

You Know More Than You Think

Surfacing the Data Visualization Knowledge
You Already Have





**“Data visualization isn’t just my job, it’s my
autistic special interest.”**

Heather Bree - Portland, Oregon

Outline

What do you know?

Let's get a sense of the knowledge and experience already in the room.

What should you use?

Consider the data, the audience, and the intended effect.

What is it?

There's both an obvious answer and a more nuanced discussion to have here.

How should you make it?

There are practical and ethical considerations to consider.

When do you use it?

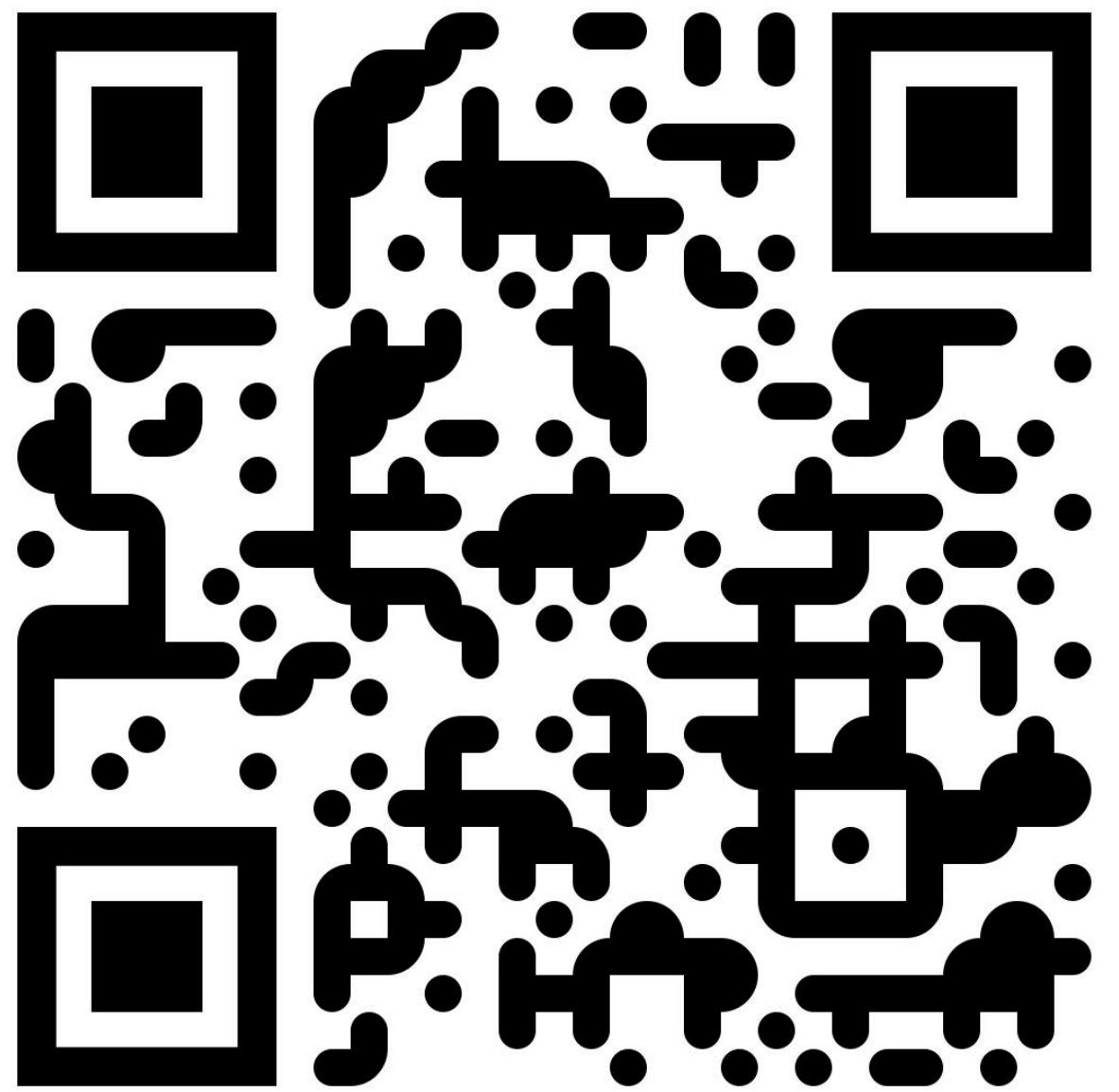
tldr: Whenever there's data.

Why should you care?

Cities need our support in making the best use of their data and visualization is crucial.

Let's find out some of what you already know

Data Visualization and You

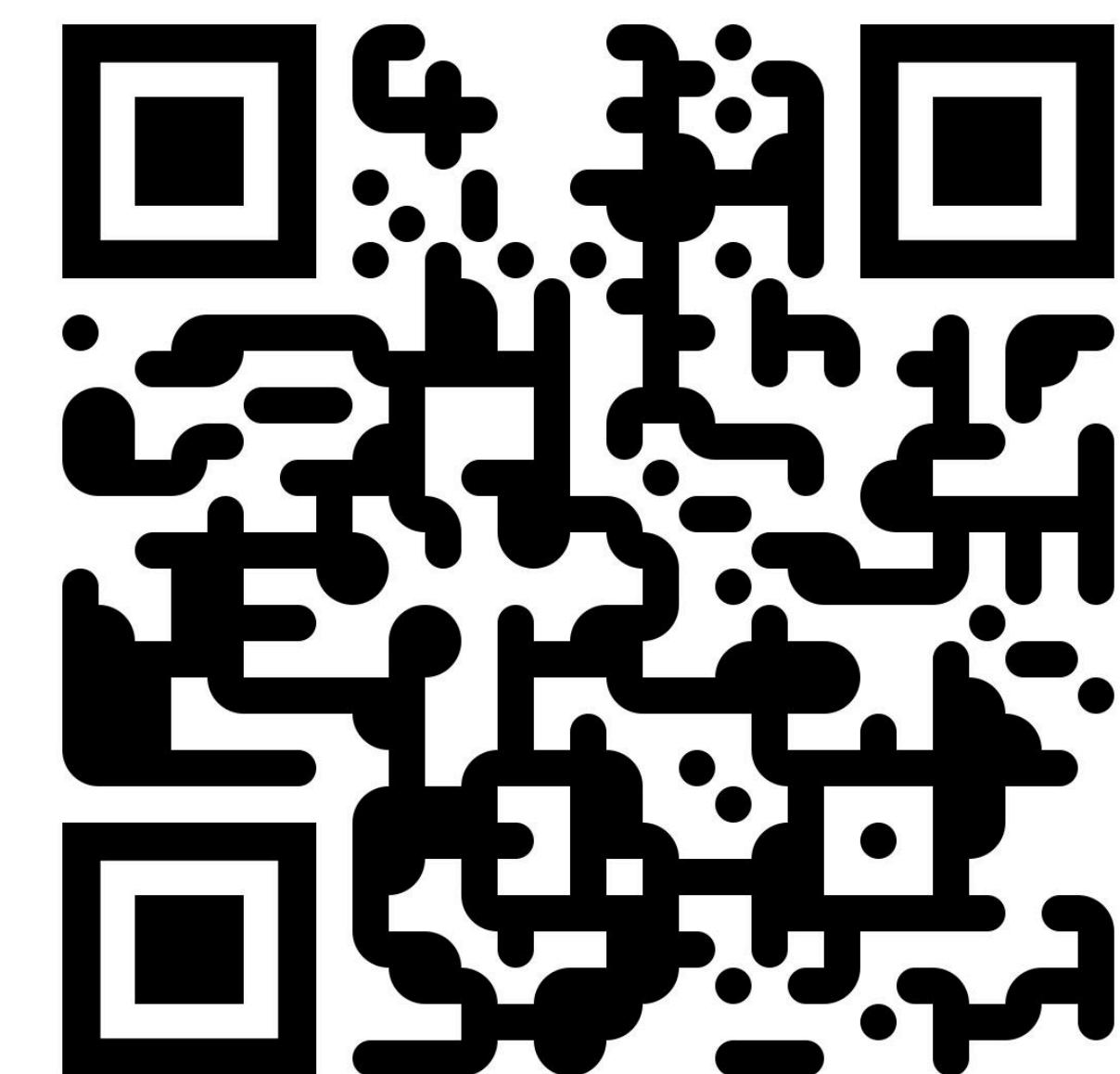


The Survey

<https://forms.gle/xZQM1ZBrp4FfEmjx8>

The Results

<https://datavizandyou.netlify.app/>



What is data visualization?

Charts and Graphs and Maps

Tangible Uses

Engage Visual Perception

for faster, better understanding of complex data.

