Package ‘episheet’

January 23, 2019

Type    Package
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Description A collection of R functions supporting the text book
License  GPL (>= 2)
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BugReports https://github.com/epijim/episheet/issues
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VignetteBuilder knitr
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Description

Person-time data for death from ebola. Data from https://datacompass.lshtm.ac.uk/599/ Marks, M. Learning Clinical Epidemiology with R. (Project). London School of Hygiene & Tropical Medicine, London, United Kingdom.

Usage

ebola

Format

A dataframe

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Unique patient identifier</td>
</tr>
<tr>
<td>age</td>
<td>Age in years</td>
</tr>
<tr>
<td>age_group</td>
<td>Grouped age</td>
</tr>
<tr>
<td>sex</td>
<td>Sex</td>
</tr>
<tr>
<td>disease_onset</td>
<td>Date of onset (date class)</td>
</tr>
<tr>
<td>disease_ended</td>
<td>Date of death or recovery (date class)</td>
</tr>
<tr>
<td>days_at_risk</td>
<td>Number of days at risk of death</td>
</tr>
<tr>
<td>status</td>
<td>Died or recovered (string)</td>
</tr>
<tr>
<td>transmission</td>
<td>How ebola was transmitted</td>
</tr>
<tr>
<td>died</td>
<td>Integer 1 = died, 0 = survived</td>
</tr>
</tbody>
</table>
**pvalueplot**  
*Plot the p-value function*

### Description

Plot the p-value function for one or two confidence interval pairs. See following for example of the use in the literature: Is flutamide effective in patients with bilateral orchiectomy? Rothman, Kenneth J et al. The Lancet, Volume 353, Issue 9159, 1184

### Usage

```r
pvalueplot(est1.ll, est1.ul, est2.ll = NA, est2.ul = NA,  
           label1 = "Estimate 1", label2 = "Estimate 2",  
           xlabel = "Relative Risk",  
           citype = "95%CI",  
           labelsize = NULL,  
           functionwidth = 1,  
           referencewidth = 1)
```

### Arguments

- `est1.ll`: Lower confidence interval of estimate 1
- `est1.ul`: Upper confidence interval of estimate 1
- `est2.ll`: Lower confidence interval of estimate 2 (optional)
- `est2.ul`: Upper confidence interval of estimate 2 (optional)
- `label1`: If using two estimates, name the 1st
- `label2`: If using two estimates, name the 2nd
- `xlabel`: The x axis label
- `citype`: Choose between '95%CI', '90%CI' or '99%CI'
- `labelsize`: Change size of labels
- `functionwidth`: Change width of pvalue function line
- `referencewidth`: Change width of reference lines

### Bugs

Code repo: [https://github.com/epijim/episheet](https://github.com/epijim/episheet)

### Examples

```r
pvalueplot(  
est1.ll = 0.9,  
est1.ul = 1.2,  
          xlabel = "Relative Risk"
)
```

```r
pvalueplot(  
est1.ll = 0.8,  
est1.ul = 3.8,
)```
rate

rate2.11 = 1.2,
rate2.1l = 2,
label1 = "Estimate 1",
label2 = "Estimate 2",
xlabel = "Relative Risk",
citype = "95%CI"
)

rate  Calculate risk ratio and risk difference

Description

Calculate risk ratios and risk differences using a Poisson distribution for person-time data. Function works on individual level data or aggregated data p244 2nd Edition

Usage

rate(data, outcome, denominator, exposure, per_unit, ci_level = 95)

Arguments

data  A dataframe
outcome  Variable with the outcomes as a numeric variable
denominator  Variable giving the amount of time at risk
exposure  Variable giving whether exposed or not
per_unit  Multiplier for rate values, e.g. 1000 for n outcomes per 1000 denominator
ci_level  A numeric value giving the confidence interval

Examples

# Using individual level data
data(ebola)
library(dplyr)
ebola %>%
  mutate(male = ifelse(sex == "male", 1, 0)) %>
  rate(outcome = died, denominator = days_at_risk, exposure = male,
       per_unit = 100)

# Using aggregated data
# Table 14-2
cancer_xray <- data.frame(cases = c(41, 15), pyar = c(28010, 19017),
radiation = c(1, 0))
cancer_xray

cancer_xray %>%
  rate(outcome = cases, denominator = pyar, exposure = radiation,
       per = 100000)
risk  

Calculate risk ratios and risk differences

Usage

\[
\text{risk(data, exposure, outcome, ci\_level = 95)}
\]

Arguments

- **data**: A dataframe
- **exposure**: Variable giving the levels of the outcome
- **outcome**: Variable giving cases (1) or non-cases (0)
- **ci\_level**: a string giving the confidence interval

Value

A dataframe with the risk ratio, risk difference and confidence intervals

Examples

```r
# Data from stratum 1 of table 15-1., p260
data <- data.frame(
  exposure_var = c(rep(1, 8), rep(0, 5), rep(1, 98), rep(0, 115)),
  outcome_var = c(rep(1, 8), rep(1, 5), rep(0, 98), rep(0, 115)),
  stringsAsFactors = FALSE
)
risk(data = data, exposure = exposure_var, outcome = outcome_var)
```

---

stratified_risk  

Stratified risk

Description

Calculate stratified risk estimates as per Chapter 15.

Usage

\[
\text{stratified\_risk(data, exposure, outcome, stratifier, ci\_level = 95)}
\]
**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>data</td>
<td>A dataframe providing the exposure, outcome and stratifying variable</td>
</tr>
<tr>
<td>exposure</td>
<td>binary variable giving the exposure status</td>
</tr>
<tr>
<td>outcome</td>
<td>binary variable giving the outcome status</td>
</tr>
<tr>
<td>stratifier</td>
<td>stratifying variable</td>
</tr>
<tr>
<td>ci_level</td>
<td>variable giving the limits for the confidence interval</td>
</tr>
</tbody>
</table>

**Value**

A dataframe giving an MH-adjusted risk ratio

**Examples**

```r
data(tolbutamide)
stratified_risk(tolbutamide, exposure = tolbutamide, outcome = dead, stratifier = age)
```

---

**Description**

Age-specific comparison of death from all causes for Tolbutamide and placebo treatment groups, University Group Diabetes Program (1970)

**Usage**

tolbutamide

**Format**

An object of class `data.frame` with 409 rows and 3 columns.

**Details**

@format A dataframe with 409 observations and 3 variables

- **tolbutamide** Given Tolbutamide (1) or placebo (0)
- **dead** Died (1) or surviving (0)
- **age** Less than 55 (<55) or 55 and over (ge55)
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