

Tuberculosis (TB) in India
(07 January, 2022)

What is Tuberculosis?

Tuberculosis (TB) is a contagious infection that usually attacks your **lungs**. It can also spread to other parts of your body, like your **brain and spine**.

What Causes Tuberculosis?

- TB is caused by bacteria (**Mycobacterium tuberculosis**) that most often affect the lungs but not just lungs but also other parts.
- Bacteria are spread through the air, just like a cold or the flu.
- When people with lung TB cough, sneeze, or spit, they propel the TB germs into the air.
- WHO said the spread of TB is due to 1) Low Immunity 2) High density and Closed space. 3) No health and hygiene (spitting).
- **Risks factors:** The most common risk factor associated with TB is HIV and other conditions that impair the immune system.
- Other factors include **Tobacco use, Malnutrition, and Alcoholism**.

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Types of Tuberculosis

- **Latent TB.** You have germs in your body, but your immune system keeps them from spreading. You don't have any symptoms, and you're not contagious. But the infection is still alive and can one day become active.
- **Active TB.** The germs multiply and make you sick. You can spread the disease to others. Ninety percent of active cases in adults come from a latent TB infection.
- **HIV or AIDS, Diabetes, etc. are opportunistic diseases for a TB Patient.**

What is MDR-TB and XDR-TB?

- Multidrug-resistant tuberculosis (MDR-TB) is a form of TB caused by bacteria that do not respond to isoniazid and rifampicin, the 2 most powerful, first-line anti-TB drugs. MDR-TB is treatable and curable by using second-line drugs.
- Extensively drug-resistant TB (XDR-TB) is a more serious form of MDR-TB caused by bacteria that do not respond to the most effective second-line anti-TB drugs, often leaving patients without any further treatment options.

Data for Tuberculosis

- TB is the top infectious killer in the world claiming 4000 lives a day
- India has the largest number of TB patients. and the largest deaths due to TB.

TB Report 2020

- India accounts for more than a quarter of the global TB burden.
- **India also has the largest burden of multi-drug-resistant TB (MDR-TB)** among all countries, with almost 150,000 cases every year.
- **Rising Tobacco Consumption:** It also revealed that Tobacco consumption is rising among Indian TB patients. 8% of TB cases can be attributable to tobacco usage.



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State TB Index:

- On the basis of the score in the State TB Index, **Gujarat, Andhra Pradesh, and Himachal Pradesh** were the top three **best**-performing states for tuberculosis control under the category of states with 50 lakh population.
- Tripura and Nagaland were best-performing in the category of states having less than 50 lakh population.

Comorbidity

- **HIV-associated TB:** India accounts for 9% of all HIV-associated TB deaths in the world, the **second-highest number** globally. A total of 92,000 HIV-associated TB patients were recorded on an annual basis. Awareness among TB patients about their HIV status has gone up to 81% from 67%.
- **Diabetes Associated TB:** The other such group is patients suffering from diabetes. According to the report, 20% of all TB cases in India also suffer from diabetes. In 2019, among the notified TB patients under the Revised National TB Control Programme, 64 % were screened for Diabetes.

Missing Patients:

- The report highlighted that the notification of TB is a major hurdle in surveillance of the disease in India.
- **Nearly 0.54 million TB cases are still missing** across India.
- **Lower Reporting than WHO:** According to the report, India notified the highest number of 24.04 lakh tuberculosis cases last year (2018) as against an estimated 26.9 lakh cases by WHO, indicating that around three lakh patients missed out from the national TB programme.

Low Fatality:

- It stated that 79,144 deaths due to tuberculosis were reported in 2019, which is much lower than the WHO estimate of 4.4 lakh fatalities.

Treatment Success Rate:

- It is around 70-73% in the last two years. From 2014-2016, it was between 76 and 77%.



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WHO released Global TB Report 2019?

