



## MALARIA RAPID TEST KITS: A STUDY OF KARU LOCAL GOVERNMENT AREA

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### Abstract

This study evaluated public knowledge of Rapid Diagnosis Test Kits for early detection of malaria parasites in rural communities of Nasarawa State. The objectives of the study were to: determine the prevalence level of malaria in Karu Local Government Area of Nasarawa State, ascertain the level of public awareness of RDT kits in the local government area, find out if RDT kits are used in health centres in the local government area and evaluate public perception of the RDT kits in the area. The data collected were qualitatively analyzed using explanation building method. Findings indicated that there was high prevalence of malaria among the study population and that although there were some levels of knowledge about RDT kits, their usage is minimal. The study concluded that adequate information about the viability and necessity of the kits should be designed and disseminated to the communities. Based on these findings and conclusion the study recommended, among others, that government, public spirited individuals and non-governmental organizations should sponsor the propagation of information on the use of the kits among the study population to encourage understanding and acceptance of the kits in Karu Local Government Area.

**Keywords:** Knowledge, Perception, RDT kits, Communities

### Introduction

Malaria is one of the most severe public health problems worldwide, particularly in Africa, where Nigeria has the greatest number of cases. Arrese (2001), posits that, malaria is a life-threatening disease typically transmitted through the bite of an infected *Anopheles* mosquito. He further notes that malaria is typically found in tropical and subtropical climates where the parasite can live. Malaria can also be transmitted through blood transfusion, an organ transplant or use of shared needles or syringes. Its common symptoms include shaking

chills, high fever, profuse sweating and headache (Amuta, Houmsou, Wana, and Ameh, 2014). To Azoma (2017), malaria continues to be a major public health problem in ninety-seven (97) countries and territories in the tropics and subtropics. He further observes that globally, approximately two hundred and forty (240) million cases of malaria occur annually and 3.2 billion people are at risk of infection. Dawaki (2016) states that approximately 438,000 deaths were attributed to malaria in 2015, particularly in Sub-Sahara Africa, where an estimated 90 percent of all malaria related deaths occur. According to WHO (2014), Nigeria suffers the world's greatest malaria burden, with approximately 51 million cases and 207,000 deaths reported annually (approximately 30 percent of the total malaria burden in Africa), while 97 percent of the total population (approximately 173 million) is at risk of infection. Moreover, malaria accounts for 60 percent of outpatient visits to hospitals and is responsible for approximately 11 percent of maternal mortality and 30 percent child mortality, especially among children less than five (5) years. The Federal Ministry of Health (2012), asserts that, this devastating disease affects the country's economic productivity, resulting in an estimated monetary loss of approximately N132 billion in treatment costs, prevention, and other indirect costs.

Azoma (2017), quotes statistics from National Malaria Elimination Programme (NMEP), which show that Nigeria accounts for 29 per cent of the global burden of malaria and has the highest number of cases than any country, highlighting the need to focus on proper diagnosis and treatment as well as prevention. He notes further that, nationwide, malaria prevalence varies widely, ranging from 14 per cent in the South-East Zone to 37 per cent in the North-West Zone.

In Nasarawa State, Liman (2016), states that, the state recorded 228,886 cases of malaria within twelve (12) months out of which 2, 437 were severe and life threatening while 226, 449 were not complicated. Moreover, statistics from the District Health Information Services Platform indicate that malaria was responsible for 61 per cent of under-five mortality in state within the twelve 12 months period. Malaria is a mosquito-borne disease caused by a parasite called plasmodium. People with malaria often experience fever, chills, and flu-like illness. Left untreated, they may develop severe complications and die (Liman, 2016).

Azoma (2017), observes that generally, malaria is recognized with these symptoms; fever, chills, headache, vomiting, impaired consciousness, prostration, deep breathing, abnormal bleeding, and vital sign failure. These symptoms are however, non-specific as they may also indicate the presence of another disease, so it is important that one gets tested to ascertain truly that it is malaria. However, malaria is clinically suspected on the basis of fever or any other feverish conditions.

Dawaki (2016), posits that the treatment of malaria depends on the type of specie that has affected the patient, the area where the infection was acquired and its drug-resistance status. Others are the clinical status of the patient, drug allergies, and any other illness that the patient may be suffering from and if the patient is female, there should be consideration of pregnancy. It is only when these factors are properly considered that treatment can start. Malaria rapid diagnostic tests (RDTs) assist in the diagnosis of malaria by providing evidence of the presence of malaria parasites in human blood.

Ibekwe, et al. (2009), note that, although previous studies have documented a high prevalence of malaria throughout Nigeria, there remains a paucity of research on people's knowledge, attitudes, and practices (KAP) towards malaria in majority of the states of the federation, particularly in Northern Nigeria, including Nasarawa State. This information is



imperative in order to identify and implement effective control measures, and plan for the participation of the targeted communities in the testing, which is one of the cardinal tools for the success and sustainability of disease control programmes.

