A Comprehensive Study on Review of Literatures on Tuberculosis

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Abstract
Background of the study: *Tuberculosis is a contagious illness caused by bacteria (Mycobacterium tuberculosis) that mostly affects the lungs. When an infected individual coughs or sneezes, it can spread via the air. Tuberculosis imposes an economic cost not only on the afflicted person, but also on his whole family and entire nations due to lost output during the ill period. Every year, ten million individuals have tuberculosis, resulting in a significant loss in the nation's per capita revenue.* **Objectives of the study:** *A greater number of articles by diverse writers demonstrate their interest in researching one economic stage of TB. Few authors have conducted reviews of the literature on the economic morbidity of TB in recent decades; however, given the economic elements in recent times, a more complete assessment is performed here to identify the Research Gap.* **Findings:** *The researcher reviewed the literature on economic morbidity of tuberculosis in this paper in order to assist other researchers, academicians, policymakers, and practitioners in taking a closer look at the recent trends and growths, statistical methods, financial gaps, and achievement rates in this studies.* **Conclusion:** *The author has examined various papers and proposed a comprehensive summary of various studies conducted in India and abroad, identifying certain recommendations and research gaps, as well as methods that would provide hints for future research in the area of Health Economics under the headings of tuberculosis.*
Keywords: Tuberculosis, Review of literature from Overseas and India, Research Gap

Introduction

Tuberculosis is one of the most frequent infectious illnesses in India, and it is one of the most lethal diseases, killing millions of people each year. There were an expected 21,000 tuberculosis fatalities in the WHO European Region in 2020, equating to 2.3 deaths per 100,000 persons, with around 3800 of these deaths happening in the EU/EEA. According to WHO estimates, around 2.7 million individuals contracted tuberculosis in India in 2017, with over 400,000 people dying as a result of the disease. The theme of World Tuberculosis Day (March 24) 2022, "Invest to End TB. Save Lives," emphasises the need of investing resources to accelerate the battle against this illness and meet global leaders' promises to eliminate TB. The TB end plan, authorised by the 67th World Health Assembly in 2014, intends to "end the global TB epidemic by 2035." In addition, the WHO global TB report for 2021 (WHO,2021) reveals a significant yearly worldwide financing deficit. Only 5.3 billion USD were available for TB care and prevention in 2020, out of an annual requirement of around USD 13 billion, and only USD 901 million were allocated for TB

research.

As a result, it is a disease that advances slowly and spreads readily due to the mechanism of transmission, and because India is wealthy in terms of population growth, TB may spread easily in crowded areas, causing millions of infected patients and fatalities each year. As a result, such studies are required to develop robust policies and planning methodologies in order to meet the TB end-of-life objectives by 2030.

Objectives of the study

- To conduct a literature review on the economic cost of tuberculosis in India and elsewhere.
- To identify research gaps for future studies on the economic effect of tuberculosis and related morbidity.

Methodology

This descriptive study uses a literature review to identify research gaps and the effects of tuberculosis and related morbidity.

Source of Data Collection

Information for this study was gathered from a variety of secondary sources, including journals, articles in newsletters, working papers, and annual reports, among others.

Economic Burden of TB and its Morbidity

The economic burden of tuberculosis on patients and their families refers to the costs incurred by patients during the six-month treatment period, and if the patient is an earning member, and the family depends on him, then the entire family will face the economic burden, because during the treatment period, a person loses his wages for at least three to six months, and if a patient is female, then caregiving activities decrease. Thus, the economic impact of tuberculosis includes pay loss, lost working capacity, out-of-pocket expense, and non-participation in productive activity. And, as a result, the nation's per capita income will fall, as will its national productivity. In response to this worry, the Indian government said in 2020 that it will eliminate tuberculosis from the country by 2025, TB Free India, through its national TB Elimination Programme. It comprises significant investment in health care, provision of supplemental nutrition credit through the Nikshay Poshan Yojana (per month 500 direct deposit to patients account), nationwide surveys and campaigns, and public-private partnerships, all of which contribute to the objective of eradicating the condition.

Discussion

As a result, the researcher summarises the literature studies from outside and India in order to identify research gaps and creative ideas in the field of social science research. As a result, the tables in the following list show the literature reviews.

Earlier Studies from Overseas (1996 to 2022)

