Color in data visualization

A quick guide to what works and what doesn't

"Color is my day-long obsession, joy and torment." ~Claude Monet

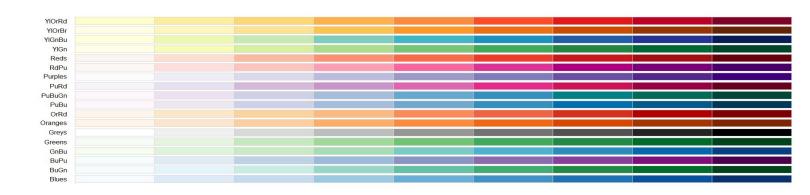
13.88	13.69	13.72	13.76	13.88	13.69	13.72	13.76
13.19	13.01	13.28	13.21	13.19	13.01	13.28	13.21
14.69	14.87	14.84	14.84	14.69	14.87	14.84	14.84
15 3	15.2	15.34	15.41	15.3	15.2	15.34	15.4

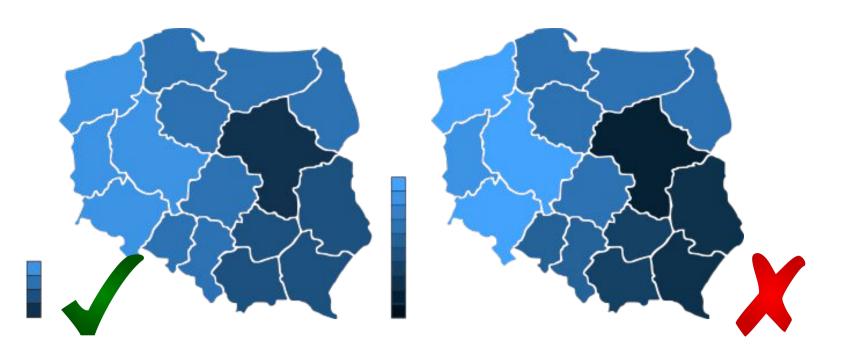
In case of visualizing data using colour **the choice of a palette is crucial** for good perception of the diagram. We highly recommend **using existing colour palettes** (Like the ones in R library RColorBrewer) **instead of making your own.**

The A - Z Of Rcolorbrewer Palette You Must Know

Choosing one yourself you risk a potential loss of clarity. Why should you bother if there is a solid set of colours ready to be used? Colours in brewers are preselected and were numerously tested just to fit the human perception of colour. So, remember to use brewers!

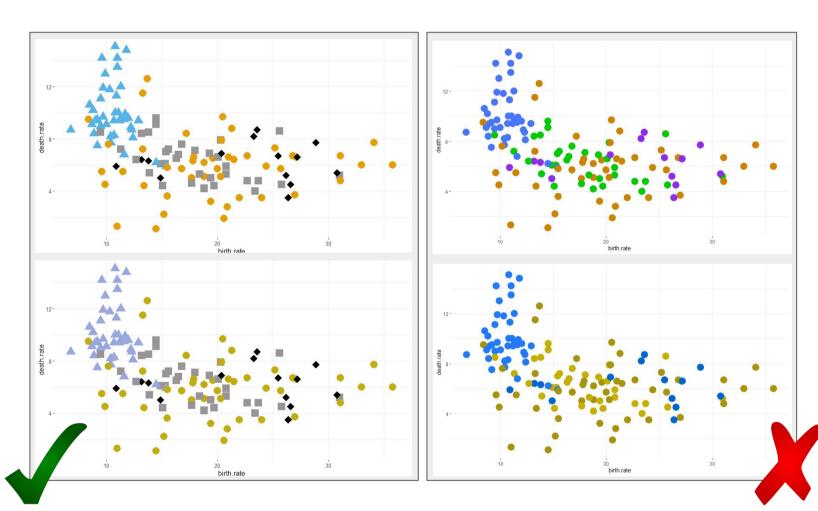
Here is convenient list of pallets for you to use:



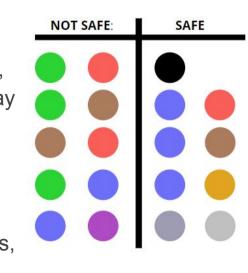


Gradients look nice, but they can be hard to read - avoid using them to represent precise data. People aren't robots and don't see shades and tints the same way a computer does.

