

CURRICULUM VITAE

DEREK A.T. CUMMINGS

PERSONAL DATA

Business Address: Department of Biology
University of Florida
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EDUCATION AND TRAINING

PhD, 2004 Johns Hopkins University, Whiting School of Engineering
Geography and Environmental Engineering

MHS, 2004 Johns Hopkins University, Bloomberg School of Public Health
International Health

MS, 2001 Johns Hopkins University, Whiting School of Engineering
Geography and Environmental Engineering

ScB, 1996 Brown University
Chemistry

PROFESSIONAL EXPERIENCE

UF Preeminence Professor Department of Biology, University of Florida

UF Preeminence Professor Emerging Pathogens Institute

Associate Professor Department of Epidemiology, Johns Hopkins Bloomberg School of
Public Health
2013-present

Adjunct Associate Professor Department of International Health, Johns Hopkins Bloomberg School of
Public Health
2013-present

Adjunct Associate Professor Department of Epidemiology, University of Pittsburgh Graduate School
of Public Health
2013-present

Nonresident Fellow Brookings Institution

	2007-present
Assistant Professor	Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health 2007-2013
Adjunct Assistant Professor	Department of International Health, Johns Hopkins Bloomberg School of Public Health 2007-2013
Adjunct Assistant Professor	Department of Epidemiology, University of Pittsburgh Graduate School of Public Health 2007-2013
Visiting Assistant Professor	Department of Epidemiology, University of Pittsburgh Graduate School of Public Health, University of Pittsburgh 2006 – 2007
Visiting Assistant Professor	Department of Biostatistics, Bloomberg School of Public Health, Johns Hopkins University 2006 – 2007
Research Associate	Department of International Health, Bloomberg School of Public Health, Johns Hopkins University 2004 – 2006
Program Coordinator	NIH Modeling Infectious Disease Agents Study (MIDAS) Center, University of Pittsburgh/Johns Hopkins University (pre-2006) 2003 - 2009
Research Assistant	Department of Geography and Environmental Engineering, GWC Whiting School of Engineering, Johns Hopkins University 1999-2004
Case Worker	Coalition for the Homeless, Crisis Intervention Program, NYC 1998

PROFESSIONAL ACTIVITIES

Society Membership

Society for Epidemiological Research
2004-present

American Academy for the Advancement of Science
2004-present

Asia Pacific Society of Medical Virology
2001-present

American Society of Tropical Medicine and Hygiene
2000-present

DIMACS Focus on Computation and Mathematical Epidemiology
2000-2008

Participation on Advisory Panels

WHO Working Group on Dengue Burden Estimation
2014-present

WHO Disease Reference Group on Dengue and other Emerging Viral Diseases
2010-2011

Member of the WHO Informal Network for Mathematical Modeling, Working Group on Influenza A (H1N1), 2009
2009

U.S. Department of Health and Human Services, Secretary's Advisory Council on Public Health Preparedness, Smallpox Modeling Working Group
2000-2002

Consultations

World Health Organization
Consultation on Mathematical Modeling of Dengue Intervention Impact
2014

Ministry of Health of Liberia
Ebola Outbreak Epidemiological Investigation
2014-present

Kingdom of Saudi Arabia MERS-CoV Outbreak Investigation Team
2013-present

Medimmune
Estimation of Burden of Influenza B
2011-2012

World Health Organization.
Disease Reference Group on Dengue and other Emerging Viral Diseases of Public Health Importance.
Scientific Committee.
2009

Epicentre and Medecins Sans Frontieres (MSF)
Outbreak investigation of measles in Maroua, Cameroon
2009

World Health Organization. Center for Vaccine Research.
Preparation of analysis of dengue models to assess future vaccine candidates.
2008

Data Safety and Management Boards (DSMB)

MSF-Epicentre

Effect of systematic utilization of antibiotic therapy in the ambulatory treatment of uncomplicated severe acute malnutrition

2013-2014

EDITORIAL ACTIVITIES

Study Sections

NIH Special Emphasis Panel on International Collaborations in Environmental Health
2014, 2015

NIH Clinical Research and Field Studies of Infectious Disease Study Section
2013, 2014

NIH Director's Independence Award
2014

NIH Modeling and Analysis of Biological Systems
2013

NIH Infectious Disease, Reproductive Health, and Asthma/Pulmonary Conditions
2012, 2013

NSF/NIH Ecology and Evolution of Infectious Diseases
2012

Peer Review Activities

Associate Editor:

American Journal of Epidemiology, 2010-2014

Academic Editor:

PLoS Medicine, 2011, 2012, 2013, 2014, 2015

PLoS Computational Biology, 2009-2010, 2014

Referee:

Nature, New England Journal of Medicine, Science, PLoS Biology, PLoS Medicine, Epidemiologic Reviews, American Journal of Epidemiology, Biostatistics, Emerging Infectious Diseases, Mathematical and Computer Modeling, PLoS Neglected Tropical Diseases, PLoS One, Biosecurity and Bioterrorism, Journal of Theoretical Biology, American Journal of Tropical Medicine and Hygiene, Journal of the Royal Society Interface, Proceedings of the Royal Society B, Physics Review A, Lancet, Proceedings of the National Academy of Science, Science

HONORS AND AWARDS

Awards

Advising, Mentoring, and Teaching Recognition Award (AMTRA)	2012
Burroughs Wellcome Career Award at the Scientific Interface	2007
UTRA Fellow, Brown University	1996
Meikeljohn Fellow, Brown University	1994
Rotary Scholarship	1992
National Merit Scholar	1992

PUBLICATIONS (*served as advisor/mentor)

Journal Articles

1. **Cummings DA**, McMaster J, Rieger AL, Rieger PH. EPR spectroscopic and theoretical study chromium(I) carbonyl phosphine and phosphonite complexes. *Organometallics* 1997;16:4362-4368.
2. Epstein JM, **Cummings DAT**, Chakravarthy S, Singa RM, Burke DS. Toward a containment strategy for smallpox bioterror: An individual based computational approach. *Brookings Monographs* 2004.
3. **Cummings DAT**, Irizarry RA, Huang NE, Endy TP, Nisalak A, Ungchusak K, Burke DS. Travelling waves in the occurrence of dengue haemorrhagic fever in Thailand. *Nature* 2004;427:344-347.
4. Longini IM, Jr., Nizam A, Xu S, Ungchusak K, Hanshaoworakul W, **Cummings DAT**, Halloran ME. Containing pandemic influenza at the source. *Science* 2005;309:1083-7.
5. Ferguson NM, **Cummings DAT**, Cauchemez S, Fraser C, Riley S, Meeyai A, Iamsirithaworn S, Burke DS. Strategies for containing an emerging influenza pandemic in Southeast Asia. *Nature* 2005;437:209-214.
6. **Cummings DAT**, Schwartz IB, Billings L, Shaw LB, Burke DS. Dynamic effects of antibody-dependent enhancement on the fitness of viruses. *Proceedings of the National Academy of Sciences* 2005;102:15259-64.
7. Schwartz IB, Shaw LB, **Cummings DAT**, Billings L, McCrary M, and Burke DS. Chaotic desynchronization of multistrain diseases. *Physical Review E*. 2005;72:066201.
8. **Cummings DAT**, Moss WJ, Long K, Wiysonge CS, Muluh TJ, Kollo B, Nomo E, Wolfe ND and Burke DS. Improved measles surveillance in Cameroon reveals two major dynamic patterns of incidence. *International Journal of Infectious Diseases* 2006;10:148-155.
9. Ferguson NM, **Cummings DAT**, Fraser C, Cajka JC, Cooley PC, Burke DS. Strategies for mitigating an influenza pandemic. *Nature* 2006;442:448-452.
10. Burke DS, Epstein JM, **Cummings DAT**, Parker JI, Cline KC, Singa RM, Chakravarty S. Individual-based computational modeling of smallpox epidemic control strategies. *Academic Emergency Medicine* 2006;13:1142-1149.
11. Longini, IM, Halloran ME, Nizam A, Yang Y, Xu S, Burke DS, **Cummings DAT**, Epstein JM. Containing a Large Bioterrorist Smallpox Attack: A Computer Simulation. *International Journal of Infectious Diseases* 2007;11:98-108.

12. Billings L, Schwartz IB, Shaw LB, McCrary M, Burke DS, **Cummings DAT**. Instabilities in multisero-type disease models with antibody-dependent enhancement. *Journal of Theoretical Biology* 2007;246:18-27.
13. Lessler J, **Cummings DAT**, Fishman S, Vora A, Burke DS. Transmissibility of Swine Flu at Fort Dix, 1976. *Journal of the Royal Society Interfaces* 2007;4:755-762.
- *14. Vora A, Burke DS, **Cummings DAT**. The impact of a physical geographic barrier on the dynamics of measles. *Epidemiology and Infection* 2008;136:713-720.
15. Halloran, M.E., Ferguson N.M., Eubank, S., Longini, I.M., **Cummings, D.A.T.**, Lewis, B., Xu, S., Fraser, C., Vullikanti, A., Germann, T.C., Wagener, D., Beckman, R., Kadau, K., Barrett, C., Macken, C., Burke, D.S., Cooley, P. Modeling targeted layered containment of an influenza pandemic in the United States. *Proceedings of the National Academy of Sciences* 2008;105:4639-4644.
16. Epstein, JM, Parker J, **Cummings DAT**, Hammond RA. Coupled Contagion Dynamics of Fear and Disease: Mathematical and Computational Explorations. *PLoS ONE* 2008;3:e3955.
- *17. Lessler, J, Reich, NG, Brookmeyer R, Perl TM, Nelson KE, **Cummings DAT**. A systematic review of the incubation periods of acute respiratory viral infections. *Lancet Infectious Diseases* 2009;9:291-300.
18. Reich NG, Lessler J, **Cummings DAT**, Brookmeyer R. Estimating incubation period distributions with coarse data. *Statistics in Medicine* 2009;28:2769-84
19. **Cummings DAT**, Iamsirithaworn S, Lessler JT, McDermott A, Prasanthong R, Nisalak A, Jarman RG, Burke DS, Gibbons RV. The impact of the demographic transition on dengue in Thailand: insights from a statistical analysis and mathematical modeling. *PLoS Medicine* 2009;6:e1000139.
20. **Cummings DAT**. Temporal and Spatial Dynamics of Dengue Virus Transmission. *Frontiers in Dengue Virus Research*. 2009:173-181.
- *21. Johansson M, **Cummings DAT**, Glass G. Multi-year climate variability and dengue: El Niño Southern Oscillation, Weather, and Dengue Incidence in Puerto Rico, Mexico, and Thailand. *PLoS Medicine* 2009;6:e1000168.
- *22. Lessler J, Reich N, **Cummings DAT**, NYC DOHMH Swine Influenza Investigation Team. Outbreak of 2009 pandemic influenza A (H1N1) at a New York City High School. *New England Journal of Medicine*. 2009 Dec 31;361(27):2628-36.
23. Solomon BD, Lachawan F, Mercier S, Clegg NJ, Delgado MR, Rosenbaum K, Dubourg C, David V, Olney AH, Wehner LE, Hehr U, Bale S, Paulussen A, Smeets HJ, Hardisty E, Tylki-Szymanska A, Pronicka E, Clemens M, McPherson E, Hennekam RCM, Hahn J, Stashinko E, Levey E, Wiczorek D, Roeder E, Schell-Apacik CC, Booth CW, Thomas RL, Kenwick S, **Cummings DAT**, Bous SM, Keaton A, Balog JZ, Hadley D, Zhou N, Long R, Vélez JI, Pineda-Alvarez DE, Odent S, Roessler E, Muenke M. Mutations in ZIC2 in Human Holoprosencephaly: Description of a Novel ZIC2-Specific Phenotype and Comprehensive Analysis of 157 Individuals. *Journal of Medical Genetics* 2010;47:513-24.
- *24. Abbott III GH, Word DP, **Cummings, DAT**, Laird, CD. Estimating Seasonal Drivers in Childhood Infectious Diseases with Continuous Time and Discrete-Time Models. *Proceedings of the American Control Conference*. 2010:5137-5142.

