

## Factors Influence Malaria Occurrence on Medical Students Poltekkes Kemenkes Jayapura

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### ABSTRACT

**Background:** Malaria is one of the world's deadly diseases caused by plasmodium, which is transmitted by Anopheles Sp mosquitoes and if not treated promptly, the patient will have severe complications and can die. Objective: To know the factors that influences the incidence of malaria in Midwifery students Mimika Poltekkes Kemenkes Jayapura Year 2018. **Methods:** Analytical survey with cross sectional study design conducted in April 2018 with a sample size of 120 people in total population. Data were obtained using questionnaire, analyzed using Chi-Square and multiple regression logistic with p-value significance <0,05. **Result:** Factors influencing the incidence of malaria in Mimika midwifery students were tribe (p-value 0,038, RP = 22,679; CI95% = 1,130- 6,354), activity at night (p-value <0,001, RP = 4,454; CI95% = 1,966-10,092), residence distance from breeding place (p-value 0,002, RP = 0,244; CI95% = 0,102- 0,588). Factors not affecting malaria incidence in midwives student are poultry cage (p-value 0,053, RP = (P-value 0,229, RP = 0,567, CI95% = 0,257-1,254), distance of health service facility (p-value 0,746, RP = 1,240; CI95% = 1,058-4,809) 0,556- 2,767), use of mosquito repellent (p-value 1,000, RP = 1.065; CI95% = 0.488-2,325). The dominant factors affecting the incidence of malaria in Mimika midwifery students are tribe, night activities, house distance with breeding place, where nighttime activities have a more dominant factor against malaria incidence in Mimika midwifery students.

**Keywords:** ethnicity, behavioral factors, environmental factors, malaria incidence

### 1. INTRODUCTION

Malaria is an important tropical parasitic disease in the world, and is still a major health problem that poses a threat to people in the tropics and sub tropics, especially in infants, toddlers and mothers. Around the world each year found 350-500 million cases of malaria that resulted in 1.1 million people died. According to WHO (2014), the number of malaria deaths in the world in 2013 is still 47% and 78% of them are children under 5 years old (Sucipto, 2015) Malaria is a serious and fatal disease caused by plasmodium, which is transmitted by mosquitoes and if not treated promptly, the patient will experience severe complications and may die (CDC, 2015). World Malaria Report 2015 mentions that malaria has attacked 106 countries in the world. The global commitment to the Millennium Development Goals (MDGs) puts malaria eradication efforts into one of the common goals to be achieved by 2015 through the seventh goal of combating HIV / AIDS, malaria and tuberculosis. With the end of the MDGs by 2015, the global commitment is continued through sustainable development Goals (SDGs). In the SDGs, malaria eradication efforts are contained in the third goal of ensuring a healthy life and seeking prosperity for all people with the specific purpose of ending epidemic AIDS, tuberculosis, malaria, neglected-tropical disease until 2030 (infoDatin 2016).

Malaria can cause blood deficiency (anemia) because the damaged blood cells are damaged or eaten by plasmodium. Anemia occurs mainly due to rupture of red

blood cells infected with plasmodium falsifarum. Red cell infection by plasmodium causes acute and chronic anemia. Symptoms of anemia include fatigue, weakness, loss of appetite/decreased, decreased concentration power, headache / dizziness. Anemia in adolescents as a result of malaria infection has a negative impact on the development of adolescents both physically and mentally, such as decreased learning concentration, weakness and pain (Infodatin, 2015).

Indonesia is still a malaria transmission country or at risk of malaria. In 2013 data show that 14% of high endemic areas of malaria and 17% of low malaria endemic areas in Indonesia (Ministry of Health, 2014). Malaria morality in a region is determined by Annual Parasite Incidence (API) per year. API is the number of malaria positive cases per 1,000 population in one year. National API trends in 2011 to 2015 continue to decline. If viewed from the API for Papua Province, West Papua, the Papua Province API number until 2015 reaches 31.93 higher by 0.64 compared to West Papua province (Infodatin Malaria, 2016). Malaria is still one of the public health problems in Mimika Regency. Several years earlier until now the disease is still always included in the first sequence of 10 diseases. It is possible that the existing environmental and climate conditions in Mimika Regency are potential to trigger the occurrence of existing malaria cases, in addition to public awareness to improve the quality of environmental health is lacking, (Mimika Regency Health Service Division, 2012).

The Health Problems Controlling Field of the Mimika Regency Health Office reported the number of patients with blood test in 2012 of 101,371 positive of 216,213 blood samples examined or 46.9% of the total blood supply were malaria patients. Mimika Regency During 2015, according to the LPMK Health Bureau, controlling malaria cases in the coastal villages of Mimika, of the 3,153 people examined, who

were positively infected with malaria as many as 161 people (Supar E, 2015).

By looking at a series of facts above, the case of malaria in Mimika Regency is part of a public health issue that is worth noting. Malaria also has an impact on adolescents including students who are anemic. Students as a young generation, agents of change to the condition of the nation. Malaria disease in students leads to anemia that disrupts the learning process, either due to decreased memory or reduced ability to concentrate.

