 (0.0)	5 (18.5)		
Health Centre	0 (0.0)	7 (25.9)		
Total	**1 (100.0)**	**27 (100.0)**		

The research revealed that there was no relationship between facility types and adherence to the T3 policy, (p = 1.000) as per the Fisher's exact test. From Table 8, only one facility responded not complying with all the three processes of the T3 guidelines. Awareness of T3 among facility level was 27 out of the 28 health facilities, so there was no relationship between the facility type and knowledge.

4.8 Basic characteristics of clients

The study conducted 590 client-based exit interviews from the three facility levels. Out of the total participants, 347 (58.8%) were from CHPS compounds, 128 (21.7%) were from the Government Hospital and 115 (19.5%) from the Health Centres, as displayed in table 9. The clients recruited into the study were distributed across the six districts, Jirapa had 105 (17.8%), West Mamprusi 104 (17.6%), Kintampo North and South had 83 (14.1%) and 89 (15.1%)

respectively, whiles Mpohor East and Nzema constitute 104 (17.6%) and 105 (17.8% respectively. The ages of clients assessed were categorized into five groupings with the CHPS compound recording the highest of 154 (44.4%) in the age category of 0-10 years. A greater proportion 392 (66.4%) out of the 590 clients in all the three facilities were female as shown in table 9 below.

Table 9 Description of basic demographic of clients

Indicators	CHPS n (%)	Gov. Hospital n (%)	Health Centre n (%)	Total n (%)
Total Clients	347 (58.8)	128 (21.7)	115 (19.5)	590 (100)
Districts				
Jirapa	62 (17.9)	27 (21.1)	16 (13.9)	105 (17.8)
Kintampo North	43 (12.4)	20 (15.6)	20 (17.4)	83 (14.1)
Kintampo South	49 (14.1)	20 (15.6)	20 (17.4)	89 (15.1)
Mpohor East	65 (18.8)	0 (0.0)	39 (33.9)	104 (17.6)
Nzema	65 (18.7)	20 (15.6)	20 (17.9)	105 (17.8)
West Mamprusi	63 (18.2)	41 (32.0)	0 (0.0)	104 (17.6)
Total	**347 (100)**	**128 (100)**	**115 (100)**	**590 (100)**
Ages in years				
0-10	154 (44.4)	42 (33.3)	16 (13.9)	212 (35.9)
11-19	46 (13.3)	14 (11.1)	19 (16.5)	79 (13.4)
20-29	61 (17.6)	31 (24.6)	30 (26.1)	122 (20.7)
30-39	39 (11.2)	22 (17.5)	28 (24.4)	89 (15.1)
40+	47 (13.5)	17 (13.5)	22 (19.1)	86 (14.6)
Total	**347 (100)**	**126 (100)**	**115 (100)**	**590 (100)**
Sex				
Female	230 (66.3)	79 (61.7)	83 (72.2)	392 (66.4)
Male	117 (33.7)	49 (38.3)	32 (27.8)	198 (33.6)
Total	**347 (100)**	**128 (100)**	**115 (100)**	**590 (100)**

4.9 Proportion of clients tested for malaria cases

The testing of cases was measured with indicators enquiring from the participants whether an exam or test was performed after visiting the facility, asking for whether temperature, lab test, and tepid sponging were performed for the clients. In assessing the knowledge of the process,

clients were asked if they were aware of the testing process and whether the results of the test performed were explained to them.

Table 10 Indicators of testing malaria cases among clients

Indicators	CHPS n (%)	Gov. Hospital n (%)	Health Centre n (%)	Total n (%)
Did they perform any exams, procedures or tests?				
No	14 (4.0)	18 (14.1)	5 (4.4)	37 (6.3)
Yes	333 (96.0)	110 (85.9)	110 (95.7)	553 (93.7)
Total	**347 (100)**	**128 (100)**	**115 (100)**	**590 (100)**
Temperature taken, Lab Test, Tepid sponging				
Temperature taken	15 (4.6)	19 (17.3)	3 (2.7)	37 (6.8)
Lab Test	7 (2.2)	0 (0.0)	12 (10.9)	19 (3.5)
Tepid sponging	2 (0.6)	1 (0.9)	3 (2.7)	6 (1.1)
RDT	299 (92.6)	90 (81.8)	92 (83.6)	481 (88.6)
Total	**323 (100)**	**110 (100)**	**110 (100)**	**543 (100)**
Were results explained?				
No	52 (15.6)	27 (24.6)	11 (10.0)	90 (16.3)
Yes	281 (94.4)	83 (75.5)	99 (90.0)	463 (83.7)
Total	**333 (100)**	**110 (100)**	**115 (100)**	**553 (100)**
Aware you must be tested for malaria before treatment				
No	25 (7.2)	28 (21.9)	21 (18.3)	74 (12.5)
Yes	322 (92.8)	100 (78.1)	94 (81.7)	516 (87.5)
Total	**347 (100)**	**128 (100)**	**115 (100)**	**590 (100)**

As shown in table 10, Clients' responses to whether the exams, procedures, or tests were performed showed that all facilities performed these processes with higher proportions in CHPS 333 (96.0%), Government Hospital 110 (85.9%), and the Health Centre 110 (95.7%). The overall proportion indicated 93.7% of the facilities performed these processes, out of 590 clients. A high proportion of facilities adhered to the use of RDTs in confirming cases. Over 86.6% of the facilities used RDTs, with 6.8% of these facilities taking temperature. Lab test

accounted for 3.5% of the total 543 facilities adhering to the process. Awareness of testing before treatment by clients was high with 92.8% in CHPS, 78.1% in Government Hospitals, and 81.7% in the Health Centres. In all, 87% of clients were aware they must be tested before treatment.

4.10 Proportion of treated malaria cases among clients

Treatment of malaria cases using the T3 process was measured by asking clients about the possible prescription of antimalarial and the type of antimalarial prescribed.

