

The Indicators Leading to Tuberculosis (Tb) Under-Reporting in Public Hospital of Kudus

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ABSTRACT

Under-reporting of tuberculosis (TB) case will have negative impact to control of disease, hinder contact tracing and move the accuracy of epidemiological data causing disease burden in Indonesia. This study examined the indicators associated with under-reporting of tuberculosis in all public hospitals of kudos, central java of Indonesia. This is cross sectional study which included TB cases diagnosed of public hospitals and data in SITT (Integrated System Information of TB) in Kudus from January 2018 - December 2018. Result and Discussion: This study revealed that 543 (21%) of 2560 TB cases were not reported in SITT. Some indicators related under-reporting were retired people (OR = 2.04; P: 0.001) extra pulmonary tuberculosis (OR = 2.87; P: 0.001) and smear negative (OR = 2.07; P:

0.001). The indicators associated with underreporting of TB were mostly related to people who retired for their job, type of tuberculosis (extra pulmonary) and smear status in the way that smear negative is strongly related to under-reporting meanwhile smear positive is not quite related.

Keyword: Individual level, Under-reporting indicators, TB Case.

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BACKGROUND

WHO estimates that almost 40% of patients with TB are not reported/under-reporting to the local or national surveillance programs each year [1]. Under-reporting is undiagnosed patients or patients are diagnosed but unreported [2]. In another opinion, under-reporting cases are translated as proportion or percentage of cases number who diagnosis TB but unreported to the national TB of surveillance system or not managed by NTP and divided by total number of diagnosed, both the cases number are reported or unreported in all public of private health services where TB patients can be diagnosed, including pharmacy, private doctor, pediatrician, small private clinic, hospital, and laboratory [3]. Under-reporting TB can occur if a patient is not diagnosed or not reported to the national TB of surveillance system after diagnosis so that it produces an estimate burden of inaccurate TB. In addition, delay in starting treatment can sustain morbidity and increase the sustainable infection [1]. Under-reporting in starting treatment can be negatively affected as

the evidence needs to prioritize resources of TB elimination program [4].

The research conducted in Kenya (2016) used inventory study. The result obtained that 715 of 3409 smear positive TB cases in the laboratory register were not found at TIBU. The estimated rate of smear-positive TB under-reporting cases in Kenya was 20.7% (95% CI 18.4-23.0) [5]. Meanwhile, the research conducted in Italy (2012). The record linkage used as method whose data was taken from TB diagnosis. It conducted at UHP and Italian Infectious Disease Control System (IIDS). The result obtained that in the first study, 293 patients were found: 80 patients (27%) confirmed TB diagnoses and unreported, 39 of them were microbiologically confirmed [6].

The result of JETSET (*Jejaring Riset*) TB Indonesia (2018). It stated that Indonesia had second rank in the top rank of tuberculosis case finding. In 2017, the cases of TB were 1.020.000 and the number of detected were 710.000 and the cases of TB were identified 401.130 [7]. For more clearly, the data will be presented in figure 1.



Figure 1: Case detection and notification of TB

Based on the figure 1, it can be stated that there were under-reported cases. From the number of cases were detected by

44% cases or around 308.870 in the national level so that the management of tuberculosis cases in Indonesia has a big

challenge, not only low achievement of treatment success but also the cases that unreported well.

Based on the results of DKK (Health Department) reported of Kudus (2018), stated that there were differences data between before cleaning process and after cleaning process of all medical recording data in the hospital in Kudus. There were also differences in medical recording data after cleaning process which means there are cases that unreported in SITT. There are two variables that relate to under-reporting including individual level and system level. The indicator from system level will be published elsewhere and this study just examined the indicator of individual level that cause under-reporting of TB case in public hospital of Kudus, part of central java, Indonesia.

