Cici X. Bauer, PhD MS

Updated: October 2025

CURRENT APPOINTMENT

Associate Professor
James W. Rockwell Professorship in Public Health (Preventive Medicine and Epidemiology) Department of Biostatistics and Data Science
Founding Director, Center for Spatial-Temporal Modeling for Applications in Population Sciences (CSMAPS)
University of Texas Health Science Center in Houston (UTHealth Houston) School of Public Health
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A. BACKGROUND

1. EDUCATION

2003 B.S. in Statistics, Anhui University, Anhui, China

2005 M.S. in Statistics, University of Alaska Fairbanks, Alaska, US

2012 Ph.D. in Statistics, University of Washington Seattle
Dissertation: *Bayesian Modeling of Health Data in Space and Time*
Advisor: Dr. Jon Wakefield
Committee: Drs. Vladimir Mini, Steve Self, Peter Guttorp and Paul Sampson

2. AWARDS AND HONORS

2007 Top scholar award, Department of Statistics, University of Washington Seattle, Seattle, WA

2010 Tuition award, the 2nd Summer Institute in Statistics and Modeling in Infectious Diseases (SISMID), Seattle, WA

2012 Travel award, the Joint Statistical Meeting (JSM), University of Washington Seattle, Seattle, WA

2013 Sheridan junior faculty teaching fellow award, Brown University (5 recipients total)

2014 Travel award, Woman in Statistics Conference, Raleigh, NC

2022 James W. Rockwell Professorship in Public Health (Preventive Medicine and Epidemiology), UTHealth Houston School of Public Health

2023 R. Palmer Beasley, M.D. faculty award for innovation, UTHealth Houston School of Public Health

3. PROFESSIONAL EXPERIENCE

2023 – Present Founding Director, Center for Spatial-temporal Modeling for Applications in Population Science (CSMAPS), UTHealth Houston School of Public Health

2022 – Present Associate Professor (Tenured), Department of Biostatistics and Data Science, UTHealth Houston School of Public Health

2019 – Present Faculty Affiliate, Center for Health Promotion and Prevention Research, UTHealth Houston School of Public Health

2021 – Present Affiliate Member, National Cancer Prevention and Control Research Network (CPCRN)

2022 – 2023 Co-Founder & Co-Director, Joint Center on Geospatial Analysis & Health (JCoGA&H), UTHealth-MD Anderson Population Health Initiative

2018 – 2022 Assistant Professor (Tenure Track), Department of Biostatistics and Data Science, UTHealth Houston School of Public Health

2016 – 2018 Associate Director of Statistics, Early Clinical Development Research, Pfizer Inc., Cambridge, MA
2012 – 2016 Assistant Professor (Tenure Track), Department of Biostatistics, Brown University
2012 – 2016 Faculty Affiliate, Spatial Structures for the Social Sciences (S4), Brown University
2015 – 2016 Fellow, Institute at Brown for the Study of Environment and Society (IBES), Brown University
2013 – 2016 Core Faculty, Biostatistics Core, Hasbro Children's Hospital, Providence, Rhode Island
2010 – 2012 Research Assistant, Statistical Center for HIV/AIDS Research & Prevention (SCHARP), Fred Hutchinson Cancer Research Center, Seattle, Washington
2008 – 2009 Research Assistant, Department of Biostatistics, University of Washington, Seattle
2005 – 2007 Biometrician II, Alaska Department of Fish and Game Wildlife Conservation, Fairbanks, Alaska

B. RESEARCH

EXPERTISE AND INTERESTS

Bayesian spatial-temporal modeling; Dynamic prediction modeling; Hierarchical models for complex data; Bayesian small area estimation; Statistical analysis of data from wearable devices; Population Health

1. PEER-REVIEWED PUBLICATIONS

**** indicates student/trainee co-author; § indicates Corresponding/Co-corresponding Author***

86. Cao J*, Zhang K, Hu G, Nelson K, **Bauer C**§. Bayesian spatio-temporal small area modeling: A case study investigating the late-stage melanoma incidence in Texas. *Journal of the Royal Statistical Society Series C*. Forthcoming.

85. Bi K, Nguyen T, Peng B, Kause T, Ganduglia Cazaban C, Rios J, **Bauer C**, Troisi C, Boerwinkle E, Naik AD. Modeling the Impact of MMR Vaccination Strategies on Measles Outbreaks in Texas. *JAMA Health Forum*. 2025;6(9): e253992.

84. Morales A*, Choh A, **Bauer C**, Czerwinski S, Lee M. Maternal sleep disorders and maternal and birth outcomes: A retrospective U.S. claims-based study. *Brain and Behavior*. 2025. Forthcoming.

83. Iqbal M*, Cazaban CG, Morgan R, **Bauer C**, Siddiqi S. Health systems responsiveness in low-and middle-income countries (L&MICs): Revisiting its scope. *BMJ Open Quality*. 2025. Forthcoming.

82. Burford KG*, Salvo D, Kohl HW III, Ganzar LA, **Bauer CX**, Resendiz E, Zhang Y, Hoelscher DM. Examination of traffic safety factors associated with active commuting to school among children residing in Austin, Texas. *Journal of Physical Activity & Health*. 2025. Advance online publication. https://doi.org/10.1123/jpah.2025-0010

81. Savas LS, Cuccaro P, Zhang K, Hernandez R, Haffey ME, Reininger B, Mendiola A, Dominguez O, Sifuentes M, **Bauer C**, Fernandez ME. Factors influencing COVID-19 vaccine uptake among vulnerable communities in Texas: Perceptions of 2-1-1 helpline callers. *Vaccine*. 2025. Forthcoming.

80. Ahmad N, Bartley B, Zhang S, Taylor MM, Schrader K, Zhang K, Doan HQ, **Bauer C**, Nelson KC, Cofer J. Assessing sun protection policies in Texas school districts located in counties with the lowest and highest melanoma risk: Content analysis and cross-sectional study. *Cancer Control*. 2025 Jun 23; 32:10732748251352702. PMCID: PMC12185954.

79. Garza AL*, Blangero J, Lee M, **Bauer C**, Czerwinski SA, Choh AC. Endophenotype informed association analyses for liver fat accumulation and metabolic dysfunction in the Fels longitudinal study. *The International Journal of Molecular Sciences*. 2025 May 17;26(10):4812. PMID: 40429953. PMCID: PMC12112654.

78. Zhang K*, Taylor M, Hunyadi J, Doan H, Adamson A, Miller P, Nelson K, **Bauer C**§. Examining demographic, geographic, and temporal patterns of melanoma incidence in Texas from 2000-2018:

Retrospective study. *JMIR Cancer*. 2025 May 2:11: e67902. PMID: 40315814. PMCID: PMC12064134.

77. Zhang K*, Cordes J, **Bauer C**, Stopka TJ, Shrestha S. Assessing spatial and temporal variation in opioid-related incidents and risk factors in Lowell, Massachusetts from 2011 to 2022: A Bayesian spatial-temporal approach. *Substance Use & Addiction Journal*. 2025 Jul;46(3):675- 685. PMID: 40176443.

76. Zhang X, Rahbar MH, Tahanan A, **Bauer C**, de Oliveira Otto MC, Morrison AC, Reininger B, Fernandez ME. An application of minimization for ensuring balanced study arms in a group-randomized COVID-19 educational intervention trial. *Contemporary Clinical Trials*. 2025 Jan 22:44:101438. PMID: 39935750. PMCID: PMC11810699.

75. Bayly R, Cordes J, Bernson D, Ackerson LK, Larochelle MR, Hassan G, **Bauer C**[§], Stopka TJ. Predicting fatal opioid-related overdoses: A social-ecological framework matched to a linked-data warehouse. *International Journal of Drug Policy*. 2025 Mar: 137:104730. PMID: 39929056. PMCID: PMC12002089.

74. Zhang K∗, Hunyadi J, de Oliveira Otto MC, Lee M, Zhang Z, Ramphul R, Yamal JM, Yaseen A, Morrison AC, Sharma S, Rahbar MH, Zhang X, Linder S, Marko D, Roy RW, Banerjee D, Guajardo E, Crum M, Reininger B, Fernandez ME, **Bauer C**[§]. Increasing COVID-19 testing and vaccination uptake in the Take Care Texas study: Adaptive geospatial design in community-based randomized trials. *JMIR Formative Research*. 2025 Feb 11:9: e62802. PMID: 39935005. PMCID: PMC11835599.

73. Hunyadi JV, Savas LS, Zheng K, Deason JE, Ramphul R, Peskin MF, Erica LF, **Bauer C**[§]. A comparison and modification of floating catchment area methodologies with applications to a dataset of clinics enrolled in a statewide child and adolescent psychiatric consultation program. *Frontiers in Public Health - Public Mental Health*. 2025 Feb 20; 13:1498819. PMID: 40051515. PMCID: PMC11882419.

72. Matas JL*, Mitchell LE, Salemi JL, **Bauer C**, Ganduglia Cazaban C. Individual and county- level factors associated with severe maternal morbidity at delivery: An investigation of a privately insured population in the United States, 2008-2018. *American Journal of Perinatology*. 2025 Jul;42(10):1257-1271. PMID: 39586980.

71. Stopka T, Cordes J, Bernson D, Bayly R, Bauer C. Public health data-to-action: Reframing surveillance to rebuild trust in public health. *American Journal of Public Health*. 2025 Mar;115(3):279-281. doi:10.2105/AJPH.2024.307947. PMID: 39938047.

