**INTRODUCTION**

A bacterial infection that mostly affects the lungs but can potentially spread to other parts of the body is tuberculosis. Mycobacterium tuberculosis is the bacteria that causes it. When an infected person coughs, sneezes or talks, they release microscopic respiratory droplets that contain the bacteria that cause tuberculosis. Although Mycobacterium tuberculosis is the main and best-known cause of tuberculosis, other related mycobacteria can also cause diseases that are similar to tuberculosis. The World Health Organization (WHO) estimates that 10.6 million individuals worldwide are afflicted with tuberculosis in 2021, and 1.6 million of those cases resulted in fatalities. Additionally, the incidence rate of tuberculosis increased significantly between 2020 and 2021 by 3.6%. While the lungs are the primary organ affected by tuberculosis, it can also damage the brain, kidneys, or spine. The primary problem that needs to be addressed is the need for early detection, prognosis, and identification of resistant tuberculosis occurrences.

Lung infections can occur when Mycobacterium tuberculosis germs get into a person's respiratory system. After then, immune cells known as macrophages absorb the bacteria, and these cells allow the germs to live and proliferate. Granulomas, which are microscopic, dense aggregates containing bacteria and immune cells, may result from this. Since ancient times, tuberculosis has been a serious threat to world health and remains so today, particularly in areas with poor access to public health resources and medical care. Vaccination, early detection, efficient treatment, contact tracking, and public health initiatives to lower transmission are all part of the fight against tuberculosis.

Concepts such as drug sensitivity and resistance are crucial for treating tuberculosis. These words describe the reactions of the Mycobacterium tuberculosis bacteria to the medications used in tuberculosis treatment. Comprehending these ideas is essential for managing tuberculosis effectively and preventing the emergence of drug-resistant forms. Drug-sensitive tuberculosis is defined as tuberculosis caused by Mycobacterium tuberculosis strains that respond well to the common antibiotics used in tuberculosis treatment. Commonly prescribed drugs for tuberculosis, such as isoniazid, rifampin, ethambutol, and pyrazinamide, effectively kill or inhibit the bacteria. Mycobacterium tuberculosis germs can become resistant to one or more of the medications used to treat the infection, which results in drug-resistant tuberculosis.