

## **Delay in Seeking Treatment among Adults with Malaria Experience in Shan State, Myanmar**

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### **Abstract**

This cross-sectional descriptive study was conducted to determine the factors associated with the delay in seeking malaria treatment among adult villagers in malaria endemic areas of Myanmar. The data collection was conducted during March and April 2015. A total of 320 questionnaires were randomly distributed to the subjects who had malaria in the last 12 months prior to data collection. There were 310 completed questionnaires (96.8 %) for analysis. Bivariate analyses were performed to identify the association between independent variables and delay in seeking malaria treatment. The results showed that majority of the respondents (84.2 %) delayed in seeking malaria treatment. Approximately one-fifth (21.0 %) went to traditional healer, quack (fake doctor) (13.9 %) and self-care (11.9 %) as the first contact after getting signs and symptoms of malaria. There were 3 factors associated with delay in seeking malaria treatment; availability of health care personnel (OR: 2.26, 95 %CI: 1.20 - 4.25), distance from home to health center (OR: 2.13, 95 %CI: 1.14 - 3.98) and perceived cost of malaria treatment (OR: 2.33, 95 %CI: 1.19 - 4.54). Based on the results of this study, government and non-government organizations should put more effort to provide a sufficient number of health care personnel or trained malaria volunteer covering all villages especially those in remote and endemic areas.

**Keywords:** Delay, malaria, seeking-treatment, endemic area, Myanmar

### **Introduction**

Malaria is still a major public health problem even though it is a preventable and treatable mosquito-borne disease [1]. Globally, an estimated 3.2 billion people in 97 countries and territories are at risk of being infected with malaria and developing the disease [2]. Most cases in 2015 are estimated by the WHO to have occurred in the African and South-East Asia regions [1]. Malaria constitutes a major public health with approximately 70 % of the population of Myanmar living in malaria endemic areas, 15.6 million people in high-risk areas, 14.3 million in moderate risk and 10.7 million in low-risk areas. For several years, Myanmar reported the highest malaria morbidity and mortality rates in both the WHO South-East Asia Region (SEAR), and in the Greater Mekong Sub-Region (GSM) [3].

Malaria is a major cause of poverty and slows economic growth up by 1.3 % per year in endemic countries [4]. In the southern Shan state of Myanmar where only a few rural health centers and a township hospital, most villagers have difficulty in accessing formal health center. There were approximately 100,000 population in this area with a 20 - 50 population density per square kilometer. Geographically, the area is full of steep mountain ranges and valleys. Villagers who live in this area could take at least 3 h by motorcycle and foot to access the nearest rural health center. According to the report of the township hospital, there were over 1,000 malaria cases in 2014. According to the Ministry of Health, Myanmar, the

area is classified as high risk of malaria which located one km from the edge of the forest or resettlement area where the vectors are present. Most deaths are likely to occur among people residing in a village near or in the forest. Adult men were the highest risk group due to entering to the forest and stay overnight for several days without any protection.

