Package 'metalr'

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Type Package

Title Likelihood ratio meta-analysis

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Description Estimates traditional confidence intervals and intrinsic confidence intervals for combined effect estimates (eg rate ratio or odds ratio) in meta-analysis.

License GPL-3

Encoding UTF-8

LazyData true

Collate 'meta_lr_final.R' 'data.R'

RoxygenNote 6.0.1

Imports forestplot,grid,devtools

Suggests knitr, rmarkdown

VignetteBuilder knitr

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RemoteType github

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R topics documented:

`forest_metalr` *Forest plot for likeliihood ratio based meta-analysis.*

Description

The function plots confidence limits of traditional 95% CIs and 95% ICIs for the studies included in the meta-analysis as well as confidence bars associated with the overall effect estimates.

Usage

```
forest_metalr(metalr_obj)
```

Arguments

`metalr_obj`	An abject from the metalr functions metalr_or() or metalr_rr(). The metalr object is a list of results computed by the metalr functions which includes a dataframe of mle of the effect estimates and their corresponding 95% CIs and ICIs. See the example below.

Value

Returns a forest plot of the 95% CIs and 95% ICIs.

Examples

```
## Not run:
data("statindata")  #statin potency and acute kidney injury dataset
# the metalr object
metalr_obj<-metalr_or(idata=statindata[,2:5],refval=0,num_iter=3000,increm=0.001,method = "random")
#forest plot of the metalr object
forest_metalr(metalr_obj)

## End(Not run)
```

`ici.or` *95% Intrinsic Confidence Interval (ICI) for Odds Ratio (OR) in observational studies.*

Description

Calculates traditional and intrinsic confidence intervals for odds ratio from an observational study.

Usage

```
ici.or(idata)
```

Arguments

`idata`	Vector of length 4: cases for treatment A, controls for treatment A, cases for treatment B and control for treatment B.

Value

OR : MLE estimate of the odds ratio

llci : Lower 95% traditional confidence limit

ulci : Upper 95% traditional confidence limit

llici : Lower 95% intrinsic confidence limit

ulici : Upper 95% intrinsic confidence limit

References

Dormuth, Colin R., Kristian B. Filion, and Robert W. Platt. "Likelihood ratio meta-analysis: New motivation and approach for an old method." Contemporary clinical trials 47 (2016): 259-265.

Examples

```
## Not run:
data("statindata") # statin potency and acute kidney injury data
ici.or(idata = statindata[1,2:5]) # ICI for study

## End(Not run)
```

`ici.rr` *95% Intrinsic confidence intervals for Rate Ratios (RR) in epidemiological studies.*

Description

Calculates 95% traditional confidence limits and 95% intrinsic confidence intervals for rate ratio from epidemiological studies.

Usage

```
ici.rr(cases, patients, person_yrs)
```

Arguments

`cases`	The number of individuals affected by the condition
`patients`	The total number of individuals in the study
`person_yrs`	The amount of time the patients were followed during the study

Value

RR MLE : estimate of the rates ratio

llci : Lower 95% traditional confidence limit

ulci : Upper 95% traditional confidence limit

llici : Lower 95% intrinsic confidence limit

ulici : Upper 95% intrinsic confidence limit

References

Dormuth, Colin R., Kristian B. Filion, and Robert W. Platt. "Likelihood ratio meta-analysis: New motivation and approach for an old method." Contemporary clinical trials 47 (2016): 259-265.

Examples

```
## Not run:
# Clopidogrel vs Aspirin trial dataset
cases<-c(939,1021)
person_yrs<-c(17636,17519)
patients<-c(9599,9586)
ici.rr(cases, patients, person_yrs)

## End(Not run)
```

`metalr_or` *Likelihood ratio meta-analysis for combining odds ratios in fixed and random effects meta-analyses.*

Description

Based on the method proposed by Dormuth et al, 2016, the function estimates traditional 95% confidence intervals and intrinsic confidence intervals for combined effect estimates (OR) in meta-analysis. It also returns an estimate of heterogeneity accross studies as well as Isq statistics in random meta-analysis.

