

## Knowledge, Attitudes and Practices (KAP) about malaria among people visiting Referral Hospitals of Eritrea in 2008

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### Abstract

**Background:** Knowledge, attitudes, awareness, practices and beliefs of communities contribute immensely to sustainable control of endemic diseases such as malaria. Strategic malaria control involves primary prevention which focuses on vector elimination and personal behavior change specifically through the consistent use of insecticide-treated nets (ITNs) and prompt and effective case management. This health facility based study was conducted to investigate the knowledge, attitudes and practices toward malaria among people visiting referral Hospitals of Eritrea, so as to develop a cost effective behavioral change communication strategy for community based malaria control.

**Methods:** The study was conducted in the Referral Hospitals of the four Zobas as well as Teseney Hospital where there was the highest malaria morbidity and mortality. A total of 250 people with 50 people from each hospital were randomly selected. A structured questionnaire covering information on respondent demographics, knowledge, attitudes and practices was administered upon receipt of an informed consent for participation.

**Results:** All the study subjects knew at least one of the symptoms of malaria with nearly three quarters mentioning three or more of the classical symptoms including fever. More than 80% knew that mosquitoes were the vector for the disease with a similar proportion having participated in environmental preventive control measures. Nearly half (44.6%) of the respondents gave priority for usage of ITNs to children under 5 years, to both children and pregnant mother and 11.2% to pregnant mothers.

**Conclusion:** The majority of the respondents in this study knew enough information about malaria, and had participated in environmental preventive measures. The primary prevention of malaria through uninterrupted use of ITNs and transformation of knowledge into practices requires emphasis on the development of a community based behavioral change communication strategy.

**Key words:** KAP, malaria, Behavioral change communication strategy, Eritrea, ITNs

## Introduction

Approximately, 40% of the world's population is at risk of contracting malaria.<sup>1</sup> It is estimated that more than 500 million people become severely ill with malaria annually with more than one million people mostly children and pregnant women and most of them in Africa dying from the disease.<sup>2</sup> These groups are at high risk due to immature and weakened immunity respectively. More than 80% of world malaria cases occur in Sub-Saharan Africa<sup>3</sup> and 90% of deaths due to malaria occur in Africa South of the Sahara.<sup>2</sup> Malaria is major public health concern in Eritrea with more than two thirds of the population living in areas at risk.<sup>4</sup> Women and children constitute more than half of this exposed population.<sup>4</sup> Plasmodium falciparum malaria is predominant in Eritrea and is mainly transmitted by Anopheles arabiensis.<sup>5,6</sup>

The Roll Back Malaria (RBM) partnership was launched in 1998 with the goal of reducing the burden of malaria by half by 2010.<sup>7</sup> Under this initiative, the Eritrean National Malaria Control Program (NMCP) developed a 5-year (2000-2004) national plan to reduce both malaria morbidity and mortality by 80%

of the 1999 levels.<sup>8</sup> In achieving this objective, the NMCP used comprehensive approach that included prompt and effective case management, selective vector control, epidemic management and control, environmental management and personal protection through the use of insecticide-treated nets (ITNs).<sup>9</sup>

Community health agents have triple roles in their community as educators, health providers, and agents of change. According to the data from National Malaria Control Program, in 2008, about 70% of the malaria cases were treated by community health agents.<sup>10</sup>

Environmental factors and behavioral patterns of vectors and human populations combine to provide favorable conditions for malaria transmission.<sup>11,12</sup> While much is known about vector biology and behavior and the malaria parasites, the importance of human behavior in malaria transmission has been largely overlooked.<sup>4,13</sup>

This failure to consider community attitudes and beliefs about malaria has contributed to the inability of programs to achieve sustainable control.<sup>14</sup> Studies on knowledge, attitudes and practices (KAP) have demonstrated that direct interaction with community

plays an important role in circumventing malaria spread.<sup>15,16</sup> Knowledge, beliefs and practices of the population must be taken into account in the design of interventions against malaria transmission.<sup>17</sup> Development of appropriate health education promotion message depends on analysis of knowledge, attitudes and behaviors of the affected community.<sup>18</sup>

