

Lei Liu, PhD

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EDUCATION

Ph.D. in Biostatistics, June 2004.

University of Michigan, Ann Arbor, Michigan.

M.S. in Statistics, December 1998.

Virginia Tech, Blacksburg, Virginia.

M.S. in Engineering (major in Industrial Automation), April 1997

Zhejiang University (ZJU), Hangzhou, China.

B.S. in Engineering (major in Scientific Instruments and Engineering), July 1994

Zhejiang University, Hangzhou, China.

ACADEMIC APPOINTMENTS:

Assistant Professor: 08/04 - 06/10, Division of Biostatistics and Epidemiology, Department of Public Health Sciences, University of Virginia School of Medicine.

Associate Professor: 07/10 - 12/11, Division of Biostatistics and Epidemiology, Department of Public Health Sciences, University of Virginia School of Medicine.

Associate Professor: 12/11 – 08/17, Division of Biostatistics and Division of Epidemiology, Department of Preventive Medicine, Northwestern University School of Medicine.

Professor: 09/17-present, Division of Biostatistics, Washington University in St. Louis (WUSTL) School of Medicine.

HONORS AND AWARDS

- Fellow, American Statistical Association (2018).
- Figure 3 in Shih et al. (2017) was shown in a report to the President of the United States from the President's Cancer Panel: Promoting Value, Affordability, and Innovation in Cancer Drug Treatment
- Elected member (2010), International Statistical Institute (ISI).
- Liu et al. (2010) was listed among the most cited *Journal of Health Economics* articles in 2010-15.
- Young Investigator Award, 2004 Joint Statistical Meetings (Statistics in Epidemiology Section).
- Student Paper Competition Award, 2004 International Biometric Society, Eastern North American Region (IBS-ENAR) conference.

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- *The Boyd Harshbarger Outstanding First Year Graduate Student*, Statistics Dept., Virginia Tech.
- Honors program for top 5% matriculates in Zhejiang University, one of the top five universities in China, Certificate of Honor.
- Phi Kappa Phi Academic Honor Society.
- Mu Sigma Rho Statistical Society.

PROFESSIONAL ACTIVITIES

EDITORIAL RESPONSIBILITIES

- Associate Editor (2011-): *Statistics in Medicine*. Handling 15-20 manuscripts each year.
- Editorial Board (2011-): *Frontiers in Psychiatry*.
- Editorial Board (2015-): *Journal of the National Cancer Institute*.
- Associate Editor (2018-): *Biometrics*.
- Associate Editor (2018-): *Biostatistics and Epidemiology*.

EXTRAMURAL MEMBERSHIP

- Member of Committee of Representative, Section G (Biological Sciences) of The American Association for the Advancement of Science (AAAS), 2017-2020
- Biometrics Section Chair, International Chinese Statistical Association (ICSA).
- Board member of International Chinese Statistical Association (ICSA), Midwest chapter.
- Member of Local Committee, 2017 ICSA Applied Statistics Symposium.
- Member of Educational Advisory Committee, International Biometric Society, Eastern North American Region 2013.
- Member of Program Committee: Tenth International Conference on Health Policy Statistics, Chicago 2013
- Co-Founder and Co-chair of Program Committee: Workshop on the Statistical Analysis of Multi-outcome Data.
 - 1st Workshop: Université Pierre-et-Marie-Curie (Paris VI), Paris. July 2012.
 - 2nd Workshop: Cambridge University, UK. July 2014.
 - 3rd Workshop: People's University of China, Beijing. July 2016.
 - 4th Workshop: Washington University in St. Louis. June 2018.
- Member of Program Committee: The 2nd Conference on Lifetime Data Science. Pittsburgh 2019.

REVIEW RESPONSIBILITIES

Grant Review:

- NIH: BMRD (Biostatistical Methods and Research Design) Standing Member 2016-2022
- RFA 1I21 CU0001 VA Cooperative Studies Program Network of Dedicated Enrollment Sites (2011). Veteran Affairs Health System.

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- Italian Competition for Targeted Research Funding Call Grant (2012, 2013, 2014). Department of Public Health and Innovation, Ministry of Health, Republic of Italy.
- Italian Medicines Agency (AIFA). Ministry of Health, Republic of Italy. 2015.
- American Heart Association. Genomics & Translational Epidemiology & Observational Epidemiology – Population Science 2 Study Section (2013).
- Medical Research Council, UK. 08/2017
- NIH: ZRG1 HDM (Healthcare Delivery and Methodologies): ad hoc member for sessions Q58 (10/2014), T2 (06/2013), Q52 (06/2014), Y55 (11/2015), Y58 (10/2015, 01/2016), W02 (06/2015), W03 (03/2016), 06/2016.
- NIH: CLHP (Community-Level Health Promotion Study Section): ad hoc member, 02/2015
- NIH: BMRD (Biostatistical Methods and Research Design): ad hoc member (06/2014, 02/2015, 06/2015).
- Northwestern University Data Science Research Support (2016-17).
- WUSTL ICTS Pilot Grant (2017)
- NSERC, Canada (2018)
- Innovative Methodology Pilot Grant: Indiana University, University of Miami (2019).

Review for Invited Sessions:

- AAAS 2019 Conference

Review for Student Paper Contest:

- Byar Award Review Committee, Joint Statistical Meeting (JSM) 2017
- Health Policy Statistics Section, JSM 2016
- Mental Health Statistics Section, JSM 2016

Review for Statistical Journals:

Journal of American Statistical Association, Journal of Royal Statistical Society Series B, Biometrika, Biometrics, Biostatistics, Statistics in Medicine, Statistical Methods in Medical Research, Lifetime Data Analysis, Journal of Computational and Graphical Statistics, Bioinformatics, BMC Bioinformatics, Journal of Statistical Software, Canadian Journal of Statistics, Scandinavian Journal of Statistics, Contemporary Clinical Trials, Journal of Statistical Planning and Inference, International Journal of Biostatistics, American Statistician, Computational Statistics and Data Analysis, Statistics and Its Interface, Communications in Statistics - Theory and Methods, Communications in Statistics - Simulation and Computation, Journal of Probability and Statistics, Computer Methods and Programs in Biomedicine, Science in China, Journal of Statistical Theory and Practice, Contemporary Clinical Trials Communications, Statistics and Probability Letters.

Review for Health Services Research & Health Economics Journals:

Journal of Applied Econometrics, Health Economics, Pharmacoeconomics, Health Services and Outcomes Research Methodology, Expert Review of Pharmacoeconomics

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& Outcomes Research, Multivariate Behavioral Research, Medical Decision Making, Value in Health, Journal of Mental Health Policy and Economics, BMC Health Services Research.

