Package 'spatialSPsurv'

August 19, 2020

Type Package

Title Bayesian Spatial Split Population Survival Model

Version 0.1.4

Description Contains functions to fit Bayesian spatial survival model for split population.

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Encoding UTF-8

LazyData true

Depends R (>= 3.6.0)

RoxygenNote 7.1.0

LinkingTo Rcpp,
RcppArmadillo

Imports MCMCpack,
FastGP,
stats,
Rcpp,
RcppArmadillo,
coda,
dplyr,
reshape2

R topics documented:

capdist *Gleditsch and Ward Distance data*

Description

Gleditsch and Ward Distance data

Usage

```
data(capdist)
```

Format

A data frame with 41006 rows and 6 variables

Details

numa ...

ida ...

numb ...

idb ...

kmdist ...

midist ...

Source

...

exchangeSPsurv *exchangeSPsurv*

Description

Markov Chain Monte Carlo (MCMC) to run Bayesian split population survival model with exchangeable frailties

Usage

```
exchangeSPsurv(
  duration,
  immune,
  Y0,
  LY,
  S,
  data,
  N,
  burn,
  thin,
```

```
  w = c(1, 1, 1),
  m = 10,
  form = c("Weibull", "exponential", "loglog"),
  prop.var
)
```

Arguments

duration	survival stage equation written in a formula of the form Y ~ X1 + X2 + ... where Y is duration until failure or censoring
immune	split stage equation written in a formula of the form C ~ Z1 + Z2 + ... where C is a binary indicator of immunity
Y0	the elapsed time since inception until the beginning of time period (t-1)
LY	last observation year (coded as 1; 0 otherwise) due to censoring or failure
S	spatial information (e.g. district ID) for each observation that matches the spatial matrix row/column information
data	dataframe
N	number of MCMC iterations
burn	burn-in to be discarded
thin	thinning to prevent from autocorrelation
w	size of the slice in the slice sampling for (betas, gammas, rho). Write it as a vector. E.g. c(1,1,1)
m	limit on steps in the slice sampling. A vector of values for beta, gamma, rho.
form	type of parametric model (Weibull, Exponential or Log-Logistic)
prop.var	Proposed variance for Metropolis-Hastings

Value

chain of the variables of interest

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pooledSPsurv *SPsurv*

Description

Markov Chain Monte Carlo (MCMC) to run Bayesian split population survival model with no frailties

Usage

```
pooledSPsurv(
  duration,
  immune,
  Y0,
  LY,
  data,
  N,
  burn,
```

```
  thin,
  w = c(1, 1, 1),
  m = 10,
  form = c("Weibull", "exponential", "loglog")
)
```

Arguments

duration	survival stage equation written in a formula of the form Y ~ X1 + X2 + ... where Y is duration until failure or censoring
immune	split stage equation written in a formula of the form C ~ Z1 + Z2 + ... where C is a binary indicator of immunity
Y0	the elapsed time since inception until the beginning of time period (t-1)
LY	last observation year (coded as 1; 0 otherwise) due to censoring or failure
data	dataframe
N	number of MCMC iterations
burn	burn-in to be discarded
thin	thinning to prevent from autocorrelation
w	size of the slice in the slice sampling for (betas, gammas, rho). Write it as a vector. E.g. c(1,1,1)
m	limit on steps in the slice sampling. A vector of values for beta, gamma, rho.
form	type of parametric model (Exponential, Weibull or Log-Logistic)

Value

chain of the variables of interest

`spatialSPsurv` *spatialSPsurv*

Description

Markov Chain Monte Carlo (MCMC) to run time-varying Bayesian split population survival model with spatial frailties

Usage

```
spatialSPsurv(
  duration,
  immune,
  Y0,
  LY,
  S,
  A,
  data,
  N,
  burn,
  thin,
```

```
  w = c(1, 1, 1),
  m = 10,
  form = c("Weibull", "exponential", "loglog"),
  prop.var
)
```

Arguments

duration	survival stage equation written in a formula of the form Y ~ X1 + X2 + ... where Y is duration until failure or censoring
immune	split stage equation written in a formula of the form C ~ Z1 + Z2 + ... where C is a binary indicator of immunity
Y0	the elapsed time since inception until the beginning of time period (t-1)
LY	last observation year (coded as 1; 0 otherwise) due to censoring or failure
S	spatial information (e.g. district ID) for each observation that matches the spatial matrix row/column information
A	an a times a spatial weights matrix where a is the number of unique spatial units (S) load as a separate file
data	dataframe
N	number of MCMC iterations
burn	burn-in to be discarded
thin	thinning to prevent from autocorrelation
w	size of the slice in the slice sampling for (betas, gammas, rho). Write it as a vector. E.g. c(1,1,1)
m	limit on steps in the slice sampling. A vector of values for beta, gamma, rho.
form	type of parametric model (Exponential, Weibull or Log-Logistic)
prop.var	proposal variance for Metropolis-Hastings

Value

chain of the variables of interest

---

spatial_SA *spatial_SA*

Description

matrix A and sp_id (S)

Usage

```
spatial_SA(data, var_ccode, threshold = 800L)
```

Arguments

data	data.frame.
var_ccode	name of the variable that contains the country codes.
threshold	...

Value

list. Contains database with variable sp_id (S) and matrix A

`SPstats` *SPstats*

Description

A function to calculate the deviance information criterion (DIC) and Log-likelihood for fitted model oupts of pooled, exchangeable, and spatial Split Population survival models for which a log-likelihood can be obtained, according to the formula *DIC = -2 * (L - P)*, where *L* is the log likelihood of the data given the posterior means of the parameter and *P* is the estimate of the effective number of parameters in the model.

Usage

```
SPstats(object)
```

Arguments

`object`	An object of the output of pooled, exchangeable, or spatial Split Population survival model .

Value

List.

`Walter_2015_JCR` *Walter_2015_JCR*

Description

Time-series-cross-sectional (TSCS) dataset extracted from Walter (2015). It has data on duration of civil war as well as information on other relevant economic and political data. Authors of this package later added the following variables: duration, cured, t.0, lastyear, S and A.

Usage

```
data(Walter_2015_JCR)
```

Format

A data frame with 1562 rows and 13 variables

Details

duration duration until failure or censoring.

immune binary indicator of immunity.

fhcompor1 Freedom House civil liberties index.

lgdpl log of per capita GDP in 2005 dollars.

comprehensive combatants signed comprehensive peace agreement.

victory end of previous war with outright victory.

instabl dummy that indicates whether there was a positive or negative change in the Polity 2 score in the previous country-year.

intensityln deaths per year – logged.

ethfrac index of ethnic fractionalization.

unpko number of UN peacekeepers on the ground.

t.0 duration of peace spell.

lastyear year of last country observation in dataset.

sp_id country unique id.

A time-invariant binary adjacency matrix

Source

Walter, Barbara F. (2015), Why Bad Governance Leads to Repeat Civil War, Journal of Conflict Resolution 59(7), 1242 - 1272.

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