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# Causal Inference for calendar-time parameters

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## Abstract

Despite what the classical biostatistics and causal inference literature might suggest, decision makers are not only concerned with parameters that can be identified in traditional randomized controlled trials (RCTs). In this work, we consider identification and estimation of counterfactual surveillance parameters, which are of broad interest in practice, but cannot be easily identified in RCTs. These parameters allow us to formally distinguish between constraints in calendar time and the time under investigation. For example, decision makers often formulate resource constraints over calendar time, such as the number of organ transplants available at a given day, and it is unclear how to translate such constraints in traditional RCT settings, where time refers to time since "study entry". We derive identification results for surveillance parameters under counterfactual treatment regimes, which are indexed by both calendar time and time since study entry. Further, we derive different estimators for these parameters, which rely on non-overlapping model assumptions.

**Keywords:** causal inference

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