



# Awareness of Malaria by the Community and Traditional Healers in A Remote Tribal Area of Car Nicobar Island, Andaman, and Nicobar Archipelago: Their Role in Malaria Elimination

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## Abstract

**Objectives:** Assessment of knowledge and awareness regarding malaria among the traditional healers and the community of Car Nicobar Island. **Methods:** Interviews were conducted using standardized questionnaire to the household head and to individual traditional healers (TKPs). **Results:** Almost >90% of the villagers were unaware of the causative agent of malaria and knowledge on vector bionomics was negligible among the community as well as TKPs. **Conclusion:** Frequent health education campaigns with more focus on vector bionomics should be carried out for achieving the elimination target sooner.

## Keywords

awareness; Car Nicobar; elimination; KAP; malaria.

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## INTRODUCTION

Earlier studies on knowledge, attitude and practices related to malaria have verified that direct interaction with the community plays a significant role in the spreading of malaria [1]. The community's socio-cultural context can play a critical role in the prevention and control of malaria. According to the world health organisation, misconceptions about the cause and transmission of malaria persist. In general, KAP surveys can be used to improve the design of community-based malaria control programs and help identify indicators of program effectiveness [2]. The important factor of the malaria elimination programmes is the participation of the community and their knowledge of methods controlling malaria

that can endorse preventive measures against malaria [3].

Historically, Andaman and Nicobar Islands were highly endemic for malaria. Andaman and Nicobar comprise of three districts and among them Nicobar is still endemic to malaria and contributes 76% of the total malaria cases. In one of the tehsils of district Nicobar viz., Car Nicobar, study on the knowledge, attitude and practices related to malaria has not been reported so far. The knowledge possessed by a community refers to their understanding of any given topic, malaria in this case especially by the local traditional healers who have been treating different ailments for past centuries.

## STUDY AREA AND DESIGN

This study was carried out in one of the tehsils of Nicobar district viz., Car Nicobar Island (located at 9.16°N, 92.75°E) spanning over 127 km<sup>2</sup> area with a population of 17,125 (census 2011). The island is predominantly inhabited by the Nicobarese tribe of Mongoloid origin. Malaria was widespread in this island during the aftermath of the tsunami, but cases declined drastically since 2010, and the annual parasite incidence (API) was found to be less than one for the past few years.

The present study was undertaken in four villages viz., Kakana, Kinyuka, Kinmai and Sawaii based on the malaria cases during the past few years. All traditional healers (n= 14) from the four villages and

300 households were interviewed using a standardized questionnaire focussing on knowledge, attitudes, and behaviours regarding malaria and prevention. The questionnaire was prepared in the English language but was translated and communicated in local *Nicobari* language by the assistance of local task force.

## RESULTS AND DISCUSSION

The respondents were categorised into different age groups ranging from 18-90 yrs. (Table 1). Most of the traditional healers were women (n= 10). The education level of the traditional healers was poor as most (n= 8) of them did not have the formal education.

**Table 1: Demographics of respondents interviewed categorised according to different age groups in the four villages**

| Age group of Traditional knowledge practitioners |            |            |            |          |                    |
|--------------------------------------------------|------------|------------|------------|----------|--------------------|
| Age groups                                       | Kakana1    | Kinyuka    | Kinmai     | Sawai    | Total              |
| 11-20                                            | 0          | 0          | 0          | 0        | 0 (0.0)            |
| 21-30                                            | 2          | 0          | 0          | 0        | 2 (14.3)           |
| 31-40                                            | 1          | 0          | 0          | 1        | 2 (14.3)           |
| 41-50                                            | 1          | 1          | 0          | 0        | 2 (14.3)           |
| 51-60                                            | 0          | 1          | 1          | 3        | 5 (35.7)           |
| 61-70                                            | 0          | 1          | 1          | 0        | 2 (14.3)           |
| 71-80                                            | 0          | 1          | 0          | 0        | 1 (7.1)            |
| 81-90                                            | 0          | 0          | 0          | 0        | 0 (0.0)            |
| <b>Total</b>                                     | <b>4</b>   | <b>4</b>   | <b>2</b>   | <b>4</b> | <b>14 (100.0)</b>  |
| Age group of the community                       |            |            |            |          |                    |
| 11-20                                            | 1          | 1          | 0          | —        | 2 (0.6)            |
| 21-30                                            | 14         | 11         | 5          | —        | 30 (10.0)          |
| 31-40                                            | 15         | 19         | 22         | —        | 56 (18.6)          |
| 41-50                                            | 36         | 18         | 23         | —        | 77 (25.6)          |
| 51-60                                            | 19         | 21         | 22         | —        | 62 (20.6)          |
| 61-70                                            | 10         | 22         | 17         | —        | 49 (16.3)          |
| 71-80                                            | 4          | 7          | 9          | —        | 20 (6.6)           |
| 81-90                                            | 1          | 1          | 2          | —        | 4 (1.3)            |
| <b>Total</b>                                     | <b>100</b> | <b>100</b> | <b>100</b> | <b>—</b> | <b>300 (100.0)</b> |

—\* Not done

Among the community surveyed, the difference according to the age groups was found statistically significant ( $F = 12.39$ ;  $df = 7$ ;  $P = 0.00$ ). Of the 300 individuals surveyed, 26 % (n=77) had no formal education and the rest were possessing the education up to the graduation level.

