Contour enhanced funnel plots for meta-analysis

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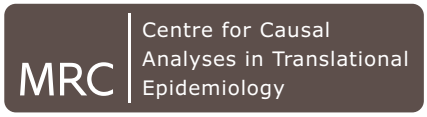
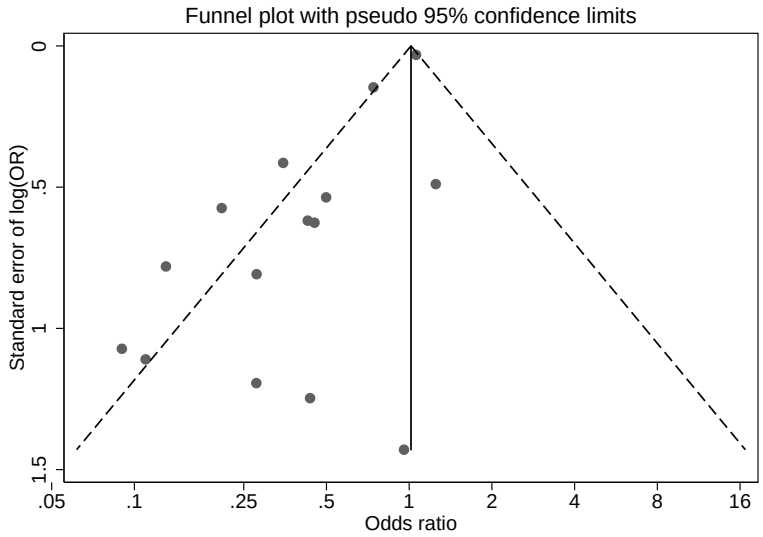


Outline

- Introduction to funnel plots & contour enhanced funnel plots
- Moreno, Sutton, Turner, et al., 2009 BMJ example
  - Use with other bias assessment methods
- `confunnel`: syntax and options
- Discussion

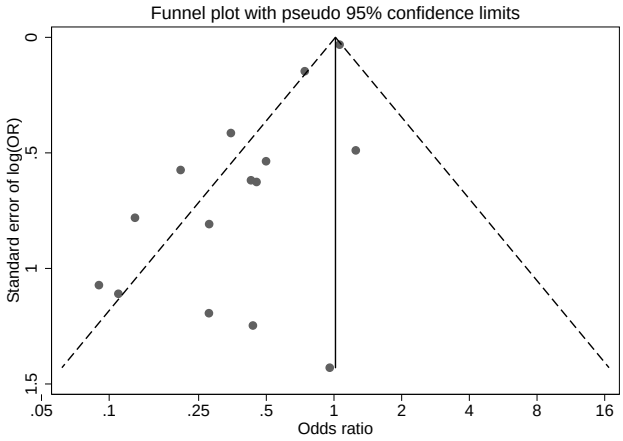
Introduction to funnel plots

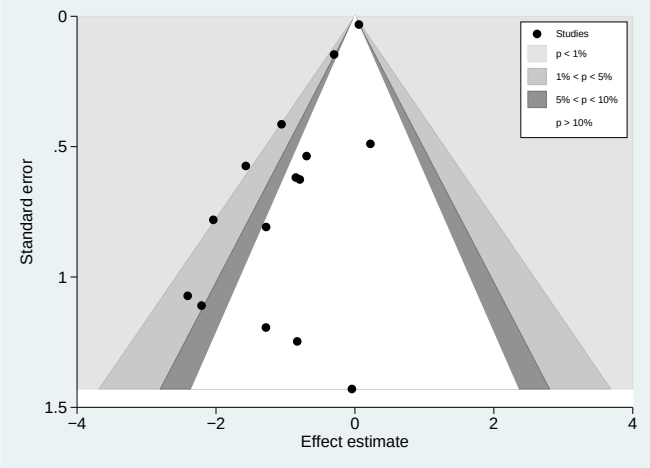


- Plot of std error (y-axis) versus effect estimate (x-axis)
- Help assess small study reporting bias/publication bias
- Sterne & Harbord, 2004; `metafunnel`, `funnel`
- Same metric as Egger's test (Egger, Davey Smith, Schneider, & Minder, 1997)

