

The Influence of Community Behavior on the Incident of Malaria in the Working Area of Larat Health Center, North Tanimbar District, Tanimbar Islands

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ABSTRACT

Malaria is one of the top 10 diseases that is still a health problem that has occurred for 3 consecutive years in the Larat Health Center working area. The aim of this research is to analyze the influence of behavior. Community regarding the incidence of malaria in the working area of the Larat Community Health Center, North Tanimbar District. This research is quantitative in approach cross sectional. The sampling technique uses random sampling with all malaria sufferers and some people who are not malaria sufferers in malaria-prone areas in the Larat Community Health Center working area as many as 372 people. Based on the SPSS test results, the significance value between the malaria incidence variable (Y) and the mosquito net variable (X1) is $0.000 < 0.05$. Furthermore, the relationship between the malaria incidence variable (Y) and the drug use variable (X2) has a sig value of $0.000 < 0.05$. Based on the results of the research that has been carried out, it can be concluded that community behavior has a significant influence on the incidence of malaria in the working area of Larat Community Health Center, North Tanimbar District, Tanimbar Islands Regency.

Keywords: Environmental cleanliness, malaria incidence, mosquito nets, mosquito repellent

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BACKGROUND

Malaria is an infectious disease that is of global concern. This is still a public health problem because it often causes extraordinary events (KLB), has a broad impact on the quality of life and the economy, and can cause death. (Ngaga, Rahayu, & Imade, 2018)

World Malaria Report In 2013, it was stated that malaria occurs in 106 countries, even 3.3 billion of the world's population lives in areas at risk of contracting malaria. The number of malaria patients in the world is 219 million cases, of which 32 million cases occur in the Southeast Asia region (SEARO WHO = South East Asia Regional Office WHO). Every year as many as 660 thousand people die from malaria, 320 thousand of whom are in Southeast Asian countries, including Indonesia. (Mustafa, M. Saleh, & Djawa, 2018)

Data from WHO (World Health Organization) 2014 recorded 214 million cases of malaria occurring globally and caused 438,000/100,000 deaths in 2015 (WHO, 2016). Based on WHO 2022 data, the estimated cases are 811,636 positive cases in 2021, Indonesia contributed the 2nd largest number of cases after India in Asia.

Of the 33 provinces in Indonesia, 15 provinces have malaria prevalence above the national figure, most of which occurs in the Eastern Region of Indonesia. The prevalence of malaria in 2013 in Indonesia was 6.0%. The five provinces with the highest incidence and prevalence are Papua (9.8% and 28.6%), East Nusa Tenggara (6.8% and 23.3%), West Papua (6.7% and 19.4%), Central Sulawesi (5.1% and 12.5%), and Maluku (3.8% and 10.7%). The number of malaria cases in Indonesia increases from year to year and the areas that contribute most to malaria cases are in the eastern region, especially in Papua, West Papua, Maluku and NTT. Nearly 89% of malaria cases still occur in these areas. Riskesdes (2013). The trend of finding the highest fluctuating malaria cases in 2022 was 3.1 million, an increase of around 56% compared to the previous year. The national target for the malaria positivity rate is less than 5%, while the national achievement this year in 2022 is 13% (Ministry of Health, 2022)

Malaria is an infectious disease whose control efforts are a global commitment Sustainable Development Goals (SDGs). The high number of malaria cases in Indonesia is closely related to several things, including environmental changes which result in the expansion of breeding places for malaria-transmitting mosquitoes, high population mobility, and climate change which causes the rainy season to be longer than the dry season. Environmental and climate changes will have a major impact on the biology, distribution and population density of vectors at certain times and places. Changing seasons will have a direct or indirect effect on malaria vectors. (Ngaga, Rahayu, & Imade, 2018)

