

In 2012 India recorded **2.8 million** cases where the global incidence during the year was 8.6 million

World TB Day
is on 24th March

TB is one of the leading causes of mortality in India, **killing 2** persons every three minute, nearly **1,000** every day

TB is Curable

An increase in the treatment success rate has been registered for new cases – from 25 % in 1995 to 88 % in 2011.

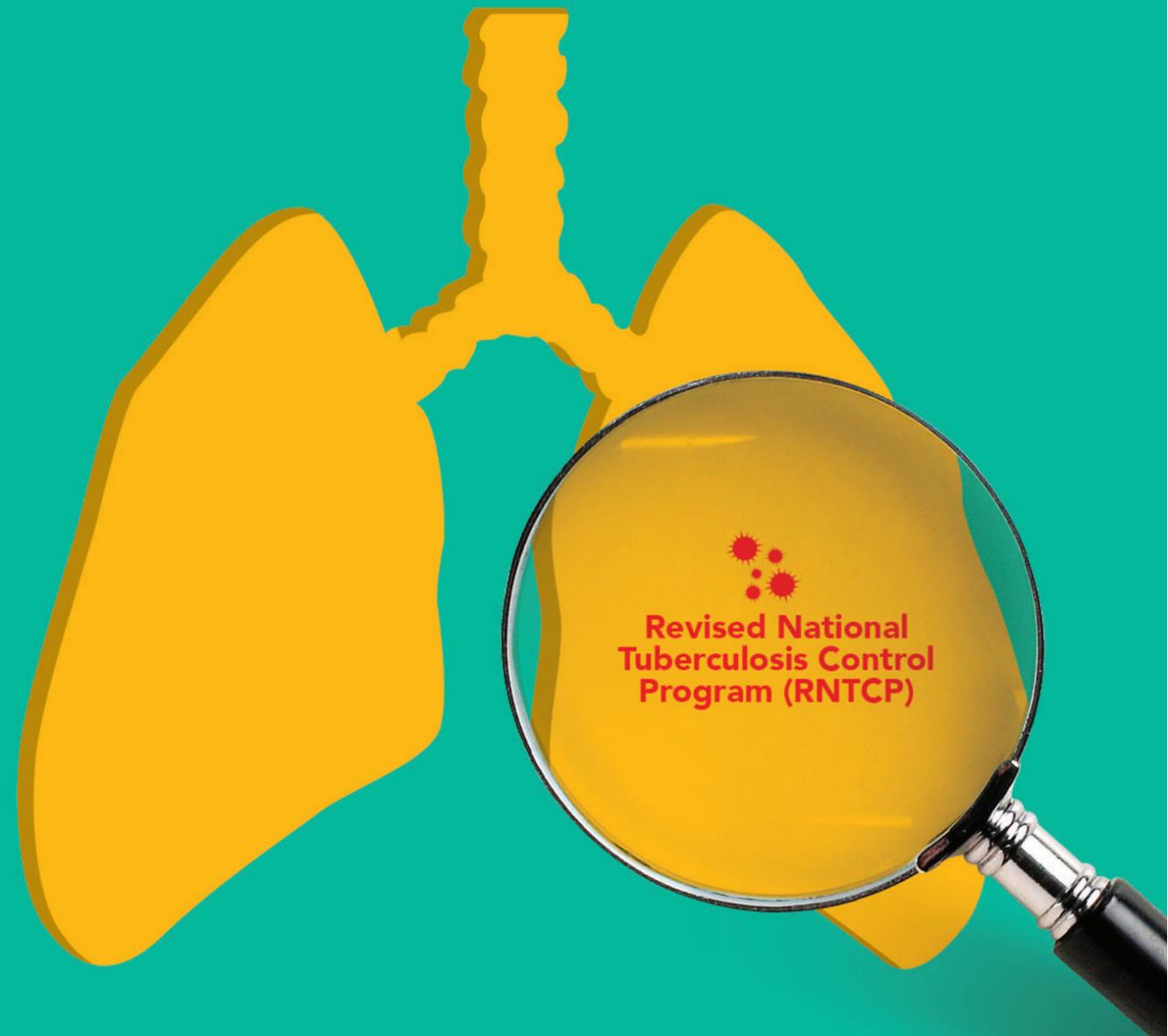
40% of Indian population is infected with TB bacillus.