Introduction to contour enhanced funnel plots

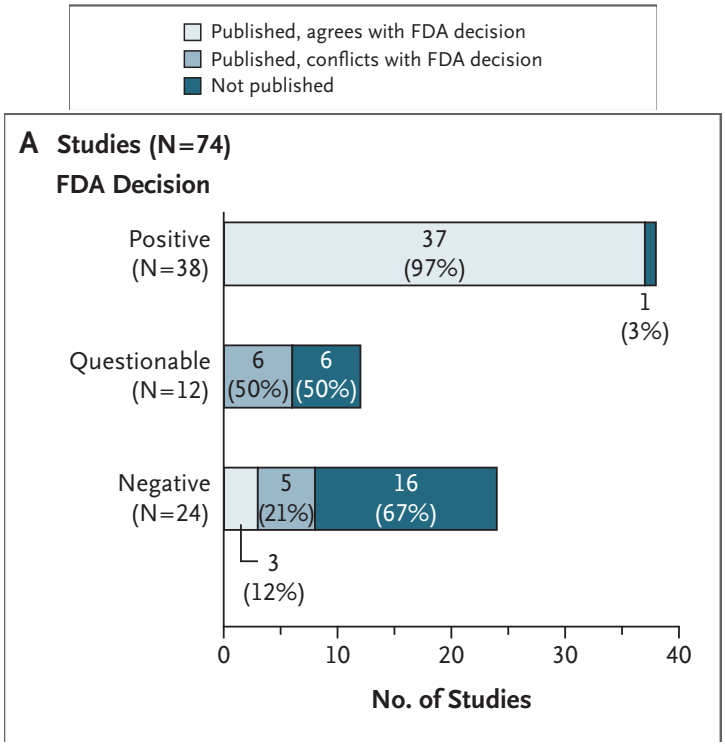
- Indicate regions of statistical significance on funnel plot
- Spiegelhalter, 2002, 2005; Peters, Sutton, Jones, Abrams, & Rushton, 2008