Increase Accessibility

from an accommodation for dyslexia/dyscalculia to a
pivotal decision-making tool

Case in Point

Data Visualization IS Assistive Technology

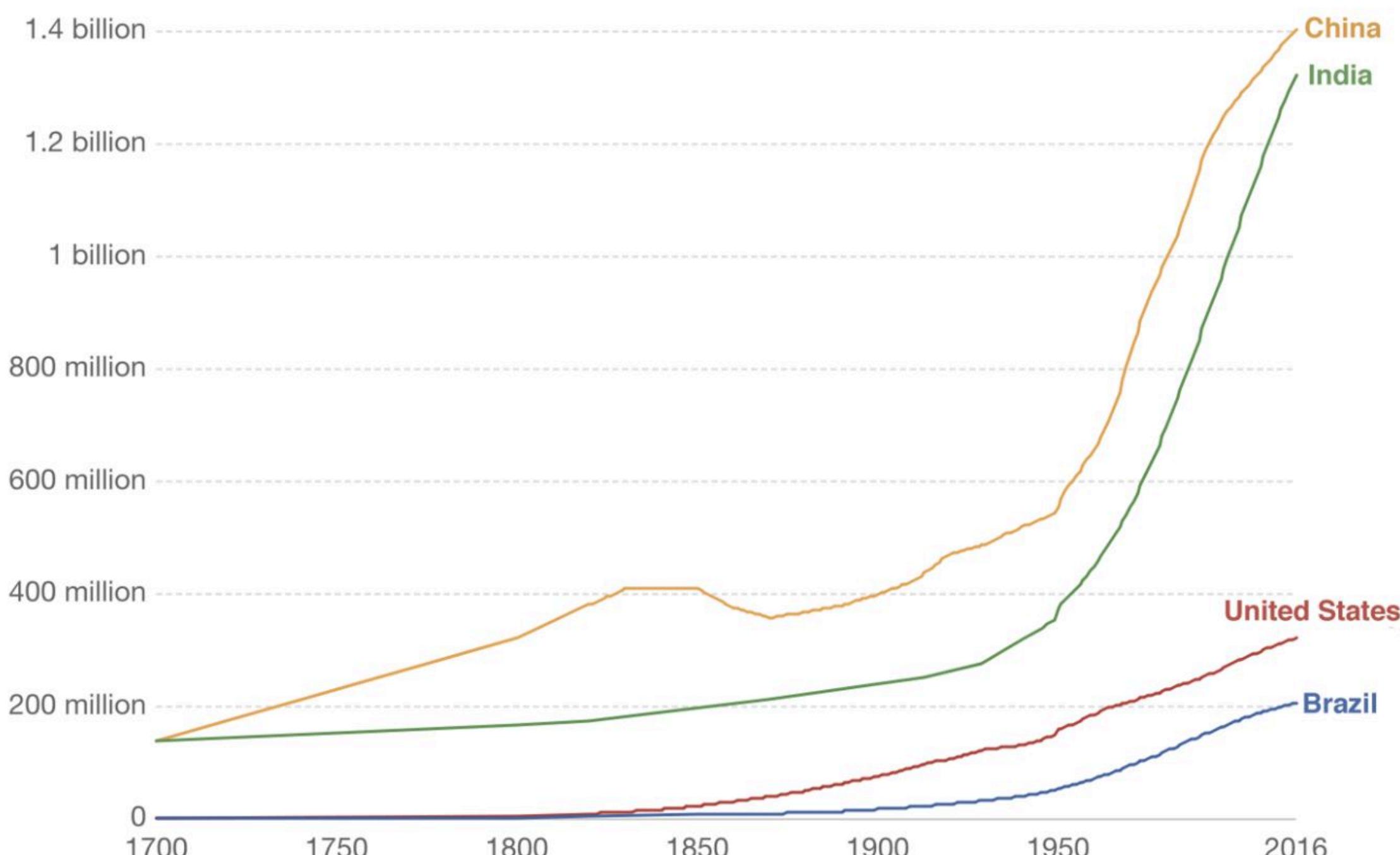
Doug Schepers - Fizz Studio - May 21, 2020

Why Accessibility is at the Heart of Data Visualization

The simple fact is that data visualization is assistive technology. It's cognitive assistive technology. Our amped-up monkey brains aren't good at seeing patterns in numbers, but they're great at discerning patterns in topological space. So we map numbers to colors, location, size, and other visual symbols, and suddenly we can understand trends and relationships.

	A	B	C	D	E
1		Brazil	China	India	United States
2	2000	175,287,600	1,283,198,976	1,053,050,880	281,982,784
3	2001	177,750,672	1,290,937,600	1,071,477,888	284,852,416
4	2002	180,151,008	1,298,646,656	1,089,807,104	287,506,848
5	2003	182,482,160	1,306,343,936	1,108,027,904	290,027,616
6	2004	184,738,448	1,314,007,552	1,126,135,808	292,539,328
7	2005	186,917,360	1,321,623,552	1,144,118,656	295,129,504
8	2006	189,012,400	1,329,209,088	1,161,977,728	297,827,328
9	2007	191,026,640	1,336,800,512	1,179,681,280	300,595,200
10	2008	192,979,024	1,344,415,232	1,197,146,880	303,374,048
11	2009	194,896,000	1,352,068,096	1,214,270,080	306,076,384
12	2010	196,796,272	1,359,755,136	1,230,980,736	308,641,408

Population by country



Source: Gapminder until 1949, UN Population Division from 1950-2016

CC BY-SA Our World in Data

Emotional Uses

Humanize Data

by connecting conceptual ideas to tangible elements,
grounded in physical reality

Provoke a Feeling

allowing the data to persuade, educate, clarify,
demonstrate, and evoke emotions

Case in Point

The Breathability Map

Jazzmen Lee-Johnson

Breathability Map

A counter-cartography* process was used to map 400 years of dominant power structures and waterfront. Activities such as redlining, mill waste and pollution, urban settlement and colonialism, psychological warfare on racism, the school-to-prison pipeline, and slavery through molasses, rum, and cotton running were depicted in a final project to underscore the debilitating health effects that historical factors can have for generations. These historical findings were the foundation of this original screen-printed piece.

*Counter-cartography is a mapping process to create counter-maps that reveal the ways in which official maps often omit valuable information to justify political actions.



What Data Visualization Is Not

A way to break up large areas of text with lots of color and drop shadows and gradients.

Remove
to improve
(the **data-link** ratio)

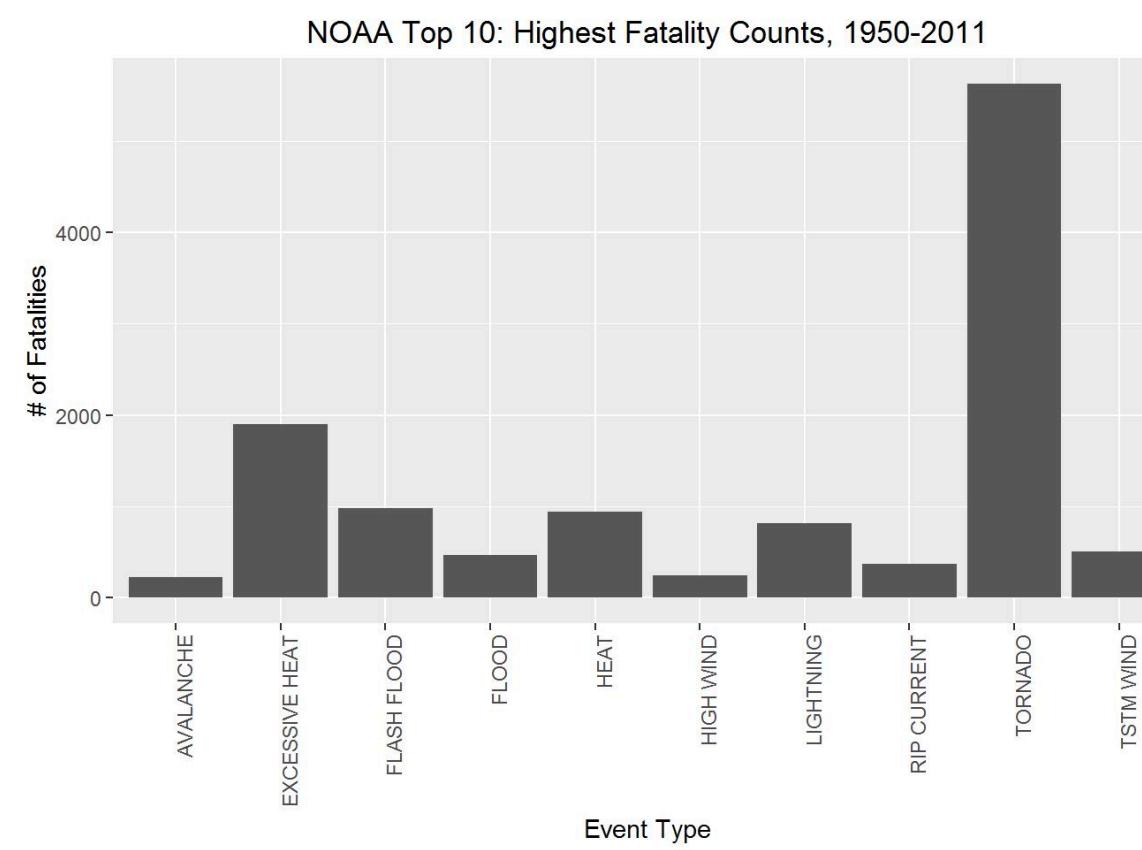
When do you use data visualization?

