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Abstract title	Use of the Peto Odds Ratio in Network Meta-Analysis

Abstract (max 500 words)

The Peto method is a classic fixed effect approach for pairwise meta-analysis of binary outcomes (Yusuf et al., 1985) and is available, for example, in Review Manager 5 by Cochrane. The Peto odds ratio – calculated using the observed and expected number of events in one treatment group under the assumption of no treatment effect – and its standard error are used in a generic inverse variance meta-analysis. Simulations have shown that the Peto method works well for very sparse binary data, when studies have balanced sample sizes in their treatment arms, and when treatment effects are small (Bradburn et al., 2007). Other simulations, however, showed that it is problematic if sample sizes are imbalanced or treatment effects are large (Brockhaus et al., 2016). The Peto method has been adapted for network meta-analysis in the seminal paper by Higgins and Whitehead (1996).

In this presentation, we will show – using some artificial and real examples – that the Peto method can lead to inconsistent treatment estimates in studies with three treatment arms (denoted as A, B, and C). I.e., the product of the Peto odds ratios for the three pairwise comparisons A vs B, B vs C, and C vs A is not equal to 1. We will describe factors influencing the degree of inconsistency and give settings when the Peto odds ratios of multi-arm studies are consistent.

We conclude that the classic Peto method should not be used in network meta-analyses.

References:

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