Review for Clinical and Epidemiological Journals:

JAMA Psychiatry, Nature Scientific Reports, American Journal of Epidemiology, Annals of Epidemiology, Obesity, Journal of National Cancer Institute, BMC Public Health, Circulation: Cardiovascular Quality and Outcomes, Journal of Immigrant and Minority Health, Frontiers in Addictive Disorders, Biomarker Research.

Book Review:

Elsevier (2009), CRC (2017).

Provide Reference Letters for Promotion and Tenure

Wrote reference letters for Promotion and Tenure for faculty members in: Dartmouth College, Washington University in St. Louis, University of Texas School of Public Health, Ohio State University, University of Colorado, Michigan State University, and West Virginia University.

INSTITUTIONAL SERVICE

Washington University in St. Louis

- Co-leader of Biostatistics, Epidemiology and Research Design (BERD) Core in the Institute of Clinical and Translational Sciences

Northwestern University

- Judge of Research Day Poster Competition 2015.
- Member of Admission Committee, Master's Program in Epidemiology and Biostatistics (since 2013).
- Member of Medical Faculty Council (since 2012)
- Member of Health Sciences Integrated PhD Program Committee (2012-13)
- Full Member, Robert H. Lurie Comprehensive Cancer Center of Northwestern University (since 2012)

University of Virginia

- Member of Division Director Search Committee, Division of Biostatistics (2011).
- Initiator and organizer of the Seminar Series in the Division of Biostatistics (2004-07).

TEACHING

- Intermediate Biostatistics (Fall 2013, 2014). 3 credits.
- Applied Biostatistical Data Analysis (Spring 2010, 2011). 3 credits.

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- Biostatistical Consulting Practice (Fall 2010). 1 credit.
- Guest lecture: Advanced Statistical Methods of Medical Cost Data. Taught in course PP 44810 “Advanced Methods for Comparative Effectiveness Research” at University of Chicago.
- Introduction to Biostatistics II: Lectures in Log rank test and Cox model

Short Courses:

- In the CARDIA workshop, February 2013.
 - a. Joint model of longitudinal and survival data
 - b. Latent class of longitudinal data
 - c. Time varying coefficient model for recurrent event data
- Analysis of Zero-inflated Continuous Data. International Conference of Health Policy Statistics in October 2013.
- Analysis of Zero-inflated Continuous Data. Joint Statistical Meetings in August 2016. Rate: 4.3/5.
- Joint Modeling of Multi-outcome Data. 2018 Workshop on the Statistical Analysis of Multi-outcome Data. Co-teach with Guoqiao Wang.
- Analysis of Medical Cost Data: Statistical and Econometric Tools. ENAR in March 2019. Co-teach with Tina Shih.

STUDENTS ADVISING

- Yue Liu (Advisor), PhD student, Department of Statistics, University of Virginia (2010-12).

Dissertation: Joint Latent Class Modeling in Longitudinal and Survival Processes.
Current Position: Merck.
- Grace Yoon (co-Advisor), PhD student, Department of Statistics, Northwestern University (2015-17)

Dissertation: Topics of Variable Selection in Biomedical Data Mining

Poster “Ultra-high Dimensional Variable Selection with Application to Normative Aging Study: DNA Methylation and Metabolic Syndrome” was awarded “Honorable Mention” in 2016 ICSA Midwest Chapter Meeting.
- Elliot Asare (Advising Committee Member). Medical Fellow, 2014-15.
- Margaret Yu (Area of Scholarly Concentration (AoSC) mentor). Medical Student, 2014-15.
- Delia Voronca (External Committee Member). PhD Student in Biostatistics, Medical University of South Carolina, 2014-16.

GRANT AWARDS

Ongoing Research Support

- R21 AG063370 Liu (Contact PI), Hou
National Institute of Aging

05/01/2019-04/30/2021

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High Dimensional Mediation Analysis for DNA Methylation Markers Mediating Cardiovascular Health Metrics and Cardiovascular Diseases

DNA methylation alterations have been widely studied as mediators of environmentally-induced disease risks. With new advances in technique, epigenome-wide DNA methylation data (EWAS) has become the new standard for epigenetic studies in human populations. However, to date most epigenetic studies of mediation effects only involve selected (gene-specific) candidate methylation markers. There is an urgent need for appropriate analytical methods for EWAS mediation analysis. In this proposal, we focus on developing and validating new analytical approaches to high-dimensional mediation analysis for DNA methylation studies. Our discoveries may identify the mechanisms by which DNA methylation mediates the effects of environmental exposures on health outcomes.

Role: Contact PI

- R01 HL136942 Zhao (PI)
NIH/NHLBI 04/01/2017– 03/31/2021
Methods to Improve Personalized Cardiovascular Disease Prevention Across the Life Course

The overall objective of this proposal is to develop methods for improving personalized CVD prevention across the life course. CVD risk prediction plays a central role in clinical CVD prevention strategies, by aiding decision making for lifestyle modification and/or to match the intensity of therapy to the absolute risk of a given patient. We will develop robust methods to improve the prediction of personalized blood pressure-lowering and cholesterol-lowering benefit with respect to CVD risk reduction as well as life expectancy lived free of CVD and life expectancy lived with CVD across the life course.

Role: Subcontract PI

- UL1 TR002345 Evanoff (PI)
NIH 06/19/2017 – 02/28/2021
Washington University Institute of Clinical and Translational Sciences

The Clinical and Translational Science Award (CTSA) is the main funding source for the Washington University Institute of Clinical and Translational Sciences (ICTS). The overall goal of this application is to accelerate advances in human health by engaging multiple stakeholders in the translation of scientific discoveries to drive improvements in health among diverse populations. Our proposal will improve clinical research through high quality and efficient methods/processes, develop a trained workforce skilled in team science, and disseminate research findings into real-world implementation to improve health and health care for patients, communities, and the nation.

Role: Co-lead of BERD Core

- UG1 EY025181 (Gordon)

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NIH/NEI

07/01/2015 – 06/30/2020

Ocular Hypertension Treatment Study 20-Year Follow Up: Coordinating Center Grant

Re-examine all surviving OHTS participants at 20 years or more. Determine the incidence and severity of POAG in the OHTS cohort and determine the frequency and the severity of self-reported functional limitations associated with POAG. Develop a 20-year prediction model for stratifying OHT patients by their risk of developing POAG and, among those who developed POAG, a prediction model for the rate of visual field loss.

