Mary Ryan Baumann

Curriculum Vitae

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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 Publich 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

2023 - present **Center for Demography and Healthy Aging**
University of Wisconsin-Madison (Madison, WI)

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*

15. **Baumann Ryan, M.**, Esserman, D., Taljaard, M., Li, F. "Power calculation for cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints." *Biometrics.* (Provisionally accepted May 2025). Preprint available on arXiv: https://doi.org/10.48550/arXiv.2312.13097

14. Dolmadjian, L.*, **Ryan Baumann, M.**, Gillen, D.L., Grill, J.D. (2025). "Impact of Study Partner Replacement in Mild Cognitive Impairment Clinical Trials." *Alzheimer's & Dementia: Translational Research & Clinical Interventions.* http://dx.doi.org/10.1002/trc2.70063.

13. Tong, G., Nevins, P., **Ryan, M.M.**, Davis-Plourde, K., Ouyang, Y., Jules Pereira Macedo, J., Meng, C., Wang, X., Caille, A., Li, F., Taljaard, M. (2024). "A review of current practice in the design and analysis of extremely small stepped-wedge cluster randomized trials." *Clinical Trials.* https://doi.org/10.1177/17407745241276137.

12. Liu, R.*, Esserman, D., Li, F., **Ryan, M.M.** (2024). "Group sequential two-stage randomized preference trial designs." *Statistics in Medicine.* http://dx.doi.org/10.1002/sim.9962. Preprint available on arXiv: https://doi.org/10.48550/arXiv.2310.11603

11. 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. (2023). "Adherence to key recommendations for design and analysis of Stepped-Wedge Cluster Randomized Trials: A Review of trials published 2016-2022." *Clinical Trials.* https://doi.org/10.1177/17407745231208397

10. **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

9. 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

8. 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

7. **Ryan, M.M.**, Gillen, D.L. (2023) "Sequential Sampling in Prospective Observational Studies." *Annals of Applied Statistics.* https://doi.org/10.1214/22-AOAS1620

6. **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

5. **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

4. 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

3. **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

2. **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

1. 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

2. Afshar, M., Resnik, F., **Ryan Baumann, M.**, ..., Gordon, J. "A Novel Playbook for Pragmatic Trial Operations to Monitor and Evaluate Ambient Artificial Intelligence in Clinical Practice." (Resubmitted April 2025). medRxiv preprint: https://doi.org/10.1101/2024.12.27.24319685

1. **Ryan Baumann, M.**, Taljaard, M., Heagerty, P.J., Harhay, M.O., Wang, R., Li, F. "A tutorial on conducting sample size and power calculation for detecting treatment effect heterogeneity in cluster randomized trials." (Resubmitted March 2025). arXiv preprint: https://doi.org/10.48550/arXiv.2501.18383

SELECTED PRESENTATIONS, POSTERS, & SHORT COURSES

INVITED PRESENTATIONS

April 2025	54.	**Clinical Trials Community of Practice, University of Wisconsin - Madison** (Madison, WI; Virtual). Presentation. *"Pragmatic Clinical Trials: What, Why, and How"*
March 2025	53.	**Eastern North American Region International Biometric Society (ENAR) Annual Meeting** (New Orleans, LA). Presentation. *"Combatting ICC uncertainty with maximin optimal cluster randomized designs"*
February 2025	52.	**University of Southern California, Division of Biostatistics** (Virtual). Seminar. *"Cluster randomized and stepped-wedge trials: design issues and tools"*
January 2025	51.	**Kaiser Permanente Washington Health Research Institute** (Virtual). Seminar. *"Cluster randomized and stepped-wedge trials: design issues and tools"*
	50.	**International Conference on Health Policy Statistics** (San Diego, CA). Presentation. *"Designing cluster randomized trials to detect treatment effect heterogeneity"*
September 2024	49.	**NIH Collaboratory Biostatistics Core Meeting, National Institutes of Health** (Virtual). Presentation. *"A web application for planning cluster randomized trials to detect treatment effect heterogeneity"*
June 2024	48.	**Western North American Region International Biometric Society (WNAR) Annual Meeting** (Fort Collins, CO). Presentation. *"Combatting ICC uncertainty with maximin optimal cluster randomized designs"*
April 2024	47.	**Department of Statistics, University of Wisconsin - Madison** (Madison, WI). Seminar. *"Powering cross-sectional stepped wedge cluster randomized trials for a time-to-event endpoints"*
	46.	**StatShare Group, University of Wisconsin - Madison** (Madison, WI; Virtual). Presentation. *"The current landscape of stepped-wedge randomized trials"*
February 2024	45.	**Pennsylvania State University, Division of Biostatistics & Bioinformatics** Student-Led Seminar Series (Virtual). Seminar. *"Pragmatic cluster trials: a statistical perspective"*
October 2023	44.	**Being Significant: 60 Years of Mizzou Statistics** (Columbia, MO). Presenation on *"Power calculation for cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
September 2023	43.	**2023 Orange County Biostatistics Symposium** (Irvine, CA). Presenation on *"Sequential Sampling in Prospective Observational Studies"*
	42.	**Department of Population Health Sciences, University of Wisconsin-Madison Seminar Series** (Madison, WI). Seminar. *"Sequential Sampling in Prospective Observational Studies"*

