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The Analysis of Malaria Risk Factor in Palangka Raya City 2018

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Abstract

Malaria is an infectious disease that is still a public health problem in Indonesia. Based on the report on the value of Annual Parasite Incidence in Palangka Raya City was 0.16 per 1000 inhabitants and malaria cases were found in 46 cases in 2017. With malaria cases still being discovered, Palangka Raya City was appointed as one of the regencies/cities to be assessed in malaria elimination programs in Central Kalimantan. This research aims to analyze the risk factors associated with malaria incidence in the City of Palangka Raya. This is quantitative research with case-control design to assess the associated risk factors (independent variable) with malaria incidence (dependent variable). Total sample in research this is 30 case and 30 control with proportionate random sampling. There is a relationship between job (p=0.000), the existence of mosquito breeding sites (p=0.001), use of mosquito nets (p=0.001) with malaria incidence. There is no relationship between the existence of cattle pens (p=0.117), installation of mosquito nets (p=0.488), health services for malaria prevention efforts (p=0.584) with malaria incidence. The dominant factor related to malaria incidence is the job (p=0.0001). There is a relationship between job, the existence of mosquito breeding sites, the use of mosquito nets with malaria incidence in Palangkaraya City while the existence of cattle pens, installation of mosquito nets and health services to prevent malaria not related.

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1. Introduction

Malaria is one of the public health issues in Indonesia. Malaria has a role in the high mortality rate in many countries in the world. Malaria is a type of infectious disease caused by a certain agent that is infective with an intermediary vector and is spread from a source of infection to the host. Malaria is one of the infectious diseases that can affect everyone, even resulting in death mainly caused by the Plasmodium parasite (Ministry of Health, 2017).

Based on data from the World Malaria Report 2016, there are about 212 million new cases of malaria and cause the death of approximately 429 thousand people worldwide (Ministry of Health, 2017). Of the total 265 million population in Indonesia as many as 4.9 million or 2% living in high endemic areas, during 2017 there were 261,617 cases of malaria nationally which killed at least 100 people (Mediani, 2018).

Based on the Indonesian Health Profile in 2009-2017, it tends to decrease from 1.8 per 1000 population in 2009 to 0.99 per 1000 population in 2017. In 2017 there are 438 districts/cities with API <1 per 1000 inhabitants, while the target of the Plan The Ministry of Health's strategy for malaria morbidity or Annual Parasite Incidence (API) in 2017 is the number of districts/cities with API <1 per 1000 population of 375 districts/cities.

Malaria is an endemic disease in several sub-districts in Palangka Raya City. From the data from the Pangka Raya City Health Office obtained in 2016 there was 65 cash in malaria with an API value of 0.22 per 1000 population and in 2017 46 cases with an API value of 0.16 per 1000 inhabitants were found. Although the API value in the City of Palangka Raya including a decline but could be a threat to malaria because of the still finding malaria cases.

Malaria prevention efforts continue to be carried out and so far have shown significant results. One of the Malaria Elimination programs is an effort to stop malaria transmission in a certain area such as district/city or province. This is a global agreement produced at the 60th WHA meeting in Geneva in 2007 concerning malaria elimination in each country and the 2014 regional commitment on malaria elimination in the entire Asia Pacific region by 2030.

Environmental factors, behavior and health services are something that has a major influence on health development in society, therefore requires a deeper study of these factors. This study aims to analyze the relationship between the incidence of malaria in the community with environmental conditions, behavior and health services.

2. Methods

The type of research used is an analytic observation with a case-control study approach. In this study will analyze the environment, behavior and health services as risk factors for malaria incidence in the community in the City of Palangka Raya by comparing the case groups namely people suffering from malaria with a control group including people who did not get malaria and lived around the case group.

The population in this study were all malaria positive sufferers who resided in Palangka Raya City in July 2017 - June 2018. For control samples by comparing cases: controls, namely 1:1. So in this study, 30 respondents and 30 control respondents were taken. Control samples were taken from neighboring patients who were negative on malaria microscopic examination.

The instruments in this study were collected through observation sheets and questionnaires which contained a number of questions by conducting observations including mosquito breeding sites, the existence

of cattle sheds, the use of mosquito nets and the installation of mosquito nets. Data will be analyzed using the chi-square test at 95% confidence level so that the relationship between research variables is known.

3. Results

This research was carried out in 5 sub-districts in Palangka Raya City, namely Pahandut Sub-District, Jekan Raya Sub-District, Sebangau Sub-District, Bukit Batu District and Rakumpit Sub-District.