The theme for World TB day 2014 is:
Reach the missing 3 million

Find, Treat, Cure TB

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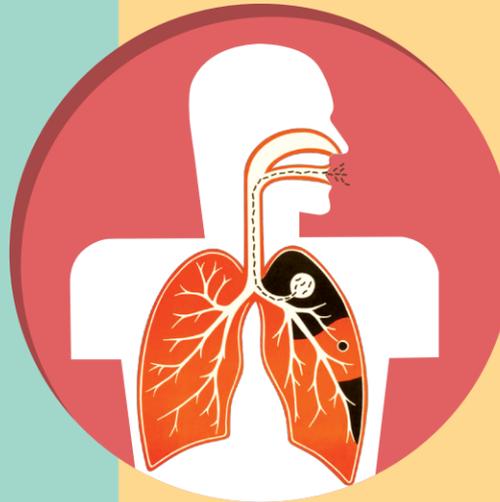
ihbp IMPROVING HEALTHY BEHAVIORS PROGRAM

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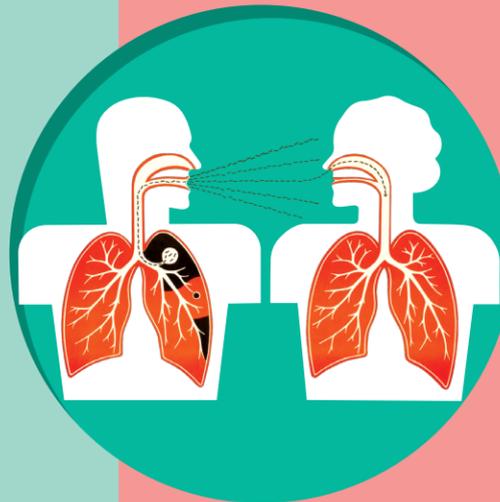
TB Basics



What is Tuberculosis (TB)?

Tuberculosis (TB) is an infectious disease that is caused by a bacterium called *Mycobacterium tuberculosis*. TB primarily affects the lungs, but can also affect organs in the central nervous system, lymphatic system, and circulatory system amongst others.

There are two forms of tuberculosis; Pulmonary TB and Extra Pulmonary TB. TB affects the lungs in more than 85% of the cases and is called Pulmonary TB. TB that effect | Extra-pulmonary tuberculosis (EPTB) is tuberculosis of organs other than the lungs, such as the pleura (pleurisy), lymph nodes, intestines, genito-urinary tract, skin, joints and bones, meninges of the brain, etc.



How does TB spread?

TB bacteria are released into the air when a person with TB disease of the lungs or throat sneezes, coughs or speaks. These germs can stay in the air for several hours, depending on the environment. Persons who breath in the air containing these TB germs can become infected, this is called latent TB infection. In some people, TB bacteria overcome the defenses of the immune system and begin to multiply, resulting in the progression from latent TB infection to TB disease. Some people develop TB disease soon after infection, while others develop TB disease later when their immune system becomes weak.

People with TB disease are most likely to spread germs to people they spend time with everyday such as family members or coworkers, since it usually takes prolonged exposure to someone with TB disease for someone to get infected.

What are the symptoms of TB?

Symptoms of TB are specific to the site affected although there are some symptoms common to all types of TB

Common symptoms

- Weight loss
- Fatigue
- Evening rise of temperature (Fever)
- Night sweats

Symptoms of Pulmonary TB are:

- Persistent cough for 2 weeks or more
- Chest pain
- Shortness of breath
- Blood in sputum

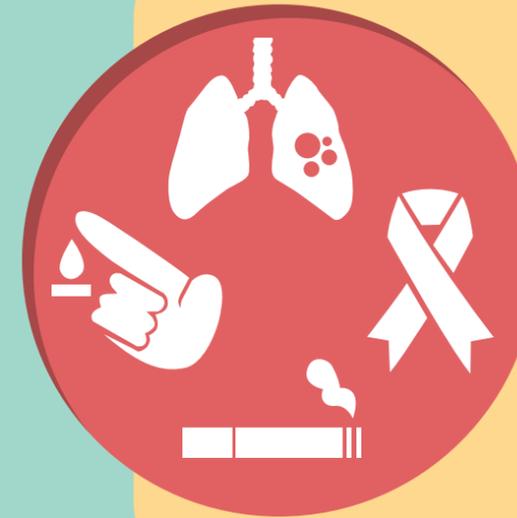
Symptoms of Extra Pulmonary TB depend on the site/organ involved.



What are the risk factors for Tuberculosis?

Following factors can increase the risk of getting tuberculosis;

- Close prolonged contact with a sputum positive pulmonary TB patient
- Overcrowding
- Smoking
- HIV infection
- Malnutrition
- Diabetes Mellitus
- Patients on immunosuppressive drugs (anti- cancer, Corticosteroids etc.)
- Certain lung diseases like Silicosis



How is TB treated?

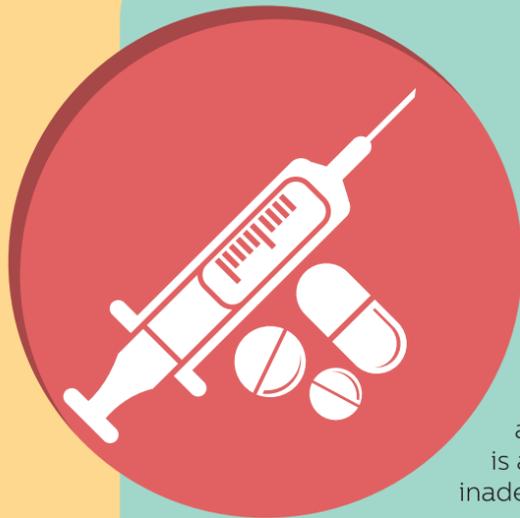
Treatment for TB depends on whether the disease is active or latent. If TB is in an inactive state, an antibiotic called isoniazid (INH) is prescribed for six to twelve months. TB disease is treated through a combination of following drugs:

- Isoniazid (INH)
- Rifampicin
- Pyrazinamide
- Ethambutol
- Streptomycin

Combination of drugs is administered to kill all the bacteria and prevent them from becoming resistant to one or more drugs. The treatment is given for 6-9 months.

