

# CURRICULUM VITAE

Kuan Liu

Oct 1, 2022

## BIOGRAPHICAL INFORMATION

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Phone: (+1) 416 978-0558 (Work)

## EDUCATION

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PhD in Biostatistics, University of Toronto	2015-2021
MMath in Statistics-Biostatistics, University of Waterloo	2011-2012
BSc Honour in Statistics, University of Alberta	2007-2011

## PROFESSIONAL EXPERIENCE

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Assistant Professor in Biostatistics (cross-appointment) Dalla Lana School of Public Health University of Toronto	Sep 2021-Present
Assistant Professor in Health Services Research Institute of Health Policy, Management and Evaluation University of Toronto	Jul 2021-Present
Biostatistics Analyst (Casual) Hospital for Sick Children	2020-2021
Biostatistician (Casual) Department of Medical Imaging University of Toronto	2016-2017
Research Analyst (Full-time) Institute for Clinical Evaluative Sciences (Western)	2013-2015
Undergraduate Summer Research Internship Faculty of Medicine and Dentistry University of Alberta	May-Aug 2011
Undergraduate Summer Research Internship Faculty of Forest and Conservation Science University of British Columbia	May-Jun 2010
Undergraduate Summer Research Internship Department of Earth and Environmental Sciences University of British Columbia Okanagan	May-Jun 2009

# GRANTS AND SCHOLARSHIPS

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## Awarded

- Connaught New Researcher Award  
Novel Bayesian Causal Inference Methods for Longitudinal Comparative Effectiveness Studies of Pediatric Rheumatic Disease  
Funding: \$20,000 (CAD); 2022-2024  
Role: Principle Investigator
- Canadian Institutes of Health Research Project Grant - PA: Patient-Oriented Research: Early-Career Investigator  
Driving Pressure-Limited Ventilation in Hypoxemic Respiratory Failure: The DRIVE RCT  
Funding: \$100,000 (CAD); 2022-2023  
Role: Co-Investigator (PIs: Goligher, Ferguson and Sahetya)
- Canadian Institutes of Health Research Project Grant  
Understanding the Impact of Public Health Pandemic Mitigation Strategies and Despair-related Health Outcomes in Mothers, Children and Youth in Ontario through a Socioeconomic Lens  
Funding: \$499,291 (CAD); 2022-2024  
Role: Co-Investigator (PI: Anderson)
- JDRF Canada – Brain Canada Addressing Mental Health in Type 1 Diabetes Team Grants  
Teaching Adolescents with type 1 Diabetes Self-compassion (TADS) to reduce diabetes distress: A randomized controlled trial  
Funding: \$249,448 (CAD); 2022-2024  
Role: Co-investigator (PI: Robinson)

## Under Review

- The New Frontiers in Research Fund - Exploration  
Understanding the Impact of Pandemic Education Disruption and Community-Level Socioeconomic Status on Longitudinal Mental Health Outcomes in Children and Youth using Innovative Statistical Methods  
Funding: \$232,000 (CAD); 2 Years  
Role: Nominated Principal Investigator
- Canada Foundation for Innovation - John R. Evans Leaders Fund  
Interdisciplinary Research Centre for Health Data and Informatics (CHDI)  
Funding: \$162,316 (CAD)  
Role: Co-PI (Lead PI: Shakeri (lead), Co-PI: Rosella)
- Canadian Institutes of Health Research Project Grant  
Driving Pressure-Limited Ventilation in Hypoxemic Respiratory Failure: The DRIVE RCT  
Funding: \$6,240,000 (CAD); 5 Years  
Role: Co-Applicant (PIs: Goligher, Fan, Ferguson, and Sahetya)
- Canadian Institutes of Health Research Project Grant  
Evaluating Subphenotypes in Immunocompromised Patients with Acute Respiratory Failure (ESCAPE Study)  
Funding: \$595,000 (CAD); 3 Years  
Role: Co-Applicant (PIs: Munshi and Fan)

## In Preparation

- The Natural Sciences and Engineering Research Council of Canada - Discovery Grants 2022  
Bayesian modelling of longitudinal and survival data in observational studies  
Funding: \$31,500 (CAD); 5 Years  
Role: Principle Investigator
- Data Sciences Institute Catalyst Grant - 2022  
Innovative Data Science Methods for Longitudinal Trajectory Modelling and Phenotyping with Multiple Features in Dementia  
Funding: \$100,000 (CAD); 2 Years  
Role: Nominated Principle Investigator