### Awareness of malaria disease

Only 15% (n= 2) of the traditional healers had the history of malaria. Ninety-three per cent (n= 13) of the traditional healers reported fever/chills as the main symptoms of malaria but all were unaware of its causative agent. Among the traditional healers, 93% (n= 13) were aware of the transmission route of malaria but only one healer reported '*Anopheles*' as its main vector. The survey revealed that majority of

the traditional healers had knowledge on symptoms of malaria, but very poor awareness of its cause, which was found inconsistent with the study elsewhere [6].

Among the other community interviewed, 11.67 % (n= 35) had the history of malaria. Only 49% (n= 148) were aware of the symptoms of malaria and 90% (n= 298) were found unaware of the causative agent of malaria. Among the community, 9 % (n= 27), 2.67 % (n=8) and 3.67 % (n=11) associated polluted water, bacteria and virus to malaria's causative agent, respectively. Sixteen per cent attributed the drinking of polluted water, bacteria and virus as the cause of malaria that was found similar to the findings in

Ethiopia where the respondents related non-causative agents to malaria [8].

Thirty-nine per cent ( $n = 117$ ) remarked that mosquitoes are the only mode of transmission of malaria but only 10 % ( $n = 29$ ) mentioned '*Anopheles*' as its main vector. Knowledge on mode of malaria transmission ( $F = 0.002$ ;  $df = 2$ ;  $P = 0.998$ ) and its symptoms ( $F = 0.424$ ;  $df = 2$ ;  $P = 0.658$ ) was not statistically significant among the respondents of the three villages. Malaria, its transmission and vector bionomics was not well understood by the community and there were misconceptions on the transmission of the disease, which were also observed in similar studies in African communities [4]. The living condition of community improved since the various developmental activities subsequent to tsunami catastrophe. Before and the aftermath of tsunami malaria was rampant in the island due to poor living conditions and poor health seeking behaviour of the tribal population, and the environment was vulnerable to them for malaria [5]. This lower awareness of malaria may be due to less number of personal interactions with malaria affected patients, as 80% of the respondents had no history of malaria. The low level of knowledge in our study area is in contrast with the study findings in Iran where a high level of knowledge was associated

with the history of malaria infection in family members [7]. The community's knowledge related to the true mode of malaria transmission and its cause, was low. These findings are in consistent to a Nigerian study where a small percentage (9.6 % and 11.8 %) of respondents enquired were aware of the cause of malaria and its transmission [2].

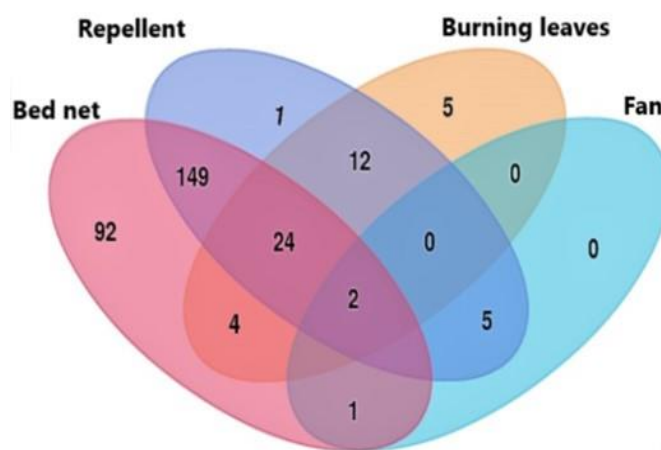
#### Knowledge of vector bionomics

Thirty-five per cent ( $n = 5$ ) of the TKPs were unaware of the breeding sites of mosquitoes. Among the traditional healers, 57.14% ( $n = 8$ ), 28.57% ( $n = 4$ ) and 14.29% ( $n = 2$ ) reported the biting period of the malaria vector as day & night, night and evening time, respectively. Fifty-three per cent ( $n = 159$ ) of the community were unaware of the breeding sites of mosquitoes. Twenty-four percent ( $n = 73$ ), 3% ( $n = 8$ ) and 13% ( $n = 39$ ) of the respondents mentioned the biting time of malaria vector as night, daytime and day & night, respectively. Lack of knowledge on the life cycle of mosquito was found among all traditional healers and the community. The knowledge on vector bionomics was negligible among the study population, which is in agreement with the studies from Northern Nigeria [3]. Knowledge on vector breeding places among the study population was low, which was found in contrast with the reports from North India [9].

