Package 'metabook'

March 4, 2026

Title Data Sets and Code for Meta-Analysis with R

Version 0.1-0

Date 2026-02-26

Depends R (>= 4.0.0)

Imports meta (>= 8.2-1), netmeta (>= 3.3-1), metasens (>= 1.5-3)

Author Guido Schwarzer [cre, aut] (ORCID:
   <https://orcid.org/0000-0001-6214-9087>)

Maintainer Guido Schwarzer <guido.schwarzer@uniklinik-freiburg.de>

URL <https://github.com/guido-s/metabook/>

Description Data sets and code supporting the second edition of Schwarzer, Carpenter, and Rücker <DOI:10.1007/978-3-319-21416-0>, ``Meta-Analysis with R''.

LazyData TRUE

License GPL (>= 2)

Encoding UTF-8

RoxygenNote 7.3.3

NeedsCompilation no

Repository CRAN

Date/Publication 2026-03-04 09:40:02 UTC

Contents

---

metabook-package   *metabook: Data Sets and Code for Meta-Analysis with R*

Description

Data sets and code supporting the second edition of "Meta-Analysis with R" by Schwarzer, Carpenter, and Rücker.

Author(s)

Guido Schwarzer <guido.schwarzer@uniklinik-freiburg.de>

References

Balduzzi S, Rücker G, Schwarzer G (2019): How to perform a meta-analysis with R: a practical tutorial. *Evidence-Based Mental Health*, **22**, 153–160

Schwarzer G, Carpenter JR and Rücker G (2015): *Meta-Analysis with R (Use-R!)*. Springer International Publishing, Switzerland

See Also

Useful links:

- <https://github.com/guido-s/metabook/>

Baker2009	*Studies on Pharmacologic Treatments for Chronic Obstructive Pulmonary Disease*

Description

Results from 39 trials examining pharmacologic treatments for chronic obstructive pulmonary disease (COPD).

Usage

```
Baker2009
```

Format

The data frame contains the following columns:

study	character	study label
year	numeric	year of publication
id	numeric	study ID
treatment	character	treatment
exac	numeric	number of individuals with one or more COPD exacerbations
total	numeric	number of individuals

Details

This Set comes from a systematic review of randomized controlled trials on pharmacologic treatments for chronic obstructive pulmonary disease (COPD) (Baker et al., 2009).

The primary outcome, occurrence of one or more episodes of COPD exacerbation, is binary (yes / no). For this outcome, five drug treatments (fluticasone, budesonide, salmeterol, formoterol, tiotropium) and two combinations (fluticasone + salmeterol, budesonide + formoterol) were compared to placebo. The authors considered the two combinations as separate treatments instead of evaluating the individual components.

Concepts

medicine, pulmonology, odds ratios, network meta-analysis, component network meta-analysis

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Baker, W. L., Baker, E. L., & Coleman, C. I. (2009). Pharmacologic treatments for chronic obstructive pulmonary disease: A mixed-treatment comparison meta-analysis. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*, **29**(8), 891–905. https://doi.org/10.1592/phco.29.8.891

Examples

```
# Load netmeta package
library("netmeta")

# Print odds ratios and confidence limits with two digits
oldset <- settings.meta(digits = 2)

# Transform data from long arm-based format to contrast-based
# format. Argument 'sm' has to be used for odds ratio as summary
# measure; by default the risk ratio is used in the metabin function
# called internally.
pw <- pairwise(treatment, exac, total, studlab = paste(study, year),
  data = Baker2009, sm = "OR")

# Conduct random effects network meta-analysis (NMA)
# with placebo as reference
nma <- netmeta(pw, common = FALSE, ref = "plac")

# Show network graph
netgraph(nma, seq = "optimal", start = "prcomp",
  labels = gsub("+", " +\n", trts, fixed = TRUE),
  plastic = TRUE, thickness = "se.fixed", number = TRUE,
  points = TRUE, cex.points = 5, col.points = "red",
  offset = 0.025)

# Print and plot results for network meta-analysis
nma
forest(nma)

# Conduct component network meta-analysis (CNMA)
cnma <- netcomb(nma)
cnma

# Compare results of NMA and additive CNMA
nb <- netbind(nma, cnma, name = c("Standard NMA", "Additive CNMA"))
forest(nb)

# Use previous settings
settings.meta(oldset)
```

Bassler2004   *Studies on Ketotifen Alone or as Additional Medication for Long-Term*
                                 Control of Asthma and Wheeze in Children

---

Description

Results from 10 trials reporting the physicians' judgement on the overall efficacy of ketotifen for long-term control of asthma and wheeze in children.

Usage

```
Bassler2004
```

Format

The data frame contains the following columns:

study	character	study label
Ee	integer	number of children with treament success (ketotifen group)
Ne	integer	number of children (ketotifen group)
Ec	integer	number of children with treament success (control group)
Nc	integer	number of children (control group)
blind	character	blinding of clinicians

Details

Results from 10 trials reporting the physicians' judgement on the overall efficacy of Ketotifen for long-term control of asthma and wheeze in children. A prespecified subgroup analysis was conducted to evaluate whether the treatment effect is different in trials with adequate blinding compared to trials with inadequate / unclear blinding.

This data set is used as an example in Schwarzer et al. (2015).

Concepts

risk ratios, medicine, subgroup analysis

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Bassler D., Mitra A. A. D., Ducharme F. M., Forster J., & Schwarzer, G. (2004). Ketotifen alone or as additional medication for long-term control of asthma and wheeze in children. *Cochrane Database of Systematic Reviews*, **1**, CD001384. https://doi.org/10.1002/14651858.CD001384.pub2

References

Schwarzer, G., Carpenter, J. R., & Rücker, G. (2015). *Meta-analysis with R*. Cham, Switzerland: Springer.

Examples

```
# Load meta package
library("meta")

# Use DerSimonian-Laird estimator (which was the default in meta in the year 2015).
# Furthermore, print meta-analysis results with two digits.
oldset <- settings.meta(method.tau = "DL", digits = 2)
```

```
# Calculate experimental and control event rates
with(Bassler2004, summary(Ee / Ne))
with(Bassler2004, summary(Ec / Nc))

# Conduct meta-analysis using the inverse variance method
mb3 <- metabin(Ee, Ne, Ec, Nc, method = "I",
               data = Bassler2004, studlab = study)
mb3

# Conduct subgroup analysis comparing trials with adequate blinding
# to trials with inadequate or unclear blinding
mb3s <- update(mb3, subgroup = blind, print.subgroup.name = FALSE)
mb3s

# Conduct subgroup analysis assuming common between-study variance in subgroups
mb3s.c <- update(mb3s, tau.common = TRUE)
mb3s.c

# Use previous settings
settings.meta(oldset)
```

Curtin2002	*Studies on Potassium Supplementation to Reduce Diastolic Blood Pressure*

Description

Results from 21 cross-over studies evaluating the effect of potassium supplementation to reduce diastolic blood pressure.

Usage

```
Curtin2002
```

Format

The data frame contains the following columns:

author	character	first author
year	character	year of publication
N	integer	total sample size
mean	numeric	mean difference in diastolic blood pressure
SE	numeric	standard error
corr	numeric	within-patient correlation

Details

Results from 21 cross-over studies evaluating the effect of potassium supplementation to reduce diastolic blood pressure (Curtin et al., 2002, Table II).

This data set is used as an example in Schwarzer et al. (2015), Chapter 2.