Cases of Malaria and KLB (Extraordinary Events) in several areas show an increasing trend. Meanwhile, monitoring and analysis of malaria data at all levels still appears weak. This can be seen in cases that occur in areas far from health service centers. Thus, the actions taken often do not provide optimal results. Malaria, epidemiologically, is an infectious disease that is locally specific. Some areas in Maluku Province are endemic areas Malaria which has the potential to increase the frequency of Malaria disease. Many rural areas consist of swamps, puddles and fish ponds, rice fields and plantations that are neglected. (Muhammad, Suarni, & Erlin, 2022)

One effort to accelerate the elimination of malaria is the provision of anti-mosquito nets, especially for high endemic areas with a target of at least 80% of the population in these areas getting them. Meanwhile, for moderate endemic areas, mosquito nets are distributed only to high-risk groups, namely pregnant women and babies. How to control malaria, apart from medication, is very important in preventing the occurrence of malaria. One prevention is to use a mosquito net when sleeping. The percentage of mosquito net use (with and without insecticide) nationally is 26.1%. (Mustafa, et al, 2018).

Larat Community Health Center is one of the community health centers located in the center of North Tanimbar District in the Tanimbar Islands group in the Tanimbar Islands Regency area. Larat Health Center with a working area consisting of 9 assisted villages, namely Ritabel Village, Ridool Village, Lelingluan Village, Watidal Village, Keliobar Village, Kelaan Village, West Lamdesar Village, East Lamdesat Village and Kainara Preparation Village with a population of 14,689 people. Health Center.

Larat has medical personnel including 1 general practitioner, 1 dentist, 18 nurses, 17 midwives, 2 sanitation workers, 3 nutrition workers, 4 administrative staff, 2 pharmacy staff, 1 pharmacist, 1 person. 1 person physiotherapy, 2 health analysis staff.

According to astronomy, Larat Health Center is located between 7.08° - 7.35° South Latitude and 131.56° – 131.99° East longitude. Geographically, Batasi's location includes the north bordering Yaru District, the south bordering Nirunmas District, the west bordering Wuarlabobar District and the east bordering the Arafura Sea.

The geographical conditions of the Larat Community Health Center working area vary, namely the condition of rivers, hilly land, plains, quite extensive forests and a lot of land near settlements that is still empty and unkempt. This region has a hot, humid climate and is accompanied by high rainfall per year. The villages in the Larat Health Center working area are located on the coast.

Based on preliminary studies conducted, malaria is among the top 10 diseases that are still a health problem. Malaria is the second most common disease after ISPA. The results of the initial survey at Larat Health Center in 3 consecutive years, namely in 2021 there were 96 people suffering, in 2022 there were 84 people suffering and in 2023 there were 104 people suffering from malaria with an increase in malaria cases occurring in January, June and November 2023, and in 2024 there will be 109 people suffering from malaria, including malaria sufferers who come from outside the region.

Factors that are considered to be related to the incidence of malaria in the Larat Community Health Center area include the use of mosquito nets and anti-mosquito medication which is still a concern for the local community because there are people who still ignore the use of mosquito nets, anti-mosquito medication and incomplete use of ventilation wire mesh resulting in mosquitoes. can enter the house through ventilation that does not use screens, thereby increasing contact between mosquitoes and humans and the public's lack of attention to the cleanliness of the home environment. (Profile of Larat Health Center in 2024)

Using mosquito nets while sleeping can help reduce contact or mosquito bites, thereby indirectly reducing the incidence of malaria. For those who travel to endemic areas for a long time, they need to use it personal protection such as using mosquito nets, repellent, wire mesh and others (Ministry of Health RI, 2018).

Based on the background description above, the author is interested in researching the influence of community behavior on the incidence of malaria in the working area of Larat Community Health Center, North Tanimbar District, Tanimbar Islands Regency.

METHODS

Types of research

This type of research is quantitative research with an analytical design using a cross sectional approach. Study Cross sectional namely, measurements of variables that influence and are influenced are carried out at the same point in time, as well as studying the dynamics of the correlation between risk factors (Wibowo, 2015). In this study, researchers measured independent variables including the use of mosquito nets, use of mosquito repellent and the cleanliness of the home environment.

Research Design

The framework explains the work material for the activities carried out, including who will be researched, the variables that will be researched and the variables that will influence this research (Aziz, Alimul H, 2003).

