



Given the high demand on modelers due to the COVID-19 pandemic, and an inability to commit too far in advance, we cannot yet list the faculty for the course. The listed topics may change slightly depending on faculty availability and what is learned as the pandemic proceeds – we will strive to have the most up-to-date lessons learned presented.

ASTMH Committee on Global Health Pre-Meeting Course:

Modeling for Disease Outbreaks Practical Approaches to Understanding, Implementing and Using Models

Sunday, November 15, 2020; 7:30 a.m. – 4 p.m.
 Metro Toronto Convention Centre; Toronto, Ontario, Canada

Course Description

The COVID-19 outbreak has demonstrated to the world again how rapidly a disease can move through populations, spread exponentially in numbers and locations, and impact transportation, economies and other important and significant aspects of life. The ability to plan and implement an effective response depends on predicting as accurately as possible who, where, how many and when cases will occur, with limited information. With this knowledge, responders can allocate resources to maximum benefit and enact the best preventive, containment and mitigation measures. This prediction requires accurate data, an understanding of pathogen transmission dynamics, the context in which the disease is transmitted, and mathematical modeling. Modeling is an essential tool in the study of infectious disease epidemiology, which allows informed policymaking, nowcasting and forecasting of epidemics, and real-time risk assessments. This pre-meeting course will provide instruction to first-time or introductory modelers in: 1) key concepts of infectious disease modeling; 2) understanding the strengths and limitations of modeling in order to critically review modeling results; 3) providing a list of resources, including modelers and open source modeling programs; and 4) a practical session to provide hands-on experience implementing, running and using models (bring your computers!).

At the end of the activity, participants will be able to:

- Understand the principles underlying infectious disease modeling;
- Describe dynamics in pathogen transmission;
- Identify necessary data elements for accurate disease modeling;
- Analyze different models and their outputs and understand limitations;
- Consider different resources and programs when determining the most appropriate modeling approach; and
- Develop and demonstrate mastery of basic modeling using a simulated example.

Course Co-Chairs

Julie Pavlin, MD, PhD, MPH, Director, Board on Global Health, National Academies of Sciences, Engineering, and Medicine

Kathryn Anderson, MD, PhD, Asst Professor of Medicine, and Microbiology and Immunology, SUNY Upstate Medical University

7:30 a.m.	Light Continental Breakfast
8 a.m.	Welcome, Introduction of Topics, and Logistics
8:15 a.m.	Keynote Address: Methods and Motives for Infectious Disease Models – The Tale of COVID-19
9 a.m.	Infectious Disease Dynamics
9:30 a.m.	Essential Data Elements in Creating a Model
10 a.m.	Data-Driven Inference for Real-Time Estimates of R_0
10:30 a.m.	Coffee Break
10:45 a.m.	Infectious Disease Model Examples and Resources
11:15 a.m.	Panel Discussion – Critical Evaluation of Models
Noon	Lunch Break (Lunch on your own)
1 p.m.	Introduction of Modeling Program and Disease Outbreak Scenarios
2:15 p.m.	Coffee Break and work in groups/individually on scenario
2:45 p.m.	Review of Modeling Results and Discussion
3:45 p.m.	Concluding remarks
4 p.m.	Course Adjourns