Indiana University Indianapolis
Department of Mathematical Sciences

STATISTICS SEMINAR

12:15pm—1:15pm, Tuesday, November 26, 2024
Zoom Meeting: Meeting ID: 845 0989 4694

Speaker: Lu Mao
Department of Biostatistics & Medical Informatics,
University of Wisconsin-Madison

Title: On the restricted mean time in favor of treatment

Abstract:

The restricted mean time in favor (RMT-IF) of treatment is a nonparametric effect size for complex life history data. It is defined as the net average time the treated spend in a more favorable state than the untreated over a prespecified time window. It generalizes the familiar restricted mean survival time (RMST) from the two-state life–death model to account for intermediate stages in disease progression. The overall estimand can be additively decomposed into stage-wise effects, with the standard RMST as a component. Alternate expressions of the overall and stage-wise estimands as integrals of the marginal survival functions for a sequence of landmark transitioning events allow them to be easily estimated by plug-in Kaplan–Meier estimators. Sample size calculations methods for testing the effect sizes are also developed. Simulation studies under realistic settings show that the RMT-IF meaningfully and accurately quantifies the treatment effect and outperforms traditional tests on time to the first event in statistical efficiency thanks to its fuller utilization of patient data. The new methods are illustrated on a colon cancer trial with relapse and death as outcomes and a cardiovascular trial with recurrent hospitalizations and death as outcomes. The R-package rmt implements the proposed methodology and is publicly available from the Comprehensive R Archive Network (CRAN).

Bio:

Dr. Lu Mao is an Associate Professor of Biostatistics at University of Wisconsin-Madison, and an experienced statistician with expertise in survival analysis and proficiency in R and Tidyverse. He got his doctoral degree in Biostatistics from UNC Chapel Hill in 2016. He currently studies statistical methodology for complex time-to-event outcomes (for which he holds an NIH R01 grant) and leads statistical teams on multiple clinical trials. In recent years he has taught a number of short courses on a variety of topics including ones on composite time-to-event endpoints in the 2024 SCT annual meeting and JSM.