# The Influence of Education, Existence of Sufferers, and Ventilation with TB Incidence in Batak Etnics in Pematang Bandar Health Centre

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## Abstract

Bandar Manis Village is in area of Pematang Bandar Health Centre, with majority population is Batak Ethnics and have a high number of lung cases. This developed as an innovation of health care program for Pulmonary TB response by the name of GEROBAK TIKA (Local Activity of Ethical Cough Behavior) to make the village free of Pulmonary TB. The aims of this research to analyse the influence of education, the existence of sufferers, ventilation with TB incidence in Batak Ethnics people. This research using case-control design, cases are patients with Pulmonary TB and control is people who does not have Pulmonary TB. Sample cases are patients with Pulmonary TB who follow the treatment of TB at Pematang Bandar Health Centre amounted to 43 people and samples of control with the same amount taken from neighbors of nearby sufferers and performed matching of age and sex with analysis of chi-square test. The results showed no educational influence ($p$ = 0,515) and ventilation area ($p$ = 0,596) to Pulmonary TB incidence. There is a significant influence the existence of sufferers with the Pulmonary TB incident in the Batak Etnics in Pematang Bandar Health Centre ($p$ = 0,002) and OR = 9.89 ( 95% CI: 9,89-46,91).

***Keywords:*** *Pulmonary TB, Education, Ventilation, Existence of TB sufferers, Batak Etnics.*

## Introduction

Pulmonary TB is an infectious disease as a leading cause of morbidity and mortality around the world, especially in countries with lower-middle socioeconomics. According to WHO (2013), TB disease as the second sequence of death causes that have infected 9.4 million people and killed 1.7 million people in the world each year. Indonesia ranks second highest with the number of cases in the world's most TB incident, which is 391 per 100,000 inhabitants (WHO, 2017)[1]. Patients with TB disease in North Sumatera province in 2013 recorded as many as 22,627 people[2].

The home environment is one of the contributing factors in the spread of TB. TB germ can live within 1-2 hours to several days depending on the absence of sunlight, good ventilation, humidity, home temperature and the density of home occupancy. Occupancy density is the result of a spacious room with the number of occupants in one house. The size of the house that is not comparable to its occupants will result in high density of home occupancy.

Pulmonary TB disease in Indonesia is an infectious disease on the 2nd rank. One of the areas endemic to the pulmonary TB is North Sumatra with the prevalence rate of 794/1000, incidence rate 515/100,000 and deaths due to Pulmonary TB of 41/100,000 in 2017. In the Bandar Manis Village many people suffer from TB disease as many as 40 people, based on report head of Health Center Pematang Bandar. On August 10, 2018 Pematang Bandar Health Centre was declared the Bandar Manis Village as a TB Village, Bandar Manis Health Centre develops an innovation of Puskesmas program for TB disease under the name of the GEROBAK TIKA (Local Activity of Ethical Cough Behavior) with the aim of making the TB free village.

Most of the villagers of Bandar Manis are Batak people, according to the research of Bintang Y.M Sinaga (2014) indicates that there is a genotyping relationship with the vulnerability to the risk of pulmonary TB incidence there is a BB genotyping relationship compared to bb genotypes with OR = 0.22, (95% CI: 0.11-0.45). Most of the Batak tribes have Bb genotypes.

## Method

This research is conducted in Bandar Manis Village District health Centers of Pematang Bandar because this village is a village where many population suffer from TB and is designated as TB village.

This research is a longitudinal observational research with case-control design. Case is pulmonary TB patients, while the control is not suffering pulmonary TB, 43 samples as cases and 43 samples as controls. Samples of cases is all pulmonary TB sufferers who were having treatment in Pematang Bandar Health Centre. The sample control is taken from the nearest neighbor sample case which does not suffer Pulmonary TB. Data collection is conducted with interviews using questionnaires have tested the validity and reliability, which has been approved by the Ethics Committee of the Faculty of Nursing at the Universitas Sumatera Utara.

## Results

**The Influence of Education with TB Incidence in Batak Etnics in Pematang Bandar Health Centre**

**Table 1. The Influence of Education with TB Incidence in Batak Etnics in Pematang Bandar Health Centre**

| Latest Education | TB Disease | | | | P | OR (95% CI) |
|---|---|---|---|---|---|---|
| | Case | | Control | | | |
| | n | % | n | % | | |
| Low | 26 | 60,5 | 22 | 51,2 | 0,515 | 1,46 (0,62-3,43) |
| High | 17 | 39,5 | 21 | 48,8 | | |
| Total | 43 | 100 | 43 | 100 | | |

Based on the table above, the proportion of the respondents were low educated in the case group as much as 60.5%, this percentage is greater than the control group which is 51.2%. The proportion of sufferers who has a higher education lowered than sufferers in low education with higher educated sufferers this is in line with the theory that bias education affects the incidence of lung. According to Green theory said that education is a major factor in behavioral building. In general the higher a person's education will be have better behavior. But the results of the Chi-square test indicate there is no influence between education and Pulmonary TB ($p > 0.05$).