Role: Co-Investigator

- R01 HD095986 (Stout and Wylie)

National Institute of Child Health & Human Development 09/12/2018-08/31/2023

The Vaginal Microbiome, Maternal Response, and Preterm Birth

Recent studies show that specific bacterial communities that can be detected early in pregnancy are associated with preterm birth. Although pregnancy alters viral infection dynamics, the influence of vaginal viral communities on preterm birth has not been investigated. We plan to analyze the comprehensive vaginal bacterial and viral communities longitudinally over pregnancy simultaneously with the maternal host response in women who deliver preterm compared with those who deliver at term. We hypothesize that defining microbial communities or host response alone is incomplete, but the combination will help outline definitions of appropriate and inappropriate maternal-microbe biology, and will shed new light on the old problem of PTB.

Role: Co-Investigator

- R01 CA225647 (Shih)

NIH/NCI

Targeted Oral Anticancer Agents: Patterns of Indicated and Off-Label Use, the Associated Factors, and Economic Implications

Role: Co-Investigator (effort starts in Y2)

Pending Research Support as PI

- UG1 EY030038 Gordon (Contact PI)

National Eye Institute

04/01/2019-03/31/2024

Priority Score: 22

Optical Coherence Tomographic Angiography Progression Analysis Study (OCTAPAS)

Optical coherence tomographic angiography is a new technology that allows the most precise clinical measurement of retinal circulation currently available. The Optical Coherence Tomographic Angiography Progression Analysis Study is a multi-center, observational diagnostic clinical trial that will determine if this novel method can improve the prediction and monitoring of glaucoma progression over current standard clinical evaluation tools.

Role: MPI

Past Research Support as PI

- R01 HS020263 Liu (contact PI), Shih

Agency for Healthcare Research and Quality 09/30/2011-08/31/2016

Funded on 1st review: Priority Score: 20; Percentile: 2.0. Total cost: \$ 2.04M.

Innovative methods for modeling longitudinal medical costs

Rising health care costs are a major concern for health policy makers. To better understand the factors associated with the growth in medical costs, it is important to study the longitudinal history of medical cost data. We developed innovative methods to capture the temporal trend of longitudinal medical care costs, and more flexibly describe the impact of risk factors on medical costs. To demonstrate the advantages of our proposed methods in clinical or policy decision making, we applied these methods to a number of clinical- or policy-relevant case studies.

Role: Contact PI

- RC1 AA019274 Liu (Contact PI), O'Quigley and Johnson

National Institute on Alcohol Abuse and Alcoholism 09/30/2009-08/31/2011

Innovative Analytic Methods of Person-Centered Data and Adaptive Designs for Alcohol Treatment Research

In this grant proposal we proposed and applied several innovative models to analyze person-centered data for alcohol treatment research. We also introduced new adaptive designs to identify optimal dose in a cost-effective way.

Role: Contact PI.

- 1 R03 HS016543 Liu (PI)

Agency for Healthcare Research and Quality

08/01/2007-07/31/2009

Statistical Analysis of Longitudinal Medical Cost Data

The objective of this grant was to develop new statistical models and methods to analyze longitudinal medical cost data, e.g., monthly or other medical cost data collected over time. Our methods would make health economic analyses more efficient and interpretation more comprehensive, insightful, and useful.

Role: PI

PUBLICATIONS:

A. Original Investigations

Peer Reviewed Papers in Statistical Methodology

1. **Liu, L.**, Wolfe, R. A., and Huang, X. (2004). Shared frailty models for recurrent events and a terminal event. *Biometrics* **60**, 747-756. PMID: 15339298.
2. **Liu, L.**, Wolfe, R. A., and Kalbfleisch, J. D. (2007). A random effects model for censored medical costs. *Statistics in Medicine* **26**, 139-155. PMID: 16526006
3. Huang, X. and **Liu, L.** (2007). A joint frailty model for survival time and gap times between recurrent events. *Biometrics* **63**, 389-397. PMID: 17688491
4. **Liu, L.**, Huang, X. and O’Quigley, J. (2008). Analysis of longitudinal data in the presence of informative observational times and a dependent terminal event, with application to medical cost data. *Biometrics* **64**, 950-958. PMID: 18162110
5. **Liu, L.**, Conaway, M. R., Knaus, W. A. and Bergin, J. (2008). A random effects four-part model, with application to correlated medical costs. *Computational Statistics and Data Analysis* **52**, 4458-4473.
6. **Liu, L.**, Ma, J. Z., and O’Quigley, J. (2008). Joint analysis of multi-level repeated measures data and survival: an application to the end stage renal disease (ESRD) data. *Statistics in Medicine* **27**, 5679–5691. PMID: 18693300
7. **Liu, L.**, and Huang, X. (2008). The use of Gaussian quadrature in frailty proportional hazards models. *Statistics in Medicine* **27**, 2665-2683. PMID: 17910008
8. **Liu, L.**, and Yu, Z. (2008). Likelihood reformulation method in non-normal random effects models. *Statistics in Medicine* **27**, 3105-3124. PMID: 18038445
9. **Liu, L.**, Ma, J. Z., and Johnson, B. (2008). A multi-level two-part random effects model, with application to an alcohol dependence study. *Statistics in Medicine* **27**, 3528-3539. PMID: 18219701
10. **Liu, L.** (2009). Joint modeling longitudinal semi-continuous data and survival, with application to longitudinal medical cost data. *Statistics in Medicine* **28**, 972-986. PMID: 19040210
11. **Liu, L.** and Huang X. (2009). Joint analysis of correlated repeated measures and recurrent events processes in the presence of a dependent terminal event. *Journal of Royal Statistical Society Series C: Applied Statistics* **58**, 65-81.
Selected as “Don’t miss these papers” in the Journal of Royal Statistical Society’s website (the only paper in this issue).
12. **Liu, L.**, Strawderman, R., Cowen, M., and Shih, T. (2010). A flexible two-part random effects model for correlated medical costs. *Journal of Health Economics* **29**, 110-123. PMCID: PMC2824028
Listed as one of the most cited *Journal of Health Economics* articles in 2010-2015

