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## Tuberculosis, a preventable pandemic through sensitization programme

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### Abstract

The focus of India's tuberculosis control measure has shifted to improving education, understanding symptoms, eliminating transmission, and trying to influence healthcare seeking behavior among both tuberculosis patients and the general public. Tuberculosis is the leading cause of death from an infectious disease worldwide, and drug-resistant strains pose a significant threat to global health security. Sensitization programmes regarding Tuberculosis Disease, Early Detection, Vaccination, Screening, Treatment Compliance, Cough Etiquette & Disposal of Sputum, National Health Programmes, Nutrition, Home & Environment Control can create patient awareness of tuberculosis can promote infection prevention and treatment adherence. Tuberculosis can be reduced by using measures like protecting one's mouth while coughing or sneezing and safely dispose of sputum. Besides that, appropriate sputum disposal will dramatically reduce disease transmission. In tuberculosis patients, knowledge and understanding of touch sensitivity to droplet infection is understood to influence their behavior and assess the frequency and level of transmission in their contacts. Early diagnosis of pulmonary tuberculosis patients and treatment with a complete course of anti-tuberculosis medications are important for TB management. As a result, any reported TB symptomatics with a cough lasting more than two weeks should be referred for TB assessment. Following that, proper treatment necessitates adherence to World Health Organization-recommended treatment guidelines as well as other relevant TB care requirements such as the International Standards for TB Care (ISTC) and the Standards for TB Care in India. Tuberculosis (TB) is still prevalent in many parts of the world, including India, and needs monitoring, clinical assessment, examination, touch tracking, proof of diagnosis, and treatment regimens that are either monitored or unsupervised for successful eradication.

**Keywords:** Tuberculosis, sensitization, prevention, treatment, health education

### Introduction

In developing countries including India, tuberculosis (TB) is a major public health problem and a leading cause of death. The general public is less aware of the disorder, which leads to a rise in morbidity. The focus of India's tuberculosis control measure has shifted to improving education, understanding symptoms, eliminating transmission, and trying to influence healthcare seeking behaviour among both TB patients and the general public <sup>[1]</sup>.

The Revised National TB Control Programme (RNTCP) is working towards elimination of TB in the country by 2025. As the RNTCP relies on passive case finding, it is crucial for the success of the RNTCP that TB patients have knowledge about their disease.

Tuberculosis can be reduced by using measures like protecting one's mouth while coughing or sneezing and safely dispose of sputum. Besides that, appropriate sputum disposal will dramatically reduce disease transmission. In tuberculosis patients, knowledge and understanding of touch sensitivity to droplet infection is understood to influence their behavior and assess the frequency and level of transmission in their contacts. According to a study conducted in Namibia, tuberculosis awareness and care was substantially correlated with elevated rates of default in tuberculosis patients. The tuberculosis prevention policy in India recommends that tuberculosis patients receive health education about safe sputum disposal <sup>[2]</sup>.

On The Global TB Survey 2019, India recorded 2.69 million tuberculosis (TB) cases, accounting for roughly a quarter of all global cases. Every year, almost half a million "missing" patients go undiagnosed, unaccounted for, or improperly handled and treated <sup>[3]</sup>.

Early diagnosis of pulmonary tuberculosis patients and treatment with a complete course of anti-tuberculosis medications are important for TB management. As a result, any reported TB symptomatics with a cough lasting more than two weeks should be referred for TB assessment. Following that, proper treatment necessitates adherence to World Health

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Organization-recommended treatment guidelines as well as other relevant TB care requirements such as the International Standards for TB Care (ISTC) and the Standards for TB Care in India (STCI) [4].

### Need for sensitization programme

A key component of tuberculosis (TB) prevention methods is improving patients' tuberculosis (TB) awareness. Patient awareness of tuberculosis can promote infection prevention and treatment adherence [5].

Tuberculosis (TB) is still prevalent in many parts of the world, including India, and needs monitoring, clinical assessment, examination, touch tracking, proof of diagnosis, and treatment regimens that are either monitored or unsupervised for successful eradication [6].

