



Socio-Economic and Environmental Risk Factors of Tuberculosis in Wonosobo, Central Java, Indonesia

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Abstract

This study discusses the dominant socio-economic and environmental risk factors for TB disease. The design of this study was a case-control study with 70 case samples and control with a contribution of $n = 1$. Variables from this study contacted personal, ventilation of the house, humidity, the temperature of the house, density of the house, kitchen, and family earnings. Multivariate data analysis uses multiple logistic regressions. The study notes that from 140 samples, 47% have basic education, and 30% are farmers. People who had a past of contact with TB cases were ten times more likely to contract TB than those who had no contacted (OR = 10.00; $p < 0.001$). Personalities who live in poorly ventilated homes who have a risk of contracting TB are 2.2 times greater than those who live in homes with standard ventilation (OR = 2.20; $p < 0.018$). The moisture increases the risk of TB by four times the low moisture (OR = 4.00; $p = 0.001$). Living in a house with a higher temperature of TB is 3.8 times higher than a lower temperature (OR = 3.80; $p = 0.009$). Living in a high population density of the house improves TB five times more than living in a lesser home (OR = 5.00; $p < 0.001$). Kitchen gas enhances the risk of TB 2.5 times greater than gasless (OR = 2.50; $p = 0.007$). Low family earnings raise the risk of TB three times greater than high family earnings (OR = 3.00; $p = 0.002$). A past of contact, poorly ventilated homes, high humidity, hothouse temperature, population density, kitchen gas, and low family earnings, are risk factors for TB in Wonosobo, Central Java.

Introduction

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis* (Gould and Brooker, 2018). According to Global Tuberculosis Control (WHO, 2011), states that there are 22 countries that approve countries with a high burden of pulmonary tuberculosis, including Indonesia, and in 2017 are still included in the 8 countries that have a high burden of TB. From year to year Indonesia is still the top rank in new TB cases. In 2017 6.4 million reported cases represent 64% of the total an estimated 10.0 million new cases have occurred. Ten countries accounted for 80% of the 3.6 million global gaps, the top three are

India (26%), Indonesia (11%) and Nigeria (9%) (WHO, 2018).

The epidemiological situation of TB in Indonesia noted that the prevalence of all types of TB by 285 per 100,000 population or approximately 660,000 cases of all strains of TB (WHO, 2012). The incidence of all TB cases is amounting to 189 per 100,000 population or approximately 430,000 cases. The incidence of smear-positive TB cases 183 366 new cases of smear-positive pulmonary TB, the number of new cases of smear-negative TB amounted to 101 247 cases and intrapulmonary amounted to 11 659. There are 28, 312 cases of child TB cases while TB 27 deaths per 100,000 populations, or about 64,000 deaths. This incidence continues to

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increase in 2018 approximately 319 per 100,000 populations. At present, Indonesia is included in the 8 overlapping countries between TB, MDR / TB and TB / HIV cases in 2018 (WHO, 2018).

In this study the incidence of pulmonary tuberculosis which mostly occurs in the productive age due to a number of risk factors including infections of Mycobacterium, direct contact with the patient, the level of socio-economic conditions seen by economic status with UMR as gold standard but according to (Senanayake *et al.*, 2018). Low socio-economic status negatively affected the lifestyle and social interactions of patients during the treatment period. Though competent treatment programs exist is still important to identify and mitigate risk factors associated with tuberculosis patients.

Acid Fast Bacterial (AFB) + case detection rate in Central Java province in 2010 was amounted to 54.2%, still far below the target of the invention is 75%. In Wonosobo regency morbidity due to TB in 2011 was 42.8%. Of the estimated cases of AFB (+) as many as 811 new cases of the invention is obtained only 347 cases of AFB (+). This figure is still far from the target estimated in Wonosobo regency. The lower the number the invention can increase the risk of incidence of TB were not netted, it has a close relation to the timeliness of TB treatment. Risk

factors for TB disease cannot be separated from the geographic and demographic conditions. Environmental conditions are not appropriate health standards is also a good place for the proliferation of bacteria such as TB bacteria (*Mycobacterium tuberculosis*). So we need an investigation related to environmental risk factors on the incidence of TB in Wonosobo regency to prevent further distribution.

Method

The population examined in this study was all individuals suspected which were found in the first trimester in January to March 2012 in Wonosobo. Cases were patients diagnosed with TB by laboratory confirmation by microscopic examination found AFB (+) in Wonosobo district health centers from January to March 2012. While control are people who are not diagnosed with TB, both clinically and with laboratory confirmation of the activities of daily services in Wonosobo district health center in January to March 2012 in the Wonosobo district.

