

Communicating with Data

PLAN 678 – Day 1

Spring 2026

Public trust in government is at historic lows

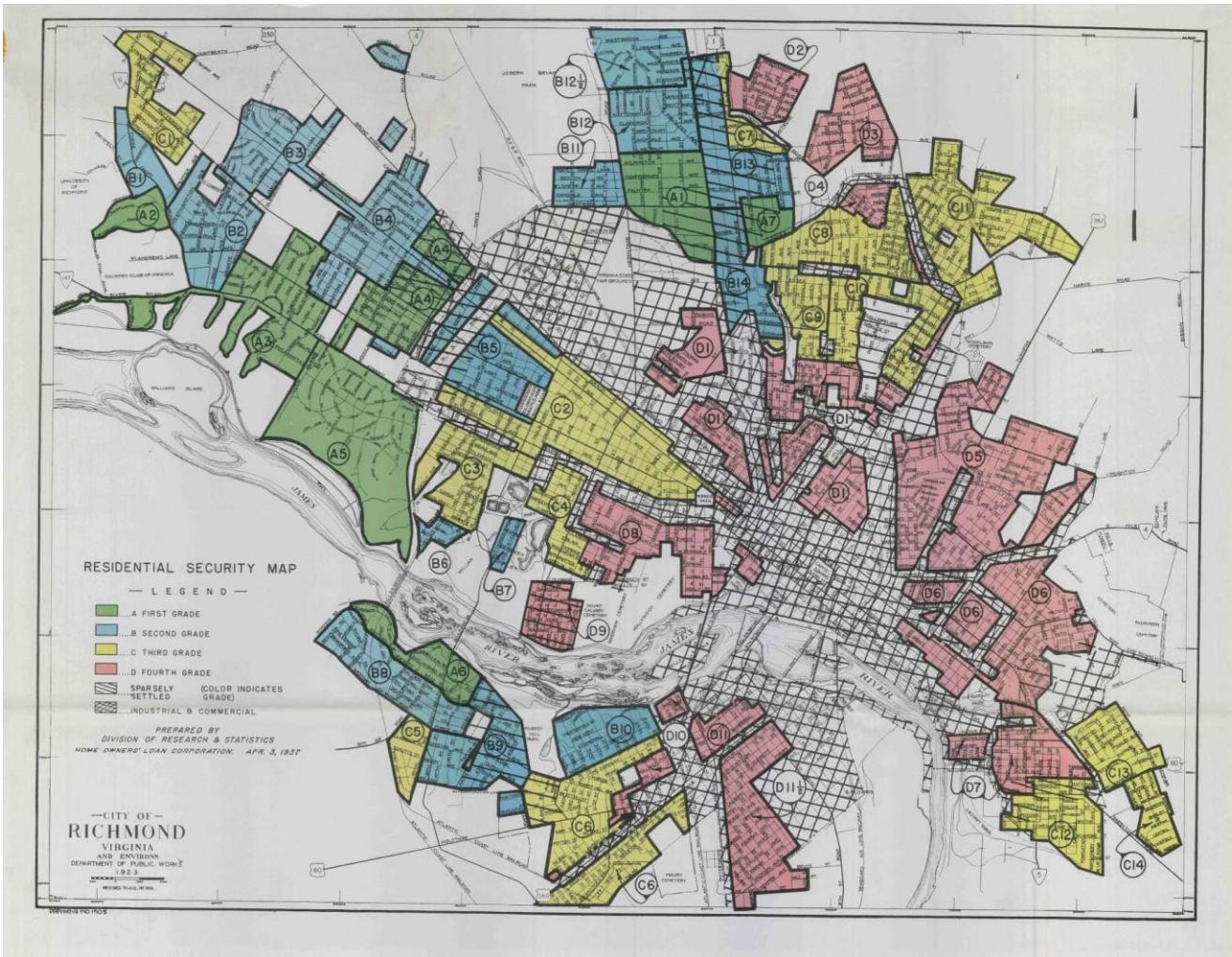
Percent who say they trust the government to do what is right just about always/most of the time



Source: Pew Research

History of data visualization in government decision-making

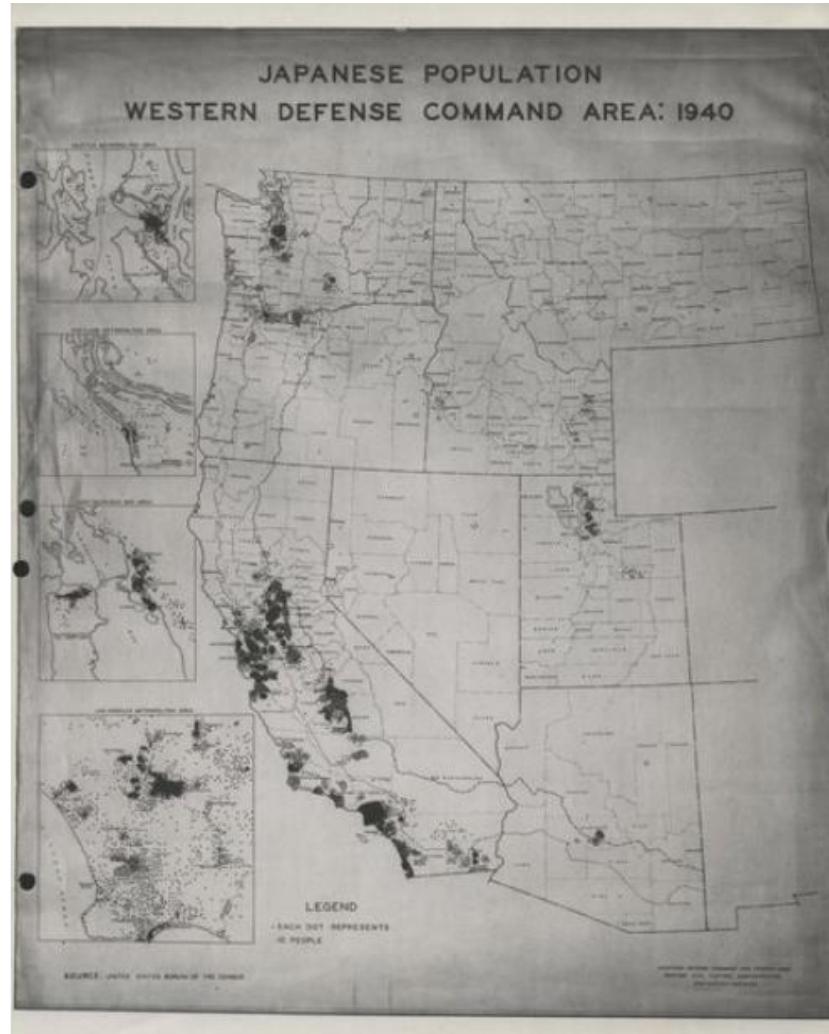
Maps created by the Federal Government to set racial housing policy.



Source: Mapping Inequality

History of data visualization in government decision-making

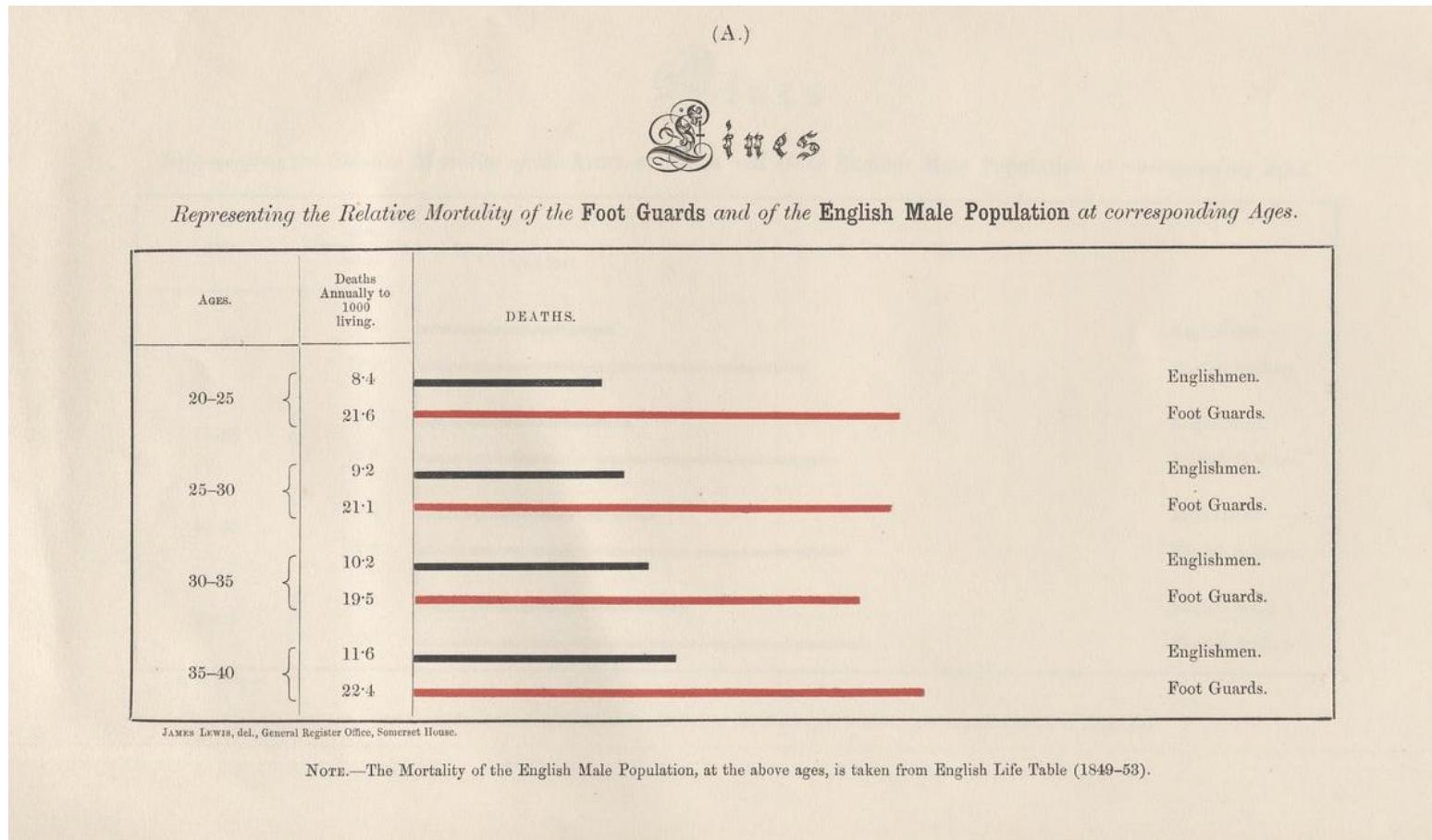
Census data used to identify neighborhoods of Japanese-Americans during internment.



Source: Berkeley Library

There are also many examples of using data viz to improve lives

Florence Nightingale during the Crimean War.



Source: Scientific American

There are also many examples of using data viz to improve lives

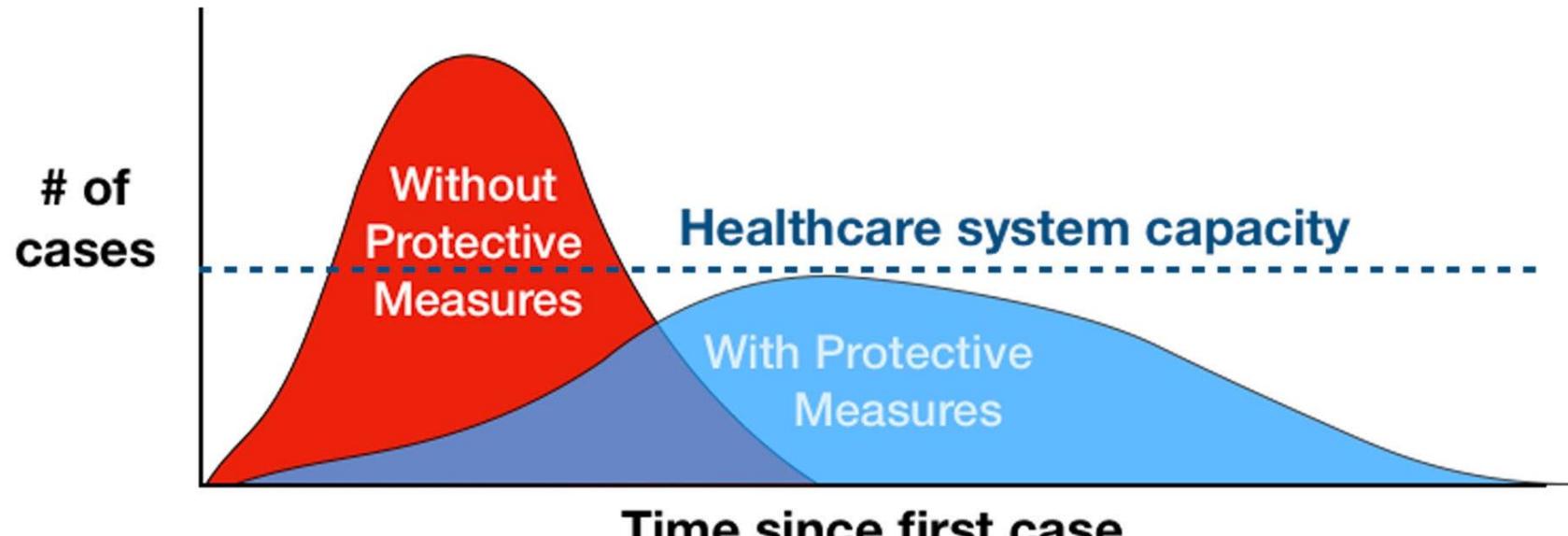
W.E.B. DeBois using data to highlight economic conditions among black Americans.



Source: Public Domain
Review

Data viz entered the national consciousness during the pandemic

"Flatten the curve!"



Adapted from CDC / The Economist

Source: The Economist

Class Schedule

Day 1: January 16

- Setting goals for your data visualizations
- Defining your audience
- Visual Processing & Cognitive Load
- How to choose the right visualization for your data (chart bootcamp)

Day 2: January 23

- XRAY discussion
- Data Visualization Research: What works
- Enough color theory to get by
- Better legends in your data visualization
- Titles, annotations, and other texts
- “Fix my chart” exercise

Day 3: January 30

- Plain language: What it is, why it’s important, and how to use it
- Writing about numbers
- What makes a compelling data story
- Mapping your data characters

Day 4: February 6

- Accessibility in data visualization
- AI and data visualization
- Data visualization in the workplace
- Workshop time for memos

Final Memo

Choose an analytical topic and write a memo for a data stakeholder (e.g., a colleague, client, or elected official).

