

Mary M. Ryan

Curriculum Vitae

Updated August 2023

Assistant Professor

Departments of Population Health Sciences & Biostatistics and Medical Informatics

University of Wisconsin-Madison | Madison, WI 53726

✉ mary.ryan@wisc.edu maryryan.netlify.app

RESEARCH INTERESTS

Clinical trials, pragmatic clinical trials, cluster randomized trials, correlated data, group sequential design, epidemiology of Alzheimer's disease, Alzheimer's disease biomarker discovery

EDUCATION

- | | |
|------|---|
| 2021 | Ph.D. (Statistics)
University of California, Irvine
<i>Dissertation: Robustness and Efficiency in Modern Biostatistical Studies</i>
<i>Advisor: Daniel L. Gillen, Professor and Chair of Statistics</i> |
| 2019 | M.S. (Statistics)
University of California, Irvine |
| 2016 | B.A. (Statistics); B.J. (Journalism)
<i>Minor, Mathematics</i>
University of Missouri, Columbia |

ACADEMIC POSITIONS

- | | |
|----------------|--|
| 2023 - present | Assistant Professor
Department of Population Health Sciences
University of Wisconsin-Madison (Madison, WI) |
| 2023 - present | Assistant Professor
Department of Biostatistics and Medical Informatics
University of Wisconsin-Madison (Madison, WI) |
| 2021 - 2023 | Postdoctoral Associate
Department of Biostatistics
Yale School of Public Health (New Haven, CT) |
| 2017 - 2021 | Graduate Research Assistant
Department of Statistics
University of California, Irvine (Irvine, CA) |
| 2014 - 2016 | Undergraduate Research Assistant
Department of Statistics
University of Missouri (Columbia, MO) |

COLLABORATIVE RESEARCH AFFILIATIONS & APPOINTMENTS

2017- present	Gillen/Grill Alzheimer's Disease Research Lab University of California, Irvine (Irvine, CA)
2021 - 2023	Yale Center for Analytical Sciences Yale School of Public Health (New Haven, CT)
2014 - 2021	Data Management and Statistics Core Alzheimer's Disease Research Center University of California, Irvine (Irvine, CA)

REFEREED JOURNAL PUBLICATIONS

"*" indicates mentored graduate student

1. **Ryan, M.M.**, Esserman, D., Li, F. (2023). "Maximin optimal cluster randomized designs for assessing treatment effect heterogeneity." *Statistics in Medicine*. <http://doi.org/10.1002/sim.9830>. Preprint available on arXiv: <https://doi.org/10.48550/arXiv.2302.09138>
2. Meng, C., **Ryan, M.M.**, Rathouz, P.J., Turner, E.L., Preisser, J.S., Li, F. (2023). "ORTH.Ord: an R package for analyzing correlated ordinal outcome using GEE with orthogonalized residuals and small-sample bias correction." *Computer Methods and Programs in Biomedicine*. <https://doi.org/10.1016/j.cmpb.2023.107567>
3. Nevins, P., Davis-Plourde, K., Pereira Macedo, J., Ouyang, Y., Meng, C., **Ryan, M. M.**, Tong, G., Wang, X., Ortiz Reyes, L.A., Caille, A., Li, F. and Taljaard, M. (2023). "A scoping review described diversity in methods of randomization and reporting of baseline balance in stepped-wedge cluster randomized trials." *Journal of Clinical Epidemiology*. <https://doi.org/10.1016/j.jclinepi.2023.03.010>
4. **Ryan, M.M.**, Gillen, D.L. (2023) "Sequential Sampling in Prospective Observational Studies." *Annals of Applied Statistics*. <https://doi.org/10.1214/22-AOAS1620>
5. **Ryan, M.M.**, Gillen, D.L., Grill, J.D. (2021). "Reasons for Undergoing Amyloid Imaging Among Cognitively Unimpaired Older Adults with Elevated and Not Elevated Amyloid." *Annals of Clinical and Translational Neurology*. <https://doi.org/10.1002/acn3.51414>
6. **Ryan, M.M.**, Cox, C.G., Witbracht, M., Hoang, D., Gillen, D.L., Grill, J.D. (2020). "Using Direct-to-Consumer Genetic Testing Results to Accelerate Alzheimer's Disease Clinical Trial Recruitment." *Alzheimer Disease & Associated Disorders*. <https://doi.org/10.1097/wad.0000000000000421>
7. Cox, C.G., **Ryan, M.M.**, Gillen, D.L., Grill, J.D. (2020). "Is reluctance to share Alzheimer's disease biomarker status with a study partner a barrier to preclinical trial recruitment?" *The Journal of Prevention of Alzheimer's Disease*. [dx.doi.org/10.14283/jpad.2020.36](https://doi.org/10.14283/jpad.2020.36)
8. **Ryan, M.M.**, Spotnitz, W.D., Gillen, D.L. (2020). "Variance estimation for the Kappa statistic in the presence of clustered data and heterogeneous observations." *Statistics in Medicine*. <https://doi.org/10.1002/sim.8522>