To avoid confusion, the control will be adjusted by age (≥ 15 years), the time of diagnosis (within the same month). As for the control of confounding variables, the control will be adjusted (matching) with the case according to the location that is far, far away in the village area.

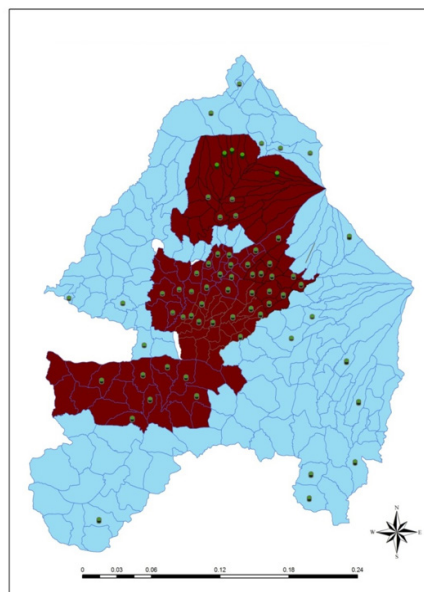


Figure 1. Map of the spread of TB cases AFB (+) Q1 2012 in Wonosobo

Sampling was conducted using the total sample of all TB cases AFB (+) adulthood in Wonosobo district in January to March 2012 as many as 70 cases. Taking control is done by simple random sampling (random) by rotating the pencil in front of the case house. Data was analyzed with univariate, bivariate analysis (chi-square test) and multivariate analysis with logistic regression.

Results and Discussion

Wonosobo regency is one of the districts located in the province of Central Java. Wonosobo regency is geographically located between 7° 11' and 7° 36' south latitude, 109° 43' and 110° 04' south longitude. Wonosobo is a mountainous area with an altitude ranging from 275 meters to 2,250 meters above sea level.

The total area of 98 468 hectares of Wonosobo regency, with the following biophysical conditions, slope of 3-8% 54.4 hectares, an area of 24768.1 hectares of 8-5%, 15-40% area of 42173.6 hectares and more than 40% area of 31 829 , 9 hectares. The average air temperature in Wonosobo between 14,30C -26,50C with average rainfall per year ranges between 1713-4255 mm / year. Generally Wonosobo have moisture class.

Based on the survey results revealed that the spread of TB cases AFB (+) 1st quarter of 2012 in the district of Wonosobo most in the middle of the district where there is a large health center health center including Wonosobo 1 Selomerto, Garung, Mojotengah. The following description of the spread of TB cases in Figure 1

A characteristic of respondents in this study is described in the univariate analysis.

Distribution of respondents by Location of Primary Health Care Services (PHC)

Table 1. Overview of respondents by Public health center in the first quarter of 2012

No.	PHC	Case	
		N	%
1	Kaliwiro	7	10
2	Kalibawang	0	0
3	Kejajar I	3	4.3
4	Kejajar II	2	2.9
5	Kepil I	4	5.7
6	Kepil II	0	0
7	I Leksono	5	7.1
8	Leksono II	1	1.4
9	Selomerto	10	14.3
10	Wadaslintang I	0	0

11	Wadaslintang II	1	1.4
12	kretek I	9	12.9
13	kretek II	1	1.4
14	Kalikajar I	2	2.9
15	Kalikajar II	0	0
16	Sapuran	1	1.4
17	Watumalang	0	0
18	Mojotengah	4	5.7
19	Sukoharjo I	1	1.4
20	Sukoharjo II	1	1.4
21	Garung	6	8.6
22	Wonosobo I	12	17.1
23	Wonosobo II	0	0
Total		70	100

Source: Primary Data, 2012

Distribution of patients with pulmonary tuberculosis at most is in Wonosobo I PHC amounted to 17.1% (12 people). Selomerto PHC with the number of patients reached 14.3% (10 people).

Distribution of respondents by characteristics

Characteristics of respondents viewed from several things including gender, age, educational status and employment status. The following is a description of the characteristics based on respondents in table 2.