As Korenromp, Hosseini, Newman, and Cibulskis (2015), note, to enable effective diagnosis of all malaria cases, the diagnostic method used must be accurate and available at the point of care. The authors therefore posit that, malaria rapid diagnostic tests (RDTs) can assist in making a rapid, accurate diagnosis in circumstances where demonstration of parasitaemia has previously been impossible or where microscopy-based diagnosis may be unreliable. To Haruna (2015), RDTs are alternative to diagnosis based on clinical grounds or microscopy, particularly where good quality microscopy services cannot be readily provided (as in rural communities of Nasarawa State). However, the level of awareness of RDTs particularly among health care givers in rural communities of Nasarawa State is uncertain. Therefore, this study was designed to investigate the current public knowledge and perception of malaria RDT kits in rural communities of Nasarawa State in North-Central Nigeria.

### **Statement of the Problem**

As incidences of malaria continue to increase, so also morbidity and mortality rates. Malaria is endemic in Nigeria, and the population at highest risk includes children and pregnant women. Malaria morbidity and mortality come with economic losses. Social and economic consequences are directly related to the severity of malaria's increased morbidity and mortality. Arrese (2001), notes that, as a result of malaria, children spend days away from school and adults lose workdays. It is against this background, that, policy makers need to aggressively pursue malaria control strategies because, malaria infections are attacking Africa's most populous country, Nigeria, at an alarming pace. In Nasarawa State, malaria is reported to be responsible for 61 per cent of under-five mortality in the state within one year.

The continued scourge and effects of malaria on the population in the state has been blamed on faulty diagnosis and inadequate treatment of the disease especially in rural communities where good quality microscopy services cannot be readily provided. Although, malaria Rapid Diagnosis Test kits are available today to confirm the presence of malaria parasites in the blood of suspected patients, the level of awareness and public perception of these kits even among health care providers is low. Therefore, the question this study seeks to answer is what is public knowledge and perception of malaria Rapid Diagnosis Test kits in rural communities of Karu Local Government Area of Nasarawa State?

### **Objectives of the Study**

The broad objective of this study is to evaluate public knowledge and perception of malaria Rapid Diagnosis Test kits (RDT) in rural communities of Nasarawa State with particular emphasis on Karu Local Government Area but more specifically, the study seeks to:

- I. determine the prevalence level of malaria in Karu Local Government Area of Nasarawa State.
- II. ascertain the level of public awareness about RDT kits in Karu Local Government Area of Nasarawa State.
- III. find out if RDT kits are used in health centers in Karu Local Government Area of Nasarawa State and
- IV. evaluate public perception of RDT kits in Karu Local Government Area of Nasarawa State.

### Conceptual Clarification

1. **Public** in this study pertains to all the people as opposed to a private group. It also concerns the whole community.
2. **Knowledge** means general understanding or familiarity with a subject or situation.
3. **Perception** means detection, identification and conscious understanding of something.
4. **Rapid Diagnosis Test Kits (RDTKs)** are medical equipment to rapidly and easily detect the presence of malaria parasites in the blood of suspected patients who manifests symptoms of malaria disease.
5. **Rural Communities** are non-urban areas that are characterized by lack of basic amenities such as electricity, good schools, standard hospitals, potable water, modern communication facilities, decent accommodation and good roads. The inhabitants of the areas are predominantly illiterate and poor.

### Knowledge Gap Theory

Knowledge Gap Theory and Health Believe Model (HBM) provided the theoretical framework for this study. The theory was propounded in 1970 by Tichenor, Donohue and Olien, the theory maintains that increase in differences between the information-rich and the information-poor, actually accentuate those differences since those at higher socio-economic levels acquire information much faster and much more easily than those at the lower levels (Anaeto, Onabajo & Osifeso, 2008). Ojobor (2002), describes the information-rich as those that possess the means of modern mass communication and use it well, advantage and sees the information-poor as those in the lower socio-economic class, whose education is poor and their resources are small and as such, they are not knowledgeable in the areas that might lift them into success. The theory has however, been criticized for being based on the traditional source-sending-message-to-receiver paradigm of communication. Severin and Tankard (2001), in particular argue that, though this paradigm has been pervasive in American communication research, it emphasizes attainment of source goals and tries to manipulate receivers to that end. Therefore, the relevance of this theory to the study is that, it emphasizes the need for adequate information on all new equipment and devices to be introduced into rural communities so that they will be useful and relevant for the dwellers.

