Why Your Organization Needs a Data Visualization Style Guide

Jon Schwabish
@jschwabish

Please note that these slides have been edited from the original slide deck presented at the April 13, 2021 Data Visualization Meetup group.

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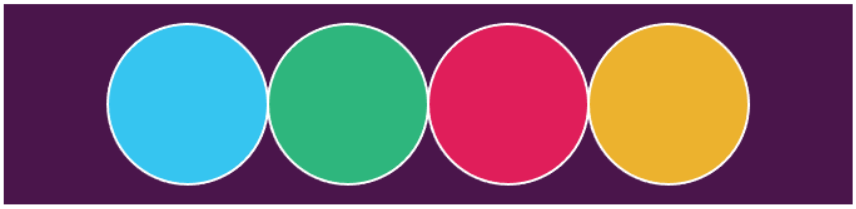
Google

FedEx



slack

[redacted]

BEST BUY®

URBAN INSTITUTE

Disney

Urban Institute

Coca-Cola

https://fontmeme.com/coca-cola-font/

URBAN INSTITUTE

LEGO®

URBAN INSTITUTE

Nintendo

URBAN INSTITUTE®

SNICKERS®

URBAN INSTITUTE

BURGER KING®

These fonts, colors, and shapes make ~~brands~~ visual and memorable.

our data visualizations

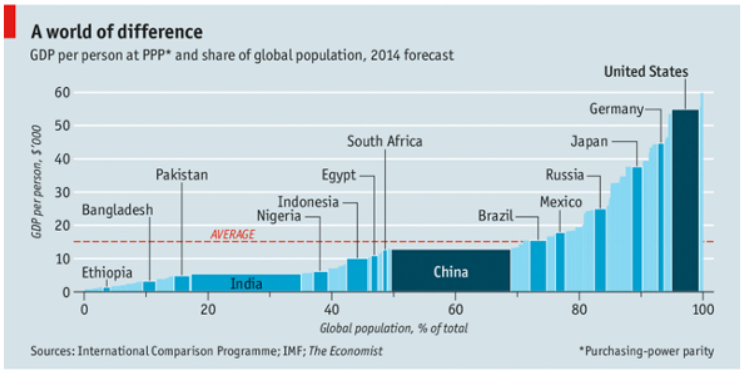
1. Why have a style guide?
2. What should your style guide include?
3. How do you develop your style guide?
4. *Example:* Urban Institute style guide

Style Guide Collection
https://policyviz.com/2016/11/30/style-guides/
BBC Visual and Data Journalism cookbook for R graphics
How to create BBC style graphics
NCI COLOR PALETTE
PRIMARY PALETTE
Alignement to the left
Gotham bold 7.5pt
Units only in the first
Sector
Earnings growth rate
Profit
Basic materials
84%
$ 70 million
Consumer
21
$ 30.5
Consumer staples
8
$ 2.3
Energy
56
$ 13.7
Financial
3
$ 1.7
Strokes 50% K 0.25pt
Primary
Helvetica Light
ABCDefgh1234
Helvetica Regular
ABCDefgh1234
Arial Regular Italic
ABCDefgh1234
Arial Bold
Basic Structure
Bar Chart
.25 pt. scale lines
.75 pt. base line
Either all horizontal or vertical axis lines
Axis labels

1 Why have a style guide?

1

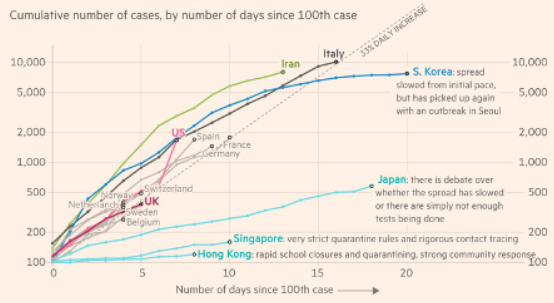
Make styles consistent & identifiable



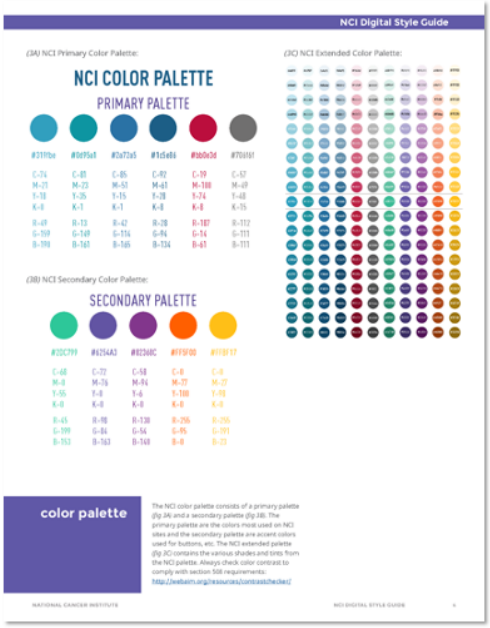
The Economist

Most western countries are on the same coronavirus trajectory. Hong Kong and Singapore have managed to slow the spread

Cumulative number of cases, by number of days since 100th case

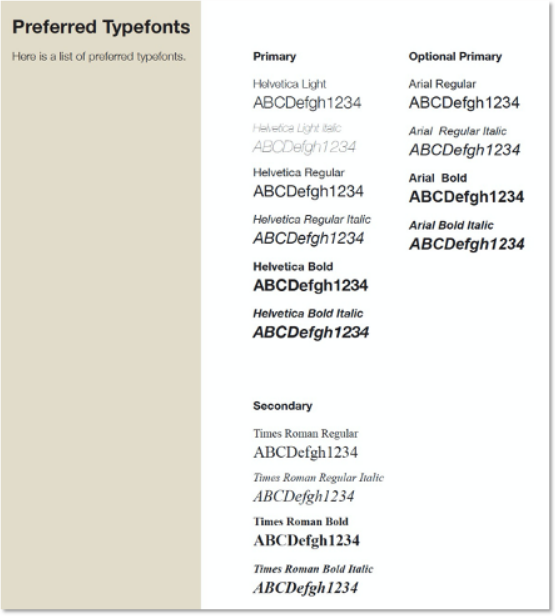


FT FINANCIAL TIMES



Source: National Cancer Institute

https://www.cancer.gov/digital-standards



Preferred Typefonts

Here is a list of preferred typefonts.

Primary

Helvetica Light
ABCDefgh1234

Helvetica Light Italic
ABCDefgh1234

Helvetica Regular
ABCDefgh1234

Helvetica Regular Italic
ABCDefgh1234

Helvetica Bold
ABCDefgh1234

Helvetica Bold Italic
ABCDefgh1234

Optional Primary

Arial Regular
ABCDefgh1234

Arial Regular Italic
ABCDefgh1234

Arial Bold
ABCDefgh1234

Arial Bold Italic
ABCDefgh1234

Secondary

Times Roman Regular
ABCDefgh1234

Times Roman Regular Italic
ABCDefgh1234

Times Roman Bold
ABCDefgh1234

Times Roman Bold Italic
ABCDefgh1234

Source: US Department of Agriculture

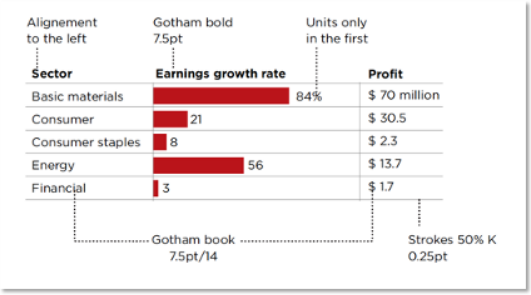
https://www.usda.gov/sites/default/files/documents/visual-standards-guide-january-2013.pdf

2

Make it easier
for all staff
to implement

Bar Chart

- ☐ .25 pt. scale lines
- ☐ .75 pt. base line
- ☐ Either all horizontal or vertical axis lines
- ☐ Axis labels



Source: Defense Intelligence Agency (left); Dallas Morning News (right)

Defense Intelligence Agency: http://policyviz.com/wp-content/uploads/2016/11/Section_L_Attachment_2.1_-_D3_Style_Guide.pdf
Dallas Morning News: https://policyviz.com/wp-content/uploads/2021/03/tdmn_graphics.pdf

