

# Knowledge, beliefs, and practices regarding malaria in urban setting of East Khasi Hills district, Meghalaya

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## Abstract

**Background:** Malaria is still a leading public health problem in the northeastern regions of India. Besides mosquitogenic conditions in tribal areas, poor knowledge and attitude toward the disease is also one of the reasons for maintaining high endemicity in some areas.

**Objective:** To assess the awareness, knowledge, and beliefs regarding malaria in the community and to know the practices followed by the families in the community for prevention of malaria.

**Materials and Methods:** This cross-sectional study was conducted in two urban areas of East Khasi Hills district—Nongmynsong and Pynthorbah. A total of 200 households were interviewed during the study period of 3 months (June to August 2013). In each household ideally the head of the household or the spouse was interviewed. The sampling method followed was simple random sampling and the tool for data collection was a pretested questionnaire. Data were analyzed descriptively using SPSS software, version 17.0.

**Result:** In the community, 92.2% people had heard of malaria, 86.4% had knowledge that mosquito bites cause malaria, and 53% know that it is preventable. Thirteen percent people said that they used mosquito nets, 42% used mosquito coils, and 41.1% commented that they adopted no measures. Of 13% people using mosquito nets, only 2.9% were found to use insecticide-treated bed nets. Regarding spraying of DDT, only 6.3% people said that DDT was sprayed in their area at least once a year. Regarding treatment-seeking behavior, 66.9% people sought treatment from government hospitals, 30.1% went to private hospitals or doctors, and 3% resorted to self-medication.

**Conclusion:** Proper health education regarding malaria is needed to increase community knowledge and awareness and to enhance the indoor residual spraying coverage and use of bed nets with special focus in urban slums for successful malaria control.

**KEY WORDS:** Knowledge, practices, malaria

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## Introduction

Even a century after the discovery of the mosquito transmission of malaria by Sir Ronald Ross in 1897 in India, malaria continues to be one of the India's leading public health problems, particularly due to *Plasmodium falciparum* that is prone to complications. Malaria is quite a challenging disease. Underreporting, drug-resistant

parasites, poor treatment-seeking behavior, and lack of knowledge on prevention further hinder control effects.<sup>[1]</sup> According to the World Malaria Report 2011, India contributed to 4.6% *P. vivax* cases, 1.1% *P. falciparum* cases, and 1.7% of world's malaria burden in 2010. About 92% malaria cases and 97% deaths due to malaria were reported from northeastern states, which comprised mainly the tribal population.<sup>[2]</sup> According to the 2001 census, the tribal population in India was 74.6 million, and it accounts for 8% of the total population, but contributes 30% of total malaria cases.<sup>[3]</sup> In Meghalaya, incidence of malaria is increasing significantly from the year 2001. Meghalaya contributes >20% cases of those reported from the northeastern states annually. A series of outbreaks had occurred in these areas in the past decade. Among all districts of Meghalaya that are malaria endemic, more than 75% of all the cases had been observed in the Garo Hills area (east, west, and south Garo Hills district) and the district is categorized as high risk for drug-resistant malaria.<sup>[4]</sup> Besides mosquitogenic conditions in tribal areas, poor knowledge and attitude toward the disease is also one of the reasons for maintaining high endemicity in some areas. With this background, this study was conducted with the following aims and objectives:

1. To assess the awareness, knowledge, and beliefs regarding malaria in the community.
2. To know the practices taken by the families in the community for prevention of malaria.

## Materials and Methods

This cross-sectional study was conducted in two urban areas of East Khasi Hills district—Nongmynsong and Pynthorbah—, which is also the field practice area of the Department of Community Medicine in North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Meghalaya, India. These areas are thickly populated ones mainly composed of migrant people. A total of 200 households were interviewed during the study period of 3 months (June to August 2013). In each household ideally the head of the household or the spouse was interviewed. The sampling method followed was simple random sampling after listing of all the houses in the area with the help of accredited social health activists. A questionnaire-based survey was conducted to understand the knowledge, awareness, and practices of people toward malaria. Information about knowledge of malaria, its transmission and causes, its prevention practices, health-seeking behavior, and education level were collected through a questionnaire prepared in English from persons in the age group of >18 years residing in the study area. Verbal informed consent in local language was taken from every respondent. Confidentiality was maintained for every respondent and questionnaires were numbered. Data were analyzed using SPSS software, version 17.0, by descriptive analysis.