70. Matas JL*, Mitchell LE, Salemi JL, **Bauer C**, Ganduglia Cazaban C. Severe maternal morbidity and postpartum care: An investigation among a privately insured population in the United States, 2008-2019. *Journal of Women's Health*. 2025 Apr;34(4):539-548. PMID: 39648755.

69. Leining LM*, Erickson TA, Hanis CL, **Bauer C**, Murry MD, Brown EL, Mejia R, Gunter SM. Epidemiologic investigation of protozoa and soil-transmitted helminths in Starr County, Texas. *American Journal of Tropical Medicine and Hygiene.* 2025 Jan 28: tpmd240364. PMID: 39874595.

68. Hunyadi JV, Zhang K, Xiao Q, Strong LL, **Bauer C**[§]. Spatial and temporal patterns of chronic disease burden in US Counties: 2018-2021. *American Journal of Preventive Medicine*. 2025 Jan;68(1):107-115. PMID: 39237065.

67. Chen X, Balliew J, **Bauer C**, Deegan J, Gitter A, Hanson B M, Maresso AW, Tisza M, Troisi CL, Rios J, Mena K D, Boerwinkle E, Wu F. Revealing patterns of SARS-CoV-2 variant emergence and evolution using RBD amplicon sequencing of wastewater. *Journal of Infection*. 2024 Nov;89(5):106284. PMID: 39341403.

66. Iqbal M*, Cazaban CG, Morgan R, **Bauer C**, Siddiqi S. Rethinking health systems responsiveness in low-and middle-income countries: A validation study. *JMIR Research Protocols*. 2024;13: e59836. PMID: 39293061. PMCID: PMC11447431.

65. Huebinger R, Hunyadi JV, Zhang K, Shekhar AC, **Bauer C**, Bakunas C, Waller-Delarosa J, Schulz K, Persse D, Witkov R. Geospatial predictive modeling for prehospital extracorporeal cardiopulmonary resuscitation in Houston, Texas. *Prehospital Emergency Care*. 2024 Sep 17:1-8. PMID: 39190864.

64. Ramphul R, Zamorano AS, Upadhyay S, Desai M, **Bauer C**. Spatiotemporal analysis of HPV

vaccination and associated neighborhood-level disparities in Texas - An ecological study. *Frontiers in Public Health*. 2024 Jun 25:12:1418526. PMID: 38983249. PMCID: PMC11232525.

63. Nze C, Andersen CR, Ayers AA, Westin J, Wang M, Iyer S, Ahmed S, Pinnix C, Vega F, Nguyen L, McNeil L, Nastoupil LJ, Zhang K, **Bauer C**, Flowers CR. Impact of patient demographics and neighborhood socioeconomic variables on clinical trial participation patterns for Non-Hodgkin Lymphoma. *Blood Advances.* 2024 Jul 23;8(14):3825-3837. PMID: 38607394.

62. Su Q, **Bauer C**, Bergquist R, Cao Z, Gao F, Hu Y, Zhang Z. Unraveling trends in schistosomiasis: Deep learning insights into national control programs in China. *Epidemiology and Health*. 2024:46: e2024039. PMID: 38514196. PMCID: PMC11369565.

61. Garza AL*, Lee M, Blangero J, **Bauer C**, Czerwinski SA, Choh AC. Genetic correlations be- tween liver fat content, metabolic health, and adiposity distribution in the FELS longitudinal study. *Nutrition, Metabolism and Cardiovascular Diseases*. 2024 Jul;34(7):1610-1618. PMID: 38555241.

60. Low EV*, Lee M, **Bauer C**, Fisher-Hoch S, McCormick JB, Rowan PJ, Abughosh S, Essien JE, Chen H. Risk factors for overweight and obesity in children and adolescents living on the Texas-Mexico Border. *Frontiers in Adolescent Medicine*. 2024 2:1297391.

59. **Bauer C**[§], Hassan GH*, Bayly R, Cordes J, Li X, Bernson D, Li W, Ackerson, LK, Dammann O, LaRochelle M, Stopka TJ. Trends in fatal opioid-related overdose in American Indian and Alaska Native communities, 1999-2021. *American Journal of Preventive Medicine*. 2024 Feb 3: S0749-3797(24)00036-9. PMID: 38311190.

58. Madrigal K, Morris L, Zhang K, Nelson E, Tran T, Galindez M, Duan Z, Adamson AS, Zhao H, Doan HQ, Taylor M, **Bauer C**[§], Nelson KC. Persistent poverty and incidence-based melanoma mortality in Texas. *Cancer Causes & Control*. 2024 Jun;35(6):973-979. PMID: 38421511.

57. Oghuan J, Chavarria C, Vanderwal SR, Gitter, A, Ojaruega AA, Monserrat C, **Bauer C**, Brown EL, Cregeen SJ, Deegan J, Hanson BM, Tisza M, Ocaranza HI, Balliew J, Maresso AW, Rios J, Boerwinkle E, Mena KD, Wu F. Wastewater analysis suggests unreported Mpox cases in a low-prevalence city: An environmental surveillance study. *The Lancet Regional Health - Americas*. 2023 Nov 24:28:100639. PMID: 38076410. PMCID: PMC10701415.

56. Cerda I*, **Bauer C**, Zhang K, Lee M, Jones M, Rodriguez A, McCormick JB, Fisher-Hoch SP. Evaluation of a targeted COVID-19 community outreach intervention: A case for precision public health. *JMIR Public Health and Surveillance*. 2023 Dec 20:9: e47981. PMID: 38117549. PMCID: PMC10765283.

55. Yeung CHC*, **Bauer C**, Xiao Q. Associations between rest-activity rhythms and function tests: the US National Health and Nutrition Examination Survey, 2011–2014. *Clocks and Sleep*. 2023 Dec; 5(4):667–685. PMID: 37987396. PMCID: PMC10660688.

54. Zhang Z, Sabharwal R, Lee M, Zhang K, McGaha P, Crum M, **Bauer C**, Fisher-Hoch SP, McCormick JB, Reininger BM, Thomas S, Guajardo E, Pinon D, Yaseen A. An interactive online dashboard with COVID-19 trends and data analysis in northeast and south Texas. *Texas Public Health Journal*. 2024 76;2;12.

53. Xiao Q, Zhou M, Lyu Y, Lu J, Zhang K, Figueiro M, Wang J, **Bauer C**. County-level variations and temporal trends of artificial light at night (ALAN) in the contiguous U.S., 2012-2019. *Environmental Science and Pollution Research*. 2023 Nov;30(54):115870-115881. PMID: 37897576.

52. Tisza M, Javornik Cregeen S, Avadhanula V, Zhang P, Ayvaz T, Feliz K, Hoffman KL, Clark JR, Terwilliger A, Matthew C, Ross MC, Cormier J, Henke D, Troisi C, Wu F, Rios J, Deegan J, Hansen B, Balliew J, Gitter A, Zhang K, Li R, **Bauer C**, Mena KD, Piedra PA, Petrosino FJ, Boerwinkle E, Maresso AW. Comprehensive wastewater sequencing reveals community and variant dynamics of the collective human virome. *Nature Communication*. 2023;14(1):6878. PMID: 37898601. PMCID: PMC10613200.

51. Yeung CHC*, Lu J, Soltero E, **Bauer C**[§], Xiao Q. U.S. Adolescent Rest-Activity patterns: insights from functional principal component analysis (NHANES 2011-2014). *International Journal of Behavioral*

Nutrition and Physical Activity. 2023; 20:125. PMID: 37833691. PMCID: PMC10571346.

50. Xiao Q, Durbin J, **Bauer C**, Yeung HC, Figueiro M. Alignment between 24-hour light and activity rhythms is associated with diabetes and glucose metabolism in a nationally representative sample of American adults. *Diabetes Care*. 2023 Sep 21: dc231034. PMID: 37734073.

49. Xiao Q, Lyu Y, Zhou M, Lu J, Zhang K, Wang, J, **Bauer C**[§]. Artificial light at night and social vulnerability: An environmental justice analysis in the U.S. 2012-2019. *Environment International*. 2023; 178:108096. PMID: 37480833.

48. Tran T, Rousseau MA, Farris D, Bauer C, Nelson KC, Doan HQ. The social vulnerability index as a risk stratification tool for health disparity research in cancer patients: A scoping review. *Cancer Causes & Control*. 2023;34(5):407-420. PMID: 37027053. PMCID: PMC10080510.

47. Stopka TJ, Larochelle MR, Li X, Bernson D, Li W, Ackerson L, **Bauer C**. Opioid-related mortality: Dynamic temporal and spatial trends by drug type and demographic subpopulations, Massachusetts, 2005-2021. *Drug and Alcohol Dependence*. 2023; 246:109836. PMID: 36931131. PMCID: PMC10121848.

46. Peterson L, Lee H, Huybrechts I, Biessy C, Neuhouser ML, Haaland B, Krick B, Gunter M, Schulze MB, Jannasch F, Coletta A, Hardikar S, Chaix A, **Bauer C**, Xiao Q, Playdon M. Reliability estimates for assessing meal timing derived from longitudinal repeated 24-hour dietary recalls. *American Journal of Clinical Nutritio*n. 2023;117(5):964-975. PMID: 36921904. PMCID: PMC10206325.

45. Clark JR, Terwilliger A, Avadhanula V, Tisza M, Cormier J, Javornik-Creegen S, Ross M, Hoffman K, Troisi C, Hanson BM, Petrosino JF, Balliew J, Piedra PA, Rios J, Deegan J, **Bauer C**, Wu F, Mena KD, Boerwinkle E, Maresso AW. Wastewater pandemic preparedness: Toward an end-to-end pathogen monitoring program. *Frontiers in Public Health*. 2023 Mar 21:11:1137881. PMID: 37026145. PMCID: PMC10070845.

