Package 'hettest'

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Type Package

Title Testing for a Treatment Effect Using a Heterogeneous Surrogate Marker

Version 1.0

Description
Tests for a treatment effect using surrogate marker information accounting for heterogeneity in the utility of the surrogate. Details are described in Parast et al (2022) <arXiv:2209.08315>.

License GPL

Imports stats

NeedsCompilation no

Author Layla Parast [aut, cre]

Maintainer Layla Parast <parast@austin.utexas.edu>

Depends R (>= 3.5.0)

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R topics documented:

`delta.e.estimate` *Tests for a treatment effect on the primary outcome using surrogate marker information, ignoring potential heterogeneity*

Description

Nonparametric test for a treatment effect on the primary outcome using surrogate marker information, ignoring potential heterogeneity. This test borrows information from a prior study about the relationship between the surrogate and the primary outcome to test for a treatment effect in the current study.

Usage

```
delta.e.estimate(sone = NULL, szero = NULL, szerop, yzerop, extrapolate = TRUE,
mat = NULL, n1 = NULL, n0 = NULL)
```

Arguments

sone	surrogate marker in the treated group in the current study
szero	surrogate marker in the control group in the current study
szerop	surrogate marker in the control group in the prior study
yzerop	primary outcome in the control group in the prior study
extrapolate	TRUE or FALSE; extrapolate for values outside of the support in the prior study
mat	for the current study, the user can either provide sone and szero or can provide a vector, mat, where the first n1 values are the surrogate marker in the treated group in the current study, and the remaining values are the surrogate marker in the control group in the current study
n1	sample size of treated group in the current study; only needed if mat is provided instead of sone and szero
n0	sample size of control group in the current study; only needed if mat is provided instead of sone and szero

Value

delta.e	estimated treatment effect using surrogate marker information
sd.e	estimated standard error of treatment effect estimate
test.statistic.e	test statistic for treatment effect
p.value.e	p-value for test statistic

Author(s)

Layla Parast

References

Parast, Cai, and Tian (2022+). Using a Surrogate with Heterogeneous Utility to Test for a Treatment Effect.

Examples

```
data(example.data)
delta.e.estimate(sone = example.data$s1, szero = example.data$s0, szerop = example.data$s0.p,
yzerop = example.data$y0.p)
```

`delta.h.estimate` *Tests for a treatment effect on the primary outcome using surrogate marker information, accounting for heterogeneity*

Description

Nonparametric test for a treatment effect on the primary outcome using surrogate marker information, accounting for heterogeneity in the utility of the surrogate. This test borrows information from a prior study about the relationship between the surrogate and the primary outcome and the baseline covariate to test for a treatment effect in the current study.

Usage

```
delta.h.estimate(sone = NULL, szero = NULL, wone = NULL, wzero = NULL, szerop,
wzerop, yzerop, extrapolate = TRUE, mat = NULL, n1 = NULL, n0 = NULL)
```

Arguments

`sone`	surrogate marker in the treated group in the current study
`szero`	surrogate marker in the control group in the current study
`wone`	baseline covariate in the treated group in the current study
`wzero`	baseline covariate in the control group in the current study
`szerop`	surrogate marker in the control group in the prior study
`wzerop`	baseline covariate in the control group in the prior study
`yzerop`	primary outcome in the control group in the prior study
`extrapolate`	TRUE or FALSE; extrapolate for values outside of the support in the prior study
`mat`	for the current study, the user can either provide sone, szero, wone, wzero or can provide a vector, mat, where the first n1 values are the surrogate marker in the treated group in the current study, the second n0 values are the surrogate marker in the control group in the current study, the next n1 values are the baseline covariate in the treated group in the current study, the next n0 values are the baseline covariate in the control group in the current study
`n1`	sample size of treated group in the current study; only needed if mat is provided instead of sone, szero, wone, wzero
`n0`	sample size of control group in the current study; only needed if mat is provided instead of sone, szero, wone, wzero

Value

delta.h	estimated treatment effect using surrogate marker information, account for heterogeneity
sd.h	estimated standard error of treatment effect estimate
test.statistic.h	test statistic for treatment effect
p.value.h	p-value for test statistic

Author(s)

Layla Parast

References

Parast, Cai, and Tian (2022+). Using a Surrogate with Heterogeneous Utility to Test for a Treatment Effect.

Examples

```
data(example.data)

delta.h.estimate(sone = example.data$s1, szero = example.data$s0, wone = example.data$w1,
 wzero = example.data$w0, szerop = example.data$s0.p, wzerop = example.data$w0.p,
 yzerop = example.data$y0.p)

#reducing dimension of example data to provide a computationally faster example
delta.h.estimate(sone = example.data$s1[1:100], szero = example.data$s0[1:100], wone =
 example.data$w1[1:100], wzero = example.data$w0[1:100], szerop =
 example.data$s0.p[1:100], wzerop = example.data$w0.p[1:100], yzerop =
 example.data$y0.p[1:100])
```

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example.data *Example data*

Description

Example data

Usage

```
data("example.data")
```

Format

A list with 9 elements:

- `w0.p` the baseline covariate in the control group in the prior study
- `s0.p` the surrogate marker in the control group in the prior study
- `y0.p` the primary outcome in the control group in the prior study
- `w1` the baseline covariate in the treatment group in the current study
- `w0` the baseline covariate in the control group in the current study
- `s1` the surrogate marker in the treatment group in the current study
- `s0` the surrogate marker in the control group in the current study
- `y1` the primary outcome in the treatment group in the current study
- `y0` the primary outcome in the control group in the current study

Examples

```
data(example.data)
names(example.data)
```

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