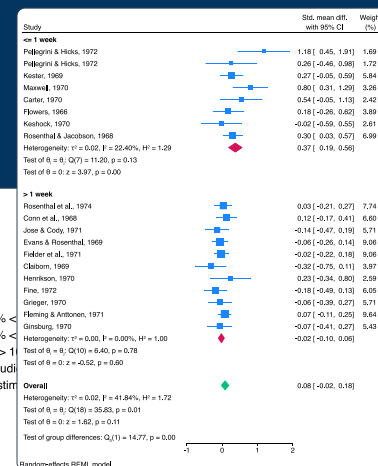
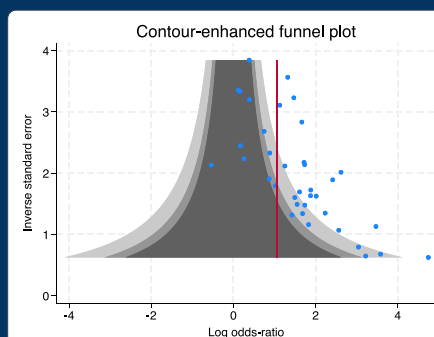


# Meta-analysis

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**, correlations **StataNow**, 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(study1b1)
```

## 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
```

Produce a funnel plot by **group**

```
. meta funnelplot, by(group)
```

Perform Egger test for funnel-plot asymmetry

```
. meta bias, egger
```

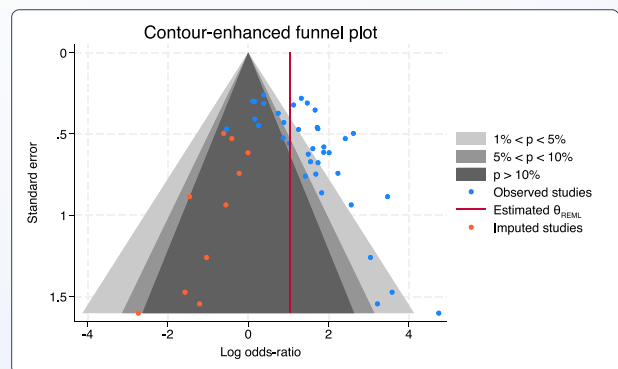
Adjust for heterogeneity due to **group** during testing

```
. 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	[95% conf. interval]	% weight
Rosenthal et al., 1974	0.030	-0.215 0.275	7.74
Conn et al., 1968	0.120	-0.168 0.408	6.60
Jose & Cody, 1971	-0.140	-0.467 0.187	5.71
Pellegrini & Hicks, 1972	1.180	0.440 1.911	1.69
Pellegrini & Hicks, 1972	0.260	-0.463 0.983	1.72
Evans & Rosenthal, 1969	-0.060	-0.262 0.142	9.06
Falster et al., 1971	-0.020	-0.222 0.182	9.06
Claiborn, 1969	-0.320	-0.751 0.111	3.97
Kester, 1969	0.270	-0.451 0.591	5.84
Hoswell, 1970	0.800	0.368 1.292	3.26
Carter, 1970	0.540	-0.052 1.132	2.42
Flowers, 1966	0.180	-0.257 0.617	3.89
Keshock, 1970	-0.020	-0.586 0.546	2.61
Henrikson, 1970	0.230	-0.338 0.798	2.59
Fine, 1972	-0.180	-0.492 0.132	6.05
Grieger, 1970	-0.060	-0.387 0.267	5.71
Rosenthal & Jacobson, 1968	0.300	0.028 0.572	6.99
Fleming & Anttonen, 1971	0.070	-0.114 0.254	9.64
Ginsburg, 1970	-0.070	-0.411 0.271	5.43
theta	0.094	-0.018 0.185	