

Package ‘RegressionCalibration’

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Type Package

Title an R-package to perform three-sample Mendelian Randomisation (MR) analyses using the Regression Calibration framework

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Description to be added... to be added... to be added...

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LazyData true

Imports magrittr,
dplyr,
rlang,
TwoSampleMR,
mr.raps,
truncnorm

Remotes MRCIEU/TwoSampleMR,

RoxygenNote 7.2.1

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raps_UMVCUE	<i>MR-RAPS using UMVCUE correction</i>
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Description

MR-RAPS using UMVCUE correction

Usage

```
raps_UMVCUE(b_disc, b_rep, b_out, se_disc, se_rep, se_out, threshold)
```

Arguments

b_disc	SNP-exposure association estimate in discovery sample
b_rep	SNP-exposure association estimate in replication sample
b_out	SNP-outcome association estimate
se_disc	SNP-exposure association standard error in discovery sample
se_rep	SNP-exposure association standard error in replication sample
se_out	SNP-outcome association standard error
threshold	p-value threshold used to select SNPs

Value

List with the following elements:

b Causal effect estimate
se Causal effect standard error
pval Causal effect p-value
nsnps Number of instruments used

raps_ZP	<i>MR-RAPS using ZP correction</i>
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Description

MR-RAPS using ZP correction

Usage

```
raps_ZP(b_exp, b_out, se_exp, se_out, threshold)
```

Arguments

b_exp	SNP-exposure association estimate
b_out	SNP-outcome association estimate
se_exp	SNP-exposure association standard error
se_out	SNP-outcome association standard error
threshold	p-value threshold used to select SNPs

Value

List with the following elements:

b Causal effect estimate

se Causal effect standard error

pval Causal effect p-value

nsnps Number of instruments used

RC	<i>Perform Regression Calibration for all estimators (IVW, simple/weighted median, simple/weighted mode)</i>
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Description

Perform Regression Calibration for all estimators (IVW, simple/weighted median, simple/weighted mode)

Usage

RC(dat)

Arguments

dat Harmonised exposure (discovery and replication) and outcome data. Output from `TwoSampleMR::harmonise_data`. Note that one extra column is needed (sample) and that only the following columns are used: `SNP`, `beta.exposure`, `beta.outcome`, `se.exposure`, `se.outcome` and `mr_keep`

Value

data.frame with Regression Calibration results For each method (IVW, simple/weighted median, simple/weighted mode)

nsnps Number of instruments used

b Causal effect estimate

se Causal effect standard error

pval Causal effect p-value

RC_ivw	<i>IVW Regression Calibration</i>
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Description

IVW Regression Calibration

Usage

```
RC_ivw(b_disc, b_rep, b_out, se_disc, se_rep, se_out)
```

Arguments

b_disc	SNP-exposure association estimate in discovery sample
b_rep	SNP-exposure association estimate in replication sample
b_out	SNP-outcome association estimate
se_disc	SNP-exposure association standard error in discovery sample
se_rep	SNP-exposure association standard error in replication sample
se_out	SNP-outcome association standard error

Value

List with the following elements:

b Causal effect estimate
se Causal effect standard error
pval Causal effect p-value
nsnps Number of instruments used

RC_simple_median	<i>Simple Median Regression Calibration</i>
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Description

Simple Median Regression Calibration

Usage

```
RC_simple_median(b_disc, b_rep, b_out, se_disc, se_rep, se_out)
```

Arguments

b_disc	SNP-exposure association estimate in discovery sample
b_rep	SNP-exposure association estimate in replication sample
b_out	SNP-outcome association estimate
se_disc	SNP-exposure association standard error in discovery sample
se_rep	SNP-exposure association standard error in replication sample
se_out	SNP-outcome association standard error

Value

List with the following elements:

- b** Causal effect estimate
- se** Causal effect standard error
- pval** Causal effect p-value
- nsnps** Number of instruments used

RC_simple_mode	<i>Simple Mode Regression Calibration</i>
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Description

Simple Mode Regression Calibration

Usage

```
RC_simple_mode(b_disc, b_rep, b_out, se_disc, se_rep, se_out)
```

Arguments

- | | |
|---------|---|
| b_disc | SNP-exposure association estimate in discovery sample |
| b_rep | SNP-exposure association estimate in replication sample |
| b_out | SNP-outcome association estimate |
| se_disc | SNP-exposure association standard error in discovery sample |
| se_rep | SNP-exposure association standard error in replication sample |
| se_out | SNP-outcome association standard error |

Value

List with the following elements:

- b** Causal effect estimate
- se** Causal effect standard error
- pval** Causal effect p-value
- nsnps** Number of instruments used

RC_weighted_median	<i>Weighted Median Regression Calibration</i>
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Description

Weighted Median Regression Calibration

Usage

```
RC_weighted_median(b_disc, b_rep, b_out, se_disc, se_rep, se_out)
```

Arguments

b_disc	SNP-exposure association estimate in discovery sample
b_rep	SNP-exposure association estimate in replication sample
b_out	SNP-outcome association estimate
se_disc	SNP-exposure association standard error in discovery sample
se_rep	SNP-exposure association standard error in replication sample
se_out	SNP-outcome association standard error

Value

List with the following elements:

b Causal effect estimate
se Causal effect standard error
pval Causal effect p-value
nsnps Number of instruments used

RC_weighted_mode	<i>Weighted Mode Regression Calibration</i>
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Description

Weighted Mode Regression Calibration

Usage

```
RC_weighted_mode(b_disc, b_rep, b_out, se_disc, se_rep, se_out)
```

Arguments

b_disc	SNP-exposure association estimate in discovery sample
b_rep	SNP-exposure association estimate in replication sample
b_out	SNP-outcome association estimate
se_disc	SNP-exposure association standard error in discovery sample
se_rep	SNP-exposure association standard error in replication sample
se_out	SNP-outcome association standard error

Value

List with the following elements:

b Causal effect estimate

se Causal effect standard error

pval Causal effect p-value

nsnps Number of instruments used

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