Package 'accrualPlot'

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Type Package

Title Accrual Plots and Predictions for Clinical Trials

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Maintainer Lukas Bütikofer <lukas.buetikofer@ctu.unibe.ch>

Description Tracking accrual in clinical trials is important for trial success. If accrual is too slow, the trial will take too long and be too expensive. If accrual is much faster than expected, time sensitive tasks such as the writing of statistical analysis plans might need to be rushed. 'accrualPlot' provides functions to aid the tracking of accrual and predict when a trial will reach it's intended sample size.

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URL https://github.com/CTU-Bern/accrualPlot, https://ctu-bern.github.io/accrualPlot/

BugReports https://github.com/CTU-Bern/accrualPlot/issues

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Author Lukas Bütikofer [cre, aut], Alan G. Haynes [aut]

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`accrualdemo` *Demonstration data set*

Description

Simulated recruitment data from three sites. Each row represents one participant. Sites one and two started on 2020-07-01, site three on 2020-09-01.

Usage

```
accrualdemo
```

Format

A data frame with two variables: `date`, and `site`.

`accrual_create_df` *accrual_create_df*

Description

Creates a data frame or a list of data frames that contains the absolute and cumululative number of participants recruited at each date from a vector with enrollment dates. Used as input for accrual plot functions.

Usage

```
accrual_create_df(
  enrollment_dates,
  by = NA,
  start_date = "site",
  current_date = "common",
  overall = TRUE,
  name_overall = "Overall",
  pos_overall = c("last", "first"),
  force_start0 = TRUE
)
```

Arguments

enrollment_dates	date vector with one entry per participants.
by	factor or character vector with sites, has to have the same length as enrollment dates. If not NA, a list with an accrual data frame for each site is generated.
start_date	date when recruitment started. Single date (used for all sites in by), named date vector (with length and names corresponding to the levels of by), "common" (first date overall) or "site" (first date for each site, default).
current_date	date of the data export or database freeze. Single date, named date vector (with length and names corresponding to the levels of by), "common" (last date overall, default) or "site" (first date for each site).
overall	logical indicates that accrual_df contains a summary with all sites (only if by is not NA).
name_overall	name of the summary with all sites (if by is not NA and overall==TRUE).
pos_overall	overall as last or first element of the list (if by is not NA and overall==TRUE).
force_start0	logical, adds an extra 0 line to the accrual data frame in cases where a start date is given and corresponds to the earliest enrollment date.

Value

Returns a data frame of class 'accrual_df' or a list of class 'accrual_list' with an 'accrual_df' for each level of by (if by is not NA). The 'accrual_df' contains a row per accrual day and the following three columns:

Date	date of accrual
Freq	absolute number accrued at Date
Cumulative	cumulative number accrued up to Date

See Also

accrual_plot_cum(), accrual_plot_abs() and accrual_plot_predict() to generate cumulative, absolute and prediction plots, and accrual_table() to generate an accrual table.

Examples

```
data(accrualdemo)
accrual_create_df(accrualdemo$date)
# different start and current date
accrual_create_df(accrualdemo$date, start_date=as.Date("2020-07-08"),
current_date=as.Date("2020-10-15"))

#by site
accrual_create_df(accrualdemo$date,by=accrualdemo$site)
```

---

accrual_linear_model *accrual_linear_model*

Description

Creates a weighted linear regression model using an accrual data frame produced by `accrual_create_df`.

Usage

```
accrual_linear_model(
  accrual_df,
  fill_up = TRUE,
  wfun = function(x) seq(1/nrow(x), 1, by = 1/nrow(x))
)
```

Arguments

`accrual_df`	object of class 'accrual_df' or 'accrual_list' produced by `accrual_create_df`.
`fill_up`	whether to fill up days where no recruitment was observed,
`wfun`	function to calculate the weights with accrual data frame as argument, default is wfun<-function(x) seq(1 / nrow(x), 1, by = 1/nrow(x)).

Value

Returns an object of class 'lm' with a weighted linear regression of cumulative accrual on dates.