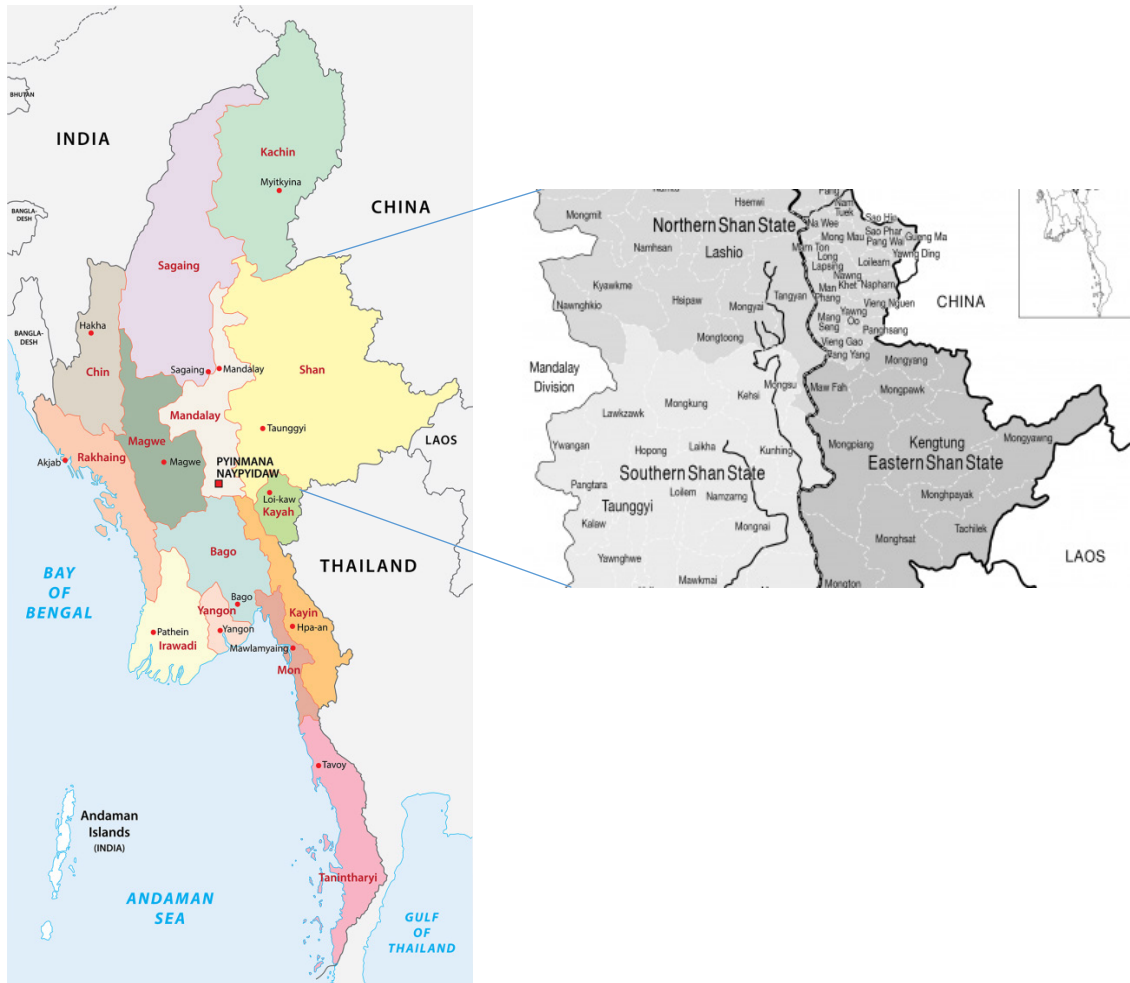
A critical review of traditional medicine and healers for malaria among people in malaria-endemic areas in low to middle-income Asia-Pacific countries reported higher prevalence of traditional medicine and healer because of geographic accessibility and financial barriers [5]. Previous research studies identified economic, geographical and health system factors as the determinants for the delay in seeking malaria treatment [6-9]. However, no previous studies have clarified the factor that may influence seeking treatment among people who live in high endemic at mountainous area. Therefore, this study attempted to determine the factors associated in the delay in seeking malaria treatment among adult villagers in malaria endemic areas of Myanmar. This investigation could assist in understanding treatment-seeking behavior and related risk factors.

## Materials and methods

### Study area and sampling

A cross-sectional study was conducted between March and April 2015 in Lawksawk township. Lawksawk is a remote, isolated township and is located in the southern part of Shan State, Myanmar. The area was 180.63 km from Nay Pyi Taw, the capital city of Myanmar (**Figure 1**). In 2015, the estimated total population of the urban area was 21,666 and rural area is 106,691 with a population density of 20 - 50 population per square kilometer. The residents are mainly Pa Oh, Shan, Danu and Burma ethnics. The township is characterized by unfavorable topographical conditions. Geographically, the northern part of the township is full of steep mountain ranges and valleys. The villages are located on the tops or slopes of mountain. Villages are scattered from one to another. There are no proper roads connecting the villages. With its remoteness and limited access worsened by high altitudes (about 2500 feet on average), the northern part of the township is socio-economically most marginalized.

There are 234 villages in the township. According to the Myanmar Medical Association, a total of 1,270 malaria cases in the township were reported. A minimum sample size of 290 subjects was calculated using the desired 5 % of precision with 95 % of confidence limits, an estimated 68 % of the malaria patients from a previous study [7] did not seek treatment within 24 h. The 7 highest malaria endemic areas were selected. Simple random sampling was employed to identify adult malaria patients in the households of 7 selected villages. Adults aged 18 years and older who reported malaria within 12 months prior the survey were approached. One-day training was conducted to ensure an appropriate quality of research assistants who were village malaria volunteers at each sampled village. Subjects were face to face interviewed in their household by trained research assistants. A total of 320 respondents were recruited in this study.



