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Risk Factors Related to Death of Tuberculosis Patients in Ciparay Health Center Bandung District Year 2022-2024

Ahmad Zaelani, Nurjamilatunnisa, Resmawati, Nanda Berliana Tania Fidzikri
Public Health Study Program, STKINDO Wirautama
Zaelaniahmad64@gmail.com

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Abstract
All over the world there must be an infectious and deadly disease, namely tuberculosis, which has many risk factors including, socioeconomics, education, age, income, gender, smoking habits, home environment conditions, making contacts and many others, the purpose of this study is to find out what factors are associated with the death of tuberculosis patients in the Ciparay Health Center, Bandung Regency, Case control is a research design used in this study assisted by questionnaires for data collection techniques, in this study as many as 82 respondents were involved as respondents, in this study the analysis used to multivariate and use binary logistic regression test, the results of this study the risk of death of tuberculosis patients is smoking with an odds ratio value (p=0.024, OR 7.273, and 95%CI: 1.298-40.757) if it is concluded that tuberculosis patients who are smokers will be at risk 7 times to experience death compared to tuberculosis patients who are not smokers, therefore it is immediately to stop smoking activities for tuberculosis patients, besides that there are other types of variables, namely the physical condition of the house (p=0.008), comorbidities in tuberculosis patients (p=0.006), gender (p=0.013), history of tuberculosis (p=0.010), and BCG immunization (p=0.002).

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Introduction

Tuberculosis is a disease that is an international problem, all over the world agree that among chronic diseases is Tuberculosis, where the cause is the bacterium Mycobacterium tuberculosis, where transmission can be through the air produced from droplets of tuberculosis patients, Tuberculosis disease if not treated properly will cause complications such as pleurisy, pleural effusion, laryngitis and intestinal TB. TB is the leading cause of death among infectious diseases (Oqui et al., 2024), (Prayudianto, 2022), (Diantara et al., 2022), (Indonesian Ministry of Health, 2022). WHO Global TB Report 2020, 10 million people in the world suffer from tuberculosis and cause 1.2 million deaths each year, in 2018, nearly 10 million people worldwide suffered from TB and 1.5 million people died from the disease. (WHO)

The prevalence of tuberculosis in Indonesia again ranks third after India and China at nearly 700,000 cases, with a mortality rate that remains at 27 per 100,000 population. According to WHO in the Global Tuberculosis Report 2017. (WHO). In 2013, tuberculosis deaths reached 1.25 million and 161,000 of them were people with HIV, tuberculosis is an infectious disease and can be deadly for every sufferer, but three years around 2019 to 2021 the death rate of tuberculosis is replaced by covid 19 infections (WHO).

One of the countries with the most tuberculosis patients is Indonesia with 845,000 sufferers and a mortality rate of 98,000 as well as the death of 11 people per hour, from these data 67% of sufferers are in the process of treatment but as many as 283,000 tuberculosis sufferers have not received treatment so they are at risk of transmitting to those around them (Christy, Susanti, & Nurmainah, 2022), (Indonesian Health Profile, Indonesian Ministry of Health 2023). Based on the health profile in Indonesia in 2022, (Indonesian Health Profile, Indonesian Ministry of Health 2022) the incidence of tuberculosis was 368,337 patients. The highest incidence rate was in West Java Province with 71,819 patients and the lowest incidence rate was in North Kalimantan Province with 1,145 patients (Rasyid, Dewi, & Inayati, 2025). Based on data from the West Java Provincial Health Office (2023 data plus February 1, 2024), West Java currently has an estimated 233,334 new Tuberculosis cases or 22% of the total national cases. The six regions with high TB burden are Bogor Regency, Sukabumi Regency, Bandung Regency, Bandung City, Bekasi Regency, and Bekasi City (Wahyuni & Sudrajat, 2024)