- *25. Word DP, Young JK, **Cummings DAT**, Laird CD. Estimation of seasonal transmission parameters in childhood infectious disease using a stochastic continuous time model. *Proceedings of the 20th European Symposium on Computer Aided Process Engineering* 2010;229-234.
- *26. Fried J, Gibbons RV, Kalayanarooj S, Thomas S, Srikiatkachorn A, Yoon IK, Jarman RG, Greene S, **Cummings DAT**. Serotype specific differences in the risk of dengue hemorrhagic fever in hospitalized cases in Bangkok, Thailand, 1994-2006. *PLoS Neglected Tropical Diseases* 2010;4:e617.
27. Solomon, BD, Pineda-Alvarez DE, Raam MS, **Cummings DAT**. Evidence for inheritance in patients with VACTERL association. *Human Genetics* 2010;127:731-3.
- *28. Lessler J, Brookmeyer R, Reich NG, Nelson KE, **Cummings DAT**, Perl TM. Identifying probable sources of infection for respiratory viruses. *Infection Control and Hospital Epidemiology* 2010;31:809-15.
- *29. van Panhuis WG, Gibbons RV, Endy TP, Rothman AL, Nisalak A, Burke DS, **Cummings DAT**. Inferring the serotype of dengue virus infections based on pre- and post-infection neutralizing antibody titers. *Journal of Infectious Diseases*. 2010;202:1002-10.
30. Solomon BD, Pineda-Alvarez DE, Raam MS, Bous SM, Keaton AA, Vélez JI, **Cummings DAT**. Analysis of component findings in 79 patients diagnosed with VACTERL association. *American Journal of Medical Genetics part A* 2010;152A:2236-44.
- *31. Lessler J, dos Santos T, Aguilera X, Brookmeyer R. PAHO Influenza Technical Working Group, **Cummings, DAT**. H1N1pdm in the Americas. *Epidemics* 2010;2:132-138.
- *32. Lessler J, Moss WJ, Lowther SA, **Cummings DAT**. Maintaining high rates of measles immunization in Africa. *Epidemiology and Infection* 2010;5:1-11.
33. Yang Y, Halloran ME, Daniel MJ, Longini IM, Jr., Burke DS, **Cummings DAT**. Modeling competing infectious pathogens from a Bayesian perspective: application to influenza studies with incomplete laboratory results. *Journal of the American Statistical Association* 2011;105:1310-1322.
34. Stebbins S, Stark JH, Prasad RK, Thompson WW, Mitruka K, Rinaldo C, Vukotich, CJ Jr., Burke DS, **Cummings DAT**. Sensitivity and specificity of rapid influenza testing of children in a community setting. *Influenza and Other Respiratory Viruses* 2011;5:104-9.
- *35. Rodriguez-Barraquer I, Corderio MT, Braga C, de Souza WV, Marques ET, **Cummings DAT**. From re-emergence to hyperendemicity: the natural history of the dengue epidemic in Brazil. *PLoS Neglected Tropical Diseases* 2011;5:e935.
36. Stebbins S, **Cummings DAT**, Stark J, Vukotich C, Mitruka K, Thompson W, Rinaldo C, Roth L, Wagner M, Wisniewski SR, Dato V, Eng H, Burke DS. Reduction in the incidence of influenza A but not influenza B associated with use of hand sanitizer and cough hygiene in schools: a randomized controlled trial. *Pediatric Infectious Disease Journal* 2011;30:921-926.
- *37. Lessler J, Reich N, Perl TM, **Cummings DAT**. Visualizing clinical evidence: citation networks for the incubation periods of respiratory viral infections. *PLoS One* 2011;6:e19496.

38. Fraser C, **Cummings DAT**, Klinkenberg D, Burke DS, Ferguson NM. Influenza transmission in households during the 1918 pandemic. *American Journal of Epidemiology* 2011;174:505-14.
39. Lee BY, Connor D, Kitchen S, Bacon K, Shah M, Brown S, Bailey R, Laosiritaworn Y, Burke DS, **Cummings DAT**. Economic value of dengue vaccine in Thailand. *American Journal of Tropical Medicine and Hygiene* 2011;84:764-72.
- *40. Van Panhuis W, Luxemburger C, Pengsaa K, Limkittikul K, Sabchareon A, Lang J, Durbin A, **Cummings DAT**. Decay and persistence of maternal dengue antibodies among infants in Bangkok. *American Journal of Tropical Medicine and Hygiene* 2011;85:355-62.
41. Lessler J, **Cummings DAT**, Read J, Wang S, Zhu H, Smith G, Guan Y, Jiang C, Riley S. Location-specific patterns of exposure to recent pre-pandemic strains of influenza A in southern China. *Nature Communications* 2011;2:423.
42. Johansson M, Hombach J, **Cummings DAT**. Models of the impact of dengue vaccines: a review of current research and potential approaches. *Vaccine* 2011;29:5860-8.
43. Luquero FJ, Pham-Orsetti H, **Cummings DAT**, Ngaunji PE, Nimpa M, Fermon F, Ngoe N, Sosler S, Strebel P, Grais RF. A long-lasting measles epidemic in Maroua, Cameroon 2008-2009: mass vaccination as response to the epidemic. *Journal of Infectious Diseases*. 2011;204 Suppl 1:S243-51.
- *44. Althouse BM, Ng YY, **Cummings DAT**. Prediction of dengue incidence using search query surveillance. *PLoS Neglected Tropical Diseases*. 2011;5:e1258.
45. Lessler JT, Metcalf CJE, Grais RF, Luquero F, **Cummings DAT**, Grenfell BT. Measuring the performance of vaccination programs using cross-sectional surveys: a likelihood framework and retrospective analysis. *PLoS Medicine* 2011;8:e1001110.
46. Chaninan Sonthichai, Iamsirithaworn S, **Cummings DAT**, Shokekird P, Niramitsantipong A, Khumket S, Chittaganpitch M, Lessler J. Effectiveness of non-pharmaceutical interventions in controlling an Influenza A outbreak in a school, Thailand, November 2007. *Outbreak, Surveillance and Investigation Report* 2011;4:6-11.
- *47. Word DP, **Cummings DAT**, Burke DS, Iamsirithaworn S, Laird CD. A nonlinear programming approach for estimation of transmission parameters in childhood infectious disease using a continuous time model. *Journal of the Royal Society Interface*. 2012 Feb 15. [Epub ahead of print].
- *48. Reich NG, Lessler J, **Cummings DAT**, Brookmeyer R. Estimating absolute and relative case fatality ratios from infectious disease surveillance data. *Biometrics*. 2012. doi: 10.1111/j.1541-0420.2011.01709.x. [Epub ahead of print]
49. **Cummings DAT**, Boni M, WHO-VMI Dengue Vaccine Modeling Group. Assessing the potential of a candidate dengue vaccine with mathematical modeling. *PLoS Neglected Tropical Diseases*. 2012 Mar;6(3):e1450.
- *50. Stark JH, Sharma R, Ostroff S, **Cummings DAT**, Stebbins S, Ermentrout B, Burke DS, Wisniewski S. Local Spatial and Temporal Processes of Influenza in Pennsylvania, USA: 2003-2009, *PLoS One*, 2012;7(3):e34245.

51. Burton J, **Cummings DAT**, Schwartz I, Billings L. Disease Persistence in Epidemiological Models: The Interplay between Vaccination and Migration. *Mathematical Biosciences*. 2012;239(1):91-6.
52. Read JM, Edmunds WJ, Riley S, Lessler JT, **Cummings DAT**. Close encounters of the infectious kind: a review of methods to measure social mixing behavior. *Epidemiology and Infection*. 2012 Jun 12:1-14..
- *53. Salje H, Lessler J, Endy TP, Curriero F, Gibbons RV, Nisalak A, Nimmannitya S, Kalayanarooj S, Jarman RG, Thomas S, Burke DS, **Cummings DAT**. Revealing the micro-scale spatial signature of dengue transmission and immunity in an urban population. *Proceedings of the National Academy of Sciences*. 2012 Jun 12;109(24):9535-8.
54. Blackwood JC, **Cummings DAT**, Broutin H, Iamsirithaworn S, Rohani P. The population ecology of infectious diseases with pertussis as a case study. *Parasitology*. 2012 Apr 13:1-11.
55. Lessler J, Riley S, Read JM, Wang S, Zhu H, Smith GJD, Guan Y, Jiang CQ, **Cummings DAT**. Evidence for Antigenic Seniority in Influenza A (H3N2) Antibody Responses in Southern China. *PLoS Pathogens*. 2012 8(7): e1002802. doi:10.1371/journal.ppat.1002802
- *56. Stark JH, **Cummings DAT**, Ermentrout B, Ostroff S, Sharma R, Stebbins S, Burke DS, Wisniewski S. Local variations in spatial synchrony of influenza epidemics. *PLoS One*. 2012;7(8):e43528. Epub 2012 Aug 16.
- *57. Rainwater-Lovett K, Rodriguez-Barraquer I, **Cummings DAT**, Lessler J. Variation in dengue virus plaque reduction neutralization testing: systematic review and pooled analysis. *BMC Infectious Diseases*. 2012 Sep 28;12(1):233. [Epub ahead of print]
- *58. Althouse BM, Lessler J, Sall A, Diallo M, Hanley K, Watts D, Weaver S, **Cummings DAT**. Synchrony of Sylvatic Dengue Isolations: A Multi-host, Multi-vector SIR Model of Dengue Virus Transmission in Senegal. *PLoS Neglected Tropical Diseases*. 2012 Nov;6(11):e1928.
- *59. Azman A, Rudolph K, **Cummings DAT**, Lessler J. The incubation period of cholera: a systematic review. *Journal of Infection*. 2012 Nov 29. doi:pil: S0163-4453(12)00347-7.
60. Meltzer A, Pierce R, **Cummings DAT**, Pines JM, May L, Smith M, Marcotte J, McCarthy M. Rapid (13)C Urea breath test to identify Helicobacter Pylori infection in Emergency Department patients with upper abdominal pain. *Western Journal of Emergency Medicine*. 2013 May;14(3):278-82. doi: 10.5811/westjem.2012.12.15173.
61. Reiner RC, Perkins TA, Barker CM, Niu T, Fernando Chaves L, Ellis AM, George DB, Le Menarch A, Pulliam J, Bisanzio D, Buckee C, Chiyaka C, **Cummings DAT**, Garcia A, Gattton M, Gething PW, Hartley DM, Johnston G, Klein E, Michael E, Lindsay SW, Lloyd AL, Pigott D, Reisen WK, Ruktanonchai N, Singh B, Tatem AJ, Kitron U, Hay SI, Scott TW, Smith DL. A systematic review of mathematical models of mosquito-borne pathogen transmission: 1970-2010. *Journal of the Royal Society Interface*. 2013 Feb 13;10(81):20120921. doi: 10.1098/rsif.2012.0921. Print 2013 Apr 6. Review.
62. Blackwood J, **Cummings DAT**, Broutin H, Iamsirithaworn S, Rohani P. Deciphering the impacts of vaccination, demographic transition and immunity on pertussis epidemiology in Thailand. *Proceedings National Academy of Sciences USA*. 2013 Jun 4;110(23):9595-600. doi: 10.1073/pnas.1220908110. Epub 2013 May 20.