Sl. No	Name of the author	Objectives/Methods/Sampling	Findings/Results	Conclusion/ Suggestions
1	Dubos R. & Dubos J. (1996)	Rene and Jean Dubos argue in The White Plague that the great increase in tuberculosis was inextricably linked with the rise of an industrialised, urbanised society, and a much more controversial idea when this book first appeared forty years ago that medical science progress had very little to do with the marked decline in tuberculosis in the twentieth century.	Tuberculosis was, in reality, the first punishment that capitalistic society had to pay for cruel labour exploitation. Tuberculosis rates in developed countries fell in the first half of the twentieth century.	Funding for public health TB control facilities was also curtailed in the second part of the twentieth century as tuberculosis cases declined.
2	Norbert L. Vecchiato (1997)	This paper investigates ethnomedical knowledge and practises about TB conceptualization and management in a rural southern Ethiopian community. An adult health-status survey of 217 persons chosen using quota sampling techniques was used to evaluate prevalent nosological structures. Furthermore, disease-promoting habits were discovered using qualitative study methodologies.	The importance of TB-related ethnomedical knowledge and management practises in Ethiopian primary health care and disease control programmes is explored.	It is suggested that health education programmes depict the nature and transmission routes of TB, as well as the consequences of biological therapy. The significance of adequate nutrition in illness prevention.
3	P. Komalratanakul et al., (1998)	The calculation of direct and indirect patient costs is essential to assess the entire economic burden of the disease and the efficacy of existing management techniques from a society standpoint. All adult TB patients who finished treatment between August 1996 and February 1997 at 16 randomly chosen government health care institutions in Thailand (n=673) were questioned using a structured questionnaire in a cross-sectional study.	Patients with low incomes were particularly hard hit by illness-related expenditures. Expenditure was often funded by home savings or transfers from community members and relatives.	The stringent application of an existing government policy of free health care. Further service decentralisation to cut travel costs and job absences, as well as social security payments for patients undergoing treatment.
4	Christopher J.et al., (1998)	A TB epidemiological model has been built and applied to five areas of the world. In 1998, it is estimated that there were 6.7 million new cases of TB and 2.4 million tuberculosis deaths worldwide.	A TB epidemiological model has been built and applied to five areas of the world. In 1998, it was projected that there were 6.7 million new cases and 2.4 million fatalities worldwide. A new vaccination with 50% effectiveness might reduce the number of illnesses by 36 million and the number of fatalities by 9 million.	Support for large additions to global TB control programmes will be forthcoming only if the magnitude of the problem and the possibilities for response are broadly recognised.

5	Antonio Marrero et al., (2000)	This study examines the epidemiology of TB in Cuba as well as the effectiveness of the tuberculosis control campaign. The factors that contributed to a rise in the number of new TB cases between 1991 and 1994 were investigated and remedied in 1995-97. A descriptive investigation of the incidence rates of new TB cases reported from 1962 to 1997 was conducted, with specific attention on the overall shift between 1965 and 1991 and the subsequent rise.	Reducing diagnostic delays caused by flaws in the health-care system. Making the TB programme a priority again.	Cuba is a good example of how, even in a low-income country, it is possible to fight tuberculosis effectively by implementing control strategies advocated by the World Health Organisation and the International Union Against Tuberculosis and Lung Disease and by providing adequate political support to the programme.
6	K. Floyd (2003)	This research examines the effects of economic studies on tuberculosis control from 1982 to 2002, with an emphasis on cost and cost-effectiveness studies. The impact of economic studies of tuberculosis control on practise is then examined using a thorough assessment of the literature on cost and cost-effectiveness studies connected to tuberculosis control, as well as three case studies.	After 1994, 66 cost effectiveness studies and 31 cost studies on a range of major tuberculosis control subjects were conducted throughout the next 20 years. The developed world is more likely to have an influence on screening and preventive policy and practise. Despite the high prevalence of tuberculosis in underdeveloped nations, relatively fewer research have been conducted.	Cost and cost effectiveness studies, as well as other forms of economic research, will be essential in the future.
7	M.J Ho (2004)	This research examines sociocultural approaches to TB based on their emphasis on cultural, environmental, and political and economic aspects. Examine an immigrant TB case study.	Sociocultural approaches to TB are discussed in terms of their emphasis on cultural, environmental, and political-economic variables.	The cultural, environmental, and political-economic elements forming TB and supporting an emergent tuberculosis theory.
8	S. Jackson et al., (2006)	To evaluate the economic impact of illness on individual tuberculosis cases in rural China and to demonstrate a strong TB-poverty relationship, patients and controls were questioned 1-3 months following diagnosis. The matched multivariate logistic regression method is employed.	Using household income, assets, and relative wealth within the village, multivariate logistic regression is used to compare cases and controls for poverty status. Even after adjusting for smoking and other risk factors, poverty is highly related with tuberculosis incidence. The cure rate for DOT was 91%.	Because DOTs were either incomplete or not completed, mortality was high. Poverty is both a cause and a terrible result of tuberculosis.