Before, During, and After

3 Results of Analysis

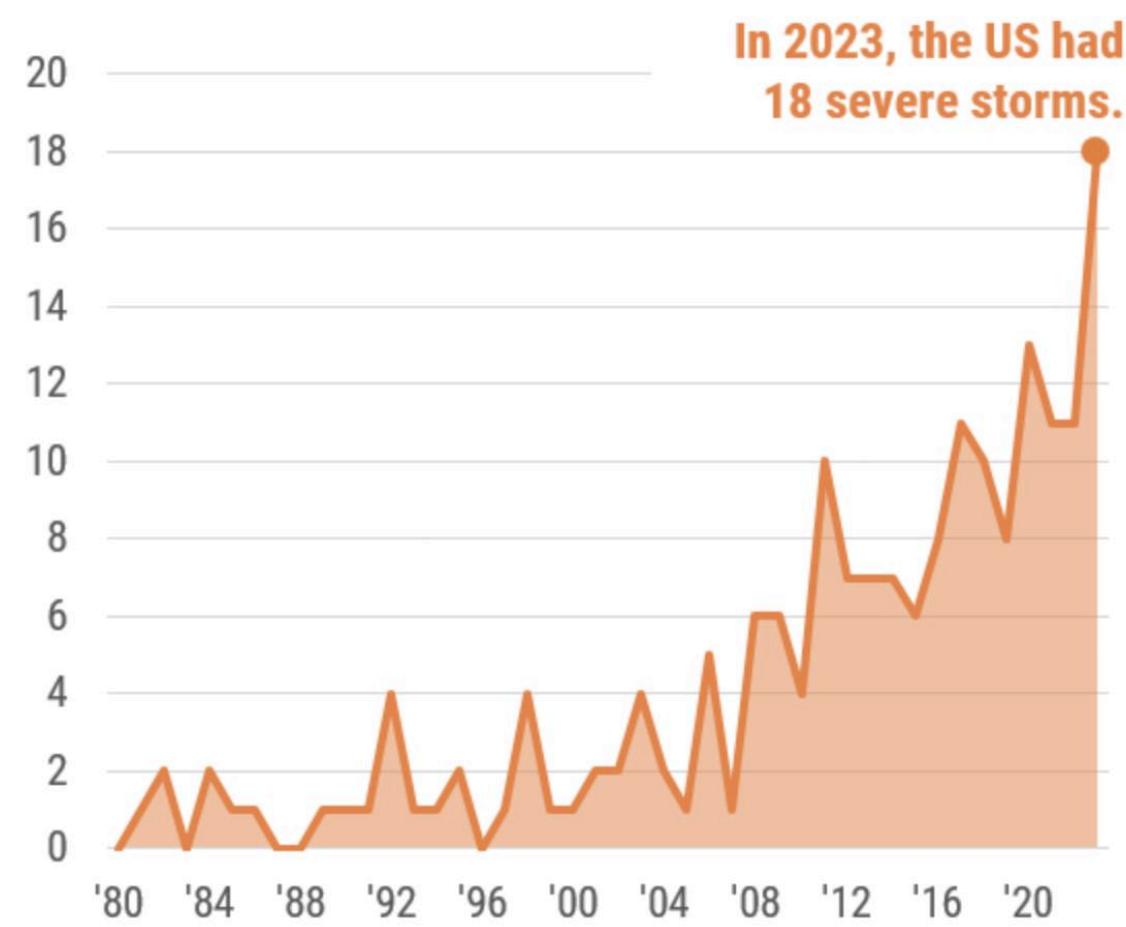
3.1 Top 10 events that are most harmful with respect to population health?

```
ggplot(data = stormTopFatalities, aes(x = stormTopFatalities$NSD.EVTYPE, y = stormTopFatalities$# of Fatalities)) + geom_bar(stat = "identity") + theme(axis.text.x = element_text(angle = 90, hjust = 1)) + xlab("Event Type") + ylab("# of Fatalities") + ggtitle("NOAA Top 10: Highest Fatality Counts, 1950-2011")
```



The number of severe storms in the United States has increased by 800% since the 80s.

Source: NOAA



Best Time to Post Based on Impressions

	S	M	T	W	Th	F	Sa
6			7K	11K	16K		24K
7	7K			9K		3K	10K
8		8K			2K	3K	
9				4K	10K	19K	
10	23K				5K		
11		5K	7K		5K		
12		7K				33K	17K
13	25K	11K	9K	11K		3K	18K
14				14K		17K	
15					5K	2K	17K
16					10K		2K
17		5K				7K	6K
18		10K	26K				3K
19		4K				7K	23K
20	20K				8K		
21	7K	7K				4K	8K
22	5K					13K	
23						6K	25K

Before

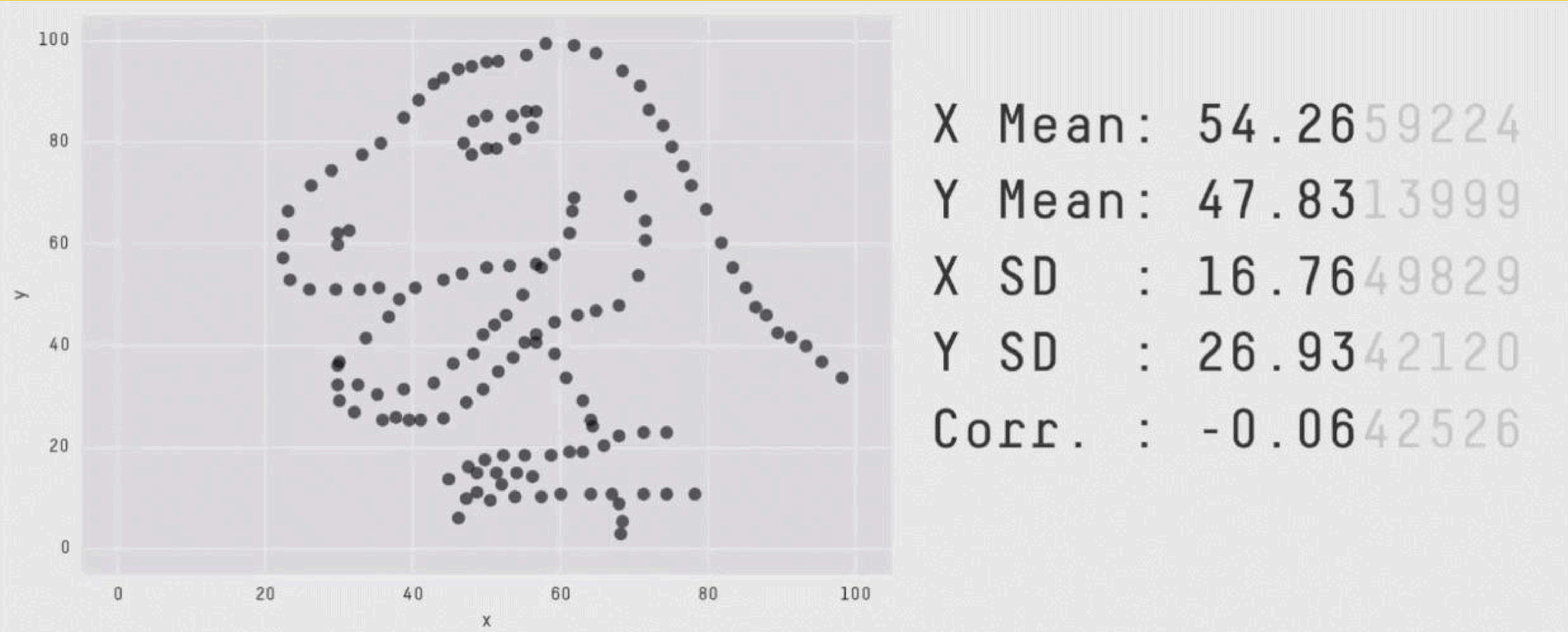
as a crucial step in the exploratory analysis phase of any data exercise.

During

as the product or the output of the exercise itself.

After

to track the impact of a data exercise over time or a follow-up tool for gauging effectiveness.



The Datasaurus Dozen

A case for ensuring visualization is part of every exploratory analysis routine.

Data Visualization Products

Single Chart

For a presentation slide or an Instagram post

Infographic

As a printed mailer or shared to LinkedIn

Multi-page Report

A PDF or a brochure website

Article or Blog Post

Using static or interactive graphics to tell a story or highlight key points.