Table 2. Overview of respondents by individual characteristics

Characteristics of respondents	Cases (n = 70)	Controls (n = 70)
Gender		
Man	33 (48%)	36 (51%)
female	37 (52%)	34 (49%)
Age (years)		
15-21	16 (23%)	14 (20%)
22-45	49 (70%)	51 (73%)
46-56	3 (4%)	2 (3%)
> 57	2 (3%)	3 (4%)
Level of education		
Primary School	33 (47%)	32 (45%)
Junior High School	26 (38%)	23 (33%)
Senior High School	6 (8%)	13 (19%)
College	5 (7%)	2 (3%)
Job status		
learner	5 (7%)	6 (9%)
House wife	17 (24%)	14 (20%)
farmer	21 (30%)	15 (21%)
Private	14 (20%)	26 (37%)
labor	10 (14%)	9 (13%)
Civil Servant	3 (4%)	0 (0%)

Source: Primary Data, 2012

Based on the survey results revealed that the majority of TB patients is female by

Table 3. Bivariate analysis of environmental risk factors on the incidence of pulmonary TB in Wonosobo

The risk factors	Case n = 70	Controlsn = 70	OR (95% CI)	P-value
Gender				
Man	37 (52.8%)	34 (48.5%)	1.2 (0.39 - 3.4)	0, 782
female	33 (47.1%)	36 (51.4%)		
Education				
basic education	26 (70%)	22 (30%)	1.0 (0.3 - 2.9)	1, 000
further Education	11 (30%)	52 (70%)		
Patients with a history of contacts with				
Yes	56 (80%)	20 (28.57%)	10 (4.29-23.70)	0, 000
No	14 (20%)	50 (71.48%)		
Altitude Region of residence				
> 750 asl	14 (20.71%)	15 (21.43%)	0.9 (0.39-.25)	0, 834
<750 asl	56 (79.29%)	55 (78.55%)		
Humidity Compliant				
Yes	38 (54.29%)	16 (22.86%)	4.0 (1.8-8.9)	0, 000
No	32 (44.71%)	54 (77.14%)		
House ventilation according to the standard				
Yes	39 (55.71%)	25 (35.71%)	2.26 (1.08-473)	0, 0175
No	31 (44.29%)	45 (64.29%)		
Density Residential				
Solid	41 (58.57%)	15 (21.43%)	5.1 (2.3-11.73)	0, 000
Compliant	29 (41.43%)	55 (78.57%)		
Economic Status				
Low	52 (74.29%)	34 (48.57%)	3.05 (1.4-6.6)	0, 0018
Enough	18 (25.71%)	36 (51.43%)		
Room temperature according to standard				
Yes	16 (22.86%)	5 (7.14%)	3.8 (1.2-14.2)	0009
No	54 (77.14%)	65 (92.86%)		
Distance from the house to the Health Facilities				
> 3 km	47 (67.14%)	40 (57.14%)	1.5 (0.7-3.3)	0, 222
<3 km	23 (32.86%)	30 (42.86%)		
Fuel wood use				
Wood	41 (62.1%)	25 (37.8%)	2.5 (1.2-5.3)	0, 006
Oil and gas	29 (39.1%)	45 (60.8%)		

Source: Primary Data, 2012

52%, while in the more control is male. Most respondents are in the age range of 22-45 years of age was 49%, demonstrating the productive age at most risk of TB disease.

TB patients most in Wonosobo regency most have low levels of education are up at the elementary school level by 47%, while in further education is high school and college level by 14%. Based on the status of work at most of the respondents were farmers by 30%. While

in control most types of jobs taken are private employees by 37%.

In this study, there are 11 environmental risk factors are thought to cause the incidence of TB. Relationships environmental risk factors with the incidence of TB were analyzed using bivariate analysis; the following is the result of research.

Based on the survey, results revealed that respondents comparison between male and

female are not much different, statistically no significant relationship with the occurrence of pulmonary TB with $P = 0.782$. Category educational status of respondents were classified into two basic educations (primary and secondary) and Advanced Education (high school and college), from the results of analysis show that there is no statistically significant relationship between education and the incidence of TB is evidenced by the p-value of 1.000.

Most of the respondents claimed to have had direct contact with TB patient before they get sick as many as 73.6%. So after a statistical test to know that there is a relationship between a history of contact with patients on the incidence of pulmonary tuberculosis with p-value 0.000

Environmental risk factors such as altitude area in Wonosobo regency varies based on median calculation of the overall height of the area in Wonosobo is between 450 to 2500 asl above sea level to obtain the value of 750 asl. Based on the characteristic note, there is no significant relationship between the heights of the TB incidence with p-value 0.0834.