- *63. Mier-y-Teran-Romero L, Schwartz IB, **Cummings DAT**. Breaking the symmetry: Differences among serotypical transmission rates enhance persistence in dengue fever models. *Journal of Theoretical Biology*. 2013 Sep 7;332:203-10. doi: 10.1016/j.jtbi.2013.04.036. Epub 2013 May 7.
- *64. Reich NG, Shrestha S, King AA, Rohani P, Lessler J, Kalayanarooj S, Yoon IK, Gibbons RV, Burke DS, **Cummings DAT**. Interactions between serotypes of dengue highlight epidemiological impact of cross-immunity. *Journal of the Royal Society Interface*. 2013 Jul 3;10(86):20130414. doi: 10.1098/rsif.2013.0414. Print 2013.
65. Assiri A, McGeer A, Perl TM, Price CS, Al Rabeah AA, **Cummings DAT**, Alabdullatif ZN, Assad M, Almulhim A, Makhdoom H, Madani H, Alhakeem R, Al-Tawfiq JA, Cotten M, Watson SJ, Kellam P, Zumla AI, Memish ZA; the KSA MERS-CoV Investigation Team. Hospital outbreak of Middle East Respiratory Syndrome Coronavirus. *New England Journal of Medicine*. 2013. Jun 19. Epub ahead of Print.
66. Liu SH, Brotman RM, Zenilman JM, Gravitt PE, **Cummings DAT**. Menstrual cycle and detectable human papillomavirus in reproductive women: a time series study. *Journal of Infectious Diseases*. 2013 Jul 24. Epub ahead of Print.
- *67. Rodriguez-Barraquer IB, Mier-y-Teran-Romero L, Burke DS, **Cummings DAT**. Challenges in the interpretation of dengue vaccine trial results. *PLoS Neglected Tropical Diseases*. 2013 Aug 29;7(8):e2126
68. Anderson KB, Gibbons RV, **Cummings DAT**, Nisalak A, Green S, Libraty DH, Jarman RG, Srikiatkachorn A, Mammen MP, Darunee B, Yoon IK, Endy TP. A shorter time interval between first and second dengue infections is associated with protection from clinical illness in a school-based cohort in Thailand. *Journal of Infectious Diseases*. 2013 Aug 20. [Epub ahead of print]
69. Lee RM, Lessler JT, Lee RA, Rudolph K, Reich NG, Perl TM, **Cummings DAT**. Incubation periods of viral gastroenteritis: a systematic review. *BMC Infectious Disease*. 2013. 13(1):446.
70. Word DP, Young JK, **Cummings DAT**, Iamsirithaworn S, Laird CD. Interior-Point Methods for Estimating Seasonal Parameters in Discrete-Time Infectious Disease Models. *PLoS One*. 2013. 8(10):e74208.
- *71. Liu SH, **Cummings DAT**, Zenilman JM, Gravitt PE, Brotman RM. Characterizing the Temporal Dynamics of Human Papillomavirus DNA Detectability Using Short-Interval Sampling. *Cancer Epidemiology, Biomarkers and Prevention*. 2013. Oct. 15. Epub ahead of print.
72. Live Dengue Vaccines Technical Consultation Reporting Group (including **Cummings DAT**), Bentsi-Enchill AD, Schmitz J, Edelman R, Durbin A, Roehrig JT, Smith PG, Hombach J, Farrar J. Long-term safety assessment of live attenuated tetravalent dengue vaccines: deliberations from a WHO technical consultation. *Vaccine*. 2013;31(23):2603-9.
- *73. Rodriguez-Barraquer I, Buathong R, Iamsirithaworn S, Nisalak A, Lessler JT, Jarman RG, Gibbons RV, **Cummings DAT**. Revisiting Rayong: Shifting seroprofiles of dengue in Thailand and their implications for transmission and control. *American Journal of Epidemiology*. doi:10.1093/aje/kwt256.

- *74. Rodriguez-Barraquer I, Mier-y-Teran-Romero L, Schwartz IB, Burke DS, **Cummings DAT**. Potential opportunities and perils of imperfect dengue vaccines. *Vaccine*. 2013. doi:pii: S0264-410X(13)01537-5.
75. van Panhuis WG, Grefenstette J, Jung SY, Chock NS, Cross A, Eng H, Lee BY, Zadorozhny V, Brown S, **Cummings DAT**, Burke DS. Contagious diseases in the United States from 1888 to the present. *New England Journal of Medicine*. 2013. Nov. 28 369(22):2152-8.
- *76. Azman AS, Stark JH, Althouse BM, Vukotich CJ Jr., Stebbins S, Burke DS, **Cummings DAT**. Household transmission of influenza A and B in a school-based study of non-pharmaceutical interventions. *Epidemics*. 2013. 5(4): 181-6.
77. Smith DL, Perkins TA, Reiner RC, Barker CM, Niu T, Fernando Chaves L, Ellis AM, George DB, Le Menach A, Pulliam JRC, Bisanzio D, Buckee C, Chiyaka C, **Cummings DAT**, Garcia AJ, Gatton ML, Gething PW, Hartley DM, Johnston G, Klein EY, Michael E, Lloyd AL, Pigott DM, Reisen WK, Ruktanonchai N, Singh BK, Stoller J, Tatem AJ, Kitron U, Godfray HCJ, Cohen JM, Hay SI, Scott TW. Recasting the theory of mosquito-borne pathogen transmission dynamics and control. *Trans R Soc Trop Med Hyg*. 2014 April; 108(4): 185–197.
78. Grabowski MK, Lessler J, Redd AD, Kagaayi J, Laeyendecker O, Ndyababo A, Nelson MI, **Cummings DAT**, Bwanika JB, Mueller AC, Reynolds SJ, Munshaw S, Ray SC, Lutalo T, Manucci J, Tobian AAR, Chang LW, Beyrer C, Jennings JM, Nalugoda F, Serwadda D, Wawer MJ, Quinn TC, Gray RH, and the Rakai Health Sciences Program. The role of viral introductions in sustaining community-based HIV epidemics in rural Uganda: evidence from spatial clustering, phylogenetics, and egocentric transmission models. *PLoS Medicine*. 2014 Mar 4;11(3):e1001610.
79. Rudolph K, Lessler J, Moloney R, Kmush B, **Cummings DAT**. Incubation periods of mosquito-borne viral infections: a systematic review. *American Journal of Tropical Medicine and Hygiene*. 2014. May 90(5):882-91.
- *80. Althouse BA, Durbin AP, Hanley KA, Halstead SB, Weaver SC, **Cummings DAT**. Viral kinetics of primary dengue virus infection in non-human primates: a systematic review and individual pooled analysis. *Virology*. 2014 Mar;452-453:237-46.
81. Bhooniboonchoo P, Gibbons RV, Huang A, Yoon IK, Buddhari D, Nisalak A, Chansatiporn N, Thipayamongkolgul M, Kalanarooj S, Endy T, Rothman AL, Srikiatkachorn A, Green S, Mammen MP, **Cummings DAT**, Salje H. The spatial dynamics of dengue virus in Kamphaeng Phet, Thailand. *PLoS Neglected Tropical Diseases*. 2014. Sep 11;8(9); e3138
- *82. Salje H, Rodriguez-Barraquer I, Rainwater-Lovett K, Nisalak A, Thaisomboonsuk, Thomas SJ, Fernandez S, Jarman RG, Yoon IK, **Cummings DAT**. Variability in Dengue Titer Estimates from Plaque Reduction Neutralization Tests Poses a Challenge to Epidemiological Studies and Vaccine Development. *PLoS Neglected Tropical Diseases*. 2014. Jun 4;8(6).
82. Ferguson NM, **Cummings DAT**. How season and serotype determine dengue transmissibility. *Proceedings of the National Academy of Science USA*. 2014. Jun 19. pii: 201407648.
83. Read JM, Lessler J, Riley S, Wang S, Tan LJ, Kwok KO, Guan Y, Jiang CQ, **Cummings DAT**. Social mixing patterns in rural and urban areas of southern China. *Proceedings of the Royal Society B*. 2014 Apr 30;281(1785)20140268.

84. Kucharski AJ, Kwok KO, Wei VW, Cowling BJ, Read JM, Lessler J, **Cummings DAT**, Riley S. The contribution of social behavior to the transmission of influenza A in a human population. *PLoS Pathogens*. 2014 Jun;10(6):e1004206.
85. Velasco JMS, Alera MTP, Ypil-Cardenas CA, Dimaano EM, Jarman RG, Chinnawirotpisan P, Thaisomboonsuk B, Yoon IK, **Cummings DAT**, Mammen P Mammen Jr. Demographic, clinical and laboratory findings among adult and pediatric patients hospitalized with dengue in the Philippines. *Southeast Asian Journal of Tropical Medicine and Public Health*. 2014 45(2); 337-345.
86. Reich NG, **Cummings DAT**, Lauer SA, Zorn M, Robinson C, Nyquist AC, Price CS, Simberkoff M, Radonovich LJ, Perl TM. Triggering Interventions for Influenza: The ALERT Algorithm. *Clinical Infectious Diseases*. 2014 doi: 10.1093/cid/ciu749
87. Kwok KO, Cowling BJ, Wei VW, Wu KM, Read JM, Lessler J, **Cummings DAT**, Malik Peiris JS, Riley S. Social contacts and the locations in which they occur as risk factors for influenza infection. *Proc. R. Soc. B* 2014 Aug; 281(1789); 20140709.
88. Kwok KO, Jiang C, Tan L, Justin L, Read JM, Zhu H, Guan Y, **Cummings DAT**, Riley S. [An international collaborative study on influenza viruses antibody titers and contact patterns of individuals in rural and urban household of Guangzhou]. *Zhonghua liu zing bing xue za zhi*. 2014 April; 35(4); 433-436. In Chinese.
- *89. Althouse BA Hanley KA, Diallo M, Sall A, Ba Y, Faye O, Watts D, Weaver SC, **Cummings DAT**. Impact of climate and mosquito vector abundance on sylvatic arbovirus circulation dynamics in Senegal. *Am J Trop Med Hyg*. 2014 Nov. 13-0617.
90. Lessler JT, Rodriguez-Barraquer I, **Cummings DAT**, Garske T, Van Kerkhove M, Mills H, Truelove S, Hakeem A, Albarrak A, Ferguson NM. Estimating potential incidence of MERS-CoV associated with Hajj pilgrims to Saudi Arabia, 2014. *PLoS Currents Outbreaks*. OBK-14-0048.
91. Jiang CQ, Lessler J, Kim L, Kwok KO, Read JM, Wang S, Tan L, Zhu H, Guan Y, Riley S, **Cummings DAT**. A study of influenza immunity in urban and rural Guangzhou region of China, the Fluscape Study. *Chinese Journal of Preventive Medicine*. 2014 Apr;35(4):433-6.
92. Kucharski A, Lessler JT, Read J, Zhu H, Jiang CQ, Guan Y, **Cummings DAT**, Riley SR. Estimating the life course of influenza A(H3N2) antibody responses from cross-sectional data. 2015. *PLoS Biology*. 13(3):e1002082.
93. Mazet J, Daszak P, Wei Q, Zhao G, **Cummings DAT**, Desmond JS, Sung N, Rosenthal J, Zhang S, Xiao X, Xu J, Zhu G, Shi Z, Cao W, Feng F, Liu X, Pan W, Zuo L. A Joint China – US Call for an Interdisciplinary Approach to Emerging Infectious Diseases. *EcoHealth*. In Press.
- *94. Mier-y-Teran-Romero L, Schwartz IB, Rodriguez-Barraquer I, **Cummings DAT**. Competition and Invasion of Dengue Viruses in Vaccinated Populations. *Epidemics*. In revision.
95. Van Panhuis W, Choisy M, Xiong X, Chok NS, Akarasewi P, Iamsirithaworn S, Lam SK, Chong CK, Lam FK, Phommasak B, Vongphrachanh P, Bouaphanh K, Rekol H, Hien NT, Thai PQ, Duong TN, Chuang JH, Liu YL, Ng LC, Shi Y, Tayag EA, Roque Jr. VG, Lee Suy LL, Jarman RG, Gibbons RV, Velasco JMS, Yoon IK, Burke DS, **Cummings DAT**. Synoptic epidemiology of dengue across eight

