Curriculum Vitae: Corwin Matthew Zigler, Ph.D.

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Contact Information

Brown University School of Public Health
Department of Biostatistics
121 S. Main Street
Providence, RI 02903

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Citizenship: United States Citizen

Education

Ph.D. Biostatistics, University of California, Los Angeles 2010
Thesis: Bayesian strategies for posttreatment variable adjustment using principal stratification: Application to treatment noncompliance and principal surrogate endpoints.
Advisor: Professor Thomas R. Belin

M.A. Mathematics with Specialization in Probability and Statistics, Boston University 2005
Summa Cum Laude

B.A. Mathematics with Specialization in Probability and Statistics, Boston University 2005
Summa Cum Laude

Research Interests

Statistical and data science methodology, causal inference, missing data, observational studies, Bayesian methods, spatial statistics, network data, environmental health, air pollution epidemiology, atmospheric modeling, regulatory impact assessment, health disparities, health policy

Employment

Professor, Department of Biostatistics 2024 -
Director of the Doctoral Program, Department of Biostatistics 2025 -
Brown University School of Public Health, Providence, RI

Adjunct Associate Professor, Department of Statistics and Data Sciences 2024-
University of Texas, Austin, TX

Associate Professor, Department of Statistics and Data Sciences 2018 - 2024
University of Texas, Austin, TX

Associate Professor, Department of Women's Health (joint appointment) 2018 - 2022
Dell Medical School, University of Texas, Austin, TX

Associate Professor, Department of Biostatistics 2018
Harvard T.H. Chan School of Public Health, Boston, MA

Assistant Professor, Department of Biostatistics 2013 - 2018
Harvard T.H. Chan School of Public Health, Boston, MA

Postdoctoral Research Associate, Department of Biostatistics 2010–2013
Harvard School of Public Health, Boston, MA
Faculty Mentor: Professor Francesca Dominici

Research Assistant, Section of Oral and Maxillofacial Surgery 2005–2010
UCLA School of Dentistry, Los Angeles, CA

Research Statistician, Center for AIDS Research, Education, and Services 2005
Charles Drew University, Los Angeles, CA

Intern, Center for Birth Defects Research and Prevention 2004–2005
Massachusetts Department of Public Health, Boston, MA

Honors and Awards

Fellow of the American Statistical Association, elected 2023

2023 Health Policy Statistics Section Mid-Career Achievement Award recognizing outstanding contributions to health policy through methodological or applied work and promise for continued excellence.

2019 International Society for Bayesian Analysis Mitchell Prize. Honorable Mention for: Bayesian Methods for Multiple Mediators: Relating Principal Stratification and Causal Mediation in the Analysis of Power Plant Emission Controls.

2019 Rothman Epidemiology Prize for the best paper published in *Epidemiology* for: Impact of National Ambient Air Quality Standards Nonattainment Designations on Particulate Pollution and Health.

2012 American Statistical Association Statistics in Epidemiology Section Young Investigator Award.

2010 Carolbeth Korn Prize awarded to the most outstanding graduating student in the UCLA School of Public Health.

Oral and Maxillofacial Surgery Foundation (OMSF) Daniel M. Laskin Award for the most outstanding article published in the *Journal of Oral and Maxillofacial Surgery* in 2008.

College Prize for Excellence in Statistics, Boston University, 2005.

Scholarship Recipient, Summer Institute for Training in Biostatistics, NHLBI, 2004.

Teaching Experience

Instructor, Brown Department of Biostatistics 2025
Course: Linear Models

Instructor, UT Austin Statistics and Data Sciences 2023
Course: Elements of Statistics

Instructor, UT Austin Statistics and Data Sciences 2020-2023
Course: Linear Models

Instructor, UT Austin Masters of Data Science Online 2021-2023
Course: Design Principles and Causal Inference for Data-Based Decision Making

Instructor, UT Austin Statistics and Data Sciences 2020
Course: Causal Inference Methodology

Instructor, Harvard Department of Biostatistics 2016 - 2017
Course: Applied Bayesian Analysis

Instructor, Harvard Department of Biostatistics 2012 - 2015
Course: Bayesian Methodology in Biostatistics

Publications and Refereed Conferences

1. Shetty V, Murphy DA, Zigler C, Resell J, and Yamashita DD. Accuracy of data collected by surgical residents. *Journal of Oral and Maxillofacial Surgery*, 2008; **66**:1335–1342.
2. Shetty V, Atchison K, Leathers R, Black E, Zigler C, Belin T. Do the benefits of rigid internal fixation of mandible fractures justify the added costs? Results from a randomized controlled trial. *Journal of Oral and Maxillofacial Surgery*, 2008; **66**:2203–2212.
3. **Zigler CM** and Shetty V. Article analysis and evaluation for: Manual reduction to assist intraoperative maxillomandibular fixation may suffice for mandibular angle fractures treated with open reduction and internal fixation. *Journal of Evidence Based Dental Practice*, 2009; **9**:236–237.
4. Murphy DA, Shetty V, Resell J, Zigler C, Yamashita D. Substance use in vulnerable patients with orofacial injury: prevalence, correlates, and unmet service needs. *Journal of Trauma: Injury, Infection, and Critical Care*, 2009; **66** (2):477–484.
5. **Zigler CM** and Belin TR. The potential for bias in principal causal effect estimation when treatment received depends on a key covariate. *Annals of Applied Statistics*, 2011; **5**(3): 1876-1892.
6. Murphy DA, Shetty V, Zigler C, Resell J, Yamashita, D. Willingness of facial injury patients to change causal substance using behaviors. *Substance Abuse*, 2010; **31**: 35–42.
7. Shetty V, Mooney LJ, Zigler CM, Belin TR, Murphy D, Rawson R. The relationship between methamphetamine use and increased dental disease. *Journal of the American Dental Association*, 2010; **141**: 307–318.
8. Shetty V, Zigler CM, Robles T, Elashoff D, and Yamaguchi M. Developmental validation of a point-of-care, salivary α-amylase biosensor. *Psychoneuroendocrinology*, 2011; **36**: 193–199.
9. Robles T, Shetty V, Zigler CM, Glover D, Elashoff D, Murphy D, and Yamaguchi M. The feasibility of ambulatory biosensor measurement of salivary alpha amylase: Relationships with self-reported and naturalistic psychological stress. *Biological Psychology*, 2011; **86**: 50–56.
10. Shetty V, Murphy DA, Zigler CM, Yamashita DD, and Belin TR. Randomized controlled trial of personalized motivational interventions in substance using patients with facial injuries. *Journal of Oral and Maxillofacial Surgery*, 2011; **69**: 2396–2411.
11. Belin TR, Fischer HJ, and Zigler CM. Using a Density-Variation/Compactness measure to evaluate redistricting plans for partisan bias and electoral responsiveness. *Statistics, Politics, and Policy*, 2011; **2**.
12. **Zigler CM**, Dominici F, and Wang Y. Estimating causal effects of air quality regulations using principal stratification for spatially-correlated multivariate intermediate outcomes. *Biostatistics*, 2012; **13**(2): 289–302.
13. **Zigler CM** and Belin TR. A Bayesian approach to improved estimation of causal effect predictiveness for a principal surrogate endpoint. *Biometrics*, 2012; **68**(3): 922-932.
14. Arcaya M, Brewster M, Zigler CM, and Subramanian SV. Area variations in health: A spatial multilevel modeling approach. *Health and Place*, 2012; **18**(4): 824-831.
15. **Zigler CM**, Watts K, Yeh RW, Wang Y, Coull BA, and Dominici F. Model feedback in Bayesian propensity score estimation. *Biometrics*, 2013; **69**(1): 263 -273.
16. **Zigler CM** and Dominici F. Uncertainty in propensity score estimation: Bayesian methods for variable selection and model averaged causal effects. *Journal of the American Statistical Association*, 2014; **109**(505), 95–107.
17. **Zigler CM** and Dominci F. Clarifying Policy Evidence with Potential-Outcomes Thinking: Beyond Exposure-Response Estimation in Air Pollution Epidemiology. *American Journal of Epidemiology*, 2014; **180**(12), 1133–1140.