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- Geographically, most TB cases in 2018 were in the WHO regions of South-East Asia (44%), Africa (24%), and the Western Pacific (18%).
- 8 countries accounted for 2/3rd of the global total include India (27%), China (9%), and Indonesia (8%).
- India has announced a contribution of \$22 million to the Global Fund for AIDS, TB, and Malaria (GFTAM) for the 6th replenishment cycle (2020-22).

Tuberculosis vaccine

- Children in countries where TB is common often get the **BCG vaccine**.
- It isn't widely used in the United States, and it doesn't always protect against infection.
- Doctors recommend it only for children living with someone who has an active TB infection with a very drug-resistant strain or who can't take antibiotics.
- Other vaccines are being developed and tested.

Diagnosis of TB: Blood tests

- **Sputum examination**- Samples of mucous and phlegm are checked for the presence of bacteria.
- **Chest X-ray**: This uses radiation to create an image of the lungs. In TB infection, there are changes in the structure of the lungs, which lungs, are visible on the X-ray.
- **Drug susceptibility testing**: It provides a definitive diagnosis of drug-resistant TB.
- **CBNAAT (Cartridges Based Nucleic Acid Amplification Test)**: CBNAAT is used for early diagnosis of MDR-TB and TB in high-risk populations such as presumptive TB cases in PLHIV (people living with HIV), EP-TB (extra-pulmonary TB), and pediatric populations. The CB NAAT machines have been placed at most of the districts in the country at headquarter or Medical College, ART Center, or major Pediatric hospitals.
- **Apart from Blood tests, for TB of extrapulmonary sites, diagnosis includes CT scan, MRI scan, Ultrasound scan, Urine tests, and Biopsy.**

Treatment of Tuberculosis

- **TB is a treatable and curable disease.** It is treated with a standard 6-month course of 4 antimicrobial drugs that are provided with information, supervision, and support to the patient by a health worker or trained volunteer.
- All health care providers (both public and private providers), laboratories, and

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chemists have to notify the TB cases to local government health authorities. Notification of cases is done with the case-based web-based TB surveillance system called “NIKSHAY” (<https://nikshay.gov.in>).

- Free TB drugs are provided under the programme in the form of daily fixed-dose combinations (FDCs) for all TB cases on the **strategy of directly observed therapy (DOT)**. DOT is a specific strategy, to improve adherence by any person observing the patient taking medications in real-time. The treatment observer does not need to be a healthcare worker but could be a friend, a relative, or a layperson who works as a treatment supervisor or supporter. If treatment is incomplete, patients may not be cured and drug resistance may develop.
- **For new TB cases**, the treatment in the intensive phase (IP) consists of four drugs FDCs- Isoniazid (INH), Rifampicin, Pyrazinamide, and Ethambutol (HRZE) in daily doses.
- **For previously treated cases of TB**, the intensive phase is of 12 weeks, where injection streptomycin is given for eight weeks along with four drugs FDCs (INH, Rifampicin, Pyrazinamide, and Ethambutol)
- Second-line drugs are the TB drugs that are used for the treatment of drug-resistant TB. The second line drugs include levofloxacin, moxifloxacin, bedaquiline, delamanid and linezolid.
- RNTCP has introduced a new drug bedaquiline for MDR-TB under a conditional access program in 2016 across six sites, with a country-wide scale-up plan in 2017-2020.
- There is also pretomanid which is a new second-line drug recommended in 2019 for the treatment of drug-resistant TB.

Efforts of the Indian Government to eradicate TB

- In 1962, the **National TB Programme (NTP)** was launched in the form of District TB Centre model, with **Bacillus Calmette–Guérin (BCG)** vaccination. Although BCG immunization does prevent severe multi-organ TB disease in young children, **it does not control TB**.
- In 1978, the **Expanded Programme on Immunisation (EPI)** began, giving BCG to all babies soon after birth and achieving more than 90% coverage. However, the NTP and the EPI had not reduced India’s TB burden.
- In 1993, the **Revised National TB Control Programme (RNTCP)** was launched, offering free diagnosis and treatment for patients rescuing them from otherwise sure death. It brought down TB incidence in India at an annual rate of 1.7%.

