



MOOC MODELING OF INFECTIOUS DISEASES

A NEW FREE ONLINE COURSE OF THE INSTITUT PASTEUR

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$$\frac{dx}{dt} = k - ux - \beta xy$$

$$R_0 = \frac{0.1 \beta}{u + v} \cdot \frac{k}{u}$$

We live in an interconnected world, where infectious diseases find opportunities to spread globally, like never before. This raises new challenges in public health for epidemiologists, medical doctors and biologists engaged in the prevention and treatment of infectious diseases. Mathematical and computational models contribute in this cross-disciplinary effort. They can make short-term predictions on epidemics progress, help analyze scenarios on epidemic outcome and inform about the impact of public health interventions.

In this MOOC, you will learn a basic, yet very general approach to mathematical modeling of infectious disease dynamics.

We will discuss how to build a model using flow diagrams, and how flow diagrams are translated into ordinary differential equations. Furthermore, we will discuss techniques to derive formulae for the basic reproduction number, R_0 , and the effective reproduction number, R . We will describe the principles of estimating these key quantities from data. The SIR model will be discussed in detail and serves as an example.

Finally, we will show how public health interventions can be modeled using flow diagrams.

-  Starts on October 1st, 2021
-  FREE
-  Certificates available
-  English, with French and English subtitles
-  Estimated effort: 2h30/week
-  Forum to exchange opinions, etc.

5 CHAPTERS
21 VIDEOS
13 WEEKS

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