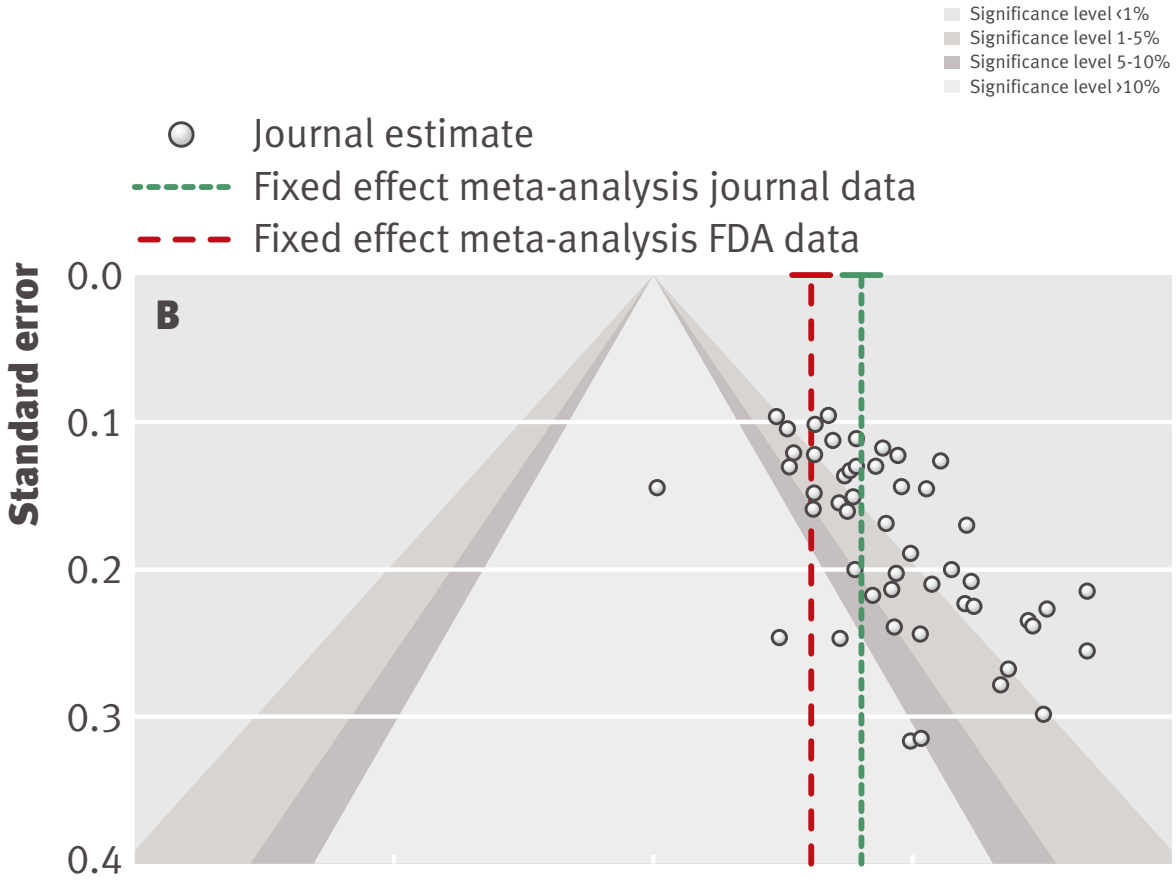




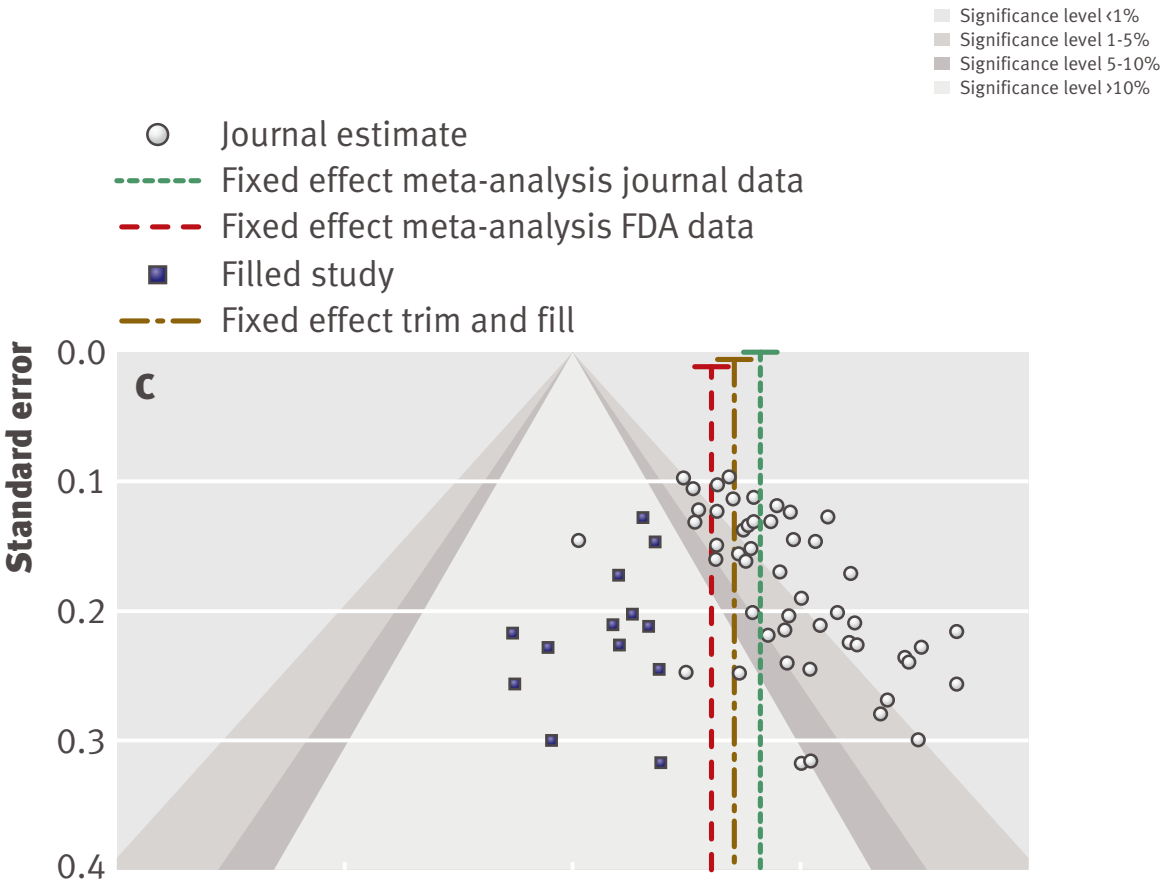
Moreno, Sutton, Turner, et al., 2009, BMJ, example

