THE UNIVERSITY OF CHICAGO | DEPARTMENT OF STATISTICS

# Statistics Colloquium

FAN BU
Department of Statistics
University of California, Los Angeles

"Statistical Methods for Observational Data on Infectious Diseases"

WEDNESDAY, JANUARY 18, 2023, at 2:00 PM
Jones 303, 5747 S. Ellis Avenue

## ABSTRACT

Emerging modern datasets in public health call for development of innovative statistical methods that can leverage complex real-world data settings. We first discuss a stochastic epidemic model that incorporates contact tracing data to make inference about transmission dynamics on an adaptive contact network. An efficient data-augmented inference scheme is designed to accommodate partially epidemic observations. This networked epidemic model allows flexible extensions to account for individual heterogeneity, disease latency and social interventions to help bring new epidemiological insights. We then discuss a collaborative work with the US FDA to improve post-market vaccine safety surveillance procedures. We propose a Bayesian statistical framework to tackle the challenge of sequentially analyzing observational healthcare data to detect vaccine adverse events. This new framework is substantially more flexible as it does not require a pre-specified analysis schedule in the standard procedure. It also adaptively corrects for bias in observational healthcare data to improve the quality of data-driven decision-making by reducing decision error.

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