Table 11 Indicators of treatment of malaria cases among clients

Indicators	CHPS n (%)	Gov. Hospital n (%)	Health Centre n (%)	Total n (%)
Were you prescribed any antimalarial medicine				
No	6 (1.7)	5 (3.9)	0 (0.0)	11 (1.9)
Yes	341 (98.3)	123 (96.1)	115 (100)	579 (98.1)
Total	**347 (100)**	**128 (100)**	**115 (100)**	**590 (100)**
What antimalarial were prescribed to you?				
Arsuamoon	26 (7.6)	8 (6.5)	0 (0.0)	34 (5.9)
Camoquine plus	16 (4.7)	2 (1.6)	0 (0.0)	18 (3.1)
Chloroquine	0 (0.0)	1 (0.8)	0 (0.0)	1 (0.2)
Coarsucam	2 (0.6)	3 ((2.4)	0 (0.0)	5 (0.9)
Coartem	40 (11.7)	30 (24.4)	11 (9.6)	81 (14.0)
Don't Know	20 (5.9)	7 (5.7)	0 (0.0)	27 (4.7)
Duocotexcin	0 (0.0)	1 (0.8)	0 (0.0)	1 (0.2)
Gunate	2 (0.6)	2 (1.6)	6 (5.2)	10 (1.7)
Herbal medicine	0 (0.0)	1 (0.8)	1 (0.9)	2 (0.4)
Lonart	91 (26.7)	34 (27.6)	53 (46.1)	178 (30.7)
Lumarterm	68 (19.9)	13(10.6)	17 (14.8)	98 (16.9)
Other	22 (6.5)	9 (7.3)	0 (0.00%)	31 (5.4)
Palaxin	0 (0.0)	0 (0.0)	1 (0.87%)	1 (0.2)
Quinine	2 (0.6)	1 (0.08)	0 (0.0)	3 (0.5)
Wintrhop	52 (15.3)	11 (8.9)	26 (22.6)	89 (15.4)
Total	**341 (100.0)**	**123 (100.0)**	**115 (100.0)**	**579 (100.0)**

In table 11, Above 90% of antimalarials were prescribed to clients who visited at each level of the health facility. The study revealed that 98% of the health facilities were treated with antimalarial, most of clients were provided with Lonart, followed by Lumarterm and Wintrhop, and only 0.2% were treated with Chloroquine.

4.11 Proportion of tracked malaria cases among clients

Adherence to tracking of malaria cases on clients who visited the various facilities was examined through provider follow-ups after treatment of malaria, actual tracking after medication, the staff responsible for the follow-up, and how the tracking was done.

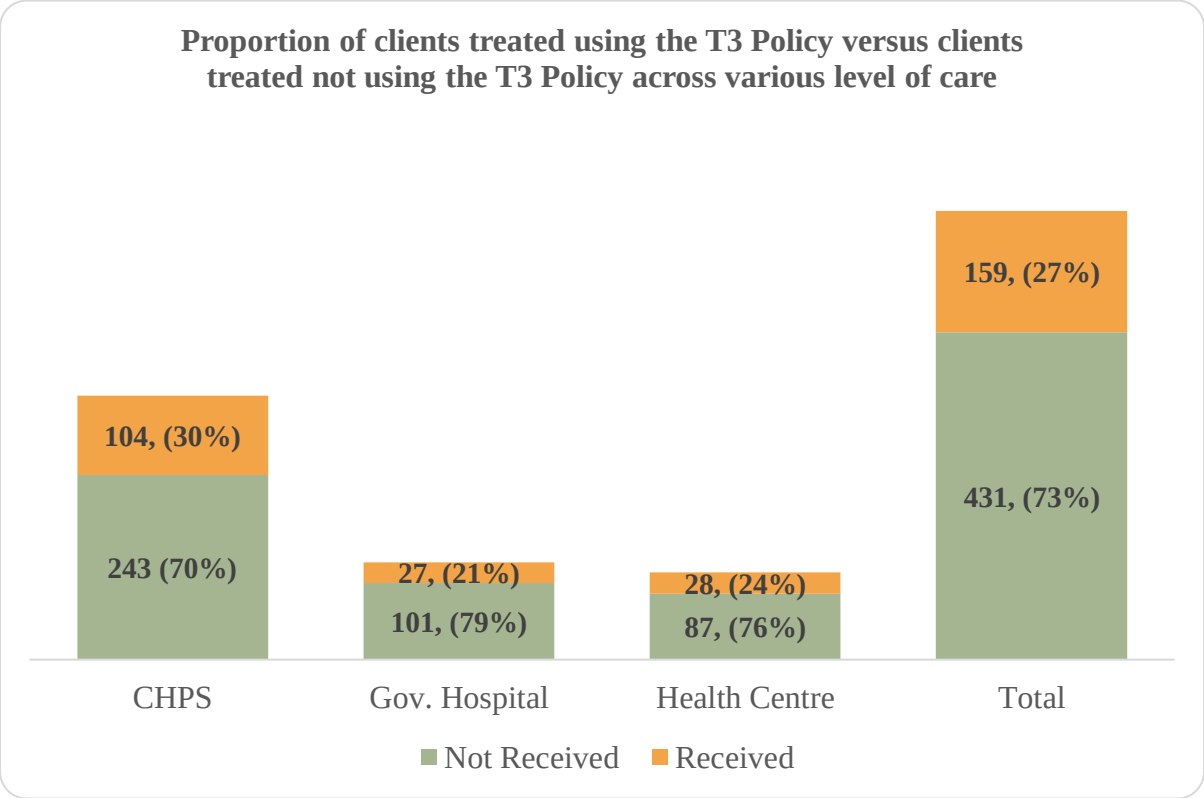
Table 12. Indicators of tracking clients after treatment

Indicators	CHPS n (%)	Gov. Hospital n (%)	Health Centre n (%)	Total N (%)
Did the provider follow-up after treating you for malaria?				
A different provider followed up	30 (8.7)	26 (20.3)	8 (7.0)	64 (10.9)
No one from facility followed up	207 (59.7)	95 (74.2)	79 (68.7)	381 (64.6)
Same provider followed up	110 (31.7)	7 (5.5)	28 (24.4)	145 (24.6)
Total	**347 (100.0)**	**128 (100.0)**	**115 (100.0)**	**590 (100.0)**
Tracking after medication				
Yes, provider track	108 (31.1)	27 (21.1)	29 (25.2)	164 (27.8)
No tracking	239 (68.9)	101 (78.9)	86 (74.9)	426 (72.2)
Total	**347 (100.0)**	**128 (100.0)**	**115 (100.0)**	**590 (100.0)**
Who asked you for follow-up				
Community Health nurse	60 (55.6)	3 (11.1)	1 (3.5)	64 (39.0)
Doctor	0 (0.0)	0 (0.0)	1 (3.5)	1 (0.6)
General Nurse RGN	11 (10.2)	8 (29.6)	16 (55.2)	35 (21.3)
Health Assistant Clinical	25 (23.2)	2 (7.4)	1 (3.5)	28 (17.1)
Medical Physician Assistant	2 (1.9)	13 (48.2)	8 (27.6)	23 (14.0)
Midwife	10 (9.3)	1 (3.7)	2 (6.9)	13 (7.9)
Total	**108 (100.0)**	**27 (100.0)**	**29 (100.0)**	**164 (100.0)**
How was the follow-up done?				
Home visit	59 (54.6)	1 (3.7)	4 (13.8)	64 (39.0)
Phone call	6 (5.7)	1 (3.7)	0 (0.0)	7 (4.3)
Return	43 (39.8)	25 (92.6)	25 (86.2)	93 (56.7)
Total	**108 (100.0)**	**27 (100.0)**	**29 (100.0)**	**164 (100.0)**

As shown in Table 12, in cases where no one from the facility followed up, 59.7% were from the CHPS compound, 78.9% from the Government Hospitals, and 68.7% from the Health Centres. The results showed in table 107 showed that the CHPS compound had an indication of 110 clients using the same provider follow up. In all 164 (27.8%) clients were tracked out of 590, whiles no tracking was done to 426 (72.2%) of the participants.