RESULTS

Data collection was carried out in malaria-prone areas, namely Lelingluan Village, Ritabel Village, Ridool Village, and Watidal Village in the Larat Community Health Center working area, North Tanimbar District, Tanimbar Islands Regency on November 2 2024. The research results explain the description of the research location and the research results that have been obtained. The working area of Larat Health Center is located in the northern area of the Tanimbar Islands which oversees 9 villages including Lelingluan Village, Ritabel Village, Ridool Village, Watidal Village, Keliobar Village, Kelaan Village, West Lamdesar Village, East Lamdesar Village and Kainara Preparation Village, North Tanimbar District, Tanimbar Islands Regency. The population in the working area of the health center is 14,689 residents. Larat Community Health Center with Plenary Accreditation status in 2023.

Vision and mission of Larat Community Health Center services, North Tanimbar District, Tanimbar Islands Regency.

Vision: The realization of a healthy, intelligent, productive, independent and just North Tanimbar community.

The mission of the Larat Health Center is:

- a. Creating professional, productive and health resources quality
- b. Realizing public and individual health efforts through a life cycle approach that is quality, easy and affordable
- c. Realizing efficiency and effectiveness in Puskesmas management
- d. Realizing the strengthening of basic health services
- e. Realizing healthcare transformation

Motto: My clothes are as white as my heart and devotion

Description of Respondents

This research involved 372 respondents who were members of the community in malaria-prone areas in the Puskesmas work area. The following are the demographic characteristics of the respondents:

In this study, univariate analysis was carried out to describe each characteristic of the respondents studied in this study, consisting of age, gender, education and occupation with a total of 372 respondents. The results of research regarding data on the characteristics of the majority of respondents aged 26-35 years are:

Respondent's Age

Age is the time span from human birth to the present. Productive age (McKenzie, 2006) is the working age that can produce goods and services. In the age range of 15-64 years, many people have completed their education, work, have families, and so on.

Based on age, respondents were categorized into 5 sections, namely 25% (93 people) aged 15 to 25 years, 30% (112 people) aged 26 to 35 years, 25% (93 people) aged 36 to 45 years, aged 46 years to 55 years as much as 10% (37 people), and over 55 years as much as 10% (37 people). The largest respondents were respondents aged more than 26 to 35 years.

Last education

Educational level is a condition of the level of education that a person has through formal education. In this study, there were five levels of education of respondents, namely Not Completed Elementary School, Elementary School (SD), Middle School (SMP), High School (SMA), and College.

5 sections, namely: 15% (56 people) have not finished elementary school, 20% (74 people) have finished elementary school, 25% have finished junior high school (93 people), 30% have finished high school (112 people), and 10% have finished high school. (37 people). The largest respondents were respondents with a high school education of 30% (112 people).

Employment Status

Work plays an important role in managing human resources and understanding employee behavior. Clear definitions help organizations set expectations, evaluate performance, and maintain accountability. However, there are varying perspectives on what actually constitutes work, leading to varying definitions.

A clear job definition is critical for several reasons. First, it helps organizations set clear expectations with employees regarding their roles and responsibilities. Second, it provides a basis for evaluating employee performance and identifying areas for improvement. Third, it helps maintain accountability and ensures that employees are held accountable for their contributions.

Based on table 2.3, it can be seen that the dominant employment status of respondents in this research is Farmers at 40% (149 people), Private Workers at 30% (112 people), Civil Servants at 15% (56 people) and other occupations at 15% (37 people). person). The large number of respondents who are high school graduates is related to the respondent's employment status as a housewife who does not have a permanent job and whose daily activities only take care of the family's household needs.

Research result

Quantitative research is a research method that uses numerical data and statistical analysis to answer research questions and test hypotheses. This research is statistical in nature, so the data collected for analysis is mostly in the form of numbers. Quantitative research has several characteristics, namely: Using numbers or mathematics to study phenomena and causal relationships, Focusing on the influence between variables, Using samples and the principle of representativeness, Being objective, Relatively short. Quantitative research is often used in natural and social sciences, such as physics, biology, sociology, and journalism.