The Revised National Tuberculosis Control Program (RNTCP) in India provides standardized anti-TB treatment through DOTS. Directly Observed Treatment, Short-Course (DOTS) strategy is the internationally recommended strategy of choice for TB control.

In RNTCP Directly Observed Treatment (DOT) is one of the five components of the DOTS strategy, in which a trained peripheral health worker or community volunteer watches as patients swallow all medicines, is fundamental to ensuring cure. DOT should be ensured for every dose in the intensive phase of treatment and at least the first dose of the week in the continuation phase. In RNTCP drugs for treatment are supplied as 'Patient wise boxes'. One such box is earmarked for every patient registered ensuring the availability of the full course of treatment to the patient.



Drug resistance and MDR and XDR-TB

Drug-resistant tuberculosis (DR TB) is caused by strains of the TB bacteria resistant to one or more anti TB drugs.

Multidrug-resistant TB (MDR-TB) is defined as the disease caused by TB bacilli resistant to at least two most powerful anti-TB drugs isoniazid and rifampicin. MDR TB, like all drug resistance TB, is a man-made phenomenon caused by irregular or inadequate treatment when:

- Patients do not take regular and complete treatment
- Health care providers prescribe inappropriate treatment regimens
- The quality and supply of drugs is unreliable.

MDR TB requires extensive treatment (18-24 months or more of treatment) with second-line anti-TB drugs like fluoroquinolones, Kanamycin, Ethionamide, and Cycloserine. These second line drugs are more costly and toxic than the first-line drugs. The treatment success for MDR TB is only about 60-70% in comparison to 90%-95% for drug sensitive TB.

But the largest barrier to successful treatment is that patients tend to stop taking their medicines because they begin to feel better. It is important to take regular and complete treatment in order to achieve cure.

Extensively drug resistant TB (XDR TB) is a form of DR TB which is resistant to second line drugs especially fluoroquinolones and at least 1 of the 3 injectables (capreomycin, kanamycin or amikacin) with or without Rifampicin and Isoniazide resistance.

In RNTCP, drugs for treatment are supplied as 'Patient Wise Boxes'.

One such box is earmarked for every patient registered ensuring the availability of the full course of treatment to the patient. Hence, in RNTCP the treatment never fails on account of non-availability of medicines.



TB and HIV Co-infection

TBTB is one of the earliest opportunistic diseases to develop amongst persons infected with HIV. HIV debilitates the immune system increasing the vulnerability to TB and increasing the risk of progression from TB infection to TB disease. TB treatment with DOTS reduces the morbidity and mortality among people living with HIV (PLHIV). HIV infection increases the risk of progression of latent TB infection to active TB disease. It increases risk of death if not timely treated for both TB and HIV, and also risk of recurrence even if successfully treated.

Correspondingly, TB is the most common opportunistic infection and cause of mortality among PLHIV. It is difficult to diagnose and treat owing to challenges related to co-morbidity, pill burden, co-toxicity and drug interactions. Though only 5% of TB patients are HIV-infected, in absolute terms it means more than 100,000 patients annually, ranks 2nd in the world and accounts for about 10% of the global burden of HIV-associated TB.

India ranks 2nd in the world and accounts for more than 100,000 patients annually which is about 10% of the global burden of HIV-associated TB.

TB and Diabetes

In 2012, there were an estimated 371 million cases of Diabetes Mellitus (DM) globally. In the South East Asia Region, more than 70.3 million people have diabetes. In India, As a consequence of population growth, aging, changed lifestyle and urbanization, the country has 63 million persons with diabetes mellitus Tuberculosis and Diabetes Mellitus:

The recent medical literature on the interactions between Tuberculosis and Diabetes has shown that:-

- People with a weak immune system, as a result of chronic diseases such as diabetes, are at a higher risk of progressing from latent to active TB. Hence, people with diabetes have a 2-3 times higher risk of TB compared to people without diabetes
- About 10% of TB cases globally are linked to diabetes
- Large proportions of people with diabetes as well as TB are not diagnosed, or are diagnosed too late.
- Early detection can help improve prognosis.
- Diabetes Mellitus (DM) can lengthen the time to sputum culture conversion and theoretically this could lead to the development of drug resistance if a 4-drug regimen in the intensive phase of therapy is changed after 2 months to a 2-drug regimen in the presence of culture-positive TB.
- People with diabetes who are diagnosed with TB have a higher risk of death during TB treatment and of TB relapse after treatment.
- DM is complicated by the presence of infectious diseases, including TB. It is important that proper care for diabetes is provided to patients suffering from TB/DM.
- It has been argued that good glycemic control in TB patients can improve treatment outcomes.

