

國立中山大學應用數學系

學術演講

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講題：Causal mediation of hepatitis C on mortality via liver
and non-liver diseases

時間：2020/10/16 (Friday) 14:10 ~ 15:00

地點：理學院四樓理 SC 4009-1 室

茶會：13:30 於理 SC 4010 室 (系辦公室)

Abstract

A natural history of human diseases is comprised of multiple health events in sequence, say an intermediate event and a terminal event. The semi-competing risk problem arises when one is interested in the effect of an exposure or treatment on both intermediate (e.g., having cancer) and terminal events (e.g., death) where the intermediate event may be censored by the terminal event, but not vice versa. Here we propose a nonparametric approach to investigate the natural histories of patients infected by hepatitis C virus (HCV), casting the semi-competing risks problem in the framework of causal mediation modeling. We set up a mediation model with the intermediate and terminal events, respectively as the mediator and the outcome, and define indirect effect as the effect of the exposure on the primary event mediated by the intermediate event and direct effect as that not mediated by the intermediate event. Asymptotic properties were established for the proposed estimators and were supported by numerical simulation. Our analyses showed that the effect of HCV infection on mortality was through liver cancer incidence as well as other diseases, including cardiovascular diseases, diabetes and renal diseases. The pattern of causal mediation also varied by age and gender.

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