Package ‘epitab’

Type Package

Title Flexible Contingency Tables for Epidemiology

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Description Builds contingency tables that cross-tabulate multiple categorical variables and also calculates various summary measures. Export to a variety of formats is supported, including: ‘HTML’, ‘LaTeX’, and ‘Excel’.

URL https://github.com/stulacy/epitab

License GPL-2

Imports kableExtra, knitr, MASS, survival, xml2

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contingency_table

Description

A contingency table provides cross-tabulated frequencies between an outcome of interest and one or more independent variables. This function extends contingency tables to include summary statistics formed both column-wise and row-wise, looking at outcomes and covariates respectively in isolation. This allows for a large amount of flexibility and tables can be drawn for a variety of situations. By default, the print method fits these tables to standard R console output, but publication quality tables can be produced using the neat_table function. See the vignette for further guidance.

Usage

contingency_table(independents, data, outcomes = NULL, crosstab_funcs = NULL, row_funcs = NULL, col_funcs = NULL, marginal = TRUE)

Arguments

- **independents**: A named list of independent variables, which will be distributed down the table’s rows. The variables must be specified by strings, with the item name used as the column header.
- **data**: The data set that contains the columns specified in `cat_vars` and `outcome`.
- **outcomes**: The variables to cross-tabulate by. These will be distributed across the table’s columns. Specified as a named list of strings. Must correspond to factor or character variables.
- **crosstab_funcs**: A list of functions that are applied to every cross-tabulation permutation of `independents` and `outcomes`. The most common function, the frequency, is provided with the package in function `freq`. See the vignette for further guidance.
- **row_funcs**: A list of functions that are applied row-wise to the table, one independent variable at a time, providing a value for each level of the factors specified in `independents`. Two functions: `odds_ratio` and `hazard_ratio` come provided with the package. See the vignette for further guidance.
- **col_funcs**: A list of functions that are applied column-wise to the table, to every outcome separate from the independent variables. Examples provided with the package included `summary_mean` and `summary_median`, which calculate the mean and median value of a specified continuous variable for each level of the outcome. See the vignette for further guidance.
- **marginal**: Whether to include the counts of each level of `cat_vars`, the marginal frequency.
freq

Value

An S3 object of class 'contintab', that provides the cell contents as a matrix of strings.

Examples

# This example uses a dummy data set of whether an individual was treated or not
treat <- data.frame(age=abs(rnorm(100, 60, 20)),
                   sex=factor(sample(c("M", "F"), 100, replace=TRUE)),
                   variant=factor(sample(c("A", "B"), 100, replace=TRUE)),
                   treated=factor(sample(c("Yes", "No"), 100, replace=TRUE),
                       levels=c("Yes", "No")))
treat$agebin <- cut(treat$age, breaks=c(0, 40, 60, 80, 9999),
                   labels=c("0-40", "41-60", "61-80", "80+"))

# Displays a standard contingency table
contingency_table(list("Age"="agebin", "Sex"="sex"),
                   outcomes=list("Treated"="treated"),
                   crosstab_funcs=list(freq()),
                   data=treat)

# Continuous variables can be summarised with respect to the outcome
# by using col_funcs
contingency_table(list("Age"="agebin", "Sex"="sex"),
                   outcomes=list("Treated"="treated"),
                   crosstab_funcs=list(freq()),
                   col_funcs=list("Mean age"=summary_mean("age")),
                   data=treat)

# Regression coefficients can be added using row_funcs
contingency_table(list("Age"="agebin", "Sex"="sex"),
                   treat,
                   outcomes=list("Treated"="treated"),
                   crosstab_funcs=list(freq()),
                   row_funcs=list("Odds ratio"=odds_ratio("treated"),
                                   "Adjusted odds ratio"=odds_ratio("treated", adjusted=TRUE)))

freq

Builds a function to calculate cross-tabulated frequencies

Description

Builds a function to calculate cross-tabulated frequencies

Usage

freq(proportion = c("column", "row", "none"), display = c("percentage", "ratio"), digits = 3, missing = NULL)
Arguments

- **proportion**: Whether to display proportions in brackets after the counts as either row-wise or column-wise, or not at all.
- **display**: How to display the proportions if required.
- **digits**: The number of digits to specify proportion to.
- **missing**: Specifies covariates that shouldn’t be included in calculating proportions for column-wise summaries.