9	Ramanan Laxminarayan et al., (2007)	The economic benefits of extending the World Health Organization's DOTS policy, as outlined in the Global Plan to Stop Tuberculosis, 2006-2015, are examined in this research. The authors employed a model-based method that included epidemiological forecasts of prevented mortality and economic gains calculated using the value of statistical Life for Sub-Saharan Africa and the world's 22 high burden tuberculosis-endemic nations.	Between 2006 and 2015, the economic advantages of maintaining DOTs at present levels are much larger than the expenses in the 22 high burden TB endemic nations and the Africa region.	In all nine high burden nations, benefit cost ratios of the Global Plan strategy relative to prolonged DOTs were unequivocally more than one.
10	David Stuckler et al., (2008)	The study's goal is to look at how the IMF (International Monetary Fund) has responded to changes in TB incidence, prevalence, and death rates in these nations. Multivariate regression analyses TB incidence, prevalence, and death data over two decades versus factors possibly impacting tuberculosis programme results in 21 postcommunist nations with comparative data.	In post-communist Eastern European and Soviet nations, IMF economic reform programmes are connected with considerably higher TB incidence, prevalence, and mortality rates. In two decades, multivariate regression is utilised to examine the incidence mortality and prevalence of tuberculosis.	Future studies should look into how IMF programmes could have affected non-tuberculosis health outcomes.
11	C Dye et al., (2009)	To assess if disparities in national TB incidence patterns are due to the varying performance of central policies or biological, social, and economic variables. The author utilised regression analysis to examine patterns in case notifications as a metric of trends in incidence in 134 countries from 1997 to 2006.	In nations with more health-care spending, TB incidence rates fell faster. The rate of identification of smear-positive cases correlated negatively with national trends.	Although TB control measures have saved millions of lives, their impacts on transmission and incidence rates are not yet generally recognised.
12	Sandra V kik et al., (2009)	This study looked at the direct and indirect expenses of immigrants with tuberculosis in the Netherlands. A cross-sectional survey was done at 14 municipal health agencies and two specialised TB hospitals using the interview approach.	The majority of the money is spent while in the hospital. Time and additional work days are lost.	Patients with tuberculosis are economically vulnerable.
13	Comas I Gagneux S (2009)	This paper contends that new interdisciplinary techniques, including the merging of epidemiology and system biology, dubbed "systems epidemiology," will be necessary to eradicate tuberculosis.	To eradicate tuberculosis, new interdisciplinary techniques, particularly the merging of epidemiology and systems biology known as "systems epidemiology," will be necessary.	Renewed TB research efforts have yielded vital new insights into the biology and epidemiology of this deadly disease.

14	D. Falzon et al., (2011)	To investigate WHO recommendations for the programmatic management of drug-resistant TB. To create recommendations, a diverse expert panel employed the Grading of Recommendation Assessment, Development, and Evaluation (GRADE) method.	WHO recommendations for the programmatic treatment of drug-resistant TB were reviewed. To increase the quality of current evidence, controlled trials are required.	Scientific and medical organisations should spread the advice among MDR-TB practitioners and public-health decision-makers.
15	Boika Rechel et al., (2011)	The impact of the present global economic crisis on the spread and control of communicable illnesses is still unknown. This research sought to investigate specialists' perspectives on the present crisis's impact, as well as government efforts to ameliorate the crisis's purported negative influence on communicable illnesses. From November 2009 to February 2010, an online poll was undertaken among specialists from national communicable disease control agencies in European Union (EU) and European Free Trade Association (EFTA) nations.	There are just a few particular national policies and initiatives targeted at reducing the effects of the economic crisis.	Financial resources, public health personnel, and infrastructure must be sustainable.
16	Alice & David (2013)	To conduct research on the economic evaluations of point-of-care testing options for active TB. POC (Points of Care) testing is utilised to improve conceptualization as a diagnosis and treatment system.	POC diagnostics are frequently heralded as having the ability to change tuberculosis (TB) control efforts. Economic analysis assists decision makers in allocating scarce resources for tuberculosis control.	POC testing evaluation has unique issues, such as assessing the entire diagnostic system, including implementation costs, translating diagnostic results into health outcomes, and accounting for downstream treatment costs.
17	James Brown et. al., (2015)	This study examines the health state and quality of life in TB patients through the evaluation of innovative therapies or prevention techniques, as well as health policy.	Because there is no validated Tb-specific instrument for measuring health status, a diverse and non-standardized set of evaluation methods has been used. There is a scarcity of normative data on the general population's health.	Systematic assessments of quality of life are urgently needed in certain populations, such as individuals with extrapulmonary TB, drug-resistant illness, HIV co-infection, and latent TB infection, as well as in children with TB; post-treatment disability assessment is also essential.

18	Adamuet.al., (2017)	Using data from a big treatment institution in Nigeria, estimate mortality following treatment initiation. A retrospective cohort of TB patients treated at Aminu Kano Teaching Hospital between January 2010 and December 2014 was studied. Mortality rates estimated per person-months at risk (pm). To identify risk variables for death, the Cox proportional hazards model was utilised.	In this cohort of 1,424 patients with a median age of 36.6 years, 237 patients (16.6%) died after starting TB therapy, yielding a death rate of 3068 per 100 pm of treatment. Being HIV-positive but not on antiretroviral therapy (ART) was a risk factor for mortality.	This study attributes early fatalities in this relatively young group to TB diagnosis and treatment delays, insufficient drug-resistant TB therapy, and poor ART availability. Expansion and improvement in the quality of TB and HIV diagnostic and treatment services are required to meet the sustainable development objective of decreasing TB fatalities by 95% by 2035.
19	H.Wang et.al., (2018)	The purpose of this study was to characterise the monthly TB notification rate in China. The monthly TB notification rate was used from 2005 to 2017. SARIMA (seasonal autoregressive integrated moving average) was employed.	From 2005 to 2016, there was a declining trend and seasonal fluctuation in the rate of TB notifications in China, with the peak being in the spring. ARIMA's SARIMA model was discovered.	In China, tuberculosis is a seasonal illness with a spring peak, and the TB notification rate has declined by 3.17 percent every year. The SARIMA-GRNN model might be more effective than other SARIMA models. The existence of risk variables in the winter should be included into decision-making.
20	Chu-chang Ku, et. al., (2019)	The Lee-Carter models, which were created for mortality modelling, were used to estimate the temporal changes in age-specific TB incidence data in Taiwan from 2005 to 2018. Male and female models were modelled separately. The demographic estimates were integrated with age-specific TB incidence forecasts to project TB incidence to 2035, and TB incidence projections with demography fixed in 2018 were compared to projections allowing for demographic change.	The models in this investigation measured rising incidence rates with age and diminishing temporal patterns. According to the estimate, TB incidence rates in Taiwan would fall by 54% by 2035 compared to 2015, with most age-specific incidence rates falling by more than 60%.	The influence of population ageing on TB epidemics is informed by age-specific incidence projections combined with demographic forecasts. Taiwan's TB control programme should create programmes tailored to older age groups and their care requirements.