In 2022, there were 10,650 patients, consisting of 5,660 males and 4,990 females, and there were 3,266 tuberculosis patients in the child age (0-14 years), bacteriologically confirmed tuberculosis as many as 1,990 patients, clinically confirmed tuberculosis 5,692, extrapulmonary 1,76 (Health profile of Bandung Regency, 2022). Bandung Regency has 62 health centers that function as institutions responsible for the technical implementation of health development in the region (Nuraeni & Rinaldi, 2024). Data on cases of tuberculosis patients recorded at the Ciparay Health Center, Bandung Regency from 2020 to 2024 recorded 80 people, the number of deaths of tuberculosis patients in the working area of the Ciparay Health Center, Bandung Regency recorded 19 people (CFR 31.67%).

Tuberculosis has various types of risks, including socioeconomics, education, age, income, gender, smoking habits, home environment conditions, making contacts and many others Sunita A (2018). The high number of tuberculosis cases in Indonesia has prompted WHO to warn developing countries, including Indonesia, to develop strategies to tackle tuberculosis. The government attempted to carry out 6 national strategies for tuberculosis elimination as stated in Presidential Regulation number 67 of 2021

concerning Tuberculosis control (Cahyaningrum, Ka'arayeno, Woli, & Kurniawan, 2025). Efforts towards tuberculosis elimination in Indonesia by 2030 as mandated in the RPJMN 2020-2024 and the national strategy for tuberculosis control 2020-2024 and interim plan 2025-2026.

Method

Case control is the research design used in this study, the method is to compare cases of tuberculosis patients with controls who are not tuberculosis patients, the saving is to look retrospectively or look back (Nugrahaeni and Mauliku 2011). The research data used are different data from TB registers 01, 04 and 06 at the Ciparay Health Center, Bandung Regency.The actual population in this study were all TB patients at the Ciparay Health Center in Bandung Regency who were registered in TB registers 01, 04 and 06 at the Ciparay Health Center in Bandung Regency. At the time of sample selection, patients who died were selected, and the controls were TB patients who recovered in the same year. Outcome measurements were conducted simultaneously with exposure measurements in the population. The sample in this study were all tuberculosis patients who died in the working area of the Ciparay Health Center, Bandung Regency in 2022-2024, totaling 19 people.

Researchers set the ratio of cases: control = 1: 3, so that from the above calculations the researcher gets a minimum sample size of 76 samples, plus 10% for the effect of non-response / lost to follow up to 82 respondents in this study.

Result and Discussion

1. Result

Univariate Analysis

Table 1
Frequency Distribution of Cases and Controls

Variable	Category	Mortality of Pulmonary TB Patients				Total	
		Control (Healed)		Case			
		n	%	n	%	N	%
Gender	Female	30	47.6	3	15.8	33	40.2
	Male	33	52.4	16	84.2	49	59.8
	Total	**63**	**100**	**19**	**100**	**82**	**100**
Age	<20 Years	16	25.4	4	21.1	20	24.4
	>=20 Years	47	74.6	15	78.9	62	75.6
	Total	**63**	**100**	**19**	**100**	**82**	**100**
Jobs	Workers	21	33.3	3	15.8	24	29.3
	Labor	42	66.7	16	84.2	58	70.7
	Total	**63**	**100**	**19**	**100**	**82**	**100**
BCG Vaccine	Yes	36	57.1	3	15.8	39	47.6
	No	27	42.9	16	84.2	43	52.4
	Total	**63**	**100**	**19**	**100**	**82**	**100**
Comorbid	No	39	61.9	5	26.3	44	53.7
	Yes	24	38.1	14	73.3	38	46.3
	Total	**63**	**100**	**19**	**100**	**82**	**100**
Previous history of TB	No	31	49.2	3	15.8	34	41.5
	Yes	32	50.8	16	84.2	48	58.5
	Total	**63**	**100**	**19**	**100**	**82**	**100**
Revenue	>= 4.039.067	12	19.0	5	26.3	17	20.7
	< 4.039.067	51	81.0	14	73.7	65	79.3
	Total	**63**	**100**	**19**	**100**	**82**	**100**
Smoking	No	32	50.8	3	15.8	35	42.7
	Yes	31	49.2	16	84.2	47	57.3
	Total	**63**	**100**	**19**	**100**	**82**	**100**
Education	High	31	49.2	7	36.8	38	46.3
	Low	32	50.8	12	63.2	44	57.7
	Total	**63**	**100**	**19**	**100**	**82**	**100**
Physical Condition of the House	Healthy Home	47	74.6	8	42.1	55	67.1
	Unhealthy House	16	25.4	11	57.9	27	32.9
	Total	**63**	**100**	**19**	**100**	**82**	**100**