## Methods and Materials

**Study area and population:** Geographically Eritrea is divided into six Zobas or administrative Zones (Maekel, Southern Red Sea, Anseba, Debub, Gash Barka and Northern Red Sea). Epidemiologically it is divided into three distinct strata, all prone to sporadic malaria epidemics: Coastal plains with altitude from sea level to 1000m have minimal malaria transmission due to poor precipitations, Western lowlands between 700 and 1500m above sea level where malaria is highly seasonal and highlands with altitude of 1500m and above sea level generally are free of malaria. The main malaria transmission seasons in Eritrea are September to November for central, southern, western lowlands and January to March for coastal plains. Four zobas Anseba, Debub, Gash Barka and Northern Red Sea have the highest risk for contracting malaria, representing 67% of the population and almost 80% of the landmass. Eritrea is inhabited by more than 13 different species of anopheline mosquitoes but the main malaria transmitting mosquito is *Anopheles arabiensis* and *Falciparum* malaria is the predominant parasite. Inoculation rates have high seasonal variability, with peak inoculation rates during the rainy season and minimal or no transmission during the dry season<sup>4,9</sup>.

The objective of increasing awareness is aimed at promoting attitudes that encourage health service seeking behaviour and to increase community participation in malaria control and preventive activities thus empowering the community to determine their own destiny.<sup>18</sup> The study was conducted between July and September 2008 in four of the six Zobas Referral Hospitals and Teseney hospital where malaria morbidity and mortality was the highest. These Zoba referral hospitals are in the highest malaria risk areas Barentu Referral hospital (Gash Barka), Keren Referral Hospital (Anseba), Mendefera Referral Hospital (Debub) and Ghindae Referral Hospital (Northern Red Sea).

**Study design:** The study was descriptive cross-sectional study. A structured questionnaire was used covering questions on socio-demographic data, knowledge on transmissibility, preventive measures on malaria, availability of integrated mosquito nets and health seeking behavior of the patients.

**Sampling:** The study was conducted in four of Zoba referral hospitals and Teseney hospital where there was the highest rate of malaria morbidity and mortality. A total of 250 people composed of 50 people from each hospital attendants were randomly selected, between July and September 2008 which is the peak malaria transmission season in Eritrea. The target population was all people above 15 years of

age who came to these hospitals, from the inpatient and outpatient departments either as a patient or accompanying patient / child care taker.

**Data analysis:** All data were entered and analyzed using the statistical software (Epi info). Analyses of the outcome of variables were performed excluding non-responders or missing data points, therefore only valid percentages of the responses were accepted with a total number of 249 respondents.

## Results

### Respondents' Identifications

A total of 250 people were interviewed. Due to incompleteness of the data set, one was excluded, the valid sample was 249. Fifty people from each of the three Zobas (Northern Red Sea, Zoba Debub, and Zoba Anseba) and 50 from Teseney, 50 from Barentu (Zoba Gash Barka) were enrolled. Forty six percent of the respondents were females. The sample was disaggregated by religion as follows: 47.4% Moslem, 45.8% Orthodox, 4.8% Catholic and 2% Protestant. Ethnically respondents were distributed as follows; Tigrigna 51.4%, Tigre 27.7%, Saho 8%, Bilen 8%, Kunama 2.4%, Nara 1.6% and Hidarb 0.8%. More than one third of the subjects had completed primary school education (37.3%) followed by those who did not attend any formal education (35.7%) then those with secondary education (16.1%) and least those who attained grades higher than 12th grade (4.8%).