13. Yu, Z. and **Liu, L.** (2011). A joint model of recurrent events and a terminal event with a nonparametric covariate function. *Statistics in Medicine* **30**, 2683-2695.
14. Sun, L., Song, X., Zhou, J. and **Liu, L.** (2012). Joint analysis of longitudinal data with informative observation times and a dependent terminal event. *Journal of American Statistical Association: Theory and Method* **107**, 688-700.
15. Yu, Z., **Liu, L.**, Bravata, D. M., Williams, L.S. and Tepper, R.S. (2013). A semiparametric recurrent events model with time-dependent coefficients. *Statistics in Medicine* **32**, 1016-1026.
16. Chen, J., **Liu, L.***, Johnson, B. A., and O'Quigley, J. (2013). Penalized likelihood estimation for semiparametric mixed models, with application to alcohol treatment research. *Statistics in Medicine*. **32**, 335-46. PMID: 22833388 (*: Corresponding Author, the first author is a postdoc under my supervision)
17. Chen, J., **Liu, L.***, Zhang, D., and Shih, T. (2013). A flexible model for the mean and variance functions, with application to medical cost data. (*: Corresponding Author, the first author is a postdoc under my supervision). *Statistics in Medicine* **32**, 4306-4318. PMCID: PMC4669967
18. Yu, Z., **Liu, L.**, Bravata, D. M., Williams, L.S. (2014). A joint model of recurrent events and a terminal event with time-varying coefficients. *Biometrical Journal*. **56**, 183-97
19. Zhao X., Deng S., Liu L., **Liu, L.** (2014). Sieve estimation in semiparametric modeling of longitudinal data with informative observation times. *Biostatistics*. **15**, 140-153.
20. Han, M., Song, X. Y., Sun, L., **Liu, L.** (2014). Joint modeling of longitudinal data with informative observation times and dropouts. *Statistica Sinica*. **24**, 1487-1504.
21. Chen, J., Kim, I., Terrell, G. R., **Liu, L.** (2014). Generalized partial linear single-index mixed models for repeated measures data. *Journal of Nonparametric Statistics*. **26**, 291-303.
22. Kang J., Su, X., **Liu, L.**, and Daviglus, M. L. (2014). Causal inference of interaction effects with inverse propensity weighting, G-computation and tree-based standardization. *Statistical Analysis and Data Mining*. **7**, 323-336.
23. Zheng, Y., Fei, Z., Zhang, W., Starren, J. B., **Liu, L.**, Baccarelli A., Li, Y., Hou, L. (2014). PGS: a tool for association study of high-dimensional microRNA expression data with repeated measures. *Bioinformatics*. **19**, 2802-2807.
24. Chen, X., Sun, J., **Liu, L.** (2015). Semiparametric partial linear quantile regression of longitudinal data with time-varying coefficients and informative observation times. *Statistica Sinica*. **25**, 1437-1458
25. Liu, Y., **Liu, L.***, Zhou, J. (2015). A joint latent class model of survival and longitudinal data. *Computational Statistics & Data Analysis*. **91**, 40-50. (The first author is a PhD student under my supervision).
26. **Liu, L.***, Huang, X., Yaroshinsky, A., Cormier, J. (2016). Joint frailty models for zero-inflated recurrent events in the presence of a terminal event. *Biometrics*. **72**, 204-214. PMID: 26295794

27. Chen, J., **Liu, L.***, Shih, T., Zhang, D., Severini, T. (2016). A flexible model for correlated medical costs, with application to medical expenditure panel survey data. *Statistics in Medicine* **35**, 883-894. PMID: PMC5025040 (*: Corresponding Author, the first author is a postdoc under my supervision).
28. **Liu, L.***, Strawderman, R. L., Johnson, B. A., O'Quigley, J.M. (2016). Analyzing repeated measures semi-continuous data, with application to an alcohol dependence study. *Statistical Methods in Medical Research*. **25**, 133-152. PMID: 22474003
29. Han, M., Song, X., Sun, L, **Liu, L.** (2016). An additive-multiplicative means model for marker data contingent on recurrent event with an informative terminal event. *Statistica Sinica*. **26**, 1197-1206.
30. Dagne, G. A., Brown, C. H., Howe G., Kellam, S. G., **Liu, L.** (2016). Testing moderation in network meta-analysis with individual participant data. *Statistics in Medicine*. **35**, 2485–2502. PMID: PMC4893003
31. Zhang, H., Zheng, Y., Zhang, Z., Gao, T., Joyce, B., Yoon, G., Zhang, W., Schwartz, J., Just, A., Colicino, E., Vokonas, P., Baccarelli, A., Hou, L., **Liu, L.***. (2016). Estimating and testing high-dimensional mediation effects in epigenetic studies. *Bioinformatics*. **32**, 3150-3154. PMID: PMC5048064 (*: Corresponding Author. The first author is a postdoc under my supervision)
32. Qu, L., Sun, L., **Liu, L.** (2017). Joint modeling of recurrent and terminal events using additive models. *Statistics and Its Interface*. **10**, 699-710.
33. Yoon, G., Zheng, Y., Zhang, Z., Zhang, H., Gao, T., Joyce, B., Zhang, W., Guan, W., Baccarelli, A., Jiang, W., Schwartz, J., Vokonas, P., Hou, L., **Liu, L.***. (2017). Ultra-high dimensional variable selection with application to normative aging study: DNA methylation and metabolic syndrome. *BMC Bioinformatics*. **18**:156. PMID: PMC5340011 (*: Corresponding Author. The first author is a PhD student under my supervision)
34. **Liu, L.**, Sun, Z. (2017). Kernel-based global MLE of partial linear random effects models for longitudinal data. *Journal of Nonparametric Statistics*. **29**, 615-635.
35. Voronca, D., Gebregziabher, M., Durkalski, V., **Liu, L.**, Egede, L. (2017). MTPmle: A SAS Macro and Stata Programs for Marginalized Inference in Semi-Continuous Data. *Journal of Statistical Software*. Accepted.
36. Zhang H, Zheng Y, Yoon G, Zhang Z, Gao T, Joyce B, Zhang W, Schwartz J, Vokonas P, Colicino E, Baccarelli A, Hou L, **Liu L.***. (2017). Regularized Estimation in Sparse Multivariate Regression with High-dimensional Responses. *Statistical Applications in Genetics and Molecular Biology*. **16**, 159-171 (*: Corresponding Author. The first author is a post doc under my supervision). PMID: PMC5812465
37. Li, Z., Frost, H., Bakitas, M., Zhao, L., **Liu, L.**, Lyons, K., Chen, H., Cole, B., Currow, D., Tosteson. T. (2017). A Semiparametric Joint Model for Longitudinal and Survival Data in End-of-Life Studies. *Statistics in Medicine*. **36**, 4692-4704. PMID: PMC5698117
38. Su, X., Pena, A., **Liu, L.**, Levine R. A. (2018). Random forests of interaction trees for estimating individualized treatment effects in randomized trials. *Statistics in Medicine*. **30**, 2547-2560. PMID: PMC6028297

