Package ‘tsriadditive’

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Title Two Stage Residual Inclusion Additive Hazards Estimator

Version 1.0.0

Description Additive hazards models with two stage residual inclusion method are fitted under either survival data or competing risks data. The estimator incorporates an instrumental variable and therefore can recover causal estimand in the presence of unmeasured confounding under some assumptions. A. Ying, R. Xu and J. Murphy. (2019) <doi:10.1002/sim.8071>.

Depends R (>= 3.5.0)

Imports survival

License LGPL (>= 2)

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plot.tsriadditive  

Plotting Predicted Survival Function or Cumulative Incidence Function with Pointwise Confidence Intervals

Description

The function will plot the predicted survival function when fitting a survival model and the predicted cumulative incidence function when fitting a competing risks model. Corresponding pointwise confidence intervals at level alpha are also included.

Usage

```r
## S3 method for class 'tsriadditive'
plot(x, newtreatment = NULL, newIV = NULL,
     newcovariates = NULL, alpha = 0.05, unit = "", ...)  
```

Arguments

- `x`: the fitting object after fitting our model
- `newtreatment`: a new treatment value
- `newIV`: a new instrumental variable value
- `newcovariates`: a new observed covariates
- `alpha`: the confidence level $1 - \alpha$ for confidence interval
- `unit`: the time unit we focus
- `...`: the other arguments you want to put in the built-in plot function

Value

No return value, called for side effects

Examples

```r
survtime <- rexp(100)  
cause <- rbinom(100, 1, 0.7)  
treatment <- rbinom(100, 1, 0.5)  
IV <- rnorm(100)  
covariates <- rnorm(100)  
fit <- tsriadditive(survtime, cause, treatment, IV, covariates)  
plot(fit, 1, 0, 0)
```
predict.tsriadditive

Predict method for Additive Hazards Model with Two Stage Residual Inclusion Method Fits

Description

Predicted values based on tsriadditive object.

Usage

## S3 method for class 'tsriadditive'
predict(object, newtreatment = NULL,
         newIV = NULL, newcovariates = NULL, ...)

Arguments

object     an object of class "tsriadditive", usually, a result of a call to tsriadditive.
newtreatment a new treatment value.
newIV       a new instrumental variable value.
newcovariates a new observed covariates.
...         further arguments passed to or from other methods.

Value

predict.tsriadditive produces a vector of predictions based on new values. A list with the following components is returned:

- newobsz the vector grouping newtreatment, new IV and newcovariates
- score_pred the predicted scores
- hazard_pred the predicted baseline hazards function
- survival_pred the predicted survival function

Examples

```r
survtime <- rexp(100)
cause <- rbinom(100, 1, 0.7)
treatment <- rbinom(100, 1, 0.5)
IV <- rnorm(100)
covariates <- rnorm(100)
fit <- tsriadditive(survtime, cause, treatment, IV, covariates)
predict(fit, 1, 0, 0)
```
summary.tsriadditive  

Summarizing Additive Hazards Model with Two Stage Residual Inclusion Method Fits

Description

summary method for class "tsriadditive".

Usage

## S3 method for class 'tsriadditive'
summary(object, ...)

## S3 method for class 'summary.tsriadditive'
print(x, ...)

Arguments

object an object of class "tsriadditive", usually, a result of a call to tsriadditive.

... further arguments passed to or from other methods.

x an object of class "summary.tsriadditive", usually, a result of a call to summary.tsriadditive.

Value

print.summary.lm tries to be smart about formatting coefficients, an estimated variance covariance matrix of the coefficients, Z-values and the corresponding P-values

Examples

survtime <- rexp(100)
cause <- rbinom(100, 1, 0.7)
treatment <- rbinom(100, 1, 0.5)
IV <- rnorm(100)
covariates <- rnorm(100)
fit <- tsriadditive(survtime, cause, treatment, IV, covariates)
summary(fit)
Description

tskiadditive is used to fit additive hazards models with two stage residual inclusion method.

Usage

tskiadditive(survtme, cause = NULL, treatment = NULL, IV = NULL, covariates = NULL)

Arguments

survtme the event time
cause the indicator records the cause. Default to all one. Zero means right censoring. Greater than or equal to two means other cause.
treatment the treatment variable, can be null
IV the instrumental variable
covariates all the observed confounders

Value

tskiadditive returns an object of class "tskiadditive". An object of class "tskiadditive" is a list containing the following components:

coef an estimate of the coefficients
baseline an estimate of the baseline hazards function
vcov an estimate of the variance covariance matrix of coef
byprod a byproduct, that will used by other functions

References


Examples

survtme <- rexp(100)
cause <- rbinom(100, 1, 0.7)
treatment <- rbinom(100, 1, 0.5)
IV <- rnorm(100)
covariates <- rnorm(100)
fit <- tskiadditive(survtme, cause, treatment, IV, covariates)
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