Caitlin Ward

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Education

2018-2021	**University of Iowa** PhD, Biostatistics Advisors: Dr. Jacob Oleson and Dr. Grant Brown Dissertation Title: Bayesian Methods for Spatio-Temporal Epidemic Models to Accurately Capture Complex Dynamics of Disease Spread
2016-2018	**University of Iowa** MS, Biostatistics
2012-2016	**Iowa State University** BS, Statistics, *Summa Cum Laude*, Minors in Mathematics and Russian Studies

Research Interests

Bayesian statistics

Statistical Computing

Infectious disease epidemiology

Spatio-temporal modeling

Employment

Aug 2021-Present	**University of Calgary** *CANSSI Distinguished Postdoctoral Fellow* Behavioral Change in Infectious Disease Systems Supervised by Drs. Rob Deardon and Alexandra Schmidt	Calgary, AB, CA
Sept 2021-Present	**University of Iowa** *Adjunct Assistant Professor*, College of Nursing	Iowa City, IA, US
2016-2021	**University of Iowa** *Graduate Research Assistant*, Department of Biostatistics Biostatistics Consulting Center Center for Public Health Statistics Public Policy Center	Iowa City, IA, US

Teaching

Institution/Course	Role	Semester	Delivery Method	Class Size
University of Calgary				
STAT:205 Introduction to Statistical Inquiry	Instructor	Spring 2022	In-person (planned)	Cap 180
University of Iowa				
BIOS:4120 Introduction to Biostatistics	Instructor	Summer 2019	In-person	7
	Instructor	Fall 2019	Online	27
	Instructor	Spring 2020	Online	33
	Instructor	Summer 2020	Online	65
BIOS:4110 General Biostatistics Topic: Epidemic Modeling	Guest Lecturer	Summer 2021	Online	15
EPID:5540 Public Health Surveillance Topic: COVID-19 Modeling	Guest Lecturer	Fall 2020	Hybrid	16

Publications

Peer-Reviewed Journal Publications

16. **Ward, C.**, Brown, G., Oleson, J. (2021). An Individual Level Infectious Disease Model in the Presence of Uncertainty from Multiple, Imperfect Diagnostic Tests. *Biometrics.* doi: 10.1111/biom.13579

15. Lence, T., Lockwood, G. M., Storm D. W., **Ward, C.**, Cooper, C. S. (2021). The Utility of Renal Sonographic Measurements in Differentiating Children with High Grade Congenital Hydronephrosis. *Journal of Pediatric Urology.* doi: 10.1016/j.jpurol.2021.07.021

14. Priya, S., Aggarwal, T., **Ward, C.**, Bathla, G., Jacob, M., Gerke, A., Hoffman, E., Nagpal, P. (2021). Radiomics side experiments and DAFIT approach in identifying pulmonary hypertension using Cardiac MRI derived radiomics based machine learning models. *Scientific Reports.* doi: 10.1038/s41598-021-92155-6

13. Priya, S., Lui, Y., **Ward, C.**, Le, N., Neetu, S., Maheshwarappa, R., Monga, V., Zhang, H., Sonka, M., Bathla G. (2021). Radiomic Based Machine Learning Performance for a Three Class Problem in Neuro-Oncology: Time to Test the Waters? *Cancers.* doi: 10.3390/cancers13112568

12. Priya, S., Agarwal, A., **Ward, C.**, Locke, T., Monga, V., Bathla G. (2021) Survival prediction in glioblastoma on post-contrast magnetic resonance imaging using filtration based first-order texture analysis: Comparison of multiple machine learning models. *The Neuroradiology Journal.* doi: 10.1177/1971400921990766

11. Priya, S., Lui, Y., **Ward, C.**, Le, N., Neetu, S., Maheshwarappa, R., Monga, V., Zhang, H., Sonka, M., Bathla G. (2021). Machine Learning Based Differentiation of Glioblastoma from Brain Metastasis using MRI Derived Radiomics. *Scientific Reports.* doi: 10.1038/s41598-021-90032-w

10. Priya, S., Aggarwal, T., **Ward, C.**, Bathla, G., Jacob, M., Gerke, A., Hoffman, E., Nagpal, P. (2021). Radiomics Detection of Pulmonary Hypertension via Texture-based Assessments of Cardiac MRI: A Machine-learning Model Comparison. *Journal of Clinical Medicine.* doi: 10.3390/jcm10091921

