# Assessing the suitability of print IEC materials used in malaria prevention among rural dwellers in South-West Nigeria

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**Abstract**
Malaria is a major health challenge in Nigeria and many studies have focused on various aspects of its prevention. However, scant attention has been given to the content of prevention information. Therefore, this study explored the content of printed IEC materials used in malaria prevention with a view to establishing their suitability for the rural dwellers in south-west, Nigeria. Content analysis and focus group discussion (FGD) methods of research were employed. While five IEC materials (one IPC Guide, one IPC flip chart, and three generic posters) were content analysed, 16 focus group discussions were held in primary health centres across the 16 rural communities selected for the study. Data were analysed using simple percentages, summative approach and the explanation building technique. Findings showed that the IPC Guide and two of the posters, 'Take Good Care of Your Net' (83.3%) and 'NetSafe' (83.3%) were considered suitable to a great extent while the IPC flipchart was considered suitable to some extent. Two of the cards of the flip chart and the 'Disease prevention' poster (36.1%) were found to be unsuitable for the rural audience. Although the narratives of the materials were deemed credible, most of the visuals were unacceptable to the rural audience. The participants perceived the illustrations as culturally insensitive. Findings have implications for malaria prevention message development. The content of IEC material for malaria prevention should be accurate, action-oriented, culturally sensitive and acceptable to the target audience.

**Key Words**: Malaria Information, Malaria Prevention, Information, Education and Communication, Roll Back Malaria, Rural Dwellers

## Introduction

Malaria is one of the major public health problems in Africa and Nigeria is no doubt the most affected in the continent. According to the World Health Organization (WHO), in 2018, an estimated 228 million cases of malaria occurred worldwide and most of these cases (213 million or 93%) were in the African Region. Six countries accounted for more than half of all malaria cases worldwide: Nigeria (25%), the Democratic Republic of the Congo (12%), Uganda (5%), Côte d'Ivoire, Mozambique and Niger (4% each). Thus, indicating that Nigeria has the highest rate of malaria cases in the world (World Malaria Report 2019).

Malaria is the most important cause of morbidity and mortality especially among pregnant women and children aged under 5 years. In 2018, there were an estimated 405,000 deaths from malaria globally. Nigeria accounted for almost 24% of all global malaria deaths which again is the highest rate worldwide (World Malaria Report 2019). For the prevention of malaria, WHO recommends vector control (i.e. reducing the chances of mosquitoes biting human beings) or chemoprevention (i.e. providing drugs that suppress infections) in specific population subgroups (i.e. pregnant women, children and other high-risk groups). The core interventions to prevent mosquito bites are sleeping under an insecticide-treated net (ITN) and indoor residual spraying (IRS) (WHO, 2019). By 2018, in all of the 11high burden to high impact (HBHI) countries, at least 40% of the population at risk were sleeping under long-lasting insecticidal nets (LLINs), the highest percentage being in Uganda (80%) and the lowest in Nigeria (40%) (World Malaria Report 2019).

The knowledge about the preventive measures of malaria is an important preceding factor for the acceptance and use of malaria preventive measures by community members. However, studies have indicated that gaps still exist in the knowledge of causation and treatment of malaria in rural areas and that these gaps have serious public health implications (Comoro et al., 2003, Falade et al., 2006; Okeke, Uzochukwu &

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Okafor, 2006, as cited by Adebayo, Akinyemi & Cadmus, 2015). For instance, findings of the cross-sectional survey carried out by Adebayo et al. (2015) showed that knowledge of malaria prevention was below average among female caregivers of under-five children and pregnant women in Igbo-Ora, a rural community in south-west Nigeria. Most of the rural respondents exhibited some myths and misconceptions about malaria prevention. The probable reasons given for the poor knowledge included lack of exposure to health education messages regarding malaria prevention, difficulty in understanding malaria prevention information given during antenatal and postnatal clinics, inappropriate means of communication and delivery of these messages by the health workers and the low level of education of the respondents. This implies that adequate knowledge of preventive measures would require well designed health education and promotion materials. To address the issues of malaria prevention and control, Roll Back Malaria (RBM) Partners in line with the recommendation of WHO have consistently developed and distributed Information, education and communication (IEC) materials. However, little is known about the suitability of these materials in the rural setting.