Examples

```
data(accrualdemo)
accrual_df<-accrual_create_df(accrualdemo$date)
accrual_linear_model(accrual_df)

#unweighted
accrual_linear_model(accrual_df, wfun=function(x) rep(1,nrow(x)))

#different start and current date
accrual_df<-accrual_create_df(accrualdemo$date,start_date=as.Date("2020-07-08"),
```

```
    current_date=as.Date("2020-07-15"))
accrual_linear_model(accrual_df)

#accrual_df with by option
accrual_df<-accrual_create_df(accrualdemo$date,by=accrualdemo$site)
accrual_linear_model(accrual_df)
```

`accrual_plot_abs` *Absolute accrual plots*

Description

Plot of absolute recruitment by time unit using an accrual data frame produced by `accrual_create_df`.

Usage

```
accrual_plot_abs(
  accrual_df,
  unit = c("month", "year", "week", "day"),
  target = NULL,
  overall = TRUE,
  name_overall = attr(accrual_df, "name_overall"),
  ylim = NULL,
  xlim = NULL,
  ylab = "Recruited patients",
  xlabformat = NULL,
  xlabsel = NA,
  xlabpos = NULL,
  xlabsrt = 45,
  xlabadj = c(1, 1),
  xlabcex = 1,
  col = NULL,
  legend.list = NULL,
  ...
)

gg_accrual_plot_abs(
  accrual_df,
  unit = c("month", "year", "week", "day"),
  xlabformat = NULL
)
```

Arguments

`accrual_df`	object of class 'accrual_df' or 'accrual_list' produced by `accrual_create_df`.
`unit`	time unit for which the bars should be plotted, one of `"month"`, `"year"`, `"week"` or `"day"`.

target	adds horizontal line for target recruitment per time unit.
overall	logical, indicates that accrual_df contains a summary with all sites that should be removed from stacked barplot (only if by is not NA).
name_overall	name of the summary with all sites (if by is not NA and overall==TRUE).
ylim	limits for y-axis.
xlim	limits for x-axis.
ylab	y-axis label.
xlabformat	format of date on x-axis.
xlabsel	selection of x-labels if not all should be shown, by default all are shown up to 15 bars, with more an automated selection is done, either NA (default), NULL (show all), or a numeric vector.
xlabpos	position of the x-label.
xlabsrt	rotation of x-axis labels in degrees.
xlabadj	adjustment of x-label, numeric vector with length 1 or 2 for different adjustment in x- and y-direction.
xlabcex	size of x-axis label.
col	colors of bars in barplot, can be a vector if accrual_df is a list, default is grayscale.
legend.list	named list with options passed to legend().
...	further arguments passed to barplot() and axis().

Details

When the accrual_df includes multiple sites, the dataframe passed to ggplot includes a site variable which can be used for facetting

Value

accrual_plot_abs returns a barplot of absolute accrual by time unit (stacked if accrual_df is a list).

Examples

```
set.seed(2020)
enrollment_dates <- as.Date("2018-01-01") + sort(sample(1:100, 50, replace=TRUE))
accrual_df<-accrual_create_df(enrollment_dates)
accrual_plot_abs(accrual_df,unit="week")

#time unit
accrual_plot_abs(accrual_df,unit="day")

#include target
accrual_plot_abs(accrual_df,unit="week",target=5)

#further plot options
accrual_plot_abs(accrual_df,unit="week",ylab="No of recruited patients",
   xlabformat="%Y-%m-%d",xlabsrt=30,xlabpos=-0.8,xlabadj=c(1,0.5),
```

```
   col="pink",tck=-0.03,mgp=c(3,1.2,0))

#accrual_df with by option
set.seed(2020)
centers<-sample(c("Site 1","Site 2","Site 3"),length(enrollment_dates),replace=TRUE)
centers<-factor(centers,levels=c("Site 1","Site 2","Site 3"))
accrual_df<-accrual_create_df(enrollment_dates,by=centers)
accrual_plot_abs(accrual_df=accrual_df,unit=c("week"))

### ggplot2 approach
data(accrualdemo)
accrual_df<-accrual_create_df(accrualdemo$date)
gg_accrual_plot_abs(accrual_df, unit = "week")
gg_accrual_plot_abs(accrual_df, unit = "week") +
  ggplot2::theme_classic()

#time unit
gg_accrual_plot_abs(accrual_df, unit = "day")

#accrual_df with by option
accrual_df <- accrual_create_df(accrualdemo$date, by = accrualdemo$site)
gg_accrual_plot_abs(accrual_df = accrual_df, unit = "week")
gg_accrual_plot_abs(accrual_df = accrual_df, unit = "week") +
  ggplot2::scale_fill_discrete(type = c("black", "red", "blue", "green"))
```

