

Package ‘epidesc’

August 8, 2026

Title Calculation of Epidemiological Descriptors

Version 0.1.0

Description Provides tools to easily compute a series of epidemiological indicators to characterise different transmission profiles of infectious diseases with a simple pipeline: format the dates in epiyearweek format, choose the descriptors and their parameters, and compute them. The package is based on the publication 'How heterogeneous is the dengue transmission profile in Brazil? A study in six Brazilian states' <doi:10.1371/journal.pntd.0010746>.

License GPL (>= 2)

URL <https://github.com/BSC-ES/epidesc>

BugReports <https://github.com/BSC-ES/epidesc/issues>

Depends R (>= 4.1.0)

Imports lubridate, nseq

Encoding UTF-8

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

VignetteBuilder knitr

Config/testthat/edition 3

LazyData true

Config/roxygen2/version 8.0.0

NeedsCompilation no

Author Raquel Martins Lana [aut] (ORCID:

<<https://orcid.org/0000-0002-7573-1364>>),

Carles Milà [aut, cre] (ORCID: <<https://orcid.org/0000-0003-0470-0760>>),

Iasmin Ferreira de Almeida [aut],

Claudia Torres Codeço [aut] (ORCID:

<<https://orcid.org/0000-0003-1174-178X>>),

Daniela Lührsen [aut] (ORCID: <<https://orcid.org/0009-0002-6340-5964>>),

Diego Ricardo Xavier Silva [aut] (ORCID:

<<https://orcid.org/0000-0001-5259-7732>>),

Christovam Barcellos [aut] (ORCID:

<<https://orcid.org/0000-0002-1161-2753>>),
Raphael Saldanha [aut] (ORCID: <<https://orcid.org/0000-0003-0652-8466>>),
Rachel Lowe [aut] (ORCID: <<https://orcid.org/0000-0003-3939-7343>>)

Maintainer Carles Milà <carles.milagarcia@bsc.es>

Repository CRAN

Date/Publication 2026-08-07 22:00:09 UTC

Contents

dengueRio	2
desc_Ap	3
desc_Cmax	4
desc_Cmed	4
desc_Cnf	5
desc_Cwf	6
desc_Cwmax	7
desc_Cwmed	7
desc_Inc	8
desc_Isof	9
desc_list	9
desc_p	10
desc_Tp	11
desc_year	11
epiyearweek	13

Index	15
--------------	-----------

dengueRio	<i>Dengue in Rio de Janeiro state</i>
-----------	---------------------------------------

Description

A data.frame containing weekly dengue cases for the different municipalities in the state of Rio de Janeiro for the period 2017-2022.

Usage

data(dengueRio)

Format

dengueRio:
A data frame with 28,796 rows and 4 columns:
muni_code Municipality code
date Starting date of the week (Sunday)
cases Number of dengue cases
pop Population

Source

[doi:10.1371/journal.pntd.0010746](https://doi.org/10.1371/journal.pntd.0010746)

desc_Ap	<i>Ap</i>
---------	-----------

Description

Maximum cases peak - amplitude.

Usage

```
desc_Ap(df)
```

Arguments

`df` A data.frame with a numeric 'cases' column.

Details

This function is designed to be called by [desc_year](#) on data that has already been split into a single epidemiological year for a single spatial unit. Using it directly outside of that context is not recommended, as no input validation is performed.

Value

The computed Ap epidescrptor.

Examples

```
# Single spatial unit and epidemiological year
oneyear <- dengueRio[dengueRio$muni_code == 330455, ]
oneyear$time <- epiyearweek(oneyear$date)
oneyear <- oneyear[substr(oneyear$time, 1, 4) == "2019", ]
desc_Ap(oneyear)
```

desc_Cmax

*Cmax***Description**

Maximum duration in consecutive weeks with at least 'x' cases.

Usage

```
desc_Cmax(df, x)
```

Arguments

df A data.frame with a numeric 'cases' column.
x Number of cases.

