



Leptospirosis Modeling, a NIMBioS Investigative Workshop June 3-5, 2014

Tuesday, June 3

- 8:00-8:45 Breakfast at NIMBioS
- 8:45-9:00 Introduction to NIMBioS
- 9:00-9:30 Introduction of Participants
- OVERVIEW OF LEPTOSPIROSIS**
- 9:30-10:15 Talk: “**Burden and transmission of leptospirosis in people**” by Albert Ko
- 10:15-11:00 Talk: “**Burden and transmission of leptospirosis in animals**” by Sreekumari Rajeev
- 11:00-11:20 Break
- 11:20–12:00 Talk: “**Leptospira molecular and antigenic diversity, immunology, pathogenesis, and host adaptation**” by Rudy Heartskeerl
- 12:00-1:00 Lunch at NIMBioS
- MATHEMATICAL MODELS FOR DYNAMICS OF INFECTION WITHIN AND BETWEEN ANIMAL POPULATIONS**
- 1:00-2:00 Discussion: “Key leptospirosis questions that could be investigated through mathematical modeling”
- 2:00-2:20 Talk: “**Review of mathematical models applied to leptospirosis**” by Claudia Munoz-Zanzi
- 2:20-3:00 Talk: “**Mathematical modeling on leptospirosis in urban setting in Brazil**” by Mike Begon
- 3:00-3:40 Talk: “**A mathematical model to investigate the ecology of leptospirosis in a rural setting in Chile**” by Maud Lelu
- 3:40-4:00 Break
- 4:00-5:30 Discussion: “Remarks on development of models for understanding small-scale transmission dynamics (within animal species, between animal species, and spillover to people)”
- 5:30-6:30 Reception at NIMBioS

Wednesday, June 4

- 8:00-9:00 Breakfast at NIMBioS
- LARGE SCALE MATHEMATICAL TRANSMISSION MODELS**
- 9:00-9:40 Talk: “**Ecohydrological modeling and waterborne disease epidemics**” by Lorenzo Mari
- 9:40-10:20 Talk: “**Complex systems modeling: Meta-modeling, reverse engineering techniques, optimization**” by Matteo Convertino
- 10:20-10:50 Discussion: “Remarks on large scale models for leptospirosis”.

10:50-11:10 Break

EMPIRICAL DATA FOR PARAMETER ESTIMATION

11:10-11:40 Talk: “**Leptospira in the environment**” by Arnau Casanovas

11:40-12:10 Talk: “**Methods for human environmental exposure assessment**” by Tim Julian

12:10-12:40 Talk: “**Data-driven understanding of leptospirosis ecology and epidemiology in the Indian Ocean**” by Vincent Herbreteau

12:40-1:40 Lunch at NIMBioS

1:40-2:40 Discussion: “Remarks on connecting empirical data and mathematical models”

MODELS FOR EVALUATION AND OPTIMIZATION OF INTERVENTIONS

2:40-3:10 Talk: “**Intervention and control strategies for leptospirosis**” by Eric Bertherat

3:10-3:30 Break

3:30-4:00 Talk: “**Rodent ecology and control**” by Jamie Childs

4:00-5:30 Discussion: “Remarks on use of mathematical models to identify and evaluate interventions”

5:30 Dinner on your own

Thursday, June 5

8:00-9:00 Breakfast at NIMBioS

9:00-10:00 Small group discussion: “Model framework, parameters, and data gaps to develop models for i) understanding dynamics of animal and human leptospirosis infection, ii) large-scale prediction of increased incidence and outbreaks

10:00-10:30 Reports from small groups

10:30-10:45 Break

10:45-12:00 Conclusions and discuss future plans

12:00-1:00 Lunch at NIMBioS