March 2023	41.	**Department of Mathematics & Statistics, University of Massachusetts Amherst** (Amherst, MA). Seminar. *"Maximin optimal cluster randomized designs for assessing treatment effect heterogeneity"*
	40.	**Department of Biostatistics, Epidemiology and Informatics, University of Pennsylvania Perelman School of Medicine** (Philadelphia, PA). Seminar. *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
Feburary 2023	39.	**Department of Biostatistics, University of Florida** (Gainesville, FL). Seminar. *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
January 2023	38.	**Departments of Population Health Sciences and Biostatistics & Medical Informatics, University of Wisconsin-Madison** (Madison, WI). Seminar. *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
	37.	**Department of Epidemiology & Biostatistics, University of South Carolina** (Columbia, SC). Seminar. *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
	36.	**Rutgers Cancer Institute of New Jersey** (Virtual). Seminar. *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
	35.	**Department of Biostatistics, University of Washington** (Virtual). Seminar. *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
	34.	**Department of Epidemiology & Biostatistics, Michigan State University** (Virtual). Seminar. *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
	33.	**Department of Biostatistics & Health Data Science, Indiana University School of Medicine** (Indianapolis, IN). Seminar. *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
	32.	**Department of Biostatistics & Informatics, Colorado School of Public Health** (Virtual). Seminar. *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
	31.	**Department of Biostatistics & Data Science, Wake Forest University** (Virtual). Seminar. *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*
November 2022	30.	**Department of Mathematics & Statistics, University of Otago** (Virtual). Seminar. *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*

29. **Department of Epidemiology & Biostatistics, Temple University** (Philadelphia, PA). Seminar. *"Design & analysis of cross-sectional stepped wedge cluster randomized trials with time-to-event endpoints"*

April 2021
28. **ASQ Silicon Valley Section's Statistics & Reliability Discussion Group** (Virtual). Presenation on *"Variance Estimation for the Kappa Statistic in the Presence of Clustered Data and Heterogeneous Observations"*

February 2021
27. **Department of Family Medicine, Oregon Health & Science University** (Virtual). Seminar. *"Sequential Sampling in Prospective Observational Studies"*

26. **Department of Global & Community Health, George Mason University** (Virtual). Seminar. *"Sequential Sampling in Prospective Observational Studies"*

25. **Department of Biostatistics, Wake Forest University** (Virtual). Seminar. *"Sequential Sampling in Prospective Observational Studies"*

24. **Division of Biostatistics, University of Minnesota** (Virtual). Seminar. *"Sequential Sampling in Prospective Observational Studies"*

January 2021
23. **Department of Mathematics & Statistics, Wake Forest University** (Virtual). Seminar. *"Sequential Sampling in Prospective Observational Studies"*

22. **American Statistical Association Biopharmaceutical Section Webinar** (Virtual). Seminar. *"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). Seminar. *"On Confounding, Efficiency, & Prospective Observational Study Design"*

December 2020
20. **Department of Biostatistics, Vanderbilt University** (Virtual). Seminar. *"On Confounding, Efficiency, & Prospective Observational Study Design"*

November 2020
19. **Orange County Biostatistics Symposium** (Virtual). Seminar. *"Variance Estimation for the Kappa Statistic in the Presence of Clustered Data and Heterogeneous Observations"*

CONTRIBUTED PRESENTATIONS

August 2024
18. **Joint Statistical Meetings (JSM)** (Portland, OR). Presentation. *"Comparing cross-sectional stepped-wedge and cluster randomized trials with time-to-event endpoints"*

May 2023
17. **Society for Clinical Trials** (Baltimore, MD). Presenation on *"Power calculation for cross-sectional stepped wedge cluster randomized trials with a time-to-event endpoint"*

March 2023
16. **Eastern North American Region International Biometric Society (ENAR) Annual Meeting** (Nashville, TN). Presenation on *"Power calculation for cross-sectional stepped wedge cluster randomized trials with a time-to-event endpoint"*

