

# Martha Barnard

(952) 217-0405 • barna126@umn.edu

## Education

---

- May 2026      **PhD, Biostatistics**  
(Anticipated) University of Minnesota  
Advisors: Drs. Julian Wolfson and Jared Huling
- May 2021      **BA, Mathematics**, *summa cum laude*  
St. Olaf College  
Distinction in Mathematics, Concentrations in Statistics and Data Science and  
Mathematical Biology

## Research Experience

---

- 2024–      **Graduate Researcher**  
Department of Family Medicine & Community Health, University of Minnesota  
Supervisors: Drs. Katie Loth, Julian Wolfson
- 2022–      **Graduate Researcher**  
Division of Biostatistics & Health Data Science, University of Minnesota  
Supervisors: Drs. Julian Wolfson and Jared Huling
- 2021–2022      **Post Bachelor Researcher**  
A-1 Information Systems & Modeling, Los Alamos National Laboratory  
Supervisors: Drs. Geoffrey Fairchild, Carrie Manore, Ashlynn Daughton,  
Sara Del Valle
- 2020      **Research Assistant**  
St. Olaf College  
Supervisors: Dr. Meredith Holgerson
- 2020      **Research Assistant**  
Dordt University  
Supervisors: Dr. Nathan Tintle

## Teaching Experience

---

*St. Olaf College:*

- Fall 2020      **Teaching Assistant**, Abstract Algebra I
- Spring 2020      **Teaching Assistant**, Statistical Modeling
- Fall 2018      **Teaching Assistant**, Calculus I
- Spring 2019

## Honors and Awards

---

2025	<b>R&amp;D 100 Award (LANL EpiEarth Team)</b>
2025	<b>R&amp;D Gold Medal for Corporate Social Responsibility (LANL EpiEarth Team)</b>
2025	<b>Student Paper Travel Award</b> , International Conference on Health Policy Statistics
2022-2026	<b>Graduate Research Fellowship</b> , National Science Foundation
2022-2024	<b>Jean Roberts Biostatistics Research Fellowship</b> , University of Minnesota
2022	<b>Dean's Ph.D. Scholars Award</b> , University of Minnesota
2022	<b>Distinguished Student Performance Award</b> , Los Alamos National Laboratory
2020	<b>Phi Beta Kappa</b> , St. Olaf College
2019	<b>Pi Mu Epsilon Honorary Math Society</b> , St. Olaf College
2017-2021	<b>Buntrock Scholarship</b> , St. Olaf College

## Publications

---

Preprints:

\* Authors contributed equally

1. **Barnard, M.**, Huling, J. D., and Wolfson, J. (2025+b). A Unified Framework for Causal Estimand Selection. URL <https://arxiv.org/abs/2410.12093>. (Revision submitted to *Biometrics*)

Peer-reviewed publications:

12. **Barnard, M.**, Fan, Y., and Wolfson, J. (2025a). Adjacency Matrix Decomposition Clustering for Human Activity Data. *Journal of the American Statistical Association*. 10.1080/01621459.2025.2506196. URL <https://doi.org/10.1080/01621459.2025.2506196>
11. Loth, K. A., Wolfson, J., **Barnard, M.**, Hogan, N., Brandt, T. J., Fulkerson, J. A., and Fisher, J. O. (2025). Examining the Longitudinal Impact of Within- and Between-Day Fluctuations in Food Parenting Practices on Child Dietary Intake: Protocol for a Longitudinal Cohort Study Within a Sample of Preschooler-Parent Dyads. *JMIR Research Protocols*, 14(1):e73276. 10.2196/73276. URL <https://www.researchprotocols.org/2025/1/e73276>
10. Harp, R. D., Holcomb, K. M., Retkute, R., Prusokiene, A., Prusokas, A., Ertem, Z., Ajelli, M., Kummer, A. G., Litvinova, M., Merler, S., Piontti, A. P. y., Poletti, P., Vespignani, A., Wilke, A. B. B., Zardini, A., Smith, K. H., Armstrong, P., DeFelice, N., Keyel, A., Shepard, J., Smith, R., Tyre, A., Humphreys, J., Cohnstaedt, L. W., Hosseini, S., Scoglio, C., Gorris, M. E., **Barnard, M.**, Moser, S. K., Spencer, J. A., McCarter, M. S. J., Lee, C., Nolan, M. S., Barker, C. M., Staples, J. E., Nett, R. J., and Johansson, M. A. (2025). Evaluation of the 2022 West Nile virus forecasting challenge, USA. *Parasites & Vectors*, 18(1):152. 10.1186/s13071-025-06767-2. URL <https://doi.org/10.1186/s13071-025-06767-2>

