Package ‘PScr’

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Type Package

Title Estimation for the Power Series Cure Rate Model

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Description Provide estimation for particular cases of the power series cure rate model
<doi:10.1080/03610918.2011.639971>. For the distribution of the concurrent causes the
alternative models are the Poisson, logarithmic, negative binomial and Bernoulli (which
are included in the original work) and the polylogarithm model
<doi:10.1080/00949655.2018.1451850>. The estimation procedure is based on the EM algorithm
For the distribution of the time-to-event the alternative models are slash half-normal,
Weibull, gamma and Birnbaum-Saunders distributions.

Depends R (>= 4.0.0), stats

Imports nlme, gtools, LambertW, survival, pracma, mstate, VGAM

License GPL (>= 2)

NeedsCompilation no

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EM.PScr

Maximum likelihood estimation based on EM algorithm for the Power Series cure rate model

Description

This function provides the maximum likelihood estimation based on the EM algorithm for the Power Series cure rate model

Usage

EM.PScr(t, delta, z, model = 1, dist = 1, max.iter = 1000, prec = 1e-04)

Arguments

t observed times
delta failure indicators
z matrix of covariates (with n rows and r columns)
model distribution to be used for the concurrent causes: 1 for Poisson, 2 for logarithmic, 3 for negative binomial, 4 for bernoulli and 5 for polylogarithm (Gallardo et al. 2018).
dist distribution to be used for the time-to-event: 1 for slash half-normal (Gallardo et al., 2022), 2 for Weibull, 3 for gamma and 4 for Birnbaum-Saunders.
max.iter maximum number of iterations to be used by the algorithm
prec precision (in absolute value) for the parameters to stop the algorithm.

Details

The EM algorithm for the model is implemented as in Gallardo et al. (2017).

Value

estimate a matrix containing the estimated parameters and their standard error
loglike the estimated log-likelihood function evaluated in the maximum likelihood estimators
AIC the Akaike information criterion
BIC the Bayesian (also known as Schwarz) information criterion

Author(s)

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EM.PScr

References


Examples

```r
require(mstate)
data(ebmt4)
attach(ebmt4)
t = srv / 365.25 # Time in years
delta=srv.s
prophy=as.factor(proph)
year2=ifelse(year=="1985-1989",0,1)
z=t(model.matrix(~proph-1))
#Computes the estimation for Poisson-Slash half-normal cure rate model
EM.PScr(t, delta, z, model=1, dist=1)
```
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