From table 12, it is shown that 55.6% of clients who visited the CHPS were asked for follow up by CHNs and indication of 54.6% actual home visits, followed by Registered Nurses with 21.3%. Most of the tracking was for clients to return to the facility for review by Medical Physician Assistants who dominated the request for follow ups in the Government Hospitals and the Health Centres with 48.2% and 27.6% respectively. In summary, 28% of the clients were indicated to be tracked by CHO in the form of returning to the health facility for review.

Figure 5 Total proportion of clients received T3 policy



The overall compliance to the T3 policy based on the various indicators measured portrayed lower compliance levels from the client's perspective. As shown in figure 6, 30% of the total 347 from the CHPS compound, 21% of 128 from Government Hospitals, and 24% of 115 from the Health Centres did not receive or complete the three processes of the policy (Test, Treat, and Track). The compliance level among clients was lower in general with 27.0% out of the total of 590 clients assessed in the study.

4.12 Clients factors associated with proportion that received T3

Pearson's chi-squared analysis was applied to determine the association between clients' demographic characteristics, facility type, and compliance with the T3 policy.

Table 13: Association between clients' demographics, facility type and compliance

Variable	Proportion of clients that received T3 policy		Pearson's chi2 Test	p-value
	Not received T3(%)	Received T3 (%)		
Sex			0.4357	0.509
Female	283 (65.7)	109 (68.6)		
Male	148 (34.4)	50 (31.5)		
Age			12.2626	*0.016
0-10	163 (38.0)	49 (30.8)		
11-19	57 (13.3)	22 (13.8)		
20-29	85 (19.8)	37 (23.3)		
30-39	54 (12.6)	35 (22.0		
40+	70 (16.3)	16 (10.1)		
Facility type			4.2343	0.12
CHPS	243 (56.4)	104 (65.4)		
Gov. Hospital	101 (23.4)	27 (17.0)		
Health Centre	87 (20.19)	28 (17.6)		
Total	**431(100.0)**	**159 (100.0)**		
*Statistically significant (p<0.05)				

The Chi test from table 13 showed that there is an association between client age and compliance with the T3 policy, ($p<0.05$). Other variables like sex and the facility type had no association with compliance or the proportion of clients tested, treated, and informed to return for a review.

CHAPTER FIVE

DISCUSSIONS

5.0 Background

The study revealed high knowledge among facility-level healthcare providers, and both RDTs and ACTs were adequately available at all the various levels measured. The adherence level among health facility operations was found to be high. However, the compliance to the tracking component of the policy was found to be very low among clients. In other words, most of the clients could not complete the three processes, though many clients were tested and treated, there was no indication of tracking for T3 process completion.

The study examined 28 different health facilities out of the total 30 facilities selected at three levels in six districts: CHPS, Hospital, and Health Centre. Among the three facilities, all the assessed CHPS compounds were found in the rural settings, while Government Hospitals were mostly located in the urban areas. The research evaluated the facility infrastructure, in line with WHO assertion that health facility service delivery is influenced deeply by the availability of basic infrastructure services. Facility approach to conduct effective service delivery was assessed by looking at basic infrastructure and operational items available at various facility level. The assessment done at the facility level revealed that a lower number proportion of CHPS had no access to designated phones, but a higher proportion had access to water and toilet facilities. More than half of the Health Centres also had no access to a phone but had water.

The study revealed that almost all the health facility levels displayed malaria service materials as a communication strategy to educate both service providers and patients. A higher proportion of the various facilities had malaria guidelines and treatment protocols serving as a reference for adherence to treatment guidelines. Government Hospitals had a higher proportion of operational infrastructure than all the facilities assessed. CHPS compounds assessed had no

functioning laboratory for malaria microscopy. This is in line with the NMCP recommendations that CHPS are supposed to use RDTs in confirm malaria cases. Health Centres have a higher percentage (85.7%) of functioning laboratory for testing cases and use RDTs in confirming cases. Apart from the Government Hospitals with 100% testing of patients for hemoglobin, the CHPS and lower proportion of Health Centers do not test for hemoglobin in the process of care. Almost all the facilities assessed had a high percentage of available kits for malaria testing with a total of 96.4%.

5.1 Knowledge of testing malaria cases among different health facility levels

The malaria treatment guidelines of the T3 policy recommend that every suspected malaria case be tested and diagnosed with RDT or microscopy before treatment with ACT according to the prescribed guidelines. The finding of the study revealed that the knowledge of the T3 policy in all the three-level facilities was higher in terms of awareness (100%), which depicted that they were mostly aware of the existence of the policy and had some sort of training on its implementation. This is higher compared to a study by Bamiselu et al., 2016 which showed 98.1% awareness of the treatment guideline among public health workers and 94.8% among private health workers and contrary to a study conducted by Asibong et al. (2019), which overall scored fair knowledge awareness of the T3 guidelines among primary healthcare workers.

The result of this study is higher compared to a study conducted among Ghanaian prescribers which had a knowledge level of 73% by Prah et al. (2019). Another study that assessed knowledge of malaria among healthcare providers done in Ethiopia portrayed that though 69% of 183 respondents were aware of RDTs, only 55% knew about the testing and interpretation of test results (Argaw, 2015). Almost all the health facilities studied had received training on T3 policy to the tune of 100% for the Hospitals and the Health Centres, except for 37.5% of the CHPS who reported not to have had training on the policy. Confirmation of malaria cases

was mostly done with RDTs in all the CHPS, and Health Centres surveyed. A study by Prah et al. (2019) depicted that out of the 84% prescribers who used the test kits in confirmation of malaria cases, only 9% used the results for treatment. This is in sharp contrast to this study which shows that health facilities mostly used results for the antimalarial prescription at the rate of 96.4%. In addition to this, another study by Christian (not published) shows a higher percentage of 96.3% RDT positive cases that received antimalarial drugs. The study may provide evidence for RDT and microscopy services as recommended by Prah et al, (2019) which recommended that further research could highlight the availability of RDT and microscopy services in health facilities.

5.2 Adherence to treatment and tracking of malaria cases at different health facility levels

In all, 27 facilities from the total of 28 used required ACTs in the treatment of malaria cases representing 96.4%. Among the ACTs that was reported to be available, artemether-lumefantrine, artesunate-amodiaquine, and quinine were highly used by the facilities. The data on treatment from the indicators used showed that the CHPS compound had 73.3% usage of artesunate-amodiaquine. The increase in the usage of artesunate-amodiaquine could have emerged from a better supply of drugs as suggested by a household survey in Volta and Northern region of Ghana by Ferrer et al, 2016, or as shown by a study conducted in the Bosomtwi district in Ghana on compliance to T3 which showed that increase in ACTs for treatment could be too high compliance of ACTs on specifically the under-five children who are the most vulnerable group to malaria infection (Oteng et al., 2020).