RNTCP - National Tuberculosis Elimination Program (NTEP), National Strategic Plan (NSP)

- At the start of 2020, the central government has renamed the RNTCP the

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National Tuberculosis Elimination Program (NTEP), the commitment is emphasized by the Union government achieving the **sustainable development goal of ending TB by 2025**, five years ahead of the global targets.

- The large-scale implementation of the Indian government's Revised National TB Control Program (RNTCP) (sometimes known as RNTCP 1) was **started in 1997**.
- **RNTCP II**: The RNTCP was then expanded across India until the entire nation was covered by the RNTCP in March 2006. At this time the RNTCP also became known as RNTCP II. RNTCP II was designed to consolidate the gains achieved in RNTCP I, and to initiate services to address TB/HIV, MDR-TB, and extend RNTCP to the private sector.
- **RNTCP uses** the World Health Organisation (WHO) recommended **Directly Observed Treatment Short Course (DOTS) strategy** and reaches over a billion people in 632 districts/reporting units. The RNTCP is responsible for carrying out the Government of India five-year TB National Strategic Plans.
- With the RNTCP **both diagnosis and treatment of TB are free**.
- There is also, at least in theory, no waiting period for patients seeking treatment and TB drugs.
- **Objectives of RNTCP**:
 1. To achieve and maintain a TB treatment success rate of at least 85% among new sputum positive (NSP) patients.
 2. To achieve and maintain detection of at least 70% of the estimated new sputum-positive people in the community.
 3. New sputum-positive patients are those people who have never received TB treatment before, or who have taken TB drugs for less than a month. They have also had a positive result to a sputum test, which diagnoses them as having TB.2

National Strategic Plan (NSP) 2012 - 2017

- There have been a number of five-year National Strategic Plans (NSP)s since the start of the RNTCP. The NSP 2012 - 2017 had the aim of achieving **universal access to quality diagnosis and treatment**.
- Before this, there was little treatment available through the RNTCP for the **treatment of drug-resistant TB**.
- Complete geographical coverage for diagnostic and treatment services for multi-drug resistant TB was achieved in 2013.
- **A total of 93,000 people with MDR TB were diagnosed** and had been given treatment for drug-resistant TB by 2015.
- Also, the National AIDS Control Organisation (NACO) had **collaborated with the RNTCP** and had made the HIV-TB collaboration effective.

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- Most TB patients registered by the RNTCP were receiving HIV screening and 90% of HIV positive TB patients were receiving antiretroviral treatment.

Development of Nikshay

- The Central TB Division developed a case-based and web-based system called “Nikshay”.
- This helped with the reporting of all TB cases. It was scaled up nationally.

Standards for TB Care in India

- The Standards for TB Care in India was also developed and it was published in 2014. The Standards describe what should be done, and the TB treatment and care that should be provided throughout India, including what should be provided in the private sector.

Revised Technical & Operational Guidance

- So in 2016 the RNTCP published revised technical and operational guidance. The new guidelines, the RNTCP Technical and Operational Guidelines for Tuberculosis Control in India 2016 did not replace the previous guidance (the Standards of TB Care in India), but they provide updated recommendations.
- They also make it absolutely clear that the **guidance applies to the private sector as well as the public sector**.
- The strategic vision of the RNTCP is to lay down guidelines and norms for TB care in the country. So the principle of the RNTCP is that they should extend public services to privately managed patients.
- Instead of the requirement being that patients receiving care from a private provider should be referred to the RNTCP. Now the aim was that the patient should be able to stay with the private provider but be able to receive RNTCP services.
- The decision was also made to introduce a **daily TB treatment regimen**. The new anti TB drug **bedaquiline** for the treatment of drug-resistant TB was also to be made available initially in five states.
- For diagnosis, the GoI set up more than **600 CB-NAAT laboratories** and enhanced their capacity with highly sensitive diagnostic services. CB-NAAT is the name given in India to **Cartridge Based Nucleic Acid Amplification tests** such as Genexpert and TrueNat.

