Kolloquium „Statistische Methoden in der empirischen Forschung"

Wann: 28. Oktober 2014, 17:00 – 18:30 Uhr

Wo: Lebenswissenschaftliche Fakultät, Humboldt-Universität zu Berlin,
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The Peto odds ratio viewed as a new effect measure

Meta-analysis has generally been accepted as a fundamental tool for combining effect estimates from several studies. For binary studies with rare events, the Peto odds ratio (POR) method has become the relative effect estimator of choice. However, the POR leads to biased estimates for the odds ratio (OR) when treatment effects are large or the group size ratio is not balanced.

The aim of this work is to derive the limit of the POR estimator for increasing sample size, to investigate whether the POR limit is equal to the true OR and, if this is not the case, in which situations the POR limit is sufficiently close to the OR. It was found that the derived limit of the expected POR is not equivalent to the OR, since it depends on the group size ratio. Thus, the POR represents a different effect measure.

We investigated in which situations the POR is reasonably close to the OR and found that this depends only slightly on the baseline risk within the range [0.001; 0.1], yet substantially on the group size ratio and the effect size itself. We derived the maximum effect size of the POR for different group size ratios and tolerated amounts of bias, for which the POR method results in an acceptable estimator of the OR. We conclude that the limit of the expected POR can be regarded as a new effect measure, which can be used in the presented situations as a valid estimate of the true OR