

Heidi E. Brown, Ph.D., M.P.H.

Contact Information

Department of Epidemiology and Biostatistics
Mel & Enid Zuckerman College of Public Health
University of Arizona
1295 N Martin
Tucson, AZ 85724-5211
P.O. Box 245211
Phone: (520) 626-2262
Fax: (520) 626-2767
E-mail: heidibrown@email.arizona.edu

Chronology of Education

- 1995 B.S., Department of Psychology, Virginia Polytechnic Institute & State University,
Major: Psychology, Minor: Biology
- 1999 M.P.H., Division of Global Health, School of Public Health, George Washington
University, Major: International Health Promotion
- Rabies in Fairfax County, VA, USA, Masters of Public Health Thesis, George
Washington University, Gilbert Kombe, Chair
- 2006 M.Phil., Division of Epidemiology of Microbial Diseases, Department of Epidemiology,
Yale University
- 2007 Ph.D., Division of Epidemiology of Microbial Diseases, Department of Epidemiology,
Yale University
- Into the Environment of Mosquito-Borne Disease: Spatial Analysis of Vector
Distribution Using Traditional and Remotely Sensed Methods, Doctor of Philosophy
Dissertation, Yale University, Durland Fish, Chair

Chronology of Employment

- 2004 – 2007 Graduate Student, Vector Ecology Laboratory, Department of Epidemiology of Microbial
Diseases, Yale University, New Haven, CT
- 2007 – 2008 Postdoctoral Research Assistant, Spatial Ecology and Epidemiology Research Group,
Department of Zoology, Oxford, UK
- 2008 – 2009 Oak Ridge Institute for Science and Education (ORISE) Post-Doctoral Fellow, Division of
Vector-borne Zoonotic Diseases, Bacterial Diseases Branch, Centers for Disease Control
and Prevention, Fort Collins, CO
- 2009 – 2010 Senior Service Fellow, Division of Vector-borne Zoonotic Diseases, Bacterial Diseases
Branch, Centers for Disease Control and Prevention, Fort Collins, CO
- 2010 – 2011 Visiting Scientist, Texas Biomedical Research Institute, San Antonio, TX
- 2010 – 2013 Postdoctoral Research Associate, Applied Climate for Environment and Society
Laboratory, School of Geography and Development, University of Arizona, Tucson, AZ

- 2013 – Assistant Professor, Epidemiology and Biostatistics, Mel and Enid Zuckerman College of Public Health, University of Arizona, Tucson, AZ
- 2013 – Faculty, Graduate Interdisciplinary Program - Entomology and Insect Science, University of Arizona, Tucson, AZ
- 2015 – Affiliate Faculty, School of Geography and Development, University of Arizona, Tucson, AZ
- 2015 – Faculty, Graduate Interdisciplinary Program – Remote Sensing and Spatial Analysis, University of Arizona, Tucson, AZ

Honors and Awards

- 2004 – 2007 McDougal Fellow for Academic and Student Life- Community Service, Career Services and Coordinating Fellow, Yale University, New Haven, CT
- 2005 Student Presentation Award, “Predicting mosquito species distribution using satellite imagery,” Society for Vector Ecology 37th Annual Conference, Anchorage, AK
- 2005 McColgan Grant-in-Aid, “Wetland Types: Hyperspectral Image Analysis and Mosquito Sampling,” Northeast Mosquito Control Association annual conference, Northhampton, MA
- 2005 Summer Travel Award, “Modeling of Vector-Borne Disease Epidemics,” Yale Council on Southeast Asia Studies, Yale University, New Haven, CT; Host: Institute for Research Development, Mahidol University, Bangkok Thailand
- 2015 Defense Advanced Research Projects Agency (DARPA) Forecasting Chikungunya Challenge Top Solver (with Joceline Lega, UA Mathematics)

Publications

Refereed Journal Articles (*denotes dissertation work; **denotes student mentored)