India National Strategic Plan (NSP) for TB 2017 - 2025

- The Indian TB National Strategic Plan (NSP) 2017 - 2025 is the plan produced by the government of India (GoI) which sets out what the government believes is needed to eliminate TB in India.
- The NSP 2017 - 2025 **describes the activities and interventions that the**

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GoI believes will bring about significant change in the incidence, prevalence, and mortality from TB. This is in addition to what is already going on in the country.

- **The vision of NSP:** The Vision is of a TB free India with zero deaths, disease, and poverty due to tuberculosis
- **Goals of NSP:** The Goal is to achieve a rapid decline in the burden of TB, mortality, and morbidity while working towards the elimination of TB in India by 2025.
- **Four strategic areas of Detect, Treat, Prevent & Build.**
- There is also across all four areas, an overarching theme of the Private Sector. Another overarching theme is that of Key Populations.

Detect

- The aim is to detect all those people with drug-sensitive TB as well as those with drug-resistant TB.
- The emphasis is to be on reaching TB patients seeking care from private providers and also finding people with undiagnosed TB in “high risk” or key populations. This is to be done through:
 1. Scaling up free, high sensitivity TB diagnostic tests such as CBNAAT;
 2. Scaling up private provider engagement approaches;
 3. Universal testing for drug-resistant TB;
 4. & Systematic screening of high-risk populations.

Diagnosis

- The Technical & Operational Guidelines for TB Control (TOG) describes how various tests should be used to diagnose anyone who has signs and symptoms suggesting that they might have TB.
- The tests to be used are sputum smear microscopy, chest X-ray, and the new CB-NAAT test.
- The CB-NAAT test is beginning to be made available throughout India. There is a diagram, or set of rules, which shows which tests should be used for different groups of people.

Active case finding

- The main objective of active case finding (ACF) is to detect TB cases early and to initiate treatment promptly.
- The NSP emphasizes the need to shift from passive case finding, which is waiting for people to seek care, to ACF which involves seeking out people in targeted groups.

Treat

- Initiate and sustain all patients on appropriate anti-TB treatment wherever

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they seek care. Provide patient-friendly systems and social support. This is to be done through:

- Preventing the loss of TB cases in the cascade of care by providing support systems. The “cascade of care” means every step in the provision of treatment, from when it is first started, to the point at which the patient finishes their treatment and is cured of TB;
- Providing free TB drugs for all patients with TB;
- Provide daily TB drugs for all patients with TB and a rapid scale-up of short-course regimens for drug-resistant TB. Provide treatment approaches guided by drug sensitivity testing.
- Providing patient-friendly adherence monitoring and social support in order to sustain TB treatment;
- Nutritional support for patients with TB. It has now been announced that patients with TB will receive R500 a month for food.
- **Undernutrition is a risk factor for TB in India.** Undernutrition worsens the nutritional status, generating a vicious cycle that can lead to adverse outcomes during and after treatment for patients with active TB. This includes those with MDR-TB. So this payment is partially to ensure that patients with TB have adequate food. There is more about food and TB and nutrition & TB.

Prevent

- Preventing the emergence of TB in susceptible populations. This is to be done through
- Scaling up air-borne infection control measures at health care facilities;
- Providing treatment for latent TB infection for the contacts of people with confirmed TB;
- & Addressing the social determinants of TB through an approach across different sectors. The social determinants of health are generally considered to be the conditions in which people live and work that affect their health.