a. 33 (52.4%) were control group respondents who were male, 16 (84.2%) were case group respondents who were dominated by male respondents.
b. 47 (74.6%) were control group respondents aged ≥20 years, 15 (78.9%) were case group respondents dominated by respondents aged ≥20 years.
c. 42 (66.7%) were control group respondents whose type of work was a laborer, 16 (84.2%) were case groups dominated by respondents whose work was a laborer.
d. 36 (57.1%) were control group respondents who received BCG vaccine, 16 (84.2%) were case group dominated by respondents who did not receive BCG vaccine.
e. 39 (61.9%) were control group respondents who did not have comorbidities, 14 (73.3%) were case group dominated by respondents who had comorbidities.
f. 32 (50.8%) were control group respondents who had a previous history of tuberculosis, 16 (84.2%) were case group respondents who had a previous history of tuberculosis.

g. 51 (81.0%) were control group respondents whose income was <4,039,067, 14 (73.3%) were case group respondents whose income was <4,039,067.
h. 32 (50.8%) were control group respondents who did not smoke, 16 (84.2%). were case groups dominated by respondents who smoked.
i. 32 (50.8%) were control group respondents who had low education, 12 (63.2) were case groups dominated by respondents who had low education.
j. 47 (74.6%) were control group respondents who had healthy physical house conditions, 11 (57.9) were case groups dominated by respondents who had unhealthy physical house conditions.

Bivariate Analysis

Table 2
Bivariate Analysis of Risk Factors with Mortality of Tuberculosis Patients

Variable	*p-Value*	OR	CI (95%)	Description
Gender	0.013	4.848	1.284-18.306	Candidate
Age	0.699	1.277	0.369-4.413	-
Jobs	0.141	2.667	0.698-10.182	-
BCG Vaccine	0.002	7.111	1.880-26.894	Candidate
Comorbid	0.006	4.550	1.454-14.237	Candidate
Previous history of TB	0.010	5.167	1.369-19.503	Candidate
Revenue	0.717	0.659	0.199-2.186	-
Smoking	0.007	5.505	1.458-20.782	Candidate
Education	0.343	1.661	0578-4.769	-
Physical Condition of the House	0.008	4.039	1.381-11.810	Candidate

a. After the chi-square test, the variable of gender with the death of tuberculosis patients statistically has a relationship obtained p value (0.013) <α (0.05). With an OR = 4.848 (95%CI; 1.284-18.306), respondents who were male had a risk of death of tuberculosis patients 4.848 times greater than respondents who were female.
b. After the chi-square test, the age variable with the death of tuberculosis patients statistically has no relationship obtained p value (0.699) >α (0.05). With an OR value of 1.277 (95%CI; 0.369-4.413), the conclusion is that there is no influence of age on the death of tuberculosis patients.
c. After the chi-square test was conducted, the employment variable with the death of tuberculosis patients statistically did not have a relationship obtained p value (0.141) >α (0.05). With OR=2.667 (95%CI; 0.698 10.182), the conclusion was that there was no effect of occupation on the death of tuberculosis patients.
d. After conducting the chi-square test, the BCG vaccine variable of death of tuberculosis patients statistically has a relationship obtained p (0.002) <α (0.05). With an OR = 7.111 (95%CI; 1.880-26.894), respondents who did not get the BCG vaccine had a risk of death of tuberculosis patients 7.111 times greater than respondents who received the BCG vaccine.
e. After the chi-square test, the comorbidity variable with the death of tuberculosis patients statistically has a relationship obtained p (0.006) <α (0.05). With an OR = 4.550 (95%CI; 1.454-14.237), respondents who had comorbid or accompanying diseases had a risk of death of tuberculosis patients 4.550 times greater than respondents who did not have comorbid or accompanying diseases.
f. After the chi-square test, the variable of previous history of tuberculosis with the death of tuberculosis patients statistically has a relationship obtained p (0.010) <α