Concepts

raw mean differences

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Curtin, F., Altman, D. G., & Elbourne, D. (2002). Meta-analysis combining parallel and cross-over clinical trials. I: Continuous outcomes. *Statistics in Medicine*, **21**(15), 2131–2144. https://doi.org/10.1002/sim.1205

References

Schwarzer, G., Carpenter, J. R., & Rücker, G. (2015). *Meta-analysis with R*. Cham, Switzerland: Springer.

Examples

```
# Load meta package
library("meta")

# Use DerSimonian-Laird estimator (which was the default in meta in the year 2015).
# Furthermore, print meta-analysis results with two digits.
oldset <- settings.meta(method.tau = "DL", digits = 2)

# Conduct meta-analysis
mg2 <- metagen(mean, SE, studlab = paste(author, year),
               data = Curtin2002, sm = "MD")
mg2

# Use previous settings
settings.meta(oldset)
```

Dogliotti2014   *Studies on Antithrombotic Treatments to Prevent Strokes*

Description

Results from 20 trials examining the effectiveness of antithrombotic treatments to prevent strokes in patients with non-valvular atrial fibrillation.

Usage

```
Dogliotti2014
```

Format

The data frame contains the following columns:

study	character	study label
id	numeric	study ID
treatment	character	treatment
stroke	numeric	number of strokes
total	numeric	number of individuals

Details

This Set comes from a systematic review aiming to estimate the effects of eight antithrombotic treatments including placebo in reducing the incidence of major thrombotic events in patients with non-valvular atrial fibrillation (Dogliotti et al., 2014).

The review included 20 studies with 79,808 participants, four studies are three-arm studies. The primary outcome is stroke reduction (yes / no).

Concepts

medicine, odds ratios, network meta-analysis, Mantel-Haenszel method

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Dogliotti, A., Paolasso, E., & Giugliano, R. P. (2014). Current and new oral antithrombotics in non-valvular atrial fibrillation: A network meta-analysis of 79808 patients. *Heart*, **100**(5), 396–405. https://doi.org/10.1136/heartjnl-2013-304347

Examples

```
# Load netmeta package
library("netmeta")

# Print odds ratios and confidence limits with two digits
oldset <- settings.meta(digits = 2)

# Change appearance of confidence intervals
cilayout("(", "-")

# Transform data from long arm-based format to contrast-based
# format. Argument 'sm' has to be used for odds ratio as summary
# measure; by default the risk ratio is used in the metabin function
# called internally.
```

```
pw <- pairwise(treat = treatment, n = total, event = stroke,
  studlab = study, data = Dogliotti2014, sm = "OR")

# Print log odds ratios (TE) and standard errors (seTE)
head(pw, 5)[, 1:5]

# Conduct network meta-analysis (NMA) with placebo as reference
nma <- netmeta(pw, ref = "plac")

# Details on excluded study
selvars <- c("studlab", "event1", "n1", "event2", "n2")
subset(pw, studlab == "WASPO, 2007")[, selvars]

# Show network graph
netgraph(nma, seq = "optimal", number = TRUE)

# Conduct Mantel-Haenszel NMA
nma_mh <- netmetabin(pw, ref = "plac")

# Compare results of inverse variance and Mantel-Haenszel NMA
nb <- netbind(nma, nma_mh, random = FALSE,
  name = c("Inverse variance", "Mantel-Haenszel"))
forest(nb, xlim = c(0.15, 2), at = c(0.2, 0.5, 1, 2))

# Print and plot results for inverse variance NMA
nma
forest(nma)

# Use previous settings
settings.meta(oldset)
```

Dong2013	*Studies on Safety of Inhaled Medications for Chronic Obstructive Pulmonary Disease*

Description

Results from 41 trials examining the safety of inhaled medications in patients with chronic obstructive pulmonary disease.

Usage

```
Dong2013
```

Format

The data frame contains the following columns:

id	integer	study ID
treatment	character	treatment
death	integer	mortality
randomized	integer	number of individuals

Details

This network meta-analysis compared the safety of inhaled medications in patients with chronic obstructive pulmonary disease (Dong et al., 2013).

Mortality was reported in 41 randomized trials, with a total of 52 462 patients. Mortality was low, with 2 408 deaths (4.6%) reported across all studies. There were nine studies that reported zero events in at least one of the treatment arms and three additional studies had zero events in all treatment arms.

This Set was used in Efthimiou et al. (2019) to illustrate the Mantel-Haenszel method for network meta-analysis.

Concepts

medicine, odds ratios, network meta-analysis, Mantel-Haenszel method

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Dong, Y.-H., Lin, H.-H., Shau, W.-Y., Wu, Y.-C., Chang, C.-H., & Lai, M.-S. (2013). Comparative safety of inhaled medications in patients with chronic obstructive pulmonary disease: Systematic review and mixed treatment comparison meta-analysis of randomised controlled trials. *Thorax*, **68**(1), 48–56. https://doi.org/10.1136/thoraxjnl-2012-201926

References

Efthimiou, O., Rücker, G., Schwarzer, G., Higgins, J., Egger, M., & Salanti, G. (2019). A Mantel-Haenszel model for network meta-analysis of rare events. *Statistics in Medicine*, **38**(16), 2992–3012. https://doi.org/10.1002/sim.8158

Examples

```
# Load netmeta package
library("netmeta")

# Print odds ratios and confidence limits with two digits
oldset <- settings.meta(digits = 2)

# Change appearance of confidence intervals
cilayout("(", "-")

# Transform data from long arm-based format to contrast-based
# format. Argument 'sm' has to be used for odds ratio as summary
```

```
# measure; by default the risk ratio is used in the metabin function
# called internally.
pw <- pairwise(treatment, death, randomized, studlab = id,
  data = Dong2013, sm = "OR")

# Calculated log odds ratios (TE) and standard errors (seTE)
pw[1:3, 1:9]

# Conduct Mantel-Haenszel network meta-analysis (NMA)
nma <- netmetabin(pw, ref = "plac")

# Network graph
netgraph(nma, seq = "optimal", col = "black", plastic = FALSE,
  points = TRUE, pch = 21, cex.points = 3, col.points = "black",
  bg.points = "gray", thickness = "se.fixed",
  number.of.studies = TRUE)

# Show results for Mantel-Haenszel NMA
nma
forest(nma)

# League table with network estimates in lower triangle and direct
# estimates in upper triangle
netleague(nma)

# Assess inconsistency
print(netsplit(nma), show = "both", ci = TRUE, overall = FALSE,
  nchar.trts = 6)

# Use previous settings
settings.meta(oldset)
```

Feng2019   *Studies on the Prevalence of Depression After Myocardial Infarction*

Description

Results from 19 studies assessing the prevalence of depression after myocardial infarction

Usage

    Feng2019

Format

The data frame contains the following columns:

author	character	first author

year	`integer`	publication year
region	`character`	country
design	`character`	study design
source	`character`	sample source
age	`numeric`	mean age
males	`numeric`	percentage of males
first	`numeric`	percentage of first-time MI
questionnaire	`character`	self-report questionnaire
interview	`character`	structured interview
timing	`character`	timing of depression assessment
depr	`integer`	subjects with depression
n	`integer`	sample size

Details

This data set comes from a meta-analysis with 19 studies to estimate the prevalence of depression after a myocardial infarction. The variables depr and n contain the number of depressive patients and the total number of patients.

Author(s)

Guido Schwarzer, `<guido.schwarzer@uniklinik-freiburg.de>`

Source

Feng, L., Li, L., Liu, W., et al. (2019). Prevalence of depression in myocardial infarction: A PRISMA-compliant meta-analysis. *Medicine*, **98**.