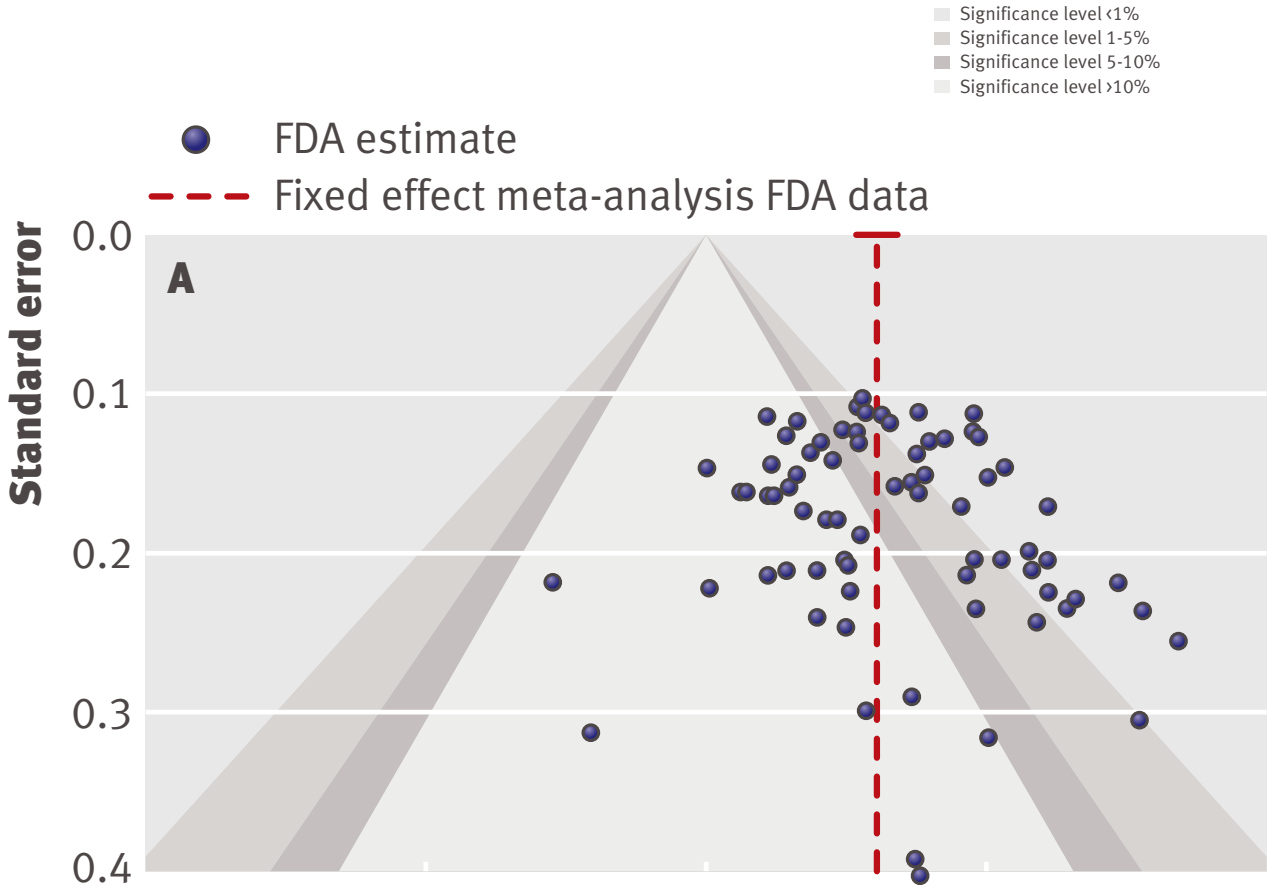
- Re-analysis of Turner, Matthews, Linardatos, Tell, & Rosenthal, 2008, NEJM
- Results of 74 trials of 12 antidepressant drugs
- Compare FDA results versus journal results