(0.05). With an OR = 5.167 (95%CI; 1.369-19.503), respondents who had a previous history of tuberculosis had a risk of death of tuberculosis patients, which was 5.167 times greater than respondents who did not have a previous history of tuberculosis.

g. After conducting the chi-square test, the income variable with the death of tuberculosis patients statistically has no relationship obtained p value (0.717) >α (0.05). With an OR= 0.659 (95%CI; 0.199-2.186), the conclusion is that there is no effect of income with the death of tuberculosis patients.
h. After the chi-square test, the variable of smoking with the death of tuberculosis patients statistically has a relationship obtained p value (0.007) < α (0.05). With OR = 5.505 (95%CI; 1.458-20.782), respondents who smoked had a risk of death of tuberculosis patients 5.505 times greater than respondents who did not smoke.
i. After the chi-square test, the education variable with the death of tuberculosis patients statistically did not have a relationship obtained p value (0.343) > α (0.05). With an OR value of 1.661 (95%CI; 0.578-4.769), the conclusion is that there is no effect of education on the death of tuberculosis patients.
j. After the chi-square test, the variable of physical condition of the house with the death of tuberculosis patients statistically has a relationship obtained p value (0.008) < α (0.05). With an OR=4.039 (95%CI; 1.381-11.810), respondents who lived in unhealthy houses had a 4.039 times greater risk of death of tuberculosis patients compared to respondents who lived in healthy houses.

Multivariate Analysis

Multivariate analysis in this study was used to see the modeling between variables related to the occurrence of death of pulmonary Tuberculosis patients in the ciparay Health Center work area, Bandung Regency using multiple logistic regression analysis of the binary logistic model.

Full Model/Candidate Model/Multivariate Initial Model

Table 3

Multivariate Logistic Regression Analysis of candidate model variables/Full Model

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)	95%C.I.forEXP(B)	
							Lower	Upper
Gender	1.744	0.870	4.018	1	0.045	5.719	1.039	31.470
BCG Vaccine	1.913	0.798	5.744	1	0.017	6.775	1.417	32.388
Comorbid	1.254	0.753	2.770	1	0.096	3.503	0.800	15.334
Previous history of TB	1.417	0.838	2.859	1	0.091	4.123	0.798	21.296
Smoking	1.984	0.879	5.091	1	0.024	7.273	1.298	40.757
Physical Condition of the House	1.120	0.762	2.161	1	0.142	3.064	0.689	13.630

In table 3, variables that have P-value > 0.05 are removed one by one from the model starting from the largest p-value. If after removing the variable it results in a change in the OR of another variable >10% then the variable is re-entered into the model, if after removing the variable it results in a change in OR <10% then the variable will be removed permanently. This analysis begins by removing the physical condition of the house variable because it has the largest P-value of 0.142.

