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1

## Characteristics of home environment factors and community behavior of endemic malaria area in Jampea Island<sup>☆</sup>



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3

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11

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### KEYWORDS

Malaria;  
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1

### Abstract

**Objective:** This study aims to understand the characteristics of houses and the behavior of residents in malaria endemic areas carried out on the islands of Jampea, Selayar Islands.

**Methods:** The method study used the observational method using an observation sheet.

**Results:** The results showed that there are still many people who less concerned with malaria problems than being supported by home environment that is fully related to water inundation and the dwelling population that dense.

**Conclusion:** Therefore, it is important to improve the strategy for optimizing the implementa-

tion of supervision in the region by the local government.

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### Introduction

Malaria is a disease caused by intracellular obligate protozoa of the genus Plasmodium that naturally transmitted by female Anopheles mosquitoes. Based on the World Malaria

Report, Malaria cases worldwide in 2017 is estimated 219 million cases, slightly higher than in 2016.<sup>1</sup> Nationally, Malaria cases period of 2013–2016 tended to decrease, 1.38% in 2013, 0.77% in 2016.<sup>2</sup> Selayar Islands District Health Office reported in 2016 that number of clinical Malaria was 2.228 cases with a positive case of 23 people (API 0.18), in 2017 number of cases increased, where number of clinical Malaria was 2.408 cases with 36 positive cases (API 0.27%). But in 2018 decreased where clinical Malaria number was 1.975 with positive case 27 people (API 0.2%).

API numbers on Jampea Island tend to increase in the last 3 years, 2016 API 0.46% (low endemicism), 2017 1% (moderate endemic), and 2018 1.63% (moderate endemic), two

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6

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endemic villages on Jampea island, Ma'Minasa (API 5.83%) and Teluk Kampe (API 2.02%) in 2018. Even though there are traditional community prevention efforts such as catching mosquitoes, the high incidence of malaria in various regions proves need for more control efforts. Based on the description, researchers were interested in conducting research related to Characteristics of Home Environmental Factors and Endemic Malaria Residents' Behavior on Jampea Island.

8

## Methods

### Location and design of research

The study was conducted in Selayar Islands focusing on Jampea Island, the selection of Jampea Island as a research location because malaria cases were found every year in the region. In addition, Jampea Island is a coastal area with a low land type that strongly supports the breeding of Anopheles.

### Population dan sample

The population in this study was all 483 houses in Ma'minasa and Teluk Kampe villages, consisting of 214 houses in Maminasa village and 269 houses in Teluk Kampe village, with a sample count of 105 samples.

### Collecting data

Primary data obtained through field observations using observation sheets and equipped with secondary data obtained from WHO, Ministry of Health, and the Selayar Islands District Health Office regarding Malaria endemicity data.

### Data analysis

Data that has been collected is analyzed using the SPSS program (Statistical Package for Social Science).

5

## Results

Data showed that most of the respondents were women 76.2%, education dominated by elementary and junior high school education levels 44.8% and 34.3%, work related 48.6% of respondents were housewives. Observation results of environmental characteristics respondent's house in Table 2, 84.8% of respondents did not install the ceiling where the most widely used type of ceiling was plywood and tarpaulin, 91.4% of the wall type of the house was not constructed but made of boards, for the presence of 100% ventilation have ventilation. Houses that have planks/non-cement 91%, house density is less than 8M<sup>2</sup> totaling 16 houses (15.2%), which is good because most respondents have houses with densities of residents who meet the requirements (84.8%) (Table 1).

However, the results of observations on standing water respondent's home environment showed that all respondents had houses that were in the vicinity of standing water or the highest were around sewers and swamps 31.4% respectively. The distance of the respondent's house with the

**Table 1** Distribution of respondents.

Characteristics	n	%
<i>Gender</i>		
Men	25	23.8
Women	80	76.2
<i>Level of education</i>		
No school	18	17.1
Elementary school	47	44.8
Junior high school	36	34.3
DIPLOMA	2	1.9
S1/S2/S3	2	1.9
<i>Occupation</i>		
Farmer	28	26.7
Civil servant/honorary	9	8.6
Fisherman	2	1.9
Student	1	1.0
Does not work	9	8.6
Housewife	51	48.6
Others	5	4.8

overall puddle is within a radius of  $\leq 250$  m from the puddle so that all of them have the risk of vector breeding sites. The surrounding houses have shrubs 28.6% while houses that are free of shrubs around it are 71.4%, most of the respondents maintain and moor livestock around the house which is 85.7% and those who do not have livestock or tether cattle around the house 14.3% (Table 2).

