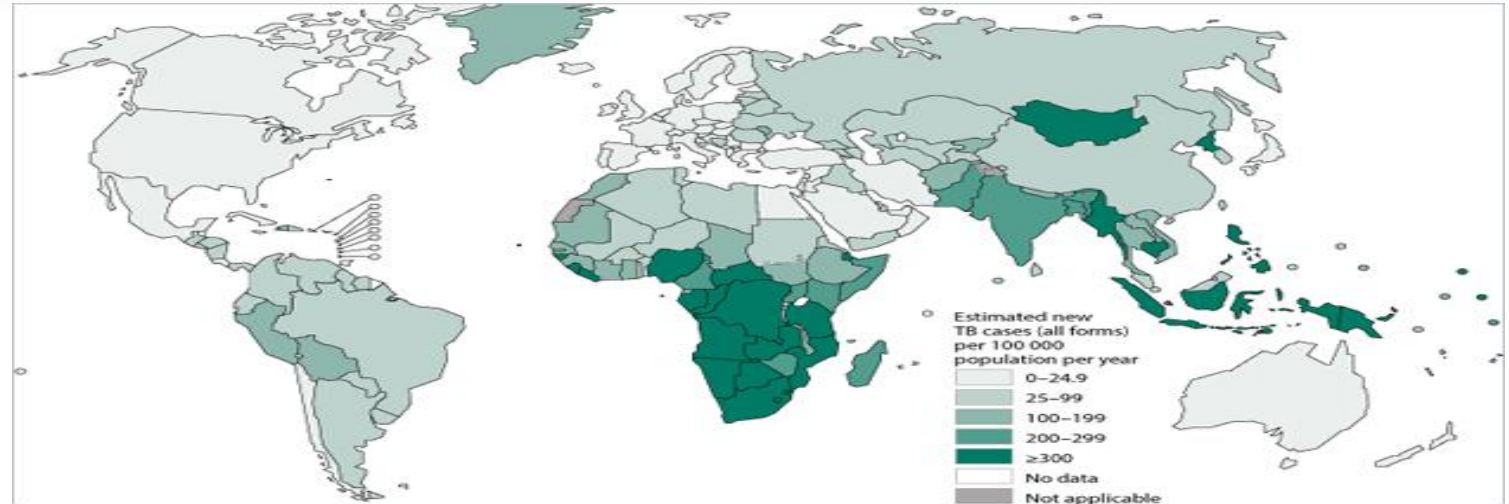# DETERMINANTS OF DEATH DURING TB TREATMENT

- *TB = Main infectious killer at a global level.*
- *Many case of death observed, despite of effectiveness of therapeutic strategy.*

Estimated new TB cases (all forms) per 100 000 population per year
- 0–24.9
- 25–99
- 100–199
- 200–299
- ≥300
- No data
- Not applicable

➢ **Statistical model question:**
What are the factors that determine the death during tuberculosis treatment?
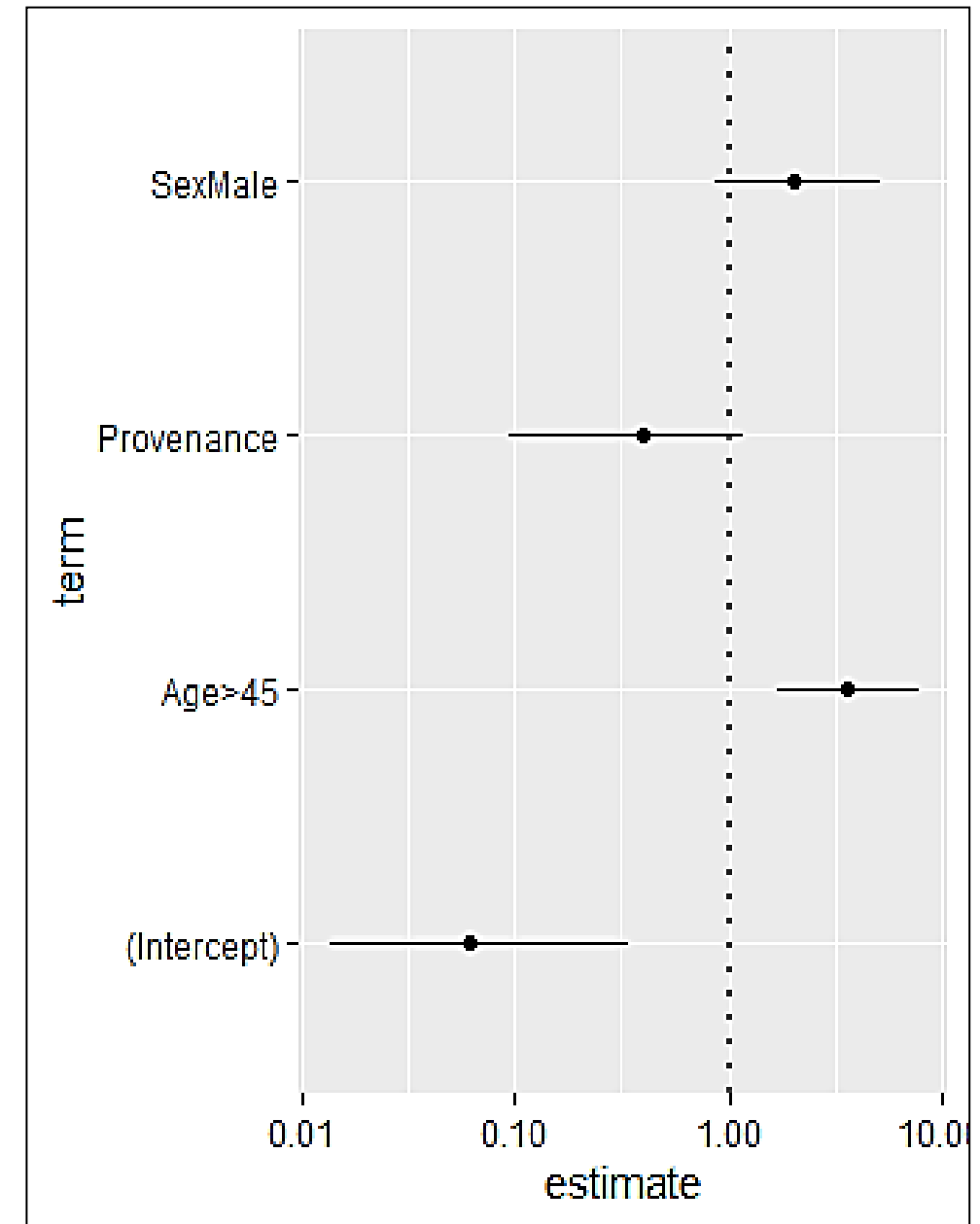
➢ **Dynamical model question:**
How does the old age influence the death during tuberculosis treatment?

