

Many older mothers and caregivers are not responding positively to Roll Back Malaria campaign intervention messages in South East Nigeria

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Roll Back Malaria (RBM) initiative, a part of recently concluded Millennium Development Goal (MDG) 6, launched in year 2000 incorporated several efforts including media campaign aimed at reducing morbidity and mortality caused by malaria in endemic countries such as Nigeria. The study investigated the responsiveness of caregivers' of under five children to media and inter-personal campaigns messages on RBM interventions in South East Nigeria in 2011. A survey was conducted among caregivers made up of mothers and grandmothers. The multi-stage sampling method was used in the selection of respondents. An interview schedule was administered to 600 selected caregivers drawn from two States (Anambra and Imo) in the South East Nigeria. Relationship between respondents' age and level of behaviour change was considered significant at less than 0.009. Significant relationship was found between age and behaviour change. The study found that older mothers and caregivers (aged 55yrs and above) were neither as aware nor as responsive as younger mothers and caregivers to the RBM campaign messages in South East Nigeria. While only 8 to 12 % of younger mothers and caregivers had low awareness of RBM campaign messages, as much as 33 % of older mothers and caregivers showed low awareness of RBM campaign messages. Consequently, between 17 and 23 % of younger mothers and caregivers showed low level of behavior change due to the RBM campaign messages and as much as 41 % of older mothers and caregivers showed low level of behavior change due to the RBM campaign messages. The study concludes that older mothers and caregivers did not show appreciable awareness and knowledge of RBM campaign messages that could lead to positive behavioural responsiveness. The study recommends further and targeted RBM campaign strategies for caregivers aged 55 and above. The importance of our findings lies in the fact that campaign messages leading to behaviour change should be re-strategized to reduce the mortality and morbidity among under 5 children due to malaria in endemic countries such as Nigeria.

Keywords: *Roll Back Malaria, Media Campaign, RBM interventions, Caregivers, South East Nigeria*

I. INTRODUCTION

Malaria has been widely documented as one of the major public health challenges undermining development in the poorest countries in the world. In recent times, the burden of malaria has become a critical global issue. Globally, malaria is responsible for a large burden of disease in endemic countries (Brinkman & Brinkman, 1991, p. 205; World Health Report, 1999, p. 5). Statistical evidence shows that more than 40 percent of the world's population out of which 1.1 and 2.7 million people die each year from more than 300 million acute cases of malaria and about 86 percent of these global deaths are in children (RBM, 2009, p.1; WHO, 2001, p.3; Oriang, 2006, p.3; CDC, 2012, p. 1). Malaria cases that have been recorded from different continents show that an estimated 91 percent of deaths in 2010 occurred in African region, followed by 6 percent in South East Asian region and 3 percent in the Eastern Mediterranean region (Center for Disease Control, 2012). In Africa, an estimated one million people die from malaria each year and most of these are children under the age of five. The situation in sub-Saharan Africa is further exacerbated by generally poor access to health care, poor health service infrastructure, and limited financial or human resources. Thus, malaria continues to be a major impediment to health in Africa south of the Sahara, where it frequently takes its greatest toll on very young children under the age of five and pregnant women (WHO/UNICEF, 2003, p.5; Kofoed, 2006, p.14).

In Nigeria, it is one of the leading causes of morbidity and mortality, especially among the most vulnerable groups of pregnant women and children under the age of five. According to the RBM partnership report, Nigeria ranks highest with statistical figures of 57,506,000 and 225,424 among the top five African countries with the highest incidence of malaria and malaria deaths respectively (RBM Partnership, 2009 p. 3). The high prevalence rate of malaria in Nigeria accounts for 25 per cent of newborn mortality and 30 per cent of childhood mortality in Nigeria (Ejezie, Ezedinachi, Usanga, Gemade, Ikpat, & Alaribe, 1991, p.20; FMOH, 2001, p.4; Mugisha & Arinaitwe, 2003, p.5). Malaria as a major public health problem in the world has attracted

concerted efforts at prevention and control including the use of communication in the form of media and interpersonal campaign messages on Roll Back Malaria interventions. Despite these efforts, Okafor and Amzat (2007) observe that malaria still remains a leading cause of morbidity and mortality especially in sub-Saharan Africa.

Evidence shows that effective interventions against malaria are available, yet the burden of the disease persists, largely because most people at risk of malaria are unaware of interventions; they are unable to afford them; or the interventions are inaccessible. Muhe (2002) identified lack of education; information and access to effective interventions as major constraints to the success of RBM initiatives, especially among the poor, and in poorer countries generally. The importance of effective communication in malaria control therefore becomes very critical. Effective communication is crucial to understanding how, when and where to engage with individuals and communities to successfully combat malaria. Effective communication is believed to be the basis of behaviour change. Within the field of public health, much attention has been devoted to potential uses of communication to modify attitudes, shape behaviour, and generally persuade audiences to protect their health (Amezcuca, McAllister, Ramirez, & Espinoza, 1990; Wallack, 1989).

