

# Package ‘betaSandwich’

December 16, 2022

**Title** Robust Confidence Intervals for Standardized Regression Coefficients

**Version** 1.0.2.9000

**Description** Generates robust confidence intervals for standardized regression coefficients using heteroskedasticity-consistent standard errors for models fitted by `lm()` as described in Dudgeon (2017) <[doi:10.1007/s11336-017-9563-z](https://doi.org/10.1007/s11336-017-9563-z)>.

**URL** <https://github.com/jeksterslab/betaSandwich>,  
<https://jeksterslab.github.io/betaSandwich/>

**BugReports** <https://github.com/jeksterslab/betaSandwich/issues>

**License** MIT + file LICENSE

**Encoding** UTF-8

**LazyData** true

**Roxygen** list(markdown = TRUE)

**Depends** R (>= 3.5.0)

**Imports** methods

**Suggests** knitr, rmarkdown, testthat

**RoxygenNote** 7.2.3

**NeedsCompilation** no

**Author** Ivan Jacob Agaloos Pesigan [aut, cre, cph]  
(<<https://orcid.org/0000-0003-4818-8420>>)

**Maintainer** Ivan Jacob Agaloos Pesigan <[r.jeksterslab@gmail.com](mailto:r.jeksterslab@gmail.com)>

## R topics documented:

BetaHC . . . . .	2
BetaN . . . . .	3
coef.betasandwich . . . . .	4
confint.betasandwich . . . . .	5
nas1982 . . . . .	5
print.betasandwich . . . . .	6
summary.betasandwich . . . . .	7
vcov.betasandwich . . . . .	8

## Index

9

---

BetaHC	<i>Estimate Standardized Regression Coefficients and Robust Sampling Covariance Matrix</i>
--------	--

---

## Description

Estimate Standardized Regression Coefficients and Robust Sampling Covariance Matrix

## Usage

```
BetaHC(object, type = "hc3", g1 = 1, g2 = 1.5, k = 0.7)
```

## Arguments

object	Object of class <code>lm</code> .
type	Character string. Correction type. Possible values are "hc0", "hc1", "hc2", "hc3", "hc4", "hc4m", and "hc5".
g1	Numeric. g1 value for type = "hc4m" or type = "hc5".
g2	Numeric. g2 value for type = "hc4m".
k	Numeric. Constant for type = "hc5"

## Value

Returns an object of class `betaSandwich` which is a list with the following elements:

**call** Function call.

**type** Standard error type.

**beta** Vector of standardized slopes.

**vcov** Sampling covariance matrix of the standardized slopes.

**n** Sample size.

**p** Number of regressors.

**df**  $n - p - 1$  degrees of freedom

## Author(s)

Ivan Jacob Agaloos Pesigan

## References

Dudgeon, P. (2017). Some improvements in confidence intervals for standardized regression coefficients. *Psychometrika*, 82(4), 928–951. doi:10.1007/s113360179563z

## See Also

Other Beta Sandwich Functions: [BetaN\(\)](#)

**Examples**

```

object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
# Methods -----
print(std)
summary(std)
coef(std)
vcov(std)
confint(std, level = 0.95)

```

---

BetaN	<i>Estimate Standardized Regression Coefficients and Sampling Covariance Matrix Assuming Multivariate Normality</i>
-------	---

---

**Description**

Estimate Standardized Regression Coefficients and Sampling Covariance Matrix Assuming Multivariate Normality

**Usage**

```
BetaN(object)
```

**Arguments**

**object**                Object of class `lm`.

**Value**

Returns an object of class `betaSandwich` which is a list with the following elements:

**call** Function call.

**type** Standard error type.

**beta** Vector of standardized slopes.

**vcov** Sampling covariance matrix of the standardized slopes.

**n** Sample size.

**p** Number of regressors.

**df**  $n - p - 1$  degrees of freedom

**Author(s)**

Ivan Jacob Agaloos Pesigan

**See Also**

Other Beta Sandwich Functions: [BetaHC\(\)](#)

**Examples**

```

object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaN(object)
# Methods -----
print(std)
summary(std)
coef(std)
vcov(std)
confint(std, level = 0.95)

```

---

coef.betasandwich	<i>Standardized Regression Slopes</i>
-------------------	---------------------------------------

---

**Description**

Standardized Regression Slopes

**Usage**

```

## S3 method for class 'betasandwich'
coef(object, ...)

```

**Arguments**

object	Object of class betaSandwich.
...	additional arguments.