Although a lot of work has been done in the area of malaria prevention and control, there are scant studies on IEC strategy related to malaria prevention. Many studies have focused on the knowledge, attitude and practices about malaria and its prevention, the use of ITNs and intermittent preventive treatment for pregnant women (IPTp). Such studies include, Ojo (2005), Kigodi and Komanya (2006), Morenikeji (2009), Okwa and Ibidapo (2010),Karunamoorthi and Abdi (2010), Jombo, Araoye and Damen (2011), Akaba, Otubu, Agida, and Onafowokan (2013), Konlan, Amu, Konlan and Japiong (2019)**.** Most of these works have looked at how populations respond to malaria prevention information without examining the content of the information itself. Indeed, little research has been conducted to explore the content of IEC materials on malaria prevention. This study therefore analyses the content of IEC materials on malaria prevention targeted at the rural community in south-west Nigeria with a view to determining their suitability for the rural audience in Oyo and Osun States.

**Concept of Information, Education and Communication**

Information, Education and Communication (IEC) is a generic term applied in the field of public health to carry out public health education and promotion (Maloreh-Nyamekye, 2013).As stated in the RBM Global Malaria Action Plan (2008 p.210), "IEC is broadly defined as providing knowledge to enable individuals, families, groups, organizations and communities to play active roles in achieving, protecting and sustaining their own health". According to the World Health Organization (2001), IEC can be defined as an approach which attempts to change or reinforce a set of behaviours in a target audience regarding a specific problem in a predefined period of time. It is multidisciplinary and client-centred in its approach. IEC strategies involve planning, implementation, monitoring and evaluation. The WHO also reported that the most important lesson learned from more than two decades of experience in IEC interventions in support of public health is that "IEC works. It creates awareness, increases knowledge, changes attitudes and moves people to change or continue their behaviour or to adopt an innovation" (WHO, 2001 p. 3). Similarly, Mala (2019) states that IEC has played a pivotal role in the health sector. It has become an effective medium for bringing awareness, providing information, eradicating mythical beliefs, and championing the cause for health and development. In essence, IEC informs, inspires, motivates, and empowers people to make decisions towards the healthy way by making changes in terms of knowledge, attitudes, and beliefs (Puri, 2017).

IEC material refers to "any media campaign material related to public health with an approach aiming at changing or reinforcing health-related behaviours in a target audience, concerning a specific problem and within a pre-defined period of time, through communication methods and principles" (Chinnappan & Aram, 2015 p.350). Basically, IEC materials are designed to deliver health messages to the local community where community-based health workers primarily use them to support their communication (Birhanu, Godesso, Jira, & Morankar, 2011). Most IEC materials do not aim to just draw attention to an issue about disease or risks to health; they aim to provide usable information and help the reader/viewer take some kind of action (Pathfinder International, n.d.). In short, they aim to increase awareness and bring about a desired positive behaviour in the target audience. IEC messages are therefore designed to support existing desired behaviours, promote new behaviours as necessary, and alter unhealthy behaviours (WHO, 2001).

In order to bring about behavioural change leading to decline in morbidity and mortality due to malaria, IEC strategies need to be feasible,

appropriate, meaningful and effective (Maloreh-Nyamekye, 2013). IEC materials are most effective when they are relevant, need based and used by the target audience (Pratheepa & Nithya, 2014 as cited by Nyantong'a 2016)**.** Research in international public health has revealed that IEC interventions that are reflective of and responsive to local cultures and conditions are far more effective to bring behaviour change (Birhanuet al., 2011). Hence, IEC materials should be produced in line with the principles of health education and promotion to deal with a specific health concern, be distributed timely and utilised efficiently to give production meaning (Birhanu et al., 2011).

IEC materials can be in print or electronic forms. These include posters, flip charts, booklets, leaflets, brochures, display boards/billboards, banners, newsletters, pamphlets, stickers, calendars, t-shirts, bags, newspaper and magazine articles, radio and television spots/jingles/programmes, CDs, DVDs, etc. The present study focuses on print IEC materials.

**Roll Back Malaria Partnership and IEC Strategy**

The Roll Back Malaria (RBM) Partnership to End Malaria is the global platform for coordinated action against malaria. It was launched in 1998 by WHO, UNICEF, UNDP and the World Bank in an effort to provide a coordinated global response to the disease (RBM Partnership, 2018: 17). African heads of states met in Abuja, Nigeria on 25 April 2000, "to express commitment to the Roll Back Malaria (RBM) initiative having recognized the public health and economic burden the disease has placed on the continent as well as the barrier it constitutes to development and poverty alleviation" (Chukwuocha, 2012 p.1). Roll Back Malaria (RBM) is the umbrella organ for executing malaria prevention activities across Nigeria using the National Malaria Strategic Plan (NMSP). The communication component of the NMSP is embedded within the concept of ITN Massive Promotion and Awareness Campaign (IMPAC) which involves the production of Information, Education and Communication materials on malaria prevention as well as social mobilisation of target audiences. IEC materials can be used to increase knowledge regarding "the transmission and prevention of malaria; the link between bed net use and malaria control; the recognition of signs and symptoms, risk groups, rapid treatment-seeking behavior and full compliance with treatment; the consequences of malaria in pregnancy and the need for antenatal care which includes LLINs and, as appropriate, IPTp; and the motivation and intention to use tools for malaria prevention and control" (RBM Global Malaria Action Plan, 2008 p.210).