countries in Southeast Asia reveals region-wide synchrony and traveling waves. *Proceedings of the National Academy of Sciences*. In press.

96. Read JM, **Cummings DAT**, Solomon T, Baylis M. Passenger flight booking data shine new light on risk of international spread of Ebola virus. *BMC Infectious Diseases*. In revision.

*97. Rodríguez-Barraquer I, Solomon SS, Kuganatham P, Srikrishnan AK, Vasudevan CK, Iqbal SH, Balakrishnan P, Solomon S, Mehta SH, **Cummings DAT**. The hidden/unseen burden of dengue and chikungunya in Chennai, India. *PLoS Neglected Tropical Diseases*. In revision.

98. Bessesen M, Gaydos C, Nyquist C, Price C, Cummings DAT, Gilbert CL, Gorse G, Reich NG, Rodriguez-Barradas M, Simberkoff M, Radonovich L, Perl TM. ResPECT Study: A cluster-randomized clinical trial to compare the effectiveness of respirators and medical masks in preventing respiratory infection and illness in healthcare workers. *BMC Infectious Diseases*. Submitted.

99. Reich NG, Lessler JT, Sakrejda K, Lauer SA, Iamsirithaworn S, **Cummings DAT**. Evaluating time-series prediction models using a generalization of the Mean Absolute Scaled Error. *American Statistician*. Submitted.

100. Lessler JT, Salje H, Van Kerkhove MD, Ferguson NM, Cauchemez S, Rodriguez-Barraquer I, Hakeem R, Jombart T, Aguas R, Al-Barrak A, **Cummings DAT*** and the MERS-CoV Scenario and Modeling Working Group. Estimating the Severity and Subclinical Burden of MERS-CoV Infection in the Kingdom Saudi Arabia. *eLife*. Submitted.

101. Althouse BM, Guerbois M, Sall AA, Diallo M, Diallo D, Faye O, Benefit B, Simons E, Watts DM, Weaver SC, Hanley KA, **Cummings DAT**. Transmission Dynamics of Sylvatic Chikungunya virus in Non-human Primates in Senegal. *Nature Communications*. Submitted.

102. Blackwood J, **Cummings DAT**, Iamsirithaworn S, Rohani P. Does pertussis vaccination reduce transmission or symptomatic disease only? An example using age-structured data from Thailand. *Epidemics*. Submitted.

103. Salje H, **Cummings DAT**, Lessler JT. Estimating infectious disease transmission distances using the overall distribution of cases. *Statistics in Medicine*. Submitted.

Articles and Editorials not peer reviewed

1. Epstein JM, **Cummings DA**, Chakravarthy S, Singa RM, Burke DS. Toward a containment strategy for smallpox bioterror: an individual-based computational approach. Brookings Institution Center on Social and Economic Dynamics, 2002. Working Paper 31.

2. Epstein, J.M., Parker J., **Cummings, D.A.T.**, Hammond, R. Coupled Contagion Dynamics of Fear and Disease: Mathematical and Computational Explorations. Brookings Institution Center on Social and Economic Dynamics, 2007. Working Paper 50.

3. Yin Y, Cummings DAT, Burke, D.S., Louis, T.A. Bayesian analysis of infectious disease time series data. Technical report. Johns Hopkins Bloomberg School of Public Health Department of Biostatistics. 2007.

4. Johansson, M., Hombach, J. **Cummings DAT**. Models of the impact of dengue vaccines: a review of current research and potential approaches. WHO Report. Initiative for Vaccine Research. 2008.
5. **Cummings DAT**, Lessler J. Design and Analysis of Vaccine Studies by M. Elizabeth Halloran, Ira M. Longini, Jr., and Claudio J. Struchiner. *Am J Epidemiol* 2011;174:872-3.
6. **Cummings DAT**. Jumping Germs. *Ecohealth*. July. 2013. 1-2. Epub ahead of publication.

Letters

1. Bhandari A, Schaefer A, **Cummings DAT**. Comment on “Simple models of influenza progression with a heterogeneous population” by Richard Larson. *Operations Research Forum*. 2007. 55:3.
2. Solomon B, Raam MS, Pineda-Alvarez DE, **Cummings DAT**. Patients with VACTERL association deserve careful scrutiny: Response to Jenetzky et al. *American Journal of Medical Genetics Part A* 2011;155:2042-3.
3. Rodriguez-Barraquer I, Mier-y-Teran-Romero L, Ferguson NM, Burke DS, **Cummings DAT**. Differential efficacy of dengue vaccine by immune status. *Lancet*. In press.

Chapters

1. **Cummings DAT**, Lessler J. Infectious Disease Dynamics. In *Infectious Disease Dynamics: Theory and Practice*. Third Edition.
2. Perkins TA, Reiner, Jr., RC, Rodriguez-Barraquer I, Smith DL, Scott TW, **Cummings DAT**. A review of transmission models of dengue: a quantitative and qualitative analysis of model features. In *Dengue and Dengue Hemorrhagic Fever*. Second Edition. 2014/8/29. CABI Publishing.

Meeting abstracts and presentations

*served as advisor/mentor; presenting author)

1. AL Roberts, **Cummings DA**, Totten LA, Leckta T. Computational methods for predicting heats of formation of halogenated methyl and ethyl radicals. National Meeting of the American Chemical Society, 2000, San Francisco, CA
2. **Cummings DAT**, Burke DS. Spatial Synchrony and Phase Coherency of Seasonal Variation in Temperature, Rainfall and Dengue in Thailand. *GEOMED, 2003, Baltimore, MD*
3. **Cummings DAT**, Huang NE, Nisalak A, Endy TP, Burke DS. Periodic traveling waves in dengue hemorrhagic fever incidence in Thailand. *American Society of Tropical Medicine and Hygiene, 2003, Philadelphia, PA*
4. **Cummings DAT**, Huang NE, Nisalak A, Endy TP, Burke DS. Traveling waves in dengue hemorrhagic fever incidence in Thailand. *6th Asia Pacific Congress of Medical Virology. 2003, Kuala Lumpur, Malaysia*

5. **Cummings DAT**, Huang NE, Nisalak A, Endy TP, Burke DS. Spatial coherence and association of temperature, rainfall and the incidence of dengue hemorrhagic fever in Thailand. *53rd Annual Meeting of the American Society of Tropical Medicine and Hygiene, 2004, Miami, FL*
6. **Cummings DAT**, Schwartz IB, Shaw L, Billings L, Burke DS. Simulation of the Population Effects of Dengue Vaccination. *First Asian Regional Dengue Research Network Meeting, 2004, Bangkok, Thailand*
7. **Cummings DAT**, Schwartz IB, Shaw L, Billings L, Burke DS. Dynamic effects of antibody-dependent enhancement on the fitness of dengue viruses. *National Institutes of Allergy and Infectious Disease Modeling Immunity for Biodefense Annual Meeting, 2006, Boston, MA*
- *8. **Cummings DAT**, **Rabaa MA**. The relative timing of seasonal weather patterns and dengue incidence across the Southeast Asian region. *55th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Atlanta, GA, 2006. [Am J Trop Med Hyg 2005;75:S137-138].*
- *9. **Fichtenberg CM**, **Cummings DAT**, Glass TA, Ellen JM. The impact of differential mixing by sexual activity on racial/ethnic STI disparities: A simulation study. *2nd North American Congress of Epidemiology, Seattle, WA, 2006.*
10. **Cummings DAT**, Schwartz I, Burke DS, Gibbons RV. Spatial heterogeneity in the force of infection of dengue in Thailand and the spatial structure of phase relationships in multiannual oscillations. *57th Annual Meeting of the American Society of Tropical Medicine and Hygiene, New Orleans, LA, 2008.*
11. **Cummings DAT**, Imsirithaworn S, Lessler J, Prasanthong R, Jarman RG, Burke DS, Gibbons RV. Dengue and the demographic transition. *57th Annual Meeting of the American Society of Tropical Medicine and Hygiene, New Orleans, LA, 2008.*
- *12. **Rodriguez-Barraquer I**, Marques E, **Cummings DAT**. Age shifts of DHF in Brazil: insight from a serological survey in Recife. *58th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Washington, DC, 2009.*
- *13. **Benenson JD**, Gibbons RV, Nisalak A, Kalayanaroj S, **Cummings DAT**. Susceptible reconstruction and serotype specific estimates of the transmissibility and seasonality of transmission of dengue viruses in Thailand. *58th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Washington, DC, 2009.*
- *14. **Van Panhuis WG**, Gibbons RV, Endy T, Burke DS, **Cummings DAT**. Assessing the accuracy of inferring the serotype of dengue virus infections based on pre- and post-infection neutralizing antibody titers. *58th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Washington, DC, 2009.*
15. **Cummings DAT**, Imsirithaworn S, Lessler JT, McDermott A, Prasanthong R, Nisalak A, Jarman RG, Burke DS, Gibbons RV. The impact of changes in human demography on cycles of dengue hemorrhagic fever incidence in Thailand. *42nd Annual Meeting of the Society for Epidemiologic Research, Anaheim, CA, 2009.*
- *16. **Lessler J**, Read JM, Riley SR, **Cummings DAT**. The use of satellite imagery in contact/travel questionnaires. *42nd Annual Meeting of the Society for Epidemiologic Research, Anaheim, CA, 2009.*

