

# CURRICULUM VITAE

Karoun H. Bagamian

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Emerging Pathogens Institute/

Department of Environmental and Global Health

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## EDUCATION

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- Emory University, Atlanta, GA* 2004-2012  
**Ph.D., Population Biology, Ecology, & Evolution**
- Tulane University, New Orleans, LA* 1997-2001  
**B.S., cum laude Ecology & Evolutionary Biology**

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## PROFESSIONAL EXPERIENCE

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- Emerging Pathogens Institute, University of Florida, Gainesville, FL*  
*Department of Environmental and Global Health* 2017  
**Research Scientist**  
**Supervisor: Sadie J. Ryan, PhD**

- Participating in a project applying multi-level statistical models to assess diarrheal disease and childhood stunting in seven low-to middle income countries (LMICs) in relation to childhood undernutrition and access to health care and improved water and sanitation. This is a collaborative project among the University of Florida, London School of Hygiene and Tropical Medicine, and Overseas Development Institute, led by Oxford Policy Management and funded by the World Bank's Water and Sanitation Program.
- Will be conducting spatial analyses and modeling of data from four countries, to assess relationships among rotavirus vaccine cost-effectiveness and coverage, economic status, health care access, and social and economic burden.
- Completing publications related to characterizing ETEC (enterotoxigenic *Escherichia coli* (*E. coli*)) and *Shigella* burden and potential vaccine effectiveness globally (96 low to middle countries worldwide) and sub-nationally (in eleven countries in East-Central Africa).

- Postdoctoral Associate** 2014-2016  
**Supervisor: Richard Rheingans, PhD**

- Led an analysis and writing team on a project on assessing WASH-related disease risk in relation to economic and spatial heterogeneities in order to better target interventions. This was a collaborative project among University of Florida, London School of Hygiene and Tropical Medicine, and Overseas Development Institute, led by Oxford Policy Management and funded by the World Bank's Water and Sanitation Program.
- Conducted spatial analyses and modeling of data from multiple countries around the world, assessing relationships among diarrheal diseases, vaccination coverage, poverty levels, access to water and sanitation, and social and economic burden. Project goals included characterization of areas of high need and burden for public health interventions and of vaccination coverage in select nations. Funders included PATH and Gates foundation.
- Participated in guidance of molecular laboratory testing of samples collected as a part of a UK Department for International Development funded WASH Disparities study in Kisumu.

*Department of Environmental and Global Health*

June-Jul 2015

**Course co-instructor for “Field course in OneHealth Problem Solving and Laboratory Methods”**

- Developed and taught laboratory methods in Kisumu, Kenya to American Masters of Public Health students and African Masters of Community Development students
- Coordinated and personally facilitated the transportation of all equipment, supplies, and reagents of a molecular laboratory to set up in a basic laboratory in Kenya.
- Supervised and trained students in DNA extraction, PCR, and electrophoresis techniques.

*Department of Geography*

2012-2014

**Postdoctoral Associate**

**Supervisor: Jason K. Blackburn, PhD**

- Investigated the spatio-temporal dynamics of bacterial zoonoses and disease spillover into wildlife, livestock, and human populations in countries of the former Soviet Union. Projects were funded by the Defense Threat Reduction Agency of the United States Department of Defense.
- Led a serological surveillance project investigating anthrax exposure in wildlife in North America and Ukraine.
- Led a project employing geographic information systems (GIS) analysis of livestock and human anthrax in Ukraine with Ukrainian collaborators.
- Trained international collaborators on GIS methods.
- Coordinated processes and products through UF and governmental employees/contractors in the US and abroad.

**Research and Grant Writing Consultant**

2014

*College of Medicine/Emerging Pathogens Institute, University of Florida, Gainesville, FL*

**Supervisor: Amy J. Vittor, MD, PhD, MHS**

- Co-wrote intramural proposals to identify animal reservoir hosts of South American Eastern Equine Encephalitis virus implementing a novel field-based method.

