Yale SCHOOL OF PUBLIC HEALTH

Center for Methods in Implementation and Prevention Science (CMIPS), Yale School of Public Health; **Department of Statistics and Data Science**, Yale University; **Yale Research Initiative on Innovation and Scale (Y-RISE)**; **The Institution for Social & Policy Studies (ISPS) with the MacMillan Center - CSAP Quantitative Research Methods Workshop**

"A Bayesian Approach to Estimate Population Impact Fraction with Exposure Measurement Error under the Internal Validation Design"

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10:00 - 11:00 AM
Via Zoom

Abstract: The partial Potential Impact Fraction (pPIF) describes the proportion of disease cases that could be prevented if the distribution of continuous exposures or risk factors in a population is modified under counterfactual scenarios. It represents a useful quantity to evaluate the potential effect due to targeted interventions in epidemiology and public health studies. In epidemiologic studies, exposures are often recorded with measurement errors, leading to biased pPIF estimates. Motivated by the Health Professionals Follow-up Study (HFPS), we develop a Bayesian approach for correcting the exposure measurement error in estimating pPIF under the main study/internal validation study design. We adopted the reclassification approach that exploits the relationship between the true exposures and surrogate exposures, and clarified transportability assumptions for valid inference. We assessed the finite-sample performance of both the point and credible interval estimators via extensive simulations and apply this approach to estimate the pPIF when adjusting the distribution of red meat intake, alcohol intake, and folate intake in relation to colorectal cancer (CRC) incidence in HPFS.

Eric Chen is a PhD candidate in the Department of Statistics and Data Science at Yale University. He currently works with Professors Donna Spiegelman and Fan Li. His research interests are Bayesian Inference, Causal Inference, and Measurement Error.