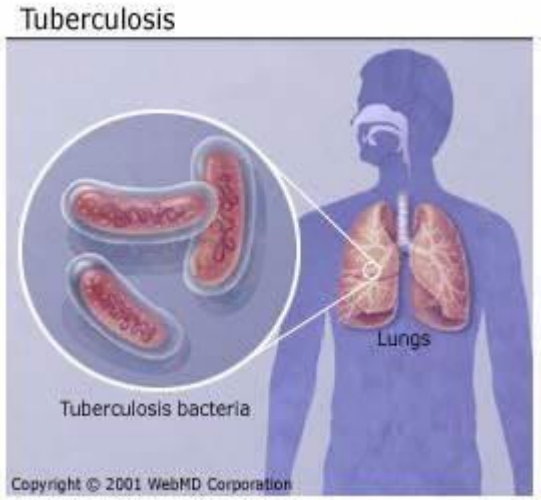
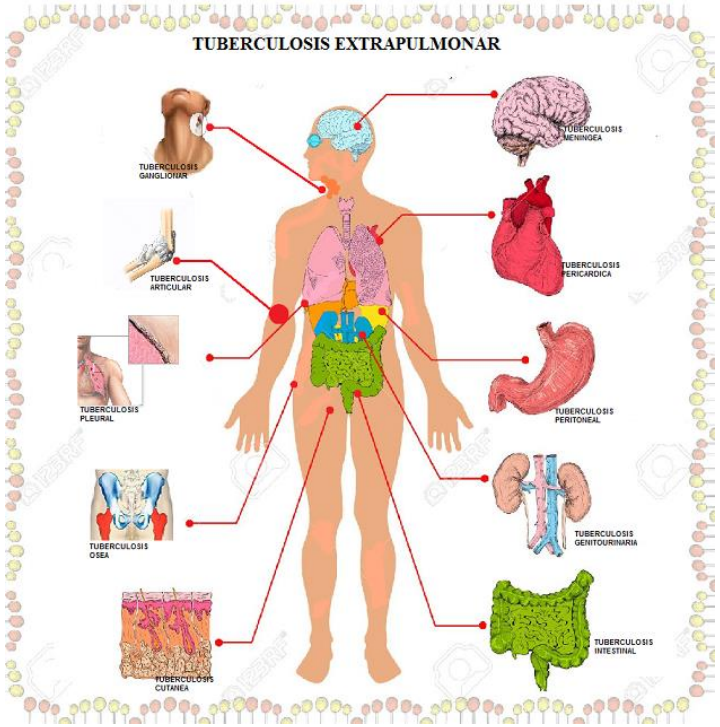
Tuberculosis'wicked prognosis factors

Background: Tuberculosis TB, is a disease bacterial infectious, caused by bacilli Mycobarterium tuberculosis, which affects lungs by air. It can reach all organs in the event of lymphatic dissemination, or vascular bacilli, this is extrapulmonary TB. Extrapulmonary TB causes more mortality, even under treatment. Risk factors are responsible extrapulmonary TB. But we don't know how they give a high mortality rate in treated populations.





Before a tuberculosis disease, the patient has already passed through the stage of primary infection and latent TB, in case of weakness of immunity, TB disease develops.

Primary infection and latent TB go unnoticed because of the relatively effective screening in the country.

Statistical question: What is the effect of tuberculosis localization (pulmonary, extra-pulmonary) to the therapeutic outcomes?

Mechanistic question: How does tuberculosis extrapulmonary treated caused more death?

Acknowledgements: Christian, Gwen, Santino and Michelle

Orimbato Raharijaona, University of Antananarivo

Statistical question:

What is the effect of tuberculosis localization (pulmonary, extra-pulmonary) to the therapeutic outcomes?