The Palangka Raya City Region is the capital of Central Kalimantan Province. The city of Palangka Raya is in the north with Gunung Mas District, east and south of Pulang Pisau Regency and west of Katingan Regency.

Table 1. Distribution of Frequency of Characteristics of Respondents in the City of Palangka Raya

No.	Characteristics Respondents	Category	Case		Control	
			n	%	n	%
1.	Gender	Man	26	86.7	26	86.7
		Woman	4	13.3	4	13.3
2.	Age	17-29 years	12	40.0	12	40.0
		30 - 39 years old	7	23.3	7	23.3
		40 - 49 years old	7	23.3	7	23.3
		> 50 years old	4	13.3	4	13.3
3.	Job	Gardening/farmers	3	10.0	3	10.0
		Housewife	4	13.3	2	6.7
		Fisherman	1	3.3	7	23.3
		Miners	20	66.7	3	10.0
		Army/police	1	3.3	2	6.7
		Private	1	3.3	9	30.0
		Civil servants	0	0.0	4	13.3

Table 2. Relationship Between The Location of Mosquito Breeding and The Incidence of Malaria in Palangka Raya City in 2018

The existence of mosquito breeding sites	Control		Case		*P Value*	OR	95% CI
	n	%	n	%			
No	20	66.7	7	23.3	0.001	6.571	2.109-20.479
Have	10	33.3	23	76.7			

Based on bivariate results, using the chi-square test in table 2 shows the value of p-value of 0.001 (p <0.005), meaning that there is a significant relationship between the existence of mosquito breeding sites and the incidence of malaria. Risk calculations estimate obtained OR 95% CI 6.571 to 2.109 to 20.479, which means if there is a community around the house where breeding places likelihood 6.5 times higher risk of suffering from malaria compared with people who their house have mosquitoes breeding place. From the multivariate results obtained p-value = 0.002 and after being controlled with other variables the existence of mosquito breeding sites obtained Exp B 57.163 values.

This is in line with the results of research by Ferdiani (2003) in Sutarto & Cania (2017) in Nongso Subdistrict, Batam City which states that residents living near mosquito breeding sites have a risk of 2.31 times malaria than residents who live in surrounding areas with no breeding places mosquito (p = 0.000, OR

0.32 , 95% CI 1.401-3.23)

Table 3 The Relationship Between The Existence of Cattle Pens and The Incidence of Malaria in Palangka Raya City in 2018

The existence of cattle pen	Control		Case		*P Value*	95% CI
	n	%	n	%		
No	26	86.7	21	70.0	0.117	0.751-10.331
Have	4	13.3	9	30.0		

From the results of chi-square test table 3 shows the value of p-value of 0.117 (p> 0.005) means that there is no significant relationship between the existence of cattle sheds with the incidence of malaria. There was no relationship in this study because the proportion of exposure in the case and control groups was almost the same, this was due to other stronger risk factors. From the calculations found in the group of cases where there were 8 5 livestock cages around the house, 7 % did not install mosquito nets. In addition to 76.2 % of the group of cases that have livestock cages around their homes also have jobs at risk of malaria.

This study is in accordance with Pratiwi's research (2016) in Kulon Progo Regency which states that there is no significant influence between the existence of livestock pens around the house and the incidence of malaria. Likewise with the results of research by Nababan & Rahmah (2018) in the highest endemic areas of malaria in Central Java concluded that the existence of livestock cages had no relation to the incidence of malaria.

Table 4. Relationship Between Job and Malaria Incidence in Palangka Raya City in 2018

Job	Control		Case		*P Value*	OR	95% CI
	n	%	n	%			
Not at risk	24	80.0	7	23.3	0.000	13.143	3.837-45.023
At risk	6	20.0	23	76.7			

Based on the bivariate results, using the chi-square test table 4 shows the value of p-value of 0,000 (p <0,005), meaning that there is a significant relationship between work and the incidence of malaria. Risk Calculation OR 13.143 estimate obtained with 95% CI 3.837 to 45.023, which means people who have a risky job will have 13.1 times more likely to suffer malaria disease compared with people who have jobs are not at risk. From the multivariate results obtained p-value = 0.001 and after being controlled by other variables the existence of mosquito breeding sites obtained Exp B 50.298.

This research is in line with the research conducted by Krisna & Sudirman (2015) in Parigi Mountong Regency which states that there is a significant relationship between risky work and malaria incidence of 3.4 times compared to non-risky ones (p = 0.036).

