Juliet R. C. Pulliam, PhD

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EDUCATION Emory University, Atlanta, Georgia USA

> Coursework in Applied Epidemiology, Career Master of Public Health Program 2007-2012

Princeton University, Princeton, New Jersey USA

Ph.D., Ecology & Evolutionary Biology June 2007

Dissertation: Determinants & Dynamics of Viral Host Jumps

Advisors: Andrew P. Dobson & Simon A. Levin

M.A., Ecology & Evolutionary Biology November 2004

Duke University, Durham, North Carolina USA

A.B., Biology (minors: Mathematics, Linguistics) with Distinction May 2002

Magna cum laude

University of Florida, Gainesville, FL USA EMPLOYMENT

August 2011 - Present

Assistant Professor, Department of Biology and Emerging Pathogens Institute

Fogarty International Center, National Institutes of Health August 2012 - Present Bethesda, MD USA

Research Associate, Division of International Epidemiology and Population Studies

Research and Policy for Infectious Disease Dynamics Program July 2008 - July 2011 Fogarty International Center, National Institutes of Health, Bethesda, MD USA Department of Ecology & Evolutionary Biology, UCLA, Los Angeles, CA USA (from 2010)

RAPIDD Program Fellow, Focus on Modeling Zoonoses and Pathogen Emergence

Developed collaborative research projects focused on the dynamics of cross-species viral transmission and the interactions between human, domestic animal, and wildlife health. (Supervisors: F. Ellis McKenzie & James O. Lloyd-Smith)

International Conservation and Education Fund January 2008 - June 2008 Washington, DC USA & Brazzaville, Republic of Congo

Program evaluation and statistical consultant, Everyone for Conservation Project

Developed program evaluation tools for the Everyone for Conservation Project, which aims to educate local populations in the Republic of Congo about conservation of natural resources and health risks associated with the bushmeat and wildlife trades.

Emory University, Atlanta, Georgia USA

July 2007 - June 2008

Postdoctoral fellow, Department of Biology & Center for Disease Ecology

Developed research tools to help understand the dynamics of Ebola virus transmission in wild ape populations in western equatorial Africa, in collaboration with Wildlife Conservation Society - Congo's Field Veterinary Program. (Supervisor: Leslie A. Real)

AND FELLOWSHIPS

Selected Awards Fulbright Specialist Grant (Math Education), 2013

International Educator of the Year (Junior Faculty), UF College of Liberal Arts and Sciences, 2012

Research and Policy in Infectious Disease Dynamics Fellowship, 2008-2011

Princeton University Centennial Fellow, 2002-2006

National Science Foundation Graduate Research Fellowship, 2002-2007

Pew Training Grant in Biocomplexity Fellow, 2002-2006

Center for Health & Wellbeing Graduate Research Grant, Princeton University, 2003

Sigma Xi Grant-in-Aid of Research, 2003

Edward C. Horn Prize for Excellence in Biology, Duke University, 2002

Faculty Scholar (Honorable Mention), Duke University, 2002

Beckman Scholar, Duke University, 2000-2002

Grants

NIGMS Award R25GM102149, National Institutes of Health (Role: PI), 2012-2016

IC Postdoctoral Research Fellowship Program, ICPDP-2011-0001 Topic 12.16 (Role: PI), 2011-2013

Ecology of Infectious Diseases Award #1134964, National Science Foundation (Role: PI), 2011

PUBLICATIONS

Peer-reviewed

Reiner, R.C., T.A. Perkins, C.M. Barker, T. Niu, L.F. Chaves, A.M. Ellis, D.B. George, A. Le Menach, J.R.C. Pulliam, D. Bisanzio, C. Buckee, C. Chiyaka, D.A.T. Cummings, A.J. Garcia, M.L. Gatton, P.W. Gething, D.M. Hartley, G. Johnston, E.Y. Klein, E. Michael, S.W. Lindsay, A.L. Lloyd, D.M. Pigott, W.K. Reisen, N. Ruktanonchai, B. Singh, A.J. Tatem, U. Kitron, S.I. Hay, T.W. Scott and D.L. Smith. (2013) A systematic review of mathematical models of mosquito-borne pathogen transmission: 1970-2010. Journal of the Royal Society Interface. DOI:10.1098/?rsif.2012.0921

