Grant D. Brown

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Contact Information

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Education

• Ph.D.	Biostatistics	University of Iowa	2012-2015
• M.S.	Biostatistics	-	2010-2012
• B.S.	Statistics	-	2006-2010
• B.A.	International Studies	-	2006-2010

Dissertation

"Application of Heterogeneous Computing Techniques to Compartmental Spatiotemporal Epidemic Models" Advisor: Dr. Jacob J. Oleson

Publications

Peer Reviewed

- Ozanne, M., **Brown, G.**, Toepp, A., Scorza, B., Oleson, J., et al. (2019) Bayesian compartmental models and associated reproductive numbers for an infection with multiple transmission modes. *Submitted to Biometrics.*
- Mahachi, K. et. al. (2019) Predominant risk factors for tick-borne coinfections in US hunting dogs. *Submitted to Parasites and Vectors*
- Boles, C. and **Brown, G.** and Nonnenmann, M. (2019) The Optimization of Methods for the Collection of Aerosolized Murine Norovirus. *Submitted to Journal of Virological Methods*
- Langenfeld, Natalie R., **Brown, Grant D.** (2019) First Moment Approximation in ABC-PMC and its Application to Compartmental Models. *Preparing Resubmission*
- Thedell, T., Boles, C., Cwiertny, D., **Brown, G.**, Qian, J., Nonnenmann, M. Comparisons of a Novel Air Sampling Filter Material, Wash Buffers and Extraction Methods in the Detection and Quantification of Influenza Virus. *Preparing Resubmission*
- Ozanne, Marie V., **Brown, Grant D**., Oleson, Jacob J., et. al. (2018) Bayesian compartmental model for an infectious disease with dynamic states of infection. *J. Appl. Stat*, DOI: 10.1080/02664763.2018.1531979
- Polgreen, P.M., Brown, G.D., Hornick, D.B. et. al. (2018) CFTR Heterozygotes are at increased risk of respiratory infections: A population-based study. *Open Forum Infect Dis.* 5(11). DOI: 10.1093/ofid/ofy219
- Gilbert, P., Pro, G., Zemore, S., Mulia, N., **Brown, G.** (2019) Gender differences in use of alcohol treatment services and reasons for non-use in a national sample. *Alcoholism: Clinical and Experimental Research*. DOI: 10.1111/acer.13965
- Oleson, J., **Brown, G.**, McCreery, R. (2019) Essential Statistical Concepts for Research in Speech, Language, and Hearing Sciences. *JSLHR.* DOI: 10.1044/2018_JSLHR-S-ASTM-18-0239
- Oleson, J., **Brown, G.**, McCreery, R. (2019) The Evolution of Statistical Methods in Speech, Language, and Hearing Sciences. *JSLHR.* DOI: 10.1044/2018_JSLHR-H-ASTM-18-0378
- Toepp, A.J. et.al. (2019) Comorbid Infections Induce Progression of Visceral Leishmaniasis. *Parasites & Vectors.* DOI: 10.1186/s13071-019-3312-3
- Ranapurwala, S., Carnahan, R., **Brown, G.**, Hinman, J., Casteel, C. (2018) Impact of Iowa's prescription monitoring program on opioid pain reliever prescribing patterns: An interrupted time series study 2003-2014. *Pain Med.,* pny029, DOI: 10.1093/pm/pny029

- Carnahan, R.M., **Brown, G.D.**, Letuchy, E.M., et. al. (2017) Impact of programs to reduce antipsychotic and anticholinergic use in nursing homes. *Alzheimers Dement*, 3(4). DOI: 10.1016/j.trci.2017.02.003
- **Brown, G. D.**, Porter, A. T., Oleson, J.J., Hinman, J.A. (2018). Approximate Bayesian Computation for Spatial SEIR(S) Epidemic Models. *Spat. Spatiotemporal Epidemiol*, 24. DOI: 10.1016/j.sste.2017.11.001
- **Brown, G. D.**, Oleson, J. J. and Porter, A. T. (2015). An empirically adjusted approach to reproductive number estimation for stochastic compartmental models: a case study of two Ebola outbreaks. *Biometrics.* DOI: 10.1111/biom.12432
- Oleson, J. J., Cavanaugh, J. E., McMurray, B., **Brown, G. D.** (2015) Detecting time-specific differences between temporal nonlinear curves: Analyzing data from the visual world paradigm. *Statistical Methods in Medical Research*. PMID: 26400088
- Zhang, Y., Doucette, W. R., Pendergast, J.F., **Brown, G. D.**, Frank, J. (2015) Assessing the Effect of a Cost Management Component in a Targeted Intervention Progrom. *Value in Health*. 17(3).
- Doucette, W. R., Pendergast, J. F., Zhang, Y. **Brown, G. D.** et. al. (2014) Stimulating Comprehensive Medication Reviews among Medicare part D. beneficiaries. *American Journal of Managed Care.* 21(6): e372-8