Examples

```
# Load meta package
library("meta")

# Conduct random effects meta-analysis
mp1 <- metaprop(depr, n, data = Feng2019,
  studlab = paste(author, year),
  common = FALSE, prediction = TRUE)

# Create forest plot
forest(mp1, digits = 3, xlim = c(0, 1),
  print.pval.Q = FALSE, details = TRUE)
```

Franchini2012   *Studies on Dopamine Agonists to Reduce "Off-Time" in Patients with Advanced Parkinson Disease*

Description

Results from 7 trials examining the effectiveness of four dopamine agonists and placebo to reduce "off-time" in patients with advanced Parkinson disease.

Usage

```
Franchini2012
```

Format

The data frame contains the following columns:

Study	character	study label
Treatment1	character	treatment 1
y1	numeric	treatment effect arm 1
sd1	numeric	standard deviation arm 2
n1	integer	sample size arm 1
Treatment2	character	treatment 2
y2	numeric	treatment effect arm 2
sd2	numeric	standard deviation arm 2
n2	integer	sample size arm 1
Treatment3	character	treatment 3
y3	numeric	treatment effect arm 3
sd3	numeric	standard deviation arm 2
n3	integer	sample size arm 1

Details

This network meta-analysis compared the effectiveness of four active treatments and placebo in patients with advanced Parkinson disease (Franchini et al., 2012). The outcome is mean lost work-time reduction in patients given dopamine agonists as adjunct therapy. The data are given as sample size, mean, and standard deviation in each trial arm.

This Set was used as an example in the supplemental material of Dias et al. (2013) where placebo is coded as 1 and the four active drugs as 2 to 5.

Concepts

medicine, raw mean differences, network meta-analysis

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Dias, S., Sutton, A. J., Ades, A. E., & Welton, N. J. (2013). Evidence synthesis for decision making 2: A generalized linear modeling framework for pairwise and network meta-analysis of randomized controlled trials. *Medical Decision Making*, **33**(5), 607–617. `https://doi.org/10.1177/0272989X12458724`

Franchini, A. J., Dias, S., Ades, A. E., Jansen, J. P., & Welton, N. J. (2012). Accounting for correlation in network meta-analysis with multi-arm trials. *Research Synthesis Methods*, **3**(2), 142–160. `https://doi.org/10.1002/jrsm.1049`

Examples

```
# Load netmeta package
library("netmeta")

# Print mean differences with two digits
oldset <- settings.meta(digits = 2)

# Transform data from wide arm-based format to contrast-based
# format. Argument 'sm' must not be provided as the mean difference
# is the default in R function metacont() called internally.
pw <- pairwise(list(Treatment1, Treatment2, Treatment3),
  n = list(n1, n2, n3),
  mean = list(y1, y2, y3),
  sd = list(sd1, sd2, sd3),
  data = Franchini2012, studlab = Study, sm = "MD")

# Show calculated mean differences (TE) for first three studies
pw[1:5, c(3:7, 10, 1)]

# Conduct network meta-analysis
nma <- netmeta(pw)
nma

# Draw network graph
netgraph(nma, points = TRUE, cex.points = 3, cex = 1.5,
  plastic = TRUE, thickness = "se.fixed",
  iterate = TRUE, start = "eigen")

# Use previous settings
settings.meta(oldset)
```

Furukawa2003   *Studies on Low Dosage Tricyclic Antidepressants for the Treatment of Depression*

Description

Results on depression severity from 17 studies comparing low dosage tricyclic antidepressants (TCA) and placebo for the treatment of depression.

Usage

```
Furukawa2003
```

Format

The data frame contains the following columns:

author	character	First author with information on dosage in parentheses
Ne	integer	number of patients in low TCA group
Me	numeric	depression severity (low TCA)
Se	numeric	standard deviation (low TCA)
Nc	integer	number of patients in placebo group
Mc	numeric	depression severity (placebo)
Sc	numeric	standard deviation (placebo)
measure	character	depression scale

Details

Furukawa et al. (2003) carried out a systematic review comparing low dosage tricyclic antide-pressants (TCA) with placebo for the treatment of depression. They reported the effect on presence/absence of depression and on depression severity at various time points. Here we focus on depression severity at four weeks. Most studies used some version of the Hamilton Depression Rating Scale, however, some studies used the Montgomery-Asberg Depression Rating Scale. Accordingly, it is not possible to pool the estimated effects directly.

This data set is used as an example in Schwarzer et al. (2015).

Concepts

standardized mean differences

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Furukawa, T. A., McGuire, H., & Barbui, C. (2003). Low dosage tricyclic antidepressants for depression. *Cochrane Database of Systematic Reviews*, **3**, CD003197. https://doi.org/10.1002/14651858.CD003197

References

Schwarzer, G., Carpenter, J. R., & Rücker, G. (2015). *Meta-analysis with R*. Cham, Switzerland: Springer.

Examples

```
# Load meta package
library("meta")

# Use RevMan5 settings
oldset <- settings.meta("RevMan5", digits = 2)

# Conduct random effects meta-analysis with Hedges' g as effect measure
mc2 <- metacont(Ne, Me, Se, Nc, Mc, Sc, common = FALSE,
  data = Furukawa2003, sm = "SMD")
mc2

# Use previous settings
settings.meta(oldset)
```

Greb2008   *Trials on High-Dose Chemotherapy with Autologous Stem Cell Trans-plantation in Aggressive Non-Hodgkin Lymphoma*

Description

Results on complete response from 14 trials evaluating high-dose chemotherapy with autologous stem cell transplantation in patients with aggressive non-Hodgkin lymphoma.

Usage

```
Greb2008
```

Format

The data frame contains the following columns:

study	character	study label
Ee	integer	complete responses (high-dose chemotherapy)
Ne	integer	number of patients (high-dose chemotherapy)
Ec	integer	complete responses (standard chemotherapy)
Nc	integer	number of patients (standard chemotherapy)

Details

Greb et al. (2008) conducted a Cochrane Review to assess the effects of high-dose chemotherapy with autologous stem cell transplantation as part of the first-line treatment of adult patients with aggressive non-Hodgkin lymphoma. The primary outcome was survival time; the binary outcome 'complete response' was one of several secondary outcomes. For binary outcomes, the Cochrane review used the risk ratio and the common effect model.

This data set is used as an example in Schwarzer et al. (2015).

Concepts

medicine, oncology, risk ratios

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Greb, A., Bohlius, J., Schiefer, D., et al. (2008). High-dose chemotherapy with autologous stem cell transplantation in the first line treatment of aggressive non-Hodgkin lymphoma (NHL) in adults. *Cochrane Database of Systematic Reviews*, **1**, https://doi.org/10.1002/14651858.CD004024.pub2

References

Schwarzer, G., Carpenter, J. R., & Rücker, G. (2015). *Meta-analysis with R*. Cham, Switzerland: Springer.

Examples

```
# Load meta package
library("meta")

# Use RevMan 5 settings
oldset <- settings.meta("RevMan5")

# Conduct common effect meta-analysis with risk ratio as effect measure
mb1 <- metabin(Ee, Ne, Ec, Nc,
  data = Greb2008, studlab = study,
  label.e = "High dose", label.c = "Standard",
  label.left = "Favours standard chemotherapy",
  label.right = "Favours high dose chemotherapy",
  col.label.left = "red", col.label.right = "green")
mb1

# Create forest plot
forest(mb1)

# Use previous settings
settings.meta(oldset)
```

Greenland1992   *Case-Control Studies on Impact of Alcohol Consumption on Breast Cancer Risk*

Description

Results from 16 case-control studies evaluating the impact of alcohol consumption on breast cancer risk.