9. **Ryan, M.M.**, Grill, J.D., Gillen, D.L. (2019). "Participant and Study Partner Prediction and Identification of Cognitive Impairment in Preclinical Alzheimer's Disease: Study Partner vs. Participant Accuracy." *Alzheimer's Research & Therapy*. <https://doi.org/10.1186/s13195-019-0539-3>
10. Cox, C.G., **Ryan, M.M.**, Gillen, D.L., Grill, J.D. (2019). "A preliminary study of clinical trial enrollment decisions among people with Mild Cognitive Impairment and their study partners." *The American Journal of Geriatric Psychiatry*. <https://doi.org/10.1016/j.jagp.2018.10.016>

MANUSCRIPTS UNDER REVIEW/IN PROGRESS

11. Liu, R.*, Esserman, D., Li, F., **Ryan, M.M.** "Group sequential two-stage randomized preference trial designs." *Statistics in Medicine*. (In Revision).
12. Nevins, P., **Ryan, M.M.**, Davis-Plourde, K., Ouyang, Y., Pereira Macedo, J., Meng, C., Tong, G., Wang, X., Ortiz-Reyes, L., Caille, A., Li, F., Taljaard, M. "Adherence to key recommendations for design and analysis of Stepped-Wedge Cluster Randomized Trials: A Review of trials published 2016-2022." *Clinical Trials*. (Under Review).
13. **Ryan, M.M.**, Esserman, D., Li, F. "Power calculation for cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints." *Biometrics*. (In Preparation).
14. **Ryan, M.M.**, Gillen, D.L. "Sequential Sampling for Studies Utilizing the Kappa Statistic." *Statistical Methods in Medical Research*. (In Preparation).
15. Dolmadjian, L.*, **Ryan, M.M.**, Gillen, D.L., Grill, J.D. "Impact of Study Partner Replacement in Mild Cognitive Impairment Clinical Trials." (In Preparation).
16. **Ryan, M.M.**, Gillen, D.L., Grill, J.D. "Impact of study partner type on primary endpoint variability in two phase 3 registration trials in mild-to-moderate Alzheimer's disease." (In Preparation).

SELECTED PRESENTATIONS, POSTERS, & SHORT COURSES

INVITED PRESENTATIONS

- | | |
|---------------|---|
| March 2023 | <ol style="list-style-type: none"> 1. Department of Mathematics & Statistics, University of Massachusetts Amherst (Amherst, MA). Oral seminar on "Maximin optimal cluster randomized designs for assessing treatment effect heterogeneity" 2. Department of Biostatistics, Epidemiology and Informatics, University of Pennsylvania Perelman School of Medicine (Philadelphia, PA). Oral seminar on "Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints" |
| February 2023 | <ol style="list-style-type: none"> 3. Department of Biostatistics, University of Florida (Gainesville, FL). Oral seminar on "Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints" |

