LEMBAR IDENTITAS DAN PENGESAHAN

1. Judul	:	**Rapid Survey of Malaria Prevalence And Malaria Risk Factors In Pregnant Women**
2. Penulis	:	Sutarto, Dyah Wulan S.R. Wardani, Rasmi Zakiah Oktarlina, Aila Karius, Muhammad Ricky Ramadhian dan Reni Indriyani
3. NIP	:	197200706 199503 1002
4. Jabatan/Golongan	:	Penata TK. I (III.d)
5. Instansi	:	Fakultas Kedokteran Universitas Lampung
6. Publikasi	:	International Journal of Recent Scientific Research Vol. 9, Issue, 7(C), pp. 27865-27870, 28 July, 2018,
7. ISSN	:	**0976-3031**
8. Website / e-mail	:	http://www.recentscientific.com

Bandar Lampung, 30 Oktober 2018

Mengetahui
Dekan
Fakultas Kedokteran Unila,

Dr. dr. Muhartono, S.Ked., M.Kes., Sp.PA
NIP. 19601208 200112 1 001

Penulis,

Sutarto, SKM, M.Epid.
NIP. 19720706 199503 1002

Menyetujui
Ketua Lembaga Penelitian dan Pengabdian
Universitas Lampung,

Warsono, Ir., M.S., Ph. D
NIP 19680216 198703 1 003

28 - 4 - 2018

ISSN: 0976-3081

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 9, Issue, 7(C), pp. 27865-27870, July, 2018

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Research Article

RAPID SURVEY OF MALARIA PREVALENCE AND MALARIA RISK FACTORS IN PREGNANT WOMEN

Sutarto[1*], Dyah Wulan S.R. Wardani[1], Rasmi Zakiah Oktarlina[2], Aila Karius[3] Muhammad Ricky Ramadhian[4] and Reni Indriyani[5]

[1]Departemen of Community Medicine, Faculty of Medicine University of Lampung, C Building 3rd Floor Kampus Hijau Unila Bandar Lampung, Indonesia
[2]Department of Pharmacoloy, Faculty of Medicine University of Lampung, B Building 2nd Floor Kampus Hijau Unila Bandar Lampung, Indonesia
[3]Department Health of Kabupaten Pesawaran, Lampung
[4]Department of Microbiology and Parasitology, Faculty of Medicine University of Lampung
[5]Health Polytechnic Kemenkes Tanjungkarang Bandar Lampung

DOI: http://dx.doi.org/10.24327/ijrsr.2018.0907.2349

ARTICLE INFO

Article History:
Received 15th April, 2018
Received in revised form 7th May, 2018
Accepted 13th June, 2018
Published online 28th July, 2018

Key Words:
Prevalence rate, malaria, risk factor, Pregnant Women.

ABSTRACT

Malaria is one of the contagious diseases in the world including Indonesia and malaria is an important issue in public health. Prevalence of malaria pregnant women and its risk factors are not yet known in Pesawaran, Lampung Province. The research design used cross-sectional study using rapid survey method. The data was analyzed with chi square and logistic regression. Malaria prevalence 47.6 per mile, spread over 5 from 11 sub-districts. One important information, the discovery of malaria pregnant women in non-endemic districts. The result of bivariate analysis proved knowledge relationship with malaria p-value 0,007, Odds Ratio (OR) 10. Maternal behavior p-value 0,009, OR 9, use of mosquito nets p-value 0,01, OR 5. Multivariate analysis model formula, Y (malaria pregnant woman) = -7,546 + 2,353 (knowledge) + 2,270 (use of mosquito net) + 2,250 (condition of house), and pregnant woman probability of malaria 33,9%. Prevention efforts should be undertaken through strengthening of integrated maternal class groups into malaria programs in all areas.

INTRODUCTION

Malaria is one of the most contagious diseases that are still a public health problem in the world including Indonesia. This disease affected the high mortality rate of infants, toddlers and pregnant women. Until December 2015, the number of region that reached the acceleration stage of 45 districts, intensification stage of 90 districts, and pre-elimination stage 379 districts. Of the 379 regencies/cities that existed at the pre-elimination stage of 232 districts have been declared elimination or have been free of local transmission. This result had exceeded the target of work indicator programme of Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2015 that had been about 225 districts which declared malaria elimination (Kementerian Kesehatan RI, 2016).