Usage

```
Greenland1992
```

Format

The data frame contains the following columns:

author	character	first author
year	integer	publication year
b	numeric	adjusted log risk ratio
SE	numeric	standard error

Details

Greenland and Longecker (1992) describe a method to combine trend estimates from summarised dose-response data. A meta-analysis of 16 case-control studies evaluating the impact of alcohol consumption on breast cancer risk was used as an illustrative example. The estimates are the increase in the log relative risk of breast cancer associated with an average daily alcohol consumption of 1g.

Data are provided in Greenland and Longecker (1992), Table 3.

Concepts

epidemiology, risk ratios

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Greenland , S., and M. P. Longnecker (1992). Methods for Trend Estimation from Summarized Dose-Response Data, with Applications to Meta-Analysis. *American Journal of Epidemiology*, **135**(11): 1301–9.

Examples

```
# Load meta package
library("meta")

# Inverse variance method
mg <- metagen(b, SE, data = Greenland1992,
  studlab = paste(author, year), sm = "RR",
  random = FALSE, overall.hetstat = FALSE,
  backtransf = FALSE)
# Overall result
print(mg, digits = 5)
# Standard error for common effect estimate
round(mg$seTE.common, 5)
```

Gurusamy2011	*Studies on Interventions to Reduce Mortality after Liver Transplantation*

Description

Results from 14 trials examining the mortality risk of interventions for decreasing blood loss and blood transfusion requirements during liver transplantation.

Usage

```
Gurusamy2011
```

Format

The data frame contains the following columns:

study	character	study information
treatment	character	treatment
death	integer	mortality at 60 days post-transplantation
n	integer	number of individuals

Details

This network meta-analysis compared the effectiveness of seven interventions for decreasing blood loss and blood transfusion requirements during liver transplantation (Gurusamy et al., 2011).

Fourteen studies reported mortality at 60 days, in 1,002 patients. Forty-five deaths were reported across all studies (4.5%). Six studies observed deaths in all treatment arms while three studies did not observe any deaths.

This Set was used in Efthimiou et al. (2019) to introduce the Mantel-Haenszel method for network meta-analysis.

One of the treatments (solvent detergent plasma) was only included in one study with zero events in both treatment arms; this study was excluded from all network meta-analyses. In addition, no death was observed in the antithrombin III arm of the only study evaluating this treatment which was excluded from the Mantel-Haenszel network meta-analysis.

Concepts

medicine, odds ratios, network meta-analysis, Mantel-Haenszel method

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Gurusamy, K. S., Pissanou, T., Pikhart, H., Vaughan, J., Burroughs, A. K., & Davidson, B. R. (2011). Methods to decrease blood loss and transfusion requirements for liver transplantation. *Cochrane Database of Systematic Reviews*, **12**, CD009052. `https://doi.org/10.1002/14651858.CD009052.pub2`

References

Efthimiou, O., Rücker, G., Schwarzer, G., Higgins, J., Egger, M., & Salanti, G. (2019). A Mantel-Haenszel model for network meta-analysis of rare events. *Statistics in Medicine*, **38**(16), 2992–3012. `https://doi.org/10.1002/sim.8158`

Examples

```
# Only study evaluating solvent detergent plasma
subset(Gurusamy2011, study == "Williamson 1999")

# Only study evaluating antithrombin III
subset(Gurusamy2011, study == "Baudo 1992")


# Load netmeta package
library("netmeta")

# Print odds ratios and confidence limits with two digits
oldset <- settings.meta(digits = 2)

# Change appearance of confidence intervals
cilayout("(", "-")

# Transform data from long arm-based format to contrast-based
# format. Argument 'sm' has to be used for odds ratio as summary
# measure; by default the risk ratio is used in the metabin function
# called internally.
pw <- pairwise(treatment, death, n, studlab = study,
  data = Gurusamy2011, sm = "OR")

# Conduct Mantel-Haenszel network meta-analysis (NMA)
nma_MH <- netmetabin(pw, ref = "cont")

# Conduct inverse variance (IV) network meta-analysis
nma_IV <- netmeta(pw, ref = "cont")

# Network graph (Mantel-Haenszel NMA)
netgraph(nma_MH, seq = "optimal", col = "black", plastic = FALSE,
  points = TRUE, pch = 21, cex.points = 3, col.points = "black",
  bg.points = "gray", thickness = "se.fixed",
  number.of.studies = TRUE)

# Full network graph (based on inverse variance method, including
# study comparing Antithrombin III with Control/Placebo)
netgraph(nma_IV,
  seq = "optimal", col = "black", plastic = FALSE,
```

```
    points = TRUE, pch = 21, cex.points = 3, col.points = "black",
    bg.points = "gray", thickness = "se.fixed",
    number.of.studies = TRUE)

# Compare results for Mantel-Haenszel and IV NMA
forest(netbind(nma_MH, nma_IV,
  random = FALSE, name = c("MH NMA", "IV NMA")))

# Show results for Mantel-Haenszel NMA
nma_MH
forest(nma_MH)

# League table with network estimates in lower triangle and direct
# estimates in upper triangle
netleague(nma_MH)

# Assess inconsistency
print(netsplit(nma_MH), show = "both", ci = TRUE, overall = FALSE,
  nchar.trts = 6)

# Use previous settings
settings.meta(oldset)
```

Higgins2008   *Trials on Haloperidol in Schizophrenia*

Description

Results on clinical improvement after therapy from 17 trials evaluating haloperidol in patients with schizophrenia.

Usage

```
Higgins2008
```

Format

The data frame contains the following columns:

author	character	study label
resp.halo	integer	number of responders (haloperidol group)
fail.halo	integer	number of failures (haloperidol group)
miss.halo	integer	number of missing observations (haloperidol group)
resp.plac	integer	number of responders (placebo group)
fail.plac	integer	number of failures (placebo group)
miss.plac	integer	number of missing observations (placebo group)

Details

Higgins et al. (2008) suggested several imputation methods for the meta-analysis of binary outcomes with missing data. The example data set with 17 trials comes originally from a Cochrane review comparing haloperidol with placebo for the treatment of schizophrenia. While the antipsychotic benefits of haloperidol were identified in the 1950's, trials in this patient population are prone to high proportions of missing outcome data, often due to insufficient compliance with randomised controlled trial protocols.

The outcome is clinical improvement after therapy. For each study, the number of responders, failures, and missing observations are available.