Table 4
Multivariate Logistic Regression Analysis with One of the Variables Dropped

Variable	B	S.E.	Wald	Df	Sig.	Exp (B)	95% C.I. for EXP(B)	
							Lower	Upper
Modeling Without Physical Conditions of the House								
Gender	1.586	0.828	3.669	1	0.055	4.885	0.964	24.757
BCG Vaccine	1.967	0.789	6.211	1	0.013	7.148	1.522	33.572
Comorbid	1.535	0.716	4.591	1	0.032	4.641	1.140	18.898
Previous history of TB	1.556	0.820	3.595	1	0.058	4.739	0.949	23.663
Smoking	1.785	0.811	4.842	1	0.028	5.958	1.215	29.211
Modeling Without Comorbid								
Gender	1.900	0.859	4.894	1	0.027	6.689	1.242	36.023
BCG Vaccine	2.065	0.771	7.177	1	0.007	7.882	1.740	35.698
Previous history of TB	1.410	0.804	3.076	1	0.079	4.094	0.847	19.785
Smoking	1.886	0.850	4.927	1	0.026	6.595	1.247	34.877
Physical Condition of the House	1.479	0.735	4.043	1	0.044	4.388	1.038	18.547
Modeling Without Previous History of TB								
Gender	1.774	0.851	4.339	1	0.037	5.892	1.111	31.257
BCG Vaccine	1.990	0.786	6.408	1	0.011	7.316	1.567	34.154
Comorbid	1.253	0.720	3.027	1	0.082	3.500	0.853	14.356
Smoking	1.770	0.825	4.597	1	0.032	5.870	1.164	29.596
Physical Condition of the House	1.262	0.722	3.057	1	0.080	3.534	0.858	14.548

In table 4 above, after removing the variables of physical condition of the house, comorbid and previous history of TB, each resulted in a change in the OR of the other variables >10%, then these variables were re-entered into the model.

Preparation of the Final Multivariate Model

Table 5
Final Multivariate Modeling Results

Variable	B	S.E.	Wald	Df	Sig.	Exp (B)	95% C.I. for EXP(B)	
							Lower	Upper
Gender	1.744	0.870	4.018	1	0.045	5.719	1.039	31.470
BCG Vaccine	1.913	0.798	5.744	1	0.017	6.775	1.417	32.388
Comorbid	1.254	0.753	2.770	1	0.096	3.503	0.800	15.334
Previous history of TB	1.417	0.838	2.859	1	0.091	4.123	0.798	21.296
Smoking	1.984	0.879	5.091	1	0.024	7.273	1.298	40.757
Physical Condition of the House	1.120	0.762	2.161	1	0.142	3.064	0.689	13.630

Smoking, BCG immunization, gender, comorbidities, physical condition of the house and previous history of tuberculosis, are various factors that have a relationship with the death of tuberculosis participants in the working area of the Ciparay Health Center, Bandung Regency. From these variables, it is concluded that smoking is a variable that is very risky for the death of tuberculosis patients with 7.273 times the risk when compared to non-smokers.

The final modeling results have an R2 value of 0.539, the conclusion is that of the six independent variables can interpret the variation of the variable death of tuberculosis patients by 53.9% and 46.1% can be influenced by other variables that are not included in this research category.

Table 6
R2 Value

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	61.626[a]	.448	.539

2. Discussion

Related variables

a. Gender

Gender has a significant statistical number with the result of p value = 0.013, has a relationship with death with the death of tuberculosis patients with the result of OR 4.848 (95%CI: 1.284-18.306). In this study, respondents of both sexes experienced more deaths of pulmonary TB patients, compared to female respondents, the conclusion is that there is a significant relationship between gender and the death of tuberculosis patients.

Everyone can get Tuberculosis, but men are more likely to suffer than women, the ratio is 2:1. Although there are some areas that show this incidence rate is almost the same, there are even areas that show more female sufferers. This is in line with the opinion of (Baliasa, W, et al, 2020). which states that pulmonary TB patients at risk of death are more male (64.9%) than female (32.9%). (64.9%) compared to women (35.1%) this occurs because men have more activities such as work and often have high social interactions that can cause tuberculosis, in addition, men also consume a lot of alcohol and smoking habits that cause the risk of decreasing endurance is also more prevalent in men so that they are more susceptible to tuberculosis.