**Effectiveness of IEC in Malaria Prevention**

Communication interventions hold a vital and indispensable place in the prevention and treatment of diseases (Manoj, 2020). Scholars have affirmed that community mobilisation and behavioural change mechanisms such as the use of IEC materials and community-based activities are significant for the success of all malaria prevention activities (Tizifa, Kabaghe, McCann, van den Berg, Van Vugt, & Phiri, 2018). Studies have also revealed the impact of IEC on malaria prevention knowledge, attitude and practices.

Nyunt, Aye, Kyaw, Wai, Oo, Than, et al. (2015) evaluated the effectiveness of the behaviour change communication (BCC) and community mobilisation activities in Myanmar Artemisinin Resistance Containment (MARC) zones in Myanmar by quantitative and qualitative approaches. In Myanmar, BCC and community mobilisation activities included distribution of IEC materials such as pamphlets, posters, and billboards. Findings highlighted the improvement of the behaviour change in the MARC areas although, there were still many misunderstandings and misconceptions on malaria and risk behaviours in the communities.

A quasi-experimental study was conducted by Afolaranmi, Hassan, Amaike, Miner, and Oyebode (2015) to assess the knowledge of malaria and long-lasting insecticide treated nets (LLITNs) among clients accessing care at the Out Patient Department (OPD) of SDA Hospital Jengre, Bassa Local Government Area of Plateau State, Nigeria. Health education intervention was provided to all the participants in a conducive area in the hospital. Apart from talks on malaria prevention and demonstrations on the way the LLITNs should be mounted and used, IEC materials (pamphlets and posters) providing relevant information on malaria and LLINs were also used as tools during the health education sessions and were given to all the participants to take home to serve as reminder tools. There was statistically significant improvement in the awareness of use of LLITNs as a means of malaria prevention after the intervention. The study demonstrated the effectiveness of health education (IEC) as a vital tool for improving the knowledge of malaria and LLITNs.

Another study proved that IEC in the form of designed drug bags, supplemented by verbal communication can improve Artemisinin-based Combination Therapy (ACT) adherence in Falciparum Malaria. The interventional, controlled study was conducted by Swain, Raulo, Mohapatra,

and Singha (2015) among OPD patients of both SCB Medical College, Cuttack and district headquarters hospital Cuttack district of Odisha, India. Adherence to ACT was significantly higher (81%) in patients receiving IEC compared to controlled patients not receiving IEC.

Maloreh-Nyamekye (2013) also examined the feasibility, appropriateness, meaningfulness and effectiveness of the IEC strategies adopted in malaria prevention and control during pregnancy in Ethiopia, Ghana, Nigeria and Tanzania. The survey revealed a high level of awareness of IEC strategies among pregnant women in the African countries studied. Results suggested that IEC was effective, and perceived as impacting on malaria in pregnancy. Key recommendations included establishing an IEC strategic plan and developing IEC materials and programme implementation guidelines.

However, Birhanu et al. (2011) identified the needs and gaps in printed IEC materials production, distribution and utilisation. The cross-sectional study which combined quantitative and qualitative approaches was conducted at different levels of health facilities within Jimma Zone in Ethiopia. Results revealed that the IEC materials were not fully culture sensitive. As a result, the majority of the participants were not comfortable with the materials. The design, production, distribution and utilisation of printed IEC materials were not in line with the underlying principles of IEC material development. The study recommended that culture sensitive IEC materials should be designed by taking the local context and cultures into account and by involving the zone, district health office and health centers in the development process.

These studies have investigated the effectiveness of IEC strategy in the prevention and management of malaria through the survey, FGD, interview and quasi-experimental methods of research. However, they did not analyse the content of IEC materials to determine their appropriateness for the audience for whom they had been designed. Therefore, the contents of printed IEC materials were examined in the present study with a view to establishing their suitability for the rural dwellers in Oyo and Osun States.

**Materials and Methods**

The study employed the content analysis and focus group discussion (FGD) research methods in gathering qualitative and quantitative data for the study. The sample for the content analysis was selected using convenient sampling method; based on the availability of the materials. The printed IEC materials available at the time of study included one *RBM Malaria IPC Guide*, one *Interpersonal Communication Flip Chart for Malaria Control in the Community* and three generic posters on malaria prevention. The posters were commonly distributed in the two states with the only difference being the inscription of the host state's name on the poster circulating in their respective states. The IEC materials were produced by RBM and their partners and were used in the conduct of Advocacy, Communication and Social Mobilization (ACSM) activities in Oyo and Osun States. All the selected IEC materials were produced in English language and printed in full digital colours.