Other

- **Brown, G.** and Ozanne, M. (2019) Statistical Models for Infectious Diseases: A Useful Tool for Practical Decision-Making. *American Journal of Tropical Medicine and Hygiene*. 101(1) 1-2. DOI: 10.4269/ajtmh.19-0354
- **Brown, G. D.** and Oleson, J. J. (2015) Spatiotemporal epidemic modeling with libSpatialSEIR – model specification, fitting, selection, and prediction. *Advances in Geocomputation: Geocomputation 2015 D. A. Griffith, Y. Chun and D. J. Dean. Cham, Springer International Publishing: 315-323.*
- **Brown, G. D.** and Oleson, J. J. Estimating and predicting epidemic behavior for the 2014 West African Ebola Outbreak – a quick spatial SEIR modeling approach (2014) Online Report.
- Editor: 2011 Iowa Health Fact Book

Presentations

- "Structure Penalized Trees for Ensemble Methods – Robust Prediction for Annual Outcome Data", JSM, July 2019
- "Working with Approximate Bayesian Computation in Stochastic Compartmental Models"
    - Colorado School of Mines, March 2018
- "Approximate Bayesian Computation for Compartmental Epidemic Models."
    - University of Iowa Department of Statistics, Colloquia Series, February 2016
    - JSM, August 2016
    - Emory University, November 2016
    - UI3 Student Journal Club, December 2016
- **"**Approximate Bayesian Computation for Compartmental Epidemic Models – Methods and Software", ENAR, Spring 2016
- **"**SAS and R: A practical comparison for predictive analytics" UI Business Intelligence Community, November 2016
- **"**Evaluation of Educational Programs to Improve Medication Use in Nursing Home Residents." Department of Epidemiology Seminar, October 2016.
- "Predictive Modeling for First Year Enrollment." University of Iowa Institutional Data Users Group, October 2015.
- "An Empirically Adjusted Reproductive Number for Stochastic Compartmental Models." University of Iowa Department of Biostatistics, January 2015

- "Working with Epidemic Data." Cornell College, December 2015.
- "Predicting Epidemic Behavior." Online Presentation for Project Lead the Way, November 2014

PhD. Advising

Biostatistics

- **Co-chair**: Marie Ozanne, PhD. (2019)
- **Chair**: Natalie Langenfeld, PhD. (2018)
- **Chair:** Nick Seedorff (Ongoing)
- **Co-chair:** Helin Hernandez (Ongoing)
- **Co-chair:** Caitlin Ward (Ongoing)
- Member: Brandon Butcher, PhD. Candidate. (Ongoing)
- Member: Anne Welhaven, PhD. Candidate. (Ongoing)
- Member: Qing Li, PhD. (2018)
- Member: Michael Seedorff, PhD. (2018)
- Member: Monelle Tamegnon, PhD. (2018)
- Member: Yaohui Zheng, PhD. (2017)
- Member: David Zahrieh, PhD. (2017)
- Member: John Van Buren, PhD. (2016)

External

- Member: Nicole Pierce, PhD Candidate. Nursing (Ongoing)
- Member: Sena Chae, PhD Candidate. Nursing (Ongoing)
- Member: Eric Kontowicz, PhD Candidate. Epidemiology (Ongoing)
- Member: Katy Martinez, PhD Candidate. AMS, CSM (Ongoing)
- Member: Corey Boles, PhD. Occupational and Environmental Health (2019)
- Member: Yan Zhang, PhD. Epidemiology (2018)

Masters/RA Advising

Biostatistics – Preceptorship

- Advisor: Uche Nwoke, (Ongoing)
- Advisor: Josh Tomiyama (Ongoing)
- Co-Advisor: Jenna Johnson (Ongoing)
- Co-Advisor: Felix Pabon-Rodriguez (Ongoing)
- Advisor: Lydia Garlie, MS. (2018)
- Co-Advisor: Lizzie Bair, MS. (2016)