- *17. Lessler J, **Cummings DAT**, Read JM, Wang S, Zhu H, Smith GJD, Guan Y, Jiang CQ, Riley S. Location-specific patterns of exposure to recent pre-pandemic strains of Influenza A in Southern China. 3rd North American Congress of Epidemiology, Montreal, Canada, 2010.
18. Lessler J, Reich NG, Iamsirithaworn S, **Cummings DAT**. Prediction and imputation of spatio-temporal data: dengue surveillance in Thailand. 3rd North American Congress of Epidemiology, Montreal, Canada, 2010.
- *19. Althouse B, Sall A, Hanley K, Diallo M, Watts D, Weaver S, **Cummings DAT**. A multi-host, multi-vector SIR model of Dengue-2 virus in Senegal. 59th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Atlanta, GA, 2010.
- *20. Van Panhuis WG, Luxemburger C, Pengsaa K, Limkittkil K, Sabchareon A, **Cummings DAT**, Lang J, Durbin AP. A longitudinal analysis of maternal dengue antibody kinetics among infants in Bangkok. 59th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Atlanta, GA, 2010.
- *21. Reich NG, Shrestha S, King AA, Rohani P, Gibbons RV, **Cummings DAT**. Using a discrete-time state-space model to estimate the degree of cross-protection between serotypes of dengue virus due to infection. 3rd International Conference on Infectious Disease Dynamics, Boston, MA, 2011.
- *22. Lessler J, Metcalf CM, **Cummings DA**, Grenfell BT. The coverage of measles vaccinations activities in Africa. 3rd International Conference on Infectious Disease Dynamics, Boston, MA, 2011.
- *23. Chadsuthi S, Althouse B, Iamsirithaworn S, Wannapong T, **Cummings DAT**. Climate, land use and travel times predict the spatial advance of chikungunya during an outbreak in Southern Thailand. 60th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Philadelphia, PA 2011.
- *24. Rainwater-Lovett K, Rodriguez-Barraquer I, **Cummings DAT**, Lessler J. Variation in dengue virus plaque reduction neutralization testing: systematic review and pooled analysis. 60th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Philadelphia, PA 2011.
- *25. Althouse BM, Ng YY, **Cummings DAT**. Prediction of dengue incidence using search query surveillance. 60th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Philadelphia, PA 2011.
26. **Cummings DAT**, Reich NG, Burke DS, Nisalak A, Jarman R, Gibbons RV. Estimates of the degree of length of cross-protection between dengue serotypes from time series models. 60th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Philadelphia, PA 2011.
- *27. Rodriguez-Barraquer I, Buathong R, Iasirithaworn S, Lessler JT, Jarman RG, **Cummings DAT**. The changing epidemiology of dengue in Thailand: insights from serological studies conducted in the same location, 30 years apart. 60th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Philadelphia, PA 2011.
- *28. Buathong R, Rodriguez-Barraquer I, Iasirithaworn S, Lessler JT, Jarman RG, Gibbons RV, **Cummings DAT**. Serological survey of dengue infections among individuals in Rayong, Thailand. 60th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Philadelphia, PA 2011.
- *29. Azman A, Salje J, Rodriguez-Barraquer I, Althouse BM, Endy TP, Nisalak A, Jarman R, Gibbons RV, **Cummings DAT**. Longitudinal characterization of antibody response to dengue virus in Bangkok,

Thailand. 60th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Philadelphia, PA 2011.

*30. Salje H, Lessler J, Endy T, Curriero F, Gibbons RV, Nisalak A, Nimmannitya S, Jarman R, Burke DS, **Cummings DAT**. Evidence for spatially and temporally clustered transmission and immunity of dengue virus from hospital-based surveillance. 60th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Philadelphia, PA 2011.

31. Building models of school-based interventions to control influenza and other respiratory pathogens: the role of proximity detectors and contact surveys to describe the social mixing of school aged children. **Cummings DAT**, Cousins JH, Creppage K, Galloway D, Guclu H, Li K, Noble E, Brown S, Rainey J, Read J, Gao H, Uzicanin A, Vukotich CJ Sr., Zimmer SM. Dynamics of Preparedness. University of Pittsburgh.

32. Seroprevalence of dengue immunity among multiple species of non-human primates in Senegal. American Society of Tropical Medicine and Hygiene. **Cummings DAT**, Althouse BA, Cummings DAT, Guerbois M, Althouse BM, Sall AA, Diallo M, Diallo D, Diop O, Benefit B, Simons E, Watts DM, Weaver SC, Hanley KA. *American Society of Tropical Medicine and Hygiene*. 2013.

*33. Potential opportunities and perils of imperfect dengue vaccines: Direct vs. indirect vaccine effects Rodriguez-Barraquer I, Mier-y-Terán-Romero L, Schwartz IB, Burke DS, **Cummings DAT**. *Epidemics*. Amsterdam, 2013.

34. Recreating Historic Patterns of Influenza Incidence from Cross-Sectional Serologic Data. Lessler J, Riley S, Read JM, Zhu H, Jiang CQ, Guan Y, **Derek AT Cummings**. *Epidemics*. Amsterdam, 2013.

35. Social behavior and influenza infection. Kucharski AJ, Kwok KO, Wei VWI, Cowling BJ, Read JM, Lessler JT, Cummings DAT, Riley S, *Epidemics*. Amsterdam, 2013.

36. Social connectivity along a population density gradient in southern China. Read JM, Lessler J, Riley S, Wang S, Tan LJ, Kwok KO, Guan Y, Jiang CQ, **Cummings DAT**. *Epidemics*. Amsterdam, 2013.

37. Nonlinear Programming Techniques for Efficient Estimation of Large Spatio-Temporal Infectious Disease Models. **Cummings DAT**, Laird CD, Word D, Burke DS. *MIDAS Annual meeting*. 2014

38. Adjusting underreported real time case data for prediction of Dengue in Thailand. Sakrejda K, Reich NG, **Cummings DAT**, Suangtho P, Hinjoy S, Iamsirithaworn S, Clapham HE, Salje H. *American Society of Tropical Medicine and Hygiene*. 2014

*39. Characterizing global and local trends in dengue transmission: insight from age-specific surveillance data. Rodriguez Barraquer I, **Cummings DAT**. *American Society of Tropical Medicine and Hygiene*. 2014

*40. Estimating cross-enhancement and cross-protection of dengue viruses using time series data from Thailand. Clapham HE, Reich NG, Yoon IK, Jarman RG, Sakrejda K, Fernandez S, Nisalak A, Kalayanaroj S, **Cummings DAT**. *American Society of Tropical Medicine and Hygiene*. 2014

*41. Evidence for the recent emergence of dengue in Bangladesh: results from a seroprevalence study. Salje H, Naser AM, Rahman M, Rahman MZ, Lessler J, **Cummings DAT**, Luby SP, Gurley E. *American Society of Tropical Medicine and Hygiene*. 2014

*42. Mechanisms of traveling waves and periodic spatial synchronization of dengue hemorrhagic fever incidence in Thailand. Mier-y-Teran Luis, Grabowski K, Lessler J, Salje H, Rodriguez-Barraquer I, Burke D, Anantapreecha S, A-Nuegoonpipat A, Jarman R, Iamsirithaworn S, Bianco Si, Shaw LB, Schwartz IB, **Cummings DAT**. *American Society of Tropical Medicine and Hygiene*. 2014

43. Real-time forecasting of the 2014 dengue fever season in Thailand. Reich NG, Sakrejda K, **Cummings DAT**, Suarngtho P, Hinjoy S, Iamsirithaworn S, Clapham HE, Salje H, Lessler J. *American Society of Tropical Medicine and Hygiene*. 2014

*44. Variability in dengue titer estimates from plaque reduction neutralization tests poses a challenge to epidemiological studies and vaccine development. Salje H, Rodriguez-Barraquer I, Rainwater-Lovett K, Nisalak A, Thaisomboonsuk B, Thomas SJ, Fernandez S, Jarman RG, Yoon IK, **Cummings DAT**. *American Society of Tropical Medicine and Hygiene*. 2014

*45. What proportion of dengue virus infections result in no apparent disease? Clapham HE, **Cummings DAT**, Johansson MA. *American Society of Tropical Medicine and Hygiene*. 2014

Scientific Presentations (without abstracts)

1. Time-series decomposition methods for infectious disease epidemiology. *North American Congress of Epidemiology, 2006, Seattle, WA*.

2. Spatial coherence and association of temperature, rainfall and the incidence of dengue hemorrhagic fever in Thailand. *DIMACS Workshop on Facing the Challenge of Infectious Diseases in Africa: The Role of Mathematical Modeling, 2006, Johannesburg, South Africa*

3. Modeling new vaccines for measles. *DIMACS Workshop on Facing the Challenge of Infectious Diseases in Africa: The Role of Mathematical Modeling, 2006, Johannesburg, South Africa*

4. Strategies for looking for pattern in spatio-temporal data. *DIMACS Workshop on Spatio-temporal and network models of disease spread, 2007, Edinburgh, Scotland*

5. Dengue and the demographic transition. *2nd International Conference on Dengue and Dengue Hemorrhagic Fever, 2008, Phuket, Thailand*

6. Influenza transmission in households in 1918. *Epidemics Conference on Infectious Disease Dynamics, 2008, Asilomar, CA*

7. Immune landscapes of human influenza in southern China. *Ecology and Evolution of Infectious Diseases, National Institutes of Health and National Science Foundation, 2010, Snowbird, UT*

8. Location-specific patterns of exposure to recent pre-pandemic strains of influenza A in southern China: the Fluscape project. *Ecology and Evolution of Infectious Diseases, National Institutes of Health and National Science Foundation, 2011, Madison, WI*

9. The role of modeling epidemics. What do we learn? *Infectious Disease Society of America, 2011, Washington, DC*

10. Location-specific patterns of exposure to recent pre-pandemic strains of influenza A in southern China: the Fluscape project. *Ecohealth, 2011, Baltimore, MD*

11. Dengue Work of the VMI. *Vaccine Modeling Initiative, 2011, Princeton, NJ.*
12. Estimates of the degree and length of cross-protection between dengue serotypes from time series models. *American Society of Tropical Medicine and Hygiene, 2011, Philadelphia, PA*
13. Immunological landscapes of influenza in southern China: the Fluscape project. *NIH MIDAS annual meeting, 2012, Boston, MA.*
14. Estimates of the degree and length of cross-protection between dengue serotypes from time series models. *NIMBioS Dengue Workshop, 2012, Knoxville, TN.*
15. Interactions between serotypes of dengue highlight epidemiological impact of cross-immunity. *Dynamical Systems Applied to Biology and Natural Sciences, 2013, Lisbon, Portugal.*
16. Models of the impact of partially effective dengue vaccines. *Gates Foundation Mathematical Modeling Summit. 2013. Seattle, WA.*
17. Integrated dengue control strategies. *Gates Foundation Mathematical Modeling Summit. 2013. Seattle, WA.*
18. Mechanistic models of transmission utilizing contact data. *Society for Epidemiologic Research. 2013, Boston, MA.*
19. Natural History and Transmissibility of the MERS-CoV. American Society of Microbiology. Annual Meeting. 2014. *Washington, DC.*
20. Spatiotemporal patterns of Dengue and Chikungunya virus. NIH RAPIDD Annual Meeting. 2014. *Bethesda, MD.*
21. Dengue modeling consortium: Analysis of CYD23 data. Sanofi. 2014. *Lyon, France.*
22. Spatiotemporal patterns of Dengue and Chikungunya virus. MIDAS Annual meeting. 2014. *Atlanta, GA.*
23. Middle Eastern Respiratory Syndrome (MERS): Investigating a Novel Coronavirus. MIDAS Annual meeting. 2014. *Atlanta, GA.*
24. Spatial dynamics of dengue at multiple scales. Gates Grand Challenges Meeting. 2014. *Seattle, WA.*
25. Transmission dynamics of dengue at multiple scales. WHO Consultation on Dengue Burden. 2014. *Atlanta, GA.*
26. Reporting requirements. Specific requirements for dengue intervention models. WHO Consultation on the impact of dengue vaccines. 2014. *Geneva, Switzerland.*
27. Transmission dynamics of dengue and immunization impact at multiple scales. WHO Consultation on the impact of dengue vaccines. 2014. *Geneva, Switzerland.*

