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Empowering the Critical Role of Public Health Center on Communicable Disease Prevention and Control of Drug-Resistant Tuberculosis

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Abstract Tuberculosis has become an infectious disease with a high prevalence in developing countries, requiring serious handling from all stakeholders. Public health centers in this context have a critical role in relation to their function as first-level health care facilities. This study seeks to analyze the empowerment of the role of public health centers in the control of drug-resistant tuberculosis (DR-TB) in Central Java, Indonesia. This study was conducted using a field research method through a survey with the method of observation and interviews with respondents. The analysis technique is done by using the mixing method. Quantitative techniques are extracted from data related to the treatment of tuberculosis in Central Java, and are equipped with qualitative methods to get feedback from doctors and nurses at public health centers regarding strategies and challenges in treating tuberculosis. The results of the study show opportunities for empowering the role of public health centers through regulatory channels to give greater authority to the public health center to handle drug-resistant TB. The results of this study are practically useful for stakeholders and policymakers to elaborately place the important functions of the public health center in handling drug-resistant TB.

Keywords Health Center, Disease Control, Drug-Resistant Tuberculosis, Regulatory Framework, Empowerment

1. Introduction

Tuberculosis (TB) is still a public health problem in the world, although efforts to control TB have been carried out in many countries since 1995 [1–3]. According to 2015 WHO report, at the global level, it was estimated that 9.6 million new TB cases were found, of which 3.2 million were women, with 1.5 million deaths due to tuberculosis, of which 480,000 cases were women, of which 1.1 million TB cases were found. 12%) HIV positive with 320,000 deaths (140,000 people were women) and 480,000 drug-resistant tuberculosis (DR-TB) with 190,000 deaths. 9.6 million new TB cases, an estimated 1 million TB cases in children (under 15 years of age) and 140,000 deaths/year. According to 2015 WHO report, the number of TB cases in Indonesia is estimated to be 1 million new TB cases per year (399 per 100,000 population) with 100,000 deaths per year (41 per 100,000 population). An estimated 63,000 TB cases are HIV positive (25 per 100,000 population). The Case Notification Rate (CNR) of all cases was reported as 129 per 100,000 population. The total number of cases is 324,539, of which 314,965 are new cases. Nationally, the estimated prevalence of HIV among TB patients is estimated at 6.2%. The number of DR-TB cases is estimated to be 6700 cases originating from 1.9% of DR-TB cases from new TB cases and 12% of DR-TB cases from TB with re-treatment [4].

Table 1. Tuberculosis in Indonesia (2019)

TB situation in Indonesia	
TB case estimation	845.000
TB case notified	543.874
TB cases not reported	35%
RR/MDR TB Notified	9.875
Child TB case	63.111
HIV TB cases	11.117
Treatment success rate	87%
Death due to TB	11.993
TB case estimate 2019 (absolute)	
Aceh, West Sumatera, Riau, Bengkulu, Jambi, Kepulauan Bangka Belitung, Kepulauan Riau, West Kalimantan, Central Kalimantan, North Kalimantan, East Kalimantan, South Kalimantan, North Sulawesi, Central Sulawesi, South Sulawesi, Gorontalo, DI Yogyakarta, Bali, West Nusa Tenggara, East Nusa Tenggara, Maluku, North Maluku, Papua, West Papua	2768 - 27796
South Sumatera, Lampung, Banten, West Sulawesi, South Sulawesi	27796 - 52823
North Sumatera	52823 – 77851
Central Java, East Java	77851 - 102878
West Java, DKI Jakarta	102878 - 127906

Source: Exposure Material for TB Sub-Directorate of the Indonesian Ministry of Health

Genetic factors can affect the increase in cases of infectious diseases if the DR-TB patient is a patient who also happens to have comorbidities that are genetically related, such as diabetes mellitus (DM) [5-9]. DR-TB patients with comorbid DM require more treatment than DR-TB patients without comorbidities. The treatment process for DR-TB patients with DM is longer. This can be a source of TB transmission for the people around them.

