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Marlena Bannick

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

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

Honors, Awards, & Fellowships

2024 FDA & Oncology Center of Excellence & American Statistical Association Educational Fellowship

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

Experience

Summer 2024 **Biostatistics Graduate Intern, Cell Therapy**, *Bristol Myers Squibb*.
- Designed and conducted simulations to answer questions related to the design and analysis of clinical trials of CAR-T Cell Therapy
- Summarized and communicated key insights to project stakeholders using engaging presentations
- Built an R Shiny application for clinical trials practitioners to perform the simulation studies for different disease and therapeutic areas

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
- Engineered COVID-19 modeling software.
- 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

Software

2024 RobinCar (on CRAN): Robust Estimation and Inference for Covariate-Adaptive Randomization

2023 XSRecency: Cross-Sectional Incidence Estimation of HIV Using Recent Infection Testing Algorithms

Publications

Preprints

1. **Bannick MS**, Heltshe S, and Simon N. Accounting for inconsistent use of covariate adjustment in group sequential trials. 2024+. 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.

4. Pan J, **Bannick MS**, and Gao F. Estimating HIV cross-sectional incidence using recency tests from a non-representative sample. 2024+. DOI: 10.48550/arXiv.2412.12316.

Methodological

5. **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.

6. 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 2 2023;7:159–63. DOI: 10.1080/24754269.2023.2205802.

7. **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 6 2023;192:1016–28. DOI: 10.1093/aje/kwad046.

8. 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.

9. **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.

10. **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.

Collaborative

11. **IHME COVID-19 Forecasting Team**. COVID-19 scenarios for the United States. Nature Medicine 2020. DOI: 10.1038/s41591-020-1132-9.

12. 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.

13. **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.

Presentations

14. **Bannick, MS**. A general form of covariate adjustment in randomized clinical trials. Joint Statistical Meetings. Oral Presentation. Portland, Oregon, 2024.

15. **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.

16. **Bannick, MS**. Accounting for inconsistent use of covariate adjustment in group sequential trials. ENAR Conference. Oral Presentation. Nashville, Tennessee, 2023.

17. **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.

18. **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.

19. **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.

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

21. 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.

22. **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.

23. **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.

24. **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

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 & 2023 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 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

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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.

Tutoring

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

Service and Affiliations

Affiliations

2019–present American Statistical Association

Peer Review

2024 Pharmaceutical Statistics

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