Tuberculosis is the leading cause of death from an infectious disease worldwide, and drug-resistant strains pose a significant threat to global health security [7].

### Topics to be incorporated in sensitization programme

#### 1. Tuberculosis disease

The current priority of the Government of India, according to the National Strategic Plan (NSP) 2017-2025, is to achieve rapid reductions in TB cases, morbidity, and mortality, while moving toward TB elimination in the country by 2025. Since India's Revised National TB Control Programme (RNTCP) depends on passive case finding, it's critical that chest symptomatic people and the general public understand the disease's etiology, symptoms, diagnosis, mode of transmission, and preventive steps, as well as the disease's care length. Lack of such awareness among TB patients and the general public may result in a delay in seeking medical help, the perpetuation of social stigma and misunderstandings regarding TB, and poor adherence to TB care [8].

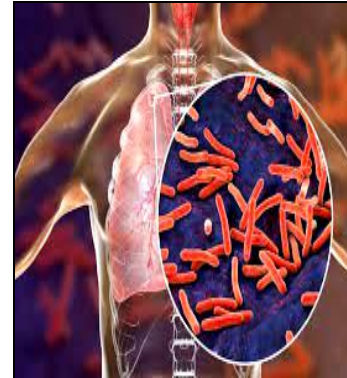
The general public is less aware of the disorder, which leads to an uptick in morbidity. The focus of India's tuberculosis prevention policy has turned to improving education, understanding symptoms, preventing infection, and influencing healthcare seeking behavior in both TB patients and the general public [9].

#### 2. Early Detection

The World Health Organization recognizes diagnosing and treating latent tuberculosis (TB) infection (LTBI) as an effective technique for accelerating global TB decline and achieving TB elimination. Even in low-TB burden countries with high rates of active TB diagnosis and good care, a range of obstacles have hindered the implementation or expansion of LTBI treatment programmes. Just a small percentage of people afflicted with tuberculosis can experience active illness, and existing diagnosis tests have a poor predictive reliability. Owing to the longtime of therapy and poor tolerability, isoniazid (INH) treatment for LTBI has a low completion rate. Patients and clinicians commonly conclude that the chance of toxicity is higher than the risk of reactivation TB.

As a consequence, outside of countries with ample resources and a low disease burden, LTBI care has played a minor or non-existent role. Interferon-gamma release assays, for example, have been established to more accurately diagnose LTBI, especially in people who have been vaccinated with Bacillus Calmette-Guerin (BCG). Rifampicins are proving to be safe and effective alternatives to INH because they are shorter and better tolerated. Though still imperfect,

modeling trials in the United States show that TB prevention using these advanced diagnosis and treatment methods is cost efficient and has the potential to boost global TB prevention efforts. To build better methods, more research is required to clarify the host-organism interactions across the LTBI continuum. Before then, addressing obstacles and improving our existing resources are critical steps in the fight against tuberculosis [10].



Source: Pulmonology advisor 24

Fig 1: Latent Tuberculosis

Patients of pulmonary tuberculosis (PTB) who take longer to be diagnosed have a more serious illness, more symptoms, and a greater death risk as the disease progresses. The study's aim was to determine the percentage of patients that had a delayed diagnosis of PTB, as well as the time it took for patients and health services to receive a diagnosis and the reasons that contributed to this delay [11]. In India, the annual prevalence of tuberculosis (TB) is projected to be 27 lakh. An untreated smear positive pulmonary tuberculosis (PTB) patient is expected to infect 10-15 people per year. Often cases go undiagnosed, which may be due to reasons such as people avoiding getting medical help or health services failing to identify patients in a timely manner. Longer than two-month diagnosis delays will spread the disease to up to 25 domestic contacts. Patients with a delayed diagnosis had a more acute illness, more symptoms, and a higher death rate [12].

The stigma associated with tuberculosis (TB) is a significant obstacle to achieving the global target of tuberculosis (TB) management. Perceived stigma can cause a sputum test to be delayed. If you wait too long, the virus will spread across the population. In India, there is no research data on the relationship between sputum test delay and stigma [13].