Your memo should include:

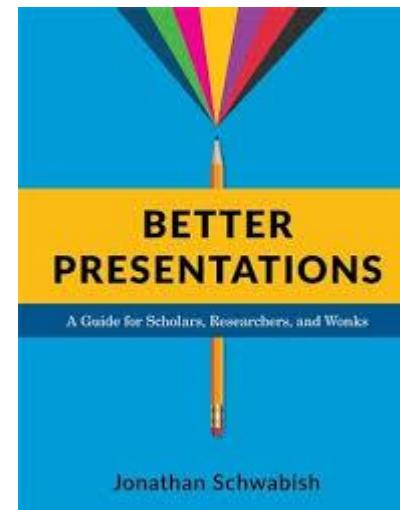
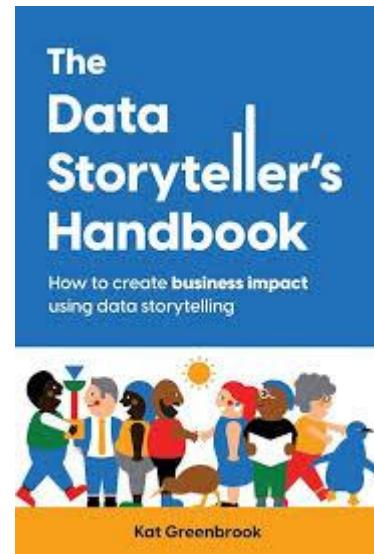
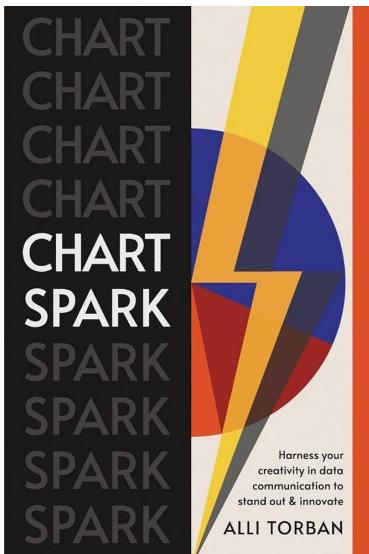
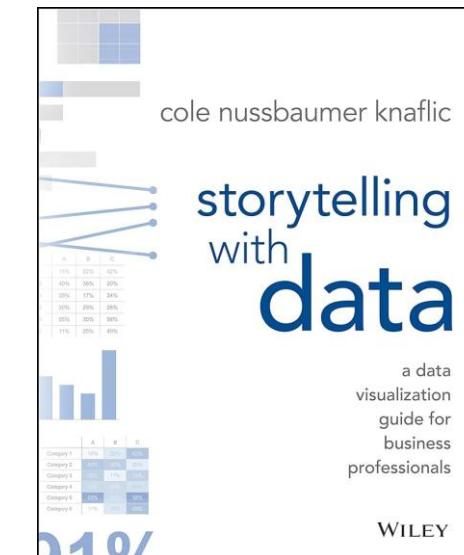
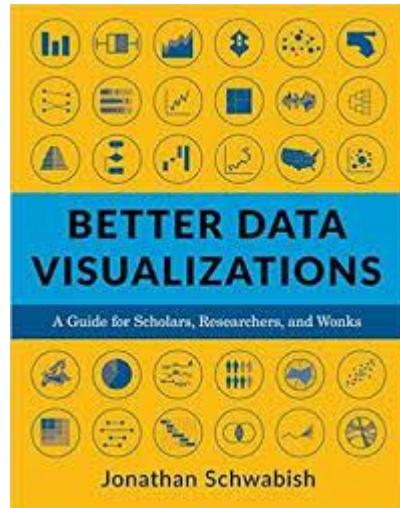
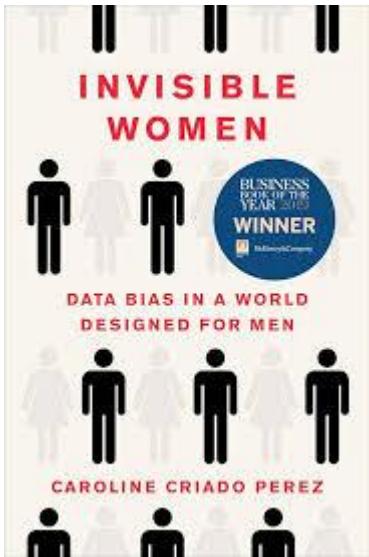
1. The question or problem you are addressing.
2. Your findings and any potential limitations.
3. The implications of your findings.
4. A brief summary of your data sources and the approach you used to analyze the data.

Due Date: February 27

Word Limit: No more than 2,500 words.

Use as many charts or visuals as needed but only include those essential to telling your data story.

We're in a golden age for data viz resources



Blog

Datawrapper

Course Objectives

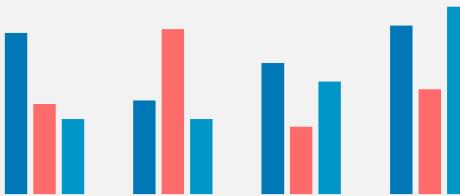
1. **Data Viz Craft** – Understand the research behind visual communication and develop a vocabulary for effective data visualization.
2. **Data Communication** – Learn how to write and present analysis using plain language and understand the elements of an effective data story.
3. **Data Viz Tools** – Practice visualizing data using your preferred data viz tools.

Why visualize data?

Discover

I want to **discover** insights about my data.

e.g. charts made during analysis



Inform

I want to **inform** others about my data.

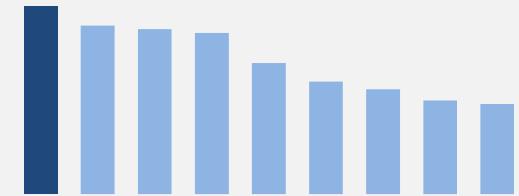
e.g. dashboards, regular reports



Educate

I want to **educate** others about my data.

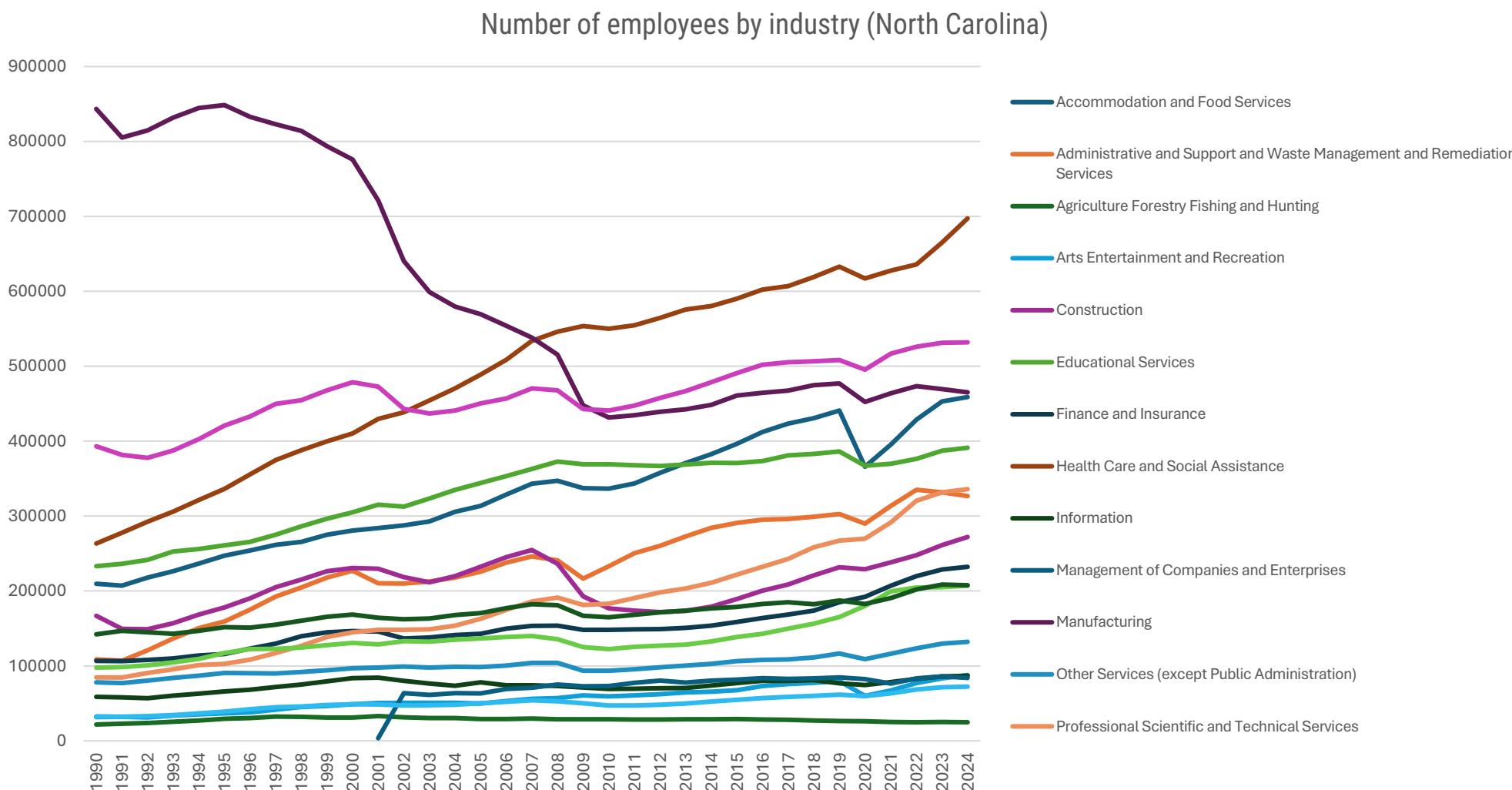
e.g. data story telling



Source: *The Data Storyteller's Handbook*
By Kat Greenbrook

Visualizing data to **discover**

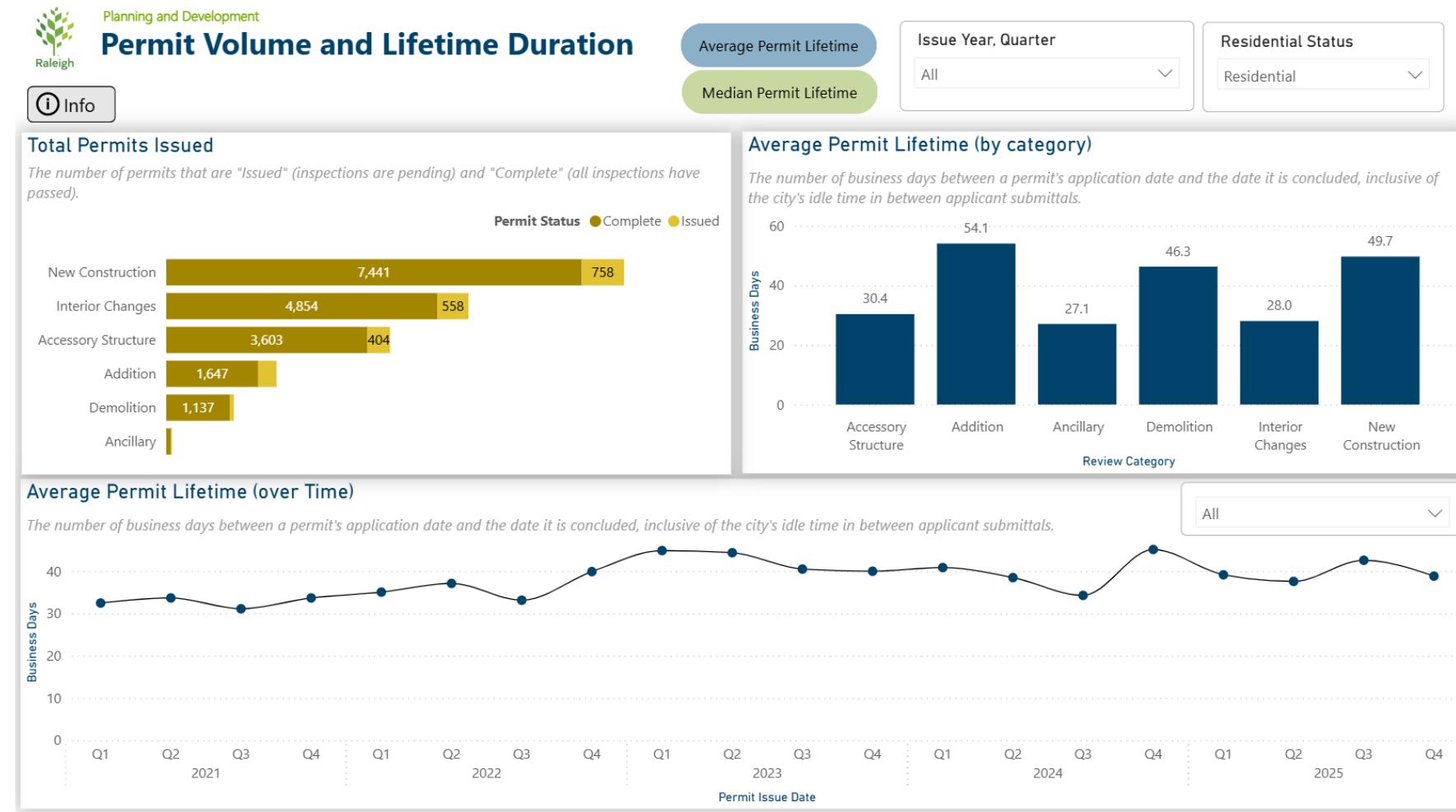
The only audience member should be you.



Source: NC Commerce

Visualizing data to inform

The audience member is usually familiar with the data sources.

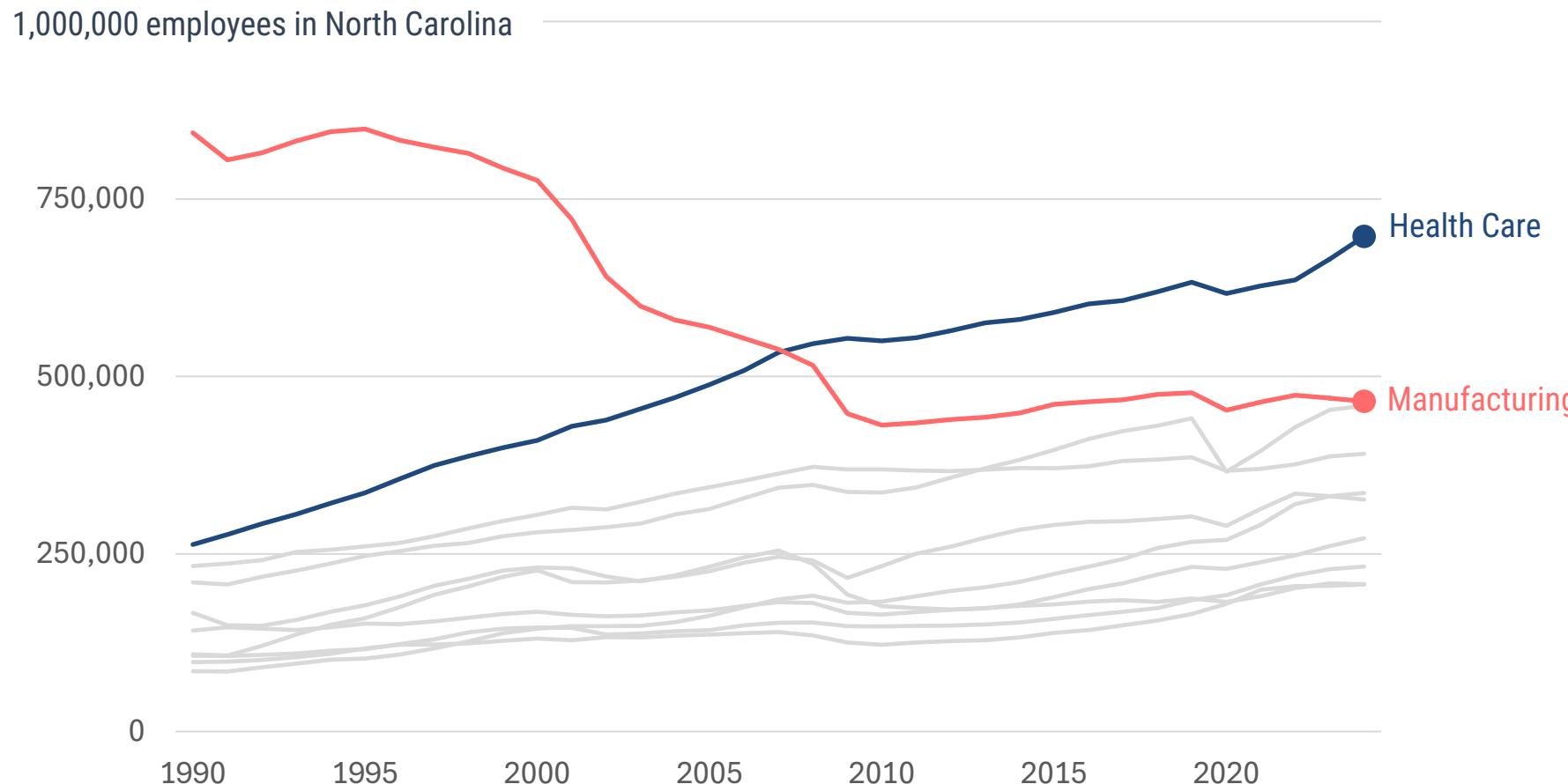


Source: City of Raleigh

Visualizing data to educate

Data is in story form catered to your audience member.

