Package 'CMMs'

January 20, 2025

Type Package

Title Compositional Mediation Model

Version 1.0.0

Description

A compositional mediation model for continuous outcome and binary outcomes to deal with mediators that are compositional data. Lin, Ziqiang et al. (2022) <doi:10.1016/j.jad.2021.12.019>.

Depends R (>= 3.5.0)

License GPL-3

Encoding UTF-8

Imports fastDummies,survey,robCompositions,ggplot2,forcats,dplyr

LazyData true

RoxygenNote 7.1.2

NeedsCompilation no

Author Ziqiang Lin [aut, cre],
Jinqun Cheng [aut],
Qiaoxuan Lin [aut],
Wayne Lawrence [aut],
Wangjian Zhang [aut],
Yanhui Gao [aut]

Maintainer Ziqiang Lin <linziqiang0314@gmail.com>

Repository CRAN

Date/Publication 2022-10-17 06:35:19 UTC

Contents

1

CMMs   *Compositional Mediation Model*

Description

A compositional mediation model for continuous outcome and binary outcomes to deal with mediators that are compositional data

Usage

```
CMMs(data,outcome,med,pred,cov_con=NULL,cov_cat=NULL,
            weight=NULL,family="identity",boot=5000)
```

Arguments

data	an input dataframe
outcome	column number that locate continuous or binary outcome variable in data
med	a vector of column numbers that locate the compositional mediators in data
pred	column number that locate continuous or binary exposure in data
cov_con	a vector of column numbers that locate the continuous covariates in data (default NULL).
cov_cat	a vector of column numbers that locate the categorical covariates in data (default NULL).
weight	column number that locate weights in data (default NULL).
family	If your outcome variable is continuous, then family="identity"; if your outcome variable is binary, then family="logistic" (default "identity")
boot	Number of bootstrap (default 5000)

Details

This code can be used to model with a situation when the mediators are compositional data.

Value

An object of class CMM, which is a list with the following components:

Indirect.effect	Indirect effects of exposure on an outcome variable (with 95% bootstrap confidence intervals)
Direct.effect	Direct effects of exposure on an outcome variable (with 95% bootstrap confidence intervals)
Total.effect	Total effects of exposure on an outcome variable (with 95% bootstrap confidence intervals)

Mediation.effect.plot

>   A plot shows mediation effect of exposure on an outcome variables (mediation effect with with 95% bootstrap confidence intervals)

Relative.Effects.plot

>   A plot shows relative effect of exposure on an outcome variables (relative effect with with 95% bootstrap confidence intervals)

References

Lin Z, Zhu S, Cheng J, Lin Q, Lawrence WR, Zhang W, Huang Y, Chen Y, Gao Y. The mediating effect of engagement in physical activity over a 24-hour period on chronic disease and depression: using compositional mediation model. *J Affect Disord.* 2021 Dec 10:S0165-0327(21)01337-9. doi: 10.1016/j.jad.2021.12.019.

Examples

```
data(CMM_test_data)
result=CMMs(CMM_test_data,1,3:22,2,cov_con=23:24,cov_cat=NULL,weight=NULL,boot=100)
```

CMM_test_data   *Test Data*

Description

Contains artificial 100 samples with a continuous outcome variable y, a continuous treatment tr, 20 compositional mediators M and 2 covariates X. The true direct and indirect effects of treatment on the outcome both are 1.00. The true component-wise indirect effects (M1-M20) are 0.693, -0.425, 0.135, -0.057, -0.268, 0.970, -0.843, 0.805, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000.

Usage

```
data(CMM_test_data)
```

Index