### Knowledge on clinical manifestation, mode of transmission and Care-seeking behavior

Out of the 249 respondents 93.6% had been ill with fever in their life time and 92.8% of the total respondents had sought medical advice in different health services. Health facilities (hospitals, health centres, health stations, clinics) were found to be the most commonly used treatment source (81.8%) for most of the respondents followed by pharmacies (11.25%) and finally the community health agents (6.9%). Out of those who sought medical help, one third asked for help on the same day of feeling sick, slightly more than one third on the next day and slightly less than one third three days or later.

With regard to malaria transmission, 85% of the respondents indicated that the mosquito bite was the mode of malaria transmission. The remainder identified house fly (6.4%), marsh area (2.8%), drinking dirty water (1.6%), and blood transfusion (1.6%) as the mode of transmission. Only 2% did not identify any mechanism for malaria transmission.

More than 90% of the respondents mentioned fever as one of the classical symptoms of malaria; fever, chills, sweating, arthralgia, headache, vomiting, loss of appetite (Table 1).

Table1: Knowledge of the clinical manifestation of malaria

Symptom of malaria	Frequency	Percent
Fever	19	7.6%
Fever+ One of the other symptoms	21	8.4%
Fever+ two of the other symptoms	15	6%
Fever+ three or more of the other symptoms	180	72.3%
One of the other symptoms with out fever	14	5.6%

**Knowledge and practices regarding malaria causation, prevention and control**

From the total respondents, 80% owned at least one bed net, one third of the mosquito nets were long lasting. The reasons for not having ITNs were, 30% could not afford the cost and 18% did not want it. Each house hold owned an average of 3 bed nets. More than 95% knew ITNs prevented malaria and that malaria was a serious illness. Two percent did not know any preventive measure for malaria.

In this study 190 (80.3%) of the ITNs had been impregnated after they had been bought, with three quarters of them done within the previous month. One quarter of the study subjects had not re-impregnated their ITNs. The reasons cited were owners were not present during the impregnation time (60%), and 20% said they were not informed of the time of impregnation and the rest had transport problems.

In this study 40.2% mentioned pregnant mothers and children under 5 year as a priority groups 44.6% only children and 11.2% cited that pregnant mothers and the remaining 4% did not know whom to prioritize. Almost half (48.6%) of the sample responded that malaria control should be done by governmental agents plus the public, followed by less than 20% was cited that governmental agents plus the public and individuals (Table 2).

Table 2: Responsibility for malaria control

Responsible body	Frequency	Percent
Government only	36	14.5%
Government plus Public	121	48.6%
The above plus Individual	45	18.1%
NGO, Government, Public	41	16.5%
Do not know	6	2.4%
Total	249	100%

**Environmental measures in malaria control**

In this study 86.3% of the respondents participated in environmental measures to control malaria. Three

quarters of the respondents knew more than three measures (filling/ clearing/ draining/ levelling of the breeding sites), 4.8% one, 8% two and the rest 12% did not know any environmental preventive measure. In 95.2% of the study group, dirty stagnant water was mentioned to be the place of vector breeding site 2.8% clean water and 2% did not know the breeding site of mosquito.

**Discussion**

The objective of the national malaria control programme (NMCP) of Eritrea is to reduce morbidity and mortality due to malaria to a level that it is no longer a public health problem in the country.<sup>9</sup> Key success factors for this goal are; clear knowledge on the clinical manifestation of malaria and early care seeking behavior. Positive health seeking behavior is critical in successful case management. The objective of this study was to investigate the knowledge, attitudes and practices of the community toward malaria in referral hospitals of Eritrea, so as to develop a cost effective behavioral change community strategy for community based malaria control. Knowledge of clinical manifestations, mode of transmission and causation of malaria is satisfactory. However, the practice especially use of mosquito bed nets, knowledge of environmental measures were lower than the knowledge and need to be systematically strengthened.