Health care replaced **manufacturing** as the dominant industry in North Carolina

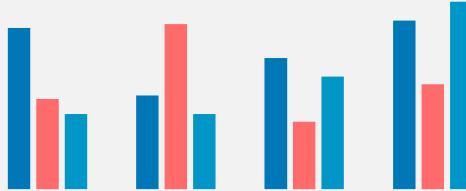


Source: NC Commerce

Who do you visualize data for?

Discover

Yourself



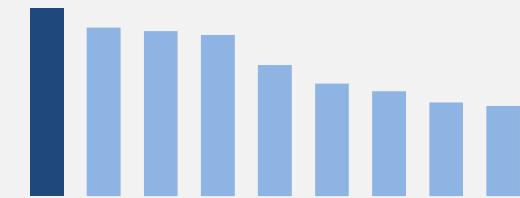
Inform

Subject Expert



Educate

Everyone Else



Source: *The Data Storyteller's Handbook*
By Kat Greenbrook

Defining your audience

Visualizing data to **discover**

The only audience member should be you.



Source: *The Data Storyteller's Handbook*
By Kat Greenbrook

Visualizing data to **inform**

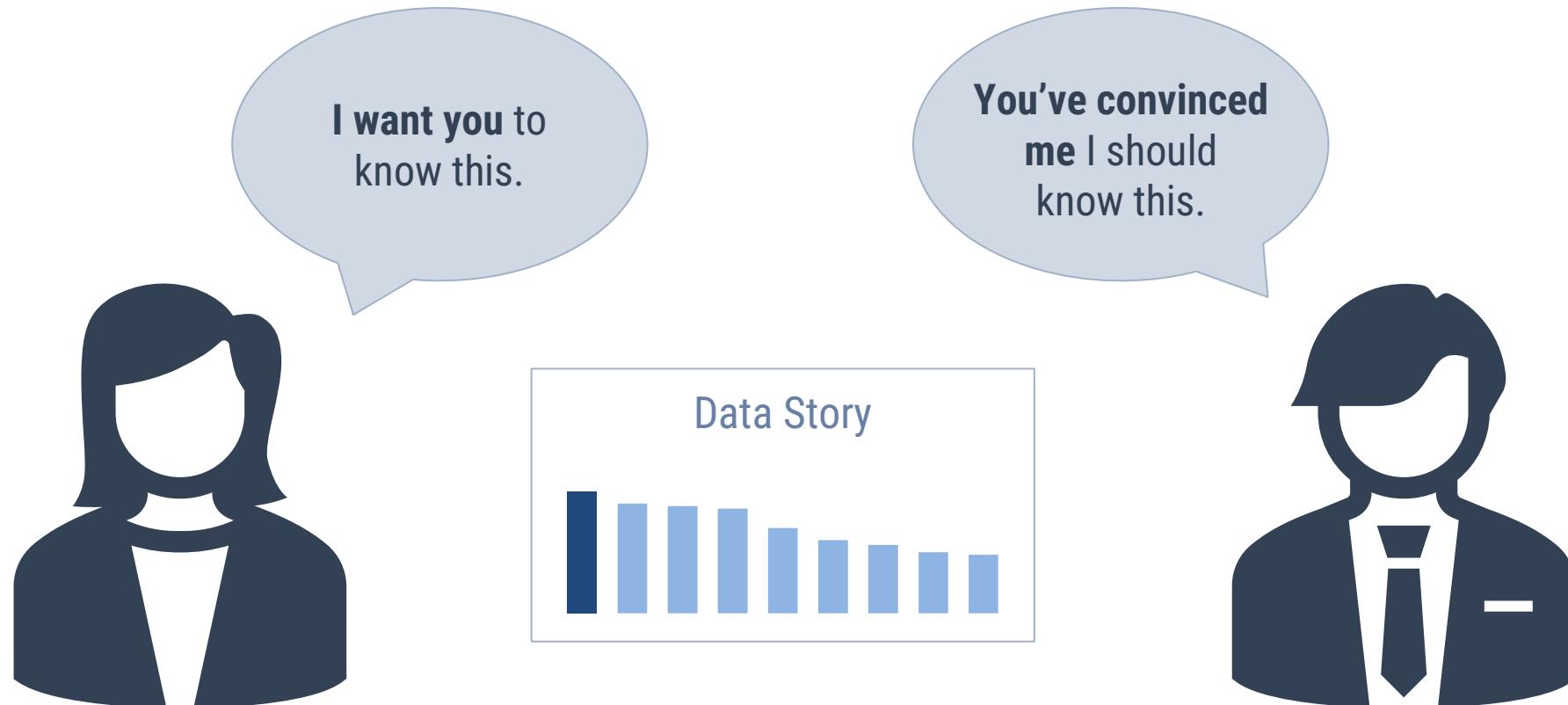
The audience member is usually familiar with the data sources.



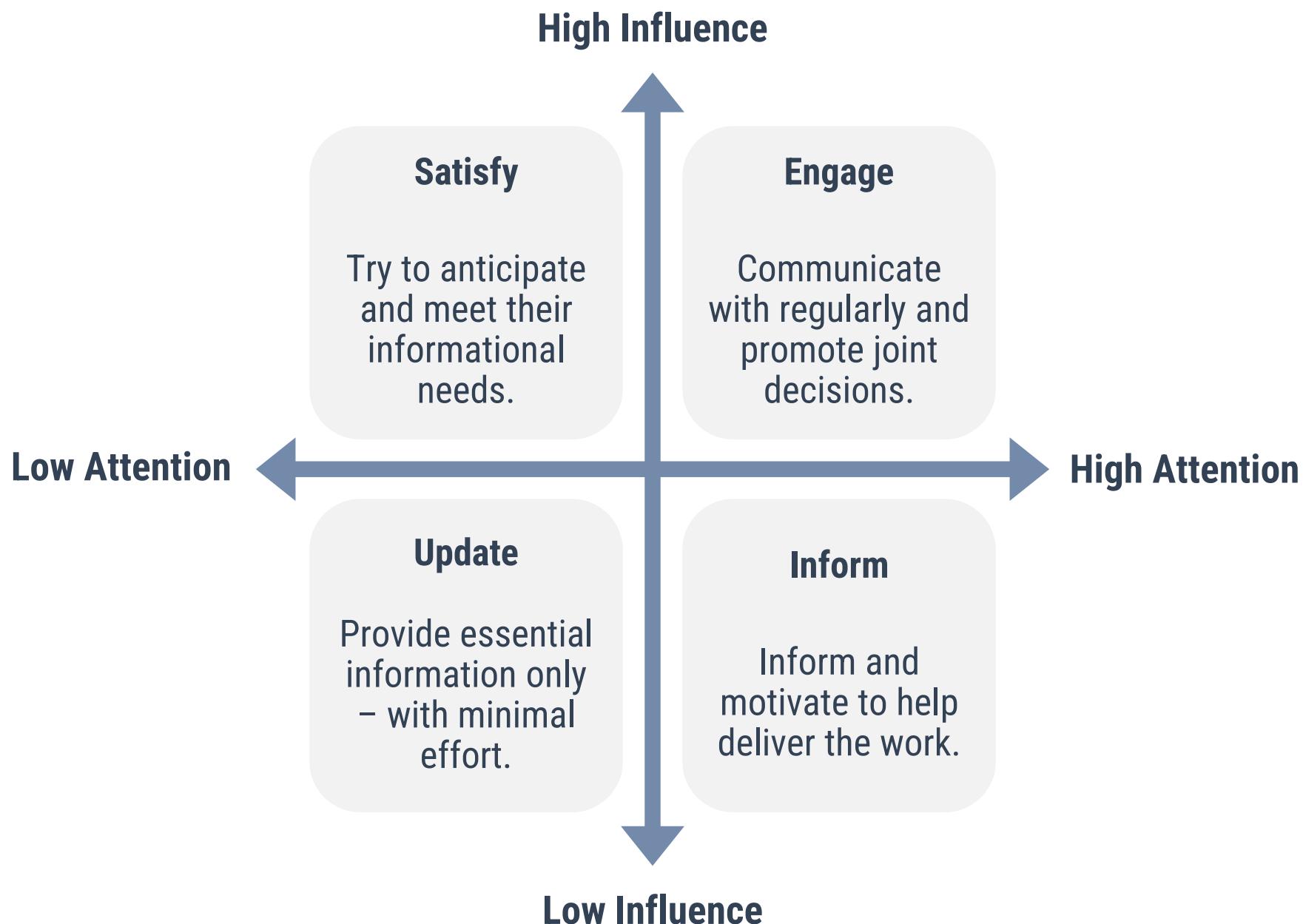
Source: *The Data Storyteller's Handbook*
By Kat Greenbrook

Visualizing data to **educate**

Data is in story form catered to your audience member.



Source: *The Data Storyteller's Handbook*
By Kat Greenbrook



Source: *The Data Storyteller's Handbook*
By Kat Greenbrook

Introductions

- Who have been your data stakeholders in past jobs or internships?
- Thinking about your interests and career goals, who do you imagine your future audience members will be?
- What do you hope to get out of this class?

Principles of data visualization

Gestalt's Principles of Visual Processing

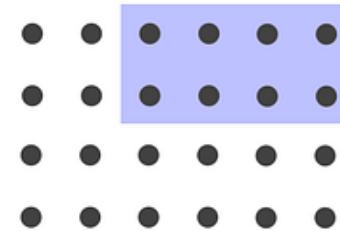
Proximity



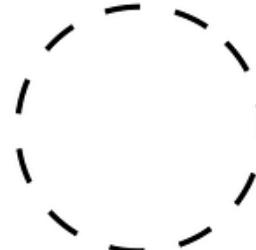
Similarity



Enclosure



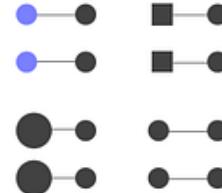
Closure



Continuity



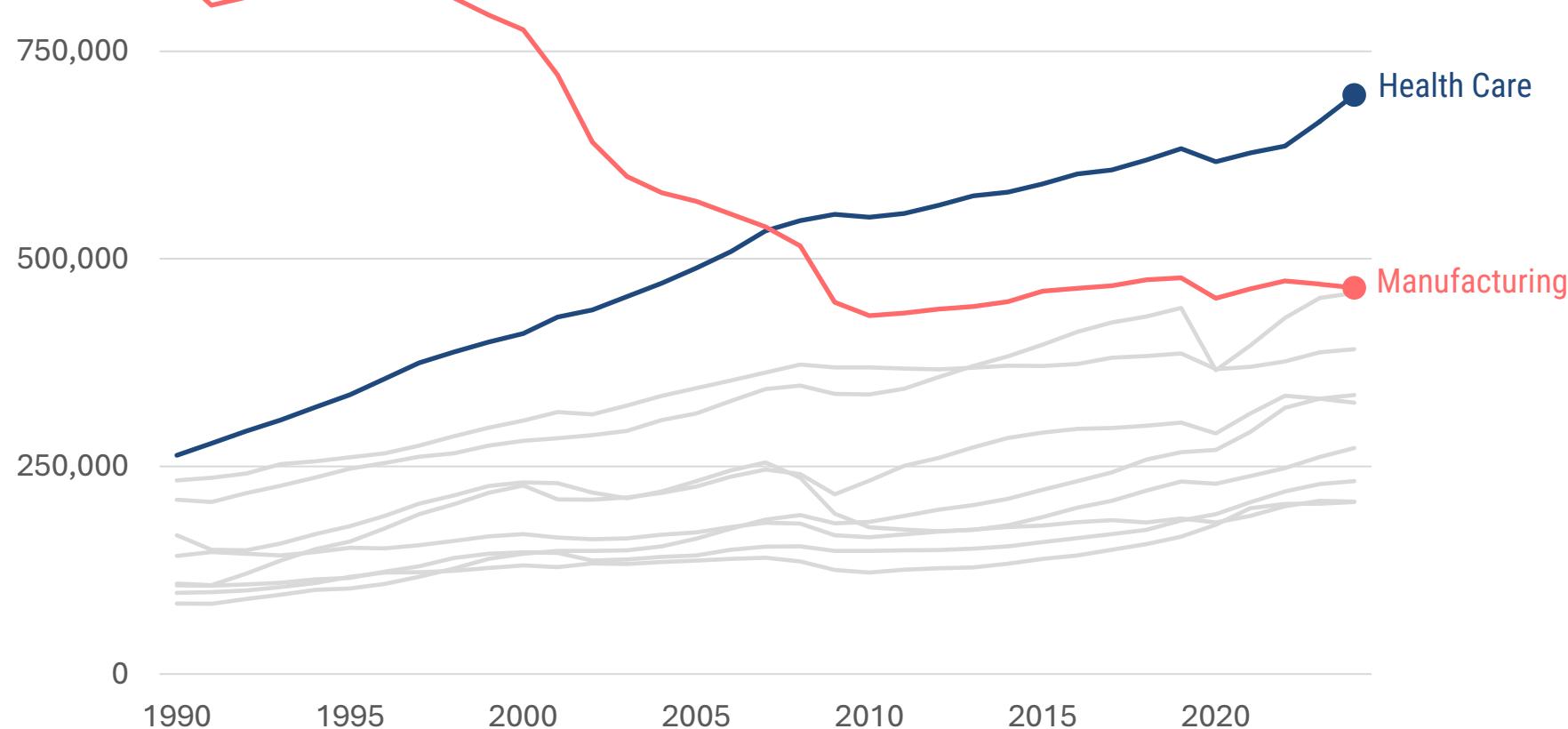
Connection



Source: [Anastasiya Kuznutsova](#)

Health care replaced manufacturing as the dominant industry in North Carolina

1,000,000 employees in North Carolina



Proximity



Similarity



Enclosure



Connection



Closure

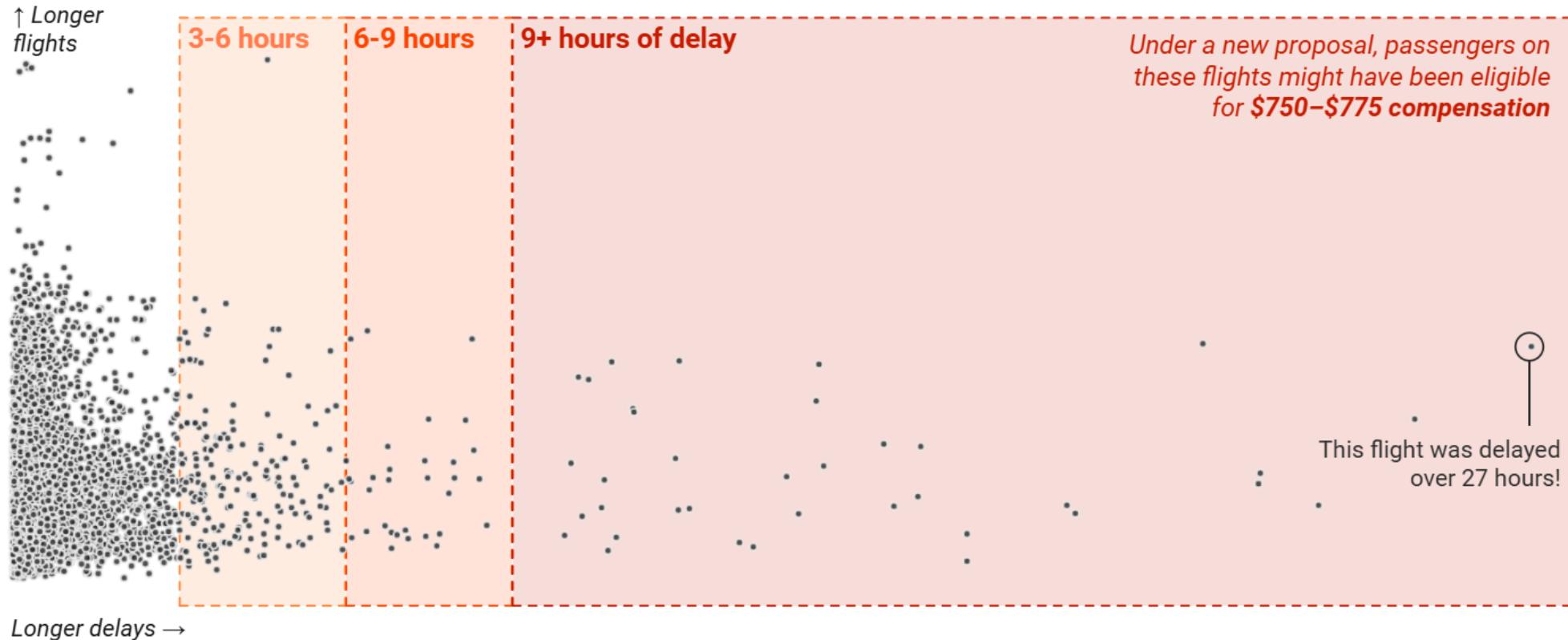


Continuity



How long are flight delays during the winter holiday season?

