

Mycobacterium tuberculosis (M. tuberculosis), the culprit behind tuberculosis (TB), primarily spreads through airborne transmission: ### 1. **Airborne Transmission** – **Droplet Nuclei**: When a person with active pulmonary or laryngeal TB coughs, sneezes, talks, or sings, they release tiny droplets containing the bacteria into the air. These droplets are so small that they can remain suspended for extended periods. – **Inhalation**: Infection occurs when a person inhales these airborne droplets, which travel to the lungs, allowing the bacteria to establish an infection. ### 2. **Close and Prolonged Contact** – **Proximity to Infectious Individuals**: The risk of transmission is higher in situations where people are in close, prolonged contact with someone who has active TB, such as in households, healthcare settings, or crowded living conditions. – **Enclosed Environments**: Poorly ventilated spaces increase the risk because the bacteria can accumulate in the air, increasing the likelihood of inhalation. ### 3. **Other Forms of Transmission (Rare)** – **Direct Contact**: Transmission through direct physical contact with an infectious individual is very rare and not a significant mode of transmission for TB. – **Extrapulmonary TB**: Tuberculosis in parts of the body other than the lungs (like the kidneys or spine) is generally not contagious. However, if a person has both pulmonary and extrapulmonary TB, they can still transmit the disease through the respiratory route. ### Important Notes: – **Latent TB Infection**: People with latent TB infection do not spread the bacteria. They have the bacteria in their body, but it is not active and does not cause symptoms. – **Active TB Disease**: Only individuals with active TB disease in the lungs or throat are capable of spreading the infection to others. Effective measures to prevent the spread include early detection, isolation of contagious individuals, adequate ventilation, use of protective masks, and adherence to treatment protocols.