Malaria is an infectious disease caused by the Plasmodium parasite which is transmitted through the bite of female Anopheles mosquitoes. This parasite will multiply in the liver and infect red blood cells. Several factors that can increase a person's risk of contracting malaria are: Age, living in an environment with a tropical climate, being in an area with minimal health facilities. Malaria can be classified into two types, namely benign malaria and malignant malaria. Benign malaria is generally caused by plasmodium vivax and is rarely fatal. Meanwhile, malignant malaria is caused by Plasmodium falciparum and has a poor prognosis.

The results of giving several questions to respondents in the Larat Community Health Center working area related to the symptoms referred to in the case of malaria with laboratory results of plasma/serum bilirubin > 3 mg/dL and parasite density $> 100,000/\mu\text{L}$. 8.9% of patients (33 people) had low scale symptoms, 42.2% (157 people) had symptoms that referred to malaria symptoms with moderate allocation and 48.9% (182 people) had malaria symptoms characterized by laboratory results of plasma bilirubin > 3 mg/ dL and parasite density $> 100,000/\mu\text{L}$. This nominal can describe/illustrate that the incidence of malaria is characterized by laboratory results of plasma/serum bilirubin > 3 mg/d L and parasite density $> 100,000 / \mu\text{L}$.

According to the results of data collection for the variable use of mosquito nets, the correct use of mosquito nets is to use a mosquito net that is not torn when sleeping in the mosquito net, the entire bottom edge of the mosquito net is tucked under the mattress/mattress so that there is no possibility of mosquitoes getting into the mosquito net

and the mosquito net is used all night long. year, not only when mosquitoes are a nuisance or when it is thought there are no mosquitoes. 37 respondents answered that the parameters of using mosquito nets had no influence, 156 respondents understood that the effect of using mosquito nets was only a moderate effect and 179 people strongly agreed that the correct use of mosquito nets is to use mosquito nets that are not torn. When sleeping in the mosquito net, the entire bottom edge of the mosquito net is tucked in. under the mattress/mattress so that there is no possibility of mosquitoes getting into the mosquito net and the mosquito net is used all night throughout the year, not only when mosquitoes are a nuisance or it is thought that there are no mosquitoes. The use of mosquito nets is one of the parameters for the incidence of malaria. The use of mosquito nets can reduce contact between vectors and humans, so that they can be a means of protection for the community against malaria transmission. The use of mosquito nets is one of the parameters for malaria incidence. The use of mosquito nets can reduce contact between vectors and humans, so that they can be a means of protection for the community against malaria transmission. The use of mosquito nets is one of the efforts made to prevent malaria. The use of mosquito nets is expected to protect people from mosquito bites, so that at night people do not need to worry about mosquito bites when they sleep. Public awareness in the Larat Community Health Center working area to use mosquito nets is still low and this is also in accordance with direct observations made during research. Many malaria sufferers do not use mosquito nets, not because they do not have mosquito nets, but many do not use them. Based on the observations that researchers observed, there are signs to hang mosquito nets to ensure that respondents use mosquito nets and that the nets are in good condition and do not have holes. The mosquito nets that can be used are mosquito nets that are in good condition and do not have holes so they can avoid and protect people from mosquito bites, especially babies, toddlers and pregnant women. Using this mosquito net is safe and not dangerous for humans. Efforts that can be made to combat the incidence of malaria are by increasing public awareness through education about the importance of using mosquito nets.

Research conducted by Rachman et al (2022) has similarities, namely that based on the results of observations in every house in Durian Luncuk Village, Batang Hari Regency, the majority of houses with malaria sufferers do not use mosquito nets, with 78 malaria sufferers not using mosquito nets. 3% of respondents, while in the group who did not suffer from malaria, 52.2% of respondents did not use mosquito nets. This shows that if you don't use a mosquito net, mosquitoes will bite more easily and can transmit malaria, while those who use a mosquito net will be more protected from mosquito bites.

