Package ‘CMMs’

October 17, 2022

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

$\text{R topics documented:}$

CMMs ................................................................. 2
CMM_test_data .................................................. 3
Index 4

1
**Description**

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

**Usage**

```r
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

Examples
```r
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**

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>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, 0.000.</td>
</tr>
</tbody>
</table>

**Usage**
```r
data(CMM_test_data)
```
Index

* datasets
  CMM_test_data, 3

CMM_test_data, 3
CMMs, 2