

# Créer des packages sous R

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Déjeuner R

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# Glossaire

- **Package**: An extension of the R base system with code, data and documentation in standardized format.
- **Library**: A directory containing installed packages.
- **Repository**: A website providing packages for installation (e.g. CRAN, github)
- **Source**: The original version of a package with human-readable text and code.
- **Binary**: A compiled version of a package with computer-readable text and code, may work only on a specific platform.
- **Base packages**: Part of the R source tree, maintained by R Core.
- **Recommended packages**: Part of every R installation, but not necessarily maintained by R Core.
- **Contributed packages**: All the rest. This does not mean that these packages are necessarily of lesser quality than the above, e.g., many contributed packages on CRAN are written and maintained by R Core members. We simply try to keep the base distribution as lean as possible.

# Plan

1. Pourquoi créer un package?
2. Contenu d'un package
3. Roxygen
4. Petite démonstration

# Pourquoi un package?

## *Le principe*

“Because R is programmable, it permits users to develop software for their own use. The package system encourages them then to share this software with others and, to a limited extent, facilitates recognition for software development. This process allows R to grow in a natural, organic manner.”

[Fox 2009](#)

# Pourquoi un package?

*Motivations personnelles (entre autres)*

- Conserver des fonctions de manière sûre
- Publier des fonctions => reproductibilité
- Gratuit
- Peuvent être activés ou non
- Mises à jour automatisées
- Inclut des exemples
- .zip => non-testé et distribué «manuellement»
- CRAN => testé et disponible pour tous