The results of this study are in line with the study conducted by Sianturi, Ruslantri in 2013, namely on the risk of death of tuberculosis patients in the work area of the Cirebon District Attorney's Health Center, if gender has a significant relationship, namely gender with the risk of death of tuberculosis sufferers with a p value of 0.001, the Odds ratio (OR) value of 8.415, the conclusion is that a male person with tuberculosis has a risk of 8.415 times greater to experience death compared to a female person.

b. BCG Vaccine

Statistically, BCG vaccination has a significance with a p value = 0.002, meaning there is a relationship with the death of tuberculosis sufferers, with an OR of 7.111 (95% CI: 1.880-26.894). In this study, quite a lot or even most of the respondents in the case group did not receive BCG vaccination so that they experienced death of pulmonary TB sufferers, compared to the control group, the conclusion is that there is a significant relationship between BCG vaccination and death of tuberculosis sufferers. The results of this study are in line with the research of Putrali, J, 2008, namely there is a relationship between BCG vaccination and the risk of death of tuberculosis sufferers with a p value = 0.049, OR 2.851 (OR> 1), namely respondents who have smoking behavior are at risk 2.851 times of death of tuberculosis sufferers compared to sufferers who do not receive the BCG vaccine.

c. Comorbid.

Statistically, comorbid or accompanying illnesses, there is a relationship with the death of tuberculosis sufferers, namely with a value of p = 0.006, OR 4.550 (95% CI: 1.454-14.237), tuberculosis sufferers who died in a state of only being diagnosed with tuberculosis as much as 60%, but if there are accompanying illnesses the percentage is 40%, among the diseases are diarrhea, kidney disease, HIV / AIDS, gastritis, anemia and many other diseases. The results of Triman Daryatno's study, 2002 found OR 3.412 tuberculosis sufferers at risk of death due to accompanying illnesses 3 times more at risk, meaning this study is in line.

d. Previous history of TB

he results of this study indicate that a previous history of tuberculosis has a p value = 0.010, namely there is a relationship between a previous history of tuberculosis and the death of tuberculosis sufferers, namely with an OR value of 5.167 (95% CI: 1.369-19.503) The results of Apriani's study, W. (2001) also said that there is a relationship between a previous history of tuberculosis and the risk of death for tuberculosis sufferers, the value is p = 0.036, OR 2.366 (OR> 1), the conclusion is that tuberculosis sufferers who have a history of tuberculosis are at 2.366 times risk of death when compared to tuberculosis sufferers but do not have a previous history of tuberculosis.

e. Smoking

Smoking is statistically significant with p value = 0.007, associated with the death of pulmonary TB patients, with OR5.505 (95%CI: 1.458-20.782). Half of the deaths due to pulmonary TB in men are caused by smoking and 3.25 of smokers develop into pulmonary tuberculosis sufferers. Mortality in pulmonary TB patients is 4 times greater in the smoking group than in non-smokers Alif R, Bagaskara A, Peristiowati Y. (2022). The results of this study are in line with the research of Wulandari, Leni, (2012). that there is a significant relationship between smoking behavior and the risk of death of pulmonary TB patients with a p value = 0.035, OR 2.464 (OR> 1), meaning that respondents who have smoking behavior are 2.464 times the risk of death of pulmonary TB patients compared to patients who do not have smoking behavior.

f. Physical Condition of the House

Statistically, the physical condition of the house has a significant relationship, with a p value = 0.008, there is a relationship with the death of pulmonary tuberculosis sufferers, the OR value is 4.039 (95% CI; 1.381-11.810). The results of the study by Lestari D, Masra F. (2022) statistically there is a significant relationship between the physical condition of the house and the risk of death of tuberculosis sufferers, the results are (p = 0.016; OR = 3.172; 95% CI: 1.268-7.986). Tuberculosis sufferers who live in houses with poor physical conditions have a 3.172 times greater risk of death compared to tuberculosis sufferers who live in houses with good physical conditions.

