

Installation Guides

We will primarily use R for data analyses and examples in this SISCER module, although implementations of the methods we will discuss are available in most other statistical software as well.

If you typically use a different program, it's up to you whether you want to explore R during these two days or work on implementation in your software or programming language of choice.

R

Installing R: Go to <https://www.r-project.org/>, click the "download" link, choose a CRAN mirror relatively near you, and click "Download R for [your operating system]." Install R by running the file you have downloaded.

Mac users: You will need to make sure the R application goes into your Applications folder instead of a temporary directory. You may need to drag it there. Also, the newest version of R requires OS X 10.13 (High Sierra) or higher. You can check what version you have by clicking on Apple menu (upper left corner) > About This Mac. If you have a version earlier than 10.13, scroll down to an earlier version of R that is compatible with your system.

RStudio

R comes with a default user interface, but it's not very pretty. We'll use RStudio, essentially a wrapper program for interacting with R.

Installing Rstudio: Go to <https://www.rstudio.com/>, click the "download" link under RStudio (<https://www.rstudio.com/products/rstudio/download/#download>), scroll down to "Installers for Supported Platforms" and click the link for your operating system. Download the resulting file, then run it to install RStudio.

RMarkdown

RMarkdown is actually a *package* or *library* within R. (That means it's an extra piece you can install from inside of R, which gives R extra functionality.) Using RMarkdown, you can create documents that combine text, R code and results, plots and graphs, and even mathematical notation -- all from within R. This is an important step toward making your work reproducible. Plus, no worrying about copying and pasting things into a Word document!

RMarkdown can produce output as HTML, Word, or PDF (among other things). To get PDF output, your computer must have a version of LaTeX installed. For the purposes of this module, if you're not already a LaTeX user, it may be easiest to use Word or HTML output.

Getting RMarkdown: Open up RStudio. Go to "Tools," then "Install Packages..." Type "rmarkdown" into the "Packages" field, and click "Install." You may also need to load the package into your current R session by running the command `library(rmarkdown)` (just type that into the command window, which is the bottom left pane in RStudio, and hit enter).

R Packages for This Module

You will need several R packages for this SISCER module. For each of these packages, either follow the instructions above for RMarkdown or type `install.packages("package-name")`

at the console for each of them (fill in the correct package name). As above, you'll also need to load the package before using it by running `library(package-name)` at the console.

Required packages:

- geepack
- nlme
- lme4

Optional packages (needed to be able to run all of our sample code):

- tidyverse
- multcomp
- ggcorrplot
- Ggally
- mice
- knitr
- kableExtra
- wgeesel
- lattice
- corrplot
- lmtest
- sandwich
- car
- broom
- broom.mixed
- doBy