Meanwhile, according to data obtained from students of Midwifery Diploma Program of Midwifery Mimika Poltekkes Kemenkes Jayapura in March 2018 through interview with total student number 120 people, consisting of second semester: 52 people, semester IV: 38 people, semester VI: 30 people, and about 90% (108 people) have had malaria. And students who have received the Malaria course is the fourth semester and semester VI. Dengan doing efforts to prevent malaria, especially for students are expected to improve the quality of human resources. Based on this background, the researcher is interested to conduct research on "Factors Affecting Malaria Incidence in Midwifery Student Mimika Poltekkes Kemenkes Jayapura Year 2018".

## **2. MATERIALS AND METHODS**

This research is an observational analytic research that is research which answer how or why health phenomenon happened by design of approach of cross-sectional that is method of taking data which done at the same time or research where variable cause or risk and result or case happened at research object measured or collected simultaneously (Notoatmojo, 2012). This research was conducted in March - May 2018 at the Mimika Polytechnic Midwifery Study Program of Kemenkes Jayapura. The population in this research is all students of Department III Midwifery Mimika Poltekkes Kemenkes Jayapura that is a number of 120 people.

Samples in this study the entire population used as a sample (total population) that is the whole student of Prodi D-III Midwifery Mimika Poltekkes Kemenkes Jayapura as many as 120 people. In data collection is through questionnaires, interviews, malaria examination with RDT and Observation to student house and analyzed using Chi-Square Test and multiple logistic regression.

### 3. RESULTS

#### 3.1 Bivariate Analysis

##### a. Influence of Tribe Against malaria incidence in Mimika Poltekkes Midwifery students Kemenkes Jayapura

**Table 1** Frequency Distribution of Respondents Based on Tribes Against Malaria Incidence in Midwifery Students Mimika Poltekkes Kemenkes Jayapura

No	Tribe	Malaria				n	%
		Not		Yes			
		n	%	n	%		
1	Non Papua	35	43,8	45	56,3	80	100
2	Papua	9	22,5	31	77,5	40	100
Total		44	36,7	76	63,3	120	100

*p-value* = 0,038; RP = 22,679; CI95% (1,130– 6,354)

Based on Table 1 of 120 respondents there are non-Papua tribe as much as 80 respondents and tribe of Papua as many as 40 respondents. Of the 80 non-Papuan respondents, there were 35 respondents (43.8%) who were not malaria and 45 respondents (56.3%) suffered malaria while 40 respondents were 9 respondents (22.5%) did not suffer from malaria and 31 of respondents (77,5%) suffer from malaria disease. After statistical test using chi-square test with 95% confidence level obtained *p-value* value 0,038 which means smaller than  $\alpha$ - value 0,05. So it can be concluded that there is a significant influence between the tribes on the incidence of malaria in midwifery students Mimika Poltekkes Kemenkes Jayapura Year 2018. Midwifery students with the Papuan tribe increase the risk of malaria incidence by 22,679 times compared to non-Papuan (PR: 22.679, CI 95%: 1,130-6,354).

##### b. Influence of Events At Night With Malaria Incidence In Midwifery

##### Students Mimika Poltekkes Kemenkes Jayapura

**Table 2.** Distribution of Respondents Frequency Based on Events At Night With Malaria Incidence In Midwifery Students Mimika Poltekkes Kemenkes Jayapura

No	Night activity	Malaria				n	%
		Not		Yes			
		n	%	n	%		
1	Not	23	60,3	15	39,5	38	100
2	Yes	21	25,6	61	74,4	82	100
Total		44	36,7	76	63,3	120	100

*p-value* = 0,000; RP = 4,454; CI95% (1,966– 10,092)

Based on Table 2 of 120 respondents there are respondents who perform activities at night as many as 82 respondents and who do not conduct activities at night as many as 38 respondents. Of the 82 respondents who performed activities at night there were 61 respondents (74.4%) suffering from malaria and 21 respondents (25.6%) did not suffer from malaria. Of the 38 respondents who did not perform the activities at night as many as 15 respondents (39.5%) suffered from malaria and 23 respondents (60.3%) did not suffer from malaria. After the statistical test using chi-square test with 95% confidence level obtained *p-value* 0,000 which means smaller than  $\alpha$ -value 0.05. So it can be concluded that there is a significant influence between the activities at night with the incidence of malaria in midwifery students Mimika Poltekkes Kemenkes Jayapura Year 2018. Midwifery students who perform activities at night increase the risk of malaria incidence of 4.454 times compared to students who perform activities at night (RP: 4,454, CI 95%: 1,966-10,092).