METHOD

This study employed cross sectional study to calculate the rate and some factors associated with under-reporting of TB in public Hospital in 2018 in Kudus, Central Java of Indonesia. The data were collected from January to December 2018 to make sure that the records of the study period were totally completed. The number of under-reporting was evaluated by the medical record of TB case in

all public hospital of Kudus but not reported in SITT of Kudus Health Department.

The study population were all TB case reporting records in SITT and medical record in public hospital of Kudus during the period from January to December 2018. The data were collected from all confirmed TB cases recorded medical record of public hospitals and SITT record from January to December 2018 which included both outpatient and inpatient records and then were compared. Confirmed TB cases in medical record which did not also appear in SITT were considered as unreported. Meanwhile, the demographic and social characteristics of the unreported TB patients were analysed to identify possible factors leading to their exclusion. The variables applied to calculate the scores showed a degree of completeness of at least 90%, so that there was no loss in the comparison process. Moreover, bivariate and multivariate logistic regression was performed with all variables with association to outcome $p < 0.20$ in the bivariate analysis, and adjusted odds ratios (OR) and 95% confidence intervals were calculated. The inclusion of the variables was done one by one, following the order of statistical association with associations whose p value was less than 0.05 being considered significant.

RESULT

Table 1: Distribution of reported and unreported case based on medical record and SITT

No	Hospital	TB Case		Total
		Reported	Unreported	
		N/%	N/%	N/%
1	Mardirahayu	206 66%	105 34%	311 100%
2	Loekmono Hadi	374 84%	72 16%	446 100%
3	Aisyiyah	308 86%	52 14%	360 100%
4	Kumalasiwi	274 83%	58 17%	332 100%
5	Kartika	49 64%	27 36%	76 100%
6	Sunan Kudus	602 79%	163 21%	765 100%
7	Nurussyifa	204 76%	66 24%	270 100%
	Total	2017 79%	543 21%	2560 100%

It can be said that of the 2560 TB cases diagnosed from January to December 2018 at seven public hospitals (Table 1), 543 cases (21%) were not reported in SITT and the proportion ranged from 0 to 36 % according to healthcare facility.

Table 2: Demographic characteristic of TB cases

Variables	Total	Reported		Unreported		Bivariate		Multivariate		
		N	%	n	%	OR (95%)	p-value	OR (95%)	p-value	
Employment	Employed	1081	735	68	346	32	1,08	0,000	1,90	0,004
	retired	1479	593	36	886	64	1,47	0,000	2,04	0,000

Sex	Male	1189	796	67	393	33	1,18	0,000
	Female	1371	891	65	480	35	1,37	0,030
Living Situation	In a group	1507	964	64	543	36	2,50	0,004
	alone	1053	726	69	327	31	1,05	0,002
Centre of Diagnosis	Emergency Unit	850	552	65	298	35	1,50	0,000
	Public Clinic	1020	693	68	327	32	2,02	0,003
	Pulmo Clinic	690	445	66	245	34	1,90	0,002

Table 3: Clinical Characteristic of TB cases

Variables	Total	Reported		Unreported		Bivariate		Multivariate	
		N	%	n	%	OR (95%)	p-value	OR (95%)	p-value
Smoking									
	559	357	64	202	36	1,27	0,001		
	2001	1200	60	801	40	1,32	0,030		
Alcohol use									
	573	355	62	218	38	3,37	0,001		
	1987	1271	64	716	36	0,42	0,020		
Drug Resistant									
	795	469	59	326	41	1,47	0,005		
	1765	1111	63	654	37	1,52	0,006		
HIV Status									
	5	5	100	0	0	0,57	0,020		
	2555	2018	79	537	21	1,62	0,001		
Smear									
	1487	877	59	610	41	1,67	0,009	1,23	0,003
	1073	321	31	752	69	2,72	0,002	2,07	0,000
TB types									
	1764	1181	67	583	33	1,77	0,010	1,36	0,002
	796	231	29	565	71	1,82	0,012	2,87	0,000

It can be said based on the demographic characteristic of tuberculosis cases found in the population that 42% is employed and 58% is retired people. Male is about 46% and female 54%, 59% lived in a group and 41% is alone, later on about 33% was diagnosed in emergency unit, 40% in public clinic and 27% pulmonary clinic. Meanwhile based on clinical characteristic, it is stated that 22% is smoker and 78% is no active smoker, 78% is no alcoholic drink. Moreover, 31% is drug resistant and 69% is non drug resistant, some of them had pulmonary tuberculosis (69%) and the rest is extra pulmonary.

