Package ‘metapro’

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**Type**  Package

**Title**  Robust P-Value Combination Methods

**Version**  1.5.11

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**Description**  The meta-analysis is performed to increase the statistical power by integrating the results from several experiments. The p-values are often combined in meta-analysis when the effect sizes are not available. The ‘metapro’ R package provides not only traditional methods (Becker BJ (1994, ISBN:0-87154-226-9), Mosteller, F. & Bush, R.R. (1954, ISBN:0201048523) and Lancaster HO (1949, ISSN:00063444)), but also new method named weighted Fisher’s method we developed. While the (weighted) Z-method is suitable for finding features effective in most experiments, (weighted) Fisher’s method is useful for detecting partially associated features. Thus, the users can choose the function based on their purpose. Yoon et al. (2021) "Powerful p-value combination methods to detect incomplete association" <doi:10.1038/s41598-021-86465-y>.

**License**  GPL (>= 2)

**Encoding**  UTF-8

**Imports**  metap, stats

**RoxygenNote**  7.2.3

**Suggests**  testthat (>= 3.0.0)

**Config/testthat/edition**  3

**NeedsCompilation**  no

**Repository**  CRAN

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**R topics documented:**

- F_i  ................................................................. 2
- lancaster ....................................................... 2
- wFisher ......................................................... 3
- wZ  .............................................................. 4
**Index**

| F_i | Beta probability |

**Description**

Beta probability

**Usage**

\[ F_i(p, i, n) \]

**Arguments**

- \( p \)
  - p-value
- \( i \)
  - rank
- \( n \)
  - The number of inputs

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**lancaster**

**Description**

P-value combination based on Lancaster's procedure

**Usage**

\[ \text{lancaster}(p, \text{weight}, \text{is.onetail} = \text{TRUE}, \text{eff.sign}) \]

**Arguments**

- \( p \)
  - A numeric vector of p-values
- \( \text{weight} \)
  - A numeric vector of weights (e.g., samples sizes)
- \( \text{is.onetail} \)
  - Logical. If set TRUE, p-values are combined without considering the direction of effect, and vice versa. Default: TRUE.
- \( \text{eff.sign} \)
  - A vector of signs of effect sizes (1 or -1). It works when is.onetail = FALSE

**Value**

- \( p \): Combined p-value
- overall.eff.direction: The direction of combined effects.
References


Examples

lancaster(p=c(0.01,0.2,0.8), weight=c(20,50,10), is.onetail=FALSE, eff.sign=c(1,1,1))

wFisher

Description

sample size-weighted Fisher's method

Usage

wFisher(p, weight = NULL, is.onetail = TRUE, eff.sign)

Arguments

p A numeric vector of p-values
weight A numeric vector of weight or sample size for each experiment
is.onetail Logical. If set TRUE, p-values are combined without considering the direction of effects, and vice versa. Default: TRUE.
eff.sign A vector of signs of effect sizes. It works when is.onetail = FALSE

Value

p : Combined p-value
overall.eff.direction : The direction of combined effects.

References


Examples

wFisher(p=c(0.01,0.2,0.8), weight = c(50,60,100), is.onetail=FALSE, eff.sign=c(1,1,1))
Description

P-value combination based on weighted Z-method

Usage

\[ wZ(p, \text{weight} = \text{NULL}, \text{is.onetail} = \text{TRUE}, \text{eff.sign}) \]

Arguments

- **p**: A numeric vector of p-values
- **weight**: A numeric vector of weights (e.g., sample sizes)
- **is.onetail**: Logical. If set TRUE, p-values are combined without considering the direction of effect, and vice versa. Default: TRUE.
- **eff.sign**: A vector of signs of effect sizes. It works when is.onetail = FALSE

Value

- **p**: Combined p-value
- **overall.eff.direction**: The direction of combined effects.
- **sumz**: Sum of transformed z-score

References


Examples

\[ wZ(p=c(0.01,0.2,0.8), \text{weight} = c(20,10,40), \text{is.onetail}=\text{FALSE}, \text{eff.sign}=c(1,-1,1)) \]
Index

$F_i$, 2
lancaster, 2
wFisher, 3
wZ, 4