Global Tuberculosis Scenario

MDG global target for TB 6, aims to begin reverse TB incidence by 2015.

- The rate of new TB cases has been falling worldwide for about a decade, achieving the MDG global target. TB incidence rates are also falling in all six WHO regions. The rate of decline (2% per year) remains slow.
- Globally by 2012, the TB mortality rate had been reduced by 45% since 1990. The target to reduce deaths by 50% by 2015 is within reach.
- An estimated 1.1 million (13%) of the 8.6 million people who developed TB in 2012 were HIV-positive. About 75% of these cases were in the African Region
- The five countries with the largest number of incident TB cases in 2012 were India (2.0 million – 2.4 million) China (0.9 million –1.1 million), South Africa (0.4 million –0.6 million), Indonesia (0.4 million –0.5 million) and Pakistan (0.3 million –0.5 million); these are the top five countries with largest number of cases.
- Majority of cases worldwide in 2012 were in South-East Asia (29%), African (27%), and West Pacific Regions (17%). India and China alone accounted for 26% and 12% of global cases, respectively
- Approximately 75% of total TB deaths occurred in the African and South East Asia Regions in 2012 (both including and excluding TB deaths among HIV-positive people). India and South Africa accounted for about one-third of global TB death.
- Globally in 2012, an estimated 450,000 people developed MDR TB and there were estimated 170,000 deaths from MDR TB.

Source: WHO Global TB report 2013

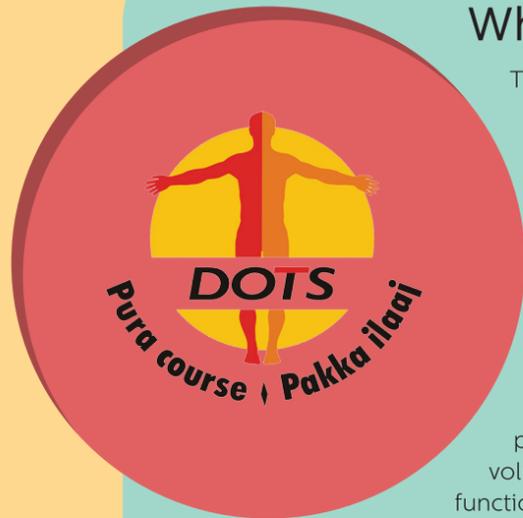
Fact sheet on Tuberculosis in India

- Each year nearly 2.2 million people in India develop TB, of which around 0.87 million are infectious cases.
- It is estimated that annually around 270,000 Indians die due to TB.
- An increase in the treatment success rate has been registered for new cases – from 25% in 1995 to 88% in 2011.
- 40% of Indian population is infected with TB bacillus.

Source: TB Annual Report 2013 & 2014, RNTCP

RNTCP Key Achievements

RNTCP Key Achievements



What is RNTCP?

The Revised National TB Control Programme (RNTCP) widely known as DOTS, which is WHO recommended strategy, is being implemented as a 100% Centrally Sponsored Scheme in the entire country. Under the programme, diagnosis and treatment facilities including a supply of anti TB drugs are provided free of cost to all new and retreatment TB patients. More than 13,000 microscopy centers have been established in the country.

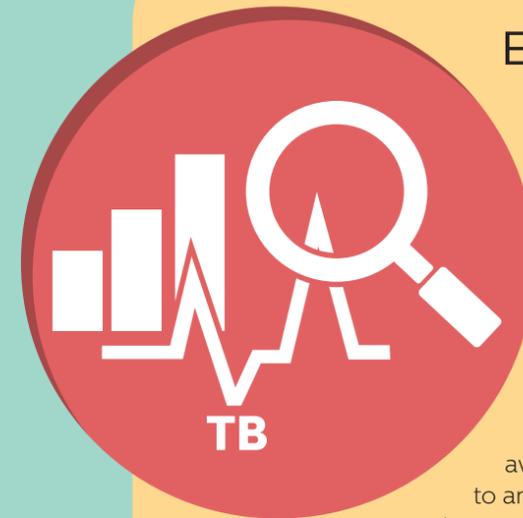
Treatment centers (DOT centers) have been established near to residence of patients to the extent possible. All government hospitals, community health centers (CHC), primary health centers (PHCs), sub-centers are DOT Centers. In addition, NGOs, private practitioners (PPs) involved under the RNTCP, community volunteers, anganwadi workers, women self-help groups etc. also function as DOT providers/DOT centers. Drugs are provided under direct observation and the patients are monitored so that they complete their treatment. Under RNTCP, DOTS Plus services for the diagnosis and management of MDR-TB are presently available in all States free of cost.

What is the role of Central TB Division (CTD), MoHFW?

The role of CTD is to implement RNTCP across the country thereby making provision of free Quality assured diagnostic services and treatment with quality assured drugs to all cases including DR-TB and other comorbidity associated TB.