Wonosobo regency is an area with high humidity. Values of moisture entry into the health standard is between 40-80%, so in this study is categorized into two humidity standards compliance with a value of 40-80% and is not compliant if the humidity is less than 40% or more than 80%. Based on the results of analysis show that there is a significant relationship between the humidity with a TB incidence with p-value 0.000

Ventilation meet health standards is more than 10% of the floor area of the house, based on the survey results revealed that home ventilation that does not comply with the standards a risk of TB incidence with statistical p-value of 0.0175.

The habit of living with a large family in one house is into consideration elections environmental risk factors in this study. Residential density standards based building a modest home that is at least 10 m² occupied by one person. Based on the survey results revealed many respondents who live in crowded house occupants by 58% so that statistically at risk of causing a pulmonary TB

with a p-value of 0.000.

Minimum wage employment (UMR) in Wonosobo regency is Rp 834 000, - so as to determine the economic status. This research is categorized into two, above, or below the minimum wage. Based on the survey results revealed that most respondents have incomes below the minimum wage is as much as 74%, so that there is a statistically significant relationship between low economic status with pulmonary TB incidence with p-value of 0.0018 on the other hand this research deference with (Setiarni, Sutomo and Hariyono, 2013), with result there is no relationship between economic status with lung tuberculosis case at adult in Public health center in Tuan-Tuan Ketapang region by p-value 0.082.

The room temperature can be measured by using a thermometer room with classification in accordance with health standards that temperatures between 20-25 °C. Based on the survey results revealed that the room temperature does not meet the standards that are at a temperature below 20 °C or above 25 °C higher risk of pulmonary TB incidence with p-value of 0.009.

Distance from the house to get to a health facility to health services becomes important environmental risk factors where the majority of TB patients have a house range of more than 3 km of existing health facilities, however in this study there was no statistically significant relationship.

More than half of the respondents in this study are still using firewood for cooking. It is a risk factor for the environment duet to air pollution risk of causing pulmonary TB incidence was supported by statistical results p 0.006. OR value of 2.5 indicates that the incidence of pulmonary TB 2.5 times greater in people who use firewood for cooking compared to people that use kerosene or gas.

Multivariable analysis was done to avoid the possibility of risk factors that are not statistically significant but biologically meaningful. The independent variables included in the bivariate analysis results of multivariable analysis is economic status, contact with patients, humidity, room temperature and cooking with firewood by using limit value $p = 0:25$. To search for a dominant value subsequent

Table 4. Multivariable analysis of environmental risk factors cause pulmonary TB using model 1

Characteristics	OR multi variable (CI)	p-value
Economy	2.33 (0.89-6.03)	0.082
Contact	8.78 (3.35-23.00)	0.000
Ventilation	1.73 (0.68-4.24)	0.248
Density residential	3.18 (1.20-8.14)	0.020
Humidity	5.39 (2.09-14.38)	0.001
Room temperature	7.64 (1.87-31.19)	0.005
Distance	1.23 (0.47-3.18)	0.660
Cooking with firewood	1.56 (0.60-4.04)	0.358

Table 5. Multivariable analysis of environmental risk factors cause pulmonary TB using model 2

Characteristics	OR Multi Variable (CI)	p-value
Contact	10.41 (4.08-26.57)	0000
Density residential	3.95 (1.56-9.98)	0004
Humidity	5.72 (2.16-15.11)	0000
Room temperature	6.66 (1.81-24.45)	0004

LR chi2 = 70.60

regression analysis of factors as shown in Table 4 below.

LR chi2 = 77.56 Based on the multivariable analysis known that the risk factors that influence to incidence of pulmonary TB in Wonosobo regency is direct contact with patients with $P = 0.000$, risk factors residential density with a value of $p = 0.020$, a risk factor for the air humidity in the house with a value of $P = 0001$ and the risk factors the temperature inside the house with a value of $P = 0.005$. and other variables greater than 0.05 were excluded from the analysis of modeling so do multivariable model 2 as follows in Table 5.

Variable dominant with incident infection with TB AFB (+) after the analysis of model 2 is contact with TB patients earlier with a value of $p = 0.000$ and $OR = 10:41$ (95% CI 4.08-26.57). From equation generating log likelihood of -61 741, Pseudo $R^2 = 0.3638$ and the overall percentage is 70.60%. By looking at the overall percentage 29.40% of cases are caused by other risk factors that are not netted in this study. The ability to predict the incidence of pulmonary TB infection AFB (+) is approximately 71%.

