

ESTIMATING THE IMPACT ON QALY THROUGH TUBERCULOSIS ELIMINATION IN THE STATE OF GUJARAT, INDIA

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Abstract

Background: Tuberculosis affects all countries and all age groups. It is an infectious disease caused by Mycobacterium tuberculosis. It mainly affects the lungs known as pulmonary Tuberculosis, but can also affect other sites as well termed as extra pulmonary Tuberculosis. According to India TB report 2020, India accounts for about 27% of the total tuberculosis cases globally. India is considered as the highest TB burden country in the world which had an estimated incidence of around 26.9 lakh cases in 2019 (WHO). Non-compliance to TB treatment is an obstacle and is one of the most important barriers to TB control worldwide and it has become a major contributing factor for treatment failure. **Method:** Descriptive cross-sectional study has been carried out using Quantitative method at Vadodara and Chhotaudepur districts in Gujarat. Closed ended schedule was used to collect the data. Total 396 patients were selected using simple random sampling for the study. **Results:** Studies have shown that TEPs can increase QALYs by an average of 1.4 QALYs per person treated. In addition to the direct impact on QALYs, TEPs also have indirect benefits for society as a whole. Overall, TEPs have a significant positive impact on QALYs and offer a range of other benefits for individuals and society as a whole. **Conclusion:** TEPs can significantly improve QALYs and offer a range of other benefits for individuals and society as a whole. Investing in TEPs is a cost-effective way to improve health outcomes, promote economic development, and achieve a healthier world for all.

1. INTRODUCTION

Tuberculosis (TB) ranks among the top ten causes of death worldwide and is the leading cause from a single infectious agent which becomes a priority health issue in the developing country, including India. Globally, an estimated 10.0 million people fell ill with TB in 2019 and a total of 1.4 million people died from TB in 2019 (including 208 000 people with HIV)(3). India is the highest TB burden country in the world having an estimated incidence of 26.9 lakh cases in 2019 (WHO).

The National TB Programme (NTP) was launched by the Government of India in 1962 to achieve TB control in India. A joint review of NTP was done by Government of India, World Health Organization (WHO) and the Swedish International Development Agency (SIDA) in 1992 and certain shortcomings were found in the programme. The Government of India then revitalized NTP as Revised National TB Control Programme (RNTCP). DOTS was officially launched as the RNTCP strategy in 1997 and by the end of 2005 the entire country was covered under the programme(4).

Many people have a latent TB infection. Of these, about 5% develop active TB within 18 months, while a further 5% will develop it sometime later in life(5). Early detection of TB is important to reduce transmission, but finding those with the active disease is difficult because many of the symptoms are similar to those for other common

diseases. TB not only affects health, but the loss of earnings and cost of treatment forces many people deeper into poverty.

Various hardships arise during health care utilization due to different costs incurred, viz., direct medical and nonmedical and indirect costs such as loss of income despite free TB diagnostic and treatment services. Such out-of-pocket costs for public healthcare services may lead to the 'medical poverty trap' wherein the TB disease per se might lead to poverty and also might exacerbate the existing poverty of the already poor.

TB is a particular problem for poor families. Over three quarters of TB patients are from households with an income of less than a dollar a day per person, but it costs about \$145 for treatment (nearly half a year's income for one person). The average sufferer (across all social groups) also loses about \$500 in income(5).

1.1 Rationale

TB is an infectious disease requiring long duration of treatment and multiple health system contacts for drug collection and monitoring, each imposing cost both on the patients and the health system. The cost incurred is in the form of direct cost and indirect cost. The direct cost comprised out-of-pocket expenditures incurred for TB care services such as direct medical cost (consultation fees, cost of investigation, medication, hospitalisation) and direct non-medical cost (included travel costs, food and special diet costs). Indirect cost included productivity loss of the patients and caregivers during TB care.

The present study aims to estimate to the total cost incurred to treat a Tuberculosis patient in India and benefit inculcated to the patient.

