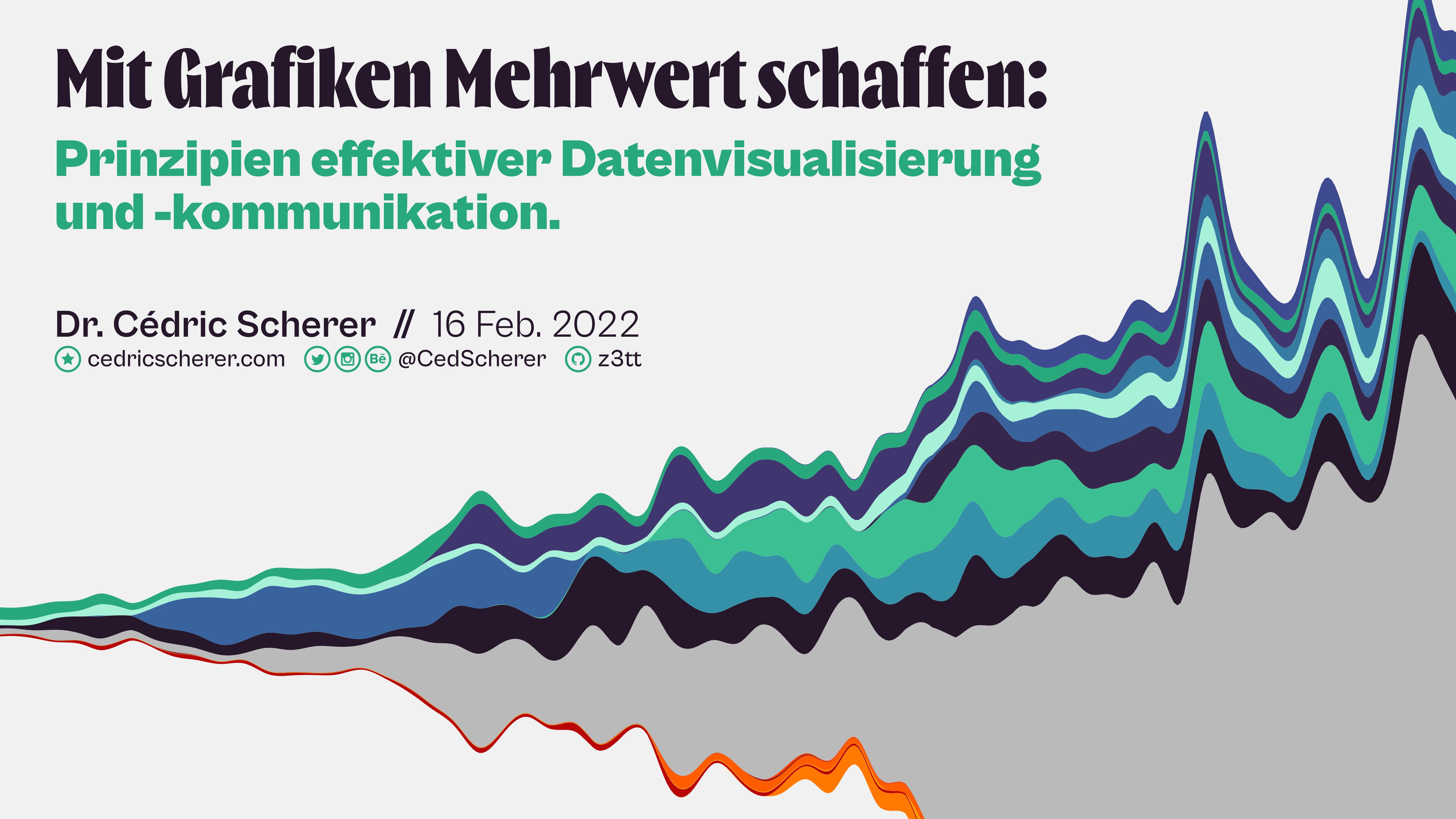


Mit Grafiken Mehrwert schaffen: Prinzipien effektiver Datenvisualisierung und -kommunikation.