Invited Seminars

1. Recurring spatial temporal traveling waves in dengue hemorrhagic fever incidence in Thailand.
Capitol Area Dengue Research Meeting, 2004, Silver Spring, MD
2. Modeling outbreaks for public health response.
Emerging Respiratory Infections Conference, Delaware Health and Social Services, 2004, Dover, DE
3. Spatial patterns of dengue hemorrhagic fever in Thailand.
Department of Geography, University of Maryland, 2004, College Park, MD
4. Periodic Traveling Waves in Dengue Hemorrhagic Fever Incidence in Thailand.
Virginia Bioinformatics Institute, 2004, Blacksburg, VA
5. Processes impacting the incidence of dengue hemorrhagic fever on multiple temporal and spatial scales.
53rd Annual Meeting of the American Society of Tropical Medicine and Hygiene, 2004, Miami, FL
6. Dynamic effects of antibody dependent enhancement on the fitness of dengue viruses.
Fogarty International Center, 2005, Washington, DC
7. Spatial synchrony of the waves of incidence of influenza in 1918.
Influenza Modeling Workshop, Global Health Security Action Group, G8, 2005, London, UK.
8. Can pandemic influenza be contained with antivirals?
Global Emerging Infections Surveillance and Response System, U.S. Department of Defense, 2005, Linthicum, MD
9. Dynamic effects of antibody dependent enhancement on the fitness of dengue viruses.
Center for Infectious Disease Dynamics, Penn State University, 2005, State College, PA
10. Strategies for containing an emerging influenza pandemic in Southeast Asia.
Modeling Working Group. Johns Hopkins Department of Biostatistics, 2005, Baltimore, MD
11. Simulating Pandemic Influenza.
Global Pandemic Initiative. IBM Industry Solutions Laboratory, 2005, Hawthorne, NY
12. Containing Pandemic Influenza.
Pandemic Influenza Preparedness Training, Johns Hopkins Center for Preparedness, 2006, Cumberland, MD
13. Dengue dynamics in Thailand over the last 20 years.
Thailand Centers for Disease Control, 2006, Bangkok, Thailand
14. Containing Pandemic Influenza.
Infectious Disease Informatics. Surveillance, Modeling and Response. National Center for Supercomputing Applications, 2006, Urbana-Champaign, IL
15. Dengue viruses: periodic traveling waves and serotype cycling in Thailand.
Five decades of discovery: A symposium to honor the contributions of Monto Ho, 2006, Pittsburgh, PA
16. Shifts in the epidemiology of dengue in Thailand.
University of Pittsburgh. Department of Epidemiology, 2007, Pittsburgh, PA

17. Dengue and the demographic transition.
NIH Fogarty Center, 2008, Bethesda, MD
18. Open questions in dengue research.
Penn State University: Research and Policy for Infectious Diseases Dynamics, 2008, University Park, PA
19. Shifts in the age of dengue hemorrhagic fever cases in Thailand.
CDC Branch, 2008, Puerto Rico
20. Models of the impact of dengue vaccines: a review of current research and potential approaches.
WHO Scientific Consultation of Dengue Vaccines, 2008, Belem, Brazil
21. Swine H1N1 influenza A: transmissibility, natural history and the potential impact of non-pharmaceutical interventions.
Johns Hopkins University, 2009, Baltimore, MD
22. Recent findings of transmission dynamics of dengue.
WHO Dengue Reference Group, 2009, Havana, Cuba
23. Dynamics and natural history of H1N1 influenza.
Grand Rounds, Welch Center, Johns Hopkins University, 2010, Baltimore, MD
24. The impact of spatial heterogeneity in the transmission of dengue on the synchrony of incidence.
University of Michigan MAC-EPID Annual Seminar, Ann Arbor, MI 2010.
25. Spatial variation in the transmission of dengue in Thailand: the role of demography and density.
Harvard School of Public Health, 2010, Boston, MA
26. Dengue Virus: Global trends, cycles and waves.
University of Michigan, 2010, Ann Arbor, MI
27. Spatial heterogeneity in the transmission of dengue at multiple spatial scales.
National Center for Medical Intelligence, 2011, Frederick, MD
28. Modeling approaches in long-term safety assessment of live attenuated dengue vaccines. Technical consultation on long term safety assessment of live attenuated dengue vaccines.
WHO, 2011, Geneva
29. Immune landscapes of human influenza in southern China: The Fluscape Project.
Harbin School of Public Health, 2011, Harbin, China
30. Modeling approaches in long-term safety assessment of live attenuated dengue vaccines. Technical Consultation on a Framework for Dengue Vaccine Safety Assessment.
WHO, 2011, Geneva
31. Dengue modeling work at Johns Hopkins and the Vaccine Modeling Initiative.
Secretaría de Salud (Ministry of Health), 2011, México
32. Spatial heterogeneity of influenza immunity and infection: the effect of population density and effective neighborhood size. *University of Massachusetts Amherst, 2012, Amherst, MA*

33. Models of the impact of partially effective dengue vaccines. 2013. *Sanofi Pasteur. Lyon, France.*
34. Spatial heterogeneity of influenza immunity and infection: the Fluscape study. *Ecology and Evolution of Infectious Disease Meeting. 2013. State College, PA.*
35. Techniques and Opportunities in Infectious Disease Modeling. *Center for AIDS Research Seminar. Johns Hopkins Bloomberg School of Public Health. 2013. Baltimore, MD.*
36. The Fluscape study. *Guangzhou Centers for Disease Control. 2013. Guangzhou, China.*
37. Social Mixing and Respiratory Transmission in Schools Study. *US Centers for Disease Control. 2013. Atlanta, GA.*
38. Middle Eastern Respiratory Syndrome (MERS): Investigating a Novel Coronavirus. *Johns Hopkins Health Advisory Board. 2013. Baltimore, MD.*
39. Social Mixing and Respiratory Transmission in Schools. *US Centers for Disease Control. 2013. Atlanta, GA.*
40. Opportunities and challenges to treatment as prevention approaches for Hepatitis C virus control. *Johns Hopkins University Center for AIDS Research. 2014. Baltimore, MD.*
41. Review of Dengue Models. *White House Office of Science and Technology Policy meeting on Integrating Prediction and Forecasting Models for Decision-making: Dengue Epidemic Prediction. 2014. Washington, DC.*
42. Potential opportunities and peril of imperfect dengue vaccines. *Johns Hopkins Medical School. 2014. Baltimore, MD.*
43. Ventilator Associated Pneumonia among ICU patients: *S. aureus* and *Pseudomonas* spp. *Medimmune. 2014. Gaithersburg, MD.*
44. Assessing local transmission of Ebola virus in Liberia. *Imperial College. 2014. London, UK.*
45. Spatial dynamics of dengue and vaccine models. *Royal Society. 2014. London, UK.*

CURRICULUM VITAE
DEREK A. T. CUMMINGS

PART II

TEACHING

Advisees

Current Advisees

Post-doctoral

Hannah Clapham		2013-present
Henrik Salje (co)		2014-present

PhD

Kristen Little	Epidemiology	2012-present
Talia Quandelacy	Epidemiology	2013-present

Masters

Andrew Marsh	MS in Epidemiology	2011-present
Jordan Johnson	MS in Epidemiology	2013-present
Jacob Carey	MS in Epidemiology	2014-present

Past Advisees

Post-doctoral

Luis Mier-y-Teran-Romero		2010-2014
Current Position: US CDC ORISE Fellow		
Isabel Rodriguez-Barraquer		2012-2014
Current Position: Research Associate, Johns Hopkins Bloomberg School of Public Health		
Kaitlin Rainwater-Lovett		2012-2013
Current Position: Research Associate, Johns Hopkins School of Medicine		
Nicholas Reich		2010-2011
Current Position: Assistant Professor, University of Massachusetts, Biostatistics		
Justin Lessler		2008-2011
Current position: Assistant Professor, Johns Hopkins Bloomberg School of Public Health		
Carl Laird		2007-2008
Current Position: Associate Professor, Texas A&M University, Department of Chemical Engineering		

PhD

Henrik Salje Epidemiology 2009-2014
Thesis title:
Insights into the microscale spatial dynamics of dengue and chikungunya in Southeast Asia

Andrew Azman Epidemiology 2009-2014
(co with Justin Lessler)
Thesis title: Heterogeneities in Cholera Transmission

Ben Althouse Epidemiology 2009-2013
Thesis title: Mechanistic Modeling of Sylvatic Arboviruses in Senegal

Su-Hsun Liu Epidemiology 2008-2012
Thesis title: Detectable Human Papillomavirus DNA: Prevalent vs. Incident Infection

Isabel Rodriguez-Barraquer Epidemiology 2007-2012
Thesis title: The Shifting Epidemiology Of Dengue: Insight From Serological Surveys

Justin Lessler Epidemiology 2004-2008
Thesis title: Detection and characterization of respiratory pathogens in institutions

Masters

Yanjie Huang MS in Epidemiology 2013-2014
Thesis title: Quantifying Human Mobility Using The Longest Disease Traveled

Rome Buathong MS in Tropical Medicine 2010-2014
Royal Tropical Institute, Amsterdam, Netherlands
Thesis title: Risk and protective factors for primary and secondary dengue infections among school-aged children in Meuang district, Rayong province, Thailand

Madhura Rane MS in Epidemiology 2012-2013
Socioeconomic determinants of mortality and disease transmission at census tract level during the 1918 H1N1 Influenza pandemic in Chicago

Katrina Mott MS in Epidemiology 2010-2012
The Effect Of Age And Syndrome On Serotype Prevalence In Invasive Pneumococcal Disease: A Sub-Analysis Of The Pneumococcal Global Serotype Project

Paul Maurizio MS in Molecular Microbiology and Immunology 2009-2011
Thesis Title: Detection And Vertical Transmission Of Culex Flavivirus In Culex Quinquefasciatus (Diptera: Culicidae) Mosquitoes From Zambia, Africa

Ben Althouse MS in Biostatistics 2009-2010
Thesis Title: A Multi-Host Multi-Vector SIR Model of Dengue Fever in Senegal