Details

This function is designed to be called by [desc_year](#) on data that has already been split into a single epidemiological year for a single spatial unit. Using it directly outside of that context is not recommended, as no input validation is performed.

Value

The computed Cmax epidescrptor.

Examples

```
# Single spatial unit and epidemiological year
oneyear <- dengueRio[dengueRio$muni_code == 330455, ]
oneyear$time <- epiyearweek(oneyear$date)
oneyear <- oneyear[substr(oneyear$time, 1, 4) == "2019", ]
desc_Cmax(oneyear, 50)
```

desc_Cmed

*Cmed***Description**

Median duration in consecutive weeks with at least 'x' cases.

Usage

```
desc_Cmed(df, x)
```

Arguments

df	A data.frame with a numeric 'cases' column.
x	Number of cases.

Details

This function is designed to be called by [desc_year](#) on data that has already been split into a single epidemiological year for a single spatial unit. Using it directly outside of that context is not recommended, as no input validation is performed.

Value

The computed Cmed epidescrptor.

Examples

```
# Single spatial unit and epidemiological year
oneyear <- dengueRio[dengueRio$muni_code == 330455, ]
oneyear$time <- epiyearweek(oneyear$date)
oneyear <- oneyear[substr(oneyear$time, 1, 4) == "2019", ]
desc_Cmed(oneyear, 50)
```

desc_Cnf

Cnf

Description

Frequency of periods of consecutive 'n' weeks or longer with at least 'x' cases.

Usage

```
desc_Cnf(df, n, x)
```

Arguments

df	A data.frame with a numeric 'cases' column.
n	Number of consecutive weeks.
x	Number of cases.

Details

This function is designed to be called by [desc_year](#) on data that has already been split into a single epidemiological year for a single spatial unit. Using it directly outside of that context is not recommended, as no input validation is performed.

Value

The computed Cnf epidescrptor.

Examples

```
# Single spatial unit and epidemiological year
oneyear <- dengueRio[dengueRio$muni_code == 330455, ]
oneyear$time <- epiyearweek(oneyear$date)
oneyear <- oneyear[substr(oneyear$time, 1, 4) == "2019", ]
desc_Cnf(oneyear, 3, 50)
```

desc_Cwf	<i>Cwf</i>
----------	------------

Description

Frequency of periods of consecutive weeks with at least 'n' weeks without cases.

Usage

```
desc_Cwf(df, n)
```

Arguments

- df A data.frame with a numeric 'cases' column.
- n Number of consecutive weeks.

Details

This function is designed to be called by [desc_year](#) on data that has already been split into a single epidemiological year for a single spatial unit. Using it directly outside of that context is not recommended, as no input validation is performed.

Value

The computed Cwf epidescriptor.

Examples

```
# Single spatial unit and epidemiological year
oneyear <- dengueRio[dengueRio$muni_code == 330455, ]
oneyear$time <- epiyearweek(oneyear$date)
oneyear <- oneyear[substr(oneyear$time, 1, 4) == "2019", ]
desc_Cwf(oneyear, 3)
```

desc_Cwmax	<i>Cwmax</i>
------------	--------------

Description

Maximum duration in consecutive weeks without cases.

Usage

```
desc_Cwmax(df)
```

Arguments

df A data.frame with a numeric 'cases' column.

Details

This function is designed to be called by [desc_year](#) on data that has already been split into a single epidemiological year for a single spatial unit. Using it directly outside of that context is not recommended, as no input validation is performed.

Value

The computed Cwmax epidescriptor.

Examples

```
# Single spatial unit and epidemiological year
oneyear <- dengueRio[dengueRio$muni_code == 330455, ]
oneyear$time <- epiyearweek(oneyear$date)
oneyear <- oneyear[substr(oneyear$time, 1, 4) == "2019", ]
desc_Cwmax(oneyear)
```

desc_Cwmed	<i>Cwmed</i>
------------	--------------

Description

Median duration in consecutive weeks without cases.

Usage

```
desc_Cwmed(df)
```

Arguments

df A data.frame with a numeric 'cases' column.

