Swiss Epidemiology Winter School 2021

UNIVERSITÄT BERN

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

SSPH+ SWISS SCHOOL OF PUBLIC HEALTH +

Infectious disease models and their use in the Covid-19 pandemic

18 – 20 January 2021

Faculty	**Dr. Christian Althaus, PhD** Institute of Social and Preventive Medicine (ISPM), University of Bern, Switzerland **Prof. Sebastian Bonhoeffer, PhD** Institute of Integrative Biology, ETH Zurich, Switzerland **Prof. Nicola Low** Institute of Social and Preventive Medicine (ISPM), University of Bern, Switzerland
Venue	**CH – 3823 Wengen | SWITZERLAND** Hotel Sunstar (see map on http://www.epi-winterschool.org/hotels)
Description	Infectious disease modelling has become a key tool for improving understanding about transmission and the potential impact of public health interventions, as illustrated during the SARS-CoV-2 pandemic. In this course, students will be introduced to the main concepts of mathematical modelling of infectious diseases such as compartmental models, the basic and effective reproduction numbers and the vaccination threshold. We will further study topics such as stochastic effects, branching processes, superspreading and model inference using maximum likelihood and Bayesian approaches. The students will be able to work on and discuss real-life applications of infectious disease modelling with case studies from the SARS-CoV-2 pandemic. Exercises will be conducted in the programming language R. Previous knowledge of R will be useful but is not essential.
Objectives	• To understand the role of infectious disease dynamics for research and health care • To become familiar with the basic concepts of mathematical models of infectious diseases • To use simple mathematical models to study disease transmission and control interventions, with a focus on Covid-19.

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Target audience	PhD students and post-doctoral researchers who want to gain a basic understanding of mathematical modelling in infectious disease epidemiology and/or who are interested in the role of mathematical modelling in understanding and controlling a pandemic.
Outline	The course will run over three days and consist of lectures, group work and computer practical sessions. We start early in the morning with a review of the previous day. During the extended break in the afternoon participants review course materials, catch up on emails or go skiing. We reconvene at 4:30 pm for the computer sessions. ***Monday, 18 January (8:00 – 12:00 | 16:30 – 18:30)*** ***Tuesday, 19 January (8:00 – 12:00 | 16:30 – 18:30)*** ***Wednesday, 20 January (8:00 – 12:00 | 16:30 – 18:30)***
Credits	1.0 ECTS
To bring along	Students will bring their own laptops with an installed version of the R software environment for statistical computing. R runs on Windows, Mac OS X and Linux and can be freely downloaded at http://www.r-project.org. University of Bern IT staff onsite can provide help upon request per e-mail (it@ispm.unibe.ch)
Course fee	SSPH+ students: CHF 700 Academic: CHF 900 Industry: CHF 2000
Registration	You can register on the Winter School website www.epi-winterschool.org.
Accomodation	Participants must book their accommodations themselves. Please see our recommendations on www.epi-winterschool.org/hotels for special prices.

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