

# Package ‘dejaVu’

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**Type** Package

**Title** Multiple Imputation for Recurrent Events

**Version** 0.3.0

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**Description** Performs reference based multiple imputation of recurrent event data based on a negative binomial regression model, as described by Keene et al (2014) <[doi:10.1002/pst.1624](https://doi.org/10.1002/pst.1624)>.

**License** GPL (>= 2)

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---

ConstantRateDrop      *Create a Dropout Mechanism with constant dropout rate*

---

## Description

Creates an MCAR DropoutMechanism object where subject  $i$  dropout is exponentially distributed with rate  $R_i$  where  $R_i = C \cdot \exp(X_i)$  for constant  $C$  and  $X_i$  a random normal variable with mean 0 and standard deviation  $\sigma$

## Usage

```
ConstantRateDrop(rate, var = 0)
```

## Arguments

rate	C described in the details
var	$\sigma^2$ described in the details section, by default = 0

**Value**

A DropoutMechanism object

**See Also**

[DropoutMechanism.object](#)

**Examples**

```
ConstantRateDrop(rate=0.0025)
ConstantRateDrop(rate=0.0025, var=1)
```

---

copy_reference	<i>Create a copy reference ImputeMechanism object</i>
----------------	---

---

**Description**

Missing counts for subjects in both arms are imputed by assuming the rate before and dropout are both equal to the control (reference) estimated rate. This corresponds to what is usually termed the copy reference assumption.

**Usage**

```
copy_reference(proper = TRUE)
```

**Arguments**

proper	If proper=TRUE then proper imputation is performed, in which each imputation is created based on parameters values drawn from the (approximate) posterior distribution of the imputation model. If proper=FALSE, improper imputation is performed. This means all imputed datasets are generated conditional on the maximum likelihood estimates of the parameters.
--------	---

**Value**

An ImputeMechanism object

**See Also**

[ImputeMechanism.object](#)

**Examples**

```

sim <- SimulateComplete(study.time=365,number.subjects=50,
                       event.rates=c(0.01,0.005),dispersions=0.25)
sim.with.MCAR.dropout <- SimulateDropout(sim,
                                         drop.mechanism = ConstantRateDrop(rate = 0.0025))
fit <- Simfit(sim.with.MCAR.dropout)
imps <- Impute(fit, copy_reference(), 10)

```

---

CreateNewDropoutMechanism

*A function which creates a DropOut Mechanism object*

---

**Description**

A function which creates a DropOut Mechanism object

**Usage**

```

CreateNewDropoutMechanism(
  type,
  text,
  cols.needed = vector("character"),
  GetDropTime,
  parameters = NULL
)

```

**Arguments**

type	The type of mechanism (e.g. "MCAR" or "MNAR")
text	A short string describing the mechanism (only used for printing)
cols.needed	Which columns in the SingleSim\$data data frame must be included for this drop out mechanism to work. This option could allow drop out mechanism which depend on covariates to be included.
GetDropTime	A function with two arguments event.times and data, the corresponding entries from the SingleSim object. This function should return a list of dropout times (if a subject does not dropout its dropout time should be their current censored.time (i.e. the study follow up time))
parameters	A list of named parameters for the mechanism (only used for printing) or NULL if none

**Value**

A [DropoutMechanism.object](#)

**See Also**

[DropoutMechanism.object](#)

---

CreateNewImputeMechanism

*A function which creates an Impute Mechanism object*

---

**Description**

A function which creates an Impute Mechanism object

**Usage**

```
CreateNewImputeMechanism(  
  name,  
  cols.needed = vector("character"),  
  impute,  
  parameters = NULL  
)
```

**Arguments**

name	The method name (used for printing)
cols.needed	which columns of the SingleSim data frame are required by the method, typically <code>c("censored.time", "observed.events", "arm")</code>
impute	A function which takes a SingleSimFit object and outputs the details for a single imputed data set, specifically a list with two elements: <code>new.censored.times</code> - a vector of times subjects were censored (after taking into account imputation) and <code>newevent.times</code> - a list of vectors where the vectors contain the imputed event times for the subjects (these vectors do not contain the observed event times before subject drop out). If a subject has no imputed events then the vector <code>numeric(0)</code> is returned.
parameters	A list of named parameters describing the method (used for printing) - or NULL if none

