Kristin A. Linn

CONTACT

Department of Biostatistics, Epidemiology, and Informatics   kristinlinn.com
Perelman School of Medicine   github.com/kalinn
University of Pennsylvania
423 Guardian Drive
Philadelphia, PA 19104

EDUCATION

Ph.D., Statistics, North Carolina State University   2014
- Advisors: Dr. Eric B. Laber and Dr. Leonard A. Stefanski
- Thesis Title: Interactive Model Building Techniques for Non-smooth Functionals in Dynamic Treatment Regimes

M.Stat., North Carolina State University   2011

B.M., Music Performance (Statistics Minor), University of Michigan   2008

EXPERIENCE

Associate Director of the PARITY Center   2023–present
University of Pennsylvania
- Led by Dr. Amol Navathe, the PARITY Center aims to develop and evaluate algorithms and payment programs for health care with a focus on equity.

Associate Director of the PennSIVE Center   2019–present
Center for Clinical Epidemiology and Biostatistics (CCEB)
University of Pennsylvania
- The Penn Statistics in Imaging and Visualization Endeavor (PennSIVE), a Center of Excellence based in the CCEB, includes faculty, staff, and students who develop and apply biostatistical methods for image analysis.

Senior Fellow, Leonard David Institute for Health Economics   2019–present
University of Pennsylvania
- LDI's mission centers on health system-related research policy analysis and education.
- Affiliated faculty in the Center for Health Incentives and Behavioral Economics (CHIBE) which was founded within LDI at Penn in 2008.

Assistant Professor of Biostatistics   2017–present
Department of Biostatistics, Epidemiology, and Informatics
University of Pennsylvania
- *Select research interests:* clinical trials, SMART designs, dynamic treatment regimes, algorithmic fairness, methods for analysis of neuroimaging data, causal inference.
- *Select applications:* health behavioral economics, neurodevelopment and neurodegenerative diseases, transcranial magnetic stimulation, implementation science.

Post-doctoral Fellow   2014–2017
Center for Clinical Epidemiology and Biostatistics (CCEB)
University of Pennsylvania
- Developed statistical methods for neuroimaging data with advisor Dr. Russell (Taki) Shinohara.

PEER-REVIEWED PUBLICATIONS

1. Wainwright JV, Aggarwal C, Beucker S, Dougherty D, Gabriel P, Jacobs LA, Kalman J, **Linn KA**, Martella AO, Mehta S, Rhodes C, Roy M, Schapira M, Shulman LN, Steltz J, Stephens Shields AJ, Tan ASL, Thompson JC, Toneff H, Wender RC, Zeb S, Rendle KA*, Vachani A*,

Bekelman JE* on behalf of Penn TRACE (Penn Telehealth Research Center of Excellence). (2024) "University of Pennsylvania Telehealth Research Center of Excellence (Penn TRACE)." *Journal of the National Cancer Institute.* *indicates co-senior authors.

2. Mehta SJ, Rhodes C, **Linn KA**, Reitz C, McDonald C, Okorie E, Williams K, Resnick D, Arostegui A, McAuliffe T, Wollack C, Snider CK, Peifer MK, Weinstein SP. (2024) "Behavioral Interventions to Improve Breast Cancer Screening Outreach: two Randomized Clinical Trials." *JAMA Internal Medicine.* In press.

3. Waddell KJ, Goel K, Park S, **Linn KA**, Navathe AS, Liao JM, Mehta SJ. (2023) "Impact of a Self-Scheduling Feature on Screening Mammography Completion Rates Among Primary Care Patients." *American Journal of Preventive Medicine.* In press.

4. Oathes DJ, Liang X, Duprat R, Long H, Scully M, DeLuisi J, Sheline YI, **Linn KA**. (2023) "Non-invasively targeting, probing and modulating a deep brain circuit for depression remediation." *Nature Mental Health.* *Paper was recognized as one of the 2023 Leading Research Achievements by Brain and Behavior Research Foundation Grantees, Prize Winners, and Scientific Council Members.

5. Yuan C, **Linn KA***, Hubbard RA*. (2023) "Algorithmic Fairness of Machine Learning Models for Alzheimer's Disease Progression." *JAMA Network Open.* In press. *indicates co-senior authors.

6. Underhill K, Bair E, Dixon E, Ferrell W, **Linn KA**, Volpp KG, Venkataramani A. "Public Views on Medicaid Work Requirements and Mandatory Premiums in Kentucky." *JAMA Health Forum.* In press.

7. Shen J, Hubbard RA, **Linn KA**. (2023) "Estimation and Evaluation of Individualized Treatment Rules Following Multiple Imputation." *Statistics in Medicine.* 42(23), 4236-4256.

8. Teeple S, Chivers C, **Linn KA**, Halpern S, Eneanya N, Draugelis M, Courtright K. (2023) "Evaluating equity in performance of an electronic health record-based 6-month mortality risk model to trigger palliative care consultation: a retrospective model validation analysis." *BMJ Quality & Safety.* doi: doi.org/10.1136/bmjqs-2022-015173

9. McDermotta CL, Lee J, Park AT, Tooley UA, Boroshoka AL, Hilton K, **Linn KA**, Mupparapu M, Mackey AP. (2023) "Developmental correlates of accelerated molar eruption in early childhood." *Biological Psychiatry Global Open Science.* doi: doi.org/10.1016/j.bpsgos.2023.02.006

10. Getz K, Hubbard RA*, **Linn KA***. (2023) "Performance of multiple imputation using modern machine learning methods in electronic health records data." *Epidemiology.* 34(2), 206-215. *indicates co-senior authors.