44. Yeung CHC*, **Bauer C**, Xiao Q. Associations between actigraphy-derived rest-activity rhythm characteristics and hypertension in US adults. *Journal of Sleep Research*. 2023;32(5): e13854. PMID: 36807441.

43. **Bauer C**[§], Zhang K, Li W, Bernson D, LaRochelle M, Dammann O, Stopka TJ. Small area forecasting of opioid-related mortality: Bayesian spatiotemporal dynamic modeling approach. *JMIR Public Health and Surveillance*. 2023 Feb 10;9: e41450. PMID: 36763450. PMCID: PMC9960038.

42. Gitter A, **Bauer C**, Wu F, Ramphul R, Chavarria C, Zhang K, Petrosino J, Mezzaric M, Gallegos G, Terwilliger AL, Clark JR, Feliz K, Avadhanula V, Piedra PA, Weesner K, Maresso AW, Mena KD. Assessment of a SARS-CoV-2 wastewater monitoring program in El Paso, Texas, from November 2020 to June 2022. *International Journal of Environmental Health Research*. 2023; 3:1-11. PMID: 36595614.

41. **Bauer C**[§], Li X, Zhang K, Lee M, Guajardo E, Fisher-Hoch S, McCormick J, Fernandez ME, Reininger B. A novel Bayesian spatial-temporal approach to quantify COVID-19 testing disparities for small area estimation. American Journal of Public Health. 2023;113(1):40-48. PMID: 36516388. PMCID: PMC9755943.

40. Suk R, Liao K, **Bauer C**, Basil C, Li M. HPV vaccination trends among commercially insured adults aged 27 to 45 before and after advisory committee on immunization practices recommendation change in the US, 2007-2020. *JAMA Health Forum*. 2022;3(12): e224716. PMID: 36525257. PMCID: PMC9856534.

39. Heckler B*, Lee M, Stone K, **Bauer C**[§], Xiao Q. Cross-sectional and prospective associations of rest-activity rhythms with body mass index in older men: a novel analysis using Harmonic Hidden Markov Models. *Journal of Biological Rhythms.* 2023;38(1):87-97. PMID: 36416436. PMCID: PMC10074583.

38. **Bauer C**, Zhang K, Xiao Q, Lu J, Hong YR, Suk R. County-level social vulnerability and breast, cervical, and colorectal cancer screening rates in the United States, 2018. *JAMA Network Open*. 2022:5(9): e2233429. PMID: 36166230. PMCID: PMC9516325.

37. Blackburn CC, Jones M, Lee M, **Bauer C**, Rodriguez A, Garcia R, Fisher-Hoch S, McCormick JB, Zhang K, Garrett A, Esteves J. Autoethnographic examination of data-driven, community-tailored COVID-19 response in Brownsville, Texas. *Journal of Humanistic Psychology*. 2022:00221678221118708.

36. Low EV*, Lee M, **Bauer C**, Fisher-Hoch S, McCormick JB, Abughosh S, Essien E, Rodriguez J, Chen H. Association of pubertal stage and weight status with cardiometabolic risk factors in children and adolescents living on the Texas-Mexico border. *Metabolic Syndrome and Related Disorders*. 2022;20(8):440-450. PMID: 35819796. PMCID: PMC9595617.

35. Lai H*, Mubashir T, Shiwalkar N, Ahmad H, Balogh J, Williams G, **Bauer C**, Maroufy V. Association of pre-admission opioid abuse and/or dependence on major complications in traumatic brain injury (TBI) patients. *Journal of Clinical Anesthesia*. 2022; 79:110719. PMID: 35276593.

34. Xiao Q, Lu J, Matthews C, Zeitzer JM, **Bauer C**[§]. Rest-activity profiles among U.S. adults in a nationally representative sample: A functional principal component analysis. *International Journal of Behavioral Nutrition and Physical Activity*. 2022; 19:32. PMID: 35819796. PMCID: PMC8944104.

33. Oluwadairo T*, Whitehead L, Symanski E, **Bauer C**, Carson A, Han I. Effects of road traffic on the validity of low-cost particulate matter sensor measurements in Houston, Texas. *International Journal of Environmental Health Research*. 2022;19(3):1086. PMID: 35162113. PMCID: PMC8833980.

32. Oluwadairo T*, Whitehead L, Symanski E, **Bauer C**, Carson A, Han I. Effects of aerosol particle size on the measurement of ambient $PM_{2.5}$ with a low-cost particulate matter sensor monitor (LCPMS) in a laboratory chamber. 2022. *Environ Monit Assess*. 2022;194(2):56. PMID: 34989887. PMCID: PMC8842881.

31. Xiao Q, Playdon M, Matthews C, **Bauer C**. The association between rest-activity rhythms and glycemic markers: the US National Health and Nutrition Examination Survey, 2011-2014. *Sleep*. 2022;45(2): zsab291. PMID: 34897522. PMCID: PMC9013003.

30. **Bauer C**[§], Zhang K, Lee M, Jones M, Rodriguez A, Cerda I, Reininger B, Fisher-Hoch S, McCormick J. Real-time geospatial analysis identifies gaps in COVID-19 vaccination in a minority population. *Scientific Reports*. 2021;11(1):18117. PMID: 34518570. PMCID: PMC8437959.

29. Xiao Q, Gierach GL, **Bauer C**, Blot W, James P, Jones RR. The association between outdoor light at night and breast cancer risk in black and white women in the southern community cohort study. *Environmental Health Perspectives*. 2021;129(8): 087701. PMID: 34379524. PMCID: PMC8357036.

28. Erdman E, Young L, Bernson D, **Bauer C**, Chui K, Stopka T. A novel imputation approach for sharing protected public health data. *American Journal of Public Health*. 2021;111(10):1830- 1838. PMID: 34529494. PMCID: PMC8561211.

27. **Bauer C**[§], Zhang K, Lee M, Fisher-Hoch S, Guajardo E, McCormick J, de la Cerda I, Fernandez ME, Reininger B. Census tract patterns and contextual social determinants of health associated with COVID-19 in a Hispanic population from South Texas: A spatiotemporal perspective. *JMIR Public Health and Surveillance.* 2021;7(8): e29205. PMID: 34081608. PMCID: PMC8354426. (IF 4.11)

26. Hong S, Liu F, **Bauer C**, Chen Y, Tu W, Zhang J, Hu J, Zhang W, Hu Y, Lynn HS, Li Y, Chang Z, Zhang ZJ. Intra-area factors dominate the spatio-temporal transmission heterogeneity of Hand, Foot, and Mouth disease in China: a modelling study. *Science of the Total Environment*. 2021;775(7):145859.

25. **Bauer C**, Champagne-Langabeer T, Bakos-Block C, Zhang K, Persse D, Langabeer J. Patterns and risk factors of opioid-suspected EMS overdose incidents in Houston metropolitan Area, 2015-2019: a Bayesian spatiotemporal analysis. *PLOS One*. 2021;16(3): e0247050. PMID: 33705402. PMCID: PMC7951926.

24. Suk R*, Sonawane K, Bauer C, Lairson D, Deshmukh AA. Risk of anal cancer in inflammatory bowel disease patients in the US: a population-based study 2008–2018. 2021. *Gastroenterology.* 160 (3), S28-S29.

23. Zhang K*, Reininger B, Lee M, Xiao Q, **Bauer C**[§]. Individual and community social determinants of health on diabetes management in a Mexican American population. *Frontiers in Public Health*. 2021; 8:633340. PMID: 33614572. PMCID: PMC7888279.

22. Zhang D, **Bauer C**, Powell-Wiley T, Xiao Q. Neighborhood socioeconomic status trajectories and weight change in a large US cohort of older men and women. *JAMA Network Open*. 2021;4(2): e2036809.

PMID: 33544146. PMCID: PMC7865190.

21. Xiao Q, **Bauer C**, Layne T, Playdon M. The association between overnight fasting and body mass index in older adults: the interaction between duration and timing. *International Journal of Obesity*. 2021 Mar;45(3):555-564. PMID: 33214704.

20. Xie L*, Atem F, Gelfand A, **Bauer C**, Messiah S. United States prevalence of pediatric asthma by environmental tobacco smoke exposure, 2016-2017. *Journal of Asthma*. 2021;58(4):430-437. PMID: 31877060.

19. Shrestha S, **Bauer C**, Hendricks B, Stopka T. Spatial epidemiology: an empirical framework for syndemics research. *Social Science & Medicine*. 2022:295:113352. PMID: 32950331. PMCID: PMC7962030.

18. Miao H, Gao Q, Feng H, Zhong C, Zhu P, Wu L, Swartz M, Luo X, DeSantis SM, Lai D, Bauer C, Pérez A, Rong L, Lairson D. Mathematical modeling of business reopening when facing SARS-CoV-2 pandemic: protection, cost and risk. *Frontiers in Applied Mathematics and Statistics*. 2020;6.

17. Sonawane K, Zhu Y, Montealegre J, Lairson DR, **Bauer C**, McGee LU, Giuliano AR, Deshmukh A. Parental intent to initiate and complete the human papillomavirus vaccine series in the USA: a nationwide, cross-sectional survey. *The Lancet Public Health*. 2020;5(9): e484-e492. PMID: 32707126. PMCID: PMC7484349.