This is in agreement with a similar study on adherence of health workers conducted in Zambia which revealed that ACTs were more prescribed than any other anti-malarial (Manyando, 2014). This assertion is in agreement with a WHO report in 2012 that elicit an increased in the supply of ACTs to many countries due to discount and increased inaccessibility (WHO, 2012).

Another study revealed a higher proportion of antimalarial drugs usage in both public and private health facilities like chloroquine and artesunate-amodiaquine (Bamiselu et al., 2016). In determining casual stock out from facilities 37.5% of the CHPS experienced stock-outs which might affect the service delivery, whiles the Government Hospital and the Health Centre revealed a lower proportion of these facilities experiencing stock out for more than 72 hours.

In terms of tracking malaria cases after treatment as required by the WHO guidelines, health facilities needed transport means to enhance the process, so the study sought to find out the mode of emergency transport to facilitate the process. The facility assessment showed that CHPS relied mostly on taxis 56.3% and motorbikes 31.3%, 3 out of the 5 Government Hospitals surveyed had ambulance services for tracking and at the Health Centres level, 2 (28.6%) out of the 7 with the remaining 5 (71.4%) of the facilities surveyed use taxis and motorbikes respectively. The tracking is in line with the Global technical strategy for malaria 2016-2030, surveillance is to form the core intervention for malaria-endemic regions (WHO, 2018). The responsibility for tracking malaria cases after the required treatment in CHPS was mostly assigned to the CHN 56.3%, like the Health Centres with 42.9%. This study outcome is in line with a study by Kwarteng et al, 2015 showed that the CHNs and midwives who formed part of the lower cadre of staff when it comes to the health service professional hierarchy are the ones mostly responsible for surveillance of treated cases and mostly adhere to treatment guidelines more than the doctors and the physician assistants due to lack of this category of staff in the rural setting (Kwarteng, 2015).

The outcome of the study revealed a higher adherence level at all the various facility levels. Both the Government Hospitals and the Health Centres had a 100% adherence score from all the indicators. The CHPS also had 96.4% adherence from the analysis, which supports the WHO accession that all suspected malaria must be tested to confirm case by the use of RDT in most cases, treat confirmed cases with the required antimalarial drugs, and enhanced routine

surveillance to reduce the disease burden (Graz, 2011) . This process is in line with an effort to prevent presumptive treatment and overdiagnosis, which will ensure that only malaria cases are treated using antimalarial as recommended by the WHO, 2012. The implementation of RDTs and ACTs have improved the management of malaria cases and building resistance to antimalarial could have a dire consequence for malaria control and prevention if health care providers do not adhere to the guidelines, a study by Bamiselu et al. (2016).

The study did not find any relationship between facility type and knowledge of T3 policy. This suggests appropriate implementation of the T3 policy across different levels of facilities in the health system hierarchy. Almost all the facility levels adhered to the policy so there was no relationship between facility type and adherence from the Fishers exact test performed.

5.3 Proportion of T3 malaria cases among clients at different facility levels

The study showed that clients who were taken through examination and test procedures were high (93.7%) in the various facilities. This is in line with the findings of a similar study which recorded 91.2% tested cases (Agandaa et al, 2016). Though the results of the study could not reach the target of universal test and treat measures expounded by the WHO case management guidelines, it revealed a significantly higher percentage of testing and treatment components of the measures. From the study, 92.6% of CHPS, 81.8% of Government Hospital, and 83.6% used RDTs in diagnosing cases. Overall, a total of 88.6% RDT usage was recorded from the client's perspective which is higher than a similar study carried out in Papua Guinea among service providers which revealed a 77.6% rate of tested malaria cases using RDTs (Pulford, 2016). This means that the GHS must ensure regular supply of RDTs to the various health facilities especially to the CHPS compounds that have 100% use of it without microscopy test. The unlikely event of a shortage of RDTs to the CHPS will affect the adherence level of the treatment guidelines. On RDT supply, a study on scaling up RDTs in Sub Saharan Africa showed that sustaining a constant supply of RDTs to rural facilities where access is high

remains a challenge and emphasized that supply remains the major challenge facing the health system (Bastiaens, Bousema, & Leslie, 2014).

The 88.6% finding from this study is still not up to the WHO recommendation which advocates for universal testing and treatment of malaria infections (WHO, 2012). Despite the WHO recommendations for universal accessibility of malaria diagnostic tools, most consultations at facilities often do not use the treatment guidelines, as indicated by research among healthcare providers (Kwarteng, 2015). The result is higher than the NMCP statistics in 2016 which indicated that the malaria testing rate in 2015 rose from 73.6% to 77.3% in 2016. Awareness of the T3 policy implementation showed that 87.5% among the clients who visited the facilities and about 83.7% of the facilities confirmed that results of the malaria test were explained to them which also contributed to the level of knowledge on the policy.

On the treatment of malaria cases among clients, the results from the research showed a higher level of 98.1% antimalarial prescription in all the facility level, which is higher compared to research conducted among health workers in Ogun State, Nigeria where the study revealed 60.6% adherence to diagnoses and treatment procedures of the T3 policy among public healthcare providers (Bamiselu et al., 2016). Another research in line with the treatment of malaria by healthcare providers depicted a high proportion of about 89.2% correct diagnosis in line with the national guidelines (Kwarteng, 2015). Other studies in public health facilities found contrasting results of 49% laboratory confirmation and a low level of compliance on the recommended treatment guidelines for treating malaria cases (Ampadu et al., 2019). Comparing the results of the study to other studies reveals a lower testing percentage rather than the higher percentage found by this study, this may be since many facility levels had no stock out for more than 72 hours, had a lot of antimalarials, and assigned responsibility for tracking of malaria cases. The facility stock is very significant to note because a comparative study evaluating the impact of 10 interventions on RDT test for malaria found out that ACT

stockout is associated with variations in adherence to malaria test results that are positive (Burchett et al., 2017). Many different antimalarials dominated the prescription pattern of the three-level facilities but Lonart usage recorded the highest of 30.7%, followed by Lumarterm (16.9%), and Winthrop (15.4%) as the third-highest antimalarial. Out of the 590 clients, 98.1% were tested and prescribed with an antimalarial. This is in line with the WHO requirement of universal access to the required antimalarial after confirmed diagnosis.