Malaria is an important public health problem and accounts for almost half of the world's population. This condition is associated with high morbidity and mortality and when it comes to pregnant women, it can adversely affect the mother and her fetus. Malaria in pregnant women is associated with a higher risk of having anemia, having low birth weight (LBW), premature birth and perinatal death. All of these conditions contribute to high maternal and infant mortality, especially in malaria endemic areas. In addition, fetuses exposed to malaria parasites may develop congenital infections or modify the immune system against malaria that would affected the immune response of infants to malaria in the first 1-2 years of life (Briand *et al*., 2016).

This condition is exacerbated by the spread of *P. falciparum* with chloroquine resistance (Cq) and sulfadoxine-

*Corresponding author: **Sutarto**
Departemen of Community Medicine, Faculty of Medicine University of Lampung, C Building 3rd Floor Kampus Hijau Unila Bandar Lampung, Indonesia

pyrimethamine and P. vivax against chloroquine in malaria endemic areas. This is a serious challenge to the effectiveness of malaria prevention programs in pregnancy (Karyana *et al.*, 2008).

Pregnancy will aggravate malaria suffered, and malaria will affect pregnancy and complicate both mother and baby. Malaria infection in pregnancy is very harmful to the mother and fetus it contains, because this infection can increase the incidence of maternal and fetal morbidity and mortality. Mothers with malaria may develop anemia, cerebral malaria, pulmonary edema, kidney failure can even cause death. In the fetus, malaria can cause abortion, premature labor, low infant weight (LBW), and fetal death. Infection in pregnant women by malaria parasites can change in the mother's immune system during pregnancy, both cellular immunity and humoral immunity, and also suspected as a result of increased hormone cortisol in women during pregnancy (Ruajdi, 2012).

In Lampung Province, there were 4 districts that had API (Annual Parasite Insidence) in moderate category such as Kabupaten Pesawaran (6.36 per mile), Pesisir Barat (3.47 per mile) and Kota Bandar Lampung (0.58 per mile) and Lampung Selatan (0.23 per mile)(Kementerian Kesehatan RI, 2016).

The prevalence of malaria cases in pregnant women and how the control of malaria in pregnant women in Lampung Province is not known with certainty. This research chose Kabupaten Pesawaran for rapid survey to determine the prevalence of malaria pregnant women and risk factors for optimal control and prevention.

The World Health Organization (WHO) had developed a quick and inexpensive survey technique to see the extent of health issues. This survey technique was known as the Rapid Survey Method. Rapid Survey Method is used to view health problems.

The formulation of the problem in this study was not yet known the prevalence of malaria rate of pregnant women and how the effort of controlling the risk factor of malaria of pregnant mother in Kabupaten Pesawaran. General objective of this research was to know the prevalence rate of malaria in pregnant mother and malaria risk factor and also its controlling effort in Kabupaten Pesawaran, Provinsi Lampung, Indonesia.

METHOD

The design of this research is non experimental, cross sectional study using rapid survey method. Sampling method was done with 2 stages. First, we used cluster sampling and then determined the respondents at the cluster. The research location was in KabupatenPesawaran, for 4 months in 2017. Pregnant women as population in the work area of KabupatenPesawaran Regency were 8,821 people spread in 11 districts in 144 villages. The sample was selected by the method of mapping the proportion of target pregnant women according to the village area at the cluster, with the number of villages per sub-district based on the proportion of pregnant women. The first stage of selecting clusters was taken randomly (30 villages), and then in the second stage, each village was taken a number of respondents. The number of respondents per village was 7 people, so the number of respondents was 210 people (30 villages x 7 people). Data collection used collecting primary data and secondary data. Primary data collected by trained enumerators through malaria examination using rapid diagnostic test (RDT) to determine the status of malaria disease in pregnant women, as the dependent variable. The other primary data were data about malaria risk factors through interview with structured questionnaires on each respondent whether knowledge, behavior, use of mosquito net and condition of house and its environment, as independent variable. While secondary data was taken from related institutions namely District Health Office Department, KabupatenPesawaran, Puskesmas(Induk (Community Primary Health Care Center) in sub-district (kecamatan) and village midwife. Independent and dependent variables were analyzed using bivariate test with chi square and multivariate analysis with logistic regression method, and selection of candidate models with p-value limits below 0,26 other factors. Bivariate test is used to prove the hypothesis of the relationship of independent variables and dependent variable without considering other factors. Furthermore multivariate test is used to make a model of incidence of malaria disease in pregnant women related to 4 independent variables. The approval number on this research ethic is No.3239 / UN26.8 / DL / 2017 in August 16, 2017.