Table 1 showed the prevalence of DR-TB patients since the management of DR-TB has been implemented in Indonesia since 2009. Treatment of DR-TB was determined to be part of the National TB Control Program with the issuance of the Regulation of the Minister of Health of the Republic of Indonesia number 565/MENKES/PER/III/2011 concerning the National Strategy for Control of TB in 2011-2014. The national strategy in the treatment of DR-TB always strives to keep up with the latest global developments, which are expected to provide maximum treatment success rates. The results of treatment for DR-TB patients from 2009–2017 still show a tendency to decrease the success rate of treatment, an increase in the number of patients dropping out of treatment, as well as an increase in the number of patients dying [10]. Tuberculosis has become a disease with a high prevalence in developing countries, so it requires serious handling from all stakeholders. Public health centers in this context, have a critical role in relation to their function as first-level health care facilities. This study seeks to analyze the empowerment of the role of the public health center in the control of DR-TB in Central Java, Indonesia.

2. Method

This research was conducted in 2020-2021 to analyze the DR-TB control program in Central Java that was started in 2010. Central Java is a pilot province of integrated management for DR-TB control. The hospital that was used as a referral pilot was Moewardi Hospital in Surakarta. There is an increasing number of DR-TB cases in Central Java, thus requiring additional health facilities, not only in hospitals, but also with the expansion of the role of health centers in satellite areas. The research was conducted by field research by selecting respondents through the purposive sampling method. In this case, stakeholder analysis is used to select stakeholders who clearly know the handling of DR-TB in Central Java. A number of 25 stakeholders were interviewed from the provincial level to the public health center, including the Head of the Communicable Disease Prevention and Control Section of Central Java Province. A series of in-depth interviews were also conducted in several areas in Central Java with TB program managers at the local health center level, namely in Ngawen District, Klaten District, Seborokrapyak health center, Purworejo District, and Rembang 1 health center in Rembang District, as well as TB program managers at Larangan public health center in Brebes Regency.

The data collection technique was carried out with a data-based approach to collect quantitative data through secondary sources. In addition, to gain insight from stakeholders regarding the handling of DR-TB, data collection was also carried out through interviews and

observations. In connection with the research focus to analyze the empowerment of the role of the public health center, this study focuses on the prevention and control of DR-TB in Central Java which is analyzed in a regulatory framework. The references used in this study are several regulations and policies from the Ministry of Health related to the handling of DR-TB. Furthermore, regulations and policies in general TB RO is a program with a TB infectious disease control program, these regulations and policies include Regulation of the Minister of Health Number 67 of 2016 concerning Prevention and Control of Tuberculosis and Regulation of the Minister of Health Number 13 of 2013 concerning Guidelines for Integrated Management Control of Drug Resistant Tuberculosis which has been updated in the technical guidelines for the management of drug-resistant TB in Indonesia. The analysis technique is done by using the mixing method. Quantitative techniques are extracted from data related to the treatment of tuberculosis in Central Java, and are equipped with qualitative methods to get feedback from doctors and nurses at public health centers regarding strategies and challenges in treating tuberculosis. This study examined the qualitative research by using some techniques including interview, recording, scripting, theme generation and transcript. The collected data was then analyzed through data reduction, data display, and conclusion drawing and verification.

3. Results

3.1. Tuberculosis Prevalence in Central Java: Provincial Dataset

Data collected by government agencies show a gap between the number of DR-TB cases and their treatment. In 2019, 1,091 DR-TB patients were reported with only 608 treatments. This shows that only 55.73 percent of DR-TB patients received treatment, while the remaining 483 or 44.27 percent of DR-TB patients were not treated. There are several reasons for the unwillingness of DR-TB patients to seek treatment, including mental unpreparedness, poor perception of health services, lack of family support and the absence of known symptoms.

Treatment of DR-TB requires active drug-safety monitoring and management (aDSM) and managing side effects of medicines known as MESO-active. MESO-active is an active and systematic process of clinical and laboratory assessment of all patients receiving TB treatment with the new regimen. This activity aims to detect, manage and report adverse events (AEs). All adverse events that occur in both serious and non-serious patients require appropriate clinical management, in an effort to strengthen the MESO system in patients receiving TB treatment with second-line OAT, carried out by strengthening MESO recording and reporting. The recording and reporting of serious and non-serious MESOs follow the current flow issued by the Indonesian Food and Drug Administration [10]. Data for controlling DR-TB in Central Java in 2019 is shown in Table 2.