Almost all the facilities had measures in place for tracking cases, however, the means of transportation was 50.0% use of taxis which mainly operate for commercial purpose and private ownership and cannot be always relied upon for service delivery especially in cases of emergencies. In all, the percentage of clients tested and treated was 98.1%, however, only 27.8% were tracked with the remaining 72.2% not tracked from the study, showing a lower percentage concerning a similar facility-based study by Agandaa et al, 2016 which revealed that 52.7% of total 351 children were not tracked to complete the T3 process (Agandaa et al, 2016). In the same study, 70.6% of the children were requested to return for a review, while this study mainly had 56.7% returned to facility visit for review and 39.0% home visits to ensure effective tracking of cases after treatment. The responsibility for tracking cases were 39.0% done by CHNs and about 55.6 percent at the CHPS compound level. The overall compliance at the client level was lower 27.0% toward the T3 malaria policy as compared to the facility level. The results of the study showed 2 critical interesting findings, adherence at the facility level was high based on the indicators measured which are positive for the continuum management of malaria cases. On the other hand, though client testing and treatment were high, the implementation of the tracking component for malaria cases to complement the total compliance was very low. The clients exit interview carried on revealed a significant association between age of the participants and the compliance level at the facilities from the Chi test performed.

5.4 Limitations of the study

The limitation of the research may be recall bias because the study embarked on the exit interview process, so clients may have forgotten about some of the actual events that took place and real drug names. The kind of treatment given to clients may be missed in the responses. The study may also suffer the Hawthorne effect as responses from healthcare providers may be to please investigators on adherence to implementing policy recommendations by the GHS. Limited information on clients' demographic characteristics like marital status and occupation prevented further analysis on some interested independent variables and the outcome of the study.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.0 Conclusion

The WHO recommends that all healthcare providers adhere to the test, treat and track policy guidelines in managing malaria infections and this can be successful if implementers of the policy have the knowledge and adhere to the principles. This study revealed that knowledge of the T3 policy was very high among health facility levels, and showed that CHPS, Government Hospital, and Health Centres in all the six districts have high adherence level towards the implementation of the policy. However, adherence to the policy at the client level remains very low, due to the tracking rate of the T3 policy which was below average. Health facilities approach to malaria service delivery by healthcare providers is the main source that could predict the success or failure of the malaria case management initiation by WHO through compliance. The outcome of the study revealed that despite the adherence to testing and treating of malaria cases which remains high at the facility level, there were still more patients who were not informed to be tracked to ensure completion of the process prescribed by healthcare providers. This continues to be a challenge to the successful implementation of the generally accepted treatment guidelines.

6.1 Recommendations

- The NMCP should develop effective educative programs for community members to know the importance of the tracking component of the policy, specifically adhering to invitation to reviews to enhance surveillance at the various health facilities. This will strengthen the tracking process.
- The NMCP should also consider promoting effective supervision and monitoring, as well as organizing training sessions at the facility levels and sensitization programmes for clients to ensure total adherence in the entire implementation process.

- Further research is needed to explore the detailed reasons for the ineffective tracking response from both the facility and client level to inform policy decisions. This will help in evaluating the challenges associated with the programme with field practical data for future policy planning.
- The GHS and the NMCP must work to ensure a regular supply of RDTs to the CHPS facilities that mostly rely on RDTs for testing to support the adherence process. This is because there is no way the adherence to the policy process would increase if prescribers anticipated stock-outs for more than 72 hours in most facilities

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APPENDICES

APPENDIX 1

Coffey International/Comic Relief

Participant's information sheet and Informed Consent Form

Protocol Title: "Ghana's implementation of the Test, Treat and Track Policy for Malaria: an assessment of malaria management and control in selected districts in Ghana"

INTRODUCTION

My name is _____from the _____ (KHRC/ARHR/ADDRO). I am assisting with this research run by the three institutions (KHRC/ARHR/ADDRO) in Ghana and supported by Coffey International and Comic Relief. The research is interested in collecting information on whether health facilities adhere to the test, treat and track (T3) policy for malaria treatment in Ghana. We are inviting you to participate in this aspect of the study which is focused on health seeking for malaria as well as its prevention, management and treatment at the health facility.

PURPOSE OF STUDY/BACKGROUND

The impact of malaria on health and local economies in sub-Saharan Africa (SSA) is alarming. Over three million people, mostly children under ten (<10) years of age are reported dead annually. In Ghana, malaria is the leading cause of death in children under 5 years old and among the top causes of death for adults. This project is aimed at assessing the knowledge and adherence of T3 policy among healthcare providers in health facilities in Ghana, assess the knowledge of clients on the T3 policy, determine the level to which health workers adhere to the T3 policy, identify challenges that hinder the easy implementation of the T3 policy in health facilities, and to determine the association between knowledge of T3 policy and adherence to the T3 policy

PROCEDURES

This study uses quantitative approach such as the use of structured questionnaires and a Scorecard to collect information on whether health facilities adhere to the test, treat and track (T3) policy for malaria treatment in Ghana. The approach will focus on using the community scorecards mechanisms to ascertain whether health providers are aware of and adhere to the policy and the strategies they adopt to follow up on clients who assess malaria services within health facilities as part of the T3.

This study on the implementation of Ghana's T3 will be conducted in six selected districts: Kintampo North Municipality and Kintampo South district in Bono East Region, Mpohor District and Nzema East Municipality in the Western North region, Jirapa Municipality and West Mamprusi Municipality in the Upper East region. If you agree to participate in the study, you will be invited once to participate in an exit interview and administered a questionnaire to obtain information on the demographic, socio-economic and the quality of malaria care received from malaria care providers (MCP) at the health facilities.

RISKS/DISCOMFORTS/CAN ANYTHING HAPPEN TO ME FOR PARTICIPATING IN THIS STUDY?

No harm is expected in the course of this study to you. Some of the questions you will be asked might sound personal to you. However, you will not be forced to respond to all questions and you are free to stop the interview if you feel uncomfortable.

BENEFITS / COST

The information you will give us will aid us to find solutions on issues impeding quality malaria prevention, treatment, management and care through the generation of evidence through routine facility assessments to improve the quality of malaria care and surveillance in Ghanaian communities to accelerate the reduction of malaria burden among particularly children under ten years of age and pregnant women.

You will not be paid directly for your participation in this study and it will not cost you anything to be part in the study.

CONFIDENTIALITY

The information that will be collected from you, if you agree to be part of the study, will be used only for the purpose of this study and will not be used against you in anyway. Your identity will remain anonymous: we will not use your name or any information that will make it possible to identify you personally when we are reporting or writing about this study. We will also not share the information with anybody apart from those involved directly in the study. All the information that we will collect will be stored in lockable cabinets.

VOLUNTARINESS/VOLUNTEER PARTICIPATION

Your participation in this research is entirely voluntary. You have every right to decide not to participate or withdraw your participation at any point in time without any penalty. You will not be adversely affected if you decline to participate or later stop participating. If you decide to participate, you will be asked to provide either your thumbprint or signature on the following page.

