Statistical approaches to understanding Tuberculosis transmission dynamics

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Tuberculosis (TB) is one of the oldest infectious diseases, yet is the leading cause of death from infectious disease. Our understanding of the transmission dynamics of TB is still quite limited, due to poor diagnostics and limited research. In this talk, I will discuss work we are doing to better understand the dynamics of TB spread. I show how we can re purpose and modify statistical methods to infer the degree to which TB is transmitting in the community versus home, timelines between infector and infectee, as well as cure rates, and estimate the likelihood of an infectious link between two individuals. We use a combination of random effects models, survival models and machine learning tools in a bayesian context to make use of multiple data sources. Until better diagnostics and data exist, developing methods that maximize the information we can gain from existing data are important.