Communication experts maintain that behaviour change requires strategic use of communication (Melkote & Steeves, 2001). Communication medium serves as the vehicle for dislodging misconceptions about beliefs and attitudes as well as in conveying information that can achieve behaviour change in desired ways. The practical implication of this is that communication media channels are appropriate for creating awareness as well as persuading individuals to adopt health-promoting behaviours. Since malaria is a health problem that affects many people especially in developing nations, it is arguable that targeting appropriate interventions and effective campaign messages to elicit behaviour change among caregivers of children under the age of five is central to achieving substantial progress. It has been established that communication is among the measures needed for effective control and prevention of the malaria as well as improving the adoption of ideal behaviour. Several campaign messages on RBM interventions have been ongoing on print and electronic media as well as through health talks given in hospitals and health centers nationally and in the states. Some radio campaign messages on RBM interventions have been running on various radio stations. These messages focus on increasing awareness and knowledge of the various interventions as well as encouraging adoption and practice of the interventions among various categories of the audience leading to behaviour change which is the essence of communication for development (C4D). Also some billboards mounted in strategic locations in the country convey various messages on the RBM interventions. Several posters on various RBM interventions focus on enlightening the public about malaria prevention, control, and treatment have been produced to create awareness about the RBM interventions by the National Malaria and Vector Control Programme (NMVCP). Apart from mediated intervention messages, in various hospitals and health facilities all over the country health workers give health talks on different health issues including HIV/AIDs, Immunization, hypertension, hepatitis, malaria among others. These talks on various aspects of health are avenues for sensitizing the public on prevention and control measure that should be taken against diseases.

As observed by the National Malaria Control Programme, communication on malaria preventive and treatment measures as well as provision of the commodities had been provided through advocacy, trainings, the mass media, community awareness campaigns, local medium etc. However to date, statistics still show insignificant reduction in malaria incidence, poor management of malaria at home, low uptake of IPT by pregnant women at the Ante natal clinics ANC, low possession of and/or inappropriate use of nets (National Malaria Control Programme, 2012). Beyond these successes in creating awareness, the continued burden of malaria in sub-Saharan Africa paints the picture that apart from awareness of an intervention some other factors may be responsible for achieving the ideal behaviour change required in tackling an epidemic. This thus forms the crux of the investigation into the responsiveness of caregivers to the various mediated RBM intervention and interpersonal campaign messages in the country.

II. RESEARCH PROBLEM

The focus on malaria control programme was initially on the control of insect vectors with very little attention given to reducing the impact of malaria on individuals through prevention and treatment (Heggenhougen, Hackenthal, & Vivek, 2003). However in recent times, the emphasis on malaria control has shifted to include attitudinal and behavioural control pattern among individuals and communities, where communication interventions play a paramount role. RBM communication intervention messages, in the form of radio jingles, posters, handbills and billboard messages on the various RBM interventions have been mounted in both print and electronic media in the country since 2010. Findings of most malaria studies (National Malaria Control Programme, 2012; (Mwenesi, Baume, Holschneider, & Nachbar, 2002; Worrall, Basu, & Hanson, 2002) show that there is awareness and knowledge of RBM interventions but very little corresponding response by way of health actions on the part of the target groups. In the light of the foregoing, the question is: in spite of communication interventions and knowledge of RBM interventions recorded among the target audience, why

does it appear that the target audience does not take health actions to show positive response in line with the RBM intervention initiative?

III. PURPOSE OF STUDY

Several media and interpersonal campaign messages have been mounted in the country with regard to malaria prevention and treatment. This study specifically examined how caregivers of children under five years respond to these campaigns on Roll Back Malaria intervention. To this end the following research questions were a guide to this study:

1. What is the level exposure and awareness of caregivers to media campaigns and interpersonal communication on Roll Back Malaria?
2. How does caregivers' level of knowledge affect their behavioural responsiveness to the media campaigns?
3. What are the behavioural changes resulting from exposure to these malaria control interventions in malaria prevention?

IV. REVIEW OF LITERATURE

Roll Back Malaria Initiative: An Overview

Prior to 1970, Heggenhougen, Hackenthal, and Vivek (2003) observed that malaria eradication programmes were based on indoor residual spraying. However, massive use of the pesticide with insufficient attention to agricultural consequences and economic development efforts resulted in major increases in insecticide resistance in the vector. Following the failure of the eradication efforts of the 1970s in many areas, a shift was made from eradication to control. A revised strategy – the Roll Back Malaria Initiative which is based on a realistic assessment of individual regions was adopted. The two main strategies adopted in this initiative involved a strengthening of basic primary health services to ensure adequate diagnosis, access to care and treatment for individuals while providing protective measures to communities by providing insecticide-treated bed nets and environmental anti-vector measures that will change the epidemiologic equilibrium of malaria transmission.

This initiative brought about a global partnership founded by the World Health Organization (WHO), the United Nations Development Programme (UNDP), the United Nations Children's Fund (UNICEF) and the World Bank alongside national governments, civil society and non-governmental organizations, research institutions, professional associations, UN and development agencies, development banks, the private sector and the media.

Roll Back Malaria evolved some strategies for achieving the objectives of reducing the burden of malaria. They include:

- Prompt access to treatment especially to the most vulnerable groups.
- Scaling-up the use of insecticide treated mosquito nets.
- Prevention and control of malaria in pregnant women.
- Emergency response to malaria epidemic (AMREF, 2007).

