

広島統計談話会
Hiroshima Statistics Study Group

第 293 回談話会を下記のように開催致しますので
御参集下さいますようご案内申し上げます。

You are cordially invited to the 293rd meeting as scheduled below.

日 時 : 2015 年 10 月 2 日 (金) 15:00 –
Date : October 2, 2015 (Fri) 15:00 –

場 所 : 放射線影響研究所 講堂
Place : RERF Auditorium

演 者 : ジョン B. コローン (放射線影響研究所 統計部 主任研究員)
Speaker : John B. Cologne, Ph.D.
Senior Scientist
Department of Statistics, RERF

演 題 : 「二値データに対する一般リスクモデルから非交絡予測変数を除外する時の
効果について」
Title : “Effects of omitting non-confounding predictors from general risk models for binary
outcome data”

要 約 :

Summary:

The effect in terms of bias and precision of omitting non-confounding predictive covariates from generalized linear models has been well studied, and this issue has received renewed attention recently in terms of case-control studies of genetic risk factors with high-dimensional data. Briefly, except with ordinary linear regression (identity link) or a log link, estimated parameters of included covariates are biased and precision is affected in a way depending on the mathematical properties of the link function. Contrary to conventional wisdom based on ordinary linear regression, where including or omitting predictive covariates has no effect on bias but omitting them can reduce precision of estimates of parameters of included covariates, with logistic regression omitting predictive covariates results in bias towards the null value and a gain in precision, with the bias predominating asymptotically so that omitting covariates is not recommended even though there may be slight gains in power in small samples. However, many epidemiologic risk analyses are based on models that do not involve a linear predictor, and the effect of omitting covariates from such general risk models has not been characterized. We employed algebraic approximation and simulation to study differences between effects of omitting covariates in ordinary logistic models versus the excess relative risk (ERR) model with binary outcome data, such as case-control data. We also studied the effect of omitted covariates with commonly employed general risk models, including the Breslow-Storer power model and the Thomas additive-multiplicative mixture model. We demonstrate that prior conclusions regarding omitted covariates for generalized linear models can be applied without substantial change to assess the effect of omitted covariates on general risk models. The extent of the difference in effect of omission between logistic and general risk models may depend, however, on the magnitude of the risk.