Interactive Website

With animated scroll-through annotations or data explorers

Real-time Tracker

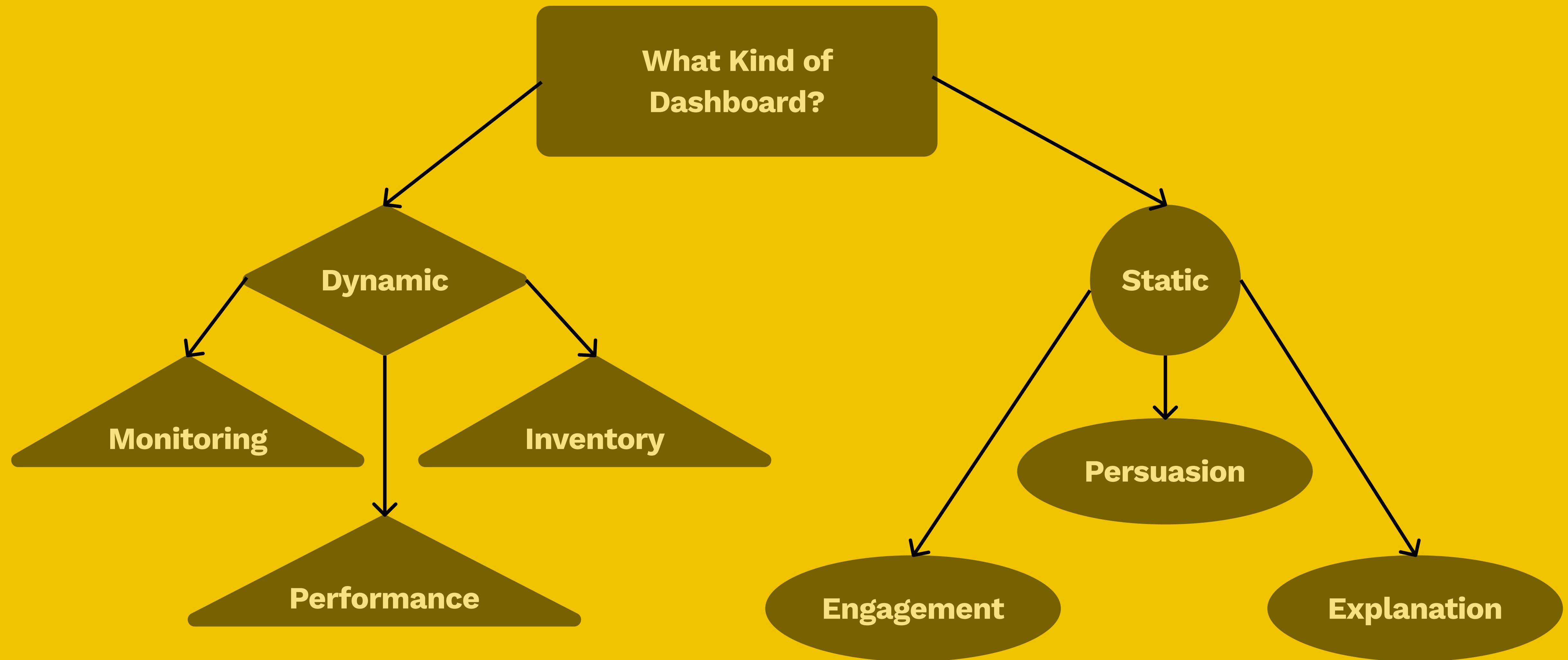
Providing a holistic assessment with constantly updating data

Video

Accessed via a kiosk or used during a keynote address

What else?

What about Dashboards?



How do you know which visualization to use?

There's a Viz for That.

Key Considerations

What kind of data?

Geographic, temporal,
categorical, numeric,
disaggregated, multi-dimensional,
update cadence, privileged.

How will they see it?

Digital, print, a social media post,
an intranet tool, a lobby display, a
television commercial, a
billboard, a mailer, a
presentation.

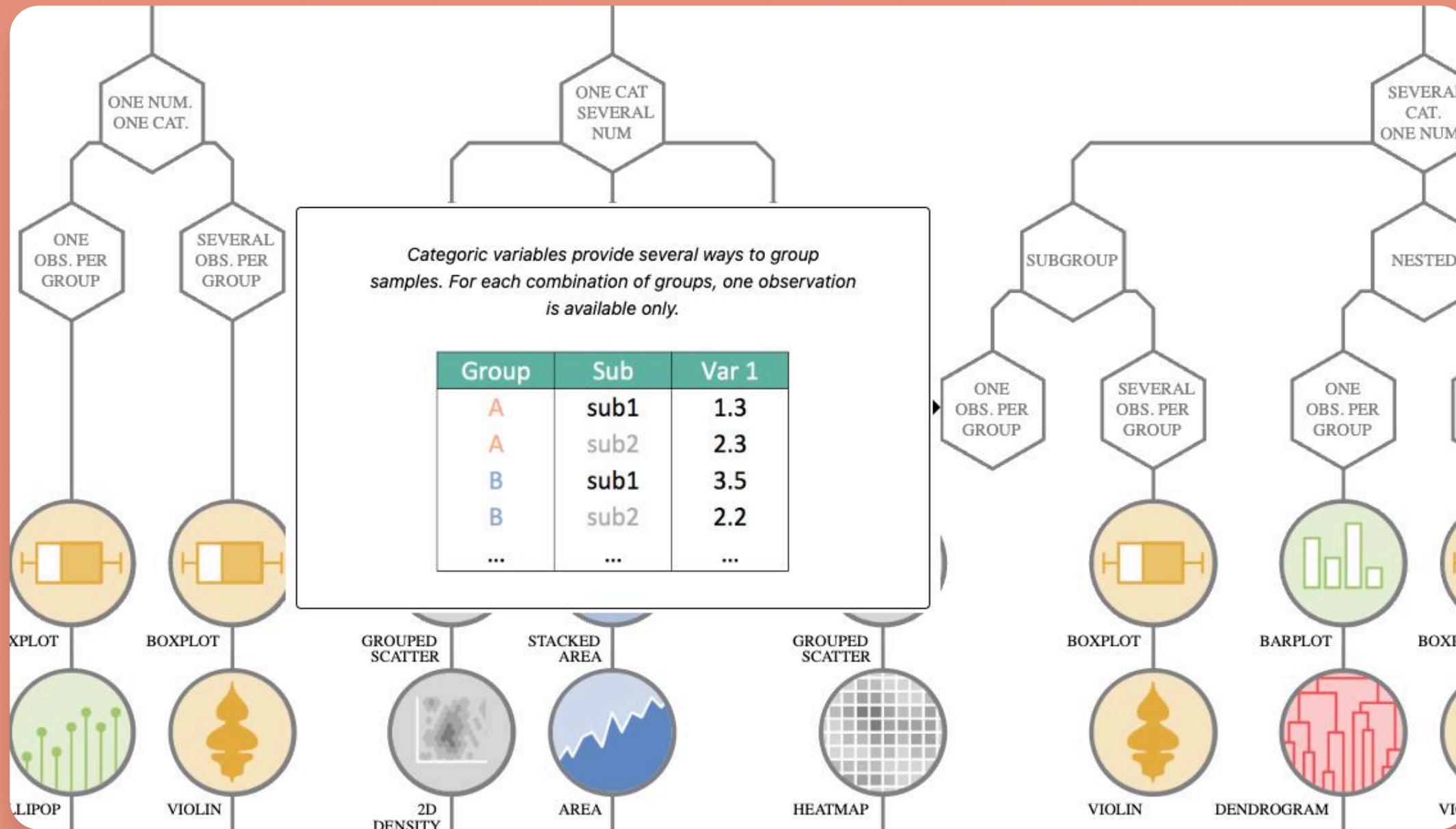
Who is the audience?

Needs, knowledge, expertise,
actions, uses.

When will they use it?