##### c. The Influence of Night Netting Using Malaria Incidence in Midwifery Students of Mimika Poltekkes Kemenkes Jayapura

**Table 3.** Distribution of Respondents Frequency Based on Use of Mosquito Nets At Night With Malaria Occurrence In Midwifery Students Mimika Poltekkes Kemenkes Jayapura

No	Netting use	Malaria				n	%
		Not		Yes			
		n	%	n	%		
1	Not	27	32,5	56	67,5	83	100
2	Yes	17	45,9	20	54,1	37	100
Total		44	36,7	76	63,3	120	100

*p-value* = 0,229; RP = 0,567; CI95% (0,257– 1,254)

Based on Table 3, from 120 respondents there are respondents who use netting at night as many as 37 respondents and who do not use bed nets at night as much as 83 respondents. Of 37 respondents who used bed nets at night there were 20 respondents (54.1%) suffering from malaria and 17 respondents (45.9%) did not suffer from malaria. Of the 83 respondents who did not use mosquito nets during the night, 56 respondents (67.5%) suffered malaria and 27 respondents (32.5%) who did not use bed nets at night and did not suffer from malaria. After the statistical test using chi-square test with 95% confidence level obtained p-value value 0.229 which means greater than  $\alpha$ -value 0.05. So it can be concluded that there is no significant influence between the use of bed nets at night to the incidence of malaria in midwifery students Mimika Poltekkes Kemenkes Jayapura Year 2018.

d. Influence of Anti Mosquito Medication Using Malaria Incidence in Midwifery Student of Mimika Poltekkes Kemenkes Jayapura

**Table 4** Frequency Distribution of Respondents Based on the Use of Anti Mosquito Drugs with Malaria Incidence in Midwifery Students Mimika Poltekkes Kemenkes Jayapura

No	use anti-mosquito	Malaria				n	%
		Not		Yes			
		n	%	n	%		
1	Not	29	37,2	49	62,8	78	100
2	Yes	15	35,7	27	64,3	42	100
Total		44	36,7	76	63,3	120	100

*p-value* = 1,000; RP = 1,065; CI95% (0,488– 2,325)

Based on Table 4 of 120 respondents there are respondents who use anti-mosquito repellent as much as 42 respondents and who do not use anti mosquito repellent as much as 78 respondents. Of the 42 respondents who used bed nets at night, 27 respondents (64.3%) suffered malaria and 15 respondents (35.7%) did not use mosquito repellent and did not suffer from malaria. Of the 78 respondents who did not use anti-mosquito drugs, 49 respondents (62.8%) suffered from malaria and 29 respondents (37.2 %) did not use bed nets at night and did not suffer from malaria. After statistical test using chi-square test

with 95% confidence level obtained p-value 0.874 which means bigger than  $\alpha$ - value 0,05. So it can be concluded that there is influence and not significant between the use of anti-mosquito drugs against the incidence of malaria in midwifery students Mimika Poltekkes Kemenkes Jayapura Year 2018.

e. Influence of Home Distance From Breeding Place With Malaria Incidence In Midwifery Students Mimika Poltekkes Kemenkes Jayapura

**Table 5** Distribution of Respondents Frequency Based on Distance Home From Breeding Place With Malaria Occurrence In Midwifery Students Mimika Poltekkes Kemenkes Jayapura

No	distance of breeding place	Malaria				n	%
		Not		Yes			
		n	%	n	%		
1	Close	26	28,6	65	71,4	91	100
2	Far	18	62,1	11	37,9	29	100
Total		44	36,7	76	63,3	120	100

*p-value* = 0,002; RP = 0,244; CI95% (0,102– 0,588)

Based on Table 5 of 120 respondents there are respondents with close distance of breeding place of 91 respondents and respondents with home distance away from breeding place. From 29 respondents with home distance from breeding place, there were 11 respondents (37.9%) who suffered malaria and 18 respondents (62.1%) not suffering from malaria. From 91 respondents with close spacing of breeding place, 65 respondents (71,4%) suffer from malaria and 26 respondents (28,6%) distance of house close to breeding place not suffering from malaria.

After the statistical test using chi-square test with 95% confidence level obtained p-value value 0.002 which means smaller than  $\alpha$ -value 0.05. So, it can be concluded that there is significant influence between home distance from breeding place and malaria incidence in obstetric students Mimika District Poltekkes Kemenkes Jayapura Year 2018. Midwifery students with a distance home with breeding place reduces the risk of malaria incidence of 0.244 compared to students with a distance home near the breeding place (PR: 0.244, CI 95%: 0,102-0,588).

f. Influence of Livestock Shedding on Malaria Events in Midwifery Student of Mimika Poltekkes Kemenkes Jayapura

**Table 6.** Distribution of Respondents Frequency Based on the Presence of Shedding Stall Against Malaria Incidence in Midwifery Student Mimika Poltekkes Kemenkes Jayapura

No	livestock enclosure	Malaria				n	%
		Not		Yes			
		n	%	n	%		
1	None exist	25	47,2	28	52,8	53	100
2		19	28,4	48	71,6	67	100
Total		44	36,7	76	63,3	120	100

*p-value* = 0,053; *RP* = 2,256; *CI95%* (1,058– 4,809)