18. Arvold ND, Wang Y, Zigler CM, Schrag D, and Dominici F. Hospitalization burden and survival among elderly patients with glioblastoma. *Neuro-Oncology*, 2014; **16**(11), 1530-1540.

19. Wang C, Parmigiani G, and Dominici, F, and **Zigler CM**. Accounting for Uncertainty in Confounder and Effect Modifier Selection when Estimating Average Causal Effects in Generalized Linear Models. *Biometrics*, 2015; **71**(3), 654–665.

20. **Zigler, CM**. The Central Role of Bayes Theorem for Joint Estimation of Causal Effects and Propensity Scores. *The American Statistician*, 2016; **70**(1), 47–54.

21. **Zigler, CM**, Kim C*, Choirat C, Hansen JB, Wang Y, Hund L*, Samet J, King G, and Dominici F. Causal Inference Methods for Estimating Long-Term Health Effects of Air Quality Regulations; Research Report 187; *Health Effects Institute*, Boston, MA 2016.

22. Antonelli JL*, Zigler CM, and Dominici F. Guided Bayesian imputation to adjust for confounding when combining heterogeneous data sources in comparative effectiveness research. *Biostatistics*, 2017; **18**(3) 553–569.

23. Braun D*, Gorfine M, Parmigiani G, Arvold ND, Dominici F, and **Zigler CM**. Propensity scores with misclassified treatment assignment: a likelihood-based approach. *Biostatistics*, 2017; **8**(4) 695–710.

24. Dominici F and **Zigler CM**. Best practices for gauging evidence of causality in air pollution epidemiology. *American Journal of Epidemiology*, 2017; **186**(12) 1303–1309.

25. Arvold ND, Cefalu M, Wang Y, Zigler CM, Schrag D, and Dominici F. Comparative Effectiveness of Radiotherapy With vs. Without Temozolomide in Older Patients with Glioblastoma. *Journal of Neuro-Oncology*, 2017; **131**(2), 301-311.

26. Connelly M, Sullivan A, Chinchilla M, Dale M, Emans J, Nadelson C, Notman M, Tarbell N, Zigler CM, and Shore E. Impact of a junior faculty fellowship award on academic advancement and retention. *Academic Medicine*, 2017; **92**(8), 1160-1167.

27. Wasfy JH, Zigler CM, Choirat C, Wang Y, Dominici F, and Yeh RW. Readmission Rates Following Passage of the Hospital Readmissions Reduction Program. *Annals of Internal Medicine*, 2017; **166**(5) 324.

28. Waldo S, McCabe J, Kennedy K, Zigler CM, Pinto D, and Yeh RW. Quality of care at hospitals identified as outliers in publicly reported mortality statistics for percutaneous coronary intervention. *Circulation*, 2017; **135**(20) 1897–1907.

29. **Zigler CM**, Choirat C, and Dominici F. Impact of National Ambient Air Quality Standards nonattainment designations on particulate pollution and health. *Epidemiology*, 2018; **292**(2) 165–174.

    * Recognized with the 2019 Rothman Epidemiology Prize for the best paper published in *Epidemiology*

30. Wilson A*, Zigler CM, Patel CJ, Dominici F. Model averaged confounder adjustment for estimating multivariate exposure effects with linear regression. *Biometrics*, 2018; **74**(3) 1034–1044.

31. Ruiz ES, Morgan FC, Zigler CM, Besaw RJ, Schmults CD. Analysis of national skin cancer expenditures in the United States Medicare population, 2013. *Journal of the American Academy of Dermatology*, 2019; **80**(1), 275–278.

32. Lin C-K, Lin R-T, Chen P-C, Wang P, De Marcellis N, Zigler CM, and Christiani DC. A Global Perspective on Sulfur Oxide Controls in Coal-Fired Power Plants and Cardiovascular Disease. *Scientific Reports*, 2018; **8** Article number 2611.

33. Lin C-K, Lin R-T, Chen T, Wei Y, Weng W-HW, Zigler CM, and Christiani DC. A Global Perspective on Coal-Fired Power Plants and Lung Cancer Mortality. *Environmental Health*, 2019; 18:9.

34. Papadogeorgou G*, Choirat C, and **Zigler CM**. Adjusting for Unmeasured Spatial Confounding with Distance Adjusted Propensity Score Matching. *Biostatistics*, 2019; **20** (2) 256-272.

    * Georgia Papadogeorgou recognized with JSM 2016 Student Paper Award from Health Policy Statistics Section, ICHPS 2015 student travel award

35. Henneman L*, Choirat C, Ivey C, Cummiskey K*, **Zigler C**. Characterizing Population Exposure to Coal Emissions Sources in the United States using the HyADS Model. *Atmospheric Environment*, 2019; 203, 271-280.

