



Overcoming Positivity Violations in Causal Inference for Complex Longitudinal Exposures

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(New York University)

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Department of Statistics, Ludwigstr. 33, Room 144

and online via Zoom ([Link](#))

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Causal inference often relies on a positivity (or overlap) assumption, which requires that all strata of the population have a positive probability of receiving each level of the exposure. In practice, *positivity violations*—where some strata have near-zero probability of exposure—can lead to unstable estimates and inflated variance. These challenges are particularly severe for exposures that are continuous, multi-valued, or time-varying. In this talk, we present two complementary strategies to address positivity violations in complex causal inference settings. First, we show how careful design of the intervention through *modified treatment policies* can yield scientifically meaningful causal estimates that avoid extreme non-overlap. Second, we introduce novel *partial identification bounds* that quantify the range of plausible causal effects when positivity fails. Together, these approaches offer a principled framework for causal inference in realistic longitudinal settings with limited overlap.

About the Speakers:

Iván Díaz is Professor of Biostatistics at the Institute for Population Health at NYU Grossman School of Medicine. His research focuses on developing nonparametric methods for causal inference in both observational and randomized studies, as well as in settings involving missing data, survival analysis, and longitudinal data. He integrates causal modeling with semiparametric estimation theory and machine learning to address methodological challenges in health research.

Herbert Susmann is a postdoctoral fellow in the Department of Biostatistics at the NYU Grossman School of Medicine. His research interests include causal inference, semiparametric statistics, and probabilistic forecasting, with applications in global health, climate change, and political economy. He is currently a Visiting Fellow at the Center for Advanced Studies, Research Focus *Medical Data Processing*.
