"Introduction to R" series

Aug.30 1-3pm: Part 1 – Data Wrangling

Sep.06 1-3pm: Part 2 - Data Visualization

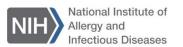
Sep.13 1-3pm: Part 3 – Data Analysis

Sep.20 1-3pm: Part 4 – Real-world Data Analysis Using R



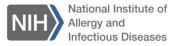
Where to find R?

- Within NIAID, you can use self-service:
 - Windows Software Center: https://inside.niaid.nih.gov/it-equipment/installing-scientific-software-using-software-center
 - Mac self-service: https://inside.niaid.nih.gov/it-equipment/installing-scientific-software-mac-self-service
- Within NIH, you can use the Biowulf HPC cluster: https://hpc.nih.gov/
- Download and install R and Rstudio:
 - R: https://www.r-project.org/
 - Rstudio: https://www.rstudio.com/



Part 2: Data Visualization Review

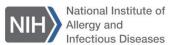
- Materials: https://github.com/niaid/2024 Introduction-to-R/tree/main/Part%202 Data%20visualization
- Recording: https://bioinformatics.niaid.nih.gov/programming/55.2.1
- Base R plotting system
 - https://r-charts.com/base-r/
 - Base R graphics functions can be customized adding legends, texts, grids, modifying the axes, among other functions.
- Package ggplot2
 - https://ggplot2.tidyverse.org/
- Three good places to start with different level and purpose:
 - The <u>Data Visualization</u> and <u>Communication</u> chapters in <u>R for Data Science</u>.
 - Make common graphics as quickly as possible: <u>The R Graphics Cookbook</u> by Winston Chang.
 - If you've mastered the basics and want to learn more, read ggplot2: Elegant Graphics for Data Analysis.





Part 3: Data Analysis Overview

- Correlation
- Principal component analysis
- Statistical Test
 - One/Two sample t-test, Paired t-test,
 - One-way ANOVA, Two-way ANOVA, Pairwise t-test
 - Fisher's test, Chi-square test
- Statistical Model Analysis:
 - Linear regression model
 - Logistic regression model
- Other reference sources:
 - R Tutorials for Applied Statistics





Tutorial Set Up

Download file from Github link or attachment:

https://github.com/niaid/2024_Introduction-to-R/tree/main/Part%203_Data%20Analysis

- Open the subfolder "Part 3_Data analysis" and then the "2024_Part 3_Intro to R_Data analysis.Rmd" file
- If Rstudio is installed, then this should open the project in RStudio