**Table 1:** Distribution of people with regard to knowledge, beliefs, and practices regarding malaria

Parameters	Yes	No
<b>Knowledge</b>		
Have heard of malaria	184 (92.2%)	16 (7.8%)
Transmission of malaria	173 (86.4%)	27 (13.6%)
Symptoms of malaria	162 (80.6%)	38 (19.4%)
Breeding place of mosquito	164 (82%)	36 (18%)
Malaria is preventable	106 (53%)	94 (47%)
Know name of insecticide	68 (34%)	32 (36%)
<b>Beliefs</b>		
Transmission by dirty water	12 (5.6%)	188 (94.4%)
Transmission by contaminated food	4 (1.9%)	196 (98.1%)
Transmission by polluted air	2 (1%)	198 (99%)
<b>Practices</b>		
<b>Prevention of mosquito bites</b>		
Mosquito nets	26 (13%)	174 (87%)
Mosquito coils	84 (42%)	116 (58%)
Burning of cloth	8 (3.9%)	192 (96.1%)
<b>Health-seeking behavior</b>		
Government hospitals	134 (66.9%)	66 (33.1%)
Private hospitals	61 (30.1%)	139 (69.9%)
Self-medication	6 (3%)	194 (97%)
<b>Spraying of insecticides</b>		
Indoor residual spray at least once a year	13 (6.3%)	187 (93.7%)
Use of bed nets	26 (13%)	174 (87%)
Use of insecticide-treated bed nets	6 (2.9%)	194 (97.1%)

## Results

It was observed that 184 (92.2%) people in the community had heard of malaria. In the community, 173 (86.4%) people had knowledge that mosquito bites cause malaria whereas 27 (13.6%) were not aware about its cause. Also, 109 (54.4%) people had beliefs that malaria is transmitted by close contact from person to person. Other false beliefs about causes of malaria were that 12 (5.6%) people believed that it is because of dirty water, 2 (1%) attributed it to polluted air, and 4 (1.9%) believed it to be due to contaminated food.

In the community, 162 (80.6%) people knew about the symptoms of malaria, 19 (9.2%) had experienced it, and only 30 (15%) knew that it could lead to death. 106 (53%) people in the community knew that malaria is preventable. Regarding the biting time for malaria mosquito, 112 (55.8%) stated that nighttime is the common biting time whereas 89 (44.2%) stated that it can be any time. Regarding mosquito breeding site, 164 (82%) people commented that it was dirty stagnant water whereas 36 (18%) had no idea. Regarding the resting habits of the mosquito, 114 (57%) people said that it were in the dark corners of houses, 26 (13%) said that it was in cattle sheds whereas 60 (30%) said that it can be anywhere. Sixty-eight (34%) people were able to name a commonly used insecticide whereas 32 (66%) did not have any idea.

Regarding the methods practiced by the people to prevent themselves from mosquito bites, 26 (13%) said that they used mosquito nets, 84 (42%) mosquito coils, 8 (3.9%) burnt clothes or with smoke, and 83 (41.1%) commented that they adopted no measures.

Regarding the health-seeking behavior in case of fever, 134 (66.9%) people sought treatment from government hospitals, 61 (30.1%) went to private hospitals or doctors, and 6 (3%) resorted to self-medication. Most of the people (164; 82%) had not heard about chloroquine tablets, however 66 (33%) knew that there were antimalarial tablets. Regarding the knowledge of commonly used insecticides, only 64 (32%) people had heard about DDT whereas 136 (68%) had no knowledge of insecticides.

