

BIOGRAPHICAL SKETCH

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NAME: James Holland Jones

eRA COMMONS USER NAME (credential, e.g., agency login): jhj1@stanford.edu

POSITION TITLE: Associate Professor, Senior Fellow

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
New College of Florida, Sarasota FL, USA	B.A.	1991	Anthropology & Biology
Harvard University, Cambridge, MA, USA	A.M.	1994	Anthropology
Harvard University, Cambridge, MA, USA	Ph.D.	2000	Anthropology
University of Washington, Seattle, WA, USA	Post-Doc	2001-2003	Infectious Disease, Demography, Statistics

A. Personal Statement

I am a biological anthropologist, with a strong background in classical social anthropology, and training in human evolutionary, behavioral, and population ecology. Through a number of interdisciplinary post-docs and a career award from NICHD/DBSB, I have parlayed my interest in population phenomena in the ecological context into a research program focused on biodemography, the evolution of human life histories, and the evolutionary ecology of infectious disease. Ultimately, I am interested in questions about why the human life-cycle is organized the way it is, with late age at first reproduction, relatively high fertility, long reproductive span, long post-reproductive period, and massive economic transfers supporting reproduction. I am also interested in the remarkable variation in demographic rates across (and within) populations. Both sets of questions – i.e., over both evolutionary and historical times scales – ultimately find their answers in the way that people make their living and, crucially, the degree of uncertainty they have in their biophysical, economic, and social environments. Infectious disease is a major contributor to variation in mortality through time and across space. Infectious disease also provides a major source of uncertainty over reproductive decisions. It is thus natural that a biodemographer interested in the evolution of human life histories should turn to disease ecology. I combine anthropological fieldwork and mathematical formalism – optimality models, transmission-dynamics models, models of social networks, models of decision-making – to produce theoretically-informed and empirically-grounded biosocial science. I have recently undertaken a new research focus integrating evolutionary ecology and the analysis of livelihoods with microeconomics and decision theory. Following the publication of original theoretical work on evolutionary economics, I am turning to a trade publication tentatively titled *The Most Rational People in the World: Risk and Rationality in Human Societies* along with a more technical work on human adaptation to changing environments under contact with Princeton University Press. With methodological expertise in formal demography, social network analysis, modern statistics, and transmission-dynamics modeling, interdisciplinary connections across the social, natural, and environmental sciences, and research interests that address both the core and frontiers of demography and disease ecology, I am in a strong position to provide leadership for this interdisciplinary, cutting-edge research project that brings together social networks, demography, and transmission dynamics in the context of broader questions of human ecology.

B. Positions and Honors

2003-2007 Assistant Professor, Department of Anthropological Sciences, Stanford University
2007-2010 Assistant Professor, Department of Anthropology, Stanford University
2007-2010 Center Fellow, Woods Institute for the Environment
2010- Senior Fellow, Woods Institute for the Environment, Stanford University
2010-2015 Associate Professor, Department of Anthropology, Stanford University
2013-2018 Senior Scientist, Grand Challenges in Ecosystems and the Environment, Imperial College London
2015- Associate Professor, Department of Earth System Science, Stanford University
2015-2016 Andrew W. Mellon Foundation Fellow, Center for Advanced Study in the Behavioral Sciences, Stanford University

Memberships

2001- Member, American Association of Physical Anthropologists (Lifetime)
2003- Member, International Network for Social Network Analysis
2004 Panel Member, National Science Foundation Human Social Dynamics Competition
2005 Panel Member, Models of Infectious Disease Agent Systems (MIDAS), NIH/NIGMS
2006-2008 Panel Member, Doctoral Dissertation Improvement Grant Panel, NSF/BCS
2008-2010 Associate Editor, *PLoS ONE*
2008-2010 Panel Member, Ecology of Infectious Disease Program, NSF/NIH
2009-2014 Director, Methods of Analysis Program in the Social Sciences (MAPSS)
2010-2011 Member, Ecology of Infectious Disease Executive Board
2010-2012 Member, Cultural Anthropology Senior Panel, NSF/BCS
2010-2015 Associate Editor, *Journal of Animal Ecology*
2012-2016 Associate Editor, *American Anthropologist*
2012-2017 Member, Executive Committee, Stanford Center of Population Research
2012-2015 Chair, Environmental Ventures Projects Scientific Committee
2015- Member, Evolutionary Demography Society (EvoDemoS) Board
2020- Member, Dynamics of Integrated Socio-Environmental Systems (CNH2), NSF
2020-2021 President, Evolutionary Demography Society
2016- Member, International Scientific Advisory Board, Max Planck Institute, Leipzig