`accrual_plot_cum` *Cumulative accrual plots*

Description

Plot of cumulative recruitment using an accrual data frame produced by `accrual_create_df`.

Usage

```
accrual_plot_cum(
  accrual_df,
  ylim = NA,
  xlim = NA,
  ylab = "Recruited patients",
  xlabn = 5,
  xlabminn = xlabn%/%2,
  xlabformat = "%d%b%Y",
  xlabpos = NA,
  xlabsrt = 45,
  xlabadj = c(1, 1),
  xlabcex = 1,
  col = rep(1:8, 5),
  lty = rep(1:5, each = 8),
```

```
  legend.list = NULL,
  ...
)

gg_accrual_plot_cum(accrual_df, xlabformat = "%d%b%Y")
```

Arguments

accrual_df	object of class 'accrual_df' or 'accrual_list' produced by accrual_create_df.
ylim	limits for y-axis.
xlim	limits for x-axis.
ylab	y-axis label.
xlabn	integer giving the desired number of intervals for the xlabel, default=5.
xlabminn	negative integer giving the minimal number of intervals.
xlabformat	format of date on x-axis.
xlabpos	position of the x-label.
xlabsrt	rotation of x-axis labels in degrees.
xlabadj	adjustment of x-label, numeric vector with length 1 or 2 for different adjustment in x- and y-direction.
xlabcex	size of x-axis label.
col	color for line(s) in plot
lty	line type(s) in plot
legend.list	named list with options passed to legend().
...	further options passed to plot() and axis().

Details

When the accrual_df includes multiple sites, the dataframe passed to ggplot includes a site variable which can be used for faceting

Value

accrual_plot_cum returns a plot of the cumulative accrual (per site if accrual_df is a list).

ggplot2 object

Examples

```
set.seed(2020)
enrollment_dates <- as.Date("2018-01-01") + sort(sample(1:30, 50, replace=TRUE))
accrual_df<-accrual_create_df(enrollment_dates)
accrual_plot_cum(accrual_df)
accrual_plot_cum(accrual_df,cex.lab=1.2,cex.axis=1.1,xlabcex=1.1)

#several sites
set.seed(1)
```

```
centers<-sample(c("Site 1","Site 2","Site 3"),length(enrollment_dates),replace=TRUE)
accrual_df<-accrual_create_df(enrollment_dates,by=centers)
accrual_plot_cum(accrual_df)

#assuming a common start and current date
accrual_df<-accrual_create_df(enrollment_dates,by=centers,start_date="common",current_date="common")
accrual_plot_cum(accrual_df)

#plot and legend options
accrual_plot_cum(accrual_df,col=c("red",rep(1,3)),lty=c(1,1:3),cex.lab=1.2,cex.axis=1.1,xlabcex=1.1)
accrual_plot_cum(accrual_df,legend.list=list(ncol=2,bty=TRUE,cex=0.8))

#without overall
accrual_df<-accrual_create_df(enrollment_dates,by=centers,overall=FALSE)
accrual_plot_cum(accrual_df)

### ggplot2 approach
data(accrualdemo)
accrual_df<-accrual_create_df(accrualdemo$date)
gg_accrual_plot_cum(accrual_df)
gg_accrual_plot_cum(accrual_df) +
  ggplot2::theme_classic()

#several sites
accrual_df <- accrual_create_df(accrualdemo$date, by = accrualdemo$site)
gg_accrual_plot_cum(accrual_df)

#assuming a common start and current date
accrual_df <-
  accrual_create_df(
    accrualdemo$date,
    by = accrualdemo$site,
    start_date = "common",
    current_date = "common"
  )
gg_accrual_plot_cum(accrual_df)

#without overall
accrual_df <-
  accrual_create_df(accrualdemo$date, by = accrualdemo$site, overall = FALSE)
gg_accrual_plot_cum(accrual_df)
```