Regarding spraying of DDT, only 13 (6.3%) people said that it was sprayed in their area at least once a year whereas 187 (93.7%) had said that there was no spraying done. However most of the people in the community did not accept spraying as an effective measure and commented that it can poison the food items and cause a foul odor and can cause staining of the walls. Of 26 (13%) people using bed nets, only 6 (2.9%) were found to use insecticide-treated bed nets. Sixty-two (30.6%) people reported that they cleaned their water storing tanks on a daily basis, 82 (40.8%) did it on weekly basis, 51 (25.2%) did it once a month, and only 7 (3.4%) cleaned it two to three times a year.

## Discussion

In our study, we observed that 184 (92.2%) people in the community had heard of malaria, 173 (86.4%) had knowledge that mosquito bites cause malaria whereas 27 (13.6%) were not aware about the cause of malaria. In a study conducted by Hlongwana et al.,<sup>[5]</sup> 93.1% ( $n = 320$ ) respondents were found to have heard about malaria and almost all (99.7%,  $n = 297$ ) of them correctly associating malaria with mosquito bites.

False beliefs about causes of malaria were that 12 (5.6%) people believed that malaria is because of dirty water, 2 (1%) attributed it to polluted air, and 4 (1.9%) believed that it was due to contaminated food. In a systematic review by Maslove et al.,<sup>[6]</sup> 27 of the 39 articles analyzed described the belief that malaria is caused by factors other than mosquitoes (median publication year 2002). Of these, the most frequently identified included environmental factors (excessive heat, wind, or cold), dietary factors (eating oily foods, certain fruits and grains, or too much of the same foods), drinking or bathing in dirty water, and supernatural causes (witchcraft, sorcery, and possession by spirits).<sup>[6]</sup>

In the community, 106 (53%) people knew that malaria is preventable. In the study conducted by Hlongwana et al.,<sup>[5]</sup> it was observed that knowledge about malaria prevention among the participants was high (78%,  $n = 320$ ), and only a small proportion (14.7%) said malaria cannot be prevented and the remaining 7.3% participants did not know whether malaria is preventable.

A total of 164 (82%) people commented that mosquitoes breed in dirty stagnant water whereas 36 (18%) had no idea. In a study conducted by Singh et al.,<sup>[7]</sup> most of the respondents were not aware of mosquito breeding associated with clean water bodies.

Regarding the methods practiced by the people to prevent themselves from mosquito bites, 26 (13%) said that they used mosquito nets, 84 (42%) used mosquito coils, 8 (3.9%) burnt clothes or with smoke, and 83 (41.1%) adopted no measures. In a study conducted by Soan and Chand,<sup>[3]</sup> 84.5% respondents were using preventive measures and most of the respondents (69%) used smoke, made by burning of leaves/wood, to avoid mosquito bites. Only 7.9% respondents told that they used some kind of oil on skin that is available with them and 15.5% do not use any kind of preventive measures.

Regarding the health-seeking behavior in case of fever, it was observed in our study that 134 (66.9%) people sought treatment from government hospitals, 61 (30.1%) went to private hospitals or doctors, and 6 (3%) people resorted to self-medication. In a study conducted by Tyagi et al.<sup>[8]</sup> on the health-seeking behavior, government hospitals were found to be the most commonly used treatment source for most of the respondents residing in semiurban areas. Self-treatment, especially with chloroquine, was found prevalent among the residents of village. Practice of *desi ilaaj* (traditional healing) was found to be common among rural respondents (especially farmers and rural women).

Regarding the knowledge of commonly used insecticides, only 64 (32%) people had heard about DDT whereas 136 (68%) had no knowledge of insecticides. In a study conducted by Ediau et al.,<sup>[9]</sup> 64.3% (274/426) respondents specifically mentioned DDT and 32.4% (138/426) said they did not know.

Of 26 (13%) people using bed nets, only 6 (2.9%) were found to use insecticide-treated bed nets. In the study by Hlongwana et al.,<sup>[5]</sup> overall 38.8% ( $n = 124$ ) of study households reported ownership of one or more bed nets.

## Conclusion

Proper health education and sensitization is needed to increase community knowledge and awareness about malaria prevention and control. It is required to enhance the coverage of IRS and use of bed nets in these urban areas and remove false perceptions regarding malaria transmission and IRS. Only then will be the benefits and services under the malaria control program reach the target population.

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