Table 2. The TB situation in Central Java in 2019

Indicators	Distribution
Case estimation	82.978
Case notification	73.171
Treatment success	83%
Case not reported	12%
DR-TB enrollment/confirmed	608/1091
Child TB	6260
TB HIV	1049

Source: Central Java Health Office, 2020

The side effects can occur suddenly in DR-TB patients. Side effects can be in the form of mild, moderate and severe side effects. The public health center as one of the first-level health care facilities is required to carry out early screening for the emergence of side effects. Its function is to prevent DR-TB from becoming chronic which can be life-threatening for DR-TB patients. However, handling DR-TB at the public health center level will require the support of specialized and competent medical facilities, infrastructure and personnel. So far, health centers are still experiencing limitations in medical equipment and the number of doctors. As a result, the treatment of DR-TB has not been fully implemented in first-level health facilities. In addition, the health center is not able to handle the side effects of DR-TB, which is one of the reasons patients stop treatment. To explain the most common side-effect of DR-TB, Table 3 showed drug side effects at one of the DR-TB referral hospitals in Central Java in 2019.

Table 3 showed that the most common side effects were nausea, then hyperuricemia, ringing in the ears, impaired heart function, impaired liver function (SGOT, high SGPT), decreased hearing and anemia. When there are side effects that appear in the patient, it is necessary to re-administer the patient, whether there are drugs that must be changed or continue with special monitoring. Drug side effects are one of the reasons patients stop treatment (loss to follow-up) and also one of the reasons why DR-TB patients who have been diagnosed or have been designated as DR-TB patients refuse to start treatment for fear of drug side effects. The case finding data for DR-TB and patients treated are depicted in Table 4; Figure 1.

Table 4 showed that the number of DR-TB cases in Indonesia is increasing over time. In 2017, the number of confirmed cases was 5,201, while in 2018 it was 8,527. However, when compared to the number of treated confirmed cases found, it is getting more and more the percentage decreased. In 2016, the percentage of confirmed cases of DR-TB compared to those treated (enrolment) was 71%. This number decreased to 59% in 2017, and 51% in 2018. The compilation results as shown in Table 5 show the number of patients for each classification of DR-TB treatment progression from 2017-2019. The results show the large number of patients who drop out and die in the DR-TB treatment process.

Table 3. EAs at a DR-TB referral hospital, 2019

Side effect reported	Frequency
Nauseous vomit	18
Hyperuricemia	15
Ears ringing	12
Prolonged Qtc	7
Anemia	6
Itching	5
Hallucination	4
SGOT SGPT goes up	4
Tingling	2
Joint pain	2
Hearing impairment	1
Hipokalemi	1
Blurred vision	1
Changes in behavior	1
Difficulty breathing	1
Tendinitis	1
EAs: adverse events; DR- TB; drug-resistant tuberculosis	

Source: Central Java Health Office, 2020

Table 4. DR-TB case finding in Indonesia, 2019

Year	Confirmed cases (percentage)	Enrolled cases (percentage)
2009	66 (100%)	34 (52%)
2010	216 (100%)	155 (72%)
2011	460 (100%)	296 (64%)
2012	696 (100%)	441 (63%)
2013	1,094 (100%)	819 (75%)
2014	1,656 (100%)	1,299 (78%)
2015	1,896 (100%)	1,581 (83%)
2016	2,731 (100%)	1,935 (71%)
2017	5,201 (100%)	3,090 (59%)
2018	8,527 (100%)	4,356 (51%)

Source: TB Sub-Directorate of the Indonesian Ministry of Health, 2020

Table 5. Evaluation of DR-TB Treatment in 2017 – 2019 Central Java Province

Indicator	2017	2018	2019
Healed	145	86	2
Complete	4	17	3
Dropping out	54	109	55
Fail	13	16	0
Die	78	84	86
Move	0	0	2
Other	1	3	1
Still on treatment	48	225	459

