TB is spread from person to person through the air. When people with lung TB cough, sneeze or spit, they propel the TB germs into the air. A person needs to inhale only a few of these germs to become infected. The World Health Organization (WHO) TB statistics for India for 2019 gives an estimated incidence figure of 2.64 million cases. This is a rate of 193 per 100,000 populations. The TB incidence is the number of new cases of active TB disease during a certain time period (usually a year).

BACKGROUND: TB occurs in every part of the world. In 2019, the largest number of new TB cases occurred in the WHO South-East Asian region, with 44% of new cases, followed by the WHO African region, with 25% of new cases and the WHO Western Pacific with 18%. In 2019, 87% of new TB cases occurred in the 30 high TB burden countries. Eight countries accounted for two thirds of the new TB cases: India, Indonesia, China, Philippines, Pakistan, Nigeria, Bangladesh and South Africa.
INTRODUCTION:
Tuberculosis is a bacterial disease showing extreme resistance today, with some countries reporting cases with total resistance. WHO agreed with TB being a lead priority but left it off the list as it has its own arm of specific research and development to address the issue. Tuberculosis (TB) is caused by bacteria (Mycobacterium tuberculosis) that most often affect the lungs. Tuberculosis is curable and preventable. The issue of resistance has received attention in recent years. It was addressed during the United Nations General Assembly in 2016 and an independent review on antimicrobial resistance, commissioned by the UK government, concluded last year with a list of priorities to target the problem. But new drugs are still yet to be identified. "This shows that WHO see antibiotic resistance as a major global challenge. Hopefully this will focus efforts on these areas of greatest need," said Dr. Andrew Edwards, a molecular microbiologist at Imperial College London, who believes governments must also set policies in place to support drug development. "There's no point having these drugs if there are no policies in place."

Tuberculosis (TB) is an old disease – studies of human skeletons show that it has affected humans for thousands of years. Its cause remained unknown until 24 March 1882, when Dr Robert Koch announced his discovery of the bacillus responsible, subsequently named Mycobacterium tuberculosis. The disease is spread when people who are sick with TB expel bacteria into the air (e.g. by coughing). TB typically affects the lungs (pulmonary TB) but can also affect other sites (extrapulmonary TB).

Symptoms and diagnosis
Common symptoms of active lung TB are cough with sputum and blood at times, chest pains, weakness, weight loss, fever and night sweats, Unintentional weight loss, Fatigue. Live in crowded or unclean living conditions, Have poor nutrition. People living with HIV are 18 (15-21) times more likely to develop active TB disease than people without HIV.

Tuberculosis with wider vision:
Patients with AIDS can contract various life-threatening infections such as pneumocystis carinii pneumonia and Tuberculosis (TB). Additionally, they may develop a rare type of cancer called Kaposi’s sarcoma.

Following is a list of the various subtypes of Tuberculosis:
1. Childhood Tuberculosis (TB, primary) involves first-time infection of TB.
2. Cutis Colliquativa Tuberculosis (Gumma, tuberculous) is a childhood type of TB involving lesions on the back and legs.
3. Disseminated Hematogenous Tuberculosis (TB, Military) is a serious form of TB with a sudden onset occurring mostly during early childhood. Many areas of the body are involved.
4. Tuberculosis Lichenoides (Lichen Scrofulosorum) occurs in children with a high immunity to TB. It is marked by red skin areas appearing chiefly on the trunk.
5. Lymph node Tuberculosis is an adult form of TB involving the lymph nodes. This disorder is marked by swelling and fever.
6. Papulonecrotic Tuberculosis occurs in adults. This form of TB involves the face, arms, legs, and trunk. Ulceration of the skin occurs causing small scars. This form of TB is likely to recur.
7. Pulmonary Tuberculosis is usually an active flare-up of some type of childhood TB affecting the lungs.
8. Pulmonary Atypical Tuberculosis is a type of TB caused by certain rarely seen Mycobacterium. This type of TB could extend to organs other than the lungs.
9. Tuberculous Arthritis involves the lungs initially then can spread to bones and joints and may be related to various other diseases including prior joint trauma, alcoholism, diabetes mellitus and chronic debilitating states that possibly predispose to activation of disease.
10. Tuberculosis of the Spine (Pott Disease) begins gradually and involves pain in the spinal nerve
root and weight loss. More serious cases may cause paralysis.

11. Tuberculous Meningitis involves the central nervous system and is usually found in children aged one to five years although it may occur at any age. Headache and behavioral changes may be noticed initially. Later symptoms may include convulsive disorders, communicating hydrocephalus (accumulation of fluid in the brain cavity), mental retardation, and other neurological abnormalities.

12. Pleural Tuberculosis can occur in at least two forms usually in conjunction with Pulmonary TB. Surgical drainage may be required as well anti tuberculosis treatment.

13. Genitourinary Tuberculosis (Tuberculosis Pyelonephritis) is characterized by an initial lack of typical TB symptoms. When long established, this disorder may spread from the kidneys to the urethras, bladder, seminal vesicles, and prostate.

14. Tuberculosis Peritonitis may spread from the lymph nodes, gastrointestinal tract or uterine tube and ovary to surrounding areas. Local tenderness and signs of infection are symptomatic of this type of TB.

15. Tuberculosis Pericarditis is usually due to spread from infected mediastinal nodes (separating the lungs) and affects the membrane around the heart. Surgery may be necessary in the more serious cases of this type of TB.