## Completed

- Data Sciences Institute Summer Undergraduate Data Sciences Research Opportunity Award  
Advanced causal inference analysis in R  
Funding: \$7,500 (CAD); May 2022-Aug 2022  
Role: Principle Investigator (Undergraduate Trainee: Yutong Lu)
- Canadian Institutes of Health Research Doctoral Award - Frederick Banting and Charles Best Canada Graduate Scholarship  
Improving clinical decision making through Bayesian causal inference with irregularly observed complex longitudinal data  
Funding: \$105,000 (CAD); Sep 2017-Aug 2020  
Role: Principle Investigator
- Hospital for Sick Children Research Training Competition (Restracomp) Scholarship  
Developing dynamic statistical models to improve disease prediction with irregularly observed complex longitudinal data  
Funding: \$24,000 (CAD); Sep 2016-Aug 2017  
Role: Principle Investigator

## HONOURS AND AWARDS

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### • Research Awards

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| <b>The 2020 Beverly Antle Award</b>  | Jun 2020 |
| Child Health Evaluative Sciences, Hospital for Sick Children   |          |
| <b>University of Toronto COVID-19 Student Engagement Award</b>   | Jun 2020 |
| Investigators: <b>Kuan Liu</b> (Lead), Rose Garrett, Alexandra Bushby,<br>Thai-Son Tang, Maxwell Garrett and Laura Garrett<br>Current COVID-19 student research viewable at <a href="#">Link</a> |          |

### • Data Challenge Competitions

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|---|----------|
| <b>Top 8 finalists, the 2018-2019 National Policy Challenge</b>   | Jun 2019 |
| Canadian Research Data Centre Network, SAS Canada and Statistics Canada<br>Spatial analysis of cannabis and tobacco consumption among Canadian youth and adults |          |

**Kuan Liu** (Lead), Dominika Bhatia and Shahriar Shams  
Presentation slides accessible via [Link](#)

**First prize, the 2016 Case Studies in Data Analysis Competition** May 2016  
Statistical Society of Canada  
Predicting flu cases using dynamic regression with Google Flu Trend  
Mohammad Khan, Sangook Kim, **Kuan Liu** and Michael Moon  
Presentation poster accessible via [Link](#)

**First prize, the 2015 ImagineNation Data Impact Challenge** May 2015  
Canada Health Infoway  
Repeated diagnostic imaging studies in Ontario  
Blayne Welk, **Kuan Liu**, Ahmed Al-Jaishi, Eric McArthur, Arsh Jain and Michael Ordon

• **Conference Presentation Awards**

Student Best Poster Presentation Award Dec 2020  
The 30th International Biometric Conference

Student Best Poster Presentation Award Jul 2018  
The 29th International Biometric Conference, Barcelona, Spain

Paul Corey Student Poster Presentation Award Jun 2018  
Dalla Lana School of Public Health Biostatistics Research Day, Toronto, Canada

• **Conference Travel Awards**

The 2019 Canadian Statistics Student Conference, Calgary, Canada May 2019  
The 2019 Atlantic Causal Inference Conference, Montreal, Canada May 2019  
The 2019 Eastern North American International Biometric Society Annual Meeting, Philadelphia, USA Mar 2019  
The 46th Statistical Society of Canada Annual Meeting, Montreal, Canada May 2018

• **Academic Merits and Study Body Services Award**

The John Hsieh Award, DSLPH, University of Toronto Aug 2020  
Statistics and Actuarial Science Chair Award, University of Waterloo 2011-2012  
Faculty of Science, Dean's Honor Roll List, University of Alberta 2008-2010  
Registrar's International Student Scholarship, University of Alberta 2007-2011

## TEACHING AND SUPERVISION

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• **Course Instructor**

HAD5319H Biostatistics III: Advanced Biostatistical Techniques for Observational Studies (Fall 2022)

HAD5314H Applied Bayesian Methods in Clinical Epidemiology and Health Care Research, University of Toronto (Winter 2022)