RESULTS AND DISCUSSION

Research has been conducted in all sub-districts of KabupatenPesawaran to know the prevalence and risk factors of malaria disease in pregnant women, during September - October 2017 and found 10 people from 210 pregnant women examined. From this research, it is known that malaria prevalence is 4,76 per 100 pregnant women (47,6 per mile), and spread in 5 sub-districts from 11 districts. One important information is the discovery of maternal pregnant women in KecamatanNegeriKaton, because this area during the last 5 years has never happened malaria pregnant women with prevalence 35,71 per mil and highest prevalence of malaria is in KecamatanPundohPedada (428,57 per mile).

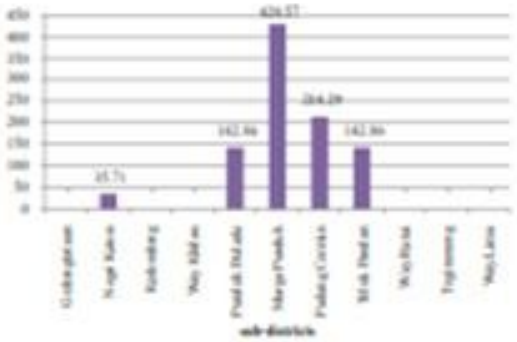

Figure 1 Malaria Rate Prevalence Pregnant Women(pointed Pregnant Women

This research got pregnant women which had malaria in 5 sub-districts (kecamatan), of which 4 sub-districts were malaria endemic and 1 sub-district was non-endemic malaria (KecamatanNegeriKaton). This situation indicates that there is already transmission of malaria out of endemic areas, so it needs special attention for local government of KabupatenPesawaran. The prevalence of malaria showed higher result compared to data of reporting result of

Community Health Centers (Puskesmas) at KabupatenPesawaran in last 3 years. This situation provides information for related institutions both Health Office of KabupatenPesawaran and Puskesmas, intensive activities in all endemic sub-districts (Padang Cermin, MargaPunduh, PunduhPedada and TelukPandan). This intervention is a malaria integrated activity with the services of pregnant mothers and immunization carried out through basic primary immunization services at basic health care facilities (Puskesmas, midwives, practicing physicians, clinics and other health services both government and private).

Pregnancy in people with malaria will affect the pregnancy and cause complications, both against the mother and the baby it contains. Mothers with malaria may develop anemia, cerebral malaria, pulmonary edema, kidney failure can even cause death. In the fetus causes abortion, premature labor, low birth weight (LBW), and fetal death. Infection in pregnant women by malaria parasites is very easy, because it is caused by changes in the mother's immune system during pregnancy, both cellular immunity and humoral immunity, and also suspected as a result of increased hormone cortisol in women during pregnancy(Muktar, 2007).

Malaria risk factors observed in this study were risk factors that exist around pregnant women such as knowledge of malaria pregnant women, the behavior of preventing malaria, the use of mosquito nets and the condition of pregnant housings.

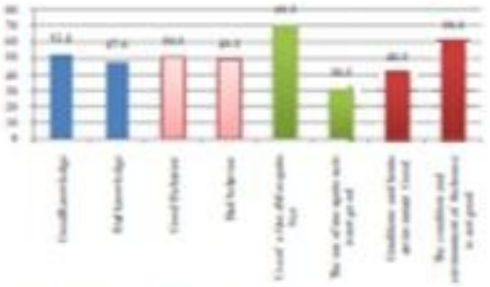

Figure 2 Distribution of Risk Factors Malaria Disease (%)

The percentage of malaria risk factors was generally the same proportion between good and bad category, except for the risk factor of using mosquito net with "good" category (69.5%) had more than "bad" category (30.5%), that mean KabupatenPesawaran people had "good" behavior in use of mosquito nets to prevent malaria in pregnant women.