Multivariate Analysis Results

Final modeling results of the risk factors for the death of tuberculosis patients in the working area of the Ciparay Health Center, Bandung Regency are gender with a p value of 0.045 and an OR value of 5.719 and 95% CI: 1.039-31.470), BCG vaccine with a p value of 0.017 and an OR of 6.775 and 95% CI: 1.417-32.388), comorbidities with a p value of 0.096 and an OR of 3.503 and 95% CI: 0.800-15.334), previous history of tuberculosis with a p value of 0.091 and an OR of 4.123 and 95% CI: 0.798-21.296), smoking with a p value of 0.024, and an OR of 7.273 and 95% CI: 1.298-40.757) which The last is the physical condition of the house with a p value of 0.142 and OR 3.064 and

95% CI: 0.689-13.630). The variable with the largest OR is the habit of smoking which increases the risk of death of tuberculosis sufferers by 7.273 greater risk when compared to non-smokers. 15.8% of respondents who have non-smoking behavior in the case group, the control group is 50.8% meaning lower, 84.2% are the case group who have smoking behavior while 49.2% of respondents in the control group are higher when compared to the control group.

Based on the results of the researcher's observations, it can be concluded that smoking behavior in respondents is still high, this is because respondents are also in a smoking environment, making it difficult to stop smoking. Therefore, programs are needed to help people quit smoking, such as tobacco control policies, counseling on the dangers of smoking, and developing smoke-free areas. (Hapsari AR, dkk. 2013). According to Subchan, Djadid, Iswanto. (2009) half of tuberculosis deaths are caused by smoking, so that it develops into tuberculosis with a figure of 3.25. The death statistics in tuberculosis sufferers are 4 times greater when compared to non-smokers, in addition to causing tuberculosis, smoking can also cause acute respiratory infections, obstructive pulmonary dysfunction, influenza, pneumonia and other respiratory diseases.

BCG vaccination is given to prevent pulmonary TB infection, first to infants with protection for their mothers and families. Repeated 5 years later, and at 12 years at that level in the form of a prevention place. BCG vaccination has been accepted worldwide because BCG vaccination has an effectiveness rate of around 80% to prevent tuberculosis infection and almost 100% to prevent infections that occur to become fatal (Public Health Service/Centers for Disease Control, 1979). (Putrali, J). The spread of tuberculosis is one of the physical conditions of the house that does not meet the requirements, which include walls, ventilation and floors, houses that are too small are easy to invite sources of disease (WHO), good and hygienic houses include good types of floors, ventilation according to floor size, population density is not too dense, unhealthy physical conditions of the house can be concluded as the low physical health of the owner. (Sunarmi, Kurniawaty 2020).

A healthy house must meet the requirements, including meeting physiological needs, preventing the transmission of disease and preventing accidents Lestari D, Masra F. (2022). Based on the results of the researcher's observations, it can be concluded that the physical condition of the house in many respondents still does not meet the requirements, this is because the physical condition of the house includes the type of floor that is still made of soil and cracked plaster, most of the ventilation is permanent so that it cannot be opened, so that the poor physical condition of the house can be a breeding ground for disease-causing bacteria.

Conclusion

Risk factors associated with the death of pulmonary TB patients in the Ciparay Health Center work area, Bandung Regency are gender (p value 0.013, OR 4.848, and 95% CI: 1.284-18.306), BCG vaccine (p value 0.002, OR 7.111, and 95% CI: 1.880-26.894), comorbidities (p value 0.006, OR 4.550, and 95% CI: 1.454-14.237), previous history of TB (p value 0.010, OR 5.167, and 95% CI: 1.369-19.503), smoking (p value 0.007, OR 5.505, and 95% CI: 1.458-20.782), and physical condition of the house (p value 0.008, OR 4.039, and 95% CI: 1.381-11.810). The final modeling results obtained the variable with the largest OR was smoking (p value 0.024, OR 7.273, and 95% CI: 1.298-40.757) which increased the risk of death of pulmonary TB patients by 7.273 greater than non-smokers.