V. THE ROLE OF COMMUNICATION IN HEALTH INTERVENTIONS

Many intervention and communication campaign messages have been designed and used over the years in an attempt to affect various health behaviours by focusing the message at mass and local populations. These campaigns place messages in the media that reach large audiences most frequently through television or radio and other outdoor media such as billboards and posters and print media such as newspapers and magazines.

Such campaigns may take place for a short duration or may extend over long periods. The impact of such media interventions are usually varied based on the behaviour being promoted or the settings and structure of the programme. The great promise of such campaigns lies in their ability to communicate well defined behaviour change messages to large audiences, repeatedly, over time. The mass media generally are recognized as important components of any intervention programme. They are channels of communication that are capable of reaching heterogeneous audiences simultaneously to create awareness and knowledge about health issues. Several media campaigns on health related issues have played major roles in encouraging change in behaviour among people. These campaigns involving a wide range of innovations and investments have been employed as a contribution to the improvement of the quality of life of people.

Some health intervention campaigns have been variously used for promoting programmes such as: immunizations, prevention of diarrhoea dehydration, Roll Back Malaria, HIV/AIDS, female literacy, population and family planning, among others. These have been in the form of mass media campaigns, radio programmes, posters, street plays and localized outreach through communities and NGOs.

Mass media have made people aware of modern contraception and where to access it, as well as linking family planning to other reproductive health care and to broader roles for women. Communication about family planning and population control creates awareness, increases knowledge, builds approval, and encourages

healthful behaviours. In Egypt, where nearly all households have television, population control objectives have been achieved through televised Public Service Announcements (PSAs) (Ramirez, McAlister, Villarreal, Suarez, Talavera, Perez-Stable, Marti, & Trapido, 1998).

A Tanzania-based study carried out in 1999 by a team of researchers led by Everett M. Rogers showed how the popularity of a radio soap opera promoting family planning increased listeners' self-efficacy with respect to discussing contraception with spouses and peers (Rogers, Vaughan, Swalehe, Rao, Svenkerud, & Sood, 1999). Other studies further corroborate the effectiveness of media campaigns in changing health behaviours. Keating, Meekers and Adewuyi (2006) in a VISION project used media campaigns that focused on reproductive health and HIV/AIDS prevention to assess the extent programme exposure translates to increased awareness and prevention of HIV/AIDS. Their study discovered that media campaigns by VISION and its partners reached a large portion of the target population and exposure to mass media campaigns increased awareness of HIV/AIDS resulting in change in behaviour.

Similarly, a survey conducted in Nigeria among women of reproductive age correlated current use of contraception with whether the women had watched television music videos three years earlier. The study revealed that women who were exposed to pro-family planning messages were more likely to use contraception and desired fewer children, even when other variables such as education and urban residence were taken into consideration (Bankole, 1994).

In malaria control efforts, communication has played a pivotal role in educating the public about malaria causes and methods of preventing the disease. As a source of malaria information to the public, communication enhances the content and penetration of Roll Back Malaria campaigns messages using various channels of the media in disseminating malaria related information. Since 2006, when the Nigerian Liquefied Natural Gas (NLNG) launched its RBM campaign message in all its host local government areas in Rivers State, with the aim of rolling back malaria through improved sanitation habits and use of mosquito/insecticide treated bed nets, over 8,000 homes have been reached with the message and insecticide treated bed nets. The nets are mainly targeted at children under five years and pregnant women in these communities.

Thwing, Hochberg, Eng, Issifi, James Eliades, Minkoulou, Wolkon, Gado, Ibrahim, Newman, and Lama, (2008), evaluated the campaign effectiveness, net retention, Insecticide-Treated Net (ITN) ownership, and usage of the nationwide integrated campaigns to distribute polio vaccine and Long Lasting Insecticide-treated Nets (LLINs) to children less than 5 years of age in Niger. The survey discovered that during the integrated campaign, free distribution of ITNs rapidly increased ITN ownership and decreased inequities between those in the highest and lowest wealth quintiles. Retention of ITNs was very high, and usage was high during malaria transmission season. However, ITN ownership and usage by vulnerable groups continues to fall short of RBM targets, thus the study suggests additional strategies needed to increase ownership and usage.

Oyeyemi, Alawode and Sogunro (2010) investigated the ownership and utilization of LLIN after LLIN distribution campaign in Ekiti state in South Western Nigeria. The study revealed that distribution of LLIN through campaign increased ownership and utilization of LLIN rapidly especially among vulnerable groups. However, utilization still fell short of national target especially among non pregnant adult. The study thus recommends additional strategies to increase utilization and sustain current ownership level. These studies point to the increasing important role that communication continues to play in health intervention efforts. However, these successes are without certain challenges which concern the behavioural and social aspects of disease prevention and control among individuals.