**Value**

A [ImputeMechanism.object](#)

**See Also**

[ImputeMechanism.object](#)

---

CreateScenario	<i>Create Scenario object from list of Fit Summaries</i>
----------------	--

---

**Description**

Create Scenario object from list of Fit Summaries

**Usage**

```
CreateScenario(object, description = "")
```

**Arguments**

object	Either a list of <code>summary.SingleSimFit</code> or <code>summary.ImputeSimFit</code> objects
description	A character string describing the scenario (used for printing)

**Value**

A Scenario object

**See Also**

[Scenario.object](#)

---

DejaData.object	<i>Data frame of covariates for simulating recurrent events</i>
-----------------	---

---

**Description**

This object allows covariates to be included in the simulation procedure The object is created using the [MakeDejaData](#) function

**Arguments**

data	A data frame containing the subject
arm,	character the column name of the treatment arm for each subject
rate,	character the column name of the rate to be used when simulating
Id,	character the column name of subject Id

**Structure**

The above components must be included in a DejaData Object

---

 DropoutMechanism.object

*DropoutMechanism object*


---

### Description

An object which defines a specific mechanism which takes a complete SingleSim object and returns a set of drop out times for subjects

### Arguments

type	The type of mechanism (e.g. "MCAR" or "MNAR")
text	A short string describing the mechanism (only used for printing)
cols.needed	Which columns in the SingleSim\$data data frame must be included for this drop out mechanism to work. This option could allow drop out mechanism which depend on covariates to be included.
GetDropTime	A function with two arguments event.times and data, the corresponding entries from the SingleSim object. This function should return a list of dropout times (if a subject does not dropout its dropout time should be their current censored.time (i.e. the study follow up time))
parameters	A list of named parameters for the mechanism (only used for printing) or NULL if none

### Details

It is possible to create user defined mechanisms, however, certain common mechanisms have already been implemented. For example see [ConstantRateDrop](#) and [LinearRateChangeDrop](#)

Only the GetDropTime and cols.needed entries are required for calculation, the other entries are used for printing the object

print.DropoutMechanism methods is defined.

### Structure

The following components must be included in a DropoutMechanism Object

---

expandEventCount	<i>Expand event counts into a list of event times</i>
------------------	---

---

### Description

This function exists to allow clinical trial data which typically gives event counts over time to be plugged into this software, which relies on actual event counts.

**Usage**

```
expandEventCount(count, time)
```

**Arguments**

count	a vector of event counts. All entries must be non-negative.
time	a matching (strictly positive) vector of followup times.

**Details**

This function always produces a warning: anyone relying on this function to actually analyze data should take great care.

**Value**

a list of vectors of event times

**Examples**

```
expandEventCount(count=c(0, 20), time=c(10, 20))
```

---

extract_results	<i>Extract the results of running a scenario</i>
-----------------	--

---

**Description**

This function is a wrapper around [CreateScenario](#) See the user guide vignette for an example of using this function

**Usage**

```
extract_results(answer, name, description)
```

**Arguments**

answer	A named list of lists
name	The name of the lists of answer which should be extracted and put together into a sc
description	The description parameter to be passed into the CreateScenario function

**Value**

A Scenario object

**See Also**

[CreateScenario](#)



---

GetImputedDataSet	<i>Output a single imputed data set</i>
-------------------	---

---

**Description**

Output a single imputed data set

**Usage**

```
GetImputedDataSet(imputeSim, index)
```

**Arguments**

imputeSim	A ImputeSim object which contains multiple imputed data sets
index	numeric, which of the multiple imputed data sets to output

**Value**

A SingleSim object with status="imputed"

**See Also**

[ImputeSim.object](#)

**Examples**

```
sim <- SimulateComplete(study.time=365,number.subjects=50,
event.rates=c(0.01,0.005),dispersions=0.25)
sim.with.MCAR.dropout <- SimulateDropout(sim,
drop.mechanism = ConstantRateDrop(rate = 0.0025))
fit <- Simfit(sim.with.MCAR.dropout)
imps <- Impute(fit, copy_reference(), 10)
imp1 <- GetImputedDataSet(imps, 1)
```

---

ImportSim	<i>Import an existing data frame for use with the package</i>
-----------	---