Luis, A.D., D.T.S. Hayman, T.J. OShea, P.M. Cryan, A.T. Gilbert, **J.R.C. Pulliam**, J.N. Mills, M.E. Tinonin, C.K.R. Willis, A.A. Cunningham, A.R. Fooks, C.E. Rupprecht, J.L.N. Wood, and C.T. Webb. (2013) A comparison of bats and rodents as reservoirs of zoonotic viruses: are bats special? *Proceedings of the Royal Society of London B* **280**. Published online ahead of print 1 February 2013. DOI:10.1098/rspb.2012.2753

Restif, O., D.T.S. Hayman, J.R.C. Pulliam, R.K. Plowright, D.B. George, A.D. Luis, A.A. Cunningham, R.A. Bowen, A.R. Fooks, T.J. OShea, J.L.N. Wood, and C.T. Webb. (2012) Model-guided fieldwork: practical guidelines for multi-disciplinary research on wildlife ecological and epidemiological dynamics. *Ecology Letters*. Published online ahead of print 20 July 2012. DOI:10.1111/j.1461-0248.2012.01836.x

Bellan, S.E., **J.R.C. Pulliam**, J.C. Scott, J. Dushoff, and the MMED Organizing Committee. (2012) How to make epidemiological training infectious. *PLoS Biology*, **10(4)**: e1001295. DOI: 10.1371/journal.pbio.1001295

J.R.C. Pulliam, J.H. Epstein, J. Dushoff, S.A. Rahman, M. Bunning, A.A. Jamaluddin, A.D. Hyatt, H.E. Field, A.P. Dobson. P. Daszak, and the Henipavirus Ecology Research Group. (2011) Agricultural intensification, priming for persistence, and the emergence of Nipah virus, a lethal bat-borne zoonosis. *Journal of the Royal Society Interface*. DOI: 10.1098/rsif.2011.0223

H.R. Pulliam, J.M. Drake, and **J.R.C. Pulliam**. On estimating demographic and dispersal parameters for niche and source-sink models. in *Sources, Sinks, and Sustainability* (J. Liu, V. Hull, A. Morzillo, and J. Wiens, eds.) Cambridge University Press: Cambridge, 2011.

K.M. Pepin, S. Lass*, **J.R.C. Pulliam***, A. Read and J.O. Lloyd-Smith. (2010) Identifying genetic markers of adaptation for surveillance of viral host jumps. *Nature Reviews Microbiology*, **8**: 802-813. DOI: 10.1038/nrmicro2440 [* equal contributors, listed alphabetically]

J.O. Lloyd-Smith, D. George*, K.M. Pepin*, V.E. Pitzer*, **J.R.C. Pulliam***, A.P. Dobson, P.J. Hudson, and B.T. Grenfell. (2009) Epidemic dynamics at the human-animal interface. *Science* **326**: 1362-1367. DOI: 10.1126/science.1177345 [* equal contributors, listed alphabetically]

