Factors that affect on the Event of Lung TB in Jati Kudus Health Center

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Factors that affect on the Event of Lung TB in Jati Kudus Health Center

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Abstract

Pulmonary tuberculosis is an infectious disease caused by Mycobacterium tuberculosis, which can attack the lungs and other organs. Pulmonary tuberculosis is still one of the world's public health problems even though TB control efforts have been implemented in many countries since 1995. The target of the national pulmonary TB prevention program is eliminated in 2035 and Indonesia free from pulmonary TB in 2050. Purpose of Research, this is to find out the factors that influence the incidence of pulmonary tuberculosis in the Jati Health Center Area. This study uses secondary data taken from data from the Jati Health Center and the analysis in this study uses the CHAID Exhaustive method. The results of this study indicate that the number of pulmonary tuberculosis patients with a positive smear suspicion when viewed from the type of sufferers is mostly new cases as many as 216 people. Associated with the type of patient who came for treatment at the Teak Health Center, all patients seeking treatment received a cure category of 99.6% which is a new patient treatment category. So the factors that influence the incidence of pulmonary tuberculosis are the type of patient and treatment results.

Keyword: *exhaustive CHAID, tuberculosis, treatment results, type of sufferer*

Introduction

Pulmonary tuberculosis is an infectious disease caused by Mycobacterium tuberculosis, which can attack the lungs and other organs. Lung tuberculosis is still one of the world's public health problems even though TB control efforts have been implemented in many countries since 1995. The national pulmonary TB prevention program targets are eliminated in 2035 and Indonesia free from pulmonary TB in 2050. (1)

Data from World Health Organization(2) states that every year, millions of people in the world have been infected with pulmonary tuberculosis. One of the countries with the most pulmonary TB sufferers in the world is Indonesia. The population reported with the highest cases (43% of the total number of pulmonary tuberculosis cases in Indonesia) is found in the provinces of West Java, Central Java and East Java.(3)

The notification rate for all cases of pulmonary TB in the population of Central Java Province in 2017 is 132.9 per 100,000 population, this shows that the discovery of pulmonary TB cases in Central Java has increased compared to 2016 which was 118 per 100,000 population. (4) Data on pulmonary TB cases that obtained from 19 public health centers in the Kudus Regency area in 2014 stated that as many as 495 people were infected with pulmonary tuberculosis. (5)

Method

This study uses secondary data taken from data from the Jati Health Center. The population in this study was all people in the working area of the Jati Health Center who came for treatment at the Puskesmas and conducted sputum checks. While the sample in this study is the entire community in the work area of the Jati Health Center with the incidence of pulmonary tuberculosis.

The analysis in this study used the CHAID Exhaustive method. Exhaustive CHAID is an exploration method for classifying data by building a classification tree that can provide information in the form of independent variables that significantly influence the dependent variable. Exhaustive CHAID has three stages, namely: the merging stage, the splitting stage, and the stoping stage.[6]

The dependent variable in this study is the incidence of pulmonary tuberculosis. While the independent variables in this study are age, sex, type of patient, and treatment results.

Result

Characteristics of Respondents

Of the 313 research subjects, their characteristics can be seen in the table below:

Table 1. Characteristics of Research Subjects

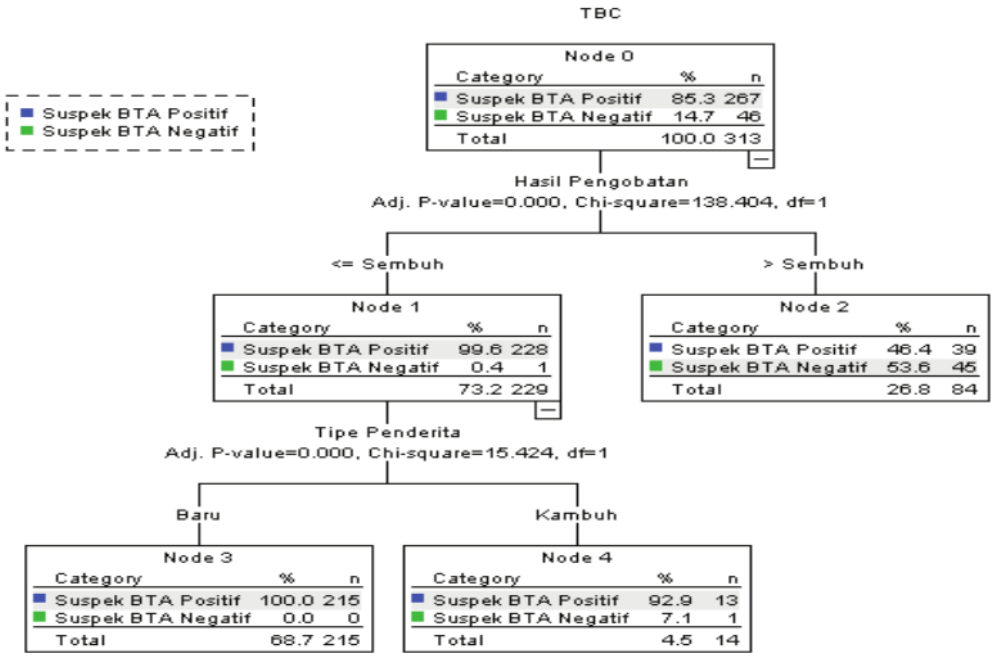
Number		Karakteristik Data	f	(%)
		Age		
1	-	<= 25 Years	72	23.0
	-	> 25 Years	241	77.0
		Sex		
2	-	Male	173	55.3
	-	Female	140	44.7
		Type of Sufferer		
3	-	New sufferer	299	95.5
	-	sufferers relapse	14	4.5
		Treatment results		
4	-	Heal	229	73.2
	-	Complete Treatment	84	26.8

