

# Sean McGrath

[sean.mcgrath@yale.edu](mailto:sean.mcgrath@yale.edu) | [Website](#) | [Google Scholar](#) | [GitHub](#)

## EDUCATION

<b>Ph.D. Biostatistics</b> , Harvard University	<i>2024</i>
<i>Advisor:</i> Dr. Rajarshi Mukherjee	
<b>A.M. Biostatistics</b> , Harvard University	<i>2021</i>
<b>B.Sc. Mathematics</b> , McGill University	<i>2018</i>

## ACADEMIC APPOINTMENTS

<b>Postdoctoral Associate</b> , Yale School of Public Health	<i>2025–Present</i>
<i>Advisors:</i> Dr. Bhramar Mukherjee, Dr. Harsh Parikh	
<b>Postdoctoral Research Fellow</b> , Harvard Medical School and Harvard Pilgrim Health Care Institute	<i>2024–2025</i>
<i>Advisor:</i> Dr. Jessica Young	

## FELLOWSHIPS

- Thomas O. Pyle Fellowship, Harvard Medical School and Harvard Pilgrim Health Care Institute *2024–2025*
- National Science Foundation Graduate Research Fellowship *2019–2024*
- Fonds de recherche du Québec - Nature et technologies B1X Research Scholarship *2019–2021*
- National Institutes of Health T32 Ruth L. Kirschstein Institutional National Research Service Award *2019–2021*

## SELECTED AWARDS

- NeurIPS Scholar Award *2025*
- Best Poster Award (Runner-Up), Society for Epidemiologic Research *2025*
- Certificate of Distinction in Teaching, Harvard University (three times) *2020, 2021, 2023*
- Honorable Mention in the New Advances in Statistics and Data Science Poster Competition *2022*
- Top Cited Article 2020-2021, Wiley (Biometrical Journal) *2022*
- Professional Development Fund Award, Harvard University *2022*
- Undergraduate Student Research Award, Natural Sciences and Engineering Research Council of Canada *2018*
- McGill Science 21<sup>st</sup> Century Ambassador Fund Award, McGill University *2018*
- Travel Award, Statistical Society of Canada *2017*
- First Place in Case Studies in Data Analysis Poster Competition, Statistical Society of Canada *2017*
- Summer Studentship Award, Meakins-Christie Laboratories (twice) *2016, 2017*
- Best Oral Presentation, RI-MUHC Joint Summer Student Research Day *2017*

## PUBLICATIONS

1. **McGrath S**, Mukherjee D, Mukherjee R, Wang ZJ. Optimal nuisance function tuning for estimating a doubly robust functional under proportional asymptotics. *Advances in Neural Information Processing Systems (NeurIPS)*. Spotlight paper (top 3% of submissions). Forthcoming.
2. de Vries TAC, Mallick IU, Bhagirath VC, Eikelboom JW, Gomes C, Yi Q, **McGrath S**, Hirsh J, Chan NC. Usual on-therapy ranges of drug concentrations in patients with atrial fibrillation treated with direct oral anticoagulants: A systematic review and meta-analysis. *Thrombosis and Haemostasis*. 2025; 125: 563–573.