On a bivariate level, the indicators related to under-reporting were retired people, people who live in a group, cases who were diagnosed in pulmonary clinic, people who drink alcoholic, non-drug resistant. Furthermore, on a multivariate level, the following variables were associated with unreported TB were retired people which have OR of 2.04 and P-value of 0.001, extra pulmonary tuberculosis with OR of 2.87 and P-value of 0.001 and smear negative with OR of 2.07 and P-value 0.001.

DISCUSSION

The results of this study stated that 21% of the total TB cases were not reported to the SITT and the average cases were not reported around 0 and 45.2%. This was also veiled by previous studies from various countries including Italy with an under-report rate of 27% , 38-49% in the United Kingdom,

80% in Greece and 20% -46% in Spain. In addition, the rate of TB case reporting from all hospitals in Kudus is an average of 78% of medical records to the SITT Kudus by forming a team of TB medical staff groups that serve as a liaison between the medical team and the TB infection control team, assisted with collection data, contact tracking, and case reporting to hospitals and SITT.

This study shows that several indicators related to TB cases are underreported at the bivariate level and the statistical significance states that fewer people living in groups report that people living alone, some TB cases diagnosed in lung clinics are reported more frequently than in emergency and lung clinics, people who drink alcohol, and are not drug resistant.

Meanwhile, according to the results of the multivariate test stated that retirement is strongly associated with underreporting, not even age dependent. This is also veiled by previous studies from other countries that 25% of unreported cases are patients older than 60 years. This may be due to the difficulty of older people being diagnosed and reported by the service provider as well as comorbid conditions and some reasons for hospital admission, which can interfere with service providers who will diagnose and report TB cases.

Other indicators based on multivariate test results are extra-pulmonary TB and smear-negative TB associated and unreported cases. This is because smear positive TB patients

are more infectious so case reporting and contact tracing are very important. Our study found that 41% of smear-positive cases were not reported, which is actually lower than the rate described in other studies. Most cases were diagnosed and reported from the emergency department and specialized clinics in our study as well as from other published studies, and half were diagnosed in the emergency department. Case detection in primary care settings is essential for early diagnosis and eventual disease control. We found that the diagnosis of TB in primary care centers was not associated with poor reporting which was different from one Spanish study. However, the percentage of TB cases diagnosed at the primary center is small and can represent an early opportunity for missed diagnosis.

The recommendations of this study are that when TB is not diagnosed or not reported, the opportunity to prevent transmission of the disease is lost and the disease can spread so that patients with TB problems must be evaluated and the diagnosis must be reported to the public health department without delaying. This requires coordination between the hospital, the epidemiology department, and the microbiology and pathology department. For example, electronic reporting systems, etc.

A limitation of this study is that the prospective study design can lead to high compliance and reporting bias where the health facilities participating in this study only show good estimates of TB cases that are not reported. In addition, the number of patients not evaluated in special clinics is low. Patients diagnosed and followed by primary care centers have microbiological data recorded in the microbiology registry compiled with data from specialized clinics, but there are no electronic medical records.

CONCLUSION

It can be concluded that there are three indicators related to under-reporting, namely pension, extra-pulmonary AFB type, and negative AFB in patients. TB control programs in the region or country are very important for better case reporting and improved disease control, contact tracking and accuracy of epidemiological data. The results of this study suggest that the role of TB officers (medical staff groups) can minimize under-reporting rates.

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