

# Economic Loss Analyses Due to Tuberculosis at Kolaka Regency in South-East Sulawesi Province

La Ode Saafi\*, La Ode Kamalia and Risal

STIKES Mandala Waluya Kendari Jalan Jend. AH. Nasution, Kec. Kambu, Kota Kendari, Sulawesi Tenggara 93561

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**Abstract:** Tuberculosis can cause pain and even death, as well as can cause psychosocial and economic problems. The purpose of the study was to determine the economic losses due to tuberculosis in Kolaka Regency. This study was an analytical survey, the sample was all tuberculosis patients in 2018. The indicators used to measure the economics loss due to tuberculosis were government costs, household health costs, economic value of productive time lost due to illness and death. Analysis of government and household costs were calculated based on the cost component used for the treatment of tuberculosis, analysis of economic values due to illness using the analysis of years life with disability (YLD) and economic value dies using years of life lost (YLL) analysis amounting to Rp.452,482,857. Household health costs amounted to Rp.28, 699,500. Economic value due to illness amounting to Rp.612, 068,012. While economic value died by tuberculosis in the amount of Rp.4, 717,807,453. The total economic loss due to tuberculosis in Kolaka Regency during 2018 were Rp. 5,811,057,822.

## 1 INTRODUCTION

The main objective of the health development program was to increase the equity and health efforts that were successful and efficient and affordable by all members of the community. One of which is an effort to control and prevent tuberculosis that aims to reduce the morbidity, mortality and cases of tuberculosis and prevent the spread and reduce the impact social and economic losses, so it does not become a public health problem (Getahun *et al.*, 2016; Collins, Hafidz and Mustikawati, 2017).

Tuberculosis is an infectious disease caused by microorganisms *Mycobacterium tuberculosis* which mostly attacks lung organs in addition to other organs. Tuberculosis is commonly found in developing countries as a result of the country's inability to provide adequate services in the field of health, education, and socio-economic welfare to the community (World Health Organization, 2012). Based on the World Health Organization (WHO) global report in 2018 at the global level it is estimated that the number of new TB cases is as many as 3.2 million cases where most TB sufferers are of productive age (15-55 years), in Indonesia (World Health Organization, 2018).

Losses from the economic aspect can be caused due to the costs incurred to tackle tuberculosis which include: direct costs, indirect costs and household costs. TB is also associated with economic lost, this is caused because the population group of economically productive age (15-59 years) around 75% who suffer from pulmonary tuberculosis (Kementrian Kesehatan Republik Indonesia, 2019).

In Kolaka Regency in 2018 the number of positive acid-resistant bacterial pulmonary tuberculosis (BTA) sufferers was 235 with a case detection rate (CDR) of 24% (Kolaka, 2017). Tuberculosis treatment requires a long time period of 6-8 months and requires a very high cost. However, until now there has been no data regarding the real cost of tuberculosis treatment. In fact, the data is needed to provide input to policy makers in the framework of budget planning to controlling and preventing tuberculosis (Collins, Hafidz and Mustikawati, 2017).

This study wants to analyse the economic losses due to tuberculosis in Kolaka Regency which carried out treatment at puskesmas and hospitals. The choice of calculating the economic burden derived by tuberculosis patients and their family members is very high, both direct costs from the government, but also household health costs as well as the substantial loss of income due to illness and death (Collins, Hafidz

and Mustikawati, 2017). Based on the above, the purpose of this study was to calculate the total economic loss due to tuberculosis in Kolaka Regency from the case finding to the end of treatment.

## 2 METHODS

This type of study was a descriptive study, which was to analyse the estimated economic losses due to tuberculosis in Kolaka Regency in 2018. This study was carried out in 14 Puskesmas and 1 Hospitals, spread over 12 District Areas in Kolaka Regency. Data collection and analysis is conducted from May to July 2019.

The population in the study were all patients with tuberculosis in Kolaka Regency in 2018 totalling 235 people. The sampling method was census. Data collection was done through observation, structured interviews using interview instruments, and collecting data through documentation that is looking at documents that are related to this study. Data obtained were analysed to determine government and household health expenditures. The economic loss due to illness and death were analysed by the Disability Adjusted Life Years (DALY) method (Murray *et al.*, 2012).

## 3 RESULTS AND DISCUSSION

The socio-economic characteristics of tuberculosis patients in this study indicate that 70% are male and 30% are female or the proportion of female patients is 1: 2, 82% are aged 15-59 years, 47% work in the informal sector like fishermen and farmers.

### 3.1 Government Budget for Tuberculosis Control

The funding for tuberculosis treatment with the DOTS program in Kolaka Regency is sourced from the regional budget (APBD) of Rp. 297,477,857, - which is focused on financing TB diagnosis and treatment activities (Indonesia, 2018; World Health Organization, 2018). While the funding for the TB control program comes from the National Budget (APBN) through the health operational assistance fund (BOK) of Rp. 141,050,000, - which was used for indirect activities for prevention and promotion, and funding came from grants from the global TB component fund of Rp. 13,955,000, - which is used for program supervision and monitoring (Getahun *et al.*,

2016; Kementerian Kesehatan Republik Indonesia, 2019).