Concepts

psychiatry, odds ratios, missing data

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Higgins, J.P.T., White, I.R., Wood, A.M. (2008). Imputation methods for missing outcome data in meta-analysis of clinical trials. *Clinical Trials*, **5**: 225-39

Examples

```
# Load metasens package
library("metasens")

# Print odds ratios and confidence limits with three digits
oldset <- settings.meta(digits = 3)

# Conduct common effect meta-analysis of available data
m <- metabin(resp.halo, resp.halo + fail.halo,
  resp.plac, resp.plac + fail.plac,
  data = Higgins2008, studlab = author,
  sm = "OR", method = "Inverse", random = FALSE,
  label.e = "Haloperidol", label.c = "Placebo",
  label.left = "Favours placebo",
  label.right = "Favours haloperidol")

# Best case scenario for haloperidol
m.b <- metamiss(m, miss.halo, miss.plac,
  method.miss = "b", small.values = "undesirable")
# Worst case scenario for haloperidol
m.w <- metamiss(m, miss.halo, miss.plac,
  method.miss = "w", small.values = "undesirable")

# Forest plot
m.sens <- metamerge(m, m.b, text.pooled2 = "Best case scenario")
m.sens <- metamerge(m.sens, m.w, text.pooled2 = "Worst case scenario")
forest(m.sens)
```

Law1994	*Trials on Serum Cholesterin Concentration Lowering and Risk of Ischaemic Heart Disease*

Description

Results from 28 trials evaluating effect of serum cholesterin concentration lowering on risk of ischaemic heart disease

Usage

```
Law1994
```

Format

The data frame contains the following columns:

studyid	integer	study ID
ihd.cont	integer	number of ischaemic heart disease (control group)
noihd.cont	integer	number of non-events (control group)
ihd.exp	integer	number of ischaemic heart disease (treated group)
noihd.exp	integer	number of non-events (treated group)
OR	numeric	odds ratio
logOR	numeric	log odds ratio
varlogOR	numeric	variance of log odds ratio
cholr	numeric	cholesterol reduction (mmol/l)

Details

Thompson & Sharp (1999) compare several meta-regression approaches to explain heterogeneity in meta-analysis. The data set used is originally from Law et al. (1994).

Concepts

epidemiology, odds ratios, meta-regression

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Law, M.R., Wald, N.J., Thompson, S.G. (1994). By how much and how quickly does reduction in serum cholesterol concentration lower risk of ischaemic heart disease? *British Medical Journal*, **308**, 367-73

References

Thompson, S. G. Sharp, S. J. (1999). Explaining heterogeneity in meta-analysis: a comparison of methods. *Statistics in Medicine*, **18**: 2693-708

Examples

```
# Load meta package
library("meta")

# Conduct meta-analysis
m <- metabin(ihd.exp, ihd.exp + noihd.exp, ihd.cont, ihd.cont + noihd.cont,
  data = Law1994, sm = "OR", method = "Inverse")

# Thompson & Sharp (1999), Table III
# (1) None
metareg(m, cholr, method.tau = "FE")
# (3a) Additive (MM)
metareg(m, cholr, method.tau = "DL")
```

Linde2015   *Studies on Classes of Antidepressants for the Primary Care Setting*

Description

Results from 66 trials examining eight classes of antidepressants and placebo for the primary care setting.

Usage

```
Linde2015
```

Format

The data frame contains the following columns:

id	integer	study ID
author	character	first author
year	integer	year of publication
treatment1	character	treatment 1
treatment2	character	treatment 2
treatment3	character	treatment 3
n1	integer	number of patients (arm 1)
resp1	integer	number of early responder (arm 1)
remi1	integer	number of early remissions (arm 1)
loss1	integer	number of patients loss to follow-up (arm 1)
loss.ae1	integer	number of patients loss to follow-up due to adverse events (arm 1)
ae1	integer	number of patients with adverse events (arm 1)

n2	integer	number of patients (arm 2)
resp2	integer	number of early responder (arm 2)
remi2	integer	number of early remissions (arm 2)
loss2	integer	number of patients loss to follow-up (arm 2)
loss.ae2	integer	number of patients loss to follow-up due to adverse events (arm 2)
ae2	integer	number of patients with adverse events (arm 2)
n3	integer	number of patients (arm 3)
resp3	integer	number of early responder (arm 3)
remi3	integer	number of early remissions (arm 3)
loss3	integer	number of patients loss to follow-up (arm 3)
loss.ae3	integer	number of patients loss to follow-up due to adverse events (arm 3)
ae3	integer	number of patients with adverse events (arm 3)

Details

This Set comes from a systematic review of 8 pharmacological treatments of depression and placebo in primary care with 66 studies (8 of which were 3-arm studies) including 14,785 patients.

The primary outcome is early response, defined as at least a 50% score reduction on a depression scale after completion of treatment. Secondary outcomes (also measured as dichotomous) were early remission (defined as having a symptom score below a fixed threshold after completion of treatment), lost to follow-up, lost to follow-up due to adverse events, and any adverse event. The odds ratio was used as effect measure.

This Set was used as an example in Rücker and Schwarzer (2017) who introduced methods to resolve conflicting rankings of outcomes in network meta-analysis.

Concepts

medicine, psychiatry, odds ratios, network meta-analysis

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Linde, K., Kriston, L., Rücker, G., Jamil, S., Schumann, I., Meissner, K., Sigterman, K., & Schneider, A. (2015). Efficacy and acceptability of pharmacological treatments for depressive disorders in primary care: Systematic review and network meta-analysis. *Annals of Family Medicine*, **13**(1), 69–79. https://doi.org/10.1370/afm.1687

References

Rücker, G., & Schwarzer, G. (2017). Resolve conflicting rankings of outcomes in network meta-analysis: Partial ordering of treatments. *Research Synthesis Methods*, **8**(4), 526–536. https://doi.org/10.1002/jrsm.127

Examples

```
# Load netmeta package
library("netmeta")
```

```
# Print odds ratios and confidence limits with two digits
oldset <- settings.meta(digits = 2)

# Change appearance of confidence intervals
cilayout("(", "-")

# Define order of treatments in printouts
trts <- c("TCA", "SSRI", "SNRI", "NRI", "Low-dose SARI",
 "NaSSa", "rMAO-A", "Hypericum", "Placebo")

# Transform data from wide arm-based format to contrast-based format
# (outcome: early response). Argument 'sm' has to be used for odds
# ratio as summary measure; by default the risk ratio is used in the
# metabin function called internally.
pw1 <- pairwise(list(treatment1, treatment2, treatment3),
  event = list(resp1, resp2, resp3),
  n = list(n1, n2, n3),
  studlab = id, data = Linde2015, sm = "OR")

# Conduct random effects network meta-analysis for primary outcome
# (early response); small number of early responses is bad (argument
# small.values)
nma1 <- netmeta(pw1, common = FALSE, reference = "Placebo", seq = trts,
  small.values = "undesirable")
nma1

# Random effects NMA for early remission
pw2 <- pairwise(treat = list(treatment1, treatment2, treatment3),
  event = list(remi1, remi2, remi3),
  n = list(n1, n2, n3),
  studlab = id, data = Linde2015, sm = "OR")
nma2 <- netmeta(pw2, common = FALSE,
   seq = trts, ref = "Placebo", small.values = "undesirable")
nma2

# Ranking of treatments
nr1 <- netrank(nma1)
nr2 <- netrank(nma2)
nr1
nr2

# Partial order of treatment rankings (two outcomes)
outcomes <- c("Early response", "Early remission")
po12 <- netposet(nr1, nr2, outcomes = outcomes)
plot(po12)

# Use previous settings
settings.meta(oldset)
```

Linde2016   *Studies on Antidepressants for the Primary Care Setting*

Description

Results from 93 trials examining 22 interventions (including placebo and usual care) for the primary care of depression.

Usage

```
Linde2016
```

Format

The data frame contains the following columns:

id	integer	study ID
author	character	first author
year	numeric	year of publication
resp	numeric	number of responders
n	numeric	number of patients
int	character	intervention label
int.long	character	intervention label (full name)

Details

This Set comes from a network meta-analysis of 22 treatments of depression in primary care (Linde et al., 2016), based on 93 trials (79 two-arm trials, 13 three-arm trials, and one four-arm trial). The primary outcome was response after treatment (yes/no), defined as a reduction from baseline by at least 50% on a depression scale. The Set contains log odds ratios with standard errors for all pairwise comparisons.