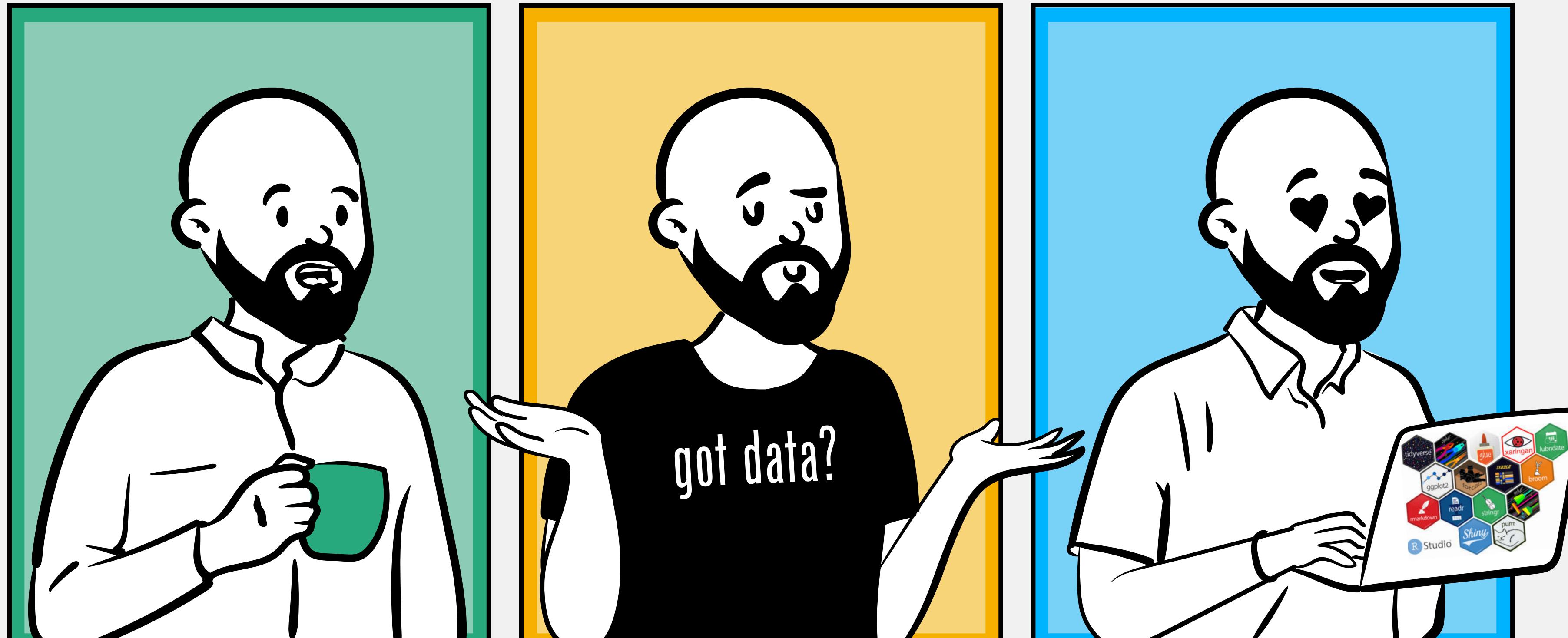
Dr. Cédric Scherer // 16 Feb. 2022