21	Guy Stallworthy et. al., (2020)	The quality of Tuberculosis treatment in the private health sector was the subject of this article. This article is mainly based on two publications released in October 2018 by the World Health Organisation and its partners. "A Landscape Analysis of Private Healthcare Provider Engagement in Tuberculosis Care and Prevention."	Failure to engage the full range of health care providers for tuberculosis has serious consequences in terms of access to quality care, resulting in increased transmission due to delayed diagnosis and treatment; excess mortality and morbidity due to inappropriate treatment; and increased drug resistance due to incomplete treatment.	To accomplish this and guarantee that patients have access to excellent treatment wherever they want it, new collaborations, updated data systems, new payment methods, new talents, and different mindsets will need to be leveraged even more. This is the fundamental definition of universal health care.
22	M.J.A reid and E.Goosby et.al., (2020)	The research attempted to answer the issue, "How should TB high-burden countries and their development partners target future investments to ensure that TB is eradicated?" It offers a thorough analysis as well as precise solutions to solve the issue and, eventually, remove the impediments to achieving a TB-free world. The research emphasises the necessity of enhancing care quality as a critical component of resolving the pandemic.	Promoting communities of practise via QI learning networks can have a significant influence on other clinical activities. WHO can encourage enhanced quality at the global level by providing quality indicators for reporting and facilitating the delivery of QI-specific technical assistance. According to the Lancet Commission, numerous countries, including many poor and middle-income countries, have demonstrated that it is possible.	To guarantee better fairness in TB service provision and the adoption of evidence-based practises and clinical recommendations, strategies for increasing quality must be strengthened into how national TB programmes are organised. Investing in TB research and development, as well as strategies to improve accountability at all levels, and the commission concludes that the prospect of a Tb-free world is achievable with the right leadership and resources, but will only be realised when quality of care is prioritised as a central tenet of all TB programmes.

23	Janne Estrill et al.,(2021)	Estimates tuberculosis disease burden and return on investment in TB care in selected high-burden nations of the Western Pacific Region (WPR) through 2030. The TB pandemic in Vietnam and Lao People's Demographic Republic (PDR) was projected using a mathematical model in 2020.	The TB pandemic in Vietnam and Lao Peoples Democratic Republic (PDR) was projected using mathematical models from 2020 to 2030. Furthermore, the four nations' TB incidence reduced from (97-0/100,000/year) (2019) to (90-1/100,000/year) (2030), and TB mortality decreased from 83,300/year (2019) to 71,100/year (2030). Active case finding (ACF) techniques were the most successful single interventions in terms of return on investment (2020-2030) for tuberculosis care in Vietnam and Lao PDR, ranging from $4 to $49 per dollar invested; additional interventions ranged from $2 to $7 per dollar spent.	Without additional actions, TB incidence in the modelled countries will only decline somewhat. Although ACF interventions can lower TB burden, meeting the End TB incidence and death objectives would be challenging without new transformational tools (e.g., vaccine, better diagnostic techniques, shorter treatment). However, even at its current level, TB care may provide a multiple-fold return on investment.
24	James O Connell et al., (2022)	The goal of this study was to calculate the cost of failing to fulfil the WHO End TB objective of a 90% decrease in TB incidence in Ireland between 2015 and 2035.The estimated cost of expected tuberculosis cases between 2022 and 2035 is based on trends in surveillance data from 2015 to 2019 and outcomes documented in the literature.	The cost of failing to meet the World Health Organisation End TB strategy target of a 90% reduction in TB incidence in Ireland between 2015 and 2035 is estimated to be an additional 989 cases of TB, 577.3 disability-adjusted life years, and 85 deaths with TB in Ireland between 2022 and 2035. This is expected to cost $70.779 million.	Given the expected cost, Ireland's existing hopes of eradicating TB, and the international trend towards programmatic funding, increasing investment in TB prevention and control in Ireland seems acceptable. A nationwide eradication plan should be financed, involving efforts at the levels of the socioeconomic determinants of health system and the TB programme.