Usage

```
metalr_or(idata, refval, num_iter, increm, method = "random")
```

Arguments

`idata`	A dataframe of 4 columns for cases control pairs for treatments
`refval`	The reference value for the log of the alternate hypothesis
`num_iter`	The number of iterations or steps from the alternate hypothesis
`increm`	The quantity of increments of the refval upto the number of iterations
`method`	The meta-analytic method i.e. fixed or random effect method.

Value

Total_RE : A dataframe of total effect estimate from meta analysis, the 95% CIs and intrinsic CIs.

Tausq : Measure of heterogeneity between the studies used in the meta-analysis in random effect meta-analysis.

Isq : The I^2 statistics

meta_results : Dataframe effect estimates from all the studies, the 95% confidence limits and the 95% intrinsic confidence limits.

References

Dormuth, Colin R., Kristian B. Filion, and Robert W. Platt. "Likelihood ratio meta-analysis: New motivation and approach for an old method." Contemporary clinical trials 47 (2016): 259-265.

Examples

```
## Not run:
# statin potency and acute kidney injury data
data("statindata")
metalr_or(idata=statindata[,2:5],refval=0,num_iter=3000,increm=0.001,method = "random")

## End(Not run)
```

`metalr_rr` *Likelihood ratio meta-analysis for combining rate ratios in fixed and random effects meta-analyses.*

Description

Based on the method proposed by Dormuth et al, 2016, the function estimates traditional 95% confidence intervals and intrinsic confidence intervals for combined effect estimates (RR) in meta-analysis. It also returns an estimate of heterogeneity accross studies as well as Isq statistics in random meta-analysis.

Usage

```
metalr_rr(idata, refval, num_iter, increm, method = "random")
```

Arguments

`idata`	A dataframe of atleast 4 columns of: cases for treatment A, cases for treatment B, person time for treatment A and person time for treatment B.
`refval`	The reference value for the log of the alternate hypothesis
`num_iter`	The number of iterations or steps from the alternate hypothesis
`increm`	The quantity of increments of the refval upto the number of iterations
`method`	The meta-analytic method i.e. fixed or random effect method.

Value

Total_RE : A dataframe of total effect estimate from meta analysis, the 95% CIs and intrinsic CIs.

Tausq : Measure of heterogeneity between the studies used in the meta-analysis in random effect meta-analysis.

Isq : The I^2 statistics

meta_results : Dataframe effect estimates from all the studies, the 95% confidence limits and the 95% intrinsic confidence limits.

References

Dormuth, Colin R., Kristian B. Filion, and Robert W. Platt. "Likelihood ratio meta-analysis: New motivation and approach for an old method." Contemporary clinical trials 47 (2016): 259-265.

Examples

```
## Not run:
Random dataset
data("sample_metarr_data")
metalr_rr(idata=sample_metarr_data,refval=0,num_iter=3000,increm=0.001,method = "random")

## End(Not run)
```

sample_metarr_data *Random toy dataset for 2 observational studies*

Description

Random toy dataset for 2 observational studies

Usage

```
sample_metarr_data
```

Format

A data frame with 6 columns and N studies

C1 cases for treatment 1

C2 cases for treatment 2

PY1 person years for treatment 1

PY2 person years for treatment 2

N1 Number of participants in treatment 1

N2 Number of participants in treatment 2 ...

Source

https://www.sciencedirect.com/science/article/pii/S1551714416300088/

statindata *statin potency and acute kidney injury data*

Description

statin potency and acute kidney injury data

Usage

```
statindata
```

Format

A data frame with 5 columns and N columns; only 4 columns useful for functions:

study Name of the region where study was conducted

HPcase High potency cases

HPcontrol High potency controls

LPcase Low potency cases

LPcontrol Low potency controls ...

Source

https://www.sciencedirect.com/science/article/pii/S1551714416300088/

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