

Evaluation of The Tuberculosis Program Drug Management at the Pharmacy Installation of the Bengkulu Provincial Health Office

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ABSTRACT

Tuberculosis is currently a public health problem both in Indonesia and internationally, so it is one of the Sustainable Development Goals (SDGs) for sustainable health development. Therefore, good drug management is needed. The purpose of this study is to determine the level of suitability of the tuberculosis program drug management process at the planning, distribution, and control stages in 2020 and 2021 compared to drug management quality indicators and determine the factors that affect it. This study was conducted in October–November 2022. Descriptive observational research methods with quantitative data were obtained retrospectively, and qualitative data were obtained through observation and interviews with selected resource persons by purposive sampling. The results showed that the planning, distribution, and control of tuberculosis drugs in the Bengkulu Provincial Health Office had not met the indicator standards, which were shown by seven indicators not in accordance with drug management standards, namely the accuracy of planning, ITOR, empty stock, less stock, safe stock, excess stock, and expired. There are six indicators that meet the standards: accuracy of distribution; level of availability of drug; organization; funding; information systems; and the amount of human resources. Influencing factors are a lack of coordination in planning, record keeping, and reporting, and a lack of operational funds and transportation tools for anti TB drugs distribution.

Keywords: evaluation; drug management; tuberculosis program drugs; Bengkulu Provincial Health Office

INTRODUCTION

Tuberculosis disease is still a major concern in the world, and all countermeasures, although prevention has been carried out in various countries since 1995, are still ineffective (Tefahuneygn *et al.*, 2015). Tuberculosis (TB) is currently a public health problem both in Indonesia and internationally, so it becomes one of the Sustainable *Development Goals (SDGs)* for sustainable health development. Tuberculosis is still a health problem in Indonesia and poses complex problems both medically and socially, economically, and culturally. Based on the WHO Global TB Report 2020, Indonesia is ranked second with the highest number of TB sufferers in the world after India. Globally, an estimated 10 million people had TB in 2019. Of the entire population diagnosed with pulmonary TB by health workers, only 44.4% were treated with a treatment program (Zuriya, 2016). In the Anti-Tuberculosis Drug Logistics Management Guide, "No OAT, No Program", this illustrates that the availability of anti-TB drugs is a major factor in increasing the success of TB control programs. Inefficient drug management causes the level of drug availability to decrease, drug vacancies to increase, the number of drugs that accumulate due to inappropriate drug planning to increase, and the number of expired or damaged drugs to increase due to poor distribution systems (Pramukantoro, 2018). The problem is that the availability of drugs and the ineffectiveness of drug management can have a negative impact on services in health facilities.

Given the importance of drug management in order to achieve quality service and prevent problems that often occur, especially in the aspects of planning, distribution, and control, it is necessary to evaluate the implementation of drug management in these three aspects to determine any problems or weaknesses in its implementation. Based on this, researchers are encouraged to evaluate the drug management of the TB program so that problems and weaknesses in its implementation can be identified and improvements can be made in improving health services to the

community. Research related to drug management evaluation has been widely conducted. The difference between this study and previous drug management studies is in the research variables; this study uses variables at the planning, distribution, and control stages of the tuberculosis program drugs. The purpose of this study is to determine the level of suitability of the tuberculosis program drug management process in 2020 and 2021 at the planning, distribution, and control stages of TB drugs compared to drug management quality indicators and determine the factors that influence it.