The interventions comprised both medical and psychological treatments, also in combination, including placebo and usual care (UC) (Linde et al., 2016). Pharmacological interventions were tricyclic antidepressants (TCA), selective serotonin reuptake inhibitors (SSRI), serotonin-noradrenaline reuptake inhibitors (SNRI), noradrenaline reuptake inhibitors (NRI), low- dose serotonin (5-HT2) antagonists and reuptake inhibitors (low-dose SARI), noradrenergic and specific serotonergic agents (NaSSa), reversible inhibitors of monoaminoxidase A (rMAO-A), hypericum extracts, and an individualized drug. Psychological interventions were cognitive behavioral therapy (CBT; four forms: face-to-face CBT, remote therapist-led CBT, guided self-help CBT, and no or minimal contact CBT), face-to-face problem-solving therapy (PST), face-to-face interpersonal psychotherapy, face-to-face psychodynamic therapy, and "other face-to-face therapy". Combination therapies were face-to-face CBT + SSRI, face-to-face PST + SSRI, and face-to-face interpersonal psychotherapy + SSRI.

The Set was used as an example in Rücker et al. (2020) to illustrate component network meta-analysis using frequentist methods.

Concepts

medicine, psychiatry, odds ratios, network meta-analysis, component network meta-analysis

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Linde, K., Rücker, G., Schneider, A., & Kriston, L. (2016). Questionable assumptions hampered interpretation of a network meta-analysis of primary care depression treatments. *Journal of Clinical Epidemiology*, **71**, 86–96. https://doi.org/10.1016/j.jclinepi.2015.10.010

References

Rücker, G., Petropoulou, M., & Schwarzer, G. (2020). Network meta-analysis of multicomponent interventions. *Biometrical Journal*, **62**(3), 808–821. https://doi.org/10.1002/bimj.201800167

Examples

```
# Load netmeta package
library("netmeta")

# Print odds ratios and confidence limits with two digits
oldset <- settings.meta(digits = 2)

# Define order of treatments in printouts and forest plots
trts <- c("SSRI",
  "Face-to-face CBT", "Face-to-face interpsy", "Face-to-face PST",
  "Face-to-face CBT + SSRI", "Face-to-face interpsy + SSRI",
  "Face-to-face PST + SSRI",
  "Face-to-face psychodyn", "Other face-to-face",
  "TCA", "SNRI", "NRI", "Low-dose SARI", "NaSSa", "rMAO-A", "Ind drug",
  "Hypericum",
  "Remote CBT", "Self-help CBT", "No contact CBT",
  "UC", "Placebo")

# Use pairwise() to transform data to comparison-based format
pw <- pairwise(treat = int,
  event = resp, n = n,
  studlab = paste(author, year),
  data = Linde2016,
  reference = "plac",
  sm = "OR")

# Conduct random effects network meta-analysis
nma <- netmeta(pw, reference.group = "placebo",
  seq = trts, common = FALSE)

# Network graph
netgraph(nma, seq = "o")
```

```
# Show results
nma
forest(nma, xlim = c(0.2, 50))

# Additive component network meta-analysis with placebo as inactive
# treatment
cnma <- netcomb(nma, inactive = "placebo")
cnma
forest(cnma, xlim = c(0.2, 50))

# Use previous settings
settings.meta(oldset)
```

Lloyd2010   *Studies on Anti-TNF-alpha Inhibitors in Rheumatoid Arthritis*

Description

Results from 16 studies evaluating anti-TNF-alpha inhibitors in patients with rheumatoid arthritis.

Usage

```
Lloyd2010
```

Format

The data frame contains the following columns:

author	character	first author
year	integer	publication year
mean.das	numeric	mean for outcome DAS-28
lower.das	numeric	lower limit for outcome DAS-28
upper.das	numeric	upper limit for outcome DAS-28
mean.haq	numeric	mean for outcome HAQ
lower.haq	numeric	lower limit for outcome HAQ
upper.haq	numeric	upper limit for outcome HAQ
n	integer	sample size

Details

Lloyd et al. (2010) report results of a systematic review evaluating the effectiveness of anti-TNF-alpha inhibitors in the treatment of rheumatoid arthritis. The authors conducted separate meta-analyses for HAQ and DAS-28.

Concepts

medicine, raw mean differences

Author(s)

Guido Schwarzer, `<guido.schwarzer@uniklinik-freiburg.de>`

Source

Lloyd, S., Bujkiewicz, S., Wailoo, A.J., et al. (2010). The effectiveness of anti-TNF-alpha therapies when used sequentially in rheumatoid arthritis patients: A systematic review and meta-analysis. *Rheumatology (Oxford)*, **49**, 2313-21. `https://doi.org/10.1093/rheumatology/keq169`

Examples

```
# Load meta package
library("meta")

# Only consider studies providing data for both outcomes
lloyd5 <- subset(Lloyd2010, !is.na(mean.haq) & !is.na(mean.das))

# Univariate meta-analysis of the DAS-28 outcome
m.das <- metagen(mean.das,
  lower = lower.das, upper = upper.das,
  data = lloyd5, sm = "MD",
  studlab = paste(author, year),
  random = FALSE)
# Univariate meta-analysis of the HAQ outcome
m.haq <- metagen(mean.haq,
  lower = lower.haq, upper = upper.haq,
  data = lloyd5, sm = "MD",
  studlab = paste(author, year),
  random = FALSE)

# Forest plots
forest(m.das, test.overall = TRUE, hetstat = FALSE,
  digits.TE = 2, digits.se = 2)
forest(m.haq, test.overall = TRUE, hetstat = FALSE,
  digits.TE = 2, digits.se = 2)
```

Moore1998   *Trials on Non-Steroidal Anti-Inflammatory Drugs in Acute Pain*

Description

Results from 37 trials evaluating non-steroidal anti-inflammatory drugs (NSAIDS) in patients with acute pain.

Usage

```
Moore1998
```

Format

The data frame contains the following columns:

id	integer	study ID
author	character	first author
year	integer	publication year
Ee	integer	number of treatment successes (NSAIDS group)
Ne	integer	number of patients (NSAIDS group)
Ec	integer	number of treatment successes (control group)
Nc	integer	number of patients (control group)
nonenglish	integer	non-English publication
medline	integer	listed in Medline
grey	integer	grey literature
samecont	integer	same control group
journal	character	journal

Details

Moore et al. (1998) conducted a systematic review of 37 randomised placebo-controlled trials on the effectiveness and safety of topical non-steroidal anti-inflammatory drugs (NSAIDS) in acute pain. The main outcome was treatment success, defined as a reduction in pain of at least 50%.

This data set is used as an example in Schwarzer et al. (2015).

Concepts

medicine, odds ratios, publication bias

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Moore, R. A., Tramèr, M. R., Carroll, D., et al. (1998). Quantitative systematic Review of topically applied non-steroidal anti-inflammatory drugs. *British Medical Journal*, **316**, 333-38

References

Schwarzer, G., Carpenter, J. R., & Rücker, G. (2015). *Meta-analysis with R*. Cham, Switzerland: Springer.

