

Marlena Bannick

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Education

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

- 2020–present **Graduate Research Assistant**, *Fred Hutchinson Cancer Research Center*.
Supervisor: Dr. Fei Gao
- Creating statistical methods for cross-sectional HIV incidence estimation that require fewer resources than existing methods and make use of diverse data sources
- 2019–2020 **Mathematical Sciences Researcher**, *Institute for Health Metrics and Evaluation*.
Supervisor: Dr. Aleksandr Aravkin
- Developed quantitative methods and modeling strategies that incorporated all possible relevant global health data to achieve credible and policy-relevant results
 - Implemented methods into code that addressed analytical challenges across teams at IHME
 - Built COVID-19 modeling software for the IHME COVID-19 projections
 - Led engineering design and implementation efforts for an epidemiological modeling software program in Python, managing feature requests and expectations from key stakeholders across the institute.
- 2016–2019 **Post Bachelor Fellow**, *Institute for Health Metrics and Evaluation*.
Supervisors: Dr. Stephen Lim, Dr. Kyle Foreman, Dr. Theo Vos
- Global Burden of Disease Study*
- Designed and maintained data processing and statistical modeling software for a large cluster computing platform used by dozens of disease modelers as the core component of the flagship research project of the organization.
- 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

- 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 presented by Dr. Hughes at the CDC Expert Consultation on Advancing Methods for Biobehavioral Surveys in 2018
- 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
- 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

Honors and Awards

- 2024 Student Scholarship Award, Biopharmaceutical Section of the American Statistical Association
- 2024 Honorable Mention in the Student Paper Competition, Biopharmaceutical Section of the American Statistical Association
- 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

Preprints

1. **Bannick MS**, Heltshe S, and Simon N. Accounting for inconsistent use of covariate adjustment in group sequential trials. *Statistics in Medicine* 2024+. *Provisionally accepted*. DOI: [10.48550/arXiv.2206.12393](#).
2. **Bannick MS** and Simon N. Improved convergence rates of nonparametric penalized regression under misspecified total variation. 2024+. DOI: [10.48550/arXiv.2308.01470](#).
3. **Bannick, MS**, Shao J, Liu J, Du Y, Yi Y, and T Y. A general form of covariate adjustment in randomized clinical trials. 2024+. DOI: [10.48550/arXiv.2306.10213](#).

Methodological

4. **Bannick MS**, Donnell D, Hayes R, Laeyendecker O, and Gao F. An enhanced cross-sectional HIV incidence estimator that incorporates prior HIV test results. *Statistics in Medicine* 2024. DOI: [10.1002/sim.10112](#).

5. Ye T, **Bannick MS**, Yi Y, and Shao J. Robust variance estimation for covariate-adjusted unconditional treatment effect in randomized clinical trials with binary outcomes. *Statistical Theory and Related Fields* 2023;7:159–63. DOI: [10.1080/24754269.2023.2205802](https://doi.org/10.1080/24754269.2023.2205802).
6. **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* 2023;192:1016–28. DOI: [10.1093/aje/kwad046](https://doi.org/10.1093/aje/kwad046).
7. Gao F and **Bannick MS**. Statistical considerations for cross-sectional incidence estimation based on recency test. *Statistics in Medicine* 2022;41:1446–61. DOI: [10.1002/sim.9296](https://doi.org/10.1002/sim.9296).
8. **Bannick MS**, McGaughey M, and Flaxman A. Ensemble modelling in descriptive epidemiology: burden of disease estimation. *International Journal of Epidemiology* 2020;49:2065–74. DOI: [10.1093/ije/dyz223](https://doi.org/10.1093/ije/dyz223).
9. **Norwood MS**, Hughes J, and Amico K. The validity of self-reported behaviors: methods for estimating underreporting of risk behaviors. *Annals of Epidemiology* 2016;26:612–8. DOI: [10.1016/j.annepidem.2016.07.011](https://doi.org/10.1016/j.annepidem.2016.07.011).

Collaborative

10. **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).
11. 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* 2019;4:449–61. DOI: [10.1016/S2468-2667\(19\)30125-2](https://doi.org/10.1016/S2468-2667(19)30125-2).
12. **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.

13. **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* 2020;396:1204–22. DOI: [10.1016/S0140-6736\(20\)30925-9](https://doi.org/10.1016/S0140-6736(20)30925-9).
14. **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* 2019;18:459–80. DOI: [10.1016/S1474-4422\(18\)30499-X](https://doi.org/10.1016/S1474-4422(18)30499-X).
15. **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* 2018;18:56–87. DOI: [10.1016/S1474-4422\(18\)30415-0](https://doi.org/10.1016/S1474-4422(18)30415-0).
16. **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* 2018;392:1736–88. DOI: [10.1016/S0140-6736\(18\)32203-7](https://doi.org/10.1016/S0140-6736(18)32203-7).

17. **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).
18. **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).
19. **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

20. **Bannick, MS.** A novel covariate adjustment strategy for guaranteed efficiency gain in randomized clinical trials. Computational and Methodological Statistics Conference. Oral Presentation. Berlin, Germany (remote), 2023.
21. **Bannick, MS.** Accounting for inconsistent use of covariate adjustment in group sequential trials. ENAR Conference. Oral Presentation. Nashville, Tennessee, 2023.
22. **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.
23. **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.
24. **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.
25. **Bannick, MS.** Cause of Death Modeling. Global Burden of Disease Technical Workshop. Plenary Session. Eretria, Greece, 2019.
26. 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.
27. **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.
28. **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.
29. **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.

Software

- 2024 [RobinCar](#): Robust Estimation and Inference for Covariate-Adaptive Randomization
- 2023 [XSRecency](#): Cross-Sectional Incidence Estimation of HIV Using Recent Infection Testing Algorithms

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, & 2023 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 Ontario (remote).
- 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 & 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.

Tutoring

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

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

- 2023 Student Representative, UW Biostatistics

- 2022 Graduate Program Admissions, UW Biostatistics
- 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