Final symposium,

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Aknowledgement for partners who reviewed my slide : Hajalalaina RABARISOA , Miraimila Botovola

Background

- Background : Soil transmitted Helminth infection ➔ human nutritional disorder by nutrient depletion mechanism
- Neglected disease (3 species for Madagascar) :
  - *Ascariasis*
  - *Trichocephalosis*
  - *Hookworm*

Statistical

Statistical Question : What is the relationship between mother soil transmitted helminth infection status during the last 3 months of pregnancy and new born weight in the district of Ambalavao?

X1 : Mother soil transmitted helminth infection (Binary : yes/no),

X2 : occurrence of non communicable disease (high blood pressure and diabetes) (Binary : yes/no)

Y : new born birth weight (numerical)

Hypothesis 1 : new born birth weight decrease when mother has STH infection

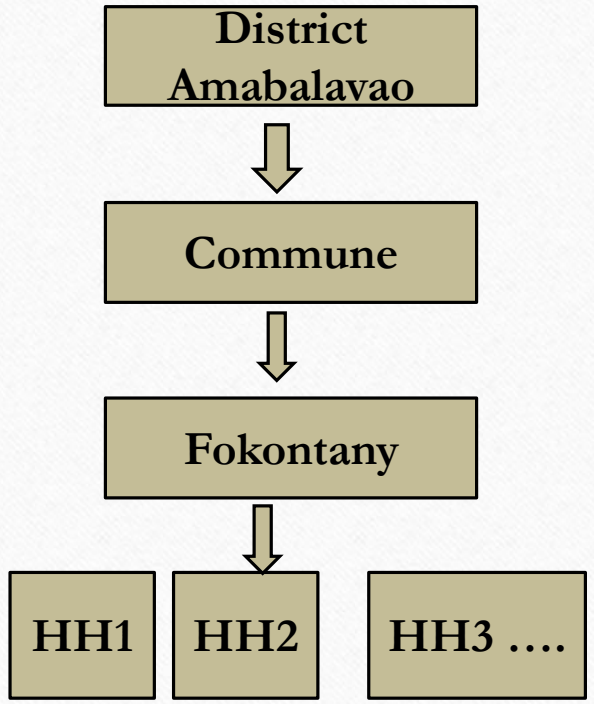
Hypothesis 2 : new born birth weight decrease with presence of high blood pressure

Hypothesis 3 : new born birth weight increase with presence of mothers diabetes

R function : lmer

Rcode : lmer (Y ~ X1 + X2 + (1|fokontany/HH), Family = "Gaussian", (link = "lognormal"), data = sth) ➔ validation : AIC

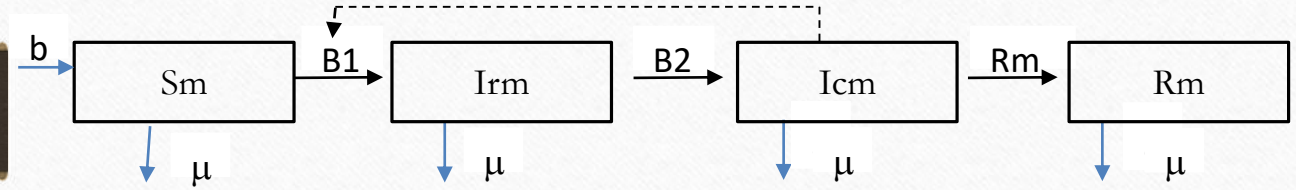
Data collection : cluster survey



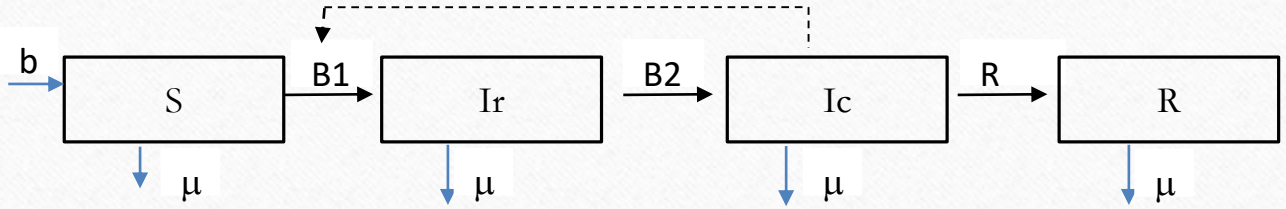
Mechanistic

Mechanistic Question : How does mass drug administration affect the prevalence of soil transmitted helminth in the district of Ambalavao for the aged school children (0 – 15 years old) ?

POPULATION MDA



POPULATION NO MDA



Prevalence (t) = (Ir (t) + Ic (t)) / (S(t) + Ir (t) + Ic (t) + Rc (t))

S : susceptible, **Ir :** recently infected, **Ic :** chronic infection, **R :** recovery

PROCESS

- BIRTH : b
- μ : NATURAL DEATH
- TRANSMISSION RATE : B1
- REINFESTATION : B2
- NATURAL RECOVERY RATE : R
- RECOVERY RATE AS FUNCTION MDA : Rm

dS/dt = b(Sm+Irm+Icm+Rm)-B1SmIcm - μSm
dIr/dt = B1SmIcm - B2Irm - μIrm
dIc/dt = B2Irm - μIcm - RmIcm
dR/dt = RmIcm - μRm

dS/dt = b(S+Ir+Ic+R)-B1SIc - μS
dIr/dt = B1SIc – B2Ir - μIr
dIc/dt = B2Ir - μIc - RIc
dR/dt = RIc - μR

Nexts steps

- Data collection for statistical model
- Collecting the different rate of process for mechanistic model

Thanks ☺