

Package: modMStates (via r-universe)

October 4, 2026

Type Package

Title What the Package Does (Title Case)

Version 0.1.0

Description More about what it does (maybe more than one line).
Continuation lines should be indented.

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Encoding UTF-8

LazyData true

Imports msm

RoxygenNote 7.3.3

URL <https://github.com/infinitebstats/modMStates>

BugReports <https://github.com/infinitebstats/modMStates/issues>

Repository <https://infinitebstats.r-universe.dev>

Date/Publication 2026-03-30 16:21:32 UTC

RemoteUrl <https://github.com/infinitebstats/modmstates>

RemoteRef HEAD

RemoteSha b1e7fa184da0c93467c87f9e2a1dc88eab24307c

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fit.msm

*Fit a Continuous-Time Multi-State Model***Description**

A unified interface to fit predefined continuous-time Markov multi-state models using the **msm** package. The function selects an appropriate model structure based on the specified process type and returns key inferential results including transition intensities, sojourn times, and transition probability matrices.

Usage

```
fit.msm(data, process, state, subject, time, t = 4)
```

Arguments

data	A data frame containing the multi-state panel data.
process	Character string specifying the MSM structure. One of: "two_state", "recurrent", "illness_death3", "illness_death4", "reversible_id", "competing_risks", "complex".
state	Character string. Name of the state variable in data.
subject	Character string. Name of the subject identifier in data.
time	Character string. Name of the time variable in data.
t	Numeric. Time point at which transition probabilities are computed (default 4).

Details

The following process types map to predefined intensity matrix structures:

```
"two_state" 1 -> 2 (absorbing).
"recurrent" 1 <-> 2 (reversible).
"illness_death3" 1 -> 2, 1 -> 3, 2 -> 3; state 3 absorbing.
"illness_death4" 1 -> 2 -> 3 -> 4; state 4 absorbing.
"reversible_id" 1 <-> 2, 1 -> 3, 2 -> 3; state 3 absorbing.
"competing_risks" 1 -> 2, 1 -> 3; states 2 and 3 absorbing.
"complex" 1 <-> 2, 1 -> 3, 1 -> 4, 2 -> 3, 2 -> 4; states 3 and 4 absorbing.
```

Value

An object of class "msm_results", which is a named list with the following components:

fit Summary of the fitted msm model object.
state_table Observed transition frequency table.
qmatrix Estimated transition intensity matrix with confidence intervals.
sojourn Estimated mean sojourn times in each transient state.
pmatrix Transition probability matrix at time t.

See Also

[sim.mspdata](#) for simulating multi-state data, [msm](#) for the underlying model fitting engine.

Examples

```
dat <- sim.mspdata(process = "two_state", n = 200, t = 10)
res <- fit.msm(
  data      = dat,
  process   = "two_state",
  state     = "state",
  subject   = "subject",
  time      = "time",
  t         = 4
)
res$qmatrix
res$sojourn
res$pmatrix
```

sim.mspdata

*Simulate Multi-State Model Data***Description**

A unified interface to simulate data from different continuous-time Markov multi-state processes using predefined MSM structures. Data are generated using [simmulti.msm](#) from the **msm** package.

Usage

```
sim.mspdata(process, n, t)
```

Arguments

process	Character string specifying the MSM type. One of: "two_state", "recurrent", "illness_death_3state", "illness_death_4state", "reversible_illness_death", "competing_risks", "complex".
n	Integer. Number of subjects to simulate.
t	Numeric. Maximum follow-up time (observations are generated at integer times from 0 to t).

Details

The following process structures are available:

"two_state" Simple failure process: state 1 (alive) to state 2 (failure, absorbing).

"recurrent" Recurrent event process: individuals move between state 1 (no event) and state 2 (event) repeatedly.

"illness_death_3state" Three-state illness-death model: healthy, ill, and death (absorbing). Transitions from healthy to ill, healthy to death, and ill to death.

"illness_death_4state" Four-state illness-death model: healthy, mild illness, severe illness, and death (absorbing).

"reversible_illness_death" Reversible illness-death model: healthy and ill states are reversible, with death as absorbing.

"competing_risks" Competing risks process: state 1 (event-free) with two absorbing failure states.

"complex" Complex hybrid model combining recurrent illness, competing risks, and illness-dependent mortality.

Value

A data frame containing simulated multi-state panel data with columns `subject`, `time`, and `state`. Additional attributes `"process"`, `"n"`, and `"t"` record the simulation parameters.

See Also

[fit.msm](#) for fitting multi-state models to the simulated data.

Examples

```
sim <- sim.msdata(process = "two_state", n = 200, t = 10)
head(sim)

sim2 <- sim.msdata(process = "recurrent", n = 150, t = 10)
head(sim2)
```

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