2 What should your style guide include?

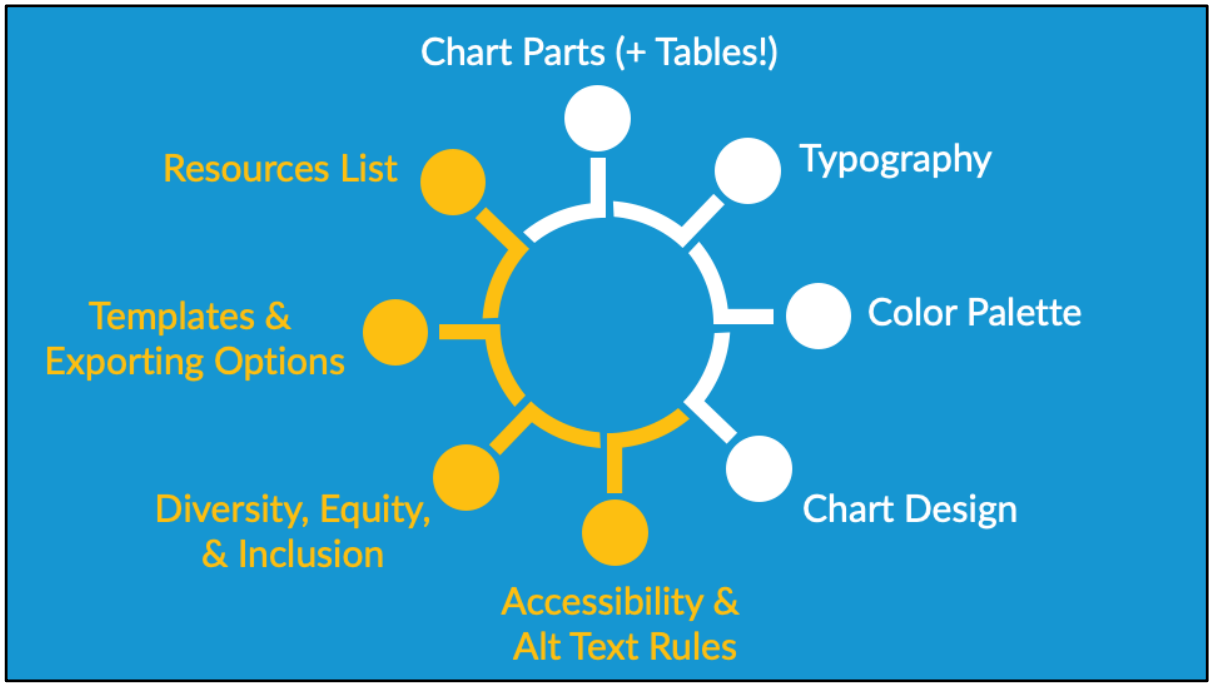
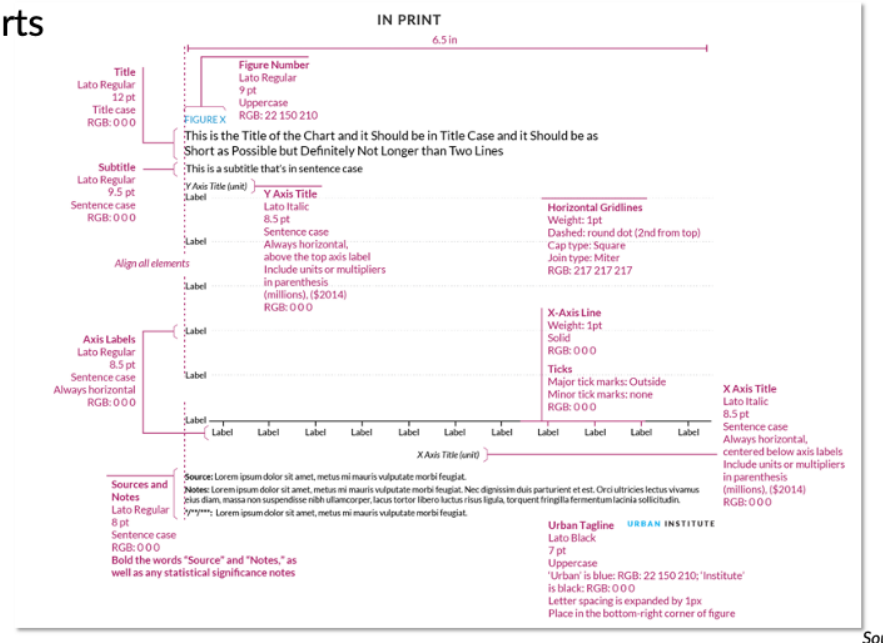


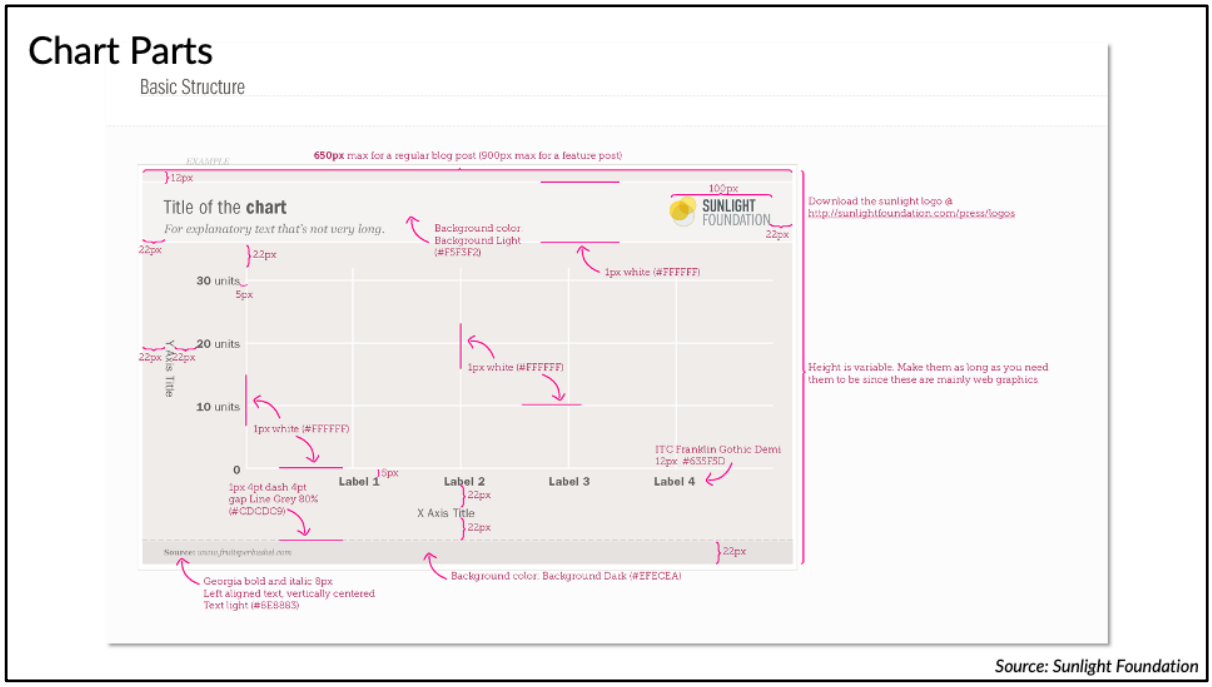
Chart Parts (+ Tables!)
Typography
Color Palette
Chart Design
Accessibility &
Alt Text Rules
Diversity, Equity,
& Inclusion
Templates &
Exporting Options
Resources List

Chart Parts



Source: Urban institute

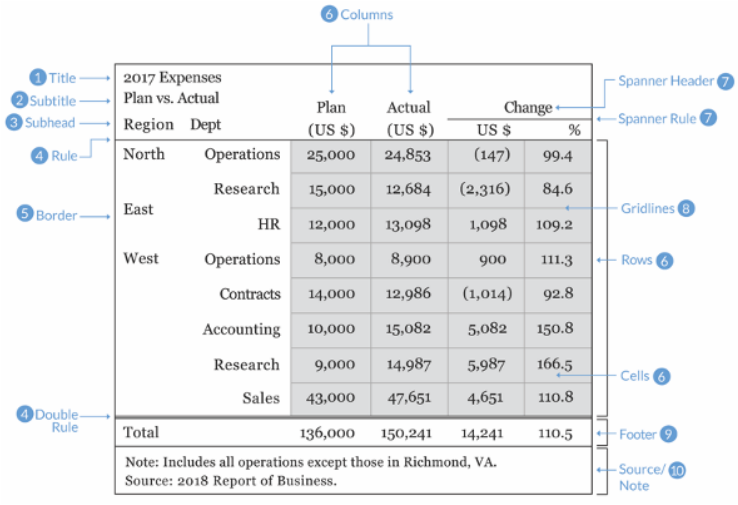
http://urbaninstitute.github.io/graphics-styleguide/



Source: Sunlight Foundation

https://sunlightfoundation.com/2014/03/12/datavizguide/

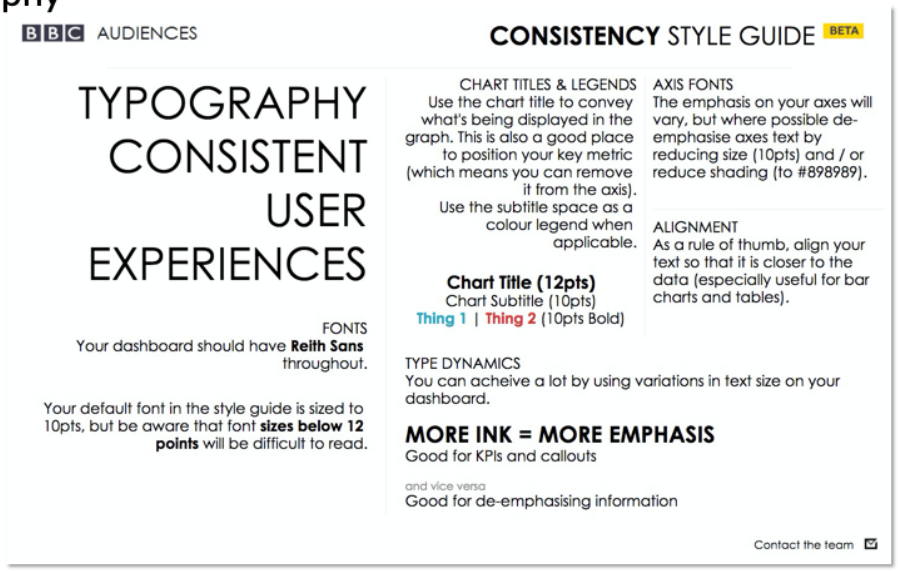
Table Parts



Source: Schwabish, Better Data Visualizations

Better Data Visualizations: A Guide for Scholars, Researchers, and Wonks
https://amzn.to/2zHQ4qv