1. Helmbrecht, G.D., Farhat, M.Y., Lochbaum, L., **Brown, H.E.**, Yadgarova, K.T., Eglinton G.S., and Ramwell, P.W. “L-Arginine reverses the adverse pregnancy changes induced by Nitric Oxide Synthase inhibition in the rat.” *American Journal of Obstetrics and Gynecology*. 1996, 175 (4pt1):800-805.
2. Eden, G.F., Joseph, J.E., **Brown, H.E.**, Brown, C.P., and Zeffiro, T.A. “Utilizing hemodynamic delay and dispersion to detect fMRI signal change without auditory interference: the BIG technique.” *Magnetic Resonance in Medicine*. 1999, 41(1):13-20.
3. *Diuk-Wasser, M.A., **Brown, H.E.**, Andreadis, T.G., and Fish, D. “Modeling the spatial distribution of mosquito vectors for West Nile virus in Connecticut, USA.” *Vector-Borne and Zoonotic Diseases*. 2006, 6(3):283-95.
4. ***Brown, H.**, Diuk-Wasser, M.A., Guan, Y., Caskey, S., and Fish, D. “Comparison of three satellite sensors at three spatial scales to predict larval mosquito presence in CT Wetlands.” *Remote Sensing of the Environment*. 2008, 112(5): 2301-2308.
5. ***Brown, H.E.**, Diuk-Wasser, M.A., Andreadis, T.G., and Fish, D. “Remotely-Sensed Vegetation Indices Identify Mosquito Clusters of West Nile Virus Vectors in an Urban Landscape in the Northeastern United States.” *Vector-borne and Zoonotic Diseases*. 2008, 8(2): 197-206.
6. ***Brown, H.E.**, Paladini, M., Kline, D., Barnard, D., and Fish, D. “Effectiveness of mosquito traps in measuring species abundance and composition.” *Journal Medical Entomology*. 2008, 45(3): 517-521.

