

# Package ‘Wcompo’

October 12, 2022

**Type** Package

**Title** Semiparametric Proportional Means Regression of Weighted Composite Endpoint

**Version** 1.0

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**Description** Implements inferential and graphic procedures for the semiparametric proportional means regression of weighted composite endpoint of recurrent event and death (Mao and Lin, 2016, <[doi:10.1093/biostatistics/kxv050](https://doi.org/10.1093/biostatistics/kxv050)>).

**License** GPL (>= 2)

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 7.1.1

**VignetteBuilder** knitr

**Imports** survival

**Depends** R (>= 2.10)

**Suggests** knitr, rmarkdown

**NeedsCompilation** no

**Repository** CRAN

**Date/Publication** 2021-11-30 21:30:02 UTC

## R topics documented:

CompoML . . . . .	2
hfmock . . . . .	3
plot.CompoML . . . . .	4
print.CompoML . . . . .	5
<b>Index</b>	<b>6</b>

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CompoML

*Fit a proportional means regression model for weighted composite endpoint of recurrent event and death*

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## Description

Fit a semiparametric proportional means regression model for the weighted composite endpoint of recurrent event and death (Mao and Lin, 2016). (Jared D. Huling (ORCID: 0000-0003-0670-4845) contributed to the optimization of this code.)

## Usage

```
CompoML(id, time, status, Z, w = NULL, ep = 1e-04)
```

## Arguments

id	A vector of unique patient identifiers.
time	A vector of event times.
status	A vector of event type labels. 0: censoring; 1: death; 2, 3,..., $K$ : different types of (possibly recurrent) nonfatal event.
Z	Covariate matrix (must be time-constant).
w	A $K$ -vector of weights assigned to event types 1 (death), 2, ..., $K$ (nonfatal events); If NULL, an unweighted endpoint is modeled (i.e., with $w=c(1, 1, \dots, 1)$ ).
ep	Convergence threshold for the Newton-Raphson algorithm.

## Value

An object of class `CompoML` with the following components. `beta`: a vector of estimated regression coefficients (log-mean ratios); `var`: estimated covariance matrix for `beta`; `t`: unique event times; `y`: estimated baseline mean function (of `t`).

## References

Mao, L. and Lin, D. Y. (2016). Semiparametric regression for the weighted composite endpoint of recurrent and terminal events. *Biostatistics*, 17, 390-403.

## See Also

[plot.CompoML](#), [print.CompoML](#)

## Examples

```
## load package and data
library(Wcompo)
head(hfmock)
## fit a weighted PM (w_D=2, w_1=1)
obj <- CompoML(hfmock$id,hfmock$time,hfmock$status,hfmock[,c("Training","HF.etiology")],
              w=c(2,1))
## print out the result
obj

oldpar <- par(mfrow = par("mfrow"))
par(mfrow=c(1,2))
## plot the estimated mean function for
## non-ischemic patients by treatment
plot(obj,c(1,0),ylim=c(0,1.5),xlim=c(0,50),
      main="Non-ischemic",
      xlab="Time (months)",cex.main=1.2,lwd=2)
plot(obj,c(0,0),add=TRUE,cex.main=1.2,lwd=2,lty=2)
legend("topleft",lty=1:2,lwd=2,c("Exercise training","Usual care"))

## plot the estimated mean function for
## ischemic patients by treatment
plot(obj,c(1,1),ylim=c(0,1.5),xlim=c(0,50),
      main="Ischemic",
      xlab="Time (months)",cex.main=1.2,lwd=2)
plot(obj,c(0,1),add=TRUE,cex.main=1.2,lwd=2,lty=2)
legend("topleft",lty=1:2,lwd=2,c("Exercise training","Usual care"))
par(oldpar)
```

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hfmock

*A dataset from the HF-ACTION trial*

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## Description

The Heart Failure: A Controlled Trial Investigating Outcomes of Exercise Training (HF-ACTION) study was conducted between 2003–2007 to investigate whether adding exercise training to the usual care of heart failure patients improves their cardiovascular outcomes (O’Conner et al., 2009). This is a mock dataset consisting of 963 patients with baseline information about heart failure etiology.

## Usage

hfmock

**Format**

A data frame with 1,315 rows and 5 variables:

**id** Unique patient identifier.

**time** Event time (months).

**status** Event type; 2 = recurrent hospitalization, 1 = death, 0 = censoring.

**Training** 1 = exercise training, 0 = usual care.

**HF.etiology** 1 = ischemic, 0 = non-ischemic.

**References**

O'CONNOR, C. M., WHELLAN, D. J., LEE, K. L., KETAYIAN, S. J., COOPER, L. S., ELLIS, S. J., LEIFER, E. S., KRAUS, W. E., KITZMAN, D. W., BLUMENTHAL, J. A. et al. (2009). Efficacy and safety of exercise training in patients with chronic heart failure: Hf-action randomized controlled trial. *J. Am. Med. Assoc.* 301, 1439–1450.

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plot.CompoML

*Plot the predicted mean function under the proportional means model*

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**Description**

Plot the predicted mean function under the proportional means model for a new observation.

**Usage**

```
## S3 method for class 'CompoML'
plot(
  x,
  z = NULL,
  xlab = "Time",
  ylab = "Mean function",
  lty = 1,
  frame.plot = FALSE,
  add = FALSE,
  ...
)
```

**Arguments**

x	An object returned by <a href="#">CompoML</a> .
z	Covariate vector for the new observation. If NULL, the baseline mean function will be plotted.
xlab	A label for the x axis.
ylab	A label for the y axis.
lty	Line type for the plot.

<code>frame.plot</code>	Boolean argument indicating whether to add a rectangular frame to the plot.
<code>add</code>	If TRUE, the curve will be overlaid on an existing plot; otherwise, a separate plot will be constructed.
<code>...</code>	Other arguments that can be passed to the underlying plot method.

**Value**

No return value, called for side effects.

**See Also**

[CompoML](#), [print.CompoML](#).

**Examples**

```
## see example for CompoML
```

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```
print.CompoML          Print the analysis results of the proportional means model
```

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**Description**

Print the analysis results of the proportional means model.

**Usage**

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

**Arguments**

<code>x</code>	An object returned by <a href="#">CompoML</a> .
<code>...</code>	Further arguments passed to or from other methods.

**Value**

Print the results of [CompoML](#) object

**See Also**

[CompoML](#), [plot.CompoML](#).

# Index

- \* **CompoML**

- CompoML, [2](#)

- plot.CompoML, [4](#)

- print.CompoML, [5](#)

- \* **datasets**

- hfmock, [3](#)

CompoML, [2](#), [4](#), [5](#)

hfmock, [3](#)

plot.CompoML, [2](#), [4](#), [5](#)

print.CompoML, [2](#), [5](#), [5](#)