Package 'medAMM'

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Type Package

Title Mediation Analysis with Multiple Mediators using a Weighted Approach

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Description Provides functions to calculates the proportion of the exposure effect explained by individual mediators, as well as by all the mediators together. Only appropriate for a binary outcome and a binary exposure; mediators and confounders may be binary and/or continuous. Implements the weighting approach of VanderWeele TJ, Vansteelandt S (2014). ``Mediation Analysis with Multiple Mediators." Epidemiol Methods. 2(1):95-115.

License GPL

Imports survey, ggplot2, stats

NeedsCompilation no

Depends R (>= 3.5.0)

R topics documented:

`causal.calc.all` *Main function for causal mediation analysis*

Description

Main function for causal mediation analysis. Calculates the proportion of the exposure effect explained by each given mediator, as well as by all the mediators together. Implements the weighting approach of VanderWeele TJ, Vansteelandt S. Mediation Analysis with Multiple Mediators. Epidemiol Methods. 2014;2(1):95-115. doi:10.1515/em-2012-0010.

Usage

```
causal.calc.all(datas, confounders, outcome, mainpred, mediator.names,
survey = FALSE, survey.diagnose = FALSE, conf = TRUE, plot = TRUE, plot.labels
= NULL, plot.order = NULL)
```

Arguments

datas	dataset; if survey=TRUE this must be a svydesign object
confounders	names of confounders, should be provided as a vector of strings that corresponds to the variable names in datas e.g. c("age","sex")
outcome	names of outcome, should be provided as a string that corresponds to the variable name in datas
mainpred	names of main predictor or exposure, should be provided as a string that corresponds to the variable name in datas
mediator.names	names of mediators, should be provided as a vector of strings that corresponds to the variable names in datas e.g. c("income","health")
survey	TRUE or FALSE, if the data is a svydesign object; default is FALSE
survey.diagnose	TRUE OR FALSE, if the user would like a summary of the interim weights printed to diagnose possible extreme weights; default is FALSE
conf	TRUE OR FALSE, if confidence intervals are wanted, which are obtained via bootstapping and are computationally intensive; default is TRUE
plot	TRUE OR FALSE, if plot is wanted, which requires confidence intervals obtained via bootstapping and is computationally intensive; default is TRUE
plot.labels	a vector of strings for the labels for the mediators in the plot; if not supplied then the variable names are used
plot.order	a vector of numbers specifying the order of the plot

Value

If plot = TRUE, a plot of returned. In addition, a list is returned:

results	A formatted table of results
values	A table of values used for plotting; will be empty if plot=FALSE

Author(s)

Layla Parast

References

VanderWeele TJ, Vansteelandt S. Mediation Analysis with Multiple Mediators. Epidemiol Methods. 2014;2(1):95-115. doi:10.1515/em-2012-0010

Examples

```
data(datamed)

causal.calc.all(datas = datamed, confounders = c("con1","con2"), outcome = "outcome",
mainpred = "exposure", mediator.names = c("med1","med2","med3"),conf=FALSE, plot=FALSE)

#computationally intensive
## Not run: causal.calc.all(datas = datamed, confounders = c("con1","con2"),
outcome = "outcome", mainpred = "exposure", mediator.names = c("med1","med2",
"med3"),plot=TRUE)
## End(Not run)
```

`causal.calc.plot.only` *Function to plot causal mediation results*

Description

Function to plot causal mediation results; must be run after causal.calc.all and use the output from causal.calc.all where plot was set to TRUE so that the values are returned. The purpose of this function is to allow the user to make some edits to the plot, without having to re-run all the mediation analyses.

Usage

```
causal.calc.plot.only(values, mediator.names, plot.labels = NULL, plot.order = NULL)
```

Arguments

`values`	values to be used for plotting which come form causal.calc.all
`mediator.names`	names of mediators, should be provided as a vector of strings that corresponds to the variable names in datas e.g. c("income","health")
`plot.labels`	a vector of strings for the labels for the mediators in the plot; if not supplied then the variable names are used
`plot.order`	a vector of numbers specifying the order of the plot

Value

returns a plot

Author(s)

Layla Parast

Examples

```
data(datamed)

output = causal.calc.all(datas = datamed, confounders = c("con1","con2"), outcome = "outcome",
mainpred = "exposure", mediator.names = c("med1","med2","med3"),plot=TRUE)

causal.calc.plot.only(output$values, mediator.names = c("med1","med2","med3"),
plot.labels = c("Employed", "Pollution exposure","Prior arrest"), plot.order = c(2,3,4,1))
```

`datamed` *Example data*

Description

Example data; simulated

Usage

```
data("datamed")
```

Format

A data frame with 5000 observations on the following 7 variables.

`outcome` the binary outcome,a numeric vector

`exposure` the binary exposure, a numeric vector

`med1` mediator 1, a numeric vector

`med2` mediator 2, a numeric vector

`med3` mediator 3,a numeric vector

`con1` confounder 1, a numeric vector

`con2` confounder 2, a numeric vector

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