3. Wang G\*, McGrath S\*, Lian Y\*. CausalMetaR: An R package for performing causally interpretable meta-analyses. *Research Synthesis Methods*. 2025; 16: 425-440. [Erratum in: *Research Synthesis Methods*. 2025; 16: 441-441]
4. Al Tawil A, McGrath S, Ristl R, Mansmann U. Addressing treatment switching in the ALTA-1L trial with g-methods: Exploring the impact of model specification. *BMC Medical Research Methodology*. 2024; 24: 314.
5. Lui L, Réquia WJ, dos Santos F, Albert CE, da Cruz Vieira L, McGrath S. Determining factors associated with vaccination coverage in the first year of life in Brazil (2013-2022). *Vaccine*. 2024; 42: 126382.
6. Iskander R, Moyer H, Fergusson D, McGrath S, Benedetti A, Kimmelman J. The benefits and risks of receiving investigational solid tumour drugs in randomized trials: A systematic review and meta-analysis. *Annals of Internal Medicine*. 2024; 177: 759-767.
7. McGrath S, Zhao XF, Ozturk O, Katzenschlager S, Steele R, Benedetti A. metamedian: An R package for meta-analyzing studies reporting medians. *Research Synthesis Methods*. 2024; 15: 332-346.
8. McGrath S, Mukherjee R, Réquia WJ, Lee WC. Wildfire exposure and academic performance in Brazil: A causal inference approach for spatiotemporal data. *Science of the Total Environment*. 2023; 905: 167625.
9. Chiu YH, Wen L, McGrath S, Logan R, Dahabreh IJ, Hernán MA. Evaluating model specification when using the parametric g-formula in the presence of censoring. *American Journal of Epidemiology*. 2023; 192: 1887-1895.
10. McGrath S, Mehta P, Zytek A, Lage I, Lakkaraju H. When does uncertainty matter?: Understanding the impact of predictive uncertainty in ML assisted decision making. *Transactions on Machine Learning Research*. 2023.
11. McGrath S, Katzenschlager S, Zimmer AJ, Seitel A, Steele R, Benedetti A. Standard error estimation in meta-analysis of studies reporting medians. *Statistical Methods in Medical Research*. 2023; 32: 373-388.
12. Lee JH, Garg T, Lee J, McGrath S, Rosman L, Schumacher SG, Benedetti A, Qin ZZ, Gore G, Pai M, Sohn H. Impact of molecular diagnostic tests on diagnostic and treatment delays in tuberculosis: A systematic review and meta-analysis. *BMC Infectious Diseases*. 2022; 22: 940.
13. Brümmer LE, Katzenschlager S, McGrath S, Schmitz S, Gaeddert M, Erdmann C, Bota M, Grilli M, Larmann J, Weigand MA, Pollock NR, Macé A, Erkosar B, Carmona S, Sacks JA, Ongarello S, Denkinger CM. Accuracy of rapid point-of-care antigen-based diagnostics for SARS-CoV-2: An updated systematic review and meta-analysis with meta-regression analyzing influencing factors. *PLOS Medicine*. 2022; 19: e1004011.
14. Chiu YH, Yland JJ, Rinaudo P, Hsu J, McGrath S, Hernández-Díaz S, Hernán MA. Effectiveness and safety of intrauterine insemination vs. assisted reproductive technology: Emulating a target trial using an observational database of administrative claims. *Fertility and Sterility*. 2022; 117: 981-991.
15. Zimmer AJ, Lainati F, Aguilera Vasquez N, Chedid C, McGrath S, Benedetti A, MacLean E, Ruhwald M, Denkinger CM, Kohli M. Biomarkers that correlate with active pulmonary tuberculosis treatment response: A systematic review and meta-analysis. *Journal of Clinical Microbiology*. 2022; 60: e01859-21.
16. McGrath S, Young JG, Hernán MA. Revisiting the g-null paradox. *Epidemiology*. 2022; 33: 114-120.
17. Katzenschlager S, Zimmer AJ, Gottschalk C, Grafeneder J, Seitel A, Maier-Hein L, Benedetti A, Larmann J, Weigand MA, McGrath S\*, Denkinger CM\*. Can we predict the severe course of COVID-19 - A systematic review and meta-analysis of indicators of clinical outcome? *PLOS One*. 2021; 16: e0255154.
18. McGrath S, Zhao XF, Steele R, Thombs BD, Benedetti A, and the DEPRESSion Screening Data (DEPRESSD) Collaboration. Estimating the sample mean and standard deviation from commonly reported quantiles in meta-analysis. *Statistical Methods in Medical Research*. 2020; 29: 2520-2537.
19. McGrath S\*, Lin V\*, Zhang Z, Petito LC, Logan RW, Hernán MA, Young JG. gfoRmula: An R package for estimating the effects of sustained treatment strategies via the parametric g-formula. *Patterns*. 2020; 1: 100008.
20. McGrath S, Sohn H, Steele R, Benedetti A. Meta-analysis of the difference of medians. *Biometrical Journal*. 2020; 62: 69-98.
21. McGrath S, Zhao XF, Qin ZZ, Steele R, Benedetti A. One-sample aggregate data meta-analysis of medians. *Statistics in Medicine*. 2019; 38: 969-984.