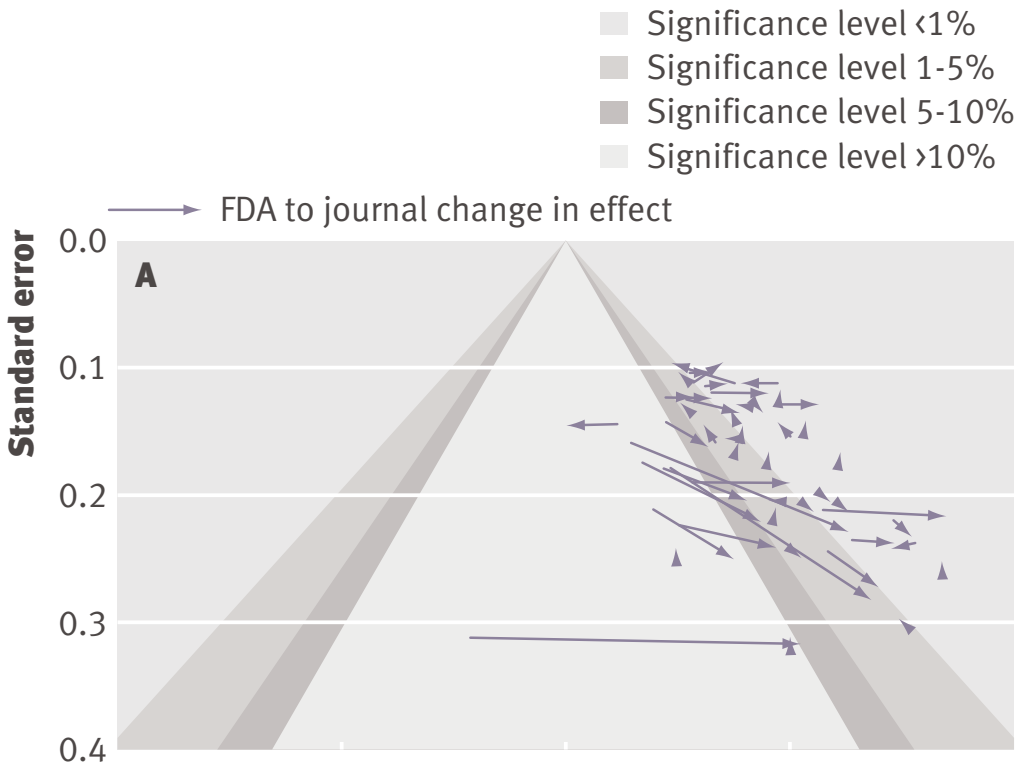




- Trim & fill: Duval & Tweedie, 2000b, 2000a






Significance level <1%
Significance level 1-5%
Significance level 5-10%
Significance level >10%
FDA to journal change in effect
Standard error
0.0
0.1
0.2
0.3
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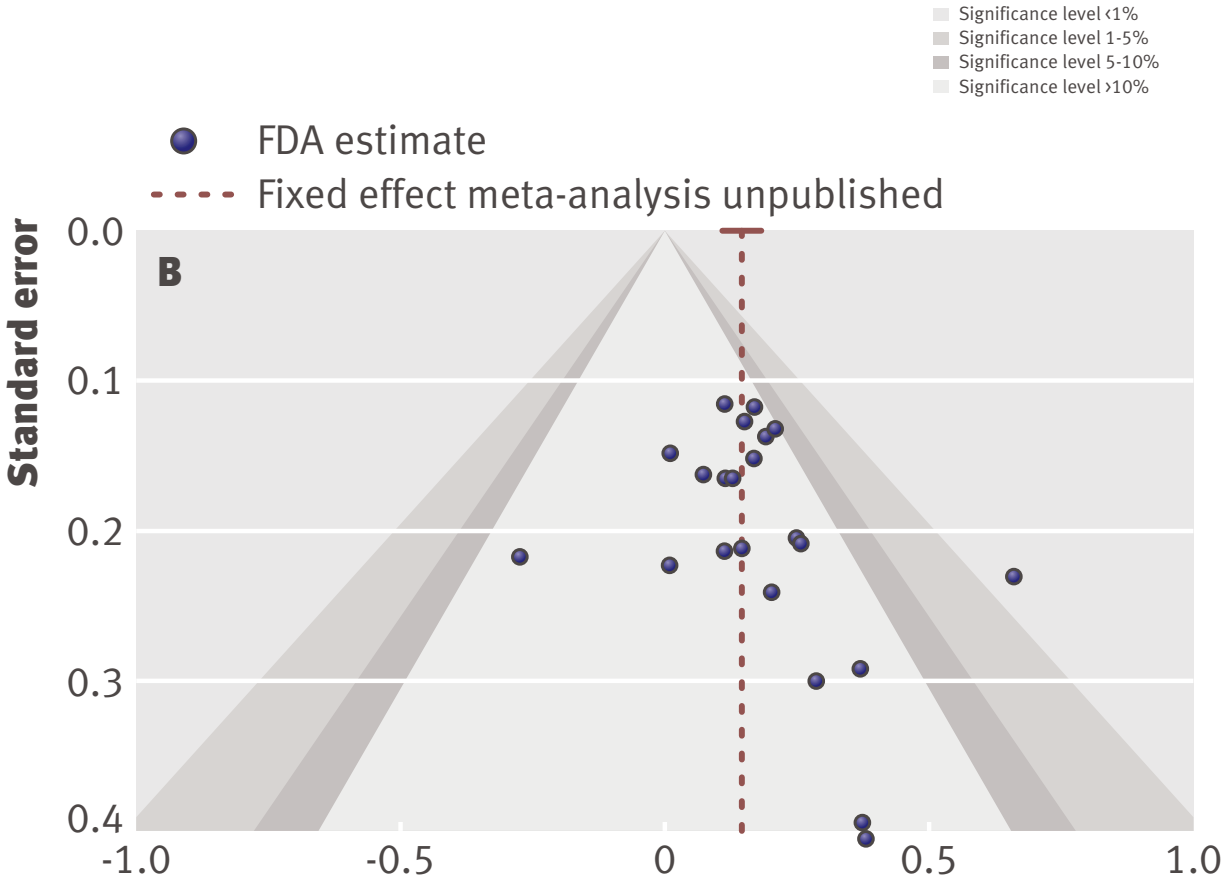
A