METHOD

This study is a descriptive observational study with a *cross-sectional* approach used for qualitative data collection to obtain information through observation using a checklist and in-depth interviews using interview guides with selected resource persons by *purposive sampling*, with the consideration that the resource persons are considered to know and be most responsible for the management of TB drugs at the Bengkulu Provincial Health Office. The participants in this study are the Head of the Health Office, the Head of the Disease Control and Environmental Health Section, the TB Program Manager, the Head of the Medical Devices and PKTR Pharmaceutical Section, and the TB management officer. The qualitative data obtained were analyzed for the content of the interview, then presented in narrative form in the form of an overview of the planning, distribution, and control of TB drugs and factors affecting the management of TB drugs in the Bengkulu Provincial Health Office. Quantitative data were obtained retrospectively through tracing documents used in the process of planning, distributing, and controlling TB drugs at the Bengkulu Provincial Health Office in 2020 and 2021. The studied had 4 TB drugs items in 2020 and 5 TB drugs items in 2021. Quantitative data were analyzed and presented in tabular form and then compared with drug management quality indicator standards based on Satibi *et al.*'s 2019 indicators. This study was conducted in October–November 2022. This research was approved by the Medical and Health Research Ethics Committee (MHREC) of the Faculty of Medicine, Universitas Gadjah Mada–Dr. Sardjito General Hospital Yogyakarta, with certificate number KE/FK/0473/EC/2023.

RESULTS AND DISCUSSION

Characteristics of respondents

Data on the characteristics of respondents can be seen in table I.

Planning Accuracy

The calculation data for this indicator is taken from the calculation of TB drugs planning and usage in Bengkulu Province in 2020 and 2021. This indicator is used to determine the accuracy of the planned amount and type of drug. The percentage accuracy of planning in 2020 and 2021 can be seen in Table II.

Based on the results of the calculation of planning accuracy obtained in 2020, two items are still lacking, namely 60%, and two items are excessive, which is 102.3%. In 2021, the planning accuracy of 4 items is still lacking, and 1 item is in excess by 147.6%. The accuracy of planning in 2020 and 2021 has not met drug management standards, which are 100%, indicating that the planning carried out has not been appropriate. Based on the results of study (Rahayu *et al.*, 2016) related to the percentage accuracy of TB drugs planning, FDC Category 1 is 110.5%, Category 2 is 100%, and the Child Category is 131.1%. The results of Research (Lubis *et al.*, 2015) related to the Percentage of Planning Accuracy in Surakarta City Pharmaceutical Installations are 219.2%, Banyuanyar Health Center 116.7%, Pajang Health Center 100% and Sibela Health Center 100% The high percentage of Planning Accuracy is due to the development of TB cases, both the discovery of new cases and old cases; the number is always changing. Estimates of new case discovery targets are often less than or more than targets because the number of new case discovery targets depends on contact investigations by officials and population growth in each city or district. The results of the study (Febreani & Chalidyanto, 2016; Rohmani *et al.*, 2016; Wati R *et al.*, 2013) showed that the percentages of planning accuracy were 72.3%, 50%, and 105.1%. This is due to drugs not being received as planned, the presence of drug *drops*, drug acceptance at the end of the year, inaccurate usage data, and changes in disease treatment patterns.

Table I. Characteristics of Respondents

Name	Position	Gender	Education	Employee Status
Report 1	Head of Service	Man	S2	PNS
Report 2	Head of Pharmacy, Medical Devices and PKRT Section	Man	S2	PNS
Report 3	TB Program Manager/Wasor	Woman	S1	PNS
Report 4	OAT Manager	Woman	S2	PNS
Report 5	P2PM Section Head	Woman	S2	PNS

Table II. Percentage of Planning Accuracy

No	Year	Σ drugs	Planning Accuracy					
			Less (<100)		Exact (100)		Overweight (>100)	
			Σ drugs	%	Σ drugs	%	Σ drugs	%
1	2020	4,0	2,0	60,7	0,0	0,0	2,0	102,3
2	2021	5,0	4,0	0,0	0,0	0,0	1,0	147,6

Table III. Accuracy of TB Drugs Distribution

No.	Year	The amount of drug distributed	Requested amount of medication	Percentage of Distribution Accuracy (%)
1	2020	2508	2508	100
2	2021	2193	2193	100

Accuracy of TB drugs distribution

Distribution of TB drugs from the medical equipment pharmaceutical section and provincial to district or city pharmaceutical installations is based on a logistical request letter from the district or city health office to the provincial health office using the request form. The percentage accuracy of the TB drugs distribution in 2020 and 2021 can be seen in Table III.