**Figure 1** The study site Shan state, Myanmar.

### Research instrument

The draft of interview questionnaire was developed based on the literature [6-9] and local context in the high endemic area. The first draft in English was translated into the Myanmar language by 2 epidemiologists in Myanmar. The questionnaire consisted of 4 domains: (i) demographic characteristics, (ii) knowledge related to the sign and symptom of malaria, (iii) accessibility to the health service, and (iv) malaria seeking treatment. Delay in seeking malaria treatment was defined as seeking treatment from a trained health personnel 24 h after the onset of the fever. In this study, the first treatment source sought was asked if they were trained personnel or health facilities. If not, the treatment-seeking was considered delayed. The questionnaire was pre-tested in a village with comparable proximity and demographic distribution to the target area before finalizing for data collection. Cronbach's alphas were in the range 0.67 - 0.82 in knowledge and perception. Some questions had to be revised and adjusted for clarification. The Burmese language was used in the interview. Approximately 20 to 30 min was needed to complete the questionnaire for each respondent.

### Data analysis

Descriptive statistics were employed to determine the central distribution and frequency of the study variables. Chi-square tests were used to identify the associations between each independent variable with delay in seeking malaria treatment. A *P value* < 0.05 was considered statistically significant.

### Ethical considerations

The study was reviewed and approved by the committee for research ethics (Social Sciences), Mahidol University (COA No.2015/142.2204). The study was a collaboration with the Ministry of Health, Myanmar and department of health at Shan state. Participants were explained the purpose of the study and obtained the consent before conducting the interview. Personal data of respondents were coded and kept as confidential information.

### Results and discussion

A total of 320 subjects were approached with the response rate 96.87 %, with 310 completed cases used for analysis. The median age of the respondents was 43 years (QD = 13), range 18 - 81 years. The majority were male (64.2 %) and married (75.2 %). Most of them (90 %) were of Burmese ethnicity. The median family income was 41.6 USD a month (QD = 29.1). About 70.3 % of the respondents had a forest related work (**Table 1**). The majority of the respondents (84.2 %) were classified as delayed in seeking malaria treatment. The top 3 first contacts for malaria treatment included a traditional healer (21.0 %), health care workers (20.0 %), and contact malaria volunteers (19.0 %) within 24 h from the onset of the first symptoms of malaria (**Table 2**).

There were factors associated with the delay in seeking malaria treatment; availability of health personnel (OR 2.26, 95 %CI: 1.20 - 4.25), distance from home to health facilities (OR 2.13, 95 %CI: 1.14 - 3.98), and perceived cost of treatment (OR 2.33, 95 %CI: 1.19 - 4.54) (**Table 3**).

**Table 1** Demographic characteristic of respondents (n = 310).

Respondent's characteristics	Number	(%)
<b>Age in years</b>		
Less than 31	83	(26.8)
31 - 60	162	(52.3)
60+	65	(21.0)
Median 43, IQR 26, range 18 - 81 years		
<b>Gender</b>		
Male	199	(64.2)
Female	111	(35.8)
<b>Marital status</b>		
Single	61	(19.7)
Married	233	(75.2)
Divorces/Separated	16	(5.2)
<b>Family income per month (Kyat*)</b>		
Less than or 50,000	160	(51.6)
More than 50,000	150	(48.4)
Median 50,000; QD 35,000; range 10,000 – 400,000 Kyat		
<b>Education level</b>		
Illiterate and primary school	207	(66.8)
Secondary school and higher	103	(33.2)
<b>Occupation</b>		
Forest related work and farmer	218	(70.3)
Other work	92	(29.7)

\*1200 kyat = 1 US\$, IQR = Inter quartile range, QD = Quartile deviation

**Table 2** Delay in seeking malaria treatment and first contact.

	n	(%)
<b>Delay in seeking malaria treatment in last 12 months</b>		
Yes	261	(84.2)
No	49	(15.8)
<b>First contact after onset of malaria symptom</b>		
Traditional healer	65	(21.0)
Health care worker	62	(20.0)
Malaria volunteer	59	(19.0)
Township hospital	44	(14.2)
Quack doctor	43	(13.9)
Self-care	37	(11.9)