Biostatistics – RA

- Supervisor: Josh Tomiyama (Ongoing)
- Supervisor: Felix Pabon-Rodriguez (Ongoing)
- Co-Supervisor: Marie Ozanne (2016-2019)
- Supervisor: Uche Nwoke (2016-2019)
- Supervisor: Daren Kuwaye (2017-2018)
- Supervisor: Biyue Dai (2015-2016)

External

- Member: Shelby Clark, MS, Occupational and Environmental Health (2019)
- Member: Terrance Thedell, MS. Occupational and Environmental Health (2017)

Research Interests

- Bayesian Inference
- Statistical Computing
- Stochastic Compartmental Models and Spatial Generalizations
- Statistical/Machine Learning, Ensemble Learning Techniques
- Data Visualization

Teaching

Instructor – University of Iowa

- Regression and ANOVA in the Health Sciences (Spring 2019, 2018)
- Biostatistical Methods I (Fall 2018)
- Advanced Biostatistical Computing (Fall 2017)
- Biostatistical Methods II (Spring 2017)
- Introduction to Biostatistics (Spring/Fall 2016)
- Design and Analysis of Biomedical Experiments (Summer 2013)

Guest Lecturer – University of Iowa

- First year seminar: The Human Side of Big Data (Spring 2017-2018)
- Epidemiology of Infectious Diseases (Fall 2015-2017)

Professional and Academic Experience

Assistant Professor, Department of Biostatistics, University of Iowa (2015-Present)

- UI^3 Cluster Faculty
- Developed advanced computing course
- Developed predictive models for undergraduate student enrollment and retention with enrollment managers, and created several R packages to facilitate the use of institutional data at the University of Iowa
- Contributed to several projects focused on antipsychotic use in elderly patients
- Consulted on the development of statistical methods for grant proposals to a variety of federal funding agencies, including collaboration with the departments of Epidemiology and Community and Behavioral Health
- Participated in an interdisciplinary working group to study the opioid epidemic in Iowa
- Mentored several MS and PhD students
- Worked with students to provide analytical deliverables using SAS, R, knitr, rmarkdown, d3, and other technologies

Research Assistant, Center for Public Health Statistics, University of Iowa. (2009-2015)

- Helped to build and maintain the Iowa Get Screened colorectal cancer screening program data management website
- Helped to build and maintain the Care For Yourself breast and cervical cancer screening program data management website
- Conducted collaborative research with individuals in the University of Iowa College of Pharmacy, including design of data collection tools, implementation of stratified sampling techniques, and designing medication therapy management program evaluation analyses
- Worked with researchers in Community and Behavioral Health to evaluate the effectiveness of a large unplanned pregnancy prevention project

Statistical Consultant, University of Iowa College of Nursing (2013)

- Worked with PhD candidates in the College of Nursing
- Helped plan and execute statistical analyses
- Used extensive one-on-one meetings to explain statistical concepts
- Designed standard statistical analysis reports to provide to clients

Programmer, HOBU Inc. (Summer 2013)

- Developed the ‘laspy’ LIDAR data abstraction library for python
- Worked to create extensive technical documentation and tutorials
- Worked on LIDAR file bounding algorithms

Software Projects

sptcart
A forthcoming R package implementing structure penalized CART and Random Forest Algorithms

MAUIDW
A UI specific R package designed to enable institutional data users at the University of Iowa to easily interact with the MAUI Data Warehouse

EMPredict
A UI specific R package intended to streamline the use of predictive models for enrollment and retention outcomes at the University of Iowa

ABSEIR
An R package implementing path-specific spatial SEIRS models using Approximate Bayesian Computing techniques.

RcppCAF
An R package designed to simplify the inclusion of the C++ Actor Framework (CAF) in software projects

libSpatialSEIR
A C++ library and associated R package interface, designed to intuitively and efficiently fit stochastic spatial SEIRS epidemic models

laspy
A python package providing read-write access to binary LIDAR files following the ASPRS .LAS file format, version 1.0-1.4, in addition to a suite of visualization tools

Service, Professional Organizations

- Member, CPH Undergraduate Steering Committee (2018-2019)
- Member, Admissions Committee, Department of Biostatistics (2015-2019)
- Chair, Advanced Biostatistical Computing Exploratory Committee (2015-2016)
- Member, Statistical Methods Task Force, College of Public Health (2017)
- Member, UI Business Intelligence Community Steering Committee (2016-2019)
- Member, Computing Committee, Department of Biostatistics (2015-2019)
- Biostatistics department representative, undergraduate subgroup of the Curricula Innovations Committee, College of Public Health (2015)
- Member, American Statistical Association (2015-2019)
- Member, International Biometric Society (2015-2019)