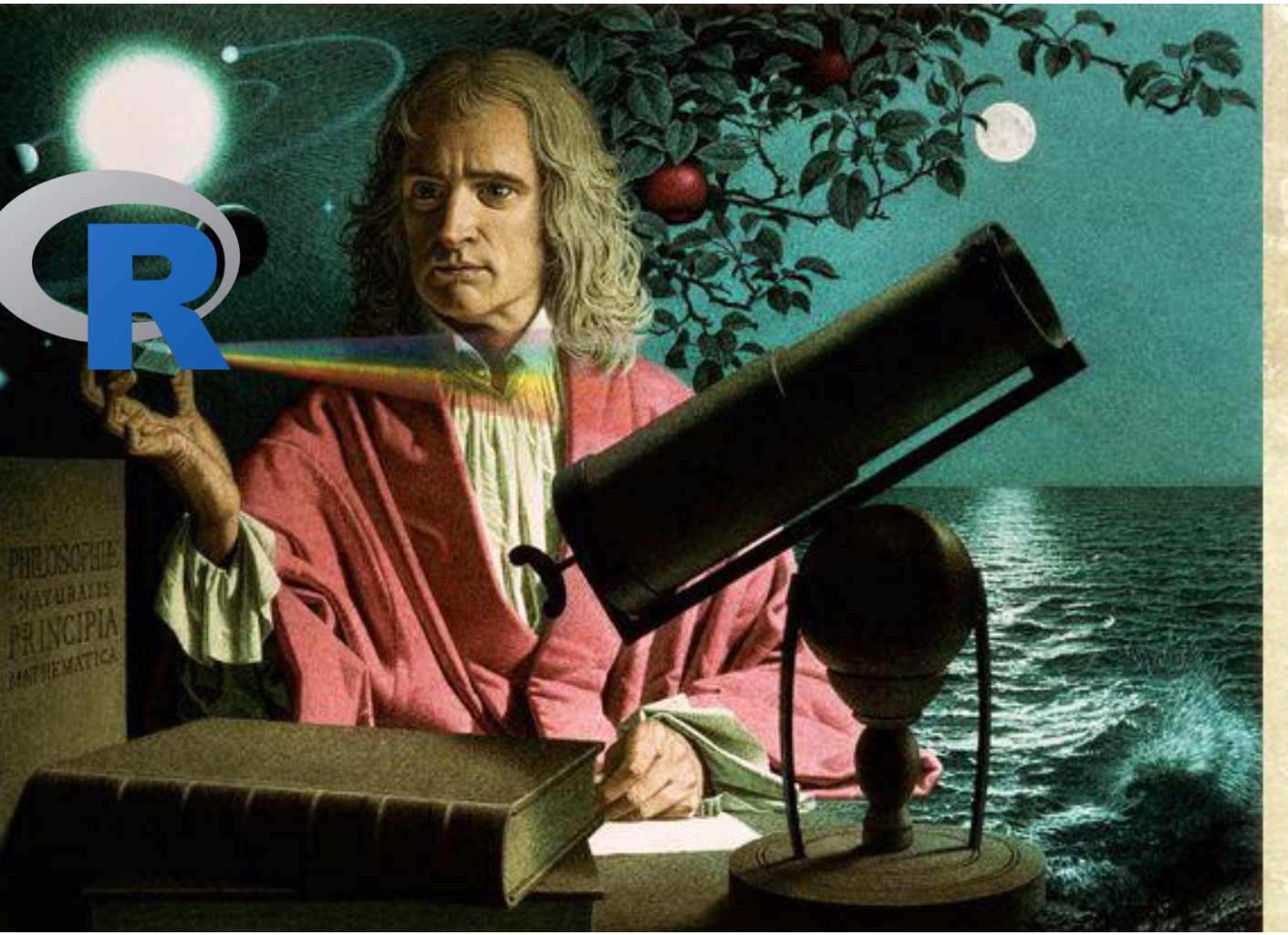


"If I have seen further than others, it is by standing upon the shoulders of giants."