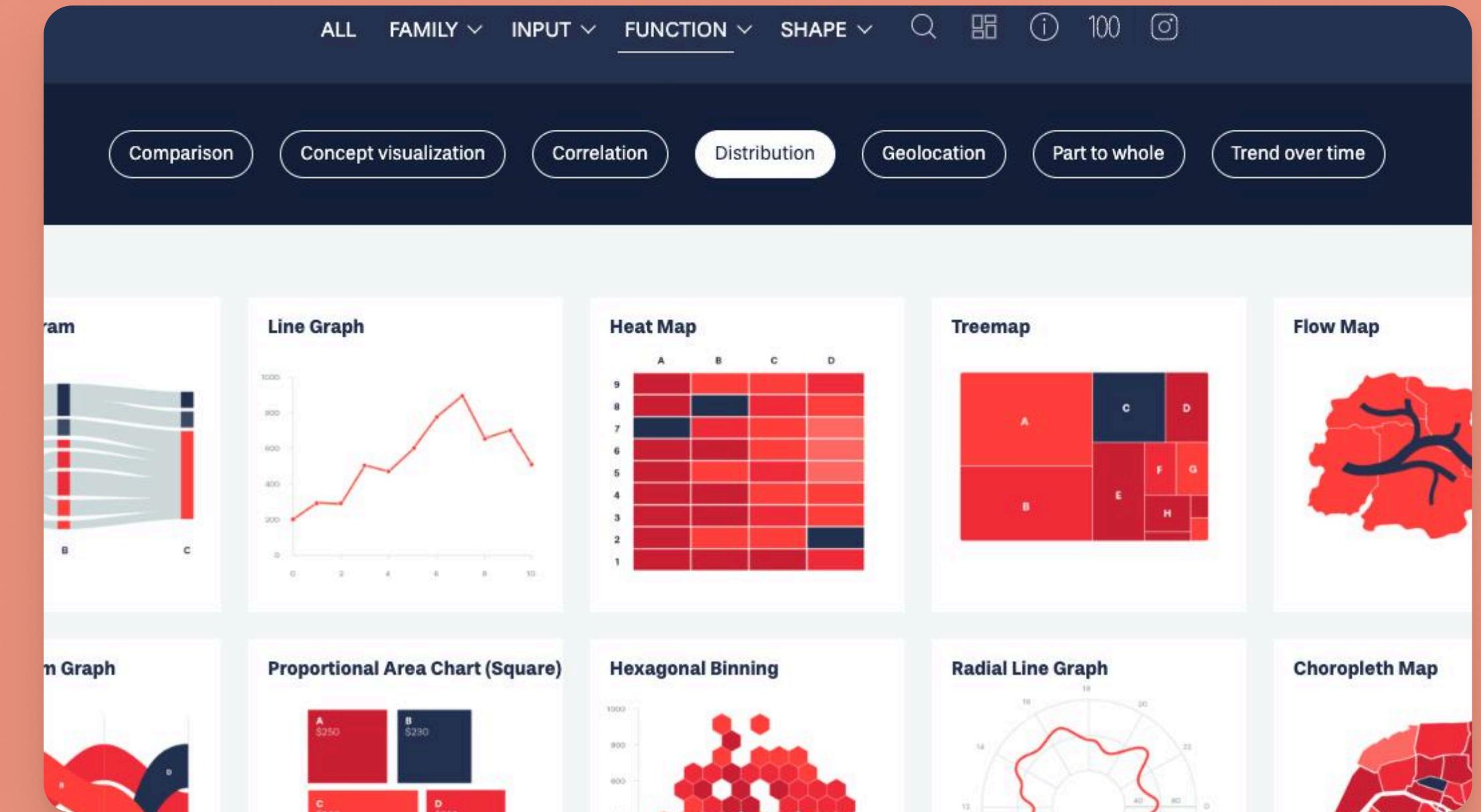
Once, weekly, yearly, every time
there's an emergency.

Tools You Can Use



From Data to Viz

A very useful flow chart, with links to code examples of specific visualizations.

