Package 'OSsurvival'

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Title Assessing Surrogacy with a Censored Outcome

Version 1.0

Description Identifies the optimal transformation of a surrogate marker and estimates the proportion of treatment explained (PTE) by the optimally-transformed surrogate at an earlier time point when the primary outcome of interest is a censored time-to-event outcome; details are described in Wang et al (2021) <doi:10.1002/sim.9185>.

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Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

Depends R (>= 2.10)

Suggests testthat, stats

NeedsCompilation no

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data.example *Simulated data for the example.*

Description

Simulated data for the example.

Usage

```
data.example
```

Format

A data list with 5 elements:

t.0 time at which the surrogate is measured

t time at which the primary outcome is measured

xob observed survival time

s.ob surrogate information at t.0

deltaob event indicator

aob treatment indicator

pte.survival *Estimates the proportion of treatment effect explained*

Description

Estimates the proportion of treatment effect explained by the optimally transformed surrogate

Usage

```
pte.survival(xob, s.ob, deltaob, aob, t, t.0, varind = 0, re = 100)
```

Arguments

xob	observed survival time
s.ob	surrogate information at time t.0
deltaob	event indicator
aob	treatment indicator
t	time at which the primary outcome is measured
t.0	time at which the surrogate is measured
varind	whether to estimate variance (yes=0, no=1)
re	number of replications for resampling, if varind=0

Value

A list of the following:

pte.est	The estimated proportion of treatment effect explained (PTE) by the optimally transformed surrogate
pte.ese	Standard error estimate for the PTE, provided if var.ind=0
g1.est	Estimated g1
g1.ese	Standard error estimate for ge, provided if var.ind = 0
sgrid	Grid used for the surrogate marker, equally spaced
gs.est	Estimated g(s), optimal transformation of s, for the sgrid
gs.ese	Standard error estimate for g(s), provided if var.ind = 0

Examples

```
# load the data
data("sysdata")

# time at which the surrogate is measured
t.0 = data.example$t.0

# time at which the primary outcome is measured
t = data.example$t

# observed survival time
xob = data.example$data$xob

# surrogate information at t.0
s.ob = data.example$data$s.ob

# event indicator
deltaob = data.example$data$deltaob

# treatment indicator
aob = data.example$data$aob

# main estimation function
# varind: whether to estimate variance; re:number of replications for resampling
out = pte.survival(xob, s.ob, deltaob, aob, t, t.0, varind=0, re=100)

# estimated PTE
out$pte.est

# estimated g1
out$g1.est

# estimated g2(s) at equally spaced s point
plot(out$sgrid, out$gs.est, type="l", xlab = "Surrogate Marker", ylab = "Optimal Transformation")
#The PTE result indicates that this is a moderate to high surrogate marker in this setting.
```

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