39. Zhao, X., Xu, G., **Liu, L.***, Shih, TYC. (2018). Partially Nonlinear Single-index Quantile Regression Model with Application to Medical Costs. *Statistics in Medicine*. **37**, 2645-2666. PMID: 29722044 (*: Corresponding Author)
40. **Liu L***, Zheng C, Kang J. (2018). Causality in the joint analysis of longitudinal and survival data. *Statistics in Medicine*. Accepted.
41. Han D, **Liu L***, Su X, Johnson B, Sun L. (2018). Variable selection for random effects two-part model. *Statistical Methods in Medical Research*. Accepted. (*: Corresponding Author)
42. Chai HT, Jiang HM, Lin L, **Liu L.*** (2018). A Marginalized Two-Part Beta Regression Model for Microbiome Compositional Data. *PLOS Computational Biology*. **14**(7):e1006329. PMID: PMC6072097 (*: Corresponding Author. The first author is a student under my supervision)
43. **Liu, L.***, Shih, YCT, Strawderman RL, Zhang, DW, Johnson, B., Chai, HT. (2018). Statistical analysis of zero-inflated continuous data: a review. *Statistical Science*. Accepted.
44. Huang, X., **Liu, L.**, Ning, J., Li, L., Shen, Y. Estimation of the Distribution of Longitudinal Biomarker Trajectories Prior to Disease Progression. *Statistics in Medicine*. Accepted.
45. Lu, E., **Liu, L.**, Colditz, G. (2019). Optimal designs in three-level cluster randomized trials with a binary outcome. *Statistics in Medicine*. Accepted.
46. Yoon, G., Jiang, W., Liu L., Shih YCT. Robust Bayesian variable selection for modeling mean medical costs. *International Journal of Biostatistics*. Accepted.

Peer Reviewed Papers in Statistical Applications

47. Perlman, R. L., Kiser, M., Finkelstein, F., Eisele, G., Roys, E., **Liu, L.**, Burrows-Hudson, S., Port, F., Messana, J. M., Bailie, G., Rajagopalan, S., Saran R. (2003). The longitudinal chronic kidney disease study: a prospective cohort study of pre-dialysis renal failure. *Seminar in Dialysis* **16**, 418-423.
48. Ilag, L., Kronick, S., Ernst, R., Grondin, L., Alaniz, C., **Liu, L.**, Herman, W. (2003). Impact of a critical pathway on inpatient management of diabetic ketoacidosis. *Diabetes Research and Clinical Practice* **62**, 23-32.
49. Perlman, R. L., Finkelstein, F., **Liu, L.**, Roys, E., Kiser, M., Eisele, G., Burrows-Hudson, S., Messana, J. M., Levin, N., Rajagopalan, S. R., Port, F. K., Wolfe, R. A., Saran, R. (2005). Quality of Life in Chronic Kidney Disease (CKD): a Cross-sectional Analysis in the Renal Research Institute-CKD Study. *American Journal of Kidney Disease* **45**. 658-666.
50. Bailie, G., Eisele, G., **Liu, L.**, Roys, E., Kiser, M., Finkelstein, F., Wolfe, R., Port, F., Burrows-Hudson, S., Saran, R. (2005). Patterns of Medication use in the RRI-CKD Study: Focus on Medications with Cardiovascular Effects. *Nephrology Dialysis Transplantation* **20**. 1110-1115.
51. Li, Y., Oskouian, R. J., Day, Y., Rieger, J. M., **Liu, L.**, Kern, J. A., and Linden, J. (2006). Mouse spinal cord compression injury is reduced by either activation of the adenosine A_{2a} receptor on bone marrow-derived cells or deletion of the A_{2a} receptor on non-bone marrow-derived cells. *Neuroscience*. **141**, 2029-2039.

52. Zaman, K., Carraro, S., Doherty, J., Henderson, E. M., Lendermon, E., **Liu, L.**, Verghese, G., Zigler, M., Ross, M., Park, E., Palmer, L., Doctor, A., Stamler, J., Gaston, B. (2006). S-nitrosylating agents: a novel class of compounds that increase CFTR expression and maturation in epithelial cells. *Molecular Pharmacology* **70**. 1435-1442.
53. Gaston, B., Kelly, R., Urban, P., **Liu, L.**, Teague, W. G., Fitzpatrick, A., Erzurum, S., Hunt, J. F. (2006). Buffering airway acid decreases exhaled nitric oxide in asthma. *Journal of Allergy and Clinical Immunology*. **118**, 817-822.
54. Johnson, B.A., Roache, J.D., Ait-Daoud, N., Wells, L.T., Wallace, C.L., Dawes, M.A., **Liu, L.**, Wang, X.-Q. (2007). Effects of acute topiramate dosing on methamphetamine-induced subjective mood. *The International Journal of Neuropsychopharmacology*, **10** (1): 85-98.
55. Johnson, B.A., Roache, J.D., Ait-Daoud, N., Wells, L.T., Wallace, C.L., Dawes, M.A., **Liu, L.**, Wang, X.-Q. (2007). Effects of topiramate on methamphetamine-induced changes in attentional and perceptual-motor skills of cognition in recently abstinent methamphetamine-dependent individuals. *Progress in Neuro-Psychopharmacology and Biological Psychiatry* **31** (1): 123-130
56. Johnson, B.A., Wells, L.T., Roache, J.D., Wallace, C.L., Ait-Daoud, N., Dawes, M.A., **Liu, L.**, Wang, X.-Q., Javors, M.A. (2007). Kinetic and cardiovascular effects of acute topiramate dosing among non-treatment-seeking, methamphetamine-dependent individuals. *Progress in Neuro-Psychopharmacology and Biological Psychiatry* **31**, 455-461.
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101. Shen, C., Shih, T., Zhao, B., **Liu, L.** (2018). Adherence to tyrosine kinase inhibitors among Medicare Part D beneficiaries with chronic myeloid leukemia. *Cancer*. **124**, 364-373. Cited in a report to the President of the United States from the President's Cancer Panel
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105. Vu, T.H., Zhao, Z., **Liu, L.**, Schiman, C., Lloyd-Jones, D.M., Daviglius, M.L., Liu, K., Garside, D.B., Stamler, J., Fries, J.F., Shih, Y.C.T., Allen, N.B. (2018). Favorable Cardiovascular Health at Young and Middle Ages and Dementia in Older Age - The Chicago Heart Association Detection Project in Industry Study (CHA). *Journal of the American Heart Association*. Accepted.

