# Modeling geographical access to health care in Ifanadiana district

- **Background** : Majority of people in Ifanadiana district live in remoted rural areas very far away from the Primary health center (PHC)

- **Statistical model question:** What are factors associated to travel time from house to PHC for people in remoted rural areas when seeking for care in Ifanadiana district?

- **Dynamical model question:** How does geographic barriers influence the access at PHC for sick people?
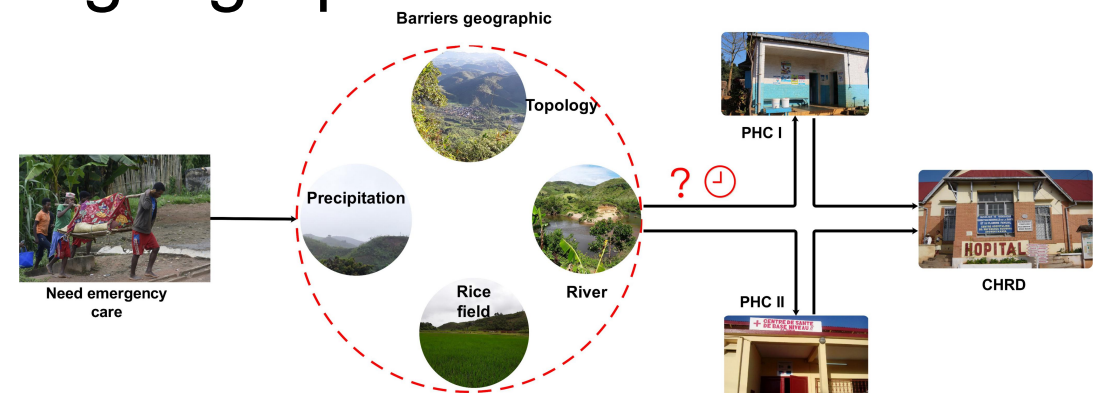
What are factors associated to travel time from house to PHC for people in remoted rural areas when seeking for care in Ifanadiana district?

- **R code:** gam(speed ~ s(slope) + distance+ precipitation +landcovers+ individual+ s(track,bs="re"), data=model.df)

- **Variable response:** travel speed

- **Variables predictor:** slope, distance, precipitation (rain), landcovers (occupation), individual, track

- **Distribution:** Normal

- **Data structure:**

Histogram of variable response

speed	slope	categorydistance	rain	occupation	individual	track
4,43337666	0,16240443	[0,13]	0,223	Zone_Habitation	paysan	track63
5,67013586	0,08465406	[0,13]	0,223	Zone_Habitation	paysan	track63
6,23619465	0,30788006	[0,13]	0,223	Zone_Habitation	paysan	track63
5,30772562	0,18086843	[0,13]	0,223	Zone_Habitation	paysan	track63
5,92147154	0,07369176	[0,13]	0,223	Zone_Habitation	paysan	track63
6,00840367	0,11983216	[0,13]	0,223	Zone_Habitation	paysan	track63
4,74278476	0,41402603	[0,13]	0,223	Zone_Habitation	paysan	track63
5,43629682	0	[0,13]	0,223	Savane_Arboree	paysan	track63
6,26273453	0,38321918	[0,13]	0,223	Savane_Arboree	paysan	track63
5,00780872	0,04792515	[0,13]	0,223	Zone_Habitation	paysan	track63
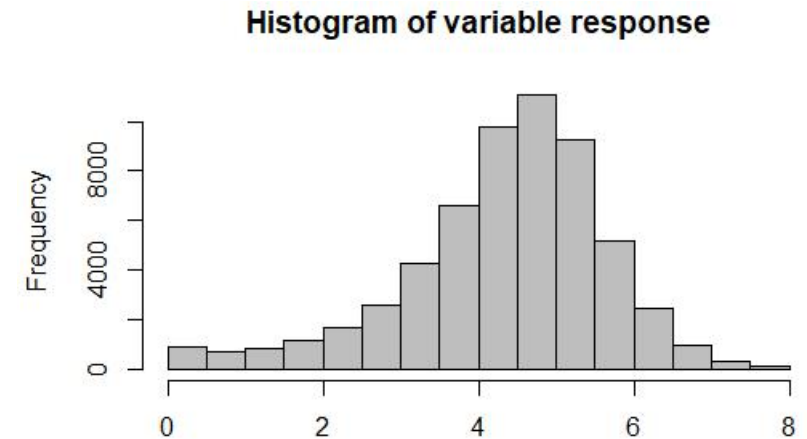
How does geographic barriers influence the access at PHC for sick people?

- **Dynamical model diagram :**
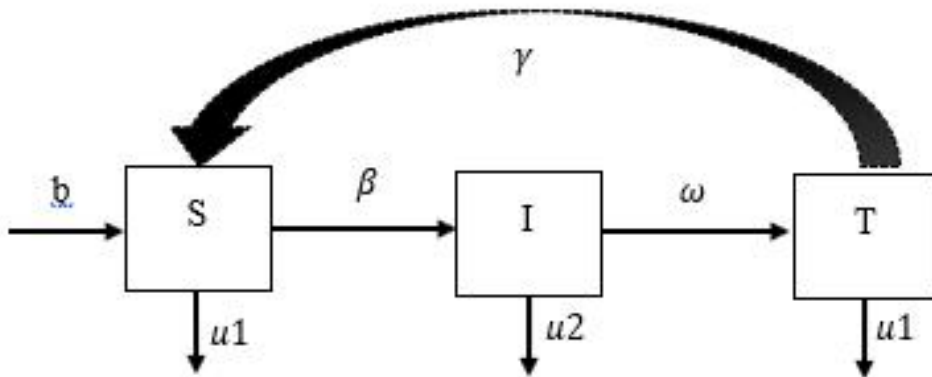
States	Process
S= Healthy people	b= Birth rate
I= Sick people	β = Sickness rate
T=Treated people	ω = Treatments rate
	γ = Treatment success rate
	μ = Death rate

Access to care in Ifanadiana district is influenced by geographical barriers such as distance, topology, precipitation and landcovers driving the route to primary health center.

Next steps

- Advance in the structuring of the dynamic model:
  - improvement of model framework
  - estimation of parameters

- Model validation

- Set up IT tools for prediction of time to travel and accessibility rate

Misaotra betsaka 🙂 **.**