### The Health Belief Model (HBM)

The Health Belief Model (HBM) is a psychological health behaviour change model that helps to explain and predict health-related behaviours, particularly, in regard to the uptake of health services. In the model, a stimulus, or cue to action must also be present in order to trigger the health promoting behavior of the individual, developed in the 1950s by a group of social scientists, it attempts to explain and predict health behaviours of individuals by focusing on their attitudes and beliefs. The purpose of the model is to explain the widespread failure of people to engage with preventative strategies or screening tests for early detection of diseases (Rosenstock, Strecher and Becker, 1994).

But Porch (2004) sees the Health Belief Model as a theoretical model that can be used to guide health promotion and disease prevention programmes. To him, it is used to explain and predict individual changes in health behaviours. To the Rural Health Information Hub (2015), it defines the major factors that shape health behaviours to include an individual's perceived threat to sickness or disease (perceived susceptibility), belief of consequence (perceived severity), potential positive benefits of action (perceived benefits), perceived barriers to action, exposure to factors that prompt action (cues to action), and confidence in ability to succeed (self-efficacy). The HBM is relevant to the present study because it predicts the action individuals will take regarding health issues if they see themselves as being



susceptible to the health condition and if they believe in the equipment to be applied in remedying that health condition.

### Literature Review

Malaria is a major public health problem in Nigeria where it accounts for more cases and deaths than in any other country in the world. Malaria is a risk for 97 per cent of Nigeria's population, the remaining 3 per cent live in malaria free highlands. Arrese (2001), says there are an estimated 100 million malaria cases with over 300,000 deaths per year in Nigeria. This compares with 215,000 deaths per year in Nigeria from HIV/AIDS. As records from District Health Information Services Platform in Nasarawa State show, malaria contributes to an estimated 11 per cent of maternal mortality particularly in rural communities.

To Abdulkadir, et al. (2015), malaria is one of the most serious health problems facing the world today. The World Health Organization estimates that over 300 million new cases of malaria arise each year, with approximately two to three million deaths resulting from contraction. Malaria is endemic in tropical Africa, with an estimated 90 per cent of total malaria incidences and deaths occurring, particularly amongst pregnant women and children. More specifically, malaria causes various health problems in Nigeria and it is the only vector borne disease to be placed on WHO's Disability Adjusted Life Years (DALYS) list. It is therefore, important to look at malaria related health problems that affect the morbidity and mortality rates, as well as, the economy of a developing country, such as Nigeria. Nigeria has a population of about 123.9 million people with a large percentage living in extreme poverty in rural areas, with no access to potable water and adequate healthcare.

Commenting on the prevalence of malaria in rural communities of Nigeria, Amuta, Houmsou, Wama, and Ameh, (2014), argue that malaria infection in these areas are highly inevitable because most of the rural areas do not have access to good health care systems, children wear little clothing during the day and at night due to heat and humidity, thus leaving their bodies exposed to mosquito bites. Rural dwellers cannot afford to purchase bed nets. Mud houses are poorly constructed and are surrounded by bushes. Water is collected from streams and wells and left standing in open clay pots since there are usually no running taps.

Usually, there are no accessible roads to the health centers, which in turn are poorly equipped and have inadequate drugs for malaria treatment, to them, drug resistant malaria is common and anti-malaria drugs are becoming less effective as the plasmodium parasite develops resistance to affordable drugs. This poses a serious threat to clinical management and treatment of malaria. Azoma (2017), adds that, people cannot afford anti-malaria drugs so they tend to self-medicate with local herbs. Similarly, Abdulkadir, Rufai, Ochapa, Malam, Garba, Oloko, and George (2015), posit that malaria remains a major cause of under-five morbidity and mortality in Nigeria and prompt diagnosis occupies a strategic position in its management. To them, therefore, malaria rapid diagnostic test (RDT) kits, a nontechnical, easy-to-perform test, promises to meet this need.

### Methods

The research design employed in this study was survey while interview guide was the instrument for data collection. The choice of survey research design was informed by its suitability to social science studies and Ada, Abul, Ker and Okwu (2003), submission is that, it enhances efforts at finding meaning and obtaining understanding of respondents'

attitudes, opinions and beliefs. The interviews were administered on suspected patients of malaria who came to three health centers with symptoms of malaria and staff members of the same health centers in Karu Local Government Area of Nasarawa State namely: ROSOWA Health Center, FRSC Wole Soyinka Estate, Kuchikau, New Nyanya, Community Health Center New Karu, and Aso Pada Community Health Center, New Karu, over a period of two weeks. The inclusion criteria for the interviewees were: patients aged from 18 years and above, with symptoms such as fever, headache, vomiting and deep breathing. For the health care providers, they were required to have worked in the Health Center for a period not less than six (6) months.

The respondents (patients and health care givers) were asked six basic questions bordering on their knowledge of malaria, the prevalence rate in the community, knowledge of RDT kits, the use of RDT kits in the health center for diagnosis of malaria, and their perception of RDT kits as equipment for rapid diagnosis of malaria. Data obtained from the interviews were analyzed qualitatively using explanation building method.