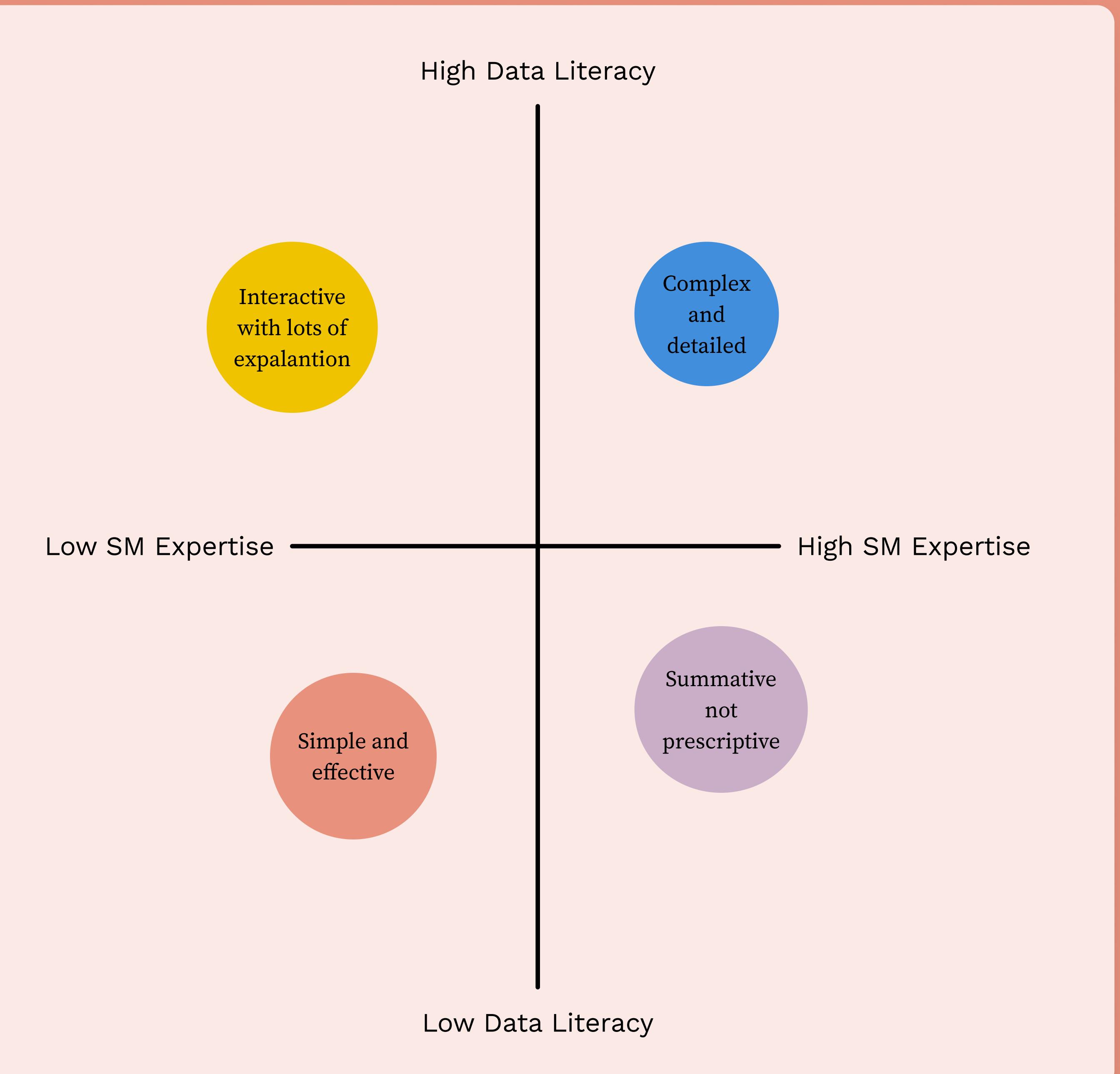


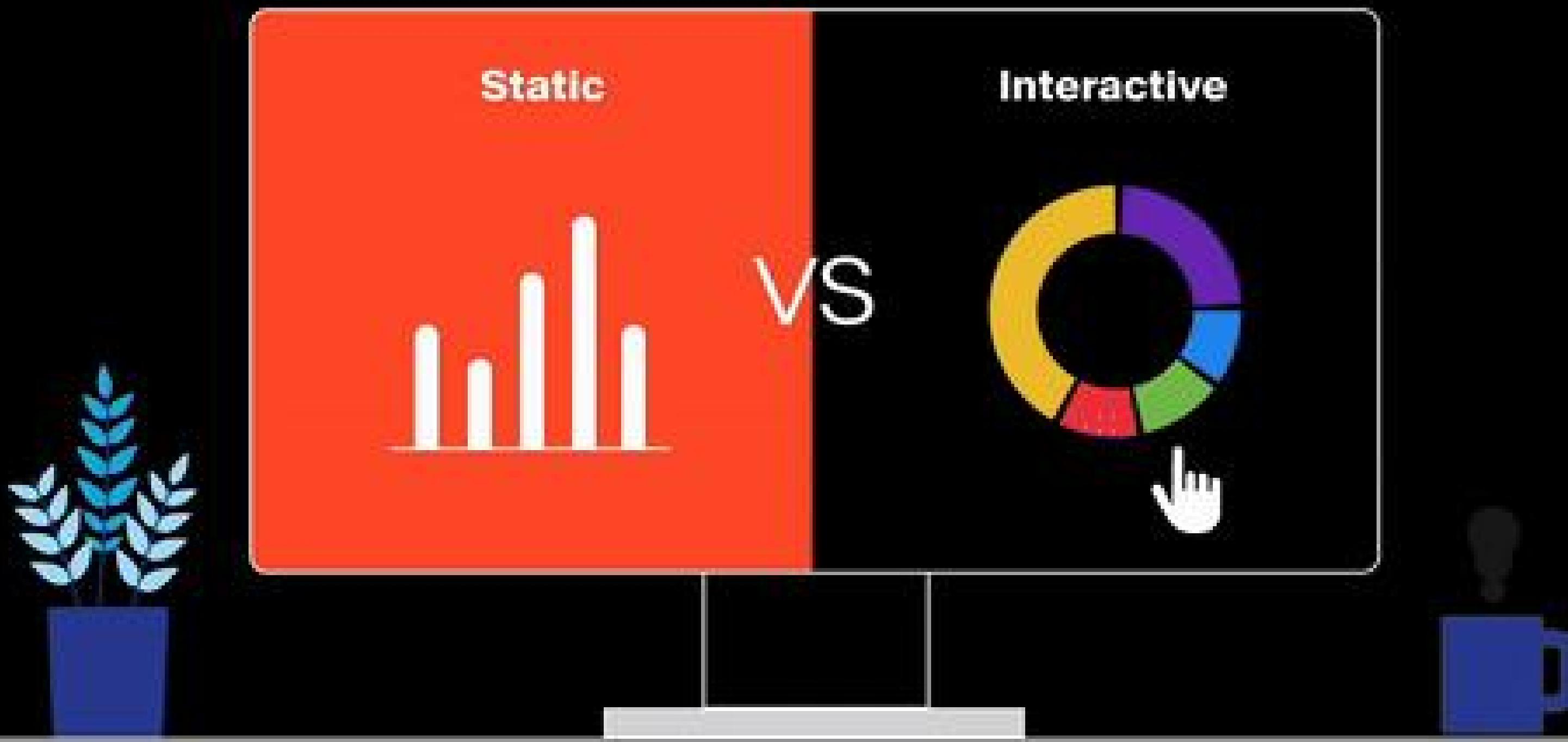
The Data Viz Project

Visualization types categorized by shape, function, input, and family.

Where Data Literacy and Lived Experience Collide

The lenses you choose to evaluate your audience and their needs can interact in multiple and complex ways.





Why Choose Just One?

Multiple Stories/Audiences/Impacts = Multiple Vizualizations

How do data visualizations get made?

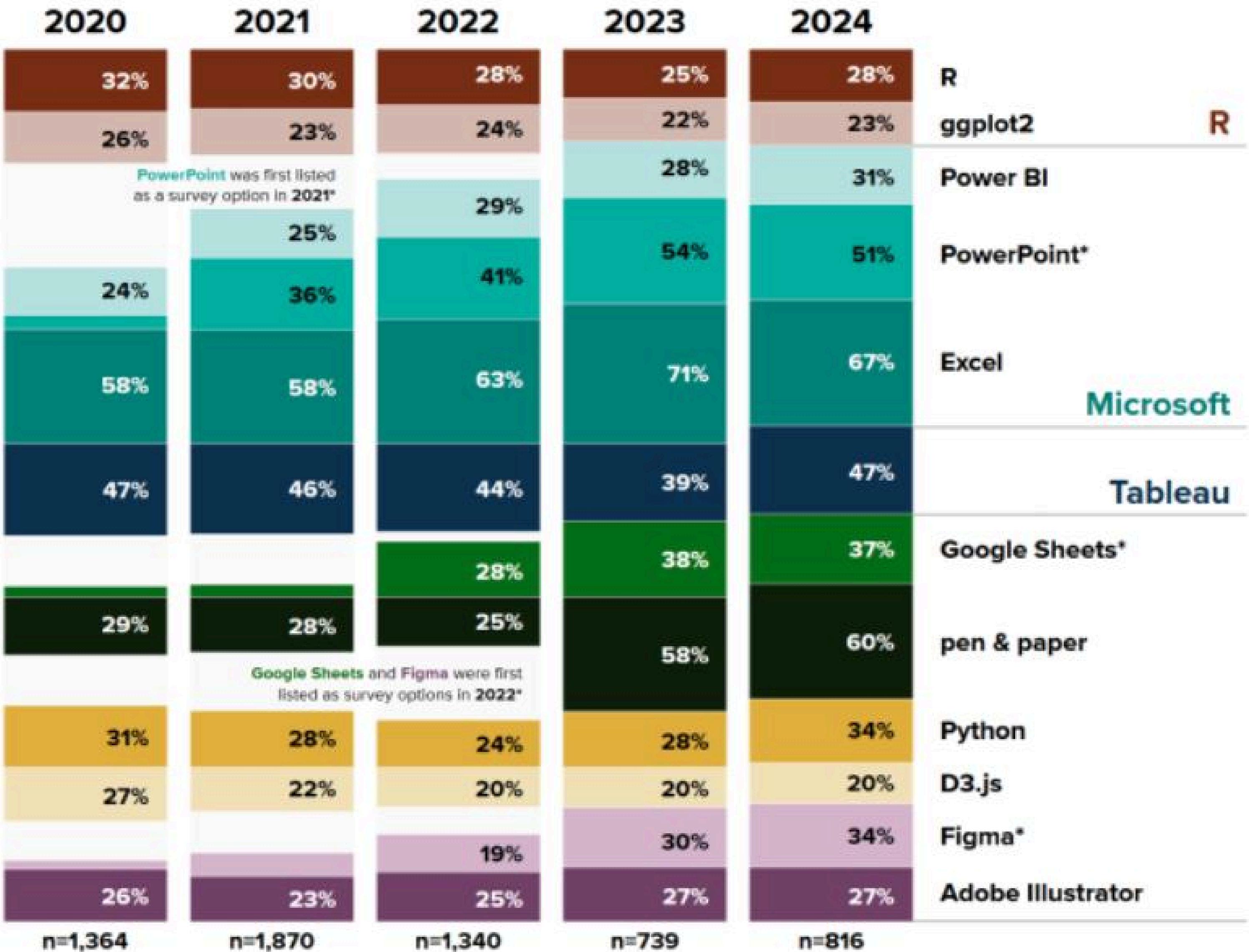
No Code, No Problem

2024 DVS Report

What do the pros use?

We sketch, we drag and drop, and some of us code.

Figure 14. Technologies Most Used in 2024 Compared with Four Previous Years (percents)



Tips, Tricks and Tools of the Trade

One Story Per Chart

Simplify the focus to most effectively communicate the point.

5-Second Rule

What can you retain from a 5-second glance?

Title Your Chart

State the main finding, don't just describe the data.

Visual Hierarchy

LtR readers' eyes graze a page in a Z shape, unless larger or more catchy elements pull focus.

Correlation is Not Causation

Be careful how declarative you are in your storytelling.

Data Gaps vs. Unknowns

Know when to prune data without compromising data integrity.

Don't Axe Your Axes

Dual Y axes and axes that are broken or don't start at zero can be problematic.

Acknowledge Uncertainty

Sometimes data is suppressed for good reason.

Justice and Accessibility

Data frequently represents people, and often those in marginalized communities. Involve those communities early and implement their feedback to avoid perpetuating harm.

In Addition to the Audience, Consider the Subject

Consider audiences who use assistive technology. Make the source data available where possible. Think of translation and transculteration. Write good alt-text and descriptive titles and captions. Honor the users browser settings.

It's More Than a Colorblind-Friendly Palette

The curb-cut effect is applicable here, too.

