VICTORIAN CENTRE FOR BIOSTATISTICS

ViCBiostat

Victorian Centre for Biostatistics

Seminar

Thursday 22nd May 2014
9.30am to 10.30am
Melbourne School of Population and Global Health, Melbourne University
Room 515, Level 5,
207 Bouverie Street, Carlton

Likelihood-based estimators for meta-regression analyses of standardized differences of means

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In this seminar we present the distribution for standardized difference of means (SMD) estimators under the assumption that the data is sampled from a normal distribution which includes a normally distributed random effect component. This distribution, a rescaled non-central t and which is not conditional on the random effect, can then be used to create maximum likelihood estimators (MLEs) where our main focus is on the meta-regression setting. Additionally, we explore the use of normalization transformations on the SMD estimates that can be used to obtain MLEs based on approximate normal densities which may reduce the computational effort required for estimation. An advantage of our approaches is that they do not require individual studies to consist of large sample sizes which is commonly assumed to be the case. We also highlight how simple these estimates and associated confidence intervals are to obtain using existing functionality within the R statistical package. Examples from the scientific literature are considered and we also present some simulation studies that compare these MLE estimators with other common approaches. Despite this being on-going work, some excellent simulation results point to the future availability of useful estimators for meta-regression analysis of SMDs.

Dr Luke Prendergast is a Senior Lecturer in the Department of Mathematics and Statistics at La Trobe University. His main research areas are dimension reduction techniques and meta-analytic methods. Luke is also an Honorary Senior Fellow, Department of Medicine, Austin Health at the University of Melbourne where he works with scientists from the Obesity Consortium. He has also recently become the Vice President of the Victorian Branch of the SSAI (SSA Vic).

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