\* indicates equal contribution

## SELECTED PREPRINTS

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22. **McGrath S**, Mukherjee R. Nuisance function tuning and sample splitting for optimal doubly robust estimation. Preprint: <https://arxiv.org/abs/2212.14857>.
23. **McGrath S**, Zhu C, O'Dea R, Guo M, Duan R. LEARNER: A transfer learning method for low-rank matrix estimation. Preprint: <https://arxiv.org/abs/2412.20605>.
24. **McGrath S**, Kawahara T, Petimar J, Rifas-Shiman SL, Díaz I, Block JP, Young JG. Time-smoothed inverse probability weighted estimation of effects of generalized time-varying treatment strategies on repeated outcomes truncated by death. Preprint: <https://arxiv.org/abs/2509.13971>.
25. **McGrath S**, Yang CH, Kimmelman J, Ozturk O, Steele R, Benedetti A. Meta-analysis of median survival times with inverse-variance weighting. Preprint: <https://arxiv.org/abs/2503.03065>.
26. Kawahara T, **McGrath S**, Young JG. Illustrating implications of misaligned questions and statistics with competing events and interest in treatment mechanisms. Preprint: <https://arxiv.org/abs/2510.24018>.
27. Wang Y, Lin YT, **McGrath S**, Meeker JD, Park SK, Warren JL, Mukherjee B. A tutorial on conducting mediation analysis with exposure mixtures. Preprint: <https://arxiv.org/abs/2509.10916>.

## SOFTWARE

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1. Lin V\*, **McGrath S\***,<sup>†</sup>, Zhang Z, Logan R, Petito LC, Li J, McGee E, Cheng C, Young JG, Hernán MA. gfoRmula: Parametric g-formula. R package version 1.1.0. <https://CRAN.R-project.org/package=gfoRmula>.
2. Li J, Rein S, **McGrath S**, Logan R, O'Dea R, Hernán MA. pygformula: A python implementation of the parametric g-formula. Python package version 1.1.3. <https://pypi.org/project/pygformula>.
3. Cheng Z, Li J, Rein S, O'Dea R, **McGrath S**, Wen L, Hernán MA. gfoRmulaICE: Parametric iterative conditional expectation g-formula. R package version 0.1.0. <https://CRAN.R-project.org/package=gfoRmulaICE>.
4. **McGrath S**,<sup>†</sup>, Kawahara T, Young JG. smoothedIPW: Time-smoothed inverse probability weighting for repeatedly measured outcomes. R package version 0.1.0. <https://CRAN.R-project.org/package=smoothedIPW>.
5. **McGrath S**,<sup>†</sup>, Seaman S, Zhang W, Mathur MB. mia: Marginalization over incomplete auxiliaries. R package version 0.1.0. <https://github.com/stmcg/mia>.
6. Liu P, Hou Y, **McGrath S**, Parikh H. ROOT: Identifying underrepresented subpopulations with interpretable trees. R package version 0.1.0. <https://github.com/peterliu599/ROOT-R-Package/>.
7. Yi L, Wang G, **McGrath S**,<sup>†</sup>, Dahabreh IJ. CausalMetaR: Causally interpretable meta-analysis. R package version 0.1.2. <https://CRAN.R-project.org/package=CausalMetaR>.
8. **McGrath S**,<sup>†</sup>, O'Dea R, Zhu C, Duan R. learner: Latent space-based transfer learning. R package version 1.0.0. <https://CRAN.R-project.org/package=learner>.
9. **McGrath S**,<sup>†</sup>, O'Dea R, Zhu C, Duan R. learner-py: Latent space-based transfer learning. Python package version 1.0.0. <https://pypi.org/project/learner-py/>.
10. **McGrath S**,<sup>†</sup>, Zhao XF, Katzenschlager S, Ozturk O, Steele R, Benedetti A. metamedian: Meta-analysis of medians. R package version 1.1.1. <https://CRAN.R-project.org/package=metamedian>.
11. **McGrath S**,<sup>†</sup>, Zhao XF, Steele R, Benedetti A. estmeansd: Estimating the sample mean and standard deviation from commonly reported quantiles in meta-analysis. R package version 1.0.1. <https://CRAN.R-project.org/package=estmeansd>.