The use of mosquito nets is a behavior in protecting her and her family from Anopheles mosquito bites. The results of research generally pregnant women in KabupatenPesawaran showed good in using of mosquito net. WHO Regional of Africa recommends malaria control strategies among pregnant women in the form of use of insecticide-treated mosquito nets, and effective management of malaria cases (Muktar, 2007).

The results of this study used bivariate and multivariate test. Bivariate analysis proved that there is enough evidence of risk factors studied in relation to the incidence of maternal malaria disease, except for the risk factors of the house's condition and environment. The result of statistical test of risk factor and malaria incidence shows that 4 risk factors are closely related to malaria incidence, except house's condition and environment. So prevention efforts at the household level have a good impact, by preventing, among others, strengthening the maternal groups integrated in malaria programs in all areas, especially in endemic areas, knowledge provision could change the behavior of both prevention on personal, and prevention in surrounding environment. Rigorous monitoring / surveillance by local Community Health Centers against pregnant women suffering from malaria.

Table 1 Relationship of Risk Factor of Pregnant Woman with Malaria incidence in KabupatenPesawaran, 2017

Malaria Risk Factors	Malaria				p-value and OR
	Not Patient with Malaria		Patient with Malaria		
	n	%	N	%	
Knowledge					p-value=
Good	109	99,1%	1	0,9%	0,007
Bad	91	91,0%	9	9,0%	OR=10,78
Total	200	95,2%	10	4,8%	(1,3-86,4)
Behavior					p-value=
Good	105	99,1%	1	0,9%	0,009
Bad	95	91,3%	9	8,7%	OR=9,94
Total	200	95,2%	10	4,8%	(1,2-79,9)
Use of mosquito net					p-value=0,010
Good	143	97,9%	3	2,1%	OR=5,85
Bad	57	89,1%	7	10,9%	(1,4-23,4)
Total	200	95,2%	10	4,8%	
House's Conditions and Environment to Prevention Malaria					p-value=0,032
Good	84	98,8%	1	1,2%	OR=4,52
Bad	116	92,8%	9	7,2%	(0,8-52,4)
Total	200	95,2%	10	4,8%	

From table 1, there is a correlation between maternal knowledge about malaria and women got malaria disease with p-value 0,007 and Odds Ratio (OR) 10. It means that pregnant women with bad knowledge of malaria will be at risk of malaria 10 times well-informed pregnant women. Research by Ngantbut, knowledge of respondents about malaria transmission is 86% of people know that malaria is transmitted by mosquito bites. Knowledge of the impact of malaria if left untreated is 82.6% of people said malaria can kill and 96% of people know malaria can interfere with work (Ngantbut & Sila, 2013).

Information gained from malaria risk factors that knowledge of pregnant women is closely related to the incidence of malaria. Community-owned malaria knowledge alone is not enough without behavioral changes to prevent malaria, so that malaria transmission will continue. Community knowledge not accompanied by measures to avoid contact with vector mosquitoes will remain at risk of malaria. If their knowledge is incorrect, it could false perceptions that making it difficult for treatment. Besides, people also need to know how to prevent or protect themselves and their families to avoid malaria bites. For example, using of mosquito net at bedtime, smearing the body with mosquito-bitten drugs, using mosquito repellants, whether burning, spraying or otherwise, installing mosquito wire mesh on windows and ventilation (Suharjo, 2015).

Research conducted by Sukiswo, knowledge shows there is a relationship between knowledge with the incidence of malaria. Subjects with less knowledge have a 17.5 times greater risk than those with good knowledge. A person's behavior is influenced by knowledge. The lack of knowledge has an impact

on low public awareness of malaria prevention, such as environmental sanitation (Sukiswo, Rinidar, & Supito, 2014).
Based on research conducted by R.Aisyah, that the highest incidence of malaria in respondents with low education, usually have limited knowledge dibandingrespondents with higher education. Therefore, it is necessary to increase knowledge by conveying information related to malaria through electronic media, print media (Aisyah & Susanna, 2014).