- J.H. Epstein, K.J. Olival, **J.R.C. Pulliam**, C. Smith, J. Westrum, T. Hughes, A.P. Dobson, A. Zubaid, S.A. Rahman, M. Basir, H.E. Field, and P. Daszak. (2009) *Pteropus vampyrus*, a hunted migratory species with a multinational home-range and a need for regional management. *Journal of Applied Ecology* **46(5)**: 991-1002. DOI: 10.1111/j.1365-2664.2009.01699.x
- **J.R.C. Pulliam** and J. Dushoff. (2009) Ability to replicate in the cytoplasm predicts zoonotic transmission of livestock viruses. *Journal of Infectious Diseases* **199(4)**: 565-568. DOI: 10.1086/596510
- **J.R.C. Pulliam**. (2008) Viral host jumps: moving toward a predictive framework. *EcoHealth* 5(1): 80-91. DOI: 10.1007/s10393-007-0149-6
- **J.R.C. Pulliam**, J. Dushoff, S.A. Levin, and A.P. Dobson. (2007) Epidemic enhancement in partially-immune populations. *PLoS ONE* **2(1)**: e165. DOI:10.1371/journal.pone.0000165
- J.H. Epstein, H.E. Field, S. Luby, **J.R.C. Pulliam**, and P. Daszak. (2006) Nipah virus: impact, origins, and cause of emergence. *Current Infectious Disease Reports* 8: 59-65.
- **J.R.C. Pulliam**, H. Field, K.J. Olival, and the Henipavirus Ecology Research Group. (2005) Nipah virus strain variation [letter]. *Emerging Infectious Diseases* **11(12)**: 1978-1979.
- S. Altizer, C.L. Nunn, P.H. Thrall, J.L. Gittleman, J. Antonovics, A.A. Cunningham, A.P. Dobson, V. Ezenwa, K.E. Jones, A.E. Pedersen, M. Poss, and **J.R.C. Pulliam**. (2003) Social organization and parasite risk in mammals: integrating theory and empirical studies. *Annual Reviews in Ecology, Evolution, and Systematics* **34**:517-147.
- H.R. Pulliam and **J.R.C. Pulliam**. (1999) Population regulation and social behaviour in the non-breeding season. In: Adams, N.J. and Slotow, R.H. (eds) *Proceedings of the 22nd International Ornithological Congress*, Durban: 2968-2982. Johannesburg: BirdLife South Africa.

BOOK CHAPTERS

- D.T.S. Hayman, E.S. Gurley, **J.R.C. Pulliam**, and H.E. Field. The application of One Health approaches to henipavirus research. In *One Health: The Human-Animal-Environment Interfaces in Emerging Infectious Diseases*, (J.S. Mackenzie, M. Jeggo, P.Daszak, and J. Richt, Eds.). *Current Topics in Microbiology and Immunology*. Published online ahead of print 17 November 2012. DOI:10.1007/82_2012_276
- P. Daszak, S.P. Luby, J.H. Epstein, M.J. Hossain, E.S. Gurley, and **J.R.C. Pulliam**. Nipah virus outbreaks and agricultural practices in Malaysia and Bangladesh (in Chapter 5: Emerging and Reemerging diseases, edited by C. Witt). In *Environmental Tracking for Public Health Surveillance* (S.A. Morain and A. Budge, eds.) CRC Press: 2012. ISBN 9780415584715.
- P. Daszak, R. Plowright, J. Epstein, **J. Pulliam**, S. Abdul Rahman, H.E. Field, A. Jamalludin, M.Y. Johara, C.S. Smith, K.J. Olival, S. Luby, K. Halpin, A.D. Hyatt, A.A. Cunningham, and the Henipavirus Ecology Research Group. The emergence of Hendra and Nipah viruses: pathogen dynamics in wildlife, livestock, and humans. in *Disease Ecology: community structure and pathogen dynamics* (Sharon Collinge and Chris Ray, eds.) Oxford University Press: Oxford, 2006.

Commentaries, News, and Reports

- **Pulliam, J.R.C.** and J. Dushoff. (In press) Re: The Case-Chaos Study as an Adjunct of Alternative to Conventional Case-Control Study Methodology. Letter to the editor of *American Journal of Epidemiology*.
- **Pulliam, J.R.C.** (2013) Commentary on: Causal inference in disease ecology: investigating ecological drivers of disease emergence by Plowright *et al.* F1000 Public Health & Epidemiology. DOI:10.3410/f.1147165.793481572
- **Pulliam, J.R.C.** (2012) Commentary on: Bats host major mammalian paramyxoviruses by Drexler et al. F1000 Public Health & Epidemiology. DOI:10.3410/f.714797869.790252867