Key achievements of RNTCP

- Since March 2006, RNTCP has covered the entire nation reaching over a billion population (1,164 million) in 632 districts and reporting through 690 units.
- Since inception, RNTCP has evaluated over 70 million persons for TB and initiated treatment for over 17.5 million TB patients
- 50,000 MDRTB and 500 XDRTB cases placed on treatment
- 3.1 million additional lives saved
- The incidence of TB has come down from 209/lakh population in 2005 to 176/lakh population in 2012
- The prevalence has come down from 365/ lakh population in 2005 to 230/lakh population in 2012
- The mortality from TB has reduced from 36 per lakh population in 2005 to 22 per lakh population in 2012.



Economic impact of RNTCP

A study on the economic impact of scaling up of RNTCP in India in 2009 shows that on an average each TB case incurs an economic burden of around US\$ 12,235 and a health burden of around 4.1 DALYs. The disability-adjusted life year (DALY) is a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death. Similarly, a death from TB in India incurs an average burden of around US\$ 67,305 and around 21.3 DALYs.

- A total of 6.3 million patients have been treated under the RNTCP from 1997-2006. This has led to a total health benefit of 29.2 million DALYs gained including a total of 1.3 million deaths averted. In 2006, the health burden of TB in India would have risen to around 14.4 million DALYs or have been 1.8 times higher in the absence of the programme.

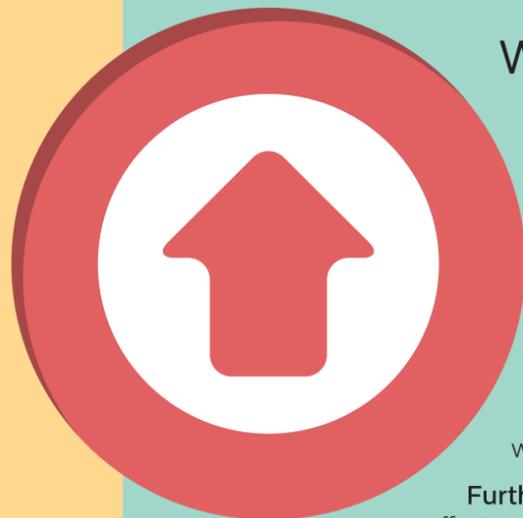
- The RNTCP has also led to a gain of US\$ 88.1 billion in economic wellbeing over the scale-up period. In 2006, the gain in economic wellbeing is estimated at US\$ 19.7 billion per annum equivalent on a population basis to US\$ 17.1 per capita.
- In terms of TB patients, each case treated under DOTS in India results in an average gain to patients of 4.6 DALYs and US\$ 13,935 in economic well-being.

What is the vision of RNTCP and how does the program plan to achieve it?

The vision of the Government of India is for a "TB free India" with reduction in the burden of the disease until it is no longer a major public health problem. During 12th Five Year Plan (2012-2017) to achieve this vision, the Programme has now adopted a strategy of Universal Access by providing free quality assured diagnostic services and treatment with quality assured drugs to all cases including DR-TB and other comorbidity associated TB.

Objectives

- To ensure early quality assured diagnosis of all TB patients
- To provide quality assured treatment for all diagnosed
- To scale-up access to effective treatment of drug-resistant TB
- To decrease the morbidity and mortality of HIV-associated TB
- To extend RNTCP services to patients diagnosed and treated in the private sector



What are the latest and upcoming initiatives of RNTCP?

Core programme functions remain the first priority, which includes ensuring sanctioned posts are filled and the staff is appropriately trained. Other details include, ensuring and improving quality diagnostic services, maintaining quality drug supply for treatment, strengthening supervision and monitoring at all levels. Bringing diagnosis and treatment services closer to the patient at the community level, notably through the network of community DOT Providers including ASHA workers, will remain a priority for DOTs.

Further alignment with National Rural Health Mission (NRHM): efforts are being made to align Tuberculosis Units with Block level so that all diagnostic and treatment services are integrated into the general health system by 2017.

Promote research for development and implementation of improved tools and strategies:

New diagnostics, drugs, and vaccines for TB are in the development pipeline, and hold the possibility of greatly facilitating TB control efforts. Expand efforts to engage all care-providers: To achieve the Programme targets more successful engagement of the private sector at a scale commensurate with its presence and importance.

Strengthen urban TB control:

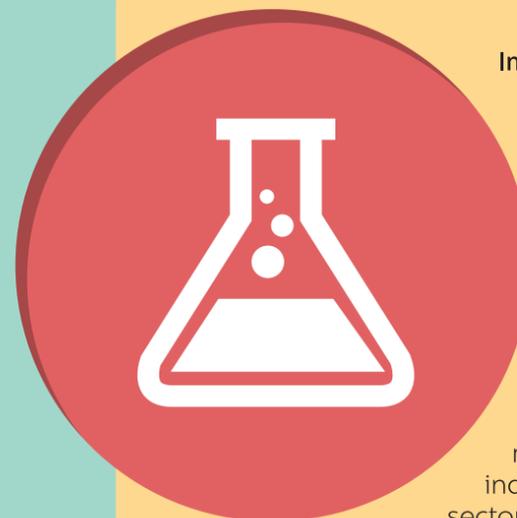
Despite the successes of the Programme, TB burden and transmission remains highest in the urban areas, which have the largest and most dense concentrations of vulnerable populations. Stopping TB transmission in cities will require early diagnosis.