VI. EMPIRICAL REVIEW

Several studies have provided evidence supporting the utility of the Health Belief Model in understanding the factors associated with parents' behaviours. A 1996 study carried out by Tuma in a rural Cameroonian village analyzed factors associated with caregiver compliance to child immunization schedules. The study found that both perceived susceptibility and perceived severity of infectious diseases were reliably associated with greater compliance to appropriate vaccination timelines. Similarly, another study conducted among mothers and primary caregivers in Indianapolis, Indiana (USA) by Zimet in 1995 also showed that perceived severity and susceptibility were two components of the Health Belief Model that were significantly related to greater likelihood of immunization (Matsuda, 2002, p.14).

Similarly Uzochukwu, Onwujekwe, Onoka and Ughasoro (2008) in their study of rural-urban differences in maternal response to childhood fever in South East Nigeria hinged their study on the premise that the degree of vulnerability perceived by mothers will affect their perception of the severity and threat of their child's fever and the patterns of health care use. A cross-sectional study by Oguonu, Okafor, and Obu (2005) tested caregivers' knowledge, attitude and practice regarding malaria and treatment of children in rural and urban communities in Enugu. A total of 224 and 184 caregivers selected by convenience sampling were interviewed in pediatric out-patient clinics in rural and urban areas respectively, using structured questionnaires. The result of the study revealed that most of the respondents in rural and urban areas have heard about malaria

(99 percent urban; 74 percent rural; $P < \text{or} = 0.05$). However, both groups were unaware of the particular susceptibility of children and pregnant women to the disease, thus their preference for self-medication (urban, 79 percent; rural, 20 percent). The rural and urban caregivers were quite familiar with and used anti-malarial drugs such as chloroquine (urban, 23 percent; rural, 15 percent) and sulphadoxine-pyrimethamine (urban, 50 percent; rural, 6 percent), although in inappropriate dosages. They were also aware of preventive measures against malaria such as insecticide-treated nets (urban, 32 percent; rural, 56 percent), although there was low usage in both communities (7 and 2 percent, respectively). Both rural and urban communities were aware of the severity of malaria as a disease, but practices were grossly inadequate. The study thus recommended provision of affordable healthcare facilities and the use of health education to change knowledge, attitude and practice that will help meet the target goals of the 'Roll Back Malaria' campaign in the study area.

Proponents of the HBM claim that beliefs about disease and what can be done to prevent diseases affect individuals' tendency to perform certain health behaviours. Working on the notion of the underlying framework, the rate of adoption of RBM intervention messages to effect behavioural changes in caregivers would be dependent on the susceptibility and severity of malaria and the benefits of taking a positive health action. Knowledge about the susceptibility and severity of malaria should naturally influence caregivers to take positive actions to prevent malaria.

VII. THEORETICAL FRAMEWORK

The Health Belief Model (HBM), one of the models useful in explaining health behaviours provides the theoretical approach for the promotion and maintenance of a lifestyle change that encourages health promotion, health maintenance, and assists in decreasing complications due to chronic illness. At the individual level, it has been used to explain change and maintenance of health-related behaviours. The HBM developed in the 1950s by Hochbaum, Rosenstock and Kegels attempts to explain and predict health behaviours by focusing on the attitudes and beliefs of individuals.

The assumption of the HBM is that people are most likely to take health-related action if they feel that by doing so they can avoid a negative health condition. For example, malaria is a negative health consequence, and the desire to avoid malaria results in motivating people into practicing preventive methods against malaria. In this case, an understanding and acknowledgment of the severity of malaria will help in motivating people to take media campaigns on RBM interventions seriously.

The six key concepts of HBM: Perceived Susceptibility, Perceived Severity, Perceived Benefits, Perceived Barriers, Cues to Action and Self-efficacy are used to describe the typical role that information and knowledge could play in highlighting health issues as well as in influencing health behaviours. The HBM proposes that individuals will alter health-related behaviour according to the perceived severity of the threat to their health (Chen and Land, 1986).

VIII. METHODOLOGY

This study was designed as a survey. The population for the study comprises of the population of women in Anambra and Imo States within age brackets 15 years and above which is 1,333,321 and 1,269,910 respectively (2006 census figure). A multi-stage sampling technique was used in the selection. First stage was selection of states namely Anambra and Imo States from the five states in the South East. The second stage was the selection of the senatorial zones in the sampled states. Each of the states have three senatorial zones, Anambra state has Anambra Central, Anambra North and Anambra South senatorial zones, while Imo state has Orlu, Owerri and Okigwe senatorial zones. The third stage was the random sampling of one local government area from each of the senatorial zone. The senatorial zones in Anambra state have an even spread of local government at seven LGAs per zone. These were coded one to seven respectively. Using the table of random numbers, Awka North, Ogbaru and Aguata respectively, were selected from a random vertical movement downwards on the table of random numbers. For Imo state, the Orlu senatorial zone had its 12 Local government coded 1-12, Ideato North was randomly selected using table of random numbers. Also, for Owerri senatorial zone with 8 LGAs, Ngor-Okpala was selected using table of random numbers. Similarly, Obowo local government was selected from Okigwe senatorial zone with 7 LGAs using table of random numbers. Thus a total of six local government areas were selected for the study. The fourth stage involved the random selection of communities from each of the local government areas. One urban community and one rural community were randomly selected from the local government areas. Communities described as rural are characterized based on low population density, small settlements, and few infrastructural development. On the other hand, high population density, availability of social amenities such as markets, parks, nature of roads and housing as well as occupation of the people characterized the communities viewed as urban in this study. The next stage involved sampling of eligible respondents (women who are caregivers of under five children) from the selected households/*umunnas*.