`accrual_plot_predict` *Accrual prediction plots*

Description

Generates an accrual prediction plot using an accrual data frame produced by `accrual_create_df` and a target sample size. Prediction is based on a weighted linear regression. If the accrual data frame is a list (i.e. using the by option in `accrual_create_df`), or if center start dates are given, the number of enrolled and targeted sites is included.

Usage

```
accrual_plot_predict(
  accrual_df,
  target,
  overall = TRUE,
  name_overall = attr(accrual_df, "name_overall"),
  fill_up = TRUE,
  wfun = function(x) seq(1/nrow(x), 1, by = 1/nrow(x)),
  col.obs = NULL,
  lty.obs = 1,
  col.pred = "red",
  lty.pred = 2,
  pch.pred = 8,
  pos_prediction = c("out", "in", "none"),
  label_prediction = NULL,
  cex_prediction = 1,
  format_prediction = "%B %d, %Y",
  show_center = TRUE,
  design = 1,
  center_label = "Centers",
  center_legend = c("number", "strip"),
  targetc = NA,
  center_colors = NULL,
  center_legend_text_size = 0.7,
  ylim = NA,
  xlim = NA,
  ylab = "Recruited patients",
  xlabformat = "%d%b%Y",
  xlabn = 5,
  xlabminn = xlabn%/%2,
  xlabpos = NA,
  xlabsrt = 45,
  xlabadj = c(1, 1),
  xlabcex = 1,
  mar = NA,
  legend.list = NULL,
  ...,
  center_start_dates = NULL
)

gg_accrual_plot_predict(
  accrual_df,
  target,
  overall = TRUE,
  name_overall = attr(accrual_df, "name_overall"),
  col.pred = "red",
  lty.pred = 2,
  pch.pred = 8,
```

```
  fill_up = TRUE,
  wfun = function(x) seq(1/nrow(x), 1, by = 1/nrow(x)),
  pos_prediction = c("out", "in", "none"),
  label_prediction = NULL,
  format_prediction = "%B %d, %Y",
  xlabformat = "%d%b%Y"
)
```

Arguments

accrual_df	object of class 'accrual_df' or 'accrual_list' produced by accrual_create_df.
target	target sample size or date to predict end date or expected sample size, respectively. A single number or date, or a named vector with the same length as accrual_df. For the latter, center-specific predictions are shown.
overall	logical, indicates that accrual_df contains a summary with all sites (only if by is not NA).
name_overall	name of the summary with all sites (if by is not NA and overall==TRUE).
fill_up	whether to fill up days where no recruitment was observed, otherwise these points do not contribute to the regression.
wfun	function to calculate the weights with accrual data frame as argument, default is wfun<-function(x) seq(1 / nrow(x), 1, by = 1/nrow(x)).
col.obs	line color of cumulative recruitment, can be a vector with the same length as accrual_df.
lty.obs	line type of cumulative recruitment, can be a vector with the same length as accrual_df.
col.pred	line color of prediction, can be a vector with the same length as accrual_df.
lty.pred	line color of prediction, can be a vector with the same length as accrual_df.
pch.pred	point symbol for end of prediction, can be a vector with the same length as accrual_df.
pos_prediction	position of text with predicted end date or sample size, either "out", "in" or "none".
label_prediction	label for predicted end date or sample size.
cex_prediction	text size for predicted end date or sample size.
format_prediction	date format for predicted end date (only if target is a sample size)
show_center	logical, whether the center info should be shown (if accrual_df is a list or if center_start_dates are given).
design	design options for the center info 1 (default): below plot, 2: within plot, top, 3: within plot, bottom.
center_label	label for the center info.
center_legend	either "number" to plot numbers in the center strip or "strip" to add a legend strip, requires specification of center_colors.