Special Populations:

Enhanced outreach by RNTCP to poor and disadvantaged populations belonging to schedule caste/schedule tribe and economically backward districts is critical to universal access. Resources will be required to finance scale-up of innovative approaches to engage the private sector, with development of more flexible strategies. TB is a Notifiable disease and mechanisms are needed to ensure that all TB cases treated under other sector are notified to RNTCP.

Expand diagnosis and treatment of drug-resistant TB:

Important activities during the 2012-2017 period will be investment in public sector laboratory capacity, development of systems for quality-assuring and purchasing additional laboratory services from the private sector, assurance of reliable supply of drugs for second-line treatment, deployment of information systems, expansion of collaboration with private providers and improved regulation and promotion of rational use of second-line drugs in the private sector.



Improve Advocacy Communication and Social Mobilization:

For both basic DOTS services and control of drug-resistant TB, achieving the ambitious “universal access” objectives of the Programme will require additional development of focused strategies targeted on hard-to-reach groups as well as addressing socio-economic-related barriers to providing care.

Banning of serological test:

The tests approved by the Revised National Tuberculosis Control Programme (RNTCP) for diagnosis of TB include sputum microscopy, X-ray Chest, Solid & Liquid Culture methods and Rapid molecular tests. Available evidence indicates that besides the tests mentioned above the private sector heavily relies on serological tests for diagnosis of TB.

As per the WHO recommendation, the currently available commercial serological tests provide inconsistent and imprecise estimates of sensitivity and specificity and these tests should not be used for the diagnosis of pulmonary and extra-pulmonary TB. Government of India imposed ban on manufacture, sale, distribution, use and import of the Sero-diagnostic test kits for diagnosis of TB as per Government of India Gazette Notification Nos. G.S.R. 432 (E) and G.S.R. 433 (E) dated 7th June 2012.

TB Notification:

Health care providers in the private sector play an important role in ensuring proper diagnosis and treatment of TB patients. Government of India hence made TB notification mandatory to all health care providers to the local health authorities. This is also a step to curb TB transmission and address problem of emergence and spread of Drug Resistant TB in India.

TB Surveillance in India with Nikshay:

Central TB Division (CTD) in collaboration with National Informatics Centre (NIC) has developed a Case Based Web online (cloud) application named Nikshay. This online system also provides platform to all private health care provides to notify TB cases to the RNTCP. Notification gives an opportunity to support private sector for better practices in terms of Standard TB Care which include helping the patients to get right diagnosis, treatment, Follow up, Contact Tracing Chemoprophylaxis & facilitates social support systems. NIKSHAY was honored with National e-Governance Award (Gold) 2013-14.



Standards of TB care in India (STCI)

Central TB Division with support from WHO India developed standards of TB Care in India with consultative process and inputs from all stake holders. The STCI is developed as a way to engage with the Indian private sector for effective TB prevention and control. The STCI covers 25 standards in TB care and is applicable to all health care providers in all setting of India. The STCI takes into account World Health Organization (WHO) and International Standards for TB Care (ISTC) endorsed regimens used across the globe. The standards of TB care India includes a new set of standards for social inclusion that goes beyond the areas covered in the International Standards for TB Care (ISTC) 2009.

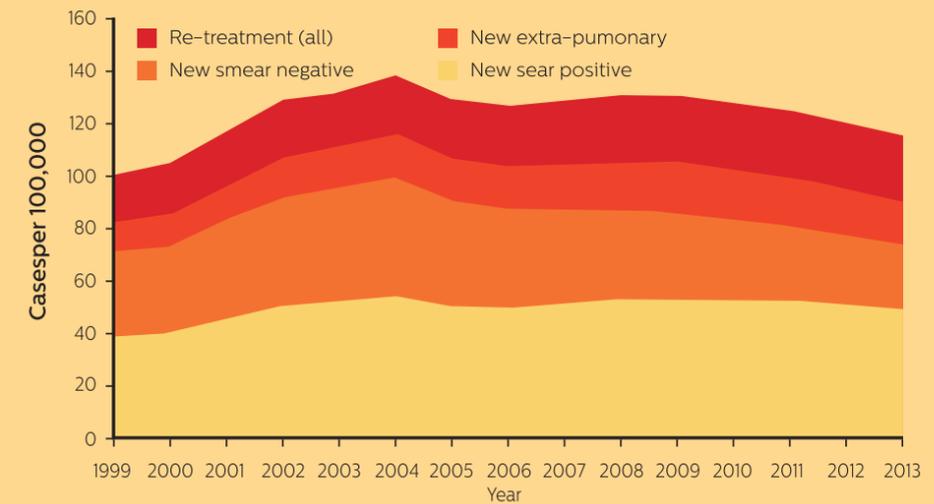
What is the success rate of TB treatment In India?