From the percentage table of distribution accuracy in 2020 and 2021, it is known that the accuracy of TB drugs distribution in 2020 and 2021 is according to the standard, which is 100%. This is because the number of TB drugs requested by district or city health offices in 2020 and 2021 is small because it coincides with the COVID-19 pandemic and is always fulfilled by the provincial health office on demand. The number of TB drugs requested by the district or city is based on the number of case findings from the Public Health Center (PHC). TB drugs granting is adjusted to wasor verification and TB drugs availability. The results of the study (Sanjaya & Hidayat, 2016) stated that the distribution of program drugs is the responsibility of referees, district or city installations, and Provindi as facilitators.

Inventory Turnover Ratio (ITOR)

The standard value according to the (Satibi *et al.*, 2019) ITOR values is 8–12 times per year, where distribution is carried out at least once a month according to the needs of health facilities. ITOR, which is smaller than the standard, shows that the turnover of TB dru in the medical equipment, pharmaceutical section, and PKRT Bengkulu Provincial Health Office is slow. The results of the calculation of ITOR values in 2020 and 2021 can be seen in Table IV.

All TB drugs items in 2020 and 2021, as shown in the table, do not meet the ITOR value standard. The ITOR value in 2020 was 1.1 times smaller than in 2021, with an ITOR value of 1.62 times smaller. This illustrates that distributed TB drugs turnover is not yet efficient. The results of this study are no better than the study (Wati R *et al.*, 2013) ITOR values of 5.77 times. This is due to the presence of an excess number of dropping drugs from the center, drug receipts at the end of the

Table IV. Inventory Turn Over Ratio (ITOR) Value

No	Year	Distributed TB dug's value for a year	Early year stock	Year-end stock	Average OAT inventory	ITOR	Standard
		A	B	C	D=(B+C)/2	A/D	
1	2020	852,019,674	913,454,068	138,320,630	525,887,349	1,1	8-12 times
2	2021	1,704,039,348	1,826,908,136	276,641,260	1,051,774,698	1,62	

Table V. TB Drugs Availability Levels

No	Year	Total Stock (A)	Total Usage (B)	Average usage per month (C=B/12)	Availability Rate (month) (D=A/C)	Standard Value
1	2020	2853	2508	209	13.65	12-18 months
2	2021	2271	2193	182.75	12.43	

year, and the absence of city or regency demand for certain drugs, so that it will affect the value of dead drug stocks and the value of expired drugs.

Availability Rate

The calculation of the level of drug availability in 2020 and 2021 requires recapitulation data from the quarterly report on the receipt and use of district and city. The following calculation results can be seen in Table V.

The calculation results on Tabel V. show that in general, the level of TB drugs availability in 2020 and 2021 is quite effective because it is included in the safe category with a standard value of 12-18 bullan, which is 13.65 months for 2020 and 12.43 months for 2021. Based on the results of the study related to the availability rate of TB drugs in district pharmaceutical installations, FDC Category 1 is 43 months; Category II is 34 months; and Child Category is 42 months. Too large a level of availability that is not balanced with large usage can also cause a buildup of stock in Pharmaceutical installation, and if supervision is not good, the value of expired stock will be high. The solution is to evaluate and conduct a drug planning and procurement system selectively tailored to the needs of health services and refer to the principles of effective, safe, economical, and rational (Embrey, 2012).

Percentage of empty stock items

At the stage of controlling empty drug items, TB drugs only exists in 2020, namely there is 1 empty drug item, namely Kombipak Category I. If the value of the total TB drugs items in 2020 is calculated, the percentage of empty drugs in 2020 is 25%. This happens because the use of Kombipak Category I drugs is rarely used and requested by the district or city health office. In 2021, there were no empty TB drugs stock items, or a percentage of 0%, which shows the percentage of empty stock items in 2021 according to the indicator standard, which is 0%. The results of the calculation of the percentage of burned stock items can be seen in Table VI.

