

## Conference Paper

# Tuberculosis Epidemiology and Medical Treatment Efforts in Indonesia in the Year 2020

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Tuberculosis (TB) is a deadly disease caused by the Mycobacterium tuberculosis bacteria which affects the lungs. Tuberculosis (TB) has become a public health problem in Indonesia and around the world. Tuberculosis prevention is one of the goals of the Sustainable Health Development (SDGs). In the year 2020, 17.3% of TB patients were 45-54 years old, 16.8% were 25-34 years old, and 16.7% were 15-24 years old. The treatment coverage (TC) of Tuberculosis cases in the year 2020 was 41.7%, which was lower than three years ago. Tuberculosis medical treatment needs to be improved since the percentage was (82.7%).

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**Keywords:** tuberculosis, mycobacterium, health, lungs

## 1. INTRODUCTION

Tuberculosis is a deadly disease that spread out around the world caused by Mycobacterium tuberculosis [1]. Tuberculosis (TB) is a public health problem in Indonesia and around the world. TB prevention becomes one of the goals of Sustainable Health Development (SDGs). Pulmonary TB is a very fast contagious disease. The transmission of pulmonary TB is through the meeting of phlegm (droplet nuclei) [2][3]. It is easy to be infected if someone get coughs or sneezes and living with other people at home. Family behavior in the prevention of pulmonary TB is very important to decline the transmission of pulmonary TB. The increasing number of pulmonary TB patients in Indonesia is caused by bad living behavior. The results of a survey by the Directorate General of Communicable Disease Eradication and Environmental Health showed that one of the causes of the high pulmonary TB cases is lack of knowledge [4]. One of the top 10 death causes worldwide is TB. Ten million people infected TB in year 2017 [5]. The prevalence of TB in Indonesia in year 2013 was 0.4%. It was not increase in 2018 [6]. Tuberculosis is a major health problem in the world.[7][8] World Health Organization (WHO) and the countries members are trying to reduce pulmonary TB

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in 20 years. Pulmonary tuberculosis is an infectious disease caused by an infectious infection by the bacterium *Mycobacterium tuberculosis*. The source of transmission is smear-positive TB patients through the sputum droplets that they excrete. This disease will bring to the death if not treated immediately [9].

TB causes several complications such as anemia, increased erythrocyte sedimentation rate, decreased serum albumin, hyponatremia, impaired liver function, leukocytosis, and hypocalcemia [10]. Anemia is the most common complication of pulmonary TB. The prevalence ranges is 16-94% in some studies [10]. There are various pathogenesis that explain the relationship between TB and anemia. There are some studies shown that the cause of anemia is suppression of erythropoiesis by inflammatory mediators, namely IL-6, IFN- $\gamma$ , IL-1 $\beta$ , TNF- $\alpha$ [10]. Poor nutrition have high possibility to get anemia for TB patients other than healthy people (Weiss and Goodnough, 2005). One parameter of nutritional status is body mass index (BMI), and a decreased BMI is related to the anemia in pulmonary TB patients [11].

Indonesia is ranked as the highest second country for TB cases in the world after India. It has been estimated that 10 million people will suffer TB in 2019. Despite the decline of new TB cases, it is not fast enough to achieve the target the END TB strategy for the year 2020 is 20% reduction in year 2015 – 2020. In the year 2015 – 2019 the cumulative decrease of TB cases only 9%[12]. Likewise TB deaths, the number of deaths in 2019 was 1.4 million. Generally, TB deaths case per year was decreased, but did not reach the END TB Strategy 2020 to achieve 35% in year 2015 – 2020. The cumulative number of deaths between 2015 – 2019 was 14%, which is less than half of the goals [12].

## 2. METODHOLOGY

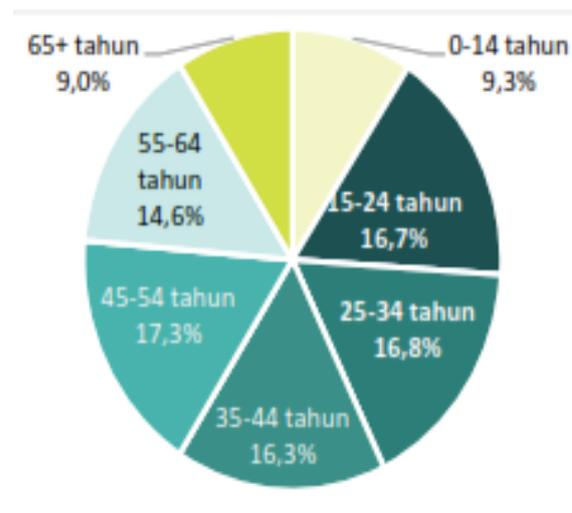
Indonesia is located at 60 NL (North latitude) to 110 SL (south latitude) and 950 EL (East Longitude) to 1410 EL (East Longitude).