---

**Description**

Import an existing data frame for use with the package

**Usage**

```

ImportSim(
  dejaData,
  event.times,
  status,
  study.time,
  censored.time = NULL,
  actual.events = NULL,
  allow.beyond.study = FALSE
)

```

**Arguments**

<code>dejaData</code>	a <code>DejaData</code> object contain the subject covariates and treatment arm
<code>event.times</code>	A list of vectors, containing the observed event times of each subject. If no events are observed then <code>numeric(0)</code> should be used. See example in this help file for more details
<code>status</code>	The status of the data set imported, either "complete" (if all subjects complete their follow up period) or "dropout" (if not)
<code>study.time</code>	The total follow up time according to study protocol
<code>censored.time</code>	If status is "dropout", this is a vector of the times at which each subject is censored
<code>actual.events</code>	If status is "dropout" and the total number of events (i.e. not just the number observed) is known (e.g. if a different simulation procedure was used) a vector of total number of events should be included. If the number is not known or status is "complete" then this should be set to <code>NULL</code>
<code>allow.beyond.study</code>	Whether or not to allow imported data with events after the nominal end of study.

**Value**

A `SingleSim` object

**Examples**

```

covar.df <- data.frame(Id=1:6,
                      arm=c(rep(0,3),rep(1,3)),
                      Z=c(0,1,1,0,1,0))

dejaData <- MakeDejaData(covar.df,arm="arm",Id="Id")

event.times <- list(c(25,100,121,200,225),
                  c(100,110),c(55),numeric(0),
                  150,45)

complete.dataset <- ImportSim(dejaData, event.times,

```

```
        status="complete",
        study.time=365)

censored.time <- c(365,178,100,245,200,100)

dropout.dataset <- ImportSim(dejaData, event.times,
                             status="dropout",
                             study.time=365,
                             censored.time=censored.time)
```

---

Impute

*Produce imputed data sets*

---

### Description

Given a `SingleSimFit` object (with `impute.parameters` not `NULL`) and an imputation mechanism, create a collection of imputed data sets

### Usage

```
Impute(fit, impute.mechanism, N)
```

### Arguments

<code>fit</code>	A <code>SingleSimFit</code> object
<code>impute.mechanism</code>	An <code>ImputeMechanism</code> object
<code>N</code>	The number of data sets to impute

### Value

An `ImputeSim` object

### Examples

```
sim <- SimulateComplete(study.time=365,number.subjects=50,
                       event.rates=c(0.01,0.005),dispersions=0.25)
sim.with.MCAR.dropout <- SimulateDropout(sim,
    drop.mechanism = ConstantRateDrop(rate = 0.0025))
fit <- Simfit(sim.with.MCAR.dropout)
imps <- Impute(fit, copy_reference(), 10)
```

---

ImputeMechanism.object

*ImputeMechanism object*

---

## Description

An object which defines a mechanism for taking a `SingleSimFit` object and imputing missing data to create a `ImputeSim`

## Arguments

<code>name</code>	The method name (used for printing)
<code>cols.needed</code>	which columns of the <code>SingleSim</code> data frame are required by the method, typically <code>c("censored.time", "observed.events", "arm")</code>
<code>impute</code>	A function which takes a <code>SingleSimFit</code> object and outputs the details for a single imputed data set, specifically a list with two elements: <code>new.censored.times</code> - a vector of times subjects were censored (after taking into account imputation) and <code>newevent.times</code> - a list of vectors where the vectors contain the imputed event times for the subjects (these vectors do not contain the observed event times before subject drop out). If a subject has no imputed events then the vector <code>numeric(0)</code> is returned.
<code>parameters</code>	A list of named parameters describing the method (used for printing) - or NULL if none

## Details

It is possible to create user defined mechanisms, however, common mechanisms have already been implemented. For example see [weighted\\_j2r](#)

A `print.ImputeMechanism` method is defined.