Accessibility Improves Everybody's Experience

Case in Point

Bar Chart Induced Bias

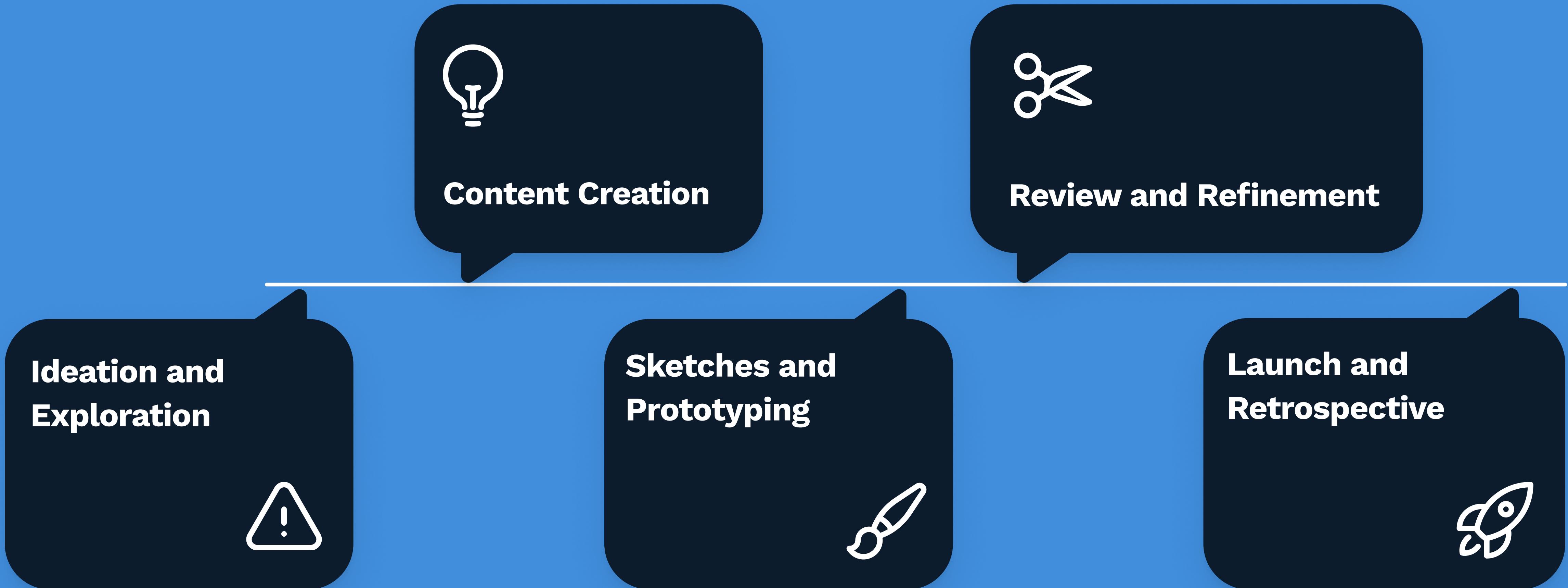


Unfair Comparisons: How Visualizing Social Inequality Can Make It Worse

Eli Holder - The Nightingale - December 1, 2022

“Accurate, well-intentioned dataviz can still backfire. Our duty of care towards audiences (and the people we visualize) means expanding our definition of “good dataviz.” Clarity, approachability, and aesthetics are important, but insufficient. To avoid backfire effects, we also need to consider and minimize the ways that even accurate reads of data can still contribute to inaccurate, harmful beliefs about the people we visualize.”

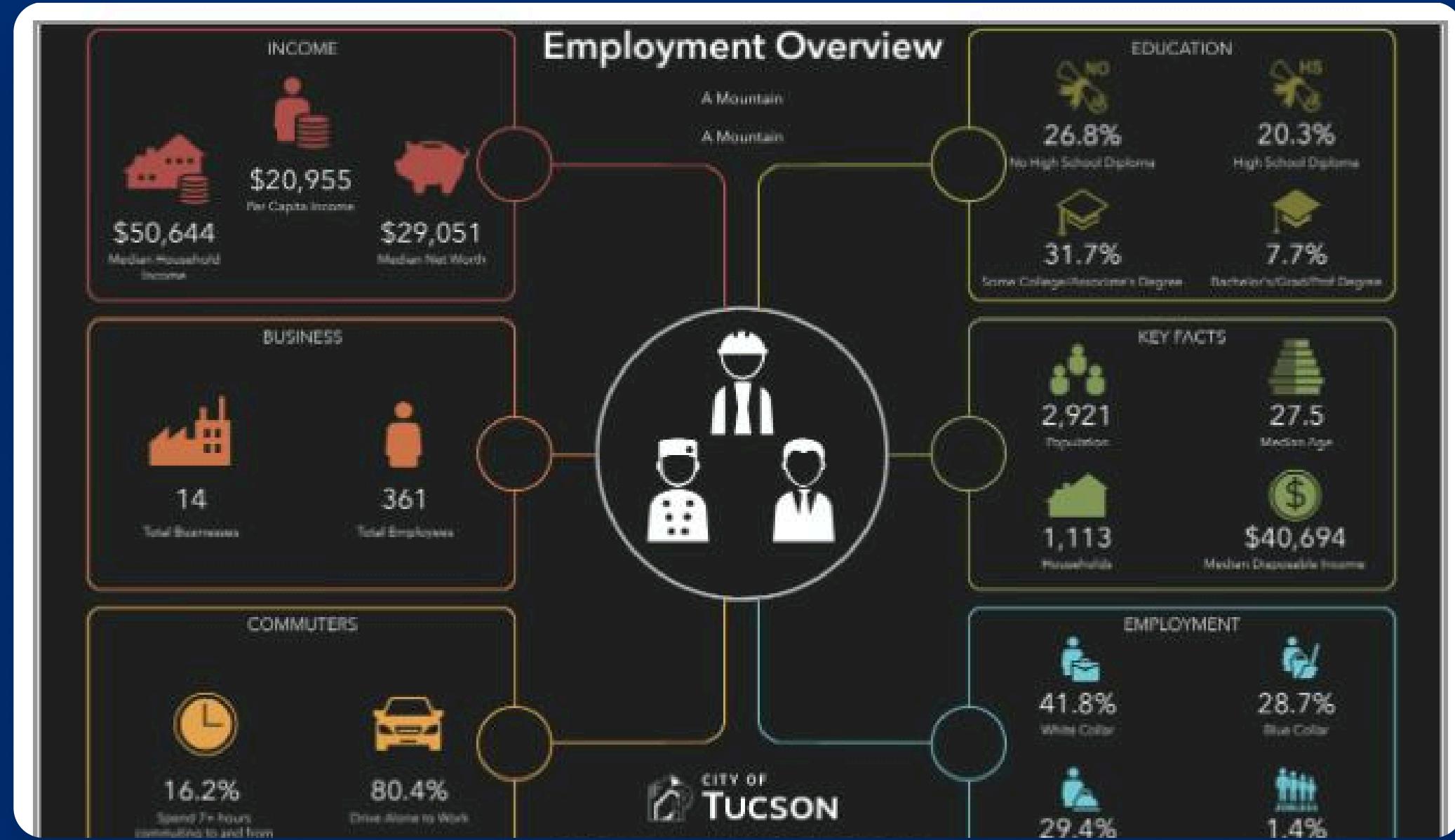
A Data Visualization Project Life Cycle



Why should you care?

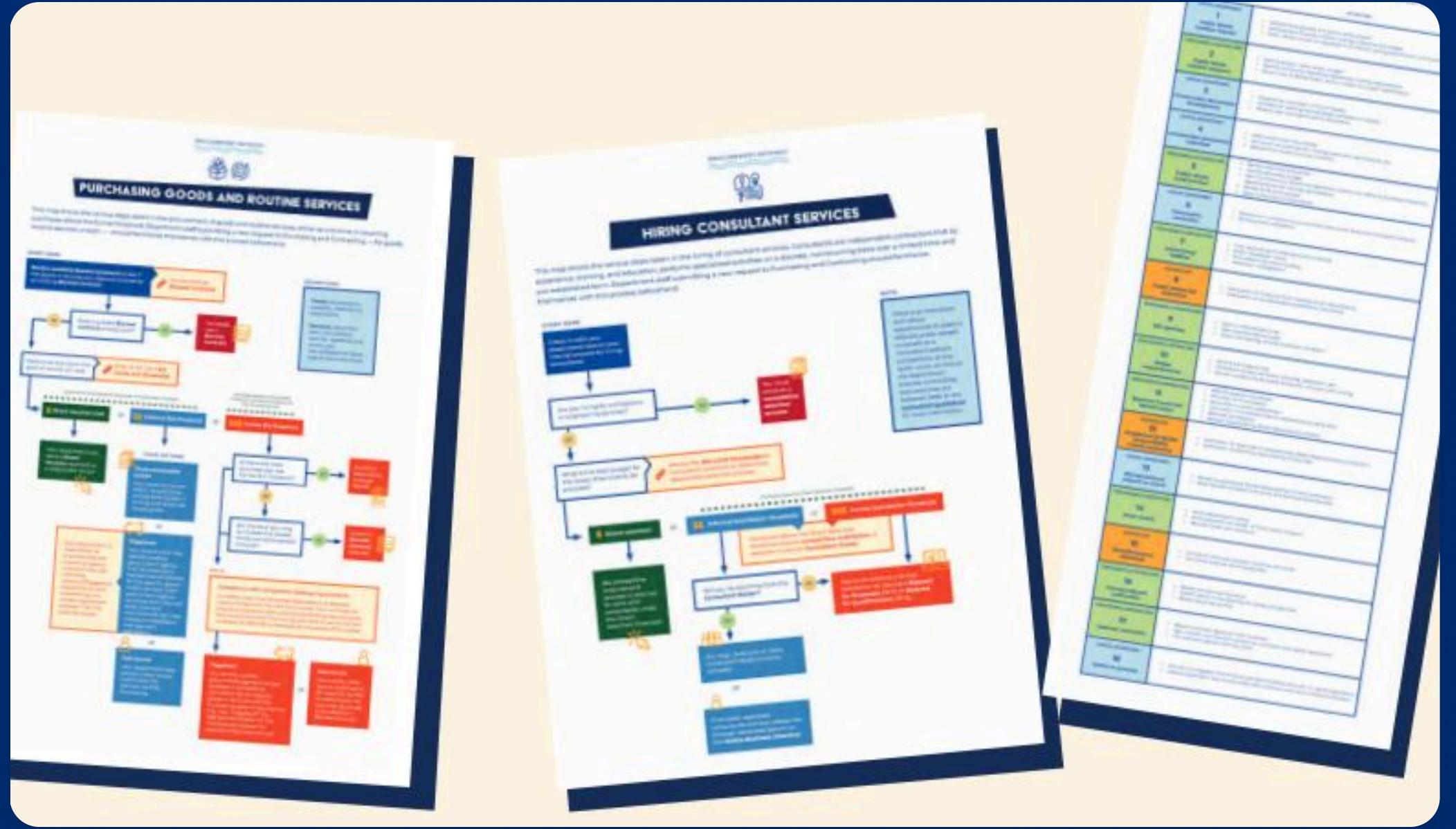
Cities Need Viz

Civic Examples



Tucson Equity Data Strategy

The portal provides access to a mapping tool and the ability to create targeted infographics based on predefined templates.



