

## 2022년 제 13회 통계세미나

고려대학교 통계연구소와 BK21 통계학교육연구팀이 다음과 같이 공동으로 세미나를 개최하오니 많은 참여 바랍니다.

일시 : 2022년 10월 14일(금) 오전 11시

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### **Marginal structural model to estimate the effect of time-varying, nonrandomized treatment**

<Abstract>

Estimation of the causal effect of time-varying treatment based on longitudinal data from observational study is a common problem in clinical science. When there are time-varying confounders that are also intermediate factors between the treatment and outcome, standard approaches to control for confounders can lead to substantial bias in estimates of treatment effect. We describe Marginal Structural Models (MSM) and Inverse-Probability-of-Treatment-Weighted (IPTW) estimators, which can provide unbiased estimates of causal effects when unmeasured confounding and model misspecification are absent. We apply MSM to the data of patients with ankylosing spondylitis to estimate the effect of biologics on radiographic progression controlling for the effect of inflammation. Here, inflammation affects the subsequent biologics prescription and the radiographic progression, as well as is affected by previous biologics administration. We demonstrate how this method corrects for the imbalance in inflammation at the time of treatment initiation vs. discontinuation, and thus provides unbiased estimate of the biologics effect.

Keywords: Marginal structural model, Inverse probability of treatment weighting, Causal inference, Time-varying confounder

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