*College of Forestry & Conservation/Dept. of Ecosystem and Conservation Sciences,  
University of Montana, Missoula, MT*

**Supervisor: Angela D. Luis, PhD**

- Co-wrote extramural grants on hantavirus-rodent host ecology.
- Established and trained personnel on new field sampling and laboratory protocols in support of new hantavirus-rodent ecology projects.

*Journal of Wildlife Disease, Lawrence, KS*

2011-2014

**Editorial Assistant**

**Supervisor: James N. Mills, PhD**

- Supported editor-in-chief and assistant editors by implementing manuscript quality control.
- Provided authors assistance with technical, style, format, language, and general scientific issues during the submission, review, and publication process.
- Managed manuscript process from receipt of manuscript to time it is sent to the publisher.

**Guest Researcher**

2012

**Supervisor: Johnathan S. Towner, PhD**

- Established new laboratory procedures and trained personnel at Montana Tech, University of Montana, Butte, MT, initiating an ongoing research project using Sin Nombre hantavirus (SNV) sequence information to infer host population processes in deer mouse in Montana.

Emory University/ Centers for Disease Control and Prevention, Atlanta, GA 2005-2012

**Research Fellow/PhD Candidate**

**Advisor: James N. Mills, PhD**

- Devised and implemented dissertation project: "Transmission Ecology of Sin Nombre Hantavirus in Deer Mice Populations in outdoor enclosures" in Butte, Montana in collaboration with Montana Tech University, Emory University and Centers of Disease Control & Prevention Special Pathogens Branch.
- Led a field team in enclosure construction, as well as trapping, processing, and stocking deer mice (*Peromyscus maniculatus*) into enclosures. Conducted collection of blood and saliva specimens and mouse life history data on all experimental animals used.
- Supervised, trained, and mentored undergraduates (including an international student from Argentina) working on my project and on other field projects.
- Performed and optimized serological (enzyme immunoassays: EIA and enzyme immunoabsorbent assays: ELISA) and molecular assays (reverse transcriptase polymerase chain reaction: RT-PCR & quantitative RT-PCR) on fluid and blood specimens.
- Established and optimized new methods for oropharyngeal swab and blood RNA extractions and molecular testing methods for SNV RNA.

Emory Summer Abroad Program, Queensland, Australia 2006

**Teacher's Assistant**

**Supervisor: Christopher Beck, PhD**

- Functioned as a resident advisor/student-faculty liaison for Evolutionary Biology and Ecology of Invasions.
- Primary responsibilities included grading tests, lecturing, administering student-led discussion groups, formulating exam questions, and aiding in field coursework.

Evolutionary Biology, Emory University 2006

**Teacher's Assistant**

**Supervisor: Christopher Beck, PhD**

- Primary responsibilities included grading tests, administering student-led discussion groups, lecturing, formulating exam questions, and holding office hours for students.

Baxter Bioscience, Los Angeles, CA 2004

**Quality Lab Associate**

**Supervisor: David Swartz**

- Part of a team to set up a new laboratory to support a state-of -the-art plasma fractionation facility.
- Established safety policies and wrote standard operating procedures.
- Collaborated on research projects to validate biological assays and equipment.

Alpha Therapeutic Corporation, Los Angeles, CA 2001-2003

**Quality Control Chemist** 2002-2003

**Supervisor: Jeff Dodd**

- Tested human serum products for protein and activity levels, HIV/HCV antibodies, and processing chemicals. Chosen by management to participate in special testing for anti-complementary activity in immunoglobulin products.

**Quality Control Training Associate** 2001-2002

**Supervisor: Brandi Farmer**

- Enhanced scientific and technical understanding of pharmaceutical science among non-technical staff by assisting in course development for diverse departments. Facilitated communication among technical and non-technical staff.