Earlier studies from India (1962 to 2022)

Sl. No	Name of the author	Objectives/Methods/Sampling	Findings/Results	Conclusion/ Suggestions
1	J. Frimodt. Moller (1962)	To learn about the number of people infected with TB, as well as the number of individuals who have died from tuberculosis. A multi-year survey and observation of the Madanapalle people in South India.	Failure or relapse of DOT. Women are less likely than males to be diagnosed with DOT.	The DOT programme must be both private and convenient.
2	Andersen.S & Banerji. D (1963)	This report describes the operation of a clinic in a big city in India (Bangalore). The current research focuses on all 784 people who were diagnosed as having active TB demonstration and training centres between March 13 and May 1961. The interview approach was used.	Fundamental flaws in the treatment organisation of the TB programme. Failure to finish the 12-month therapy period.	Inadequate treatment issues can be addressed by better administration and organisation.
3	V.V. Krishna Murthy (1993)	Evaluate the success of India's National Tuberculosis Programme during the VII Plan. NTP reports received from various states for 10 years of VI and VII plans (1980-1985) & (1985-1990) at National Tuberculosis Institute Bangalore and publications of Ministry of Health and Family Welfare, Health Information India, performance budget, etc., have been used.	The total financial outlay during the VII FYP (1985-1990) was Rs. 1,800,000,000. 3.7% of the plan outlay was given, compared to around 3% in the prior six FYP. NTP performance evaluation. The TB project received the smallest share of the health budget (1.7%).	The program's efficiency has significantly increased. The cost of identifying a sputum positive case in the project was Rs79.52, necessitating a more thorough cost-effectiveness study.
4	Rajeswari.R et al., (1999)	To explore the factors related with delay in seeking care and receiving a diagnosis from a health practitioner (health system delay) among smear positive TB patients prior to the adoption of large-scale DOTS in South India. A standardised Questionnaire was used to interview new-smear patients. Multivariate analysis was used with 531 individuals.	The total expected cost for six months of therapy includes both indirect and direct costs. Female patients in rural and urban areas were rejected by their families. 11% of school-age youngsters dropped out. Total expenses, particularly indirect costs attributable to tuberculosis, were rather significant; salaries were lost for three months, and female patients' caregiving duties were reduced.	Fear and shame connected with tuberculosis affect women more than males. Create innovative techniques for policymakers, health series, and donors to promote TB control more effectively.

5	Rajeswari R et al., (2002)	To look at the factors that contribute to delays in 1) care-seeking (patient delay) and 2) diagnosis by health professionals (health system delay) in smear-positive TB patients before large-scale DOTS deployment in South India.A standardised questionnaire was used to interview new smear-positive patients. Multivariate analysis was also employed.	Total delay in seeking care of more than one month. Men delayed seeking care for longer times than women due to a lack of information about tuberculosis.	Public knowledge of chest symptoms should be raised, as should the provision of free diagnostic series. When examining outpatients, both government and private physicians should be taught about the likelihood of tuberculosis. Smear microscopy that is effective should be developed.
6	V. Singh et al., (2002)	This article presents the outcomes of operational research investigations conducted in two New Delhi pilot locations from 1996 to 1998. Semi-structured interviews, focus group discussions, non-participant observations, and data collecting from TB registers were employed as operational research approaches.	Patients were assessed by health personnel to establish their capacity to comply with the RNTCP direct observation therapy. Emphasises the significance of operational research.	Equity is critical in public health efforts. DOTs are a sign of high-quality treatment. Simple initiatives that would strengthen the connection between patients and doctors.
7	G.R. Khatri et al., (2002)	The consequences of new policies implemented in 1993 that resulted in more resources, enhanced laboratory-based diagnosis, direct monitoring of therapy, and the adoption of standardised antituberculosis regimens and reporting techniques were examined.	The improved programme has saved more than $400 million in indirect savings, which is more than eight times the cost of implementation.	The programme must be sustained and expanded.
8	V.K. Arora & Visalakshi.P (2003)	This article examines its management in the context of RNTCP, with a particular emphasis on DOTS plus, a strategy resulting from the formation of the Green Light Committee to successfully address MDR TB patients worldwide.	DOTs have proved helpful in increasing TB cure rates over the world.	In the management of MDR-TB, a dot is an ineffective technique.
9	M.V. Murhekar et al., (2004)	To evaluate the tuberculosis condition in the Car Nicobar tribal group 15 years after the national TB programme was introduced in this region following an intensive phase of TB Control in 1986. A house-to-house survey was used to count the whole population of Car Nicobar.	Absence of district TB programmes (Car Nicobar Island), present high risk of TB infection transmission on this island.	The need for continuous improvement in TB control strategies.