Based on Table 6 of 120 respondents there are respondents with houses close to livestock enclosure containing livestock counted 67 respondents and respondents with distant home distance with livestock enclosure containing livestock as much as 53 respondents. Of the 67 respondents with close proximity to livestock enclosures, 48 respondents (71.6%) suffered from malaria and 19 respondents (28.4%) were close to the livestock enclosure containing livestock and did not suffer from malaria. Of the 53 respondents with distant home distance with livestock enclosure containing cattle as much as 28 respondents (52.8%) suffered malaria and 25 respondents (47.2%) did not suffer from malaria. After the statistical test using chi-square test with 95% confidence level obtained *p-value* 0,053 which means bigger than  $\alpha$ - value 0,05. So it can be concluded that there is influence but not significant between the existence of livestock enclosure containing livestock against the incidence of malaria in Midwifery students Mimika Year 2018.

g. Influence of Home Distance With Health Service Facilities With Malaria Incidence In Midwifery Students Mimika Poltekkes Kemenkes Jayapura

Based on Table 7, from 120 respondents, there are respondents who have close range

of house with health service facility as many as 39 respondents and respondents with remote home distance with health service facilities as much as 81 respondents. Of the 39 respondents who have close distance to health facilities, 26 respondents (66,7%) suffered malaria and 13 respondents (33,3%) distance of house near health facility did not suffer from malaria. Out of 81 respondents of distant house distance with health service facility 50 respondents (61,7%) suffer from malaria and 31 respondents (38,3%) did not suffer from malaria. After the statistical test using chi-square test with 95% confidence level obtained *p-value* 0.746 which means greater than  $\alpha$ -value 0.05. So it can be concluded that there is influence but not significant between the distance home with health service facilities to the incidence of malaria in midwifery students Mimika District Poltekkes Kemenkes Jayapura Year 2018.

**Table 7.** Distribution of Respondents Frequency Based on Distance Houses With Health Service Facilities With Malaria Incidence In Midwifery Students Mimika Poltekkes Kemenkes Jayapura

No	range of house with health service facility	Malaria				n	%
		Not		Yes			
		n	%	n	%		
1	Far	31	38,3	50	61,7	81	100
2	Close	13	33,3	26	66,7	39	100
Total		44	36,7	76	63,3	120	100

*p-value* = 0,746; *RP* = 1,240; *CI95%* (0,556– 2,767)

**3.2 Multivariate Analysis**

To find out which factors influenced the incidence of malaria in midwifery students of Mimika Poltekkes Kemenkes Jayapura, bivariate analysis was conducted and continued on multivariate analysis. Bivariate modeling using logistic regression test begins with bivariate modeling where each independent variable is tested against dependent variable gradually with *p value* <0.25.

**Table 8. Bivariate Analysis Between Dependent and Independent Variables**

No	Variables	<i>p-value</i>	RP	95% C. I. for Exp (B)	
				Lower	Upper
1	Tribe	0,038	22,679	1,130	6,354
2	Night activity	0,000	4,454	1,966	10,092
3	Use net	0,229	0,567	0,257	1,254
4	Anti mosquitoes use	1,000	1,065	0,488	2,325
5	Distance of breeding place	0,002	0,244	0,1021,	0,588
6	Livestock enclosure	0,053	2,256	058	4,809
7	Distance of health facility	0,746	1,240	0,556	2,767

Table 8 above shows that bivariate modeling on tribal variables, nighttime activities, use of mosquito nets, house spacing with breeding place, the existence of livestock enclosures is included in the p-value category <0.25, so it is included in the multivariate model using logistic binary regression test, in table 4.11 below.

**Table 9. Analysis of Simple Logistic Regression Variables**

No	Variables	B	p-value	OR	95% C. I. for Exp (B)	
					Lower	Upper
1	Tribe	1,136	0,023	3,115	1,174	8,270
2	Night activity	1,217	0,013	3,377	1,295	8,805
3	Use net	0,495	0,293	0,610	0,242	1,532
4	Breeding Place	1,110	0,036	0,329	0,117	0,930
5	Livestock	0,116	0,813	0,891	0,342	2,324
	Constant	0,734	0,600	0,480		

Table 9 above, tribes (0,023), night activities (0.013), breeding place (0,036) have significant value or <0,05, so get into multivariate model using logistic binary regression test, as in table below:

**Table 10. Multiple Logistic Regression Variable Analysis**

No	Variables	B	p-value	OR	95% C. I. for Exp (B)	
					Lower	Upper
1	Tribe	1,072	0,025	2,921	1,144	7,459
2	Night activity	1,181	0,010	3,256	1,330	7,974
3	Breeding Place	1,114	0,028	0,328	0,122	0,886
	Constant	0,734	0,600	0,480		

Table 10, shows tribes, nighttime activities and breeding places have a dominant influence where nighttime activities have a stronger dominant factor against malaria incidence in Mimika midwifery students.