## GRANTS, SCHOLARSHIPS, AND ACHIEVEMENTS

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- National Institute for Mathematical and Biological Synthesis (NIMBIOS) Short Term Visitor, 2013
- Wildlife Disease Association Graduate Research Recognition Award, 2012, \$5,000
- Newcomb College Young Alumna Award, Tulane University, May 18, 2012
- Oak Ridge Institute for Science & Education Research Fellowship, 2009-2010, \$80,000
- NIH-CDC Public Health Dissertation Research Grant, 2008-2009, \$36,942
- NIH Training Grant in Population Biology of Infectious Diseases, 2004-2007, \$66,316
- Alternate, Howard Hughes Teaching Fellowship, 2007-2008
- National Merit Scholar, 1997-2001

## PUBLICATIONS/SUBMISSIONS/SELECTED MANUSCRIPTS IN PREPARATION

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### *Peer-reviewed manuscripts*

- Kaplan, M., Manore, C., and **Bagamian, K.** 2016. Agent-based hantavirus transmission model incorporating host behavior and viral shedding heterogeneities derived from field transmission experiments. *Letters in Biomathematics* 3, 209-228.
- Blackburn, J. K., Morris, L.R., **Bagamian, K.H.**, Proffitt, K., Nekorchuk, D., Asher, V., and Hunter, D.L. 2015. Examining seasonal anthrax risk in wildlife: comparing home ranges and site fidelity in sero-positive and sero-negative ungulates. *Intermountain Journal of Sciences* 21, 57-58.
- Bezymennyi, M.\*, **Bagamian, K.H.\***, Barro, A., Skrypnyk, A., Skrypnyk, V., Blackburn, J.K. 2014. Spatio-temporal patterns of livestock anthrax in Ukraine during the past century (1913-2012). *Applied Geography*, 54,129-138. \*Equal contributors.
- **Bagamian, K.H.**, Skrypnyk, A., Rodina, Y, Bezymennyi, M., Nevolko, O., Skrypnyk, V., and Blackburn, J.K. 2014. Serological anthrax surveillance in wild boar (*Sus scrofa*) in Ukraine. *Vector-Borne and Zoonotic Diseases*, 14(8):618-20.
- Blackburn, J. K., Skrypnyk, A., **Bagamian, K.H.**, Nikolich, M.P., Bezymennyi, M., and Skrypnyk, V. 2014. Anthrax in a backyard domestic dog in Ukraine: a case report. *Vector-Borne and Zoonotic Diseases*, 14(8):615-7.
- Skrypnyk, V.G., Koziy, R.V., Skrypnyk, A.V., Rublenko, I.O., **Bagamian, K.H.**, Farlow, J., Nikolich, M.P., Mezhenkiy, A.O., Nevolko, O.M., Blackburn, J.K. 2014. Anthrax in dogs. *уча СучаССні наукові розробки*. 1(215): 14-17.
- **Bagamian, K.H.**, Alexander K.A., Hadfield T.L., and Blackburn, J.K. 2013. Ante- and post-mortem diagnostic techniques for anthrax: rethinking pathogen exposure and the geographic extent of the disease in wildlife. *Journal of Wildlife Diseases* 49, 786-801.
- **Bagamian, K.H.**, Towner, J. T., Mills, J.N., and Kuenzi, A.J. 2013. Increased detection of Sin Nombre hantavirus RNA in antibody-positive deer mice from Montana, USA: Evidence of male bias in RNA viremia. *Viruses: Special Issue: Hantaviruses*, 5, 2320-2328.
- **Bagamian, K.H.**, Towner, J.S., Douglass, R.J., Kuenzi, A.J., Rollin, P.E., Waller, L.A., and Mills, J.N. 2012. Transmission ecology of Sin Nombre hantavirus in North American deer mouse populations in outdoor enclosures. *PloSOne* 7(10): e47731.
- **Bagamian, K.H.**, Douglass, R.J., Alvarado, A., Kuenzi, A.J., Amman, B.A., Waller, L.A., and Mills, J.N. 2012. Population density and seasonality effects on Sin Nombre virus transmission in North American deer mice (*Peromyscus maniculatus*) in outdoor enclosures. *PLoSOne*, 7(6): e37254.
- Carver, S., Kuenzi, A.J., **Bagamian, K.H.**, Mills, J.N., Rollin, P.E., Zanto, S.N. and Douglass, R.J. 2011. A temporal dilution effect: hantavirus infection in deer mice in Montana: effect of intermittent presence of voles. *Oecologica* 166, 713-721.