- | | |
|---------------|---|
| January 2023 | <ol style="list-style-type: none"> 4. Departments of Population Health Sciences and Biostatistics & Medical Informatics, University of Wisconsin-Madison (Madison, WI). Oral seminar on <i>"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"</i> 5. Department of Epidemiology & Biostatistics, University of South Carolina (Columbia, SC). Oral seminar on <i>"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"</i> 6. Rutgers Cancer Institute of New Jersey (Virtual). Oral seminar on <i>"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"</i> 7. Department of Biostatistics, University of Washington (Virtual). Oral seminar on <i>"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"</i> 8. Department of Epidemiology & Biostatistics, Michigan State University (Virtual). Oral seminar on <i>"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"</i> 9. Department of Biostatistics & Health Data Science, Indiana University School of Medicine (Indianapolis, IN). Oral seminar on <i>"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"</i> 10. Department of Biostatistics & Informatics, Colorado School of Public Health (Virtual). Oral seminar on <i>"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"</i> 11. Department of Biostatistics & Data Science, Wake Forest University (Virtual). Oral seminar on <i>"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"</i> |
| November 2022 | <ol style="list-style-type: none"> 12. Department of Mathematics & Statistics, University of Otago (Virtual). Oral seminar on <i>"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"</i> 13. Department of Epidemiology & Biostatistics, Temple University (Philadelphia, PA). Oral seminar on <i>"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"</i> |
| April 2021 | <ol style="list-style-type: none"> 14. ASQ Silicon Valley Section's Statistics & Reliability Discussion Group (Virtual). Oral presentation on <i>"Variance Estimation for the Kappa Statistic in the Presence of Clustered Data and Heterogeneous Observations"</i> |
| February 2021 | <ol style="list-style-type: none"> 15. Department of Family Medicine, Oregon Health & Science University (Virtual). Oral seminar on <i>"Sequential Sampling in Prospective Observational Studies"</i> 16. Department of Global & Community Health, George Mason University (Virtual). Oral seminar on <i>"Sequential Sampling in Prospective Observational Studies"</i> |

- | | |
|---------------|--|
| | 17. Department of Biostatistics, Wake Forest University (Virtual). Oral seminar on <i>"Sequential Sampling in Prospective Observational Studies"</i> |
| | 18. Division of Biostatistics, University of Minnesota (Virtual). Oral seminar on <i>"Sequential Sampling in Prospective Observational Studies"</i> |
| January 2021 | 19. Department of Mathematics & Statistics, Wake Forest University (Virtual). Oral seminar on <i>"Sequential Sampling in Prospective Observational Studies"</i> |
| | 20. American Statistical Association Biopharmaceutical Section Webinar (Virtual). Oral seminar on <i>"Variance Estimation for the Kappa Statistic in the Presence of Clustered Data and Heterogeneous Observations"</i> |
| | 21. Department of Biostatistics, St. Jude Children's Research Hospital (Virtual). Oral seminar on <i>"On Confounding, Efficiency, & Prospective Observational Study Design"</i> |
| December 2020 | 22. Department of Biostatistics, Vanderbilt University (Virtual). Oral seminar on <i>"On Confounding, Efficiency, & Prospective Observational Study Design"</i> |
| November 2020 | 23. Orange County Biostatistics Symposium (Virtual). Oral seminar on <i>"Variance Estimation for the Kappa Statistic in the Presence of Clustered Data and Heterogeneous Observations"</i> |

CONTRIBUTED PRESENTATIONS

- | | |
|---------------|---|
| May 2023 | 24. Society for Clinical Trials (Baltimore, MD). Oral presentation on <i>"Power calculation for cross-sectional stepped wedge cluster randomized trials with a time-to-event endpoint"</i> |
| March 2023 | 25. Eastern North American Region International Biometric Society (ENAR) Annual Meeting (Nashville, TN). Oral presentation on <i>"Power calculation for cross-sectional stepped wedge cluster randomized trials with a time-to-event endpoint"</i> |
| November 2022 | 26. Current Development in Cluster Randomised Trials and Stepped Wedge Designs (Virtual/London, UK). Oral presentation on <i>"Power calculation for cross-sectional stepped wedge cluster randomized trials with a time-to-event endpoint"</i> |
| August 2022 | 27. Joint Statistical Meetings (JSM) (Washington, D.C.). Oral presentation on <i>"Maximin Optimal Cluster Randomized Designs for Assessing Treatment Effect Heterogeneity"</i> |
| May 2022 | 28. Society for Clinical Trials (San Diego, CA). Oral presentation on <i>"Maximin Optimal Cluster Randomized Designs Accounting for Treatment Effect Heterogeneity"</i> |