Data analysis and discussion

IX. DEMOGRAPHIC DATA

The data on age distribution of the respondents involved in the study show that about one-third (31 percent) of the respondents are in the 26-35 age bracket while 1 in 4 (25 percent) of the respondents are in the age brackets 36-45 years. The indication is that over one-half of the respondents are within the age bracket of 26 – 45 years, which is considered the age brackets for most women at their reproductive age and as such issues of malaria control and prevention would be of major interest to them. Twenty-two percent of the population fall between 15-25 age brackets. The remaining respondents 14 percent were in 46-55 age brackets while only 8 percent of the respondents were within the age brackets 56 and above. These groups which constitute a little below one-half of the respondents consist of grandmothers who have past the active child bearing age but may still be involved in taking care of their grandchildren and those who are not yet engaged fully in childbearing. Regarding the marital status of respondents, a little over one-half (53 percent) of the respondents are currently married. Another 11 percent are living with a partner which suggests that about two-thirds or two in three of the respondents are either married or living with a partner. Sixteen percent of the respondents are widowed. Another nine percent are either divorced or single. This shows that majority of the respondents sampled in the study are currently married. Respondents were asked to indicate if they ever attended school. From the analysis, more than three-fourths of the sampled proportion for this study have attended school while 11 percent of the respondents have not attended any form of formal education. This suggests that more than 3 in 4 of the respondents are literates. Respondents who indicated they have attended school were asked to indicate their various levels of educational attainment. About one-half of the respondents have secondary school education; more than one quarter of the respondents were university graduates and the remaining 21 percent attained primary school education.

Figure 1: Exposure and awareness of Respondents to Roll Back Malaria Campaign Messages

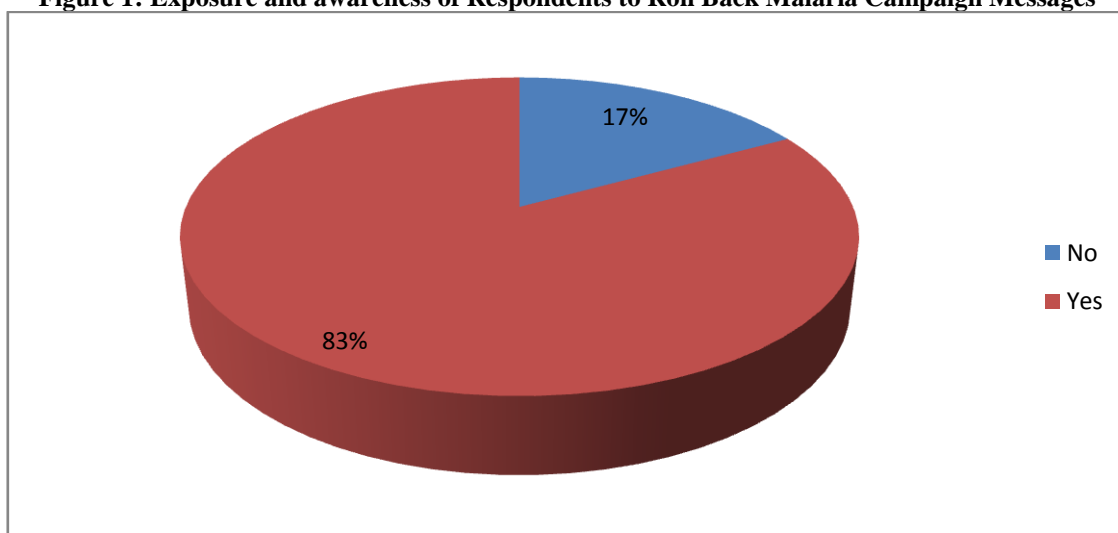


Figure 1 contains computation of respondents’ indication of exposure and awareness of Roll Back Malaria (RBM) campaign messages in percentages. There was the indication from the data that 83 percent of the respondents are possibly exposed to and are aware of RBM campaign messages while only 17 percent are not exposed to and aware of the RBM campaign messages. This indicates that most of the respondents are exposed to and are aware of RBM media campaign messages.

Table 1: Respondents’ exposure/awareness to various RBM campaign messages

	Complete your prescribe treatment	Prevent mosquitoes breeding in environment	Sleep under Insecticide Treated Nets (ITN) every night	Indoor residual spraying prevent malaria	Health workers prevent malaria in pregnancy	Use long lasting Insecticide Treated Nets (ITN)
Have not heard	21%	16%	9%	22%	29%	14%
Have heard	79%	84%	91%	78%	71%	86%
Total	100%	100%	100%	100%	100%	100%

Table 1 displays data showing the distribution of respondents’ exposure and awareness of specific RBM campaigns. As can be gleaned from the table, more than three-quarter of the respondents are generally exposed to and are aware of the various RBM intervention messages under review. This goes from a high of 91 percent for the campaign on “Sleep under ITN every night”, 86 percent for campaign on “Use long lasting ITN”, to a

low of 71 percent for the campaign on “Health workers prevent malaria in Pregnancy.” About 80 percent of the respondents were equally aware of the remaining four media RBM campaigns as can be seen in table four. The result generated in this table is consistent with Nigerian Malaria Indicator Survey (NMIS) 2010 that showed high awareness to RBM intervention messages.