November 2022	15.	**Current Development in Cluster Randomised Trials and Stepped Wedge Designs** (Virtual/London, UK). Presenation on *"Power calculation for cross-sectional stepped wedge cluster randomized trials with a time-to-event endpoint"*
August 2022	14.	**Joint Statistical Meetings (JSM)** (Washington, D.C.). Presenation on *"Maximin Optimal Cluster Randomized Designs for Assessing Treatment Effect Heterogeneity"*
May 2022	13.	**Society for Clinical Trials** (San Diego, CA). Presenation on *"Maximin Optimal Cluster Randomized Designs Accounting for Treatment Effect Heterogeneity"*
July 2019	12.	**Joint Statistical Meetings (JSM)** (Denver, CO). Presenation 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*
	11.	**Western North American Region International Biometric Society (WNAR) Annual Meeting** (Portland, OR). Presenation on *"An Investigation of the Kappa Statistic Under Clustered Data and Group Sequential Testing, with an Application to Surgical Rating"*

POSTERS

April 2025	10.	**Alzheimer's Disease and Related Dementias Research Day** (Madison, WI). Poster. *"Accelerated Phenotypical Aging in Midlife is Associated with Long-Term Cognitive Decline in Middle-Aged Adults"*
November 2023	9.	**Clinical Trials in Alzheimer's Disease (CTAD)** (Boston, MA). Poster. *"Impact of study partner type on primary endpoint volatility in two phase 3 registration trials of mild-to- moderate Alzheimer's disease"*
July 2022	8.	**Alzheimer's Association International Conference (AAIC)** (Virtual/San Diego, CA). Poster. *"Impact of Study Partner Type on Primary Endpoint Volatility in a Phase 3 Registration Trial of Mild-to-Moderate Alzheimer's Disease"*
November 2021	7.	**Clinical Trials on Alzheimer's Disease (CTAD)** (Virtual). Poster. *"Perceptions of Amyloid Imaging Among Cognitively Normal Older Adults with Elevated and Not Elevated Amyloid"*
December 2019	6.	**Clinical Trials on Alzheimer's Disease (CTAD)** (San Diego, CA). Poster. *"Using Direct-to-Consumer Genetic Testing Results in Alzheimer's Disease Clinical Trial Recruitment"*
July 2019	5.	**Alzheimer's Association International Conference (AAIC)** (Los Angeles, CA). Poster. *"Participant and Study Partner Prediction and Identification of Cognitive Impairment in Preclinical Alzheimer's Disease: Study Partner vs. Participant Accuracy"*
March 2018	4.	**REMIND Emerging Scientists Symposium** (Irvine, CA). Poster. *"Scientific Necessity of Study Partners in Preclinical Alzheimer's Disease Trials"*

SHORT COURSES & WORKSHOPS

March 2019	3.	**Computer-Assisted Reporting Conference** (Newport Beach, CA). Workshop on *"R: Models for Clustered and Correlated Data"*
	2.	**Computer-Assisted Reporting Conference** (Newport Beach, CA). Workshop on *"Building Graphics in R"*
March 2018	1.	**Computer-Assisted Reporting Conference** (Chicago, IL). Workshop on *"R: Machine Learning and Data Models"*

TEACHING EXPERIENCE

Fall 2024   *****Faculty Instructor, Advanced Reggression for Population Health** (Face-to-Face)
75 minute, twice weekly lecture; 12 graduate and medical students
Department of Population Health Sciences
University of Wisconsin - Madison (Madison, WI)

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

2025   **Outstanding Instructor Award**
Department of Population Health Sciences, University of Wisconsin- Madison

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

2025 - present   BMJ Open

                 Annals of Applied Statistics

2024 - present   Journal of the National Cancer Institute Monographs

                 Environmental Health Perspectives

                 Alzheimer's & Dementia

2023 - present   Nature Communications

                 Communications in Statistics - Theory and Methods

                 Alzheimer's Research & Therapy

2022 - present   Statistics in Medicine

                 Statistics in Biopharmaceutical Research

                 Clinical Trials

SERVICE TO PROFESSION

COMMITTEE SERVICE

2025 - present	**Associate Editor (Equity, Inclusion, & Diversity)** *Journal for Statistics and Data Science Education*
2024	**Co-Chair, Students & Young Professional Committee** *Justice, Equity, Diversity, and Inclusion (JEDI) Outreach Group*
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

August 2024	**Topic Contributed Session Chair** Joint Statistical Meetings (Portland, OR)
June 2024	**Invited Session Co-Organizer** Western North American Region International Biometric Society Annual Meeting (Fort Collins, CO)
May 2023	**Contributed Session Moderator** Society for Clinical Trials (Baltimore, MD)
August 2022	**Topic Contributed Session Chair** Joint Statistical Meetings (Washington, D.C.)

INSTITUTIONAL SERVICE

2023 - present	**Population Health Sciences Senator Alternate**, University of Wisconsin - Madison Faculty Senate University of Wisconsin-Madison (Madison, WI)
2023 - present	**Member**, Department of Population Health Sciences Curriculum Committee University of Wisconsin-Madison (Madison, WI)
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	