

# Marlena Bannick

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## Education

- 2019–present **Doctor of Philosophy in Biostatistics**, *University of Washington*.
- 2016–2019 **Master of Science in Biostatistics**, *University of Washington*.  
Committee: Ruth Etzioni chair; 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

- 2019–present **Mathematical Sciences Researcher**, *Institute for Health Metrics and Evaluation*.  
Supervisor: Dr. Aleksandr Aravkin
- Develop new quantitative methods and modeling strategies that incorporate all possible relevant global health data to achieve credible and policy-relevant results
  - Implement new and existing quantitative methods into code that address analytical challenges experienced 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
  - Designed and 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
  - Conceptualized and implemented strategies to estimate 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

## Publications

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](https://doi.org/10.1093/ije/dyz223).
2. 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](https://doi.org/10.1016/S2468-2667(19)30125-2).
3. **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](https://doi.org/10.1371/journal.pone.0179006).
4. **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](https://doi.org/10.1016/j.annepidem.2016.07.011).

## Global Burden of Disease Collaboration

Included as an author on the following publications as part of the [Global Burden of Disease Study](#) Global Burden of Disease Project. 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](#).

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## Presentations

11. **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.
12. **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.
13. **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.

14. **Bannick, MS.** Cause of Death Modeling. Global Burden of Disease Technical Workshop. Plenary Session. Eretria, Greece, 2019.
15. 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.
16. **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.
17. **Bannick, MS.** The Validity of Self-Reported Behaviors: Methods for Estimating Under-reporting of Risky Behaviors. School of Public Health Undergraduate Symposium. Poster Presentation. University of Washington, Seattle, Washington, 2015.
18. **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.

## 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

### 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.

## 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