The distribution of public knowledge on these three knowledge variables is relatively good. This is also in accordance with the results of a study conducted by Joseph *et al*, who concluded that people in Haiti know that malaria is a common problem that occurs in the community and knows mosquitoes are a vector of malaria transmitters(Keating, Eisele, Bennett, Johnson, & Macintyre, 2008; Ngambut & Sila, 2013).

The level of education affects one's knowledge. In general, people who have a high level of education are easier to know about malaria because it is easier to understand information about malaria. Conversely people with low levels of education tend to be difficult to understand about malaria. Malaria incidence occurred in many respondents with primary education level. This indicates the low knowledge of the patient about malaria. Education level is often associated with socio-economic conditions. People with good economics tend to send their families to college degrees. People with a high level of education tend to have a good income, have a permanent home and pay attention to family health. Conversely people with poor economic conditions tend to neglect family education. The low knowledge of respondents also shows access to health information is difficult to obtain due to lack of information and low awareness of respondents to seek and receive health information. So that efforts can be done to prevent the incidence of malaria that is by increasing knowledge about malaria with media(Manampa, 2015).

Knowledge of the impact of malaria if left untreated is 82.6% of people said malaria can kill and 96% of people know malaria can interfere with work(Ngambut & Sila, 2013).Information gained from malaria risk factors that knowledge of pregnant women is closely related to the incidence of malaria. Community-owned malaria knowledge alone is not enough without behavioral changes to prevent malaria, so that malaria transmission will continue. Community knowledge not accompanied by measures to avoid contact with vector mosquitoes will remain at risk of malaria. If their knowledge is incorrect, it could false perceptions that making it difficult for treatment. Besides, people also need to know how to prevent or protect themselves and their families to avoid malaria bites. For example, using of mosquito net at bedtime, smearing the body with mosquito-bitten drugs, using mosquito repellants, whether burning, spraying or otherwise, installing mosquito wire mesh on windows and ventilation (Suharjo, 2015).

Research conducted by Sukiswo, knowledge shows there is a relationship between knowledge with the incidence of malaria. Subjects with less knowledge have a 17.5 times greater risk than those with good knowledge. A person's behavior is influenced by knowledge. The lack of knowledge has an impact on low public awareness of malaria prevention, such as environmental sanitation (Sukiswo *et al*., 2014).

Based on research conducted by R.Aisyah, that the highest incidence of malaria in respondents with low education, usually have limited knowledge dibandingrespondents with higher education. Therefore, it is necessary to increase knowledge by conveying information related to malaria through electronic media, print media (Aisyah & Susanna, 2014).

The distribution of public knowledge on these three knowledge variables is relatively good. This is also in accordance with the results of a study conducted by Joseph *et al*, who concluded that people in Haiti know that malaria is a common problem that occurs in the community and knows mosquitoes are a vector of malaria transmitters(Keating *et al*., 2008; Ngambut & Sila, 2013).

The level of education affects one's knowledge. In general, people who have a high level of education are easier to know about malaria because it is easier to understand information about malaria. Conversely people with low levels of education tend to be difficult to understand about malaria. Malaria incidence occurred in many respondents with primary education level. This indicates the low knowledge of the patient about malaria. Education level is often associated with socio-economic conditions. People with good economics tend to send their families to college degrees. People with a high level of education tend to have a good income, have a permanent home and pay attention to family health. Conversely people with poor economic conditions tend to neglect family education. The low knowledge of respondents also shows access to health information is difficult to obtain due to lack of information and low awareness of respondents to seek and receive health information. So that efforts can be done to prevent the incidence of malaria that is by increasing knowledge about malaria with media (Manampa, 2015).