Independent Variables that Affect the Incidence of Lung TB

Table 2. Variable Significance Test
Model Summary

	Growing Method	EXHAUSTIVE CHAID
Specifications	Dependent Variable	Tuberculosis
	Independent Variables	Age, Sex, Type of sufferer, Treatment result
	Validation	None
	Maximum Tree Depth	3
	Minimum Cases in Parent Node	10
	Minimum Cases in Child Node	5
Results	Independent Variables Included	Treatment result, Type of sufferer
	Number of Nodes	5
	Number of Terminal Nodes	3
	Depth	2

The results of the Exhaustive CHAID analysis showed that the independent variables that significantly affected the incidence of pulmonary tuberculosis were the treatment outcome variable and the type of sufferer. While gender and age variables do not affect the incidence of pulmonary TB, so these variables are automatically discarded. The number of nodes formed is 5 (five) pieces, the number of terminal nodes is 3 (three) pieces and the depth of the trees formed there are 2 (two) branches.



Classification of the CHAID Exhaustive Method

Figure 1. Exhaustive CHAID Classification Of Tree Diagram

Figure 1 shows that from a sample of 313 people studied, the results obtained were 267 patients with positive smear suspected (85.3%) and 46 patients with negative smear suspected (14.7%). The treatment outcome variable is the best predictor variable to explain the incidence of pulmonary tuberculosis, so the variable is used as an insulating variable. The treatment outcome variable is divided into two nodes (nodes 1 and 2), node 1 is the patient whose treatment results is cured. For node 2 is a patient with complete treatment.

At node 1, it is continued by patient type variables which are divided into two nodes (nodes 3 and 4) with a recurrence category (node 3) and a new category (node 4). Whereas on the second node, the partitioning process is stopped because all cases contained in the node have identical values for each predictor variable, so the second node becomes the last node.

The accuracy of the CHAID Exhaustive Method Classification

Table 3. Accuracy of Classification *Exhaustive* CHAID Methods

Classification

Observed	Predicted		
	BTA Positive Suspect	**BTA Negative suspect**	**Percent Correct**
BTA Positive Suspect	228	39	85.4%
BTA Negative Suspect	1	45	97.8%
Overall Percentage	73.2%	26.8%	87.2%
Growing Method: EXHAUSTIVE CHAID Dependent Variable: Tuberculosis			

Table 3 is a classification performance evaluation can be determined by looking at the overall accuracy value generated in the Exhaustive CHAID analysis of 87.2%. The accuracy between observations and predictions for the incidence of pulmonary tuberculosis with a positive smear suspect category was 85.4% with mis-classification errors of 14.6%. While the accuracy between observations and predictions for the incidence of pulmonary tuberculosis with a negative smear suspected category was 97.8% with mis-classification of 2.2%.

Discussion

In this study respondents aged <= 25 years were 72 (23%), while those aged> 25 years were 241 (77%). This shows that in terms of age, respondents in the work area of the Teak Health Center were mostly of productive age. This is consistent with previous WHO reports two-thirds of TB cases occur in the economically productive age group, which is 15 - 59 years. [7]

In this study, respondents who were male were 173 (55.3%), while those who were female were 140 (44.7%). This shows that the average gender of pulmonary TB respondents in the Jati Health Center area is male. Similar to the results of research from Susilayanti et al in BP4 Lubuk Alung, respondents were male as many as 784 (70.8%), while those who were female were 324 (29.2%). [8]

Other studies have shown that men are more susceptible to M. tuberculosis infection. This can be related to greater smoking habits in men, which causes interference with the respiratory system immunity so that it becomes more susceptible to infection. Disturbances in the respiratory tract immunity can be in the form of mucociliary damage due to toxic cigarette smoke and decrease the response to antigens, thereby increasing the susceptibility to pulmonary tuberculosis.[9]

The number of pulmonary TB patients with suspected smear positive when viewed from the type of sufferer mostly in the form of 216 new cases. This is probably due to the number of patients who come to the Puskesmas Jati who have never come for treatment and have never received pulmonary TB treatment. The results of this study are consistent with Karolina's research at the Kabanjahe Health Center in Karo District that the largest proportion of pulmonary TB sufferers in new cases is 97.5%.[10]

In addition to new cases, the number of pulmonary TB sufferers with suspected smear positive also there were 92.9% recurrence patients. Results This study is in accordance with research Sukmaningtyas, et al [11] that patients who complete treatment with less / more than 6 months (not on time) have a 5% risk of recurrence to

patients who complete treatment exactly 6 months. In a systematic review study, the largest recurrence rate occurred in India, which was 10%, which is the highest among other Countries.[12]

Associated with the type of patient who came for treatment at the Jati Health Center, all patients seeking treatment received a cure category of 99.6% which is a new patient treatment category. The choice of treatment category adjusts to the type of patient and the result of smear examination. Research by Laily et al[13] at the Tuminting Health Center in Manado showed that 194 patients had been treated regularly (99%) and the remaining 2 patients (1%) had irregular treatment. This shows that the awareness of the Tuminting community for treatment and recovery is good. Regularity of treatment is closely related to the results of treatment to be achieved by patients.