Ripa Chakravorty MS in Epidemiology 2009-2010

Thesis Title: Modeling the incubation period of Escherichia coli

Jon Benenson	MS in Biostatistics	2008-2010
Thesis Title: Susceptible reconstruction and serotype specific estimates of seasonality of transmission of dengue viruses in Thailand using a Time-Series-Susceptible-Infected-Recovered model		
Jodi Udd	MPH	2009-2010
Eileen Obe	MPH	2009-2010
Yih Yng Ng	MPH	2008-2009
Thesis title: Prediction of Influenza-Like Illness trends in Singapore using Internet search data		
Hannah Lee	MPH	2008-2009
Katherine Lin	MHS in Epidemiology	2007-2008
Thesis Title: A Method to Geocode Rural Addresses and Post Office Boxes: Application to a Study of Drinking Water Nitrate Exposure and Cancer Incidence		
Duza Baba,	MHS in International Health	2006
Heidi Hallman	MHS in International Health	2006
Kristin Kelling	MHS in International Health	2005
Alex Ruan	Undergraduate in Public Health	2012

*Preliminary Oral Participation (*alternate)*

Departmental

Name	Date
Rebecca Pierce*	PhD 2014
Andrew Azman	PhD 2012
Henrik Salje	PhD 2011
Isabel Rodriguez-Barraquer	PhD 2011
Benjamin Althouse	PhD 2010
Su-Hsun Liu	PhD 2009
Amanda Latimore	PhD 2007
Bridget Ambrose	PhD 2006

Schoolwide

Mariam Fofana	PhD	Epidemiology	2014
Holly Schuh	PhD	International Health	2014
Kristen Little	PhD	Epidemiology	2014
Huitong Qui	PhD	Biostatistics	2014
Mufaro Kanyangarara	PhD	International Health	2014
Ian Craig	PhD	International Health	2013
Jessica Atwell	PhD	International Health	2013
Ricardo Castillo	PhD	Epidemiology	2012
Andrew Azman	PhD	Epidemiology	2012

Benjamin Althouse	PhD	Epidemiology	2012
Genevieve Wojcik	PhD	Epidemiology	2011
Michelle Mergier*	PhD	International Health	2011
Alison Turnbull*	PhD	Epidemiology	2011
Emily Gurley	PhD	Epidemiology	2011
Henrik Salje	PhD	Epidemiology	2011
Su-Hsun Liu	PhD	Epidemiology	2011
Amanda Latimore	PhD	Epidemiology	2010
James Stark	PhD	Epidemiology, University of Pittsburgh	2010
Isabel Rodriguez-Barraquer	PhD	Epidemiology	2010
Nikolas Wada*	PhD	Epidemiology	2010
Adrienne Shapiro	PhD	Epidemiology	2009
Bridget Ambrose	PhD	Epidemiology	2008
Willem van Panhuis	PhD	International Health	2008
Nicholas Reich	PhD	Biostatistics	2008
Kathryn Anderson	PhD	Epidemiology, Emory University	2008
Tassanee Silawan	PhD	Epidemiology, Mahidol University	2007

Final Oral Participation

Henrik Salje	PhD	Epidemiology	2014
Andrew Azman	PhD	Epidemiology	2014
Kara Randolph*	PhD	Epidemiology	2014
Ben Althouse	PhD	Epidemiology	2013
Hannah Clapham	PhD	Infectious Disease Epidemiology Imperial College	2013
Melinda Munos*	PhD	International Health	2012
Alison Liu	PhD	Epidemiology	2012
Isabel Rodriguez-Barraquer	PhD	Epidemiology	2012
Kaitlin Rainwater Lovett	PhD	Epidemiology	2012
Johns Ayers*	PhD	Health, Behavior and Society	2011
Kathryn Anderson	PhD	Epidemiology, Emory University	2010
James Stark	PhD	Epidemiology, University of Pittsburgh	2010
Nicholas Reich	PhD	Biostatistics	2010
Emily Henkle*	PhD	Epidemiology	2010
Willem van Panhuis	PhD	International Health	2009
Justin Lessler	PhD	Epidemiology	2008
Michael Johansson	PhD	Molecular Microbiology & Immunology	2008
Christina Schumaker	PhD	Epidemiology	2008
David Dowdy	PhD	Epidemiology	2008
Tassanee Silawan	PhD	Epidemiology, Mahidol University	2008

Thesis Committee Participation

Andrew Azman	Heterogeneities in Cholera Transmission
Mary Grabowski	Patterns and predictors of the epidemiological and evolutionary dynamics of HIV-1 infection in Rakai, Uganda
Ben Althouse	Studies of Sylvatic Dengue in Senegal
Henrik Salje	Combining surveillance data with genetic analysis in the characterization of spatiotemporal clustering of dengue cases in Bangkok

Isabel Rodriguez-Barraquer	Towards a better estimation of the force of infection and basic reproductive number of dengue virus
Su-Hsun Liu	Mathematical modeling to inform likelihood of second peak HPV prevalence in older women
Kaitlin Lovett	The Impact of Immune Reconstitution and Revaccination on Measles Immunity in HIV-infected Zambian Children initiating Antiretroviral Therapy
Genevieve Wojcik	A Genome-Wide Association Study of Oral Polio Vaccine Failure in Infants from Bangladesh (MAL-ED Study):Gene-, and Pathway-Level Analyses
Emily Gurley	Exposure to Indoor Air Pollution and Pneumonia in Dhaka, Bangladesh
Justin Lessler	The Detection and Characterization of Respiratory Virus Transmission in Institutions
Willem van Panhuis	Dynamics of Dengue Antibodies : Transplacental Transfer, Decline after Birth and the Serotype Specific Response to Infection among Infants and Children in Thailand
Christina Schumacher	Identifying, Characterizing and Predicting the Role of Core Groups in Syphilis Epidemics
Nicholas Reich	Statistical Methods for Incomplete Data from Infectious Disease Outbreaks
Michael Johansson	The Influence of Climate on Dengue Transmission in Puerto Rico
David Dowdy	Impact and Cost-Effectiveness of Improved Diagnostics for Tuberculosis in Developing Countries

Classroom Instruction

2014

Principal Instructor (with Dr. Kenrad Nelson, Dr. Shruti Mehta, and Dr. Isabel Rodriguez-Barraquer)
 Department of Epidemiology
 Bloomberg School of Public Health
 Johns Hopkins University
 Epidemiology of Infectious Diseases
 Enrollment: 42

2009-2015

Principal Instructor (with Dr. William Moss and Dr. Justin Lessler)
 Department of Epidemiology
 Bloomberg School of Public Health
 Johns Hopkins University
 Concepts and Methods in Infectious Disease Epidemiology
 Enrollment: 10, 35, 35, 35, 32, 27

2007-2008, 2009-2015

Principal Instructor
 Department of Epidemiology
 Bloomberg School of Public Health
 Johns Hopkins University
 Infectious Disease Dynamics: Theoretical and Computational Approaches
 Enrollment: 18, 25, 20, 30, 20, 22, 24, 20

2011

Guest Lecturer “Modeling and prediction of DHF”, “Models of dengue transmission and dengue vaccines”

PAHO/Instituto Pedro Kouri Dengue Institute

Havana, Cuba

Enrollment: 210

2010

Principal Instructor

Infectious Disease Dynamics: Theoretical and Computational Approaches

Johns Hopkins Bloomberg School of Public Health Fall Institute

Barcelona, Spain

Enrollment: 20

2007-2013

Instructor

Department of Epidemiology

Bloomberg School of Public Health

Johns Hopkins University

Epidemiologic Methods 3

Enrollment: 220 on average in class total each year, 60 in lab section each year.

2007-2013

Faculty Advisor

Department of Epidemiology

Bloomberg School of Public Health

Johns Hopkins University

Modeling of Spatial and Temporal Disease Epidemiology Forum-Student Group

2005-2006

Principal Instructor

Department of International Health

Bloomberg School of Public Health

Johns Hopkins University

Infectious Disease Dynamics: Theoretical and Computational Approaches

Enrollment: 19, 15

2005-2013 (12 separate lectures)

Guest Lecturer “Introduction to mathematical modeling of infectious diseases”, “Influenza”

Department of Epidemiology

Bloomberg School of Public Health

Johns Hopkins University

Infectious Disease Epidemiology

2012-2014 (5 separate lectures)

Guest Lecturer “MERS Coronavirus”, “Dengue”, “SARS Coronavirus”

Department of Epidemiology

Bloomberg School of Public Health

Johns Hopkins University

Emerging Infectious Disease

2008-2010

Guest Lecturer “Host demographics and infectious disease dynamics”
Department of Molecular Microbiology and Immunology
Bloomberg School of Public Health
Johns Hopkins University
Ecology of Infectious Disease

2007-2008

Co-organizer
Departments of Epidemiology and Biostatistics
Bloomberg School of Public Health
Johns Hopkins University
Epi/Biostats Working Group on Infectious Disease

2014, 2015

Guest Lecturer “Infectious Disease Epidemiology”
Global Institute of Public Health
New York University

2006-2008

Guest Lecturer
University of Pittsburgh Graduate School of Public Health
Department of Epidemiology
Infectious Disease Epidemiology

2012

Guest Lecturer “A Practical Short Course in Infectious Disease Modeling”
Harvard University/Mahidol University
Bangkok

2006-2014

Guest Lecturer “Models of infectious disease dynamics”
United States Uniformed Services University
Bethesda, MD
Infectious Disease Epidemiology

2006-2011

Instructor
Field Epidemiology Training Program
Thailand Ministry of Public Health
Bangkok, Thailand
Infectious Disease Dynamics

2003-2004

Guest Lecturer
Department of Earth and Planetary Sciences
Zanvyl Krieger School of Arts and Sciences
Johns Hopkins University
Climate Change and Global Health

2001
Tutorial Instructor
GEOMED 2001
Université Pierre et Marie Curie, Paris
Time-Series Analysis, Pre-conference Tutorial

1996
Teaching Assistant
Inorganic Chemistry, Brown University

RESEARCH GRANT PARTICIPATION

Active Support

Linking antigenic and genetic variation of dengue to individual and population risk

02/01/15-1/31/2020, NIH R01

Principal Investigator: Derek Cummings

Funding Level: 2.4 calendar months

Primary Goal: Characterize the genetic and antigenic variability of dengue viruses circulating over the last twenty years using a large repository of viral samples and build population models of ecological interactions between dengue viruses and its impact on human health.

Monitoring cause-specific school absences to estimate influenza transmission in Western PA

09/01/13-08/31/16, CDC

Principal Investigator: Derek Cummings

Funding Level: 1.2 calendar months

Primary Goal: To refine surveillance in communities for influenza and other respiratory disease incidence using cause-specific absenteeism in school-children in western Pennsylvania.

Role: Principal Investigator

Staphylococcus aureus and Pseudomonas Hospital Acquired Infections

01/01/13-12/31/16, MedImmune

Principal Investigator: Derek Cummings (co) with Trish Perl

Funding Level: 0.6 months

Primary Goal: Identify risk factors for hospital acquired infections of staphylococcus aureus and pseudomonas in 7 hospital centers and assist in trial design for new intervention products.

Role: Principal Investigator

Modeling of infectious disease; A study of repeat influenza vaccination, and how population based immunity impacts the genetic makeup of dengue viruses.

