Package: heterometa (via r-universe)

October 10, 2026

Type Package

Title Convert Various Meta-Analysis Heterogeneity Measures

Version 0.5

Date 2026-04-28

Description Published meta-analyses routinely present one of the measures of heterogeneity introduced in Higgins and Thompson (2002) <doi:10.1002/sim.1186>. For critiquing articles it is often better to convert to another of those measures. Some conversions are provided here and confidence intervals are also available.

Depends R (>= 3.5.0)

Imports Rdpack (>= 0.7),mathjaxr (>= 2.0-0)

RdMacros Rdpack,mathjaxr

BuildManual TRUE

License GPL-2

LazyLoad yes

NeedsCompilation no

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Repository https://deweyme.r-universe.dev

Date/Publication 2026-04-28 17:06:34 UTC

RemoteUrl https://github.com/cran/heterometa

RemoteRef HEAD

RemoteSha 78b6abe188ca6d152a06d0836e198652ef8544b5

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`heterometa-package` *Convert Various Meta-Analysis Heterogeneity Measures*

Description

Published meta-analyses routinely present one of the measures of heterogeneity introduced in Higgins and Thompson (2002) <doi:10.1002/sim.1186>. For critiquing articles it is often better to convert to another of those measures. Some conversions are provided here and confidence intervals are also available.

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                        Measures
higgins                 Compute heterogeneity statistics after Higgins
```

Published meta–analyses often only provide a subset of the heterogeneity measures first described in Higgins and Thompson (2002). This package provides a way of converting between some of them. It allows for the input of I2, Q or p and outputs Q, H, I2, and confidence intervals for them. It also contains the data used as examples in that original article.

References

Higgins JPT, Thompson SG (2002). "Quantifying heterogeneity in a meta–analysis." *Statistics in Medicine*, **21**, 1539–1558. doi:10.1002/sim.1186.

`dat.higgins02` *Example data*

Description

The package contains the following dataset: `higgins02`.

Usage

```
data(dat.higgins02)
```

Format

A data frame with 5 observations (meta-analyses) on 13 variables:

`Q` Values of the heterogeneity χ^2

`trials` The number of studies in each meta-analysis

`tau2` The value of τ^2

`pval` The associated p-value

`H` The value of H

`Hlo` Lower limit of the interval for H

`Hhi` Upper limit of the interval for H

`R` The value of R

`Rlo` Lower limit of the interval for R

`Rhi` Upper limit of the interval for R

`I2` The value of I^2

`I2lo` Lower limit of the interval for I^2

`I2hi` Upper limit of the interval for I^2

Note

These are values from Higgins and Thompson (2002). They are provided here for testing the package. The row names of the data frame are labels for the topic of the meta-analysis: Albumin, AdjuvantChemo, Sclerotherapy, CDPCholine, GammaNail. The value for I^2 for AdjuvantChemo is as given in the article but is almost certainly a typo for 29 not 20.

Not all the variables are used in this package but are here for reference or possible use elsewhere.

Author(s)

Michael Dewey

References

Higgins JPT, Thompson SG (2002). "Quantifying heterogeneity in a meta–analysis." *Statistics in Medicine*, **21**, 1539–1558. doi:10.1002/sim.1186.

Examples

```
data(dat.higgins02)
```

higgins *Compute heterogeneity statistics after Higgins*

Description

Computes various statistics suggested by Higgins and Thompson for quantifying heterogeneity in meta-analysis

Usage

```
higgins(Q = NULL, k = NULL, I2 = NULL,
   pval = NULL, slab = NULL, conflevel = 95)
## S3 method for class 'higgins'
print(x, type = "I2", na.print = "", ...)
```

Arguments

Q	Numeric: a vector of heterogeneity χ^2 from the meta–analyses
k	Numeric: a vector of number of studies in each meta-analysis
I2	Numeric: a vector of values of I^2
pval	Numeric: a vector of p values
slab	Character: a vector of labels for the meta-analyses
conflevel	Numeric: a vector of confidence levels
x	An object of class higgins
type	One of "H", "I2", "both"
na.print	What to print instead of NA
...	Argument(s) to be passed through

Details

Either Q or pval or I2 should be provided. If I2 is provided it may be either as a percentage or a proportion. If a single value is given for conflevel it is used for all the analyses.

Limited error checks for illegal parameters are performed. If conflevel is ≤ 1 the function proceeds assuming that was meant as a value of α. If the parameters are supplied as vectors a check is made for equal length. If they are not then a warning is issued but the function tries to return a sensible result which should be checked to see if it is what was desired.

For reference the formulae used are $Q = H^2(k-1)$, $H^2 = \frac{Q}{k-1}$, $I^2 = \frac{H^2-1}{H^2}$, $H^2 = -\frac{1}{I^2-1}$.

The print method allows for printing H or I^2 or both of these and this is controlled by the parameter type.

Value

A list of type `higgins` containing

`H`	A data frame with columns Q, k, H, ll, ul, where ll and ul are the confidence limits
`I2`	A data frame with columns Q, k, I2, ll, ul
`call`	The call

Note

I^2 is always printed as a percentage even if the input parameter was supplied as a proportion.

If $k = 2$ confidence intervals cannot be computed but other values are returned

Author(s)

Michael Dewey

References

Higgins JPT, Thompson SG (2002). "Quantifying heterogeneity in a meta–analysis." *Statistics in Medicine*, **21**, 1539–1558. doi:10.1002/sim.1186.

Examples

```
# first the examples one by one
higgins(14.4, 24) # 1    (1, 1.34)      0 (0, 45)
higgins(14.1, 11) # 1.19 (1, 1.64)     20 (0, 65) probably a typo for 29
higgins(81.5, 19) # 2.13 (1.71, 2.64)  78 (66, 86)
higgins(41.5, 7)  # 2.63 (1.90, 3.65)  86 (72, 92)
higgins(130.3, 3) # 8.07 (6.08, 10.72) 98 (97, 99)
# now repeat getting from dat.higgins02
data(dat.higgins02)
dat <- dat.higgins02
with(dat, higgins(Q, trials, slab = rownames(dat.higgins02)))
# supply I2 or pval
higgins(I2 = dat$I2[3], k = dat$trials[3])
higgins(pval = dat$pval[3], k = dat$trials[3])
# get both
res <- higgins(I2 = dat$I2[3], k = dat$trials[3])
print(res, type = "both")
```

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