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Tuberculosis Referral Cases In Primary Care: An Evaluation On Public-Private Mix Program In Indonesia

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ABSTRACT
Background. The public-private mix (PPM) has been considered as a successful strategy for tuberculosis (TB) care and control worldwide. Despite the implementation and regulation of the PPM approach, the distribution of TB patients has still been one-sided that public health centers were still more preferred by the patients rather than the private provider.
Objective. This study was aimed to evaluate the enactment of PPM in the Indonesian context by analyzing the difference of referral cases in primary care.
Method. Drawing on a cross-sectional analysis, based on visitation data of TB patients in Indonesia (n = 19,462).Samples were collected by stratified, non-proportional random sampling method.
Results. The analysis shows that the distribution of TB patients is still one-sided, that the majority of the patients chose public health centers (69.13%). TB visitors between public and private health providers were still not in balance. Visits to a practicing doctor (OR = 7.93; $p < 0.001$) and a primary clinic (OR = 8.16; $p < 0.001$) will have a risk of further referral.
Conclusions. The involvement of the private sector is needed. The district-based public-private mix is the chosen method to improve the TB service network, especially in areas with high visits to the private sector.

Keywords: tuberculosis; referral case; public-private mix

1. Introduction

Public-private mix (PPM), initially introduced by the World Health Organization (WHO) in 1999, has been adopted and enacted by many countries to overcome the global tuberculosis (TB) pandemic. Viewed by some to be the best way in TB care and control, there are still many people who fell ill and died with TB (1). Additionally, many countries have to experience many challenges in the enactment of this strategy.

TB care and control with PPM approaches, particularly in high burden countries, like Ghana, India, Myanmar, Vietnam, and Indonesia, has always been challenging. Ghana, for example, negative perceptions of private providers interfere with the implementation of PPM (2). In India, TB patients have been mostly treated by private health centers. However, to improve public-private partnership the so-called revised national tuberculosis control program (RNTCP) was introduced (3).

Myanmar TB patients have also already sought care from private general practitioners, but many of these TB cases are not reported to the government. To detect these cases, PPM is implemented and viewed as the best way to create health system linkages (4). Meanwhile, in Vietnam, a private sector engagement model was enacted in 2018. The model includes active facility-based screening, a mobile application, and enhanced follow-up care by community health workers (5).

As one of the highest TB burden countries, Indonesia has been implementing PPM since 2003. A system known as Hospital DOTS Linkage (HDL) was introduced, and then it was scaled up at the national level. This involves primary (public) healthcare centers (*puskesmas*), public and private hospitals, specialized lung clinics, and private health practitioners. The HDL activities comprise reinforcing case management networks and patient referrals, laboratory quality assurance, supervision, and monitoring and evaluation(6).

The success of the program, including PPM, is heavily dependent on the program funding, evaluation, and support systems, like medical and administrative staff(7).To successfully implement TB control programs, local governments have also been intensively involved. Their involvement includes regulating some related policies,

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providing anti-TB drugs and laboratories as well as quality assurance, medical supplies, monitoring, evaluation, and guidance(8).

With this in mind, the current study examines the implementation of PPM in Indonesia by analyzing the data provided by *Badan PenyelenggaraJaminan Sosial Kesehatan* (BPJS Kesehatan), a state-owned health insurance company. The data provides the number of TB referral cases from primary health services, private clinics, and health practitioners to public and private hospitals in 2017-2018. These visitation cases describe the distribution of TB patients in public and private health services.

2. Methods

This research is an analytical study with a cross-sectional design. The data source is secondary data, namely from the sample data that has been collected by BPJS Kesehatan (2017-2018)(9)by stratified, non-proportional random sampling(10). The number of samples was 19,462 visits by TB patients at the primary carethroughout Indonesia (34 provinces).Data were analyzed using STATA and SPSS for univariate and bivariate analysis.