- **Bagamian, K.H.**, Heins, D.C., and Baker, J.A. 2004. Body condition and reproductive capacity of three-spined stickleback infected with the cestode *Schistocephalus solidus*. *Journal of Fish Biology* 64, 1568-1576.

*Selected manuscripts in preparation*

- Rheingans, R, **Bagamian, K.H.**, Muhib, F., Amaya, M.P., Laytner, L.A., Anderson, J. Global burden and distribution of ETEC and *Shigella* infections in 96 Low and Middle Income countries. *In prep.*
- **Bagamian, K.H.**, Anderson, J., Laytner, L., Cumming, O., and Rheingans, R. Spatial Heterogeneity and disparities in enteric disease risk (ETEC and *Shigella* infection) in East and Central Africa: implications for new vaccines.
- Rheingans, R, **Bagamian, K.H.**, Laytner, L.A., Amaya, M.P., Anderson, J. Potential impact and cost-effectiveness of ETEC and *Shigella* vaccines in 96 Low and Middle Income countries. *In prep.*
- Rheingans, R, Anderson, J. and **Bagamian, K.H.** Effects of geographic and economic heterogeneity on rotavirus burden and vaccination impact and cost-effectiveness in Pakistan. *In prep.*
- **Bagamian, K.H.**, Ali, M., Hunter, D., and Blackburn, J.K. Comparison of two commercially available enzyme-linked immunoassays for detection of antibody to anthrax in wildlife. *Will be submitted for publication.*

*Reports*

- Rheingans, R., **Bagamian, K.H.**, Anderson, J. D., Ryan, S. J., Amratia, P., Amaya, M. P., Bouland, J., Laytner, L. A., Watson, J., Cumming, O. 2016 WASH Poverty Diagnostic; Poverty Risk Model Assessment: Bangladesh. World Bank Report, 56pp
- Rheingans, R., Anderson, J. D., **Bagamian, K.H.**, Ryan, S. J., McNamara, K., Laytner, L. A., Amratia, P., Watson, J., Cumming, O. 2016 WASH Poverty Diagnostic; Poverty Risk Model Assessment: Democratic Republic of Congo. World Bank Report, 56pp
- Rheingans, R., **Bagamian, K.H.**, Anderson, J. D., Ryan, S. J., Laytner, L. A., McNamara, K., Watson, J., Cumming, O. 2016 WASH Poverty Diagnostic; Poverty Risk Model Assessment: Ethiopia. World Bank Report, 56pp
- Rheingans, R., **Bagamian, K.H.**, Anderson, J. D., Ryan, S. J., Laytner, L. A., McNamara, K., Amaya, M. P., Watson, J., Cumming, O. 2016 WASH Poverty Diagnostic; Poverty Risk Model Assessment: Haiti. World Bank Report, 54pp
- Rheingans, R., Anderson, J.D., **Bagamian, K. H.**, Ryan, S.J., Watson, J., Laytner, L.A., Cumming, O. 2016 WASH Poverty Diagnostic; Poverty Risk Model Assessment: Mozambique. World Bank Report, 62pp
- Rheingans, R., **Bagamian, K.H.**, Anderson, J.D., Ryan, S. J., Laytner, L. A., McNamara, K., Watson, J., Cumming, O. 2016 WASH Poverty Diagnostic; Poverty Risk Model Assessment: Nigeria. World Bank Report, 54pp
- Rheingans, R., Anderson, J. D., **Bagamian, K.H.**, Ryan, S.J., Amaya, M. P., Laytner, L. A., McNamara, K., Watson, J., Cumming, O. 2016 WASH Poverty Diagnostic; Poverty Risk Model Assessment: Tajikistan. World Bank Report, 54pp
- Rheingans, R., **Bagamian, K.H.**, Anderson, J. D., Ryan, S. J., Watson, J., Amratia, P., Laytner, L. A., Cumming, O. 2016 WASH Poverty Diagnostic; Poverty Risk Model Assessment: Pakistan. World Bank Report, 58pp
- Ryan, S. J., Rheingans, R., Amratia, P., Amaya, M.P., Laytner, L. A., **Bagamian, K.H.**, Anderson, J.D., Watson, J., McNamara, K., Cumming, O. 2016 WASH Poverty Diagnostic; Poverty Risk Model Assessment: Ecuador. World Bank Report, 51pp
- Ryan, S. J., **Bagamian, K.H.**, Rheingans, R., Cumming, O. 2016. An exploratory validation of the WASH PRM for the Democratic Republic of Congo, Haiti, and Tajikistan. World Bank Report, 47pp