- July 2019 29. **Joint Statistical Meetings (JSM)** (Denver, CO). Oral presentation on "*An Extension of Cohen's Kappa for Clustered Data and Group Sequential Testing*"
★ Received JSM Contributed Presentation Honorable Mention Award from ASA Biopharmaceutical Section
30. **Western North American Region International Biometric Society (WNAR) Annual Meeting** (Portland, OR). Oral presentation on "*An Investigation of the Kappa Statistic Under Clustered Data and Group Sequential Testing, with an Application to Surgical Rating*"

POSTERS

- July 2022 31. **Alzheimer's Association International Conference (AAIC)** (Virtual/San Diego, CA). Poster presentation on "*Impact of Study Partner Type on Primary Endpoint Volatility in a Phase 3 Registration Trial of Mild-to-Moderate Alzheimer's Disease*"
- November 2021 32. **Clinical Trials on Alzheimer's Disease (CTAD)** (Virtual). Poster presentation on "*Perceptions of Amyloid Imaging Among Cognitively Normal Older Adults with Elevated and Not Elevated Amyloid*"
- December 2019 33. **Clinical Trials on Alzheimer's Disease (CTAD)** (San Diego, CA). Poster presentation on "*Using Direct-to-Consumer Genetic Testing Results in Alzheimer's Disease Clinical Trial Recruitment*"
- July 2019 34. **Alzheimer's Association International Conference (AAIC)** (Los Angeles, CA). Poster presentation on "*Participant and Study Partner Prediction and Identification of Cognitive Impairment in Preclinical Alzheimer's Disease: Study Partner vs. Participant Accuracy*"
- March 2018 35. **REMIND Emerging Scientists Symposium** (Irvine, CA). Poster presentation on "*Scientific Necessity of Study Partners in Preclinical Alzheimer's Disease Trials*"

SHORT COURSES & WORKSHOPS

- March 2019 36. **Computer-Assisted Reporting Conference** (Newport Beach, CA). Workshop on "*R: Models for Clustered and Correlated Data*"
37. **Computer-Assisted Reporting Conference** (Newport Beach, CA). Workshop on "*Building Graphics in R*"
- March 2018 38. **Computer-Assisted Reporting Conference** (Chicago, IL). Workshop on "*R: Machine Learning and Data Models*"

TEACHING EXPERIENCE

- Summer 2020 ***Instructor of Record, Basic Statistics** (Virtual)
3-hour, twice weekly lecture; approx. 80 undergraduate students
Department of Statistics
University of California, Irvine (Irvine, CA)

Winter 2020	Teaching Assistant, Introduction to Biological Statistics (Face-to-Face) <i>Two, 1-hour weekly lab sections; approx. 35 undergraduate students each</i> Department of Statistics University of California, Irvine (Irvine, CA)
Fall 2019	Teaching Assistant, Introduction to Probability & Statistics for Computer Science (Face-to-Face) <i>Two, 1-hour weekly lab sections; approx. 50 undergraduate students each</i> Department of Statistics University of California, Irvine (Irvine, CA)
Summer 2017	*Instructor of Record, Introduction to Biological Statistics (Face-to-Face) <i>1.5-hour, thrice weekly lecture; approx. 36 undergraduate students</i> Department of Statistics University of California, Irvine (Irvine, CA)
Spring 2016	Teaching Assistant, Advanced Data Journalism (Face-to-Face) Missouri School of Journalism University of Missouri (Columbia, MO)