11. Hoskins K, **Linn KA**, PhD, Ahmedani BK, Boggs JM, Johnson C, Heintz J, Marcus SC, Kaminer I, Zabel C, Wright L, Quintana L, Buttenheim AM, Daley MF, Elias ME, Jager-Hyman S, Lieberman A, Lyons J, Maye M, McArdle B, Ritzwoller DP, Small DS, Westphal J, Wolk CB, Zhang S, Shelton RC, Beidas RS. (2022) "Equitable Implementation of S.A.F.E. Firearm: A Multi-Method Pilot Study." *Preventative Medicine.* 165, 107281.

12. Liao JM, Huang Q, Wang E, **Linn KA**, Shirk T, Zhu J, Cousins D, Navathe AS. (2022) "Comparing Performance of Physician Groups and Hospitals Participating in Bundled Payments Among Medicare Beneficiaries." *JAMA Health Forum.* 3(12), pp. e224889-e224889.

13. Weinstein SM, Davatzikos C, Doshi J, Erus G, **Linn KA***, Shinohara RT* for the Alzheimer's Disease Neuroimaging Initiative. (2022) "Penalized Decomposition Using Residuals (PeDeCURe) for Feature Extraction in the Presence of Nuisance Variables." *Biostatistics.* 24(3), 653-668. *indicates co-senior authors.

14. Hu F, Weinstein SM, Baller EB, Valcarcel AM, Adebimpe A, Raznahan A, Roalf DR, Robert-Fitzgerald T, Gonzenbach V, Gur RC, Gur RE, Vandekar S, Detre JA, **Linn KA**, Alexander-Bloch A, Satterthwaite TD, and Shinohara RT. (2022) "Voxel-wise Intermodal Coupling Analysis of Two or More Modalities using Local Covariance Decomposition." *Human Brain Mapping.* 43(15), 4650-4663.

15. Baller EB, Valcarcel AM, Adebimpe A, Alexander-Bloch A, Cui Z, Gur RC, Gur RE, Larsen BL, **Linn KA**, O'Donnell CMC, Pines AR, Raznahan A, Roalf DR, Sydnor VJ, Tapera TM, Tisdall MD, Vandekar S, Xia CH, Detre JA, Shinohara RT, Satterthwaite TD. (2022) "Development of the coupling of cerebral blood flow and fMRI fluctuations in youth." *Cell Reports.* 38(13).

16. Markman TM, Krishna NVK, Zghaib T, Smietana J, McBride D, Amankwah NA, **Linn KA**, Kumareswaran R, Hyman M, Arkles J, Santangeli P, Schaller RD, Supple GE, Frankel DS, Deo R, Lin D, Riley MP, Epstein AE, Callans DJ, Marchlinski FE, Hamilton R, Nazarian S. (2022) "Transcutaneous Magnetic Stimulation to Treat Ventricular Tachycardia Storm: a Randomized Controlled Trial." *JAMA Cardiology.* 7(4), 445-449.

17. Brown DA, McMahan CS, Shinohara RT, **Linn KA**. (2022) "Bayesian Spatial Binary Regression for Label Fusion in Structural Neuroimaging." *Journal of the American Statistical Association.* 117(538), 547-560.

18. Sharif MA, Dixon EL, Bair EF, Garzon C, Gibson LA, **Linn KA**, Volpp KG. (2021) "Effect of Nudges on Downloads of COVID-19 Exposure Notification Apps: A Randomized Clinical Trial." *JAMA Network Open.* 4(12), e2140839-e2140839.

19. Beidas RS, Ahmendani B, **Linn KA**, Marcus SC, Johnson C, Maye M, Westphal J, Wright L, Beck A, Buttenheim A, Daley M, Davis M, Elias M, Jager-Hyman S, Hoskins K, Leiberman A, McArdle B, Ritzwoller D, Small D, Wolk CB, Williams N, Boggs JM. (2021) "Study protocol for a Type III hybrid effectiveness-implementation trial of strategies to implement firearm safety promotion as a universal suicide prevention strategy in pediatric primary care." *Implementation Science.* 16(1), 1-16.

20. Dworkin JD, **Linn KA**, TD Satterthwaite TD, Raznahan A, Bakshi R, Shinohara RT. (2021) "A local group differences test for subject-level multivariate density neuroimaging outcomes." *Biostatistics.* 22(3), 646-661.

21. Teran-Merino F*, Paradis NA, Delgado KM, **Linn KA**, Dean AJ, Kramer JA, Morgan RW, Sutton RM, Gaspari R, Weekes A, Adhikari S, Noble VE, Nomura JT, Theodoro D, Woo MY, Panebianco NL, Chan W, Centeno C, Mitchell O, Peberdy MA, Abella BS. (2021) "Quantitative Characterization of Left Ventricular Function During Pulseless Electrical Activity Using Echocardiography During Out-of-Hospital Cardiac Arrest." *Resuscitation.* 167, 233-241. *Denotes MSCE advisee.

22. Wang TT, Dixon EL, Bair EF, Ferrell W, **Linn KA**, Volpp KG, Underhill K, Venkataramani AS. (2021) "Oral health and oral health care use among able-bodied adults enrolled in Medicaid in Kentucky after Medicaid expansion: A mixed methods study." *Journal of the American Dental Association.* 152(9), 747-755.

23. Parikh RB, **Linn KA**, Yan J, Maciejewski ML, Rosland A, Volpp KG, Groeneveld PW, Navathe AS. (2021) "A Machine Learning Approach to Identify Distinct Subgroups of Veterans at Risk for Hospitalization or Death using Administrative and Electronic Health Record Data." *PLOS ONE.* 16(2) e0247203. *Winner of the VA's Health Services Research & Development Best Research Paper of the year.