36. Lin CK, Chen T, Li X, De Marcellis-Waring N, Zigler CM, and Christiani DC. Are Per Capita Carbon Emissions Predictable Across Countries? *Journal of Environmental Management*, 2019; 237, 569–575.

37. Anoke S*, Normand S-L, and **Zigler CM**. Approaches to Treatment Effect Heterogeneity in the Presence of Confounding. *Statistics in Medicine*, 2019; **38** (15), 2797–2815.

38. Henneman L*, Choirat C, **Zigler C**. Accountability assessment of health improvements in the United States associated with reduced coal emissions between 2005 and 2012. *Epidemiology*, 2019; **30** (4), 447-485.

39. Papadogeorgou G*, Mealli F, and **Zigler CM**. Causal Inference for Interfering Units with Cluster and Population Level Treatment Allocation Programs. *Biometrics*, 2019; **75**(3), 778-787.

40. Kim C*, Daniels MJ, Hogan JW, Choirat C, and **Zigler CM**. Bayesian Methods for Multiple Mediators: Principal Stratification and Causal Mediation Analysis of Power Plant Emission Controls. *Annals of Applied Statistics*, 2019; **13**(3), 1927–1956.

    * Chanmin Kim recognized with JSM Student Paper Award from Biometrics Section

    * Recognized with honorable mention for the International Society for Bayesian Analysis Mitchell Prize

41. Barnhart D, Semaru K, Zigler CM, Molina R, Delane MM, Hirschhorn L, Spiegleman D. Optimizing the development and evaluation of complex interventions: Lessons learned from the BetterBirth Program and associated trial. *Implementation Science Communications*, 2020; **1** (13).

42. Liao S* and **Zigler CM**. Uncertainty in the Design Stage of Two-Stage Bayesian Propensity Score Analysis. *Statistics in Medicine*, 2020; **39**(17) 2265-2290.

43. Henneman L*, Mickley L, and **Zigler C**. Air pollution accountability of energy transitions: the relative importance of point source emissions and wind fields in exposure changes. *Environmental Research Letters*, 2019; **14**.

44. Kim C, Henneman LH, Choirat C, and **Zigler CM**. Health Effects of Power Plant Emissions Through Ambient Air Quality. *Journal of the Royal Statistical Society, Series A*, 2020; **183**(4), 1677-1803.

45. Barnhart D, Spiegleman D, Zigler CM, Kara N, Delaney MM, Kalita T, Maji P, Hirschhorn L, Semaru K. Coaching intensity, adherence to essential birth practices, and health outcomes in the BetterBirth Trial. *Global Health: Science and Practice*, 2020; **8**(1) 38–54.

46. Henneman L*, Dedoussi I, Casey J, Choirat C, Barrett S, and **Zigler CM**. Comparisons of simple and complex methods for quantifying exposure to individual point source air pollution emissions. *Journal of Exposure Science and Environmental Epidemiology*, 2021; **31**(4) 654–663.

47. Casey JA, Su JG, Henneman L*, Zigler CM, Neophytou AM, Catalano R, Gondalia R, Chen YT, Moyer SS, Combs V, Simrall G, Smith T, Sublett J, and Barrett MA. Improved asthma outcomes observed in the vicinity of coal power plant retirement, retrofit and conversion to natural gas. *Nature Energy*, 2020; **5** 398–408.

48. Harel O and Zigler C. A conversation with Thomas (Tom) R. Belin - 2020 HPSS long term excellence award winner. *Health Services and Outcomes Research Methodology*, 2020; **20**, 195-207.

49. Qiao D, Zigler CM, Cho MH, Silverman EK, Zhou X, Castaldi P, Laird N. Statistical Considerations for the Analysis of Massively Parallel Reporter Assays. *Genetic Epidemiology* 2020; **44**(7).

50. **Zigler CM** and Papadogeorgou G*. Bipartite Causal Inference with Interference. *Statistical Science*, 2021; **36**(1), 109-123.

51. Liao S* and **Zigler CM**. Posterior Predictive Treatment Assignment Methods for Causal Inference in the Context of Time-Varying Treatments. *Epidemiologic Methods*, 2020; **9**(1).

    * Shirley Liao recognized with JSM Student Paper Award from Health Policy Statistics Section

52. Henneman L*, Shen H, Hogrefe C, Russell AG, **Zigler CM**. Four decades of United States mobile source pollutants: spatial-temporal trends assessed by ground-based monitors, air quality models, and satellites. *Environmental Science & Technology*, 2021 **55**(2), 882-892.

53. Comment L*, Coull BA, Zigler CM, and Valeri L. Bayesian data fusion: probabilistic sensitivity analysis for unmeasured confounding using informative priors based on secondary data. *Biometrics*, 2022; **78**(2), 730-741.

54. Daouda M, Henneman L, Kioumourtzoglou M, Gemmill A, Zigler C, Casey J. Association between county-level coal-fired power plant pollution and racial disparities in preterm births from 2000 to 2018. *Environmental Research Letters*, 2021; **16** (3).

55. **Zigler CM**. Invited Commentary: The promise and pitfalls of causal inference with multivariate environmental exposures. *American Journal of Epidemiology*, 2021; **190**(12), 2658-2661.

56. Audirac M, Tec M*, Ancel Meyers L, Fox S, **Zigler C**. Impact of the Timing of Stay-at-Home Orders and Mobility Reductions on First-Wave COVID-19 Deaths in US Counties. *American Journal of Epidemiology*, 2021; **191**(5), 900-907.

57. Wikle N*, Hanks E, Henneman L, and Zigler CM. A mechanistic model of annual sulfate concentrations in the United States. *Journal of the American Statistical Association*, 2022; **117** (539), 1082-1093.

58. Qiu M, Zigler C, and Selin NE. Statistical and Machine Learning Methods for Evaluating Trends in Air Quality under Changing Meteorological Conditions. *Atmospheric Chemistry and Physics*, 2022; **22**, 10551–10566.

59. Qiu M, Zigler C, and Selin NE. Impacts of wind power on air quality, premature mortality and environmental justice in the US. *Science Advances*, 2022; **8**(48).

60. Schulz K, Gaither K, Zigler CM, Urban T, Drake J, and Bukowski R. Optimal mode of delivery in pregnancy: Individualized predictions using national vital statistics data. *PLOS Digital Health*, 2022; **1** (12).