Typography



Source: BBC

https://public.tableau.com/profile/bbc.audiences#!/vizhome/BBCAudiencesTableauStyleGuide/Hello

Typography

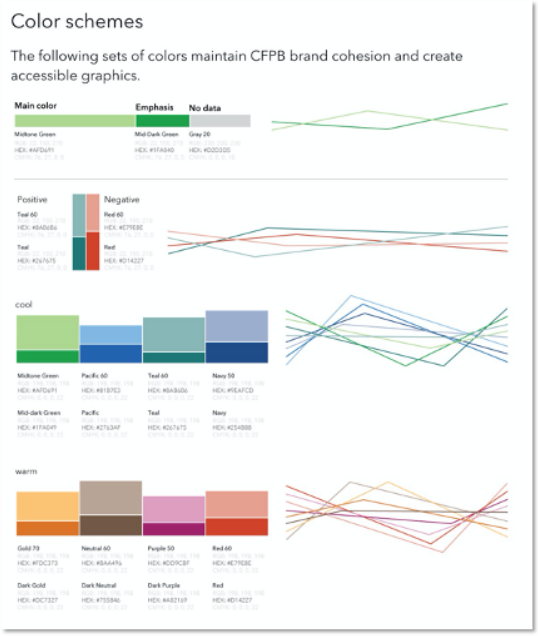
	Lato	Georgia
17	591,858.47	17,591,858.47
97	652,352.36	97,652,352.36
23	511,288.30	23,511,288.30
69	776,455.88	69,776,455.88

Source: Schwabish, Better Data Visualizations

Better Data Visualizations: A Guide for Scholars, Researchers, and Wonks
https://amzn.to/2zHQ4qv

https://developer.mozilla.org/en-US/docs/Web/CSS/font-variant-numeric
https://spectrum.adobe.com/page/table/#Use-tabular-numbers-for-numerical-data

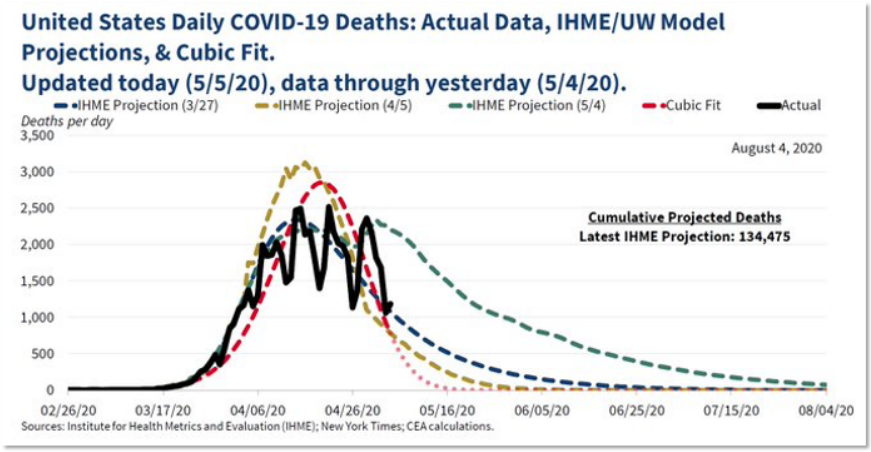
Colors



Source: Consumer Finance Protection Bureau

https://cfpb.github.io/design-system/?utm_source=designmanual&utm_medium=redirect&utm_campaign=designsystemlaunch

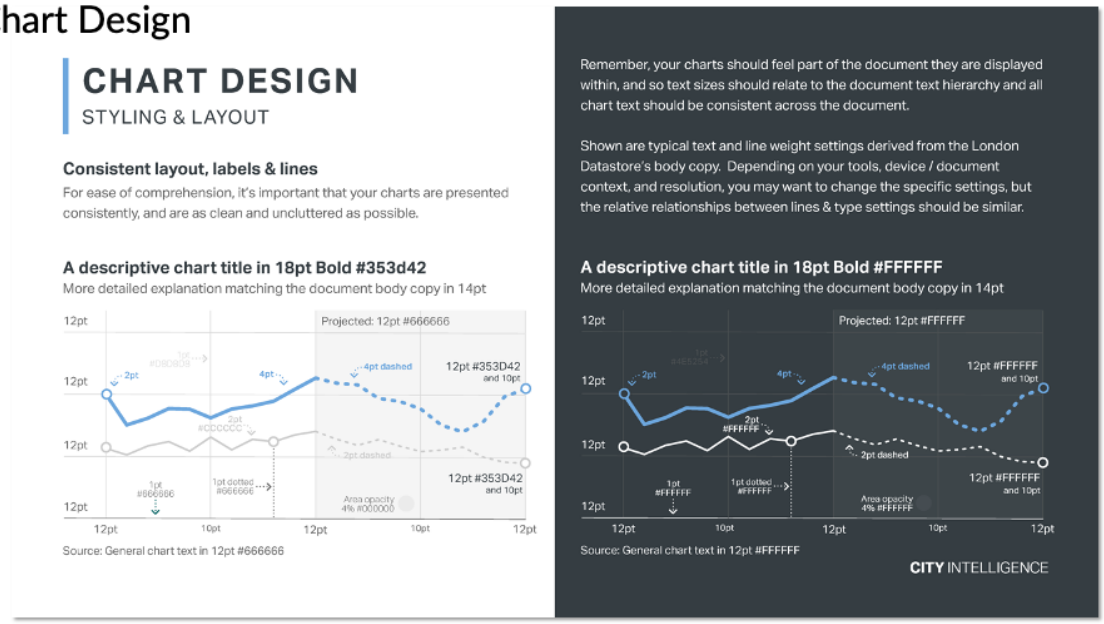
Colors



Source: Council of Economic Advisers, May 2020

https://twitter.com/WhiteHouseCEA45/media
Discussion of this graph: https://policyviz.com/2021/02/15/the-ten-most-misleading-charts-during-donald-trumps-presidency/

Chart Design



Source: Mike Brondbjerg of the Greater London Authority

https://data.london.gov.uk/blog/city-intelligence-data-design-guidelines/

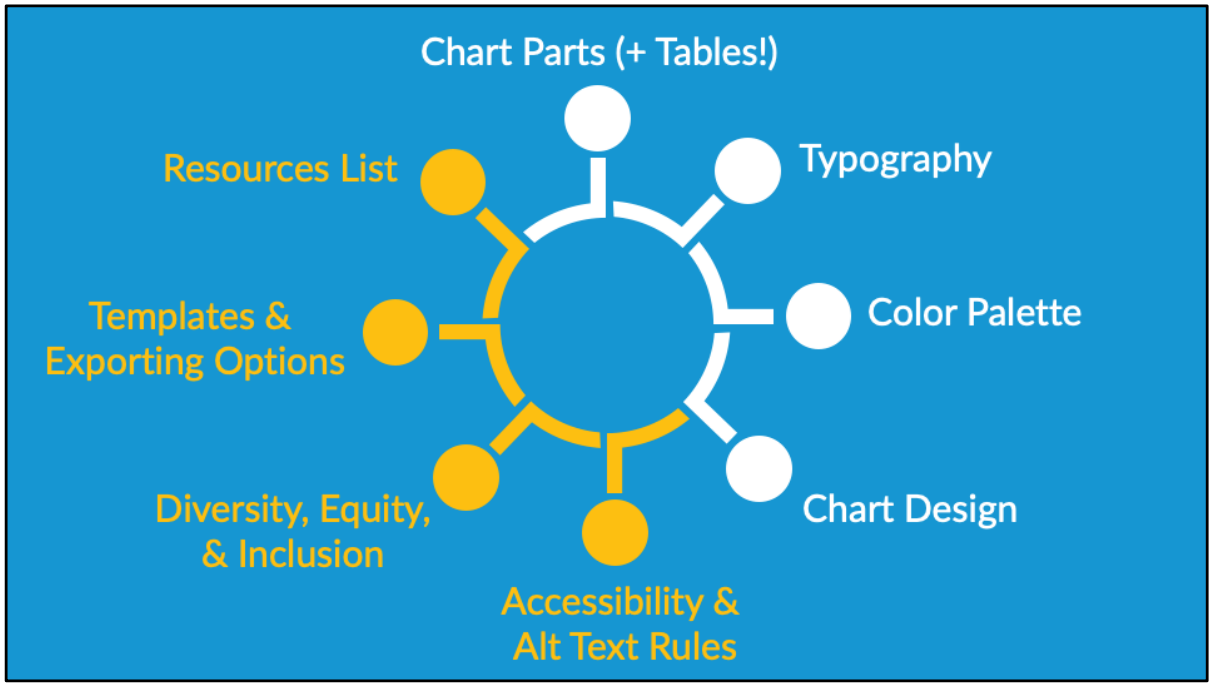
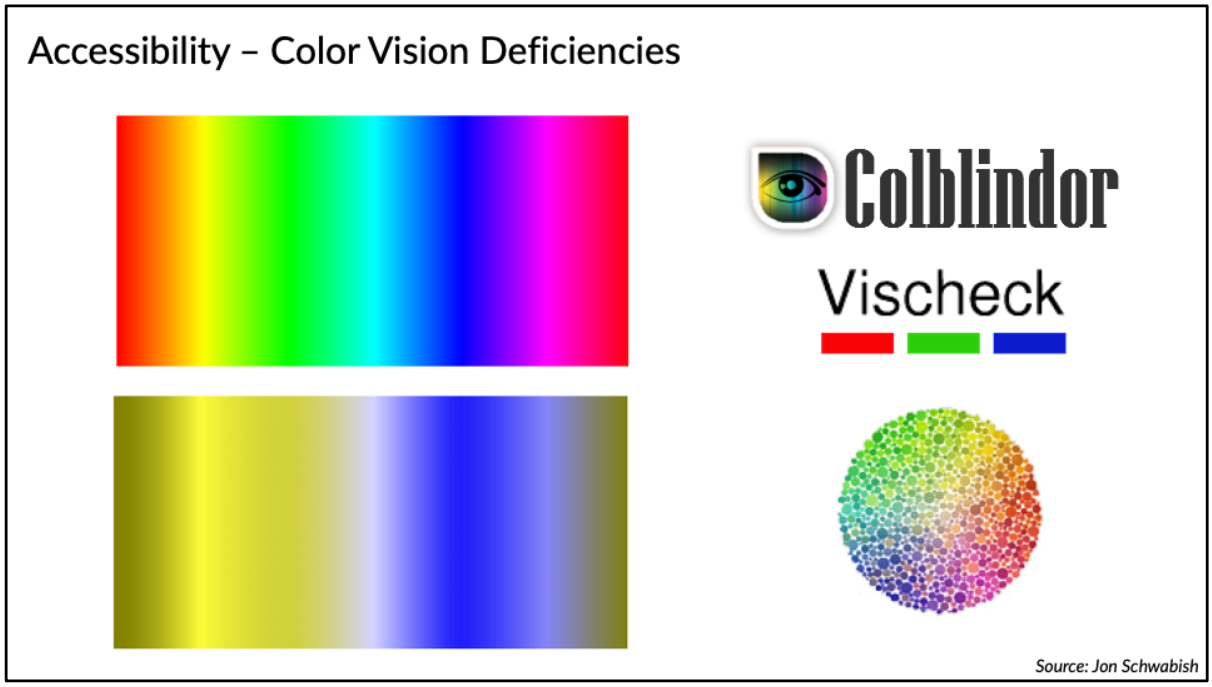


