

## Tuberculosis 2.0 in India: A Review

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Tuberculosis (TB) is initially a chest disease but slowly it shows its impact on lungs. Even though death is inevitable, death due to curable diseases should be controlled, if we can identify them at the early stage. Even though, TB is the due to an infectious bacterial agent - *Mycobacterium tuberculosis*, but it is curable and preventable disease. TB is becoming the lead disease, causing more deaths and occupying 10<sup>th</sup> position by pushing down the other major diseases like HIV/AIDS etc. By considering "Tubercle" as the basis of the disease, Prof. Schonlein suggested in 1839 that "Tuberculosis" be used as a generic name for all variants of Phthisis.

sick with the indications of TB. The following is the action that any government can do for such diseases: (i) Control (ii) Elimination of disease (iii) Elimination of infections (iv) Eradication and (v) Extinction.

India, as a country, has conferred high priority for ending Tuberculosis (TB) by 2025, five years ahead of Sustainable Development Goals (SDG). It is a right initiative and good assurance from the government.

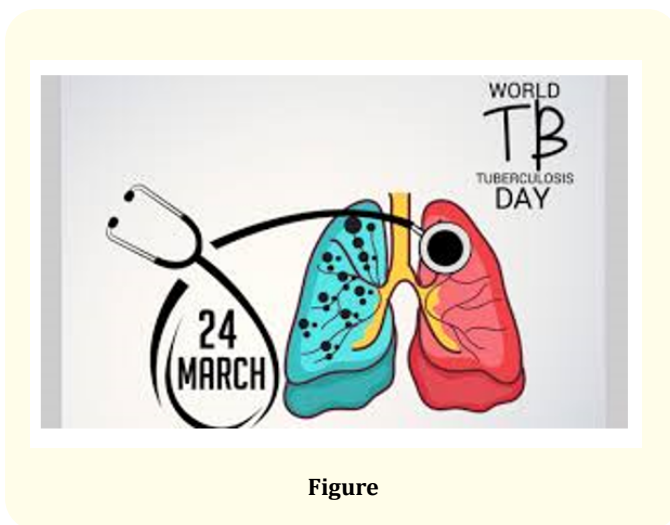
Details/Year	2000	2015	2019
Incidence of TB	289/lakh/year	217/lakh/year	193/lakh/year
Mortality due to TB	56/lakh/year	36/lakh/year	32/lakh/year

**Table 1:** Statistics of tuberculosis (TB) in India.

(Source: TBFACTS.ORG).

Tuberculosis (TB) has existed in India from ancient times until the end of the Royal rule. The disease may be mild in a TB patient for many months, but if the patient is not taking the medical care, then it may affect people around him. Statistics says that on an average, a TB patient may infect 5 - 15 other people in his neighborhood in a duration of a year. Even though, all age groups of people are vulnerable to TB, it generally affects grownup people in productive years.

Under the initial investigation, World Health Organization (WHO) endorses Rapid Molecular Diagnostic tests as the to all



**Figure**

Tuberculosis (TB) is an air-borne disease, it means that when the patients of Lung TB cough, or sneeze or spit, they impel the TB microbes into the air. Any person gulps these germs, become

suspected TB patients. World Health Organization (WHO) also recommends Bacillus Calmette-Guerin (BCG) Vaccine to all children during the child birth in all countries to shield against infant Meningitis and also for the disseminated Tuberculosis (TB).

Assessment and Forecasting may not go as per planned calculations in this VUCA (Volatility, Uncertainty, Complexity, Ambiguity) sphere. There are many cases of Tuberculosis (TB) which are correlated with other diseases like HIV/AIDS epidemic (in terms of spread) and recent Pandemic COVID-19 (in terms of chest related). This can be viewed as Tuberculosis 2.0 and analyzed.

One should understand that Acquired Immuno-Deficiency Syndrome (AIDS) is a chronic, life-threatening disease caused due to the Human Immunodeficiency Virus (HIV), a sexually transmitted infection (STI), impedes with your body's ability to fight infection, by damaging your immune system. Also, it is possible to spread by contact with infected blood or from mother to child during pregnancy or breast-feeding.

In 2019, Coronavirus disease (COVID-19) which is caused by newly discovered Coronavirus has become widespread as Pandemic. Elder people and/or patients of Cardiovascular disease, Diabetes, chronic respiratory disease, and Cancer became vulnerable to COVID-19, as it is also an air-borne disease. Patients of COVID-19 will experience respiratory disorder. The Trends of recovery and deaths due to COVID-19 are unable to track as still lot more research studies are to be done to draw conclusions. To prevent from COVID-19, one has to wear face mask and regularly sanitize their hands which may be the first level shielding from the hidden and inviable virus. Now that the Government has developed Vaccine and distributing on priority basis, one has to take it a second level protection.

Any Otolaryngologist (ENT Physician), who deals with the disorders of the head and neck that includes Ears, Nose, and Throat has to find the interaction effect of Tuberculosis (TB) with other diseases than considering them in an isolated way. Data plays an important role in understanding such diseases, where meta data-based research is essential. In good olden years, where may be 1 in 10,000 people effected to any diseases like Cancer, or HIV/AIDS etc. then Case Study Research may be appropriate to understand the impact. But today, with the advent of COVID-19 Pandemic, where majority people affected and recovered, but some died, we need to use Big Data Analytical Tools to establish the relationships. If the

Micro-Data is accessible to all researchers by keeping confidential of only Patient name and address with Contact details, then we can do lot of analysis in terms of Regional, Communal practices and other factors like Socio-economic and Demographic influences. Then only we can understand the Interaction effects in all such cases of Tuberculosis (TB) with COVID-19 Pandemic and other ENT issues.

It may be difficult to eradicate Tuberculosis (TB) by 2025, as researchers are able to find it's association and interaction effects with other diseases like HIV/AIDS and COVID-19. In order to reach nearer to the goal, we have to make all stakeholders to come together and work on the single point agenda.

Researchers should analyze the data and find out the correlations and trends in the data and give valuable suggestions to governments - both local and central. Government has to implement the National TB Control Program by redefining the budgets and focus on efficiency and effectiveness through redefined Key Process Indicators (KPIs) are Key Process Area (KPA), as creating awareness and implementing the local solutions may solve such problems in a better manner. Academic and Research Institutions should involve in conducting Awareness Programs to reach the target population, which minimizes the risk of fake news about the diseases [1-3].

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