61. Papadogeorgou G, Menchetti F, Choirat C, Wasfy JH, Zigler CM, and Mealli F. Evaluating Federal Policies Using Bayesian Time Series Models: Estimating the Causal Impact of the Hospital Readmissions Reduction Program. *Health Services and Outcomes Research Methodology*, 2023; **23**, 433-451.

62. Tec M* , Scott J, and **Zigler CM**. Weather2vec: Representation learning for causal inference with non-local confounding in air pollution and climate studies. *Proceedings of the AAAI Conference on Artificial Intelligence*, 2023; **37**(12) 14504-14513.

    Earlier version included in *UAI 2022 First Workshop on Causal Representation Learning*

63. Henneman LF, Rasel M, Choirat C, Anenberg S, and **Zigler CM**. Inequitable exposures to U.S. Coal Power Plant-Related $PM_{2.5}$: 22 Years and Counting. *Environmental Health Perspectives*, 2023; **131** (3).

Featured in *Environmental Health Perspectives* Editor's Choice Collection of 12 articles published in 2023.

64. Kim C, Tec M*, and **Zigler CM**. Bayesian nonparametric adjustment of confounding. *Biometrics*, 2023; **79**(4).
65. Tec M, Cadei R, Dominici F, and Zigler CM. Projecting the climate penalty on PM2.5 pollution with spatial deep learning (Proposals Track, lightly reviewed). *ICLR 2023 Workshop: Tackling Climate Change with Machine Learning*, 2023; 63.
66. Frankel M, Katz L, Kinney K, Werth F, Zigler CM, and Sela L. A Framework for Assessing Uncertainty of Water Quality in Distribution Networks with Application to Monochloramine Decay. *Journal of Cleaner Production*, 2023; **407**.
67. Henneman L, Choirat C, Dedoussi I, Dominici F, Roberts J, and **Zigler CM**. Mortality risk from United States coal electricity generation. *Science*, 2023; **382**(6673).
68. Jurek M*, Calder C, and Zigler CM. Statistical inference for complete and incomplete mobility trajectories under the flight-pause model. *Journal of the Royal Statistical Society, Series C*, 2024; **73**(1).
69. Chambliss SE*, Campmier JM, Audirac M, Apte JS, and **Zigler CM**. Local exposure misclassification in national models: Relationships with urban infrastructure and demographics. *Journal of Exposure Science and Environmental Epidemiology*, 2024; **34**; 761-769.
70. Li L, Powers CI, Ezzati M, Butler JP, **Zigler CM**, and Spengler JD. Chronic household air pollution and exposure patterns among Himalayan nomads. *Journal of Exposure Science and Environmental Epidemiology*, 2024; **34**: 973-980.
71. Chambliss SE*, Matsui E, Zarate R, and **Zigler CM**. The role of neighborhood air pollution in disparate racial and ethnic asthma acute care use. *American Journal of Respiratory and Critical Care Medicine*, 2024; **210**(2): 178-185.
72. Antonelli J and **Zigler CM**. Causal Analysis of Air Pollution Mixtures: Estimands, Positivity, and Extrapolation. *American Journal of Epidemiology*, 2024; **193** (10), 1302-1398.
73. Wikle N* and **Zigler CM**. Causal health impacts of power plant emission controls under modeled and uncertain physical process interference. *Annals of Applied Statistics*, 2024; **18**(4), 1-22.
74. Katz D, Zigler CM, Bhavnani D, Matsui E.Pollen and viruses contribute to spatio-temporal variation in asthma-related emergency department visits. *Environmental Research*, 2024; **257**.
75. Chambliss S, Quynh Nhu Bui La Frinere-Sandoval N, Zigler C, Mueller EJ, Peng RD, Hall EM, Matsui EC, and Cubbin C. Alignment of air pollution exposure inequality metrics with environmental justice and equity goals, *International Journal of Environmental Research and Public Health*, 2024; **21**(12).
76. Comment L*, Mealli F, Haneuse S, and **Zigler CM**. Survivor average causal effects for continuous time: a principal stratification approach to causal inference with semicompeting risks. *Biometrical Journal*, 2025; **67**(2).
77. **Zigler CM**, Liu V, Forastiere L, and Mealli F. Bipartite interference and air pollution transport: estimating health effects of power plant interventions. *Biostatistics*, 2025; **26**(1).
78. Avanceña A, Lai JH, Velasquez M, Zigler CM, Frei C, and Pignone M. Trends in prevalence and correlates of alcohol use disorder diagnoses among US adult cancer survivors: a serial cross-sectional analysis. *Journal of the National Comprehensive Cancer Network*, 2025; **23**(5): 156-163.
79. Kim C and **Zigler CM**. Bayesian nonparametric trees for principal causal effects. *Biometrics*, 2025; **81**(1).

80. Avanceña A, Lai JH, Zigler CM, Velasquez MM, Frei C, Pignone M. Alcohol use disorder treatment initiation among US adult cancer survivors with commercial insurance: a cohort study. *Annals of Internal Medicine*, 2025; **in press**.

81. Frankel M, De Florio M, Schiassi E, Werth CJ, Katz LE, Kinney K, Zigler CM, and Sela L. Enhancing Drinking Water Quality Modeling: Leveraging Physics Informed Neural Networks for Learning with Imperfect Reaction Models and Partial Data. *Environmental Science: Water Research & Technology*; **in press**.

82. Avancenña A, Lai JH, Nguyen MHK, Zigler CM, Velasquez MM, Frei CR, and Pignone M. Trends, timing, and predictors of alcohol use disorder treatment among US adult cancer survivors, *Journal of Internal Medicine*; **Available online**, doi: 10.1111/joim.70033.

83. Chambliss SE, Warner A, Zigler CM, Cubbin C, Mueller EJ, Peng RD, and Matsui EC. Health disparities and industrial emissions: a case study of semiconductor manufacturing and asthma morbidity in Austin, Texas, *Population and Environment*; **To appear**.

Preprints and Manuscripts Under Review

Kunwar G, Zigler C, Werth CJ, and Sela L. Linking drinking water violations to public health: A statewide analysis of emergency department visits for waterborne diseases. *Submitted*.

Zorzetto D, Landy J, Zigler CM, Parmigiani G, and De Vito R. Multivariate causal effects: a Bayesian causal regression factor model, *Biometrics*; **Under revision**. https://arxiv.org/abs/2504.03480.