Examples

```
# Load meta package
library("meta")

# Conduct meta-analysis
m <- metabin(Ee, Ne, Ec, Nc, data = Moore1998,
```

```
  sm = "OR", studlab = id,
  label.e = "NSAIDS", label.c = "Placebo")

# Funnel plot
fun <- funnel(m, type = "contour",
  random = FALSE, pch = 16)
legend(0.25, 1.25, bty = "n",
  legend = fun$text.contour, fill = fun$col.contour)
```

Poole2003   *Trials on Mucolytic Agents in Chronic Bronchitis or Chronic Obstructive Pulmonary Disease*

Description

Results from 19 trials evaluating mucolytic agents in patients with chronic bronchitis or chronic obstructive pulmonary disease.

Usage

```
Poole2003
```

Format

The data frame contains the following columns:

author	character	first author
year	integer	publication year
Ne	integer	sample size (mucolytic agents)
Me	numeric	mean exacerbations per months (mucolytic agents)
Se	numeric	standard deviation (mucolytic agents)
Nc	integer	sample size (placebo)
Mc	numeric	mean exacerbations per months (placebo)
Sc	numeric	standard deviation (placebo)
duration	character	study duration

Details

Poole and Black (2003) conducted a Cochrane review to evaluate mucolytic agents versus placebo for patients with chronic bronchitis or chronic obstructive pulmonary disease. The outcome used here is the mean number of acute exacerbations per month. Acute exacerbation is defined as an increase in cough and in the volume or purulence of sputum. All 17 studies included in the meta-analysis report a mean number of exacerbations and we can work with mean differences, rather than standardised mean differences. Note, later versions of this Cochrane review no longer evaluate the mean number of exacerbations per month.

This data set is used as an example in Schwarzer et al. (2015).

Concepts

medicine, raw mean differences, subgroup analysis

Author(s)

Guido Schwarzer, `<guido.schwarzer@uniklinik-freiburg.de>`

Source

Poole, P.J., Black, P.N. (2003). Mucolytic agents for chronic bronchitis or chronic obstructive pulmonary disease. *Cochrane Database of Systematic Reviews*, **1**, `https://doi.org/10.1002/14651858.CD001287`

References

Schwarzer, G., Carpenter, J. R., & Rücker, G. (2015). *Meta-analysis with R*. Cham, Switzerland: Springer.

Examples

```
# Load meta package
library("meta")

# Use RevMan 5 settings
oldset <- settings.meta("RevMan5",
  digits.I2 = 2, digits.tau = 3, digits.sd = 2)

# Conduct random effects meta-analysis
m <- metacont(Ne, Me, Se, Nc, Mc, Sc, data = Poole2003,
  studlab = paste(author, year), common = FALSE,
  subgroup = duration,
  subgroup.name = "Duration", sep.subgroup = ": ",
  label.e = "Mucolytic agent",
  label.c = "Placebo",
  label.left = "Favours mucolytic agent",
  label.right = "Favours placebo",
  col.label.left = "green", col.label.right = "red")

# Forest plot
forest(m, xlim = c(-0.5, 0.2),
  xlab = paste0("Difference in mean number of\n",
    "acute exacerbations per month"))

# Use previous settings
settings.meta(oldset)
```

Quan2000   *Studies on Pharmacotherapy for Hypertension*

Description

Results from 11 studies evaluating pharmacotherapy in patients with hypertension.

Usage

```
Quan2000
```

Format

The data frame contains the following columns:

study	character	study label
Ee	integer	fatal cerebrovascular events (pharmacotherapy)
Ne	integer	number of patients (pharmacotherapy)
Ec	integer	fatal cerebrovascular events (control)
Nc	integer	number of patients (control)

Details

Quan et al. (2000) conducted a Cochrane Review to evaluate whether the benefit of treating hypertension in women differed between younger and older women, as well as between white and African American women. In the systematic review, the Peto method was used for pooling. The primary outcome was the occurrence of fatal cerebrovascular events, a rare event in hypertension. The Set contains the subgroup of women older than 55 years.

This data set is used as an example in Schwarzer et al. (2015).

Concepts

medicine, Peto's method

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Quan, A.P., Kerlikowske, K. Gueyffier, F., et al., & Indana Investigators (2000). Pharmacotherapy for hypertension in women of different races. *Cochrane Database of Systematic Reviews*, **2**, https://doi.org/10.1002/14651858.CD002146

References

Schwarzer, G., Carpenter, J. R., & Rücker, G. (2015). *Meta-analysis with R*. Cham, Switzerland: Springer.

Examples

```
# Load meta package
library("meta")

# Use RevMan 5 settings
oldset <- settings.meta("RevMan5")

# Conduct meta-analyis with Peto method
m <- metabin(Ee, Ne, Ec, Nc, sm = "OR", method = "Peto",
  data = Quan2000, studlab = study, random = FALSE)
m

# Use previous settings
settings.meta(oldset)
```

Spooner2002	*Studies on Nedocromil Sodium for Preventing Exercise-Induced Bronchoconstriction*

Description

Results from 17 trials, 11 studies in children and 6 studies in adults, reporting the maximum fall in the forced expiratory volume in 1 second (FEV_1) over the course of follow-up, expressed as a percentage.

Usage

```
Spooner2002
```

Format

The data frame contains the following columns:

author	character	first author
year	character	year of publication
Ne	integer	number of participants in nedocromil sodium group
Me	numeric	maximum fall in the FEV_1 (nedocromil sodium)
Se	numeric	standard deviation (nedocromil sodium)
Nc	integer	number of participants in placebo group
Mc	numeric	maximum fall in the FEV_1 (placebo)
Sc	numeric	standard deviation (placebo)
agegroup	factor	age group (children or adults)

Details

Spooner et al. (2002) conducted a Cochrane review comparing nedocromil sodium (experimental treatment) with placebo (control) for preventing exercise-induced bronchoconstriction. Primary outcome was the maximum fall in the forced expiratory volume in 1 second (FEV_1) over the course of follow-up, expressed as a percentage. This outcome is available for 17 studies, 11 studies in children and 6 studies in adults. For each study, the mean value, standard deviation, and sample size are reported for both the experimental and control group. The authors conducted a random-effects meta-analysis with the mean difference as effect measure, i.e.\ mean value in the nedocromil sodium group minus mean value in the placebo group.

This data set is used as an example in Schwarzer et al. (2015).

Concepts

raw mean differences, subgroup analysis

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Spooner, C., Saunders, L. D., & Rowe, B. H. (2002). Nedocromil sodium for preventing exercise-induced bronchoconstriction. *Cochrane Database of Systematic Reviews*, **1**, CD001183. https://doi.org/10.1002/14651

References

Schwarzer, G., Carpenter, J. R., & Rücker, G. (2015). *Meta-analysis with R*. Cham, Switzerland: Springer.

Examples

```
# Load meta package
library("meta")

# Use settings from RevMan5
oldset <- settings.meta("RevMan5")

# Conduct random effects meta-analysis with age subgroups
mc1 <- metacont(Ne, Me, Se, Nc, Mc, Sc,
                data = Spooner2002, studlab = paste(author, year),
                subgroup = agegroup, print.subgroup.name = FALSE,
                label.e = "Nedocromil sodium", label.c = "Placebo",
                common = FALSE)
mc1

# Use previous settings
settings.meta(oldset)
```

Steurer2006	*Trials on Single-Agent Purine Analogues for the Treatment of Chronic Lymphocytic Leukaemia*

Description

Results from 4 trials evaluating single-agent purine analogues in patients with chronic lymphocytic leukaemia.