Table 2: Distribution of medium of exposure to specific RBM campaign messages

	Complete your prescribe treatment	Prevent mosquitoes breeding in environment	Sleep under ITN every night	Indoor residual spraying prevent malaria	Health workers prevent malaria in pregnancy	Use long lasting ITN
Radio	40%	37%	37%	37%	28%	36%
Television	15%	13%	14%	17%	12%	12%
Word of mouth	27%	26%	35%	24%	40%	33%
All of the above	11%	19%	16%	15%	11%	15%
None of the above	7%	4%	3%	7%	9%	4%
Total	100%	100%	100%	100%	100%	100%

Table 2 shows the utilization of various media of communication by the respondents in obtaining information on the RBM campaigns under study. From the table, it was observed that radio seems to be the medium of choice for most respondents. Over one third of the respondents obtain information about the various campaigns from radio. This goes from a high of 40 percent for the campaign on “complete your prescribe treatment”, to a low of 28 percent for the campaign on “Health workers prevent malaria in pregnancy”. Apart from radio, word of mouth communication was identified as the next medium of choice for the various campaigns, one in four of the respondents used this medium to obtain messages in three of the campaigns; one in three utilized the same source for two of the campaigns and 40 percent utilized the same source to obtain messages on “Health workers prevent malaria in pregnancy. This particular campaign on “Health workers prevent malaria in pregnancy” received the 40 percent probably due to the fact that health workers in the various health centers gave talks on malaria prevention during ante-natal and routine immunization visits. This is consistent with studies by Oresanya, Hoshen, & Sofola (2008) that showed that the presence of health facility in the community in addition to caregiver’s level of education and age of the child is a predictor of bed net utilization in Nigeria, in urban children.

The data generated from this analysis indicate that over two-thirds of the respondents receive their information on RBM mainly from two sources—radio and word of mouth communication.

Table 3: Relationship between respondents’ level of awareness of all the Roll Back Malaria media campaigns and age

Level of RBM awareness	Respondent's age				
	15-25 years	26-35 years	36-45 years	46=55 years	56 years and above
Low	12%	6%	10%	8%	33%
High	88%	94%	90%	92%	67%
Total	100%	100%	100%	100%	100%

X= 27.475; DF 4; p<.000

Table 7 suggests a high level of awareness to all the Roll Back Malaria media campaigns among the respondents across the various age brackets. The relationship was found to be statistically significant at .000 level. The table shows that more than three-fourths of the respondents in age brackets 15-55 have high level of awareness of RBM campaign messages compared to two-thirds of respondents aged 56 and above. This high level of awareness to RBM campaign messages among respondents may be linked to the frequency of exposure of the respondents as indicated in table 6 above.

Table 4: Knowledge of malaria prevention among respondents

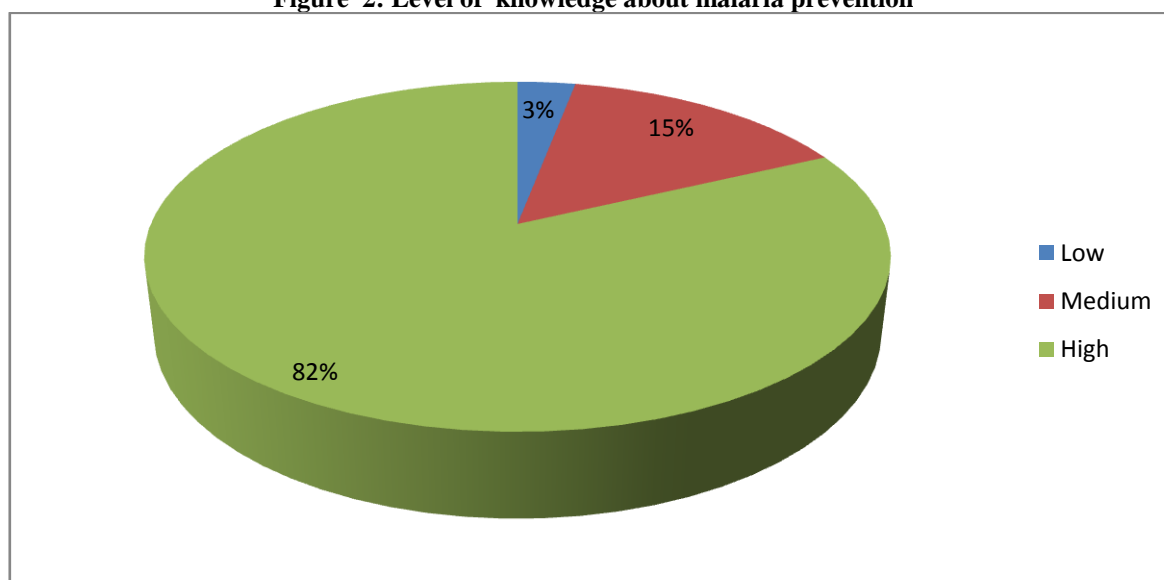
	Sleep under ITN	Take prescribed treatment	Take preventive treatment in pregnancy	Fill potholes in environment	Cut grasses and bushes	Bury empty containers, cans and pure water sachets	Dispose refuse and waste properly	Store water with a lid or cover	Respondents spray home
True	88%	89%	87%	87%	97%	86%	96%	88%	85%
False	12%	11%	13%	13%	3%	14%	4%	12%	15%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

