International Journal of Sciences: Basic and Applied Research (IJSBAR)

ISSN 2307-4531
(Print & Online)

http://gssrr.org/index.php?journal=JournalOfBasicAndApplied

Factors Affecting the Spread of Filariasis Disease in Mimika District of Papua Province

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Abstract

Elephantiasis or filariasis is a group of infectious diseases, the caused by filarial worms that are transmitted through mosquitoes. After being bitten by mosquitoes, the larvae parasites will spread and when it comes to network lymph system then develops into the disease. This study aimed to analyze the causes of the incidence of filariasis, already endemic to the Mimika district in Papua province, so it needs to be further investigated the factors that influence the spread. The study population was 144 people and the entire population sampled, so it is a census study (saturated sample). Variable used as an independent variable in this study consisted of nutritional status, economic status, and environmental status. While the dependent variable was the incidence of filariasis in Mimika district. The results of study revealed that the nutritional status, economic status and environmental status of both partially and simultaneously the three variables used in this study and significant positive effect on the incidence of filariasis in Mimika district in Papua province. The dominant factor on the incidence of filariasis disease is the status of the environment.

Keywords : Elephantiasis; spread; filariasis; and health status.

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1. Introduction

Health factors are closely related to the quality of human resources (quality of human resources) itself. High and low quality of human resources (HR) will be determined by the status of health, education and per capita income levels [1]. In economic activities, the three indicators of the quality of human resources will also indirectly impact on the high and low productivity of human resources, in this particular labor productivity. National Health System is an order which reflects the efforts of Indonesia to improve the ability of achieving optimal health status as the embodiment of general welfare as referred to in the Preamble of the Constitution of 1945. It is therefore a basic premise of the National Health System is essentially determine the direction, objectives and base- basic health development as a whole entity, integrated and sustainable as part of national development.

Efforts in the System of National Health committed in the health sector-related, organized by the government and society, including private business, either in the form of organizations, foundations, businesses and individuals are included in order to increase (promotion), prevention (preventive), healing (curative) and recovery (rehabilitative) that is comprehensive, integrated and sustainable [2-6].

Filariasis or elephantiasis disease is an infectious disease which is a chronic disease caused by filarial worms and transmitted by mosquitoes. This disease can cause permanent disability in the form of enlargement of the legs, arms, scrotal sac, the breasts and genitals of women. Symptoms and Signs Filariasis, among others, at the stage of Early (acute) form of recurrent fever 1-2 times or more per month for 3-5 days, especially when working hard. Fever can heal itself without treatment also raised bumps and feels pain in the groin or armpit without bodily injury. Then when palpable veins like ropes that are red and sore from the groin or armpit and walked toward the foot or hand. While at Advanced stage (chronic), there will be intermittent enlargement on the feet, hands, pockets testicles, breasts and genitals of women and gradually becomes permanent disability Filariasis is a disease caused by infection with the nematode parasite that is spread in Indonesia. Although the disease is rarely fatal, but can reduce the productivity of sufferers due to the onset of physical disorders. The disease is rare in children because clinical manifestations years later after infection. Symptoms appear leg swelling due to blockage of microfilariae in the lymphatics that usually occur in over 30 years after exposure to the parasite for many – years [7 – 9].

Therefore, filariasis disease is often called elephantiasis. The most fatal result for the patient is very disturbing permanent disability productivity. In the area - endemic areas, 80% of the population could become infected, but only about 10-20% of the population show clinical symptoms. This parasitic infection spread tropical areas like Africa, Asia, South America and the South Pacific. has been known for more than 200 species of filaria. Of the 200 species are only a few that attack humans. Society at risk are those who work in the area affected by chronic exposure to mosquitoes containing the larvae. worldwide, filarial infection approximate figure of 250 million people. In Asia filaria endemic in Indonesia, Myanmar, India, and Sri Lanka [10, 11].