 cedricscherer.com    @CedScherer  z3tt



Cédric Scherer

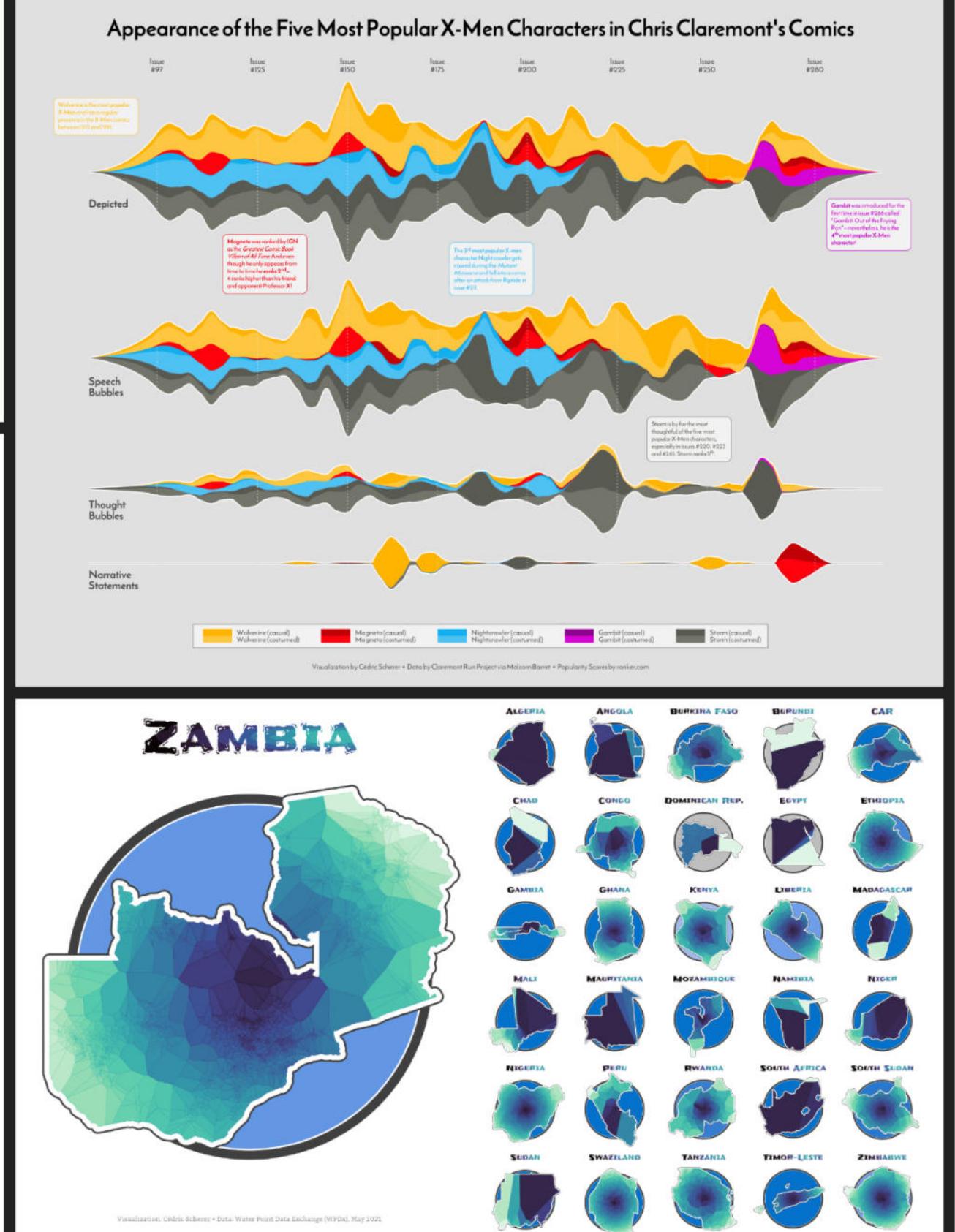
