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Causal Inference Program Opening Workshop
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SPEAKER TITLES/ABSTRACTS

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"Social Network Dependence, the Replication Crisis, and (In)Valid Inference"

In the first part of this talk, we show that social network dependence can result in *confounding by network structure*, akin to confounding by population structure in GWAS studies, potentially contributing to replication crises across the health and social sciences. Researchers in these fields frequently sample subjects from one or a small number of communities, schools, hospitals, etc., and while many of the limitations of such convenience samples are well-known, the issue of statistical dependence due to social network ties has not previously been addressed. A paradigmatic example of this is the Framingham Heart Study (FHS). Using a statistic that we adapted to measure network dependence, we test for network dependence and for possible confounding by network structure in several of the thousands of influential papers published using FHS data. Results suggest that some of the many decades of research on coronary heart disease, other health outcomes, and peer influence using FHS data may suffer from spurious estimates of association and anticonservative uncertainty quantification due to unacknowledged network structure.

But data with network dependence abounds, and in many settings researchers are explicitly interested in learning about social network dynamics. Therefore, there is high demand for methods for causal and statistical inference with social network data. The second part of the talk describes recent work on causal inference for observational data from a single social network, focusing on (1) new types of causal estimands that are of interest in social network settings, and (2) conditions under which central limit theorems hold and inference based on approximate normality is licensed.