24. Oathes DJ, Zimmerman J, Duprat R, Cavdaroglu S, Scully M, Rosenberg B, Flounders M, Long H, Elliott M, Shandler G, Shinohara RT, **Linn KA**. (2021) "Resting fMRI-guided TMS results in subcortical and brain network modulation indexed by interleaved TMS/fMRI." *Experimental Brain Research.* 239(4), 1165-1178.

25. Oathes DJ, Balderston NL, Kording KP, DeLuisi JA, Perez G, Medaglia JD, Duprat R, Satterthwaite TD, Sheline YI, **Linn KA**. (2021) "TMS/fMRI for Probing and Modulating Neural Circuits Relevant to Affective Disorders." *WIREs Cognitive Science.* 12(4), e1553.

26. Yu M*, Cullen N*, **Linn KA**, Oathes DJ, Seok D, Cook PA, Duprat R, Aselcioglu I, Moore TM, Davatzikos C, Oquendo MA, Weissman MM, Shinohara RT, Sheline YI. (2021) "Structural brain measures are linked to clinical phenotypes in major depression." *Indicates co-first author. *Molecular Psychaitry.* 26(7), 2764-2775.

27. Navathe AS, Liao JM, **Linn KA**, Mishra A, Wang R, Dinh CT, Zhu J, Cousins DS, Emanuel EJ. (2020) "Spillover Effects of Medicare's Voluntary Bundled Payments for Joint Replacement

Surgery to Patients Insured by Commercial Health Plans." *Annals of Internal Medicine.* 174(2), 200-208.

28. **Linn KA**, Underhill K, Dixon EL, Bair EF, Ferrell WJ, Montgomery M, Volpp KG, Venkataramani AS. (2020) "The Design of a Randomized Controlled Trial to Evaluate Multi-Dimensional Effects of a Section 1115 Medicaid Demonstration Waiver with Community Engagement Requirements." *Contemporary Clinical Trials.* 98, 106173. ePub

29. Baller EB, Kaczkurkin AN, Sotiras A, Adebimpe A, Bassett DS, Calkins ME, Chand G, Cui Z, Gur RE, Gur RC, **Linn KA**, Moore T, Varol E, Wolf DH, Xia CH, Davatzikos C, Satterthewaite TD. (2020) "Neurocognitive and Functional Heterogeneity in Depressed Youth." *Neuropsychopharmacology.* 46(4), 783-790. ePub

30. Chen XS, Changolkar S, Navathe AS, **Linn KA**, Reh G, Szwartz G, Steier D, Godby S, Balachandran M, Harrison JD, Rareshide CAL, Patel MS. (2020) "Association between Behavioral Phenotypes and Response to a Physical Activity Intervention Using Gamification and Social Incentives: Secondary Analysis of the STEP UP Randomized Clinical Trial." *PLOS ONE.* 15(10), e0239288. ePub.

31. Beer JC, Tustison NJ, Cook PA, Sheline YI, Shinohara RT, **Linn KA**. (2020) "Longitudinal ComBat: A method for harmonizing longitudinal multi-scanner imaging data." *NeuroImage.* 220, 117-129. ePub.

32. **Linn KA**. (2020) "Moving Toward Rigorous Evaluation of Mobile Health Interventions." *Statistical Science.* 35(3) 394-395.

33. Powers BW, Yan J, Zhu J, **Linn KA**, Jain SH, Kowalski JL, Navathe AS. (2020) "The Beneficial Effects Of Medicare Advantage Special Needs Plans For Patients With End-Stage Renal Disease." *Health Affairs.* 39(9), 1486-1494.

34. Dworkin JD, **Linn KA**, Teich E, Zurn P, Shinohara RT, Bassett DS. (2020) "The extent and drivers of gender imbalance in neuroscience reference lists." *Nature Neuroscience.* 23(8), 918-926. ePub.

35. Venkataramani A, Bair E, Dixon E, **Linn KA**, Ferrell W, Montgomery M, Strollo MK, Volpp K, Underhill K. (2020) "Association Between State Policies Using Medicaid Exclusions to Sanction Noncompliance With Welfare Work Requirements and Medicaid Participation Among Low-Income Adults." *JAMA Network Open.* 3(5), e204579-e204579.

36. Navathe AS, Volpp KG, Bond A, **Linn KA**, Caldarella KL, Troxel AB, Zhu J, Yang L, Matloubieh S, Lee EO, Mugiishi M, Endo KT, Emanuel EJ. (2020) "Assessing The Effectiveness of Peer Comparisons As A Way To Improve Health Care Quality." *Health Affairs.* 39(5), 852-861.

37. Dinh CT, **Linn KA**, Isidro U, Emanuel EJ, Volpp KG, Caldarella K, Troxel A, Zhu J, Yang L, Matloubieh SE, Drye E, Bernheim S, Lee EO, Mugiishi M, Endo KT, Yoshimoto J, Yuen I, Okamura S, Tom J, Navathe AS, (2019) "The association between a new primary care population-based payment model and changes in outpatient imaging utilization and spending." *Journal of the American College of Radiology.* 17(1), 101-109.

38. Navathe AS, Emanuel EJ, Bond A, **Linn KA**, Caldarella KL, Troxel AB, Zhu J, Yang L, Matloubieh S, Drye E, Bernheim S, Lee EO, Mugishi M, Endo KT, Yoshimoto J, Yuen I, Okamura S, Stollar M, Tom J, Gold M, Volpp KG. (2019) "Association Between the Implementation of a Population-Based Primary Care Payment System and Achievement on Quality Measures in Hawaii." *Journal of the American Medical Association.* 322(1), 57–68.

