

# Mary M. Ryan

Curriculum Vitae

Updated August 2023

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Assistant Professor

Departments of Population Health Sciences & Biostatistics and Medical Informatics

University of Wisconsin-Madison | Madison, WI 53726

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## 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  
*Dissertation: Robustness and Efficiency in Modern Biostatistical Studies*  
*Advisor: Daniel L. Gillen, Professor and Chair of Statistics*
- 2019 **M.S. (Statistics)**  
University of California, Irvine
- 2016 **B.A. (Statistics); B.J. (Journalism)**  
*Minor, Mathematics*  
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>

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#### 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

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##### INVITED PRESENTATIONS

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

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- January 2023
4. **Departments of Population Health Sciences and Biostatistics & Medical Informatics, University of Wisconsin-Madison** (Madison, WI). Oral seminar on *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
  5. **Department of Epidemiology & Biostatistics, University of South Carolina** (Columbia, SC). Oral seminar on *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
  6. **Rutgers Cancer Institute of New Jersey** (Virtual). Oral seminar on *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
  7. **Department of Biostatistics, University of Washington** (Virtual). Oral seminar on *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
  8. **Department of Epidemiology & Biostatistics, Michigan State University** (Virtual). Oral seminar on *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
  9. **Department of Biostatistics & Health Data Science, Indiana University School of Medicine** (Indianapolis, IN). Oral seminar on *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
  10. **Department of Biostatistics & Informatics, Colorado School of Public Health** (Virtual). Oral seminar on *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
  11. **Department of Biostatistics & Data Science, Wake Forest University** (Virtual). Oral seminar on *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
- November 2022
12. **Department of Mathematics & Statistics, University of Otago** (Virtual). Oral seminar on *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
  13. **Department of Epidemiology & Biostatistics, Temple University** (Philadelphia, PA). Oral seminar on *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
- April 2021
14. **ASQ Silicon Valley Section's Statistics & Reliability Discussion Group** (Virtual). Oral presentation on *"Variance Estimation for the Kappa Statistic in the Presence of Clustered Data and Heterogeneous Observations"*
- February 2021
15. **Department of Family Medicine, Oregon Health & Science University** (Virtual). Oral seminar on *"Sequential Sampling in Prospective Observational Studies"*
  16. **Department of Global & Community Health, George Mason University** (Virtual). Oral seminar on *"Sequential Sampling in Prospective Observational Studies"*

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

#### CONTRIBUTED PRESENTATIONS

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

- 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*"

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## 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*"

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## 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)  
*Two, 1-hour weekly lab sections; approx. 35 undergraduate students each*  
 Department of Statistics  
 University of California, Irvine (Irvine, CA)
- Fall 2019        **Teaching Assistant, Introduction to Probability & Statistics for Computer Science** (Face-to-Face)  
*Two, 1-hour weekly lab sections; approx. 50 undergraduate students each*  
 Department of Statistics  
 University of California, Irvine (Irvine, CA)
- Summer 2017    **\*Instructor of Record, Introduction to Biological Statistics** (Face-to-Face)  
*1.5-hour, thrice weekly lecture; approx. 36 undergraduate students*  
 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 70<sup>th</sup> 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

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- 2023 - present     **Editorial Board Member**  
                               *Significance* 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

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- May 2023            **Contributed Session Moderator** for the session "*Adaptive/Sequential*"  
                               Society for Clinical Trials (Baltimore, MD)
- August 2022        **Topic Contributed Session Chair** for the session "*New Models, Diagnos-  
                               tics and Considerations in Evaluating Intervention and Policy Effects*"  
                               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 Neuro-  
                               logical 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 |     |