

Controlling Tuberculosis: Two Modeling Approaches

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Abstract

We develop a stochastic and a deterministic model of tuberculosis. Going beyond the basic SEIR four class disease model, we divide the population into six classes. In the deterministic model, we numerically solve a system of six ordinary differential equations, employing vaccination and antibiotic treatment to attempt to control the disease. The stochastic model is a cellular automata simulation that introduces spatial effects. Here we investigate the effects of varying movement on disease spread and, again, explore treatment options, including vaccination, antibiotic treatment, and quarantine. In addition, we compare results between models, where applicable.