**Table 2: Different preventive methods for the mosquito bite adopted by the community**

| Prevention from mosquito bite | No. of Respondents (%) |
|-------------------------------|------------------------|
| Bed net                       | 278 (92.7)             |
| Repellent                     | 194(64.7)              |
| Burning leaves                | 47(1.7)                |
| Fan                           | 8(2.7)                 |
| Electric bat                  | 1(0.3)                 |

**Figure 1: Venn diagram illustrating the different preventive measures adopted by the tribal community for avoiding the mosquito bites**



### Awareness of preventive measures

Regarding the preventive measures of malaria, 57.14% (n= 8) and 28.57% (n= 4) of the traditional healers mentioned the use of bed nets and repellents as the preventive measure for the mosquito bites, respectively. The majority (97%) of the community reported the use of personal protection against the mosquito bites (Table 2 & Figure 1). Ninety-two per cent of them used mosquito nets and 65% (n=194) used repellents as the preventive measure for the mosquito bite. None of them reported the use of insecticide treated bed-nets. The use of insecticide-treated bed nets (ITNs) was not reported in the present study, as this is one of the main tools in the prevention and control of malaria [10]. In the Andaman and Nicobar Islands, malaria control activities are being implemented by the National Vector Borne Disease Control Programme of the State Department, which includes a biannual spray of insecticides for adult mosquito control.

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**Competing interests:** None declared

### CONCLUSION

It is evident that the lack of awareness among the study population about malaria and the role of mosquitoes in transmitting malaria parasites may result in the failure of strategies being implemented in the malaria elimination programme. Hence, it is pertinent to take into consideration the various aspects of vector bionomics in the health education campaigns to mobilize the community, which will make the malaria control strategies more effective and thus achieve the goal of elimination faster.

### REFERENCES

1. Mazigo HD, Obasy E, Mauka W, Manyiri P, Zinga M, Kweka EJ, et al. Knowledge, attitudes, and practices about malaria and its control in rural northwest Tanzania. *Malar Res Treat*, 2010; 794261 doi: 10.4061/2010/794261.
2. Singh R, Musa J, Singh S, Ebere UV. Knowledge, attitude and practices on malaria among the rural

communities in Aliero, Northern Nigeria. *J Family Med Prim Care*, 2014; 3:39–44.

3. Soleimani-Ahmadi M, Vatandoost H, Zare M, Alizadeh A, Salehi M. Community knowledge and practices regarding malaria and long-lasting insecticidal nets during malaria elimination programme in an endemic area in Iran. *Malar J*, 2014; 13: 511.
4. Mboera, L.E., Rumisha, S.F., Senkoro, K.P., Mayala, B.K., Shayo, E.H., Kisinza, W.N. Knowledge and health information communication in Tanzania. *East Afr. J. Public Health*, 2007; 4:33–39.
5. Joshi RD, Sharma SN, Dhingra N, Thapar BR, Yadava RL, et al. Some aspects of changing the behaviour of malaria vectors in tribal areas of India. *J Commun Dis*, 1998; 30: 267-278.
6. Traore, M. S., Baldé, M. A., Diallo, M. S. T., Baldé, E. S., Diané, S., & Camara, A. Ethnobotanical survey on medicinal plants used by Guinean traditional healers in the treatment of malaria. *Journal of Ethno pharmacology*, 2013; 150(3), 1145–1153.
7. Hanafi BojdA A, H Vatandoost, MA Oshaghi, MR Eshraghian, AA Haghdost, F Abedi ,GhZamani, MM Sedaghat, A Rashidian, AH Madani and A Raeisi. Knowledge, attitudes and practices regarding malaria control in an endemic area of southern Iran. *Southeast Asian J Trop Med Public Health*, 2011; Vol 42 No. 3
8. Abate et al., Community knowledge, attitude and practice about malaria in a low endemic setting of Shewa Robit Town, north-eastern Ethiopia. *BMC Public Health*, 2013; 13:312.
9. Gupta, R. K. et al. A household survey to assess community knowledge, attitude and practices on malaria in a rural population of Northern India. 2016;5(1). pp. 101–107. doi: 10.4103/2249-4863.184632.
10. Tamirat A, Geremew M, Abamecha F, Wollancho W. Knowledge, Attitude and Practice about Malaria in Maji District, Bench Maji Zone, Southwest Ethiopia. *J Trop Dis*, 2016; 4:217. doi:10.4172/2329-891X.1000217