Sir Isaac Newton

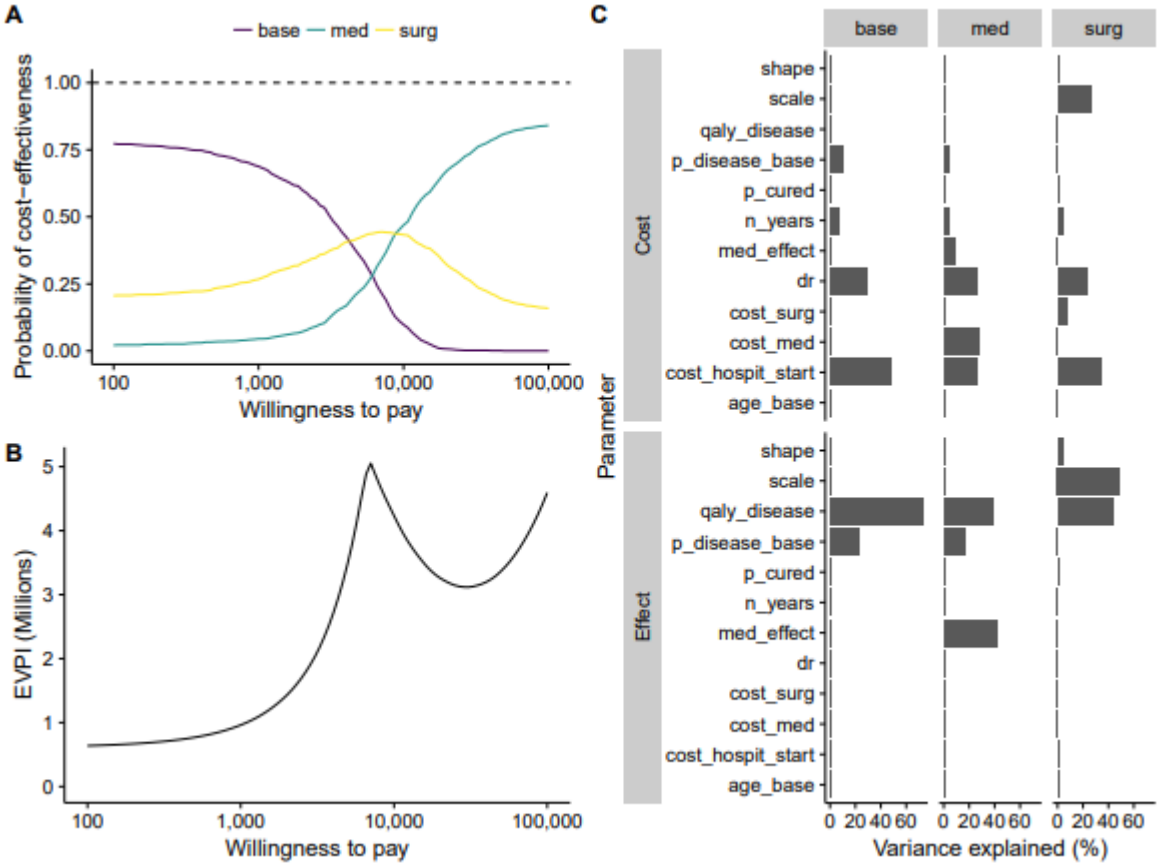
heemod - Health Ecomomic Evaluation MODelling

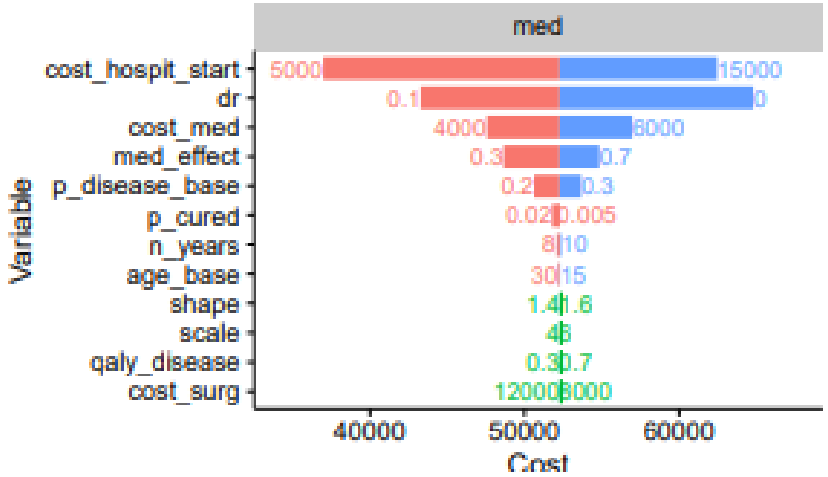
"an R package for Markov models implementing most of the modelling and reporting features described in reference textbooks and guidelines: deterministic and probabilistic sensitivity analysis, heterogeneity analysis, time dependency on state-time and model-time (semi-Markov and non-homogeneous Markov models), etc"