The percentage of stock items is less.

The category of items lacking in the Bengkulu provincial health office can be seen in Table VI. In 2020, there were two OAT items that were lacking, namely FDC Category II and FDC in the child category with a stock percentage of less than 25%. In 2021, there was only one TB drugs item that was lacking, namely the FDC in the Child category, with a percentage of stock less than 20%. In another study, there were five indicator drugs that experienced less stock in East Java Province in 2018(Suryagama *et al.*, 2019).

Table VI. TB drugs Availability

No	Year	Σ drugs	Empty Stock		Stock Less		Excess Stock		Safe Stock	
			Σ drugs	%	Σ drugs	%	Σ drugs	%	Σ drugs	%
1	2020	4,0	1,0	25,0	2,0	25,0	0,0	0,0	1,0	25,0
2	2021	5,0	0,0	0,0	1,0	20,0	2,0	40,0	2,0	40,0

Table VII. Percentage of expired/damaged drugs value in 2020

No	Drug Name	The medicinal value of ED	The value of the whole drug	Percentage of ED Value
1	FDC Child Category	13.286.826	137.036.676	9,7%

Percentage of safe stock items

The category of safe-stock items at the Bengkulu provincial health office can be seen in Table VI. In 2020, only 1 item of safe stock will be FDC Category I with a percentage of 25%. In 2021, 1 item of safe stock there are 2 items, namely FDC category I and FDC II with a percentage of 40%. Another studies (Rahem, 2019) also showed that the availability of oral antidiabetic drugs in the Pamekasan Regency health center in the safe category was only 23.3%.

Percentage of overstocked items

There were no excess stock items in 2020 with a percentage of 0%, meaning that the percentage of excess stock items in 2020 was according to standards, while in 2021 there were only two excess drug items, namely Kombipak category I and KDT. Daily dose of lupine with a percentage of 40% To avoid excess drug stocks, the planning team only held a few OAT in 2020 and 2021 to minimize the occurrence of excess stock and expiration, and if the demand for TB drugs increases, it can still be covered from the existing *buffer stock*. For category I, which is included in the excess category in 2021 because the total use of drugs is very little or small, The tendency for excess stock here is more due to planning that exceeds use and changes in disease patterns from the previous year (Boku *et al.*, 2019). The results of research in East Java Province found that there were five drugs that experienced excess stock (Suryagama *et al.*, 2019). The calculation of the percentage of excess TB drugs stock items can be seen in Table VI.

Percentage of expired or damaged TB drugs values

The TB drugs value expiring in 2021 is according to the standard, which is 0%. In 2020, there was 1 TB drugs item that expired, namely FDC in the child category, as many as 51 packages with a value of 13,286,826.00 and a percentage of 9.7%. In contrast, the percentage of expired drugs in PHC throughout Banjarbaru City in 2014–2015 was 0.50% and 0.52% (Nabila Hadiyah Akbar, Nani Kartinah, 2019), respectively. The results of this study (Waluyo W. *et al.*, 2015) are no better than the results of studies obtained related to the percentage of expired drugs, which is 7.01%. The amount of TB drugs that expires is useful for determining the level of accuracy of planning and the absorption of drugs according to the target or not, as well as the drug distribution system. The results of observations of expired drugs and the value of damaged drugs in 2020 and 2021 can be seen in Table VII.

Support Management

Indicators used in supporting management are organization, funding, information systems, and human resources (HR).

Organization

TB drugs logistics management in the Bengkulu Provincial Health Office is carried out at every level of implementation, starting from the central, provincial, and district levels to the level of health

service facilities in the regions. This is in accordance with organizational standards (Kemenkes RI, 2011a), namely tiered.

Funding

The source of funding for TB drugs procurement mostly comes from the state budget and from the grant (Global Found). The anti-tuberculosis drug program is a drug program whose availability is fully supported by the center. According to government regulations (Kemenkes RI, 2016), the central and local governments are responsible for the availability of medicines and health supplies in the fight against TB.