10	S.R Atre et al., (2004)	To better understand gender, culture, and tuberculosis in a rural enemic community in Maharashtra, India. This research of 80 men and 80 women used cultural epidemiology qualitative and quantitative approaches, including a locally developed semi-structured Expalanatory Model Interview Catalogue (EMIC).	Emotional and social problems, as well as a lack of community support for women with tuberculosis	Limited access to TB information and treatment.
11	Ray TK, Sharma. N et al., (2005)	This study was designed to evaluate economic loss among tuberculosis patients. Using a semi-structured pretested interview schedule, 156 patients from two DOT sites were questioned in depth about economic loss owing to TB during a 5-month period.	The spread of tuberculosis has a detrimental influence on worldwide socioeconomic success. Estimates economic loss among tuberculosis patients. Direct and indirect economic expenses. Attendance at DOT centres is being delayed.	A public awareness campaign focused on treatment availability and the DOT Centre might aid in the reduction of such economic losses.
12	L.S. Chauhan and J. Tonsing (2005)	Since 1997, the nation has been doing research on RNTCP, an adaptation of the Directly Observed Treatment, Short Course (DOTS) method to prevent tuberculosis. The purpose of the RNTCP is to reduce TB mortality and morbidity while also reducing infection transmission before TB becomes a serious public health concern in India.	The RNTCP is the world's largest programme. Since 1998, RNTCP coverage has grown by more than 50 times. More than 3.5 million patients were on therapy by September 2005, saving almost 600,000 extra lives.	Implementing DOTs while retaining service quality The key problems are decentralisation of programme administration and programme reach.
13	Muniyandi.M et al., (2006)	A review of studies conducted by the TB research centre during the last two decades. This research centre conducted a series of studies on the economic aspects of tuberculosis. The interview approach was employed.	After successfully completing therapy, half of TB patients experienced chronic respiratory problems. Existing tuberculosis control programmes are ineffective.	Education on public health is required.
14	Ramya Ananthakrishnan et al., (2007)	To examine the social and economic impact of tuberculosis on DOTS patients and their families. Between March and June 2007, a cross-sectional study of 300 TB patients at Chennai's Tuberculosis Units was conducted utilising a pre-coded semi-quantitative questionnaire.	Female patients experienced social influence more strongly than male patients. The availability of DOTs has decreased, as has the percentage of patients who mortgaged assets or took out loans. However, two-thirds of patients still feel TB's societal impact.	Social support services, public awareness, and therapy for patients and families must be incorporated into the programme.

15	P.G. Gopi et al., (2007)	To investigate the influence of better treatment outcomes in a cohort of patients treated with the DOTS approach on the community prevalence of pulmonary TB. Data from one Tuberculosis Unit's TB registration in Tamil Nadu's Tiruvallur district, as well as two TB illness surveys done in the same region between 1999 and 2003, were evaluated.	In the first cohort period (1999-2001), patients using DOTs had a higher probability of treatment success.	A higher proportion of effective treatment completion after the deployment of DOTs was related with a significant decrease in the prevalence of tuberculosis.
16	Sudha Ganapathy et al., (2007)	To investigate the relationship between gender and TB in a South Indian urban community. A qualitative research employing focus group talks was carried out among men and women of different ages from low-income communities.	DOTS detects approximately three times as many male TB cases as female TB patients. The cause behind this is unknown. Gender disparities in community perception of tuberculosis appear to be crucial in marriage-related issues.	Although awareness of tuberculosis was adequate, it appeared to be related with a respiratory ailment, and the most prevalent symptom associated with TB was cough. Gender-specific intervention techniques are required to improve access to TB care.
17	Kelkar-Khambete et al., (2008)	To investigate patient delays in judging directly witnessed therapy. A semi-structured interview schedule was used to obtain data from 117 new sputum positive patients.	Patient delays, as well as diagnostic and treatment delays, reflect NTB's performance. Delays in entrance into India's RNTCP were mostly due to provider delays.	Provider interventions to increase early suspicion and referral to the RNTCP. PPM (Public-Private-Mix) initiatives are more helpful in increasing patient access to TB care than those aimed at minimising patient waits.
18	Muniyandi.M & Rajeswari.R (2008)	To investigate the socioeconomic differences associated with tuberculosis in India. The study of varying prevalence and infection, regional disparities, and demographic disparities of disease of TB in India was reviewed in order to establish a link between TB and poverty, in terms of income, standard of living, house type, and social class.	The prevalence of tuberculosis was substantially greater among individuals living below the poverty level compared to those living above the poverty line. Poverty and inequality were inextricably connected.	Accelerating health improvement in low-income and socially disadvantaged populations.

19	Lancelot M. Pinto (2010)	To assess the degree of awareness and knowledge of private TB patients visiting clinic at a tertiary private healthcare facility about the DOTS programme, as well as to understand the reasons for their preference and to evaluate their attitudes. Between January 2006 and November 2007, a structured interview schedule was delivered to private TB patients at the P.D Hinduja Hospital and Medical Research Centre in Mumbai, India.	A lack of understanding and awareness of the DOTs project. The vast majority of people seek private health care.	DOT in its current form is viewed as overly stiff and obtrusive, and it is unlikely to be adopted.
20	Anurag .B et al., (2011)	To investigate TB mismanagement in India, including the reasons, consequences, and next steps. The initial National Tuberculosis Programme failed due to inadequate case detection and cure rates. With wider access to improved diagnosis, short-course regimens, and excellent cure rates, the RNTCP has reversed these trends in the public sector. The World Health Organization's Global Tuberculosis Control Reports were used.	The first NTB initiative failed due to low case detection and cure rates. The private sector in India, which cares for more than half of all TB patients, is a persistent source of TB mismanagement and falls entirely beyond the ambit of the RNTCP.	As the RNTCP enters its new phase (2012-2017), there is an urgent need to involve and integrate the private sector in national TB control in order to allow universal access and prevent TB mismanagement, which undermines India's TB control efforts.
21	Rocha.C et al., (2011)	To assess socioeconomic initiatives for enhancing adoption of TB care and preventative services in order to increase TB control. Interviews with TB-affected households were used to characterise the barriers to TB control.	Increases in home contact TB screening were linked to socioeconomic interventions.	Socioeconomic initiatives can help to boost TB control efforts.
22	S S Nair (2011)	The Revised National Tuberculosis Control Programme raises several ethical problems in this research. Data and information were gathered from public health institutions, X-rays, and chest symptoms.	Identifies ethical issues with the RNTCP.	The use of the "success rate" instead of the well-known "cure rate" in the RNTCP was unethical and unjustified.