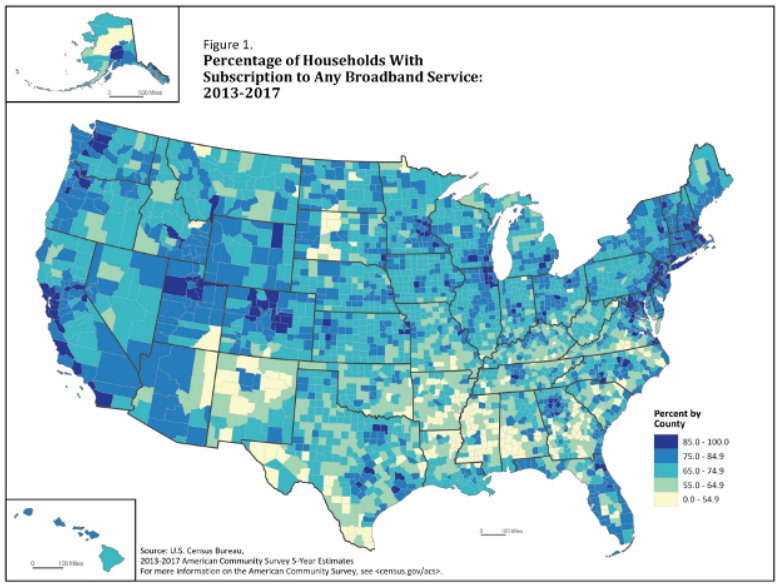
Chart Parts (+ Tables!)
Typography
Color Palette
Chart Design
Accessibility &
Alt Text Rules
Diversity, Equity,
& Inclusion
Templates &
Exporting Options
Resources List



https://www.color-blindness.com/coblis-color-blindness-simulator/
https://www.vischeck.com/vischeck/
https://www.colororacle.org/

Other tools:
https://color.adobe.com/create/color-accessibility
https://projects.susielu.com/viz-palette
https://www.colourblindawareness.org/
http://zapmap.com/colors/

Accessibility – Broadband Gaps



Source: US Census Bureau

https://www.census.gov/library/visualizations/2018/comm/broadband.html

See also Jacob's Law: https://lawsofux.com/jakobs-law/

Accessibility – Alt Text

alt= "**Chart type** of **type of data** where **reason for including chart**"

Include a **link to data source** somewhere in the text

Source: Amy Cesal

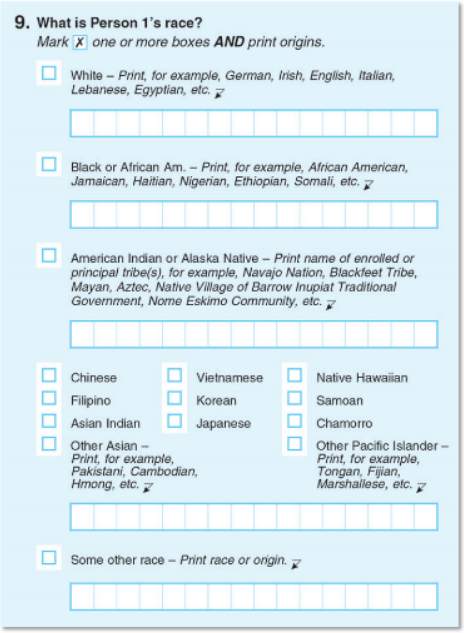
https://medium.com/nightingale/writing-alt-text-for-data-visualization-2a218ef43f81

See also Accessibilty Weekly Newsletter:
https://a11yweekly.com/

Blog post: https://urban-institute.medium.com/applying-racial-equity-awareness-in-data-visualization-bd359bf7a7ff
Paper on OSF: https://osf.io/x8tbw/

See also *Data Feminism*: https://amzn.to/32gbhD4

Diversity, Equity, & Inclusion



9. What is Person 1's race?
Mark [X] *one or more boxes* ***AND*** *print origins.*

- ☐ White – *Print, for example, German, Irish, English, Italian, Lebanese, Egyptian, etc.*
- ☐ Black or African Am. – *Print, for example, African American, Jamaican, Haitian, Nigerian, Ethiopian, Somali, etc.*
- ☐ American Indian or Alaska Native – *Print name of enrolled or principal tribe(s), for example, Navajo Nation, Blackfeet Tribe, Mayan, Aztec, Native Village of Barrow Inupiat Traditional Government, Nome Eskimo Community, etc.*
- ☐ Chinese
- ☐ Filipino
- ☐ Asian Indian
- ☐ Other Asian – *Print, for example, Pakistani, Cambodian, Hmong, etc.*
- ☐ Vietnamese
- ☐ Korean
- ☐ Japanese
- ☐ Native Hawaiian
- ☐ Samoan
- ☐ Chamorro
- ☐ Other Pacific Islander – *Print, for example, Tongan, Fijian, Marshallese, etc.*
- ☐ Some other race – *Print race or origin.*

Blog post: https://urban-institute.medium.com/applying-racial-equity-awareness-in-data-visualization-bd359bf7a7ff
Paper on OSF: https://osf.io/x8tbw/

See also *Data Feminism*: https://amzn.to/32gbhD4

Templates

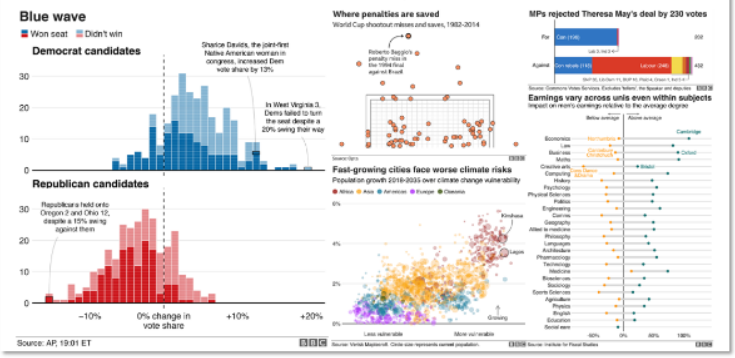
BBC Visual and Data Journalism cookbook for R graphics

Last updated: 2019-01-24

How to create BBC style graphics

At the BBC data team, we have developed an R package and an R cookbook to make the process of creating publication-ready graphics in our in-house style using R's ggplot2 library a more reproducible process, as well as making it easier for people new to R to create graphics.