#### 4. DISCUSSION

4.1. The Influence of Papuan and Non Papuan Tribe with Malaria Incidence in Midwifery Student of Mimika Poltekkes Kemenkes Jayapura.

From result of research got result of Chi square test which meaning p-value 0,038 (p-value <0,05). So it can be concluded that there is influence between the tribe against the incidence of malaria in Midwifery students Mimika District Year 2018. Midwifery students with the tribe of Papua increase the risk of malaria incidence of 22.679 times compared non-Papuan tribe. This study is in line with research conducted by Esther (2013) reported that ethnic Papuans have an understanding of malaria based on their beliefs and experiences. The community's decision on malaria prevention and treatment is conducted in accordance with the guidance of people who are considered important especially from the

family, the knowledge of malaria (causes, signs and symptoms) possessed by ethnic Papuan communities is still very low, support of community leaders is not maximized, availability resources in the prevention of malaria by ethnic Papuans has not been maximized and socio-cultural less supportive in the prevention of malaria. In this study, midwifery students with the Papuan tribe increased the risk of malaria incidence by 22,679 times compared to non-Papuan tribe allegedly because the students of midwifery tribe of Papua do malaria treatment done traditionally by consuming decoction of foliage based on the parent's instruction, the physical condition of the house with the swamp land construction so it is very potential to accommodate water during the rain and risky behavior such as the pile of garbage that is not destroyed / burned. So that the density of Anopheles mosquitoes tends to be stable even increase in the environment around the tribe of Papua.

4.2. Influence of Events At Night With Malaria Incidence In Midwifery Students Mimika Poltekkes Kemenkes Jayapura

From result of research got result of Chi square test meaning p-value 0,000 (p-value <0,05). So it can be concluded that there is influence of activities at night with the incidence of malaria in Mimika midwifery students in 2018. Midwifery students who perform activities at night increase the risk of malaria events by 4,454 times compared to students who do not perform activities at night. This study is in accordance with the research Fien Lumolo et al (2015) reported that there is a significant relationship between nighttime activities with the incidence of malaria in Puskesmas Mayumba.

This means that people who have a habit outside the home at night without wearing protective clothing have a risk of getting malaria than people who do not have a habit outside the home at night. The habit of going out at night at *Anopheles* spp. Actively biting is very risky for contracting malaria, because this mosquito is eksofagik where actively seek blood outside the house at night. This habit will be increasingly risky if people used to go outdoors without wearing protective clothing such as long-sleeved shirts and trousers. The presence of malaria cases in people who have a habit outside the home can be seen from Oroporsi people who have a habit outside the home at night with the incidence of malaria greater 74.4% than those who do not perform activities at night with the incidence of malaria of 39.5% . This suggests that outdoor habits at night are at risk of contact between healthy people and *Anopheles* mosquitoes requiring blood to meet their gonotropic cycles. If a biting mosquito contains sporozoid in its salivary glands, then the chances of people contracting malaria will be even greater. Habits out of the house at night have a risk of malaria by 4,454 times compared to students who do not perform activities at night allegedly because of contact between healthy people with mosquitoes *Anopheles* sp.

#### 4.3. The Influence of Night Netting Using

Malaria Incidence in Midwifery Students of Mimika Poltekkes Kemenkes Jayapura.

From result of research got result of Chi square test meaning p-value 0,229 (p-value > 0,05). So it can be concluded that there is no influence between the use of bed nets at night to the incidence of malaria in Midwifery students Mimika Regency Year 2018. Study not in line with research conducted Ria N et al (2013) reported that the habit of using mosquito nets is a risk factor for malaria incidence.

Ria N (2013) reports that the habit of using mosquito nets is an effective attempt to prevent and avoid contact between *Anopheles* mosquitoes and healthy people while sleeping at night, in addition to the use of mosquito repellent. Because the habit of *Anopheles* mosquitoes to look for blood is at night, so always sleeping using a mosquito net that is not damaged or perforated at night can prevent or protect from *Anopheles* mosquito bites. The hypothesis of this study was rejected because although there are respondents who say that while sleeping using a mosquito net but the possibility of sleeping them out of the mosquito net due to overheating, causing mosquitoes to bite them. Where mosquito activity bites at night from 20.00 to 04.00. Non-proven habit of using mosquito nets is also caused by respondents using bed nets while sleeping but ventilation is not installed wire netting thus allowing mosquitoes to enter the house and bite.

#### 4.4. Effect of Anti Mosquito Medication Using Malaria Incidence in Midwifery Student of Mimika Poltekkes Kemenkes Jayapura.

From result of research got result of Chi square test meaning p-value 1,000 (p-value > 0,05). So it can be concluded that there is no influence between the use of anti-mosquito drugs against the incidence of malaria in Midwifery students Mimika Regency Year 2018. Rian N et al (2013) reported that the habit of using anti-mosquito drugs was a risk factor for malaria incidence. Use of mosquito repellent can

reduce the contact between mosquitoes with a person.

