

# Knowledge of malaria prevention measures of rural adults: Implication for malaria elimination in the East Nusa Tenggara Province, Indonesia

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## Introduction

Malaria still remains to be a major public health problem globally as well as in Indonesia. The country is expected to achieve malaria elimination by 2030. However, the Eastern part of the country including in the East Nusa Tenggara Province (ENTP) still has a disproportionately high rate of malaria. To progress to malaria elimination, community should have adequate level of knowledge on malaria prevention measures (MPM) and their knowledge should be incorporated in the planning of various malaria elimination programs [1,2]. However, knowledge of MPM is not well studied in Indonesia; particularly, in the study area.

## Objectives

This study aimed to investigate the diversity of knowledge of MPM and their associated factors among rural adults in ENTP.

## Methods

A community-based cross-sectional study was conducted from October to December 2019 among a randomly selected 1503 households at rural ENTP [3] as shown in Fig 1. Multistage sampling technique was employed to recruit participants.

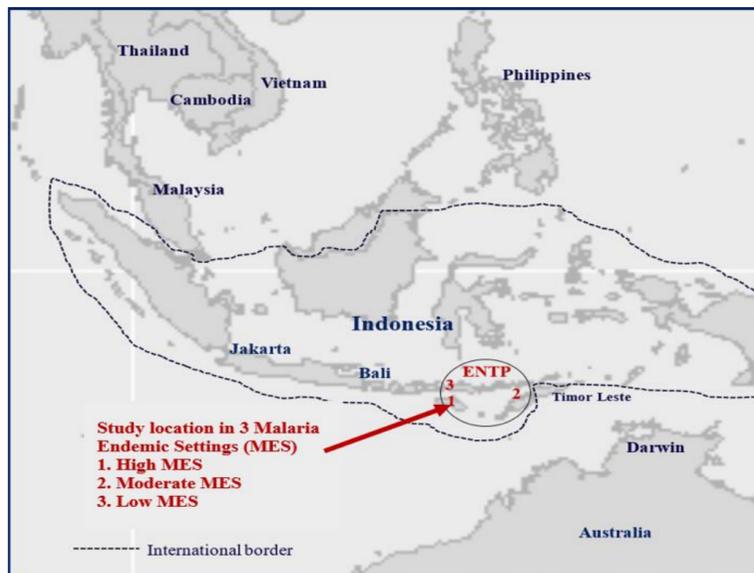


Figure 1: Location of study.

Univariate and multivariable logistic regression model was used to assess factors affecting knowledge of MPM. Finally, adjusted odds ratio together with 95% Confidence Interval (CI) and p-value <0.05 was used to declare the statistical significances.

## Results

The result of this study shows that there were 9 MPM knowledge amongst participants. This includes sleeping under LLINs (MPM<sub>1</sub>); keeping house clean (MPM<sub>2</sub>); sleeping under non LLINs (MPM<sub>3</sub>); using mosquito coil (MPM<sub>4</sub>); using Indoor Residual Spraying (MPM<sub>5</sub>); wearing long sleeved clothes when going outdoors at night (MPM<sub>6</sub>); covering ventilation with anti-mosquito nets (MPM<sub>7</sub>); taking anti-malaria drugs when staying at malaria endemic areas (MPM<sub>8</sub>); and others (MPM<sub>9</sub>). Overall, the coverage of various knowledge on MPM was very low. Only 58.4% of participants has knowledge on long-lasting insecticide-treated nets (LLINs) as a method to prevent malaria. Whilst, knowledge on sleeping under non-LLINs, using mosquito coil, using Indoor Residual Spraying, was only 27.1%, 26.7%, 19% respectively as indicated in Figure 2.

Knowledge on sleeping under non-LLINs was significantly higher for adults with a diploma or above education level (AOR: 11.2, 95% CI: 4.84, 25.8) compared to those with no education level; living in low MES (AOR: 38.3, 95% CI: 22.9, 63.9) compared to those in high MES. Whilst, knowledge on LLINs was significantly higher for adults living closed to a village maternity post (AOR: 3.27, 95% CI: 2.18, 4.90) compared to those residing closed to a village health post; having high socio economic status (AOR: 1.97, 95% CI: 1.31, 2.96) compared to those having low SES (Table 1).

Figure 2: Distribution of MPM knowledge amongst participants.