39. Venkataramani A., Bair E, Dixon E, **Linn KA**, Ferrell W, Montgomery M, Strollo MK, Volpp K, Underhill K. (2019) "Assessment of Medicaid Beneficiaries Included in Community Engagement Requirements in Kentucky." *JAMA Network Open.* 2(7), e197209-e197209.

40. Yu M, **Linn KA**, Shinohara RT, Oathes DJ, Cook PA, Duprat R, Moore TM, Oquendo MA, Phillips ML, McInnis MG, Fava M, Trivedi MH, McGrath PJ, Parsey R, Weissman MM, Sheline YI. (2019) "Childhood trauma history is linked to brain connectivity abnormalities in major depression." *PNAS.* 116(17), 8582-8590.

41. Yan J*, **Linn KA***, Powers BW, Zhu J, Jain SH, Kowalski JL, Navathe AS. (2018) "Applying Machine Learning Algorithms to Segment High-Cost Patient Populations." *Journal of General Internal Medicine.* 34(2), 211-217. *Indicates co-first author.

42. Powers BW, Yan J, Zhu J, **Linn KA**, Jain SH, Kowalski JL, Navathe AS. (2018) "Identifying Clinically and Operationally Significant Subgroups of High Cost Medicare Advantage Patients." *Journal of General Internal Medicine.* 34(2), 218-225.

43. Valcarcel AM, **Linn KA**, Khalidb F, Vandekar SN, Tauhidb S, Satterthwaite TD, Muschelli J, Bakshib R, Shinohara RT. (2018) "A Dual Modeling Approach to Automatic Segmentation of Cerebral T2 Hyperintensities and T1 Black Holes in Multiple Sclerosis." *NeuroImage: Clinical.* 20, 1211-1221.

44. Yang Z, Gu S, Honnorat N, **Linn KA**, Shinohara RT, Aselcioglu I, Bruce S, Oathes DJ, Satterthwaite TD, Bassett DS, Sheline YI. (2018) "Network Changes Predict Transdiagnostic Depressive Symptom Improvement Following Cognitive Behavioral Therapy in MDD and PTSD" *Molecular Psychiatry.* 23(12), 2314-2323.

45. Yu M, **Linn KA**, Cook PA, Phillips MA, McInnis M, Fava M, Trivedi MH, Weisman MM, Shinohara RT, Sheline YI, (2018) "Statistical harmonization corrects site effects in functional connectivity measurements from multi-site fMRI data." *Human Brain Mapping.* 39(11), 4213-4227.

46. Valcarcel AM, **Linn KA**, Vandekar SN, Satterthwaite TD, Muschelli J, Calabresi PA, Pham DL, Martin ML, Shinohara RT. (2018) "MIMoSA: An Automated Method for Intermodal Segmentation Analysis of Multiple Sclerosis Brain Lesions." *Journal of Neuroimaging.* 28(4), 389-398.

47. Zhen Y, Oathes D, Bruce SE, **Linn KA**, Satterthwaite TD, Cook PA, Satchell EK, Shou H, Sheline YI. (2018) "Cognitive Behavioral Therapy Enhances Cognitive Control Network Activity in Depression and Post-Traumatic Stress Disorder." *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging.* 3(4), 311-319.

48. Dworkin JD, **Linn, KA**, Oguz I, Fleishman G, Bakshi R, Nair G, Calabresi PA, Henry RG, Oh J, Papinutto N, Pelletier D, Rooney W, Stern W, Sicotte NL, Reich DS, Shinohara RT, North American Imaging in Multiple Sclerosis Cooperative, (2018) "An Automated Statistical Technique for Counting Distinct Multiple Sclerosis Lesions. " *American Journal of Neuroradiology.* 39(4), 626-633.

49. Shinohara RT, Oh J, Nair G, Calabresi PA, Davatzikos C, Doshi J, Henry RG, Kim G, **Linn KA**, Papinutto N, Pham DL, Reich DS, Rooney W, Roy S, Stern W, Tummala S, Yousuf F, Zhu A, Sicotte NL, and Bakshi R, North American Imaging in Multiple Sclerosis Cooperative, (2017) "Volumetric Analysis From A Harmonized Multi-Site Brain MRI Study of a Single-Subject with Multiple Sclerosis." *American Journal of Neuroradiology.* 38(8), 1501-1509.

50. Bruno AV, Klein JP, Nirola DK, Nidup D, Cash SS, Lim AS, Leung ECW, Thibert R, Lam A, Zepeda R, Bui E, Lee L, Tshering L, Deki S, McKenzie ED, Cohen J, Mantia J, Sorets TR, Wong J, Clark SJ, **Linn KA**, Shinohara RT, Dorji C, Cole AJ, Mateen FJ, (2017) "Yield of brain MRI in clinically diagnosed epilepsy in the Kingdom of Bhutan: A prospective study." *Annals of Global Health.* 83(3-4), 415-422.

51. **Linn KA**, Laber EB, Stefanski LA, (2017) "Interactive Q-learning for Quantiles." *Journal of the American Statistical Association.* 112(518) 638-649.

52. **Linn KA**, Gaonkar B, Doshi Satterthwaite TD, J, Davatzikos C, Shinohara RT, (2016) "Control-Group Feature Normalization for Multivariate Pattern Analysis of Structural MRI Data using the Support Vector Machine." *NeuroImage.* 132, 157-166.