For the focus group discussion, eight local government areas (four in each state) were purposively selected on the recommendations of Malaria Programme Office/Malaria Action Programme for States (MAPS) (for Oyo state) and Malaria Programme Office /ACOMIN/AFRICARE (for Osun state) based on the perceived effectiveness of their malaria prevention activities. The selected local governments are: Ogbomosho South, Oyo East, Afijio, Surulere in Oyo state and Irepodun, Orolu, Egbedore and Ejigbo in Osun state. From each local government, two Primary Health Centres (PHCs) were also selected purposively with the assistance of the Malaria Programme Officer (MPO) in each local government area based on the MPO's evaluation of the active malaria prevention activities of each PHC. The MPO also assisted in selecting six participants from the community hosting the PHC. Each PHC hosted one focus group made up of literate and non-literate men, women and expectant mothers (pregnant women). Hence, there were 16 focus groups and 96 FGD participants.

A coding sheet and focus group discussion guide were the main instruments used in collecting data for the study. A coding sheet comprising eight content categories was created for the evaluation (see appendix). The categories were adapted from the works of Jefkins (1982: 172-177) and Doghudje (1988: 21-22) as reproduced by Olatunji (2003: 124-126) as well as those of Chen (2006: 27). Two coders who are familiar with content analysis procedures were engaged for the study. Their coding was subjected to an inter-coder reliability test which indicated 85 % agreement indicating that the coders had good understanding of the process.

A copy of the *Interpersonal Communication Flip Chart for Malaria Control in the Community* was collected from Malaria Action Programme for States (MAPS) in Oyo state while a copy of the

*RBM Malaria IPC Guide* was collected from Association of Civil Society Organisations for Malaria Control, Immunisation and Nutrition (ACOMIN) in Osun state. The posters were collected from the Malaria Programme Offices in Oyo and Osun states. Data for the FGD were collected by one of the researchers with the aid of a digital tape recorder. The FGDs took place at the Primary Health Centres in the selected communities. Copies of the IEC materials were presented to the participants and their opinions on the suitability of the materials in the prevention of malaria in their communities were sought. The discussions were conducted in Yoruba language.

**Methods of Data Analysis**

The contents of the IEC materials were analysed using the summative approach which allows for the consideration of both the manifest and latent content of the materials and from which appropriate inferences could be drawn. The *Interpersonal Communication Flip Chart for Malaria Control in the Community* is a 12-Card document while the *RBM Malaria IPC Guide* is a 13-Page document. Each 'Card' and 'Page' comprised a "message page", where the written message is displayed and an adjacent "illustration page" (a pictorial representation of the message). The 'Cards' of the IPC Flip Chart and the 'Pages' of the IPC Guide as well as the three generic posters were assessed individually. The unit of analysis was the individual image/text of each of the IEC materials under study.

In the analysis, generally a "Yes" answer was coded "1" for each item under a category to indicate that it has met the requirement of the specific category while a "No" was coded "0", to indicate such material had not met the requirement. However, there were items where the reverse was the case because the questions in such items were in the negative form. Thus, in such instance, a 'No' was scored as "1" and a "Yes" as "0". The scores for each material analysed across the eight content categories were collated and weighed in simple percentages. The maximum attainable score for each category was determined by the number of items under it. Thus, while the category 'Attracting Attention' for example has a maximum score of 7 points, 'Message Approach' has 5 points. Data obtained through the FGDs were analysed using the explanation building approach to bring out their salient points relative to the objective of the study.

**Results**

**Table 1: Scores for content analysis of the IPC Flip Chart (Cards 1-12)**

| **Category** | **Maximum Score** | **Total Score** | **Percentage** |
|---|---|---|---|
| Attention | 84 | 71 | 84.5 |
| Interest | 48 | 38 | 79.2 |
| Desire | 48 | 43 | 89.6 |
| Sensitivity | 48 | 33 | 68.8 |
| Credibility | 36 | 29 | 80.1 |
| Action Cue | 36 | 26 | 72.2 |
| Message Appeal | 72 | 40 | 55.6 |
| Message Approach | 60 | 50 | 83.3 |

**Table 2: Scores for content analysis of RBM IPC GUIDE (Pages 1-13)**

| Category | Maximum Score | Score | Percentage |
|---|---|---|---|
| Attention | 91 | 82 | 90.1 |
| Interest | 52 | 44 | 84.6 |
| Desire | 52 | 46 | 88.5 |
| Sensitivity | 52 | 39 | 75 |
| Credibility | 39 | 39 | 100 |
| Action Cue | 39 | 30 | 76.9 |
| Message Appeal | 78 | 52 | 66.7 |

