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mbannick

Marlena Bannick

Research Interests

- Statistical learning for population health applications
- Health metrics
- Clinical trials methods
- Software engineering and statistical computing

Education

2020–present **Doctor of Philosophy in Biostatistics**, *University of Washington*.

2016–2019 **Master of Science in Biostatistics**, *University of Washington*.
Committee: Dr. Ruth Etzioni chair; Dr. Megan Othus
Thesis: Estimating time to intermediate endpoints using population-level survival data and deconvolution methods, with application to cancer progression and recurrence

2012–2016 **Bachelor of Science in Public Health**, *University of Washington*.
Minor in Mathematics; College Honors
magna cum laude; Phi Beta Kappa

Experience

10/2020–present **Graduate Research Assistant**, *Fred Hutchinson Cancer Research Center*.
Supervisor: Dr. Fei Gao

10/2020–present **Graduate Trainee**, *Institute for Health Metrics and Evaluation*.
Supervisor: Dr. Aleksandr Aravkin

2019–2020 **Mathematical Sciences Researcher**, *Institute for Health Metrics and Evaluation*.
Supervisor: Dr. Aleksandr Aravkin

- Develop quantitative methods and modeling strategies that incorporate all possible relevant global health data to achieve credible and policy-relevant results
- Implement methods into code that address analytical challenges across teams at IHME
- Lead Python software developer for a multi-stage hierarchical disease dynamics model
- Translate quantitative methodology to IHME research teams through consultations
- Built COVID-19 modeling software for the IHME COVID-19 projections

2016–2019 **Post Bachelor Fellow**, *Institute for Health Metrics and Evaluation*.
Supervisors: Dr. Stephen Lim, Dr. Kyle Foreman, Dr. Theo Vos

Central Computation for the Global Burden of Disease Study

- Backend development for the institutional statistical modeling program to make cause of death estimates for the Global Burden of Disease Study 2017 and 2019
- Designed software for a large cluster computing platform used by dozens of disease modelers as a key part of the GBD estimation pipeline

Natural Language Processing Applications

- Developed a tool to screen the results of PubMed queries for relevance to research teams at IHME using natural language processing and deep learning methods

Disease Estimation for the Global Burden of Disease Study

- Developed estimates of non-fatal injury burden for the Global Burden of Disease Study 2016 and sexual violence indicators for the Sustainable Development Goals

2015–2016 **Research Assistant**, *Fred Hutchinson Cancer Research Center*.
Supervisor: Dr. Beth Mueller

- Performed statistical analyses for a cohort study of pregnancy outcomes in women with multiple sclerosis, and a case-control study of congenital malformations and childhood cancer
- Researched the capacity of each state in the U.S. to link birth certificates to state cancer registries for a National Cancer Institute-funded study

06–09/2015 **Research Assistant**, *Department of Biostatistics, University of Washington*.
Supervisor: Dr. James Hughes

- Developed a statistical method to estimate under-reporting of sensitive, self-reported behaviors in a study population with biomarkers
- Authored a publication on the novel method that was ultimately presented by Dr. Hughes at the CDC Expert Consultation on Advancing Methods for Biobehavioral Surveys in 2018

06–08/2014 **Research Assistant**, *Fred Hutchinson Cancer Research Center*.
Supervisor: Dr. Deborah Donnell, HIV Prevention Trials Network

- Developed an R program for an HIV Prevention Trials Network study to inform the categorization of biological specimens in a way that optimized sensitivity and specificity

04–08/2014 **Student Research Assistant**, *University of Washington*.
Center for Clinical and Epidemiological Research

- Supported the maintenance of a large health research registry
- Performed targeted literature reviews to inform grants for new epidemiological twin studies

2013–2014 **Student Research Assistant**, *University of Washington*.
Supervisor: Dr. Suzanne Kerns, Division of Public Behavioral Health and Justice Policy

- Analyzed qualitative survey data using ATLAS.ti to determine barriers to implementing evidence-based parenting interventions in Washington State
- Designed online data collection platforms for intervention monitoring and evaluation
- Assisted in writing monitoring and evaluation progress reports for the Washington State Division of Behavioral Health and Recovery

Honors and Awards

2019 Senior MS in Biostatistics Award, Department of Biostatistics, University of Washington

2019 Graduate School Conference Travel Award, University of Washington

2016 Husky 100 Award, University of Washington

2016 Outstanding Student Award, School of Public Health, University of Washington

Teaching

Guest Lectures

07/2020 "Introduction to Epidemiological and Biostatistical Thinking", Neurology Clinical Fellowship Didactics *Instructor: Dr. Andrea Cheng-Hakimian*, University of Washington, Seattle. Materials: https://github.com/mbannick/uw-neurology-fellows

08/2018 & 2019 "Cause of Death Ensemble Model (CODEm)", Global Burden of Disease (GH 590) *Instructor: Dr. Jeffrey Stanaway*, Department of Global Health, University of Washington, Seattle

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Workshops

09/2020 "Introduction to Research at the Institute for Health Metrics and Evaluation: Training Bootcamp for First-Year Post-Bachelor Fellows". Designed curriculum and facilitated a week-long crash course on intro epidemiology, biostatistics, R, Git and high performance computing. Institute for Health Metrics and Evaluation, University of Washington, Seattle.

05/2019 "Data to DALYs: Case Study on Diabetes", with Dr. Theo Vos and Dr. Liane Ong. 2-day short course. Global Burden of Disease Workshop, Eretria, Greece.

