

# Package: ccostr (via r-universe)

October 25, 2024

**Type** Package

**Title** ccostr - Estimation of mean costs in censored data

**Version** 0.1.0

**Description** This package implements various estimators for inferring the mean censored cost data.

**License** MIT + file LICENSE

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 6.1.1

**Suggests** rmarkdown, parallel, testthat (>= 2.1.0)

**VignetteBuilder** knitr

**Imports** ggplot2, dplyr, tibble, knitr, msm, forcats, rlang, data.table, survival, Rdpack

**Depends** R (>= 3.5.0)

**RdMacros** Rdpack

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

**RemoteUrl** <https://github.com/larshernandez/ccostr>

**RemoteRef** HEAD

**RemoteSha** 7c61f941f9202df12438baa0e977ee1bc197f91a

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 ccmean

*Calculates estimates of the mean cost with censored data*


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### Description

This function calculates the mean cost for right-censored cost data over a period of L time units (days, months, years,...)

### Usage

```
ccmean(x, L = max(x$surv), addInterPol = 0)
```

### Arguments

x	A dataframe with columns: id, cost, delta and surv. If Cost history is available it can be specified by: start and stop,
L	Limit. Mean cost is calculated up till L, if not specified L = max(surv)
addInterPol	This parameter affects the interpolation of cost between two observed times. Defaults to zero.

### Details

The function returns four estimates. The first two are simple and biased downwards, and included for comparison. The estimates are:

- AS: "Available Sample estimator" - The simple sample mean
- CC: "Complete Case estimator" - The mean of fully observed cases
- BT: "Weighted Complete Case estimator" - Bang and Tsiatis's estimator
- ZT: "Weighted Available estimator" - Zhao and Tian's estimator

The function needs the following in a dataframe:

- id: The id separating each individual
- cost: The total cost, or if start and stop provided the specific cost
- start: Start of cost
- stop: End of cost, if one time cost then start = stop
- delta: Event variable, 1 = event, 0 = no event
- surv: Survival

### Value

An object of class "ccobject".

## References

Bang H, Tsiatis AA (2000). “Estimating medical costs with censored data.” *Biometrika*, **87**(2), 329–343. ISSN 00063444, doi:10.1093/biomet/87.2.329, <http://www.ncbi.nlm.nih.gov/pubmed/304515374>.

Zhao H, Tian L (2001). “On Estimating Medical Cost and Incremental Cost-Effectiveness Ratios with Censored Data.” *Biometrics*, **57**(4), 1002–1008. ISSN 0006341X, doi:10.1111/j.0006-341X.2001.01002.x, <http://www.ncbi.nlm.nih.gov/pubmed/11764238>.

## Examples

```
hcost
ccmean(hcost, L = 1461, addInterPol = 1)
```

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hcost	<i>Simulated data from the stata hcost package</i>
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## Description

Simulated data from the stata hcost package

## Usage

```
data(hcost)
```

## Format

An object of Rdata

## Source

[Blog](#)

## References

Chen S, Rolfes J, Zhao H (2015). “Estimation of Mean Health Care Costs and Incremental Cost-effectiveness Ratios with Possibly Censored Data.” *The Stata Journal: Promoting communications on statistics and Stata*, **15**(3), 698–711. ISSN 1536-867X, doi:10.1177/1536867X1501500305, The Stata Journal, <http://www.ncbi.nlm.nih.gov/pubmed/25080530>.

## Examples

```
data(hcost)
```

plot.cobject

*Adding to the generic plot function*

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**Description**

Adding to the generic plot function

**Usage**

```
## S3 method for class 'cobject'  
plot(x, ...)
```

**Arguments**

x	The cobject
...	passthrough

**Value**

a plot

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print.cobject

*Adding to the generic print function*

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**Description**

Adding to the generic print function

**Usage**

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

**Arguments**

x	The cobject
...	passthrough

**Value**

a plot

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simCostData	<i>Simulates censored cost data</i>
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**Description**

This function can be used to demonstrate the bias and coverage of the estimators in the ccmean function

**Usage**

```
simCostData(n = 100, dist = "unif", censor = "light",  
            cdist = "exp", L = 10)
```

**Arguments**

n	Number of individuals to simulate
dist	Survival distribution either "unif" = unif(0,10) or "exp" = exp (1/6)
censor	Censoring "light" ~ 25% or "heavy" ~ 40%, changes a bit depending on cdist
cdist	Distribution used to censor, "exp" exponential or "unif" uniform
L	Number of years to summarize over

**Details**

The function simulates survival times from either an uniform distribution or an exponential distribution, and a cost history. There are two options for censoring, heavy (~40 light (~25

**Value**

Simulation of censored cost

**References**

Lin DY, Feuer EJ, Etzioni R, Wax Y (1997). "Estimating Medical Costs from Incomplete Follow-Up Data." *Biometrics*, **53**(2), 419. ISSN 0006341X, doi:10.2307/2533947, <http://www.ncbi.nlm.nih.gov/pubmed/9192444>.

**Examples**

```
# The simulated data can be used to show how the estimators perform  
  
simCostData(n = 100, dist = "unif", censor = "light", cdist = "exp", L = 10)
```

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