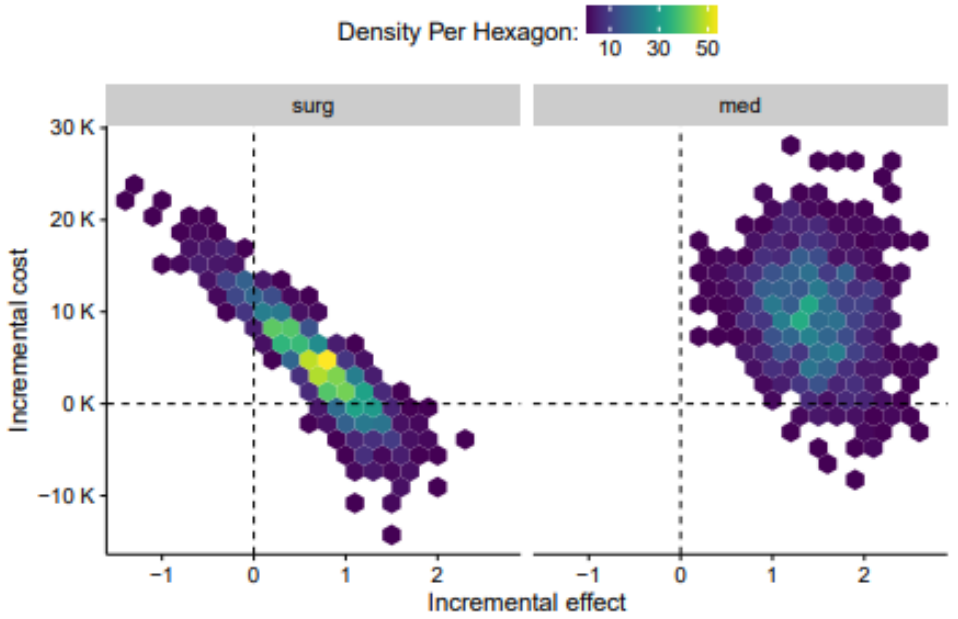
- **Markov Models for Health Economic Evaluations: The R Package heemod (2017)** Antoine Filipović-Pierucci, Kevin Zarca, Isabelle Durand-Zaleski, arXiv

- Main features:
- Accounting for time-dependency:
  - For both model time and state time.
  - Time-varying transition probabilities.
  - Time-varying values attached to states.
- Probabilistic uncertainty analysis (PSA).
  - With correlated resampling.
  - Covariance analysis for PSA.
  - Expected value of perfect information (EVPI).
- Deterministic sensitivity analysis (DSA).
- Other features:
- Multiple state membership correction methods (life-table, custom method, etc.).
- Demographic analysis to compute population-level results.
- Heterogeneity analysis.
- Parallel computing support.
- Features for budget impact analysis.
- Interface with SAVI and BCEA.

Plotting


A
base
med
surg
Probability of cost−effectiveness
1.00
0.75
0.50
0.25
0.00
100
1,000
10,000
100,000
Willingness to pay
B
EVPI (Millions)
5
4
3
2
1
0
100
1,000
10,000
100,000
Willingness to pay
C
base
med
surg
Parameter
Cost
Effect
shape
scale
qaly_disease
p_disease_base
p_cured
n_years
med_effect
dr
cost_surg
cost_med
cost_hospit_start
age_base
0 20 40 60
Variance explained (%)


med
Variable
cost_hospit_start
dr
cost_med
med_effect
p_disease_base
p_cured
n_years
age_base
shape
scale
qaly_disease
cost_surg
5000
15000
0.1
0
4000
8000
0.3
0.7
0.2
0.3
0.02
0.005
8
10
30
15
1.4
1.6
4
8
0.3
0.7
12000
8000
40000
50000
60000
Cost


Density Per Hexagon:
10
30
50
surg
med
Incremental cost
30 K
20 K
10 K
0 K
−10 K
−1
0
1
2
Incremental effect

heemod: Markov Models for Health Economic Evaluations

An implementation of the modelling and reporting features described in reference t
Modelling for Health Economic Evaluation. Oxford Univ. Press, 2011; Siebert, U. e
690-700 (2012).): deterministic and probabilistic sensitivity analysis, heterogeneity
Markov and non-homogeneous Markov models), etc.

Version:	0.11.0
Depends:	R (≥ 3.3.0)
Imports:	dplyr (≥ 0.7.2), ggplot2 (≥ 2.2.0), lazyeval (≥ 0.2.0), memoise (≥ 1.3.0), rlang (≥ 0.3)
Suggests:	BCEA, diagram, flexsurv, knitr, logitnorm, lpSolve, mgcv, opti testthat, triangle, magrittr
Published:	2019-10-22
Author:	Kevin Zarca [aut, cre], Antoine Filipovic-Pierucci [aut], Matth Jordan Amdahl [ctb], Yonatan Carranza Alarcon [ctb], Vince D
Maintainer:	Kevin Zarca <kevin.zarca at gmail.com>
BugReports:	https://github.com/pierucci/heemod/issues
License:	GPL (≥ 3)
NeedsCompilation:	no
Citation:	heemod citation info
Materials:	README NEWS
CRAN checks:	heemod results

Downloads:

Reference manual:	heemod.pdf
Vignettes:	An Introduction to heemod Time-varying values Simple Markov Models (Homogeneous) Time-varying Markov Models (Non-Homogeneous) Probabilistic Uncertainty Analysis Deterministic Sensitivity Analysis Heterogeneity & Demographic Analysis Tabular Input Reproducing Exact Results from DMHEE Survival models Calibrating heemod models