STAB22 Statistics I, University of Toronto Scarborough (Fall 2020)

- **Graduate Students**

Ismail Benchekroun, MSc Research student (Statistics), 2022-present

Fatema Tuj Johara, PhD Practicum student (Biostatistics, jointly with Linda Hiraki), 2021-2022;  
Current appointment - PhD student in Biostatistics

Ha-Seul (Steve) Jeoung, MSc Practicum student (Biostatistics, jointly with Deborah Levy),  
2021-2022; Current appointment - Research Analyst at ICES

- **Undergraduate Students**

Yutong Lu, Data Sciences Institute - Summer Undergraduate research student (Applied Statistics), 2022-Present

Nicholas Chen, Sickkids research student (Health and Disease Specialist, jointly with Brian Feldman), 2021-Present

- **Advisory Committees**

Member of thesis advisory committee of MSc student Luis Ledesma (Biostatistics, supervisor Eleanor Pullenayegum), 2022-Present

Member of thesis advisory committee of MSc student Stephan von During (Clinical Epidemiology, supervisor Eddy Fan), 2021-Present

Member of thesis advisory committee of PhD student Adeteju Ogunbameru (Health Services Research, supervisor Beate Sander), 2021-Present

## SERVICES

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<b>Faculty Mentor of International Biometric Society Mentoring Program</b> International Biometric Society	2022
<b>Member of Recruitment, Hiring and Appointments Advisory Committee</b> Dalla Lana School of Public Health	2022
<b>Member of Search Committee, NSERC Canadian Research Chair</b> Dalla Lana School of Public Health	2022
<b>Internal Reviewer - Ontario Graduate Scholarship</b> Dalla Lana School of Public Health	2022
<b>Faculty Mentor, Biostatistics PhD Comprehensive Exam Study Group</b> Dalla Lana School of Public Health	2022
<b>Member of Biostatistics MSc admission committee</b> Dalla Lana School of Public Health	2021
<b>Member of Search Committee, NSERC Canadian Research Chair</b> Dalla Lana School of Public Health	2021
<b>Co-Lead, Health Data Working Group</b> Dalla Lana School of Public Health	2021-Present

<b>Member of Student and Recent Graduate Committee</b> Statistical Society of Canada	2021-Present
<b>Member of Data Sciences Institute Research &amp; Academics Committee</b> Data Sciences Institute, University of Toronto	2021-Present
<b>Member of the Data and Safety Monitoring Board</b> The Simple Bone Cysts in Kids (SBoCK) study, Hospital for Sick Children	2021-Present
<b>Faculty Mentor, R Interest Group</b> Institute of Health Policy, Management and Evaluation	2021
<b>Biostatistics Section Editor</b> University of Toronto Journal of Public Health	2019-2021
<b>Member of Search Committee, Biostatistics Tenure Stream</b> Dalla Lana School of Public Health, University of Toronto	2020
<b>President, Biostatistics Union of Graduate Students</b> University of Toronto	2017-2018
<b>Conference organization Co-Chair</b> The 2017 Canadian Statistics Student Conference, Statistical Society of Canada	2016-2017
<b>Conference organization Scientific Program Lead</b> The 2016 Canadian Statistics Student Conference, Statistical Society of Canada	2015-2016

## PUBLICATIONS

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**Google Scholar Profile** [Link](#)

**ResearchGate Profile** [Link](#)

Total Citations: 1370

h-index: 19

i10-index: 27

## SUBMITTED MANUSCRIPTS

1. **Liu K**, Saarela O, Tomlinson G, Feldman BM, Pullenayegum E. (2022). A Bayesian latent class approach to causal inference with longitudinal data. *Statistical Methods in Medical Research*.
2. Bastas D, Brandão LR, Allen D, Vincelli J, Amiri Nour, Abdul-Samad K, [et al, including **Liu K**] (2022). Understanding the Functional Impact of Pediatric Post-Thrombotic Syndrome. *Journal of Thrombosis and Haemostasis*

## SELECTED PEER-REVIEWED PUBLICATIONS

JAN 2015-PRESENT

1. Yarnell CJ, Johnson A, Dam T, Jonkman A, **Liu K**, Wunsch H et al. (2022). Do Thresholds for Invasive Ventilation in Hypoxemic Respiratory Failure exist? A Cohort Study. *American Journal of Respiratory and Critical Care Medicine*. (In press). [Link](#)