# Pourquoi un package?

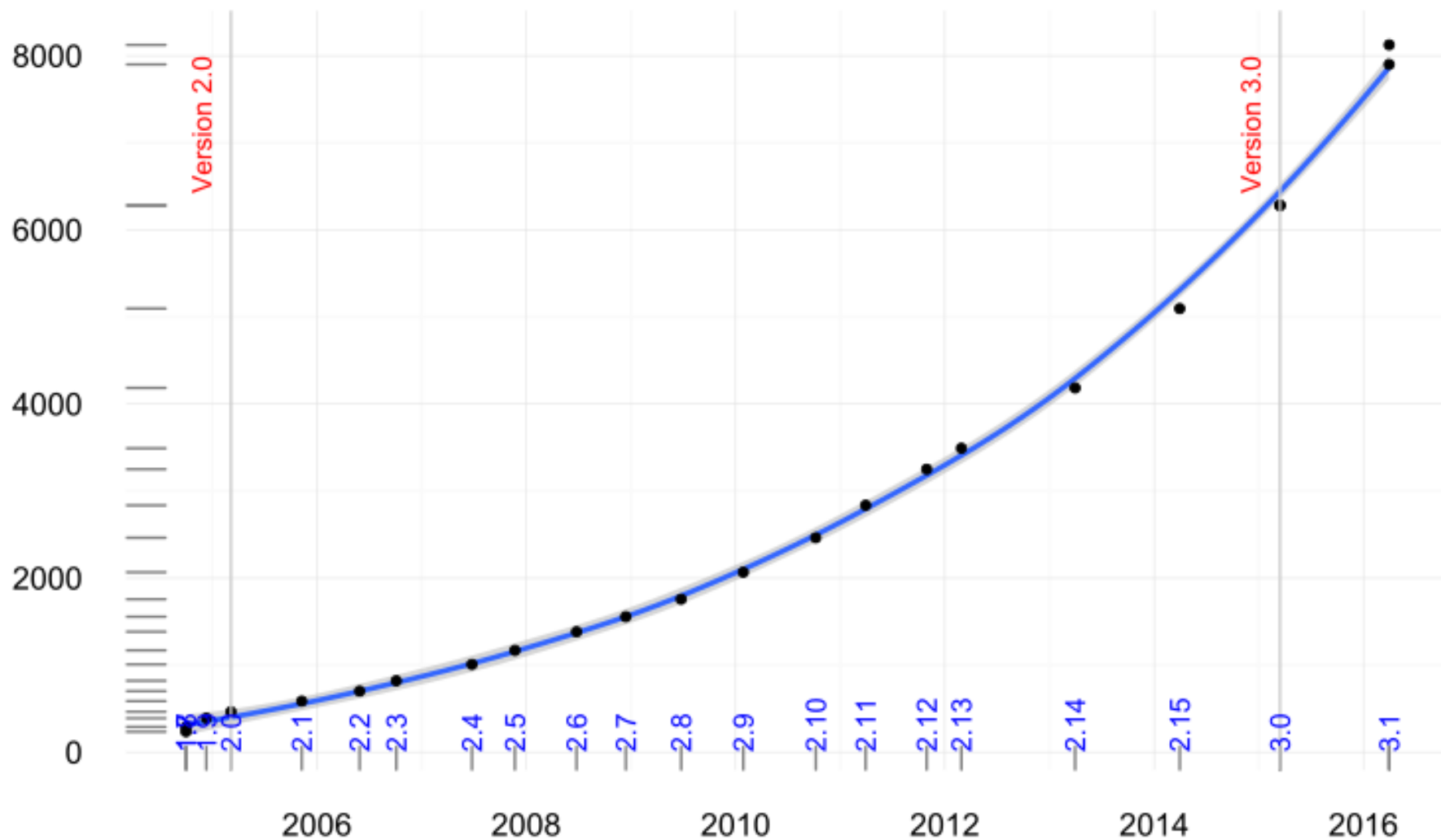
## *Motivations pour le projet R*

“The package system also serves at least partly to circumvent disputes that might otherwise fracture the R Project.”

“The package system provides a variety of integrative functions, including quality control; enforcement of standards; provision of a common documentation format (...)”

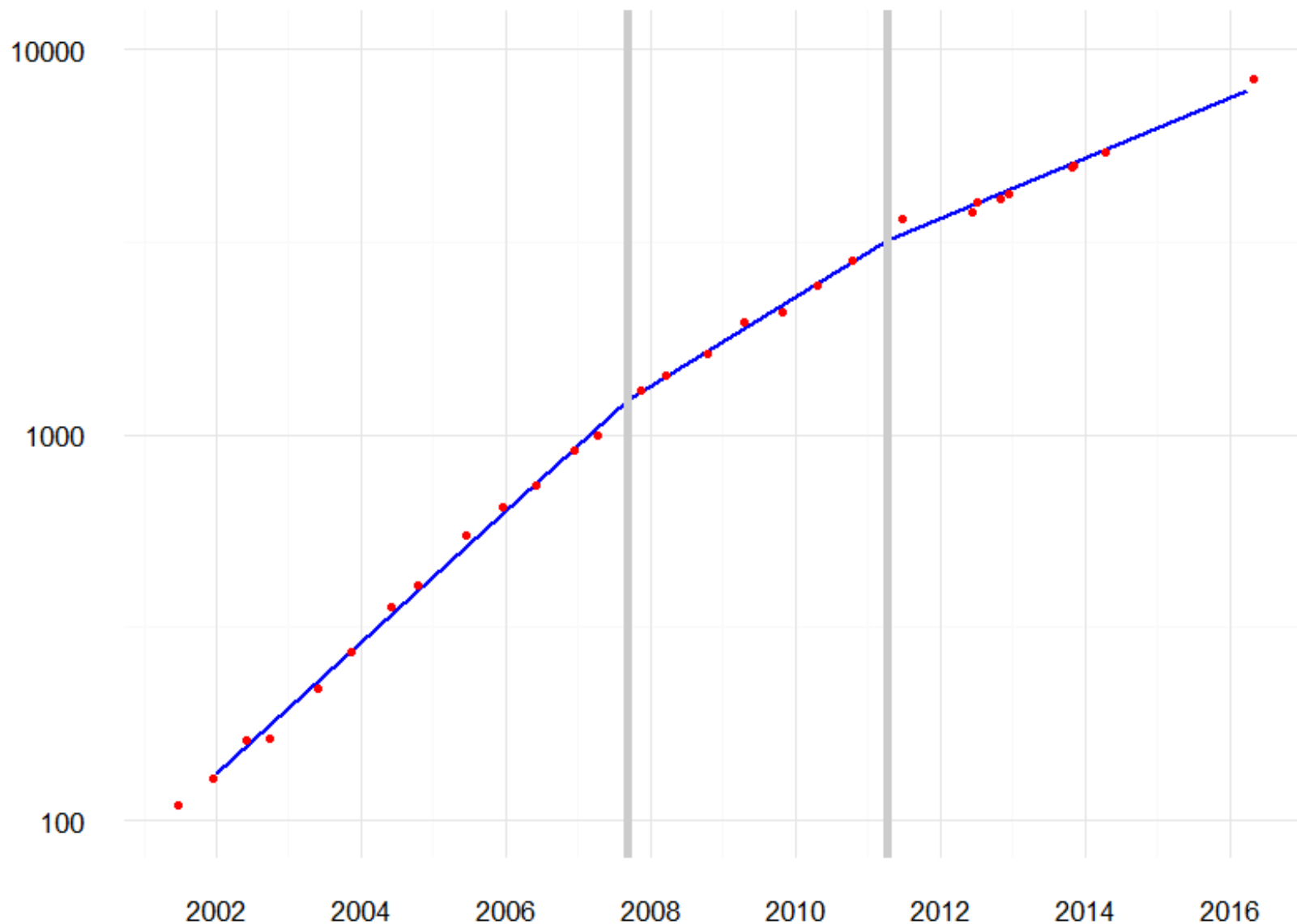
[Fox 2009](#)