Tuberculosis case data was obtained from the Indonesian Health Profile issued by the Ministry of Health of the Republic of Indonesia in 2020. The data was annual health fact sheet published by the North Buton District Health Office. The research results are presented in Portable Document Format (PDF).

### 3. RESULT

The number of tuberculosis cases found was 351,936 cases in 2020. It was decrease compared to all tuberculosis cases found in 2019 was 568,987 cases. The highest number cases were reported from provinces with large populations, namely West Java, East Java, and Central Java. Tuberculosis cases in these three provinces almost reached half of the total tuberculosis cases in Indonesia (46%).

Compared by gender, the number of male cases is higher than female in general or in national scale and each province. Even in Aceh, North Sumatra, and North Sulawesi males were almost twice that of females.



**Figure 1:** TB cases by Age in 2020.

Figure 1 shows that in 2020 the most TB cases were found in the 45-54 year age group which was 17.3%. The 25-34 year age group was 16.8% and the 15-24 year age group 16.7%.

#### 3.1. Coverage of Tuberculosis Case Finding and Treatment (Treatment Coverage/TC)

Treatment Coverage (TC) is the number of TB cases treated and reported in a given year divided by the estimated number of TB cases in the same year and described as a percentage. TC describes how many tuberculosis cases are covered by the program.

Figure 2 shows that the TC of tuberculosis cases in 2020 was 41.7%. It was relatively decreased compared three years ago. Indonesia has not reached the expected TC

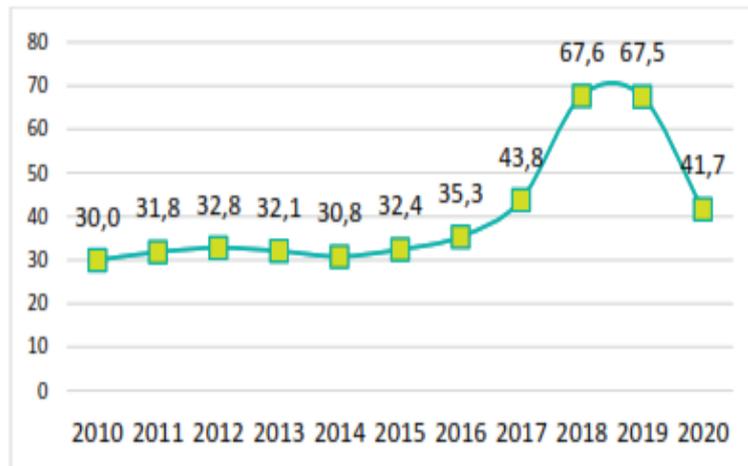


Figure 2: Treatment coverage (TC) year 2010-2020.

target of 80% in 2020 and much lower than the global TC of 71% in 2019 (WHO, Global Tuberculosis Report, 2020).

