

PB HLTH 295 – Infectious Disease Modeling Seminar Fall 2017

Instructor: Dr. John Marshall

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Class hours: Wednesday 4-5pm, room: 240 Mulford Hall

Office hours: By appointment, room: 344C Li Ka Shing Building

Synopsis: In recent years, mathematical models have greatly enhanced our understanding of the epidemiology of infectious diseases. In this seminar, we will review the fundamental concepts and classic papers in infectious disease modeling. We will then move on to current papers covering some of the latest developments in the field. Examples will be drawn from HIV, TB, malaria, Ebola, Zika and diseases and methods of particular interest to class members.

Class structure: The class will take the form of a journal club:

- First 10 minutes:
 - Powerpoint presentation by class member on the paper
 - Propose questions for small groups to discuss (usually 2 questions)
- Middle 20 minutes:
 - Class divides into 2 groups & discusses questions
- Last 20 minutes:
 - Groups report back what they discussed
 - General group discussion of the paper

When it's your week to present:

- Email the instructor (john.marshall@berkeley.edu) by Monday 9am with your proposed question(s) for that week's paper
- Prepare a presentation for the first 10 minutes of class that week

Grading: Class presentation: 50%, Participation in discussion: 50%

Papers and presentation schedule:

- All papers & discussion questions will be uploaded to bCourses (papers asap, discussion questions 24 hours before class).
- A possible sequence of papers is provided below with papers uploaded to bCourses.
- These are just recommendations. If you have any papers you'd like to see included, any methodology you'd like covered, or any infectious diseases you'd like included, please email the instructor by Monday 28th August.
- If there are any particular papers you'd particularly like to present, please email the instructor by Monday 28th August.
- The instructor will present the first and second papers (30th August & 6th September) and a draft schedule for the rest of the semester (papers and presenters) will be handed out on 30th August.

Date: Paper (subject to change, dependent on student interests):

Aug 30 (John Marshall):

- [Bernoulli D & Blower S \(2004\) An attempt at a new analysis of the mortality caused by smallpox and of the advantages of inoculation to prevent it. Rev Med Virol 14: 275-288.](#)

Sep 6 (John Marshall):

- [Kermack WO & McKendrick AG \(1927\) A mathematical contribution to the theory of epidemics. Proc Roy Soc London A 115: 700-721.](#)

Sep 13 (this could be you):

- [Feng Z *et al.* \(2000\) A model for tuberculosis with exogenous reinfection. Theor Popul Biol 57: 235-247.](#)

Sep 20 (your enthusiasm, it's infectious):

- [Kucharski AJ *et al.* \(2016\) Transmission dynamics of Zika virus in island populations: A modelling analysis of the 2013-14 French Polynesia outbreak. PLoS NTDs 10: e0004726.](#)

Sep 21 (etc.):

- [Lipsitch M *et al.* \(2003\) Transmission dynamics and control of severe acute respiratory syndrome. Science 300: 1966-1970.](#)

Oct 4:

- [Saad-Roy CM *et al.* \(2016\) Estimation of Zika virus prevalence by appearance of microcephaly. BMC Infect. Dis. 16: 754.](#)

Oct 11:

- [Granich RM *et al.* \(2008\) Universal voluntary HIV testing with immediate ART as a strategy for elimination of HIV transmission: a mathematical model. Lancet 373: 48-57.](#)

Oct 18:

- [Walker PW *et al.* \(2016\) Estimating the most efficient allocation of interventions to achieve reductions in *Plasmodium falciparum* malaria burden and transmission in Africa: a modelling study. Lancet Glob Health 4: e474-e484.](#)

Oct 25:

- [Cerdeira M *et al.* \(2015\) To treat or to prevent?: Reducing the population burden of violence-related post-traumatic stress disorder. Epidemiology 26: 681-689.](#)

Nov 1:

- [Boily MC *et al.* \(2007\) Evaluating large-scale HIV prevention interventions: Study design for an integrated mathematical modeling approach. Sex Transm Infect 83: 582-589.](#)

Nov 8:

- [Ratmann O *et al.* \(2012\) Phylodynamic inference and model assessment with approximate Bayesian computation: Influenza as a case study. PLoS Comput Biol 8: e1002835.](#)

Nov 15:

- [Buceta J *et al.* \(2017\) Modeling the Ebola zoonotic dynamics: Interplay between enviroclimatic factors and bat ecology. PLoS ONE 12: e0179559.](#)

Nov 22: Thanksgiving (Holiday)

Nov 29:

- [Eaton *et al.* \(2015\) Assessment of epidemic projections using recent HIV survey data in South Africa: a validation analysis of ten mathematical models of HIV epidemiology in the antiretroviral therapy era. Lancet Glob Health 3: e598-e608.](#)

Dec 6 (John Marshall):

- [Crazy Monkey Games \(2015\) Pandemic 2. <http://www.pandemic2.org/>](#)