Each dot represents one delayed U.S. domestic flight. **3.4%** were delayed for 3-6 hours, **0.6%** for 6-9 hours and **0.5%** for more than 9 hours. Does not include delays due to weather.



All 5,908 U.S. domestic flights that were delayed due to the carrier between December 19, 2022 and January 1, 2023.

Chart: Michael Do Thoi • Source: [US DOT: Bureau of Transportation Statistics via Kaggle](#)

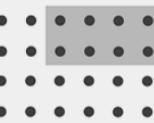
Proximity



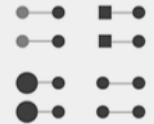
Similarity



Enclosure



Connection



Closure



Continuity



Proximity



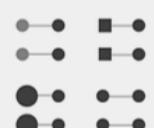
Similarity



Enclosure



Connection



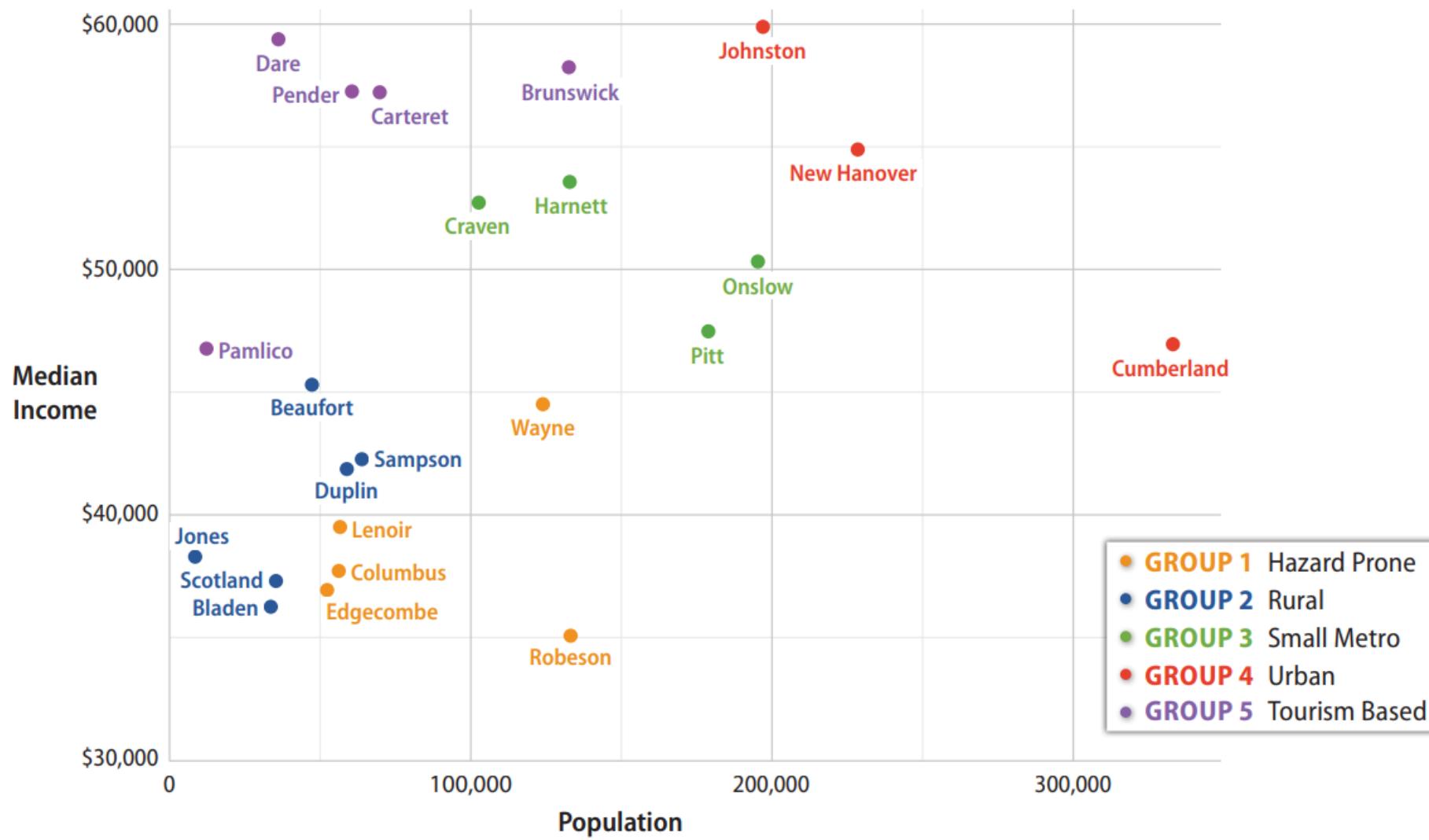
Closure



Continuity



Figure B.1. Population and Median Income by Group



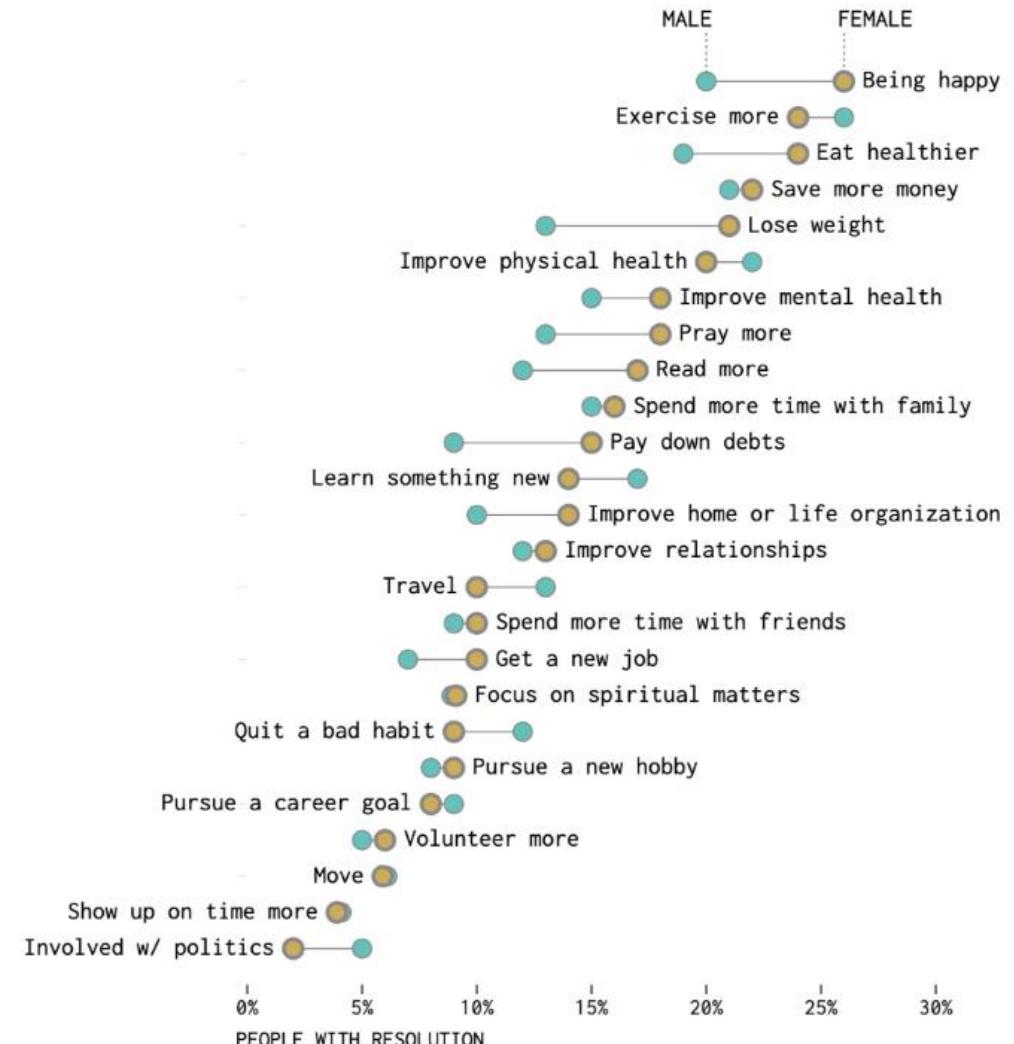
Goals for New Year, Male and Female

Among U.S. adults who selected all the resolutions that applied to them

SORT BY

Male Hope

Female Hopes



Proximity



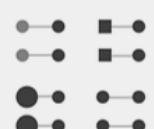
Similarity



Enclosure



Connection



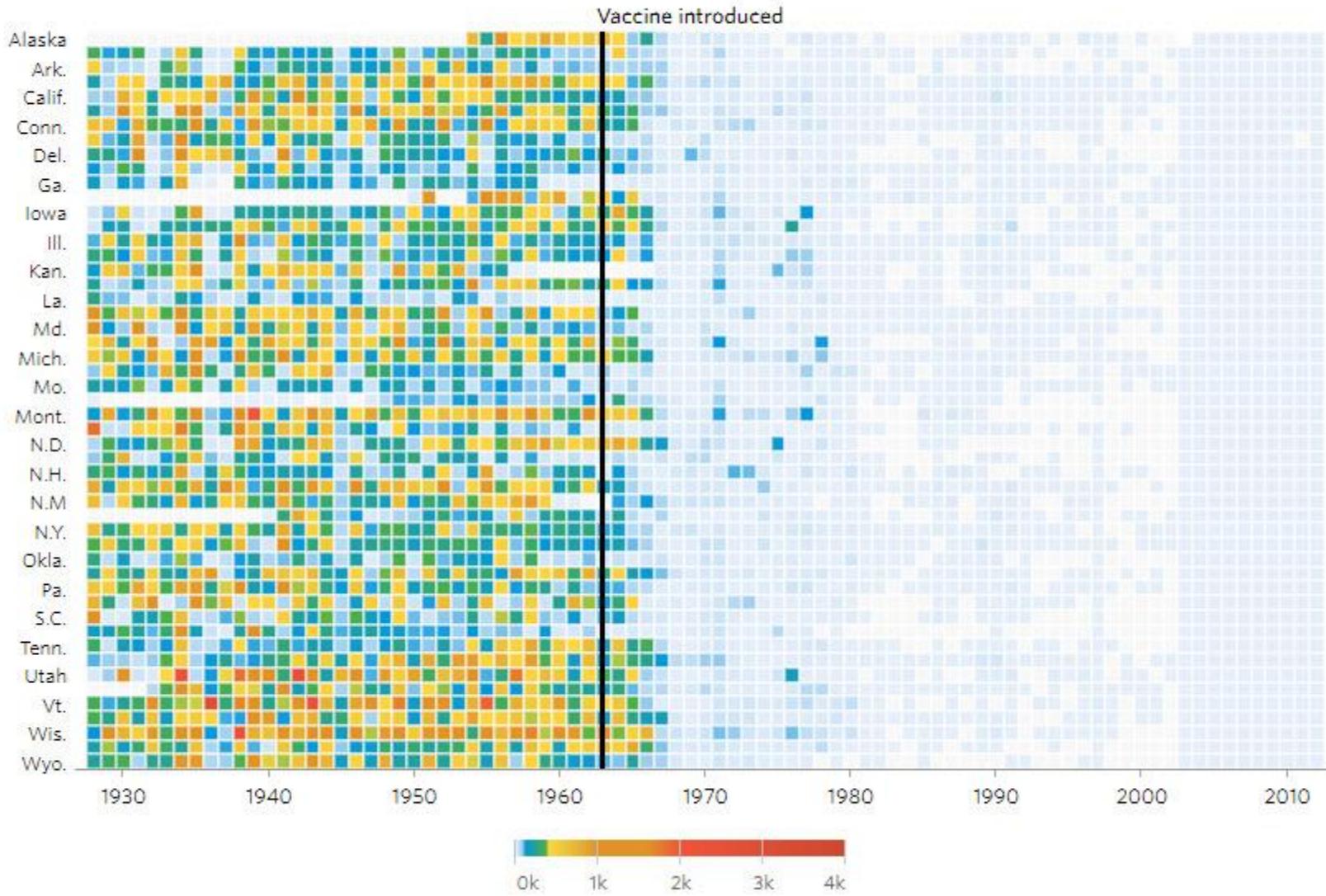
Closure



Continuity



Measles



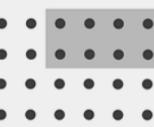
Proximity



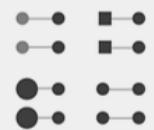
Similarity



Enclosure



Connection

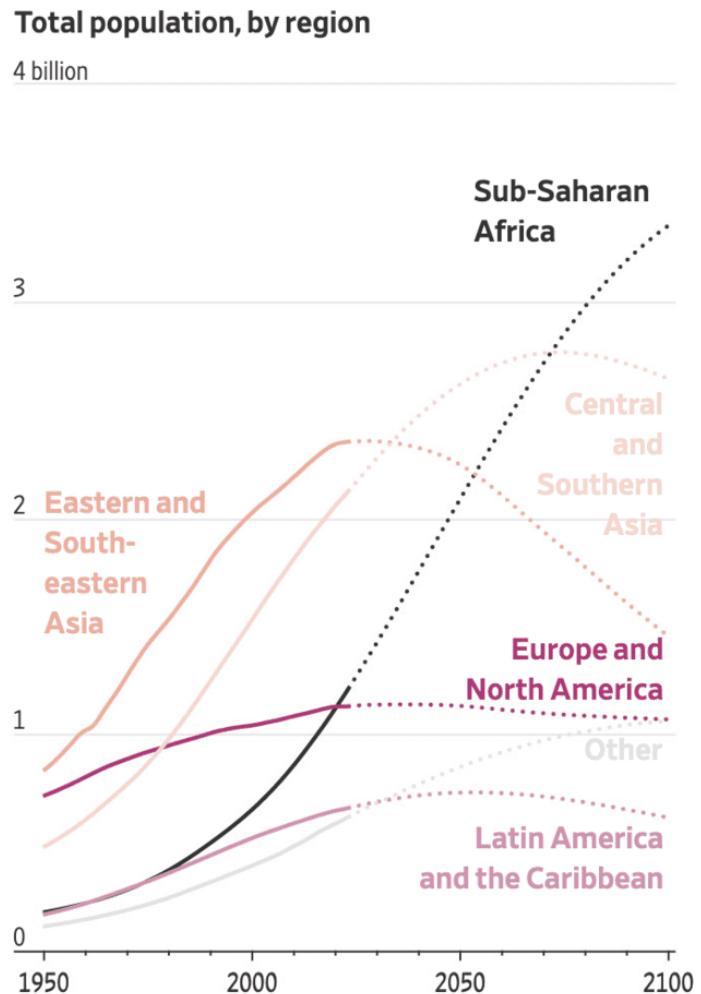
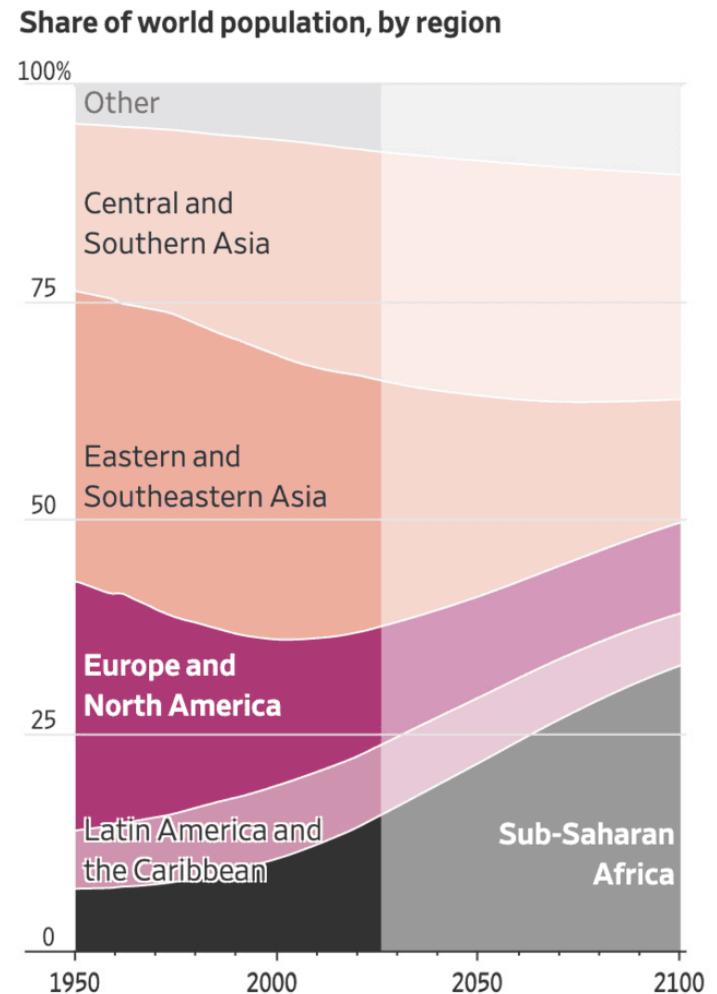