The results of observational studies study was conducted in 70 cases and 70 control respondents drawn from secondary data TB patients in Q1 2012, primary data collection through questionnaire interviews conducted over two months by using door to door home respondents. It is known that the research on

the relationship several risk factors with the incidence of infectious pulmonary TB, there are 3 (three) variable that is in contact with the patient, a room humidity and room temperature have a relationship that was statistically significant with the onset of pulmonary TB variables that do not have a relationship with the occurrence of TB infection lung ventilation is variable, economic status, population density, distance from the house to the health facilities, the use of fuel wood for cooking.

Here is an explanation regarding the 4 dominant factor affecting the incidence of TB such as Contact with patients, density residential, humidity and room temperature

Characteristics of study respondents.

Distribution of gender in all patients with TB in Wonosobo regency has the same ratio that is 51% female and 49% male. Statistically $p = 0782$, there are no differences between the male and female to develop TB in this study. This is in accordance with the opinion of (Crofton and Miller, 2002), that the events that affect the way the body against the tuberculosis bacillus is virtually no difference between male and female. However, this is not in line with recent research on the effect of age on TB that the prevalence of tuberculosis (TB) disease is higher in males (Fernandes *et al.*, 2018). The risk in men increases with the absence of smoking habits such as research conducted by (Setiarni, Sutomo and Hariyono, 2013), that the most dominant variable that is related to lung tuberculosis case

at adult in Public health center of Tuan-Tuan Ketapang region is smoking habit. Although in this study the level of education and economic status did not pose a risk of spreading TB but other studies said that an increase in economic status and education could improve prevention of the incidence of TB based (Rahayu *et al.*, 2017), on The dominant factors that influence the occurrence of TB are number of suspect, education and income.

Contact with patients

Contact with patients in this study was defined as a contact in one house. The survey results revealed that most of them admit that in one house there family members who have a history of previous TB disease. A total of 80% (56) make contact with people with TB. In bivariate analysis there is a statistically significant correlation with p value of 0.000. In multivariable analysis contact with patients is a risk factor most dominant with odd ratio 10:41 times greater than those who did not have contact history. Based on research conducted by (Hill *et al.*, 2006), household contact with TB patients conducted in The Gambia Africa had 6.2 times the risk of the p -value less than 0.0001. Active tuberculosis (TB) has a greater burden of TB bacilli than latent TB and acts as an infection source for contacts (Lee, 2016) and (Gil *et al.*, 2018).

History of contact with the patient must be special attention to pulmonary TB disease, because *Mycobacterium tuberculosis* is a very tiny aerobic bacteria that live in the air and can survive in sputum. Another excreta can be transmitted by the patient through aerosol droplets when cough and remove spark. So contact with patients who are active, especially in the family will be at risk to get greater exposure. The prevalence of smear-positive pulmonary tuberculosis in people with close household contact was 199.5 times more than that of the general population. The TB incidence was positively associated with the temperature, precipitation, and wind speed (all P -values < 0.05) (Moosazadeh, Khanjani and Parsaee, 2015). The risk factors for the development of TB, specifically in a high-risk population, should be targeted through the implementation of specialized interventions (Mohidem *et al.*, 2018).

Density residential

Results of univariate analysis showed that most of the respondents of both groups, have a number of occupants that is much in one house, where there are two families in one house or in one family having more than two children. The proportion of the cases as much as 58.57%, while the control group 21:43%. The results of the bivariate analysis showed an odds ratio of 5:18 values with 95% CI: 2.32-11.73 and $p = 0.0001$ statistically significant, so the variable density of occupancy have a relationship and a risk factor for pulmonary TB infection. Nevertheless the results of this study are different from the research that has been carried out by (Sejati and Sofiana, 2015), there was no relationship between the density of residential with tuberculosis proven by p value 0,422.

On multivariate analysis, earned value model 2 odds ratio of 3.95 with 95% CI: 1.59-9.98 and p .value: 0.004 statistically significant, so the population density variable in this study have a strong relationship and a risk factor for infectious pulmonary TB patient contact pulmonary TB AFB (+). The results are consistent with research (Ruswanto, Nurjazuli and Raharjo, 2012), about the condition of the house as a risk factor for pulmonary tuberculosis in Pekalongan, which concluded that those who stay at home with a high density has a 3.1 times greater risk of suffering from tuberculosis, when compared with no solid occupants. This variable meaningless because most cases and controls to stay at home or a room overcrowded and known to have a significant correlation with p -value 0.003. The TB incidence was positively associated with the temperature, precipitation, and wind speed (all P -values < 0.05) in recent population areas (Rao *et al.*, 2016).