Information System

The information system of the Bengkulu Provincial Health Office uses an information system developed by the Ministry of Health in the form of ITIS (Integrated Tuberculosis Information System). This is in accordance with the standards specified by (Kemenkes RI, 2011b) the available information system. According to study (Rahmawatie & Santosa, 2015), a well-functioning information system can help in making decisions, especially in planning drug needs.

Human Resources (HR)

The Bengkulu Provincial Health Office has one TB drugs Manager as the person in charge of TB drugs in the Pharmaceutical Warehouse, where the qualifications are pharmaceutical technical personnel. As for the TB/Wasor TB program manager, there is one person in charge with a public health undergraduate background; this is in accordance with the technical guidelines for the Logistics Management Guide for the Tuberculosis Control Program. Each district, city, and provincial health office must be able to establish a work unit that can be responsible for managing the TB control program.

Influencing factors

Factors that affect the management of TB program drugs at the Bengkulu Provincial Health Office, namely organization, recording and reporting, operational funds, and transportation of TB drugs distribution.

Organization

Coordination between Wasor, the person in charge of the program, and drug management officers at the Bengkulu Provincial Health Office has been going well but has not been optimal because the Integrated Drug Planning Team (IDPT) has not been formed. This is the same as the results of the study (Indriawan *et al.*, 2014), which state that the new style of health center drug warehouse installation does not yet have a team that specifically handles drug planning, while according to the results of the study (Rumbay *et al.*, 2015), good and appropriate drug needs planning will be achieved if there is good coordination and monitoring.

Logging and reporting

The recording and reporting system is already running well at the Bengkulu provincial health office, but program holders in all district and city health offices have not updated the latest data regarding the discovery of TB cases every month at ITIS and have been slow to report TB drugs receipts and requests to ITIS. According to research (Triana *et al.*, 2014), recording and reporting are two of the sources used in planning; if they are not accurate, then the planning carried out is not optimal.

Operational Fund and Distribution Transportation

Limited operational funds at the Bengkulu Provincial Health Office are still a concern. This is because the operational budget for TB drugs distribution is very limited and is still combined with other program drugs. The budget for distribution to regions is not enough to distribute to all areas of Bengkulu province because of the vast area and geographical location from province to district. Besides that, a means of transportation for TB drugs distributions also exists. Based on (Kementerian

Kesehatan RI, 2016) chapter 20, the central government and local governments must ensure the availability of TB control budgets. The results of the study (Nursyandi *et al.*, 2012) stated that the availability of operational funds can affect the availability of drugs.

CONCLUSION

Based on the results of research at the Bengkulu Provincial Health Office, it shows that the planning, distribution, and control stages of tuberculosis drugs at the Bengkulu Provincial Health Office need to be improved because they have not met the indicator standards. There are 7 indicators that are not in accordance with drug management standards, namely the accuracy of planning 2020 (102.3%) and 2021 (147.6%); ITOIR 2020 (only 1.1 times) and 2021 (1.62); Empty stock 2020: 1 item or 25%. Stock less: 2020, 2 items or 50%; 2021, 1 item or 20%; safe stock 2020 at 25%; 2021 at 40%; excess stock in 2021 at 40%; and there was one type of expiration in 2020 with a percentage value of 9.7%. There are six indicators that meet the standard: 100% distribution accuracy; availability levels of 13.65 and 12.43 months; organization (tiered); funding (available); information systems (available); and a sufficient number of human resources. There are six indicators that meet the standards, namely the accuracy of TB drugs distribution and the level of availability of TB drugs. Influencing factors are lack of coordination in TB drugs needs planning, record keeping, and reporting, limited operational funds, and transportation tools for TB drugs distribution. The limitation of this research is that it is only carried out at the Bengkulu Provincial Health Office, where it is expected that other researchers can conduct further research, especially at the district or city level in Bengkulu province.

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