Virus Ecology: Institute of Tropical Medicine

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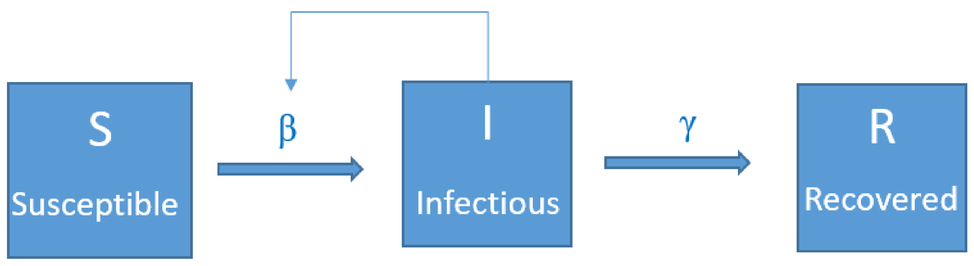
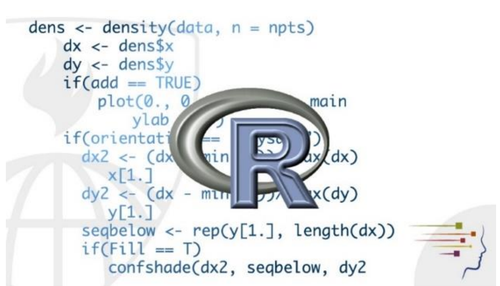
Our research unit investigates the ecology of viruses in wildlife populations. The central question is: **under what conditions is pathogen transmission more or less efficient in nature?** For most zoonotic pathogens, we still lack the field data needed to answer this question. To fill this gap, we focus on **small mammal communities**. Small mammals are ideal model systems because they can be studied in large numbers, are relatively easy to handle in experiments, and host more zoonotic pathogens than any other group of mammals.
Our work combines:
Field ecology – capture–mark–recapture studies and ecological experiments in Africa (Tanzania, DRC, Guinea).
Laboratory research – serology, PCR, and sequencing (Sanger and MinION metagenomics).
Quantitative approaches – statistical and mathematical models to test transmission hypotheses.



$$\frac{dS}{dt} = \Phi(S+R) - \frac{\beta K^q S(I)}{N^q} - \mu S$$

$$\frac{dI}{dt} = \Phi V\_I(I) + \frac{\beta K^q S(I+C)}{N^q} - \mu I$$

$$\frac{dR}{dt} = \gamma I - \mu R$$



Topic 1: diversity and host specificity of paramyxoviruses in Tanzanian and Congolese rodents
Topic 2: Diversity and host specificity of cytomegaloviruses in multimammate mouse from Tanzania
Topic 3: Mathematical modelling of arenavirus transmission in multimammate mouse
Topic 4: Screening of Congolese rodents on mpox antibodies and viruses

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