16. Logan J, **Bauer C**, Ke J, Xu H, Li F. Models for small area estimation for census tracts. *Geographical Analysis*. 2020 Jul;52(3):325-350. PMID: 33041360. PMCID: PMC7546254.

15. Dumont M, Roy M, Jodoin PM, Morency F, Houde JC, Xie Z, Bauer C, Samad T, Van Dijk K, Goodman J, Descoteaux M. Free water in white matter differentiates MCI and AD from control subjects. *Frontiers in Aging Neuroscience*. 2019; 11:270. PMID: 31632265. PMCID: PMC6783505.

14. Sahlu I*†, **Bauer C**†, Ganaba R, Preux P, Cowan L, Dorny P, Millogo A, Carabin H†. The impact of imperfect screening tools on measuring the prevalence of epilepsy and headaches in Burkina Faso. *PLOS Neglected Tropical Diseases*. 2019;13(1): e0007109. PMID: 30653519. PMCID: PMC6353216. † equal contribution as first author

13. Sahlu I*, Carabin H, Ganaba R, Preux P, Cisse, A.K., Tarnagda Z, Gabriel S, Dermauw V, Dorny P, **Bauer C**, Millogo A. Estimating the association between being seropositive for cysticercosis and the prevalence of epilepsy and severe chronic headaches in 60 villages of rural Burkina Faso. *PLOS Neglected Tropical Diseases*. 2019;13(1): e0007101. PMID: 30677038. PMCID: PMC6345432.

12. **Bauer C**, Wakefield J. Stratified space-time infectious disease modeling: with an application to hand, foot and mouth disease in China. *Journal of the Royal Statistical Society Series C*. 2018; 67:1379-1398.

11. Servadio J*, Rosenthal S, Carlson L, **Bauer C**. Climate patterns and mosquito-borne disease outbreaks in south and southeast Asia. *Journal of Infection and Public Health*. 2018 Jul- Aug:11(4):566-571. PMID: 29274851.

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2. GRANTS AND CONTRACTS

Active Grants: Principal Investigator or Co-Principal Investigator

1. P250630 6/1/2025 – 5/31/2030
CPRIT (Cancer Prevention and Research Institute of Texas) Total amount: $2,977,115
Texas Spatial-Temporal Data Science, Informatics and Modeling Core Facility (TEX-SIM)
Role: Principal Investigator (PI)
The TEX-SIM aims to support communities across Texas by offering advanced spatial-temporal data science analytical tools and informatics. By integrating environmental exposure data, georeferenced health information, and healthcare access metrics, TEX-SIM supports better understanding of how these factors impact cancer risk, treatment, and outcomes. TEX-SIM will also serve as the central hub for cancer population health research in Texas, positioning itself as a statewide resource in spatial-temporal data science by fostering partnerships and enhancing transdisciplinary collaboration. Project website: https://sph.uth.edu/projects/tex-sim/

2. R01DA054267 5/15/2022 – 3/31/2027
NIH/NIDA Total amount: $3,446,178
Predict to Prevent: Dynamic Spatiotemporal Analyses of Opioid Overdose to Guide Preemptive Public Health Responses
Role: MPI (Stopka, Tufts/Bauer, UTHealth)
This project proposes to use a statewide Public Health Data Warehouse with a large number of linked administrative datasets to identify current opioid overdose patterns, predict future opioid overdose epidemics, and evaluate the effectiveness of public health and clinical interventions.
Project website: https://spatiotemporal-data-science.shinyapps.io/PredictToPrevent/

3. RP230036 3/01/2023 – 2/28/2028
CPRIT (Cancer Prevention and Research Institute of Texas) Total amount: $1,998,196
Geospatial Approaches to Melanoma Early Detection – The GAMED Project
Role: MPI (Nelson, MD Anderson/Bauer, UTHealth)

In this project we aim to use data-driven approach to creating statistical models that predict which areas may have the most late-stage melanomas in the future, and identifying the multi-level factors associated with the late-stage melanoma diagnosis in Texas. We then plan to identify PCPs in high melanoma burden areas who are interested in learning about skin cancer, and deploy our multimodal educational intervention program, tailored to the social and community patient context, to clinical sites in those communities.

4. RSG-25-1432864-01-ESED 9/01/2025 – 8/31/2029
American Cancer Society (ACS) Total amount: $946,000
The Vaccines for Children Program and HPV Vaccination among Medicaid/CHIP Enrolled Children in Texas: Public Health Impact and Areas for Improvement
PI: Suk (Emory)
Role: Subcontract-PI
This study proposes to utilize Texas All Payers Claims Data (APCD) to address HPV vaccination improvement among low-income children experiencing disparate access to cancer prevention services in Texas.

5. 90DPTB0025-01-00 9/1/2022 – 8/31/2027
National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR)
TIRR Memorial Hermann/Baylor College of Medicine/UTHealth Collaborative Traumatic Brain Injury Model System (TBI) Model System
PI: Sander/Juengst (TIRR Memorial Hermann Research Center)
Role: Subcontract-PI

Active Grants: Co-Investigator

1. 25ISA1469479 4/01/2025 – 4/01/2027
American Heart Association (AHA) Total amount: $399,902
Evaluating An Implementation Strategy to Improve Physical Activity and Reduce Cardiovascular Risk Factors in Children
PI: Timothy Walker (UTHealth)
This study proposes to evaluate an implementation strategy to improve physical activity and reduce cardiovascular risk factors in children.

2. U24AG098157 9/15/2025 – 8/31/2030
NIH/NIA Total amount: $27,200,000
ReCARDO: Using Real-World Data to Derive Common Data Elements for Alzheimer's Disease and AD-Related Dementias Research Through Ontological Innovation
MPI: Zhang GQ/Liu HF/Cui (UTHealth)

3. 1UH2ES036681 8/30/2024 – 7/30/2026
NIH/NIEHS Total amount: $409,974
A Validation Study of Satellite-based Measure of Artificial Light at Night for its Application in Epidemiological Research
PI: Xiao (UTHealth)
This project aims to validate satellite-based Artificial Light at Night (ALAN) measures in a large, nationally representative dataset, improving the accuracy of exposure assessments, guiding future studies, and enhancing the translational value of ALAN research.

4. U54CA280804 6/15/2023 – 5/30/2028
NIH/NCI
Acres Homes Cancer Prevention Collaboration
MPIs: Basen-Engquist/McNeill/Rechis (MD Anderson)
Serve as the geospatial analytics core to investigate the effect of environmental variables on intervention

effectiveness.

5. R01CA228527 11/01/2018 – 10/31/2025
NIH Total amount: $2,858,386
Development and Validation of a Measure of Organizational Readiness (motivation × capacity) for Implementation
PI: Fernandez ME (UTHealth)
Organizational readiness plays a critical role in the implementation of evidence-based interventions (EBIs) for cancer control and prevention (programs, practices, and policies). This study develops and validates measures for diverse settings (clinics and schools) and topics (cancer screening and nutrition).

Active Grants: Mentor (No FTE)
1. 2T32CA057712-31 9/1/2023 – 8/31/2028
NIH/NCI Total amount: $2,412,545
Cancer Prevention and Control Research Training and Career Development Program
PI: Fernandez/Balasubramanian (UTHealth)

2. K08HL173697 9/15/2025 - 8/31/2030
NIH/NHLB Total amount: $2,207,265
Artificial Intelligence for Thoracic Aortic Disease Screening and Gene Discovery
PI: Murdock (UTHealth)

3. UTHealth School of Public Health PRIME Award 9/1/2025 – 8/31/2026
Total amount: $25,000
Mapping Heterogeneity in Influenza: Synthetic Population Framework for Precision Prevention in Texas
PI: Bi (UTHealth)

Completed Grants: Principal Investigator or Co-Principal Investigator

1. 1OT2OD032581-02-274 1/15/2024 – 7/31/2026
NIH/UNTHSC AIM-AHEAD Consortium Total amount: $994,295
Enhancing Equity in Opioid Medication Treatment: Confronting Disparities and Biases for Medicaid Beneficiaries with Responsive Machine Learning
PI: Yanmin Gong (UTSA)
Role: Subcontract-PI
This project aims to address medication disparities for opioid use disorder among Medicaid beneficiaries by considering social determinants and using advanced machine learning techniques. The initiative emphasizes algorithmic fairness, creating a framework to improve treatment adherence, and offering open-source toolkits and resources for stakeholders.

2. U01TR004355 11/1/2022 – 11/30/2024
NIH/NCATS Total amount: $2,179,847
Addressing COVID-19 Testing Disparities in Vulnerable Populations Using a Community JITAI (Just in Time Adaptive Intervention) Approach: RADxUP Phase III
Role: MPI (Fernandez/McPherson/Reininger/Fujimoto/McGaha/Bauer)
This project focuses on understanding factors associated with rapid SARS-CoV-2 testing through a mixed methods study and adapt our intervention messages, materials and strategies to increase relevance, intensity, and reach. We also include a broader focus on addressing the social determinants of health (SDoH) experienced by our communities and a greater focus on combating misinformation. Because the communities in which we are working are particularly vulnerable, and in need of many other services, broadening the topics on which outreach and education topics are covered.

3. 0017402 3/1/2022 – 5/30/2024

Cameron County Public Health Department (CCPH) Total amount: $225,000
COVID-19 Data Analytics
Role: MPI (Bauer/Lee)
This project aims to conduct sophisticated spatial-temporal analysis to provide insight into the temporal trends, spatial trends, and disparities in COVID-19 infection, fatality, testing, and vaccination by age, gender, ethnicity and location for CCPH.

