

Package ‘metawho’

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Type Package

Title Meta-Analytical Implementation to Identify Who Benefits Most from Treatments

Version 0.2.0

Description A tool for implementing so called 'deft' approach (see Fisher, David J., et al. (2017) <[DOI:10.1136/bmj.j573](https://doi.org/10.1136/bmj.j573)>) and model visualization.

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URL <https://github.com/ShixiangWang/metawho>

BugReports <https://github.com/ShixiangWang/metawho/issues>

Depends metafor, R (>= 3.5)

Imports dplyr, forestmodel, magrittr, purrr, rlang (>= 0.1.2), stats

Suggests covr, knitr, rmarkdown, roxygen2, testthat

VignetteBuilder knitr

Encoding UTF-8

LazyData true

RoxygenNote 7.0.0

NeedsCompilation no

Author Shixiang Wang [aut, cre] (ORCID: <<https://orcid.org/0000-0001-9855-7357>>)

Maintainer Shixiang Wang <w_shixiang@163.com>

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deft_do	<i>Implement deft method</i>
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Description

'deft' method is a meta-analytical approach to pool conclusion from multiple studies. More details please see references.

Usage

```
deft_do(prepare, group_level, method = "FE")
```

Arguments

prepare	a result data.frame from deft_prepare function or a data.frame contains at least 'trial', 'subgroup', 'yi' and 'sei' these four columns.
group_level	level of subgroup, should be a character vector with length 2 and the reference should put in the first. For example, if you have 'Male' and 'Female' groups and want compare 'Female' with 'Male', then should set c('Male', 'Female').
method	character string specifying whether a fixed- or a random/mixed-effects model should be fitted. A fixed-effects model (with or without moderators) is fitted when using method="FE". Random/mixed-effects models are fitted by setting method equal to one of the following: "DL", "HE", "SJ", "ML", "REML", "EB", "HS", or "GENQ". Default is "REML". See 'Details'.

Details

About model fit, please see [metafor::rma\(\)](#).

Value

a list which class is 'deft'.

Author(s)

Shixiang Wang w_shixiang@163.com

References

Fisher, David J., et al. "Meta-analytical methods to identify who benefits most from treatments: daft, deluded, or deft approach?." *bmj* 356 (2017): j573.

Wang, Shixiang, et al. "The predictive power of tumor mutational burden in lung cancer immunotherapy response is influenced by patients' sex." *International journal of cancer* (2019).

Examples

```
data("wang2019")
deft_do(wang2019, group_level = c("Male", "Female"))
```

deft_prepare	<i>Prepare log transformation data for effect size estimation according to confidence level and distribution</i>
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Description

A variety of different outcome measures which used in meta-analysis as input are in the form of log, such as hazard ratio (HR). This function is used to do log transformation to calculate effect size and standard error. Then the result can be easier used for model fit.

Usage

```
deft_prepare(data, conf_level = 0.05)
```

Arguments

data	a data.frame contains at least columns 'trial', 'hr', 'ci.lb', 'ci.ub' and 'ni'.
conf_level	a number specify confidence level, default is 0.05.

Value

a data.frame

Author(s)

Shixiang Wang w_shixiang@163.com

References

Wang, Shixiang, et al. "The predictive power of tumor mutational burden in lung cancer immunotherapy response is influenced by patients' sex." International journal of cancer (2019).

Examples

```
### specify hazard ratios (hr)
hr <- c(0.30, 0.11, 1.25, 0.63, 0.90, 0.28)
### specify lower bound for hr confidence intervals
ci.lb <- c(0.09, 0.02, 0.82, 0.42, 0.41, 0.12)
### specify upper bound for hr confidence intervals
ci.ub <- c(1.00, 0.56, 1.90, 0.95, 1.99, 0.67)
### specify sample number
ni <- c(16L, 18L, 118L, 122L, 37L, 38L)
### trials
trial <- c(
```

```

    "Rizvi 2015", "Rizvi 2015",
    "Rizvi 2018", "Rizvi 2018",
    "Hellmann 2018", "Hellmann 2018"
  )
  ### subgroups
  subgroup <- rep(c("Male", "Female"), 3)

  entry <- paste(trial, subgroup, sep = "-")
  ### combine as data.frame

  wang2019 <-
    data.frame(
      entry = entry,
      trial = trial,
      subgroup = subgroup,
      hr = hr,
      ci.lb = ci.lb,
      ci.ub = ci.ub,
      ni = ni,
      stringsAsFactors = FALSE
    )

  deft_prepare(wang2019)

```

 deft_show

Show deft result

Description

Show deft result

Usage

```

deft_show(
  deft,
  element,
  study_labels = NULL,
  headings = list(study = ifelse(element == "all", "Study-subgroup", "Study"), n = "N",
    measure = NULL, ci = "HR (95% CI)"),
  trans = base::exp,
  show_model = ifelse(element == "all", FALSE, TRUE),
  show_stats = list(`I^2` = rlang::quo(sprintf("%0.1f%", I2)), p =
    rlang::quo(format.pval(QEp, digits = 2))),
  ...
)

```

Arguments

<code>deft</code>	result from <code>deft_do</code> .
<code>element</code>	'all' or 'subgroup'.
<code>study_labels</code>	labels for studies.
<code>headings</code>	a list for controlling plot headings.
<code>trans</code>	an optional transform function used on the numeric data for plotting the axes
<code>show_model</code>	a logical value, if TRUE, show model result, otherwise only show forest plots for studies
<code>show_stats</code>	a list of stats to show at the bottom of the forest plot for e.g. heterogeneity
<code>...</code>	other arguments except 'panels', 'trans', 'study_labels', and 'show_stats' passed to <code>forestmodel::forest_rma()</code> .

Value

a ggplot object

Author(s)

ShixiangWang w_shixiang@163.com

Examples

```
data("wang2019")
res <- deft_do(wang2019, group_level = c("Male", "Female"))

p1 <- deft_show(res, "all")
p1

p2 <- deft_show(res, "subgroup")
p2
```

wang2019

Hazard ratio (HR) for disease progression analysis comparing TMB-high with TMB-low in three NSCLC datasets

Description

Hazard ratio (HR) for disease progression analysis comparing TMB-high with TMB-low in three NSCLC datasets

Format

a data.frame

Source

Wang, Shixiang, et al. "The predictive power of tumor mutational burden in lung cancer immunotherapy response is influenced by patients' sex." *International journal of cancer* (2019).

Examples

```
data("wang2019")
```

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