53. Satterthwaite TD, Wolf DH, Calkins ME, Vandekar SN, Erus G, Ruparel K, Roalf DR, Elliott MA, Moore TM, Hakonarson H, Shinohara RT, **Linn KA**, Davatzikos C, Gur RC, Gur RE, (2016) "Structural Brain Abnormalities in Youth with Psychosis-Spectrum Symptoms." *JAMA Psychiatry.* 73(5), 515-524.

54. **Linn KA**, Gaonkar B, Doshi J, Davatzikos C, Shinohara RT, (2015) "Addressing Confounding in Predictive Models with an Application to Neuroimaging." *International Journal of Biostatistics.* 12(1), 31-44.

55. Wong JC*, **Linn KA***, Shinohara RT, Mateen FJ, (2015) "Traumatic brain injury in Africa in 2050: a modeling study." *European Journal of Neurology.* 23(2), 382-386. *Indicates co-first author.

56. Abdulhaqq SA, Zorrilla C, Kang G, Yin X, Tamayo V, Seaton KE, Joseph J, Garced S, Tomaras GD, **Linn KA**, Foulkes AS, Azzoni L, VerMilyea M, Coutifaris C, Kossenkov AV, Showe LC, Kraiselburd E, Li Q, Montaner LJ. (2015) "HIV-1 Negative Female Sex Workers Sustain High Cervical IFNε and Low Immune Activation and Expression of HIV-1 Required Host Genes." *Mucosal Immunology.* 9(4), 1027-1038.

57. Takeshita J, Wang S, Shin DB, Callis Duffin K, Krueger GG, Kalb RE, Weisman JD, Sperber BR, Stierstorfer MB, Brod BA, Schleicher SM, Robertson AD, **Linn KA**, Shinohara RT, Troxel AB, Van Voorhees AS, Gelfand JM, (2014) "Comparative Effectiveness of Less Commonly Used Systemic Monotherapies and Common Combination Therapies for Moderate-to-Severe Psoriasis in the Clinical Setting." *Journal of the American Academy of Dermatology.* 71(6), 1167–1175.

58. **Linn KA**, Laber EB, Stefanski LA, (2014). "iqLearn: Interactive Q-learning in R." *Journal of Statistical Software.* 64(1).

59. Laber EB, **Linn KA**, Stefanski LA, (2014) "Interactive model building for Q-learning." *Biometrika.* 101(4), 831-847.

Book Chapters

1. Valcarcel AM, **Linn KA**, Khalid F, Vandekar SN, Tauhid S, Satterthwaite TD, Muschelli J, Bakshi R, Shinohara RT, (2019) "MIMoSA: An Approach to Automatically Segment T2 Hyperintense and T1 Hypointense Lesions in Multiple Sclerosis." Chapter in *Brainlesion: Glioma Multiple Sclerosis Stroke and Traumatic Brain Injuries.* Edited by Crimi A, Bakas S, Kuijf H, Keyvan F, Reyes M, van Walsum T. Springer International Publishing.

2. **Linn KA**, Laber EB, Stefanski LA, (2015) "Constrained Estimation for Competing Outcomes." Chapter in *Adaptive Treatment Strategies In Practice.* Edited by Kosorok MR and Moodie EEM. ASA-SIAM Statistics and Applied Probability Series.

Grant Funding as PI

02/15/22 – 01/31/24, Multiple Principal Investigator: 1R21AG075574-01 (joint with MPI Rebecca Hubbard). "Informatics Methods for Leveraging Clinical Data Sources to Study Risk Factors for Alzheimer's Disease." $454,731 total awarded.

03/01/22 – 08/31/23, Multiple Principal Investigator: Commonwealth Foundation (joint with MPIs Ravi Parikh and Amol Navathe). "Examining Unfairness in CMS's Hierarchical Condition Categories Score and the Potential Impact on Health Systems and Health Plans Serving Minorities." $200,000 total awarded.

01/10/19 – 01/09/20, Principal Investigator: UPenn Center for Biomedical Image Computing and Analytics Seed Grant. "Longitudinal Multi-site Image Harmonization." $50,000 total awarded.

Invited Presentations

International Chinese Statistical Association (ICSA) Applied Statistics Symposium, Nashville, TN, June 2024.

16th International Conference of the ERCIM WG on Computational and Methodological Statistics, Berlin, Germany, December 2023.

Department of Biostatistics, University of Minnesota, Minneapolis, MN, November 2023.

Statistical Methods in Imaging Conference, University of Minnesota, Minneapolis, MN, May 2023.

15th International Conference of the ERCIM WG on Computational and Methodological Statistics, London, UK, December 2022.

Center for Clinical Quality and Implementation Research (CCQIR) in the Institute for Medicine and Public Health at Vanderbilt University Medical Center, Nashville, TN, October 2022. (Virtual)

Department of Statistics, University of Wisconsin, Madison, WI, September 2022.

Joint Statistical Meetings, Washington D.C., August 2022.

The 5th International Conference on Econometrics and Statistics (EcoSta 2022), Kyoto, Japan, June 2022.