**Table 3** Factors related to delay in seeking malaria treatment 12 months prior to the survey.

	n	Yes %	No %	OR (95 %CI)	p-value
<b>Respondents' characteristics</b>					
Age					
Less than 31	83	81.9	18.1	0.82 (0.34-1.98)	0.665
31 - 60	162	85.2	14.8	1.04 (0.47-2.33)	0.931
61 +	65	84.6	15.4	1	
Sex					
Male	199	84.4	15.6	1.05 (0.56-1.98)	0.883
Female	111	83.8	16.2	1	
Marital status					
Married	233	85.4	14.6	1.42 (0.72-2.77)	0.310
Others	77	80.5	19.5	1	
Family income (kyat)					
Less than 50000	160	84.4	15.6	1.03 (0.56-1.89)	0.928
50000 +	150	84.0	16.0	1	
Education					
Illiterate and primary school	207	86.0	14.0	1.48 (0.79-2.77)	0.221
Secondary school and above	103	80.0	19.4	1	
Occupation					
Forest related work	218	84.4	15.6	1.05 (0.54-2.05)	0.876
Other work	92	83.7	16.3	1	
<b>Knowledge related to malaria treatment</b>					
Poor	174	85.1	14.9	1.16 (0.63-2.14)	0.637
Good	136	83.1	16.9	1	
<b>Accessibility</b>					
Availability of health personnel					
Yes	144	78.5	21.5	1	
No	166	89.2	10.8	2.26 (1.20-4.25)	0.011
Proximity to health service (miles)					
Less than 14	169	78.7	21.3	1	
More than or 14	141	88.8	11.2	2.13 (1.14-3.98)	0.017
Time spend to health center/hospital					

	n	Yes %	No %	OR (95 %CI)	p-value
Less than or 1 h	129	80.6	19.4	1	
More than 1 h	181	86.7	13.3	1.57 (0.85-2.09)	0.147
Mode of transportation					
Own vehicle	169	84.6	15.4	1	
Public transportation	141	83.7	16.3	1.07 (0.58-1.97)	0.824
Perceived cost of transportation					
Low	150	81.3	12.7	1	
High	160	87.3	18.8	1.59 (0.85-2.97)	0.144
Perceived cost of treatment					
Low	140	79.4	20.6	1	
High	170	90.0	10.0	2.33 (1.19-4.54)	0.013

### Discussion

This study demonstrated that the majority of respondents (84.2 %) delayed seeking malaria treatment and nearly half of respondents did not seek formal treatment and utilized a traditional healer (21 %), quack (13.9 %) and self-care (11.9 %) after the onset of malaria symptoms. Similar percentages were reported in a previous study and the delay in seeking treatment was due to affordability, distance from health facilities including availability of the health care service [7]. Many research studies indicate that patients did not seek treatment within 24 h because of the high cost of diagnosis and treatment, and accessibility to health care facilities [6-13]. Traditional medicine and traditional healers are indigenous to the local culture and which have historically operated predominantly outside the state-funded healthcare system. It's an important, popular component of healthcare and treatment for the majority of people in Asia-Pacific including Myanmar [5].

The analysis of this study could not detect an association between family income and the delay in seeking treatment. This could be explained by the fact that a household with high income might have many family members and this may affect their expenditures. Therefore, a high income may not lead to no delay in seeking treatment. In addition, there was no association between the level of knowledge and delay in seeking malaria treatment. The majority (56.1 %) of respondents had a poor level of knowledge, for instance, they believed that malaria could be detected by a traditional healer, and they can stop taking anti-malaria drugs if they have no fever. This indicates that good knowledge is not related to good health behavior but due to other influence factors as well. Similar findings were reported in a study in Ethiopia, knowledge was not associated with timely treatment seeking behavior [9]. Villagers in this area were forest related workers and they have to go into the jungle for several days. Even though 65 % of them believed that sleeping under the mosquito net is an effective way to prevent malaria, however, the action is not possible in every situation. Therefore, another effective way to prevent mosquito bites could be introduced to this high risk group.

Access to health services in low-to middle income countries is often limited, especially in rural and remote regions [14-17]. This study indicated that there was a significant association of availability of health personnel, proximity to a health center, perceived cost of treatment and delay in seeking treatment. Similar findings were reported in previous studies [6,8,9,16], accessibility plays a crucial role in the health care system. Due to a small number of human resources for health, there is a big challenge for Myanmar in guaranteeing access to services in those areas. Since 1980, the Myanmar government started a policy to develop community health workers (CHWs) and auxiliary midwives (AMWs) selected from the villages and trained as voluntary health workers (VHW), with the support by WHO, USAID and UNICEF [18]. They have to serve in their own community as a bridge between the midwife and the community. However, this is still not enough to fill the needs of the people.

The study highlighted the importance of health infrastructure, good prospects for increased national and external investments in malaria control. Myanmar has tried to achieve effective malaria control and further reduce the burden of disease. Enhancing current malaria control efforts is imperative, given the enormity of the burden and the threat of artemisinin-resistance spreading further [3]. This will require vastly strengthening the national malaria control program, better coordination of the implementing partnership and working on the basis of a single operational malaria control plan. In addition, operational research is needed to provide evidence for local, risk-based approaches to malaria control in areas of, and population groups who currently suffer from intense transmission.

This study has a certain limitation; the findings of this study may not be generalized to other endemic townships and cannot represent the whole population in Myanmar. The significant factors found by bivariate analysis are the initial factors, and there might be confounding factors affecting the delay in seeking treatment. Moreover, a recall bias due to the pattern of seeking malaria treatment during the past 12 months could occur.