**Table 3: Scores for content analysis for three 'generic posters'**

| Category | Disease Prevention | Take Good Care | NetSafe |
|---|---|---|---|
| Attention | 3 | 7 | 6 |
| Interest | 3 | 3 | 4 |
| Desire | 1 | 3 | 3 |
| Sensitivity | 1 | 3 | 3 |
| Credibility | 0 | 3 | 3 |
| Action Cue | 1 | 3 | 3 |
| Message Appeal | 1 | 3 | 3 |
| Message Approach | 3 | 5 | 5 |
| **Total** | **13 (36.1%)** | **30 (83.3%)** | **30 (83.3%)** |

**Discussion**

The major question which this study sought to answer was: to what extent are the contents of printed IEC materials on malaria prevention provided by Roll Back Malaria and other Partners suitable for rural dwellers in Oyo and Osun states? The IEC materials were analysed and discussed by examining their manifest and latent contents based on the content categories of the study. The results for the test of suitability of the *Interpersonal Communication Flip Chart for Malaria Control in the Community* (IPC Flip Chart) used by MAPS in Oyo State are presented in Table 1. The 'Attracting Attention' category attracted a total score of 71(84.5%). For each of the 12 Cards, the headlines were bold, easily readable and attractive. The combination of blue, yellow and black over white background made each card colourful and attractive to the eyes.

However, some of the illustrations of the concepts were not quite clear. Cards 10 and 12 were seen as having used illustrations that were difficult to understand. Two things were considered wrong with the hand-drawn illustrations. First, the illustration for Card 10 was supposed to be of a young lady sweeping the frontage of her house, to indicate parts of steps to taking care of the environment in order to prevent the breeding of mosquitoes but what the lady was holding did not actually look like a broom. The second was about the difficulty in easily establishing the cultural identity of the lady, given her dressing. The reservation about the illustrations used in Card 10 was also raised by FGD participants in Oyo state. There was controversy over the cultural identity of the female model. The same issues were raised by the FGD participants with Card 12 which was illustrated with the picture of a nursing mother who at first look, appeared to be breastfeeding her baby under a big tree while two other children were seen performing household chores. However, on closer look, the woman was actually giving her baby medication. This confusion was apparent among participants in all the FGD sessions. Most of the participants at the initial exposure to the material would chorus, "she is breastfeeding" but when asked to take a closer look would change to "she is feeding her baby". None of them came to see that the woman in the picture was actually giving medication to her baby because the pack of drugs was at a corner to her left hand. Again, participants were divided over her cultural identity. A participant in Jabata PHC said "she does not resemble a Yoruba woman. She is not feeding her baby like a Yoruba woman. It does not reflect Yoruba culture".

The category, 'Generating Interest', had a total score of 38(79.2%). All the cards used concise words and simple and easy to understand language. However, Cards 10, 11 and 12 were adjudged as having illustrations that were difficult to understand while the illustrations used in Cards 7, 8 and 11 were adjudged as not relevant to the environment of the audience. The issue about Cards 10 and 12 have been highlighted above. For Card 11, the illustration was meant to be a session at a medical laboratory where a patient was being tested for malaria using the Rapid Diagnostic Test (RDT). However, the impression could be that the picture was about a nail-painting session in a salon.

Many participants argued that the illustration in Card 11 was not relevant to them as most of them were not used to RDTs. For Card 8, many considered the picture as too elitist for rural dwellers. It was that of a woman and her baby on what was seen as a 'very fine bed' with mosquito net. In short, the major complaint against Cards 8, 10, 11 and 12 under this category had to do with

the choice of illustration for the message being communicated. They were considered difficult to understand and irrelevant to the rural environment.

The next category investigated was "Benefits to Desire". It attracted the highest total score of 43(89.6%). The IPC Flip Chart stated the benefits that the audience stands to gain on the adoption of the behaviour change being canvassed. It is expected that when the audience sees such benefits as meaningful, relevant and topical, adoption becomes easier. All the messages in the IPC Flip Chart except those in Cards 6 and 7 were considered to have satisfied the requirement of this category. Since the messages in Cards 1-12 were all about malaria, it could be adduced that the messages were topical and important. FGD participants agreed during the various sessions that the messages were topical for them.

For the 'Sensitivity' category, results show that some of the illustrations were culturally insensitive. Nonetheless, most of the texts in the IPC Flip Chart indicated concern and respect for the religion and gender of the target audience. Except for Cards 6 and 7 none of the narratives was considered offensive. This category scored 33(68.8%).

