

1.3.5: Statistical Tests and Models

(In Person)

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.)

Arel-Bundock, Vincent. 2022. "modelsummary: Data and Model Summaries in R." *Journal of Statistical Software* 103 (1): 1–23. https://doi.org/10.18637/jss.v103.i01.

- ———. 2025a. Modelsummary: Summary Tables and Plots for Statistical Models and Data: Beautiful, Customizable, and Publication-Ready. https://modelsummary.com.
- ——. 2025b. Tinytable: Simple and Configurable Tables in HTML, LaTeX, Markdown, Word, PNG, PDF, and Typst Formats. https://vincentarelbundock.github.io/tinytable/.



- Horst, Allison, Alison Hill, and Kristen Gorman. 2022. Palmerpenguins: Palmer Archipelago (Antarctica) Penguin Data. https://allisonhorst.github.io/palmerpenguins/.
- Ihaka, Ross, Paul Murrell, Kurt Hornik, Jason C. Fisher, Reto Stauffer, Claus O. Wilke, Claire D. McWhite, and Achim Zeileis. 2023. *Colorspace: A Toolbox for Manipulating and Assessing Colors and Palettes*. https://colorspace.R-Forge.R-project.org/.
- Kowarik, Alexander, and Matthias Templ. 2016. "Imputation with the R Package VIM." Journal of Statistical Software 74 (7): 1–16. https://doi.org/10.18637/jss.v074.i07.
- R Core Team. 2025. R: A Language and Environment for Statistical Computing. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.
- Stauffer, Reto, Georg J. Mayr, Markus Dabernig, and Achim Zeileis. 2009. "Somewhere over the Rainbow: How to Make Effective Use of Colors in Meteorological Visualizations." Bulletin of the American Meteorological Society 96 (2): 203–16. https://doi.org/10.1175/BAMS-D-13-00155.1.
- Templ, Matthias, Alexander Kowarik, Andreas Alfons, Gregor de Cillia, and Wolfgang Rannetbauer. 2022. VIM: Visualization and Imputation of Missing Values. https://github.com/statistikat/VIM.
- Waring, Elin, Michael Quinn, Amelia McNamara, Eduardo Arino de la Rubia, Hao Zhu, and Shannon Ellis. 2022. Skimr: Compact and Flexible Summaries of Data. https://docs.ropensci.org/skimr/.
- Zeileis, Achim, Jason C. Fisher, Kurt Hornik, Ross Ihaka, Claire D. McWhite, Paul Murrell, Reto Stauffer, and Claus O. Wilke. 2020. "colorspace: A Toolbox for Manipulating and Assessing Colors and Palettes." *Journal of Statistical Software* 96 (1): 1–49. https://doi.org/10.18637/jss.v096.i01.
- Zeileis, Achim, Kurt Hornik, and Paul Murrell. 2009. "Escaping RGBland: Selecting Colors for Statistical Graphics." Computational Statistics & Data Analysis 53 (9): 3259–70. https://doi.org/10.1016/j.csda.2008.11.033.