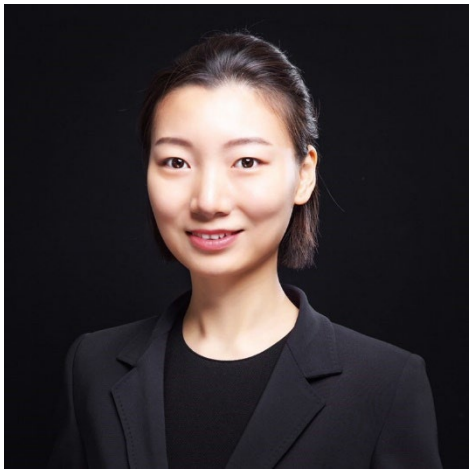
McGill | Department of Epidemiology, Biostatistics and Occupational Health

Biostatistics Seminars
Fall 2023



Rui Duan, PhD

Assistant Professor of Biostatistics
Harvard T.H. Chan School of Public Health

Federated and Transfer Learning for Healthcare Data Integration

Wednesday, September 13, 2023
3:30 pm – 4:30 pm
Room 1140
Hybrid Seminar (Dr. Duan will present virtually from Boston)
Zoom Link: https://mcgill.zoom.us/j/88354140659

Abstract: The growth of availability and variety of healthcare data sources has provided unique opportunities for data integration and evidence synthesis, which can potentially accelerate knowledge discovery and improve clinical decision-making. However, many practical and technical challenges, such as data privacy, high dimensionality, and heterogeneity across different datasets, remain to be addressed. In this talk, I will introduce several methods for the effective and efficient integration of multiple healthcare datasets in order to train statistical or machine learning models with improved generalizability and transferability. Specifically, we develop communication-efficient federated learning algorithms for jointly analyzing multiple datasets without the need of sharing patient-level data, as well as transfer learning approaches that leverage shared knowledge learned across multiple datasets to improve the performance of statistical models in target populations of interest. I will discuss both the theoretical properties and examples of implementation of our methods in real-world research networks and data consortia.

Bio: Dr. Rui Duan is an Assistant Professor of Biostatistics at the Harvard T.H. Chan School of Public Health, where she is also a primary faculty member in the Department of Epidemiology and an affiliated member of the Harvard Data Science Initiative. She obtained her PhD in Biostatistics from the University of Pennsylvania in 2020. Dr. Duan has focused her research on developing advanced methods to analyze and integrate big data from diverse sources, including electronic health records (EHR), biobanks, medical claims, and health surveys. Her work in integrating EHR data from different healthcare systems with privacy protection and communication efficiency has been implemented in large clinical research networks to study various diseases, including pediatric Crohn's disease, major depression, opioid use disorder, Alzheimer's disease, and COVID-19. Dr. Duan's research has earned her multiple prestigious awards, including the Harvard Chan School Dean's Award for Scientific Advancements, the Harvard Data Science Initiative Competitive Research Award, and the Institute of Mathematical Statistics New Researcher Award. She has also received extramural research grants from renowned organizations such as NIH and Google Research.