04/01/14-3/30/2015, WRAIR

Principal Investigator: Derek Cummings

Funding Level: 0.12 calendar months

Primary Goal: Two part project to determine the impact of successive influenza vaccine on immunity and risk and 2) dengue population immunity and how this shapes the dengue viral evolution.

Role: Principal Investigator

Methods for Reducing Spatial Uncertainty and Bias in Disease Surveillance

02/01/2013-01/31/2018, NIH NIAID

Principal Investigator: Justin Lessler

Funding Level: 2.4 calendar months

The goal of this research is to develop methods that can improve forecasting and current estimates of the incidence of dengue and other infectious diseases. The project uses multiple approaches including mechanistic models and models that traverse multiple temporal and spatial scales to produce estimates of incidence.

Role: Investigator

The RESPECT Study

09/01/10-08/31/15, CDC/VA

Principal Investigators: Trish Perl, Lew Radonovich (co-PI's)

Funding Level: 1.2 calendar months

Primary Goal: The goal of this research is to compare the efficacy of surgical masks to N95 respirators in protecting health care workers from respiratory viruses including influenza.

Role: Investigator

Inference for interacting pathogens with mechanistic and phenomenological models

09/01/14-08/31/16, NIH

Principal Investigators: Derek Cummings (local PI), Nick Reich (overall PI)

Funding Level: 1.56 calendar months

Primary Goal: Develop inference framework to estimate interactions of multiple pathogens that co-circulate and induce immune responses that might create competitive and/or enhancing relationships.

Role: Investigator

University of Pittsburgh MIDAS Center of Excellence: Data and Statistical Inference Project

07/01/14-08/31/19, NIH

Principal Investigators: Derek Cummings (local PI), Donald Burke (overall PI)

Funding Level: 3.00 calendar months

Primary Goal: Computational modeling for science and policy is driven by availability of data to estimate model parameters. Insights for disease transmission dynamics are derived from statistical inference using these models. This project will capitalize on new opportunities provided by large scale genetic and epidemiological data created during MIDAS-II to study infectious disease transmission dynamics at the micro- and macro level using innovative statistical approaches and parameter estimation methods.

Role: Investigator

Analytic Support for the Ebola Outbreaks and Strengthening Primary Health Care in West Africa and Democratic Republic of Congo

10/15/14-01/31/15, Unicef

Principal Investigators: David Peters (PI)

Funding Level: 0.12 calendar months

Primary Goal: The goal of this project is to conduct analyses and simulations to support UNICEF's response to the Ebola virus outbreak in West Africa.

Role: Investigator

Completed Support

VMI II: Application of Computational Models to Guide and Evaluate Global
07/01/13-06/30/15, University of Pittsburgh, Bill and Melinda Gates Foundation

Principal Investigator: Derek Cummings

Funding Level: 0.60 calendar months

Primary Goal: To use theoretical models to evaluate multiple vaccination strategies and vaccine candidates to control dengue and other vector-borne diseases

Role: Principal Investigator

Quantifying Contact Rates and Mixing Patterns in School Aged Children

08/31/11 - 08/30/14, CDC

Principal Investigator: Derek Cummings (co) with Shanta Zimmer

Funding Level: 1.2 calendar months

Primary Goal: The goal of this work is to use multiple methods to quantify the contacts that school children make that could potentially transmit influenza including survey, proximity detectors and GPS devices in order to evaluate each of these methods. We will also link measures of social contact to the risk of acquisition of influenza.

Role: co-Principal Investigator

Immune Landscapes of Human Influenza in Households, Towns and Cities in Southern China

10/01/08-8/31/14, NIH

Principal Investigator: Derek Cummings

Funding Level: 1.8 calendar months

Primary Goal: The goal of this work is to characterize immunological profiles to human influenza in space and time among individuals living in Guangzhou province, China, and to build computational models that capture the transmission dynamics that could create the specific distributions observed.

Role: Principal Investigator

Career Award at the Scientific Interface

07/01/07 - 07/31/15, Burroughs Wellcome

Principal Investigator: Derek Cummings

Funding Level: 0.12 calendar months

Primary Goal: To study natural and vaccine-induced immunity and spatial-temporal dynamics of epidemic dengue

Role: Principal Investigator

Using Viral Sequences to Characterize the Micro-scale Dispersal Dynamics of Dengue in Bangkok

2/1/2012-12/31/2014, Johns Hopkins Center for Global Health

Principal Investigator: Derek Cummings

Funding level: \$50,000 research funds (0 months)

Primary Goal: Describe the micro-scale transmission of dengue in an urban environment using genetic and geographic information on the occurrence of cases.

Role: Principal Investigator

Computational Models of Infectious Disease Threats Center for Excellence

04/01/09 – 04/01/14, NIH-NIGMS

Principal Investigator: Don Burke

Funding Level: 3.0 calendar months

Primary Goal: Integrate the most advanced and powerful techniques of epidemiological data analysis with those of computer simulation to produce a unified computational epidemiology.

Role: Investigator

Vaccine Modeling Initiative

04/1/08-04/31/13, Bill and Melinda Gates Foundation

Principal Investigator: Don Burke

Funding Level: 1.0 calendar months

Primary Goal: Evaluation of candidate vaccine technologies using computational models.

Role: Investigator

Temporal and Spatial Dynamics of Sylvatic Arbovirus Transmission and Emergence

10/1/08-09/31/13, NIH

Principal Investigator: Scott Weaver

Funding Level: 1.8 calendar months

Primary Goal: The goal of this project is to study the dynamics of transmission of dengue and chikungunya virus among non-human primate species in Senegal and determine which species support transmission of these viruses endemically and which ones appear to be only spillover species.

Role: Investigator

Multi-Scale Modeling of Infectious Diseases in Fluctuating Environments

09/01/09 – 08/31/13, NIH

Principal Investigator: Derek Cummings, Lora Billings (co)

Funding Level: 0.6 calendar months

Primary Goal: The objective of this proposal is to develop new mathematical models of infectious disease transmission that effectively, capture the impact of stochasticity on dynamics and lead to more effective control. The group will study the dynamics of disease spread in fluctuating environments modeled at various population scales.

Role: Co-Principal Investigator

Preparedness and Catastrophic Event Response (PACER)

06/01/09 – 05/31/12, US department of Homeland Security

Principal Investigator: Gabe Kelen

Funding Level: 0.12 calendar months

Primary Goal: PACER is a consortium of research institutions studying how the nation can best prepare for and respond to potential large-scale incidents and disasters. My work on this project is on model development for pandemic influenza models particularly, methods for parameter estimation for individual based simulations.

Role: Investigator

Immune Reconstitution of HIV-1 Infected Zambian Children Initiating Antiretroviral Therapy 03/01/07 – 02/28/12, NIH

Principal Investigator: William Moss

Funding Level: 0.6 calendar months

Primary Goal: This project will study measles and measles vaccination in HIV-1-infected

children in Lusaka, Zambia to characterize measles virus-specific immune reconstitution and immunologic memory in Zambian children initiating ART.
Role: Investigator

Planning for Avian Influenza Outbreaks and Potential Pandemics
9/14/05 – 3/31/10, NIH-Fogarty International Center

Principal Investigator: Don Burke
Funding Level: 0.6 calendar months
Primary Goal: Develop capacity among epidemiologists at the Thai Ministry of Public Health to utilize new theoretical and computational tools in concert with traditional epidemiologic approaches to address issues surrounding avian influenza and potential influenza pandemics.
Role: Investigator

Computational Models of Infectious Disease Threats
04/01/04 – 04/01/09, NIH-NIGMS

Principal Investigator: Don Burke
Funding Level: 4.2 calendar months
Primary Goal: Integrate the most advanced and powerful techniques of epidemiological data analysis with those of computer simulation to produce a unified computational epidemiology.
Role: Program Coordinator and Investigator

Pittsburgh Influenza Prevention Program
10/01/06 - 09/31/08, CDC

Principal Investigator: Don Burke
Funding Level: 0.6 calendar months
Primary Goal: Study the transmission dynamics of influenza in Pittsburgh elementary schools and conduct trials of non-pharmaceutical interventions targeting influenza transmission.
Role: Investigator

Harmonic Decomposition and Compartmental Models in the Analysis of Epidemiologic and Climatic Data: An Analysis of Dengue in Southeast Asia
07/01/04 - 06/31/07, NOAA

Principal Investigator: Don Burke
Funding Level: 2.4 calendar months
Primary Goal: Apply methods developed under previous funding cycle to data from Southeast Asia on dengue hemorrhagic fever.
Role: Investigator

Ethical Issues in Influenza Pandemic Preparedness and Response
04/01/06 - 10/01/06, Rockefeller Foundation

Principal Investigators: Ruth Faden and Ruth Karron (co-PI's)
Funding Level: 0.12 calendar months
Primary Goal: Identify current and potential responses to the threat of pandemic influenza that profoundly affect the world's disadvantaged and to undertake concrete action to prevent or at least to mitigate those responses that are the most unjust. Simulate the impact of pandemic mitigation responses in resource poor settings.
Role: Investigator

Computational Modeling of Vaccination Strategies against Smallpox

08/01/02 - 07/31/04, Alfred P. Sloan Foundation

Principal Investigator: Joshua Epstein

Funding Level: 2.4 calendar months

Primary Goal: Develop computer simulations of the introduction and spread of a bio-terrorist agent such as smallpox in human populations, and evaluate possible response strategies.

Role: Investigator

Research to Guide Allocation of Public Resources in the Event of an Intentional Introduction of Smallpox

12/01/02 – 05/31/04, FIC / NIH / DHHS

Principal Investigator: Don Burke

Funding Level: 2.4 calendar months

Primary Goal: Develop, evaluate, and utilize computational models of smallpox introduction into the USA, and of public health strategies to contain smallpox epidemics.

Role: Investigator

Harmonic Deconstruction in the Analysis of Epidemiologic and Climatic Data.

08/01/02 – 07/31/03, NOAA

Principal Investigator: Don Burke

Funding Level: 2.4 calendar months

Primary Goal: Develop and evaluate new computational methods for correlating dengue epidemiologic data and weather data, such as wavelet transforms and Empiric Mode Decomposition.

Role: Investigator

ACADEMIC SERVICE

Department of Epidemiology

Lead, Department of Epidemiology Self-study	2013-present
Chair of Faculty Executive Committee	2013-present
Faculty Executive Committee	2012-present
Infectious Disease Journal Club, Faculty Coordinator	2009-2012
Admissions and Credentialing Committee, Member	2009-2012

Department of International Health

Steering Committee, Member	2005-2006
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School-wide

Technology Transfer Committee, Member	2010-present
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ADDITIONAL INFORMATION

Personal statement of research and research objectives

I am interested in developing effective strategies for the control infectious diseases. My approach in doing this is to develop temporally or spatially targeted administration of vaccines or other interventions to produce the largest reduction in morbidity and mortality. I utilize a mix of field study and theoretical models of infectious disease in order to understand the transmission dynamics of dengue, influenza, measles, hepatitis C and chikungunya and to estimate the impact of specific interventions.

Keywords

Infectious disease, dynamics, influenza, dengue, measles, hepatitis C, ebola, social dynamics, vaccine-preventable, mathematical models, ecology