Mathematical modeling of tuberculosis to evaluate vaccine strategies in Korea

Jonggul Lee and Sunhwa Choi

1) Division of Medical Mathematics, National Institute for Mathematical Sciences, Daejeon, 34047, KOREA
2) Cancer Control and Policy, National Cancer Center Korea, Goyang-si, 10408, KOREA

Corresponding Author: Jonggul Lee, jlee@nims.re.kr

ABSTRACT

Tuberculosis (TB) is one of the top fatal infectious diseases worldwide. Although, to date, no effective vaccine is not available for treatment of pulmonary TB in adults, some candidates are in progress of the clinical trail. In this work, we present an SEIR model for TB transmissions that incorporate pre- and post-vaccine strategies which are designed to prevent initial infection and reactivation of latent individuals who have already been infected with TB. The model parameters, such as natural birth/death rate, transmission rate, reactivation (or relapsed) rate, and progression rate, are estimated from the incidence and relapse data in Korea. This study determine how to best vaccinate a population in Korea when effective pre- and post-exposure vaccines for pulmonary TB is available.

REFERENCES