7. ***Brown, H.E.**, Childs, J.E., Diuk-Wasser, M.A., and Fish, D. "Ecological factors associated with West Nile virus transmission, northeastern United States." *Emerging Infectious Diseases*. 2008, 14(10): 1539-1545.
8. Purse, B.V., **Brown, H.E.**, Harrup, L., PPC Mertens, and Rogers D.J., "Invasion of bluetongue and other orbivirus infections into Europe: the role of biological and climatic processes." *Revue scientifique et technique*. 2008, 27(2): 427-442.
9. Hartemink, N., Purse, B.V., Meiswinkel, R., **Brown, H.E.**, de Koeijer, A., Elbers, A.R., Jan Boender, G., Rogers, D.J., and Heesterbeek, H. "Mapping the basic reproduction number (R_0) for vector-borne diseases: A case study on bluetongue virus." *Epidemics*. 2009, 3(1): 153-161.
10. **Brown, H.E.**, Ettestad, P., Reynolds, P., Brown, T., Hatton, E., Holmes, J., Glass, G., Gage, K., and Eisen, R. "Climatic predictors of the intra- and inter-annual distributions of plague cases in New Mexico based on 29 years of animal-based surveillance data." *American Journal of Tropical Medicine and Hygiene*. 2010, 82(1): 95-102.
11. **Brown, H.E.**, Yates, K., Dietrich, G., MacMillan, K., Graham, C.B., Reese, S.M., Helterbrand, W.S., Nicholson, W.L., Blount, K., Mead, P., Patrick, S.L., and Eisen, R.J. "An acarological survey and *Amblyomma americanum* distribution map with implications for tularemia risk in Missouri." *American Journal of Tropical Medicine and Hygiene*. 2011, 84(3): 411-419.
12. Cox, J., **Brown, H.E.**, and Rico-Hesse, R. "Variation in vector competence for dengue viruses does not depend on mosquito midgut binding affinity." *PLoS Neglected Tropical Diseases*. 2011, 5(5): e1172.
13. **Brown, H.E.**, Doyle, M.S., Cox, J., Eisen, R.J., and Nasci, R.S. "The effect of spatial and temporal subsetting on *Culex tarsalis* abundance models - a design for the sensible reduction of vector surveillance." *Journal of the American Mosquito Control Association*. 2011, 27(2): 120-128.
14. **Brown, H.E.**, Levy, C.E., Ensore, R.E., Schriefer, M.E., DeLiberto, T.J., Gage, K.L., and Eisen, R.J. "Annual seroprevalence of *Yersinia pestis* in coyotes as predictors of interannual variation in reports of human plague cases in Arizona, USA." *Vector-Borne and Zoonotic Diseases*. 2011, 11(11): 1439-1446.
15. Borchert, J.N., Eisen, R.J., Holmes, J.L., Atiku, L.A., Mpanga, J.T., **Brown, H.E.**, Graham, C.B., Babi, N., Montenieri, J.A., Ensore, R.E., and Gage, K.L. "Evaluation and Modification of Off-Host Flea Collection Techniques Used in Northwest Uganda: Laboratory and Field Studies." *Journal of Medical Entomology*. 2012. 49(1): 210-214.
16. Sedda, L., **Brown, H.E.**, Purse, B.V., Burgin, L., Gloster, J., and Rogers, D.J. "A new algorithm quantifies the roles of wind and midge flight activity in the bluetongue epizootic in North-West Europe." *Proceedings of the Royal Society Biology*. 2012, 279: 787-793. doi:10.1098/rspb.2011.2555.
17. **Brown, H.E.**, Harrington, L.C., Kaufman, P.E., McKay, T., Bowman, D.D., Nelson, C.T., Wang, D., and Lund, R. "Key Factors Influencing Canine Heartworm, *Dirofilaria immitis*, in the United States." *Parasites Vectors*. 2012. 5:245. doi: 10.1186/1756-3305-5-245
18. Wang, D., Bowman, D.D., **Brown, H.**, Harrington, L.C., Kaufman, P.E., McKay, T., Nelson, C.T., Sharp, J.L., and Lund, R. "Factors Influencing U.S. Canine Heartworm (*Dirofilaria immitis*) Prevalence." *Parasites Vectors*. 2014.7(264). doi:10.1186/1756-3305-7-264.
19. Sedda, L., Morley, D., and **Brown, H.E.** "Characteristics of wind-infective farms of the 2006 Bluetongue Serotype 8 epidemic in Northern Europe" *EcoHealth*. 2015, 12(3): 461-7. doi: 10.1007/s10393-014-1008-x.
20. **Clark, R., Taylor, A., Garcia, F., Krone, T. and **Brown, H.E.** "Recognizing the role of skunks in human and animal rabies exposures" *Vector-Borne Zoonotic Diseases*. 2015, 15(8): 494-501. doi: 10.1089/vbz.2014.1719.
21. Nsoesie, E.O., Ricketts, P., **Brown, H.E.**, Fish, D., Durham, D.P., Mbah, M.L.N., Trudy, C., Ahmed, S., Marcellin, C., **Shelly, E., Owers, K., Wenzel, N., Galvani, A.P., and Brownstein, J.S. "Spatial and Temporal Clustering of Chikungunya Virus Transmission in Dominica" *PLoS Neglected Tropical Diseases*. 2015. 9(8):e0003977. doi:10.1371/journal.pntd.0003977.