16. Silicotuberculosis results from exposure to silicon dust.

**Tuberculosis Complications**

Tuberculosis infection can cause complications such as:

- Joint damage
- Lung damage
- Infection or damage of your bones, spinal cord, brain, or lymph nodes
- Liver or kidney problems
- Inflammation of the tissues around heart.

**Symptoms and diagnosis**

Common symptoms of active lung TB are cough with sputum and blood at times, chest pains, weakness, weight loss, fever and night sweats, Unintentional weight loss, Fatigue. Live in crowded or unclean living conditions, Have poor nutrition

People living with HIV are 18 (15-21) times more likely to develop active TB disease than people without HIV.

**OBJECTIVE:** To discover safe, effective and low cost medication from the plant bioactive sources.

**Multidrug-Resistant TB**

Anti-TB medicines have been used for decades and strains that are resistant to one or more of the medicines have been documented in every country surveyed. Drug resistance emerges when anti-TB medicines are used inappropriately, through incorrect prescription by health care providers, poor quality drugs, and patients stopping treatment prematurely. Multidrug-resistant tuberculosis (MDR-TB) is a form of TB caused by bacteria that do not respond to ionized and rifampicin, the 2 most effective first-line anti-TB drugs. MDR-TB is treatable and curable by using second-line drugs. However, second-line treatment options are limited and require extensive chemotherapy (up to 2 years of treatment) with medicines that are expensive and toxic.

**International scenerio and expert estimation Antibiotic resistance platform**

In the United States, one in 25 hospital patients are estimated to have at least one hospital-acquired infection, according to the US Centers for Disease Control and Prevention. Globally, antibiotic resistance has been seen in every country, according to WHO, and drug-resistant bacteria are estimated to cause 700,000 deaths each year. If no action is taken, they are expected to kill 10 million people annually by 2050. The risk of death from resistant pathogens is two to three times greater said Dr. Carmem Pessoa da Silva, coordinator of antimicrobial resistance at WHO. Drug-resistant superbug may be craftier, more widespread

The top three bacteria listed have shown resistance against multiple antibiotics, including those known as carbapenems, which are considered to be the most effective against multi-drug resistance.
WHO has released its list in hope of guiding and promoting the research and development of new drugs -- which can take as long as 10 years to reach the market?

"The (drug) pipeline is practically dry," Kenny said during a press conference, adding that new antibiotics are difficult to develop. She also highlighted the fact that antibiotics are typically used as short-term treatment, not long-term, meaning they have less market incentives to pharmaceutical companies.

SUPERBUGS: 5 THINGS TO KNOW ABOUT ANTIMICROBIAL RESISTANCE:
"The top three (bacteria) have nothing to treat them," said Dr. Vicky Enne, a clinical microbiologist at UCL in the UK.

Though Enne did not help with the final list, she agrees that these 12 types of bacteria are the ones in need of most attention, adding that the top three types on the list currently require use of a less than ideal drug, known as Colistin, to treat them. "At the moment, (Colistin) is the antibiotic of last resort ... but resistance is also becoming more common," she said. The second and third groups name bacteria that are increasingly showing resistance against the main drugs used against them, but which still have a few options remaining. "These still have some drugs to fight them ... but doctors are being forced to use last resort drugs because resistance levels are so high," Enne said.

CONCLUSION: Enne believes the drugs named in these lower groups also require the development of better rapid diagnostics so any resistance can be identified immediately, meaning drugs are not used unnecessarily. "This fuels more resistance," she said.

natural product and organic/synthetic is a contrivance in rational drug design
Natural product has played pivotal role in even modern drug discovery since millennia/ As per the WHO more than 75 % of the World population are using natural products for their healthcare and sixty percent of the orthodox drugs currently in use have their origin from the natural products (Craig and Newman, 2005)
that TQ attenuates tissue haemorrhage, hepatic necrosis, inflammation, fibrosis and cell damage (Aycan et al. 2014; Jaswal et al. 2013).

9. **Piper nigrum (PN)**-Inhibit pulmonary cytochrome P450 activities
10. **PN** Inhibit UDP-glucose dehydrogenase and UDP-glucuronyl transferase
11. **PN** Shows antileishmanic activity
12. **PN** Inhibit mitochondrial dysfunction and cell death in PC_{12} cells

**ANTI TUBERCULOSIS DRUG DISCOVERY – MOLECULAR STRUCTURE**

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**Author's information:**
The author is an eminent scientist in the field of drug discovery through plant kingdom.
The author is having seven Indian-US patents for the drug discovery including Anti HIV, Liver Dysfunction-Jaundice, Anti Oxidant, Anti Malaria and more than fifteen other researches focused on plant bioactive. He is has pocketed many awards and credentials besides honored by the distinguished institutes on International stage.
The recent drug discovery on *SARS-CoV2* and the *Mucormycosis* has fetched remarkable results. He is more interested in natural source of medication to safeguard people’s health at large. His objective diverted towards natural source of drugs after observing undue toxic effects of conventional drugs.

**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>TB-</td>
<td>Tuberculosis</td>
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<tr>
<td>CL -</td>
<td>Curcuma longa</td>
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<tr>
<td>PN -</td>
<td>Piper nigrum:</td>
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<tr>
<td>NS-</td>
<td>Nigella sativa</td>
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<tr>
<td>MDR-</td>
<td>Multi Drug Resistance</td>
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