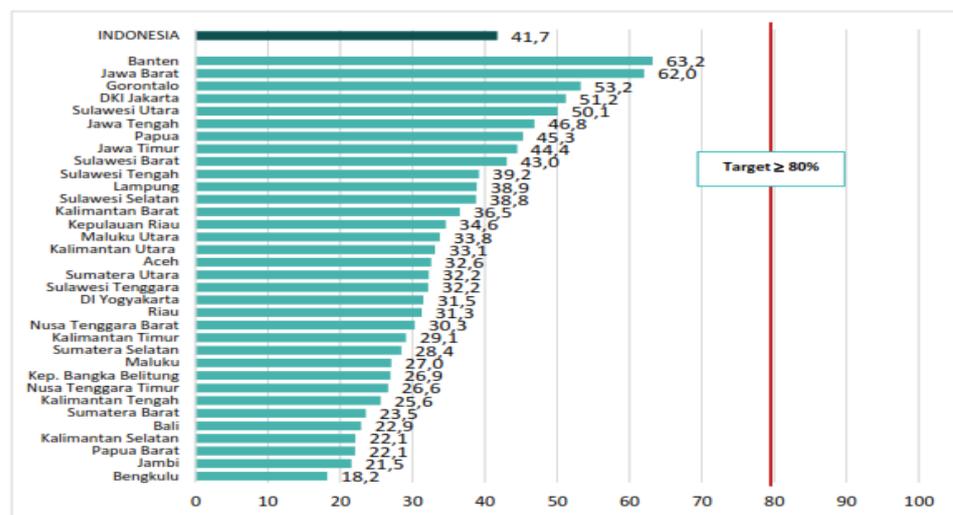
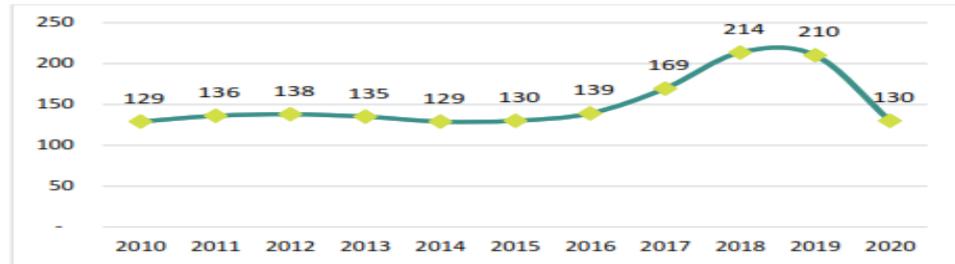


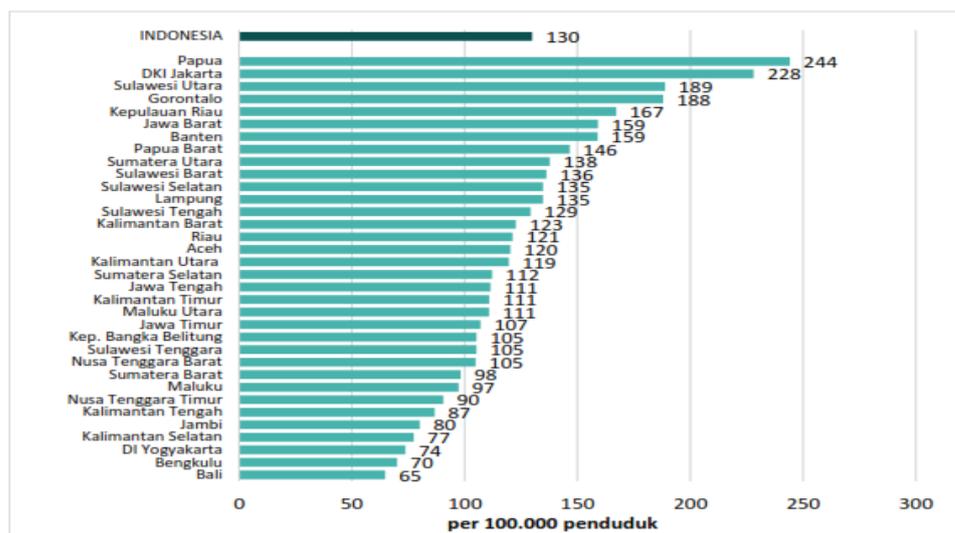
Figure 3: Treatment coverage (TC) by province in year 2020. Figure 3 shows that no province reached TC 80% in 2020. However, the provinces with the highest TC are Banten at 63.2% and West Java at 62.0%.

### 3.2. Case Notification Rate (CNR)

Case Notification Rate (CNR) is the number of all tuberculosis cases treated and reported among 100,000 residents in the certain area. If the data collected in serial, it will describe a trend (trend) of increasing or decreasing case finding from year by year in one region. Figure 6.4 shows the number of notifications of all tuberculosis cases per 100,000 population from 2010-2020 which nationally shows a trend of increasing CNR in 2018 and decreasing in 2019 and 2020.