4. FORE Opioid Crisis Innovation Challenge 2021 2/1/2022 – 1/31/2024
Foundation for Opioid Response Efforts (FORE) Total amount: $300,000
Syndromic Surveillance of the Opioid Crisis in Lowell, Massachusetts: Data to Action and Evaluation
PI: Shrestha/Pustz/Stopka (Tufts University)
Role: Subcontract-PI

5. UTH-MDA Population Health Initiative Collaborative Projects 1/1/2022 – 12/31/2023
IMPACT FUND – Core Resources Total amount: $200,000
Joint Center on Geospatial Analysis and Health
Role: MPI (Bauer/Ramphul/Strong/Walsh) (No FTE for PIs)
The Joint Center on Geospatial Analysis & Health (JCoGA&H) is a collaboration between The University of Texas Health Science Center at Houston – School of Public Health (UTHealth) and The University of Texas MD Anderson Cancer Center (MD Anderson), to conduct and deploy focused geospatial analysis to: build consensus on shared strategic impact priorities in population health and health equity; enhance access to spatial analysis essential to research, policy analysis, and public health practice; and directly enable researchers, public health practitioners, and community-based organizations in Greater Houston and across the state of Texas to utilize spatial analysis to improve and inform their work in population health.

6. NIH Consortium for Cancer Implementation Science (CCIS) 10/1/2021 – 9/31/2022
Individual Award Total amount: $20,000
Developing Geospatial Data Visualizations for Cancer Screening Inequality and Contextual Factors
Role: Principal Investigator
This project aims to develop a public-facing data visualization dashboard to inform understanding of geographical variation of cancer screening inequality and its relation to social determinants of health and social vulnerability.
Developed R Shiny dashboard: https://spatiotemporal-data-science.shinyapps.io/CancerScreening-SDOH/

7. R01CA095994 2014 – 2018
NIH/NCI Total amount: $1,622,394
Spatio-temporal Epidemiology: Methods and Applications
PI: Wakefield (University of Washington Seattle)
Role: subcontract-PI (ended in 2016 due to job change)
This project proposes new statistical methodology development methods for the prediction of space-time health data.

8. R21AI119773 2015 – 2017
NIH/NIAID Total amount: $435,990
Spatial-temporal Modeling for Surveillance Data of Multiple Pathogens
PI: Y Yang (University of Florida)
Role: subcontract-PI (ended in 2016 due to job change)
This project proposes new statistical methods for analyzing infectious disease surveillance data to address the challenges of multiple transmission routes, multiple co-circulating pathogen types and complex system of immunity, cross-immunity and unobserved asymptomatic infections.

9. CFAR Developmental Grant 2015 – 2016
The Providence/Boston Center for AIDS Research (CFAR) Total amount: $40,000

The Spatial Pattern of HIV Treatment Cascade from Home-based Counseling and Testing in Western Kenya
Role: Principal Investigator
The project investigates the spatial patterns of linkage to and retention in HIV care from home- cased counseling and testing (HBCT) program in Western Kenya.

10. Seed Grant 2014 – 2016
Institute at Brown for the Study of Environment and Society (IBES) Total amount: $150,000
Effects of climate and land-cover change on human infectious disease outbreaks
PI: Smith (Brown University)/Bauer
Role: Co-Investigator (2014 – 2015), Principal Investigator (2015 – 2016)

11. Salomon Faculty Research Awards 2012 –2013
Brown University Total amount: $7,500
Small-area estimation using complex survey data

12. USDA Forest Service Summer 2011
PNW Research Station, Olympia, WA Total amount: $2,000
Statistical analysis of spatial variability and correlation among various soil characteristics

Completed Grants: Co-Investigator

1. 80NSSC25K7030 9/15/2024 – 9/14/2027
National Aeronautics & Space Administration (NASA) Total amount: $707,414
CIELO: Chicago's Initiative for Environmental Justice and Light Pollution Outreach
PI: Xiao (UTHealth)
This project aims to address the environmental and public health implications of light pollution, particularly in marginalized communities. Our team is responsible for developing a GIS-enabled dashboard that integrates satellite-derived artificial light at night (ALAN) data with sociodemographic and health data. We apply advanced data visualization and analysis tools to characterize the burden of light pollution and its disproportionate impact on vulnerable populations. Additionally, we expand educational programs, providing local high school students with hands-on experience in light pollution research and its public health effects.
(Project terminated on Apr 9th, 2025, due to the changes in agency priorities)

2. 80NSSC21K0510 01/2021 – 01/2025
National Aeronautics & Space Administration (NASA) Total amount: $497,301
Apply NASA's Earth Observation Product to Improve Artificial Light at Night (ALAN) Mapping and Public Health Surveillance
PI: Xiao (UTHealth)
The aims of this study are to use satellite data to measure spatial variations and temporal trends of light at night in the U.S. and link the data with existing public health datasets to examine their public health implications.
Project website and dashboard: https://spatiotemporal-data-science.shinyapps.io/ALAN/

3. P008536 11/8/2021 – 12/31/2024
Office of the Governor
Texas Epidemic Public Health Institute (TEPHI) - Wastewater Monitoring
PI: Boerwinkle (UTHealth)
Role: Bauer leads the statistical analytics core
This project aims to identify multiple public health-relevant pathogens through wastewater monitoring. Bauer's team is responsible for processing and analyzing wastewater data obtained from the wet lab, using advanced statistical and machine learning techniques to detect pathogen signatures, identify anomalies, capture temporal trends, and develop predictive models. Additionally, we design and maintain a comprehensive data dashboard,

enabling effective real-time monitoring and actionable public health insights.

4. HHS001089700001 10/1/2021 – 5/31/2025
Texas DSHS/CDC Total amount: $15,000,000
Texas SARS-CoV-2 Variant Sequencing Network
PI: Boerwinkle (UTHealth)
Role: Co-Investigator (Bauer co-leads the data coordinating and analytical core)
This state-wide project will create a networked partnership between DSHS, academic, commercial, and public health laboratories for high throughput SARS-CoV-2 sequencing and analysis for Texas, to enable an efficient and comprehensive approach to identify the presence of known variants of interest (VOI) and variants of concern (VOC) and will provide the capability to identify new variants as they emerge.

5. R21HL165369-01 7/1/2022 – 6/30/2024
NIH/NHLBI Total amount: $275,000
Studying 24-hour rhythms of light exposure, alignment with rest-activity cycle, and cardiometabolic health in a nationally representative sample
MPI: Xiao (UTHealth)/Figueiro (RPI)
The aims of this study are to investigate 24-hour exposure patterns of light and the alignment between light-dark and rest-activity cycles in relation to cardiometabolic health.

6. UL1TR003167-03S3 9/01/2021 – 1/31/2024
NIH/NCATS Total amount: $2,333,630
Addressing COVID-19 Testing Disparities in Vulnerable Populations Using a Community JITAI (Just in Time Adaptive Intervention) Approach – RADxUP Phase II
MPI: Fernandez/McPherson/Fujimoto/McGaha/de Oliveira Otto/Reininger (UTHealth)
This study will leverage long-standing academic-community partnerships to examine COVID- 19 infection, testing, and vaccination patterns in three Texas regions (Houston/Harris County, South Texas, and Northeast Texas) to identify underserved communities. In these communities, we will provide and evaluate a multilevel intervention to increase reach, uptake, implementation, and sustainment of SARS-CoV-2 testing and COVID-19 vaccination. We will also explore the impact and reach of people's communication networks on attitudes, intentions, and decisions on behavior regarding SARS-CoV-2 testing and COVID-19 vaccination.

7. 3UL1TR003167-02S10 9/1/2020 – 8/31/2023
NIH/NCATS Total amount: $4,998,788
RADxUP: Understanding and Addressing COVID-19 Testing Disparities in Vulnerable Populations: A Multilevel and Multi-method Approach - RADxUP Phase I
MPI: Fernandez/McPherson/Reininger/de Oliveira Otto (UTHealth)
Building on the partnerships and resources of the Center for Clinical and Translational Science (CCTS), the goal of the study is to partner with our community and stakeholder colleagues to identify dynamic disease hotspots and testing deserts in racially diverse neighborhoods of the target regions, and to use that information to inform the rapid adaptation and deployment of multilevel level just-in-time adaptive intervention strategies to reach vulnerable populations.

8. Valley Baptist Legacy Foundation 03/2021 – 03/2024
Total amount: $750,000
Establishment of a Public Health Laboratory and Integrated Data Management System for the Cameron County and Municipalities
PI: Fisher-Hoch (UTHealth)
Role: Biostatistician

9. National Aeronautics & Space Administration (NASA) 09/2021 – 02/2023
Tiger Team Award, Satellite Data for Environmental Justice (SD4EJ) Total amount: $179,527

PI: Anenberg (GWU)/Xiao (UTHealth)
Role: Statistical Lead
The aims of this study are to develop a central warehouse for long-term satellite data on multiple environmental exposures and hold regular teleconferences with EJ stakeholders to enhance their ability to map EJ for various environmental exposures and produce new understanding of which communities may experience benefits from governmental initiatives.

10. 6U3SHS45319-01-03.6 11/01/2021 – 10/31/2023
Health Resources & Services Administration (HRSA) Total amount: $10,345,056
Community-Based Workforce Development and Mobilization to Increase COVID-19 Vaccination Equity in Texas
MPI: Fernandez/Reininger/Cuccaro (UTHealth)
Role: Bauer co-leads the data coordinating and analytics core)
The goals are to address personal and community factors influencing vaccination decisions, and increase access to vaccination. Throughout the performance period, we will continuously monitor our efforts to provide information for rapid-cycle improvements to increase program reach and effectiveness.