Publications

Methodological

1. **MS Bannick**, McGaughey M, and Flaxman A. Ensemble modelling in descriptive epidemiology: burden of disease estimation. International Journal of Epidemiology 2019. DOI: 10.1093/ije/dyz223.

2. **MS Norwood**, Hughes J, and Amico K. The validity of self-reported behaviors: methods for estimating underreporting of risk behaviors. Annals of Epidemiology 9 2016;26:612–8. DOI: 10.1016/j.annepidem.2016.07.011.

Collaborative

3. Duan L, Pengpeng Y, Haagsma J, Ye J, Yuan W, Yuliang E, Xiao D, Xin G, Cuirong J, Linhong W, **MS Bannick**, Mountjoy-Venning C, Hawley C, Liu Z, Smith M, James S, Vos T, and Murray C. The burden of injury in China, 1990 - 2017: findings from the Global Burden of Disease Study 2017. The Lancet Public Health 9 2019;4:449–61. DOI: 10.1016/S2468-2667(19)30125-2.

4. **MS Norwood**, Lupo P, Chow E, Scheurer M, Plon S, Danysh H, Spector L, Carozza S, and Mueller B. Childhood cancer risk in those with chromosomal and non-chromosomal congenital anomalies in Washington State: 1984-2013. PLoS One 2017. DOI: 10.1371/journal.pone.0179006.

Global Burden of Disease Collaboration

Included as an author on the following publications as part of the Global Burden of Disease Study. Developed statistical and computational machinery and performed analyses.

5. **GBD 2016 Neurology Collaborators**. Global, regional, and national burden of neurological disorders, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet Neurology 5 2019;18:459–80. DOI: 10.1016/S1474-4422(18)30499-X.

6. **GBD 2016 Traumatic Brain Injury and Spinal Cord Injury Collaborators**. Global, regional, and national burden of traumatic brain injury and spinal cord injury, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet Neurology 1 2018;18:56–87. DOI: 10.1016/S1474-4422(18)30415-0.

7. **GBD 2017 Causes of Death Collaborators**. Global, regional, and national age-sex-specific mortality for 282 causes of death in 195 countries and territories, 1980-2017: a systematic analysis for the Global Burden of Disease Study 2017. The Lancet 10159 2018;392:1736–88. DOI: 10.1016/S0140-6736(18)32203-7.

8. **GBD 2016 Disease and Injury Incidence and Prevalence Collaborators**. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet 10100 2017;390:1211–59. DOI: 10.1016/S0140-6736(17)32154-2.

9. **GBD 2016 DALYs and HALE Collaborators**. Global, regional, and national disability-adjusted life-years for 332 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet 10100 2017;390:1260–344. DOI: 10.1016/S0140-6736(17)32130-X.

10. **GBD 2016 SDG Collaborators**. Measuring progress and projecting attainment on the basis of past trends of the health-related Sustainable Development Goals in 188 countries: an analysis from the Global Burden of Disease Study 2016. The Lancet 10100 2017;390:1423–59. DOI: 10.1016/S0140-6736(17)32336-X.

Preprints

11. **IHME COVID-19 Forecasting Team**. COVID-19 scenarios for the United States. MedRxiv 2020. DOI: 10.1101/2020.07.12.20151191.

Presentations

12. **Bannick, MS**. Estimating time to intermediate endpoints using population-level survival data and deconvolution methods, with application to cancer progression and recurrence. Women in Statistics and Data Science Conference. Oral and Poster Presentation. Bellevue, Washington, 2019.

13. **Bannick, MS**. Estimating time to intermediate endpoints using population-level survival data and deconvolution methods, with application to cancer progression and recurrence. Joint Statistical Meetings. Poster Presentation. Denver, Colorado, 2019.

14. **Bannick, MS**. Behind the Scenes: Building Tools to Visualize Intermediate Results in Complex Data Science Pipelines. Symposium on Data Science and Statistics. Invited Presentation. Bellevue, Washington, 2019.

15. **Bannick, MS**. Cause of Death Modeling. Global Burden of Disease Technical Workshop. Plenary Session. Eretria, Greece, 2019.

16. Misganaw A, **Bannick, MS**, and Srinivasan V. Ethiopia Disease Burden within the Global Burden of Disease Study 2016. Ethiopian Public Health Institute. Addis Ababa, Ethiopia, 2018.

17. **Bannick, MS**. Childhood cancer in relation to the presence of congenital malformations in Washington State. School of Public Health Undergraduate Symposium. Poster Presentation. University of Washington, Seattle, Washington, 2016.

18. **Bannick, MS**. The Validity of Self-Reported Behaviors: Methods for Estimating Underreporting of Risky Behaviors. School of Public Health Undergraduate Symposium. Poster Presentation. University of Washington, Seattle, Washington, 2015.

19. **Bannick, MS**. A Public Health Approach to Parenting Interventions: Implementation Issues. School of Public Health Undergraduate Symposium. Poster Presentation. University of Washington, Seattle, Washington, 2014.

Service and Affiliations

Affiliations

2019–present American Statistical Association

Peer Review

2020 Journal of Medical Internet Research

Additional Training

2015 Summer Institute in Statistics and Modeling in Infectious Diseases, University of Washington

2015 Writing in the Sciences, *with distinction*, via Stanford Online, Lagunita