Jurek M, Calder CA, Zigler C, Boettner B, and Browning CR.. Toward a data processing pipeline for mobile-phone tracking data, *Submitted*.

Dong Z, Zigler CM, and Lee Y. Disentangling network dependence among multiple variables, *Submitted*. https://arxiv.org/abs/2506.20974

Wooten SV, Cantoni B*, Audirac M, Gilchrist SC, Livingston JA, Roth ME, Zigler CM, Kleinerman ES. Physical Activity Monitoring in Adolescents and Young Adults with Cancer: Observations, Challenges and Lessons Learned. *Submitted*.

Rauschendorfer SV, Wang F, Liu G, Jaybel P, Zigler C, Zhou Y, Roth ME, Amini B, Kleinerman ES. Muscle wasting in adolescent and young adults with cancer: Potential biomarkers, and preventive interventions. **Under revision**.

Xiao Y*, **Zigler C**, Hennings PH, Savvaidis A, Pyrcz MJ. Applying spatial causal inference on induced seismicity. *Submitted*.

Kim C, Zigler CM, Daniels MJ, Choirat C, and Roy J. Bayesian Longitudinal Causal Inference in the Analysis o the Public Health Impact of Pollutant Emissions. *Submitted.* https://arxiv.org/abs/1901.00908

Braun D*, Zigler CM, Gorfine M, Dominici F. The Effect of Measurement Error in the Treatment Assignment on the Estimation of the Average Treatment Effect. *Epidemiology* **Under revision**.

Zigler CM and Cefalu M. Posterior Predictive Treatment Assignment for Estimating Causal Effects with Limited Overlap. *Bayesian Analysis* **Under revision**. http://arxiv.org/abs/1710.08749

Cummiskey K*, Kim C*, Choirat C, Henneman L*, Schwartz J, and **Zigler CM**. A Source-Oriented Approach to Coal Power Plant Health Effects. *Submitted*. https://arxiv.org/abs/1902.09703

* Kevin Cummiskey recognized with ICHPS 2018 Student Paper Award

Talks and Conference Participation

1. Contributed Poster Presentation: "Identification of treatment effects in the presence of deviation from randomized assignment: application to a surgical setting." Joint Statistical Meetings, 2007.
2. Contributed Talk:"Sensitivity analysis for the effect of treatment received in a principal stratification framework." Joint Statistical Meetings, 2008.
3. Invited Speaker: "Evaluating candidate surrogate endpoints with principal stratification." Center for HIV Identification Prevention Treatment and Services (CHIPTS) Methods Seminar Series, 2008.
4. Topic-Contributed Talk: "Principal stratification for evaluation of surrogate endpoints with variable control-group response." Joint Statistical Meetings, 2009.
5. Session Organizer: "Advancements in principal stratification for causal inference." Joint Statistical Meetings, 2009.
6. Contributed Talk: "Estimating treatment effects in a principal stratification framework when treatment received depends on a key covariate." International Conference on Health Policy Statistics, 2010.
7. Invited Speaker: "Principal stratification for evaluation of surrogate endpoints with varying control-group response." Bayesian Biostatistics Conference, 2010.
8. Invited Seminar Speaker: "An Approach to Multipollutant Accountability Research Using Principal Stratification." Harvard University Department of Biostatistics Environmental Health Seminar, 2011.
9. Invited Seminar Speaker: "Bayesian Evaluation of Principal Surrogate Endpoints." Harvard University Department of Biostatistics HIV Working Group Seminar, 2011.
10. Contributed Talk: "Multipollutant accountability research using principal stratification." Joint Statistical Meetings, 2011.
11. Invited Symposium Participant: "What will be the role of epidemiological research in the future of air quality management?" International Society for Environmental Epidemiology, 2011.
12. Invited Seminar Speaker: "Estimating Causal Effects of Air Quality Regulations Using Principal Stratification for Spatially-Correlated Multivariate Intermediate Outcomes." Brown University Center for Statistical Science, 2011.
13. Contributed Talk: "Accountability research for air quality regulations using principal stratification." International Conference on Health Policy Statistics, 2011.
14. Invited Seminar Speaker: "Estimating Causal Effects of Air Quality Regulations Using Principal Stratification for Spatially-Correlated Multivariate Intermediate Outcomes." Brigham Young University Department of Statistics, 2011.
15. Invited Speaker: "Estimating causal effects of air quality regulations using principal stratification for spatially-correlated multivariate intermediate outcomes." Atlantic Causal Inference Conference, 2012.
16. Contributed Talk: "Estimating causal effects of air quality regulations using principal stratification for spatially-correlated multivariate intermediate outcomes." Joint Statistical Meetings, 2012.
17. Invited Seminar Speaker: "Bayesian Variable Selection and Model Averaging for Propensity Score Estimation." Harvard University Department of Biostatistics Environmental Health Seminar, 2012.
18. Session organizer: "The role of causal inference in policy and regulatory decision making." Atlantic Causal Inference Conference, 2013.
19. Panel discussant: "Workshop on assessing the effectiveness of policies reducing PM2.5." US EPA, 2013.