Although it is theoretically said that the habit of not using anti-mosquito drugs is a risk factor for malaria but the results of this study show no relationship. This is probably due to the respondents who use anti-mosquito repellent for up to 10 hours so that when the anti-mosquito drugs run out then the mosquitoes will come back to bite, where the mosquito activity bites from 20.00 to 04.00 am. Allegedly due to lack of awareness on Mimika district midwifery students to use anti mosquito repellent.

#### 4.5. The Influence of Distance from Breeding Place with Malaria Incidence in Midwifery Student Mimika Poltekkes Kemenkes Jayapura.

From result of research got result of Chi square test meaning p-value 0,002 (p-value <0,05). So it can be concluded that there is influence between distance of place from breeding place to malaria incidence in Midwifery student of Regency of Mimika Year 2018. Midwifery students with distance of distant place with breeding place reduce the risk of malaria incidence by 0,244 compared to student with distance of residence near breeding place. This study is in line with Ahmad F.R et al (2016) who reported that standing water is a risk factor for malaria incidence. The existence of puddles is very beneficial for the life of Anopheles mosquitoes because of its life cycle from egg to pupa need water media. Type of puddles found in the form of sewers, swamps, puddles, rivers and also ponds. The most puddle type is the ditch. Almost in every village or kelurahan was found a ditch. The condition of the flow of water in some ditches does not always flow at all times causing a small pool of inundation in the channel. The sewer functioned as a household sewerage. The existence of breeding places is very difficult to avoid. For example, the ditch throughout the village is almost in every village. This actually works for water channels. But sometimes the water is not smooth, causing

puddles in some parts. In addition, the drainage ditch is also often encountered around the houses where this can also cause. Based on observations in the field of swamp land construction on the homes of a very potential to become a rain water reservoir so that there is a puddle of water. In this study, midwives students with distant distances with breeding places reduced the risk of malaria incidence by 0.244 compared to those with close proximity to the breeding place because the water puddle is very beneficial for Anopheles mosquito life because the life cycle from egg to pupa requires water media so that potentially becoming a breeding ground for Anopheles mosquitoes.

#### 4.6. Influence of Livestock Shedding on Malaria Occurrence in Midwifery Student of Mimika Poltekkes Kemenkes Jayapura.

The result of this research shows that Chi-square test is significant with p-value 0,053 (p-value <0,05) so it can be concluded that there is no influence between the existence of livestock to malaria incidence in Midwifery students of Mimika Regency Year 2018. This research is in line with research conducted by Ria N et al (2013) who reported that the existence of livestock pens is not a risk factor for malaria incidence. This study is not in line with research conducted by Arief Mulyono et al (2013) who reported that a significant association between livestock raising and livestock raising sites to malaria cases in NTT. This is related to the preferences of malaria vectors in choosing the source of blood food. Large livestock blood such as buffaloes and cows is preferred by Anopheles mosquitoes rather than moderate cattle blood like goats, pigs and sheep. In areas where there are no cows or buffaloes, most vector mosquitoes (more than 75%) are caught biting people or alighting within the house, only a small part (less than 25%) are caught in the goat and its surroundings. On the examination of the mosquito-borne blood in areas where cows and buffaloes are more than 80% come from cow and buffalo

blood, 20% comes from human blood and only 0.5% comes from goat's blood. Livestock enclosure is found as a resting place for *Anopheles aconitus* mosquitoes with percentage of mosquitoes reaching 60% (Handayani and Darwin, 2006). If there is a cattle pen around the house, it does not rule out that the mosquitoes that feed on the cage also go into the house. In this study it was reported that there was no influence between the presence of livestock against malaria incidence in Midwifery students of Mimika Regency Year 2018. This is presumably because midwifery students have dwellings in densely populated areas (Timika city) so it is not possible for the community to rear large livestock cow / pig). 7. Influence of Distance of Residence With Health Service Facility With Malaria Incidence In Midwifery Student Mimika Poltekkes Kemenkes Jayapura.

From result of research (table 4.16) got result of Chi square test meaning p-value 0,599 (p-value > 0,05). So it can be concluded that there is no influence between the distance of residence with health service facilities to the incidence of malaria in Midwifery students Mimika Regency Year 2018. The results of this study are not in line with that done by Rika M.S et al. (2013) reported that), there is a relationship between travel time to the place of health services with the incidence of malaria. Mendrofa et al (2007) reported that the further the distance to health facilities, the greater the risk of malaria. There are various reasons why people do not seek treatment at government-provided facilities because the clinic hours do not fit into the spare time of the community, long time-consuming queues, distance from home or expensive transportation costs, perceptions of service quality, including availability of drugs, other. Distance limits the ability and willingness of people to seek services, especially if available transportation facilities are limited, communication difficult and in the area. Based on the results of the study there is no effect between the

distance of residence with health service facilities to the incidence of malaria in midwifery students Mimika District Year 2018 this is suspected because malaria is endemic disease in Papua so that promotive efforts such as extension efforts conducted by health workers provide awareness to the community if experiencing early symptoms of malaria, then immediately go to the nearest health care facility.