<sup>†</sup> indicates package maintainer

## PRESENTATIONS

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### Seminar Presentations

1. **McGrath S.** Frailty and pancreatic cancer: a target trial framework. Talk presented at: *Yale Public Health Data Science and Data Equity / Public Health Modeling Unit Seminar*. September 22 2025; New Haven, USA.
2. **McGrath S.** Nuisance function tuning and sample splitting for optimal doubly robust estimation. Talk presented at: *Yale School of Public Health Biostatistics Seminar*. September 9 2025; New Haven, USA.
3. **McGrath S.** Comparative effects of generalized time-varying treatment strategies with repeatedly measured outcomes in EHR data. Talk presented at: *Causal Inference Seminar at Boston University*. April 1 2025; Boston, USA.
4. **McGrath S.** Comparative effects of generalized time-varying treatment strategies with repeatedly measured outcomes in EHR data. Talk presented at: *Research Café Seminar at the Harvard Pilgrim Health Care Institute*. March 27 2025; Boston, USA.
5. **McGrath S.** Meta-analysis of studies reporting medians. Talk presented at: *Lady Davis Institute Centre for Clinical Epidemiology Seminar*. April 11 2023; Online.
6. **McGrath S.**, Kaouache M, Grover S. Estimating the long-term effects of weight loss and the risk of dementia using the McGill Cardiometabolic Model. Talk presented at: *Metabolic Disorders and Complications Program Seminar at the Research Institute of the McGill University Health Centre*. December 6 2018; Montreal, Canada.
7. **McGrath S.**, Zhao X, Qin ZZ, Steele R, Benedetti A. Meta-analysis of medians. Talk presented at: *Respiratory Epidemiology and Clinical Research Unit Seminar at the Research Institute of the McGill University Health Centre*. December 2 2016; Montreal, Canada.