Conclusion

1. Patients with pulmonary TB who are suspected of having BTA positive who seek treatment at Jati Health Center are mostly of productive age.

2. Patients with pulmonary TB with suspected BTA positive who seek treatment at Jati Health Center are mostly male.

3. Factors that influence the incidence of pulmonary TB in the Jati Health Center area are the type of patient and treatment outcome.

4. In general, the type of pulmonary TB sufferers with the most positive smear suspects found in Jati Health Center are new cases and relapse sufferers.

Suggestion

It is necessary to educate the public about the pulmonary TB disease, so that they know the cause of pulmonary TB disease. In addition, the community must also prevent pulmonary tuberculosis by maintaining a healthy environment and promptly taking treatment if there are symptoms of pulmonary TB disease, so it is not transmitted to others.

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References

1. Regulation of the Minister of Health of the Republic of Indonesia Number 67 Year 2016 concerning Tackling Tuberculosis. [Internet] http://hukor.kemkes.go.id/uploads/produk_hukum/PMK_No._67_ttg_Penanggulangan_Tuberkolosis_.pdf
2. World Health Organization (WHO). *Global Tuberculosis Report 2017*. Switzerland; 2017. [Internet] https://www.who.int/tb/publications/global_report/gtbr2017_main_text.pdf
3. Ministry of Health of the Republic of Indonesia. *Indonesian Health Profile for 2017*. Jakarta: Ministry of Health of the Republic of Indonesia; 2018. [Internet] https://www.depkes.go.id/resources/download/pusdatin/profil-kesehatan-indonesia/Data-dan-Informasi_Profil-Kesehatan-Indonesia-2018.pdf
4. Central Java health office. Health Profile of Central Java Province 2017. Semarang: Central Java Provincial Health Office; 2018. [Internet] http://dinkesjatengprov.go.id/v2018/dokumen/profil_2018/mobile/index.html
5. Kudus Health Service. Kudus District Health Profile 2015. Kudus: Kudus District Health Office; 2016. [Internet] https://www.depkes.go.id/resources/download/profil/PROFIL_KAB_KOTA_2015/3319_Jateng_Kab_Kudus_2015.pdf
6. Bagozzi RP. *Advanced Methods of Marketing Research*. Oxford: Blackwell Publishers Ltd; 1994.
7. World Health Organization. WHO Report 2011: Global Tuberculosis Control; 2011. Hal: 3 (diunduh 2 Maret 2013). [Internet] http://www.who.int/tb/publications/global_report/en/
8. Susilayanti EY, Medison Irvan, & Erkadius. Profile of Positive AFB Lung Tuberculosis Patients Discovered in Lubuk Agung BP4 from January

2012 - December 2012. *Andalas Health Journal*. 2014; 3(2). [Internet] http://jurnal.fk.unand.ac.id/index.php/jka/article/view/69

9. Iskandar. Relationship between Characteristics of Patients, Physical Environment, Houses and Regions with the Incidence of Pulmonary Tuberculosis in Southeast Aceh District in 2009 [Thesis]. Faculty of Public Health, University of North Sumatra; 2010. [Internet] https://text-id.123dok.com/document/6zkwowmz-hubungan-karakteristik-penderita-lingkungan-fisik-rumah-dan-wilayah-dengan-kejadian-tuberkulosis-paru-di-kabupaten-aceh-tenggara-tahun-2009.html
10. Karolina. Characteristics of Positive AFB Lung Tuberculosis Patients Completed Following the DOTS Strategy Treatment Program at the Kabanjahe Health Center in Karo District in 2005-2007 [Thesis]. USU FKM Medan; 2007. [Internet] https://pdfs.semanticscholar.org/3bec/103b2ba42881e385470bd5d9cb51f4b449a1.pdf
11. Sukmaningtyas N, Rintiswati N, Ahmad RA. Predictors of Tuberculosis Recurrence Factors in Bantul Regency. *BKM Journal of Community Medicine and Public Health*. 2016; 32(9): 303-308.
12. Azhar GS. DOTS for TB relapse in India: A systematic review. *Lung India: official organ of Indian Chest Society*. 2012 Apr-Jun; 29 (2): 147-153. Do: 10.4103/0970-2113.95320.
13. Laily DW, Rombot DV, Lampus BS. Characteristics of Lung Tuberculosis Patients in Tuminting Health Center Manado. *Journal Kedokteran Komunitas Dan Tropik*. 2015 Feb; 3 (1).

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