Research in line with research of Wang X et.,al in Tianjin, China on the risk factors of pulmonary TB from year 2006-2011 acquired *p*-value = 0.61, which means there is no influence level of education with the incidence of Pulmonary TB[3]. The research of Fitriani (2013) in the working area of Ketanggungan Health Centre Semarang obtained the *p*-value = 0.098 which means there is no influence of education with Pulmonary TB events[4].

Influence Existence of Sufferers, with TB Incidence in Batak Etnics in Pematang Bandar Health Centre

**Table 2. Influence Existence of Sufferers, with TB Incidence in Batak Etnics in Pematang Bandar Health Centre**

| Family Members Suffering from TB | TB Disease | | | | p | OR (95% CI) |
|---|---|---|---|---|---|---|
| | Case | | Control | | | |
| | n | % | n | % | | |
| Yes | 14 | 32,6 | 2 | 4,7 | 0,002 | 9,89 (9,89-46,91) |
| No | 29 | 67,4 | 41 | 95,3 | | |
| Total | 43 | 100 | 43 | 100 | | |

Based on the table above, the proportion of respondents who have family members who suffer from previous TB in the case group as much as 32.6%, this number is greater than the control group as much as 4.7%. The results indicate that there is influence of existence of family members who had suffered earlier TB with the incidence of Pulmonary TB in the respondent (*p*-value < 0.05). OR = 9.89 (95% CI :2.09-46,91). Respondents who had family members suffered from pulmonary TB 9.89 times have the risk of pulmonary TB compared to those who did not have family members suffering from pulmonary TB.

This is in line with the research of Budi I, et,al (2018), showed that there is an influence of TB history in the family with the incidence of pulmonary TB ($p$-value = 0.001)[6]. Contact history with sufferers TB affects the incidence of pulmonary TB, this is in line with the Ministry of Health of the Republic of Indonesia where living together continuously with the sufferers of pulmonary TB will spreading the germ to the air in the form of splashes sputum[7].

The degree of transmission of TB in the family environment of the sufferer can transmit to 2-3 people in their home. While the risk of transmission to their neighborhood with the sufferer more than 1 person with TB is 4 times compared to households with only 1 person TB. This occurs because there are TB sufferers in the home and surrounding areas increase the frequency and duration of contact with TB, which is an important factor of TB pathogenesis[8].

Houses that have a high density of housing will be at risk of developing TB disease because the air circulation in the housing with a high density has an effect on the moisture of the house so that the germ Tuberculossis easily develop and scattered in the house that have a high dense of people.

The Influence of Ventilation with TB Incidence in Batak Etnics in Pematang Bandar Health Centre

**Table 3. The Influence of Ventilation with TB Incidence in Batak Etnics in Pematang Bandar Health Centre**

| Variable | TB Disease | | | | p | OR 95% CI |
|---|---|---|---|---|---|---|
| | Case | | Control | | | |
| | n | % | n | % | | |
| Good | 10 | 23,3 | 8 | 18,6 | 0,596 | 1,326 0,47-3,77 |
| Not good | 33 | 76,7 | 35 | 81,4 | | |
| Total | 43 | 100 | 43 | 100 | | |

According to the table above, it can be noted that the ventilation area is good in the respondents case of 23.3% while the respondents control 18.6%, the ventilation area is not good for respondents a case of 76.7% while the control is 81.4%, with the $p$-value = 0,596 which means there is no influence between the area of ventilation with TB disease.

This is in line with the research of Rosiana (2013) in Kedungmundu Health Centre Semarang which means there is no influence between the ventilation area with the occurrence of TB Paru ($p$ = 0,569)[9]. Supported also by the research of Sidiq, N et al (2011) at Somba Opu Health Centre, Sulawesi obtained the value OR = 1,220 (95% CI: 0,35-4,22)[10].

Izzati et al (2015) research in the working area of Andalas Health Centre, the $p$-value = 0,324 which means there is no influence between the area of ventilation with the incidence of TB[11]. Ventilation serves to relieve room air from pathogenic bacteria, good ventilation always occurs continuous flow of air so that the bacteria do not last long in the house[12-14].

## Conclusion

No educational influence ($p$=0.515) and ventilation area ($p$=0.596) with pulmonary TB incidence. There is influence of family members suffering Pulmonary TB with incidence of Pulmonary TB ($p$=0.002).

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Conflict of interest : authors declare no conflict of interest within this study

**Ethical Clearance**- Taken from University Ethical committee

**Conflict of Interest**– Nil

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