Closure

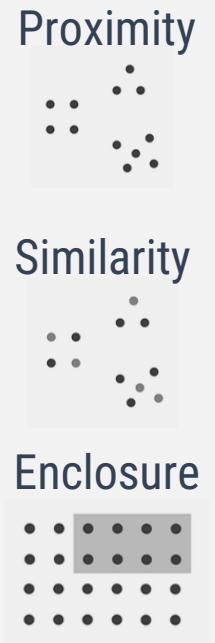


Continuity



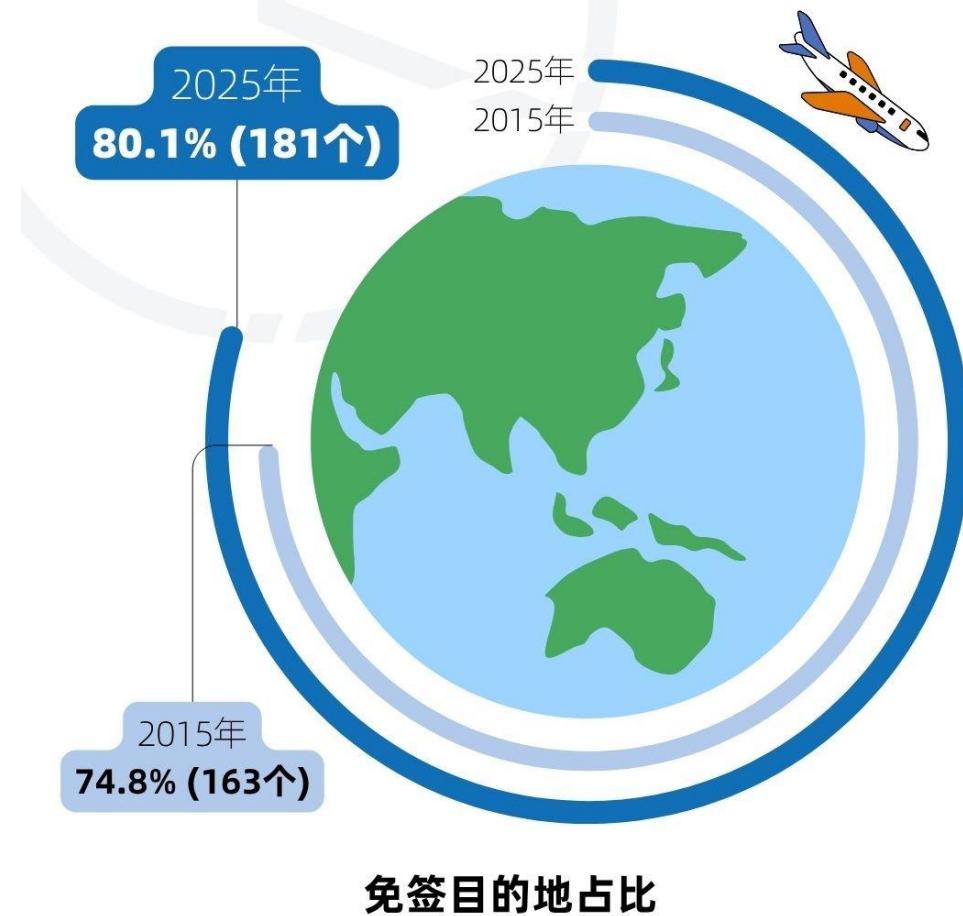


Note: Levels for July 1 of each year. Projections are the medium fertility scenario.
Source: United Nations



2025年免签目的地: 181个

今年对我国实施免签或落地签证的目的地数量,
比十年前增加了18个。



来源: 恒理护照指数

*2015年全球目的地数量为218个, 2025年则有226个。

图懂天下

Proximity



Similarity



Enclosure



Connection



Closure



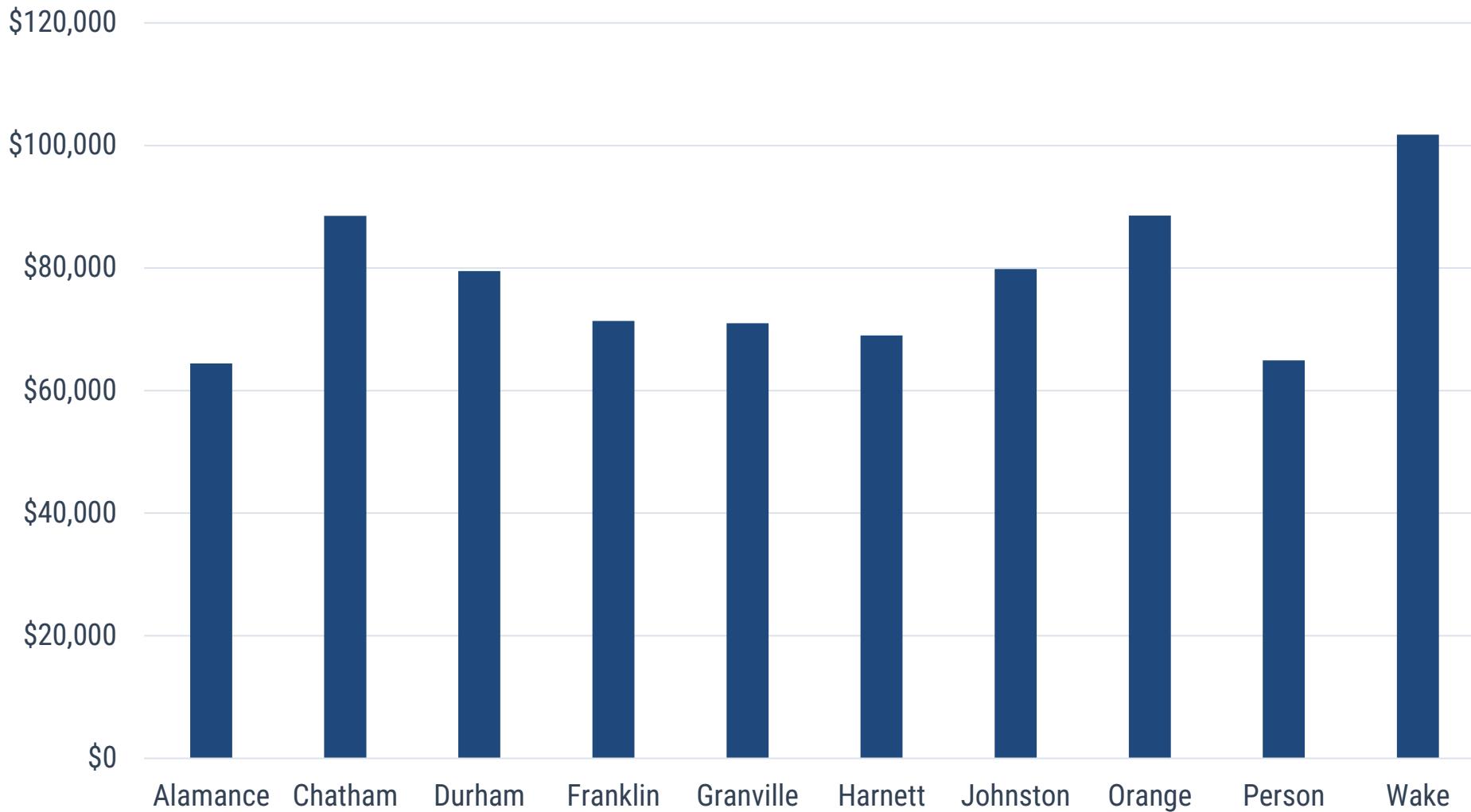
Continuity



How you arrange your data matters

Household incomes around the Triangle

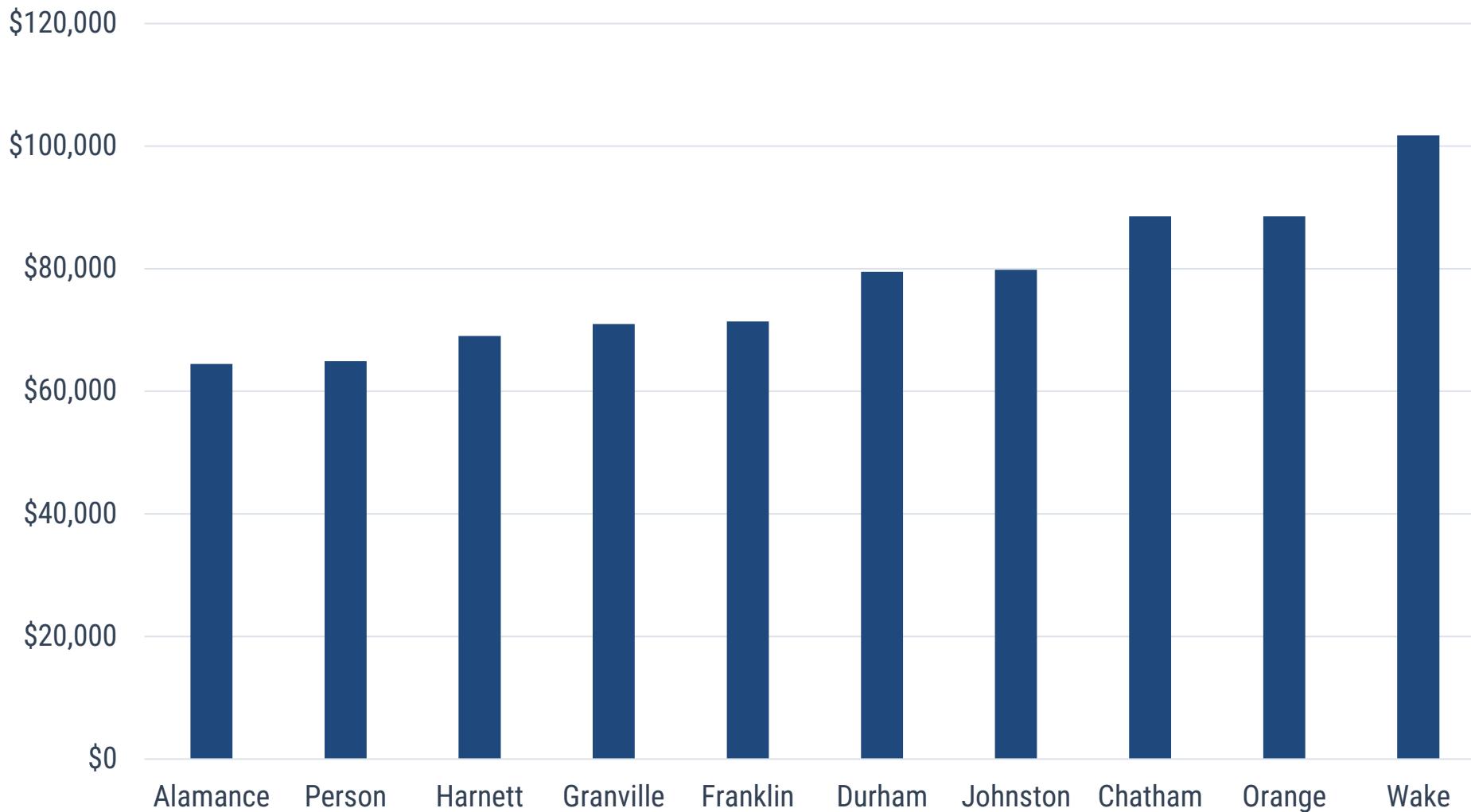
Median household income among North Carolina counties



Source: 2023
American Community
Survey (5-Year
Estimates)