Usage

```
Steurer2006
```

Format

The data frame contains the following columns:

author	character	first author
year	integer	publication year
Ne	integer	number of patients (purine antagonists)
Nc	integer	number of patients (alkylator-based)
HR	numeric	hazard ratio
lowHR	numeric	lower limit
uppHR	numeric	upper limit
lnHR	numeric	log hazard ratio
selnHR	numeric	standard error

Details

Steurer et al. (2006) conducted a Cochrane review to evaluate the effect of single-agent purine analogues for the treatment of chronic lymphocytic leukaemia. This Set contains data from the main outcome, overall survival. Note, the hazard ratios and confidence limits have been reported in the Cochrane review with only two significant figures and were recalculated using the reported log hazard ratios and standard errors.

This data set is used as an example in Schwarzer et al. (2015).

Concepts

medicine, oncology, hazard ratios

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Steurer, M., Pall, G., Richards, S., et al. (2006). Purine antagonists for chronic lymphocytic leukaemia. *Cochrane Database of Systematic Reviews*, **3**, `https://doi.org/10.1002/14651858.CD004270.pub2`

References

Schwarzer, G., Carpenter, J. R., & Rücker, G. (2015). *Meta-analysis with R*. Cham, Switzerland: Springer.

Examples

```
# Load meta package
library("meta")

# Use RevMan 5 settings
oldset <- settings.meta("RevMan5")

# Conduct common effect meta-analysis
m1 <- metagen(lnHR, selnHR, data = Steurer2006,
  studlab = paste(author, year),
  sm = "HR", random = FALSE, n.e = Ne, n.c = Nc)
m1

# Same analysis using lower and upper confidence limits
m2 <- metagen(HR, lower = lowHR, upper = uppHR,
  data = Steurer2006, transf = FALSE,
  studlab = paste(author, year),
  sm = "HR", random = FALSE, n.e = Ne, n.c = Nc)
m2

# Use previous settings
settings.meta(oldset)
```

Stowe2010   *Studies on Adjuvant Treatments to Levodopa Therapy for Parkinson disease*

Description

Results from 29 trials assessing efficacy of three drug classes as adjuvant treatment to levodopa therapy in patients with Parkinson disease and motor complications.

Usage

```
Stowe2010
```

Format

The data frame contains the following columns:

study	character	study label
id	integer	study id
t1	character	treatment 1
y1	numeric	treatment effect arm 1
sd1	numeric	standard deviation arm 1
n1	integer	sample size arm 1
t2	character	treatment 2
y2	numeric	treatment effect arm 2
sd2	numeric	standard deviation arm 2
n2	integer	sample size arm 2
t3	character	treatment 3
y3	numeric	treatment effect arm 3
sd3	numeric	standard deviation arm 3
n3	integer	sample size arm 3

Details

This Set contains data from a Cochrane review assessing efficacy and safety of three drug classes as adjuvant treatment to levodopa therapy in patients with Parkinson disease and motor complications (Stowe et al., 2010).

The authors conducted three pairwise meta-analyses comparing dopamine agonists, catechol-O-methyl transferase inhibitors (COMTI), and monoamine oxidase type B inhibitors (MAOBI) with placebo. The primary outcome was the mean reduction of the time spent in a relatively immobile 'off' phase (mean off-time), calculated in hours per day. Relative treatment effects were expressed as mean difference. Data on this outcome were available for 5,331 patients from 28 studies comparing an active treatment with placebo and one three-arm study comparing two active treatments with placebo.

Concepts

medicine, raw mean differences, network meta-analysis

Author(s)

Guido Schwarzer, `<guido.schwarzer@uniklinik-freiburg.de>`

Source

Stowe, R., Ives, N., Clarke, C. E., Deane, K., Hilten, V., Wheatley, K., Gray, R., Handley, K., & Furmston, A. (2010). Evaluation of the efficacy and safety of adjuvant treatment to levodopa therapy in Parkinson's disease patients with motor complications. *Cochrane Database of Systematic Reviews*, **7**, CD007166. `https://doi.org/10.1002/14651858.CD007166.pub2`

Examples

```
# Load netmeta package
library("netmeta")

# Print mean differences with two digits and standard errors with 3
# digits
oldset <- settings.meta(digits = 2, digits.se = 3)

# Transform data from wide arm-based format to contrast-based
# format. Argument 'sm' must not be provided as the mean difference
# is the default in R function metacont() called internally.
pw <- pairwise(treat = list(t1, t2, t3), n = list(n1, n2, n3),
  mean = list(y1, y2, y3), sd = list(sd1, sd2, sd3),
  studlab = study, data = Stowe2010, sm = "MD")

# Show calculated mean differences (TE) for three studies
selstudy <- c("COMTI(E) INT-OZ", "LARGO", "COMTI(E) Nomecomt")
subset(pw, studlab %in% selstudy)[, c(3:7, 10, 1)]

# Conduct random effects network meta-analysis (NMA)
# with placebo as reference
nma <- netmeta(pw, common = FALSE, ref = "plac")

# Show network graph
netgraph(nma, number = TRUE, multiarm = TRUE,
  cex = 1.25, offset = 0.025,
  cex.number = 1, pos.number.of.studies = 0.3)

# Print NMA results
nma

# Forest plot with NMA results
forest(nma)

# Forest plot showing all network estimates of active treatments
# compared with other treatments
forest(nma, ref = c("C", "D", "M"), baseline = FALSE, drop = TRUE)

# Treatment ranking using P-scores
netrank(nma)

# Rankogram with all ranking probabilities
set.seed(1909)
ran <- rankogram(nma)
ran
plot(ran)

# Treatment ranking using SUCRAs
netrank(ran)

# League table showing network and direct estimates
netleague(nma, seq = netrank(nma), ci = FALSE)
```

```
# Use previous settings
settings.meta(oldset)
```

Woods2010   *Studies on Treatments for Chronic Obstructive Pulmonary Disease*

Description

Results from 3 trials examining the mortality risk of three treatments and placebo in patients with chronic obstructive pulmonary disease.

Usage

```
Woods2010
```

Format

The data frame contains the following columns:

author	character	first author / study name
treatment	character	treatment
r	integer	number of deaths
N	integer	number of patients

Details

Count mortality statistics in randomised controlled trials of treatments for chronic obstructive pulmonary disease (Woods et al., 2010, Table 1).

Concepts

medicine, odds ratios, network meta-analysis

Author(s)

Guido Schwarzer, <guido.schwarzer@uniklinik-freiburg.de>

Source

Woods, B. S., Hawkins, N., & Scott, D. A. (2010). Network meta-analysis on the log-hazard scale, combining count and hazard ratio statistics accounting for multi-arm trials: A tutorial. *BMC Medical Research Methodology*, **10**, 54. https://doi.org/10.1186/1471-2288-10-54

Examples

```
# Load netmeta package
library("netmeta")

# Print odds ratios and confidence limits with two digits
oldset <- settings.meta(digits = 2)

# Change appearance of confidence intervals
cilayout("(", "-")

# Transform data from long arm-based format to contrast-based
# format. Argument 'sm' has to be used for odds ratio as summary
# measure; by default the risk ratio is used in the metabin function
# called internally.
pw <- pairwise(treatment, event = r, n = N,
  studlab = author, data = Woods2010, sm = "OR")
pw

# Conduct network meta-analysis
nma <- netmeta(pw)
nma

# Show forest plot
forest(nma, ref = "Placebo", drop = TRUE,
  leftlabs = "Contrast to Placebo")

# Use previous settings
settings.meta(oldset)
```

Index