According to this study, the behavior of pregnant women is related to malaria incidence with p-value 0,009 and OR 9. It means the risk of pregnant women who behave less will be affected by malaria by 9 times than pregnant women who behave well. Community behavior is an individual response to the stimulus from outside or from within him that is active or passive. Individual overt behaviors if enhanced and developed can encourage the growth of public awareness to prevent malaria in scope; clean the yard and ditch, drain the stagnant water around the house, install the mosquito wire mesh, keep the cattle stable at <100 meter from the house and using mosquito bed nets. (Suharjo, 2015)Predisposing factors that will affect the individual's individual behavior in addressing existing health problems(Ernawati, Soesilo, & Duarsa, 2011).
The habit of going out at night either for work or watching or sitting and drinking coffee at the contact shop is at risk for mosquito bites. Anopheles mosquitoes usually come out of the nest and actively feed at night until the early morning (ecologic), because mosquitoes need blood to meet the gonotropic. This habit becomes more risky if the person does not use night outfits that cover the entire body or use mosquito repellent before going out of the house. The percentage of out-of-doors at night was higher in the case group (51.7%) higher than the control group (20.7%) indicated the habit or number of activities performed at night so the risk of contact with the mosquitoes was higher(Pettagalih *et al*., 2016).

The use of mosquito net is associated with malaria incidence with p-value 0.01 and OR 5.85. This means that pregnant

women who wear a mosquito net that is less well at risk of malaria by 5.85 times compared with pregnant women who wear mosquito nets well.The result of the research has been done by Maurizal Dt.Manggusang, that the respondents who did not use bed nets during sleep at night were more in the case group (82.8%) than the control group (51.7%%). The results of chi square statistic test p-value = 0.025 which means there is a significant relationship between the habit of using mosquito nets with the incidence of malaria. Value Odds Ratio (OR) = 4,480 states that respondents who usually do not wear bed nets while sleeping at night 4,480 times greater risk of exposure to malaria (Dt.Manggusang 2013).

Insecticide-treated mosquito net is one of malaria prevention strategies in roll back malaria (international malaria prevention movement). But the use of mosquito net is not effective in Africa. Only one in seven children in Africa sleeps with mosquito nets, and only 2% of children use insecticide treated bed nets (Ernawati *et al*., 2011).

Respondents who did not use mosquito nets during night sleep had the potential for contact with mosquito bites more often, and not a barrier to approaching mosquitoes during sleep. In principle, the mosquito net serves as a space between mosquitoes with people who are sleeping, let alone mosquito activity at night. Used mosquito nets should also be used, no holes can be a place out of the mosquito so we avoid mosquito bites. Job variables, home environmental conditions, and community behavior that include knowledge, attitudes and actions, show a significant relationship with malaria incidence (Aisyah & Susanna, 2014).

And vice versa on house's conditions and environment factor that there is no correlation between environmental condition of house with malaria incidence, with result of p-value statistic 0,052. This situation that the condition and environment of pregnant women's house is a complex variable, especially the protection of malaria infecting mosquitoes into the house, cannot be detected in detail. The observed environment only saw from general conditions and home environment.

The research that has been done by Mardiana, the hills is one place Anopheles mosquito rest. The abundance of bushes and plantation crops, barking crops, cardamom, weeds, shrubs, and plantation crops (coffee, cacao, coconut) are good places to rest Anopheles mosquitoes before biting. Distance of the hills with the house affected the incidence of malaria. The closer the distance of the hills from the house was the more risky, while the ability to reach the house was influenced by the type of mosquito in flight and wind speed. Rice fields were one place where the malaria mosquito breeding. The affordability of malaria vector habitat from human activity sites was influenced by the type of mosquitoes in flight and wind speed. The distance between home and rice field is a risk factor for malaria disease. Forms of human intervention in the processing of agricultural land, for example the pattern of continuous rice cultivation that causes the availability of water puddles cause the life cycle of mosquitoes are not interrupted. Type of malaria mosquito breeding place in rice field is type Anopheles aconitus (Mardiana & Fibriantie, 2009).

The result of multivariate modeling analysis with logistic regression method is the following table 2.

