

# Package ‘PTCMGH’

November 27, 2025

**Type** Package

**Title** Promotion Time Cure Models with several hazard structures

**Version** 0.1.0

**Description** Simulation and maximum likelihood estimation of Promotion Time Cure Models

**License** What license is it under?

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 7.3.3

## Contents

PTCMMLE . . . . .	<a href="#">1</a>
simPTCMGH . . . . .	<a href="#">2</a>

<b>Index</b>	<a href="#">4</a>
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PTCMMLE	<i>different hazard-based regression structures (baseline, AFT, AH, PH, GH)</i>
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## Description

different hazard-based regression structures (baseline, AFT, AH, PH, GH)

## Usage

```
PTCMMLE(  
  init,  
  times,  
  status,  
  hstr = NULL,  
  dist = NULL,  
  des_theta = NULL,  
  des_t = NULL,  
  des_h = NULL,  
  des = NULL,  
  method = "Nelder-Mead",  
  maxit = 100  
)
```

**Arguments**

<code>init</code>	: initial point for optimisation step under the parameterisation ( $\log(\text{scale})$ , $\log(\text{shape1})$ , $\log(\text{shape2})$ , $\alpha$ , $\eta$ , $\beta$ ) for scale-shape1-shape2 models or ( $\mu$ , $\log(\text{scale})$ , $\alpha$ , $\eta$ , $\beta$ ) for log-location scale models.
<code>times</code>	: times to event
<code>status</code>	: vital status indicators (TRUE or 1 = observed, FALSE or 0 = censored)
<code>hstr</code>	: hazard structure: No covariates ("baseline"), Accelerated Failure Time ("AFT"), Proportional Hazards ("PH"), Accelerated Hazards ("AH"), General Hazards ("GH") *GH is not available with Weibull "dist"
<code>dist</code>	: distribution for the baseline hazard: Power Generalised Weibull ("PGW"), Generalised Gamma ("GenGamma"), Exponentiated Weibull ("EW"), Weibull ("Weibull"), Gamma ("Gamma"), LogNormal ("LogNormal"), LogLogistic ("LogLogistic")
<code>des_theta</code>	: Design matrix for cure proportion parameter
<code>des_t</code>	: Design matrix for time-level effects (GH)
<code>des_h</code>	: Design matrix for hazard level effects (GH)
<code>des</code>	: Design matrix for AFT, AH, and PH models
<code>method</code>	: "nlminb" or optimisation method to be used in optim (see ?optim)
<code>maxit</code>	: maximum number of iterations in optim or nlminb

**Value**

It returns the output from optim or nlminb for the selected model and the negative log likelihood function

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simPTCMGH	<i>simPTCMGH function: simulates from a promotion-time cure model with different hazard-based regression structures (baseline, AFT, AH, PH, GH)</i>
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**Description**

simPTCMGH function: simulates from a promotion-time cure model with different hazard-based regression structures (baseline, AFT, AH, PH, GH)

**Usage**

```
simPTCMGH(
  n,
  seed = 123,
  hstr = NULL,
  dist = NULL,
  des_theta = NULL,
  des_t = NULL,
  des_h = NULL,
  des = NULL,
  par_base = NULL,
```

```

    alpha0 = NULL,
    alpha = NULL,
    beta_t = NULL,
    beta_h = NULL,
    beta = NULL
  )

```

### Arguments

n	: sample size (number of individuals)
seed	: seed for simulation
hstr	: hazard structure (baseline, AFT, AH, PH, GH)
dist	: baseline hazard distribution
des_theta	: Design matrix for cure proportion parameter
des_t	: Design matrix for time-level effects (GH)
des_h	: Design matrix for hazard level effects (GH)
des	: Design matrix for AFT, AH, and PH models
par_base	: parameters of the baseline hazard
alpha	: parameters of the regression model on the cure proportion parameter
beta_t	: regression parameters multiplying the time scale for GH model
beta_h	: regression parameters multiplying the hazard for GH model
beta	: regression parameters for AFT, PH, and AH models

### Value

a vector containing the simulated times to event

# Index

PTCMMLE, [1](#)

simPTCMGH, [2](#)