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106. Cuiping Schiman; Lei Liu; Ya-Chen Tina Shih; Lihui Zhao; Martha Daviglus; Kiang Liu; James Fries; Daniel Garside; Thanh-Huyen Vu; Jeremiah Stamler; Donald Lloyd-Jones (2018). Cardiovascular Health in Young and Middle Adulthood and Medical Care Utilization and Costs at Older Age - The Chicago Heart Association Detection Project Industry (CHA). *Preventive Medicine*. Accepted.

B. Reviews, Case Reports, Letters, Editorials

1. Gharibvand, L. and **Liu, L.** (2009). Analysis of survival data with clustered events. SAS Global Forum 2009. Paper 237-009, available at <http://support.sas.com/resources/papers/proceedings09/237-2009.pdf>.
The first author is a graduate student in Statistics, University of California, Riverside. She won a travel award for this paper and presented it in SAS Users Group International (SUGI) Conference. Cited 24 times (Google Scholar).
2. **Liu, L.** and Ma, J. Z. (2011). Letter to Editor. *Statistical Methods in Medical Research* **20**, 445.

C. Books and Book Chapters

1. Liu, Y. and **Liu, L.*** (2015). Joint models for longitudinal and time-to-event occurrence. Book chapter in the *Routledge International Handbook of Advanced Quantitative Methods in Nursing Research*, edited by Susan Henly. 253-263. (*: Corresponding author, the first author is a PhD student under my supervision).

D. Manuscripts Submitted.

1. Krebs, E., Min, J., Evans, E., Li, L., **Liu, L.**, Huang, D., Urada, D, Kerr, T., Hser, Y., Nosyk, B. Estimating state transitions for opioid use disorders. Submitted.
2. Shen, C., Shih, T., Zhao, B., **Liu, L.** Low income subsidy status outweighs insurance cost-sharing in predicting adherence to tyrosine kinase inhibitors among Medicare Part D beneficiaries with chronic myeloid leukemia. Submitted.
3. Yinan Zheng, PhD; Brian T. Joyce, PhD; Lei Liu, PhD; Zhou Zhang, PhD; Warren A. Kibbe, PhD; Wei Zhang, PhD; Lifang Hou (2017). Prediction of genome-wide DNA methylation in repetitive elements. Submitted.
4. Yinan Zheng, Cong Liu, Brian T. Joyce, Marco Sanchez-Guerra, Zhou Zhang, Wei Zhang, Lei Liu, Tao Gao, Jun Wang, Warren A. Kibbe, Akin Cayir, Hannah Laue, Allan C. Just, Jincheng Shen, Pantel Vokonas, Joel Schwartz, Sanjiv J. Shah, Andrea A. Baccarelli, Lifang Hou. Epigenetics of Nuclear-Mitochondrial Genes and Mitochondrial DNA Oxidative Damage. Submitted.
5. Gao, Tao; Joyce, Brian; Kresovich, Jacob; Zheng, Yinan; Liu, Lei; Sparrow, David; Vokonas, Pantel ; Schwartz, Joel ; Baccarelli, Andrea A; Dai, Qi; Hou,

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- Lifang. Dietary Intakes of Calcium and Magnesium and Lung Function in the Normative Aging Study. Submitted.
6. Zheng, Yinan; Joyce, Brian; Liu, Lei; Zhang, Zhou; Kibbe, Warren; Zhang, Wei; Hou, Lifang. Prediction of genome-wide DNA methylation in repetitive elements. Submitted.
 7. Yue Liu, Ye Lin, Jianhui Zhou, and Lei Liu. A Semi-parametric Joint Latent Class Model with Longitudinal and Survival Data. Submitted.
 8. Haixiang Zhang, Jun Chen, Zhigang Li, and Lei Liu. Estimating and testing targeted mediation effect in the presence of high-dimensional mediators. Under revision.
 9. Jingxia Liu, Chengjie Xiong, Lei Liu, Guoqiao Wang, Jingqin Luo, Feng Gao, Ling Chen, Yan Li. Relative efficiency of equal versus unequal cluster sizes in cluster randomized trials with finite clusters. Submitted.
 10. Haixiang Zhang, Lifang Hou, Lei Liu. A Selective Review of High-dimensional Mediation Analyses in DNA Methylation Studies. Book Chapter. Submitted.
 11. Han D, Su X, Sun L, Zhang Z, **Liu L*** (2018). Variable selection in joint frailty models of recurrent and terminal events. Submitted.
 12. Wei Y, **Liu L**, Su X, Zhao L, Johnson B, Jiang H. Interaction tree for longitudinal trajectories. Submitted. (The first author is a student under my co-supervision)

DEPARTMENT SEMINARS AND INVITED CONFERENCE TALKS:

1. Testing Mediation Effect in High-dimensional Compositional Microbiome Data. April 2019. Department of Biostatistics. St. Jude Children Research Hospital. Invited Department Seminar.
2. Variable selection in joint frailty models of recurrent and terminal events. ENAR. March 2019. Philadelphia, PA. Invited Conference Talk.
3. Testing Mediation Effect in High-dimensional Compositional Microbiome Data. February 2019. Workshop on the Role of Genomics and Metagenomics in Human Health: Recent Developments in Statistical and Computational Methods. Banff, Canada. Invited Conference Talk.
4. Mediation Effect in High-dimensional Compositional Microbiome Data. January 2019. Department of Statistics. Purdue University. Invited Department Seminar.
5. Mediation Effect in High-dimensional Compositional Microbiome Data. December 2018. Department of Applied Mathematics. Hong Kong Polytechnic University. Invited Department Seminar.
6. Testing Mediation Effect in High-dimensional Compositional Microbiome Data. November 2018. Department of Biostatistics. University of North Carolina, Chapel Hill. Invited Department Seminar.
7. Testing Mediation Effect in High-dimensional Compositional Microbiome Data. November 2018. Department of Biostatistics. University of Texas School of Public Health. Houston, TX. Invited Department Seminar.
8. Testing Mediation Effect in High-dimensional Compositional Microbiome Data. November 2018. IMA Workshop on Statistical and Computational Challenges in Precision Medicine. Minneapolis, MN. Invited Conference Talk.
9. Robust Bayesian variable selection for modeling mean medical costs. July 2018. Joint Statistical Meetings. Vancouver, Canada. Invited Conference Talk.
10. Variable selection for random effects two-part model. July 2018. Center of Applied Mathematics. Tianjin University. Tianjin, China. Invited Department Seminar.
11. Variable selection for random effects two-part model. July 2018. Institute of Applied Mathematics, Chinese Academy of Science. Beijing, China. Invited Department Seminar.
12. Exploring causality mechanism in the joint analysis of longitudinal and survival data in clinical trials. July 2018. The 8th International Statistics Forum. Renmin (People's) University of China. Beijing, China. Invited Conference Talk.
13. A marginalized two-part beta regression model for microbiota compositional data. June 2018. Department of Biostatistics. Shandong University. Jinan, Shandong, China. Invited Department Seminar.