### Conference Oral Presentations

8. **McGrath S.**, Block JP, Young JG. Comparative effects of generalized time-varying treatment strategies with repeated outcomes. Talk presented at: *Joint Statistical Meetings*. August 2–7 2025; Nashville, USA.
9. Brümmer LE, Zorger AM, Worbes K, **McGrath S.**, Erdmann C, Tolle H, Katzenschlager S, Yerlikaya S, Grilli M, Pollock NR, Erkosal B, Mace A, Ongarello S, Johnson CC, Sacks JA, Skoetz N, Lee RA, Denkinger CM. The clinical utility and epidemiological impact of self-testing for SARS-CoV-2 using antigen detecting diagnostics: A systematic review and meta-analysis. Talk presented at: *Gesundheit Gemeinsam 2024*. September 8–13 2024; Dresden, Germany.
10. **McGrath S.**, Mukherjee R, Réquia WJ, Lee WC. Wildfire exposure and academic performance in Brazil: A causal inference approach for spatiotemporal data. Talk presented at: *35<sup>th</sup> Annual Conference of the International Society for Environmental Epidemiology*. September 17–21 2023; Kaohsiung, Taiwan.
11. **McGrath S.**, Duan R. Transfer learning approaches for synthesizing genetic association studies. Talk presented at: *17<sup>th</sup> Annual Meeting of the Society for Research Synthesis Methodology*. July 5–7 2023; Paris, France.
12. **McGrath S.**, Zhao XF, Ozturk O, Katzenschlager S, Steele R, Benedetti A. metamedian: An R package for meta-analyzing studies reporting medians. Talk presented at: *Evidence Synthesis and Meta-Analysis in R Conference 2023*. March 27–31 2023; Online.
13. **McGrath S.**, Zhao XF, Steele R, Benedetti A. estmeansd: An R package for estimating means and standard deviations from studies reporting medians in meta-analysis. Talk presented at: *Evidence Synthesis and Meta-Analysis in R Conference 2023*. March 27–31 2023; Online.
14. **McGrath S.**, Mukherjee R. Undersmoothing and sample splitting for estimating nonparametric functionals. Talk presented at: *Joint Statistical Meetings*. August 6–11 2022; Washington, D.C., USA.
15. Yland J, Chiu YH, **McGrath S.**, Hernández-Díaz S. Comparative effectiveness of ovulation induction medications: evidence from a large healthcare database in the United States. Talk presented at: *36<sup>th</sup> International Conference on Pharmacoepidemiology and Therapeutic Risk Management (ICPE 2020 All Access)*. September 16–17 2020; Online.
16. **McGrath S.**, Steele R, Benedetti A. Meta-analysis of the difference of medians. Speed presentation (talk and poster) given at: *Joint Statistical Meetings*. July 28–August 2 2018; Vancouver, Canada.
17. **McGrath S.**, Steele R, Benedetti A. Meta-analysis of the difference of medians. Talk presented at: *46<sup>th</sup> Annual Meeting of the Statistical Society of Canada*. June 3–6 2018; Montreal, Canada.
18. **McGrath S.**, Steele R, Benedetti A. Methods for estimating the sampling variance of the median for meta-analysis. Talk presented at: *McGill University (Bio)Statistics Research and Career Day*. September 22 2017; Montreal, Canada.

19. **McGrath S**, Steele R, Benedetti A. A comparison of methods for meta-analyzing medians: Applications to estimating diagnostic delays. Talk presented at: *Research Institute of the McGill University Health Centre Joint Summer Student Research Day*. August 10 2017; Montreal, Canada.
  20. **McGrath S**, Zhao X, Qin ZZ, Steele R, Benedetti A. Meta-analysis of medians. Talk presented at: *12<sup>th</sup> Annual Meeting of the Society for Research Synthesis Methodology*. July 3–5 2017; Montreal, Canada.
  21. **McGrath S**, Steele R, Benedetti A. Incorporating medians in meta-analysis. Talk presented at: *45<sup>th</sup> Annual Meeting of the Statistical Society of Canada*. June 11–14 2017; Winnipeg, Canada.

## Conference Poster Presentations

22. Rifas-Shiman SL, Young J, **McGrath S**, Rapakse NDA, Lyons J, Rasouli B, Schildcroud J, Rothman R, Block J. Associations of COVID-19 infection with two-year incident diabetes. Poster presented at: *American Diabetes Association 85<sup>th</sup> Scientific Sessions*. June 20–23 2025; Chicago, USA.
  23. **McGrath S**, Block JP, Young JG. Comparative effects of generalized time-varying treatment strategies with repeatedly measured outcomes in EHR data. Poster presented at: *2025 Society for Epidemiologic Research Annual Meeting*. June 10–13 2025; Boston, USA.
  24. **McGrath S**, Mukherjee R. Undersmoothing and sample splitting for estimating nonparametric functionals. Poster presented at: *New Advances in Statistics and Data Science*. May 24–26 2022; Honolulu, USA.
  25. Zimmer AJ, Lainati F, Aguilera Vasquez N, Chedid C, **McGrath S**, Benedetti A, MacLean E, Ruhwald M, Denkinger CM, Kohli M. Biomarkers for active pulmonary tuberculosis treatment response: A systematic review. Poster presented at: *52nd Union World Conference on Lung Health*. October 19–22 2021; Online.
  26. **McGrath S**, Sohn H, Steele R, Benedetti A. Meta-analysis of the difference of medians. Poster presented at: *Research Institute of the McGill University Health Centre Summer Student Research Day*. August 13 2018; Montreal, Canada.
  27. Coulombe J, **McGrath S**, Wang Z. Can gene expression data identify patients with Inflammatory Bowel Disease? Poster presented at: *Centre de Recherches Mathématiques Workshop: Risk Modelling, Management and Mitigation in Health Sciences*. December 11–13 2017; Montreal, Canada.
  28. Coulombe J, **McGrath S**, Wang Z. Can gene expression data identify patients with Inflammatory Bowel Disease? Poster presented at: *45<sup>th</sup> Annual Meeting of the Statistical Society of Canada*. June 11–14 2017; Winnipeg, Canada.
  29. **McGrath S**, Zhao X, Qin ZZ, Benedetti A. Meta-analysis of medians. Poster presented at: *44<sup>th</sup> Annual Meeting of the Statistical Society of Canada*. May 29–June 1 2016; St. Catharines, Canada.