11. 6U48DP006408-01-01 5/11/2021 – 5/10/2022
CDC Total amount: $396,825
Connecting Behavioral Science to COVID-19 Vaccine Demand (CBS-CVD) network
MPI: Fernandez/Cuccaro (UTHealth)
University of Texas Prevention Research Center COVID-19 Supplement.
The goal of this one-year supplement is to increase COVID-19 vaccine confidence in selected regions in Texas.

12. CPRIT RP170493 12/2016 – 5/2022
Cancer Prevention and Research Institute of Texas Total amount: $1,413,306
For Our Children: A Tailored Multi-level Intervention for Parents and Healthcare Providers to Increase HPV Vaccination Rates
PI: Fernandez ME (UTHealth)
Role: Biostatistician (contributed time 04/2021 – 05/2022)
The study aims to improve vaccination rates among Hispanic adolescents (aged 11-17). Group randomized trial of a multi-level intervention using a tailored interactive multimedia intervention (TIMI) for parents, parental text messaging, and healthcare providers training through an interactive app.

13. 10/2021 – 03/2022
Episcopal Health Foundation Total amount: $95,732
Evaluation of a Collaborative Program Between an Affordable Housing Provider and a Managed Care Organization
PI: Tsai (UTHealth)

14. Fort Bend County 11/2020 – 11/2021
Fort Bend County COVID Analytics Total amount: $122,757
PI: de Oliveira Otto (UTHealth)
The goal of this project is to understand person, place, time, disparities and trends to inform public health action and policy including vaccine distribution in Fort Bend County (FBC).

15. University of Texas College of Pharmacy 03/2020 – 08/2020
Integrated Opioid Response Team Training Program Total amount: $1,500,000
PI: Langabeer (UTHealth)
Role: Biostatistician
This project provides study design and analytical expertise for the development of an integrated emergency response program for opioids and other drug-related disorders.

16. 01/2020 – 12/2020
Texas Department of State Health Services (DSHS) Total amount: $140,000
Rider 29 - Cost Analysis of Outbreaks Involving Certain Vaccine-preventable Diseases
PI: Sonawane (UTHealth)
This project studies and assesses the direct and indirect economic costs incurred by DSHS and local public health organizations in responding to vaccine-preventable disease outbreaks

17. 01/2019 – 12/2019
Massachusetts Department of Public Health (MDPH) Total amount: $150,000
High-risk Opioid Prescribers and Overdose in MA: a Mixed Methods Approach
Role: Statistics consultant
This project aims to conduct spatial and statistical analyses by employing a mixed methods "prescriber-centered" approach to assess opioid prescribing rates and associations with fatal and non-fatal opioid overdoses in communities across the state of Massachusetts.

18. R01NS064901 2014 – 2017
NIH/NINDS Total amount: $2,294,999
EFECAB: Improving Pig Management to Prevent Epilepsy in Burkina Faso
PI: Carabin H (University of Oklahoma Health Sciences Center)
Role: Statistics consultant

19. R21HD078762 2014 – 2016
NIH/NICHD Total amount: $441,796
Investigating and Extending Bayesian Methods for Small Area Estimation
PI: Logan (Brown University)
This project evaluates the performance of Bayesian models for small area estimation with a particular focus on their performance with population data of the type provided by the census.

20. Seed Grant 2013 –2014
Institute at Brown for the Study of Environment and Society (IBES) Total amount: $20,000
Communications and Socio-environmental Drivers of Disease Outbreaks
PI: Smith (Brown University)

Completed Grants: Mentor

1. F31NS093983 2015 – 2017
NIH/NINDS Epidemiological and Spatial Methods to Improve Estimates of Neurological Disorders from Population-based Studies.
PI: Sahlu (Brown University)
This NIH F31 training grant provides predoctoral individuals with supervised research training in specified health and health-related areas leading toward the research doctoral degree.

C. TEACHING AND ADVISING

1. COURSES INSTRUCTED

Courses at UTHealth School of Public Health (†Designed new course, ‡Substantial revision/redesign)

Semester	**Course Name (Credit Hours)**	**Role (% Effort)**	**Enrollment**
Spring 2025	Spatial-temporal Analysis of Population Health Data (3)	Lead (100%)	15

Spring 2024	Introduction to Biostatistics in Public Health (4)	Lead (100%)	18
Spring 2023	†Spatial-temporal Analysis of Population Health Data (3)	Lead (100%)	12
Fall 2022	Introduction to Biostatistics in Public Health (4)	Lead (100%)	51
Spring 2021	†Spatial-temporal Analysis of Population Health Data (3)	Lead (100%)	9
Fall 2021	Introduction to Biostatistics in Public Health (4)	Lead (100%)	49
Spring 2020	Introduction to Biostatistics in Public Health (4)	Lead (100%)	62
Spring 2020	†Spatial-temporal Analysis of Population Health Data (3)	Lead (100%)	7
Fall 2020	‡ Introduction to Biostatistics in Public Health (4)	Lead (100%)	45

Courses at Brown University (†Designed new course, ‡Substantial revision/redesign)

Semester	**Course Name (Credit Hours)**	**Role (% Effort)**	
Spring 2016	Spatial Statistics (3)	Lead (100%)	
Fall 2015	Principles of Biostatistics and Data Analysis (4)	Lead (100%)	
Spring 2015	Generalized Linear Models (3)	Lead (100%)	
Fall 2014	‡Principles of Biostatistics and Data Analysis (4)	Lead (100%)	
Spring 2014	†Spatial Statistics (3)	Lead (100%)	
Fall 2013	‡Principles of Biostatistics and Data Analysis (4)	Lead (100%)	
Spring 2013	†Spatial Statistics (3)	Lead (100%)	

2. GUEST LECTURES AND WORKSHOPS (SELECTED)

a. Guest lecture on 'Bayesian spatiotemporal models for COVID-19 disparities in small area estimation: Application in infectious disease epidemiology', PH2797 Shoe leather Epidemiology: Essential skills for applied epidemiology, UTHealth Houston SPH, Fall 2024.

b. Guest lecture on 'Geospatial Data Science Supporting to Local Public Health Departments in COVID-19 Control and Mitigation', KIN127L/PH2998, Current Topics in Infectious Diseases: COVID-19, UTHealth Houston SPH, Spring 2021.

c. Guest lecture on 'Geospatial Approaches in Disease Control/Prevention and its Application in Epidemiology' in PH2990 Epidemiology Seminar, UTHealth Houston SPH, Spring 2020.

d. Guest lecture on 'Spatial-temporal Statistical Models: Some Methods and Applications', PH 2126 Fundamentals and Applications of GIS, UTHealth Houston SPH, Fall 2020.

e. Guest lecture on 'Hypothesis Testing' in PH2770 NIH Proposal Development, a required course for Epidemiology PhD students, Department of Epidemiology, UTHealth Houston SPH, Fall 2019.

f. Introduction to Statistics (Stat 300), an elementary statistics course for undergraduate students. University of Alaska Fairbanks, Fairbanks, Alaska, Fall 2005/Spring 2006.

g. Analysis of Epidemiological Data, Brown-China NIEHS Epidemiology and Biostatistics Workshop. 2 hours. Xi'an, China, Summer 2015.

h. Introduction to Spatial Statistics Workshop (3 hours), S4 GIS Institute, Brown University, Winter 2013/Summer 2014.

i. Introduction to Statistics, Brown IMSD, Brown University, Summer 2014. 4 hours.

3. STUDENT ADVISING
Research Supervising at UTHealth School of Public Health

Student	Degree	Role	Year and Thesis/Dissertation Title
Kehe Zhang	PhD in Biostatistics	Chair & Dissertation Supervisor	Current
Timothy Clark	PhD in Epidemiology	Committee Member	Current *Investigating the association between sleep disorders, rest-activity patterns, and Parkinson's disease in the All of US research program*
Zixi Wang	PhD in Biostatistics	Committee Member	Current *Bayesian semiparametric spatial and spatiotemporal methods for disease mapping*
Jingwen Deng	PhD in Biostatistics	Committee Member	Current *Linking COPD prevalence with income distribution: a spatial heterogeneous compositional regression via geographically weighted penalized approach*
Ariel C. Harrison	PhD in Healthcare Management and Health Policy	Committee Member	Current *Big city blues: the effects of eviction moratorium and the threat of evictions on the health outcomes of Houston, TX residents*
Brooke McCumpsey	PhD in Healthcare Management and Health Policy	Committee Member	Current *Navigating policy and accreditation: the role of registry participation in car-t and bone marrow transplant*
Lauren Jones	MPH in Epidemiology	Committee Member	Current *A comparative analysis of west Nile virus incidence following major flooding events in Texas and Florida (2010–2024)*
Qian Qian	PhD in Biostatistics	Committee Member	Graduated 2025 *Deep learning of multimodal time series in wearable sensing for prediction and biomarker detection*
Giselle Day	PhD in Epidemiology	Committee Member	Graduated 2025 *Centering women veterans with HIV: An analysis of care continuum outcomes in the veterans' health administration*
Francine Vega	PhD in Healthcare Management and Health Policy	Committee Member	Graduated 2025 *A multidimensional analysis of state laws regulating pediatric opioid prescribing*
Meesha Iqbal	PhD in Health Services Research	Committee Member	Graduated 2025 *Rethinking health systems responsiveness in low- and middle-income countries*