Humidity

Tuberculosis is easily transmitted to housing conditions with high humidity levels. Results of univariate analysis showed that the majority of respondents of both groups, staying at home with humidity criteria to qualify. At the population level, we estimated that a small proportion (<20%) of transmission was attributable to household exposure (Martinez *et al.*, 2017). The proportion

of the respondents' case reached 55.29% while the control group reached 22.86%. However, approximately 44.71% of respondents of cases that are in the house with humidity conditions are not eligible. (Prasetyowati and Wahyuni, 2009), shows that there is an influence on the density of occupants against the occurrence of infection in TB with the risk for occurrence is 4.653 times compared to density occupants who meet the requirements

The results of the bivariate analysis showed an odds ratio of 4:07 values with 95% CI 1825-8926 and the value of $p = 0.001$ statistically significant. In this analysis humidity variables have a relationship with infectious pulmonary TB. Results of multivariable analysis model 2 shows that the value of the odds ratio 5.74 with 95% CI 2:16 to 15:11 and $p = 0.000$, which means statistically significant. This is in accordance with the opinion of (Nguyen, Schwartz and Dockery, 2014) which states that the humidity in the room needed to obtain comfort, where the optimum humidity range of 60% with a room temperature 22-30°C. Pulmonary TB germs will die quickly when exposed to direct sunlight, but can survive for several hours in the dark and damp (Mead, 2008).

The discomfort in a room strait caused by the increased air humidity, air movement that does not exist, where all of them that occur because of ventilation (Singh, Kashyap and Puri, 2018). To prevent the transmission of tuberculosis bacilli by (Lestari *et al.*, 2011), is recommended to reduce the discomfort in the room was crowded due to the humidity by providing adequate ventilation because if the house there is a pulmonary tuberculosis patient AFB(+) along with humid air, then people who are in contact with patients, 25-50% will be easily infected and total 5-15% of infected individuals with pulmonary tuberculosis mikrobacterium develop into active pulmonary tuberculosis.

Room temperature

This study measured the room temperature by using a thermometer room. It is known that the respondents lived in the indoor air temperature is not eligible health standards where the temperature is below 20 °C, but none exceeds 30 °C. Wonosobo regency has a fairly high humidity of 75-90%, which means the sun

shines is very little to the region of Wonosobo, accompanied by low temperatures.

Most respondents live in homes with an average room temperature below 20 °C or above 25 °C in the case of as much as 77.14% (54 people) and in control as much as 89.4% (65 people). With the odd ratio 3.8 times more likely to develop TB infection. Based on multivariable analysis model 2 is known that risk factors for ambient temperatures can cause unproprioate health by 6.60 times greater. This study related to (Fernandes *et al.*, 2017) that temperatures between 20 °C and 23 °C (72.4%; $p = <0.001$) Temperatures above 25 °C is the temperature of dry air which is closely related to patient contact, here bacteria mycobacterium tuberculosis will develop optimally at temperatures of dry, easily germs that enter the body through the nose of healthy people. While on the air subu under 20 °C can affect humidity levels where the higher the temperature, the humidity will decrease . More and more solar radiation in an area causing temperatures to rise and fall of air humidity. In the state of wet air temperature Mycobacterium tuberculosis will flourish (Gould and Brooker, 2018).

Conclusion

Age characteristics of the respondents are located mainly in the productive age (22-45years) amounted to 72.85% (51 people), by Gender has the same ratio between male and female. Status, most are primary school education 47% (33 people), and most work are as much as 30% of farmers (21people). Environmental risk factors influence statistically the incidence of TB include patients with a history of contact with $p = 0.000$, spacious house ventilation with a value of $p = 0.0175$, density residential home does not comply with the standard value of $p = 0.000$, room humidity is not appropriate standard with $p = 0.000$, room temperature is not in accordance with the standards, with $p = 0.009$, use of firewood for cooking, with $p = 0.006$. The risk factors of TB most dominant after multivariate analysis were contacts of patients with $p = 0.000$, density with a value of $p = 0.004$, humidity, with $p = 0.000$, temperature with $p = 0.004$ with the ability to predict the incidence of pulmonary tuberculosis if it is found to 4 risk factors proficiency level is at 71 5.

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