ACADEMIC AWARDS & HONORS

2021	Carl W. Cotman Predoctoral Scholar Award University of California, Irvine
2020	Nominee to the 70th Lindau Nobel Laureate Meeting University of California System
2020	Division of Teaching Excellence & Innovation Summer Fellow University of California, Irvine
2019 - 2020	UCI Public Impact Fellow University of California, Irvine
2019	Honorable Mention: JSM Biopharmaceutical Section Contributed Presentation Award American Statistical Association, Biopharmaceutical Section
2017 - 2019	MIND Aging Fellow University of California, Irvine Institute for Memory Impairments and Neurological Disorders
2016	University Honors University of Missouri
2015	Excellence in Undergraduate Research Award University of Missouri
2013 - 2016	Albert Winemiller Scholar Department of Statistics, University of Missouri

PEER REVIEW ACTIVITIES

- | | |
|----------------|---|
| 2023 - present | Nature Communications
Communications in Statistics - Theory and Methods |
| 2022 - present | Statistics in Medicine
Statistics in Biopharmaceutical Research
Clinical Trials |

SERVICE TO PROFESSION

COMMITTEE SERVICE

- | | |
|----------------|---|
| 2023 - present | Editorial Board Member
<i>Significance</i> Magazine |
| 2022 - present | Social Media Manager, Instagram
Justice, Equity, Diversity, and Inclusion (JEDI) Outreach Group |
| 2022 - present | Organizing Committee Member
COPSS-NISS Leadership Webinar Series |

CONFERENCE SERVICE

- | | |
|-------------|---|
| May 2023 | Contributed Session Moderator for the session " <i>Adaptive/Sequential</i> "
Society for Clinical Trials (Baltimore, MD) |
| August 2022 | Topic Contributed Session Chair for the session " <i>New Models, Diagnostics and Considerations in Evaluating Intervention and Policy Effects</i> "
Joint Statistical Meetings (Washington, D.C.) |

INSTITUTIONAL SERVICE

- | | |
|-------------|--|
| 2020 - 2021 | Student Representative , Department of Statistics Seminar Committee
University of California, Irvine (Irvine, CA) |
| 2019 - 2021 | Department of Statistics Student Representative , Diverse Educational Community and Doctoral Experience (DECADE)
University of California, Irvine (Irvine, CA) |
| 2019 - 2021 | Organizer , Department of Statistics NSF GRFP Application Repository
University of California, Irvine (Irvine, CA) |
| 2018-2021 | Co-Chair , Research and Education in Memory Impairments and Neurological Disorders (REMIND)
University of California, Irvine (Irvine, CA) |
| 2017 - 2018 | Student Representative & Liason , Department of Statistics
University of California, Irvine (Irvine, CA) |

COMMUNITY INVOLVEMENT & OUTREACH

- July - Aug 2022 **Statistics & R Instructor** for YCAS Young Scholars in Biostatistics Program (New Haven, CT)
- July 2022 **Guest Lecturer** on the topic "*Introduction to Data Science*". YCAS Young Scholars in Biostatistics Program (New Haven, CT)
- July 2022 **Workshop Instructor** for the class "*STEM Meets Storytelling: Using Data Science to Tell Stories about Our Communities*". Pathways to Science Summer Scholars (New Haven, CT)
- March 2022 **Guest Lecturer** on the topic "*Data and Me: What is Biostatistics and How Do We Use It?*". Exploring Science Seminar Series (New Haven, CT)

PROFESSIONAL ORGANIZATIONS

- 2022 - present Justice, Equity, Diversity, and Inclusion (JEDI) Outreach Group, Member
- 2022 - present Society for Clinical Trials, Member
- 2021 - present Eastern North American Region of the International Biometrics Society (ENAR), Member
- 2020 - present Caucus for Women in Statistics, Member
- 2019 - present ISTAART, Alzheimer's Association, Member
- 2018 - present American Statistical Association, Member
- 2019 - 2021 Western North American Region of the International Biometrics Society (WNAR), Member

STATISTICAL & PROGRAMMING LANGUAGES

- | | | |
|-----|----------|-----|
| R | Python | SAS |
| SQL | HTML/CSS | |