CONTACT PERSONS

If you have any questions concerning the study or if there are things you do not understand you can ask them now. If you wish to ask questions later, please contact the PI, Mr. Annorbah-Sarpei Nii Ankonu at the Alliance for Reproductive Health Right on telephone number 0244746569 or Mrs. Charlotte Tawiah Agyemang at the Kintampo Health Research Centre (KHRC) on 0244983003 or Mr. Vitalis Atambila at the Anglican Diocesan Development Relief Organisation (ADRRO) on telephone number 0243125963. If you have any ethical concerns during or after your participation in this study, please contact the **Administrator** of the Kintampo Health Research Centre Institutional Ethics Committee on **050 4270501 / 03520 92035;**

VOLUNTEER'S STATEMENT

This study has been explained to me, and I have had a chance to ask questions. I understand that my interview will remain confidential and my answers will not be linked with my name. I understand that researchers will use the information from my interview. I volunteer to take part in this study. If I have questions later about the study, I can ask a member of the study team who will answer or direct me to a place where I can get answers. I will receive a copy of this consent form. I give permission to the researchers to use the information I will provide.

By signing/thumb printing below, the participant acknowledges that he/she has read and understood the information, is of age 18 or older, and has received a copy of the consent form.

…… ……

Date ……/……/……

Name of study Participant Signature/thumbprint of Subject

....

Date ……/……/……

Name of Investigator/Researcher Signature of Investigator/Researcher

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[Witness to Consent Procedures if Participant is illiterate]

Witness

A witness should be a literate and sit throughout the whole consenting process. The witness must, write his or her name, date and sign this document.

''I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely''.

.... Date ……/……/……

Name of Witness Signature

APPENDIX 2

T3 COLLECTIVE LEARNING QUESTIONNAIRE

	FACILITY ASSESSMENT		
1.0	**Tool 1 - Section I - Facility identification & Health facility characteristics**		
1.1	Name of Interviewer		NAME_INT
1.2	Date of facility assessment		D_ASSESS
1.3 1.4	Region District		REG DST
1.5	Community		COMM
1.6	Type of Community	Urban……..1 Periurban……..2 Rural……3	T_COMM
1.7	What type of health facility is this?	Private……1 Government……2 CHAG……3	HF_TYPE
1.8	If government, what level of facility is this?	CHPS……1 Health Centre……2 Polyclinic……..3 Government Hospital……..4 Others, specify……..5	HF_LEVEL

	For the purpose of this assessment, the availability or presence of infrastructure, equipment and drugs must be observed (or seen) by the assessment team. If an element is not seen by the assessment team, it should be counted as unavailable. Exceptions to this rule, are noted as comments under the specific questions (in this case, it is specified to whom the question should be asked). Continue assessment?		INF_SEEN
1.9	Is there a designated telephone available for this facility (a functional land line or mobile phone-not personal)	Yes ……1 No……2	TELEPH_SEEN
1.10	Do you have a main source of water in this facility?	Yes ……..……...1 No ……2	WAT_SEEN
1.11	Please specify the main source of water used in this facility	Piped……..1 Bore Hole Well/ ……2 Rain collection……3 River……4 Tanker……5 Others, specify……6	WAT_SPEC
1.12	Are there working toilet facilities available for clients in the facility?	Yes……1 No……2	TLT_SEEN
1.13	What type of toilet facility is available for clients?	Flash or pour flash ……..1 Ventilated Improved Pit Latrine (VIP)……2 Pit Latrine……..3 Bucket ……..4	TLT_TYPE
1.14	Does the facility have a power source?	Yes ……1 No……2	POW_SCE

1.15	If yes, what is the primary source of power available today in this facility?	National Grid……...1 Generators……..…2 Solar……...3	PRIMP_SCE
2.0	**Tool 1 - Section II - Staffing**		
2.1	Name of Interviewer	…….	NAME_INT2
2.2	Date of facility assessment	……	D_ASSESS2
2.3	How many full time Doctors currently work in this facility? (ask facility manager, administrator or senior staff member)		DOC_FTIME
2.4	In the last three months, how many part time Doctors have worked or currently work in this facility? (ask facility manager, administrator or senior staff member)		DOC_PTIME
2.5	How many full time physician/medical assistants currently work in this facility? (ask facility manager, administrator or senior staff member)		PM_FTIME
2.6	How many part time physician/medical assistants currently work in this facility? (ask facility manager, administrator or senior staff member)		PM_PTIME
2.7	How many full time nursing practitioners currently work in this facility? (ask facility manager, administrator or senior staff member)		NSP_FTIME
2.8	How many part time nursing practitioners currently work in this facility? (ask facility manager, administrator or senior staff member)		NSP_PTIME
2.9	How many midwives currently work in this facility? (ask facility manager, administrator or senior staff member)		MWF_FTIME
2.10	How many registered general nurses (currently work at this facility? (ask facility manager, administrator or senior staff member)		RGN_FTIME

2.11	How many (health care assistance clinical) enrolled nurses currently work at this facility? (ask facility manager, administrator or senior staff member)		HCAC_FTIME
2.12	How many community health nurses currently work at this facility? (ask facility manager, administrator or senior staff member)		CHN_FTIME
2.13	How many Biomedical scientists currently work at this facility? (ask facility manager, administrator or senior staff member)		NUM_BMS
2.14	How many laboratory technicians currently work at this facility? (ask facility manager, administrator or senior staff member)		NUM_LABTECH
2.15	How many pharmacists work at this facility? (ask facility manager, administrator or senior staff member)		NUM_PHARM
2.16	How many pharmacy technicians work at this facility? (ask facility manager, administrator or senior staff member)		NUM_PHARMTECH
2.17	How many dispensary assistants work at this facility? (ask facility manager, administrator or senior staff member)		NUM_DISPEN
2.18	How many medicine counter assistants work at this facility? (ask facility manager, administrator or senior staff member)		NUM_MCA
2.19	Was there any supervisory visit to this facility by the district health administration in the last three completed months? (ask facility manager, administrator or senior staff member)	Yes……1 No……2	SUP_VST
2.20	If Yes, how many times? (ask facility manager, administrator or senior staff member)		NUM_VST
3.0	**Tool 1 - Section III - Facility operation**		
3.1	Name of Interviewer		NAME_INT3
3.2	Date of facility assessment		D_ASSESS3
3.3	How many days per week does this facility operate? (Ask facility manager or assessment facilitator)		NUM_DAYSOP

