# 大阪医学統計学セミナ・ Osaka Biostatistics Seminar 第73回

# 10月5日(木) 16:00~17:30

## **F** Efficient Multiply Robust Estimation Under Informative Sampling.



#### 場所: 医学系研究科基礎研究棟L階 医学統計学研究室 オンライン開催

参加ご希望の方は、前日までに下記 問い合わせ先にメールにてお申込み ください。

### Speaker : Kenji Beppu Department of Engineering Science, Osaka University

Abstract: Nonresponse after probability sampling is a universal challenge, often necessitating adjustments to mitigate sampling and selection bias simultaneously. This presentation explores the removal of the bias as well as the effective utilization of available information, not just in nonresponse but also in a situation of data integration where summary statistics of other data sources are accessible. We reformulate these settings within a two-step monotone missing data framework: the first step of missingness arises from sampling, while the second originates from nonresponse. Subsequently, we derive the semiparametric efficiency bound for the target parameter. We also propose adaptive estimators, utilizing methods of moments and empirical likelihood approaches, to attain the lower bound. The proposed estimator exhibits both efficiency and double robustness. However, attaining efficiency with the adaptive estimator requires the correctness of certain working models. To reinforce robustness against misspecification of the working models, we extend the property of double robustness to multiple robustness by proposing a two-step empirical likelihood method that effectively leverages empirical weights. A numerical study is undertaken to investigate the finite sample performance of the proposed method.

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