ECVPH RESIDENTS' WORKSHOP

(MATH.) INFECTIOUS DISEASE MODELS & SOCIAL NETWORK ANALYSIS
17.-19. May 2017, Berne/CH

Objectives

Transmission models are frequently used to investigate infectious disease spread and evaluate effectiveness of measures for its control. This leads to evidence that can be further used by policy makers for the decision of outbreak control or control of endemic diseases. Several model types are available that differ with respect to their basic concepts. The best choice depends, among others, on the research question, availability of data and complexity of the host-disease-environment system.

The workshop will address the following aspects of infectious disease models:
- Formulation of research question
- Concepts, structure and use of different transmission model types: mathematical models (differential equations), agent based models, Monte Carlo simulation models, Bayesian simulation models, network based models, models for vector borne diseases, epidemic vs. endemic models, deterministic vs. stochastic models, frequency vs. density dependent models
- Applications for selected model types (SIR models and integration of social network analysis with infectious disease models)
- Basic and effective reproductive ratio (R_0, R_t), force of infection
- Sourcing of data (parameterization of the model)
- Sensitivity analysis
- Model validation
- Communication of model outcomes to stakeholders (policy, animal owners) and among researcher

The workshop will primarily address the curriculum's module A4 of the PM subspecialty on mathematical models. This module is assigned with a [P], thus practical experiences are highly recommended for its completion. We will combine theory and exercises in the workshop. We will also encourage residents to present their own work related to infectious disease mathematical and simulation models with the aim to present case studies and also to provide presenters inputs on their research projects.

Other modules partly covered are C3 from the core part I, where we will introduce burden estimators (DALY, YLL and QALY), and C4 of the PM subspecialty where the part on network analysis based on tracking data will be introduced.

Description / Schedule

We will combine theory and exercises in the workshop. Examples will be presented throughout the workshop to illustrate the theory. Participants will be asked to present and discuss own work on infectious disease models. They will have the opportunity to develop a simple model in R, Berkeley Madonna or Vensim.

	May 17th	May 18th	May 19th
AM	Registration Lecture: Concepts, structure and use of different transmission model types; basic reproduction ratio	Guest Lecturer: **Tariq Halasa** "Developing a transmission model step-by-step" Exercise: development of a simple transmission model (SIR type)	Guest Lecturer: **Christian Althaus** "Application of infectious disease models in public health – the example of Ebola, MERS and Zika" Lecture: Burden estimators (DALY, YLL, QALY)
PM	Lecture: Formulation of research question, application of transmission models, model parameterization, sensitivity analysis **Quiz:** Check learning outcome of day 1	Participants contribution (case studies) **Quiz:** Check learning outcome of day 2	Lecture: Social network analysis (SNA) Exercise: Application of SNA **Quiz:** Check learning outcome of day 3

The workshop will start Wen, 17th of May, 10AM and last until Fri, 19th of May 2017, 4PM

Lecturers:
VPH Institute, Vetsuisse Faculty, University of Bern: Salome Dürr, Beatriz Vidondo, Gertraud Schüpbach

Guest lecturers:
- Institute for Social and Preventive Medicine, University of Bern: Christian Althaus
- Technical University of Denmark (DTU): Tariq Halasa

Venue:
Vetsuisse Faculty of the University of Bern, Länggasse 120, CH-3012 Bern, Switzerland

Workshop fees:
- ECVPH residents: € 60,--
- Non-ECVPH residents: € 160,--

Residents can claim back their expenses related to travel and accommodation using the according form uploaded on **ECVPH´s website** at up to a max. of Euro 300.- per person.

Number of participants: 10-25

REGISTRATION:

Please use the following link to register:
http://www.vphibern.ch/limesurvey/index.php/775163/lang-en
Registration deadline: **April 24th 2017**