According to Widoyono [11] that elephantiasis (filariasis) are almost all over the world, especially in tropical and sub-tropical some areas. In 2004, filariasis has infected 120 million people in 83 countries worldwide. While in Asia filariasis is endemic in Indonesia, Myanmar, India and Sri Lanka. In Indonesia based on a survey

conducted in the year 2000-2004, there were more than 8000 people with chronic clinical filariasis scattered across the province. In epidemiology, this data indicates more than 60 million people in Indonesia are in areas at high risk of contracting the filariasis, with 6 million of them have been infected. Filariasis is still a public health problem in Indonesia, especially in rural areas. This is a chronic infectious disease caused by the filarial worm infections. The disease is transmitted by mosquitoes. Filarial worms has more than 200 species and only a few are found in humans. Filarial species most commonly infect humans are brancrofti Wuchereria, Brugia malayi, Brugia timori (in Indoneia), and Onchocercavolvulus. Adult worms live in the lymphatic system, subcutan and connective tissue inside. Female worms secrete microfilariae (Prelarva) who still have the egg membrane (sheath) or the membranes apart (not gloved). The microfilariae are very active, shaped like a thread and is found in the peripheral blood or skin tissue.

How filaria which infects humans through the bite of a vector Arthopoda, for example mosquitoes. This vector becomes infective because ingesting microfilariae in the blood of mammals. Each species of filaria has a complex life cycle patterns. Infection in humans occurs when exposure to infective larvae intensively in the long term, after the exposure, it takes many years for the real pathological changes in humans. Based on the presence of microfilariae in the circulatory system, each species has periodicity. When the microfilariae in the blood at night is called periodicity noktura. Filarai microfilariae in the blood during the day is called periodicity diurna. Some species of parasites are nonperiodic for microfilariae are in a fixed amount at night and during the day, but is found on most of the night and more are found in the capillaries and blood vessels of the lungs [12]. Filariasis is an infectious zoonotic diseases that are found in tropical regions around the world. The cause is a group of parasitic worms belonging nemtoda superfamilia Filarioidea that cause infection resulting in the appearance of edema. The common symptoms seen are the elephantiasis, such as enlargement of the lower limbs (legs) and the scrotum (scrotum), so in layman's disease known as elephantiasis disease. Nevertheless, this enlargement symptoms are not always caused by filariasis.

Mimika Regency is an endemic area filiaria disease (elephantiasis). It can be seen from the number of infected people in this area, however, every day more and more people are infected. Preliminary results showed that of several health centers in the district of Maimika reported that people or patients suffering from filariasis are: PHC Kwamki Lama 38, PHC Kwamki New 17, uskesmas Timika Jaya 9, PHC Limau Asri 47, and PHC Bintuka 33 person. Preliminary results found that based on reports from several health center in the district of Mimika. That is what lies behind the author intends to examine the factors that influence the spread of disease filaria in Mimika Regency of Papua Province which is used as a location for research.

2. Materials and Methods

According Mudrajad Kuncoro in Subandriyo [13] Selection of study or research the most appropriate, whether explorative study (eksplorative research) or conclusive (conclusive research), is a matter that is subjective depending on the nature of the situation and also how taker decision and the researchers understand more about the research situation. This research is a kind of exploratory research (Eksplorative research), which aims to identify research with the aim of special situations or data needed for further research. Explorative research is

very useful when the researcher wants understanding of the situation or a better state and or identify alternative decisions that will come [14]. While essentially a survey to take place in the Mimika Regency of Papua Province. This study aimed to analyze the factors that influence the incidence of filariasis disease causes the patient, then the object of this study are patients with filarial disease in Mimika Regency, Papua Province.

2.1 Location and Time Research

In this study the research location is Mimika District of Papua Province with the grounds that many people who contracted the disease filariasis and every day, so it will affect the cause of increased disease filaria. With the completion of this study are expected to answer the question against filarial disease outbreaks in Mimika, that several variables can be indicators of disease-causing filaria. So at the end in order to reduce the causes of filarial disease need to pay attention to the factors that influence the disease-causing filaria, so that health care providers in Mimika in working more optimally so as to obtain optimal performance.

2.2 Population and Sample

According Sugiyono (2000: 68), the population is a generalization which consists of object or subject that has a certain amount and characteristics determined by researchers to learn and then drawn conclusions.

