Package: malariaEquilibrium (via r-universe)

May 22, 2026

Type Package

Title Return equilibrium solution to malaria transmission model

Version 1.0.1

Description Often we are interested in the state of a given malaria transmission model at equibrium. However, some models (e.g. the Griffin et al. 2014 model) are quite complex, and can result in equilibrium solutions that are fairly in-depth. In these situations it is useful to have a ``canonical'' equilibrium solution that is tried and tested, and can be used reliably by multiple users. This package aims to be a place for hosting these canonical solutions, and for storing useful tests, checks and plotting functions for exploring a given solution.

License MIT + file LICENSE

Encoding UTF-8

LazyData true

RoxygenNote 7.0.2

BugReports https://github.com/mrc-ide/malariaEquilibrium/issues

Imports statmod, magrittr

Repository https://mrc-ide.r-universe.dev

Date/Publication 2022-01-12 17:05:32 UTC

RemoteUrl https://github.com/mrc-ide/malariaEquilibrium

RemoteRef master

RemoteSha c929c1c2e3de47e5995d4bd5ea6c7b39f48f128c

Contents

`gq_normal` *Gaussian quadrature of normal density*

Description

Return node values and weights from Gaussian quadrature of normal distribution with n nodes.

Usage

```
gq_normal(n)
```

Arguments

`n`	number of nodes

`human_equilibrium` *Equilibrium solution*

Description

Returns the equilibrium states for the model of Griffin et al. (2014). A derivation of the equilibrium solutions can be found in Griffin (2016). Integrates over the distribution of biting heterogeneity using Gaussian quadrature.

Usage

```
human_equilibrium(EIR, ft, p, age, h = gq_normal(10))
```

Arguments

`EIR`	EIR for adults, in units of infectious bites per person per year
`ft`	proportion of clinical cases effectively treated
`p`	vector of model parameters
`age`	vector of age groups, in units of years
`h`	a list of Gauss-Hermite nodes and associated weights, used for integrating over heterogeneity in biting. See `?gq_normal` for an example.

References

Griffin et. al. (2014). Estimates of the changing age-burden of Plasmodium falciparum malaria disease in sub-Saharan Africa. doi:10.1038/ncomms4136

Griffin (2016). Is a reproduction number of one a threshold for Plasmodium falciparum malaria elimination? doi:10.1186/s12936-016-1437-9 (see supplementary material)

human_equilibrium_no_het

Equilibrium solution without biting heterogeneity

Description

Returns the equilibrium states for the model of Griffin et al. (2014). A derivation of the equilibrium solutions can be found in Griffin (2016).

This function does not account for biting heterogeneity - see `human_equilibrium()` for function that takes this into account.

Usage

```
human_equilibrium_no_het(EIR, ft, p, age)
```

Arguments

`EIR`	EIR for adults, in units of infectious bites per person per year
`ft`	proportion of clinical cases effectively treated
`p`	vector of model parameters
`age`	vector of age groups, in units of years

References

Griffin et. al. (2014). Estimates of the changing age-burden of Plasmodium falciparum malaria disease in sub-Saharan Africa. doi:10.1038/ncomms4136

Griffin (2016). Is a reproduction number of one a threshold for Plasmodium falciparum malaria elimination? doi:10.1186/s12936-016-1437-9 (see supplementary material)

load_parameter_set *Laod a Parameter Set from File*

Description

Parameter sets are stored within the package inst/extdata folder. Load one of these sets by name.

Usage

```
load_parameter_set(file_name = "Jamie_parameters.rds")
```

Arguments

`file_name`	the name of a parameter set within the inst/extdata folder.

malariaEq_file *Load sytem file for this package*

Description

Load and return file from within the inst folder of this package.

Usage

```
malariaEq_file(name)
```

Arguments

name	name of file

malariaEquilibrium *malariaEquilibrium*

Description

Often we are interested in the state of a given malaria transmission model at equibrium. However, some models (e.g. the Griffin et al. 2014 model) are quite complex, and can result in equilibrium solutions that are fairly in-depth. In these situations it is useful to have a "canonical" equilibrium solution that is tried and tested, and can be used reliably by multiple users. This package aims to be a place for hosting these canonical solutions, and for storing useful tests, checks and plotting functions for exploring a given solution.

Index