9. Bathla G., Priya, S., Lui, Y., **Ward, C.**, Le, N., Neetu, S., Maheshwarappa, R., Monga, V., Zhang, H., Sonka, M. (2021). Radiomics-based Differentiation Between Glioblastoma and Primary Central Nervous System Lymphoma: A Comparison of Diagnostic Performance Across Different MRI Sequences and Machine Learning Techniques. *European Radiology.* doi: 10.1007/s00330-021-07845-6

8. Priya, S., **Ward, C.**, Locke, T., Neetu, S., Maheshwarappa, R., Monga, V., Bathla G. (2021). Glioblastoma and Primary Central Nervous System Lymphoma: Differentiation Using MRI Derived First-order Texture Analysis - A Machine Learning Study. *The Neuroradiology Journal.* doi: 10.1177/1971400921998979

7. **Ward, C.**, Oleson, J., Tomblin, B., Walker, E. (2020). Modeling Population and Subject-Specific Growth in a Latent Trait Measured by Multiple Instruments over Time using a Hierarchical Bayesian Framework. *Journal of Applied Statistics.* doi: 10.1080/02664763.2020.1817346

6. Kandemirli, S., Chopra, S., Priya, S., **Ward, C.**, Locke, T., Soni, N., Srivastava, S., Jones, K., Bathla, G. (2020). Presurgical detection of brain invasion status in meningiomas based on first-order histogram based texture analysis of contrast enhanced imaging. *Clinical Neurology and Neurosurgery.* doi: 10.1016/j.clineuro.2020.106205

5. Bathla, G., Ortega-Gutierrez, S., Klotz, E., Juergens, M., Zevallos, C. B., Ansari, S., **Ward, C.**, Policeni, B., Samaniego, E., Derdeyn, C. (2020). Comparing the outcomes of two independent computed tomography perfusion softwares and their impact on therapeutic decisions in acute ischemic stroke. *Journal of NeuroInterventional Surgery.* doi: 10.1136/neurintsurg-2020-015827

4. Bathla, G., Priya, S., Samaniego, E., Deo, S. K., Fain, N. H., Soni, N., **Ward, C.**, Derdeyn, C. P. (2020). Cerebral computed tomographic angiography using third-generation reconstruction algorithm provides improved image quality with lower contrast and radiation dose. *Neuroradiology.* doi: 10.1007/s00234-020-02406-y

3. Hartley, C. C., Renner, L. M., & **Ward, C.** (2019). A New Factor Solution for the Domestic Violence–Related Financial Issues Scale (DV-FI). *Journal of Interpersonal Violence.* doi: 10.1177/0886260519860888

2. **Ward, C.**, Oleson, J., Jones, K., Charlton, M. (2018). Showcasing Cancer Incidence and Mortality in Rural ZCTAs Using Risk Probabilities via Spatio-temporal Bayesian Disease Mapping. *Applied Spatial Analysis and Policy.* doi: 10.1007/s12061-018-9276-4

1. Saletta, M., Goffman, L., **Ward, C.**, & Oleson, J. (2018). Influence of Language Load on Speech Motor Skill in Children With Specific Language Impairment. *J Speech Lang Hear Res*v. doi: 10.1044/2017_JSLHR-L-17-0066

Journal Papers in Submission

- Heeren, T., **Ward, C.**, Ashida, S., Sewell, D. (Revisions Requested). Applying Network Analysis to Assess the Development and Sustainability of Multi-Sector Coalitions. *PLOS ONE.*
- **Ward, C.**, Brown, G., Oleson, J. (Submitted). Incorporating Infectious Duration-Dependent Transmission into Bayesian Epidemic Models.
- Walker, E. A., **Ward, C.**, Oleson, J., Sapp, C., McCreery, R. W., Tomblin, J. B., Moeller, M. P., (Submitted). Language growth in children with hearing loss who received early intervention by 3 or 6 months.
- Horak, S., **Ward, C.** (Submitted). Evaluating a State Child Care Assistance Program using Administrative Data.
- Shaw, C., **Ward, C.**, Gordon, J., Williams, K. N., Herr, K. (Submitted). Characteristics of Elderspeak Communication in Hospital Dementia Care: Findings from the Nurse Talk Observational Study.
- Narayanasamy, S., Eskandari, A., **Ward, C.**, Priya, S., Aggarwal, T., Elam, J., Nagpal, P. (Submitted). Prevalence and Significance of Incidental Findings on Computed Tomography Pulmonary Angiograms: A Retrospective Cohort Study.
- Shaw, C., **Ward, C.**, Gordon, J., Williams, K. N., Herr, K. (Submitted). Elderspeak Communication and Pain Severity as Modifiable Factors to Rejection of Care in Hospital Dementia Care.
- Sewell, D. K., Li, H., **Ward, C.**, Pham, H., Diekema, D. K., Perencevich, E. (Submitted). Evaluating the effect of quarantining in the context of regular universal testing: A validated agent-based modeling approach to assessing interventions in academic settings.