9.9% of respondents (37 people) chose to use mosquito repellent (burn, lotion and spray) on a small scale, 42.2% of respondents (157 people) understood that the use of mosquito repellent (burn, lotion and spray) had an influence moderate and 47.8% of respondents (178 people) strongly agreed that the variable using mosquito repellent (burn, lotion and spray) had the highest influence. Drug use is one of the parameters for the incidence of malaria. Most respondents used mosquito repellent in the bedroom and other rooms in the house. Contact between *Anopheles* mosquitoes spp. with healthy people not only occurs inside the house but also outside the house according to the behavior of the *Anopheles* mosquito spp. who actively bite outside the house at night.

The variable of cleanliness of the home environment has the requirements for a healthy home environment to prevent malaria transmission consisting of 2 things, namely: cleaning the environment with running water and cleaning the home environment regularly. 10.7% of respondents (40 people) chose the low scale for the parameters of this variable, 40.8% of respondents (152 people) chose to agree that the requirements for a healthy home environment to prevent malaria transmission consist of 2 things, namely: cleaning the environment by running water and cleaning the home environment regularly and as many as

48.3% of respondents (180 people) strongly agreed that the requirements for a healthy home environment to prevent malaria transmission consist of 2 things, namely: cleaning the environment with running water and cleaning the home environment regularly. The parameter of cleanliness of the home environment is one of the parameters for the incidence of malaria. The presence of bushes (resting place) in the environment around where people live is related to the incidence of malaria. Resting place one of the environmental factors that supports the provision of breeding places for Anopheles mosquitoes and plays a role in the spread and transmission of malaria. Bushes are a resting place for Anopheles after sucking blood because this place has high humidity due to blocking sunlight. House ventilation conditions that do not use mosquito screens, house ceilings can prevent the entry of Anopheles mosquitoes into the house, and gutters that do not flow, eawa, ponds that can collect rainwater so that they become a place for mosquitoes to breed.

Poor environmental sanitation can increase the risk of mosquitoes breeding **Anopheles**. This is in line with research by Fakhriyatiningrum et al. (2022) which shows that poor environmental sanitation conditions increase the risk of malaria by up to 2 times. Poor environmental sanitation is one of the main risk factors for malaria transmission. This is because of mosquitoes **Anopheles**, The main vector of malaria transmission, breeds in dirty and damp places.

An analysis of community behavior carried out by MThanks et al (2024) suggests that poor environmental sanitation conditions can include pools of dirty water, such as in ditches, rubbish dumps and bathtubs that are not well maintained, piled up rubbish, limited availability of clean water. , unhealthy latrines. These conditions can create an ideal place for Anopheles mosquitoes to breed and increase the risk of malaria transmission. Efforts to improve environmental sanitation can help reduce the risk of malaria transmission, including regularly cleaning puddles of dirty water, managing waste well, increasing access to clean water, building healthy latrines 4.2.1 Univariate Analysis.

Univariate analysis is analysis used on one variable with the aim of knowing and identifying the characteristics of that variable. Univariate analysis is used to draw conclusions using a variety of inferential analyzes that may be used. Univariate analysis is the most basic analysis technique that is often used in various types of research. Because only one variable is analyzed, the results of univariate analysis cannot and should not be concluded with other variables. This analysis is often equated with descriptive analysis because it provides an overview of just one variable without any intervention from other variables.

The characteristics of respondents in this study consisted of mosquito nets, use of medication, cleanliness of the home environment as independent variables and the incidence of malaria as the dependent variable.

Descriptive analysis of univariate data, central tendency (mean, medium and mode) provides information about the central value in a data set, while range, interquartile range, standard deviation and mean deviation give us information about the spread of the data. Analysis results using SPSS, with the dependent variable (Y) namely the incidence of malaria, the independent variables namely X1 (mosquito nets), X2 (drug use) and and standard deviation of 0.65. The mosquito net variable (X1) has a mean of 2.38, with a median of 2 and a standard deviation of 0.66. Variable X2 (drug use) has a value of 2.38, a median value of 2 with a standard deviation value of 0.66. Variable X3 (cleanliness of the home environment) has a mean value of 2.38, a median value of 2 and a standard deviation value of 0.67.

