Package ‘swimplot’

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Title Tools for Creating Swimmers Plots using ‘ggplot2’
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R topics documented:

ClinicalTrial.AE .......................................................... 2
ClinicalTrial.Arm .......................................................... 2
ClinicalTrial.Response .................................................. 3
ClinicalTrial.Stage ....................................................... 3
line_df_to_point_df ..................................................... 4
swimmer_arrows .......................................................... 4
swimmer_lines ............................................................ 6
swimmer_plot ............................................................... 8
swimmer_points .......................................................... 10
swimmer_points_from_lines .......................................... 12
swimmer_text ............................................................. 14
Clinical Trial: Adverse events

Description
A dataset containing the adverse event information from a simulated clinical trial

Usage
ClinicalTrial.AE

Format
A data frame with 11 rows and 6 variables:

- id: Patient id
- time: Time of an adverse event (AE)
- event: Type of adverse event (AE)
- Sex: Patient Sex
- Age: Age of patient at trial entry date
- Related: Likelihood the treatment is related to the adverse event

Clinical Trial: Treatment

Description
A dataset containing the treatment arm information from a simulated clinical trial

Usage
ClinicalTrial.Arm

Format
A data frame with 53 rows and 6 variables:

- id: Patient id
- Arm: Treatment Arm
- End_trt: Time since enrollment to the end of treatment, in months
- Continued_treatment: Continued treatment past end of follow up
- Sex: Patient Sex
- Age: Age of patient at trial entry date
ClinicalTrial.Response

Clinical Trial: Response

Description
A dataset containing the response information from a simulated clinical trial

Usage
ClinicalTrial.Response

Format
A data frame with 36 rows and 7 variables:

- **id**  Patient id
- **Response_start**  Time of starting response, in months since enrollment
- **Response_end**  Time of ending response, in months since enrollment
- **Response**  Type of response, CR = Complete response, and PR = Partial response
- **Continued_response**  Continued response past end of follow up
- **Sex**  Patient Sex
- **Age**  Age of patient at trial entry date

ClinicalTrial.Stage

Clinical Trial: Stage

Description
A dataset containing the Stage information from a simulated clinical trial

Usage
ClinicalTrial.Stage

Format
A data frame with 36 rows and 2 variables:

- **id**  Patient id
- **Stage**  Patients clinical stage at enrollment of the study (either Early Stage or Late Stage)
line_df_to_point_df  *Formats a dataframe of line to add points*

**Description**

This function formats a dataframe; used with `swimmer_lines`.

**Usage**

`line_df_to_point_df(df_lines, start = "start", end = "end", cont = NULL)`

**Arguments**

- `df_lines`: a dataframe
- `start`: start column name
- `end`: end column name
- `cont`: continue column name

**Value**

a dataframe in a format for adding points to a swimmers plot

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swimmer_arrows  *Adding arrows to a swimmers plot*

**Description**

This function allows you to add arrows to a swimmers plot created with `swimmer_plot`.

**Usage**

```r
swimmer_arrows(
  df_arrows,
  id = "id",
  arrow_start = "end",
  cont = NULL,
  adj.y = 0,
  name_col = NULL,
  arrow_positions = c(0.1, 1),
  angle = 30,
  length = 0.1,
  type = "closed",
  ...
)
```
Arguments

- **df_arrows**: a data frame
- **id**: column name for id, default is 'id'
- **arrow_start**: column name with the arrow locations default is "end"
- **cont**: a column name including an indicator of which ids have an arrow (NA is no arrow); when NULL will use all use all of df_arrows
- **adj.y**: amount to adjust the line within the box vertically (default is 0, line is in the centre of each bar)
- **name_col**: a column name to map the arrow colour
- **arrow_positions**: a vector of the distance from the arrow start to end, default is c(0.1,1)
- **angle**: the angle of the arrow head in degrees (smaller numbers produce narrower, pointier arrows). Essentially describes the width of the arrow head. Default is 30
- **length**: a unit specifying the length of the arrow head (from tip to base in inches (default is 0.1))
- **type**: one of "open" or "closed" indicating whether the arrow head should be a closed triangle. Default is 'closed'
- ... additional geom_segment() arguments

Value

a swimmer plot with arrows

See Also

`swimmer_plot swimmer_points swimmer_lines swimmer_lines swimmer_points_from_lines swimmer_text`