23	Sachdeva K.S (2012)	New concept for the 'Revised National Tuberculosis Control Programme (RNTCP)' was examined.-Universal access-Reaching the Unreached and comparing RNTCP Phase II (2006-2012) levels to 1990 levels. This article discusses RNTCP's new vision and provides an overview of how it will be realised.	RNTCP's new vision and an overview of how it will be realised.	It will need wide and comprehensive efforts and support from all stakeholders, as well as significant increases in commitment and money at all levels.
24	Gulrez Shah Azhar (2012)	Conduct a comprehensive assessment of the literature to identify evidence of TB recurrence following effective treatment with conventional short-course chemotherapy according to DOTS recommendations. Ten databases were searched, including Medline, the Cochrane database, Embase, and others, as well as article reference lists. These searches yielded 255 papers. After applying the inclusion, exclusion, and quality evaluation criteria, seven papers were eventually included in the review.	Medication irregularity, early medication resistance, smoking, and drunkenness were all risk factors for relapse.	There is evidence that DOTs category 2 therapy may be insufficient for retreatment patients.
25	R. Venkatesh et al., (2014)	To evaluate the socio-demographic characteristics of DOTS treatment patients. Over a three-month period, a cross-sectional research was undertaken on TB patients registered in all TB units in the Trivallur district. There are 210 total responses.	There is a significant relationship between TB type, sputum status, and gender. There are more instances of pulmonary tuberculosis and sputum negative patients.	TB types differ depending on gender and sputum condition.
26	S. Verguet et al., (2014)	This study proposes an enhanced cost-effectiveness analysis approach for assessing the effects of Universal Public Finance. It then demonstrates Extended cost-effectiveness analysis by evaluating UPF for TB treatment in India.	Creates an expanded cost-effectiveness analysis tool for assessing the effects of universal public funding. Out-of-pocket spending reductions are more evenly spread across income quintiles.	The health benefits and insurance values of UPF would predominantly benefit the poor. Lowering the cost of borrowing for the poor might potentially accomplish some of UPF's health improvements, but at the expense of putting the poor farther in debt.

27	Prashad.R Dec (2015)	This item, headed "Child-friendly paediatric TB drugs will be a game changer," was published in the news publication "THE HINDU." that young infants with drug-sensitive tuberculosis would never be the same. The availability of TB medications in appropriate dosages signals a watershed moment in which these children's particular requirements will be satisfied.	Child-friendly TB medications will be a game changer. Priority for the RNTCP-e child TB programme. India plans to roll out the new FDCs in 100 districts as a trial initiative. TB drugs have not been made available to children all around the world.	FDCs are priced at $15.54 for a six-month supply. They are roughly 20% more expensive than today's incorrectly dosed products (Dr. Scott).
28	N.A. Menzies et al., (2016)	To examine the resource needs and cost-effectiveness of solutions for achieving these goals in China, India, and South Africa. Examined intervention scenarios designed in collaboration with national stakeholders that scaled up current interventions to achieve high but attainable coverage by 2025. By combining service usage estimates, actual cost data, and expert opinion on implementation techniques, nine independent modelling groups cooperated to predict policy outcomes and the cost of each scenario for 2016-35. Costs incurred by the patient are included.	The incremental costs of TB services varied by scenario and nation. The expansion of TB care resulted in lower patient expenses. Expansion in access to care resulted in significant health benefits in all three nations (India, China, and South Africa). In comparison to existing practise and traditional cost-effectiveness thresholds, each nation requires the greatest intervention mix.	Expansion of Tuberculosis care would be cost-effective for high-burden nations and might result in significant health and economic advantages for people, while significant new money would be required. More research is needed to find the best intervention combination for each country.
29	Anita Lal., et.al., (2017)	To evaluate appropriate techniques to include equity into economic analyses of public health interventions and to identify best practises and future initiatives. A thorough evaluation of papers that employed socioeconomic position in cost effectiveness analysis was conducted. Using Medline, EconLit, and HEED, studies were discovered and evaluated based on their SEP specific inputs and methods of quantifying health and financial inequality.	The bulk of research (29 in total) were deemed as relevant. When comparing two or more treatments, the amount of the health and wealth inequality disparities was left to the render. Newer techniques include using health inequality, financial consequences, and equity weights.	Cost effectiveness methodologies have not been widely employed to create fresh knowledge regarding the health equity implications of various policy alternatives, but they should be studied to inform future decision making. Incorporating equity into economic research would allow for a more detailed comparison of interventions in terms of efficiency, equity, and financial effect.