Honors

1995 Fulbright Scholarship to Indonesia
2000 New Investigator Award, Evolution and Human Behavior Society
2001 National Research Service Award, NIAID
2005 NIH Career Development Award (K01), NICHD
2007 Hellman Faculty Scholar, Stanford University
2008 NAS/CNRS Kavli Frontiers of Science Invited Speaker
2012 Institute for Research in the Social Sciences Fellowship
2015 Margo Wilson Award for Best Paper in 2014, Evolution and Human Behavior Society
2015 Andrew W. Mellon Foundation Residential Fellowship, Center for Advanced Studies in the Behavioral Sciences (CASBS)
2019 Visiting Researcher, Economic Science Institute, Chapman University
2020 Faculty Fellow, Center for Advanced Studies in the Behavioral Sciences (CASBS)

C. Contribution to Science

1. Much of my early work on infectious disease focuses on sexual partnership distributions and their implications for epidemic behavior. The motivation for this work follows from the observation that the

distribution of contacts in an epidemic model has a profound influence on epidemic outcome and the effectiveness of different methods of control. My work provides a corrective for the common uncritical application of physical science models to human behavior by proposing multiple, behaviorally-driven mechanisms for the formation of adult sexual contacts. Models based on differing assumptions about individual behavior and the nature of its variability make different predictions about features of network structure that can be measured. By comparing the fit of the different models to the observed data using the formal techniques of multi-model inference, we can infer mechanisms of contact formation. More recently, this work has extended to the measurement of disease contact networks and the development of novel, network-based interventions.

- (a) Salathé, M., M. Kazandjieva, J. W. Lee, M.P. Levis, W. Feldman, and J. H. Jones (2010) A High-Resolution Human Contact Network for Infectious Disease Transmission. *Proceedings of the National Academy of Sciences*. 107(51): 22020-22025. (PMID: 21149721)
- (b) Salathé, M. and J.H. Jones. (2010) Dynamics and control of diseases in networks with community structure, *PLoS Computational Biology*. 6(4): e1000736. (PMID: 20386735)
- (c) Jones, J.H., and M. S. Handcock (2003b) Sexual contacts and epidemic thresholds. *Nature*. 425: 605-606. (PMID: 12789329)
- (d) Kelly, J.D., M.B. Barrie, A.W. Mesman, S. Karku, K. Quiwa, M. Drasher, G.W. Slough, K. Dierberg, S. Koedoyoma, C.P. Lindan, J.H. Jones, G. Chamie, L. Worden, B. Greenhouse, S.D. Weiser, T.C. Porco, G.W. Rutherford, and E.T. Richardson. (2018) Anatomy of a hotspot: chain and seroepidemiology of Ebola Virus Transmission, Sukudu, Sierra Leone, 2015-16. *Journal of Infectious Diseases*. 217(8): 1214–1221. (PMID: 29325149)

2. A central part of my research since 2007 has been the ecology of infectious disease and, particularly, the interaction of population processes with the dynamics of spillover of novel diseases of zoonotic origin. This work includes understanding the maintenance dynamics of highly lethal epizootics and the biodemography of SIVcpz in wild chimpanzees.