This study demonstrated that knowledge of clinical manifestations of malaria and its preventive measures were very high among the attendants of these referral hospitals compared to other African countries.<sup>16,19</sup> This increased awareness of these clinical features of malaria might be due to increased access to mass media and health education by the community health agents.<sup>7,9</sup> In addition the urban nature of the sample might also contribute to this observation as it has been shown in other studies that health seeking behavior is high in urban than rural settings.

In order to have effective management of malaria, favorable treatment seeking behavior is critical. This link between the care giver and seeker is a key success factor in the reduction of morbidity and mortality due to malaria. The level of health care seeking behavior was very high in comparison to the finding in same area in 2004.<sup>7,9</sup> These observations are similar to the findings from other studies from the African Region.<sup>19</sup> This could be correlated with their increased knowledge of malaria.

ITNs were found to be effective tool for the prevention of morbidity and mortality caused by malaria and other vector borne diseases.<sup>18</sup> A recent technological advance in the development of ITNs is the introduction of long lasting insecticide impregnated nets (LLINs) which simplify the strategy by reducing the need for re-treatment.<sup>18</sup> The use of ITNs, has contributed to most of the reduction in malaria morbidity and mortality.<sup>7, 9</sup> Some studies have indicated that preventive measures used by the community were related to the awareness about modes of transmission of malaria.<sup>11,15</sup>

Nearly all of the subjects knew that mosquito

bite was the mode of transmission of malaria. This demonstrated high level of knowledge on causation of malaria. This was very high in comparison to findings from other malaria endemic countries.<sup>19</sup> A few respondents mentioned unlikely mechanisms of transmission, such as housefly, marsh area, drinking dirty water and blood transfusion. Marsh area and drinking dirty water were probably mentioned because people who live in these areas contracted malaria, because these areas are ideal malaria vector habitats. Although a very high proportion of respondents knew that the mosquito was a vector for malaria, some respondents still did not use ITNs, a finding that was reported in studies from other African countries.<sup>18, 19</sup>

In this study, the proportion of households who owned more than 3 ITNs was higher than that of 2004 in the same population of Eritrean an observation which could be attributed to higher level of knowledge and awareness of the importance of ITNs<sup>7, 9</sup>. Greater knowledge about malaria causation, symptoms and prevention does not necessary translate into improved practice of preventive measures. This area of transforming knowledge into favorable practices albeit difficult is an important target for health education in Eritrea.

Young children and pregnant women are at high risk of contracting symptomatic malaria as a result of immature and weakened immunity respectively.<sup>1</sup> One important finding of this study is high rate of usage of mosquito nets by children and pregnant mothers in comparison to that of 2004 in Eritrea and other African countries.<sup>7, 9</sup>

Environmental vector control through elimination of the vector habitat at an early stage is an important primary preventive measure for malaria. The relative large water collection tends to be reservoirs for the vector during the dry season. In this study, there was remarkable improvement in knowledge on vector breeding site, environmental preventive measures and community participation compared to 2004.<sup>7, 11</sup> Increased knowledge of environmental preventive measures and vector breeding site does not always translate into increased community participation, an observation reflected in this study.

Communities are involved in the control of malaria in various aspects, as in environmental management by eliminating mosquito breeding sites through filling and draining stagnant water, in ITNs re-impregnation and malaria case management through trained community health agents.<sup>20</sup> Even though data from NMCP show near 70% of case are treated by community health agents,<sup>9</sup> in this study less than 10% of the study subject visit CHAs. This could be due to the urban nature of the sample where health facilities are accessible and CHAs play a minimal role.

### Conclusion and recommendations

Based on the findings from this study it can be concluded that the subjects were familiar with the symptoms of malaria, mode of transmission, environmental measures in malaria control and utilization of ITNs. Participation level was relatively

lower than their knowledge and awareness. It can be recommended that increasing utilization of preventive measures such as ITNs, informing the community of the timing of ITNs for re-impregnation and increasing their participation in environmental malaria control measures could collectively consolidate the gains made in malaria control in Eritrea.

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