- Lloyd-Smith, J.O. and **J.R.C. Pulliam** (2012) Commentary on: The role of evolution in the emergence of infectious diseases by Antia *et al.* F1000 Ecology.
- Lloyd-Smith, J.O. and **J.R.C. Pulliam** (2011) Commentary on: Visualizing uncertainty about the future by Spiegelhalter *et al.* F1000 Ecology.
- Lloyd-Smith, J.O. and **J.R.C. Pulliam** (2011) Commentary on: Disease transmission in territorial populaitons: the small-world network of Serengeti lions by Craft *et al.* F1000 Ecology.
- **J.R.C. Pulliam** (2010) Symposium 17: How does having a vector matter? Bulletin of the Ecological Society of America **90(1)**: 100-105. DOI:10.1890/0012-9623-91.1.100
- J.R.C. Pulliam, S. Bellan, J. Hargrove, B. Williams, F. Roberts, and J. Dushoff. (2010) Training clinic builds capacity for meaningful modeling in Africa. *SIAM News* 43(1): 1,12. http://www.siam.org/news/news.php?id=1692
- **J.R.C. Pulliam**, S. Bellan, J. Hargrove, B. Williams, F. Roberts, and J. Dushoff. (2010) Building capacity for meaningful modeling: a first step. *Society for Mathematical Biology Newsletter* **23(1)**: 6-7.

Invited Presentations

- **J.R.C. Pulliam**. Embracing the complexities of scale and diversity in disease ecology, Part I: Ecology of vector transmitted infections. Infectious Disease Dynamics Programme, Isaac Newton Institute. Cambridge, UK, August 2013.
- **J.R.C. Pulliam**, on behalf of the MMED Organizing Committee. Muizenberg Fever: Instructive outbreaks of a novel agent. Center for Infectious Disease Dynamics Seminar Series, Pennsylvania State University. State College, PA, February 2012.
- **J.R.C. Pulliam**. Data needs for an improved understanding of viral host jumps. Anticipating the Species Jump: Bioinformatics and information sharing, Advanced Systems and Concepts Office, Defense Threat Reduction Agency. McLean, VA, March 2011.
- **J.R.C. Pulliam**. Improving surveillance estimates for Nipah virus in Bangladesh. Rajshahi Medical College Hospital. Rajshahi, Bangladesh, February 2011.
- J.R.C. Pulliam. Nipah virus emergence in Malaysia: processes and priniciples. NIMBioS Investigative Workshop: Mathematical Modeling of Wildlife and Viral Zoonoses, National Institute for Mathematical and Biological Synthesis. Knoxville, TN, November 2010.
- **J.R.C. Pulliam**. Understanding Nipah virus transmission in pigs and people: Insights from dynamic models. Chemical and Biological Division Performers Conference, Department of Homeland Security Science and Technology Directorate. Arlington, VA, August 2010.
- **J.R.C. Pulliam**. Modeling zoonotic pathogens: Nipah virus as a case study. Infectious Disease Division, National Center for Medical Intelligence, Defense Intelligence Agency. Ft. Detrick, Frederick, MD, April 2010.
- J.R.C. Pulliam. Importance of using models to differentiate between natural and intentional pathogen release. Differentiation of Natural Versus Intentional Disease Methodology Development Conference, National Center for Medical Intelligence, Defense Intelligence Agency and USSTRAT-COM Center for Combating Weapons of Mass Destruction. Herndon, VA, April 2010.
- **J.R.C. Pulliam**. Determinants and dynamics of viral host jumps. Department of Biology, University of Florida. Gainesville, FL, April 2010.
- **J.R.C. Pulliam** Not just a flying syringe: exploring the role of mosquito behavior in cross-species transmission of West Nile and Japanese encephalitis viruses. Department of Biological Science, George Washington University, December 2009.