Household incomes around the Triangle

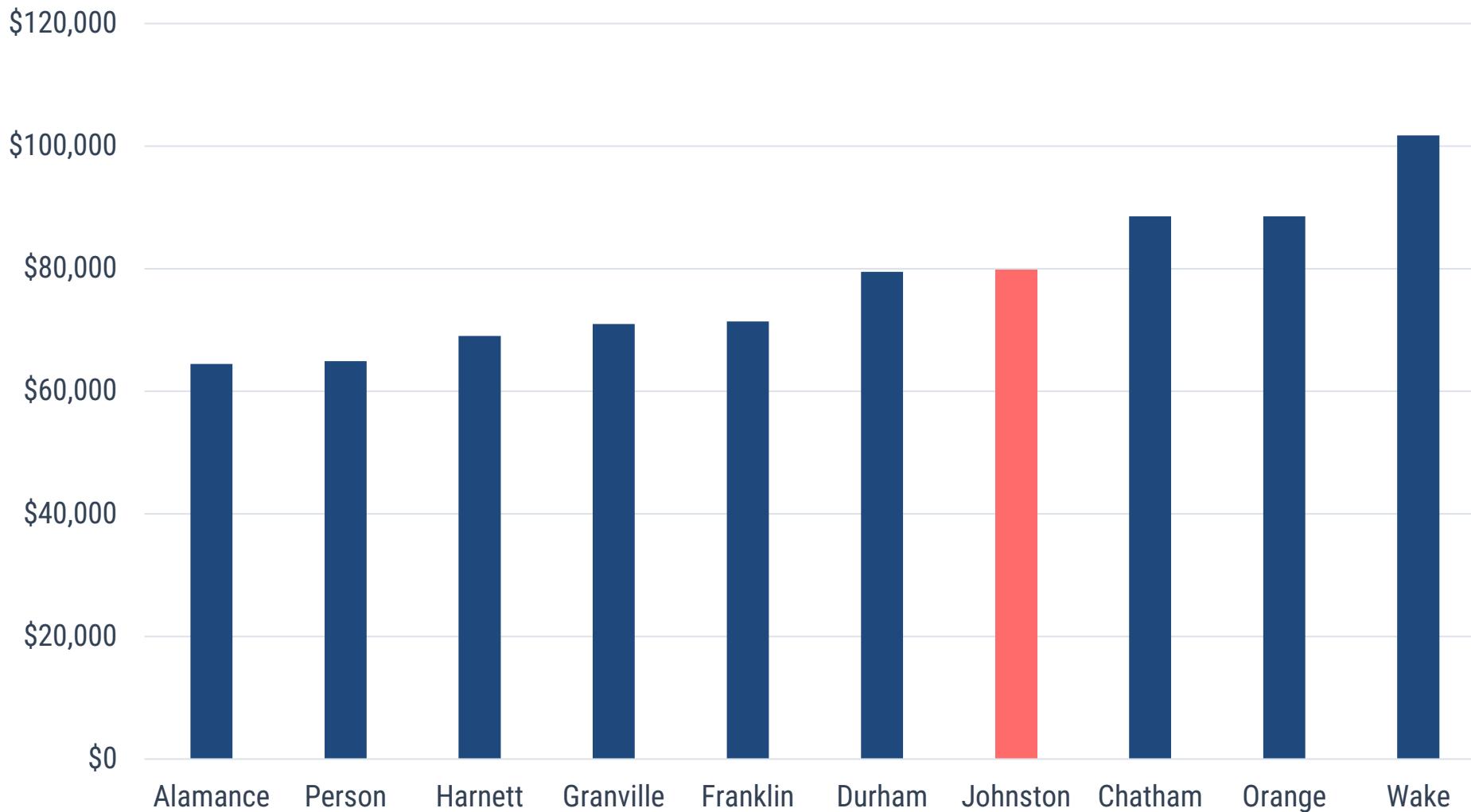
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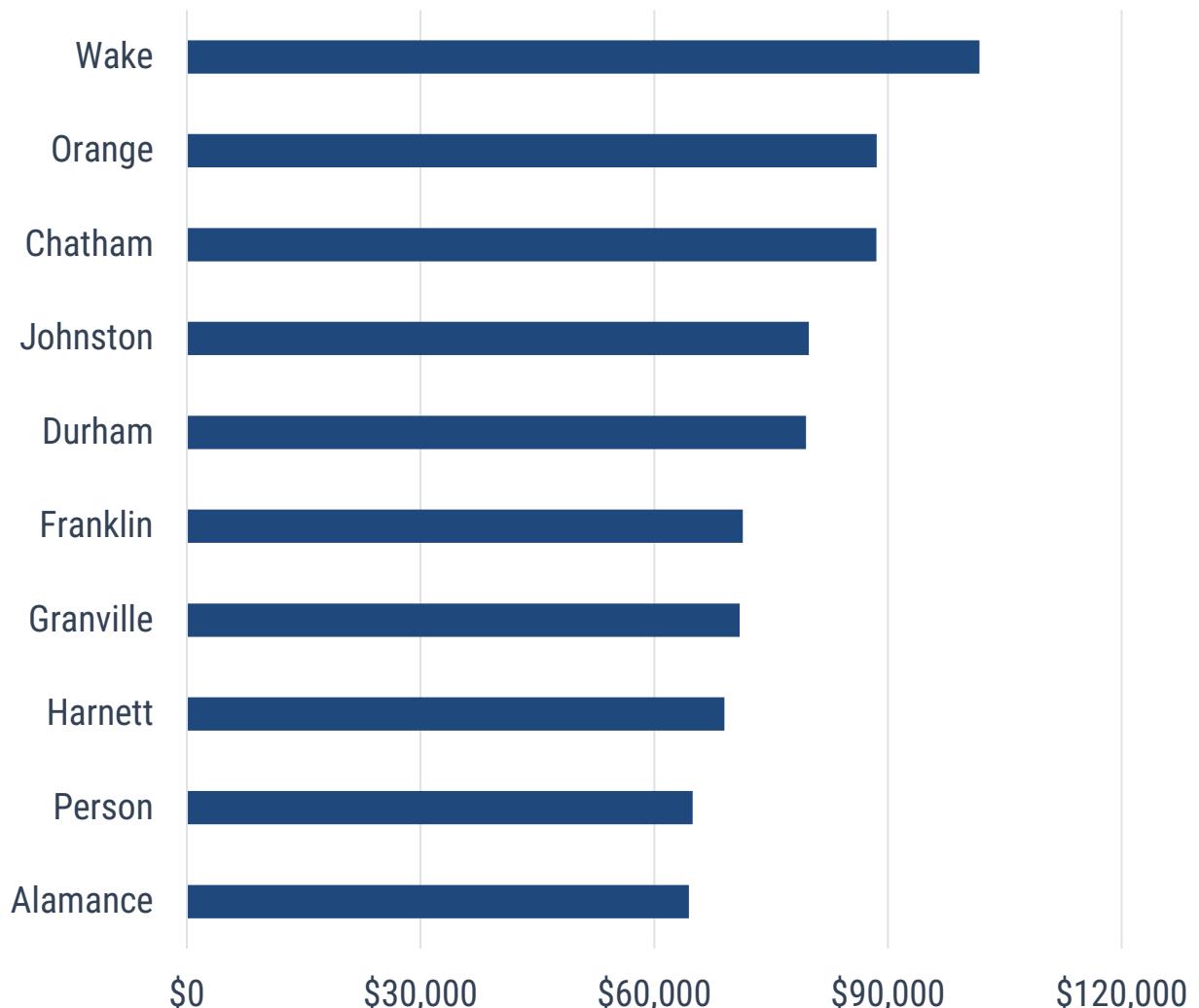
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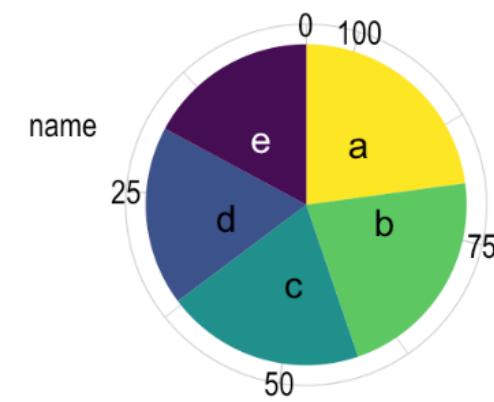
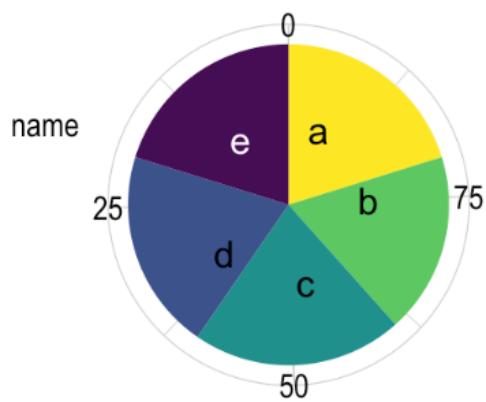
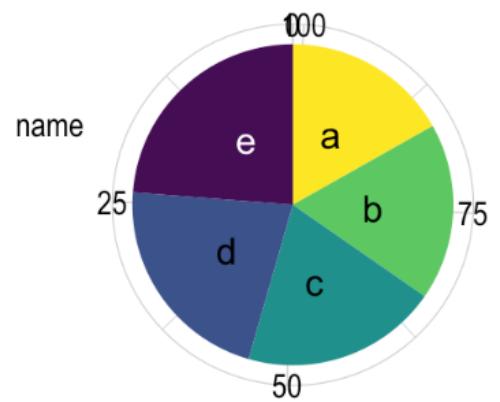
Source: 2023
American Community
Survey (5-Year
Estimates)

THE ISSUE WITH PIE CHART

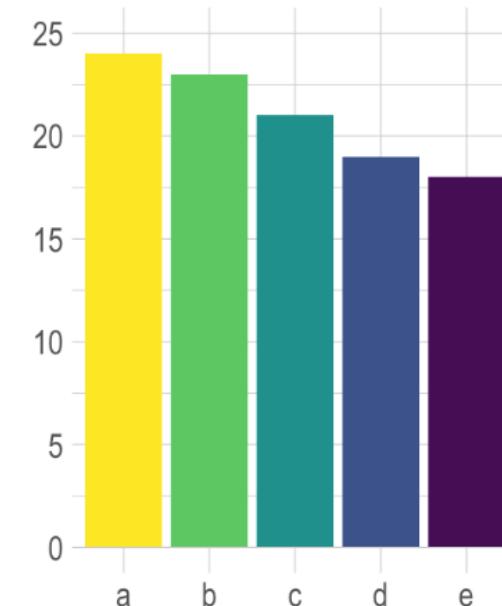
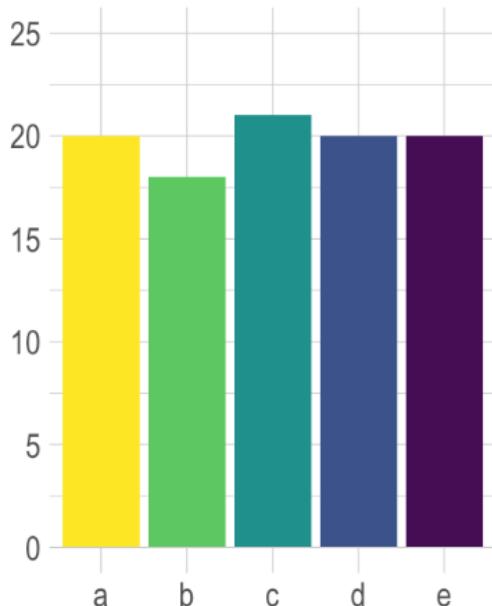
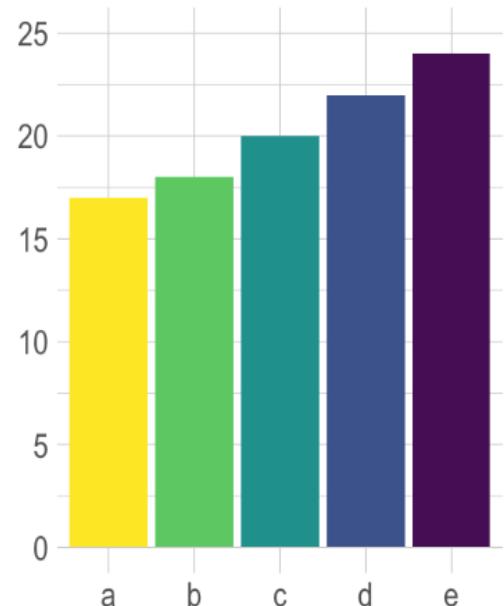
A collection of common dataviz caveats by Data-to-Viz.com



Source: [Data-to-Viz.com](https://data-to-viz.com)



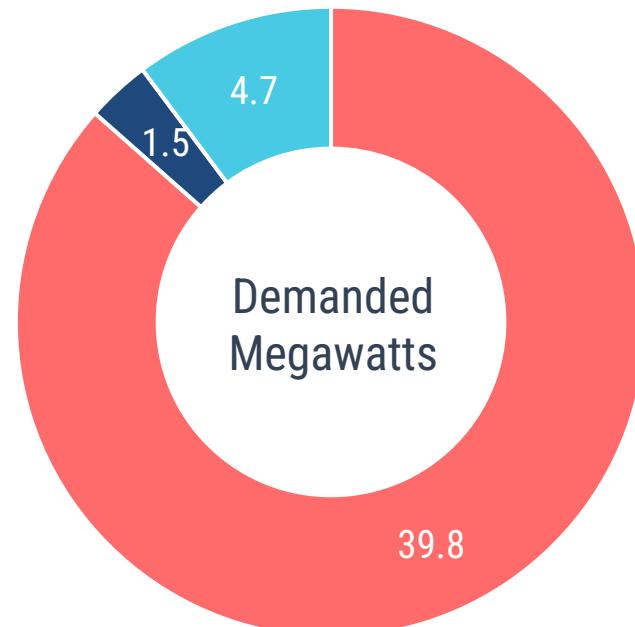
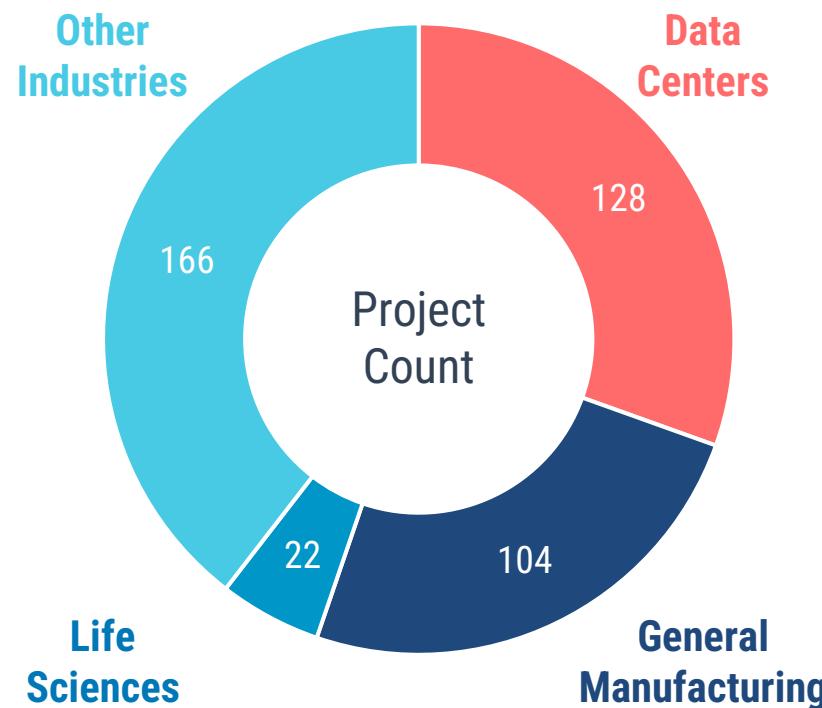
Source: Data-to-Viz.com



Source: Data-to-Viz.com

The Carolina's economic development pipeline is diverse

...But data centers dominate energy demand



Note: Pipeline includes both firm and speculative projects.

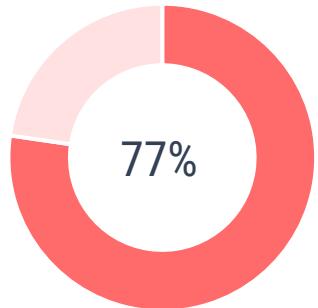
Other industries include aerospace, automotive/EV, energy, chemicals, and others.

Source: Duke Energy.
Data as of October 2025.

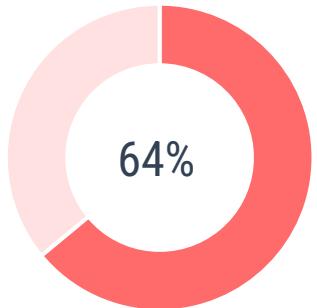
Critical industries go electric

Electricity as share of total energy inputs

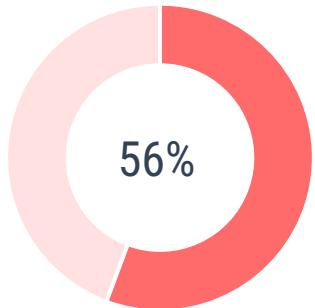
Semiconductors
and Related Devices



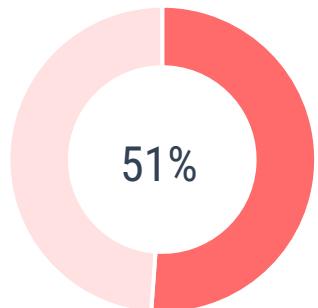
Aerospace Product
and Parts



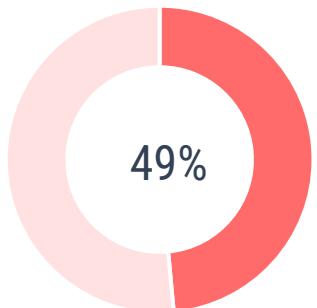
Transportation
Equipment



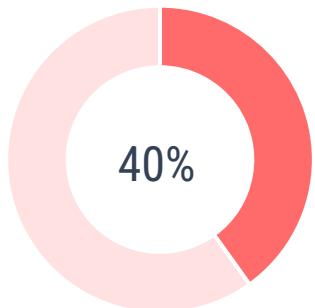
Electrical Equipment,
Appliances, and Components



Pharmaceuticals
And Medicines



Foundries



Note: Data covers the
South Census Region.