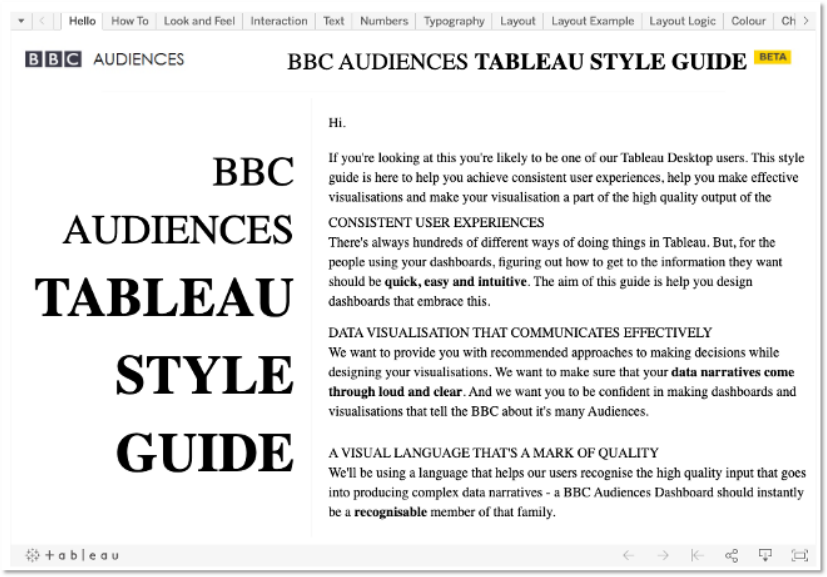
The cookbook below should hopefully help anyone who wants to make graphics like these:



Source: BBC

https://bbc.github.io/rcookbook/

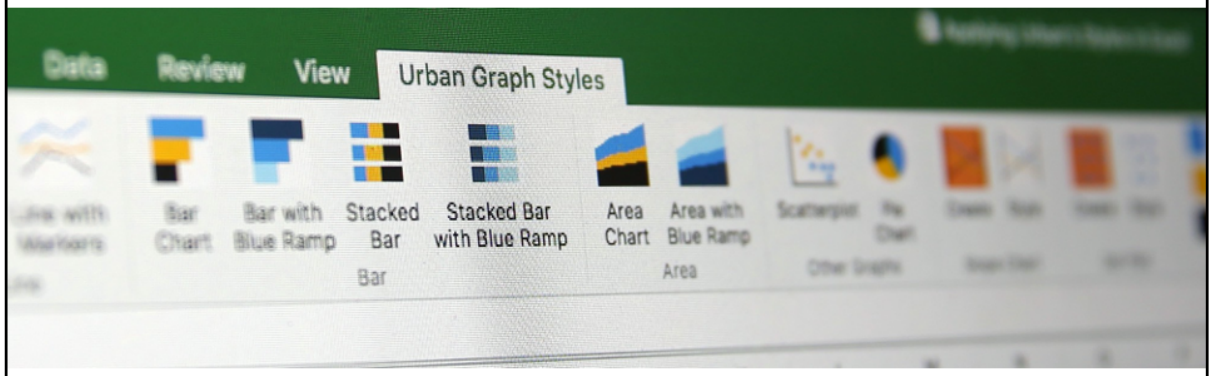
Templates



Source: BBC

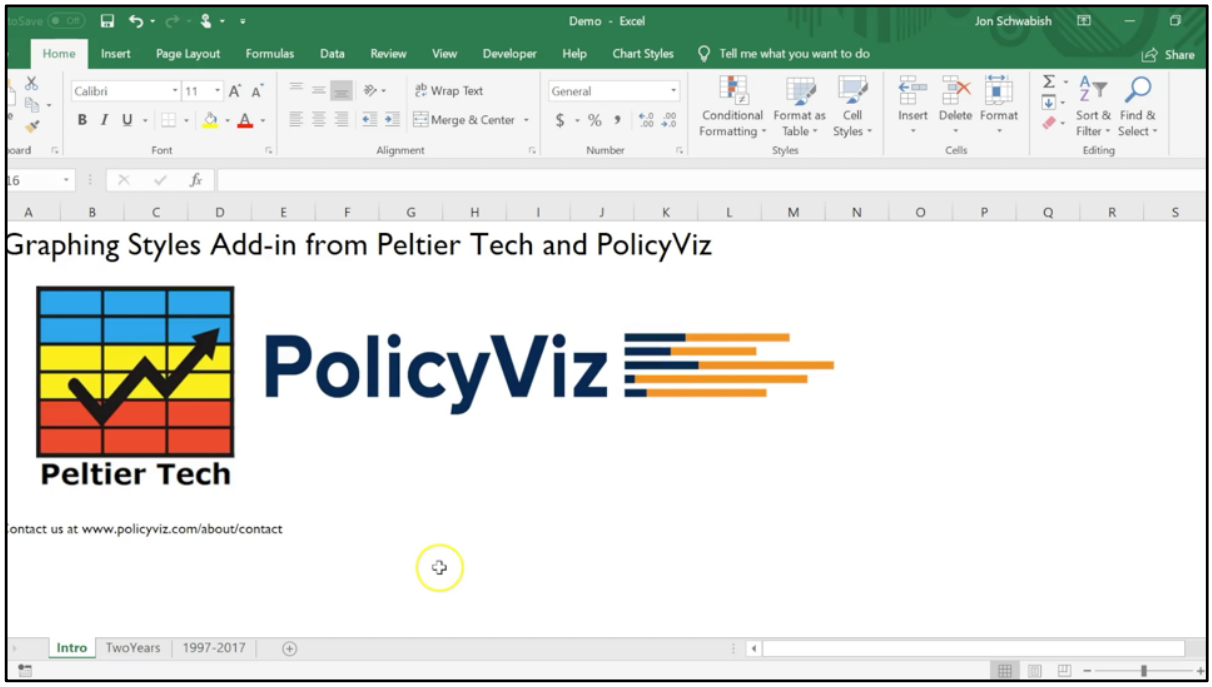
https://public.tableau.com/profile/bbc.audiences#!/vizhome/BBCAudiencesTableauStyleGuide/Hello

Templates



Source: Urban Institute

https://urban-institute.medium.com/applying-urbans-styles-in-excel-44707fbf2b75



https://policyviz.com/2019/04/09/the-chart-styles-excel-add-in/

150+ Color palettes in Excel:
https://policyviz.com/2017/01/12/150-color-palettes-for-excel/

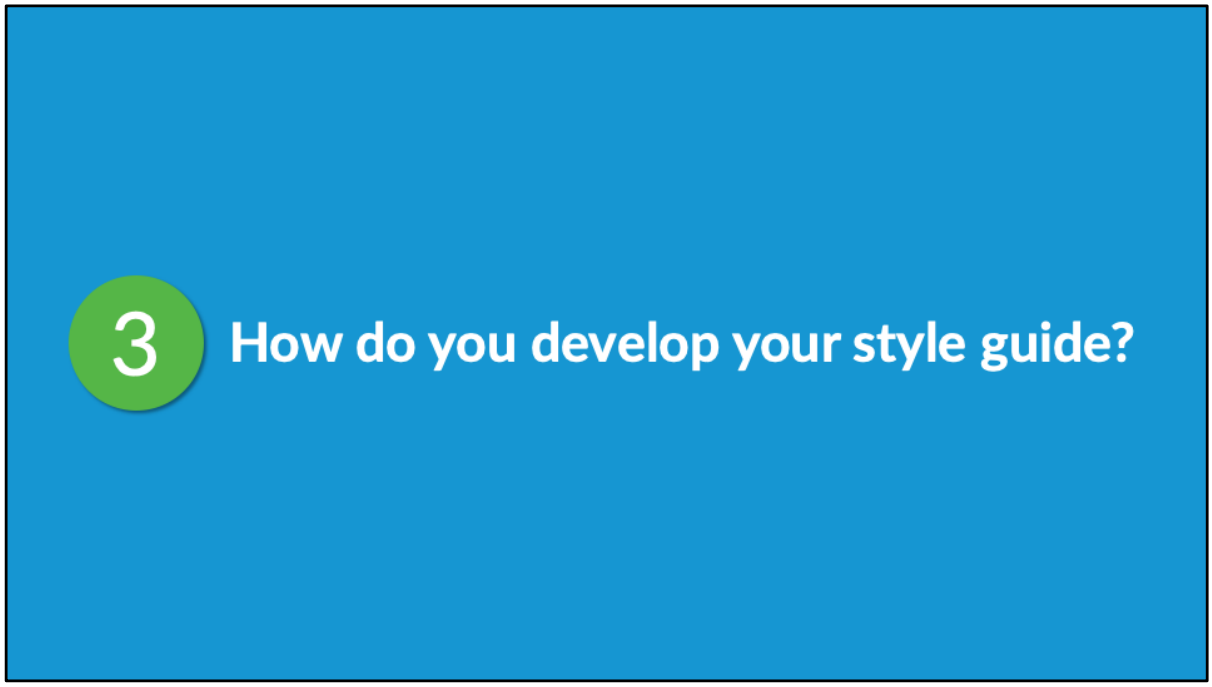
Create custom color palettes in Tableau:
https://help.tableau.com/current/pro/desktop/en-us/formatting_create_custom_colors.htm

