

# Effective Data Visualization for Scientific Researchers

VLAG PhD day, Baarlo.

## Resources

### Scientific literature on (scientific) data communication:

- Franconeri SL et al. *The Science of Visual Data Communication: What Works*. Psychol Sci Public Interest. 2021;22(3):110-61.
- Kelleher C, Wagener T. *Ten guidelines for effective data visualization in scientific publications*. Environmental Modelling & Software. 2011;26(6):822-7.
- O'Donoghue SI et al. *Visualization of Biomedical Data*. Annual Review of Biomedical Data Science. 2018;1(1):275-304.
- Rougier NP et al. *Ten simple rules for better figures*. PLoS Comput Biol. 2014;10(9):e1003833.
- Vandemeulebroecke M et al. *Effective Visual Communication for the Quantitative Scientist*. CPT Pharmacometrics Syst Pharmacol. 2019;8(10):705-19.
- Duke SP et al. *Seeing is believing: good graphic design principles for medical research*. Statist Med 2015; 34: 3040-59.
- Various authors in Nature Methods Points of View: *Visual strategies for biological data* (2010-2015).

### Data visualization books (for researchers):

- Schwabisch, Jonathan. *Better data visualizations: A guide for scholars, researchers, and works*. New York, NY: Columbia University Press, 2021.
- Yau, Nathan. *Visualize this. The FlowingData guide to design, visualization, and statistics*. Indianapolis, IN: John Wiley & Sons, 2013.
- Yau, Nathan. *Data points. Visualization that means something*. Indianapolis, IN: John Wiley & Sons, 2013.
- Zamanis, Martins. *Research data visualization and scientific graphics for papers, presentations and proposals*. Peer recognized series book 2. 2022.

### Choose a chart type:

- Download a free pdf: <https://chart.guide/>
- The data visualization catalogue: <https://datavizcatalogue.com/>
- From Data to Viz: <https://www.data-to-viz.com/>
- The chartmaker directory: <https://chartmaker.visualisingdata.com/>
- The visual vocabulary: <https://gramener.github.io/visual-vocabulary-vega/>

### Color selection:

- Lisa Charlotte Muth, which color scale to use when visualizing data – a series: <https://blog.datawrapper.de/which-color-scale-to-use-in-data-vis/>
- Storytelling with data, picking the right colors: <https://www.storytellingwithdata.com/blog/2020/5/6/picking-the-right-colors>
- Lisa Charlotte Muth, How to pick more beautiful colors for your data visualizations: <https://blog.datawrapper.de/beautifulcolors/>
- Adobe color wheel: <https://color.adobe.com/create/color-wheel>
- Color blindness simulator: <https://colororacle.org/>
- Color palettes: <https://colorbrewer2.org/>



## Data Visualization Tools:

- Excel:
  - o John Schwabish: A guide to advanced data visualization in Excel, <https://policyviz.com>
  - o Stephanie Evergreen: How to build data visualizations in Excel, <https://stephanieevergreen.com/how-to>
  - o Ann K. Emery. Depict Data Studio. <https://depictdatastudio.com/category/data-visualization-in-excel/>
- R:
  - o Claus O. Wilke, Fundamentals of Data Visualization, <https://clauswilke.com/dataviz/>
  - o Hadley Wickham, ggplot2: Elegant graphics for data analysis, <https://ggplot2-book.org/>
  - o Cedric Scherer: The evolution of a ggplot: <https://www.cedricscherer.com/2019/05/17/the-evolution-of-a-ggplot-ep.-1>
  - o The R Graph Gallery: <https://r-graph-gallery.com>
  - o Nathan Yau, FlowingData: <https://flowingdata.com/learning/>


Hans Rosling's Bubblechart: <https://www.youtube.com/watch?v=jbkSRLYSojo>


**Thank you!**



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