Source: EIA MERC
2022

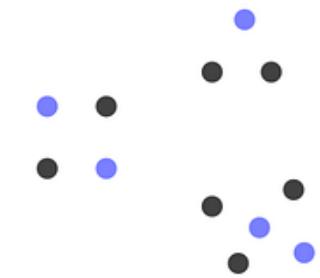
Maps

Gestalt's principles apply to maps, too

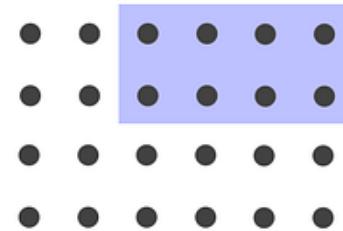
Proximity



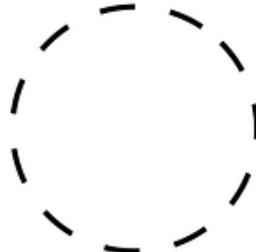
Similarity



Enclosure



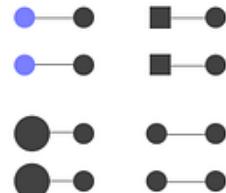
Closure



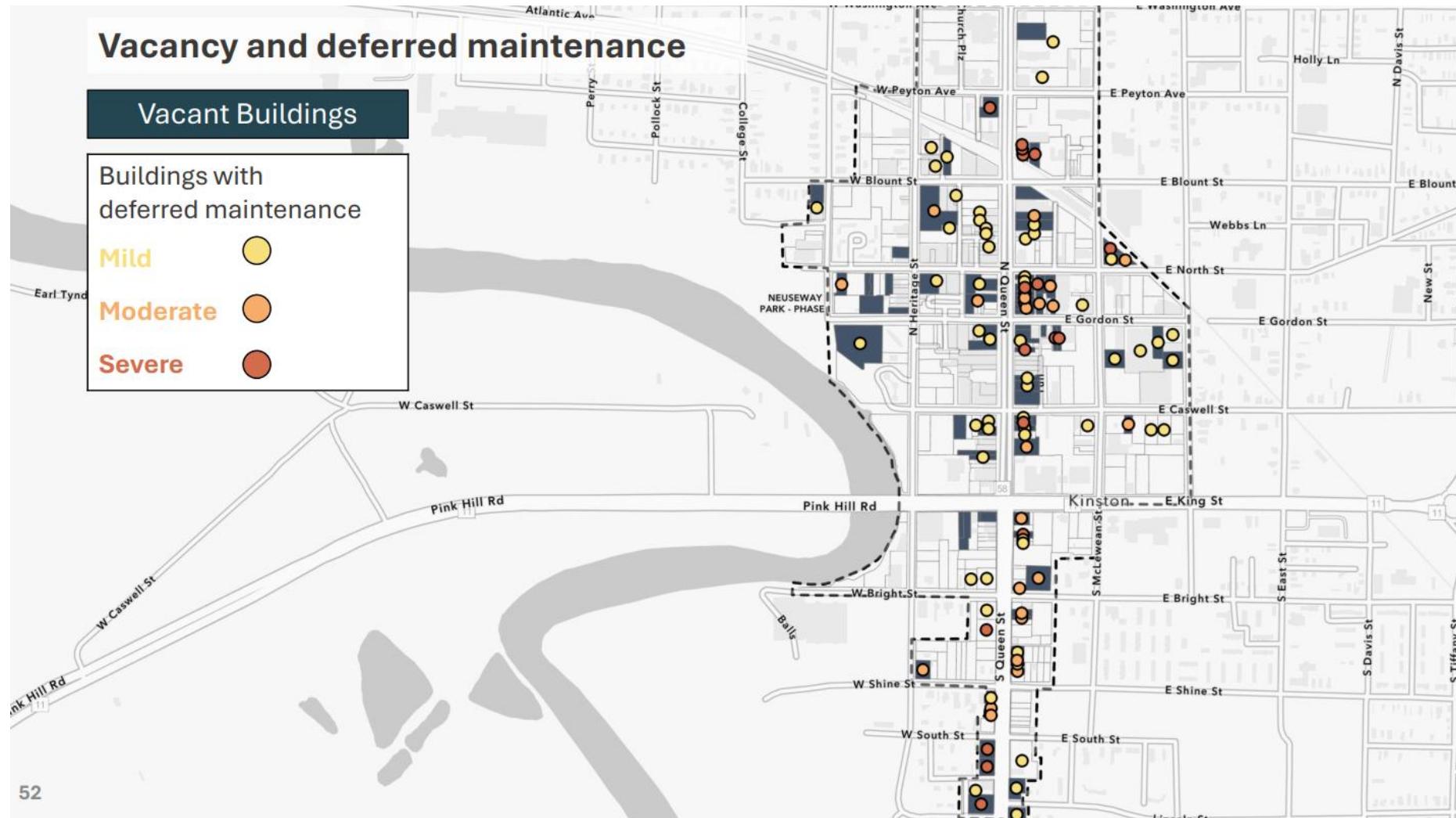
Continuity



Connection



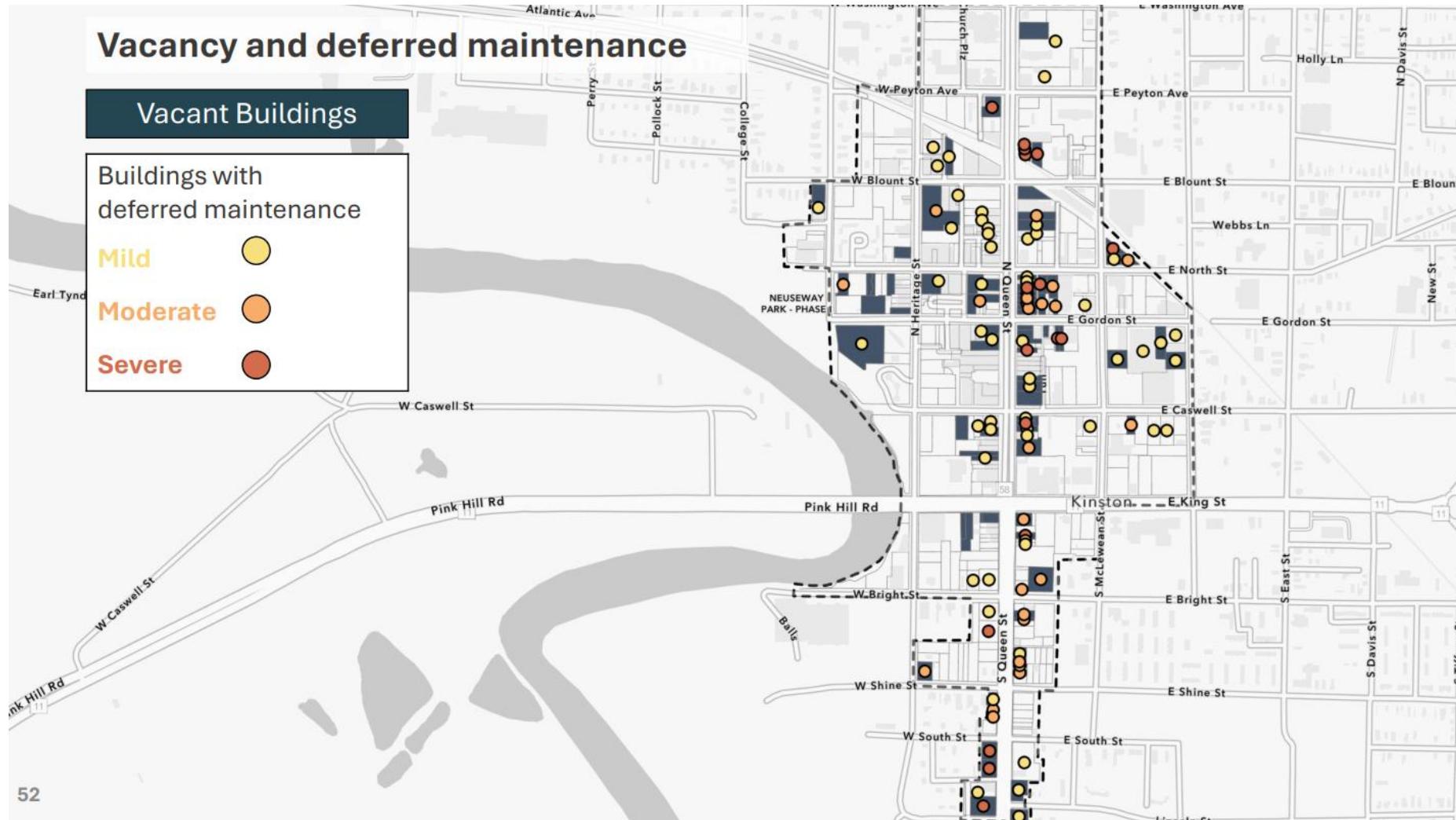
What visual principles do you see in this map?



Source: Development
Finance Initiative
(UNC School of
Government)

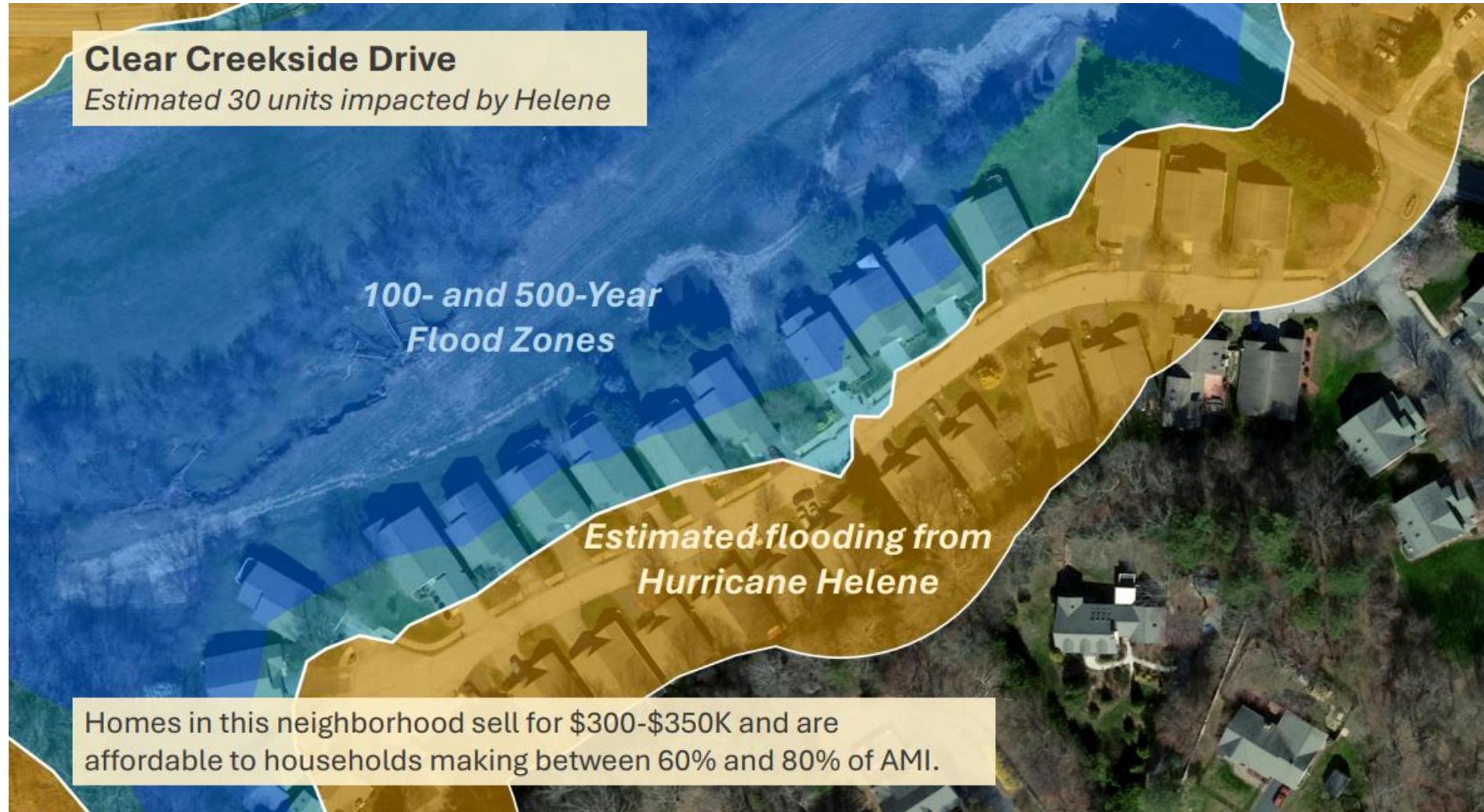
If you want your data to shine, choose neutral base maps

Minimize the competition for your viewer's attention!



Your base map *might* be part of the story

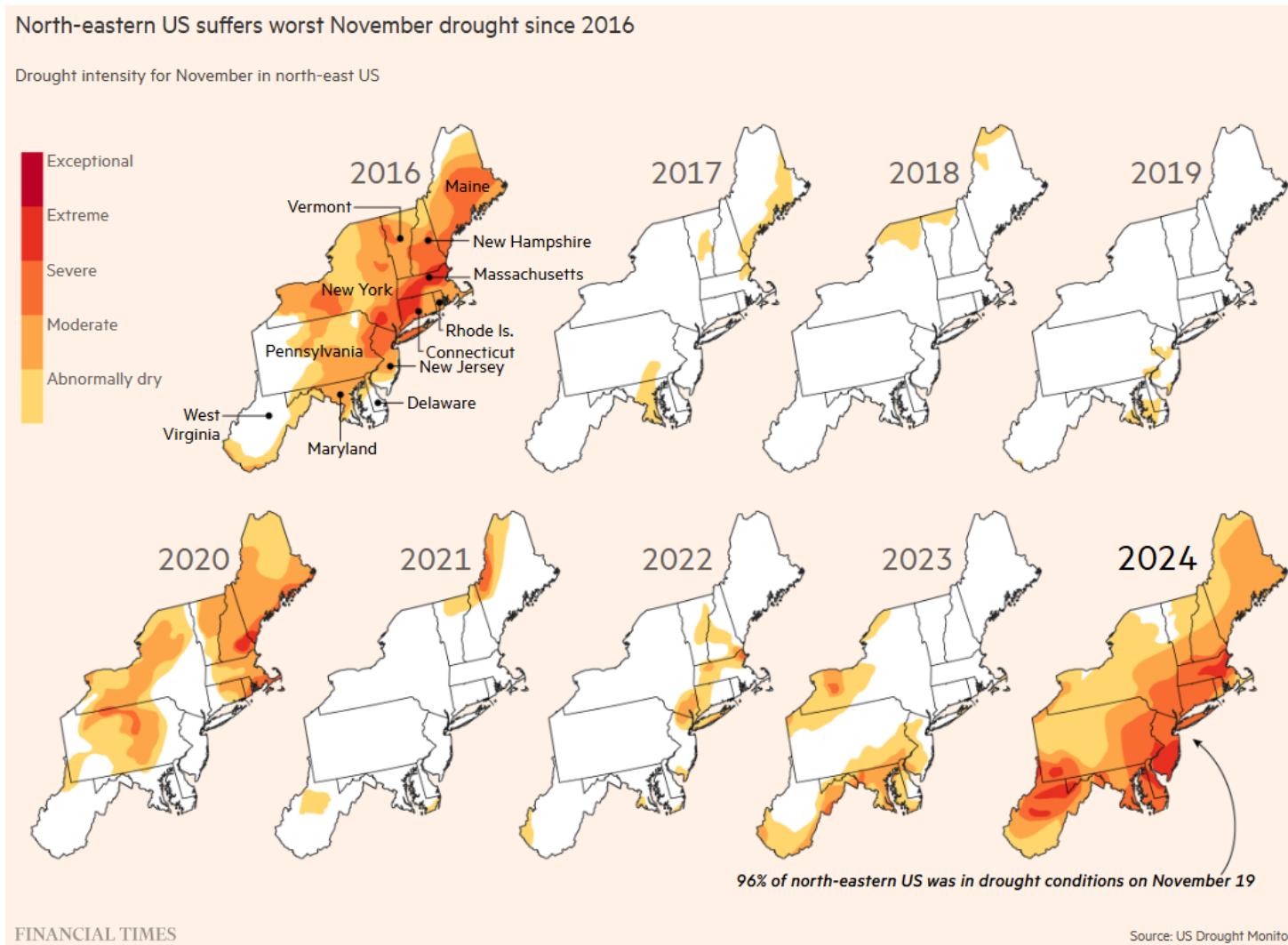
But make use other tools to differentiate it from your data – like color



Source: Development
Finance Initiative
(UNC School of
Government)

What if your data is temporal and geographic?

