Etiology

Tuberculosis is a mycobacterial disease resulting from infection with any species of the *mycobacterium tuberculosis* complex (MTBC). The species of this complex include: *M. tuberculosis, M. bovis, M. bovis BCG, M. africanum, M. canetti, M. caprae, M. microti and M. pinnipedii.* Among these species, *M. tuberculosis* (MTB) is the most common and important agent of human disease.

Figure 2.1: Mycobacterium Species

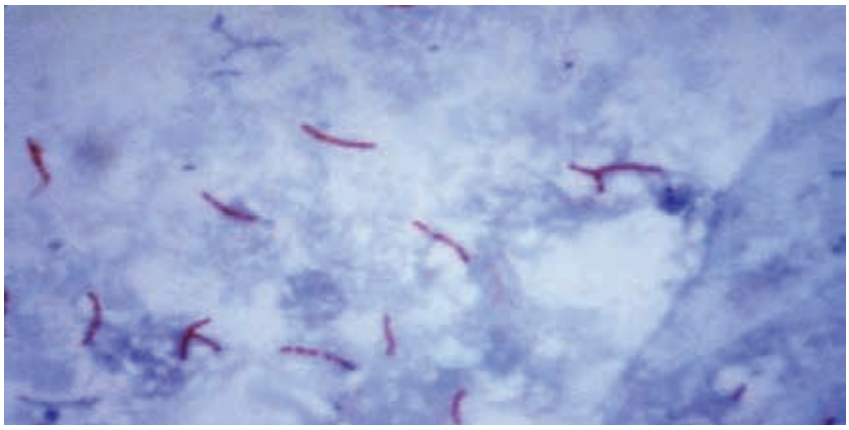

Image Credit: CDC Public Health Image Library/Dr. George P. Kubica

All species of mycobacteria that do not cause TB are referred to as non-tuberculous (or atypical) mycobacteria (NTM). They are commonly found in the environment and typically only cause human disease in people with weak immune systems (e.g. elderly). These mycobacteria have some similarities with *M. tuberculosis*. If someone has past exposure to NTM, it can cause a positive result in a screening test, such as the tuberculin skin test (TST). These NTM mycobacteria can include: *M. avium complex, M. Kansaii, M. xenopi, M. marinum, M. abscessus, M. ulcerans, M. chelonae, M. fortuitum, M. malmoense, M. haemophilum.*

Transmission of non-tuberculosis mycobacterium (NTM) between people is believed to be extremely rare. As such, NTM is not reportable. Public Health case management is not required and treatment is not mandatory but rather determined on a case by case basis.

Pathogenesis

The pathogenesis and transmission of TB are inter-related. *M. tuberculosis* is almost exclusively a human pathogen. How it interacts with the human host determines its survival. From the perspective of the bacterium, a successful host-pathogen interaction is one that results in pathogen transmission. Initial infection is usually self-limited and followed by a variable period of latency, which ultimately, in a proportion of those infected, results in infectious pulmonary TB. Transmission from a case of infectious pulmonary TB is by the airborne route in minute droplets of moisture that become increasingly reduced by evaporation, creating "droplet nuclei".