Can quantitative methods help detect and reduce "publication bias in situ"?

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Possibly the greatest challenge to the validity of epidemiologic research is the biased presentation of results. Due to worldly political bias or simply a desire to find a "better" result, researchers have an incentive to run many analyses of their data (using different functional forms, different covariates, etc.) and report or emphasize only those results they prefer. Indeed, given This creates "publication bias *in situ*", selective reporting of results not at the level of some studies never getting published, but within the published results from a particular study. The degree of bias is unknown, but somewhat biased reporting may be very common and highly biased reporting can be observed disturbingly often. This is a threat to the accuracy and integrity of the entire literature. It should be possible to develop mathematical/statistical tools that aid in producing less biased reporting choices, as well as tools for detecting and quantifying the bias that does occur.

One example: Epidemiologic analyses typically convert continuous variables to categories (most often only 2), and report results as if no other categorization were considered, or even possible though it is typical that researchers looked at the results from using a variety of cutpoints between categories. The choice of which to report may be influenced by correlations in the data, to and extreme of choosing a categorization that maximizes the effect estimate. The resulting snapshot of the data that is reported (i.e., a single RR point estimate and the corresponding confidence interval created by a particular choice of categorizations) will result is publication bias, and may not usefully represent the data. We demonstrate how these choices can influence effect estimates using data from the National Health and Nutrition Examination Survey (NHANES) and show examples from the published literature. A partial solution to this problem is found in graphically presenting the distribution of effect estimates that result from alternative plausible cutpoints, rather than misrepresenting the data as generating a single clear result. More parsimonious representations also seem to be possible.