targetc	target number of centers, to scale the legend if it is "strip".
center_colors	colors to be used for the strip with the centers, a vector of length targetc.
center_legend_text_size	size of the text of the center or legend strip, only has a function
ylim	limits for y-axis.
xlim	limits for x-axis.
ylab	y-axis label.
xlabformat	format of date on x-axis.
xlabn	integer giving the desired number of intervals for the xlabel, default=5.
xlabminn	integer giving the minimal number of intervals.
xlabpos	position of the x-label.
xlabsrt	rotation of x-axis labels in degrees.
xlabadj	adjustment of x-label, numeric vector with length 1 or 2 for different adjustment in x- and y-direction.
xlabcex	size of x-axis label.
mar	vector of length 4 (bottom, left, top, right margins), overwrite default margins.
legend.list	named list with options passed to legend(), only if accrual data frame is a list.
...	further options passed to plot() and axis().
center_start_dates	alternative way to add center info, vector with dates on which centers are enrolled.

Details

When the accrual_df includes multiple sites, the dataframe passed to ggplot includes a site variable which can be used for facetting

Value

accrual_plot_predict returns a plot with the accrual prediction.

Examples

```
data(accrualdemo)
accrual_df<-accrual_create_df(accrualdemo$date)
##Predict end date
accrual_plot_predict(accrual_df=accrual_df,target=300)
##Predict sample size
accrual_plot_predict(accrual_df=accrual_df,as.Date("2020-11-01"))

#Include site
accrual_df<-accrual_create_df(accrualdemo$date,by=accrualdemo$site)
accrual_plot_predict(accrual_df=accrual_df,target=300,center_label="Site")
## with strip and target
accrual_plot_predict(accrual_df=accrual_df,target=300,center_label="Site",
```

```
 targetc=5,center_colors=heat.colors(5),center_legend="strip")

#Design for site
accrual_plot_predict(accrual_df=accrual_df,target=300,design=2)

#Format prediction end date
accrual_plot_predict(accrual_df=accrual_df,target=300,
     pos_prediction="in",label_prediction="End of accrual: ",cex_prediction=1.2,
     format_prediction="%Y-%m-%d",ylim=c(0,150))

#Format plot
accrual_plot_predict(accrual_df=accrual_df,target=300,
     ylab="No of recruited patients",ylim=c(0,150),
     xlabcex=1.2,xlabsrt=30,xlabn=5,xlabmin=5,
     mgp=c(3,0.5,0),cex.lab=1.2,cex.axis=1.2)

#predictions for all sites
accrual_plot_predict(accrual_df=accrual_df,
target=c("Site 1"=160,"Site 2"=100,"Site 3"=40,"Overall"=300))
## different colors
accrual_plot_predict(accrual_df=accrual_df,
target=c("Site 1"=160,"Site 2"=100,"Site 3"=40,"Overall"=300),
col.obs=topo.colors(length(accrual_df)))
##not showing center info
accrual_plot_predict(accrual_df=accrual_df,
target=c("Site 1"=160,"Site 2"=100,"Site 3"=40,"Overall"=300),
show_center=FALSE)

#predictions of sample size for all sites
target<-rep(as.Date("2020-11-01"),4)
names(target)<-c("Site 1","Site 2","Site 3","Overall")
accrual_plot_predict(accrual_df=accrual_df,target=target,col.obs=topo.colors(length(accrual_df)))
### ggplot2 approach
data(accrualdemo)
accrual_df<-accrual_create_df(accrualdemo$date)
gg_accrual_plot_predict(accrual_df = accrual_df, target = 300)
gg_accrual_plot_predict(accrual_df = accrual_df, target = 300) +
  ggplot2::theme_classic()

#Include site
accrual_df<-accrual_create_df(accrualdemo$date, by=accrualdemo$site)
gg_accrual_plot_predict(accrual_df=accrual_df, target=300)


#Format prediction end date
gg_accrual_plot_predict(accrual_df = accrual_df,
target=300,
pos_prediction="in",
format_prediction="%Y-%m-%d")


#predictions for all sites
gg_accrual_plot_predict(accrual_df = accrual_df,
```

```
target=c("Site 1"=160,"Site 2"=100,"Site 3"=40,"Overall"=300))
gg_accrual_plot_predict(accrual_df = accrual_df,
 target=c("Site 1"=160,"Site 2"=100,"Site 3"=40,"Overall"=300)) +
ggplot2::theme(legend.position = c(0.15,.9)) +
ggplot2::labs(col = "Site")
```