- **J.R.C. Pulliam** Epidemic dynamics at the human-animal interface. Subcommittee on Foreign Animal Disease Threats of the Committee on Homeland and National Security, National Science and Technology Council, Executive Office of the President. Washington, DC, September 2009.
- **J.R.C. Pulliam** and the Henipavirus Ecology Research Group. Nipah virus: a case study in strategic research. "One World, One Health" Expert Consultation, Winnipeg, MN, March 2009.
- **J.R.C. Pulliam**. Dynamics of cross-species transmission: Examples from Nipah, West Nile, and Japanese encephalitis viruses. Research and Policy in Infectious Disease Dynamics (RAPIDD): Working Group Meeting, Fogarty International Center, Bethesda, MD, December 2008.
- **J.R.C. Pulliam** Insights from stochastic models of zoonotic emergence. Center for Discrete Mathematics and Computer Science: Workshop on Stochasticity in Population and Disease Dynamics, Rutgers University, December 2008.
- **J.R.C. Pulliam** Modeling zoonotic emergence: Nipah virus, epidemic enhancement, and general trends. Cambridge Infectious Disease Consortium, Cambridge University, November 2008.
- **J.R.C. Pulliam** Cross-species transmission of viruses: Patterns, dynamics, and insights. Ecology and Evolution Seminar, Department of Biology, University of Virginia, October 2008.
- **J.R.C. Pulliam**. How much is enough? Realism vs. tractability in models of disease emergence. Department of Mathematics, Howard University, September 2008.
- **J.R.C. Pulliam**. Dynamics of Nipah virus emergence, with some general implications for viral host jumps. Applications of Mathematics to Biology and Medicine, African Institute for Mathematical Sciences, July 2008.
- J.R.C. Pulliam and the Henipavirus Ecology Research Group. Dynamics of Nipah virus emergence, with some general implications for viral host jumps. Special seminar, Integrative Biology, University of Texas Austin, Austin, TX, May 2008.
- J.R.C. Pulliam and the Henipavirus Ecology Research Group. Nipah virus: insights, limitations, and key questions. Research and Policy in Infectious Disease Dynamics (RAPIDD): Workshop on Modeling Zoonotic Diseases, Pennsylvania State University, State College, PA, March 2008.
- **J.R.C. Pulliam** and the Henipavirus Ecology Research Group. Agricultural practices, epidemic enhancement, and the emergence of Nipah virus in Malaysia. Henipavirus Research Adoption Forum [remote presentation], Australian Biosecurity Cooperative Research Centre for Emerging Infectious Diseases, Canberra, Australia, July 2007.
- **J.R.C. Pulliam** and the Henipavirus Ecology Research Group. Understanding Nipah virus emergence: the collaborative approach of the Henipavirus Ecology Research Group. Meeting of the Malaysian National Veterinary Laboratories, Pulau Penang, Malaysia, November 2006.
- J.R.C. Pulliam, J.H. Epstein, P. Daszak, J. Dushoff, the Henipavirus Ecology Research Group, and A.P. Dobson. Nipah virus in peninsular Malaysia: understanding emergence and predicting re-emergence. EcoHealth ONE, Madison, Wisconsin, USA, October 2006.
- **J.R.C. Pulliam**. Understanding viral host jumps: ecological and comparative approaches. Seminar, Fogarty International Center (NIH), Bethesda, MD, February 2006.
- **J.R.C. Pulliam** and A.P. Dobson. Host switching: ecological and viral considerations. Workshop on the Emergence of New Epidemic Viruses through Host Switching (NIAID/NIH), Washington, DC, September 2005.

CONTRIBUTED
PRESENTATIONS
AND POSTERS

J.R.C. Pulliam, E.S. Gurley, A.M. Kilpatrick, M.J. Hossain, H.M.S. Sazzad, A.R.M. Saifuddin Ekram, R.C. Paul, P. Rollin, P. Daszak, and S.P. Luby. Assessing uncertainty in estimates of Nipah virus encephalitis occurrence from surveillance at a tertiary care hospital in Bangladesh (2007-2010). International Conference on Emerging Infectious Diseases. Atlanta, GA. March 2012.

