Title:
Confounding, mediation and colliding - what types of shared covariates does the sibling comparison design control for?

Abstract:
The sibling comparison design is an important epidemiological tool to control for unmeasured confounding, in studies of the causal effect of an exposure on an outcome. It is routinely argued that within-sibling associations are automatically controlled for all measured and unmeasured covariates that are shared (constant) within sets of siblings, such as early childhood environment and parental genetic make-up. However, an important lesson from modern causal inference theory is that not all types of covariate control are desirable. In particular, it has been argued that collider control always lead to bias, and that mediator control may or may not lead to bias, depending on the research question. In this presentation we use Directed Acyclic Graphs (DAGs) to distinguish between shared confounders, shared mediators and shared colliders, and we examine which of these shared covariates the sibling comparison design really controls for.