`accrual_predict` *accrual_predict*

Description

accrual_predict

Usage

```
accrual_predict(accrual_df, accrual_fit, target)
```

Arguments

`accrual_df`	accrual data frame produced by `accrual_create_df` (optionally with by option as a list)
`accrual_fit`	linear model produced by accrual_linear_model, can be a list with the same length as accrual_df
`target`	target sample size or date to predict end date or expected sample size, respectively. A single number or date, or a named vector with the same length as accrual_df (to add site-specific targets).

Details

Prediction of end date based on an accrual data frame produced by `accrual_create_df`, a fitted regression model produced by accrual_linear_model and a target sample size.

Value

Returns the predicted end date(s) or the predicted sample size(s).

Examples

```
data(accrualdemo)
accrual_df<-accrual_create_df(accrualdemo$date)
accrual_model<-accrual_linear_model(accrual_df)
#predict date for a specific n
accrual_predict(accrual_df,accrual_model,target=300)
#predict n at a specific date
accrual_predict(accrual_df,accrual_model,target=as.Date("2020-11-01"))

#different start and current date
accrual_df<-accrual_create_df(accrualdemo$date,start_date=as.Date("2020-07-09"),
```

```
    current_date=as.Date("2020-10-15"))
accrual_model<-accrual_linear_model(accrual_df)
accrual_predict(accrual_df,accrual_model,target=300)

 #accrual_df with by option
 accrual_df<-accrual_create_df(accrualdemo$date,by=accrualdemo$site)
accrual_model<-accrual_linear_model(accrual_df)
accrual_predict(accrual_df,accrual_model,
  target=c("Site 1"=160,"Site 2"=100,"Site 3"=40,"Overall"=300))
accrual_predict(accrual_df,accrual_model,target=as.Date("2020-11-01"))
```

`accrual_table` *accrual_table*

Description

Table of recruitment overview by site, rate of recruitment

Usage

```
accrual_table(
  accrual_df,
  overall = TRUE,
  name_overall = "Overall",
  pos_overall = c("last", "first"),
  unit = c("month", "year", "week", "day"),
  format_table_date = "%d%b%Y",
  format_time = "%1.0f",
  format_rrate = "%1.2f",
  header = TRUE
)
```

Arguments

`accrual_df`	object of class 'accrual_df' or 'accrual_list' produced by `accrual_create_df`.
`overall`	logical, indicates that accrual_df contains a summary with all sites (only if by is not NA).
`name_overall`	name of the summary with all sites (if by is not NA and overall==TRUE).
`pos_overall`	overall in last or first row (if by is not NA and overall==TRUE).
`unit`	time unit for time recruiting and the rate, one of `"month"`, `"year"`, `"week"` or `"day"`.
`format_table_date`	format of start date in table.
`format_time`	format of time recruiting in table.
`format_rrate`	format of recruitment rate in table.
`header`	include header, logical or character vector of length 4 or 5 (if accrual_df is a list).