## Structure

The following components must be included in an `ImputeMechanism Object`

## Examples

```
j2r <- weighted_j2r(trt.weight=0)
```

---

ImputeSim.object      *ImputeSim object*

---

### Description

This object contains a collection of imputed data sets derived from a SingleSimFit object and ImputeMechanism

### Arguments

`singleSim`      The SingleSim object from which the imputed data sets have been derived

`impute.mechanism`      The ImputeMechanism object used to perform the imputation

`imputed.values`      A matrix with 1 column per imputed data set and two rows: `newevent.times` a list of vectors containing the imputed event times (not including the events which were observed) and `new.censored.times` - a vector containing the times at which subjects (with imputed data) are now censored

`dropout`      A vector containing the number of subjects who have dropped out in each arm, for whom data is to be imputed

Use [GetImputedDataSet](#) to extract a single imputed data set and use `Simfit` to fit a model to the set of data sets

### See Also

[GetImputedDataSet](#)

---

ImputeSimFit.object      *ImputeSimFit object*

---

### Description

An object which contains both a set of imputed data sets (ImputeSim object) and a set of models fitted to them

### Arguments

`imputeSim`      The ImputeSim object for which models have been fitted

`summaries`      A list of `summary.SingleSimFit` objects containing the model fits for each of the imputed data sets

### Details

Calling `summary.ImputeSimFit` will apply Rubin's formula to calculate estimates for the treatment effect and standard error

Functions `summary.ImputeSimFit` and `as.data.frame.ImputeSimFit` have been implemented

**See Also**

`summary.ImputeSimFit` [summary.SingleSimFit](#)

---

`LinearRateChangeDrop` *Create a Dropout Mechanism with drop out rate which changes by a fixed constant after every event*

---

**Description**

Creates an MAR DropoutMechanism object where subject  $i$  has piecewise exponential dropout rate where the rate changes by a constant amount after each event, specifically after  $j$  events the subject has rate  $R_{ij} = C_j \cdot \exp(X_{ij})$  where  $C_j = C + j \cdot D$  for constants  $C, D$  and  $X_{ij}$  is a standard normal variable with mean 0 and standard deviation  $\sigma$

**Usage**

```
LinearRateChangeDrop(starting.rate, rate.change, var = 0)
```

**Arguments**

`starting.rate`  $C$ , see description section.

`rate.change`  $D$ , see description section. Note if  $D < 0$ ,  $C_j$  could be negative for large  $j$ , this is not possible and the rate remains constant if the next change would set  $C_j \leq 0$

`var`  $\sigma^2$ , see description section

**Value**

A DropoutMechanism object

**See Also**

[DropoutMechanism.object](#)

**Examples**

```
LinearRateChangeDrop(starting.rate=0.0025,rate.change=0.0005)
LinearRateChangeDrop(starting.rate=0.0025,rate.change=-0.00001,var=1)
```

---

MakeDejaData	<i>Create a DejaData object</i>
--------------	---------------------------------

---

**Description**

This object is can be used to create a SingleSim object with subject specific rates

**Usage**

```
MakeDejaData(data, arm, Id, rate = NULL)
```

**Arguments**

data	A data frame containing the subject
arm,	character the column name of the treatment arm for each subject
Id,	character the column name of subject Id
rate,	character the column name of the rate to be used when simulating (or NULL, if using DejaData to import a data set, see <a href="#">ImportSim</a> )

**Value**

A DejaData object

**Examples**

```
set.seed(232)

my.df <- data.frame(Id=1:100,
                    arm=c(rep(0,50),rep(1,50)),
                    covar=rbinom(n=100,size=1,prob=0.5))

my.df$rate <- 0.0025 + my.df$covar*0.002 + (1-my.df$arm)*0.002

my.dejaData <- MakeDejaData(my.df,arm="arm",rate="rate",Id="Id")
```

---

numberSubjects	<i>S3 generic to output the number of subjects in a given object</i>
----------------	--

---

**Description**

S3 generic to output the number of subjects in a given object

**Usage**

```
numberSubjects(x)
```

**Arguments**

x                    The object

**Value**

The number of subjects

**Examples**

```
sim <- SimulateComplete(study.time=365,number.subjects=50,  
event.rates=c(0.01,0.005),dispersions=0.25)  
numberSubjects(sim)
```

---

Scenario.object

*Scenario object*

---

**Description**

This class contains a collection of model fit summaries and summarizing this object will calculate overall summary statistics such as power/type I error

**Arguments**

description        A string containing a description of the scenario

summaries         A list of either `summary.ImputeSimFit` or `summary.SingleSimFit` objects

**Details**

Functions `as.data.frame.Scenario` and `summary.Scenario` have been implemented

**See Also**

[CreateScenario](#)