Details

This function is designed to be called by [desc_year](#) on data that has already been split into a single epidemiological year for a single spatial unit. Using it directly outside of that context is not recommended, as no input validation is performed.

Value

The computed Cwmed epidescriptor.

Examples

```
# Single spatial unit and epidemiological year
oneyear <- dengueRio[dengueRio$muni_code == 330455, ]
oneyear$time <- epiyearweek(oneyear$date)
oneyear <- oneyear[substr(oneyear$time, 1, 4) == "2019", ]
desc_Cwmed(oneyear)
```

desc_Inc	<i>Inc</i>
----------	------------

Description

Disease incidence per 'p' persons.

Usage

```
desc_Inc(df, p)
```

Arguments

df	A data.frame with numeric 'cases' and 'pop' columns.
p	Number of persons representing the scale of the incidence.

Details

This function is designed to be called by [desc_year](#) on data that has already been split into a single epidemiological year for a single spatial unit. Using it directly outside of that context is not recommended, as no input validation is performed.

Value

The computed Inc epidescriptor.

Examples

```
# Single spatial unit and epidemiological year
oneyear <- dengueRio[dengueRio$muni_code == 330455, ]
oneyear$time <- epiyearweek(oneyear$date)
oneyear <- oneyear[substr(oneyear$time, 1, 4) == "2019", ]
desc_Inc(oneyear, 100000)
```

desc_Isof

Isof

Description

Number of weeks with isolated cases, i.e. weeks with 0 cases both in the previous and following week.

Usage

```
desc_Isof(df)
```

Arguments

df A data.frame with a numeric 'cases' column.

Details

This function is designed to be called by [desc_year](#) on data that has already been split into a single epidemiological year for a single spatial unit. Using it directly outside of that context is not recommended, as no input validation is performed.

Value

The computed Isof epidescrptor.

Examples

```
# Single spatial unit and epidemiological year
oneyear <- dengueRio[dengueRio$muni_code == 330455, ]
oneyear$time <- epiyearweek(oneyear$date)
oneyear <- oneyear[substr(oneyear$time, 1, 4) == "2019", ]
desc_Isof(oneyear)
```

desc_list

List of epidescrptors and their parameters

Description

List of epidescrptors and their parameters

Usage

```
desc_list()
```

Value

A data.frame with the functions, descriptions, classes and parameters of the descriptors included in the package.

Examples

```
desc_list()
```

desc_p	<i>p</i>
--------	----------

Description

Proportion of weeks with at least 'x' cases.

Usage

```
desc_p(df, x)
```

Arguments

df	A data.frame with a numeric 'cases' column.
x	Number of cases.

Details

This function is designed to be called by [desc_year](#) on data that has already been split into a single epidemiological year for a single spatial unit. Using it directly outside of that context is not recommended, as no input validation is performed.

Value

The computed p epidescriptor.

Examples

```
# Single spatial unit and epidemiological year
oneyear <- dengueRio[dengueRio$muni_code == 330455, ]
oneyear$time <- epiyearweek(oneyear$date)
oneyear <- oneyear[substr(oneyear$time, 1, 4) == "2019", ]
desc_p(oneyear, 50)
```

desc_Tp	<i>Tp</i>
---------	-----------

Description

Week where the maximum peak occurred.

Usage

```
desc_Tp(df)
```

Arguments

df A data.frame with numeric 'cases' and 'epiweek' columns.

Details

This function is designed to be called by [desc_year](#) on data that has already been split into a single epidemiological year for a single spatial unit. Using it directly outside of that context is not recommended, as no input validation is performed.

Value

The computed Tp epidescrptor.

Examples

```
# Single spatial unit and epidemiological year
oneyear <- dengueRio[dengueRio$muni_code == 330455, ]
oneyear$time <- epiyearweek(oneyear$date)
oneyear <- oneyear[substr(oneyear$time, 1, 4) == "2019", ]
oneyear$epiweek <- as.numeric(substr(oneyear$time, 5, 6))
desc_Tp(oneyear)
```

desc_year	<i>Compute yearly epidescrptors</i>
-----------	-------------------------------------

Description

Compute yearly epi descriptors based on weekly case counts.

