

# Package ‘ceser’

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**Title** Cluster Estimated Standard Errors

**Version** 1.0.0

**Description** Implementation of the Cluster Estimated Standard Errors (CESE) proposed in Jackson (2020) <[DOI:10.1017/pan.2019.38](https://doi.org/10.1017/pan.2019.38)> to compute clustered standard errors of linear coefficients in regression models with grouped data.

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**Encoding** UTF-8

**LazyData** true

**URL** <https://github.com/DiogoFerrari/ceser>

**BugReports** <https://github.com/DiogoFerrari/ceser/issues>

**Depends** R (>= 2.10)

**Imports** magrittr, purrr, dplyr, tibble, lmtest

**RoxygenNote** 7.0.2

**Suggests** knitr, rmarkdown

**VignetteBuilder** knitr

**NeedsCompilation** yes

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**Repository** CRAN

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dcese

*Sample data set***Description**

A dataset relating the effective number of parties to the number of presidential candidates and presidential power.

**Usage**

dcese

**Format**

A data frame with rows and 9 variables:

**country** name of the country

**enep** Effective number of legislative parties

**enpc** Number of presidential candidates

**fapres** Presidential power

**proximity** Proximity of the presidential and legislative elections

**eneg** Effective number of ethnic groups

**logmag** log of average district magnitudes

**enpcfapres** Interaction between enpc and fapres

**logmag\_eneg** Interaction between logmag and eneg ...

**Source**

Jackson, John (2019) Corrected Standard Errors with Clustered Data. Political Analysis.

**References**

Elgie, Robert, Bueur, C., Dolez, B. & Laurent, A. (2014). "Proximity, Candidates, and Presidential Power: How Directly Elected Presidents Shape the Legislative Party System." Political Research Quarterly. 67(3): 467 - 477.

vcovCESE

*Cluster Estimated Standard Errors***Description**

Cluster Estimated Standard Errors (CESE)

**Usage**

```
vcovCESE(mod, cluster = NULL, type = NULL)
```

**Arguments**

|                      |                                                                                                                                                                                                                                                                                                                                                  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>mod</code>     | a model object. It can be the output of the functions <code>lm</code> , <code>glm</code> , or other regression function that returns compatible objects.                                                                                                                                                                                         |
| <code>cluster</code> | either a string vector with the name of the variables that will be used to cluster the standard errors, or a formula - e.g., <code>~ rhs</code> , with a summation of the variables that will be used to cluster the standard errors replacing the <code>rhs</code> -, or a vector, matrix, or <code>data.frame</code> with the clustering data. |
| <code>type</code>    | string with either <code>HC0</code> , <code>HC1</code> , <code>HC2</code> , <code>HC3</code> , or <code>HC4</code> . It specifies the type of heteroskedasticity correction to use (see Davidson and MacKinnon (1993) and Hayes and Cai (2007)).                                                                                                 |

**Value**

The function returns a variance-covariance matrix of the coefficient estimates using the Cluster Estimated Standard Error (CESE) method.

**References**

Jackson, John (2019) Corrected Standard Errors with Clustered Data. *Political Analysis*.

Hayes, A. F., & Cai, L., (2007) Using heteroskedasticity-consistent standard error estimators in ols regression: an introduction and software implementation, *Behavior research methods*, 39(4), 709–722.

Davidson, R., & MacKinnon, J. G., (2004) *Econometric theory and methods*: Oxford University Press New York.

**Examples**

```
mod = lm(enep ~ enpc + fapres + enpcfapres + proximity + eneg + logmag + logmag_eneg , data=dcese)

## -----
## Getting the variance covariance matrix
## -----
## Original variance-covariance matrix (no clustered std. errors)
vcov(mod)
```

```
## Variance-covariance matrix using CRSE (sandwich package)
## sandwich::vcovCL(mod, cluster = ~ country)
## sandwich::vcovCL(mod, cluster = ~ country, type="HC3")

## Variance-covariance matrix using CESE
ceser::vcovCESE(mod, cluster = ~ country)
ceser::vcovCESE(mod, cluster = ~ country, type="HC3") # HC3 correction

## -----
## Summaries
## -----
## no robust SE
summary(mod)

## summary table using CRSE (sandwich package)
## lmtest::coeftest(mod, vcov = sandwich::vcovCL, cluster = ~ country)

## summary using CESE
lmtest::coeftest(mod, vcov = ceser::vcovCESE, cluster = ~ country, type='HC3')
```

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## \* **datasets**

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