

# Sensitivity Analysis

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## 1 Overview

We divide our sensitivity analysis into two sections, to analyze the robustness of the deterministic and stochastic models separately. For the deterministic model, we used Latin Hypercube Sampling to test the sensitivity of our model to input parameters from the Hill model and estimates for treatment costs. We also performed extensive multivariate analysis on the economic components of our deterministic model which go beyond the original Hill model, including treatment costs and intervention costs to reduce incoming LTBI. For the stochastic model, we fixed all input parameters and estimates for treatment costs to default values, and ran the model for 2,000 trials.

## 2 Deterministic Model

### 2.1 Latin Hypercube Sampling

We computed partial rank correlation coefficients for each of the initial parameters and treatment costs, and validated the results against the Sensitivity Analysis in the Hill model.

### 2.2 Variability due to Uncertainty of Treatment Costs

Next, we performed more extensive multivariate analysis on the economic part of the deterministic model. Keeping all of the input parameters from the Hill model at their default values, we ran the model approximately two million times, varying the cost of treatment for LTBI and Active TB and the treatment rate for incoming LTBI.

### 2.3 Variability of Intervention Cost for Treating Cases of Incoming LTBI

Similarly, we performed extensive multivariate analysis on the intervention cost for reducing incoming LTBI. With all input parameters from the Hill model at their default values, we ran the model approximately two million times, varying

the treatment rate, incidence, and cost to cure for incoming LTBI.

### **3 Stochastic Model**

#### **3.1 Variability due to Probabilistic Nature of Disease Spread**

### **4 Summary**