### Conclusions

The study revealed that 84.2 % of the village people in the high endemic area of Myanmar delayed seeking malaria treatment. Delay in seeking malaria treatment in this study was associated with a lack of health personnel, geographic accessibility and affordability. Malaria patients in the mountainous and remote areas of Myanmar still lack of access to health care services, and nearly half sought treatment from a traditional healer, quack or self-treatment. Adequate numbers of health workers covering all the endemic area is an urgent need to reduce mortality. Government and non-government organization sectors still need to put more effort into providing health service covering all areas. In addition, capacity strengthening malaria health volunteers in these rural areas to take prompt and adequate action could be initiated to detect and prevent progression to severe illness.

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### References

- [1] World Health Organization. *World Malaria Report*. World Health Organization, Geneva, Switzerland, 2015.
- [2] World Health Organization. *World Malaria Report*. World Health Organization, Geneva, Switzerland, 2014.
- [3] World Health Organization. *External Evaluation of the National Malaria Control Program*. World Health Organization, Geneva, Switzerland, 2013.
- [4] J Sachs and P Malaney. The economic and social burden of malaria. *Nature* 2002; **415**, 680-5.
- [5] DL Suswardany, DW Sibbritt, S Supardi, S Chang and J Adams. A critical review of traditional medicine and traditional healer use for malaria and among people in malaria-endemic areas: Contemporary research in low to middle-income Asia-Pacific countries. *Malaria J.* 2015; **14**, 98.
- [6] UM Chukwuocha, AC Okpanma, GC Nwakwuo and INS Dozie. Determinants of delay in seeking Malaria treatment for children under-5 years in parts of South Eastern Nigeria. *J. Comm. Health* 2014; **39**, 1171-8.
- [7] Xu JW, Xu QZ, Liu H and Zeng YR. Malaria treatment-seeking behaviour and related factors of Wa ethnic minority in Myanmar: A cross-sectional study. *Malaria J.* 2012; **11**, 417.
- [8] K Sonkong, S Chaiklieng, P Neave and P Suggaravetsiri. Factors affecting delay in seeking treatment among malaria patients along Thailand-Myanmar border in Tak Province, Thailand. *Malaria J.* 2015; **14**, 3.
- [9] A Getahun, K Deribe and A Deribew. Determinants of delay in malaria treatment-seeking behaviour for under-five children in south-west Ethiopia: A case control study. *Malaria J.* 2010; **9**, 320.

- [10] NC Min and ML Gatton. Costs to the patient for seeking malaria care in Myanmar. *Acta Tropica* 2004; **92**, 173-7.
- [11] A Das and TS Ravindran. Factors affecting treatment-seeking for febrile illness in a malaria endemic block in Boudh district, Orissa, India: Policy implications for malaria control. *Malaria J.* 2010; **9**, 377.
- [12] R Ndyomugenyi, P Magnussen and S Clarke. Malaria treatment-seeking behaviour and drug prescription practices in an area of low transmission in Uganda: Implications for prevention and control. *Trans. Roy. Soc. Trop. Med. Hyg.* 2007; **101**, 209-15.
- [13] PO Sumba, SL Wong, HK Kanzaria, KA Johnson and CC John. Malaria treatment-seeking behaviour and recovery from malaria in a highland area of Kenya. *Malaria J.* 2008; **7**, 245.
- [14] S Allin, C Hernández-Quevedo and C Masseria. *Measuring Equity of Access to Health Care.* In: P Smith (ed.). Performance Measurement for Health System Improvement: Experiences, Challenges and Prospects. Cambridge University Press, Cambridge, 2010, p. 187-221.
- [15] A Oliver and E Mossialos. Equity of access to health care: Outlining the foundations for action. *J. Epidemiol. Comm. Health* 2004; **58**, 655-8.
- [16] D Srivastava and A McGuire. Patient access to health care and medicines across low-income countries. *Soc. Sci. Med.* 2015; **133**, 21-7.
- [17] SF Rumisha, MM Zinga, CA Fahey, D Wei, VM Bwana, MRS Mlozi, EH Shayo, RC Malima, BK Mayala, G Stanley, T Mlacha and LE Mboera. Accessibility, availability and utilisation of malaria interventions among women of reproductive age in Kilosa district in central Tanzania. *BMC Health Serv. Res.* 2014; **14**, 452.
- [18] World Health Organization. *Asia Pacific Observatory on Health System and Policies.* The Republic of the Union of Myanmar Health System Review. Health System in Transition, 2014.