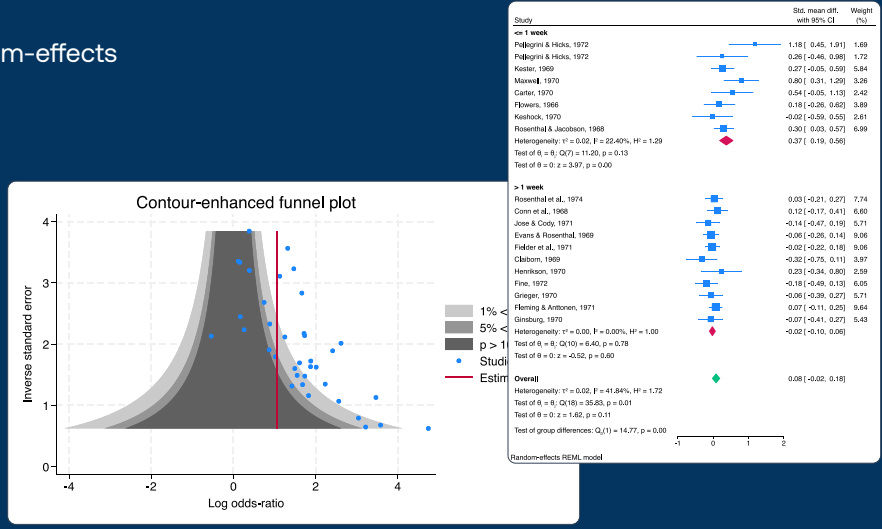


# Meta-analysis

Stata's suite of commands for meta-analysis is broad yet easy to use.

- Effect sizes: Hedges's  $g$ , Cohen's  $d$ , odds ratios, risk ratios, proportions **New**, and more
- Common-effect, fixed-effects, and random-effects models
- Forest, funnel, Galbraith, and more plots
- Subgroup analysis
- Meta-regression
- Tests of small-study effects
- Trim-and-fill analysis of publication bias
- Cumulative meta-analysis
- Leave-one-out meta-analysis
- Multivariate meta-analysis
- Multilevel meta-analysis **New**



## Prepare your data

### Continuous summary data

Compute Hedges's  $g$  effect sizes (default)

```
. meta esize n1 m1 sd1 n2 m2 sd2
```

Compute Cohen's  $d$  effect sizes

```
. meta esize n1 m1 sd1 n2 m2 sd2, esize(cohend)
```

### Binary summary data

Compute log odds-ratios (default)

```
. meta esize n11 n12 n21 n22
```

Compute log risk-ratios

```
. meta esize n11 n12 n21 n22, esize(lnrratio)
```

### Generic effect sizes

Specify precomputed effect sizes and their SEs (and label effect sizes)

```
. meta set es se, eslabel(Log hazard-ratio)
```

Or specify effect sizes and their CIs (and label studies)

```
. meta set cil ciu, studylabel(studylbl)
```

## Summarize meta-analysis data

Compute basic summaries and display in a table

```
. meta summarize
```

Or produce a forest plot

```
. meta forestplot
```

## Explore heterogeneity

Perform subgroup analysis for levels of **group**

```
. meta forestplot, subgroup(group)
```

Perform meta-regression and also account for continuous **x**

```
. meta regress i.group x
```

Produce a Galbraith plot

```
. meta galbraithplot
```

# Cumulative and leave-one-out meta-analysis

Perform cumulative meta-analysis in the order of **year**

. meta forestplot, cumulative(year)

Perform leave-one-out meta-analysis

. meta forestplot, leaveoneout

# Explore small-study effects

Produce a funnel plot

. meta funnelplot

Perform Egger test for funnel-plot asymmetry

. meta bias, egger

Produce a funnel plot by **group**

. meta funnelplot, by(group)

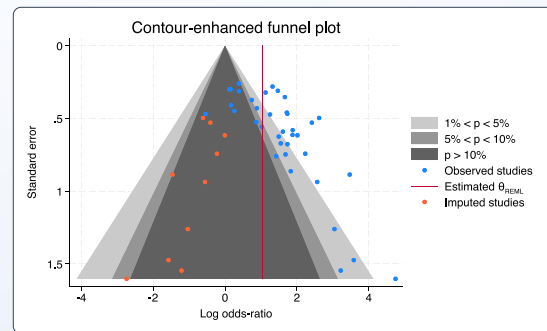
Adjust for heterogeneity due to **group** during testing

. meta bias i.group, egger

# Assess publication bias

Assess publication bias using the trim-and-fill method; produce contour-enhanced funnel plot including omitted studies

. meta trimfill, funnel(contours(1 5 10))



# Perform multivariate and multilevel meta-analysis

Multivariate meta-regression

. meta mvregress y1 y2 = x1 i.x2, wcovvariables(v11 v12 v22)

Assess multivariate heterogeneity or multilevel heterogeneity

. estat heterogeneity

Multilevel meta-regression **New**

. meta meregress y x1 i.x2 || level3var: x1 || level2var:, essevariable(se)

# Use commands or GUI

Study	Effect size	Std. mean diff.	[95% conf. interval]	% weight
Rosenzthal et al., 1974	0.000	-0.215	0.275	7.74
Cunn et al., 1968	0.120	-0.168	0.488	6.68
Jose & Cobby, 1971	-0.140	-0.467	0.187	5.71
Pallagint & Hicks, 1972	1.180	0.449	1.911	1.69
Pallagint & Hicks, 1972	0.260	-0.463	0.983	1.72
Evans & Rosenzthal, 1969	-0.060	-0.262	0.142	9.06
Fielder et al., 1971	-0.020	-0.222	0.182	9.06
Claborn, 1969	-0.120	-0.751	0.511	3.97
Keller, 1969	0.270	-0.051	0.591	5.84
Hewell, 1970	0.800	0.368	1.292	5.26
Carter, 1970	0.540	-0.092	1.132	2.42
Flowers, 1966	0.180	-0.257	0.617	3.89
Rebeck, 1970	-0.020	-0.196	0.146	2.42
Harrison, 1970	0.230	-0.338	0.798	2.59
Line, 1972	-0.180	-0.492	0.132	6.05
Granger, 1970	-0.060	-0.387	0.267	5.71
Rosenzthal & Jackson, 1968	0.300	0.038	0.572	4.99
Flensing & Antonson, 1971	0.070	-0.114	0.254	9.64
Ginsburg, 1970	-0.070	-0.411	0.271	5.43
theta	0.004	-0.018	0.185	