





The background is a dark blue gradient. On the left side, there are white circuit-like lines with small circles at the nodes, extending vertically. Scattered across the background are several stylized, glowing blue virus particles with spherical bodies and protruding spikes or surface proteins.

E²M²: Ecological & Epidemiological Modeling in Madagascar

Final symposium January 5, 2023

Presented by RABARISOA Hajalalaina

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- Background: The Covid 19 disease caused many deaths to the hospitalized patients in the world according to WHO.
 - Statistical question: what is the relationship between comorbidities and the outcome of hospitalized cases of Covid 19?
 - Dynamical question: how does the vaccination affect the outcomes of Covid 19 to the diabetes patients?
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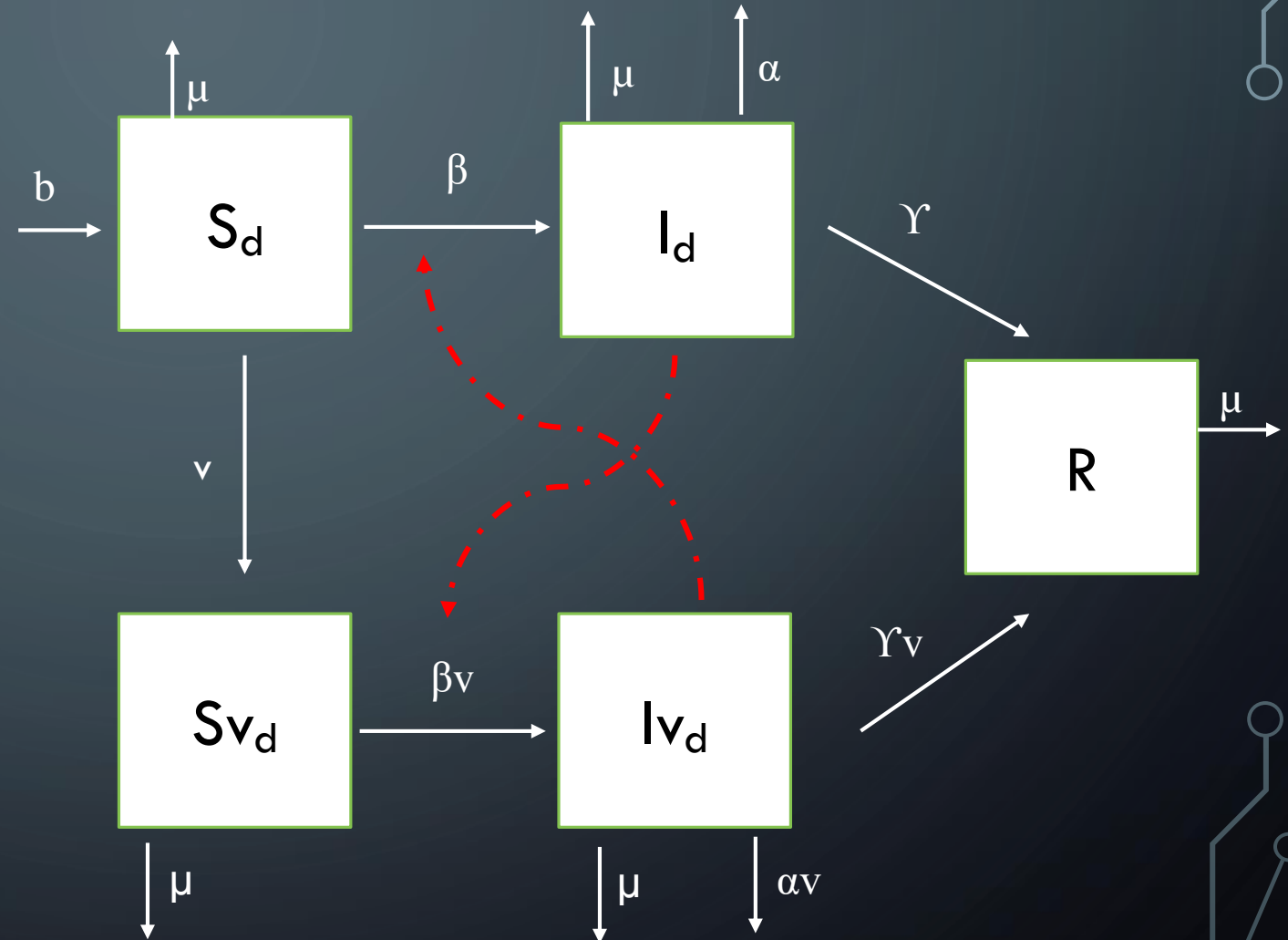
Statistical question: what is the relationship between comorbidities and the outcome of hospitalized cases of Covid 19?

- Response variable: mortality of patients
- Predictor variables:
 - X1= Age,
 - X2= Gender,
 - X3= Hypertension,
 - X4= Diabete
 - X5= Body Mass Index (BMI)
- Family: « binomial » Link: « logit »
- Hypothesis: Comorbidities increase the mortality in hospitalized patients of Covid 19
- R function: `glmer(mortality_of_patients ~Age+Gender+Hypertension+Diabete+BMI + (1 | sites), family = "binomial", link = "logit", data= Data_Covid)`

Dynamical question: how does the vaccination affect the outcomes of Covid 19 to the diabetes patients?

- Population: diabetes patients

Status	Process
S_d : Susceptible non vaccinated	b : births,
S_{vd} : Susceptible vaccinated	μ : natural mortality
I_d : Infected non vaccinated	V : vaccination rate
I_{vd} : Infected vaccinated	β : transmission rate in non vaccinated
R : Recovered	βv : transmission rate in vaccinated
	Υ : recovery rate in non vaccinated
	Υv : recovery rate in vaccinated
	α : death rate due to infection in non vaccinated
	αv : death rate due to infection in vaccinated



Next step

- Collect more data for the statistical model
- Analyse our data
- Write an article

The background is a dark teal color. On the left side, there are white circuit lines with small circles at the junctions, resembling a printed circuit board. Scattered across the background are several stylized, glowing white virus particles. These particles are spherical with a textured surface and have numerous small, rounded protrusions (spikes) extending from them. The text "THANK YOU (MISAOTRA)" is centered in the middle of the image in a white, bold, sans-serif font.

THANK YOU (MISAOTRA)