

Marlena Bannick

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Research Interests

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

Education

- 2020–present **Doctor of Philosophy in Biostatistics**, *University of Washington*.
Advised by Dr. Noah Simon and Dr. Ting Ye
- 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

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

Experience

- 10/2020–present **Research Assistant**, *Fred Hutchinson Cancer Research Center*.
Supervisor: Dr. Fei Gao
- Working on statistical methods for estimating counterfactual incidence for the placebo arm in HIV prevention trials for a variety of trial designs
 - Deriving theoretical results, running simulation studies, and preparing manuscripts
- 2020–2021 **Graduate Trainee**, *Institute for Health Metrics and Evaluation*.
Supervisor: Dr. Aleksandr Aravkin
- Consulting on statistical methods for health metrics applications and engineering projects
 - Preparing technical papers on statistical methods for health metrics applications
- 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 **Undergraduate 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 **Undergraduate 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

Teaching

Teaching Assistant

- Winter 2021 BIOST/EPI 537: Survival Data Analysis in Epidemiology, for Prof Jon Wakefield, University of Washington, Seattle. <https://github.com/mbannick/survival-discussion-section>
- Spring 2021 BIOST/STAT 524: Design of Medical Studies, for Prof Tom Fleming, University of Washington, Seattle.
- 07/2021 Supervised Methods for Statistical Machine Learning, for Profs Ali Shojaie and Noah Simon, Summer Institute in Statistics for Big Data, University of Washington.

05/2022 Workshop on Statistical Machine Learning, for Prof Noah Simon, ICES.

07/2022 Causal Inference with Observational Data: Common Designs and Statistical Methods, for Profs Ting Ye and Qingyuan Zhao, Summer Institute in Statistics for Clinical & Epidemiological Research, University of Washington.

Guest Lectures

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

08/2018 & "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.

Tutoring

Fall 2020 Medical Biometry I (BIOST 511), University of Washington, Seattle

Publications

Methodological

1. **Bannick MS**, Gao F, Brown E, and Janes H. Retrospective, Observational Studies for Estimating Vaccine Effects on the Secondary Attack Rate of SARS-CoV-2. *American Journal of Epidemiology* 2022. In Press.
2. Gao F and **Bannick MS**. Statistical Considerations for Cross-Sectional Incidence Estimation Based on Recency Test. *Statistics in Medicine* 8 2022;41:1446–61. DOI: [10.1002/sim.9296](https://doi.org/10.1002/sim.9296).
3. **Bannick MS**, McGaughey M, and Flaxman A. Ensemble modelling in descriptive epidemiology: burden of disease estimation. *International Journal of Epidemiology* 6 2020;49:2065–74. DOI: [10.1093/ije/dyz223](https://doi.org/10.1093/ije/dyz223).
4. **Norwood MS**, 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).

Collaborative

5. **IHME COVID-19 Forecasting Team**. COVID-19 scenarios for the United States. *Nature Medicine* 2020. DOI: [10.1038/s41591-020-1132-9](https://doi.org/10.1038/s41591-020-1132-9).
6. Duan L, Pengpeng Y, Haagsma J, Ye J, Yuan W, Yuliang E, Xiao D, Xin G, Cuirong J, Linhong W, **Bannick MS**, 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).

7. **Norwood MS**, 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).

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.

8. **GBD 2019 Diseases and Injuries Collaborators**. Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. The Lancet 10258 2020;396:1204–22. DOI: [10.1016/S0140-6736\(20\)30925-9](https://doi.org/10.1016/S0140-6736(20)30925-9).
9. **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](https://doi.org/10.1016/S1474-4422(18)30499-X).
10. **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](https://doi.org/10.1016/S1474-4422(18)30415-0).
11. **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](https://doi.org/10.1016/S0140-6736(18)32203-7).
12. **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](https://doi.org/10.1016/S0140-6736(17)32154-2).
13. **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](https://doi.org/10.1016/S0140-6736(17)32130-X).
14. **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](https://doi.org/10.1016/S0140-6736(17)32336-X).

Presentations

15. **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.
16. **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.
17. **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.

18. **Bannick, MS.** Cause of Death Modeling. Global Burden of Disease Technical Workshop. Plenary Session. Eretria, Greece, 2019.
19. 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.
20. **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.
21. **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.
22. **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

2021 International Journal of Epidemiology

2020, 2021 Machine Learning in Public Health Workshop, NeurIPS

2020 Journal of Medical Internet Research

Committees

2021 Open-rank Faculty Search Committee, UW Biostatistics

2020, 2021 Equity, Diversity, and Inclusion Committee, UW Biostatistics

2020 Educational Policy and Teaching Evaluation Committee, UW Biostatistics

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