14. Variable selection for random effects two-part model. June 2018. Department of Statistics. Shandong University. Jinan, Shandong, China. Invited Department Seminar.
15. Variable selection for random effects two-part model. June 2018. The 2nd International Conference on Econometrics and Statistics (EcoSta 2018). Hong Kong. Invited Conference Talk.
16. Variable selection for random effects two-part model. June 2018. Department of Preventive Medicine. Northwestern University. Chicago, IL. Invited Department Seminar.
17. Robust Bayesian variable selection for modeling mean medical costs. May 2018. CHMPAS. New Haven, CT. Invited Conference Talk.
18. Exploring causality mechanism in the joint analysis of longitudinal and survival data. March 2018. ENAR. Atlanta, GA. Invited Conference Talk.
19. Variable selection for random effects two-part model. February 2018. Department of Biostatistics. University of Florida. Gainesville, FL. Invited Department Seminar.
20. Variable selection for random effects two-part model. January 2018. Division of Biostatistics. University of Pennsylvania. Philadelphia, PA. Invited Department Seminar.
21. Exploring causality mechanism in the joint analysis of longitudinal and survival data. November 2017. Department of Mathematics, Statistics, and Computer Science. University of Illinois, Chicago. Invited Department Seminar.
22. Variable selection for random effects two-part model. September 2017. ICSA Midwest Conference. Glenview, IL. Invited Conference Talk.
23. Variable selection for random effects two-part model. September 2017. Department of Mathematics. Washington University in St. Louis. St. Louis, MO. Invited Department Seminar.
24. Regularized estimation in sparse multivariate regression with high-dimensional responses. June 2017. 2017 ICSA Applied Statistical Symposium. Chicago, IL. Invited Conference Talk.
25. A marginalized two-part beta regression model for microbiota compositional data. June 2017. Department of Epidemiology and Biostatistics. Zhejiang University. Hangzhou, Zhejiang, China. Invited Department Seminar.
26. A marginalized two-part beta regression model for microbiota compositional data. June 2017. Department of Statistics. Shandong University. Jinan, Shandong, China. Invited Department Seminar.

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27. Causality in the joint analysis of longitudinal and survival data. June 2017. The 1st International Conference on Econometrics and Statistics (EcoSta 2017). Hong Kong. Invited Conference Talk.
28. Regularized estimation in sparse multivariate regression with high-dimensional responses. May 2017. The 5th Workshop on Biostatistics and Bioinformatics. Atlanta, GA. Invited Conference Talk.
29. Regularized estimation in sparse multivariate regression with high-dimensional responses. March 2017. Department of Mathematics. University of California, San Diego. Invited Department Seminar.
30. Regularized estimation in sparse multivariate regression with high-dimensional responses. February 2017. Department of Epidemiology and Biostatistics. University of Illinois, Chicago. Invited Department Seminar.
31. Innovative data mining methods in personalized treatment of alcohol dependence. NIAAA Statistical Work Group. September 2016. Invited Government Talk (traveling expenses covered by NIAAA).
32. Regularized estimation in sparse multivariate regression with high-dimensional responses. July 2016. The 3rd Workshop on the Statistical Analysis of Multiple Outcome Data. Beijing, China. Invited Conference Talk.
33. Statistical analysis of DNA methylation data. June 2016. Department of Bioinformatics and Biostatistics. Shanghai Jiaotong University. Shanghai, China. Invited Department Seminar.
34. Innovative analytical methods in personalized treatment of alcohol dependence. June 2016. The 5th Annual Thomas R. Ten Have Symposium on Statistics in Mental Health. Philadelphia, PA. Invited Conference Talk.
35. Estimating and testing high-dimensional mediation effects in DNA methylation data. March 2016. Division of Biostatistics. Medical College of Wisconsin. Milwaukee, WI. Invited Department Seminar.
36. Estimating and testing high-dimensional mediation effects in DNA methylation data. February 2016. Department of Public Health Sciences. University of Chicago. Invited Department Seminar.
37. Joint frailty models for zero-inflated recurrent events in the presence of a terminal event. October 2015. International Chinese Statistical Association Midwest Chapter Meeting. Mettawa, Illinois. Invited Conference Talk.
38. Flexible modeling of medical cost data. July 2015. Shandong University. Jinan, China. Invited Department Seminar.

39. Joint frailty models for zero-inflated recurrent events in the presence of a terminal event. July 2015. International Chinese Statistical Association China Conference. Shanghai, China. Invited Conference Talk.
40. A generalized partially linear marginal model with semiparametric covariance structure for correlated medical cost data. June 2015. International Chinese Statistical Association Applied Statistics Symposium. Fort Collins, Colorado. Invited Conference Talk.
41. Selection bias and cost allocation in patients with polychronic disease. May 2015. International Society of Pharmacoeconomics and Outcome Research 20th Annual International Meeting. Philadelphia, PA. 1 hour workshop. Co-presenting with Kathy Schulman and Robin Turpin. Invited Conference Talk.
42. Flexible modeling of medical cost data. April 2015. Division of Statistics. Northern Illinois University. DeKalb, IL. Invited Department Seminar.
43. Joint frailty models for zero-inflated recurrent events in the presence of a terminal event. March 2015. International Biometric Society Eastern North America Region (IBS-ENAR) conference. Miami, Florida. Invited Conference Talk.
44. Flexible modeling of medical cost data. January 2015. Department of Biostatistics and Epidemiology. Medical University of South Carolina. Invited Department Seminar.
45. Flexible modeling of medical cost data. October 2014. Division of Biostatistics. Dartmouth College. Invited Department Seminar.
46. Analysis of longitudinal data in the presence of informative observational times and a dependent terminal event, with application to medical cost data. August 2014. Joint Statistical Meetings. Boston, MA. Invited Conference Talk.
47. Zero-inflated frailty model for recurrent event data. July 2014. Second Workshop on the Statistical Analysis of Multi-outcome Data. Cambridge, UK. Invited Conference Talk.
48. Flexible modeling of medical cost data. May 2014. Department of Mathematical Sciences. University of Texas, El Paso. Invited Department Seminar.
49. Innovative analytical methods in personalized treatment of alcohol dependence. April 2014. New England Statistical Symposium. Boston, MA. Invited Conference Talk.
50. Flexible modeling of medical cost data. January 2014. Department of Biostatistics. University of Illinois Chicago. Invited Department Seminar.
51. Innovative analytical methods in personalized treatment of alcohol dependence. December 2013. Biomarker & Subgroup Analysis & Identification Subteam of QSPI Multiplicity Working Group. Invited Teleconference Talk.