- (a) Arthur, R.F., E.S. Gurley, H. Salje, L.S.P. Bloomfield, and J.H. Jones. (2017) Contact structure, mobility, environmental impact and behaviour: the importance of social forces to infectious disease dynamics and disease ecology. *Philosophical Transactions of the Royal Society B: Biological Sciences*. 372 (1719). (PMID: 28289265)
- (b) Salkeld, D.J., Padgett, K.A., J.H. Jones. (2013) A meta-analysis suggesting that the relationship between biodiversity and risk of zoonotic pathogen transmission is idiosyncratic. *Ecology Letters*. 16(5): 679-686. (PMID: 23489376)
- (c) Rudicell, R. S., J. H. Jones, E. E. Wroblewski, G. H. Learn, Y. Li, J. D. Robertson, E. Greengrass, F. Grossmann, S. Kamenya, L. Pintea, D. C. Mjungu, E. V. Lonsdorf, A. Mosser, C. Lehman, D. A. Collins, B. F. Keele, J. Goodall, B. H. Hahn, A. E. Pusey, and M. L. Wilson. (2010) Impact of Simian Immunodeficiency Virus Infection on Chimpanzee Population Dynamics. *PLoS Pathogens*. 6 (9):e1001116. (PMID: 20886099)
- (d) Salkeld, D.J., M. Salathé, P. Stapp, J.H. Jones. (2010) Plague outbreaks in prairie dog populations: percolation thresholds of alternate host abundance explain epizootics, *Proceedings of the National Academy of Sciences, USA*. 107(32): 14247-14250. (PMID: 20660742)

3. I am a major contributor to the theory of life histories and its application to understanding human evolution and contemporary demographic questions such as why patterns of fertility change in systematic ways with economic development. Increasingly, this work is turning toward integrating (economic) decision theory and risk-management to understand adaptations to changing environments and the consequences for social structure and infectious disease dynamics.

- (a) Price, M.H. and J.H. Jones. (2020) Fitness-Maximizers Employ Pessimistic Probability Weighting in Decisions Under Risk. *Evolutionary Human Sciences*. 2:e28.

- (b) Jones, J.H. and S. Tuljapurkar. (2015) Measuring Selective Constraint on Fertility in Human Life Histories, in press, *Proceedings of the National Academy of Sciences, USA*. 112 (29):8982-8986. (PMID: 26150499)
- (c) Jones, J.H. (2015) Human Life Histories and Resource Transfers. *Annual Review of Anthropology*. 44 (1):513-531.
- (d) Metcalf, C.J.E. and J.H. Jones. (2015) The Evolutionary Dynamics of Timing of Maternal Immunity: Evaluating the Role of Age-Specific Mortality. *Journal of Evolutionary Biology*. 28(2): 493-502. (PMID: 25611057)

4. I use mathematical models to study the coupled dynamics of infectious-disease transmission and human behavior. Topics of particular interest include the impact of behavior change on transmission dynamics, the role of social inequality in amplifying transmission, and strategies for control that involve social-justice interventions. This is a relatively new area, and is particularly relevant to ongoing infectious-disease crises such as the COVID-19 pandemic and repeated outbreaks of Ebola Virus Disease in west Africa and Congo.

- (a) Hazel, M.A. and J.H. Jones (2018) Remoteness Influences Access to Sexual Partners and Drives Patterns of Viral Sexually Transmitted Disease Prevalence Among Nomadic Pastoralists. *PLoS ONE*. 13(1): e0191168. (PMID: 29385170)
- (b) Smaldino, P. and J.H. Jones. Coupled Dynamics of Behavior and Disease Contagion Among Antagonistic Groups. *BioRxiv*:10.1101/2020.06.17.157511.
- (c) Richardson, E.T., M.M. Malik, W.A. Darity, A.K. Mullen, M. Malik, A. Benton, M.T. Bassett, P.E. Farmer, L. Worden, and J.H. Jones. 2020. Reparations for Black American Descendants of Persons Enslaved in the U.S. and Their Estimated Impact on SARS-CoV-2 Transmission. *medRxiv*.2020.06.04.20112011.
- (d) Arthur, R.A., J.H. Jones, M. Bonds, M.W. Feldman. Complex dynamics induced by delayed adaptive behavior during outbreaks. *BioRxiv*: 2020.04.14.028407.

5. I continue to work in primate biodemography because an understanding of the evolution of human life histories and adaptations to variable infectious disease burden is predicated on a broad evolutionary, systematic perspective.