Build

- Build and strengthen relevant policies. Provide extra capacity for institutions and extra-human resources capacity. This is to be done through:
- Translating high-level political commitment into action;
- Restructuring the RNTCP and other institutional arrangements;
- Building supportive structures for surveillance, research, and innovations. Providing a range of interventions based on the local situation;
- Scaling up technical assistance at national and state levels;
- & Preventing the duplication of partners’ activities

Summary of Government initiatives for TB: RNTCP, 1993

- Key targets: TB-HIV, Diabetes, Tobacco use, Alcohol; Poor

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- undernourished, EWS, Prison inmates, etc.
- Early diagnosis of all the TB patients, prompt treatment with quality-assured drugs and treatment regimens along with suitable patient support systems to promote adherence.
- Engaging with the patients seeking care in the private sector.
- Prevention strategies including active case finding and contact tracing in high risk / vulnerable population
- Airborne infection control.
- Multi-sectoral response for addressing social determinants.
- In 2018, India has pledged to eradicate TB by the year 2025, 5 years ahead of the global deadline set for 2030.
- The Ministry of Health and Family Welfare has launched a National Prevalence Survey to estimate the prevalence of tuberculosis at national and sub-national levels.

Recent initiatives by the Government of India

- **Truenat - a molecular TB Diagnostic Test:** is made indigenously in India by Goa-based Molbio Diagnostics. ICMR has assessed and validated the diagnostic tool. WHO says it has high accuracy. Truenat can be used as an initial tool for diagnosing TB at primary, community health centers.
- New cure for TB: US Food and Drugs administration approves it. BPaL Regime = Bedaquiline, Pretomanid and Linezolid.
- Combination therapy using Malaria drug (**Chloroquine + Isoniazid**) quickly clears TB.
- India has the target to eliminate TB by 2025. The world target is 2030.
- MoHFW launched the 'TB Harega Desh Jeetega Campaign', along with National TB Prevalence Survey.
- Saharia tribe miners in Madhya Pradesh have appealed to the government to treat them for silicosis rather than Tuberculosis. They speak the Munda language.

Kerala Case Study to tackle TB elimination:

- Kerala on track to eliminate TB by 2025
- Joint Monitoring Mission (JMM 2019) by Center and WHO is assessing the RNTCP (Revised National Tuberculosis Control Programme) and India's National Strategic Plan for TB elimination, 2017-2025.
- Kerala lauded for
 - Commitment, Implementation, and Administration.
 - Integrating RNTCP into the health system.
 - The patient-centric programme, involvement of Community, the leadership of local bodies.
 - Partnership with the Private sector.

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- They can improve on CBNAAT/Genexpert machines which are molecular diagnostics services.

- Smokers are twice likely to develop active TB and die from it as non-smokers and smoking also makes TB Treatment less effective. In 2018, 9 lakh TB cases were attributed to smoking, according to the Global TB report. Tobacco control in TB control. World Lung Conference is held in Hyderabad.
- **SeeTB**: is a new diagnostic tool for detecting TB. It is a battery-operated device.
- **India and the World Bank** have signed a loan agreement of \$400 million for the Program Towards Elimination of Tuberculosis (TB).
- Lancet has published a report 'Building a Tuberculosis-free World'. Lancet is a British journal. It is among the World's oldest, most prestigious medical journals.
- [Stop TB Partnership Board](#)
- **Nikshya poshak yozana**
- For encouraging good nutrition during the treatment period financial incentive of Rs.500/- per month is provided as nutritional support to each notified TB patient for the duration for which the patient is on anti-TB treatment. Incentives are delivered through a direct benefit transfer (DBT) scheme to the bank accounts of beneficiaries.

Way Forward

- More efforts are needed to improve the early and accurate diagnosis followed by a prompt appropriate treatment which is vital for ending TB.
- India must collaborate with global efforts which are being done to eliminate TB.
- There is a need for expanding both the laboratory network as well as diagnostic facilities. There is a requirement of the crucial contribution from the private sector in terms of providing mandatory tuberculosis notification and quality care.
- There is a need to fight the stigma surrounding it so that every TB patient can seek care with dignity and without discrimination. Hence, advocacy, communication & social mobilization is vital.