## PRESENTATIONS

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### *Selected invited seminars*

- **National Institute of Allergy and Infectious Diseases Rocky Mountain Laboratories, Hamilton, MT, October 22, 2014, Bagamian, K.H., Transmission and within-host characteristics of deer mice naturally infected with Sin Nombre hantavirus.**
- **University of Florida, Gainesville, FL, *Emerging Pathogen Institute Seminar Series*, October 31, 2012, Bagamian, K.H. Transmission ecology of Sin Nombre hantavirus in North American deer mouse (*Peromyscus maniculatus*) populations in outdoor enclosures.**
- **Tulane University, New Orleans, LA, *Tulane School of Science and Engineering Seminars*, April 20, 2012, Bagamian, K.H. Transmission ecology of Sin Nombre hantavirus in North American deer mouse (*Peromyscus maniculatus*) populations in outdoor enclosures.**
- **Montana Tech, U of Montana, Butte, MT, *Freshman Seminar Series*, October 2007, Bagamian, K.H., Douglass, R.J., Kuenzi, A.J., and Mills, J.N. Manipulative experiments to monitor transmission of Sin Nombre virus in deer mouse populations under natural field conditions.**

### *Selected Conference Presentations*

- **Bagamian, K.H., Anderson, J., Laytner, L., Cumming, O., and Rheingans, R. Spatial Heterogeneity and disparities in enteric disease risk (ETEC and *Shigella* infection) in East and Central Africa: implications for new vaccines. *American Society of Tropical Medicine and Hygiene 2016 Annual Meeting*, Atlanta, GA, USA, November 13-17, 2016. *Late breaker poster presentation.***
- **Bagamian, K.H., Anderson, J., Laytner, L., Cumming, O., and Rheingans, R. Spatial Heterogeneity and disparities in enteric disease risk (ETEC and *Shigella* infection) in East and Central Africa: implications for new vaccines. *Vaccines Against Shigella and ETEC (VASE) conference*, Washington D.C., USA, June 28-30, 2016. *Poster presentation.***
- **Bagamian, K.H. and Rheingans, R. Building a high resolution spatial dataset to assess the heterogeneity of diarrheal prevalence and risk in East Africa. *Ecology and Evolution of Infectious Disease Annual Conference*, Athens, GA, USA, June 1-4, 2015. *Poster presentation.***
- **Bagamian, K.H., Skrypnik, A., Rodina, Y., Bezymennyi, M., Nevolko, O., Skrypnik, V., and Blackburn, J.K. Serological anthrax surveillance in wild boar (*Sus scrofa*) in Ukraine. *Ecology and Evolution of Infectious Disease*, Ft. Collins, USA, June 1-4, 2014. *Poster presentation.***
- **Bagamian, K.H. Transmission ecology of Sin Nombre hantavirus in North American deer mouse populations in outdoor enclosures. *Wildlife Disease Association International Conference*, Lyon, France, July 22-27, 2012. *Wildlife Disease Association Graduate Research Recognition Award Oral Presentation.***
- **Bagamian, K.H., Towner, J.S., Douglass, R.J., Kuenzi, A.J., Rollin, P.E., Waller, L.A., and Mills, J.N. Transmission ecology of Sin Nombre hantavirus in North American deer mouse populations in outdoor enclosures. *NIH-NIGMS 4<sup>th</sup> Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE)*, Washington D.C., U.S.A., June 25-27, 2012. *Highlighted Poster—Immunobiology and Infectious Diseases Session.***
- **Bagamian, K.H., Douglass, R.J., and Mills, J.N. Sin Nombre hantavirus transmission and viral RNA shedding in deer mouse populations in outdoor enclosures. *American Society of Tropical Medicine and Hygiene Annual Meeting*, Atlanta, GA, USA, November 3-7, 2010. *Poster presentation.***
- **Bagamian, K.H., Douglass, R.J., and Mills, J.N. Sin Nombre transmission in deer mouse populations in outdoor enclosures. *VII International Conference on HFRS, HPS, and Hantaviruses*, Athens, Greece, May 20-22, 2010. *Poster presentation.***