3. Results

Most of TB patients, who were members of BPJS Kesehatan, visited public health centers (69.1%). Private health services, namely clinics (21.3%) and practitioners (9.6%), were less preferred (Table 1). Ten provinces have more than 25% visit rates to private providers. The Islands of Riau, West Java, and Riau were the highest (Table 2). Table 3 shows the percentages of referral cases in the top 10 provinces.

From five categories of membership, both PBI APBD and PBI APBN patients visited the health care centers more frequently than others (40.7%) (Table 4). PBI is the underprivileged group.TB patients who were diagnosed with the International Classification of Diseases (ICD) 10 as A15 (pulmonary TB with bacteriological confirmation with or without culture) have the higher number (72%) (Table 5).

The number of referral cases washigh at 38.67%. The majority of TB cases were stopped at the first-hand health services. Based on the type of primary care, public health centers (*puskesmas*)have the most non-referred TB cases (76.1%) (see Table 6). Despite the implementation of PPM at the national level, it is found that private referral health providers received less TB cases (40.88%) than those of public providers.

4. Discussion

The results showed that the majority of TB patients visited the health center. This allows patients who visit Public Health Center to be diagnosed at the initial visit because most Public Health Center are capable of performing microscopic examinations (11).The research data also showed that the number of cases who were not referred was 61.3% and 38.7% were referred.

The majority of these referrals were made by doctors and clinics, for about 71% of visits to these facilities. This number is higher than in India, where the proportion of patients in private health facilities referred is 10-15% (12). Types of primary care facilities visited were associated with referrals for TB patients (table 6). TB patients who come to general practitioners and primary clinics have about 8 times the risk of further referrals compared to Public Health Center.

One study stated that in private services, 5% of patients started treatment at the hospital whereas 35% were diagnosed at the hospital(11), since the quality of private health facilities is still below international standards and must be improved. Some of the issues of concern are the low level of TB screening for patients with symptoms, managing TB patients with empiric antibiotic treatment so that patients visit several times and delay diagnosis, and use more frequent of rontgen examinations for TB testing(12).

TB without complications should be managed thoroughly in primary care, however, the implementation of this rule remains a challenge. The limited number of microscopes and other diagnostic tools in primary care is the reason for the referral of patients. After being diagnosed in the hospital, TB patients without complications should be referred back to primary care. However, some patients still go to the hospital, which results in delayed diagnosis, increased medical costs for patients, and higher BPJS funding (11).

The number of patient visits before being diagnosed was 6 times and it took 62 days for diagnosis. Longer treatment delays were found in private practices (13). Besides screening, private facilities can also strengthen the relationship between pharmaceutical services and private laboratories at the time of diagnosis, thereby reducing barriers to case finding. At the stage of drug administration, the role of private health care is to encourage referrals back from the hospital to primary care (14).

Strategies for increasing private engagement are called the Public-Private Mix (PPM). PPM is a change in the behavior of the public and private sectors, namely the public involving the private sector and the private sector that

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changes their practice (15). Therefore, commitment from policymakers is needed starting from the central government, regional governments, and providers (16).

PPM should focus on targeting and advocacy, the use of digital technology, incentives, allocating funds for the involvement of all health facilities (14)(including access to free TB drugs), and collaboration with NGOs or professional organizations(17). Collaboration of professional organizations, PPM, and the national TB program in Myanmar can contribute to producing 12% of case notifications and 92% of good outcomes (32% cured, 92% complete treatment) (4).

District-Based Public-Private Mix (DPPM) is a service network that involves all health facilities in a district/city. The implementation is coordinated by the District / City Health Office. The goal is to increase the participation of all health facilities to find and treat patients according to standards and keep records (18). DPPM can strengthen services at the primary level in TB management (19).

Some obstacles in the implementation of DPPM include the perception and readiness of the private health utilities. As happened in India, the readiness of private doctors only reached 50.7% (3). On the other hand, private providers feel less interested (2).Innovative ideas that have been implemented in Vietnam to increase private participation include active patient screening and onsite diagnostic tests or sputum sample transportation, the use of mobile applications to reduce dropouts, and follow-up services by cadres (5).