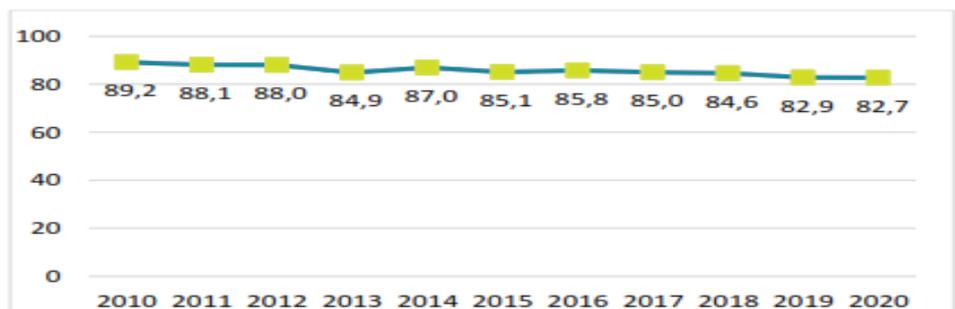
**Figure 4:** Case Notification Rate per 100.000 population in year 2010-2020 Case Nontificasion Ratte of all Tuberculosis cases by province in year 2020 is varied between 244 per 100.000 population in Papua and 65 per 100.000 population in Bali.



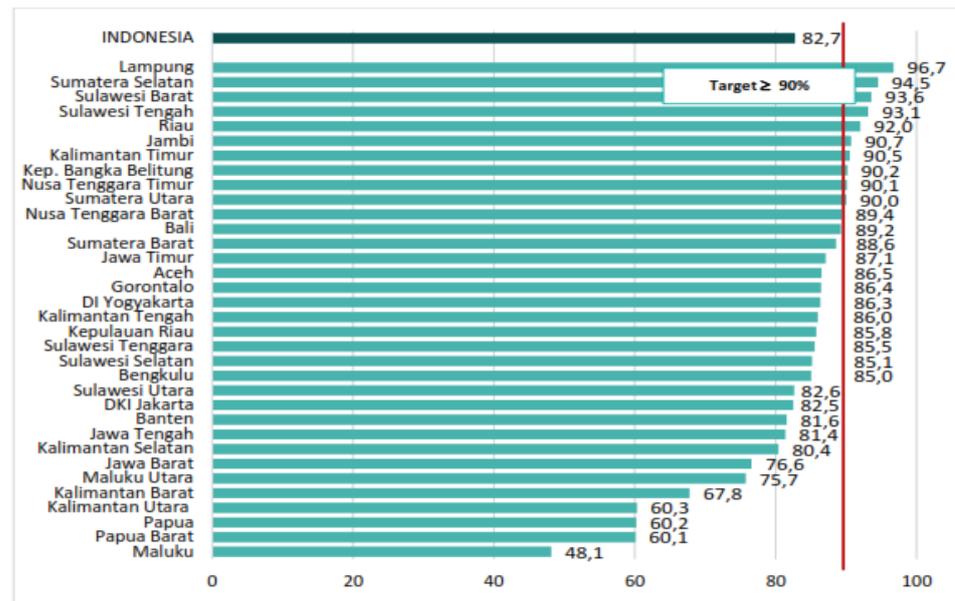
**Figure 5:** Notification rate of all tuberculosis cases per 100,000 populations by province in year 2020.

### 3.3. Medical Treatment Achieved Rate

The achieved rate of medical treatment is an indicator used to evaluate tuberculosis medical treatment. The treatment achieved rate is the number of all cured tuberculosis cases and complete treatment among all treated and reported TB cases.



**Figure 6:** The achieved rate of medical treatment of tuberculosis patients in Indonesia in year of 2010-2020 By looking at goal of Strategic Plan of Indonesia Health Ministry for the year 2020 is 90 %. The number of achieved medical treatment is not reached yet (82.7%) (Figure 6).



**Figure 7:** The achieved rate of medical treatment of tuberculosis patients by province in 2020.

Provinces that achieved a success rate of treating all tuberculosis cases at least 90% in 2020 were 10 provinces namely Lampung (96.7%), South Sumatra (94.5%), West Sulawesi (93.6%), Central Sulawesi (93.1%), Riau (92.0%), Jambi (90.7%), East Kalimantan (90.5%), Kep. Bangka Belitung (90.2%), West Nusa Tenggara (90.1%) and North Sumatra (90.0%).

## 4. CONCLUSION

In the year 2020, TC in Indonesia has not reached target of 80%. On national scale, the achieved success rate for tuberculosis medical treatment has not been reached (82.7%). According to the indicator of the Indonesia Health Ministry strategic plan target for the year 2020 is 90%.

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