Jiachen Lu	PhD in Biostatistics	Chair & Dissertation Supervisor	Graduated 2024 *A Bayesian hidden Markov model framework to investigate multiple circadian rhythmicity*
Joonha Chang	PhD in Biostatistics	Committee Member	Graduated 2024 *Latent classification of multi-model non-homogeneous continuous-time Markov chains*
Anayeli H. Morales	PhD in Epidemiology	Committee Member	Graduated 2024 *Association between maternal sleep disorders and maternal and birth outcomes: A retrospective analysis of Optum's de-identified Clinformatics® Data Mart database*
Anh Ngoc Ly	PhD in Epidemiology	Committee Member	Graduated 2024 *Hand hygiene infrastructure and practices in schools in Belize during the COVID-19 pandemic: A national assessment and intervention*
Jennifer Matas	PhD in Epidemiology	Committee Member	Graduated 2024 *Investigation of individual and social predictors of severe maternal morbidity: An analysis of privately insured population in the United States, 2007-2019*
Ariana L. Garza	PhD in Epidemiology	Committee Member	Graduated 2023 *Metabolic and genetic determinants of elevated liver fat content in the FELS longitudinal study*
Kathryn G. Burford	PhD in Epidemiology	Committee Member	Graduated 2023 *Measuring objective traffic-related safety for active commuting to school*
Allison Rector	PhD in Biostatistics	Committee Member	Graduated 2023 *Knot selection, mediation analysis, and modeling $PM_{2.5}$ and COVID-19 outcomes in a distributed lag non-linear model (TDLNM) framework*
Haley Barnes	MS in Biostatistics	Chair & Thesis Supervisor	Graduated 2022 *The impact of rest-activity patterns and neighborhood characteristics on weight status in the Dallas Heart Study: a Bayesian multilevel model approach*
Tzuruei Chao	MS in Biostatistics	Thesis Supervisor	Graduated 2022 *Sampling design of wastewater surveillance to detect SARS-CoV-2: A simulation study using geospatial kriging method*
Minji Chae	MS in Biostatistics	Chair	Graduated 2022 *Identification of a metabolite network associated with anthracycline-response in the ipsc-cardiomyocyte model system*
Yustinah Ndambakuwa	MS in Biostatistics	Chair	Graduated 2022 *Predicting hospitalization and length of stay following emergency department admission in working adults with chronic kidney disease*

Sungjin Cho	MS in Biostatistics	Thesis Supervisor (co-supervised with Dr. Michael Swartz)	Graduated 2022 *Investigating critical windows of exposure to $PM_{2.5}$ during pregnancy on estimated fetal weight using tree-based distributed lag non-linear model (TDLNM)*
Rachel White	PhD in Epidemiology	Committee Member	Graduated 2022 *What is contributing to COVID-19 mortality in Harris County?*
Alaina M Beauchamp	PhD in Epidemiology	Committee Member	Graduated 2022 *Assessing the mental health of women at the intersection of intimate partner violence and animal cruelty: Personal and population level risk factors for co-victimization*
Yenan Zhu	PhD in Health Services Research	Committee Member	Graduated 2022 *Urban-rural disparities in the utilization of post-stroke rehabilitation and long-term outcome among stroke survivors in the United States 2010-19*
Isela De La Certa	PhD in Epidemiology	Committee Member	Graduated 2022 *Improving local COVID19 outbreak response using precision public health*
Vijayashri Rallapalli	PhD in Healthcare Management and Health Policy	Committee Member	Graduated 2022 *Improving local COVID19 outbreak response using precision public health*
Brian Heckler	MS in Biostatistics	Chair & Thesis Supervisor	Graduated 2021 *Geographic variation in Hepatocellular Carcinoma incidence and its association with area-based socioeconomic measures in Texas from 2007-2016: A population-based study*
Immanuelle Azebe-Osime	MPH in Epidemiology	Committee Member	Graduated 2021 *Trends and risk factors for hospital delivery associated blood transfusions in Texas, 2009-2018: A cross-sectional study*
Temitope Oluwadairo	PhD in Epidemiology	Committee Member	Graduated 2021 *Evaluation of a low-cost sensor device for the assessment of community exposures to fine particulate matter in Houston, Texas*
Randa Hamden	PhD in Healthcare Management and Health Policy	Committee Member	Graduated 2021 *The impact of hurricane HARVEY on maternal health outcomes in FEMA designated disaster areas in Texas*
Ryan Suk	PhD in Health Economics	Committee Member	Graduated 2020 *The burden of HPV-associated cancer in inflammatory bowel disease patients*
Kehe Zhang	MS in Biostatistics	Chair & Thesis Supervisor	Graduated 2020 *Individual and community social determinants of*

			health associated with diabetes management in a Mexican American population
Lauryn Winter	MPH in Epidemiology	Committee Member	Graduated 2020 *Characterization of age-associated COPD progression in the COPD gene cohort*

Research Supervised at Brown University

Student	**Degree**	**Role**	**Year and Thesis/Dissertation Title**
Ida Sahlu	PhD in Epidemiology	Committee Member	Graduated 2016 *Estimating the burden of neurological disorders in low-resource settings*
Bahar Erar	PhD in Biostatistics	Committee Member	Graduated 2016 *Whole genome regression for modeling gene×environment interactions in structured populations*
Jun Ke	MS in Biostatistics	Thesis Supervisor	Graduated 2016 *Spatial boundary detection using Bayesian hierarchical modeling*
Zihao Zhang	MS in Biostatistics	Thesis Supervisor	Graduated 2016 *The association between ambient air pollution exposure and birth outcome: An analysis from a cohort study in Wuhan, China*
Emily Silvia	MPH	Thesis Supervisor	Graduated 2016 *Climate determinants of vector-born infectious disease outbreaks in Asia*
Joe Servadio	MS in Biostatistics	Thesis Supervisor	Graduated 2015 *Geographic variation in receipt of rehabilitation services post lower limb amputation surgery in the VA system* Winner of the best poster for Master's students, Brown University School of Public Health Research Day
Alyssa Feldman	MS in Biostatistics	Thesis Supervisor	Graduated 2015 *Analyses of the temporal trends of global infectious disease outbreaks*
Frances Terry	MPH	Reader	Graduated 2015

4. POST-DOCTORAL FELLOW MENTORING, VISITING STUDENTS AND SUMMER INTERNSHIPS

a. Jiahao Cao, Postdoctoral Fellow, UTHealth Houston SPH, 09/2024 - Present
b. Ghada Hassan, Postdoctoral Fellow, UTHealth Houston SPH, 10/2022 - 12/2024
c. CHC Yeung, Postdoctoral Fellow (co-supervised with Dr. Qian Xiao), UTHealth Houston SPH, 01/2022-02/2024
d. Dileka Gunawardana, CPRIT summer undergraduate innovation Program, Rice University, Summer 2020

e. Gabriella Novak, undergraduate summer intern, University of Rochester, Summer 2019
f. Ping Wang, PhD exchange student, City University of Hong Kong School of Public Health, Spring 2015

D. SERVICE

1. SERVICE TO THE INSTITUTION

a. Member, UTHealth Houston SPH Dean's Faculty Advisory Committee — Fall 2025 – Present
b. Member, UTHealth Houston SPH Executive Committee (SPHEC) — Spring 2024 – Present
c. Member, UTHealth Houston SPH Research Council — Spring 2023 – Present
d. Reviewer UTHealth Houston SPH PRIME pilot funding — Summer 2023
e. Co-chair, Data Committee, Texas SARS-CoV-2 Variant Network Project — Fall 2021 – Spring 2022
f. Lead, Biostatistics Teaching Assistants (TA) Bootcamp, UTHealth Houston SPH — Summer 2020
g. Member, UTHealth COVID-19 Research Task Force Informatics Workgroup — Spring 2020 – Present
h. Member, Faculty search committee for UTHealth Houston SPH Brownsville — Fall 2019 – Spring 2021
i. Member, MPH admission committee, School of Public Health, Brown University — Spring 2016
j. MPH core advisor, School of Public Health, Brown University — 2013–2015
k. Member, graduate curriculum committee, School of Public Health, Brown University — 2014–2015

2. SERVICE TO THE DEPARTMENT

a. Department strategical planning committee, UTHealth Houston — Fall 2022 – Present
b. Chair of faculty search committee (Non-tenure research-track), UTHealth Houston — Spring 2023
c. Student admission committee, UTHealth Houston — Spring 2019 – Present
d. Teaching quality and efficiency committee, UTHealth Houston — Spring 2019 – Present
e. Chair of faculty search committee (Non-tenure teaching-track) — Fall 2018 – Fall 2019
f. Data science track in Biostatistics ScM program ad-hoc committee, Brown University — Spring 2016
g. Faculty liaison for Sheridan teaching center, Brown University — Fall 2014 – Spring 2016
h. Graduate program committee, Brown University — Fall 2013 – Spring 2016
i. PhD qualifying exam committee, Brown University — Spring 2015
j. Master program admission committee, Brown University — Spring 2013/2015/2016
k. PhD program admission committee, Brown University — Spring 2014
l. Biostatistics seminar organizing committee, Brown University — Fall 2013 – Spring 2014

