# Effective Data Visualization for Scientific Researchers

yESHPM, Rotterdam, June 10th 2022

## Resources

Scientific literature on (scientific) data communication:

- o Franconeri SL, Padilla LM, Shah P, Zacks JM, Hullman J. *The Science of Visual Data Communication: What Works*. Psychol Sci Public Interest. 2021;22(3):110-61.
- o Kelleher C, Wagener T. *Ten guidelines for effective data visualization in scientific publications*. Environmental Modelling & Software. 2011;26(6):822-7.
- o O'Donoghue SI, Baldi BF, Clark SJ, Darling AE, Hogan JM, Kaur S, et al. *Visualization of Biomedical Data*. Annual Review of Biomedical Data Science. 2018;1(1):275-304.
- o Rougier NP, Droettboom M, Bourne PE. *Ten simple rules for better figures*. PLoS Comput Biol. 2014;10(9):e1003833.
- o Vandemeulebroecke M, Baillie M, Margolskee A, Magnusson B. *Effective Visual Communication for the Quantitative Scientist*. CPT Pharmacometrics Syst Pharmacol. 2019;8(10):705-19.
- o Various authors in Nature Methods Points of View: *Visual strategies for biological data* (2010-2015).

Data visualization books (for researchers):

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

Choose a chart type:

- o Download a free pdf: https://chart.guide/
- o The data visualization catalogue: https://datavizcatalogue.com/
- o From Data to Viz: https://www.data-to-viz.com/

Color selection:

- o 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/
- o Storytelling with data, picking the right colors: https://www.storytellingwithdata.com/blog/2020/5/6/picking-the-right-colors
- o Lisa Charlotte Muth, How to pick more beautiful colors for your data visualizations: https://blog.datawrapper.de/beautifulcolors/
- o Adobe color wheel: https://color.adobe.com/create/color-wheel
- o Color blindness simulator: https://colororacle.org/
- o 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/

**Thank you!**

Irene van den Broek
irene@jebentwatjemeet.nl

in  @IrenevdBroek

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🔗 https://www.jebentwatjemeet.nl

🔗 https://irenevdb.rbind.io