## **Results Presentation and Discussion**

### **Results Presentation**

The respondents demonstrated a fair knowledge of their health status and acknowledged the high prevalence of malaria in their communities, noting that, malaria infections were rampant in their areas due to the environment that provides a breeding ground for the parasite carrying mosquitos and for the rapid transmission of the disease. Majority of them had prior knowledge about malaria and knew about the transmission, symptoms, and prevention of the disease and considered malaria a serious disease. With regard to history of infection, approximately two-thirds of the respondents (patients) had experienced at least two malaria attacks within two months prior to the study, while the remaining one-third had experienced a recent malaria episode. There was a significant relationship between the patients' environment and the number of infections suffered.

Generally, the respondents had some knowledge of Rapid Diagnosis Test Kits (RDTs). While most of the health care givers knew about the test kits, knowledge about its use in health centres in the study area was low. Majority of the respondents (patients) did not know about RDT kits while a very few of them had heard about it from friends and relatives that live in major cities. While almost all the respondents (patients) mentioned fever, headaches and weakness as symptoms of malaria, majority of them stated that they had never been tested for malaria before. Furthermore, most respondents reported that, they usually start treatment of malaria at home with medication prescribed by friends or relatives but seek medical attention from health centres when the symptoms persist for some days.

Knowledge of the RDT kits as well as the perception of its ability to aid in the quick and easy diagnosis of malaria was one of the issues the respondents were interviewed on. Generally, the respondents (health personnel) were informed and had knowledge of the test kits. However, this knowledge was obtained primarily through colleagues from health centres outside the study area as very few of them in the three surveyed health centers reported having used it before. Though they perceived the kits to be a veritable piece of equipment that will aid quick and early diagnosis and treatment of malaria different from other sicknesses that come with fever, headaches and weakness as symptoms, they decried the dearth of the kits in their health centres. With respect to attitude of the patients towards the kits, most of them regarded it as good for diagnosis of malaria thus helping to determine if



other diseases with similar symptoms were afflicting them. They however, called for more information and enlightenment about the kits to convince them to use it.

### **Discussion**

This study reported high prevalence of malaria in Karu Local Government Area of Nasarawa State as majority of the patients who attended health centres in the area came with symptoms of the disease and had a history of infections with many actually testing positive to the disease. This is consistent with results of previous studies (Arrese, 2001; Amuta, et al, 2014; Abdulkadir, et al, 2015) who found that malaria remains a major cause of morbidity and mortality, in Nigeria especially among under-five and pregnant women.

Findings of the current study showed very low knowledge of RDT kits among the study respondents including health personnel. Majority of the respondents who had knowledge of the kits got that information from colleagues, friends or relatives in other developed cities. This finding is consistent with theoretical postulations that the information-rich possess the means of modern mass communication and use it to good advantage while those in the lower socio-economic class whose education is poor and their resources are small are not knowledgeable in the areas that might lift them into success (Knowledge Gap Theory).

The present study has demonstrated that although there was positive perception of the kits as a viable solution for easy and early diagnosis of malaria, its use in the surveyed health centers was either very low or zero. More worrisome was the finding that most of the health personnel in the health centres studied had not used it before. These findings agree with earlier ones by Korenromp, et al (2015), and Haruna (2015), who hold that to enable effective diagnosis of all malaria cases, the diagnostic method used must be accurate and available at the point of care.

Based on these findings, there is the need for training and retraining of health personnel at health centres in Karu Local Government Area of Nasarawa State to equip them with the requisite skills to handle these test kits for improved health service delivery in malarial diagnostic test.

### **Conclusion**

Malaria is still prevalent among rural communities of Nasarawa State especially in Karu Local Government Area. Despite some level of knowledge and perception of RDT kits in the study area, some significant gaps persist in the usage of the kits for appropriate diagnosis and treatment of the disease. Adequate information about the viability and necessity of the kits should be designed and disseminated in these communities. Community mobilization and health education regarding the use of the kits to properly diagnose and separate malaria from other diseases before treatment should be considered.

### **Recommendations**

Arising from the findings of this study and the conclusion reached, the study recommends that:

1. Nasarawa State government should urgently procure and distribute RDT kits to all the health centres to aid prompt and adequate diagnosis of malaria in Karu Local Government Area.
2. Government, public spirited individuals and non-governmental organizations should sponsor the propagation of information on the kits among the study

population to encourage understanding and acceptability of the kits in Karu Local Government Area.

3. Government should produce jingles and procure the services of opinion leaders to spread enough information on the test kits in Karu Local Government Area.
4. There is an urgent need for training and retraining of health personnel at health centres in Karu Local Government Area to equip them with the requisite skills to handle these test kits for improved health services.

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