- **Bagamian, K.H.**, Douglass, R.J., and Mills, J.N. **Field test of Outdoor Enclosure System for Sin Nombre Hantavirus Transmission Research.** *National Center for Zoonotic, Viral and Enteric Diseases (NCZVED) 2009 Science Summit, CDC, Atlanta, GA, March 2009. Poster presentation.*
- **Bagamian, K.H.**, Douglass, R.J., and Mills, J.N. **Hantavirus Transmission in Natural Populations of Deer Mice in Outdoor Enclosures.** *Wildlife Disease Association International Conference, Estes Park, Colorado August 12-17, 2007. Opening session oral presentation.*

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#### SERVICE

##### *Academic*

- Emory Laney Graduate School PhD Alumni Mentor 2013
- Population Biology, Ecology and Evolution (PBEE) Dept. Student Mentor 2005-2012
- PBEE Dept. Executive Committee Student member 2007-2008
- PBEE Dept. Student-Faculty Forum coordinator 2006
- Tutoring 1995-2001
  - Elementary-High School Level (Math, English, History, Science)
  - College (Ecology and Evolutionary Biology)
  - Trained as an SAT Tutor for *Ivy West*

##### *Professional*

- Assistant Editor for *Journal of Wildlife Diseases*
- Reviewer for *Ecology, Journal of Wildlife Disease, Viruses, Vector-Borne and Zoonotic Diseases, Journal of Vector Ecology, Ecohealth, PlosOne, PloS Neglected Tropical Diseases, and Kidney International*
- Conference volunteer for Epidemics5 2015
- Radio Interview: “Why did you choose science?”, *Cfwep.Org EcoJazz Radio Show*, KMSM 103.9, Butte, Montana 2012
- STEM (Science Technology Engineering Math) visitor, Southwest Montana Science Partnership: Workshop on Inquiry Based Instruction 2011
- Conference organizing committee, Southeastern Population Ecology and Evolutionary Genetics Annual Conference, Dahlonoga, GA 2009
- Volunteer Key Worker for the Combined Federal Campaign 2009

##### *Community*

- STEM volunteer “Girls to Young Ladies” 2014
- Member of Emory University GIVE committee (Graduate Biological & Biomedical Sciences Involved in Volunteerism at Emory) 2008-2012
- Coaching: elementary & high-school level volleyball teams 1998-2004

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#### SOCIETAL MEMBERSHIPS

American Society of Mammalogists, American Society of Tropical Medicine and Hygiene, Ecological Society of America, Wildlife Disease Association

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#### COMPUTER SKILLS

Geographic information systems (ArcGIS) and related spatial software, STATA, DNASTAR Lasergene Suite, Microsoft Office, Geneious, SAS, R, BEAST, JMP, SPSS, Laboratory Information Management System

#### OTHER TRAINING

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- Virus Evolution and Molecular Epidemiology (VEME) Workshop: Evolutionary Hypothesis Testing Module, University of Florida, Gainesville, August 25-30, 2013.
- Ecology and Evolution of Infectious Diseases Modeling Workshop on Ecology of Infectious Disease, University of Georgia, Athens, GA, May 17-20, 2009.

#### ADDITIONAL LANGUAGES

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- Armenian: Fluent, oral and written.
- Spanish: Beginner.