Don't use continuous gradient scales, reading absolute values from them is a nightmare. Make fewer, but larger steps. You can represent the precise data in another diagram, if that is necessary.

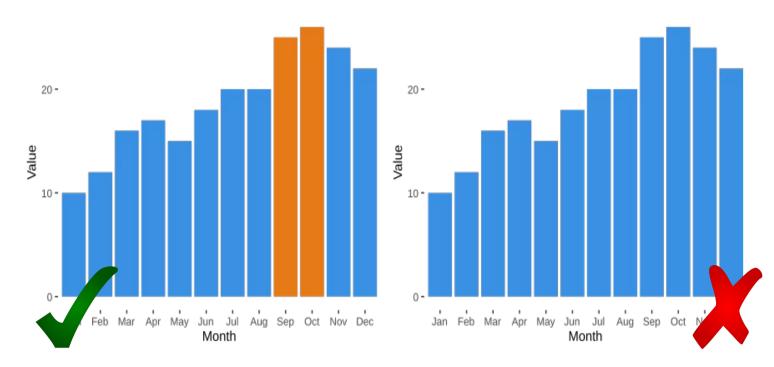


Around 8.5% of population is color blind. There are several types of color blindness (2nd row of examples is with a red-blind filter). That is why when designing a plot, you need to take into consideration that some people may view the colors in a different way, which may impact the overall clarity. There are several ways to handle that issue: use different shapes/symbols, hues and labels, don't mix too many colors together (2-3 is the most optimal number) and, if you absolutely need to use colors, use palettes designed to be color blind friendly.



Here are some useful resources for dealing with color blindness (simulators, palettes and more)

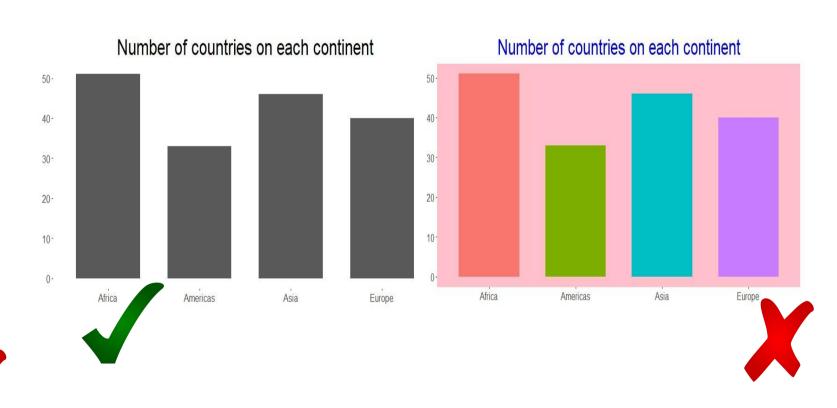
- Color Blind Vision Simulator | Color Blind Glasses Simulator
- Palette planner and tester
- Coblis Color Blindness Simulator
- DESIGNING FOR COLOR BLINDNESS | Palettes
- COLORBREWER 2.0 | Color advice for cartography



While sometimes data highlights itself (like one column being much bigger than others), it often needs a little help. If you want people to focus on something that isn't very obvious, then highlight it in a different color.

You can use a complementary color, which will harmonise well with your baseline color. You can generate them here:

<u>Color Calculator</u>. There's more types of harmonies, but remember that any color makes the plot harder to read. You have to be careful not to overuse them.



You may be tempted to make your chart as colorful as possible.

While some may argue that it would make the chart look better, **you should aim for clarity** - and many colors are distracting. That is why before you decide to color your chart, ask yourself:

Do you even need colors?

You need to remember that colors are an extremely powerful tool, and should be used with caution. Think twice before using any color. Oh, and leave the background white or grey.

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