52. Flexible modeling of medical cost data. October 2013. Department of Applied and Computational Mathematics and Statistics. University of Notre Dame. Invited Department Seminar.
53. Innovative analytical methods in personalized treatment of alcohol dependence. October 2013. International Conference of Health Policy Statistics. Chicago, IL. Invited Conference Talk.
54. Flexible modeling of medical cost data. September 2013. Department of Biostatistics and Kidney Epidemiology and Cost Center, University of Michigan. Invited Department Seminar.
55. Analyzing repeated measures zero-inflated continuous data. July 2013. Institute of Mathematical Statistics China Conference. Chengdu, China. Invited Conference Talk.
56. Flexible modeling of medical cost data. June 2013. Institute of Applied Mathematics, Chinese Academy of Science. Beijing, China. Invited Department Seminar.
57. A joint latent class model of longitudinal and survival data. June 2013. International Chinese Statistical Association Applied Statistics Symposium. Bethesda, MD. Invited Conference Talk.
58. Joint modeling of longitudinal and survival data. May 2013. Midwest Biopharmaceutical Statistics Workshop. Muncie, Indiana. Invited Conference Talk.
59. Flexible modeling of medical cost data. March 2013. Department of Biostatistics and Computational Biology, University of Rochester. Invited Department Seminar.
60. Analyzing repeated measures zero-inflated continuous data, with application to an alcohol dependence study. March 2013. International Biometric Society Eastern North America Region (IBS-ENAR) conference. Orlando, FL. Invited Conference Talk.
61. Flexible modeling of medical cost data. March 2013. Department of Mathematics and Statistics, Georgia State University. Invited Department Seminar.
62. Flexible modeling of medical cost data. February 2013. Department of Health Studies, University of Chicago. Invited Department Seminar.
63. A flexible model for mean and variance, with application to medical cost data. October 2012. Department of Statistics, University of Missouri. Columbia, MO. Invited Department Seminar.
64. A flexible model for mean and variance, with application to medical cost data. July 2012. Joint Statistical Meetings. San Diego, CA. Invited Conference Talk.
65. A flexible model for mean and variance, with application to medical cost data. July 2012. Department of Biostatistics, Erasmus University Medical Center. Rotterdam, Netherland. Invited Department Seminar.

66. A joint latent class model of longitudinal and survival data. July 2012. Workshop on the Statistical Analysis of Multi-outcome Data. Paris, France. Invited Conference Talk.
67. A flexible model for mean and variance, with application to medical cost data. May 2012. Midwest Biopharmaceutical Statistics Workshop. Muncie, Indiana. Invited Conference Talk.
68. A joint latent class model of longitudinal and survival data. April 2012. IBS-ENAR Meeting, Washington DC. Invited Conference Talk.

Invited to present. The talk was given by my PhD student Yue Liu.

69. A flexible model for mean and variance, with application to medical cost data. March 2012. Department of Statistics, Northwestern University. Invited Department Seminar.
70. A flexible model for mean and variance, with application to medical cost data. February 2012. Department of Biostatistics, Indiana University - Purdue University Indianapolis. Invited Department Seminar.
71. Statistical analysis of longitudinal medical cost data. December 2011. Department of Biostatistics, Brown University. Invited Department Seminar.
72. Statistical analysis of longitudinal medical cost data. September 2011. Department of Epidemiology and Biostatistics, University of Pennsylvania. Invited Department Seminar.
73. Statistical analysis of longitudinal medical cost data. December 2010. Department of Statistics and Actuarial Sciences, University of Waterloo, Canada. Invited Department Seminar.
74. Trajectory analysis in alcohol treatment research. September 2010. International Society for Biomedical Research on Alcoholism. Paris, France. Invited Conference Talk.
75. Statistical analysis of longitudinal medical cost data. August 2010. Joint Statistical Meetings (JSM). Vancouver, BC. Canada. Invited Conference Talk.
76. A flexible two-part random effects model for correlated medical costs. October 2009. 1st Annual Health Econometrics Workshop (AHEW), Chicago. Invited Conference Talk.

Peer reviewed and invited for oral presentation. Only 9 out of 40 submissions were selected for oral presentation.

77. A joint model of longitudinal medical cost and survival. September 2009. Department of Epidemiology, Michigan State University. Invited Department Seminar.

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78. A flexible two-part random effects model for correlated medical costs. March 2009. International Biometric Society East North America Region (IBS-ENAR) Meeting. San Antonio, TX. Invited Conference Talk.
79. Analysis of longitudinal data in the presence of informative observational times and a dependent terminal event, with application to medical cost data. November 2008. Department of Business Statistics and Econometrics, Guanghua School of Management, Peking University, Beijing, China. Invited Department Seminar.
80. A joint model of longitudinal medical cost and survival. August 2008. Joint Statistical Meetings (JSM). Denver, CO. Invited Conference Talk.
81. Analysis of longitudinal data in the presence of informative observational times and a dependent terminal event, with application to medical cost data. March 2008. IBS-ENAR Meeting. Washington DC. Invited Conference Talk.
82. Statistical analysis of longitudinal medical cost data. September 2007. Department of Statistics, Virginia Tech. Invited Department Seminar.
83. Statistical analysis of longitudinal medical cost data. September 2007. Department of Biostatistics, MD Anderson Cancer Center. Invited Department Seminar.
84. Gaussian quadrature estimation in joint frailty models of recurrent events and survival. August 2007. Joint Statistical Meetings (JSM). Salt Lake City, UT. Invited Conference Talk.
85. The use of Gaussian quadrature in frailty proportional hazards models. June 2007. Division of Biostatistics, Indiana University - Purdue University Indianapolis. Invited Department Seminar.
86. Modeling recurrent event data by stratified frailty model for gap times. October 2005. Department of Statistics, University of Virginia. Invited Department Seminar.
87. Kidney disease progression in the renal clinic: The RRI-CKD study. October 2004. American Society of Nephrology Renal Week, St. Louis, MO. Invited Conference Talk.

Peer reviewed and invited for oral presentation. Less than 10% of all submissions were selected for oral presentation.