- **J.R.C. Pulliam**, S. Blumberg, and J.O. Lloyd-Smith. A method for quantifying transmission of Stage III zoonoses. International Meeting on Emerging Diseases and Surveillance (IMED), Vienna, Austria, February 2011.
- **J.R.C. Pulliam**, S.E. Bellan, T. Porco, J.C. Scott, B.G. Williams, J. Hargrove, and J. Dushoff. Training an international community of applied infectious disease modelers in Africa. Modeling for Public Health Action: From epidemiology to operations, Centers for Disease Control and Prevention, Atlanta, GA, December 2010.
- J.R.C. Pulliam, S.A. Rahman, J.H. Epstein, H.E. Field, P. Daszak, and the Henipavirus Ecology Research Group. Longitudinal patterns of Nipah virus serology in Island Flying Foxes on Tioman Island. Bats and Emerging Viral Diseases Workshop, National Institute of Allergy and Infectious Diseases, NIH, Rockville, MD, September 2009.
- J.R.C. Pulliam, J. Dushoff, H.E. Field, J.H. Epstein, the Henipavirus Ecology Research Group, A.P. Dobson, and P. Daszak. Understanding Nipah virus emergence in peninsular Malaysia: the role of epidemic enhancement in domestic pig populations. (Presented by P. Daszak.) American Society for Tropical Medicine and Hygiene, Philadelphia, PA, USA, November 2007.
- **J.R.C. Pulliam**, J.H. Epstein, J. Dushoff, H.E. Field, A.P. Dobson, and P. Daszak. Nipah Virus in Peninsular Malaysia: process of emergence and risk of re-emergence. Ecological Society of America, San Jose, USA, August 2007.
- **J.R.C. Pulliam** and J. Dushoff. Predicting viral host jumps: Ability to replicate in the cytoplasm predicts zoonotic transmission of livestock viruses. Ecology and Evolution of Infectious Disease Conference, Cornell University, Ithaca, USA, May 2007.
- **J.R.C. Pulliam**, J.H. Epstein, J. Dushoff, A.P. Dobson, and the Henipavirus Ecology Research Group. Dynamics of Nipah virus emergence in peninsular Malaysia. Earth System Science Partnership Open Science Conference, Beijing, China, November, 2006.
- J.R.C. Pulliam, J.H. Epstein, P. Daszak, J. Dushoff, A.R. Sohayati, H.E. Field, A.P. Dobson, A.A. Jamaluddin, and the Henipavirus Ecology Research Group. Underlying cause of Nipah virus emergence in Peninsular Malaysia. Ecology and Evolution of Infectious Disease Conference, Pennsylvania State University, State College, PA, May 2006.
- J.R.C. Pulliam, A.P. Dobson, and the Henipavirus Ecology Research Group. Modeling Nipah virus dynamics in domestic pig populations: insights into emergence and implications for control. International Conference on Emerging Infectious Diseases, Atlanta, GA, USA, March 2006.
- **J.R.C. Pulliam**. Virus Emergence: What factors allow host jumps? Society for Tropical Veterinary Medicine, Hanoi, Vietnam, July 2005.
- **J.R.C. Pulliam**. Nipah virus dynamics in domestic pig populations. Soceity for Tropical Veterinary Medicine, Hanoi, Vietnam, July 2005.
- **J.R.C. Pulliam**, S.A. Alberts, and J. Altmann. Expansion or Extinction? Application of Matrix Projection Models to a Wild Baboon Population in Amboseli National Park, Kenya. Ecological Society of America, Tucson, Arizona, August 2002.

TEACHING EXPERIENCE ICI3D Program, Emerging Pathogens Institute, University of Florida, Gainesville, FL, USA

Instructor, Clinic on Dynamical Approaches to Infectious Disease Data 2012

STATISTICS UNIT, CENTRE FOR COMMUNICABLE DISEASES, ICDDR,B, DHAKA, BANGLADESH

Lectures on Mathematical Modeling of Infectious Disease Dynamics July 2012

AFRICAN INSTITUTE FOR MATHEMATICAL SCIENCES, MUIZENBERG, CAPE TOWN, SOUTH AFRICA

2003-Present

Professional Memberships

Reviewer

Professional ACTIVITIES

Henipavirus Ecology Research Group