Resources List

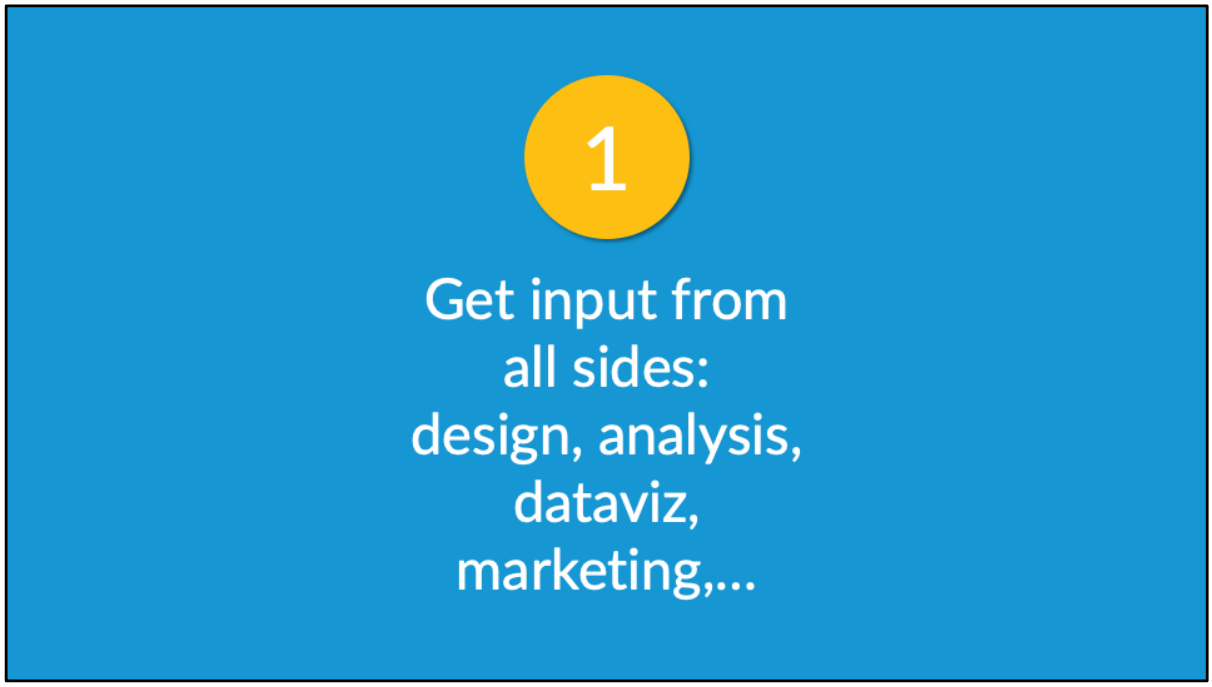
Books

Blogs

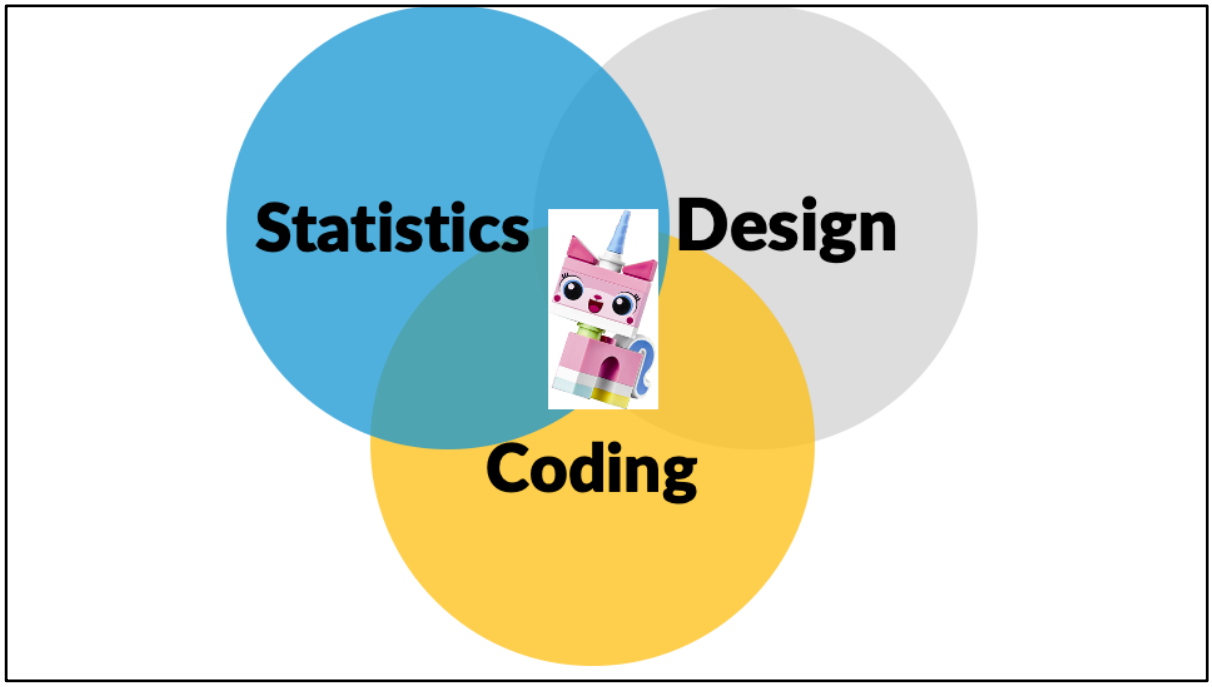
Tools



Ben Chartoff: [Urban Institute's Data Visualization Style Guide: A living document]



Ben Chartoff: [Urban Institute's Data Visualization Style Guide: A living document]



https://policyviz.com/2015/04/16/communicating-research-build-a-unicorn-dont-look-for-one/

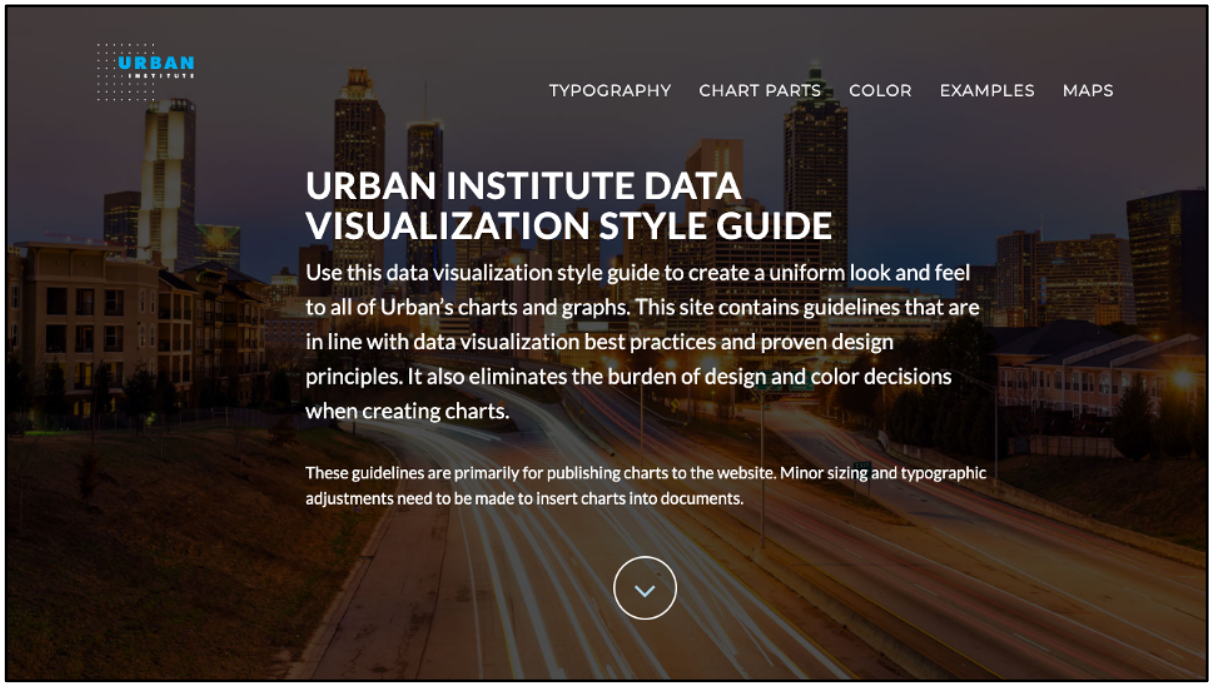
2

Iterate and treat as a living document

> “As our team grows and learns, we will continue to adapt and update it, striving to make our charts more legible, more beautiful, scalable across more platforms, and accessible to all.”
>
> — Ben Chartoff

https://urban-institute.medium.com/urban-institutes-data-visualization-style-guide-a-living-document-b90710702a9f