2.3 Sample

A sample is a subset and a unit of the population (the majority population data). Furthermore, in sampling, this research guided by the views expressed by Arikunto Suharsimi (2002: 112-113), when the subject is less than 100 people better taken everything, but when the amount of large populations can be taken between 10-20%. Thus not all populations sampled study but only taken 20%. The sample in this study was all patients with filarial disease in Kabuapten Mimika Papua province, which is 144 people, so that the sample in this study was modeled census (population saturated).

2.4 Testing Linear Regression Model Analysis Tools

a. Linearity test

To determine the independent variables are correlated linearly with the dependent variable, the test is done by comparing the significance level and linearity deviation with significance level of linearity at = 0.05.αthe level of

b. Multicollinearity Test

Linear relationship between the independent variables with the dependent variable that meets the linearity assumption, if the significance of linearity < (smaller and alpha).α This means that testing the linearity in the table shows that all independent variables are not distorted and the assumption of linearity (alpha) = 0.05.αin

Multikolinearitas degree testing method used to show the decomposition conditions index and the coefficient of variance, as well as comparing the value of tolerance (tolerance) and the variance inflation factor (variance in flat / on factor, abbreviated VIF) in the full regression analysis method (enter). Values obtained tolerance and 1 - Ri2, while VIF obtained and 1 ± Ri2. Hair, and his colleagues. (1995: 132) argues that the value of tolerance of small and large VIF values showed high colinearity. Thus the test results showed that none of the independent variables that contain multikolinearitas.

c. Heteroskidastity Test

Heteroskedastisitas test is intended to determine whether confounding variables (disturbance errors) have a constant variance. In this study tested the heteroscedasticity test to diagnose residual plot diagram, which compares student zed regression residual and predicted value (predicted value) which describes the distribution of residual changes associated with changes in the independent variable predictive value.

If the distribution of residual increase was not followed by a higher predictive value, in the sense that the predictive value of the independent variables remain constant, then the change shows that do not occur or occur homoskedastisitas heteroskedastisity.

d. Normality test

There are two methods used to test for normality, ie diagnose histogram depicting normal distribution and frequency of observation, and diagnose the scatter diagram (scatter plot) comparing the distribution of observation and residual-residual to an expected distribution, namely by creating a plot of two cumulative distribution (the cumulative probability of observation, and the expected cumulative probability). If the two distributions are identical, it will generate a straight line.

3. Results and Discussion

Effect of Independent Variable (X) Against Dependent Variable (Y). If the regression coefficients in Appendix 1 is inserted into the multiple linear regression formula, it would appear as follows:

Y = 8971 + 0,278X1 + 0.193X2 + 0,299X3

From the regression equation above shows that the parameter α (constant) is 8971 means that if the independent variables analyzed were zero then Genesis Diseases Filariasis in Mimika district amounted to 8971 times or can be increased by ± 9 times annually. Thus the Nutritional Status of the respondent, the Economic Status of the respondents, as well as the Environmental Status Respondents in Mimika district has a relevant effect on disease incidence of filariasis in Mimika district. Therefore the need for socialization continuously to the whole society against the dangers of disease transmission Filariasis in Mimika district.

Nutritional status of respondents (X1) positive and significant impact on the incidence of disease filariasis in Mimika district. Statistical analysis showed that the value t = 3.750 and the value probalility or (p) = 0,000 <α =

0.05 of the regression coefficient (β) Nutritional Status respondents (X1) worth of 0278 shows that when respondents partially Nutritional Status significantly to Genesis supports Filariasis disease in Mimika district. This proves that the rise and fall of Nutritional Status of the respondents followed the rising incidence of disease filariasis in Mimika district. This indicates that the rise in disease incidence of filariasis in Mimika district must iimbangi to improve nutritional status of respondents. This is so that the respondent can tell close family and friends to not contract the disease [15-16].