Usage

```
desc_year(
  data,
  cases,
  time,
  space,
  descriptors,
  pop = NULL,
  sweek = 1,
  collapse53 = TRUE
)
```

Arguments

data	Data frame with the input data.
cases	Character. Name of the variable in data that contains the case counts.
time	Character. Name of the variable in data that contains the <i>epiyearweek</i> date temporal identifier (see epiyearweek). It must be of type character.
space	Character. Name of the variable in data that contains the spatial identifier for which a case count time series is available.
descriptors	A named list with the descriptor function and their arguments. See details.
pop	Character. Name of the variable in data that contains the population counts. Only required if the descriptor 'Inc' (incidence) is used.
sweek	Integer between 1-52 that determines the first week of the season for which the descriptors will be calculated; e.g. <code>sweek=40</code> will compute descriptors between week 40 and week 39 next year. Defaults to 1.
collapse53	If TRUE (default), collapse week 53 such that half of the cases are assigned to the previous (w52) and next (w01) weeks. It is recommended so that all years have the same number of weeks.

Details

The argument `descriptors` consists of a nested list where:

- The name of the first level will determine the name of the descriptor.
- The elements of the first levels should also be a list with elements `fun` (descriptor type) and the parameters `n`, `x` or `p` if necessary.

Please see the example to see it in practice.

Value

A data frame with the resulting descriptors for every epidemiological year.

See Also

[desc_list](#) to access the list of descriptors and its parameters.

Examples

```
# Spatiotemporal
data(dengueRio)
dengue <- dengueRio

# Prepare epiyearweeks
dengue$yearweek <- epiyearweek(dengue$date)

# List of descriptors to be computed
descriptors <- list(
  "Ap" = list(fun = "Ap"),
  "Tp" = list(fun = "Tp"),
  "Cnf" = list(fun = "Cnf", n = 3, x = 5),
  "Cnf2" = list(fun = "Cnf", n = 6, x = 5),
  "Cmax" = list(fun = "Cmax", x = 5),
  "Cmed" = list(fun = "Cmed", x = 5),
  "p" = list(fun = "p", x = 5),
  "Cwf" = list(fun = "Cwf", n = 3),
  "Cwf2" = list(fun = "Cwf", n = 6),
  "Cwmax" = list(fun = "Cwmax"),
  "Cwmed" = list(fun = "Cwmed"),
  "Inc" = list(fun = "Inc", p = 1e5)
)

# Compute them
res <- desc_year(
  dengue,
  cases = "cases",
  time = "yearweek",
  space = "muni_code",
  pop = "pop",
  sweek = 40,
  descriptors = descriptors
)
```

epiyearweek

*Compute epiyearweek (yyyyww) indicators from dates.***Description**

Compute epiyearweek (yyyyww) indicators from dates.

Usage

```
epiyearweek(date, start = "Sunday")
```

Arguments

date	A date vector to compute epiweekyear.
start	First day of the epiweek. Defaults to 'Sunday', but can be also set to 'Monday'.

Details

The function uses lubridate's epi/iso week/year functions to compute the conversion.

Value

An epiweekyear character vector.

Examples

```
input_dates <- seq.Date(as.Date("2025-01-01"), length.out = 7, by = "week")
epiyearweek(input_dates)
```

Index

* datasets

dengueRio, [2](#)

dengueRio, [2](#)

desc_Ap, [3](#)

desc_Cmax, [4](#)

desc_Cmed, [4](#)

desc_Cnf, [5](#)

desc_Cwf, [6](#)

desc_Cwmax, [7](#)

desc_Cwmed, [7](#)

desc_Inc, [8](#)

desc_Isof, [9](#)

desc_list, [9](#), [12](#)

desc_p, [10](#)

desc_Tp, [11](#)

desc_year, [3–11](#), [11](#)

epiyearweek, [12](#), [13](#)