References

Cahyaningrum, Ika, Ka'arayeno, Arie Jefry, Woli, Onceniati Suhartini, & Kurniawan, Dimas. (2025). PENINGKATAN PELAYANAN KESEHATAN PRIMER DALAM UPAYA PENGENDALIAN TBC. *Jurnal LENTERA*, *5*(1), 92–101.

Christy, Berly Afilla, Susanti, Ressi, & Nurmainah, Nurmainah. (2022). Hubungan Tingkat Kepatuhan Minum Obat Pasien Tuberkulosis Terhadap Efek Samping Obat Anti Tuberkulosis (OAT). *Journal Syifa Sciences and Clinical Research (JSSCR)*, *4*(2).

Diantara, Lega Bisa, Hasyim, Hamzah, Septeria, Indah Puji, Sari, Dollyan Tamela, Wahyuni, Gusti Tri, & Anliyanita, Roza. (2022). Tuberkulosis masalah kesehatan dunia: tinjauan literatur. *Jurnal'Aisyiyah Medika*, *7*(2)

Kementrian Kesehatan RI. (2022). Laporan Program Penanggulangan Tuberkulosis Tahun 2022.

Nuraeni, Ine, & Rinaldi, Aris. (2024). ANALISIS PENERAPAN STANDAR PELAYANAN MINIMAL BIDANG KESEHATAN DI PUSKESMAS BANJARAN KOTA KABUPATEN BANDUNG TAHUN 2023. *Jurnal Kesehatan Tambusai*, *5*(2), 3397–3406.

Oqui, Maximiano, Ximenes, Antonio, da Costa, Joaninha, de Almeida Oqui, Serafino, Obeno, Olandino Evaristo, da Costa Guterres, Ana Claudia, & de Jesus Amaral, Isabel. (2024). Factors That Influence The Occurrence of The Disease Tuberculosis in The Clinic of Tubercolosis. *KESANS: International Journal of Health and Science*, *3*(5), 379–389.

Prayudianto, Roykhan. (2022). Prevalence of ATD (Anti Tuberculosis Drugs) Hypersensitivity Reactions in HIV Patients Period 2021 at Sanglah Central General Hospital. *KESANS: International Journal of Health and Science*, *1*(9), 881–887

Profil Dinas Kesehatan Kabupaten Bandung 2022.

Profil Kesehatan Dinas Kesehatan Provinsi Jawa Barat 2022.

Profil Kesehatan Dinas Kesehatan Provinsi Jawa Barat 2023.

Profil Kesehatan Indonesia, Kementrian Kesehatan Indonesia. 2022.

Profil Kesehatan Indonesia, Kementrian Kesehatan Indonesia. 2023.

Profil Kesehatan UPTD Puskesmas Ciparay Kabupaten Bandung Tahun 2024.

Profil Kesehatan UPTD Puskesmas Ciparay Kabupaten Bandung Tahun 2023.

Rasyid, Bayu Setiawan, Dewi, Nia Risa, & Inayati, Anik. (2025). IMPLEMENTASI EDUKASI KESEHATAN TENTANG PENYAKIT TB PARU TERHADAP PENGETAHUAN PENCEGAHAN PENULARAN PENYAKIT TB PARU. *Jurnal Cendikia Muda*, *5*(1), 87–94.

Wahyuni, Ai Eli Sri, & Sudrajat, Agus. (2024). GAMBARAN NILAI SGPT PASIEN TUBERKULOSIS DENGAN PENGGUNAAN OAT DI RUMAH SAKIT DKH KEDUNGWARINGIN. *JHAS (Journal of Health Analysis Student)*, *1*(1), 7–11.