Value

A function that calculates the frequency of a cell in a contingency table.

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### hazard_ratio

*Binds a function used to calculate hazard ratios.*

**Description**

Builds a function to fit a Cox model to the outcome survival object and returns the hazard ratios for each covariate level.

**Usage**

```r
hazard_ratio(outcome, adjusted = FALSE, relevel_baseline = FALSE,
             digits = 2, ci = TRUE)
```

**Arguments**

- **outcome**: The dependent variable, specifies a `Surv` object as a string. For example, `hazard_ratio("Surv(time, status)")`.
- **adjusted**: Whether to adjust for the other covariates, specified by `independents` argument to `contingency_table`.
- **relevel_baseline**: Whether to use the largest level as the baseline.
- **digits**: The number of digits to display.
- **ci**: Whether to include a confidence interval in parentheses after the estimate.

**Details**

See documentation for `contingency_table` and vignette for usage.

**Value**

A function that is used to calculate hazard ratios.
**neat_table**  
*Displays a neatly formatted contingency table.*

**Description**

This function provides a default means of converting a contingency table into HTML or LaTeX for publishing. By default, multiple column and row spanning cells are formed to accentuate the hierarchical nature of the data. The output of this function is a `kable` object and so can be further manipulated.

**Usage**

```r
neat_table(table, format = c("html", "latex"), ...)
```

**Arguments**

- `table`  
  A `contintab` object, output by `contingency_table`.
- `format`  
  A string specifying output format passed to `knitr::kable`. Currently only 'html' and 'pdf' are supported.
- `...`  
  Other arguments passed to `knitr::kable`.

**Value**

A `kable` object.

**Examples**

```r
# This example uses a dummy data set of whether an individual was treated or not
treat <- data.frame(age=abs(rnorm(100, 60, 20)),
                     sex=factor(sample(c("M", "F"), 100, replace=TRUE)),
                     variant=factor(sample(c("A", "B"), 100, replace=TRUE)),
                     treated=factor(sample(c("Yes", "No"), 100, replace=TRUE),
                        levels=c("Yes", "No")))
treat$agebin <- cut(treat$age, breaks=c(0, 40, 60, 80, 9999),
                     labels=c("0-40", "41-60", "61-80", "80+"))

# For use in an Rmarkdown that outputs to HTML
neat_table(treat, 'html')

# When outputting to PDF, the \code{booktabs} option produces well-formatted tables
neat_table(treat, 'latex', booktabs=TRUE)
```
odds_ratio  

Builds a function used to calculate odds ratios.

Description

Builds a function to run logistic regression on the outcome variable of interest and return the odds ratios for each covariate level.

Usage

odds_ratio(outcome, adjusted = FALSE, relevel_baseline = FALSE, digits = 2, ci = TRUE)

Arguments

outcome The dependent variable as a string.
adjusted Whether to adjust for the other covariates, specified by independents argument to contingency_table.
relevel_baseline Whether to use the largest level as the baseline.
digits The number of digits to display.
Ci Whether to include a confidence interval in parentheses after the estimate.

Details

See documentation for contingency_table and vignette for usage.

Value

A function that is used to calculate odds ratios.

print.contintab  

Prints the contingency table as an ASCII table

Description

Prints the contingency table as an ASCII table

Usage

## S3 method for class 'contintab'
print(x, ...)

---

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**summary_mean**

**Arguments**

- `x` An object of class `contintab` return by `contingency_table`.
- `...` Options passed to `print`.

**Value**

None. Prints a table to standard output.

---

**summary_median**

Builds a function to calculate the mean of a continuous variable for each level of an outcome.

**Description**

Builds a function to calculate the mean of a continuous variable for each level of an outcome.

**Usage**

```
summary_mean(var)
```

**Arguments**

- `var` A continuous variable name as a string.

**Value**

A function that calculates the mean value of `var` for each outcome level.

---

**summary_median**

Builds a function to calculate the median of a continuous variable for each level of an outcome.

**Description**

Builds a function to calculate the median of a continuous variable for each level of an outcome.

**Usage**

```
summary_median(var)
```

**Arguments**

- `var` A continuous variable name as a string.

**Value**

A function that calculates the median value of `var` for each outcome level.
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