2. Castelo M, Lu J, Paszat L, Veitch Z, **Liu K**, Sheer AS. (2022). Long-term survival in elderly women receiving chemotherapy for non-metastatic breast cancer: A population-based analysis. *Breast Cancer Research and Treatment*, 194(3), 629-641. [Link](#)
3. Dave S, Clark J, Richard L, Chan EP, **Liu K**, Wang PZT, et al. (2022). Factors which delay surgery for undescended testis in Ontario: A Retrospective Population Based Cohort Study on timing of orchidopexy between 2006 and 2012. *Journal of Pediatric Urology*. [Link](#)
4. Burns KE, Laird M, Stevenson J, Honarmand K, Granton D, Kho ME, [et al, including **Liu K**]. (2021). Adherence of Clinical Practice Guidelines for Pharmacologic Treatments of Hospitalized Patients With COVID-19 to Trustworthy Standards: A Systematic Review. *JAMA network open*, 4(12), e2136263-e2136263 [Link](#)
5. Trivedi V, Chaudhuri D, Jinah R, Piticarú J, Agarwal A, **Liu K**, et al. (2021). The Utility of the Rapid Shallow Breathing Index in Predicting Successful Extubation: A Systematic Review and Meta-analysis. *Chest*. [Link](#)
6. **Liu K**, Tomlinson G, Reed AM, Huber AM, Saarela O, Bou-Tabaku SM, et al. (2021). Pilot study of the juvenile dermatomyositis consensus treatment plans: A CARRA Registry study. *Journal of Rheumatology*, 48(1), 114-122. [Link](#)
7. Zhang X, Liu S, Wang J, Huang Y, Freeman Z, Fu S, [et al, including **Liu K**]. (2020) Local community assembly mechanisms shape soil bacterial  $\beta$ -diversity patterns along latitudinal gradients in eastern China. *Nature Communications*, 11(1):5428. [Link](#)
8. **Liu K**, Saarela O, Feldman BM, Pullenayegum E. (2020). Estimation of causal effects with repeatedly measured outcomes in a Bayesian framework. *Statistical Methods in Medical Research*, 29(9), 2507-2519. [Link](#)
9. Burns KE, Straus SE, **Liu K**, Rizvi L, Guyatt G. (2019). Gender differences in grant and personnel award funding rates at the Canadian Institutes of Health Research based on research content area: A retrospective analysis. *PLoS Medicine*, 16(10). [Link](#)
10. Jing Y, Wang Y, Liu S, Zhang X, Wang Q, **Liu K**, et al. (2019). Interactive effects of soil warming, throughfall reduction, and root exclusion on soil microbial community and residues in warm-temperate oak forests. *Applied Soil Ecology*, 142: 52-58. [Link](#)
11. Simkin P, Rattansingh A, **Liu K**, Hudson JM, Atri M, Jang H-J, et al. (2019). Reproducibility of 2 liver 2-dimensional shear wave elastographic techniques in the fasting and postprandial states. *Journal of Ultrasound in Medicine*, 38(7): 1739-1745. [Link](#)
12. MacNeil SD, Patel K, **Liu K**, Shariff SZ, Yoo J, Nichols A, et al. (2018). Survival of patients with subglottic squamous cell carcinoma. *Current Oncology*, 25(6): e569–e575. [Link](#)
13. Dave S, **Liu K**, Clark R, Garg AX, Shariff SZ. (2018). A retrospective population-based cohort study to evaluate the impact of an older sibling with undescended testis and hypospadias on the known maternal and fetal risk factors for undescended testis and hypospadias in Ontario, Canada, 1997-2007. *Journal of Pediatric Urology*, 15(1): 41.e1-41.e9. [Link](#)
14. Lazo-Langner A, **Liu K**, Shariff SZ, Garg AX, Ray JG. (2018). Immigration, region of origin, and the epidemiology of venous thromboembolism: A population-based study. *Research and Practice in Thrombosis and Haemostasis*, 2(3): 469-480. [Link](#)
15. Gnannt R, Waespe N, Temple M, Amirabadi A, **Liu K**, Brandão LR, et al. (2018). Increased risk of symptomatic upper-extremity venous thrombosis with multiple peripherally inserted central catheter insertions in pediatric patients. *Pediatric Radiology*, 48(7): 1013-1020. [Link](#)

