Package ‘hetmeta’

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Type Package

Title Heterogeneity Measures in Meta-Analysis

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Description Assess the presence of statistical heterogeneity and quantify its impact in the context of meta-analysis. It includes test for heterogeneity as well as other statistical measures (R_b, I^2, R_I).

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Depends metfor

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R topics documented:

hetmeta-package .................................................. 2
confint.hetmeta ................................................... 2
hetmeta ............................................................. 4
hetmetaObject ..................................................... 5
print.hetmeta ...................................................... 6

Index 7
**Description**

The `hetmeta` package contains functions useful to assess the presence and to quantifying the impact of statistical heterogeneity. Several measures of heterogeneity are implemented in the `hetmeta` function.

All the functions in the packages requires a meta-analytic model of class `rma.uni` that can be easily obtained using the `metafor` package. See `metafor-package` for a comprehensive and detailed description.

**Functions and data included in the package**

The main function is `hetmeta`, which calculates the measures of heterogeneity in an object of class "hetmeta" (see `hetmetaObject`). The methods `print.hetmeta` and `confint.hetmeta` defines function for printing results and deriving confidence intervals.

**Author(s)**

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**References**


**Description**

The function calculates confidence intervals for the heterogeneity measures in a 'hetmeta' object.

**Usage**

```
## S3 method for class 'hetmeta'
confint(object, parm, level, digits, ...)
```
Arguments

- **object**: an object of class `hetmeta` produced by `hetmeta`.
- **parm**: this argument is here for compatibility with the generic function `confint`, but is (currently) ignored.
- **level**: numerical value between 0 and 100 specifying the confidence interval level (if unspecified, the default is to take the value from the object).
- **digits**: an integer specifying the number of digits to which printed results must be rounded.
- **...**: further arguments passed to or from other methods.

Details

The confidence intervals are constructed based on the (asymptotic) normal distribution of the estimators. Standard error are derived using the delta method. See the references for more details.

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References


See Also

`hetmeta`

Examples

```r
## load BCG vaccine data
data(dat.bcg)

## random-effects model of log relative risks
dat <- escalc(measure="RR", ai=tpos, bi=tneg, ci=cpos, di=cneg, data=dat.bcg)
res <- rma(yi, vi, data=dat)

## heterogeneity measures
het <- hetmeta(res)
confint(het)
```
hetmeta  

Deriving Measures Of Heterogeneity

Description

The "hetmeta" implements the most common measures of heterogeneity in meta-analysis.

Usage

hetmeta(model)

Arguments

model: an object of class "rma.uni".

Details

The "hetmeta" function calculates estimates for several heterogeneity measures in meta-analysis based on a meta-analytic model of class rma.uni (see metafor-package for more details). Specifically, the measures derived in the function are the $R_b$, $I^2$, and $R_I$. To complement those measures, the Dersimonian-Laird $Q$ test is presented, together with the coefficient of variation of the pooled estimate $CV_b$, coefficient of variation of the within-study variances, and the typical within-variance terms as defined in the $I^2$ and $R_I$. See references for more details.

Value

The hetmeta function returns an object of class "hetmeta" as described in hetmetaObject.

Author(s)

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References


See Also

hetmeta-package, metafor
Examples

```r
## load data
dat <- get(data(dat.gibson2002))

## random-effects model analysis of the standardized mean differences
dat <- escalc(measure = "SMD", m1i = m1i, sd1i = sd1i, n1i = n1i, m2i = m2i, 
              sd2i = sd2i, n2i = n2i, data = dat)
res <- rma(yi, vi, data = dat, method = "REML")

## heterogeneity measures
hetmeta(res)

## load BCG vaccine data
data(dat.bcg)

## random-effects model of log relative risks
dat <- escalc(measure="RR", ai=tapos, bi=tneg, ci=Cpos, di=cneg, data=dat.bcg)
res <- rma(yi, vi, data=dat)

## heterogeneity measures
hetmeta(res)
```

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**hetmetaObject**

**hetmeta Object**

**Description**

An object returned by `hetmeta` function, inheriting from class "rma.uni"

**Details**

An object of class "hetmeta". The object is derived from an object of class `rma.uni`. In addition to that it has the following components: Objects of class "hetmeta" are lists with defined components.

- **Rb**: value of $R_b$, which quantifies the proportion of the between-study heterogeneity relative to the variance of the pooled estimate.
- **Ri**: value of $R_I$, which quantifies the proportion of the variance of the effect estimate due to between-studies variation.
- **CVb**: value of $CV_b$, the between-studies coefficient of variation.
- **se_Rb**: the standard error of $R_b$ derived using the delta method.
- **se_I2**: the standard error of $I^2$ derived using the delta method.
- **se_Ri**: the standard error of $R_I$ derived using the delta method.
- **se_CVb**: the standard error of $CV_b$ derived using the delta method.
- **s2_I2**: the "typical" within-study variance as defined in the $I^2$
- **s2_Ri**: the "typical" within-study variance as defined in the $R_I$
- **cv_vi**: value of the coefficient of variation of the within-study variances.
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See Also
hetmeta, hetmeta-package

print.hetmeta

Printing hetmeta Results

Description
Print function for objects of class "hetmeta".

Usage

```r
## S3 method for class 'hetmeta'
print(x, digits, ...)
```

Arguments

- `x`: an object of class hetmeta produced by `hetmeta`.
- `digits`: an integer specifying the number of digits to which printed results must be rounded.
- `...`: further arguments passed to or from other methods.

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See Also
hetmeta

Examples

#To be included
Index

cfint.hetmeta, 2, 2
hetmeta, 2, 3, 4, 6
hetmeta-package, 2
hetmetaObject, 2, 4, 5
metafor, 2, 4
print.hetmeta, 2, 6
rma.uni, 2, 4, 5