India is responsible for around a quarter of the world's 'missing' tuberculosis (TB) deaths. Despite the fact that 50% of patients with tuberculosis are diagnosed and treated in India's private sector, only a limited number are notified to the public healthcare system. According to India's TB notification scheme, all patients with tuberculosis must be alerted by Nikshay (TB notification portal) [14].

For early diagnosis all the suspected TB symptomatics with cough of two weeks should be referred for TB evaluation. Following that, proper treatment necessitates adherence to World Health Organization-recommended treatment guidelines as well as other relevant TB care requirements such as the International Standards for TB Care (ISTC) and the Standards for TB Care in India (STCI) [15].

### 3. Vaccination

India has the world's highest rate of new and multidrug-resistant tuberculosis (MDR) cases. The Bacille Calmette-Guerin (BCG) vaccine is the most effective TB vaccine. BCG provides some defence against severe forms of tuberculosis in children, but its effectiveness diminishes as they get older. Many new groundbreaking methods for developing safe and potent vaccines, such as mucosal- and epitope-based vaccines, are being tested to substitute or improve BCG responses. Nanotechnology for TB detection and treatment is also in the works, as are a slew of other vaccines now undergoing clinical trials. In addition, in-silico models for identifying new drug targets and designing drugs against *Mycobacterium tuberculosis* were created (Mtb). These models benefit from computational experiments that are simple, low-cost, and yield fast results. This study would concentrate on the current therapies for tuberculosis (TB) as well as alternative approaches to developing effective vaccines [16].



#### BCG Vaccination

#### Source:

<https://www.indiamart.com/proddetail/tubervac-bacillus-calmette-guerin-bcg-vaccine-ip-19587131155.html>

Fig 2: BCG Vaccination

### 4. Screening

Vulnerable people are most likely to catch the disease and transmit it to the surrounding communities. This is largely due to their way of life and social standing. Furthermore, TB patients' and the vulnerable population's level of awareness and behaviour will influence their health-seeking behaviour and, as a result, disease control at the group level. This is important because tuberculosis is a chronic infectious illness that needs long-term care. Individuals and communities will benefit from proper education that allows them to access medical attention in a time and location that is convenient for them. Despite the fact that the number of people dying from tuberculosis has decreased significantly since the launch of the Revised National Tuberculosis Control Program and the use of newer techniques and interventions, there is still a disparity in access for some populations and a lack of cases that needs immediate intervention from the public and private sectors, as well as other stakeholders. A greater level of knowledge about tuberculosis and medical services is needed in the vulnerable population so that they can access them at the right time and location, potentially contributing to a TB-free community [17].

### 5. Treatment compliance

Tuberculosis (TB), second only to the human immunodeficiency virus as the leading cause of death from infectious diseases, is a major public health problem in India. India has the largest TB burden in the world, with an average rate of 217 cases per lakh people. To alleviate this pressure, the Indian government offers free TB care based on a DOTS (directly seen treatment, short-course) approach. DOTS has been shown in studies to improve compliance, mitigate disease recurrence, and prevent the emergence of multidrug-resistant tuberculosis. According to the updated National Tuberculosis Control Program (RNTCP), one of the programme parameters should be the TB default (renamed care after failure to follow-up, i.e., lost to follow-up [LFU]) set. A qualitative approach, which can be used in conjunction with a quantitative approach, can help one better understand intangible variables. RNTCP is currently witnessing several reforms in India, so now is an excellent time to improve the software by identifying the issue of non-adherence [18].

### 6. Cough etiquette & disposal of sputum

A tuberculosis patient may infect many individuals before being diagnosed and starting therapy by coughing or sneezing droplet nuclei. Tuberculosis can be prevented by using precautions such as closing one's mouth while coughing or sneezing and properly disposing of sputum. Furthermore, proper sputum disposal will greatly minimize disease transmission. In tuberculosis patients, information and understanding of touch sensitivity to droplet infection are known to affect their actions and assess the frequency and level of transmission in their contacts. According to a report performed in Namibia, tuberculosis awareness and care was substantially correlated with elevated rates of default in tuberculosis patients. The tuberculosis prevention programme in India recommends that tuberculosis patients receive health education about safe sputum disposal [19].