**Value**

Returns a vector of standardized regression slopes.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**Examples**

```

object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
coef(std)

```

---

confint.betasandwich    *Robust Confidence Intervals for Standardized Regression Slopes*

---

### Description

Robust Confidence Intervals for Standardized Regression Slopes

### Usage

```
## S3 method for class 'betasandwich'
confint(object, parm = NULL, level = 0.95, ...)
```

### Arguments

object	Object of class betaSandwich.
parm	a specification of which parameters are to be given confidence intervals, either a vector of numbers or a vector of names. If missing, all parameters are considered.
level	the confidence level required.
...	additional arguments.

### Value

Returns a matrix of confidence intervals.

### Author(s)

Ivan Jacob Agaloos Pesigan

### Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
confint(std, level = 0.95)
```

---

nas1982	<i>1982 National Academy of Sciences Doctoral Programs Data</i>
---------	---

---

### Description

1982 National Academy of Sciences Doctoral Programs Data

### Usage

```
nas1982
```

**Format**

Ratings of 46 doctoral programs in psychology in the USA with the following variables:

**QUALITY** Program quality ratings.

**NFACUL** Number of faculty members in the program.

**NGRADS** Number of program graduates.

**PCTSUPP** Percentage of program graduates who received support.

**PCTGRT** Percent of faculty members holding research grants.

**NARTIC** Number of published articles attributed to program faculty member.

**PCTPUB** Percent of faculty with one or more published article.

**References**

National Research Council. (1982). *An assessment of research-doctorate programs in the United States: Social and behavioral sciences*. doi:10.17226/9781. Reproduced with permission from the National Academy of Sciences, Courtesy of the National Academies Press, Washington, D.C.

---

`print.betasandwich`      *Print Method for an Object of Class betaSandwich*

---

**Description**

Print Method for an Object of Class betaSandwich

**Usage**

```
## S3 method for class 'betasandwich'
print(x, alpha = c(0.05, 0.01, 0.001), digits = 4, ...)
```

**Arguments**

<code>x</code>	Object of class betaSandwich.
<code>alpha</code>	Significance level.
<code>digits</code>	Digits to print.
<code>...</code>	additional arguments.

**Value**

Returns a matrix of standardized regression slopes, standard errors, test statistics, p-values, and confidence intervals.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**Examples**

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
print(std)
```

---

summary.betasandwich    *Summary Method for an Object of Class betaSandwich*

---

**Description**

Summary Method for an Object of Class betaSandwich

**Usage**

```
## S3 method for class 'betasandwich'
summary(object, alpha = c(0.05, 0.01, 0.001), digits = 4, ...)
```

**Arguments**

object	Object of class betaSandwich.
alpha	Significance level.
digits	Digits to print.
...	additional arguments.

**Value**

Returns a matrix of standardized regression slopes, standard errors, test statistics, p-values, and confidence intervals.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**Examples**

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
summary(std)
```

---

vcov.betasandwich	<i>Robust Sampling Covariance Matrix of the Standardized Regression Slopes</i>
-------------------	--

---

**Description**

Robust Sampling Covariance Matrix of the Standardized Regression Slopes

**Usage**

```
## S3 method for class 'betasandwich'  
vcov(object, ...)
```

**Arguments**

object	Object of class betaSandwich.
...	additional arguments.

**Value**

Returns a matrix of the variance-covariance matrix of standardized slopes.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**Examples**

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)  
std <- BetaHC(object)  
vcov(std)
```



# Index

## \* **Beta Sandwich Functions**

BetaHC, [2](#)

BetaN, [3](#)

## \* **betaSandwich**

BetaHC, [2](#)

BetaN, [3](#)

## \* **data**

nas1982, [5](#)

## \* **methods**

coef.betasandwich, [4](#)

confint.betasandwich, [5](#)

print.betasandwich, [6](#)

summary.betasandwich, [7](#)

vcov.betasandwich, [8](#)

BetaHC, [2](#), [3](#)

BetaN, [2](#), [3](#)

coef.betasandwich, [4](#)

confint.betasandwich, [5](#)

nas1982, [5](#)

print.betasandwich, [6](#)

summary.betasandwich, [7](#)

vcov.betasandwich, [8](#)