Examples

# Mapping the arrows to the bars

```r
swim_plot <-
swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',col="black",id_order = 'Arm')
```

```r
swim_plot_with_arrows <- swim_plot+
swimmer_arrows(df_arrows=ClinicalTrial.Arm,id='id',arrow_start='End_trt',
cont = 'Continued_treatment',name_col='Arm',show.legend = FALSE,type = "open",cex=1.25)
```
swimmer_lines

swim.plot_with_arrows +
ggplot2::scale_color_manual(name="Treatment", values=c("#e41a1c", "#377eb8", "#4daf4a"), drop=FALSE) +
ggplot2::scale_fill_manual(name="Treatment", values=c("#e41a1c", "#377eb8", "#4daf4a")) +
ggplot2::ylab('Time (Days)')

#Mapping the arrows to lines
#Start with a base swimmer plot with lines and points

swim.plot <-
swimmer_plot(df=ClinicalTrial.Arm, id='id', end='End_trt', name_fill='Arm', col="black", id_order = 'Arm') +
swimmer_lines(df_lines=ClinicalTrial.Response, id='id', start = 'Response_start', end='Response_end', name_col='Response', size=3) +
swimmer_points_from_lines(df_lines=ClinicalTrial.Response, id='id', start = 'Response_start', end = 'Response_end', cont = 'Continued_response', name_col='Response', size=4)

# Then add arrows to the plot

swim.plot_with_arrows <- swim.plot +
swimmer_arrows(df_arrows=ClinicalTrial.Response, id='id', arrow_start='Response_end', cont = 'Continued_response', name_col='Response', show.legend = FALSE, type = "open", cex=1.25)

# Add ggplot layers to improve the plot's aesthetic

swim.plot_with_arrows +
ggplot2::scale_color_manual(name="Response", values=c("grey20","grey80")) +
ggplot2::scale_fill_manual(name="Treatment", values=c("#e41a1c", "#377eb8", "#4daf4a")) +
ggplot2::ylab('Time (Days)') +
ggplot2::guides(fill = ggpplot2::guide_legend(override.aes = list(shape = NA))) +
ggplot2::scale_shape_manual(name='', values=c(17,15), breaks = c('Response_start', 'Response_end'), labels=c('Response Start', 'Response End'))
swimmer_lines

Description

This function allows you to add lines to a swimmers plot created with swimmer_plot.

Usage

swimmer_lines(
  df_lines,
  id = "id",
  start = "start",
  end = "end",
  adj.y = 0,
  name_linetype = NULL,
  name_col = NULL,
  name_size = NULL,
  name_alpha = NULL,
  ...
)

Arguments

df_lines | a data frame
id | column name for id, default is ‘id’
start | column name with the line start locations
end | column name with the line end locations
adj.y | amount to adjust the line within the box vertically (default is 0, line is in the centre of each bar)
nname_linetype | a column name to map the line type
name_col | a column name to map the line colour
name_size | a column name to map the line size
name_alpha | a column name to map the line transparency
... | additional geom_segment() arguments

Value

a swimmer plot with lines

See Also

swimmer_plot swimmer_points swimmer_lines swimmer_points_from_lines swimmer_arrows swimmer_text

Examples

#Start with a base swimmer plot
swim_plot <-
swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',col="black",id_order='Arm')

# Then add lines to the plot
swim_plot_with_lines <- swim_plot +
swimmer_lines(df_lines=ClinicalTrial.Response,id='id',start = 'Response_start',end='Response_end',name_col='Response',size=3)

# Add ggplot layers to improve the plot's aesthetic
swim_plot_with_lines +
ggplot2::scale_color_manual(name="Response",values=c("grey20","grey80")) +
ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a")) +
ggplot2::ylab('Time (Days)')

swimmer_plot

Creating the base of a swimmers plot

Description

This function allows you to create swimmers plots with bars, includes options to have the bars change colours and create stratified plots

Usage

swimmer_plot(
  df,
  id = "id",
  end = "end",
  start = "start",
  name_fill = NULL,
  name_col = NULL,
  name_alpha = NULL,
  increasing = TRUE,
  id_order = NULL,
  stratify = FALSE,
  base_size = 11,
  identifiers = TRUE,
  ...
)