Table 2 Multivariate Analysis Results

Variable		Coefficient	p-Value	OR	Confidence interval 95% Lower Boundary Limit	Upper Boundary Limit
First Step	Knowledge	2,900	,029	10,00	1,27	93,38
	Behavior*)	1,500	,159	4,90	0,54	44,66
	Use of Mosquito Net	1,792	,025	6,00	1,26	28,63
	House & Environmental conditions	2,833	,071	7,64	0,84	69,29
	Constant	-8,332	,000	0,00		
Second Step	Knowledge (X1)	2,353	,011	10,51	1,24	89,31
	Use of Mosquito Net (X2)	2,270	,003	9,68	2,19	42,74
	House & Environmental conditions (X3)	2,250	,043	9,49	1,07	83,95
	Constant	-7,546	,000	0,00		

*) removed from the model because the p-value is more than 0.05.

The multivariate analysis of 4 risk factors were studied, 3 major risk factors interconnected with the sequence of knowledge, behavioral use of bed nets and housing conditions. As for the model equation with 3 variables of 4 variables examined, by looking at p-value above 0.05, behavioral variables are removed from the model. From the selected modeling predicted the incidence of malaria pregnant women with the formula of final regression equation Y (malaria pregnant woman) = -7.546 + 2.353 (knowledge) + 2.270 (usage of mosquito net) + 2.250 (condition of house) while the probability of pregnant woman will suffer malaria equal to 33.9% with the value of 84.3% equation model (strong).

Multivariate analysis resulted in a fit equation model to predict pregnant woman with malaria incidence of 33.9%, if the risk factor such as knowledge, using of mosquito net and house's condition and environment are bad, every 100 pregnant women in this area had 33 malaria risk person.

Prevention of malaria results of this modeling analysis found that through increasing knowledge, one of the knowledge about spraying the house. Spraying chemically is less effective because it will kill only adult mosquitoes, while excessive use of insecticides may cause resistance to the mosquito itself can even interfere with human respiration. One of the ways of preventing malaria with chemicals used in malaria eradication program in Indonesia is by insecticide treated mosquito net. (Suharjo, 2015) The most important knowledge for prevention is controlling breeding place of mosquitoes. Protecting pregnant women, infants and toddlers from transmission of malaria and promoting increased coverage of routine maternity and immunization services to reduce morbidity and mortality of mothers, infants and toddlers from malaria and P3DI (Program from diseases that can be prevented by immunization) (Muktar, 2007).

The results of the analysis on environmental factors of residential houses, showed closely related to the social and economic conditions of the community. The condition of bamboo-walled houses and *alang-alang* roofs indicates the socio-economic condition of people who are still low. Social and economic factors such as poor sanitation, housing, occupations, poverty and others have an important effect on the incidence of malaria especially in developing countries (Ngambat and Sila, 2013).

Suggested strategy in the guidelines of implementation of integrated malaria control activities, such as: a). Malaria screening in all pregnant women during the first pregnancy

examination with provision of using insecticide-treated mosquito nets and treatment according to malaria case management guidelines; b). Giving insecticide-treated bed nets to baby families after routine immunization; c). Mobilizing the community actively for integrated malaria control activities of pregnant and immunization services. (Kementerian Kesehatan RI, 2010)

CONCLUSION

Maternal malaria prevalence in Kabupaten Pesawaran (47.6 per mile), distributed in 5 sub-districts, occurred in all endemic districts and 1 non-endemic sub-district. The result of statistical test of risk factor of knowledge, behavior and using of mosquito net showed a significant correlation to malaria incidence, and reversed on risk factor of condition and environment of pregnant woman's house. But multivariate analysis of behavior is not included in the predicted maternal pregnancy model.

Suggestion

Maternal malaria control is performed by screening all pregnant women during the first pregnancy examination with provision of insecide treated mosquito nets and treatment according to guidelines.

Acknowledgement

This research was funded by DIPA Faculty of Medicine, University of Lampung in 2017, the authors also received good service from Health Office employees and Community health center of KabupatenPesawaran. The authors are very grateful to Mr. Dr. dr. Muharioto, Sp.PA, M.Kes, as the dean of the Faculty of Medicine, University of Lampung and Mr. Abdullah, SKM as the Secretary of the Department of Health for the facilities that have been given and warm reception. We are deeply indebted to have good technical support in the field.

References

Aisyah, R. A., & Susanta, D. 2014. Pemakaian kelambu berinsektisida pada anak usia 0-4 tahun terhadap kejadian malaria. *Jurnal Kesehatan Masyarakat Nasional*, 9(2), 194-200.

