Pratha Sah

Curriculum Vitae

Research interests

Computational epidemiology, data science, infectious disease ecology, public health, network analysis.

Work experience

2017-current Postdoctoral associate: Center for Infectious Disease Modeling and Analysis, Yale School of Public Health, Yale University

2011-2012 Research assistant: Population Biology Laboratory, Indian Institute of Science Education and Research (IISER), Pune, India

Education

2012-2017 **Ph.D**, *Quantitative disease ecology: Infectious disease modeling, network epidemiology*, Georgetown University, Washington, DC.
Thesis advisor: Dr. Shweta Bansal

2009-2011 **M.Sc**, *Natural resources management*, The Energy and Resources Institute (TERI) University, New Delhi, India.

2006-2009 **B.Sc.**, *Zoology, Biotechnology (minor)*, Pune University, Pune, India.

Peer reviewed publications

2018 **Sah, Pratha**, Jan Medlock, Meagan C. Fitzpatrick, Burton H. Singer, and Alison P. Galvani. Optimizing the impact of low-efficacy influenza vaccines. *Proceedings of the National Academy of Sciences*, 115(20), 5151-5156.

2018 Reyes, Olivia, Elizabeth C. Lee, **Pratha Sah**, Cécile Viboud, Siddharth Chandra, and Shweta Bansal. Spatio-Temporal Patterns and Diffusion of the 1918 Influenza Pandemic in British India. *American journal of epidemiology*.

2018 Manlove, Kezia, Christina Aiello, **Pratha Sah**, Bree Cummins, Peter J. Husdon, and Paul C. Cross. The ecology of movement and behaviour: a saturated tripartite network for describing animal contacts. *Proceedings of the Royal Society B*, 285(1887), 20180670.

2017 **Sah, Pratha**, Meagan C. Fitzpatrick, Abhishek Pandey, and Alison P. Galvani. HIV criminalization exacerbates subpar diagnosis and treatment across the United States: response to the 'Association of HIV diagnosis rates and laws criminalizing HIV exposure in the United States'. *AIDS*, 31(17), 2437-2439.

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2017 **Sah Pratha**, Janet Mann and Shweta Bansal. Disease implications of animal social network structure: a synthesis across social systems. *Journal of Animal Ecology*.

2017 **Sah, Pratha**, Stephan T. Leu, Paul C. Cross, Peter J. Hudson and Shweta Bansal. Unraveling the disease consequences and mechanisms of modular structure in animal social networks. *Proceedings of the National Academy of Sciences*, 114(16), 4165-4170.

2016 **Sah, Pratha**, Kenneth E. Nussear, Todd C. Esque, Christina Aiello, Peter J. Hudson and Shweta Bansal. Inferring social structure and its drivers form refuge use in the desert tortoise, a relatively solitary species. *Behavioral Ecology and Sociobiology*, 70(8), 1277-1289.

2016 Aiello, Christina M., Kenneth E. Nussear, Todd C. Esque, Patrick G. Emblidge, **Pratha Sah**, Shweta Bansal, and Peter J. Hudson. Host contact and shedding patterns clarify variation in pathogen exposure and transmission in threatened tortoise *Gopherus agassizii*: implications for disease modelling and management. *Journal of Animal Ecology*, 85(3), 829-842.

2014 **Sah, Pratha,** Lisa Singh, Aaron Clauset and Shweta Bansal, Exploring community structure in biological networks with random graphs. *BMC Bioinformatics*, 15(1), 220.

2014 **Sah, Pratha**, and Sutirth Dey. Stabilizing spatially structured populations through Adaptive Limiter Control. *PloS ONE*, 9(8), e105861.

2014 Aiello Christina M., Kenneth E. Nussear, Andrew D. Walde, Todd C. Esque, Patrick G. Emblidge, **Pratha Sah**, Shweta Bansal, and Peter J. Hudson. Disease dynamics during wildlife translocations: Disruptions to the host population suggest consequences for transmission as illustrated by desert tortoise spatial networks. 2014. *Animal Conservation*, 17, 27-39.

2013 **Sah, Pratha**, Joseph Paul Salve, and Sutirth Dey. Stabilizing biological populations and metapopulations by Adaptive Limiter Control. 2013. *Journal of Theoretical Biology*, 320 (7), 113-123.

Preprints

2017 **Sah, Pratha**, Jose David Mendez, and Shweta Bansal. A multi-species repository of social networks. *bioRxiv*, 464271.

2017 **Sah, Pratha**, and Shweta Bansal. Identifying the dynamic contact network of infectious disease spread. *bioRxiv*, 169573.

Outreach publications

2018 Sarah A. Galvani-Townsend and **Sah, Pratha**. Why get vaccinated when the flu vaccine doesn't work well? Science Journal for Kids

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Developed code

INoDS Inferring networks of infectious disease spread (Python)

ModNet Random modular network generator (Python)

ASNR Animal social network repository (HTML)

Epidemic simulator Simulate infectious disease spread in static or dynamic contact networks (Python)

Conference session organizer

2018 **Integration of Empirical Data in Network Epidemiology**, *NetSci 2018*, Paris, France.