16. Zhang M, Liu N, Harper R, Li Q, **Liu K**, Wei X, et al. (2017). A global review on hydrological responses to forest change across multiple spatial scales: Importance of scale, climate, forest type and hydrological regime. *Journal of Hydrology*, 546: 44-59. [Link](#)
17. Welk B, **Liu K**, Winick-Ng J, Shariff SZ. (2017). Urinary tract infections, urologic surgery, and renal dysfunction in a contemporary cohort of traumatic spinal cord injured patients. *Neurourology and Urodynamics*, 36(3): 640-647. [Link](#)
18. Liu Y, Liu S, Wan S, Wang J, Wang H, **Liu K**. (2017). Effects of experimental throughfall reduction and soil warming on fine root biomass and its decomposition in a warm temperate oak forest. *Science of the Total Environment*, 574: 1448-1455. [Link](#)
19. Welk B, **Liu K**, Shariff SZ. (2016). The use of urologic investigations among patients with traumatic spinal cord injuries. *Research and Reports in Urology*, 8: 27-34. [Link](#)
20. Welk B, **Liu K**, Al-Jaishi A, McArthur E, Jain A, Ordon M. (2016). Repeated diagnostic imaging studies in Ontario and the impact of health information exchange systems. *Healthcare Quarterly*, 19(1): 24-28. [Link](#)
21. Vinden C, Malthaner R, McGee J, McClure JA, Winick-Ng J, **Liu K**, et al. (2016). Teaching surgery takes time: The impact of surgical education on time in the operating room. *Canadian Journal of Surgery*, 59(2): 87-92. [Link](#)
22. Liu AR, Garg AX, **Liu K**, Shariff SZ, Jain AK, Weir MA. (2016). Increased risk of adverse renal outcome following polyethylene glycol bowel preparation compared to sodium picosulfate. *The Journal of Clinical Pharmacology*, 56(8): 983-987. [Link](#)
23. Hu Z, Liu S, Liu X, Fu L, Wang J, **Liu K**, et al. (2016). Soil respiration and its environmental response varies by day/night and by growing/dormant season in a subalpine forest. *Scientific Reports*, 6:37864. [Link](#)
24. Clemens KK, **Liu K**, Shariff SZ, Scherthner G, Tangri N, Garg A. (2016). Secular trends in antihyperglycaemic medication prescriptions in older adults with diabetes and chronic kidney disease: 2004-2013. *Diabetes, Obesity and Metabolism*, 18(6): 607-614. [Link](#)
25. Burneo JG, Shariff SZ, **Liu K**, Leonard S, Saposnik G, Garg AX. (2016). Disparities in surgery among patients with intractable epilepsy in a universal health system. *Neurology*, 86(1): 72-78. [Link](#)
26. Vasudev A, Shariff SZ, **Liu K**, Burhan AM, Herrmann N, Leonard S, et al. (2015). Trends in psychotropic dispensing among older adults with dementia living in long-term care facilities: 2004-2013. *The American Journal of Geriatric Psychiatry*, 23(12): 1259-1269. [Link](#)
27. MacNeil SD, **Liu K**, Garg AX, Tam S, Palma D, Thind A, et al. (2015). A population-based study of 30-day incidence of ischemic stroke following surgical neck dissection. *Medicine*, 94(33). [Link](#)
28. MacNeil SD, **Liu K**, Shariff SZ, Thind A, Winkvist E, Yoo J, et al. (2015). Secular trends in the survival of patients with laryngeal carcinoma, 1995-2007. *Current Oncology*, 22(2): e85. [Link](#)
29. Hildebrand AM, **Liu K**, Shariff SZ, Ray JG, Sontrop JM, Clark WF, et al. (2015). Characteristics and outcomes of AKI treated with dialysis during pregnancy and the postpartum period. *Journal of the American Society of Nephrology*, 26(12): 3085-3091. [Link](#)