Fig 3: cover your cough25

### 7. National health programme

In 1997, India began a phased implementation of the Revised National TB Control Policy to increase case

identification and treatment rates in the region. It was renamed the National Tuberculosis Elimination Program (NTEP) in 2020, with the aim of eliminating tuberculosis in the world by 2025 [20].

## 8. Nutrition

As a result of increased living conditions and proper diet, tuberculosis was eradicated in many Western communities years before the development of effective anti-tuberculous medicines. Despite the availability of strong anti-tuberculous drugs, India still has a long way to go in order to meet the "End TB by 2025" goal. One of the main reasons is that India's tuberculosis prevention policy has largely concentrated on case diagnosis and surgical treatment of active tuberculosis until now. If used poorly or incompletely, opioid therapy itself does not adequately eliminate the emergence of new diseases in the population, and it also leads to the production of drug resistant strains. While active cases may be treated to shorten the time of disease transmission, a large amount of disease transmission to contacts continues long before they are identified and treated. Furthermore, in the large pool of people with latent TB infection, this strategy would not preclude reactivation of active TB. Tuberculosis is a disease that affects people who have their cell-mediated immunity suppressed, mostly as a result of inadequate diet. Perhaps the only viable strategy is to improve society's nutritional condition through a combination of social programmes and the use of available anti-tuberculosis medications. The Central TB Division of India has devised promising programmatic guidelines for nutritional assistance in TB patients, but it will require a refocus of TB monitoring strategies for nutrition at all stages, as well as robust public health actions, for successful implementation [21].

## 9. Home & environment control

### A. For home control

Patients who are suspected of or have been diagnosed with tuberculosis are often returned home after beginning therapy, despite the fact that they may already be contagious. If the following conditions are met, patients with tuberculosis will be sent home even if they do not have three negative sputum smears:

- A follow-up plan with the local tuberculosis programme has been established.
- There are no babies, children under the age of 5, or people with immune compromising disorders in the household.
- The patient is on routine TB care and specifically observed therapy (DOT) has been arranged.

Until the patient's sputum smear findings are negative, the patient is willing to stay alone in the home except during health-care appointments. Patients with suspected or reported tuberculosis are more likely to have infected members of their family with the disease before being detected and receiving care.

Patients with tuberculosis and their family members, on the other hand, should take precautions to avoid the transmission of the disease after they return home. Patients with tuberculosis should be taught to cover their mouth and nose while coughing or sneezing, sleep alone rather than in a bed with other family members, and avoid receiving visits until they are no longer contagious.

### B. For environment control

Reduce the accumulation of bacterial droplet nuclei by using the following methods:

- Ventilation technologies, such as natural and mechanical ventilation
- HEPA (high quality particulate air filtration)
- UV germicidal irradiation (UVGI) [22]

### Conclusion

Health promotion and awareness programmes, among other ways of disease prevention, will encourage patients in many areas of disease control, allowing them to receive the right care, at the right time, and in the right place [23].

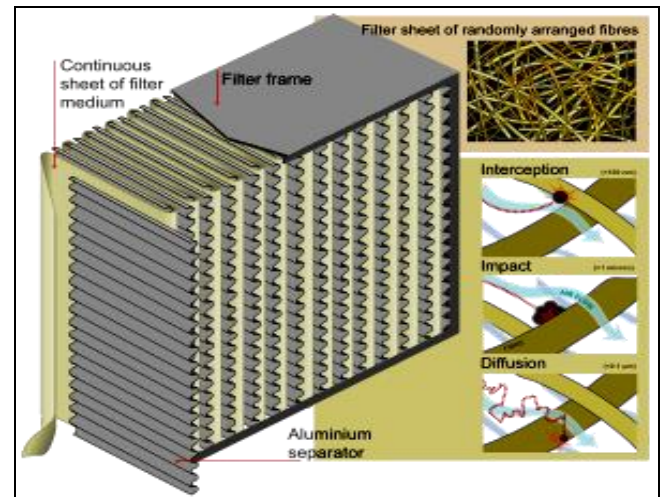


Fig 4: Wikipedia

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