Since the inception of the programme, over 85% of the patients who are registered for treatment annually are being successfully treated.

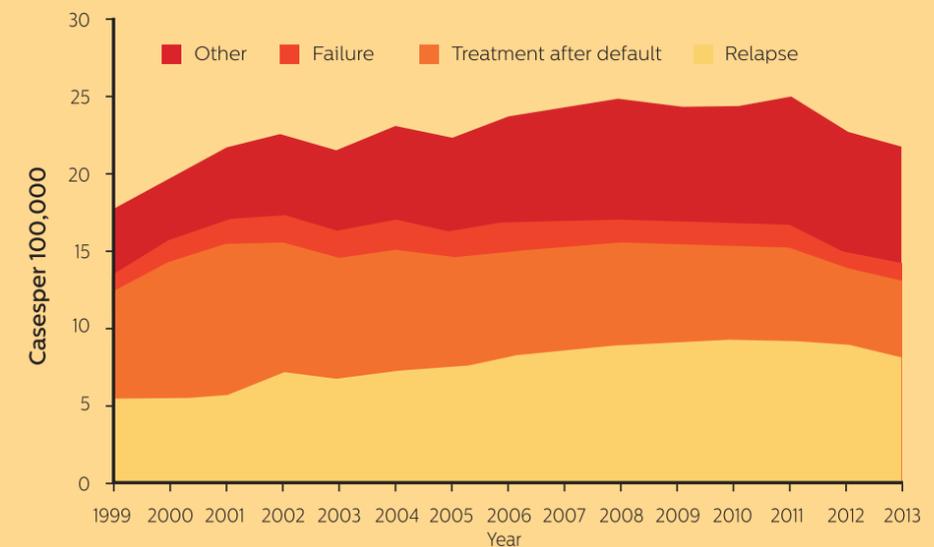
Treatment outcomes 2013

	Registered	Treatment success	Died	Failure	Defaulted	Trans out	Switched to Cat IV
New Smear Positive	6,28,897	88%	4%	2%	6%	1%	0%
New Smear Negative	3,17,155	89%	4%	0%	6%	1%	0%
New Extra Pulmonary	2,33,622	93%	2%	0%	3%	1%	0%

Trends in New TB case notification rate (1999–2013)



Trends in type of re-treatment TB case notification rates (1999–2013)





End of 2017

What are the targets set by RNTCP for the coming years?

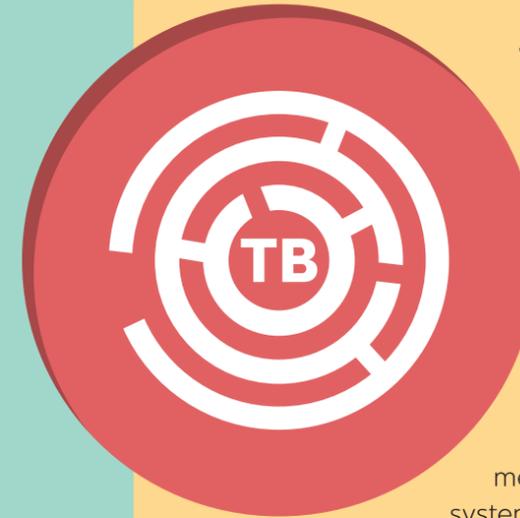
By the end of 2017, the Programme aims to achieve the following targets:

- Early detection and treatment of all TB cases including DR TB and HIV-associated TB
- Initial screening of all retreatment smear-positive TB patients for drug-resistant TB and provision of treatment services for MDR-TB patients
- Offer of HIV counseling and testing for all TB patients and linking HIV-infected TB patients to HIV care and support
- Successful treatment of all TB patients, including DR TB and TB HIV cases
 - Extend RNTCP services to patients diagnosed and treated in the private sector
- Improve integration with the health system by aligning TB supervision oversight with the block-level supervision structures under National Rural Health Mission (NRHM)
- Develop public sector laboratory capacity, systems for quality-assuring and laboratory services from the private sector and an assured supply of drugs for first & second-line treatment
- Deploy of information systems
- Collaborate with private providers for promotion of STCI in the private sector

What is the budgetary allocation in 12th five year plan for RNTCP?

The estimated funding requirement worked out by a group of experts for 12th Five Year Plan period is approximately 1.26 billion USD (INR 5,825 crores). The year wise budget outlay estimate is given below:

Year	Allocation	Year	Allocation
2012-13	710.15	2015-16	1000.00
2013-14	710.15	2016-17	978.90
2014-15	1100.95	Total	4500.15



What are the challenges faced by RNTCP?

Patients tend to stop their medication because they begin to feel better. It is important to finish medications in order to completely eradicate the TB bacteria from the body.