Source: P2-TBC Data from the Health Office of Central Java Province, 2020

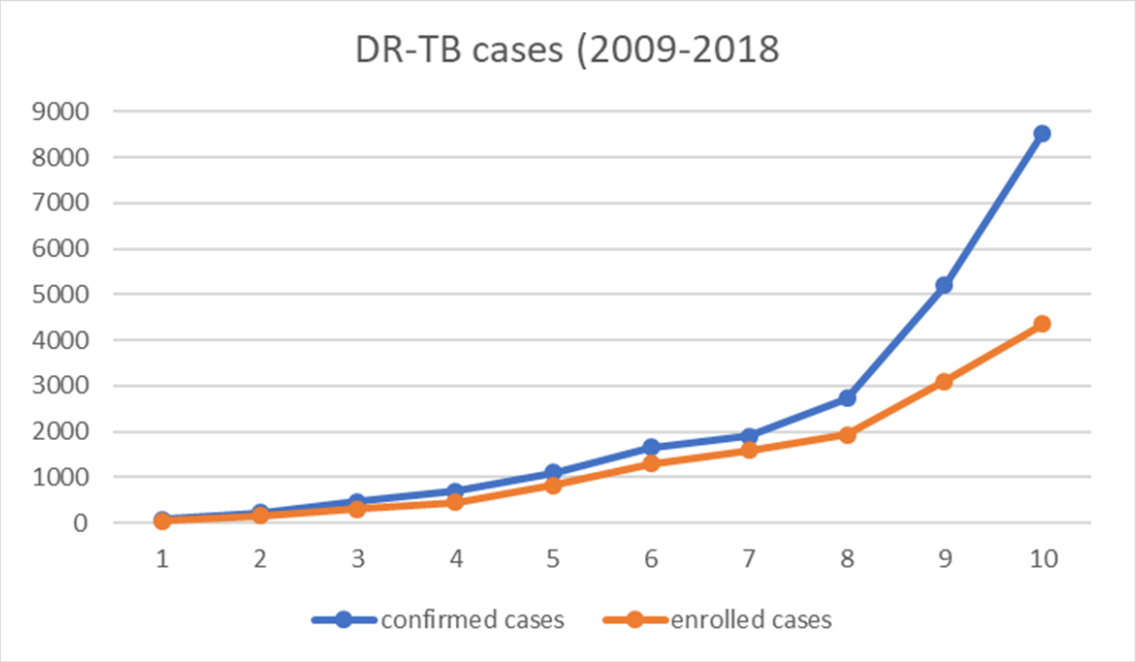

Figure 1.

The results showed a significant increase in DR-TB cases in Central Java. In this regard, regulations regarding the control of DR-TB as specified by Regulation of Ministry of Health No. 13 of 2013 concerning guidelines for integrated management of DR-TB control determined health centers as the first-level health care facilities to handle cases of DR-TB. On the other hand, there is an imbalance in the capacity of facilities and resources experienced by this health service. This management is not in accordance with the provisions which state that public health centers are health facilities that organize public health efforts and individual health efforts at the first or basic level by prioritizing promote and preventive efforts to achieve the highest public health degree in their working area as determined by Regulation of Ministry of Health No. 2019 regarding health center. To explore the perception of stakeholders regarding the condition of DR-TB treatment and the strategies to empower public health centers as described in the next part.

3.2. Stakeholder Perception on Empowering the Roles of Public Health Center

Central Java, with its large area and varied geographical characteristics, is both a challenge and an opportunity for the spread of DR-TB. Population density is one of the factors that affect the rate of TB transmission. Findings from government health agencies reveal that TB is more contagious in high-density areas of urban areas in Central Java, such as Semarang, Surakarta and Tegal. In contrast, TB prevalence is low in areas with low population density such as Blora and Wonogiri. This means that the denser the population, the easier and faster the transmission of TB will be.