Under 'Credibility', all the messages in the IPC Flip Chart were considered as containing true and sincere claims, and they were also believable. For instance, claims such as 'using LLIN every night is very important in preventing malaria', 'LLIN...reduces malaria episodes and saves lives of children and pregnant women' are true and sincere. FGD participants also affirmed this by stating some of the benefits they have derived from using LLIN. However, the models used in Cards 5, 6, 7, 10 and 11 were not acceptable to the rural dwellers. Again, this had to do with the difficulty in easily recognising the cultural identity of the models in the illustrations. Only a few of the participants saw the models in Card 5 as representing a Yoruba family; the majority 46 (48.9%) of the participants said they represented an Igbo family. For Card 6, all the participants said the female model was that of a pregnant Hausa lady while for Card 7, 40 (42.6%) participants said that the model was a Hausa man. This category scored 29(80.1%).

The next category, "Action Cue" scored 26(72.2%). All the cards except Cards 6 and 7 contained some action-oriented words. However, most of the cards (Cards 1, 2, 3, 4, 6,7,11 and 12) did not indicate where to obtain the services being communicated in the message; with none of them giving directives on where to obtain treatment for malaria. The omission was more visible with Cards 11 and 12. While Card 11 with the topic 'Malaria Diagnosis' talked about the availability of RDTs, it did not indicate where such could be accessed. Similarly, Card 12 with the topic 'Prompt and Effective Treatment of Malaria' only talked about a mother giving anti-malaria medicine (ACT) to the child without indicating where best to access the medicine. Analysis shows that most of the messages in the IPC Flip Chart, particularly Cards 6,7,11 and 12 did not indicate the appropriate locations to obtain the services being discussed. The implication of this was that the audience were left with no adequate information they could act upon to implement the behaviour change being communicated.

The 'Message Appeal' category had the least total score of 40(55.6%). The fear appeal in Cards 2 and 3 were considered threatening. For Card 2, this might have to do with the big, bold, red picture used for the mosquito to illustrate the danger it poses while for Card 3, the picture of a young boy vomiting and another one lying sick on the bed while their parents wait around could also be seen as presenting the threat of malaria to the audience. Although such threatening (fear) appeal can work to drive the audience into action, according to one of the constructs of the Health Belief Model; Perceived Threat (Rosenstock, Strecher & Becker (1988), this finding also affirms that "fear arousal as a campaign strategy needs to be used with caution. It is rarely successful as a long-term campaign strategy" (WHO, 2001 p.6).Cards 9, 10, 11 and 12 were seen as rational in the way they were presented. This could however be based on the fact that they dealt more with technical issues related with malaria. For instance, Card 9 was on 'Malaria Prevention in Pregnancy', Card 10 on 'Environmental Management', Card 11 on 'Malaria Diagnosis' and Card 12 on 'Prompt and Effective Treatment of Malaria'. Thus, the message appeal of the IPC Flip Chart could be said to be more rational than emotional.

The last content category, 'Message Approach' scored 50(83.3%). Analysis shows that all the cards except Cards 6 and 7 met the specifications of containing encouraging and educational words as well as action-oriented words.

Looking at the entire results of the IPC Flip Chart as presented in Table 1 as well as the observations of the FGD participants, it appears the hand-drawn illustrations of the flip chart are inapt. From the analysis, it can be deduced that although the messages (texts) of most of the cards were to a large extent viewed as attractive, desirable, sensitive and credible, most of the illustrations (images) of the flip chart (Cards 5,6,7,10,11 and 12) were inappropriate. The

illustrations were considered difficult to understand and irrelevant to the rural dwellers' environment. Some of the models were also unacceptable to the participants. In particular, Cards 6 and 7 were considered quite unsuitable for the rural dwellers. Lower culture sensitive printed IEC materials were also reported in similar studies from Ethiopia and South Africa (Birhanu et al., 2011).

Table 2 presents the results of the suitability test of *RBM Malaria IPC GUIDE* used by ACOMIN/Osun State Malaria Programme. The 'Attracting Attention' category has a total score of 90.1%. The results indicate that to a great extent, the *RBMIPC GUIDE* was attractive and good enough to generate interests/attention of the audience. All the headlines were boldly written. The illustrations that accompanied the headlines were also in captivating colours, mostly red, green and yellow on a general white background.