3. SERVICE TO NATIONAL AND INTERNATIONAL ORGANIZATIONS AND PROFESSIONAL SOCIETIES

Grants Reviewer

a. Reviewer, NIH Cancer and Hematologic Disorders Study Section, Population Sciences and Epidemiology Integrated Review Group, October 2024
b. Reviewer, NIH Population based Research in Infectious Disease Study Section, Population Sciences and Epidemiology Integrated Review Group, June 2024

c. Reviewer, NIH The Helping to End Addiction Long-term Initiative (HEAL Initiative), June 2022

d. Reviewer, NSF April 2022

e. Reviewer, Special Emphasis Panel, NIH/NIAID Emergency Awards: Rapid Investigation of Severe Acute Respiratory Syndrome, May 2021

f. Reviewer, NIH HEAL Initiative, June 2019

Service to the Profession

a. Organizing committee, American Statistical Association (ASA) Statistics and the Environment Section Biannual Meeting 2026.

b. President-elect, American Public Health Association (APHA) Applied Public Health Statistics (APHS) section, 2025 – 2026

c. Leadership member, American Public Health Association (APHA) Applied Public Health Statistics (APHS) section, 2023 – Present

d. Committee member, L Harry V. Roberts Statistical Advocate of the Year Award, American Statistical Association (ASA), 2024 – 2025

e. Chapter Representative, Houston Area Chapter of the American Statistical Association (HACASA), 2023 – Present

f. President, Houston Area Chapter of the American Statistical Association (HACASA), 2022-2023

g. President-elect, Houston Area Chapter of the American Statistical Association (HACASA), 2021- 2022

h. Member, American Statistical Association (ASA) Committee of Women in Statistics (CoWIS), 2022 – Present

i. Judge, ASA SBSS 2022 student paper competition, 2022

j. Steering committee member, Cancer Prevention and Control Research Network (CPCRN), October 2021 – 2024

k. Cancer Prevention and Control Research Network (CPCRN) Social Deprivation Workgroup, Co-Chair, 2021– 2023

l. Organizing committee, ASA Eastern North American Region ENAR 2022

m. Organizer, ICSA invited session 'Bayesian analysis of complex survey data', 2020 ICSA 2020 Applied Statistics Symposium, Houston, TX.

n. Member, local organizing committee/Poster session committee, ICSA 2020 Applied Statistics Symposium, Houston, TX, 2020.

o. Volunteer, *StatFest*, The University of Texas Health Science Center at Houston, Houston, TX, 2019

p. Organizer, topic-contributed paper session 'Recent advances in spatial and spatial-temporal analysis', Joint Statistical Meetings (JSM), Denver, US, 2019

q. Co-chair, local organizing committee, 4th International Conference on Big Data and Information Analytics, Houston, TX, 2018

r. Organizer, invited session 'Recent advances in Spatial statistics', The 29th New England Symposium (NESS), University of Connecticut, CT, 2015

Reviewer for Scientific Journals

Journal of American Statistical Association (JASA), Statistics, Politics and Policy (SPP), Spatial Statistics, Spatial and Spatial-temporal Epidemiology (SSTE), Journal of official statistics, Annals of Ap- plied Statistics (AOAS), Journal of Agricultural, Biological, and Environmental Statistics (JABE),

Journal of Royal Statistical Society Series C (JRSSC), Epidemiology, Social Science & Medicine (SSM), Social Science & Medicine Mental Health (SSM-MH), R Journal, Proceedings of the National Academy of Sciences (PNAS).

E. TALKS AND PRESENTATIONS (SELECTED)

- Invited talk: Application of satellite technology and AI to track air pollution impacts on lung cancer. Hang Y, Liu Y, Diner D, & Bauer C. 2025 Annual Lung SPORE Meeting, MD Anderson Cancer Center, Houston, TX, May 2025
- Invited talk: Advancing population health through spatial-temporal analytics: Biostatistical innovations and applications, Southern Methodist University, Dallas, Texas, February 2025
- Oral presentation: From sewage to solutions: the possibilities and implications of wastewater monitoring (Deegan/Hanson/Troisi/Bauer). 2024 Public Health Preparedness Summit, Cleveland, Ohio, March 25-28, 2024
- Oral presentation: Statistical methods to assess regional heterogeneity and representativeness in sample sequencing for a statewide SARS-CoV-2 genomic surveillance system in Texas. 2023 American Public Health Association Annual Meeting and Expo, Atlanta, GA, November 12-15, 2023
- Invited talk: Spatial-temporal data science applications in public health during the COVID-19 pandemic 2024 Houston Area Chapter of the American Statistical Association (HACASA) meeting, Houston, Texas, January 2024
- Invited talk: Identification and quantification of SARS-CoV-2 testing disparities for small area estimation using Bayesian spatial-temporal modeling. 2023 International Chinese Statistical Association (ICSA) Applied Statistics Symposium, Ann Arbor, Michigan, June 11-14, 2023
- Invited panelist: Panel on Careers in Data Science, 2023 International Chinese Statistical Association (ICSA) Applied Statistics Symposium, Ann Arbor, Michigan, June 11-14, 2023
- Invited talk: Bayesian spatiotemporal models for COVID-19 disparities in small area estimation: Application in infectious disease epidemiology. 2023 New England Statistical Society (NESS), Boston, MA, June 3-6, 2023
- Invited talk: Geospatial data science to support local public health departments in COVID-19 control and mitigation. 2023 Alamo Symposium in Statistics, San Antonio, Texas, March 10-11, 2023
- Invited talk: Quantification of chronic disease burden in the continental US counties. Solving critical problems in cancer control using spatial science: A national NCI comprehensive cancer center meeting, University of Southern California, Los Angeles, CA, Jan 18-19, 2023
- Invited talk: Spatial-temporal data science for population health. Social and Health Statistics Seminars, University of Massachusetts Lowell, October 19, 2022
- Invited talk: How two institutions partnered to democratize geospatial data Presenter (Bauer/Ramphul/Strong/Walsh). The Healthier Texas Summit, Austin, Texas, October 20-21, 2022
- Invited talk: Novel quantifications of rest-activity rhythms using 24-hour actigraphy data to inform diabetes status. The Digital Physical Activity and Diet (dPAD) 2022 Fall Symposia. UTHealth School of Public Health, Houston, Texas, September 8-9, 2022
- Invited talk: Stratified space-time infectious disease modeling: with an application to hand, foot and mouth disease in China. London School of Hygiene & Tropical Medicine (LSHTM), London, UK, March 2022
- Invited talk: Geospatial data science support to disease surveillance and the design and implementation of community-based interventions. CPCRN Social Deprivation Interest Group, May 2021
- Invited talk: Geospatial data science support to disease surveillance and the design and implementation of community-based interventions. Department of Epidemiology, MD Anderson Cancer Research Center,

Houston Texas, May 2021.

- Invited talk: Supporting local public health departments in COVID-19 control and mitigation – my humble experience and lessons. ASA North Texas Chapter, November 2020
- Invited talk: Spatial-temporal statistical models: some methods and applications. Department of Mathematics, University of Houston, Houston, TX, February 2019
- Contributed talk: Probabilistic modeling of sleep and awake states in Alzheimer's disease. Contributed e-poster: Using wearable devices to quantify modulation of circadian rhythms. Joint Statistical Meetings (JSM), Vancouver, Canada, August 2018
- Invited talk: Bayesian space-time models for the analysis of infectious disease surveillance data. Department of Biostatistics, Yale University, April 5, 2016
- Invited talk: Spatial-temporal statistical models: some methods and applications. IBM Thomas J. Watson Research Center, September 18, 2015
- Module of Analysis of epidemiological data, Brown-China NIEHS Epidemiology & Biostatistics Workshop, Xi'an China, June 2-5, 2015
- Statistical analysis of the ambient air pollution data in Wuhan, China. China Forum on Public Health, Environment, and Health Policy, Brown University, April 2015
- Session organizer (invited): Recent advances in Spatial statistics. The 29th New England Symposium (NESS), University of Connecticut, April 2015
- Invited talk: The use of sampling weights in Bayesian hierarchical models for small area estimation. Department of Statistics, University of Connecticut, CT, November 2014
- Invited talk: The use of sampling weights in Bayesian hierarchical models for small area estimation. Department of Management Science, Tokyo University of Science, Tokyo, Japan, July 2014
- Invited talk: Bayesian spline models for the analysis of spatial-temporal count data. The 3rd IMS-APRM (Institute of Mathematical Statistics Asia Pacific Rim Meeting), Taipei, Taiwan, July 2014
- Invited talk: Bayesian spatial-temporal models for the analysis of China Hand-foot-mouth surveillance data. China CDC, Beijing, China, June 2014
- Contributed poster: Bayesian spline models for the analysis of spatial-temporal count data. 1st Women in Statistics Conference, Cary, NC, May 2014
- Contributed talk: Space-time models for aggregated infectious disease data with different strains. Joint Statistical Meetings (JSM), Montreal, Canada, August 2013
- Invited: Bayesian spline models for the analysis of spatial-temporal count data. 15th IMS New Researchers Conference, Montreal, Canada, August 2013
- Invited talk: Bayesian spline models for the analysis of spatial-temporal count data (In the session of Recent Development in Spatial Statistics). The 27th New England Symposium (NESS), University of Connecticut, April 2013
- Invited talk: Bayesian modeling of health data in space and time. Department of Mathematics and Statistics, University of Massachusetts Amherst, April 2013
- Invited talk: Spatial statistics and its applications. S4 GIS Institute, Brown University, January 2013
- Contributed poster: Bayesian spline models for the analysis of spatial-temporal count data. Spatial Statistics Conference, University of Miami, December 2012
- Contributed talk: The use of sampling weights in Bayesian hierarchical models for small area estimation. Joint Statistical Meetings (JSM), San Diego, CA, July 2012