---

simData	<i>Simulated recurrent event data.</i>
---------	--

---

**Description**

A simulated dataset containing a randomised treatment group, follow-up time, and number of events, for 500 patients. The planned follow-up period for the study was 1 year, but some patients dropped out early and so their follow-up ended prematurely (i.e. before 1 year)

**Usage**

```
simData
```

**Format**

A data frame with 500 rows and 3 variables:

**z** a binary variable indicating randomised treatment group

**y** number of events observed during patient's follow-up

**fupTime** the time in years the patient was followed up for ...

**Source**

Simulated data

---

Simfit	<i>S3 generic for fitting models</i>
--------	--------------------------------------

---

**Description**

S3 generic for fitting models

**Usage**

```
Simfit(x, family = "negbin", equal.dispersion = TRUE, covar = NULL, ...)
```

**Arguments**

x	The S3 object
family	Either "negbin" for fitting a negative binomial model (using MASS::glm.nb), "poisson" for fitting a poisson model (glm) or "quasipoisson" for fitting a quasipoisson model glm
equal.dispersion	logical, should the arms have the same dispersion parameter when fitting negative binomial models

covar            A formula containing the additional covariates to be used when calling `glm.nb` if no covariates are included in the model this should be `NULL`, for example `~covar1 + covar2` See vignette for further details

...              Additional arguments to be passed to `glm` or `glm.nb`

**Value**

A `SingleSimFit` object

**See Also**

[SingleSimFit.object](#)

**Examples**

```
set.seed(1234)
sim <- SimulateComplete(study.time=1,number.subjects=50,
  event.rates=c(0.1,0.05),dispersions=0.1)
summary(Simfit(sim,equal.dispersion=TRUE))
```

---

SimulateComplete            *Simulate a complete data set*

---

**Description**

Simulate a complete data set of a recurrent event clinical trial without dropouts using a negative binomial model with given rates and dispersion parameters

**Usage**

```
SimulateComplete(
  study.time,
  dejaData = NULL,
  number.subjects = NULL,
  event.rates = NULL,
  dispersions
)
```

**Arguments**

`study.time`            The study follow up period

`dejaData`              If not `NULL` this should contain a `DejaData` object. If this is used then `number.subjects` and `event.rates` arguments are ignored

number.subjects	The number of subjects, if a vector $c(a, b)$ then $a$ subjects on the control arm and $b$ subjects on the active arm. If <code>number.subjects</code> is a single number then both arms have the given number of subjects.
event.rates	The rate parameter(s) for the negative binomial model (if single parameter then it is used for both arms)
dispersions	The dispersion parameter(s) for the negative binomial model (if single parameter then it is used for both arms)

**Details**

Each subject's events are described by a Poisson process with a subject specific rate given by  $\lambda/\text{study.time}$  where `study.time` is the study follow up period and  $\lambda$  has a gamma distribution with  $\text{shape}=1/\text{dispersion}$  and  $\text{scale}=\text{dispersion}*\text{event.rate}*\text{study.time}$

Different dispersions, `event.rates` and number of subjects can be specified for both arms of the trial

**Value**

A `SingleSim` object with `status='complete'`

**See Also**

[SingleSim.object](#)

**Examples**

```
sim <- SimulateComplete(study.time=365,number.subjects=50,
                       event.rates=c(0.01,0.005),dispersions=0.25)
sim2 <- SimulateComplete(study.time=365,number.subjects=c(50,75),
                        event.rates=c(0.01,0.005),dispersions=c(0,0.25))
```

---

SimulateDropout	<i>Simulate subject dropout</i>
-----------------	---------------------------------

---

**Description**

This function takes a complete recurrent event data set and drop out mechanism and creates a data set set with dropout

**Usage**

```
SimulateDropout(simComplete, drop.mechanism)
```

**Arguments**

`simComplete` A `SingleSim` object (with `status="complete"`)  
`drop.mechanism` A `DropoutMechanism` object

**Value**

A SingleSim object with status='dropout'

**Examples**

```
sim <- SimulateComplete(study.time=365,number.subjects=50,
                       event.rates=c(0.01,0.005),dispersions=0.25)

sim.with.MCAR.dropout <- SimulateDropout(sim,
                                         drop.mechanism = ConstantRateDrop(rate = 0.0025))
sim.with.MAR.dropout <- SimulateDropout(sim,
                                         drop.mechanism = LinearRateChangeDrop(
                                             starting.rate = 0.0025,
                                             rate.change = 0.0005))
```

---

SingleSim.object	<i>SingleSim Object</i>
------------------	-------------------------

---

**Description**

A class containing the data for a single simulation. Depending on the value of status, this may be a complete data set, a set including subject dropouts or a data set after multiple imputation

print.SingleSim and summary.SingleSim methods are defined.