*RBM IPC GUIDE* used clear concepts to illustrate its messages. For instance, four different pictures were used on Page 2 to illustrate the message on 'Myths and Misconceptions': a picture of a man working on the farm under the sun to address the misconception that exposure to sun could lead to malaria; a picture of a woman eating what looked like boiled yam with a bottle of palm oil beside her apart from the one in a bowl, to address the issue of those who believe that eating too much palm oil could cause malaria; a picture of a man drinking palm wine from a bottle to address the myth that doing so would expose the drinker to malaria and lastly a picture of a woman walking under the rain to explain that walking inside the rain cannot be the cause for malaria. Another evidence of clear illustrations of concepts in the *RBM IPC GUIDE* was found on Page10 under the topic 'Effective Malaria treatment'. Unlike the case with the IPC Flip Chart, this page contained three different pictures that showed different ways of managing malaria. In the first picture, a mother was seen feeling the temperature of a child while the father watched. This is the first step a caregiver needs to take in assessing fever, by feeling the body with the back of the hand. The next step was explained with the picture of another mother who had removed the baby's clothes and was applying tepid sponge to reduce the fever. Next, was the picture of two hands in gloves collecting blood sample from another hand with an instrument. There is a small picture of a microscope to indicate that it was a laboratory setting. FGD participants had no problem understanding the various illustrations in the IPC Guide during the various sessions held with them.

The 'Generating Interest' category scored 84.6%. To a great extent, the messages were seen as simple and easy to understand and the accompanying illustrations too were also considered as relevant to the environment. For instance, Page 12 focused on 'Malaria Control' and was illustrated with the picture of a family of father, mother and two children. The parents were sleeping on a local bed made from rafters while the children slept on a mat. There was a lantern on a small table near the bed. The mother, who was pregnant, was seen holding a broom, obviously to drive away mosquitoes. These are symbols which the average rural person could easily identify with. The FGD participants said they could see themselves in the illustration and could easily comprehend the message that not using mosquito nets would expose their families to malaria.

The next category, 'Benefits to Desire' attracted a total score of 46(88.5%). All the 13 pages of the Guide were adjudged to have met the requirements of this category. The messages were considered meaningful, important and topical. The treatment of 'Myths and Misconceptions' on Page 2 and the presentation of 'Special groups at risk' on Page 3 illustrated with the pictures of a pregnant woman and two children (two categories of people mostly at risk of malaria) are quite relevant and topical. FGD participants perceived the messages in the IPC Guide as beneficial.

The 'Sensitivity' category scored 39 (75%). Analysis shows that to a large extent, the Guide considered the culture, religion and gender of the audience. For instance, two of the four models on Page 2 were females. While one was dressed as a Muslim, the other was dressed in an attire that can be associated with Christianity, thus creating a balance of religious representation. None of the messages or illustrations used was perceived as offensive by the FGD participants.

The 'Credibility' category had a maximum score of 100%. This indicates that all the messages were adjudged as believable and sincere. The models used to illustrate the messages were acceptable to the rural dwellers who participated in the FGDs. Unlike the case with the IPC Flip Chart, there were no arguments among participants on the possible cultural identities of the models in the illustrations.

However, analysis under the category 'Action Cue' revealed that Pages 1, 2, 3, 5 and 6 of the Guide did not indicate specific steps to be taken by the audience nor did they clearly indicate where to obtain the specific service for malaria treatment. The reason for these omissions might be because the messages in the aforementioned pages did not focus on treatment of malaria but laid the

foundation for the discussion of the disease. This category scored 30 (76.9%).

Just as the case with the IPC Flip Chart, the 'Message Appeal' category had the least total score of 52 (66.7%). Nevertheless, the RBM *IPC GUIDE* was adjudged to have satisfied the criteria of 'Message Appeal' to some extent and the criteria of 'Message Approach' to a great extent 60 (92.3%). None of the messages in the Guide was seen as negative in tone or presentation. They were also not seen as threatening but rather encouraging the audience to take appropriate steps on malaria prevention. There were enough informational words that provided the audience with guides on what constitutes the onset of malaria, its symptoms, steps to take and treatment etc.

Overall, the *RBM IPC GUIDE* was adjudged as suitable for use among rural dwellers to a great extent. Results lend credence to previous findings which indicate that IEC interventions that are reflective of and responsive to local cultures and conditions would have more impact on the target audience (WHO, 2001; Birhanu et al., 2011; Maloreh-Nyamekye, 2013).They also affirm the assertion that IEC materials that are relevant, simple, direct, and technically correct generate trust (IEC Material Production Guidelines, n.d.; Mahapatra, 2014). Findings however suggest that there is a need to improve on the message appeal. This is in line with the guidelines that effective IEC materials should be designed to appeal to both the heart or emotions, and the head or reason (www.behaviourchange.net).