From table 4, there was an indication that a greater percentage of the respondents were highly knowledgeable about malaria prevention and control. For instance, eighty-eight percent of the respondents knew that sleeping under insecticide-treated nets and storing water with a lid or cover prevented malaria while 12 percent did not know. Another 89 percent admitted that taking prescribed treatment for malaria prevented malaria while 11 percent were not affirmative. On the issue of taking preventive treatment during pregnancy and filling potholes in the environment, 87 percent of the respondents agreed that taking preventive treatment during pregnancy and filling potholes in the environment prevented malaria while 13 percent did not know. Ninety-seven percent knew that cutting grasses and bushes around the compound prevented malaria while 3 percent did not know. Eighty-six percent knew that burying empty containers, cans and pure water sachets prevented malaria while 14 percent did not know. Ninety-six percent knew that disposing refuse and waste properly prevented malaria while 4 percent did not know. Also 85 percent of the respondents knew that spraying their homes with insecticides prevented malaria while 15 percent did not know.

Findings from this data seemed to corroborate with earlier results on awareness and exposure of respondents to RBM information. From these findings, it appeared that the high level of awareness and exposure of the respondents translated into a greater tendency of their being knowledgeable about malaria prevention and control.

The level of knowledge of RBM among respondents was measured by asking the respondents a battery of nine questions on malaria prevention and control as indicated in table 12. “True” answers got a score of 1 while “False” answers got 0. On the string of these nine questions, aggregate scores of 7-9 was rated as “High”, 4-6 was rated as “Medium” and below 3 points was rated as “Low”. The pie chart below represented the data on the level of knowledge of malaria prevention and control among respondents.

Figure 2: Level of knowledge about malaria prevention



The pie chart on figure 2 shows that more than 3 in 4 (82 percent) of respondents displayed they were highly knowledgeable about malaria prevention and control. A little above one-sixtieth of the respondents indicated they had moderate knowledge of malaria prevention and control, while only 3 percent of respondents displayed low knowledge level of malaria prevention and control. The implication from the analysis is that the level of knowledge of majority of the respondents on how to control and prevent malaria is very high which could be attributed to their exposure and awareness to RBM media campaigns.

Next relationship analyses were conducted between respondents’ level of knowledge about malaria prevention and age, marital status, education and place of residence, as can be gleaned from the tables below. This is to see if any trend and relationships could be found among these variables.

Table 5: Respondents' Level of knowledge about malaria prevention and age

Level of knowledge of malaria prevention	Respondent's age				
	15-25 years	26-35 years	36-45 years	46-55 years	56 years and above
Low	2%	2%	3%	0%	13%
Medium	14%	11%	17%	14%	24%
High	84%	87%	80%	86%	63%
Total	100%	100%	100%	100%	100%

X= 31.475; DF 8; p<.000

The table above showed that respondents have a high level of knowledge about malaria prevention regardless of age. This relationship is statistically significant at .000 levels. This level of knowledge about malaria prevention as observed in table thirteen went from a high of 87 percent for 26-35 years to a low of 63 percent for 55 years and above. However when the high and medium levels of knowledge were collapsed, no major differences were found among the other age brackets except 56 years and above. The high level of knowledge of malaria prevention among respondents might be linked to the high level of awareness about RBM as has been established earlier from figure eleven.

Table 6: Behavioural changes due to campaign messages

	Family sleep under ITN	Take IPT during pregnancy	Take children to health centre	Prompt treatment to children	Take ACT drugs	Administer complete treatment	Cut bushes and dispose refuse properly
Influenced	66%	65%	71%	77%	61%	83%	85%
Not influenced	34%	35%	29%	23%	39%	17%	15%
Total	100%	100%	100%	100%	100%	100%	100%

The data on table six show a list of behaviour respondents claimed to have been influenced as a result of exposure to the campaign messages. From the analysis of data, there is an indication that a greater percent of the respondents claimed they have been influenced by their exposure to the various media campaigns on the RBM intervention messages. Details of their responses show that more than two thirds of the respondents claimed they have had their behaviour influenced by all the RBM campaign messages they had been exposed to. This goes from a low of 61 percent for “take Artemisinin Combination Therapy (ACT)” and 65 percent for “take IPT in pregnancy”, to a high of 85 percent for “cut bushes and dispose refuse properly around their houses”. However it is interesting to note that about one-third of the respondents in most of the RBM campaigns except for “Administer complete treatment” and “cut bushes and dispose refuse properly” claimed that their behaviour change was not due to the campaigns. From the table, the specific RBM campaign messages that respondents claimed have had the greatest positive influence on their behaviour was cutting bushes and disposing refuse in environment properly. The fact that up to one-third of the respondents still claimed that their behaviours were not influenced by these campaigns should be a source of worry. Maybe they are the lagers or resistant group to the campaign messages to eradicate malaria within their environment.