**Arguments**

data	The data frame, one row per subject containing (at least) the following columns Id, arm, censored.time, observed.events and actual.events
event.times	A list of event times. event.times[[1]] is a list of event times for subject with Id 1 The length of event.times[[1]] = the number of observed events of subject with Id 1
status	Either "complete", "dropout" or "imputed" denoting the status of the data set.
subject.rates	A vector of the specific rates used for the Poisson process for subjects when generating the data
dropout.mechanism	If status is not "complete" then this contains the DropoutMechanism object used to perform the subject dropout. See <a href="#">DropoutMechanism.object</a> .
impute.mechanism	If the status is "imputed" then this contains the ImputeMechanism object used to perform the imputation. See <a href="#">ImputeMechanism.object</a>
study.time	The study follow up period (see SimulateComplete)
event.rates	The control/active event rates (see SimulateComplete), if data set was generated without using these (e.g. the dejaData argument was used) then this is set to NULL
dispersions	The control/active dispersion rates (see SimulateComplete)

**Structure**

The above components must be included in a SingleSim Object

---

SingleSimFit.object     *SingleSimFit object*

---

**Description**

A SingleSimFit object is returned from calling Simfit with a SingleSim object. It can be used to both impute data sets or can be summarized

**Arguments**

singleSim	The SingleSim object to which a model has been fitted
model	The model which has been fitted
genCoeff.function	A function which returns a list of parameters from the model fit(s) which can be used when performing the gamma imputation. It takes one argument, use.uncertainty (by default is TRUE) which if TRUE stochastically incorporates uncertainty into the parameter estimates in preparation for use with imputation If a Poisson/quasi-Poisson model was fitted to the SingleSimFit object then this will be NULL
equal	dispersion whether equal dispersions were used when fitting model(s) to the data

**Details**

A [summary.SingleSimFit](#) method has been implemented

---

subjectsPerArm	<i>S3 generic to output the number of subjects in each arm for a given object</i>
----------------	---

---

**Description**

S3 generic to output the number of subjects in each arm for a given object

**Usage**

```
subjectsPerArm(x)
```

**Arguments**

x	The object
---	------------

**Value**

A vector of the number of subjects in each arm

**Examples**

```
sim <- SimulateComplete(study.time=365,number.subjects=50,
event.rates=c(0.01,0.005),dispersions=0.25)
subjectsPerArm(sim)
```

---

```
summary.ImputeSimFit.object
```

```
summary.ImputeSimFit object
```

---

**Description**

The summary of a `ImputeSimFit` object. Rubin's formula is used to combine the test statistics into a single summary

**Arguments**

treatment.effect	The mean of the estimated treatment.effect from the imputed data
se	The standard error of the (log) treatment effect calculated using Rubin's formula
df	The number of degrees of freedom used to calculate the p-value
adjusted.df	The number of degrees of freedom used to calculate the adjusted p-value (this should be used if the complete data number of degrees of freedom is small)
dispersion	The mean of the estimated dispersion parameter
pval	The p-value for the test $\log(\text{treatment.effect})=0$ using Rubin's formula
adjusted.pval	The p-value for the test $\log(\text{treatment.effect})=0$ using Rubin's formula and the adjusted number of degrees of freedom
dropout	The number of subjects who drop out (per arm) for this imputed data set
number.subjects	The number of subjects (per arm) for this imputed data set

**Details**

A `print.summary.ImputeSimFit` object has been implemented

---

summary.Scenario.object  
*summary.Scenario object*

---

### Description

This object contains the overall summary statistics for a specific scenario. It is envisioned that multiple scenarios are run and a set of summary.Scenario objects are created and these can then be used for plotting