Economic status of respondents (X2) positive and significant impact on the incidence of disease filariasis in Mimika district. Statistical analysis showed that the value t = 2,607 while the value probalility or (p) 0,000 <of α = 0.010. The regression coefficient respondents Economy Status (X2) valued at 0193 shows that partially the Economic Status of the respondents, a significant effect on disease incidence of filariasis in Mimika district. This proves that the rise and fall of the Economic Status of the respondents followed the rise and fall of Genesis Diseases Filariasis in Mimika district. Thus if the disease will reduce the incidence of filariasis in Mimika, the local government and the competent authorities must improve the economic status of respondents. Respondents Environmental Status (X3) positive and significant impact on the incidence of disease in the Mimika district Filariasis (Y). Results of statistical analysis showed that the value t = 3,963 and the value probalility or (p) = 0,000 <α = 0.05 coefficient of regression Environmental Status of Respondents (X3) positive value of 0.299 indicates that partially Environmental Status Respondents significant effect on the incidence of disease filariasis in Mimika district. This proves that the rise and fall of the Environment Status of Respondents employees followed the rise and fall of Genesis Diseases Filariasis in Mimika district or the rise and fall along with the rise and fall of the Environment Status of Respondents. Thus if an organization wishes to lower the incidence of disease filariasis in Mimika district would be nice if the Environment Status of Respondents were also improved [17-19].

1. Effect Simultaneous

Based on the results of statistical analysis using SPSS 21:00 it can be seen that together these three factors affect the incidence of disease filariasis in Mimika district, namely by showing the value of Adjusted R square of 0.292, or 29.2%, while 70.8% incidence of disease filariasis in Mimika district is influenced by other factors not observed. Thus the Nutritional Status of the respondent, the respondent Economic Status and Environmental Status of Respondents, have a strong influence on the incidence of disease filariasis in Mimika district. It shows that together these three variables can increase the incidence of disease filariasis in Mimika district, meaning that together can increase or decrease the incidence of disease filariasis in Mimika district. From this research we obtained information that the respondents Filariasis disease sufferers in Mimika district has been working to the maximum to be able to contribute in this study, however, the need for good research in view the capacity of respondents to be more efficiently on the remnants of their lives.

2. Factors Affecting Deployment Dominant Filariasis

Based on the results of the regression coefficient test analysis (determination) Nutritional Status respondents (X1) affect disease incidence of filariasis in Mimika district DS of 0.278 or significantly contribute to the

incidence of disease filariasis in Mimika district. Economic status of respondents (X2) based on the results of statistical analysis affect disease incidence of filariasis in Mimika district by 0193 or to contribute to the incidence of disease filariasis in Mimika district. While the Environmental Status of Respondents (X3) influence the incidence of disease filariasis in Mimika district by 0299, or a contribution of 29.9%. Thus the biggest factor affecting the incidence of disease filariasis in Mimika district is the Environmental Status of the respondents.

4. Conclusion

Based on the analysis that has been done in previous chapters, the authors conclude as follows:

1. Nutritional Status of the respondents have a positive and significant effect on the incidence of disease filariasis in Mimika district is evidenced by the results of statistical analysis of the value t = 3.750 and the value probalility or (p) = 0,000 <of α = 0.05

2. The Economic Status of respondents have positive and significant influence on the incidence of disease filariasis in Mimika district is evidenced by the results of statistical analysis that the value t = 2,607 while the value probalility or (p) 0,010 <of α = 0.05

3. Environmental Status of the respondents have a positive influence and significant impact on the incidence of filariasis disease in Mimika district is evidenced by the results of statistical analysis that the value t = 3,963 and the value probalility or (p) = 0,000 <of α = 0.05

4. Simultaneously or together three variables (Nutritional Status, Status of Economic and Environmental Status positive and significant impact on the incidence of disease filariasis in Mimika district is evidenced by the results of the statistical analysis of the value of Adjusted R square of 0.292, or 29.2%, while 70.8% incidence of filariasis disease is influenced by other factors not observed.

5. The dominant factor influenced the incidence of filariasis disease in Mimika district is the status of the environment or environmental factors on the incidence of the disease filariasis respondents. This is indicated by the value of the environmental status of Respondents (X3) influence the incidence of the disease filariasis by 0299 or a contribution of 29.9%.

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