

## Executive Summary

### Research Project: Return on Investment of Tuberculosis in Thailand: a Cost-Benefit Analysis

**Introduction:** Tuberculosis (TB) is a global health problem. It not only causes disease burden, measured by combining the years of life lost due to premature death and years of life lost due to time lived in states of less than full health, but also results in economic burden. The impacts of TB can be felt by many, ranging from patients, their families, and close friends and relatives, all the way to potential productivity losses incurred on a country-level. In 2015, the World Health Organization classified Thailand as one of 14 countries on all three “high burden country” (HBC) lists: tuberculosis (TB), multidrug-resistant tuberculosis (MDR-TB), and TB/HIV.

Based on recent estimates made by the WHO, Thailand had 119,000 new TB patients in 2016, equivalent to an incidence rate of 172 per 100,000 population. This rate is more than 50 times higher than those in developed countries, and is the cause of death for up to 12,500 people per year<sup>1</sup>. Moreover, only 74,190 of all TB patients, or approximately 62%, receive treatment. The End of TB Strategy, which was initiated by the WHO in 2012 and unanimously endorsed by all WHO Member States, aims to reduce incidence levels of TB to not more than 10 per 100,000 population and the number of TB deaths by 95% compared with levels in 2015 – equivalent to not more than 6,700 incidents per year\* and not more than 700 TB deaths per year\*\*, respectively.

This study aims to estimate the cost-benefit caused by TB in Thailand by adjusting TB-related costs to 2016 values and considering them from a societal perspective. These costs comprise: 1) costs incurred by the public sector in operating TB prevention and control programs, and 2) cost of illness – consisting of medical costs, expenses and opportunity costs of patients and their relatives, and social productivity losses resulting from premature death. Additionally, to analyze what might occur in the future if nothing changes and to subsequently make policy recommendations based on these findings, forecasts regarding the severity of TB and cost-benefit in 2035 are made based on the status quo, i.e. the rates of screening coverage, disease detection, and treatment success remain the same.

**Results:** Thailand incurs an economic burden from TB of up to 75,238 million baht per year. Cost of illness excluding death amounted to 4,796 million baht per year (64,645 baht per person), productivity loss attributable to premature death was 70,442 million baht (5.63 million baht per death), and costs incurred by the public sector in operating TB prevention and control programmes averaged 330 million baht per year (0.43% of total economic burden). If the implementation of the National Tuberculosis Programme can end TB through searching for and completely curing TB patients, it will be considered cost-effective if the cost is lower than 5.63 million baht per person.

Under the assumption that the situation in 2016 remains the same for the future, the severity of TB as well as productivity loss due to TB will worsen in 2035. The number of TB patients will increase from 119,000 people in 2016 to 124,000 people in 2035, equivalent to an increase in incidence to 185 per 100,000 population – up from 172 per 100,000 population in 2016. Meanwhile, the number of deaths due to TB is expected to still be high at 11,000 people in 2035. Consequently, an economic burden is projected to rise to 358,973 million baht for the next 5 years (2017-2021) and 1.39 trillion baht for the next 21 years (2015-2035).

In addition, scenarios were made to evaluate Ending TB policies. If the government could continue to work to reduce the incidence and death of the short-term goals of 5 years will contribute to be more case notification and TB treatment processes. The cost of illness excluding death was higher than the status quo of approximately 4,825 million baht, comprised direct medical cost at 36% (1,713 million baht or 343 million baht per year) and the rest was the indirect costs. Although the cost of illness rose significantly, it would be beneficial on reducing mortality. In societal perspective, it also resulted in lost productivity as well. The overall economic burden for the 5-year period has fallen 37%, with a saving of 131,647 million baht (26,329 million baht per year). Furthermore, continuing to achieve the 21-year long-term goal, the cost is lower than status quo in all areas, which are direct medical costs, direct nonmedical costs and opportunity costs of patients and relatives, including the loss of premature death. Accordingly, the economic burden decreased by 59% or 814,190 million baht (38,771 million baht per year).

According to the comparison of the return on investment for 5-year strategic plans (2017-2021), it is expected to rise by 343 million baht per year, combined with a budget for searching, screening, protecting and disease controlling is 1,000 million baht a year. The total expected cost amounts to 1,343 million baht. Moreover, this resulted in a reduction in the economic burden, in terms of societal perspective, by an average of 26,329 million baht per year or around 19.6 folds of ROI.

### Policy Recommendations

1. Thailand must urgently increase its investments in the National Tuberculosis Programme to reduce both health and productivity losses of up to 54 billion baht per year.
2. The Ministry of Public Health should initiate measures to identify TB patients and include them into the health system in a more comprehensive manner, and increase the quality of medical care for individual patients to achieve a higher rate of successful treatment. This will reduce infections and incidence in the long-term, thus resulting in lower death rates due to TB and ultimately lowering economic losses.
3. The National Tuberculosis Programme must include multi-disciplinary research to obtain more epidemiological and clinical baseline information so that there is sufficient data to be used in forecasting future impacts. Moreover, a comparative study should be initiated which aims to identify measures that are effective in the Thai context both policy-wise and from a cost perspective.

\* The total Thai population in 2035 is forecasted to be 67 million people (Source: Population projections for Thailand 2010-2040. Bangkok: Office of National Economic and Social Development Board; 2013).

\*\* The baseline figure for number of deaths in 2015 is 13,900 people.

\*\*\* productivity losses from premature death = years of

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