- (a) Jones, J.H. (2011) Primates and the Evolution of Long-Slow Life Histories. *Current Biology*. 21(18): R708-R717. (PMID: 21959161)
- (b) Keele*, B.F., J. H. Jones*, K. A. Terio*, J. D. Estes*, R. S. Rudicell*, M. L. Wilson*, Y. Li, G. H. Learn, T. M. Beasley, J. Schumacher-Stankey, E. Wroblewski, A. Mosser, J. Raphael, S. Kamenya, E. V. Lonsdorf, J. G. Else, G. Silvestri, J. Goodall, P. M. Sharp, G. M. Shaw, A. E. Pusey and B. H. Hahn. (2009) Increased mortality and AIDS-like immunopathology in wild chimpanzees infected with SIVcpz, *Nature*. 460: 515-519. (PMID: 19626114) *=authors contributed equally.
- (c) Ryan, S.J., A.P. Dobson, and J.H. Jones. (2013) The Effects of Contact Structure, Demography and Movement on Disease Transmission Within a Primate Metapopulation. *PLoS ONE*. 8(10): e76863. (PMID: 24204688)
- (d) Jones, J.H., M.L. Wilson, C. Murray, and A.E. Pusey. (2010) Phenotypic quality influences fertility in Gombe chimpanzees. *Journal of Animal Ecology*. 79(6): 1262-1269. (PMID: 20412347)

MyNCBI Publications:

<https://www.ncbi.nlm.nih.gov/myncbi/1VkgasBapmq9wt/bibliography/public/>

Current Research Support

NSF BCS-2028160, Jones (PI), RAPID: “Coupled Contagion, Behavior-Change, and the Dynamics of Pro- and Anti-Social Behavior During the COVID-19 Pandemic.”

Role: PI.

Woods Institute Environmental Ventures Project, Jones (PI), “Mobility and Adaptation in a Changing Environment: Consequences of Water Resource Distribution for Infectious Disease Transmission in Namibia.”

Role: PI.

R01GM130900, Porco (PI), “Ebola Modeling: Behavior, Asymptomatic Infection, and Contacts.” The goal of this project is to develop mathematical models of Ebola Virus Disease transmission and control. My group leads the development of novel network inference from contact-tracing data.

Role: Co-I

Completed Research Support

R01AI098420, Goldberg (PI), “Biological and Human Dimensions of Primate Retroviral Transmission.”

The goal of this project is to develop models of transmission dynamics of retroviruses in wild primates as well as the spillover dynamics of these viruses into human populations.

Role: Co-PI.

5R24AG039345, Tuljapurkar (PI), “Research Networks in Biodemography and the Demography of Aging.”

This training grant introduced students, post-docs and junior faculty associated with NICHD-funded population centers to the methods and theories of formal demography and evolutionary biodemography.

Role: Co-PI.

U01RFA-GM-14-007, Daszak (PI), “Modeling the emergence of zoonotic diseases from wildlife to prevent global pandemics.” The goal of this project was to measure contact networks among poultry workers and model the spillover dynamics of highly pathogenic avian influenza.

Role: Co-PI.

NSF BCS-106287, Jones (PI), “Individual Decisions and Emergent Aggregate Patterns: Kin Co-residence among Hadza Hunter-Gatherers.” The goal of this project was to complete a census and gather two field seasons’ worth of relational data of the Hadza and develop models of residential decision-making, migration, and social networks.

Role: PI.

K01HD051494, Jones (PI), “Demographic Change and Dependent Social Structures.” A career award to develop tools for relating demographic change to contact networks in the context of infectious disease transmission.

Role: PI.

NSF BCS-0947132, Jones (PI), “RAPID: Structure of Contact Networks and the Spread of Flu-like Infectious Diseases: Implications for Dynamics and Control.” The goal of this project was to take extremely detailed measurements of school-based interaction networks in the context of an influenza pandemic.

Role: PI.

R25HD04498, Tuljapurkar (PI), “Workshops in Formal Demography and Biodemography.” This training grant introduced students, post-docs and junior faculty associated with NICHD-funded population centers to the methods and theories of formal demography and evolutionary biodemography.

Role: Co-PI.