Respondents who have the habit of being outdoors at night 29.5% of them by chatting and looking after the garden, and who do not have the habit of going outdoors at night is 70.5%. For the use of mosquito nets, respondents generally use bed nets at 77.1% of the total respondents, the level of alertness of the risk of Anopheles mosquito bites must still be carried out because there are still 22.9% of respondents who do not use mosquito nets at night, followed by facts at least 67.6% of respondents did not use mosquito repellent during sleep. The habit of hanging used clothes, 73.3% still do the habit, while the history of visits to malaria endemic areas is known 71.4% of respondents have never visited malaria endemic areas and 28.6% have visited malaria areas (Table 3).

## Discussion

Results of this study indicated that, there were still many respondents who less concerned with the preventive behavior of malaria cases even though they live in endemic areas where the potential for morbidity could increase, especially supported by home environment that is entirely in the vicinity of standing water and dwelling densely populated. Arsin Anopheles larvae breed in various types of puddles, but generally the water that uncontaminated.<sup>3</sup> Puspaningrum shows the existence of Malaria cases at distance of up to 300 m from standing water, but distance flying mosquitoes that can reach 1.5 km, this is associated with the influence of wind that can bring flying mosquitoes in that direction.<sup>4</sup> Yuswatiningsih found that there was significant relationship between occupancy density on the incidence of malaria, even though

**Table 2** Distribution environmental characteristics of houses.

Variable	n	%
<i>The existence of a ceiling</i>		
Exist	16	15.2
Nothing	89	84.8
<i>Type of wall</i>		
Wall	9	8.6
Not a wall	96	91.4
<i>Density of wall</i>		
Solid	9	8.6
Not solid	96	91.4
<i>Existence of ventilation</i>		
Exist	105	100
Nothing	0	0
<i>Type of floor</i>		
Cement/ceramic	14	13.3
Not cement	91	86.7
<i>Density of occupancy</i>		
Solid	89	84.8
Not solid	16	15.2
<i>Inundation</i>		
Sewer	33	31.4
Rice fields	14	13.3
Swamp	33	31.4
Ponds	12	11.4
River	13	12.4
<i>Jarak rumah dari genangan</i>		
<250m	105	100
>250m	0	0
<i>Existence of shrubs</i>		
Exist	29	27.6
Nothing	76	72.4
<i>Existence of large livestock</i>		
Exist	15	14.3
Nothing	90	85.7

a densely populated room was known to have a detrimental effect on the health of residents.<sup>5</sup>

The risk of Malaria in the home environment was also related to the distance, at a distance of <250M from the forest and swamps and <200 M from the cornfield,<sup>6</sup> Anopheles breeding sites have an optimum buffer of 100M,<sup>7</sup> highest mosquito density was found in Thailand at a distance of 2 km from the sea.<sup>8</sup> Roberts and Matthews said, children who live at home with land/sand as the main floor material are more at risk of malaria.<sup>9</sup> Then Novianti and Syam showed that there was a relationship between the presence of ceilings and the incidence of malaria.<sup>10,11</sup> Ondiba and Nababan found the average number of mosquitoes found per wall type diverse but walls of houses that have concrete construction/solid will prevent mosquitoes from entering the house.<sup>12,13</sup>

Simple but often overlooked by the community was hanging clothes in the house, even though this behavior will make

**Table 3** Distribution characteristics of malaria prevention.

Variable	n	%
<i>Habits of going out at night</i>		
Yes	31	29.5
No	74	70.5
<i>Use of mosquito nets</i>		
Yes	81	77.1
No	24	22.9
<i>Use of anti-mosquito drugs</i>		
Yes	34	32.4
No	71	67.6
<i>Habits of hanging home undergarments</i>		
Yes	77	73.3
No	28	26.7
<i>Visit to endemic areas</i>		
Yes	30	28.6
No	75	71.4

the mosquito nesting place. Stebbins stated that the use of bed nets is known to have an indirect protective effect in urban areas but there was no effect on the use of bed nets in rural areas but this is related to population density factors. In addition to the use of mosquito nets using mosquito repellent drugs is one of the prevention efforts of mosquito bites.<sup>14</sup>

## Conclusions

Most of the people in Ma'minasa and Teluk Kampe Village have home environment that does not meet the requirements so that it can transmit malaria, but prevention behaviors such as the habit of using mosquito nets are carried out by most people. Malaria prevention efforts have not yet achieved optimal results in reviewing the potential of the environment and nature in Indonesia for the propagation of vectors to adequate health services so prevention efforts must still be carried out.

## Conflict of interest

The authors declare no conflict of interest.

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