Reviewer

Ten unique journals, *Nature Communications, Proceedings of the Royal Society B: Biological Sciences, Scientific Reports, Plos One, Ecology and Evolution, Peer J, Journal of Theoretical Biology, Fish and Fisheries, International Journal of Bioinformatics Research and Applications (IJBRA), Transboundary and Emerging Diseases*.

Mentoring

Middle school, Sarah A. Galvani Townsend (Yale).

Undergraduate, José David Mendez (Georgetown), Madeline Campbell (Georgetown), Henry Banh (Georgetown), Tiffany Yang (Georgetown), Victoria Chen (Yale).

Graduate, Ryan Yucha (Yale).

Teaching

2017 **Guest discussion**, *Stage structured models*, Course: Modeling Biological Populations, Georgetown University.

2016 **Invited guest lecturer**, *Modeling infectious disease spread in host populations*, Environmental Science II Master Course, George Washington University.

2014 **Teaching Fellow**, *Course: Modeling Biological Populations*, Biology Department, Georgetown University.

2013 **Lab Instructor**, *Course: Ecology*, Biology Department, Georgetown University.

Professional presentations

2017 ***Disease implications of sociality and network structure***, *Disease ecology section*, ESA 102th Annual Meeting , Portland, Oregon.

2017 ***Identifying Dynamic Contact Networks of Infectious Disease Spread***, *NetSci 2017*, Indianopolis, Indiana.

2017 ***Disease implications of animal social organization and network structure***, *Graduate research symposium*, Georgetown University.

2016 ***Identifying networks of infectious disease spread in wildlife populations***, *Work in progress seminar*, Biology department, Georgetown University.

2016 ***Inferring transmission mode and contact network in a wildlife population***, *Disease ecology section*, ESA 101th Annual Meeting , Ft Lauderdale, Florida.

2015 ***Modeling perturbations in dynamic contact networks: Ways forward***, *Ignite session: Heterogeneity in Animal Disease Ecology: Then and Now*, ESA 100th Annual Meeting , Baltimore, Maryland.

2015 ***Using (modular) random graphs to explore the effect of modular contact networks on wildlife disease spread***, *Disease ecology section*, ESA 100th Annual Meeting , Baltimore, Maryland.

2015 ***Burrow use patterns and disease spread in desert tortoise populations***, *Work in Progress Seminar*, Georgetown University, Washington, DC.

2014 ***Exploring community structure in ecological networks with random graphs***, *NetSci 2014 Satellite*, Complex Networks in Ecology, Berkeley, California.

Honors and awards

2018 Young Initiative Award for Satellite Meetings, NetSci 2018

2017 Volterra Award for Best Talk, ESA 2018

2017 Best student paper award in disease ecology, Ecological Society of America

2017 Nomination, Dr. Karen Gale Exceptional PhD Student Award, Georgetown University

2017 Outstanding Graduate Student Award, Biology Department, Georgetown University

2016 Semi-finalist, Early Career Researcher Prize, Journal of Animal Ecology

2016 PLoS Early Career Travel Award

2014 MCED Young Modeler Award for Innovative Contributions to Ecological Modeling

2014 Best talk, Work in progress seminar, Biology Department, Georgetown University

2014 Cosmos Scholars Grant Program, Cosmos Club Foundation

2014 University of Washington SISMID scholarship for attending the Summer Institute in Statistics and Modeling in Infectious Diseases (SISMID 2014); University of Washington, Seattle, July 14 -18, 2014

2011 University topper and Gold medalist, MSc, TERI University

2010 Summer Research Fellowship, awarded by JNCASR, India

2009 State merit (7th rank) and scholarship, Graduate Excellence Examination, Pune, India

Professional development

2014 Summer Institute in Statistics and Modeling in Infectious Diseases (SISMID); University of Washington, Seattle

2014 NIMBioS Investigative Workshop: Interface Disease Models; Knoxville, Tennessee

2013 Python training workshop for Scientists and Engineers; Washington, DC

2013 Workshop on data-analysis with R; University of Maryland, Maryland

2011 International Conference on Mathematical Biology; Bangalore, India

Leadership positions

2015-2016 **Co-president**, *Biology Organization of Graduate Students*, Georgetown University.

2014-2015 **Treasurer**, *Biology Organization of Graduate Students*, Georgetown University.

2013-2014 **Vice President**, *Graduate International Student Organization*, Georgetown University.

2013 **Graduate International Student Ambassador**, *Georgetown University*.

2012-2014 **Graduate Student Representative**, *Graduate Student Organization*, Georgetown University.

Membership

2017 Ecological Society of America

References

Shweta Bansal: Assistant Professor of Biology, Georgetown University. Email - shweta.bansal@georgetown.edu

Peter J. Hudson: Willaman Professor of Biology, Director of Huck Institutes of Life Sciences, Penn State University. Email - pjh18@psu.edu

Janet Mann: Vice Provost for Research and Professor of Biology and Psychology, Georgetown University. Email - mannj2@georgetown.edu