22. **Brown, H.E.**, Young, A., Lega, J., Andreadis, T.G., Schurich, J., and Comrie, A. "Projection of climate change influences on U.S. West Nile virus vectors" *Earth Interactions*. 2015, 19:1-18. doi: EI-D-15-0008.1
23. **Shelly, E., Ernst, K., Sterling, C., Acuna-Sota, R., and **Brown, H.E.** "A critical assessment of officially reported Chagas disease surveillance data in Mexico" *Public Health Reports*. 2016. 131(1):59-66.
24. **Bui, D., **Brown, H.**, Harris, R., and Oren, E. "Serologic evidence for fecal-oral transmission of *Helicobacter pylori*" *Am J Trop Med Hygiene*. 2016, 94(1): 82-8. doi: 10.4269/ajtmh.15-0297.
25. **Haenchen, S., Hayden, M., Dickinson, K., Walker, K., Jacobs, E., **Brown, H.E.**, Gunn, J., Kohler, L., Ernst, K. "Mosquito avoidance practices and knowledge of arboviral diseases in cities with differing recent history of disease" *Am J Trop Med Hygiene*. 2016. 15:0732. doi:10.4269/ajtmh.15-0732.
26. Lega, J. and **Brown, H.E.** "Data-driven outbreak forecasting with a simple nonlinear growth model." *Epidemics*. 2016, 17:19-26.
27. **Brown, H.E.**, **Smith, C., **Lashway, S. "Influence of the length of storage on *Aedes aegypti* (Diptera: Culicidae) egg viability" *J Med Ent Dec* 2016, 54(2):489-491 doi: 10.1093/jme/tjw186.
28. **Hansen, V., Oren, E., Dennis, L., **Brown, H.E.** "Infectious Disease Mortality Trends in the United States, 1980-2014" *JAMA*. 2016. 316(20):2149 doi:10.1001/jama.2016.12423.
29. **Reyes-Castro, P., Harris, R.B., **Brown, H.E.**, Christopherson, G. Ernst, K.C., "Spatio-temporal and neighborhood characteristics of two dengue outbreaks in two arid cities of Mexico" *Acta Tropica*. 2017, 167:174-182; doi:10.1016/j.actatropica.2017.01.001.
30. **Langston, M.E., Dennis, L.K. Lynch, C.F., Roe, D.J., **Brown H.E.** "Temporal Trends in Satellite-Derived Erythematous UVB and Implications for Ambient Sun Exposure Assessment" *Internat J Env Res Public Health*. 2017, 14(2):E176. doi:10.3390/ijerph14020176.
31. **Brown, H.E.**, Barrera, R. Comrie, A.C., Lega, J. "Effect of temperature thresholds on modeled *Aedes aegypti* population dynamics" *J Med Entomol*. 2017, 54(4):869-877. doi: 10.1093/jme/tjx041
32. Lega, J., **Brown, H.E.**, Barrera, R. "*Aedes aegypti* abundance model improved with relative humidity and precipitation-driven egg hatching" *J Med Entomol* 2017, 54(5):1375-1384. doi: 10.1093/jme/tjx077.
33. **Brown, H.E.**, Cox, J., Comrie, A.C., Barrera, R. "Habitat and density of oviposition opportunity influences *Aedes aegypti* (Diptera: Culicidae) flight distance" *J Med Entomol*. 2017. 54(5):1385-1389. doi: 10.1093/jme/tjx083.
34. **Murakami, T., **Scranton, R. **Brown, H.E.**, Harris, R.B., Chen, Z., Musuku, S., and Oren, E. "Management of *Helicobacter pylori* in the United States: Results from a National Survey of Gastroenterology Physicians" *Preventive Medicine*. 2017, 100:216-222. doi: 10.1016/j.yjmed.2017.04.021.
35. **Driscoll, L.J., **Brown, H.E.**, Harris, R.B., Oren, E. "Population knowledge, attitude and practice regarding *H. pylori* transmission and outcomes: A literature review" *Frontiers in Public Health*. 2017, 5(144)1-6. doi.org/10.3389/fpubh.2017.00144.
36. **Brown, H.E.**, **Mu, W., Khan, M., Tsang, C., Liu, J., Tong, D. "Spatial scale in environmental risk mapping: A Valley fever case study" *Journal of Public Health Research*. 2017: *In press*.
37. Luz, P.M., **Johnson, R.E., **Brown, H.E.** "Workplace availability, risk group and perceived barriers predictive of 2016-17 influenza vaccine uptake in the United States: a cross-sectional study" *Vaccine*. 2017, 35(43):5890-5896. doi.org/10.1016/j.vaccine.2017.08.078

