Package ‘condGEE’

October 12, 2022

Version 0.2.0

Date 2022-05-23

Title Parameter Estimation in Conditional GEE for Recurrent Event Gap Times

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Imports numDeriv, rootSolve, stats

Suggests testthat, withr, knitr, rmarkdown

Description Solves for the mean parameters, the variance parameter, and their asymptotic variance in a conditional GEE for recurrent event gap times, as described by Clement and Strawderman (2009) in the journal Biostatistics. Makes a parametric assumption for the length of the censored gap time.

License GPL (>= 2)

RoxygenNote 7.2.0

VignetteBuilder knitr

NeedsCompilation no

Repository CRAN

Date/Publication 2022-05-23 23:00:02 UTC

R topics documented:

asthma — *Asthma recurrence in children*

Description

This data set gives the start and stop times of recurrent asthma events in children. It also provides a subject ID, treatment indicator, censoring indicator, number of events per subject and a first event indicator.

Format

A data frame with 1037 rows and 7 columns. See asthma.txt header for details.

Source

http://www.blackwellpublishing.com/rss/

References

Duchateau et al. *JRSSC* 2003. Volume 52, 355–363.

condGEE — *condGEE*

Description

Solves for the mean parameters ($theta$), the variance parameter (σ^2), and their asymptotic variance in a conditional GEE for recurrent event gap times, as described by Clement, D. Y. and Strawderman, R. L. (2009)

Usage

```
condGEE(
  data,
  start,
  mu.fn = MU,
  mu.d = MU.d,
  var.fn = V,
  k1 = K1.norm,
  k2 = K2.norm,
  robust = TRUE,
  asymp.var = TRUE,
  maxiter = 100,
  rtol = 1e-06,
  atol = 1e-08,
  ctol = 1e-08,
  useFortran = TRUE
)
```

Arguments

`data`	matrix of data with one row for each gap time; the first column should be a subject ID, the second column the gap time, the third column a completeness indicator equal to 1 if the gap time is complete and 0 if the gap time is censored, and the remaining columns the covariates for use in the mean and variance functions
`start`	vector containing initial guesses for the unknown parameter vector
`mu.fn`	the specification for the mean of the gap time; the default is a linear combination of the covariates; the function should take two arguments (`theta`, and a matrix of covariates with each row corresponding to one gap time) and it should return a vector of means
`mu.d`	the derivative of `mu.fn` with respect to the parameter vector; the default corresponds to a linear mean function
`var.fn`	the specification for V^2, where the variance of the gap time is $\sigma^2 V^2$; the default is a vector of ones; the function should take two arguments ($theta$, and a matrix of covariates with each row corresponding to one gap time) and it should return a vector of variances
`k1`	the function to solve for the conditional mean length of the censored gap times; its sole argument should be the vector of standardized (i.e.\ $(Y - \mu)/(\sigma V)$) censored gap times; the default assumes the standardized censored gap times follow a standard normal distribution, but `K1.t3` and `K1.exp` are also provided in the package - they assume a standardized *t* with 3 degrees of freedom and an exponential with mean 0 and variance 1 respectively
`k2`	the function to solve for the conditional mean length of the square of the censored gap times; its sole argument should be the vector of standardized (i.e.\ $(Y - \mu)/(\sigma V)$) censored gap times; the default assumes the standardized censored gap times follow a standard normal distribution, but `K2.t3` and `K2.exp` are also provided in the package - they assume a standardized *t* with 3 degrees of freedom and an exponential with mean 0 and variance 1 respectively
`robust`	logical, if `FALSE`, the mean and variance parameters are solved for simultaneously, increasing efficiency, but decreasing the leeway to misguess `start` and still find the root of the GEE
`asymp.var`	logical, if `FALSE`, the function returns `NULL` for the asymptotic variance matrix
`maxiter`	see `multiroot`; maximal number of iterations allowed
`rtol`	see `multiroot`; relative error tolerance
`atol`	see `multiroot`; absolute error tolerance
`ctol`	see `multiroot`; if between two iterations, the maximal change in the variable values is less than this amount, then it is assumed that the root is found
`useFortran`	see `multiroot`; logical, if `FALSE`, then an R implementation of Newton-Raphson is used

Value

conditional expectation

Author(s)

David Clement

`K1.exp` *K1.exp*

Description

`E(Y|Y>w)` where Y is exponential dist with mean 0 and variance 1

Usage

```
K1.exp(w)
```

Arguments

`w`	real value

Value

conditional expectation

Author(s)

David Clement

`K1.norm` *K1.norm*

Description

`E(Y|Y>w)` where Y is normal

Usage

```
K1.norm(w)
```

Arguments

`w`	real value

Value

conditional expectation

Author(s)

David Clement

K1.t3 *K1.t3*

Description

E(Y|Y>w) where Y is t dist with 3 df

Usage

```
K1.t3(w)
```

Arguments

w	real value

Value

conditional expectation

Author(s)

David Clement

K2.exp *K2.exp*

Description

E(Y^2|Y>w) where Y is exponential dist with mean 0 and variance 1

Usage

```
K2.exp(w)
```

Arguments

w	real value

Value

conditional expectation

Author(s)

David Clement

`K2.norm` *K2.norm*

Description

`E(Y^2|Y>w)` where Y is normal

Usage

```
K2.norm(w)
```

Arguments

`w`	real value

Value

conditional expectation

Author(s)

David Clement

`K2.t3` *K2.t3*

Description

`E(Y^2|Y>w)` where Y is t dist with 3 df

Usage

```
K2.t3(w)
```

Arguments

`w`	real value

Value

conditional expectation

Author(s)

David Clement

Index