#### 4.8. Regression Factors - Factors Affecting Malaria Incidence In Midwifery Students Mimika

Poltekkes Kemenkes Jayapura Year 2018.

The result of multiple logistic regression analysis obtained the final result that from 3 risk factors that influence the incidence of malaria in Midwifery students of Mimika Regency, the most dominant factor is activity at night p-value 0,010 (PR 3,664, 95% CI: 1.377 - 9.747).

## 5. CONCLUSION

5.1 There is influence between tribes with malaria incidence in Mimika Midwifery students (p-value = 0,038; RP = 22,679; CI95% = 1,130- 6,354)

5.2 There is an influence between the activities at night with the incidence of malaria in Mimika Midwifery students p-value = 0,000; RP = 4,454; CI95% = 1,966- 10,092)

5.3 There is no influence between the use of bed nets at night with the incidence of malaria in students Mimika Midwifery (p-value = 0.229; RP = 0,567; CI95% = 0,257- 1,254)

5.4 There is no influence between the use of anti-mosquito drugs with the incidence of malaria in students Mimika Midwifery (p-value 1,000; RP = 1.065; CI95% = 0.488- 2.325)

5.5 There is an influence between the distance of the residence and the breeding place with the incidence of malaria in the Mimika Midwifery students (p-value 0.002; RP = 0.244; CI95% = 0.102- 0.588)

5.6 No effect of cattle shed on malaria incidence in Mimika Midwifery students (p-

value 0,053; RP = 2,256; CI95% = 1,058-4,809)

5.7 There is no influence between the distance of the house and the health service facility with the malaria incidence in the Mimika Midwifery students (p-value 0.746; RP = 1.240; CI95% = 0,556- 2,767)

5.8 Tribes, night activities and breeding places have a dominant influence where nighttime activities have a stronger dominant factor on malaria incidence in midwifery students Mimika Poltekkes Kemenkes Jayapura.

## REFERENCES

- Ahmad FaizalRangkuti, Sulistyani, NurEndah W, 2017 *Faktor Lingkungan DanPerilakuYang Berhubungan DenganKejadian Malaria Di Kecamatan PanyabunganMandailing Natal Sumatera Utara* : BALABAVol.13No.1
- Anjasmoro, R. 2013. *Faktor-Faktor Yang Berhubungan dengan Kejadian Malaria di Wilayah Kerja Puskesmas Rembang Kabupaten Purbalingga. Jurnal Kesehatan Masyarakat 2*
- Arikunto, Suharsini dan Abdul Jabar. 2010. *Evaluasi Program Pendidikan, Pedoman Teoritis Praktis Bagi Mahasiswa dan Praktisi Bagi Mahasiswa*. PT Bumi Aksara, Jakarta
- Arsin, A.A. 2012. *Malaria di Indonesia: Tinjauan Aspek epidemiologi*, Magenta Press, Makasar
- Bertha Kamo, Yermia Msen, A.L. Rantetampang, Anwar Mallongi, 2018, The Factors affecting with Four Visited at Public Health Centre Sub Province Mimika Papuan Province. *International Journal of Science and Healthcare Research*, Vol.3; Issue: 2; April-June 2018
- Babba,I. 2007.*Faktor-faktor Risiko Yang Mempengaruhi Kejadian Malaria. Laporan Skripsi*: Universitas Diponegoro Semarang.
- Barodji, 1987 *Fluktuasi Kepadatan Populasi Vektor Malaria An. Aconitus Di Daerah Sekitar Persawahan*, Proc. Seminar Entomologi II, Jakarta
- Buletin Penelitian Kesehatan; 2016. 44(1) : p 13-24 24. Direktorat PPBB, Dirjen PP dan PL. *Menuju Eliminasi Malaria*. Kemenkes RI; Jakarta
- Dahlan MS. 2013. *Besar sampel dan cara pengambilan sampel*. Edisi ke 3. Salemba Medika, Jakarta
- Dahlan MS. 2014. *Langkah-langkah membuat proposal penelitian bidang kedokteran dan kesehatan*. Edisi ke 2. CV Sagung Seto, Jakarta
- Epidemiologi Malaria Di Indonesia. 2011 Dalam: Depkes RI. eds. *Buletin Jendela Data Dan Informasi Kesehatan Epidemiologi Malaria Di Indonesia*; <http://www.depkes.go.id/downloads/publikasi/buletin/BULETIN%20MALAR IA.pdf> diakses 16 Mei 2018
- Ernawati Kholis, Soesilo Budhi, Duarsa Artha, Rifqatussa'adah. 2011 *Hubungan Faktor Risiko Individu Dan Lingkungan Rumah Dengan Malaria Di Punduh Pedada Kabupaten Pesawaran Provinsi Lampung Indonesia 2010*. Makara Kesehatan
- Ester, Thaha MR, Ishak Hasanuddin. 2013.*Perilaku Etnis Papua Mengenai Penyakit Malaria Di Kabupaten Nabire Papua*; 2013. 8. Kemenkes RI. Riset Kesehatan Dasar.
- Harjanto, P.N, Nugroho, A dan Gunawan, A. 2012.*Malaria: dari molekuler ke klinis*, Jakarta: EGC
- Hasmi, 2016. *Metode Penelitian Epidemiologi Edisi Revisi*, TIM, Jakarta
- Hasmi, 2016. *Metode Penelitian Kesehatan*, IN MEDIA, Jakarta
- Hidayat, A. 2011. *Metode Penelitian Kebidanan dan TeKnik Analisis Data*, Salemba Medika, Jakarta.
- Hidayat, A. 2014. *Metode Penelitian Kebidanan dan TeKnik Analisis Data*.; Salemba Medika, Jakarta
- Honrado ER, Fungladda W. 2003 *Social and Behavioral Risk Factor Related to Malaria in Southeast Asia Countries*. Bangkok: Departement of Tropical Medicine, Faculty of Tropical Medicine, Mahidol University;
- Kementerian Kesehatan RI. 2017. *Pedoman Tata Laksana Malaria*
- KarolusNgambut, OktafianusSila, 2013. *Faktor Lingkungan DanPerilaku MasyarakatTentang MalariaDi Kecamatan KupangTimur Kabupaten Kupang*: Jurnal Kesehatan Masyarakat NasionalVol.7, No.6
- Malaria. Dalam: Depkes RI. eds.2015. *Infodatin Pusat Data Dan Informasi Kementerian Kesehatan RI*.