Chapters and Reports (+ denotes peer reviewed chapter; **denotes student mentored)

1. Hudspeth, W., Reisen, W.K., Barker, C.M., Kramer, V., Caian, M., Craciunescu, V., **Brown, H.E.**, Comrie, A.C., Zelicoff, A., Ward, T.G., Ragain, R.M., Simpson, G., Stanhope, W., Kass-Hout, T.A., Scharl, A., Sonricker, A.L., Brownstein, J.S. to "Chapter 10: Information Support Systems," *Environmental Tracking for Public Health Surveillance*. Morain, S.A. and Budge, A.M. (eds). 2012, London: Taylor & Francis Group.

2. ***Brown, H.E.**, Comrie, A., Drechsler, D., Barker, C.M., Basu, R., Brown, T., Gershunov, A., Kilpatrick, A.M., Reisen, W.K., and Ruddell, D. *Review Editor: English, P.* "Chapter 15: Health Effects of Climate Change in the Southwest," *Assessment of Climate Change in the Southwest United States: a Technical Report Prepared for the U.S. National Climate Assessment*. Garfin, G., Jardine, A., Merideth, R., Black, M., and Overpeck, J. (eds.) 2013, Tucson, AZ: Southwest Climate Alliance.
3. **Brown, H.E.**, Comrie, A.C., Tamerius, J., Khan, M., Tabor, J.A., Galgiani, J.N. "Climate, windstorms, and the risk of valley fever (Coccidioidomycosis)," *The Influence of Global Environmental Change on Infectious Disease Dynamics: Workshop Summary*. 2014, Washington, DC: The National Academies Press.
4. Ernst, K.C., Morin, C., **Brown, H.E.** "Extreme Weather Events and Vector-borne Diseases," *Public Health in Natural Disasters: Nutrition, Food, Remediation and Preparation* (Watson, R.R., Tabor, J.A., Ehiri, J.E., and Preedy, V.R. (eds.) 2014, The Netherlands: Wageningen Academic Publishers.
5. *National Academies of Science, Engineering, and Medicine. *Review of the Draft Interagency Report on the Impacts of Climate Change on Human Health in the United States*. 2015. Washington, DC: National Academies Press.
6. Roach, M., **Brown, H.E.**, Wilder, M., Smith, G. R., Chambers, S., Patten, I. E., **Rabby, Q. (2017) *Assessment of Climate and Health Impacts on Vector-Borne Diseases and Valley Fever in Arizona*. A report prepared for the Arizona Department of Health Services and the United States Centers for Disease Control and Prevention Climate-Ready States and Cities Initiative. <http://www.azdhs.gov/preparedness/epidemiology-disease-control/extreme-weather/index.php#news-publications>
7. Roach, M., Barrett, E., **Brown, H.E.**, Dufour, B., Hondula, D.M., Putnam, H., Sosa, B. (2017) *Arizona's Climate and Health Adaptation Plan*. A report prepared for the United States Centers for Disease Control and Prevention Climate-Ready States and Cities Initiative. <http://www.azdhs.gov/preparedness/epidemiology-disease-control/extreme-weather/index.php#news-publications>
8. Roach, M., **Brown, H.E.**, **Clark, R., Hondula, D., Lega, J., **Rabby, Q., **Schweers, N., Tabor, J. (2017) *Projections of Climate Impacts on Vector-Borne Diseases and Valley Fever in Arizona*. A report prepared for the Arizona Department of Health Services and the United States Centers for Disease Control and Prevention Climate-Ready States and Cities Initiative.