Briand, V., Le Hesran, J. Y., Maysay, M., Newton, P. N., Bertin, G., Houzé, S., ... Fievet, N. 2016. Prevalence of malaria in pregnancy in southern Laos: A cross-sectional survey. *Malaria Journal*, *15*(1), 1-11. https://doi.org/10.1186/s12936-016-1492-2

Ernawati, K., Soesilo, B., & Duana, A. 2011. Hubungan faktor risiko individu dan lingkungan rumah dengan malaria di puskesmas pada kabupaten pesawaran provinsi lampung indonesia 2010. *Makara Kesehatan*, *15*(2), 51-7.

Karyana, M., Burdarm, L., Yeung, S., Kosmaryati, E., Warikar, N., Maristela, R., ... Price, R. N. 2008. Malaria morbidity in Papua Indonesia, an area with multidrug resistant Plasmodium vivax and Plasmodium falciparum. *Malaria*, *10*(48), 1-10. https://doi.org/10.1186/1475-2875-7-148

Keating, J., Eisele, T. P., Bennett, A., Johnson, D., & Macintyre, K. 2008. A description of malaria-related knowledge, perceptions, and practices in the Artibonite Valley of Haiti: Implications for malaria control. *American Journal of Tropical Medicine and Hygiene*, *78*(2), 262-9.

Kementerian Kesehatan RI. 2010. Pedoman pelaksanaan kegiatan terpadu pengendalian malaria, pelayanan ibu hamil dan imunisasi. In *Malaria*. Jakarta.

Kementerian Kesehatan RI. 2016. Pusat data dan informasi. In *Pusat data dan informasi*. Jakarta.

Manuntpa, S. 2015. Penyarah faktor demografi dan riwayat malaria terhadap kejadian malaria. *Jurnal Berkala Epidemiologi*, *4*(3), 338-348. https://doi.org/10.20473/jbe.v4i3.

Mardiana, & Fibriantto, D. 2009. Hubungan karakteristik lingkungan luar rumah dengan kejadian penyakit malaria. *Jurnal Kesehatan Masyarakat*, *5*(1), 11-6. Diambil dari http://journal.unnes.ac.id/index.php/kemas

Muktar, I. 2009. Kehamilan dan kejadian malaria di puskesmas way muli, lampung selatan. *Jurnal Kesehatan Masyarakat Nasional*, *2*(1), 19-25.

Ngambut, K., & Sila, O. 2013. Faktor lingkungan dan perilaku masyarakat tentang malaria di kecamatan kupang timur kabupaten kupang. *Jurnal Kesehatan Masyarakat Nasional*, *7*(6), 271-8. Diambil dari http://jurnalkesmas.ui.ac.id/kesmas/article/view/37/38

Penggalih, M. H. S. T., Pratiwi, D., Fitria, F., Sari, M. D. P., Nasruti, N. H., Winata, I. N., ... Kusumawati, M. D. (2016). Identifikasi Somatotype, Status Gizi, Dan Dietary Atlet Remaja Step and Go Sports. *Jurnal Kesehatan Masyarakat*, *11*(2), 222. https://doi.org/10.15294/kemas.v11i2.4495

Rusjdi, S. R. (2012). Malaria pada masa kehamilan. *Majalah Kedokteran Andalas*, *36*(2), 173-8.

Suharjo. (2015). Pengetahuan sikap dan perilaku masyarakat tentang malaria di daerah endemis kalimantan selatan. *Media Litbangkes*, *25*(1), 23-32.

Sukiswo, S. S., Rinidar, & Supito. (2014). Analisis risiko karakteristik, sosial ekonomi, perilaku dan kondisi lingkungan rumah terhadap kejadian malaria. *Kesehatan Masyarakat Nasional*, *9*(2), 150-6.

How to cite this article:

Sutarto *et al.* 2018, Rapid Survey of Malaria Prevalence And Malaria Risk Factors In Pregnant Women. *Int J Recent Sci Res.* 9(7), pp. 27865-27870. DOI: http://dx.doi.org/10.24327/ijrsr.2018.0907.2349

****