20. Invited Seminar Speaker: "Uncertainty in Propensity Score Estimation: Bayesian Methods for Variable Selection and Model Averaged Causal Effects." Johns Hopkins University Department of Biostatistics. Baltimore, MD 2013.
21. Invited Seminar Speaker: "Uncertainty in Propensity Score Estimation: Bayesian Methods for Variable Selection and Model Averaged Causal Effects." University of Texas Statistical Science Seminar. Austin, TX 2013.
22. Invited Seminar Speaker: "Uncertainty in Propensity Score Estimation: Bayesian Methods for Variable Selection and Model Averaged Causal Effects." RAND Statistics Seminar. Santa Monica, CA 2013.
23. Invited Seminar Speaker: "Uncertainty in Propensity Score Estimation: Bayesian Methods for Variable Selection and Model Averaged Causal Effects." Harvard University Statistics Department Colloquium. Cambridge, MA 2013.
24. Invited Speaker: "How It's Done: Propensity Scores." Dana Farber Cancer Institute How It's Done Seminar Series, Boston, MA, 2014.
25. Invited Discussant for session: "'Causal Inference with Intermediate Variables" International Biometric Conference, Florence, Italy, 2014.
26. Invited Symposium Speaker: "Causal Effects of Regulatory Interventions: Beyond Exposure-Response Functions in Air Pollution Epidemiology." New methods to assess the health effects of air quality actions, International Society for Environmental Epidemiology, Seattle, WA 2014.
27. Topic-Contributed Talk: "CER with Ever-Increasing Amounts of Administrative Data: Bayesian Methods for Confounding Uncertainty and Heterogeneous Treatment Effects." Joint Statistical Meetings, Boston, MA 2014.
28. Invited Seminar Speaker: "Posterior-predictive treatment assignments and the estimation of causal effects." University of Chicago Booth School of Business Econometrics and Statistics Colloquium. Chicago, MA, 2014.
29. Invited Seminar Speaker: "Posterior-predictive treatment assignments and the estimation of causal effects." University of Connecticut Department of Statistics Colloquium. Storrs, CT, 2014.
30. Invited Speaker: "Confounding Uncertainty and treatment effect heterogeneity in comparative effectiveness research." Fields Institute Workshop on Big Data for Health Policy. Toronto, Canada, 2015.
31. Invited Seminar Speaker: "Posterior-predictive treatment assignments and the estimation of causal effects." Yale University Department of Biostatistics Department Seminar. New Haven, CT, 2015.
32. Invited Speaker: "CER with Administrative Data: Methods for Confounding Uncertainty and Heterogeneous Treatment Effects." Harvard Catalyst Biostatistics Seminar Series. Boston, MA, 2015.
33. Invited Seminar Speaker: "Bayesian Methods for Multiple Mediators: Principal Stratification and Causal Mediation Analysis of Power Plant Emission Controls." University of Pennsylvania Department of Biostatistics. Philadelphia, PA, 2015.
34. Invited Speaker: "Causal Methods for Evaluating Air Quality Control Policies." Session on Tools for Policy: Bayesian Assessments to Support Decision Makers, International Conference on Health Policy Statistics. Providence, RI, 2015.
35. Invited session organizer and speaker for session on Environmental Epidemiology. Talk Title: "Evaluating Power Plant Regulatory Policies: Bipartite Causal Inference with Interference." New England Statistics Symposium. New Haven, CT, 2016.
36. Invited Workshop Presenter: "Demystifying Causal Inference Methods for Air Pollution Accountability." Health Effects Institute Annual Conference. Denver, CO, 2016.

37. Invited Discussant, Causal inference with Highly Dependent Data in Communicable Diseases Research. Harvard University, Cambridge, MA, 2016.
38. Invited Speaker, "Evaluating Power Plant Regulatory Policies: Bipartite Causal Inference with Interference." Atlantic Causal Inference Conference. New York, NY, 2016.
39. Topic-Contributed Talk: "Evaluating Air Quality Control Policies: Bipartite Causal Inference with Interference." Joint Statistical Meetings, Chicago, IL, 2016.
40. Invited Speaker, University of North Carolina Department of Biostatistics Seminar Speaker. Chapel Hill, NC, 2016.
41. Invited Symposium Speaker: "Causal inference methods for evaluating national or regional air quality interventions." International Society for Environmental Epidemiology, Rome, Italy, 2016.
42. Invited Speaker, "Causal Inference Methods for Evaluating Policies to Reduce Air Pollution from Power Plants." Emory University Department of Biostatistics. Atlanta, GA, 2016.
43. Invited Speaker, "Causal Inference Methods for Evaluating Policies to Reduce Air Pollution from Power Plants." Brown University Department of Biostatistics. Providence, RI, 2016.
44. Invited Speaker, Workshop on Mixture and latent variable models for causal inference and analysis of socio-economic data. Bologna, Italy, 2017.
45. Invited Speaker, Bayesian Section of the Italian Society of Statistics 2017 Meeting. Rome, Italy, 2017.
46. Invited Pre-Event Workshop Presenter: "Demystifying Causal Inference Methods for Air Pollution Accountability." 14th Annual Air Quality and Health Workshop. Vancouver, BC, 2017.
47. Invited Speaker, 14th Annual Air Quality and Health Workshop. Vancouver, BC, 2017.
48. Invited Speaker, Center for Health Care and Policy Research/Department of Health Policy and Administration, Pennsylvania State University, 2017. "Causal Inference Methods for Evaluating Air Quality Policies."
49. Invited Speaker, International Chinese Statistical Association. Chicago, IL, 2017. "Bayesian Methods for Principal Stratification and Causal Mediation Analysis with Multiple Intermediates: Evaluating Power Plant Regulatory Interventions"
50. Invited Speaker, MIT Energy for Human Development (e4Dev) Seminar, Cambridge, MA, 2017. "Combining Statistical Methods with Atmospheric Models for Direct Accountability Assessment."
51. Invited Speaker, Harvard Data Science Initiative 45/45 Seminar Series, Cambridge, MA, 2017. "Evaluating Air Quality Policies with Statistics, Causal Inference, and Atmospheric Science."
52. Invited Speaker Workshop on Causal Adjustment in the Presence of Spatial Dependence, part of thematic program at Centre de Recherches Mathematique on Causal Inference in the Presence of Dependence and Network Structure, Montreal QC, Canada. 2018
53. Invited Speaker, JSM 2018, Vancouver, BC, Canada. "Beyond Exposure-Response Estimation in Air Pollution Epidemiology: Causal Inference for Informing Air Quality Policies."
54. Invited Speaker, American Statistical Association Biennial Workshop of the Section on Statistics and the Environment, Asheville, NC. 2018. "Bipartite Causal Inference with Interference: Estimating Health Impacts of Power Plant Regulations."
55. Invited Speaker, Johns Hopkins Bloomberg School of Public Health Department of Biostatistics, Baltimore, MD, 2018. "Bipartite Causal Inference with Interference: Estimating Health Impacts of Power Plant Regulations."
56. Invited Speaker, 4^{th} International Conference on Big Data and Information Analytics, Texas Medical Center, Houston TX, 2019. "Adjusting for unmeasured spatial confounding with distance adjusted propensity score matching."