Response variable: therapeutic outcomes death or success

Predictor variable: tuberculosis localization

Family: binomial

Link: logit

Hypothesis: therapeutic outcomes death changes
with Tuberculosis localization

R code:

```
glm ( outcomes~Tblocalization, family = binomial, (link = "logit") )
```

Mechanical question:

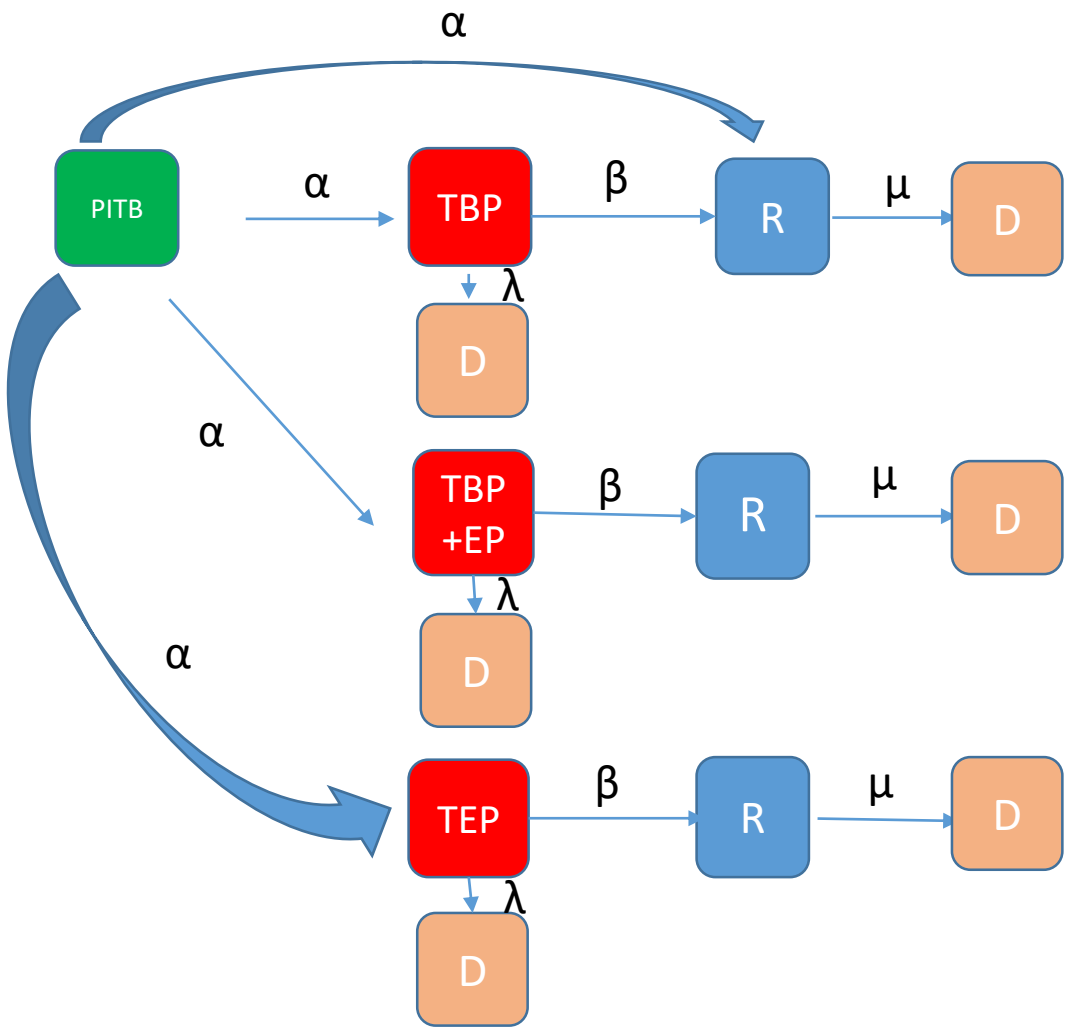
How does tuberculosis extrapulmonary treated cause more death?

States:

PITB: primary infection tuberculosis
TBP: tuberculosis pulmonary treated
TBP+EP: tuberculosis pulmonary + extra-pulmonary treated
TEP: tuberculosis extra-pulmonary treated
R: recovered
D: death

Parameters:

α : disease progression rate
β : recovered rate
λ : death caused by TB
μ : natural death rate



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Next steps:

1- Collect data with registries of patients treated
for tuberculosis, taking into account all headings

2- Fit the mechanistic model to field data

3- Conduct a descriptive statistics of death outcomes
for each form of TB, then make a comparison
if there is a difference

4- Use the mechanistic model, using the parameters,
to predict a decrease in the mortality rate caused by TB