

Master Thesis:

Meta-research on scientific publication practice: a novel approach for estimating publication bias

The current debate on reproducibility crisis in science has re-fueled concerns generations of statisticians have put forward – with limited success apparently – about the detrimental effects of flawed study designs and inappropriate statistical analyses. Biases and variation of primary study results due to reliability issues also complicate or even compromise risk assessments that are based on a synthesis of the available body of scientific evidence.

One particular aspect of concern for risk assessors is publication bias, which may result in an overrepresentation of “positive” research outcomes, for example significant positive treatment effect or identification of a substance as harmful in the available knowledge base. Methods for identifying publication bias in systematic reviews are available. However, given the serious consequences of publication bias in any research synthesis, it would be advisable to have alternative approaches for quantifying the effects of publication bias, which will be subject of the intended research project. The proposed study is a meta-research project based on published primary studies in a research area related to consumer safety.

Here we are interested to investigate whether a correlation exists between the duration of the peer reviewing and editorial process and the study outcome for a given research question. If it can be demonstrated that non-significant or negative study outcomes take longer until they become available, we may attempt to extrapolate from the available evidence to the non-available evidence using time-to-publish as predictor. This approach is in analogy to estimating characteristic of non-responders from late responders in observational studies. Moreover, we may estimate the proportion of not-yet-available evidence using waiting-time models differentially parametrized for positive and non-positive research outcomes.

The Master student should take responsibility to operationalize the basic research idea and define a study protocol, conduct systematic literature reviews for data generation, conduct all statistical analyses and draft a manuscript for publication.

The Master thesis is in cooperation with the German Federal Institute for Risk Assessment (BfR, contact: matthias.greiner@bfr.bund.de) and could be implemented as a Master project at the BfR. The thesis may be written in English or German.