## Number of CRAN packages per R version



[Andrie de Vries, 2016](#)

## CRAN packages - segmented model with 2 break points



[Andrie de Vries, 2016](#)



# Contenu

Package MASS: [binary](#) / [source](#)

- data => données intégrées au package
- inst => autres (divers)
- man => aide pour le package lui-même
- po
- R => code (fonctions)
- src => C++ / Fortran /...
- tests => validation
- Description => «carte de visite» du package
- Index
- Licence
- MD5
- Namespace => déclare les dépendances, classes, méthodes,...
- Vignettes => manuels de l'utilisateur (libre)

# Roxygen

- Pourquoi tout faire à la main?
- Rstudio & Roxygen génèrent automatiquement
  - Les fichiers de code (R)
  - Les fichiers d'aide (man)
  - Le fichier Namespace
- Ne reste plus qu'à ajouter (si nécessaire)
  - Les données (data)
  - Les manuels d'utilisateurs (vignettes)

# Roxygen

## MortHump

```
#' @title Isolate the young adult mortality hump from a set of age-specific mortality rates
#'
#' @description This function estimates a model of mortality on the provided set of age-specific death rates. Both parametric and
non-parametric models are available.
#' They are all designed to estimate the size of the young adult mortality hump, i.e. the deviation in the force of mortality often
observed during adolescence and early adulthood.
#'
#' @param data data frame produced with HMD2MH or similarly structured
#'
#' @details
#' @return Returns an object of class morthump containing the arguments used to fit the model as well as the estimated
coefficients.
#'
#' @examples
#'
#' data("CHE2010m")
#'
#' # fits the Heligman-Pollard model (parametrical)
#' fit <- morthump(data = CHE2010m, model = "hp")
#'
#' @references
#'
#' Camarda, C. G., Eilers, P. H. C., & Gampe, J. (2016). Sums of smooth exponentials to decompose complex series of counts.
Statistical Modelling.
#' @seealso
#' \link{sse.fit}, \link{summary.morthump}, \link{plot.morthump}
#'
#' @export
#'
#' @import MortalitySmooth
#' @import Matrix
#' @importFrom graphics abline arrows axis box legend lines matplot par plot points polygon segments text title
```

## Créer des packages dans Rstudio

### Roxygen

# Démonstration

The screenshot displays the RStudio environment for a project named 'mypackage' located at 'C:/Users/remunda/Desktop/mypackage'. The main window shows the source editor with the following R code:

```
1 # Hello, world!
2 #
3 # This is an example function named 'hello'
4 # which prints 'Hello, world!'.
5 # You can learn more about package au
6 # http://r-pkgs.had.co.nz/
7 #
8 # Some useful keyboard shortcuts for
9 #
10 # Build and Reload Package: 'Ctrl
11 # Check Package: 'Ctrl
12 # Test Package: 'Ctrl
13
14 hello <- function() {
15   print("Hello, world!")
16 }
17
18
19
```

The console window shows the output of the R session:

```
Copyright (C) 2016 the R Foundation for Sta
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

Restarting R session...

> library(mypackage)
>
```

The file explorer shows the contents of the 'mypackage' directory:

Name	Size	Modified
..		
.Rbuildignore	30 B	Mar 5, 2017, 10:38 PM
DESCRIPTION	305 B	Mar 5, 2017, 10:38 PM
man		
mypackage.Rproj	375 B	Mar 5, 2017, 10:38 PM
NAMESPACE	32 B	Mar 5, 2017, 10:38 PM
R		

The 'Project Options' dialog box is open, showing the 'Build Tools' tab. The 'Project build tools' are set to 'Package'. The 'Package directory' is '(Project Root)'. The 'Build and Reload' R CMD INSTALL additional options are '--no-multiarch --with-keep.source'. The 'Check Package' R CMD check additional options are '--as-cran'. The 'Build Source Package' R CMD build additional options are '--resave-data'. The 'Build Binary Package' R CMD INSTALL additional options are empty. The 'Developing Packages with RStudio' link is visible at the bottom.