Bivariate analysis is an analysis method that examines the relationship between two variables. The main goal of bivariate analysis is to find and describe the relationship or correlation between two variables. An example of bivariate analysis is a scatter plot or scatter diagram, which shows the relationship pattern between two numerical variables. Apart from

that, bivariate analysis also includes inferential statistical methods such as Pearson correlation, Spearman correlation, or two-variable hypothesis testing. This method helps provide evidence or refutation of the relationship between two variables.

Correlation analysis is a study discussing the degree of closeness of the relationship between variables which is expressed by the correlation coefficient value. The relationship between these variables can be positive and negative. In correlation analysis, there are actually no terms independent variable (x) and dependent variable (Y). because basically the relationship between the independent variable and the dependent variable will have the same meaning as the relationship between the dependent variable and the independent variable. However, in practice we often find researchers giving names to the relationship between the independent variable and the dependent variable. This is not a problem, because the purpose of naming is only as a tool so that readers can more easily understand the direction of the relationship that the researcher wants to convey in his research.

Based on the calculated r value (Pearson Correlations), it is known that the calculated r value for the relationship between malaria incidence (Y) and the mosquito net variable (X1) is $0.840 > r_{table} 0.096$, so it can be concluded that there is a relationship or correlation between the malaria incidence variable (Y) and the mosquito net variable. (X1). Furthermore, the relationship between the malaria incidence variable (Y) and the drug use variable (X2) is $0.909 > r_{table} 0.096$, so it can be concluded that there is a relationship or correlation between the malaria incidence variable (Y) and the drug use variable (X2). The calculated r value for the malaria incidence variable (Y) and the cleanliness of the home environment (X3) is $0.902 > r_{table} 0.096$, so it can be concluded that there is a relationship or correlation between the malaria incidence variable (Y) and the cleanliness of the home environment (X3).

Community behavior greatly influences the incidence of malaria in the Larat Community Health Center work area. The results of data collection show that community habits regarding maintaining environmental cleanliness have a high percentage of 15% are infected with malaria, the use of mosquito nets has a value of 30% for transmission. Meanwhile, knowledge about malaria and using mosquito repellent has the highest value for being infected with malaria.

Research conducted by AA. Alipen, et al (2024) support the research results, namely that of respondents in the Moru health center working area, Alor district, most of the respondents have the habit of doing activities outside the home at night. The number of people who have the habit of doing activities outside the home at night is 52.8%. Most people have the habit of doing activities outside the house at night to bathe and urinate or defecate, this is because many people still have bathrooms and toilets outside the house, making it easier for mosquitoes to come into contact. **Anopheles sp** which is generally active in looking for blood at night with humans.

CONCLUSION

Based on the results of research that has been carried out, it can be concluded that community behavior has a significant influence on the incidence of malaria in the work area of the Community Health Center. Some of the main findings from this research are:

1. **Use of mosquito nets** : Respondents who routinely use mosquito nets while sleeping have a lower risk of contracting malaria. This shows the effectiveness of bed nets as an important preventative tool in endemic areas.
2. **Environmental Hygiene** : People who actively maintain environmental cleanliness, such as cleaning up puddles of water, show a lower prevalence of malaria infection. This indicates that collective efforts to maintain cleanliness can reduce the risk of malaria.

3. **Knowledge Level** : Public knowledge about malaria has a positive effect on prevention behavior. Respondents who have good knowledge about symptoms and prevention methods tend to be more proactive in taking preventive steps.
4. **Use of Anti-Mosquito Medication** : The use of antimalarial drugs when traveling to endemic areas also contributes to reducing the incidence of malaria. This shows the need for education about the appropriate use of antimalarial drugs.

Overall, good community behavior in preventing malaria can help reduce the incidence of malaria in the Larat Community Health Center working area, North Tanimbar District, Tanimbar Islands Regency.

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