> *"Tuberculosis and poverty are closely related because people who live in densely populated settlements with a low economy, with poor sanitation and physical housing conditions, and inadequate nutrition are more likely to get TB. TB patients are more common in men than women. This is possible because the mobility of men, especially at productive age, is higher than women. Besides that, most men have a smoking habit which can increase the risk of being infected with pulmonary TB by 2.2 times compared to non-smokers" (Interview with Tri Yuli, Head of the Communicable Disease Prevention and Control Section, Central Java Provincial Health Office, 12 February 2020).*

In addition, education level is a predisposing factor for TB prevalence. Education level can influence behavior. The higher a person's level of education, the easier it is to receive information or knowledge about TB and vice versa, public ignorance about TB disease, symptoms, treatment, risk factors and prevention will hinder efforts to eradicate TB.

DR-TB is one of the main causes of death where most infections occur in people aged between 15 and 54 years who are the most productive age, this causes an increase in social and financial burdens for the patient's family. Public health center in Indonesia does not only carry out treatment for mild DR-TB patients, but also treats DR-TB patients with other comorbidities such as DM and HIV, as well as treatment at the public health center even though the public health center is limited (outpatient health centers are not

inpatients). This experience was also obtained in several public health centers during the study. The results of interviews with SW, a health worker and TB officers at the Ngawen Community Health Center in Klaten Regency regarding DR-TB services revealed that:

"Continuing treatment from Kariadi Hospital, Semarang, both oral drugs and injections, patients come every day there are only 2 DR-TB patients who are also DM a bit troublesome because they can't walk for 2 months, doctors and nurses have never had DR-TB training, only TB training has never attended special training for DR-TB" (interview with SW, May 15, 2019).

Another experience was explained by PI, a health worker and TB officers at the Seborokrapyak Health Center, Purworejo Regency:

"Treating 2 patients, MDR TB and the second MDR TB with HIV. After the handover of the first DR-TB patient, the patient continues treatment at the Public health center, comes every morning to take injections and take medicine, if there are side effects or complaints, they will be consulted by telephone to the referral hospital. The second patient was DR-TB with HIV positive, the patient finally died because his condition was bad, he had to drop out of treatment to go to Jakarta, then received news that in Jakarta in the end he died, there had never been any training for either doctors or officers, did not receive special training for DR-TB".(interview with PI, May 8, 2019).

Other information during the study was obtained from TB officers at the Rembang 1 Health Center located in Rembang Regency, DA revealed that:

"Once treated 6 DR-TB patients for 1 week of treatment but kept stopping because the side effects were constant vomiting, nausea and dizziness so they didn't want to continue at the age of 50, the second, aged 40, had 3 months of treatment. Then keep throwing up then stop choosing alternatives. The initial room when the first patient was in the form of a building or special room did not exist only in the form of a terrace with chairs, directly exposed to the sun but not as good as now. The officers have never had DR-TB training or on job training, only handing over of patients and being informed about what needs to be prepared, the training is only TB training and even then it has been a long time." (interview with SW, September 9, 2019).

Another interview related to the emergence of severe side effects was also obtained from the Larangan health center, Brebes Regency, almost all of the patients managed to experience severe side effects and there were even some cases that died and dropped out of treatment because of side effects that appear. The side effects that arise from some DR-TB patients managed by the Larangan health center are psychiatric disorders, hallucinations, deafness and hearing loss, high uric acid, and vomitting. The results of interviews with a health worker at the Larangan public health center in Brebes Regency are as follows (interview with PJ, February 5, 2020):

"I had a chance to find a female patient who died yesterday, a male patient died, there were some who dropped out (dropped out of treatment), some had only been a few months. Well... DO because from the patient's point of view, the patient is not strong, uncomfortable or can't stand detoxing a lot of drugs. Every time there are side effects such as mental disorders, there are some who have mental disorders I try to refer them, then there are some who have buzzing ears, I immediately refer them but after that they are stopped but the condition does not change, but after a complete stop after he decided to DO, who had been here, was carried by someone who had come here in a rickshaw. From there, almost all of the patients decided on an alternative because they were not strong with the drug, some were vomiting for a whole day. Of the 4 patients who died the side effects were 2 experienced kidney failure, 1 DM (Diabetes Mellitus) and 2 patients complained of buzzing to deafness. The doctor, who knew at that time that his condition had been vomiting continuously all day long, was taken to the hospital. Kardinah, was diagnosed with kidney failure, was treated and later died. Others who had TB-DM died during treatment at the Public health center.