Arguments

  df a data frame
  id column name for id, default is 'id'
swimmer_plot

end column name with the bar lengths (or bar end positions if bars change colour), default is 'end'
start column name with the bar start positions (only required when there are gaps between sections of bars, or bars which do not start at zero), default is 'start'
name_fill a column name to map the bar fill
name_col a column name to map the bar colour
name_alpha a column name to map the bar transparency
increasing Binary to specify bars in increasing order (Default is TRUE)
id_order order of the bars by id, can input a column name to sort by, or the ids in order.
stratify a list of column names to stratify by
base_size the base size for the plot, default is 11
identifiers Binary to specify patient identifiers are included in the y axis (default is TRUE)
... additional geom_col() arguments

Value
a swimmer plot with bars

See Also
swimmer_points swimmer_lines swimmer_lines swimmer_points_from_lines swimmer_arrows swimmer_text

Examples

```r
swim_plot <-
swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',col="black",id_order='Arm')
# Add ggplot layers to improve the plot's aesthetic
swim_plot +
  ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a")) +
  ggplot2::ylab('Time (Days)')

#Example with Stratification
swim_plot_stratify <-
swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',
col="black",alpha=0.75,width=.8,base_size = 18,stratify = c('Age','Sex'))
swim_plot_stratify +
  ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a")) +
  ggplot2::ylab('Time (Days)')
```
# Example when there are gaps between the bars and bars do not start at zero

# Both a start and end time need to be specified when there are gaps between sections of bars

Gap_data <- data.frame(patient_ID=c('ID:3','ID:1','ID:1','ID:2',
                                        'ID:2','ID:2','ID:3','ID:3','ID:2'),
                         start=c(10,1,2,7,2,10,14,5,0,22),
                         end=c(20,2,4,10,7,14,22,7,3,26),
                         treatment=c("A","B","C","A","A","C","A","B","C",NA))

swimmer_plot(df=Gap_data,id='patient_ID',name_fill="treatment",col=1,identifiers=FALSE,
              id_order = c("ID:1","ID:2","ID:3")) +
ggplot2::theme_bw()+ggplot2::scale_fill_manual(name="Treatment",
                                              values=c("A"=#e41a1c,"B"=#377eb8,"C"=#4daf4a,na.value=NA),breaks=c("A","B","C")+
ggplot2::scale_y_continuous(breaks=c(0:26))

---

swimmer_points

Adding points to a swimmers plot

Description

This function allows you to add points to a swimmers plot created with `swimmer_plot`.

Usage

```r
swimmer_points(
  df_points,
  id = "id",
  time = "time",
  adj.y = 0,
  name_shape = NULL,
  name_col = NULL,
  name_size = NULL,
  name_fill = NULL,
  name_stroke = NULL,
  name_alpha = NULL,
  ...
)
```

Arguments

- `df_points` a data frame
- `id` column name for id, default is 'id'
- `time` column name with the point locations
- `adj.y` amount to adjust the point within the box vertically (default is 0, point is in the centre of each bar)
name_shape  
a column name to map the point shape
name_col    
a column name to map the point colour
name_size   
a column name to map the point size
name_fill   
a column name to map the point fill
name_stroke 
a column name to map the point stroke
name_alpha  
a column name to map the point transparency
...         
additional geom_point() arguments

Value

a swimmer plot with points

See Also

swimmer_plot swimmer_lines swimmer_lines swimmer_points_from_lines swimmer_arrows
swimmer_text

Examples

#Start with a base swimmer plot
swim_plot <-
swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',col="black",id_order='Arm')

# Then add points to the plot
swim_plot_with_points <- swim_plot + swimmer_points(df_points=
ClinicalTrial.AE,id='id',time='time',name_shape =
'event',size=3,fill='white',col='black')

# Add ggplot layers to improve the plot's aesthetic
swim_plot_with_points + ggplot2::scale_shape_manual(name="Adverse
event",values=c(21,24,17),breaks=c('AE','SAE','Death'))+
ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a"))+
ggplot2::ylab("Time (Days)"

##Another example with the colour and shape mapped to different columns

#Start with a base swimmer plot
swim_plot <-
swimmer_points_from_lines

Adding points to a swimmers plot which match up with lines

Description

This function will create points at the beginning and end of line to match with swimmer_lines.