3.4	Does this facility provide 24 hours/7 days a week service? (Ask facility manager or assessment facilitator)	Yes……..1 No……2 If Yes, skip next question	FACT_OP24
3.5	If No, indicate number of days and number of hours facility operates in a week	No. of days……. No. of hrs.. ……	NUM_FACTOP
3.6	Are there IE&C materials displaying the availability of malaria services?	Yes……..1 No…….2	MAL_ADV
3.7	Are guidelines and protocols for malaria care available? - (ask facility in-charge to see copies of guidelines or protocols) (check for availability of Malaria case management and treatment guidelines)	Yes……1 No……..2	MALPROTO_AVAI
3.8	Is there a functioning laboratory that does malaria microscopy at this facility?	Yes……1 No……..2 (Question to be asked only at Health Centre, Polyclinic and Hospital levels)	LAB_FUNCT
4.0	**Tool 1 - Section A - Test**		
4.1	1. Are you aware of the T3 policy?	Yes……1 No……..2	3T_AWARE
4.2	2. Have you received any training on the T3 strategy within the last two years? (On-site training, on the job training and workshop training both acceptable)	Yes……1 No……..2 (If No, skip to Q4)	3T_TRAIN
4.3	3. What type of training did you undergo	O.T.S.S ……1 Workshop training ……..2 On the job training……3	TYP_TRAIN
4.4	4. State at least two details of the training	…… ……	DET_TRAIN
4.5	5. Is there at least one health provider trained in this facility to perform malaria RDT?	Yes……1 No……..2	RDT_TRAIN
4.6	6. Is there at least one health provider trained to perform microscopy for malaria diagnosis?	Yes……1 No……..2 (Question to be asked only at Health Centre, Polyclinic and Hospital levels)	MIC_TRAIN

4.7	7. Are there test kits (malaria RDT) available for testing malaria at this facility?	Yes……1 No……2	RDTKIT_AV
4.8	8. In the last 3 months, have you had any RDT stock-outs for more than 7 continuous days? (Verify from RDT stock cards)	Yes……1 No……2	RDT_STCK
4.9	9. Does this facility check Hb for patients?	Yes……1 No……2	HB_AV
4.10	10. Does the facility perform G6PD test?	Yes……1 No……2	GPD_TEST
4.11	Does the facility perform microscopy services for malaria?	Yes……1 No……2	MIC_SV
4.12	11. Are there available microscopy consumables? (Multiple Responses Allowed)	Functioning Microscope……..1 Reagent……..2 Pippette……..3 Slides……..4 Buffer tablets……5 Methanol(alcohol)……..6 Tally Counters……..7 (Question to be asked only at Health Centre, Polyclinic and Hospital levels)	MIC_CONS
4.13	12. How many people were tested for malaria in the last month?	…….	NUM_MALTEST
4.14	13. How many of them were tested using malaria RDTs in the last month?	……..	NUM_RDTMALTEST
4.15	14. How many of them were tested using microscopy in the last month?	…….. (Question to be asked only at Health Centre, Polyclinic and Hospital levels)	NUM_MICMALTEST
4.16	15. How do you suspect malaria cases?	Signs and symptoms……1 All cases……2	MAL_SUSP
4.17	16. How do you confirm (diagnose) malaria in this facility?	RDTs……1 Microscopy……2 Both……..3	MAL_CONF
5.0	**Tool 1 - Section B – Treat**		
5.1	Name of Interviewer	…….	NAME_INT4

	For the purpose of this assessment, the availability or presence of infrastructure, equipment and drugs must be observed (or seen) by the assessment team. If an element is not seen by the assessment team, it should be counted as unavailable. Exceptions to this rule, are noted as comments under the specific questions (in this case, it is specified to whom the question should be asked). Continue assessment?		
5.3	Date of facility assessment	……	D_ASSESS4
	1. Which of the following basic equipment is available in the facility today? (Multiple responses allowed)	Clinical thermometer……1 Rapid Diagnostic Test Kit……2 Disposable syringes and needle…3 Stethoscope……4 Disposable gloves……..5 Cannulas……...6 Weighing scale……7	EQUIP_AVAI
5.4	2. Are there anti-malarial medicines available in this facility?	Yes……1 No……2	MAL_MED

5.5	3. If Yes, what antimalarial drugs does this facility prescribe for patients both for complicated and uncomplicated malarial? (multiple responses allowed)	AA/ARTESUNATE AMODIAQUINE …….....1 Artesunate amodiaquine wintrhop…… i Arsuamoon……ii Camoquine plus…….iii Gunate……..iv Co-arsucam……..v AL/ARTEMETHER-LUMEFANTRINE……...2 Coartem……i Lumarterm……..ii Lonart ……..……iii DHAP/DIHYDROARTEMISININ PIPERAQUINE ……3 P-alaxin…….. i Duo-cotexcin…… ii QUININE……..4 PRIMAQUINE……5 CHLOROQUINE …… 6 HERBAL MEDICINE……...7 DON'T KNOW ……..8 OTHER ……..9 (SPECIFY)	
5.6	4. In the last 3 months, has this facility had any stock-out of anti-malarial medicines for more than 7 days?	Yes……1 No……..2	STOUT_MAL
5.7	5. Is there at least a health provider trained to offer treatment for severe malaria?	Yes……1 No……..2 (Question to be asked only at Health Centre, Polyclinic and Hospital levels)	HWKR_SEV
5.8	6. Does the facility refer severe malaria cases?	Yes……1 No……..2	REF_SEV
5.9	7. State type of functional emergency transport available?	Ambulance……1 Private vehicle……2 Taxis……..3 Motor bikes……4 Others (specify)……5	EMERG_TRANS

5.10	8. How long (in minutes) does it take to travel to the nearest higher level facility, via the means of transport stated above? (If there is no higher level facility answer zero) (Ask facility manager or assessment facilitator)?	……	MIN_TRANS
6.0	**Tool 1 - Section C - Track**		
6.1	Do providers ask patients to return for review after treatment?	Yes……1 No……2 Observe: Consulting Room register (Check Status-old or new) sample folders	TRT_REV
6.2	What time frame are patients usually given to return for review after treatment?	……	REV_TF
6.3	What systems are in place for tracking malaria cases, referrals and recovery, at this facility?	……	TRACK_SYST
	Who is responsible for tracking malaria cases, referrals and recovery, at this facility?	***1.1.1.1 Doctor …….. 1*** ***1.1.1.2 Medical/physician Assistant ……2*** ***1.1.1.3 Midwife ……3*** ***1.1.1.4 Nurse (RGN)……..4*** ***1.1.1.5 Community Health Nurse…..……5*** ***1.1.1.6 Health Assistant Clinical……..6***	
	CLIENT ASSESSMENT		
7.0	**Tool 2 - Section i - Introduction, patient identification**		
7.1	Now please obtain informed consent from your respondent. Has the respondent consented to carry on with the interview?	Yes……..1 No……2	CONSENT_OBT
7.2	Name of Interviewer		NAME_INT
7.3	Date of assessment		D_ASSESS