Aknowledgments: *Rila RATOVOSON – All mentors and instructors*

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Mahaliana
IT ALWAYS STARTS WITH A QUESTION

CENTRE VALBIO
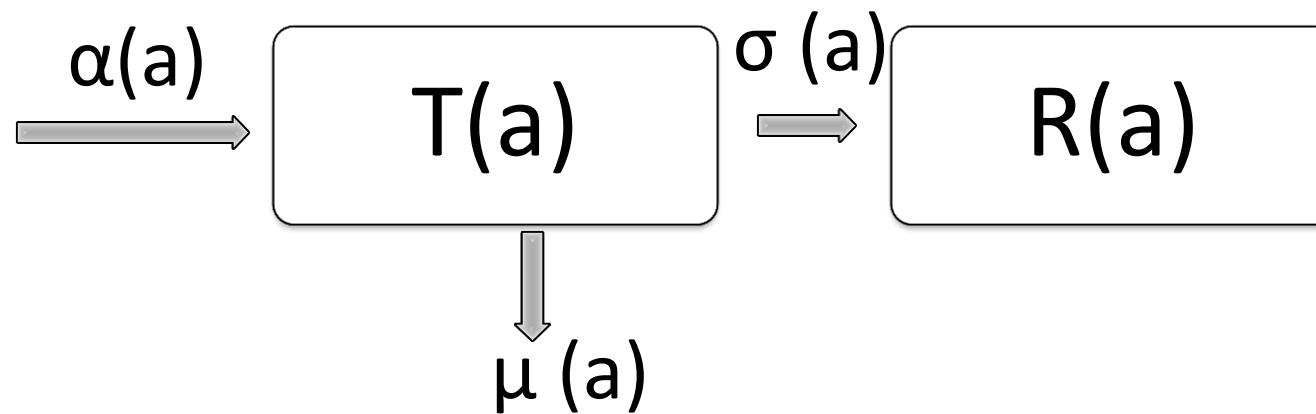
Institut Pasteur de Madagascar

STATISTICAL QUESTION: WHAT are the factors that determine the death during tuberculosis treatment in Madagascar?

- ➤ **Response variable:** Pres/abs death during tuberculous treatment

- ➤ **Predictors variables**: male/female sex, rural/urban provenance, <=45/>45 years Age.

- ➤ **Hypothesis:** We predict that age will be positively correlated with death during tuberculosis treatment.

- ➤ **Family, link:** Binomial, logit

- ➤ **R-code**: glm(death~age+Sex+Provenance, data=d, family="binomial")

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MECHANISTIC QUESTION : *HOW does the old age influence the death during tuberculosis treatment?*

States:
T(a): Under treatment by age
R(a): Recovered by age

Processes:
α(a) : New case rate by age
μ (a) : Infectious mortality rate
σ(a): Recovery rate by age

$$dT(a)/dt = α(a) - μ(a)T(a) - σ(a)R(a)$$
$$dR(a)/dt = σ(a)R(a)$$
$$dM(a)/dt = -μ(a)T(a)$$

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Next steps

- Conduct a multicenter and prospective study about the risk factors of death during treatment patient in Antananarivo and other region.

- Study how the HIV co-infection impact death during tuberculous treatment

- Sensibilisation of the family to support their patient during tuberculous treatment

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