

# Package ‘ZIKV’

May 13, 2016

**Title** R Package associated with the manuscript “Preventing Zika Virus Infection during Pregnancy by Timing Conception Seasonally”

**Version** 1.0

**Date** 2016-05-13

**Description** This R package includes data used in the manuscript “Preventing Zika Virus Infection during Pregnancy by Timing Conception Seasonally”. It also contains a function to generate region-specific conception planning calendars. The conception planner function requires user defined (1) timing of the ZIKV transmission trough, (2) susceptible weeks of gestation, and (3) a statement of whether the first trimester is particularly vulnerable to congenital Zika.

**Depends** R (>= 3.2.4), grDevices (>= 3.2.4)

**License** GPL (>= 2)

**LazyData** true

**NeedsCompilation** no

**Author** Micaela Martinez-Bakker [aut, cre]

**Maintainer** Micaela Martinez-Bakker <micaela.martinezbakker@gmail.com>

## R topics documented:

births . . . . .	1
conception.planner . . . . .	2
dengue . . . . .	3
mosquitoes . . . . .	3
planned.conception . . . . .	4
trimester.monthly.distribution . . . . .	5

<b>Index</b>	<b>6</b>
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births	<i>Monthly births in Puerto Rico.</i>
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### Description

Monthly number of births in Puerto Rico.

### Usage

births

**Format**

A data frame.

**Source**

Data obtained from:

United Nations Statistics Division: Demographics Statistics. Live births by month of birth. 2016.  
Available from: <http://data.un.org/>.

**References**

United Nations Statistics Division: Demographics Statistics. Live births by month of birth. 2016.  
Available from: <http://data.un.org/>.

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conception.planner      *Plot Conception Planning Calendar.*

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**Description**

Function for creating and plotting a conception calendar to align sensitive periods of gestation with the low-transmission season for ZIKV. It returns a data frame showing which week of the year each gestation week should be aligned with. There are assumption regarding the weeks in each trimester. We assume trimester 1 is weeks 1:13, trimester 2 is weeks 14:26, and trimester 3 is weeks 27:40.

**Usage**

```
conception.planner(transmission.trough.week = NA, start.susceptible = 1,
  end.susceptible = 20, first.trimester.priority = TRUE,
  directory = getwd(), figure.name = "conception_planner.pdf")
```

**Arguments**

transmission.trough.week	the calendar week (1-52) of the year with the lowest ZIKV transmission.
start.susceptible	the week of gestation (1-40) when the fetus is first susceptible to congenital Zika.
end.susceptible	the last week of gestation (1-40) that the fetus is susceptible to congenital Zika.
first.trimester.priority	TRUE/FALSE, if TRUE the first trimester is most vulnerable to congenital Zika and the first trimester will be aligned with the transmissison trough.
directory	the directory where the pdf should be saved
figure.name	the name of the pdf file, ending in ".pdf"

**Examples**

```
conception.plan<- conception.planner(  
  transmission.trough.week=20,  
  start.susceptible= 1,  
  end.susceptible= 20,  
  first.trimester.priority=TRUE,  
  directory=getwd(),  
  figure.name='conception_planner.pdf')
```

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dengue	<i>Dengue cases in Puerto Rico.</i>
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**Description**

Weekly Dengue virus cases reported in Puerto Rico.

**Usage**

dengue

**Format**

A data frame.

**Source**

Data were obtained from: Centers for Disease Control and Prevention. National Notifiable Disease Surveillance System (NNDSS). Morbidity and Mortality Weekly Report. Data available at <https://data.cdc.gov/>

**References**

Data were obtained from: Centers for Disease Control and Prevention. National Notifiable Disease Surveillance System (NNDSS). Morbidity and Mortality Weekly Report. Data available at <https://data.cdc.gov/>

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mosquitoes	<i>Seasonal abundance of engorged female Aedes aegypti mosquitoes.</i>
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**Description**

Monthly number of engorged female Aedes aegypti mosquitoes trapped in 20 houses in urban areas of Puerto Rico.

**Usage**

mosquitoes

**Format**

A data frame.

**Source**

The data were digitized from:

Scott TW, Morrison AC, Lorenz LH, Clark GG, Strickman D, Kittayapong P, et al. Longitudinal Studies of *Aedes aegypti* (Diptera: Culicidae) in Thailand and Puerto Rico: Population Dynamics. *Journal of Medical Entomology*. 2000;37(1):77–88.

**References**

Scott TW, Morrison AC, Lorenz LH, Clark GG, Strickman D, Kittayapong P, et al. Longitudinal Studies of *Aedes aegypti* (Diptera: Culicidae) in Thailand and Puerto Rico: Population Dynamics. *Journal of Medical Entomology*. 2000;37(1):77–88.

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`planned.conception`     *Calculate Recommended Timing of Conception.*

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**Description**

Function for creating a conception calendar to align sensitive periods of gestation with the low-transmission season for ZIKV. It returns a data frame showing which week of the year each gestation week should be aligned with. There are assumption regarding the weeks in each trimester. We assume trimester 1 is weeks 1:13, trimester 2 is weeks 14:26, and trimester 3 is weeks 27:40.

**Usage**

```
planned.conception(transmission.trough.week = NA,
  susceptible.gestation.start.week = 1, susceptible.gestation.end.week = 20,
  first.trimester.priority = TRUE)
```

**Arguments**

```
transmission.trough.week
  the calendar week (1-52) of the year with the lowest ZIKV transmission.
susceptible.gestation.start.week
  the week of gestation (1-40) when the fetus is first susceptible to congenital
  Zika.
susceptible.gestation.end.week
  the last week of gestation (1-40) that the fetus is susceptible to congenital Zika.
first.trimester.priority
  TRUE/FALSE, if TRUE the first trimester is most vulnerable to congenital Zika
  and the first trimester will be aligned with the transmissison trough.
```

**Examples**

```
conception.plan<- planned.conception(
  transmission.trough.week=20,
  susceptible.gestation.start.week=1,
  susceptible.gestation.end.week=20,
  first.trimester.priority=TRUE)
```

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`trimester.monthly.distribution`*Calculate Seasonal Distribution of Conception and Gestation.*

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**Description**

Function for creating the seasonal distribution of conception and pregnancies in the 1st, 2nd, and 3rd trimester, based on monthly birth data. The function returns a data frame containing the percent and number of births conceived each month, and the percent and number of the pregnancies in each trimester (monthly). It assumes 9 months of gestation, and months 1-3 are trimester 1, 4-6 are trimester 2, and 7-9 are trimester 3.

**Usage**

```
trimester.monthly.distribution(data)
```

**Arguments**

<code>data</code>	data must be a data frame with “year”, “month”, and “births” as column headers; month must be the full name of the month January, February, etc.
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**Examples**

```
seasonal.distribution<- trimester.monthly.distribution(data=births)
```

# Index

## \*Topic **datasets**

births, 1

dengue, 3

mosquitoes, 3

births, 1

conception.planner, 2

dengue, 3

mosquitoes, 3

planned.conception, 4

trimester.monthly.distribution, 5