5. Strengths and Limitations of the Study

This study is limited only to the visitation data provided by BPJS Kesehatan. While the majority of TB patients in Indonesia are members of this state-owned insurance company, there are still many who are non-members or members of other private insurance companies. In addition, the available variables are limited. However, this study added the lines of research on PPM strategies for TB treatment and control, particularly in the Indonesian context.

6. Conclusion

The implementation of PPM for TB care and control in Indonesia still needs some improvements. Having been enacted for almost two decades, the quality performance and management by health care providers are still challenging. Governments and the private sector are expected to improve their partnership quality, so the TB control program can succeed to decrease the disease within the society.

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Table 1. Distribution of TB Patient Visit based on Primary Health Care Type

Type	Frequency	Percentage (%)
Public Health Center	13,455	69.1
Clinic	4,147	21.3
Practitioner	1,860	9.6
Total	19,462	100.00

Table 2. Distribution of TB Patient Visited based on Provincies

	Private provider	**Public provider**
Islands of Riau	64.1%	35.9%
West Java	46.4%	53.6%
Riau	44%	56%
Central Java	38.7%	61.3%
Banten	37.8%	62.2%
South Sumatera	36%	64%
North Sumatera	35.7%	64.3%
East Kalimantan	27.2%	72.8%
Yogyakarta	26.6%	73.4%
Bengkulu	25.3%	74.7%

Table 3. Percentage of TB Referral cases at the ten most provinces

	Reffered	Not reffered
Islands of Riau	67.9%	32.1%
Aceh	50.4%	49.6%
Riau	48.8%	51.2%
North Sumatera	47.8%	52.2%
South Sumatera	45.9%	54.1%
West Java	45.1%	54.9%

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Bengkulu	43.5%	56.5%
Central Java	42.9%	57.1%
Jambi	42.4%	57.6%
Banten	40.6%	59.4%

Table 4. Distribution of TB Patient Visit based on BPJS Members' Categories

Category	Frequency	Percentage (%)
Unemployed Member	585	3.0
PBI APBD	1,604	8.2
PBI APBN	6,314	32.4
PBPU	5,722	29.4
PPU	5,237	26.9
Total	19,462	100.0

PBI APBD *(PenerimaBantuanIuranAnggaranPendapatan dan Belanja Daerah)* areRecipients of Regional Revenue and Expenditure Budget Contribution Assistance; PBI APBN *(PenerimaBantuanIuranAnggaranPendapatan dan Belanja Negara)* are Recipients of State Revenue and Expenditure Budget Contribution Assistance; PBPU *(PekerjaBukanPenerimaUpah)* or Non-Wage Workers; and PPU *(PekerjaPenerimaUpah)* or Wage Workers

Table 5. Distribution of TB Patient Visit based on Diagnosis

ICD 10 diagnosis code	Frequency	Percentage (%)
A15 (Respiratory tuberculosis, bacteriologically and histologically confirmed)	14,007	72
A16 (Respiratory tuberculosis, not confirmed bacteriologically or histologically)	5,455	28
Total	19,462	100

Table 6. Differences in TB referral cases in primary care

Type of Primary Care	Not referred	Referred	Total	OR	p
Public Health Center	10,239	3,216	13,455	Reff	
	(76.1%)	(23.9%)	(100%)		
Clinic	1,164	2,983	4,147	8.16	<0.001
	(28.1%)	(71.9%)	(100%)		
Practitioner	533	1,327	1,860	7.93	<0.001
	(28.7%)	(71.3%)	(100%)		
Total	11,936	7,526	19,462		
	(61.3%)	(38.7%)	(100%)		

Table 7. Ownership of the referral health facilities

Ownership	Frequency	Percentage (%)
Private	3,077	40.9
Public	4,449	59.1
Total	7,526	100.0