7.4 7.5	Region District	…… ……	REG DIST
7.5	Community		COMM
7.6	Type of community	Urban……..1 Periurban……..2 Rural……..3	T_COM
7.7	Type of facility	Private……..1 Government…….2 CHAG……3	
7.8	Level of Facility	CHPS……1 Health Centre….2 Government Hospital…..3	FAC_LEV
7.9	Sex of Patient	Male …….1 Female……2	SX_P
7.10	Age range	15-19 years ……..1 20-24 years ……...2 25-29 years ……..3 30-34 years ……..4 35-39 years ……..5 40-44years ……6 45 years + ……..……7	AG_RGE
8.0	Tool 2 - Section A - Test		
	Ensure that clients access treatment from Health facilities before commencing interview		
8.1	During the past 12 months, have you suspected an episode of malaria?	Yes ……..1 No ……..…….2	SUSP_MALEPI
8.2	If yes, how did you know you had malaria?	1. Personal assumption based on signs and symptoms 2. Provider assumption based on description of signs and symptoms 3. Pharmacy/Chemist Shop assumption based on description of signs and symptoms 4. Family member/Friend assumption based on description of signs and symptoms 5. Others (specify)……	KNW_MAL
8.3	The last time you had malaria, did you seek advice or treatment from any health facility?	Yes ……..1 No ……..…….2 Don't Remember……3 If No, skip next question	SEEK_AD

8.4	For this visit, did you take a test to confirm malaria?	Yes……1 No……2 If No, skip next two questions	TEST_MALCONF
8.5	If yes, what type of test? RDT or microscopy?	1. RDT……1 2. Microscopy……2	TYPE_TESTMAL
8.6	Where, did you take the malaria test?	Community Pharmacy……1 CHPS compound……2 Health Centre……3 District Hospital……4 Other (Specify)……5	WHR_TESTMAL
8.7	Were you informed you had malaria at the facility?	Yes……1 No……2 (if No, then skip the next question)	MAL_INFORMED
8.9	At the facility level, who told you that you had malaria?	Doctor ……1 Nurse ……2 Midwife ……3 Pharmacist ……4 Community Health Nurse ……5 Medical/Physician assistant……6 Others (Specify) ……7	MAL_WHOTLD
8.11	Are you aware that you must be tested for malaria before treatment?	Yes……1 No……2	AWARE_MALTEST
9.0	**Tool 2 - Section B - Treat**		
9.1	To treat malaria, were you prescribed any antimalarial medicine?	Yes……1 No……2 (If No to Question, skip next question)	ANTIMAL_PRESC

9.2	What antimalarial medicines were you prescribed/given or did you take for your last episode of malaria? Refer to drop down options (multiple responses allowed)	AA/ARTESUNATE AMODIAQUINE …….....1 Artesunate amodiaquine wintrhop…… i Arsuamoon……ii Camoquine plus…….iii Gunate……..iv Co-arsucam……..v AL/ARTEMETHER-LUMEFANTRINE……...2 Coartem……i Lumarterm……..ii Lonart ……..……iii DHAP/DIHYDROARTEMISININ PIPERAQUINE ……3 P-alaxin…….. i Duo-cotexcin…… ii QUININE……..4 PRIMAQUINE……5 CHLOROQUINE …… 6 HERBAL MEDICINE……...7 DON'T KNOW ……..8 OTHER ……..9 (SPECIFY)	ANTIMAL_MED
9.3	Did the provider perform any examinations, procedures or tests on you?	Yes……1 No……2 (If No, skip next question)	PROV_EXA
9.4	If Yes, what procedure or examination or test was conducted by the provider? (multiple options allowed)	RDT……..1 Blood sample taken for Lab test…..2 Temperature Taken…….3 Turbid Sponging……..4 Cannula Insertion……5	WHT_EXAM
9.5	Was the procedure explained to you?	Yes……1 No…….2	EXAM_EXP
9.6	Did the provider explain the results of the health examinations, procedures or tests?	Yes……1 No…….2	RSLTS_EXP
9.7	How many days will it take to complete the course?	<3 days……..1 3 days…….2 >3 days……..3	DAYS_COURSE
9.8	Were you provided education at the dispensary or pharmacy on how to take the medication?	Yes…….. No……	WR_EDU

9.9	If Yes ,What education were you provided? (multiple responses allowed)	Dosage……1 Side effects……2 Both……3	WHT_EDU
10.0	**Tool 2 - Section C - Track**		
10.1	Did the provider tell you to come for a follow up visit/review? (if no, skip the next question)	Yes……..…1 No……2	PROV_BK
10.2	If Yes, Will you return to the facility for the follow-up/review visit?	Yes……1 No……2	WL_RET
10.3	If no, why?	a) I will feel better b) No money for transport c) I did not like the service d) No reason e) Others (Specify)……. f) Wasn't asked to return…….	WHY_NORETUN
10.4	Did the provider tell you when to come back for another visit	Yes……1 No……...2 …….	PROV_WHN WHN
10.5	If Yes when were you told to come	……..	WHN
10.6	Which provider asked you to come back for a review?	Health Assistant Clinical……1 General Nurse(RGN)……..……..2 Medical/physician Assistant……..3 Midwife……4 Doctor……5 Community health nurse……..6	WHICH_PROV
10.7	Did the provider follow-up after treating you for malaria during your last malaria episode? Yes/No	Yes……1 No……2 N/A……..3	PROV_FOLLOWUP
10.8	If yes, how was the follow-up done?	Home visits……1 Phone call……2 Others (specify)……3	HOW_FOLLOWUP

Appendix 3

Kintampo Health Research Centre (KHRC) Institutional Ethics Committee (IEC)
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FULL ETHICAL APPROVAL CERTIFICATE

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James Town, Accra.

Date: 8th November, 2019

Study ID: KHRCIEC/2019-24

Title of study: Ghana's implementation of the Test, Treat and Track Policy for Malaria: an assessment of malaria management and control in selected districts in Ghana

Principal Investigator: Annorbah-Sarpei Nii Ankonu

Co- Investigator(s): Francis Agbokey, Peter Mayers Vitalis Atambila, Isaac Nyampong, Prince Awimba, Charlotte Tawiah Agyemang Darby

Type of Review: Expedited Review

Approval Date: 7th November, 2019

Expiration Date: 7th November, 2020

1. The Kintampo Health Research Centre Institutional Ethics Committee (IEC) is constituted and operates in conformance with requirements of 45 CFR 46, 21 CFR 50, 21 CFR 56 and section 3 of the International Council on Harmonization Guidelines, as well as all applicable regulatory, legal, and other ethical requirements governing human subject research in Ghana. The OHRP Federal Wide Assurance number for the committee is 00011103; the IRB registration number is 0004854.

2. The above study in title was reviewed by the IEC through expedited process and given Conditional approval.

3. The Committee acknowledge the response to the conditional approval letter and submission of revised protocol. The response and revised protocol has been reviewed and considered to be satisfactory. The Committee therefore grants you full ethical approval for implementation of the study.

4. The following documents were reviewed and approved for use;
   4.1 Ghana's implementation of the Test, Treat and Track Policy for Malaria: an assessment of malaria management and control in selected districts in Ghana. Version 3, Dated 6th November 2019

Study File number: 2019-24

THE CHAIRMAN
KINTAMPO HEALTH RESEARCH CENTRE
INSTITUTIONAL ETHICS COMMITTEE.