30	Sumit Mazumdar et.al, (2019)	Based on data from the National Family Health Survey Round 4 (NFHS-4 2014-2015), this study examines self-reported levels and socioeconomic trends in the distribution of TB cases in India. Based on a nationally representative survey of over 600,000 homes including over 2.9 million people.	Estimates a self-reported point prevalence of 304 tuberculosis cases per 100,000 population, with a larger burden visible in lower-income families and in those with low educational levels. The general community, including those with a high school diploma, still has a limited understanding of the routes of TB virus dissemination. Social stigma is still prevalent.	The need of adequate policy tools for incorporating the business sector and increasing awareness through appropriate advocacy methods is highlighted once more.
31	Anurag Bhargava et al.,(2020)	In India, TB is closely linked to poverty, and this risk is mostly mediated by malnutrition. The Covid-19 response-related lockout has caused an economic catastrophe that may quadruple poverty levels, has aggravated food insecurity, and has hindered the comprehensive assessment of TB services.	The nutritional quality of a community is a powerful predictor of TB incidence, with adults alone accounting for 32.44% of TB incidence in India. A thorough study found that for every unit fall in body mass index, there is a 14% rise in TB incidence. This might result in an increase of 185610 cases in projected incident TB cases. Disadvantaged social groups, as well as those living in states with greater levels of poverty, malnutrition, and migratory labour, are more vulnerable.	Suggests increasing rations, including pules, through the PDS (public distribution system) and direct cash transfers to the needy until livelihoods are restored. TB care should be started promptly, with increased case detection efforts, including active case discovery. Systematic identification, referral, and care of severe illness at notification should be explored to avoid mortality among TB diagnosed under the national TB programme.

32	Sachin silva et al.,(2021)	To examine the economic cost of not attaining the objective until 2045, entire income losses in 120 countries were assessed for the period 2020-50, including those owing to additional fatalities caused by COVID-19-related interruptions in TB services. For 120 nations, annual mortality risk variations at each age in each year from 2020 to 2050 were projected.	Calculated total income losses and mean life expectancy losses per person at birth at the age of 35 years under scenarios with SDG objectives in 2030 and 2045.Based on the current yearly drop in TB fatalities of 2%, 31•8 million tuberculosis deaths (95% uncertainty interval 25•2 million-39•5 million) are expected to occur between 2020 and 2050, resulting in a US$17•5 trillion (14•9 trillion-20•4 trillion) economic loss.	Failure to meet the SDG TB mortality target by 2030 would result in significant economic and health costs. Sub-Saharan Africa will bear the brunt of the consequences of the delay. Affected countries, donor countries, and the corporate sector should increase their efforts to fund TB programmes, since the economic benefit of such policies is anticipated to be significant.
33	Ranjit Bera et al., (2022)	Using three rounds of Annual Health Survey data from 2010 to 2013, this research explores the geographical variance in morbidity and death in Odisha. The status of morbidity was assessed using chronic and acute illness. The Composite index illustrated the geographical heterogeneity in morbidity and death among districts.	This study looks at the geographical variance in morbidity and death in Odisha using three rounds of Annual Health Survey data from 2010 to 2013. Principal component analysis was used to identify five dimensions that demonstrated the relationship between the selected indicators of mortality and morbidity. It was discovered that developed areas had high morbidity whereas undeveloped districts had low morbidity. On the other hand, death rates in impoverished areas were low.	The study's findings highlight the necessity of providing health facilities, improving education and medical knowledge, and implementing government policies and initiatives to enhance Odisha's overall health condition.

Research Gap

The preceding summary of literature research shows the basic weakness, limitation, failure, and gaps in the Tuberculosis programme and its aims, rate of achievement, and rising economic burden of TB in India and throughout the world. The above reviews show that the majority of the studies are on the medical, social, and emotional effects of tuberculosis, cost effectiveness, World Health Organisation performance, Tuberculosis programme evaluation and delays in seeking treatment, poor knowledge and awareness, child-pediatric TB, and health policies, among other things. For analysis based on primary data, several of these research also included income analysis, cost effectiveness techniques, multivariate member and logistic approaches, case studies, and sampling methods. However, the author believes that there is a need for various innovative researches and studies in the field of non-science, particularly in the field of social science in Health Economics, specifically focusing on the economic burden of tuberculosis, productivity losses, mortality, prevalence, incidence, and morbidity, past and future forecasting studies, and so on. As a result, the author indicates that there are few research on Health Economics or in the discipline of Economics. As a result, the author recognises all of the aforementioned areas as critical research gaps.

Conclusion

The brief studies on literatures give a fundamental foundation or base for further study and provides innovative sort of thoughts. The above stated all reviews are a blueprint which provides a basic notion to new researchers for finding the answer to the problem or research gap. Tuberculosis control is a measure of economic and social growth; India's key aim of eliminating TB completely by 2030 necessitates intervention auditing and innovative methods at all levels. As a result, excellent planning, consistent financing, and creative research can help India realise its goal of being TB-free.

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