

Mathematical models of infectious disease

List of computer exercises

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1 Objectives

The objectives of this course are:

1. To introduce the student to several models that express the core theory for the propagation of epidemics
2. To teach the numerical methods needed to study these models
3. To teach the statistical methods needed to parameterize these models for specific applications (“model fitting”)

2 Topics

These following topics will be covered in computer lab exercises:

1. Introduction to scientific programming in R
2. Numerical solution of deterministic epidemiological models
3. Structured models for host heterogeneities
4. Estimation
5. Stochastic simulation
6. Pulsed vaccination
7. Social distancing
8. Sensitivity analysis of deterministic models through Latin hypercube sampling: A model for transmission of HIV among homosexual men