

Graphical augmentations to the funnel plot assess the impact of additional evidence on a meta-analysis

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This presentation aims to illustrate how graphical methods can show the potential impact of a new study on a meta-analysis, which gives an indication of the robustness of the meta-analysis. A number of augmentations are proposed to one of the most widely used of graphical displays, the funnel plot. Namely, 1) statistical significance contours, which define regions of the funnel plot in which a new study would have to be located to change the statistical significance of the meta-analysis; and 2) heterogeneity contours, which show how a new study would affect the extent of heterogeneity in a given meta-analysis. Several other features are also described, and the use of multiple features simultaneously is considered. The statistical significance contours suggest that one additional study, no matter how large, may have a very limited impact on the statistical significance of a meta-analysis. The heterogeneity contours illustrate that one outlying study can increase the level of heterogeneity dramatically. The additional features of the funnel plot have applications including 1) informing sample size calculations for the design of future studies eligible for inclusion in the meta-analysis; and 2) informing the updating prioritization of a portfolio of meta-analyses such as those prepared by the Cochrane Collaboration.

Key words: Meta-analysis, graphical display, funnel plot