Efforts to tackle tuberculosis elimination are not only enough to rely on the availability of service personnel, adequate logistics and active involvement of community participation, but also important is the availability of adequate amounts of the budget. In 2018 the Kolaka Regency government allocated a health budget for the prevention of diseases of Rp. 1,471,682,500, - while the budget for the tuberculosis eradication program is Rp. 452,482,857, - then the amount of the Kolaka District health budget for efforts to control tuberculosis by 31%. This condition is an illustration of how high the commitment of policy makers (stakeholders) at various levels in Kolaka Regency in organizing tuberculosis prevention efforts.

### 3.2 Household Expenses of Tuberculosis Cases

Costs incurred by households in the treatment of tuberculosis patients obtained in this study consisted of transport costs incurred by patients while undergoing examinations and taking drugs at the Puskesmas or Hospital. Transport costs obtained are the real value of each patient's transport expenditure then accumulated to Rp. 28,699,068. Household expenditure from the point of view of service users is the amount of funds that must be provided to be able to use services, which are included in this expenditure is every expenditure made by consumers in order to obtain health services (Getahun *et al.*, 2016; Collins, Hafidz and Mustikawati, 2017).

In this study, the household costs that are calculated are only expenses for transportation costs, but fees for eating and drinking are not counted because tuberculosis treatment services do not require a long time. The results of an analysis conducted by Gani (2000) in Yogyakarta Regency reported that tuberculosis in Indonesia caused economic losses for household expenditure of Rp. 25,021,947,850. Compared to household expenditure due to tuberculosis in Kolaka Regency, it can be seen that the economic loss for household expenditure due to tuberculosis is 0.14% of the total value of economic losses for household expenditure due to tuberculosis nationally (Kolaka, 2017).

### 3.3 The Economic Value of Productive Time Lost Due to Suffering of Tuberculosis

Costs of productivity or lost income are related to losses incurred due to loss of work time due to seeking treatment or stopping work due to illness. Based on the results of this study it was found that the total economic value due to illness was Rp. 612,068,012, - with 221 patients. Indicator of lost productive time is how long productive time is lost due to a person or group of people experiencing illness, disability or death due to a certain health problem (Getahun *et al.*, 2016)

Income of patients with missing tuberculosis is calculated during the examination period until the end of treatment (success rate). In this study the patient has passed the examination period for diagnosis and at least has entered the final stage of the treatment program. Calculation of income of patients who were lost when taking anti-tuberculosis drugs and because they stopped working due to tuberculosis and died (Ahmad *et al.*, 2009; Ayles *et al.*, 2013; Collins, Hafidz and Mustikawati, 2017).

In this study it was found that the majority of sufferers' age groups were productive ages 15 - 59 years namely 182 people (82%) and the status of patients was also mostly as heads of families i.e. 129 people (58%). This condition can give an illustration that the sufferer's family will experience family economic difficulties because the person suffering from illness is the head of the family who acts as the main focus of the family in earning a living as well as other family members who fall into the age group of workers (Ahmad *et al.*, 2009; Nurjana, 2015).

The actual income of patients with pulmonary TB an average of Rp. 1,622,872 per month or Rp. 19,474,462, - per year, as well as patients with pulmonary TB who are sick will lose productive time as much as 10,920 days (29.9 years). If converted into rupiah value, the economic value can reach Rp.612,068,012. Pulmonary TB patients who died also lost productive time as much as 121,910 days or 334 years whose economic value reached Rp. 4,717,807,453. Thus, the economic value due to illness and death due to pulmonary TB in Kolaka Regency in 2018 reached Rp. 5,329,875,465

### 3.4 Economic Losses Due to Death of Tuberculosis Patients

Patients with tuberculosis who died during 2018 in Kolaka District were 14 people, by conducting the Years of Life Lost (YLL) analysis, the economic loss

value of Rp. 4,717,807,453, - Economically, people or people with tuberculosis who die will surely lose their work opportunities or will be completely lost, which in turn cannot earn income. The assumption of the economic value of lost time can be interpreted as the loss of one's income due to death.

In this study, the total economic loss of tuberculosis patients was the total value of the government budget allocation, household health expenditure and the economic value of productive time lost due to illness and death. The total losses incurred due to tuberculosis in Kolaka Regency amounted to Rp.5, 811,057,822.

## 4 CONCLUSIONS

Government health budget for medical expenses for patients with pulmonary TB in the district of Kolaka in 2018 amounting to Rp. 452,482,857. Household expenditure for the treatment of pulmonary TB patients in Kolaka Regency in 2018 amounting to Rp. 28,699,500. Costs lost (economic value) due to illness by patients with pulmonary TB in Kolaka Regency in 2018 amounting to Rp. 612,068,012. Costs lost (economic value) due to death before reaching an average life expectancy due to pulmonary TB disease of Rp. 4,717,807,453. Lung TB disease in Kolaka Regency in 2018 caused a total economic loss of Rp. 5,811,057,822.

From this research, it can suggest that the amount of economic losses caused by tuberculosis requires serious efforts in controlling and preventing tuberculosis. For policy makers to conduct a financing analysis of tuberculosis disease control and prevention programs so that the allocation of costs can be maximized and utilized effectively and efficiently.

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