- Malaria. Dalam: Depkes RI. eds. 2016. Infodatin Pusat Data Dan Informasi Kementerian Kesehatan RI .
  - Masra F, 2002. *Hubungan Tempat Perindukan Nyamuk Dengan Kejadian Malaria di Kecamatan Telukbetung Barat Kota Bandar Lampung* : Tesis FKM UI
  - Mayasari Rika, Andriyani Diana, Sitorus Hotnida. 2013 *Faktor Risiko yang Berhubungan dengan Kejadian Malaria Di Indonesia : Analisis Lanjut Riskesdas*.
  - Notoatmodjo, S. 2012. *Metodologi penelitian kesehatan*, Rineka Cipta, Jakarta
  - Pujjati, 2008. *Permasalahan Pembelajaran Jarak, Waktu Dan Kecepatan Serta Alternatif Pemecahannya*. Yogyakarta : Buletin Limas
  - Profil Dinas Kesehatan Mimika Tahun 2017
  - Putra Imansyah RT. 2011 *Malaria dan Permasalahannya*. Jurnal kedokteran syiah kuala.
  - RiaNurfitrihanah AS, Hasanuddin Ishak, RuslanLa Ane, 2013 *Analisis Faktor Risiko Lingkungan Terhadap Kejadian Malaria Di Wilayah Kerja Puskesmas Durikumba Kecamatan Karossa Kabupaten Mamuju: Bagian Kesehatan Lingkungan, Fakultas Kesehatan Masyarakat, UNHAS, Makassar*
  - Rika Maya Sari, LasbudiP. Ambarita, Hotnida Sitorus. 2013. *Akses Pelayanan Kesehatan Dan Kejadian Malaria Di Provinsi Bengkulu: Media Litbangkes Vol.24 No.4*
  - Sandjaja Bernadus, 2014. *Model Dinamis Penularan malaria dan Sistem Skoring Untuk Memprediksi Kejadian Malaria Berdasarkan Faktor Risiko di Kabupaten Keerom, Papua*. Undergraduate disertasi. Universitas Hasanuddin.
  - Sari Arnida. 2012 *Karakteristik Penderita Malaria Terhadap Kejadian Malaria di Kecamatan Suka Makmur Kabupaten Aceh Besar*. Jurnal Kesehatan Masyarakat Aceh Besar .
  - Siti Berlian Zebua, Evi Naria, Irnawati Marsaulina, 2013. *Hubungan Kondisi Kandang Ternak Dengan Kejadian Malaria Pada Masyarakat Di Desa Lauri Kecamatan Gido Kabupaten Nias: Program Sarjana Fakultas Kesehatan Masyarakat Universitas Sumatera Utara*
  - Soedarto 2011. *Malaria Epidemiologi Global – Plasmodium – Anopheles Penatalaksanaan Penderita Malaria.*, Sagung Seto, Jakarta
  - Supar E, 2015 <https://papua.antaraneews.com/berita/453137/malaria-di-mimika-timur-diyakini-masih-tinggi-diakses-25-Mei-2018>
  - Widoyono. 2011. *Penyakit Tropis Epidemiologi, Penularan, Pencegahan & Pemberantasannya*. Edisi kedua. Erlangga, Semarang
  - WHO. Guidelines For The Treatment Of Malaria Third Edition. 2015.
  - WHO. World Malaria Report 2015.
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