A drug side effect is any adverse drug response due to the use of drugs at normal doses. The side effects of DR-TB drugs can appear in DR-TB patients, both those who are managed in hospitals and at the Public health center. Moreover, the results of the field survey about the management of DR-TB cases carried out in 10 public health centers from 6 subdistricts are compiled and shown in Table 6.

Table 6 showed the implementation of patient management in 10 health centers consisting of 7 outpatient health centers and 3 inpatient health centers. The findings showed that not all public health centers have received special training on DR-TB, most (6 public health centers) have received information to increase knowledge about DR-TB only through OJT (On Job Training for 1 day). Outpatient health centers have more minimal infrastructure than inpatient health centers. In fact, there are 4 outpatient health centers that have not received special training on DR-TB or OJT but have implemented the management of DR-TB cases and there are 2 health centers out of the four health centers that manage DR-TB patients with comorbid DM and HIV.

Table 6. Compilation of 10 Public Health Centers with DR-TB patients (2017-2019)

Health centers	Training (day)	prevalence	recovered	Died	Rejected	Drop-out	Moved	Side effects
Kersana, Brebes	1	7	4	2	1	-	-	Nausea vomiting dizziness
Kaliwadas, Brebes	1 day	8	5	2		1	-	Nausea vomiting dizziness
Larangan, Brebes	1 day	11		7	1	3	-	Severe side effects: Hallucinations, patient has DM
Ngawen, Klaten	0	2	1	-	-	1	-	1 patient with DM, moderate side effects
Magelang Utara, Magelang City	1 day	1	1	-	-	-	-	Swollen foot
Seboro Krapyak Purworejo	0	2	1	1	-	-	-	1 patient with HIV positive, severe side effects
Rembang 1, Rembang	0	6	-	3	1	1	1	Severe nausea and vomiting
Rembang 2, Rembang	0	5	1	3	-	1	-	Severe nausea and vomiting Some have switched to alternative medicine
Ngesrep, Semarang	1 day	7	4		1	2	-	side effects joint pain vomiting
Kedungmundu, Semarang	1 day	20	9	5	1	-	4	side effects joint pain, burning skin

Source: Data processed, 2021.

4. Discussion: Empowering the Role of Public Health Center in DR-TB Cases

The results underlined the government's most important responsibility in implementing DR-TB case management in public health centers is the fulfillment of facilities or infrastructure. For instance, the management of DR-TB cases that need attention from the results of this study is 2 regencies, namely Brebes Regency and Rembang Regency. The study was conducted in Brebes Regency with 3 health centers (2 outpatients and 1 inpatient) a total of 26 cases were handled by the 3 public health centers, and the mortality rate (11 cases) was higher than the cure rate or complete treatment (9 cases), while dropouts treatment is also high (4). Rembang Regency with 2 outpatient health centers with a total of 11 cases managed with 5 cases of death and 4 cases of dropping out of treatment. The high mortality of DR-TB patients managed at the Public health center should be a program evaluation.

However, public health centers which functioned as first-level health care facilities only had infrastructure according to basic service standards. Meanwhile, DR-TB cases require specialist services which are not yet available in public health centers. To overcome budget constraints, protection is provided to those who have a high risk due to work in providing health services for patients with infectious disease DR-TB. This is in line with previous studies regarding the need for the government to evaluate and provide regular guidance on the implementation of the management of DR-TB [11–13]. However, qualitative findings indicate that public health centers have not functioned adequately as health facilities in the prevention of DR-TB, with a lack of facilities, facilities, and human resources in dealing with DR-TB.