On their own, maps are for geographic data. Adding additional dimensions requires some design strategy.



Source: [The Financial Times](#)

You could also incorporate change over time into your presentation

INVESTOR-OWNERSHIP IN 2000



Source: Hudson
Vaughn & Marion
Cheek Jackson Center

You could also incorporate change over time into your presentation

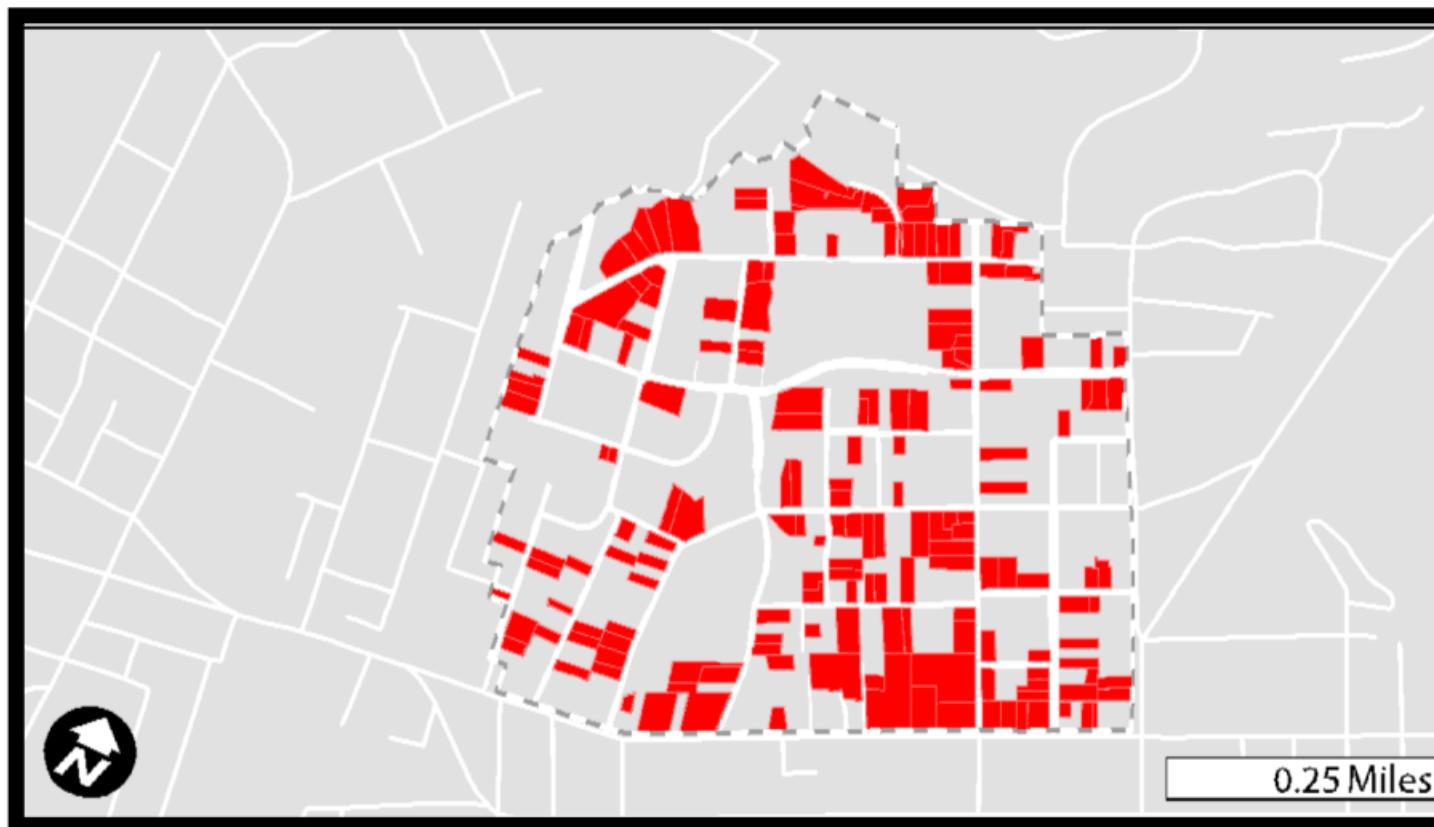
INVESTOR-OWNERSHIP IN 2005



Source: Hudson
Vaughn & Marion
Cheek Jackson Center

You could also incorporate change over time into your presentation

INVESTOR-OWNERSHIP IN 2011



Source: Hudson
Vaughn & Marion
Cheek Jackson Center

Qualitative Data

The almighty word cloud



Source: Data from Genius.com

Like quantitative data, ordering can make a difference!

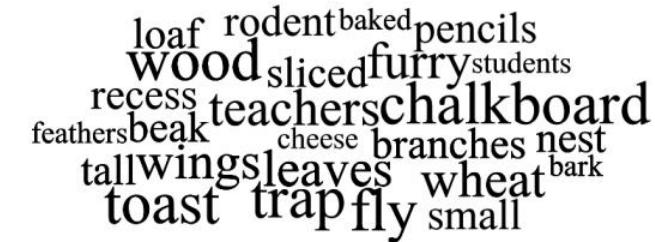
wings	sliced
beak	toast
feathers	baked
nest	wheat
fly	loaf
students	branches
teachers	leaves
pencils	bark
chalkboard	wood
recess	tall
furry	
small	
rodent	
trap	
cheese	

(a) Color Column



A word cloud visualization where words are colored based on their frequency. The words are arranged in a grid-like structure. The most frequent words, such as 'wood', 'teacher', 'chalkboard', and 'wheat', are larger and have a higher frequency color (orange). Other words like 'toast', 'trap', and 'fly' are smaller and have a lower frequency color (pink).

(b) Color Wordle



A word cloud visualization where words are colored based on their frequency. The words are arranged in a grid-like structure. The most frequent words, such as 'wood', 'teacher', 'chalkboard', and 'wheat', are larger and have a higher frequency color (orange). Other words like 'toast', 'trap', and 'fly' are smaller and have a lower frequency color (pink).

(c) Mono Wordle

Source: [Hearst et al.](#)

Tricks for visualizing categorical data might apply to qualitative data

But it might require building the categories yourself.

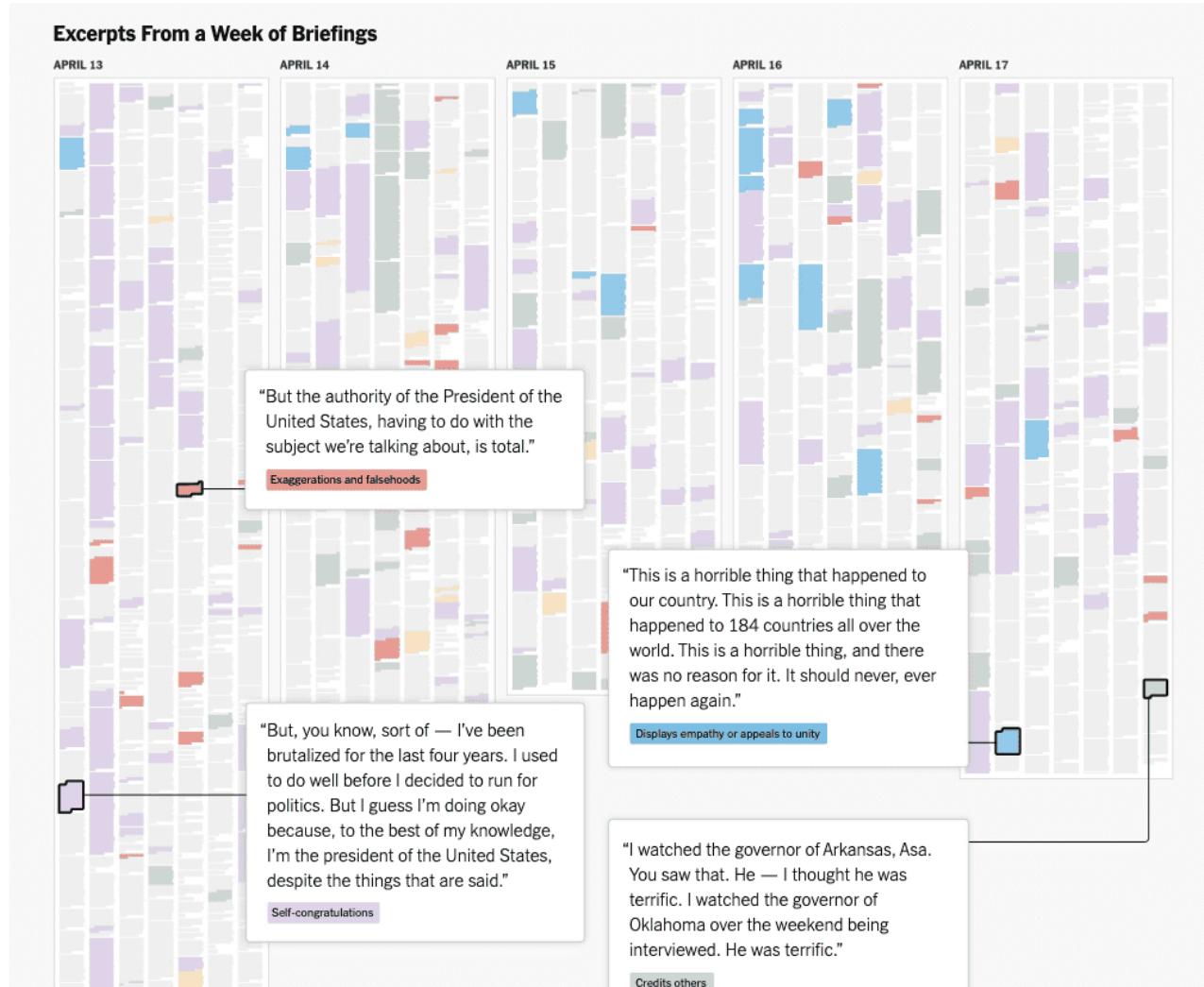
How the Cassidy-Graham plan
compares with other Republican bills

	Cassidy-Graham	Skinny repeal	Partial repeal	Repeal and replace	House-passed plan
Individual mandate	Repeal	Repeal	Repeal	Repeal	Repeal
Employer mandate	Repeal	Repeal	Repeal	Repeal	Repeal
Subsidies for out-of-pocket costs	Repeal	Keep	Repeal	Repeal	Repeal
Tax credits for premiums	Repeal	Keep	Repeal	Change	Change
Medicaid expansion	Repeal	Keep	Repeal	Change	Change
Essential health benefits	Up to states	Keep	Keep	Up to states	Up to states
Prohibitions on annual and lifetime limits	Up to states	Keep	Keep	Up to states	Up to states
Pre-existing conditions policy	Up to states	Keep	Keep	Up to states	Up to states
Restrictions on charging more for older Americans	Up to states	Keep	Keep	Up to states	Up to states
Taxes created under Obamacare	Change	Change	Change	Change	Repeal
Health savings account	Change	Change	Change	Change	Change
Dependent coverage until 26	Keep	Keep	Keep	Keep	Keep
Vote results	Expected next week	Failed 49-51	Failed 45-55	Failed 43-57	Passed 217-213
Increase in the number of uninsured in 10 years	No score	16 million	32 million	No score	23 million

Source: The New York Times

Highlighting passages also creates a new kind of chart

Here the authors highlighted passages from Trump's weekly briefings – including self-congratulations.



Source: The New York Times

Highlight notable quotes

If quotes are the “raw data” of quantitative data, why not bring out the diamonds?

SEPT. 3, 2015

What European Leaders Said

European Union officials, who have not yet agreed on how many migrants and refugees each country will accept, will meet on Sept. 14 to discuss a response to the growing crisis.

GERMANY

“Germany is doing what is morally and legally obliged. Not more, and not less.”



— Chancellor **Angela Merkel**,
on Sept. 3

HUNGARY

“The problem is not a European problem, the problem is a German problem. Nobody would like to stay in Hungary.”



— Prime Minister **Viktor Orban**,
on Sept. 3

ITALY

“It will take months, but we will have a single European policy on asylum.”



— Prime Minister **Matteo Renzi**,
on Aug. 30, according to
Reuters

SERBIA

“We will never erect any fences, any walls.”



— Prime Minister **Aleksandar Vucic**,
on Aug. 26, according to Reuters

AUSTRIA

“Europe must wake up at long last and recognize that this is a serious problem.”



— Foreign Minister **Sebastian Kurz**,
on Aug. 28

EUROPEAN COMMISSION

“We need a strong, European approach on migration. And we need it now.”



— President **Jean-Claude Juncker**,
on Aug. 23 on Twitter

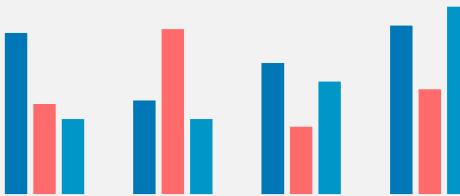
Source: [The New York Times](#)

Why visualize data?

Discover

I want to **discover** insights about my data.

e.g. charts made during analysis



Inform

I want to **inform** others about my data.

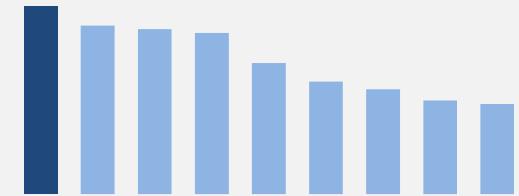
e.g. dashboards, regular reports



Educate

I want to **educate** others about my data.

e.g. data story telling



Source: *The Data Storyteller's Handbook*
By Kat Greenbrook

For next week: Alli Torban's XRAY exercise

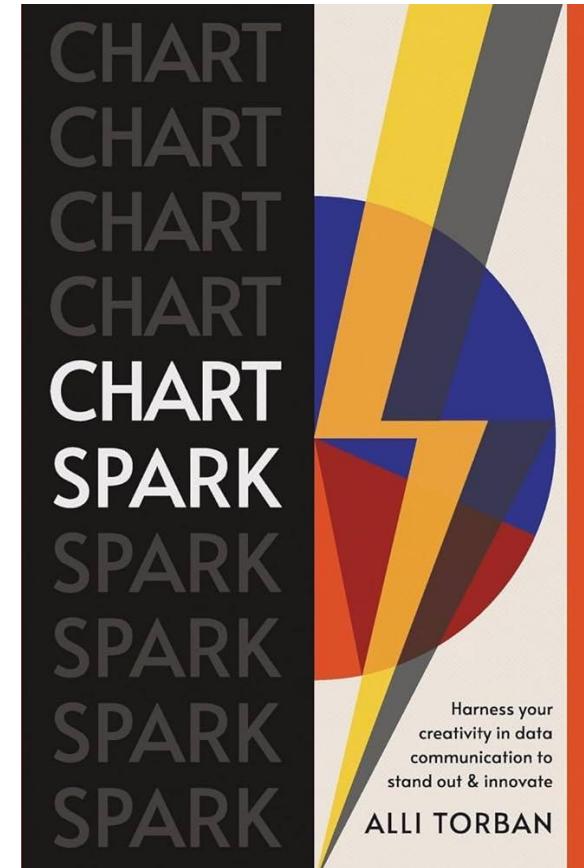
Choose a data visualization that excites or interests you and write down:

X for Excites: What excites you?

R for Rules: What rules does it follow?

A for Anarchy: How is it breaking the rules?

Y for You: How can you use it in the future?



Communicating with Data

PLAN 678

Spring 2026