57. Invited Speaker, University of Southern California Keck School of Medicine Department of Environmental Health, Los Angeles, CA 2019. "Causal inference for evaluating health impacts of power plant regulation." "Causal Inference for Evaluating Health Impacts of Power Plant Regulations."
58. Invited Speaker, University of Texas Population Research Center Methods Talk, Austin TX 2019. "A gentle introduction to Bayesian statistics".
59. Invited Speaker, Colorado State University Department of Statistics, Fort Collins, CO, 2019. "Bipartite Causal Inference with Interference: Estimating Health Impacts of Power Plant Regulations."
60. Invited Speaker, Pennsylvania State Department of Statistics, 2019. "Bipartite Causal Inference with Interference: Estimating Health Impacts of Power Plant Regulations."
61. Invited Speaker, Opening Workshop of the Program on Causal Inference, SAMSI, Durham, NC, 2019. "Bipartite Causal Inference with Interference for Evaluating Air Pollution Regulations."
62. Invited Speaker, Town Hall on Public Health Challenges and Statistical Solutions for Today and Tomorrow, International Conference on Health Policy Statistics, San Diego, CA, 2020. "The Evolving Role of Causal Inference Methods for Informing Air Quality Policy."
63. Invited Speaker, UT Austin Center for Environmental Health, Education and Research Monthly Seminar, Austin, TX, 2020. "Evaluating Health Impacts of Air Pollution from Power Plants."
64. Invited Speaker, USC Department of Biostatistics, 2020 "Causal Inference for Air Quality Policies: Point Sources, Physical Processes, and Interference on Bipartite Networks".
65. Invited Speaker, George Mason Department of Statistics, 2021 "Bipartite Causal Inference with Interference: Estimating Health Impacts of Power Plant Regulations".
66. Invited Speaker, University of Michigan Department of Biostatistics, 2021. "Bipartite Causal Inference with Interference: Estimating Health Impacts of Power Plant Regulations".
67. Invited Speaker, Yale School of Public Health Public Health Modeling Group, 2021. "Bipartite Causal Inference with Interference: Estimating Health Impacts of Power Plant Regulations".
68. Invited Speaker, Online Causal Inference Seminar, 2021. "Bipartite Causal Inference with Interference: Estimating Health Impacts of Power Plant Regulations".
69. Invited Speaker, CMStat 2021. "Adjusting for Nonlocal Spatial Confounding with U-nets in Studies of Meteorology and Air Pollution."
70. Invited Speaker, Baylor University Department of Statistics, 2022. "Weather2vec for Causal Inference with Non-Local Confounding: Applications to Air Pollution and Climate Studies."
71. Invited Speaker, Harvard University Biostatistics - Biomedical Informatics - Big Data (B3D) Seminar, 2022. "Weather2vec: Representation Learning for Causal Inference with Non-Local Confounding in Air Pollution Studies."
72. Invited Speaker, International Society for Bayesian Analysis 2022 World Meeting. "Bayesian Design Uncertainty in Two-Stage Propensity Score Analysis."
73. Invited Discussant, Joint Statistical Meetings, 2022. "Mitigating Spatial Confounding - A Modern Take"
74. Invited Panelist, Joint Statistical Meetings, 2022. "The Role of Statistics in Science and Policymaking for the Environmental Protection Agency."
75. Invited Keynote Speaker, University of Michigan Center on Lifestage Environmental Exposures and Disease (M-LEEaD) Environmental Statistics Day Symposium, 2022. "Causal Inference in Air Quality Regulation: An Overview and Topics in Statistical Methodology."
76. Invited Keynote Speaker, University of Cambridge AI for the study of Environmental Risks (AI4ER) meeting on Causal Methods in Environmental Science, 2022. "Causal Inference in Air Quality Regulation: Two Topics in Statistical and Machine Learning Methodology."

77. Panelist, Dell Medical School Healthscape Symposium: Air Pollution and Health Disparities: an Austin Assessment, 2022.
78. Invited Speaker, Columbia University Department of Biostatistics, 2023. "Weather2vec: Representation Learning for Causal Inference with Non-Local Confounding in Air Pollution and Climate Studies"
79. Invited Speaker, University of Florida Department of Statistics, 2023. "Weather2vec: Representation Learning for Causal Inference with Non-Local Confounding in Air Pollution and Climate Studies."
80. Invited Speaker, John and Susan Wierman Lecture Endowed Lecture Series, Johns Hopkins Department of Applied Mathematics and Statistics, 2023. "Causal Inference in Air Quality Regulation: An Overview and Two Topics in Statistics and Machine Learning."
81. Invited Speaker, EnviBayes Workshop on Complex Environmental Data, Colorado State University, Fort Collins, CO, 2023. "Bayesian Causal Inference with Uncertain Physical Process Interference."
82. Invited Speaker, IMS International Conference on Statistics and Data Science, Lisbon, Portugal, 2023. "Bayesian Causal Inference with Uncertain Physical Process Interference."
83. Invited Speaker, Swiss Data Science Competence Center Data Science and AI for Public Good Webinar Series, 2023. "Environmental Health Data Science for More Effective Regulation."
84. Invited Speaker, University of Utah Division of Biostatistics, 2024. "Bayesian Causal Inference with Uncertain Physical Process Interference."
85. Invited Discussant, ISBA World Meeting, 2024. "Bayesian Causal Inference for Health-related Applications and Policy Intervention."
86. Invited Panelist, Symposium on Causality, Florence, Italy, 2024.
87. Invited Speaker, Online Causal Inference Seminar, 2025. "Bayesian Causal Inference with Uncertain Physical Process Interference."
88. Invited Speaker, Brown Legoretta Cancer Center Data Science Working Group Workshop, 2025. "Data Science for Air Quality Regulation."
89. Invited Speaker, Memorial Sloan Kettering Cancer Center, 2025. "Bayesian Causal Inference with Uncertain Physical Process Interference."
90. Invited Speaker, University of Minnesota Division of Biostatistics, 2025. "Bayesian Causal Inference with Uncertain Physical Process Interference."

Students and Postdoctoral Trainees

Doctoral Students in Biostatistics (Harvard T.H. Chan School of Public Health)

1. Sarah Anoke, Ph.D., Graduated May 2017. Data Scientist, Netflix
2. Kevin Cummiskey, Graduated May 2018. Associate Professor, West Point
3. Georgia Papadogeorgou, co-Advisor with Francesca Dominici, Graduated May 2018. Assistant Professor of Statistics, University of Florida
4. Leah Comment, Graduated May 2019. Director of Decision Sciences, Foundation Medicine
5. Shirley Liao, Graduated May 2019. Biostatistician, Verily
6. Federica Licari, visiting Ph.D. student form University of Florence, Fall 2017

Doctoral Students in Statistics and Data Sciences (University of Texas)

1. Mauricio Garcia-Tec, co-Advisor with James Scott, Graduated June 2022. Postdoctoral research fellow, Harvard T.H. Chan School of Public Health
2. Yuchen (Jack) Xiao
3. Beatrice Cantoni, Graduated December 2025. Boston Consulting Group.

