



1.3.5: Statistical Tests and Models

(Asynchronous-Online)

COMING SUMMER 2025

Module “1.3.5: Statistical Tests and Models” will be posted prior to the In-Person Workshops in Summer 2025.

Session Objectives

1. Develop linear and logistic regression models.
2. (Use a survey sampling weight to generate more representative descriptive and inferential statistical values.) - Currently, this objective is under the Module 1.3.4: Missing data and sampling weight.
3. Interpret a model output.

Key points to cover:

1. Run multivariate linear regression models with R.
2. Run multivariate logistic regression models with R.
3. Include interaction terms in regression models.
4. (R packages for complex survey data (e.g., survey package)
 - R codes to generate weighted descriptive statistics and contingency tables, as well as to develop weighted linear models)
5. Interpret a model output.
6. (Compare the outputs of unweighted and weighted models.)

Iannone, Richard, Joe Cheng, Barret Schloerke, Ellis Hughes, Alexandra Lauer, JooYoung Seo, Ken Brevoort, and Olivier Roy. 2024. *Gt: Easily Create Presentation-Ready Display Tables*. <https://gt.rstudio.com>.

Kassambara, Alboukadel. 2023. *Ggpubr: Ggplot2 Based Publication Ready Plots*. <https://rpkgs.datanovia.com/ggpubr/>.



- Meyer, David, Achim Zeileis, and Kurt Hornik. 2006. “The Strucplot Framework: Visualizing Multi-Way Contingency Tables with Vcd.” *Journal of Statistical Software* 17 (3): 1–48. <https://doi.org/10.18637/jss.v017.i03>.
- Meyer, David, Achim Zeileis, Kurt Hornik, and Michael Friendly. 2023. *Vcd: Visualizing Categorical Data*. <https://CRAN.R-project.org/package=vcd>.
- Mock, Thomas. 2024. *gtExtras: Extending Gt for Beautiful HTML Tables*. <https://github.com/jthomasmock/gtExtras>.
- Pedersen, Thomas Lin. 2024. *Patchwork: The Composer of Plots*. <https://patchwork.data-imaginist.com>.
- R Core Team. 2024. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. <https://www.R-project.org/>.
- Schloerke, Barret, Di Cook, Joseph Larmarange, Francois Briatte, Moritz Marbach, Edwin Thoen, Amos Elberg, and Jason Crowley. 2024. *GGally: Extension to Ggplot2*. <https://ggobi.github.io/ggally/>.
- Sievert, Carson. 2020. *Interactive Web-Based Data Visualization with r, Plotly, and Shiny*. Chapman; Hall/CRC. <https://plotly-r.com>.
- Sievert, Carson, Chris Parmer, Toby Hocking, Scott Chamberlain, Karthik Ram, Marianne Corvellec, and Pedro Despouy. 2024. *Plotly: Create Interactive Web Graphics via Plotly.js*. <https://plotly-r.com>.
- Wickham, Hadley. 2016. *Ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York. <https://ggplot2.tidyverse.org>.
- Wickham, Hadley, Winston Chang, Lionel Henry, Thomas Lin Pedersen, Kohske Takahashi, Claus Wilke, Kara Woo, Hiroaki Yutani, Dewey Dunnington, and Teun van den Brand. 2024. *Ggplot2: Create Elegant Data Visualisations Using the Grammar of Graphics*. <https://ggplot2.tidyverse.org>.
- Wickham, Hadley, Romain François, Lionel Henry, Kirill Müller, and Davis Vaughan. 2023. *Dplyr: A Grammar of Data Manipulation*. <https://dplyr.tidyverse.org>.
- Zeileis, Achim, David Meyer, and Kurt Hornik. 2007. “Residual-Based Shadings for Visualizing (Conditional) Independence.” *Journal of Computational and Graphical Statistics* 16 (3): 507–25. <https://doi.org/10.1198/106186007X237856>.