4 *Example:* Urban Institute style guide

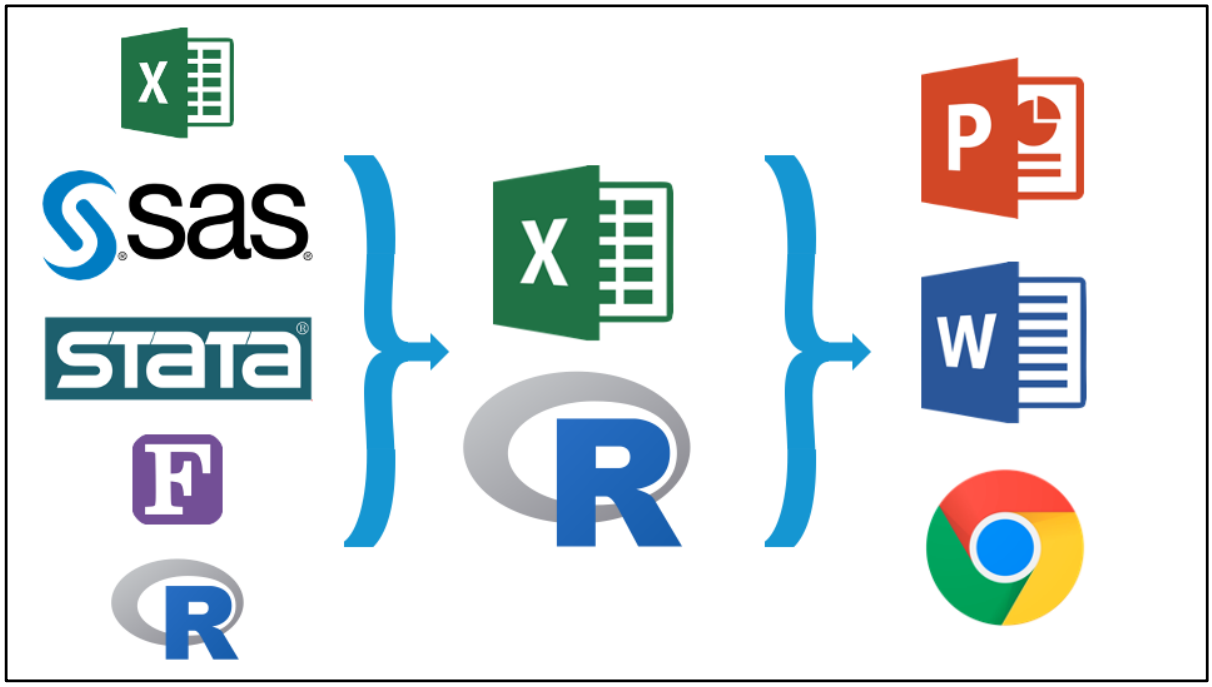

URBAN
INSTITUTE
TYPOGRAPHY
CHART PARTS
COLOR
EXAMPLES
MAPS
URBAN INSTITUTE DATA VISUALIZATION STYLE GUIDE
Use this data visualization style guide to create a uniform look and feel to all of Urban's charts and graphs. This site contains guidelines that are in line with data visualization best practices and proven design principles. It also eliminates the burden of design and color decisions when creating charts.
These guidelines are primarily for publishing charts to the website. Minor sizing and typographic adjustments need to be made to insert charts into documents.

The Urban Institute is the trusted source for unbiased, authoritative insights that inform consequential choices about **the well-being of people and places** in the United States.

We are a nonprofit research organization that believes decisions shaped by facts, rather than ideology, have the power to improve public policy and practice, strengthen communities, and transform people's lives for the better.

URBAN INSTITUTE

https://www.urban.org/


sas
STATA
F
R
X
R
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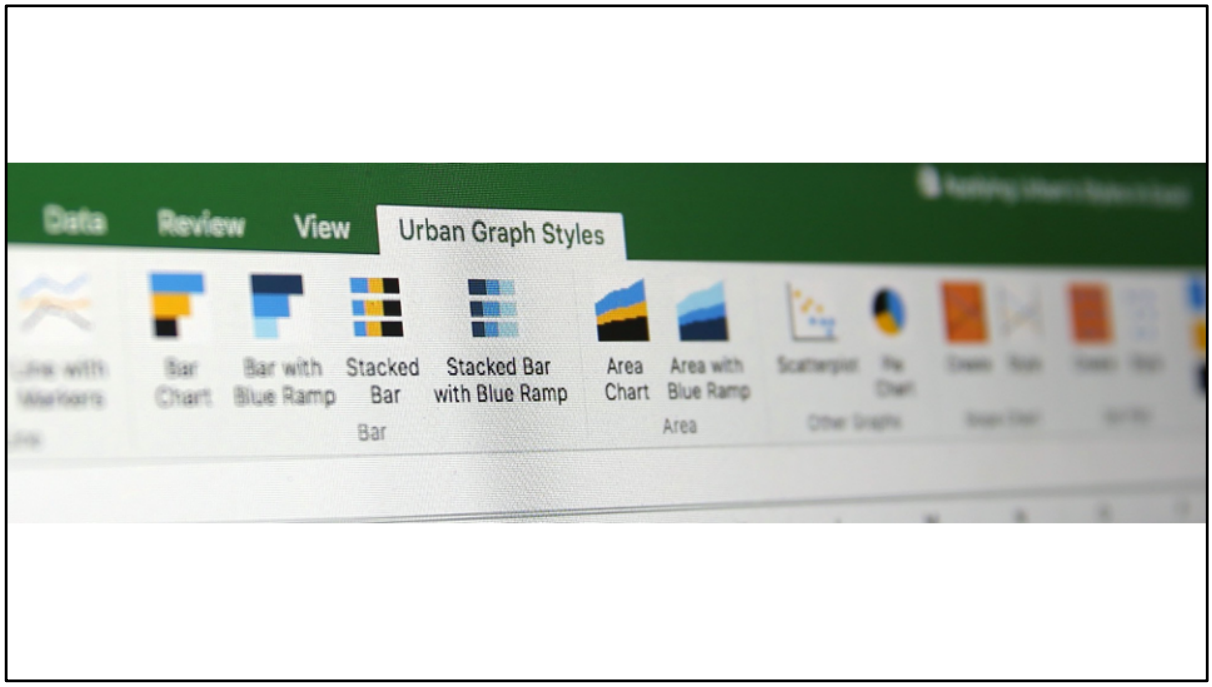
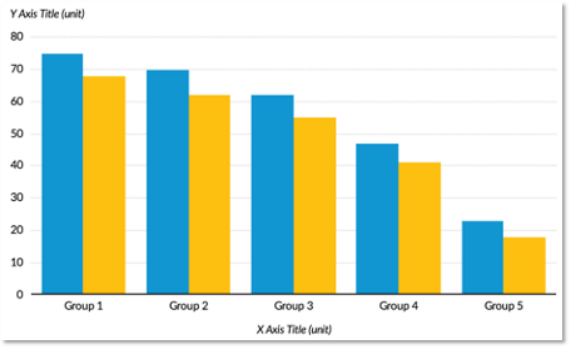
W



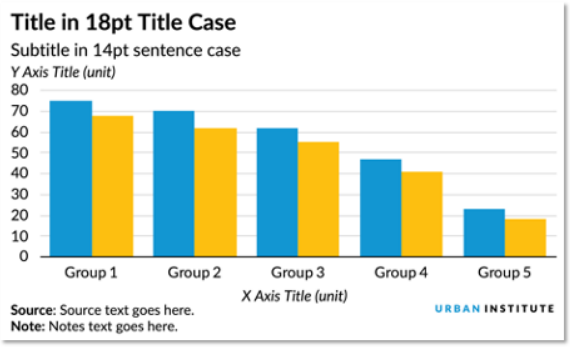
https://urban-institute.medium.com/applying-urbans-styles-in-excel-44707fbf2b75

Excel Template

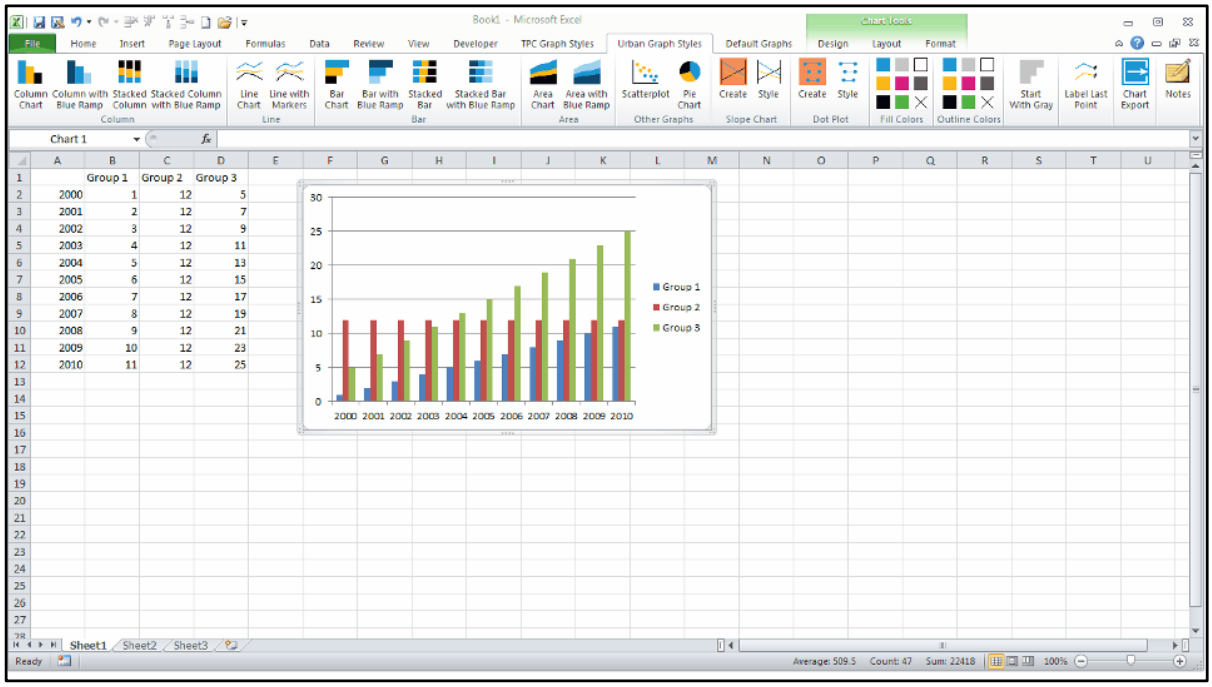
Print



Web (e.g., blog)