Table 5. The Relationship Between The Use of Mosquito Nets and The Incidence of Malaria in The City of Palangka Raya in 2018

Use of mosquito nets	Control		Case		*P Value*	OR	95% CI
	n	%	n	%			
Have	23	76.7	10	33.3	0.001	6.571	2.109-20.479
No	7	23.3	20	66.7			

From the bivariate results, using the chi-square test in table 5 shows the value of p-value of 0.001 (p <0.005), meaning that there is a significant relationship between the use of bed nets and the incidence of malaria. Risk calculations estimate obtained OR 95% CI 6.571 to 2.109 to 20.479 states that societies do not use mosquito nets at night while sleeping to the possibility of 6, 5 times more at risk of suffering from malaria than the people who use the nets while sleeping at night. From the multivariate results obtained p-value = 0.00 4 and after being controlled by other variables the existence of mosquito breeding sites obtained an Exp B value of 18.307.

In line with the results of the study by Rachman (2017) in Batang Hari Regency, it was stated that the use of mosquito nets had a significant relationship to the incidence of malaria with a value of p = 0.016 with a value of OR 3.300 (95% CI 1.330-8.187).

Table 6. The Relationship Between The Installation of Mosquito Nets and The Incidence of Malaria in The City of Palangka Raya in 2018

Installation of mosquito nets	Control		Case		*P Value*	95% CI
	n	%	n	%		
Qualify	6	20.0	4	13.3	0.488	0.408-6.469
Not eligible	24	80.0	26	86.7		

From the results of the chi-square test table 6 shows the value of p-value of 0, 488 (p> 0.005) means that there is no significant relationship between the installation of mosquito nets and the incidence of malaria. The lack of evidence of mosquito gauze installation behavior was also caused by the number of respondents who did not install mosquito nets in almost the same case and control groups. This is due to other stronger risk factors. From the calculations found in the group of cases that installed mosquito gauze fulfilled the requirements of 75% were known to have a residence adjacent to the breeding place for mosquitoes. Addition of 75% of a group of cases that put up mosquito netting eligible known not using mosquito nets while sleeping at night.

This study is in accordance with the research of Santoso & Koibito (2013) in the sub-district of Punduh Pedada, Pesawaran District, with a case-control design in the case and control groups who did not use gauze on their house ventilation by 100%, it was stated that there was no relationship between the use of mosquito

nets and the incidence of malaria.

Table 7. The Relationship Between Health Care Efforts to Prevent Malaria and The Incidence of Malaria in Palangka Raya City in 2018

Health service	Control		Case		*P Value*	95% CI
	n	%	n	%		
Good	21	70.0	19	63.3	0.584	0.460-3.968
Less	9	30.0	11	36.7		

From the results of the chi-square test table 7 shows the value of p-value of 0.584 (p> 0.005) means that there is no significant relationship between health care efforts to prevent malaria with the incidence of malaria. Unrelated health services to prevent malaria were also caused by the number of respondents who stated that the health services obtained were good in the case and control groups were almost the same. This is due to other stronger risk factors. From the calculation of case, respondents who have received health services efforts to prevent malaria by 94.7 % do not install mosquito nets that meet the requirements of their home ventilation. Moreover, by 89, 5% of respondents cases that have been getting good health care prevention efforts also found the presence of mosquito breeding places around the residence's so both these factors have the potential for transmission of malaria.

This research is in line with the results of Maritoneng's research (2015) in the Tona Public Health Center working area, Tahuna District, Singihe Regency by using cross-sectional tests to 58 respondents with results p = 0.5 22> 0.05, which means there is no relationship between health service factors and malaria incidence.

4. Conclusion

There is a relationship between the existence of mosquito breeding sites, work, the use of mosquito nets with malaria incidence in the community in Palangka Raya City in 2018. There is no relationship between the existence of livestock cages, installation of mosquito nets and health services malaria prevention efforts with malaria occurrence in communities in Palangka Raya City 2018.

It is hoped that for the community to make environmental modifications, namely by changing the physical environment permanently which aims to prevent, eliminate or reduce the breeding place of mosquitoes by hoarding, drying. Doing environmental manipulation is changing the environment temporarily so that it is not profitable for vectors to multiply by cleaning up floating water plants. The community is also expected to actively use mosquito nets at night even though there are many complaints in the form of discomfort, stuffiness, and heat when inside the mosquito net.

For people who have jobs at risk of malaria as miners are expected to use repellents (active ingredients

that have the ability to resist mosquitoes) when working to reduce and avoid the bite of the Anopheles mosquito..

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