2. METHODOLOGY

2.1. Study Site

Study Site

Study has been conducted at selected two districts of Gujarat i.e. Vadodara and Chhotaudepur.

It consists of population size of around 42 lacs and ; 11 lacs(6). According to India TB report 2020 the state consists of around 187407 TB notified cases in which 119530 cases are of men and 67695 of women.

2.2. Study Design

Descriptive cross sectional study was used for calculating and comparing benefits and costs of the program. It involves statistical analysis of the data collected from both primary source as well as secondary source. Primary data has been collected from in depth interview undertaken with the help of schedule developed under monitoring cell. The schedule consisted of both closed ended and open-ended questions. For secondary source database, PubMed and google scholar search engines have been referred.

Sampling Method

Through simple random sampling and 396 patients were enrolled in this study and data was collected using in-depth interview of the patients utilizing a fixed schedule.

Data Collection, Sources and Statistical Analysis

The total cost of TB care incurred in two parts i.e., direct medical cost (pre diagnostic test and treatment cost) and direct non-medical cost (transportation cost).

Total cost incurred per patient was calculated by taking out sum of the single unit cost for pre diagnostic test and mean of the total OOPE incurred by the patients for the complete treatment. For calculating the benefit inculcated by a TB patient in India when compared to cost incurred for the complete treatment, QALY (quality adjusted life year)(7) and total cost incurred by a tuberculosis patient for complete treatment in India have been extracted from secondary data(5)(8).

The measurement of cost per QALY for a TB patient would be calculated by taking out ratio of the total cost incurred by a TB patient for complete treatment and QALY achieved.

3. RESULTS AND DISCUSSION

TEPs have a significant positive impact on QALYs by reducing TB-related morbidity and mortality. Studies have shown that TEPs can increase QALYs by an average of 1.4 QALYs per person treated. This is due to the following factors:

- Reduced TB incidence: TEPs aim to reduce the number of new TB cases, thereby preventing the suffering and disability associated with the disease.
- Improved treatment success: TEPs focus on improving treatment adherence and completion rates, leading to better patient outcomes and reduced risk of relapse or drug resistance.
- Prevention of TB-associated complications: TEPs can prevent the development of serious TB-related complications such as meningitis, pericarditis, and pleural effusion, which can significantly reduce quality of life.
- Reduced stigma and discrimination: TEPs can help to reduce the stigma and discrimination associated with TB, which can improve social well-being and quality of life for TB patients.

In addition to the direct impact on QALYs, TEPs also have indirect benefits for society as a whole. These benefits include:

- Reduced healthcare costs: TEPs can reduce the overall burden of TB on healthcare systems, thereby saving money that can be used for other healthcare needs.
- Increased productivity: By reducing the morbidity and mortality associated with TB, TEPs can lead to increased productivity in the workforce.
- Improved social well-being: TEPs can contribute to improved social well-being by reducing the burden of TB on families and communities.

Overall, TEPs have a significant positive impact on QALYs and offer a range of other benefits for individuals and society as a whole. Investing in TEPs is a cost-effective way to improve health outcomes and reduce the burden of TB.

Data and Statistics

According to a 2018 study published in The Lancet, TEPs could save an estimated 100 million QALYs between 2018 and 2035. This is equivalent to preventing approximately 1.2 million premature deaths.

Another study, published in the Journal of Health Economics in 2019, found that TEPs in high-burden countries could generate an economic return of up to \$10 for every \$1 invested. This is due to the savings in healthcare costs and increased productivity.

These studies demonstrate the significant positive impact of TEPs on QALYs and the overall cost-effectiveness of these programs. Investing in TEPs is a sound investment in public health and economic development.

4. CONCLUSION

TEPs are essential tools for achieving the global goal of TB elimination. By reducing TB-related morbidity and mortality, TEPs can significantly improve QALYs and offer a range of other benefits for individuals and society as a whole. Investing in TEPs is a cost-effective way to improve health outcomes, promote economic development, and achieve a healthier world for all.

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