PURDUE UNIVERSITY | Department of Statistics

Seminar Series:	Myra Samuels Memorial Lecture
Speaker:	Bhramar Mukherjee
Title/Affiliation:	John D. Kalbfleisch Collegiate Professor and Chair of Biostatistics; Professor of Epidemiology and Global Public Health, University of Michigan School of Public Health
Date:	Friday, April 8, 2022
Time:	10:30 – 11:30 a.m.
Location:	WALC 2087, Zoom, and YouTube livestream: https://www.youtube.com/c/PurdueUniversityStatistics

Using Electronic Health Records for Scientific Research: Promises and Perils

Abstract: Electronic Health Records (EHR) linked with other auxiliary data sources hold tremendous potential for conducting real time actionable research. However, one has to answer two fundamental questions before conducting inference: "Who is in my study?" and "What is the target population of Inference?". Without accounting for selection bias one can quickly produce fast but inaccurate conclusions. In this lecture honoring Professor Myra Samuels, I will discuss a statistical framework for jointly considering selection bias and phenotype misclassification in EHR analyses. I will discuss large-scale association studies across multiple phenotypes, namely Phenome-wide association studies (PheWAS) that have gained traction in the genetics and medical informatics world. I will present several applications in cancer research and for identifying risk factors for COVID-19 hospitalization and mortality using EHR data. This is joint work with Lars Fritsche, Lauren Beesley and Maxwell Salvatore and many others at the University of Michigan School of Public Health.

Bhramar Mukherjee is John D. Kalbfleisch Collegiate Professor and Chair of Biostatistics; Professor of Epidemiology and Global Public Health, University of Michigan (UM) School of Public Health; She also serves as the Associate Director for Quantitative Data Sciences, The University of Michigan Rogel Cancer Center. Her research interests include statistical methods for analysis of electronic health records,

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studies of gene-environment interaction, shrinkage estimation, analysis of high dimensional exposure data. She has co-authored more than 300 articles in statistics, biostatistics, medicine and public health. She is the founding director of the University of Michigan's summer institute on Big Data. Bhramar is a fellow of the American Statistical Association and the American Association for the Advancement of Science. She is the recipient of many awards for her scholarship, service and teaching at the University of Michigan and beyond: including the Gertrude Cox Award from the Washington Statistical Society in 2016, the L. Adrienne Cupples Award from Boston University in 2020 , the 2021 Distinguished Woman Scholar Award from Purdue University and most recently the Janet L. Norwood award, from University of Alabama at Birmingham. Bhramar and her team have been modeling the SARS-CoV-2 virus trajectory in India for the last year which has been covered by major media outlets like Reuters, BBC, NPR, NYT, WP, WSJ, Der Spiegel, Australian National Radio and the Times of India.

Myra Samuels (1940-1992)

The **Myra Samuels Memorial Lecture** is named in memory of Myra Samuels, who was Associate Professor of Biostatistics and Epidemiology in Purdue University's Department of Veterinary Pathobiology and Associate Director of Statistical Consulting in the Department of Statistics. She received her PhD in Statistics from the University of California, Berkeley, under Jerzy Neyman, and taught at Purdue University for 24 years. Her research was oriented toward issues in biostatistics and included both conceptual issues in mathematical statistics and collaborations on applications. Professor Samuels was a member of the American Statistical Association, the Biometric Society and the Society for Clinical Trials. Her textbook, *Statistics for the Life Sciences,* first published in 1989, is now in its fifth edition, revised by J. Wittmer and A. Schaffner. The textbook is widely used in statistics courses.