Causal inference with time-varying treatments and confounding

25 May 2022 | Sala del Capitolo & Seminar Room 2 (Badia Fiesolana)

Abstract

This mini-workshop introduces causal inference with treatments and confounders that are time-varying. Traditional methods for causal inference were designed for time-constant treatments and confounders. These tools may lead to biased estimates when both treatments and confounders vary over time and in the presence of treatment-confounder feedback. The morning workshop introduces the problem and the afternoon one goes through social science research examples where such problems arise.

Programme

10:00-12:00 │ Sala del Capitolo (Badia Fiesolana)

"**Causal diagrams and treatment-confounder feedback**"

Speaker: Miguel Hernán (Kolokotrones Professor of Biostatistics and Epidemiology, Harvard University)

Traditional methods for confounder adjustment were designed for treatments and confounders that do not vary over time. However, we are often interested in making causal inferences about time-varying treatments, which implies that the confounders are also time-varying and that treatment-confounder feedback may arise. Traditional methods cannot appropriately adjust for confounders in the presence of treatment-confounder feedback. Rather, Robins's g-methods are needed. The use of causal diagrams is helpful both to describe treatment-confounder feedback and to explain why g-methods are needed.

14:00-16:00 │ Seminar Room 2 (Badia Fiesolana)

"**Time-varying treatments and confounders and treatment-confounder feedback: examples from social science**"

Speaker: Alejandra Rodríguez Sanchéz, (Researcher, Deutsches Zentrum für Integrations- und Migrationsforschung & Humboldt University Berlin)

Time-varying treatments and confounders and treatment-confounder feedback processes abound in the social, political and economic sciences. Examples include sequential treatments (e.g., multiple spells of unemployment, multiple elections) and cumulative (dis)advantage processes ("success-feeds-success"), where precedent treatments affect the confounders of subsequent treatments. Despite the prominence of such processes, methods to tackle the causal inference problems that they lead to have not been widely adopted in the social sciences. This lecture goes through some real-life research examples where these problems have been tackled. It follows up the topics from the more conceptual morning lecture.