9. Moser, S. K., Spencer, J. A., **Barnard, M.**, Hyman, J. M., Manore, C. A., and Gorris, M. E. (2024). Exploring Climate-Disease Connections in Geopolitical Versus Ecological Regions: The Case of West Nile Virus in the United States. *GeoHealth*, 8(6):e2024GH001024. 10.1029/2024GH001024. URL <https://onlinelibrary.wiley.com/doi/abs/10.1029/2024GH001024>
8. Mancuso, M., Martinez, K. M., Manore, C. A., Milner, F. A., **Barnard, M.**, and Godinez, H. (2023). Fusing time-varying mosquito data and continuous mosquito population dynamics models. *Frontiers in Applied Mathematics and Statistics*, 9:1207643
7. Moser, S. K., **Barnard, M.**, Frantz, R. M., Spencer, J. A., Rodarte, K. A., Crooker, I. K., Bartlow, A. W., Romero-Severson, E., and Manore, C. A. (2023). Scoping review of Culex mosquito life history trait heterogeneity in response to temperature. *Parasites & Vectors*, 16(1):200. 10.1186/s13071-023-05792-3
6. Beesley, L. J., Patelli, P., Kaufeld, K., Schwenk, J., Martinez, K. M., Pitts, T., **Barnard, M.**, McMahon, B., and Valle, S. Y. D. (2023). Multi-dimensional resilience: A quantitative exploration of disease outcomes and economic, political, and social resilience to the COVID-19 pandemic in six countries. *PLOS ONE*, 18(1):e0279894. 10.1371/journal.pone.0279894
5. Trejo, I., **Barnard, M.**, Spencer, J. A., Keithley, J., Martinez, K. M., Crooker, I., Hengartner, N., Romero-Severson, E. O., and Manore, C. (2023). Changing temperature profiles and the risk of dengue outbreaks. *PLOS Climate*, 2(2):e0000115. 10.1371/journal.pclm.0000115
4. Holgerson, M. A., **Barnard, M.**, Ahn, B., Hayes, M. P., and Strecker, A. L. (2022). Freshwater floodplain habitats buffer native food webs from negative effects of nonnative centrarchids and bullfrogs. *Freshwater Science*, 41(2):327–341. 10.1086/720137
2. Daughton, A. R., Shelley, C. D., **Barnard, M.**, Gerts, D., Ross, C. W., Crooker, I., Nadiga, G., Mukundan, N., Chavez, N. Y. V., Parikh, N., Pitts, T., and Fairchild, G. (2021). Mining and Validating Social Media Data for COVID-19–Related Human Behaviors Between January and July 2020: Infodemiology Study. *Journal of Medical Internet Research*, 23(5):e27059. 10.2196/27059
2. \*Wolf, J.M., **\*Barnard, M.**, Xia, X., Ryder, N., Westra, J., and Tintle, N. (2019). Computationally efficient, exact, covariate-adjusted genetic principal component analysis by leveraging individual marker summary statistics from large biobanks. In *Pacific Symposium in Biocomputing 2020*, pages 719–730, Kohala Coast, Hawaii, USA. ISBN 9789811215629 9789811215636. 10.1142/9789811215636\_0063
1. Friedhorsky, R., Daughton, A. R., **\*Barnard, M.**, \*O’Connell, F., and Osthus, D. (2019). Estimating influenza incidence using search query deceptiveness and generalized ridge regression. *PLOS Computational Biology*, 15(10):e1007165. 10.1371/journal.pcbi.1007165

## Presentations

---

### Contributed Talks:

Aug 2025	<i>A Unified Framework for Causal Estimand Selection</i> , JSM 2025, Nashville, TN
Mar 2025	<i>A Unified Framework for Causal Estimand Selection</i> , ENAR 2025, New Orleans, LA

Jan 2025      *A Unified Framework for Causal Estimand Selection*, International Conference on Health Policy Statistics 2025, San Diego, CA

Contributed Posters:

Sep 2024      *A Unified Framework for Causal Estimand Selection*, Advances in Learning Health System Sciences 2024, Minneapolis, MN

Mar 2024      *Adjacency Matrix Decomposition Clustering for Human Activity Data*, ENAR 2024, Baltimore, MD

Sep 2023      *The usefulness of overlap weighting for causal inference in a learning health system: a simulation study*, Advances in Learning Health System Sciences 2023, St. Paul, MN

Apr 2021      *Native fishes and larval salamanders of the Chehalis river basin exhibit trophic niche shifts when co-occurring with non-native vertebrates*, Midwest Interdisciplinary Symposium for Scientific Thought 2021, Virtual

Apr 2021      *Modeling novel indicators of student retention at St. Olaf College*, National Conference on Undergraduate Research 2021, Virtual

## Service

---

*Professional Membership:*

2024–          American Statistical Association

2023–          International Biometrics Society - ENAR

*University of Minnesota, Division of Biostatistics and Health Data Science:*

2023–          Student Advisory Council

2022–          Biostatistics Outreach and Engagement Committee

*St. Olaf College, Department of Mathematics, Statistics, and Computer Science:*

2020-2021      Math Club & Pi Mu Epsilon Honor Society President

2020-2021      Association for Women in Mathematics Chapter Vice President

*Referee for:*

Annals of Applied Statistics