Doctoral Students in Biostatistics (Brown University)

1. Yanwei Tong, current doctoral advisee

Postdoctoral Research Advisees

1. Chanmin Kim, Ph.D., Assistant Professor of Statistics, SungKyunKwan University
2. Danielle Braun, Ph.D., Research Scientist, Harvard T.H. Chan School of Public Health
3. Lucas Henneman, Ph.D., Assistant Professor of Civil, Environmental, and Infrastructure Engineering, George Mason University
4. Marcin Jurek, Ph.D., Assistant Professor of Statistics and Data Science, Southern Methodist University (co-Advised with Kate Calder)
5. Nathan Wikle, Ph.D., Assistant Professor of Statistics and Actuarial Science, University of Iowa
6. Sarah Chambliss, Ph.D., Research Scientist, Dell Medical School

Additional Dissertation Committee Membership

1. Joey Antonelli, Harvard Biostatistics, Graduated 2015
2. Yan Wang, Harvard Biostatistics and Environmental Health, Graduated May 2018
3. Catlin Powers, Harvard Environmental Health, Graduated 2014
4. Cheng-Kuan Lin, Harvard Environmental Health, Graduated May 2018
5. Dale Barnhart, Harvard Epidemiology, Graduated May 2019
6. Spencer Woody, UT Austin, Department of Statistics and Data Sciences, Graduated August 2020
7. Minghao Qiu, MIT Institute for Data, Systems, and Society, Graduated August 2021
8. Vera Liu, UT Austin Department of Statistics and Data Sciences, Graduated May 2022
9. Xizewen Han, UT Austin Department of Statistics and Data Sciences
10. Ciara Nugent, UT Austin Department of Statistics and Data Sciences

Professional Service

Member, Steering Committee for the NISS/IMSI Data Science at the Intersection of Public Health and the Environment Ideas Lab, 2025

Member, U.S. Environmental Protection Agency Clean Air Scientific Advisory Committee NOx Panel, 2024

Associate Editor, *Journal of the American Statistical Association*, 2022-2025

Steering Committee Member, Dell Medical School Center for Environmental Health, Education and Research (CHEER), 2020-2024

Member, University of Texas at Austin President's Sustainability Steering Committee, 2020-2024

Senior Researcher, 2024 Data Research Camp, Florence, Italy

Member, 2023 American Causal Inference Conference Program Committee

Member, ENAR 2023 Educational Advisory Committee

Member, U.S. Environmental Protection Agency Clean Air Scientific Advisory Committee PM Panel, 2021-2022

Executive Committee Member, ASA Health Policy Statistics Section, 2017-2022

Member, University of Texas at Austin GIS Day Planning Committee, 2022

Associate Editor, *Biostatistics*, 2016-2021

Associate Editor, *Biometrics*, 2018-2021

Member, National Academies Committee to Review EPA's IRIS Assessment Handbook, 2021

Member, University of Texas at Austin College of Natural Science Emerging Leaders Group, 2019-2021

Section Chair, ASA Health Policy Statistics Section, 2021

ENAR Program Committee, 2020

International Conference on Health Policy Statistics Outreach Committee, 2020

Reviewer, NIEHS K99/R00 Special Emphasis Review Panel, 2020

Reviewer, NIEHS Career Development in K Applications Special Emphasis Panel, 2019

Program Chair, ASA Health Policy Statistics Section, 2018

ENAR Distinguished Student Paper Awards Committee, 2018-2019

ENAR Regional Advisory Board, 2016 - 2018

International Conference on Health Policy Statistics Student Outreach Committee, 2018

Program Chair Elect, ASA Health Policy Statistics Section, 2017

Peer reviewer for Health Canada's Clean Air Regulatory Agenda, 2016

International Conference for Health Policy Statistics Scientific Organizing Committee, 2015

New England Statistics Symposium Program Committee, 2014

Thomas R. Ten Have Junior Researcher Award Committee, Atlantic Causal Inference Conference, 2012 - 2013

Journal Referee: *Journal of the American Statistical Association*; *Biometrics*; *Journal of the Royal Statistical Society*; *Annals of Applied Statistics*; *Statistics in Medicine*; *Journal of Causal Inference*; *Bayesian Analysis*; *Biometrika*; *Health Services and Outcomes Research Methodology*; *Statistical Methods in Medical Research*; *Proceedings of the National Academy of Sciences*; *New England Journal of Medicine*; *Epidemiology*; *Epidemiologic Methods*; *BMC Medical Research Methodology*; *International Journal of Biostatistics*; *Health Affairs*; *Environmental Health Perspectives*; *Environmental Health*; *Spatial Economic Analysis*; *Air Quality, Atmosphere, and Health*; *Journal of Air and Waste Management*; *Journal of General Internal Medicine*; *Circulation: Cardiovascular Quality and Outcomes*; *International Journal of Epidemiology*; *BMJ Open*; *American Journal of Political Science*; *Journal of Oral and Maxillofacial Surgery*; *Journal of the American Dental Association*; *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontology.*

Selected Research Funding

Active

Co-Investigator, NSF 1953206. Smart Sensing and Forecasting of Water Quality in the Water Distribution Network For Protection of Public Health (PI: Werth). Funding period: 2020 - 2026.

Co-Investigator, NIH R01ES034803. Urban planning, siting of air pollution sources, and asthma disparities (PI: Matsui). Funding period: 2022-2027.

Co-Investigator, NIH P20AG089308. CHAIRS-C: Climate, Health, and Aging Innovation and Research Solutions for Communities (PI: Just/SHireman). Funding period: 2025 - 2027.

Completed (as Principal Investigator)

Principal Investigator, NIH, R01ES026217. Causal Inference with Interference for Evaluating Air Quality Policies. Funding period: 2016 - 2023.

Principal Investigator, USEPA, RD-83587201. Air Climate and Energy Center: Regional Air Pollution Mixtures: The Past and Future Impacts of Emission Controls and Climate Change on Air Quality and Health, Project 4: A Causal Inference Framework to Support Policy Decisions by Evaluating the Effectiveness of Past Air Pollution Control Strategies for the Entire United States. Funding period: 2016 - 2022.

Principal Investigator, Health Effects Institute, HEI4909: Causal Inference Methods for Estimating Long Term Health Effects of Air Quality Regulations. Funding period: 2012 - 2015.