

# Package: CMMs (via r-universe)

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**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>](https://doi.org/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>

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**Repository** <https://buybnb.r-universe.dev>

**RemoteUrl** <https://github.com/cran/CMMs>

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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**

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

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

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CMM\_test\_data

*Test Data*

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## 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, 0.000.

## Usage

```
data(CMM_test_data)
```

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