Package ‘PBRF’

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Type Package

Title The Probability of Being in Response Function and Its Variance Estimates

Version 1.0.0

Date 2018-09-22

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Description Provides three ways to estimate the probability of being in response function (PBRF) The estimates are presented in Tsai, Luo and Crowley (2017) <doi: 10.1007/978-981-10-0126-0_10>.

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`PBRF-package` *The Probability of Being in Response Function and Its Variance Estimates*

Description

Provides three ways to estimate the probability of being in response function (PBRF) The estimates are presented in Tsai, Luo and Crowley (2017) <doi: 10.1007/978-981-10-0126-0_10>.

Details

The DESCRIPTION file:

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                        and Its Variance Estimates
pbf2                    prob being in response function
```

Author(s)

NA

Maintainer: Xiaodong Luo <xiaodong.luo@sanofi.com>

References

Tsai W.Y., Luo X., Crowley J. (2017) The Probability of Being in Response Function and Its Applications. In: Matsui S., Crowley J. (eds) Frontiers of Biostatistical Methods and Applications in Clinical Oncology. Springer, Singapore. <doi: https://doi.org/10.1007/978-981-10-0126-0_10>.

`pbf2` *prob being in response function*

Description

Calculate the probability of being in response function (PBRF) and the variances

Usage

```
pbf2(y1,y2,d1,d2,times=y2[order(y2)])
```

Arguments

`y1`	a numeric vector of event times denoting the minimum of event times T_1, T_2 and censoring time C, where T_2 corresponds to the event time, T_1 corresponds to the response time.
`y2`	a numeric vector of event times denoting the minimum of event time T_2 and censoring time C. Clearly, y2 is not smaller than y1.
`d1`	a numeric vector of event indicators with 1 denoting the response is observed and 0 denoting otherwise.
`d2`	a numeric vector of event indicators with 1 denoting the event is observed and 0 denoting otherwise.
`times`	a numeric vector of timepoints at which we want to estimate the PBRF

Details

There three methods to estimate PBRF: the subtraction, the division and the Semi-Markov methods are presented in Tsai et al. (2017). There are two sub-methods for division and the Semi-Markov methods when the censoring distrbution is estimated in two different ways (looking at y1=min(T_1,T_2,C) and at y2=min(T_2,C)). So there are 5 methods in total reported. Method 1: division and based on y1; Method 2: division and based on y2; Method 3: Semi-Markov and based on y1; Method 4: Semi-Markov and based on y2; Method 5: subtraction. The methods based on y2 perform better than the corresponding ones based on y1.

Value

`pbrf`	The estimates at each timepoints (row) and by methods 1-5 (column)
`vpbrf`	The variance estimates at each timepoints (row) and by methods 1-5 (column)

Author(s)

Xiaodong Luo

References

Tsai W.Y., Luo X., Crowley J. (2017) The Probability of Being in Response Function and Its Applications. In: Matsui S., Crowley J. (eds) Frontiers of Biostatistical Methods and Applications in Clinical Oncology. Springer, Singapore. <doi: 10.1007/978-981-10-0126-0_10>.

Examples

```
n<-300
rho<-0.5
lambda10<-0.1;lambda20<-0.08;lambdac0<-0.09
lam1<-rep(0,n);lam2<-rep(0,n);lamc<-rep(0,n)
z<-rep(0,n)
z[1:(n/2)]<-1
lam1<-lambda10
lam2<-lambda20
lamc<-lambdac0
tem<-matrix(0,ncol=3,nrow=n)

y2y<-matrix(0,nrow=n,ncol=3)
y2y[,1]<-rnorm(n);y2y[,3]<-rnorm(n)
y2y[,2]<-rho*y2y[,1]+sqrt(1-rho^2)*y2y[,3]
tem[,1]<--log(1-pnorm(y2y[,1]))/lam1
tem[,2]<--log(1-pnorm(y2y[,2]))/lam2
tem[,3]<--log(1-runif(n))/lamc

y1<-apply(tem,1,min)
y2<-apply(tem[,2:3],1,min)
d1<-as.numeric(tem[,1]<=y1)
d2<-as.numeric(tem[,2]<=y2)
btemp<-pbf2(y1,y2,d1,d2,times=c(1,3,5))
btemp
```

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