Package ‘survRM2’

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Title Comparing Restricted Mean Survival Time
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Depends survival
Description Performs two-sample comparisons using the restricted mean survival time (RMST) as a summary measure of the survival time distribution. Three kinds of between-group contrast metrics (i.e., the difference in RMST, the ratio of RMST and the ratio of the restricted mean time lost (RMTL)) are computed. It performs an ANCOVA-type covariate adjustment as well as unadjusted analyses for those measures.
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Description

Performs two-sample comparisons using the restricted mean survival time (RMST) as a summary measure of the survival time distribution. Three kinds of between-group contrast metrics (i.e., the difference in RMST, the ratio of RMST and the ratio of the restricted mean time lost (RMTL)) are computed. The package has a function to perform an ANCOVA-type covariate adjustment as well as unadjusted analyses for those measures.

Author(s)

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References


Tian L, Zhao L, Wei LJ. Predicting the restricted mean event time with the subject’s baseline covariates in survival analysis. Biostatistics 2014, 15, 222-233.

See Also

survival

Examples

```r
#--- sample data ---#
D=rmst2.sample.data()
time=D$time
status=D$status
arm=D$arm
tau=NULL
x=D[,c(4,6,7)]

#--- without covariates ----
a=rmst2(time, status, arm, tau=10)
print(a)
plot(a, xlab="Years", ylab="Probability", density=60)

#--- with covariates ----
a=rmst2(time, status, arm, tau=10, covariates=x)
print(a)
```
Description

S3 method for class 'rmst2'

Usage

## S3 method for class 'rmst2'
plot(
  x,
  xlab = "",
  ylab = "",
  col = "red",
  col.RMST = "pink",
  col.RMTL = "orange",
  density = 80,
  angle = 85,
  ...
)

Arguments

- `x`: Results of the unadjusted analyses.
- `xlab`: x label.
- `ylab`: y label.
- `col`: Color for line. Default is red.
- `col.RMST`: Color for areas of RMST. Default is pink.
- `col.RMTL`: Color for areas of RMTL. Default is orange.
- `density`: Density of shading lines, in lines per inch. Default is 80.
- `angle`: Slope of shading lines, given as an angle in degrees (counter-clockwise). Default is 85.
- `...`: Further arguments ignored in this function.

Value

returns a plot
print.rmst2

Description
S3 method for class 'rmst2'

Usage
## S3 method for class 'rmst2'
print(x, digits = 3, ...)

Arguments
x Object to be printed.
digits Integer indicating the number of decimal places.
... Further arguments ignored in this function.

Value
returns summary output for class 'rmst2'

---

rmst2

Comparing restricted mean survival time

Description
Performs two-sample comparisons using the restricted mean survival time (RMST) as a summary measure of the survival time distribution. Three kinds of between-group contrast metrics (i.e., the difference in RMST, the ratio of RMST and the ratio of the restricted mean time lost (RMTL)) are computed. The Greenwood plug-in estimator is used for the asymptotic variance. It performs ANCOVA-type adjusted analyses when covariates are passed to it as an argument.

Usage
rmst2(time, status, arm, tau = NULL, covariates = NULL, alpha = 0.05)

Arguments
time The follow-up time for right censored data.
status The status indicator, 1=event, and 0=right censored.
arm The group indicator for comparison. The elements of this vector take either 1 or 0. Normally, 0=control group, 1=active treatment group.
\textbf{tau} \hspace{1cm} A scaler value to specify the truncation time point for the RMST calculation. \tau needs to be smaller than the minimum of the largest observed time in each of the two groups. When \texttt{tau = NULL}, the default value (i.e., the minimum of the largest observed time in each of the two groups) is used.

\textbf{covariates} \hspace{1cm} This specifies covariates to be used for the adjusted analyses. When NULL, unadjusted analyses are performed. When non NULL, the ANCOVA-type adjusted analyses are performed using those variables passed as covariates. This can be one variable (vector) or more than one variables (matrix).

\textbf{alpha} \hspace{1cm} The default is 0.05. (1-\alpha) confidence intervals are reported.

\textbf{Details}

For more details, please see the package vignette: \texttt{browseVignettes(package = "survRM2")}

\textbf{Value}

an object of class \texttt{rmst2}.

\begin{itemize}
\item \texttt{tau} \hspace{1cm} the truncation time used in the analyses
\item \texttt{note} \hspace{1cm} a note regarding the truncation time
\item \texttt{RMST.arm1} \hspace{1cm} RMST results in arm 1. This is generated only when \texttt{covariates} is not specified.
\item \texttt{RMST.arm0} \hspace{1cm} RMST results in arm 0. This is generated only when \texttt{covariates} is not specified.
\item \texttt{unadjusted.result} \hspace{1cm} Results of the unadjusted analyses. This is generated only when \texttt{covariates} is not specified.
\end{itemize}

The values below are generated when some covariates are passed to the function.

\begin{itemize}
\item \texttt{adjusted.result} \hspace{1cm} Results of the adjusted analyses.
\item \texttt{RMST.difference.adjusted} \hspace{1cm} Results of the parameter estimates with the model to derive an adjusted difference in RMST.
\item \texttt{RMST.ratio.adjusted} \hspace{1cm} Results of the parameter estimates with the model to derive an adjusted ratio of RMST.
\item \texttt{RMTL.ratio.adjusted} \hspace{1cm} Results of the parameter estimates with the model to derive an adjusted ratio of RMTL.
\end{itemize}

\textbf{Author(s)}

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Examples

```r
#--- sample data ---#
D=rmst2.sample.data()
time=D$time
status=D$status
arm=D$arm
tau=NULL
x=D[,c(4,6,7)]

#--- without covariates ----
a=rmst2(time, status, arm, tau=10)
print(a)
plot(a, xlab="Years", ylab="Probability", density=60)

#--- with covariates ----
a=rmst2(time, status, arm, tau=10, covariates=x)
print(a)
```

---
rmst2.sample.data  Generate a sample data from the pbc data
---

Description
This is a function to retrieve 312 randomized patients from the pbc data.

Usage

```r
rmst2.sample.data(t.unit="year")
```

Arguments

t.unit Specify the time unit. It supports "year" (default), "month", and "day".

Details
The function creates a sample dataset to illustrate the usage of the function `rmst2()` in this package. The original pbc data in the `survival` package consists of 418 patients data. This function loads the pbc data, select the 312 patients who were randomized. The status variable is edited, so that 1 indicates death and 0 indicates alive.
Value
returns a data frame

See Also
pbc in survival package

Examples
D=rmst2.sample.data()
head(D)
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