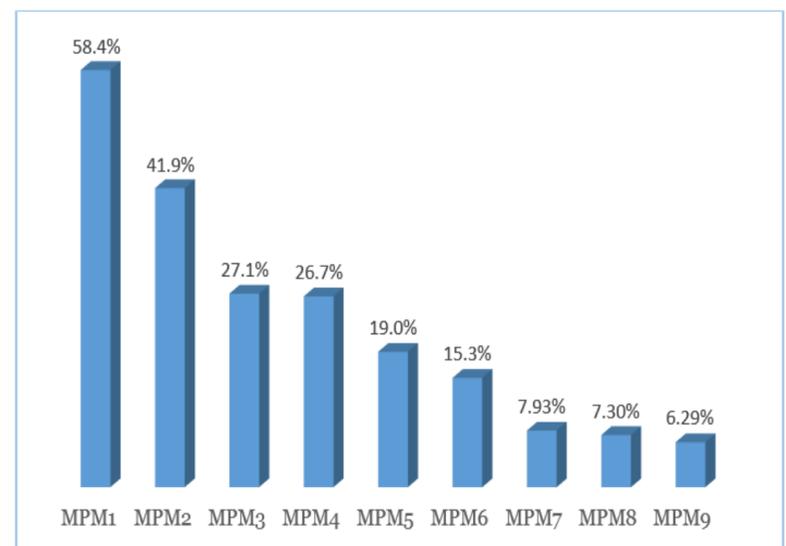


Table 1. Factors associated with knowledge of malaria prevention measures of rural adults who have heard malaria term in the East Nusa Tenggara Province, Indonesia

Characteristic	Knowledge on Malaria Prevention Measures			
	Non-LLINs		LLINs	
	COR	AOR	COR	AOR
<b>Level of Education</b>				
No education	1.00	1.00	1.00	1.00
Primary school	3.29 (2.06, 5.27)	2.91 (1.78, 4.76)	0.65 (0.47, 0.90)	
Junior High School	5.31 (3.17, 8.89)	5.99 (3.42, 10.5)	0.50 (0.34, 0.73)	
Senior High School	3.50 (2.06, 5.97)	4.32 (2.38, 7.86)	0.74 (0.50, 1.10)	
Diploma or above	8.90 (4.94, 16.0)	11.2 (4.84, 25.8)	0.51 (0.31, 0.83)	
<b>Socio-Economic Status</b>				
Poor	1.00	1.00	1.00	1.00
Average	0.65 (0.49, 0.85)	0.59 (0.43, 0.82)	1.32 (1.03, 1.70)	1.46 (1.10, 1.94)
Rich	0.86 (0.58, 1.28)	0.53 (0.32, 0.89)	1.59 (1.09, 2.30)	1.97 (1.31, 2.96)
<b>The nearest health service</b>				
Village health Post	1.00	1.00	1.00	1.00
Village maternity posts	4.81 (3.21, 7.21)	4.12 (2.65, 6.39)	1.74 (1.23, 2.47)	3.27 (2.18, 4.90)
Subsidiary PHC	1.20 (0.78, 1.85)	1.03 (0.65, 1.63)	1.63 (1.19, 2.23)	1.92 (1.33, 2.75)
PHC	3.62 (2.51, 5.23)	3.42 (2.31, 5.07)	1.02 (0.76, 1.36)	1.34 (0.97, 1.85)
<b>Malaria Endemic Settings (MES)</b>				
High	1.00	1.00	1.00	1.00
Moderate	2.80 (1.72, 4.56)	1.98 (1.16, 3.38)	0.38 (0.29, 0.51)	0.41 (0.30, 0.56)
Low	33.2 (21.3, 51.8)	38.3 (22.9, 63.9)	0.28 (0.21, 0.37)	0.22 (0.16, 0.31)
<b>Family size</b>				
<= 4	1.00	1.00	1.00	1.00
> 4	1.27 (0.99, 1.62)	1.60 (1.28, 2.00)	1.36 (1.06, 1.74)	

PHC: Public Health Centre; COR: Crude odd ratio; AOR: Adjusted Odd Ratio for all variables in the model (gender, age group, education level, occupation, socio-economic status, the nearest health service, distance to the nearest health service, family size, malaria endemic settings).

## Conclusions

The coverage of various MPM knowledge of rural adults in ENTP was low which implies that the knowledge of MPM should be scaled up to improve the chance to practice of MPM in their daily life. Higher level of education and living in low malaria endemic settings were significantly associated with the knowledge on non-LLINs. Whilst living closed to village maternity post and high SES were significantly associated with knowledge on LLINs. Therefore, health education promotion on MPM knowledge tailored with local conditions is critical to support the malaria elimination program by 2030 in the region.

## References

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