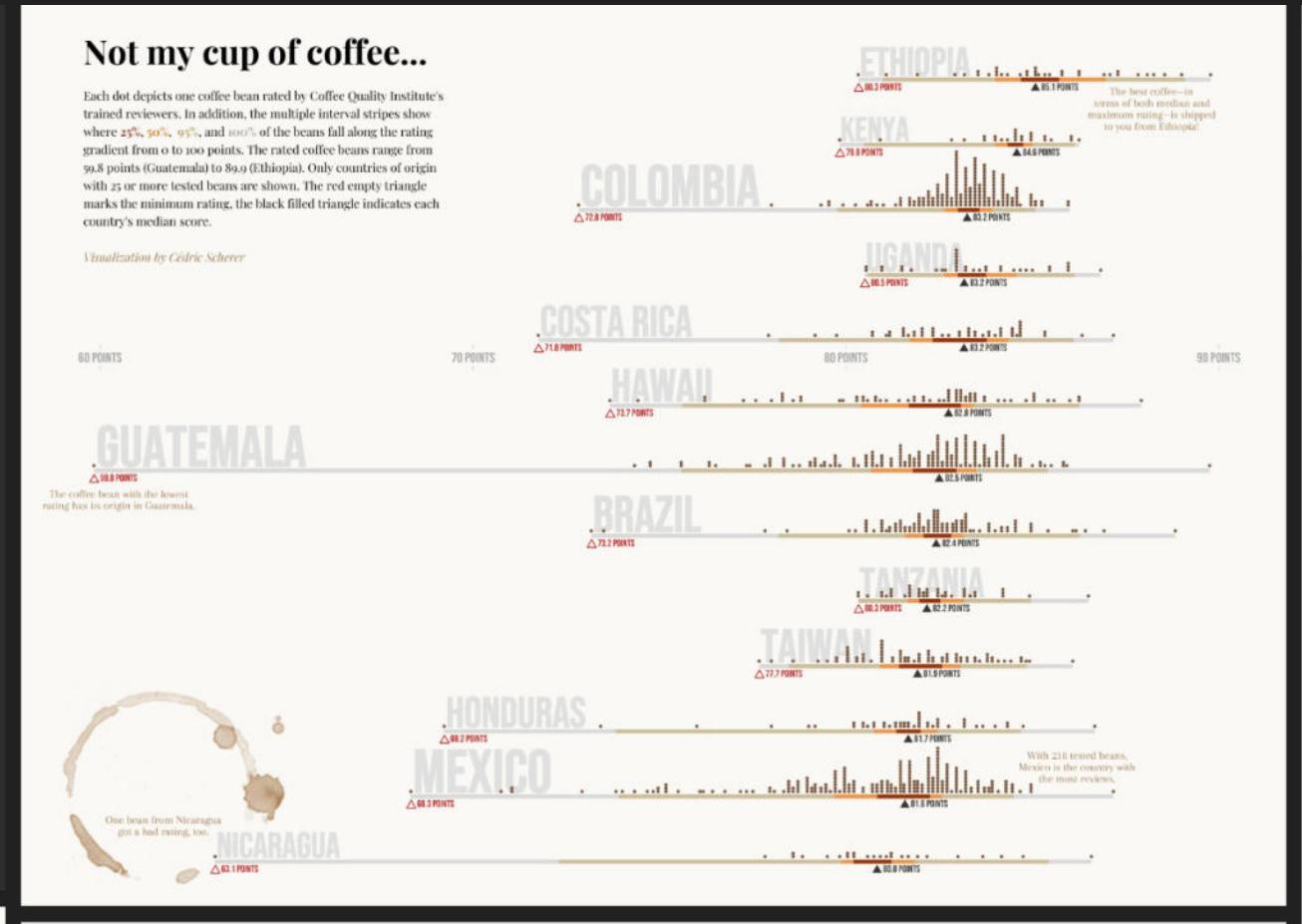
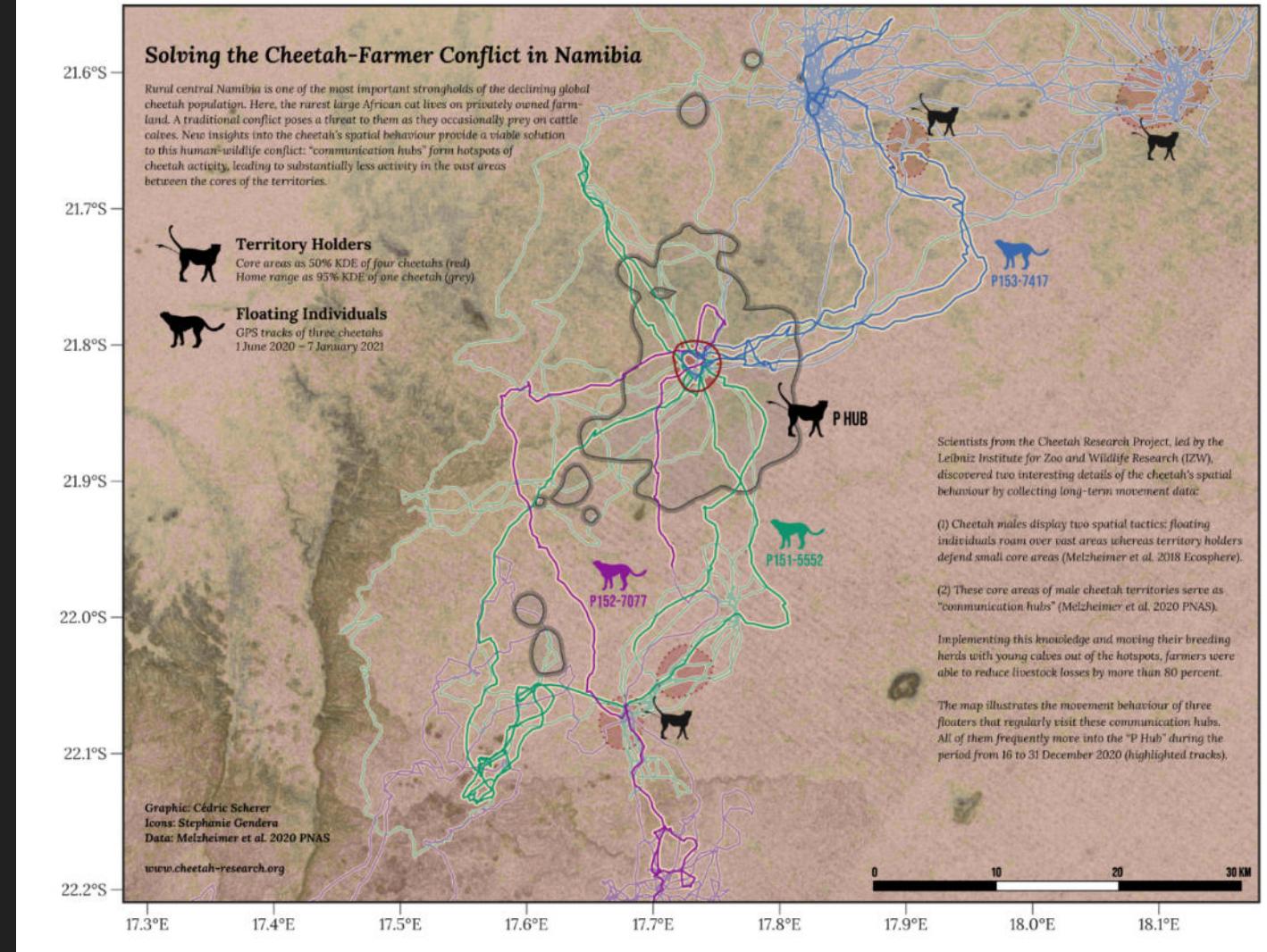