### Arguments

treatment.effect	The exp(mean(log(individual treatment effects))),
se	The mean standard error of the (log) treatment effect
power	The proportion of simulations for which the p-value is < alpha
alpha	The significance level used when calculating power, by default 0.05 use summary(object, alpha=x) to use a different p value
use.adjusted.pval	logical, default FALSE should the p values calculated using Rubin's formula with the adjusted number of degrees of freedom be used. Use summary(object, use.adjusted.pval=TRUE) to use the adjusted p values
description	A string containing a description of the scenario
dropout	A list of summary statistics regarding number of subject dropouts

### Details

A print.summary.Scenario function has been implemented

---

summary.SingleSim.object  
*summary.SingleSim object*

---

### Description

The object returned when calling the summary function on a SingleSim object

**Arguments**

status	The status of the SingleSim object
study.time	The study.time from the SingleSim object
number.subjects	The number of subjects on each arm
number.dropouts	The number of subjects who dropout on each arm
total.events	The total number of events for each arm
time.at.risk	The total time at risk for each arm
empirical.rates	total.events/time.at.risk
	The print.summary.SingleSim method has been implemented

---

summary.SingleSimFit    *summary.SingleSimFit*

---

**Description**

The summary object for a SingleSimFit object

**Arguments**

model.summary	The model summary from the fit
treatment.effect	The estimate of treatment effect from the model fit
CI.limit	The confidence interval limit (by default 0.95), call summary(object, CI.limit=x) to use CI of x instead.
CI	The confidence interval of the treatment effect
se	Estimate for the standard error of (log) treatment effect
dispersion	Estimate for the dispersion parameter or numeric(0) if Poisson/quasi-Poisson model used
rate.estimate	Estimate of the event rates from the model a vector c(control arm, treatment arm)
pval	The p value directly from the model fit (this is for the single model fit only, i.e. not using Rubin's formula)
datastatus	The status of SingleSim object to which the fit was applied
df	The number of degrees of freedom of the model
dropout	The number of dropouts of each arm
number.subjects	The number of subjects in each arm



**Details**

A `print.summary.SingleSimFit` method has been implemented

**See Also**

[SingleSimFit.object](#)

**Examples**

```
sim <- SimulateComplete(study.time=365,number.subjects=50,
event.rates=c(0.01,0.005),dispersions=0.25)
fit <- Simfit(sim)
summary(fit)
```

---

weighted\_j2r

*Create a weighted\_j2r ImputeMechanism object*

---

**Description**

Missing counts for a subject in the active treatment arm will be imputed according to a point (determined by `trt.weight`) between the means of the placebo and treatment arms, conditioned on the number of events. Missing counts for subjects in the placebo arm will be imputed according to the mean of the placebo arm, conditioned on the subject's observed number of events.

**Usage**

```
weighted_j2r(trt.weight, delta = c(1, 1), proper = TRUE)
```

**Arguments**

<code>trt.weight</code>	See details
<code>delta</code>	If <code>trt.weight=1</code> then <code>delta</code> is a vector of length 2 ( <code>control.delta,treatment.delta</code> ) and the mean number of expected events for the imputed missing data is multiplied by the appropriate <code>delta</code>
<code>proper</code>	If <code>proper=TRUE</code> then proper imputation is performed, in which each imputation is created based on parameters values drawn from the (approximate) posterior distribution of the imputation model. If <code>proper=FALSE</code> , improper imputation is performed. This means all imputed datasets are generated conditional on the maximum likelihood estimates of the parameters.

**Details**

If `trt.weight = 0` then imputation using this mechanism will follow the jump to reference (j2r) model whereby missing counts for subjects in both arms will be imputed according to the mean of the placebo arm conditioned on the subject's observed number of events

If `trt.weight = 1` then imputation using this mechanism will follow the MAR model whereby missing counts for subjects in each arm will be imputed according to the event rate of subjects in its treatment group conditioned on the subject's observed number of events

See the User guide vignette for further details

**Value**

An `ImputeMechanism` object

**See Also**

[ImputeMechanism.object](#)

**Examples**

```
sim <- SimulateComplete(study.time=365,number.subjects=50,
event.rates=c(0.01,0.005),dispersions=0.25)
sim.with.MCAR.dropout <- SimulateDropout(sim,
drop.mechanism = ConstantRateDrop(rate = 0.0025))
fit <- Simfit(sim.with.MCAR.dropout)
imps <- Impute(fit, weighted_j2r(trt.weight=0), 10)
```

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