14th International Conference of the ERCIM WG on Computational and Methodological Statistics, London, UK, December 2021. (Virtual)

Big Data Institute, University of Oxford, Oxford, UK, October 2021. (Virtual)

Department of Biostatistics, Vanderbilt University, Nashville, TN, September 2021. (Virtual)

International Chinese Statistical Association (ICSA) Applied Statistics Symposium, Washington DC, September 2021. (Virtual)

Statistical Methods in Imaging Conference, Atlanta, GA, May 2021. (Virtual)

International Conference on Medical Image Computing and Computer Assisted Intervention, Lima, Peru, October 2020. Gave a talk as part of the tutorial "Causality in Medical Image Computing." (Virtual)

Division of Biostatistics University of Pennsylvania, Philadelphia, PA, July 2020. (Virtual)

Statistical Methods in Imaging Conference, Atlanta, GA, May 2020. (Cancelled due to COVID-19)

12th International Conference of the ERCIM WG on Computational and Methodological Statistics, London, UK, December 2019.

Workshop on Higher-Order Asymptotics and Post-Selection Inference, St. Louis, MO, August 2019.

City of Hope Cancer Center, Duarte, CA, June 2019.

CHOP Clinical Trials Research Affinity Group, Philadelphia, PA, June 2019.

Thomas R. Ten Have Symposium on Statistics in Mental Health, New Haven, CT, May 2019.

ENAR, Philadelphia, PA, March 2019.

11th International Conference of the ERCIM WG on Computational and Methodological Statistics, Pisa, Italy, December 2018.

Department of Biostatistics Brown University, Providence, RI, October 2018.

Joint Statistical Meetings, Vancouver, British Columbia, Canada, July 2018.

Conference on Statistical Learning and Data Science / Nonparametric Statistics, New York, NY, June 2018.

Department of Pharmacology & Experimental Therapeutics Thomas Jefferson University, Philadelphia, PA, May 2018.

Department of Mathematics Washington University, St. Louis, MO, April 2018.

International Conference on Health Policy Statistics, Charleston, SC, January 2018.

10th International Conference of the ERCIM WG on Computational and Methodological Statistics, London, UK, December 2017.

The Global Center for Big Data and Mobile Analytics at Temple University's Fox School of Business, Philadelphia, PA, March 2017.

ENAR, Washington D.C., March 2017.

Department of Biostatistics Columbia University, New York, NY, February 2017.

Etsy, New York, NY, January 2017.

Department of Statistics Columbia University, New York, NY, January 2017.

Department of Statistics and Data Science University of Texas, Austin, TX, January 2017.

Department of Biostatistics Duke University, Durham, NC, January 2017.

Fox Chase Cancer Center, Philadelphia, PA, December 2016.

Department of Biostatistics University of Washington, Seattle, WA, December 2016.

Department of Health Care Policy Harvard University, Boston, MA, December 2016.

Department of Biostatistics and Epidemiology University of Pennsylvania, Philadelphia, PA, November 2016.

Division of Biostatistics University of Minnesota, Minneapolis, MN, November 2016.

KPMG, New York, NY, November 2016.

Department of Biotatistics Vanderbilt University, Nashville, TN, November 2016.

Department of Biotatistics and Bioinformatics Emory University, Atlanta, GA, November 2016.

Department of Biotatistics and Computational Biology University of Rochester, Rochester, NY, October 2016.

Department of Statistics North Carolina State University, Raleigh, NC, October 2016.

ENAR Spring Meeting, Austin, TX, March 2016.

Organization for Human Brain Mapping, Honolulu, HI, June 2015.

Harvard Medical School, Boston, MA, April 2015.

Department of Biostatistics Columbia, New York, NY, October 2014.

Department of Statistics George Mason University, Fairfax, VA, January 2014.

Joint Statistical Meetings, Montréal, Quebec, Canada, August 2013.

INFORMS Healthcare, Chicago, IL, June 2013.

NC State Scope Academy, Raleigh, NC, April 2013. (poster presentation)

IMPACT Symposium, Raleigh, NC, November 2012.

"Approaches for Modeling Spatially Varying Associations Between Multi-Modal Images." ISMRM Annual Meeting (virtual due to COVID-19), August 2020. (Abstract accepted for poster presentation)

"Design of a Randomized Trial to Evaluate a Medicaid Section 1115 Demonstration Waiver." Academy Health Annual Research Meeting (virtual due to COVID-19), July 2020. (Abstract accepted for poster presentation)

"Leveraging Treatment Effect Heterogeneity in the STEP UP Trial to Personalize Interventions." LDI Research Retreat, Philadelphia, PA, January 2020. (Abstract accepted for poster presentation)

"MRI-based Measures for Quantifying Treatment Efficacy in Multiple Sclerosis." European Committee for Treatment and Research in Multiple Sclerosis, Paris, France, October 2017. (Abstract accepted for poster presentation)

"Multivariate Pattern Analysis and Confounding in Neuroimaging." Women in Statistics and Data Science Conference, Charlotte, NC, October 2016. (poster)

"Inter-modal Coupling: A Class of Local Covariance Measures for Multimodal Neuroimaging Data." Challenges and Advances on Big Data in Neuroimaging, Cleveland, OH, August 2016. (poster and travel award recipient)

"Multivariate Pattern Analysis and Confounding in Neuroimaging." Joint Statistical Meetings, Chicago, IL, August 2016.

Ibid. Joint Statistical Meetings, Seattle, WA, August 2015.