To strengthen the capacity of the public health center in DR-TB services, it is necessary to strengthen regulations, systems and values of health services in a centralized manner to support the success of the DR-TB control program. This is in line with previous studies highlighting the critical role of the public health center in controlling DR-TB [14–16]. The results are also consistent with previous findings revealing the importance of capacity building for a public health center in DR-TB services [17,18]. In this case, the government needs to focus on controlling DR-TB as a priority health problem. Budgeting is needed specifically for the procurement of DR-TB drugs and drugs for side effects as well as handling DR-TB cases with certain comorbidities. For this reason, DR-TB health

services at the health center level need to be carried out with equal management standards. In this regard, Table 7 shows the distribution of the role of dr-tb control in centralized service system services, while Table 8 showed the distribution of the role of centralized DR-TB services. The analysis of strengthening regulations, systems and values need to be linked to the achievement of health status and conditions at the field level. Based on prioritization, the non-referral public health center will be more focused and have a greater priority to carry out preventive promotive efforts for the community. Promotive and preventive efforts can also be made to detect non-communicable diseases early in the community and to disseminate information about healthy living management [19,20]. In addition, clarity is needed regarding the main tasks of the functions and powers of supervision of the implementation of regulations by the health office, the Ministry of Health and professional organizations.

5. Conclusions

The results showed that the empowerment of public health centers as the first-level healthcare facilities experienced a number of problems in dealing with DR-TB. Health centers in several areas in Central Java experienced an increase in the number of cases of DR-TB. Some of the main related factors stem from the inappropriate implementation of the DR-TB control program, the lack of service provision by health workers, and the health condition of patients with DR-TB. For this reason, the legal basis or regulation of DR-TB control needs to be harmonized with the arrangement of the public health center as the first-level healthcare facility. The results of the analysis also determine the need for monitoring, evaluation and assistance mechanisms in the implementation of DR-TB control from national to local levels.

Table 7. Functional task role distribution of DR-TB control between central and local government

Central government	Local government
Conducting evaluations related to regulatory alignment on DR-TB control in Public health center	Mapping the needs of centralized DR-TB service facilities
Developing and determining the strengthening points in the current regulations	Responsible for meeting budget requirements related to infrastructure and human resources in centralized services for DR-TB
Together with the regional government, conduct a mapping to determine the centralized health facilities in each region	Monitoring evaluations related to the success of the program in the regency / city
Provide budget support, logistics and the needs of the DR-TB control program	Provide budget support, logistics and the needs of the DR-TB control program in the regency / city
Carry out monitoring evaluation and supervision on a regular basis related to DR-TB control	Carry out monitoring evaluation and supervision on a regular basis related to DR-TB control in the regency / city

Source: Data processed, 2021

Table 8. Functional task role distribution of DR-TB healthcare services

Referral Center Hospital	Referral Health Facilities
Prepare a team of clinical experts and an ad-hoc (multi-specialist) team for DR-TB services	Prepare a team of clinical experts for DR-TB services
Prepare infrastructure and service flow	Prepare infrastructure and service flow
Perform inpatient services, outpatient services, laboratory examinations and other supporting examinations	Perform inpatient, outpatient, diagnostic laboratory examinations and/or other supporting examinations
Periodically evaluate the progress of treatment of DR-TB patients	Periodically evaluate the progress of treatment of DR-TB patients
Together with the Health Service and Professional Organizations, they monitor the evaluation and guidance of the DR-TB referral health facilities in their working areas	
Receive referrals and consultations for DR-TB cases from referral health facilities	

Source: Data processed, 2021

As a managerial implication, strengthening regulations regarding the control of DR-TBs is very necessary to provide clarity of understanding and can create a clear legal basis for stakeholders in public health centers. Empowering the role of public health centers by strengthening their capacity through regulatory framework is the basis for developing follow-up actions to improve/strengthen the DR-TB control system. Theoretically, empowerment of public health centers as providers of DR-TB health services requires strengthen in the aspect of protection and legal force for health facilities, health workers and DR-TB patients. In this context, the government as a policy maker should formulate policies that are harmoniously balanced between regulations. The results of this study are expected to be used as material for drafting regulations that can provide legal certainty and strengthening related to public health center regulations for controlling DR-TBs. Practically speaking, the results of the study underscore the need for an active role from the central and local governments as determinants and policymakers to carry out their responsibilities and authorities in controlling DR-TB. The implementation of the program can run according to standards, starting with strengthening the role of the health center which is more likely to provide success in controlling DR-TBs in Indonesia.

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