Usage

swimmer_points_from_lines(
  df_lines,  
  id = "id",  
  start = "start",  
  end = "end",  
  cont = NULL,  
  adj.y = 0,  
  name_shape = "type",  
  name_col = NULL,  
  name_size = NULL,  
  name_fill = NULL,  
  name_stroke = NULL,  
  name_alpha = NULL,  
  ...  
)

Arguments

df_lines a data frame
id column name for id, default is 'id'
start column name where the line starts, default is 'start'
end column name where the line ends, default is 'end'
cont          a column name of which lines continue (NA is does not continue) these will not have a point at the end of the line
adj.y         amount to adjust the point within the box vertically (default is 0, point is in the centre of each bar)
name_shape    a column name to map the point shape
name_col      a column name to map the point colour
name_size     a column name to map the point size
name_fill     a column name to map the point fill
name_stroke   a column name to map the point stroke
name_alpha    a column name to map the point transparency
...           additional geom_point() arguments

Value

A swimmer plot with points matching the lines

See Also

swimmer_plot swimmer_points swimmer_lines swimmer_lines swimmer_arrows swimmer_text

Examples

#Start with a base swimmer plot

swim_plot <- swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',name_fill='Arm',col="black",id_order='Arm')

# Then add lines to the plot

swim_plot_with_lines <- swim_plot +
swimmer_lines(df_lines=ClinicalTrial.Response,id='id',start = 'Response_start',end='Response_end',name_col='Response',size=3)

# Add points to the start and end of the lines

swim_plot_with_lines_and_points <- swim_plot_with_lines +
swimmer_points_from_lines(df_lines=ClinicalTrial.Response,id='id',start = 'Response_start',end = 'Response_end', cont = 'Continued_response',name_col='Response',size=4)

# Add ggplot layers to improve the plot's aesthetic

swim_plot_with_lines_and_points +
ggplot2::scale_color_manual(name="Response",values=c("grey20","grey80")) +
ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c","#377eb8","#4daf4a")) +
Description

This function allows you to add text to a swimmers plot created with `swimmer_plot`.

Usage

```r
swimmer_text(
  df_text,
  id = "id",
  start = "start",
  label = "label",
  name_col = NULL,
  name_size = NULL,
  name_alpha = NULL,
  name_fontface = NULL,
  adj.y = 0,
  adj.x = 0,
  ...)
```

Arguments

- `df_text`: a data frame
- `id`: column name for id, default is 'id'
- `start`: column name with the text start locations (if there is no start column will default 0 for all text)
- `label`: a column with the text to be added to the plot
- `name_col`: a column name to map the text colour
- `name_size`: a column name to map the text size
- `name_alpha`: a column name to map the text transparency
- `name_fontface`: a column name to map the text fontface ("plain", "bold", "italic", "bold.italic" can all be used)
- `adj.y`: amount to adjust the text within the box vertically (default is 0, text is in the centre of each bar)
- `adj.x`: amount to adjust the text within the box horizontally (default is 0, text starts at the origin)
- `...`: additional `geom_text()` arguments
swimmer_text

Value

a swimmer plot with text on the bars

See Also

swimmer_plot swimmer_points swimmer_lines swimmer_points_from_lines swimmer_arrows

Examples

# Start with a base swimmer plot

swim_plot <- 
swimmer_plot(df=ClinicalTrial.Arm,id='id',end='End_trt',
name_fill='Arm',col="black",id_order='Arm',alpha=0.6)

# Then add text to the plot

swim_plot_with_text <- swim_plot + swimmer_text(df_text =
ClinicalTrial.Stage,label = 'Stage',size=3,
fontface=ifelse(ClinicalTrial.Stage$Stage=="Early Stage","bold","plain"))

# Add ggplot layers to improve the plot's aesthetic

swim_plot_with_text +
ggplot2::scale_fill_manual(name="Treatment",values=c("#e41a1c", "#377eb8","#4daf4a")+
ggplot2::ylab('Time (Days)')
Index

* datasets
  ClinicalTrial.AE, 2
  ClinicalTrial.Arm, 2
  ClinicalTrial.Response, 3
  ClinicalTrial.Stage, 3

ClinicalTrial.AE, 2
ClinicalTrial.Arm, 2
ClinicalTrial.Response, 3
ClinicalTrial.Stage, 3

line_df_to_point_df, 4

swimmer_arrows, 4, 7, 9, 11, 13, 15
swimmer_lines, 4, 5, 6, 7, 9, 11–13, 15
swimmer_plot, 4, 5, 7, 8, 10, 11, 13–15
swimmer_points, 5, 7, 9, 10, 13, 15
swimmer_points_from_lines, 5, 7, 9, 11, 12, 15
swimmer_text, 5, 7, 9, 11, 13, 14