"Interactive Q-learning for Dynamic Treatment Regimes." NCSU Graduate Research Symposium, Raleigh, NC, March 2013. (poster awarded 2nd place)

Ibid. AAAS Annual Meeting, Boston, MA, February 2013. (poster honorable mention award)

"A Bayesian Analysis of a Thorough QT Study." SRCOS Summer Research Conference, Jekyll Island, GA, June 2012. (poster award winner)

- Senior author of a paper recognized as one of the 2023 Leading Research Achievements by Brain and Behavior Research Foundation Grantees, Prize Winners, and Scientific Council Members.
- Co-authored abstract selected as a "top 4" abstract for the Equity and Disparities theme at the 2023 SGIM Annual Meeting.
- Winner of the 2023 Harold I. Feldman Distinguished Faculty Designation. This award recognizes exceptional faculty members of the DBEI whose work epitomizes the successful synergies across the Department's core disciplines (Biostatistics, Epidemiology and Informatics) to promote health, science, and education.
- Nominated by the University of Pennsylvania's Department of Biostatistics, Epidemiology, and Informatics for the 2022-23 Leonard Berwick Memorial Teaching Award.
- Nominated by the University of Pennsylvania's Department of Biostatistics, Epidemiology, and Informatics for the 2022 Dean's Award for Excellence in Basic Science Teaching.
- Co-authored a paper selected as the winner of the VA's Health Services Research & Development Best Research Paper of 2021.

- Co-authored a paper selected as a finalist for The National Institute for Health Care Management (NIHCM) Foundation's 26th Annual Health Care Research Award: Link to list of finalists
- Invited to attend the 2018 Advanced Research Institute Spring Retreat as a Biostatistician Fellow.
- 2016 travel award to present a poster at the conference Challenges and Advances on Big Data in Neuroimaging.
- Invited oral presentation at the 2015 Human Brain Mapping Conference (less than 3% of abstracts invited).
- Accepted to the Recurse Center's Fall I 2015 batch and received a grant for living expenses.
- Awarded the Graduate Assistance in Areas of National Need (GAANN) Fellowship in Scientific Computation. Provided stipend support for the 2013-2014 academic year.
- 2nd place in the 2013 NC State Graduate Research Symposium Poster Competition Physical and Mathematical Sciences Category.
- 2013 AAAS Student Poster Honorable Mention in Medicine and Public Health.
- Received a Joshua E. Neimark Memorial Travel Award to attend the 2013 AAAS Meeting.
- 2012 NSF Young Researcher Travel Award to present a talk at the International Conference on Advances in Interdisciplinary Statistics and Combinatorics in Greensboro NC.
- 2012 Winner of the Clint Miller Best Poster Award at the SRCOS Summer Research Conference.
- 2012 Boyd Harshbarger Travel Award to present at the SRCOS Summer Research Conference.
- 2011 Gertrude M. Cox Award for Outstanding Ph.D. Candidate. This departmental award is presented to the student with the top written preliminary exam.
- 1st Place 2011 A-mu-sing competition in the joke and cartoon category. Winning entry was displayed at the US Conference On Teaching Statistics May 19–21 2011.

SHORT COURSES

Co-instructor (Fall 2020), Causality in Medical Imaging Computing. MICCAI Lima Peru. (Virtual)

Co-instructor (Fall 2018), Statistical Methods for Medical Image Analysis. MICCAI Granada Spain.

Co-instructor (Spring 2018), Neuroimaging in R. ENAR Atlanta GA.

Co-instructor (Spring 2017), Neuroimaging in R. IEEE International Symposium on Biomedical Imaging Melbourne Australia.

COURSES TAUGHT

Instructor (Spring 2019–2024), BSTA 670: Programming and Computation for Biomedical Data Science.

Instructor (Spring 2014), Introduction to Statistics.

Lab Instructor (Summer 2013), Experimental Statistics for Biological Sciences II. The class covers multiple linear regression ANOVA blocked and nested designs random effects and split-plots.

Guest Lecturer (2023) Advanced Topics in Biostatistics. "Using the SMART design to develop adaptive interventions." Invited by Mingyao Li.

Guest Lecturer (2022) Imaging Statistics. "Algorithmic Fairness in Medical Imaging Analysis." Invited by Taki Shinohara.

Invited Panelist (2022) "Incorporating the use of computer software in a course." Invited by Jeremy Rubin.

Guest Lecturer (2018) Advanced Inference. "Dynmamic Treatment Regimes and Nonregularity in Inference." Invited by Taki Shinohara.

Guest Lecturer (2015) Longitudinal Data Analysis. "Introduction to Dynmamic Treatment Regimes." Invited by Michelle Ross.

Mentor (2013) SAMSI Undergraduate Modeling Workshop.

Guest Lecturer (2013) Advanced Computing. "Interactive Q-learning." Invited by Hua Zhou.

Guest Lecturer (2013) Causal Inference. "Interactive Q-learning." Invited by Anastasios Tsiatis.

Lab Instructor (2013) Used R to teach students about dynamic treatment regimes and Q-learning at the SAMSI Undergraduate Healthcare Workshop.

Tutor (2009 2012–2013) Tutored students in Introductory Statistics Undergraduate Mathematical Statistics Introduction to Biostatistics High School Pre-Calculus and SAT preparation.