Table 7: Respondents' Level of behaviour change due to campaign and age

Level of behaviour change due to campaign	Respondent's age				
	15-25 years	26-35 years	36-45 years	46=55 years	56 years and above
Low	23%	20%	17%	17%	41%
High	77%	80%	83%	83%	59%
Total	100%	100%	100%	100%	100%

X= 13.604; DF 4; p<.009

Table 7 suggests that respondents claimed a high level of behaviour change due to campaign across the various age brackets. The relationship was found to be statistically significant at .009 level. The behavior change was found to increase with age. The exception here is for respondents who are 56 years and above. The table shows that as the age of the respondents increased, their level of behaviour change increased along the same line. However, this level of behaviour change dropped for older respondents. The table shows that more than three-fourths of the respondents in age brackets 15-55 claimed they had high level of behaviour change due to the RBM campaign messages compared to a little above one half of respondents aged 56 and above. Similarly

among those who scored low in level of behavior change, it was found that the respondents who were 56 years and above were about twice as those in other age brackets (41 percent). This suggests that the lagers or resistant group suggested above earlier may be the older population who were already set in their ways on how to handle issues of malaria attacks.

Discussion

The key conclusion drawn from the study is that caregivers of under five children used in this study are exposed to campaign messages on the various RBM interventions and aware of these interventions. Awareness to an intervention according to Rogers is believed to be the first step in the process of adopting an innovation which may lead to seeking more information concerning the innovation particularly when there is a felt need for the innovation aimed at behaviour change. Respondents exposure and awareness to the intervention could be the possible reason why there was positive behavioural disposition noticed for the various RBM intervention campaign messages as indicated in the study. This positive behavioural disposition noticed among a good number of the respondents could be attributed to the high level of awareness of the RBM information which invariably may be a function of the frequency of exposure of the respondents to the RBM media campaigns. Radio and interpersonal sources of word of mouth were identified as the most prevalent modes of exposure and awareness of the respondents to RBM information. This complementarity between mass media and interpersonal channels as sources of information is consistent with Ndyomugenyi *et al* (2007) study which showed respondents heard about malaria information from radio and interpersonal sources. These findings point to the obvious importance of radio as a popular medium of information with the ability to stimulate audience imagination because of its personalized nature. However, even though radio channel has been identified by scholars (Okunna, 1992; Okigbo, 1995; Sobowale and Sogbanmu, 1984; Moemeka, 1981) as an important medium of information for development especially among rural population in third world countries. Interpersonal channels promote participation and empowerment for social change. This is consistent with UNICEF (2005) view of interpersonal channels as an important tool in communicating information on intervention to affect and change behaviour. Rogers, Singhal and Quinlan (2009) thus emphasized the importance of interpersonal communication networks more than any other communication networks in achieving behaviour change.

With regards, respondents' knowledge of malaria prevention, findings from the study showed a high knowledge of malaria prevention among respondents. The implication of this finding could be that respondents whose frequency of exposure to RBM intervention messages from various sources is more are likely to be highly knowledgeable about issues of malaria prevention and control as the length of time is considerably a long period of time for one to understand issues of malaria prevention and control. The findings from the study indicate that the application of the time element in the diffusion process determines the mental process an individual undergoes from the stage of initial knowledge of the innovation until when the innovation is either adopted or rejected.

When behavioural responsiveness was measured across the various age brackets the specific age brackets of 55 years and above showed remarkable difference in terms of behavioural disposition. This particular age bracket showed the lowest score for high behavioural disposition and the highest score for low behavioural disposition. This raises a worry for this particular age group who constitute mainly the grandmothers. One may reason that it is possible this group of caregivers is the lagers or resistant group to the campaign messages to eradicate malaria.

X. CONCLUSION

The role of health communication in providing information on health behaviours to produce desirable behaviour change in a target group has been a dominant discourse in many countries. The use of human and mediated communication channels in health care delivery and health promotion has been gaining a lot of foothold in recent years, especially at a time when many of the threats to global public health is embedded in human behaviour change. The major finding of this study which is a contribution to knowledge in malaria studies is that caregivers' high knowledge about RBM intervention campaign messages which they claimed to have translated into ideal behavioural responsiveness increased after exposure to RBM campaign messages. The findings of respondents' demographics in this study which showed most women in the study within the older age brackets (55 years and above) that constitute grandmothers with varying behavioural responsiveness from the younger mothers are most disturbing and a cause for concern in relation to the RBM intervention messages. The finding shows the possibility of an existence of gap in knowledge/information about RBM interventions which may be linked to the educational attainment of most of the caregivers in this age bracket. It is also possible that this age group may be more attuned with the socio-cultural factors prevalent in their communities. The indication is that culture and educational attainment of most women within the older age bracket could be responsible for this unusual trend.

XI. REFERENCES

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