Seattle Procurement

The overhaul process produced flowcharts to streamline processes and multiple dashboards for specific purposes and audiences.

Data Visualization: Make Them See What You're Saying

Kerry Rea for GovLoop
Sept. 8, 2025

Performance Reporting

- progress on metrics and agency goals.
- stakeholder accessibility
- reduced administrative burden

Public Trust

- highlights for understanding how policies or services effect communities
- interactive tools to zoom in and out, or apply different filters, to see themselves

Policy Briefings

- digest critical insights quickly
- focus on high-level understanding
- an entry-point to a deeper dive.

Emergency Management

- real-time data for situational awareness
- inform responses to crises
- a central source of truth for coordination

Leveraging Data Viz to Promote Innovative Policymaking

Joshua Pine - National League of Cities - June 21, 2023

If the goal is to evaluate the effectiveness of newly installed bike lanes, an effective data visualization would include both car and pedestrian crashes overlaid with bike lane infrastructure to determine whether crashes are less frequent or severe in certain neighborhoods when compared with others.

Why?

As individual experiences are aggregated up into numbers, graphs and maps, it is essential that the visualizations uplift rather than minimize their stories.

Urban Institute's [Do No Harm Guide: Applying Equity Awareness in Data Visualization](#)

Who?

There is no one-size-fits-all approach to effective visualization, but carefully considering the first two questions — why and who—will help guide local leaders in the process.

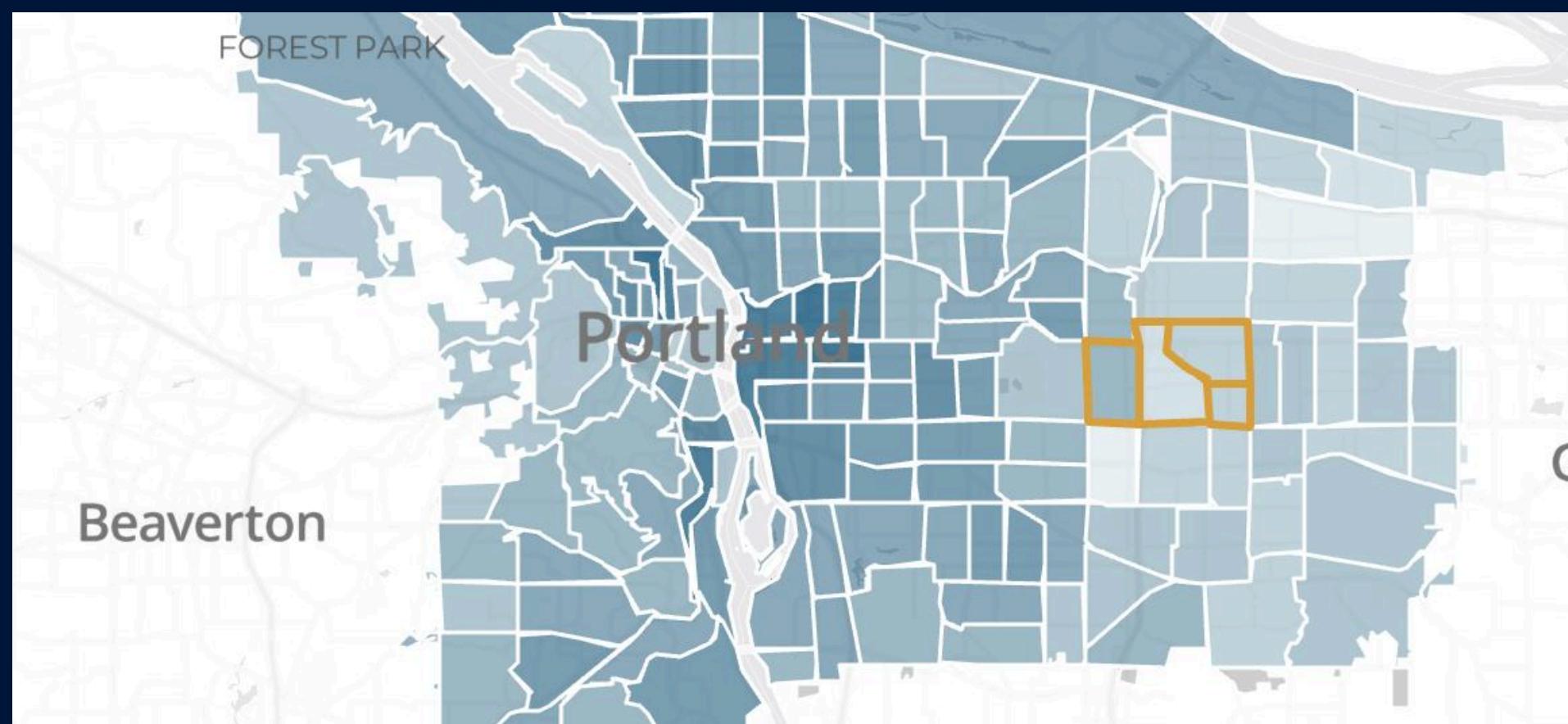
[Chart Guide from Storytelling with Data One Chart at a Time video series](#)

How?

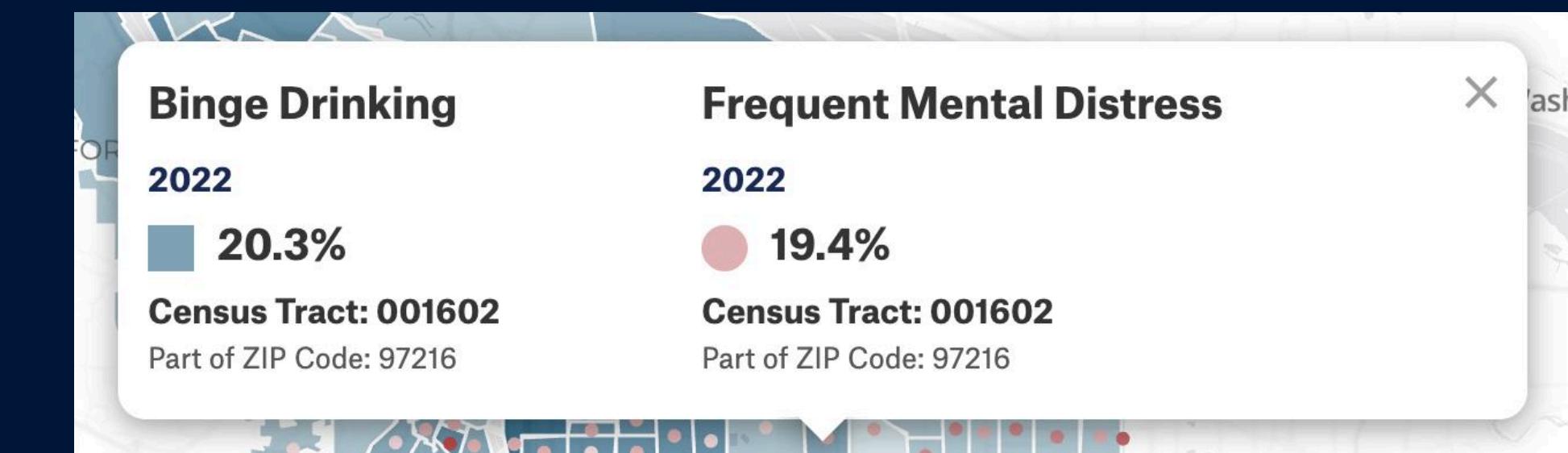
Mapping Food Insecurity: Using Local Data to Drive Community Solutions

NLC Partnerships - October 8, 2025

Visualizing geographic patterns.



Building partnerships.



Supporting planning and funding.



Raising awareness.

Portland, OR

ZIP Code: 97217, Tract #: 003701

Rent Burden	80.7%
Life Expectancy	75.5



Virtual Table Time
Wednesdays
12:30-3:30pm

Slack DM for the zoom link or to be
added to the calendar invite.

#all_dataviz

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