We now examine the suitability of the three generic posters used in this study. These are 'Disease Prevention', 'Take Good Care of Your Long Lasting Net' and 'NetSafe'. The results are presented in Table 3. Disease Prevention' poster has the least score (36.1%). The poster is cluttered with too much information. It has a lengthy 'Introduction' and several other sections were composed in long sentences which could be considered difficult for reading and ease of understanding by the audience. Also, the message was not composed in precise and concise words.

Moreover, the illustrations were not clear enough to the participants and the model used was considered as unacceptable to them. The illustration was a hand-drawn picture of a female figure sleeping on what looked like a mat. The figure was supposed to be sleeping inside a net but the net was drawn like a cone and had very large holes. The combination of yellow and red colours for the illustration made it unrealistic as a bedroom setting. More so, there were no other features around the picture to make it look like a bedroom. Results show that this material was not developed in line with the principles and elements of design which stipulate that printed materials should not be overcrowded; visual content of IEC materials should reflect the ethnic and cultural background of the intended target audience; and people should be placed in everyday settings, using familiar belongings and wearing familiar cloths (Adeniji, 2011; IEC Material Production Guidelines, n.d.).

'Take Good Care of Your LLIN' and 'NetSafe' scored 83.3% respectively. The posters generated interest and contained action-oriented words. They were considered attractive, informative, and highly credible. The participants in Oyo state had no problem accepting the model in 'Take Good Care of Your Long Lasting Nets'. Although there was controversy over the cultural identity of the female model, all the participants still agreed that she was acceptable as a model to represent the female gender in spreading the message of net use to prevent malaria. According to one participant at Akinmorin PHC, the model was 'dressed like an *omoluabi* should dress', meaning that the appearance of the model was as expected of a self-respecting woman in the community. Overall, the generic poster that was found least suitable for the rural dwellers of south-west Nigeria among the three investigated in this study was 'Disease Prevention'.

**Conclusion**

This study examined the extent to which the printed IEC materials for malaria prevention available to rural dwellers in Oyo and Osun states were suitable to the population. Findings showed that while the narratives of the selected IEC materials were deemed credible to a large extent, the visuals (illustrations) were to a very little extent acceptable to the rural audience. Findings therefore have implications for malaria prevention message development.

In designing printed IEC materials, message developers need to pay due attention to the images. The illustrations/symbols must be clear, easy to understand, visually appealing, culture sensitive and relevant to the environment of the target audience. Also, the models used to illustrate the message must be acceptable to the audience. Moreover, messages in print IEC materials on malaria prevention should be feasible and contain specific steps to be taken by the audience that would bring about the desired behaviour change. The narratives (text) should indicate clearly where to obtain the specific service being communicated. More importantly, the materials should be produced in the local language of the target audience. Community members should be involved in the development of IEC materials.

This will ensure that appropriate and meaningful materials that would be effective in the prevention of malaria are designed and produced by RBM and other stakeholders.

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## Appendix

The Content Categories are as follows:

**Category A: Attracting Attention**

To be able to attract attention of its readers, an IEC material will use

(i) a bold and compelling headline
(ii) a catchy and memorable slogan
(iii) an attractive and legible typography
(iv) a distinct unique selling point
(v) a prominent position of the key messages
(vi) a bright and attractive colour production
(vii) clear illustration of its concept

**Category B: Generating Interest**

To be able to generate interest, an IEC material will use

(a) precise and concise words
(b) simple and easy to understand language
(c) illustrations that are easy to understand
(d) illustrations that are relevant to the environment

**Category C: Benefits to Desire**

Effective malaria prevention information will contain

(a) benefits that are meaningful to audienc
(b) benefits that are relevant to audience
(c) The benefits are topical to the audience
(d) The benefits are important to the audience

**Category D: Sensitivity**

The message for effective malaria prevention must be

(a) sensitive to culture of audience
(b) sensitive to religion of audience
(c) sensitive to gender and
(d) must contain words that indicate consideration for the economic status of audience

**Category E: Credibility**

(a) The claims offered by the message must be seen as true and sincere
(b) The claims offered by the message must be believable
(c) The models used to illustrate the message must be acceptable

**Category F: Action Cues**

(a) The message must contain action-oriented words
(b) The message must contain specific steps to be taken by audience
(c) The message must indicate boldly where to obtain the specific service

**Category G: Message Appeal**

The appeal of each of the IEC material was evaluated on the basis of whether

(a) The appeal in the message is positive
(b) The appeal in the message is negative
(c) The appeal in the message is threatening
(d) The appeal in the message is encouraging
(e) The appeal in the message is rational
**(f)** The appeal in the message is emotion

**Category H: Message Approach**

The message approach for each of the IEC materials was evaluated to see if it used

(a) Encouraging words
(b) Educational words
(c) Informational words
(d) Persuasive words
(e) Action oriented words.