Journal Papers In Preparation

- Shaw, C., **Ward, C.**, Herr, K. (In preparation). Presence of Rejection of Care Behaviors in Patients with Pain and Delirium.
- Shaw, C., **Ward, C.**, Gordon, J., Williams, K. N., Herr, K. (In preparation). Reliability and Validity of an Evidence-based Elderspeak Coding Scheme.
- **Ward, C.**, Deardon, R., Schmidt, A. (In preparation). Bayesian Modeling of Dynamic Behavioral Change During an Epidemic.

Honors and Awards

- Milford E. Barnes Award, University of Iowa College of Public Health 2021
- Ada Louise Ballard and Seashore Dissertation Fellowship, University of Iowa Spring 2021
- University of Iowa Dare to Discover Banner Campaign, Featured Researcher 2021
- William R. Clarke Graduate Teaching Assistant Award, University of Iowa 2020
- University of Iowa Council on Teaching Outstanding Teaching Assistant Award 2020
- Recipient of Thank a Teacher note of appreciation through the Center for Teaching 2020, 2021
- Leon F. Burmeister Memorial Scholarship Award, University of Iowa 2018
- William R. Clarke Graduate Research Assistant Award, University of Iowa 2018
- George W. Snedecor Undergraduate Award, Iowa State University 2015

Presentations

Invited Talks

- Bayesian Modeling of Dynamic Behavioral Change During an Epidemic. *Statistical Society of Canada Annual Meeting.* Upcoming - June 2022.
- Incorporating Infectious Duration-Dependent Transmission into Bayesian Epidemic Models. *Conference on Computational and Methodological Statistics.* Upcoming - Dec 2021.
- Introduction and Demonstration of an Interactive COVID-19 Forecasting Tool. University of Iowa College of Public Health Spotlight Series on COVID-19. Virtual presentation. July 2020.
- Accountable Communities of Health: Measuring Connectivity and Sustainability using Network Analysis. University of Iowa Public Policy Center. Iowa City, IA. October 2019.

Contributed Talks

- An Individual Level Infectious Disease Model in the Presence of Uncertainty from Multiple, Imperfect Diagnostic Tests. Virtual presentation. *Joint Statistical Meetings.* August 2020.
- A Spatio-Temporal Infectious Disease Model in the Presence of Uncertainty from Multiple, Imperfect Diagnostic Tests. Speed poster presentation. *Women in Statistics and Data Science Conference.* Seattle, WA. October 2019.
- Modeling Population and Subject-Specific Growth in a Latent Trait Measured by Multiple Instruments Over Time Using a Hierarchical Bayesian Framework. Poster presentation. *Joint Statistical Meetings.* Denver, CO. August 2019.

Funding

University of Iowa Libraries Open Educational Resources (OER) Grant 2020

- "Simulation Based Inference in Introductory Statistics." Co-Principal Investigator. Total award amount: $6,000
  - Creation of an interactive OER with embedded Shiny applications to illustrate statistical concepts

Service

Department of Biostatistics, University of Iowa

- Biostatistics Student Organization Mentorship Chair, August 2020 - August 2021
- Graduate Student Team Leader, COVID-19 Modeling Web Application, May 2020 - August 2020
- Biostatistics Student Organization President, August 2019 - August 2020
- Administrative Committee, August 2019 - August 2020
- Web-Based Instruction Resource Committee, August 2019 - August 2020
- Biostatistics Student Organization Treasurer, August 2018 - August 2019

University of Iowa

- Graduate & Professional Student Government Grant Reviewer, August 2019 - August 2020

Professional

- Refereed articles for the following journals
  - Statistics in Medicine (1)
  - Journal of the American Medical Association (1)
  - JAMA Network Open (3)
  - PLOS ONE (1)
  - BMC Public Health (1)

Software

- `BayesSEIR` - An R Package designed to simulate and fit Bayesian SEIR models of infectious disease spread using various methods to model the infectious period. https://github.com/ceward18/BayesSEIR

Professional Activity

- Member, American Statistical Association (ASA)
- Center for the Integration of Research, Teaching and Learning (CIRTL) Practitioner Level
  - Teaching as Research (TAR) project: Evaluating Student Attitudes and Engagement in a Project-Enhanced Online Introduction to Biostatistics Course
- Member, Phi Beta Kappa