Significance level <1%
Significance level 1-5%
Significance level 5-10%
Significance level >10%
FDA estimate
Fixed effect meta-analysis unpublished
Standard error
0.0
0.1
0.2
0.3
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B
-1.0
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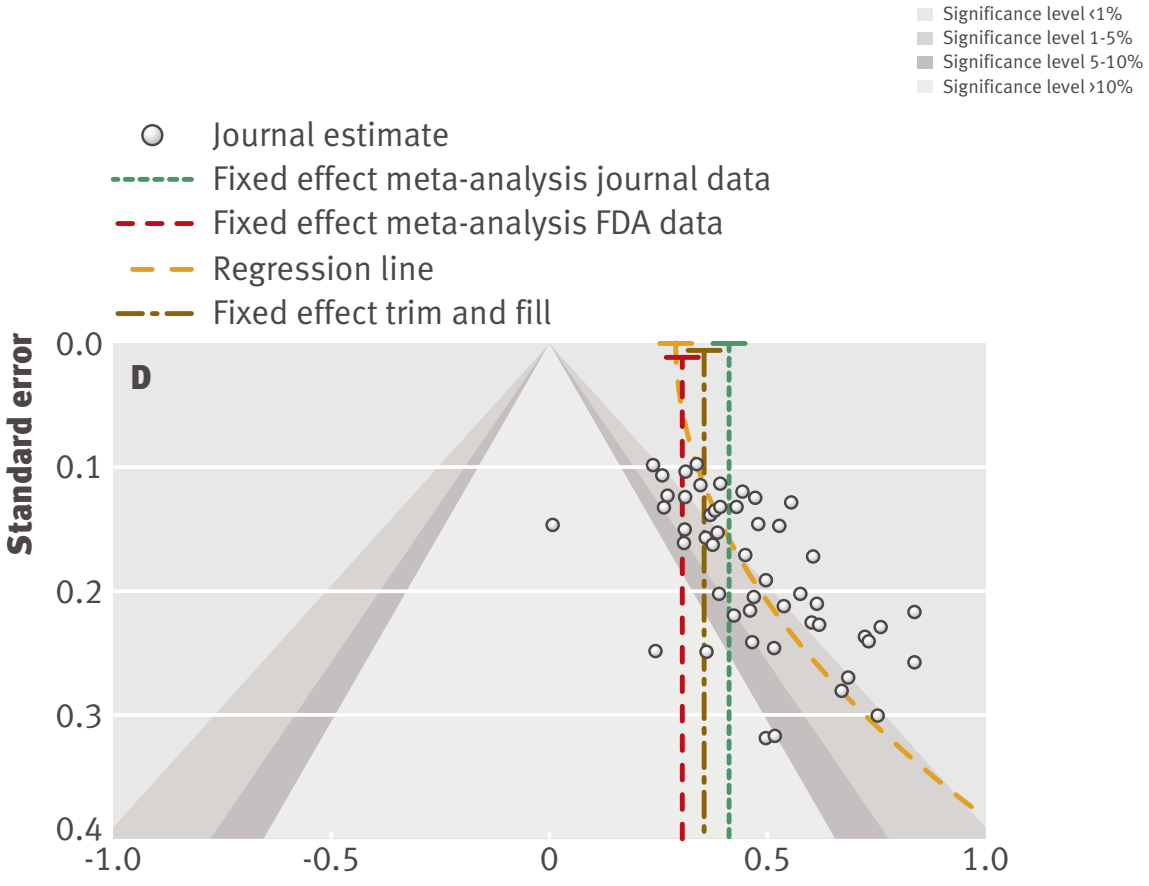
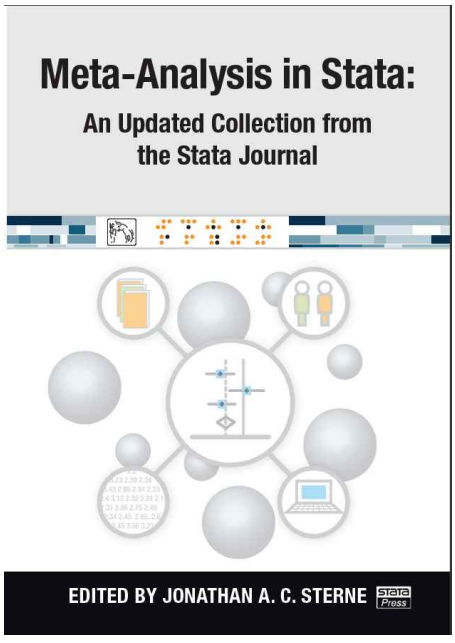
- Regression based bias adjustment methods:

Shang et al., 2005; Moreno, Sutton, Ades, et al., 2009



The `confunnel` command

- Peters et al., 2008
  - investigation of 48 published Cochrane meta-analyses
- Sterne, Egger, & Moher, 2008, Cochrane Handbook, section 10.4.b
- Palmer, Peters, Sutton, & Moreno, 2008 (v1.0.4)
- Palmer, Peters, Sutton, & Moreno, 2009 (v1.0.5)



`confunnel`: syntax and options

- Syntax:

```
confunnel logor selogor [, options]
```

- Options:
  - `metric(se|invse|var|invvar)`: different *y*-axes: variance, standard error & their inverses (Sterne & Egger, 2001)
  - `onesided(lower|upper)`: one sided significance levels
  - Other `twoway` options

Contour enhanced funnel plots discussion

- Funnel plots should be used with care (Lau, Ioannidis, Terrin, Schmid, & Olkin, 2006)
- Aid assessment of reporting biases
- Put other bias assessment methods in a context
- `confunnel` can be used with `metan`, `metabias`, `metatrim`

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