TEACHING EXPERIENCE

## Guest Lecturer

- Harvard University, BST 258: Causal Inference: Theory and Practice 2025  
Lecture Title: “Techniques for Efficient Estimation: Nuisance Function Tuning and Sample Splitting”
  - Yale University, The Big Data Summer Immersion at Yale 2025  
Lecture Titles: “Probability”, “Basic Statistics”, and “Prediction for Beginners”

## Teaching Fellow

- Harvard University, EPI 524: Confounding Control: A Component of Causal Inference  
A Master's-level course for Public Health degree programs 2025
  - Harvard University, EPI 524: Confounding Control: A Component of Causal Inference  
A Master's-level course for Public Health degree programs  
(Course development teaching assistant) 2024
  - Harvard University, BST 222: Basics of Statistical Inference  
A Master's-level course for Biostatistics degree programs 2023
  - Harvard University, BST 231: Statistical Inference I  
A PhD-level course for Biostatistics degree programs 2023
  - Harvard University, BST 230: Probability Theory and Applications I  
A PhD-level course for Biostatistics degree programs 2021
  - Harvard University, ID 201: Core Principles of Biostatistics and Epidemiology for Public Health Practice  
A Master's-level course for Public Health degree programs 2020

## PROFESSIONAL ACTIVITIES

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### Mentorship

- Research Project Mentor: Summer Program in Biostatistics and Computational Biology 2021–2024
- Project Mentor: StatStart High School Summer Program in Biostatistics 2021–2023
- Graduate Student Mentor: Group for Undergraduates in Statistics at Harvard 2020–2022

### Conference Organization and Service

- Session Chair (Precision Medicine and Machine Learning Methods): Joint Statistical Meetings 2025
- Fundraising Committee Member: Canadian Statistics Student Conference 2018
- Local Arrangements Committee Member: Society for Research Synthesis Methodology Annual Meeting 2017

### Ad-Hoc Peer Review

- Statistics and Machine Learning:
  - \* *Journal of the Royal Statistical Society: Series B, Biometrics, Statistics in Medicine, Lifetime Data Analysis, Biometrical Journal, Research Synthesis Methods, BMC Medical Research Methodology, BMC Medical Informatics and Decision Making, Journal of Open Source Software, AStA Advances in Statistical Analysis, Applied Soft Computing Journal*
- Epidemiology and Biomedical Sciences:
  - \* *American Journal of Epidemiology, Annals of Epidemiology, PLOS Global Public Health, Frontiers in Epidemiology, Journal of Evidence-Based Medicine, Journal of Public Health and Emergency*

### Other Academic Service

- Alumni Focus Group Member: External Review of Doctoral Qualifying Exam 2025

## OTHER

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**Citizenship:** United States of America, Canada

**Statistical Programming:** R, MATLAB, Stan, SAS, Stata

**Machine Learning Frameworks:** Sklearn, Keras, Tensorflow

**Programming Languages:** Python, Java, C++

**Reproducible Research:** Git/GitHub, R Markdown, Jupyter Notebook, Overleaf

**Specialized Software:** Shiny, L<sup>A</sup>T<sub>E</sub>X