30. Fraser LA, **Liu K**, Naylor KL, Hwang YJ, Dixon SN, Shariff SZ, et al. (2015). Falls and fractures with atypical antipsychotic medication use: A population-based cohort study. *Journal of the American Medical Association Internal Medicine*, 175(3): 450-452. [Link](#)
31. Clemens KK, Shariff SZ, **Liu K**, Hramiak I, Mahon JL, McArthur E, et al. (2015). Trends in antihyperglycemic medication prescriptions and hypoglycemia in older adults: 2002-2013. *PloS ONE*, 10(9): e0137596. [Link](#)

## CONFERENCE PRESENTATIONS

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### Oral Presentations

1. (Invited) Recent development on Bayesian causal estimation with longitudinal data, Dalhousie Statistics Seminars, October 2022.
2. (Invited) Bayesian Causal Estimation with Time-Dependent Latent Confounders, the 2022 Joint Statistics Meeting, Washington, DC, United States of America, August 2022.
3. (Invited) Bayesian Approaches to Causal Inference with Latent Confounders, International Chinese Statistical Association – Canada Chapter 2022 Symposium, Banff, Canada, May 2022.
4. (Invited) Introduction to causal inference with longitudinal data, ICES western research seminar, London, Canada, April 2022.
5. (Invited) Bayesian approaches to causal estimation, DLSPH Biostatistics Seminar, February 2022
6. A Bayesian latent class approach to causal inference with longitudinal data, 2021 Statistics and Mathematics Applied to Cancerology Day (Statistics, Philosophy, and Health), June 2021.
7. A Bayesian latent class approach to causal inference with longitudinal data, 2021 Annual Meeting of Statistics Society of Canada, June 2021.
8. A Bayesian latent class approach to causal inference with longitudinal data, 30th International Biometric Conference (abstracted accepted, conference moved to virtual without contributed session), July 2020.
9. (Invited) Spatial analysis of cannabis and tobacco consumption among Canadian youth and adults, 2015 Canadian Research Data Centre Network National Policy Challenge Meeting, Ottawa, Canada, June 2019.
10. On Bayesian estimation of causal effect with a latent confounder class, 2019 Canadian Statistics Student Conference, Calgary, Canada, May 2019.
11. Estimation of causal effects with longitudinal data in a Bayesian framework, 2019 Eastern North American International Biometric Society Annual Meeting, Philadelphia, USA, March 2019.
12. Estimation of causal effects with longitudinal data in a Bayesian framework, 2018 Annual Meeting of Statistics Society of Canada, Montreal, Canada, June 2018.
13. Assessing the efficacy of current consensus treatments on juvenile dermatomyositis using a complex multi-centre pilot registry, 2017 Canadian Statistics Student Conference, Winnipeg, Canada, June 2017.

## Poster Presentations

1. A Bayesian latent class approach to causal inference with longitudinal data, Biostatistics Research Day, Dalla Lana School of Public Health, University of Toronto, June 2020.
2. Estimation of causal effects with longitudinal data in a Bayesian framework, Atlantic Causal Inference Conference 2019, Montreal, Canada, May 2019.
3. Estimation of causal effects with longitudinal data in a Bayesian framework, 29th International Biometric Conference, Barcelona, Spain, July 2018.
4. Estimation of causal effects with longitudinal data in a Bayesian framework, Biostatistics Research Day, Dalla Lana School of Public Health, University of Toronto, June 2018.
5. Predicting flu cases using dynamic regression with Google Flu Trends, 2016 Annual Meeting of Statistical Society of Canada, St. Catharines, Canada, May 2016.

## EDITORIAL ACTIVITIES

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Reviewer, Arthritis & Rheumatology	2022-Present
Reviewer, The International Journal of Biostatistics	2022-Present
Reviewer, Biometrics	2022-Present
Reviewer, Annals of Epidemiology	2021-Present
Reviewer, Pharmacoepidemiology and Drug Safety	2020-Present
Reviewer, JAMA Cardiology	2016-Present
Biostatistics Section Editor, University of Toronto Journal of Public Health	2019-2021

## PROFESSIONAL MEMBERSHIPS

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Member, International Society for Bayesian Analysis	2021-Present
Member, International Chinese Statistical Association	2021-Present
Member, Caucus for Women in Statistics	2019-Present
Member, International Biometrics Society	2017-Present
Member, Statistical Society of Canada	2011-Present