Rural people in India in general, and tribal populations in particular, have their own beliefs and practices regarding health. Some rural people have also continued to follow rich, undocumented, traditional medicine systems, in addition to the recognized cultural systems of medicine such ayurveda, unani, siddha and naturopathy, to maintain positive health and to prevent disease.

Other reasons: Poor primary health-care infrastructure in rural areas of many states; unregulated private health care leading to widespread irrational use of first-line and second-line anti-TB drugs; spreading HIV infection; poverty; lack of political will; and above all corrupt administration.



Resources and references

Here are some of the important references on Tuberculosis available online

Revised national Tuberculosis Control Program (RNTCP)

www.tbcindia.nic.in

TB annual report 2013

<http://www.tbcindia.nic.in/pdfs/tb%20india%202013.pdf>

TB annual report 2014

<http://www.tbcindia.nic.in/Pdfs/TB%20INDIA%202014.pdf>

Information on TB notification & FAQ

<http://www.tbcindia.nic.in/pdfs/TB%20Notification%20Govt%20%20Order%20dated%2007%2005%202012.pdf>

<http://www.tbcindia.nic.in/Pdfs/FAQs%20for%20TB%20notification%20in%20India%20-%20FINAL.pdf>

Link to stop TB partnership

<http://www.stoptb.org/>

World TB day messages

http://www.stoptb.org/events/world_tb_day/2014/

Latest global TB reports and data

<http://www.who.int/tb/country/en/>

Standards of TB care

http://www.tbcindia.nic.in/pdfs/STCI%20Book_Final%20%20060514.pdf

Government Order on TB Notification

<http://www.tbcindia.nic.in/pdfs/TB%20Notification%20Govt%20%20Order%20dated%2007%2005%202012.pdf>

Banning of sero diagnostic test for TB

http://www.tbcindia.nic.in/pdfs/Letter_Serodiagnosis.pdf

Social media campaign on Tuberculosis

<http://www.tbnotification.in/>

<https://www.facebook.com/tbpledge>

Useful contacts

1. Government spoke person

Dr. R.S. Gupta

DDG, TB, Central TB Division, MOHFW

Email: ddgtb@rntcp.org

Contact:



Terminology guidelines/abbreviations

Active TB/TB Disease

In some TB infected people, TB Bacteria overcomes the defenses of immune system and begin to multiply, resulting in the progression from latent TB infection.

Latent TB Infection

In most people who breathe in TB bacteria the body's immune system is able to fight the TB bacteria and stop them from multiplying. Persons with latent TB infection do not feel sick, do not have any symptoms, and cannot spread TB bacteria to others.

Pulmonary TB: TB disease that occurs in the lungs, usually producing a cough that lasts 2 weeks or longer. Most TB disease is pulmonary.

Extra pulmonary TB: TB disease in any part of the body other than the lungs (for example, the kidney, spine, brain, or lymph nodes).

Smear: a test to see whether there are TB bacteria in your phlegm. To do this test, lab workers smear the phlegm on a glass slide, stain the slide with a special stain, and look for any TB bacteria on the slide. This test usually takes 1 day to get the results.

Sputum: Phlegm coughed up from deep inside the lungs. Sputum is examined for TB bacteria using a smear; part of the sputum can also be used to do a culture.

Culture: A test to see whether there are TB bacteria in your phlegm or other body fluids. This test can take 2 to 4 weeks in most laboratories.

New case: A patient who has never had treatment for TB or who has taken anti TB drugs for less than one month.

Re-treatment case/Treatment after failure: A patient previously treated for TB but treatment failed.

Treatment after default: A patient previously treated for TB for more than one month but did not complete treatment.

Treatment after relapse: Who was previously declared cured or treatment completed and is diagnosed with bacteriologically positive.

Treatment failure: Any TB patient who is smear-positive at 5 months or more after initiation of treatment.

Disability adjusted life years (DALYs): The disability-adjusted life year (DALY) is a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death.

Directly observed therapy (DOT): A way of helping patients take their medicine for TB. If you get DOT, you will meet with a health care worker every day or several times a week. You will meet at a place you both agree on. This can be the TB clinic, your home or work, or any other convenient location. You will take your medicine while the health care worker watches.

Multidrug-resistant TB (MDR TB): Multi-drug-resistant tuberculosis (MDR TB) is caused by strains of the tuberculosis bacteria resistant to the two most effective anti-tuberculosis drugs available - isoniazid and rifampicin. MDR TB can only be diagnosed in a specialized laboratory.

Extensively drug resistant TB (XDR TB) is a form of DR TB which is resistant to second line drugs especially fluoroquinolones and at least 1 of the 3 injectables (capreomycin, kanamycin or amikacin) with or without Rifampicin and Isoniazide resistance.

Resistant bacteria: bacteria that can no longer be killed by a certain medicine.

Rifampin (RIF): one of the four medicines often used to treat TB disease. It is considered a first-line drug.

HIV infection : infection with the human immunodeficiency virus, the virus that causes AIDS (acquired immunodeficiency syndrome). A person with both latent TB infection and HIV infection is at very high risk for developing TB disease.