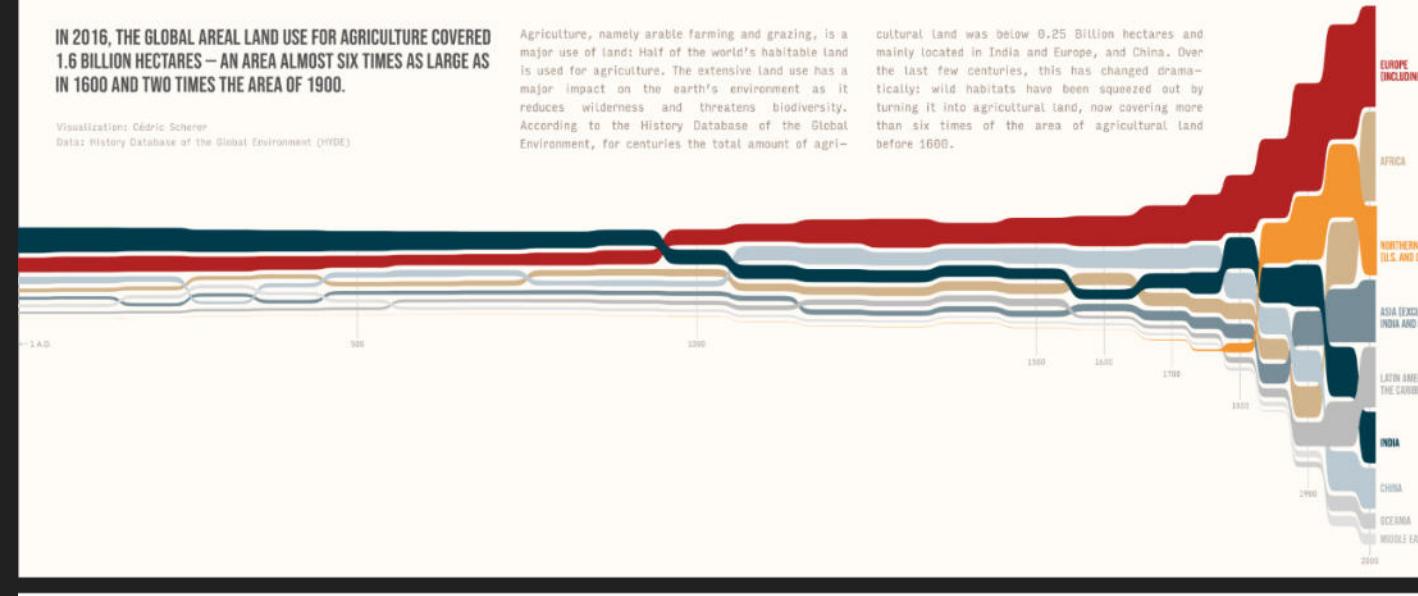
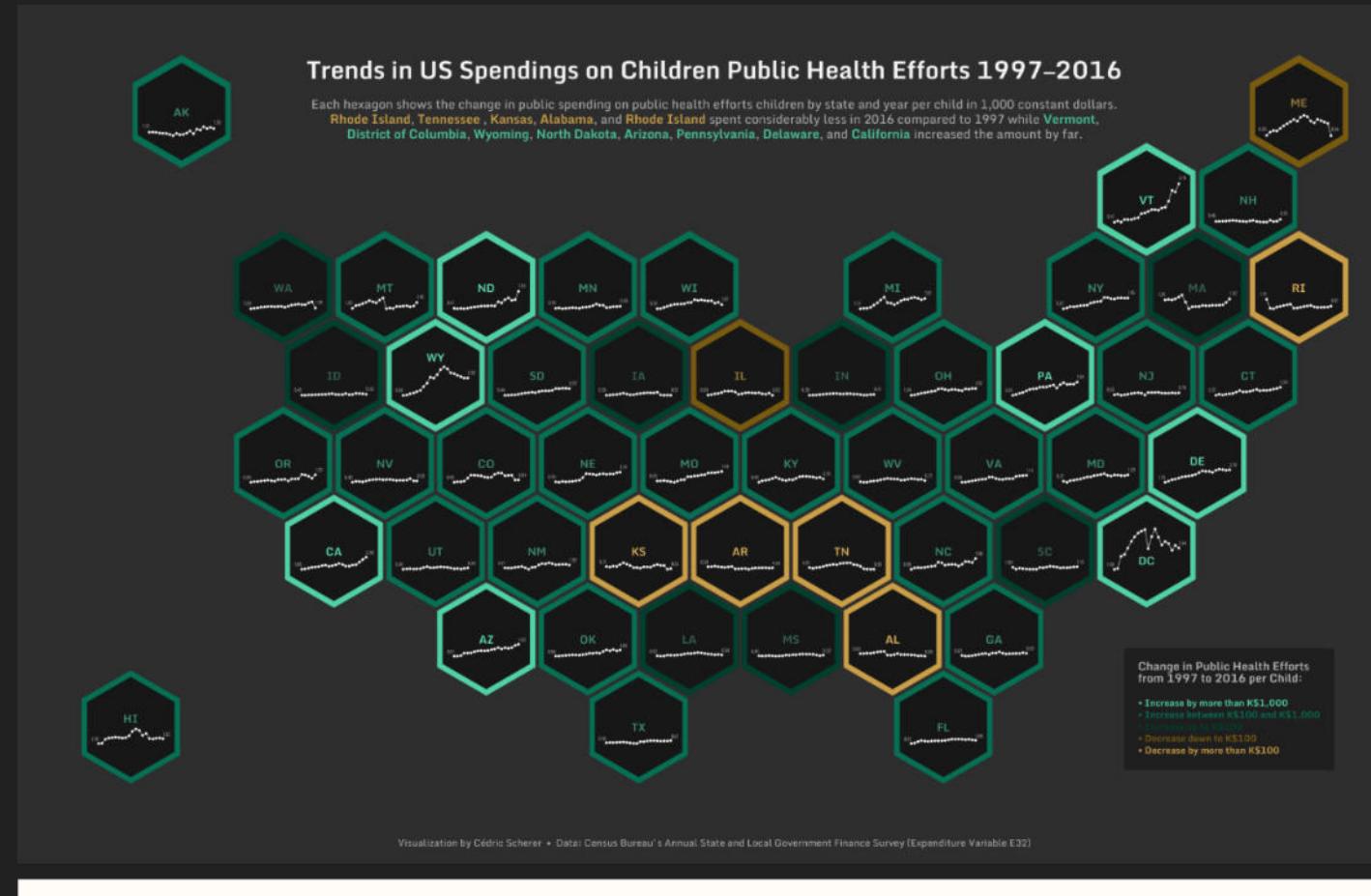
Independent Data Visualization Specialist
Computational Ecologist at IZW Berlin