POST-DOCTORAL FELLOWS

Joanne Beer PhD 2018–2021 (co-advised with Taki Shinohara)
Chenxi Yuan PhD 2022– (co-advised with Rebecca Hubbard)
Ernesto Ulloa PhD 2022– (co-advised with Rebecca Hubbard)

DOCTORAL STUDENT ADVISING

Likhitha Kolla, 2023– (co-advised with Ravi Parikh)

Sarah Hegarty, 2023– (co-advised with Jinbo Chen)

Jenny Shen, 2020– (co-advised with Rebecca Hubbard)

Sarah Weinstein, 2019–2023. Dissertation title: "Statistical Methods for Extracting and Comparing Patterns in Multimodal Neuroimaging Studies." Post-graduation: Assistant Professor of Biostatistics, Temple University. (co-advised with Taki Shinohara)

Alessandra Valcarcel, 2018–2020. Dissertation title: "Statistical Methods for Multi-Modal Image Analysis with Applications in Multiple Sclerosis and Neurodevelopment." Post-graduation: Genentech. (co-advised with Taki Shinohara)

SERVICE ON DOCTORAL COMMITTEES

Current:
Ganesh Chandrasekaran, Biostatistics
Gary Hettinger, Biostatistics (Chair)

Completed:
Andrew Chen, Biostatistics, 2023 (Chair)
Stephanie Teeple, Epidemiology, 2022
Carolyn Lou, Biostatistics, 2022
Nicholas Illenberger, Biostatistics, 2022 (Chair)
Jordan Dworkin, Biostatistics, 2020 (Chair)
Wenli Sun, Biostatistics, 2019

MASTER'S THESIS ADVISING

Nina Alfaro, 2023–2024. Thesis title: "TBD."

Kylie Getz, 2020–2021. Thesis title: "Whole-brain Analysis of a Crossover Study of Intermittent Theta Burst Stimulation (iTBS) for Affective Disorders."

Eunyoung Park, 2020–2021. Thesis title: "Latency of the BOLD Response Following Single-Pulse Transcranial Magnetic Stimulation."

LAB ROTATION STUDENTS SUPERVISED

Melissa Martin (Summer 2021)
Jenny Shen (Summer 2020, co-advised with Taki Shinohara)
Jenny Shen (Fall 2019)
Sarah Weinstein (Summer and Fall 2019, co-advised with Taki Shinohara)
Justin Lakkis (Fall 2017)

ACADEMIC ADVISOR

Noah Hillman (PhD candidate Biostatistics 2023–2024)
Hanxiang Xu (MS candidate Biostatistics 2022–2023)
Sarah Hegarty (PhD candidate Biostatistics 2020–2021)
Zi Wang (MS candidate Biostatistics 2019–2020)
Danni Tu (PhD candidate Biostatistics 2018–2020)

AD HOC RESEARCH MENTORING

Maggie Pecsok (MD/PhD in Neuroscience 2023–)
Junning Liang (MS candidate Biostatistics 2020–2020)
Virgilio Gozenbach (PennSIVE Research Associate 2020–2022)

BIOSTATISTICS ADVISOR TO MSCE STUDENTS

Tracy Flanders, Neurosurgery Resident (2018–2021)
Filipe Teran-Merino, Clinical Instructor of Emergency Medicine (2017–2020)

SERVICE TO PENN BIOSTATISTICS DIVISION

- Chair, Biostatistics Seminar Series (2022–2023)
- Chair, PennSIVE Seminar Committtee (Spring 2022)
- Member, Search Committee for a Vice Chair of Faculty Professional Development (2022–2022)
- Co-Chair, Computing Committee (2021–present)
- Member, Computing Committee (2021–present)
- Member, Admissions Committee (2018–present)
- Member, Junior Faculty Committee (2017–present)
- Co-Chair, Junior Faculty Committee (2017–2019)

CONFERENCE ORGANIZATION

- Submitted an invited session proposal on algorithmic fairness for the 2024 Joint Statistical Meetings in Portland, Oregon.
- Organized an invited session on multimodal imaging at the 2021 CMStatistics meeting in London, UK.
- Organized an invited session on dynamic treatment regimes at the 2019 CMStatistics meeting in London, UK.
- Invited to attend the 2018 Advanced Research Institute Spring Retreat as a Biostatistician Fellow.
- Organized an invited session on neuroimaging statistics at ENAR 2017.

PROFESSIONAL SERVICE AND DEVELOPMENT

- Program Chair of the American Statistical Association's Statistics in Imaging Section (2024)
- Program Chair-Elect of the American Statistical Association's Statistics in Imaging Section (2023)
- Treasurer of the American Statistical Association's Statistics in Imaging Section (2022-2024)
- Member of the American Statistical Association (ASA).
- Member of the Eastern North American Region of the Biometrics Society (ENAR).
- NC State Certificate of Accomplishment in Teaching participant (2013–2014).
- NC State Women in Statistics Networking Group (2012–2014).
- Graduate Student Professional Development Workshop (2012), one of two students nominated by the NC State Department of Statistics to participate in the workshop.
- Summer Institute in Statistical Genetics (2011), completed the "MCMC for Genetics" and "Mixed Models for Quantitative Genetics" modules Department of Biostatistics at the University of Washington Seattle WA.

OTHER SERVICE

- Ad hoc reviewer for: American Journal of Psychiatry, Annals of Applied Statistics, Biometrical Journal, Biometrics, Biostatistics, Communications in Statistics, Computational Statistics & Data Analysis, Human Brain Mapping, International Journal of Biostatistics, JAMA Network Open, Journal of Pediatric Rehabilitation, Journal of Pharmacoepidemiology, Journal of Statistical Software, Journal of the American Statistical Association, Multiple Sclerosis, NeuroImage, Neuropsycopharmacology, PCORI Final Research Report, PLOS ONE, Scientific Advances, Statistical Methods in Medical Research, Statistics in Medicine
- Statistical Reviewer for JAMA Network Open (2022–)
- Reviewer for the 2022 Statistical Methods in Imaging (SMI) student paper award (2022)
- Reviewer for the ASA's Statistics in Imaging Section's student paper award (2021, 2022)
- Co-organizer of the first NC State Statistics and Zoology Graduate Research Symposium (2013).
- Co-Vice President of the Statistics Graduate Student Association (2012–2013).
- International Dinner Chair NC State Department of Statistics (2011).