Value

Returns data frame with a header, a row per site and overall and the following columns:

name	name of the site (if accrual_df is a list)
start_date	accrual start date
time	time accruing
n	number of patients accrued
rate	accrual rate per time unit

Examples

```
data(accrualdemo)
accrual_df<-accrual_create_df(accrualdemo$date,by=accrualdemo$site)
accrual_table(accrual_df)

#format
accrual_table(accrual_df,format_time="%1.1f",format_rrate="%1.1f")

#unit
accrual_table(accrual_df,unit="day")

#common start and current dates
accrual_df<-accrual_create_df(accrualdemo$date,by=accrualdemo$site,start_date="common",
current_date="common")
accrual_table(accrual_df)
accrual_df<-accrual_create_df(accrualdemo$date,by=accrualdemo$site,start_date=as.Date("2020-07-09"),
    current_date=as.Date("2020-10-15"))
accrual_table(accrual_df)
```

---

accrual_time_unit *accrual_time_unit*

Description

Generates summary of recruitment per time unit

Usage

```
accrual_time_unit(accrual_df, unit = c("month", "year", "week", "day"))
```

Arguments

accrual_df	accrual data frame produced by accrual_create_df with by=NA.
unit	time unit for which the bars should be plotted, one of "month", "year", "week" or "day".

Value

Returns a data frame with the number of patients accrued for each time unit.

Examples

```
data(accrualdemo)
accrual_df<-accrual_create_df(accrualdemo$date)
accrual_time_unit(accrual_df,"week")
accrual_time_unit(accrual_df,"day")
```

---

as.data.frame.accrual_list

as.data.frame method for accural_list objects

Description

as.data.frame method for accural_list objects

Usage

```
## S3 method for class 'accrual_list'
as.data.frame(x, ...)
```

Arguments

x	accrual_list
...	for consistency with other as.data.frame methods (not used)

Note

methods from within the package will not work on the output from this function.

Examples

```
data(accrualdemo)
x <- accrual_create_df(accrualdemo$date, accrualdemo$site)
as.data.frame(x)
```

plot.accrual_df *Plot method for accrual data frames produced by* accrual_create_df

Description

Plot method for accrual data frames produced by accrual_create_df

Usage

```
## S3 method for class 'accrual_df'
plot(x, which = "cum", engine = c("base", "ggplot2"), ...)
```

Arguments

x	object of class 'accrual_df' or 'accrual_list' produced by accrual_create_df.
which	one of "cumulative", "absolute" or "predict". Abbreviations are allowed.
engine	string to indicate the plotting engine (base/graphics or ggplot2)
...	options passed to other functions

Value

A plot with cumulative or absolute accrual, or accrual prediction.

See Also

accrual_plot_abs(), accrual_plot_cum() and accrual_plot_predict()

Examples

```
data(accrualdemo)
accrual_df <- accrual_create_df(accrualdemo$date)
plot(accrual_df)
plot(accrual_df, "abs", unit="week")
plot(accrual_df, "pred", target = 300)
plot(accrual_df, "pred", target = 300, engine = "ggplot")
```

print.accrual_df *Print methods for accrual objects*

Description

Print methods for accrual objects

Usage

```
## S3 method for class 'accrual_df'
print(x, head = TRUE, ...)

## S3 method for class 'accrual_list'
print(x, ...)
```

Arguments

x	object of class 'accrual_df' or 'accrual_list' produced by accrual_create_df.
head	show header of the accrual data?
...	arguments passed to head

Value

No return value

Examples

```
data(accrualdemo)
accrual_df<-accrual_create_df(accrualdemo$date)
print(accrual_df)
# only show text
print(accrual_df, head = FALSE)
# show first 15 days
print(accrual_df, n = 15)
```

summary.accrual_df *Summary method for accrual_dfs (as created by accrual_create_df)*

Description

Summary method for accrual_dfs (as created by accrual_create_df)

Usage

```
## S3 method for class 'accrual_df'
summary(object, ...)
```

Arguments

object	object of class 'accrual_df' or 'accrual_list' produced by accrual_create_df.
...	options passed to other functions

Value

Returns data frame with a header, a row per site and overall and the following columns:

name	name of the site (if accrual_df is a list)
start_date	accrual start date
time	time accruing
n	number of patients accrued
rate	accrual rate per time unit

Examples

```
data(accrualdemo)
accrual_df<-accrual_create_df(accrualdemo$date, accrualdemo$site)
summary(accrual_df)
```

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