

A Confidence Interval Robust to Publication Bias for Random-Effects Meta-Analysis of Few Studies

Masayuki Henmi

The Institute of Statistical Mathematics, Tokyo, Japan

Abstract

In meta-analyses including only few studies, the estimation of the between-study heterogeneity is challenging. Furthermore, the assessment of publication bias is difficult as standard methods such as visual inspection or formal hypothesis tests in funnel plots do not provide adequate guidance. Previously, Henmi and Copas (Statistics in Medicine 2010, 29: 2969-2983) proposed a confidence interval for the overall effect in random-effects meta-analysis that is robust to publication bias to some extent. Although it was shown by their simulations that the confidence intervals have improved coverage probabilities compared with standard methods, the properties of their method have never been assessed for meta-analyses including fewer than five studies. In this study, we propose a variation of the method by Henmi and Copas employing an improved estimator of the between-study heterogeneity, in particular when dealing with few studies only. In a simulation study, the proposed method is compared to several competitors. Overall, we found that our method outperforms the others in terms of coverage probabilities.

Keywords:

Between-Study Heterogeneity; Confidence Interval; Publication Bias.