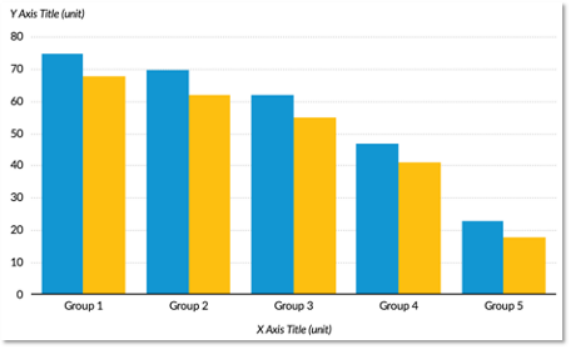
https://urban-institute.medium.com/applying-urbans-styles-in-excel-44707fbf2b75



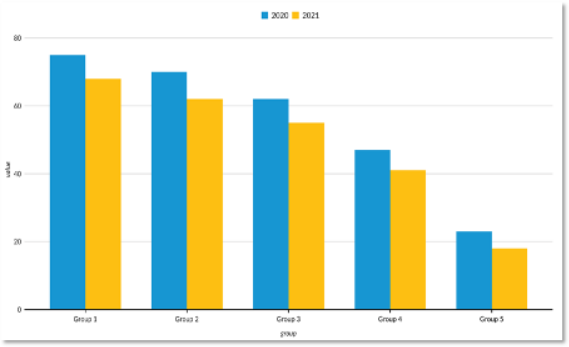
https://urban-institute.medium.com/applying-urbans-styles-in-excel-44707fbf2b75

Excel vs. R

Excel (print)



R



https://github.com/UrbanInstitute/urbnthemes

```r
library(tidyverse)
library(urbnthemes)

set_urbn_defaults(style = "print")

ggplot(data = mtcars, mapping = aes(factor(cyl))) +
  geom_bar() +
  scale_y_continuous(expand = expansion(mult = c(0, 0.1))) +
  labs(x = "Number of Cylinders",
       y = "Count") +
  remove_ticks() +
  labs(title = "Most Cars Have 8 Cylinders",
       subtitle = "1974 Motor Trend US magazine")
```

Source: https://github.com/UrbanInstitute/urbnthemes

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1 Why have a style guide?

1

Make styles consistent & identifiable

2

Make it easier for all staff to implement

2 What should your style guide include?

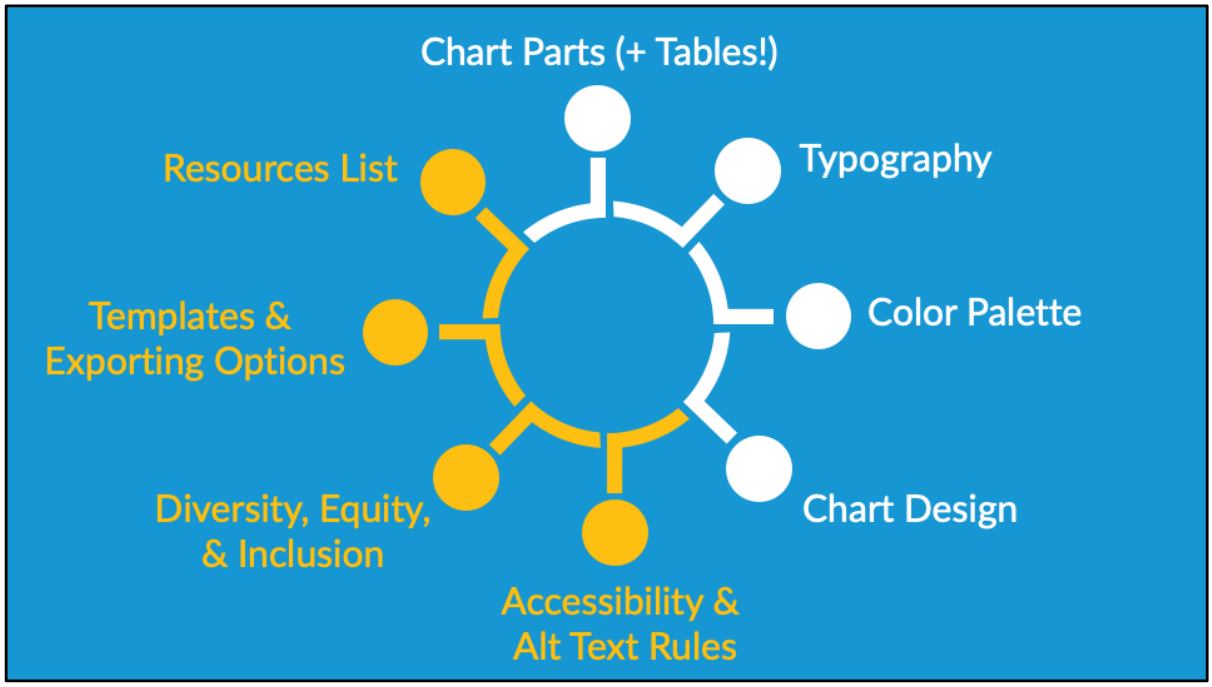
Chart Parts (+ Tables!)
Typography
Color Palette
Chart Design
Accessibility &
Alt Text Rules
Diversity, Equity,
& Inclusion
Templates &
Exporting Options
Resources List

3 How do you develop your style guide?

1

Get input from all sides: design, analysis, dataviz, marketing,…

2

Iterate and treat as a living document

Be consistent.
Be targeted.
Be thorough.
Be inclusive.
Be receptive.

Jon Schwabish | @jschwabish

Resources & Further Reading

Adele: The repository of publicly available design systems and pattern libraries, https://adele.uxpin.com/
Amy Cesal: Why does Data Vis need a style guide? (OpenVisConf talk, 2017), https://www.youtube.com/watch?v=0rQ0NP8JPHQ
Amy Cesal: Sunlight Foundation Data Visualization Style Guidelines, https://www.amycesal.com/data-visualization-style-guidelines
Amy Cesal: What are DataViz Style Guides?, https://medium.com/nightingale/style-guidelines-92ebe166addc
Amy Cesal: How to Create Brand Colors for DataViz Style Guides, https://medium.com/nightingale/how-to-create-brand-colors-for-data-visualization-style-guidelines-dbd69c586dd9
Amy Cesal: Data Visualization guidelines for the CFPB, https://www.amycesal.com/portfolio#/cfpb-design-manual-data-visualization/
Amy Cesal: Writing Alt Text for Data Visualization, https://medium.com/nightingale/writing-alt-text-for-data-visualization-2a218ef43f81
Ben Chartoff: Urban Institute's Data Visualization Style Guide: A living document, https://urban-institute.medium.com/urban-institutes-data-visualization-style-guide-a-living-document-b90710702a9f
The Datalabs Agency: Data Visualization Style Guides, http://datalabsagency.com/data-visualization-style-guides/
Data Visualization Society: Style Guidelines Collection, https://www.datavisualizationsociety.com/resources
Sara Delong: Why You Need to Create a Data Visualization Style Guide to Tell Great Stories (Part 1), https://depictdatastudio.com/why-you-need-to-create-a-data-visualization-style-guide-to-tell-great-stories/?ck_subscriber_id=273417732
Sara Delong: How to Create a Data Visualization Style Guide to Tell Great Stories (Part 2), https://depictdatastudio.com/how-to-create-a-data-visualization-style-guide-to-tell-great-stories/?ck_subscriber_id=273417732
Jovan Lekovic: How we made the BBC Audiences Tableau Style Guide, https://medium.com/bbc-data-science/how-we-made-the-bbc-audiences-tableau-style-guide-4f0a6b7525ce
PolicyViz: Why Your Organization Needs a Data Visualization Style Guide, https://policyviz.com/2021/03/16/why-your-organization-needs-a-data-visualization-style-guide/
PolicyViz: Style Guide Collection, https://policyviz.com/2016/11/30/style-guides/
Lisa Charlotte Rost: What to consider when creating tables, https://blog.datawrapper.de/guide-what-to-consider-when-creating-tables/
Richard Rutter: Web Typography: Designing Tables to be Read, Not Looked At, https://alistapart.com/article/web-typography-tables/
Jonathan Schwabish: Ten Guidelines for Better Tables (*Journal of Benefit-Cost Analysis*), https://www.cambridge.org/core/journals/journal-of-benefit-cost-analysis/article/abs/ten-guidelines-for-better-tables/74C6FD9FEB12038A52A95B9FBCA05A12
Matthew Ström: Design Better Data Tables, https://medium.com/mission-log/design-better-data-tables-430a30a00d8c
Alan Wilson: More than a Style Guide: Data Visualziation for Design Systems (VisInPractice talk, 2020), https://visinpractice.github.io/program.html#alan