# Targeted Treatment for Yaws Eradication

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**Targeting *yaws* treatment to infected individuals and their household contacts misses most latent cases. Further rounds of MDA should be considered.**

## Background

Yaws is an NTD that can cause skin lesions, with involvement of bones and joints.

- Yaws infections can be latent or active, with the latent not being infectious.
- Similarities with the syphilis bacterium mean serological tests cannot distinguish between latent yaws and syphilis in adults.

## Treatment

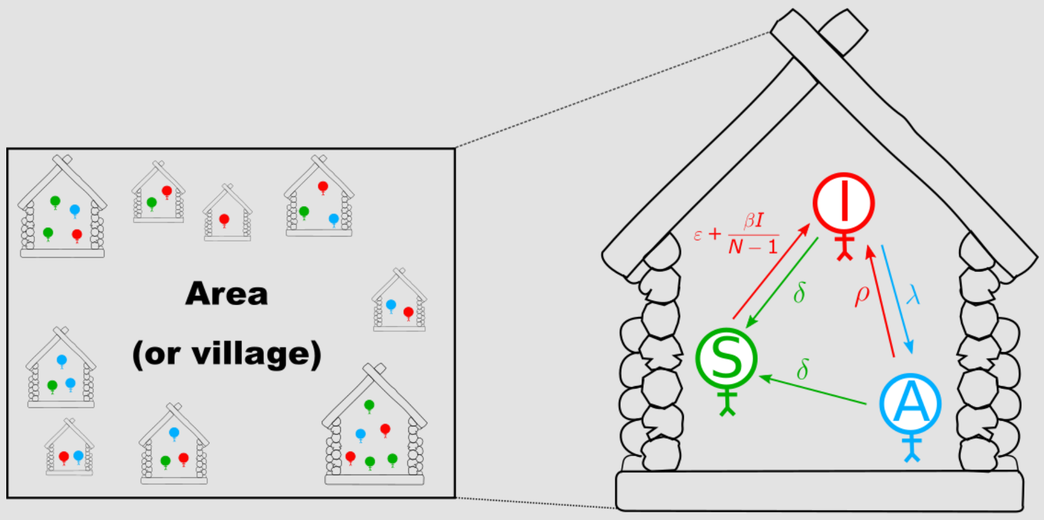
Treatment (with azithromycin) is performed through mass drug administration (MDA) or treatment of infected individuals and household contacts (contact tracing).

Yaws is targeted for eradication by the WHO by 2030 using the following strategy (Morges strategy):

1. 1-2 rounds of MDA
2. 1-3 rounds of contact tracing.

## Method

We developed a stochastic, continuous time markov model with household structure (see diagram below).



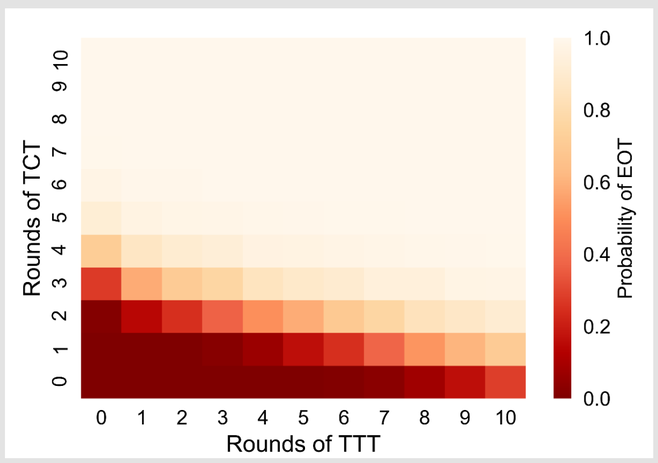

The model was fitted at steady state and simulated forward using the Gillespie algorithm, taking the between-household rate to be:

$$\epsilon = \alpha \frac{\sum_h I_h}{\sum_h N_h}$$

We then use this model to investigate the impact of the following aspects of an eradication campaign:

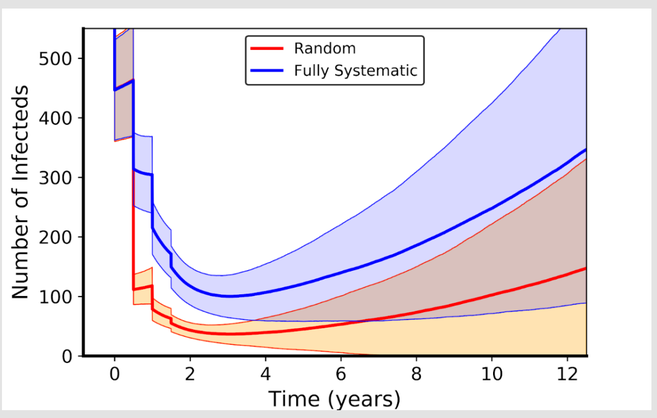
- How many rounds of TCT should be performed?
- How does the level of systematic non-compliance (the correlation between treatment rounds previously attended, and the probability of them attending future rounds) effect .
- Alternative style treatment round we could implement. We consider volunteers providing drugs to infected individuals and household contacts. Due to the voluntary nature, we would expect a very low coverage (around 5%), performed more regularly (say once a month).

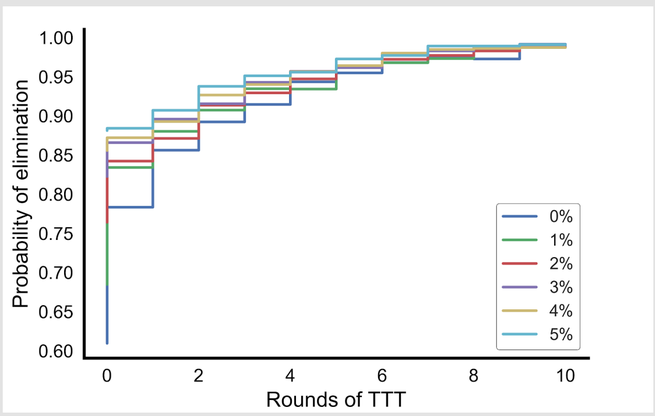
## Results




Additional TCT increases the probability of elimination (POE) much more than further TTT. It would take **4 rounds** of TTT to match an extra round of TCT.

Quality of coverage is also important. With 2 rounds of TCT and TTT, the POE drops from **14.6%** to **2.1%** when changing form random to systematic coverage.




Implementing a 5% coverage in addition to 2TTT/2TCT, the POE increases from **14.6%** to **53%**. With this volunteer treatment in general, we see TTT has little effect in increasing the POE, suggesting it may be unnecessary.