Consulting

Coaching

Coding



SCIENTIFIC
AMERICAN®

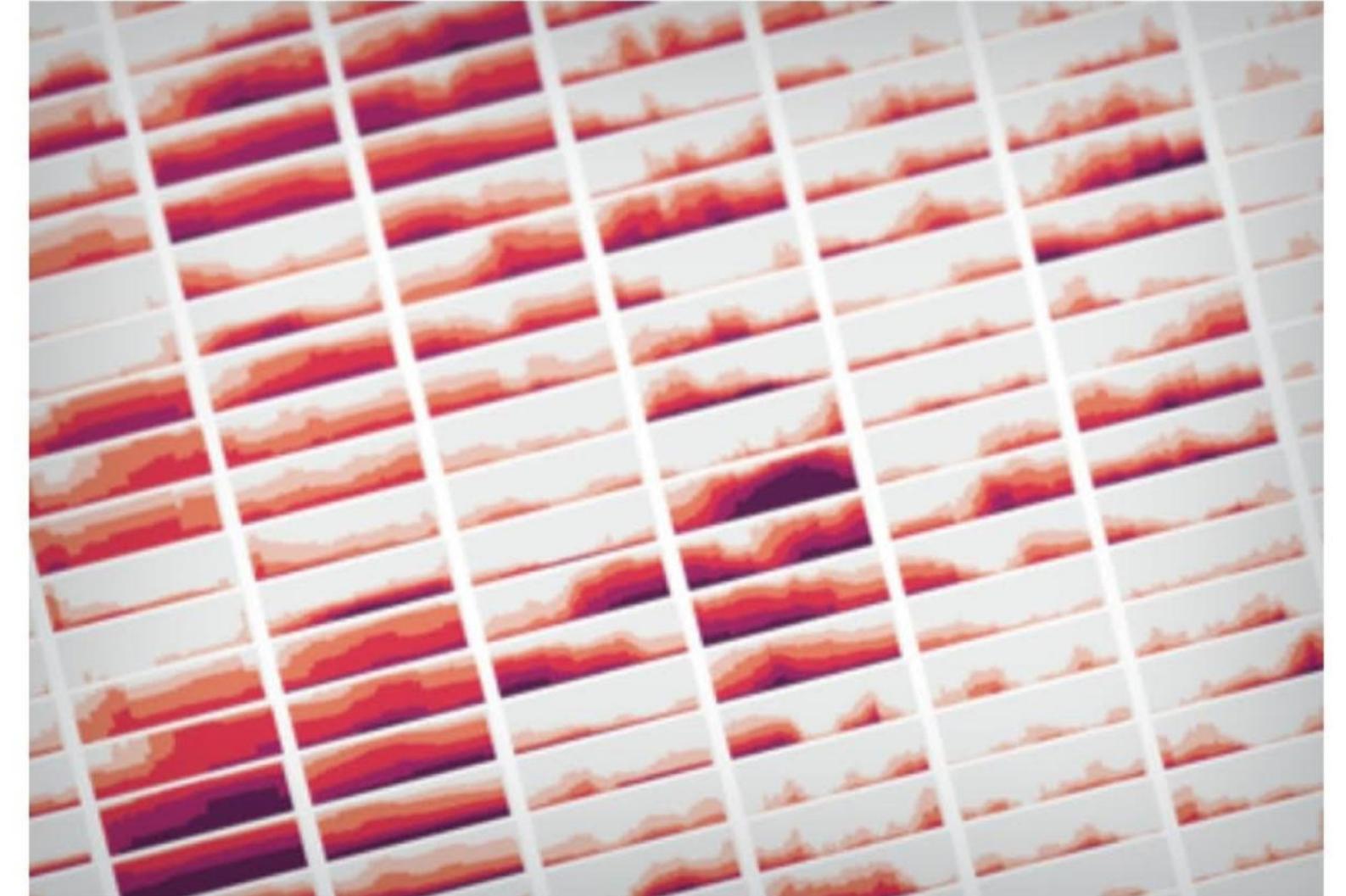
Subscribe

CLIMATE CHANGE

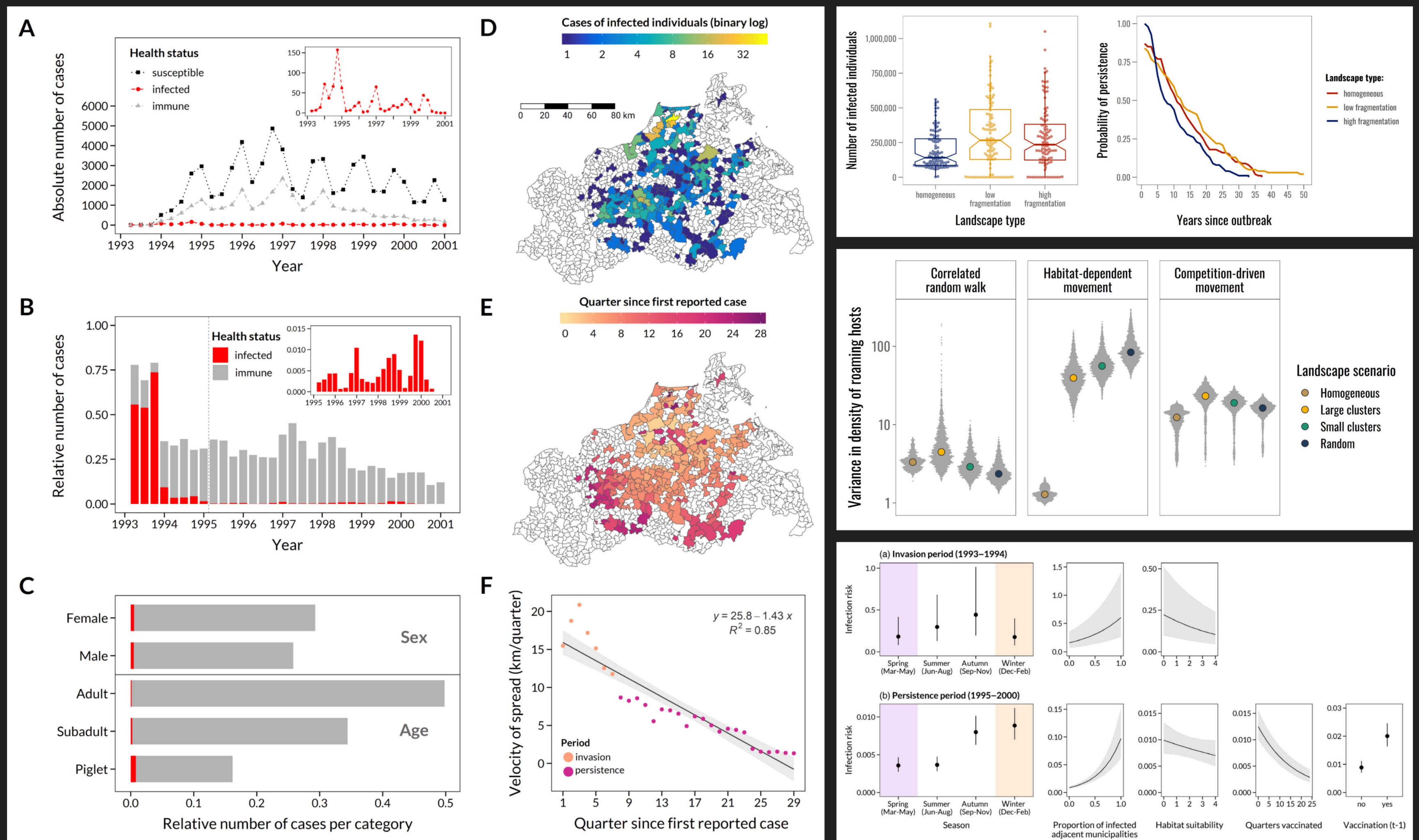
Climate Change Drives Escalating Drought

The past two decades have seen some of the most extreme dry periods in U.S. history

By Clara Moskowitz, Cédric Scherer, Georgios Karamanis
| Scientific American November 2021 Issue



Credit: Cédric Scherer and Georgios Karamanis



CÉDRIC SCHERER

Data Visualization & Computational Ecology



The World's Countries Colored by Their First Letter

While preparing the mapping section for a Pearson-O'Reilly training, I got the idea to visualize the first letter of each country. And got especially curious about how much landmass each letter covers. Turns out: A, C and R are covering the largest areas!

Posted by Cédric • Friday, August 27, 2021



Always coding. Passionate about design. Worried about nature.
Proud dad.

A Quick How-to on Labelling Bar Graphs in ggplot2

Bar charts are likely the most common chart type out there and come in several varieties. Most notably, Direct Labels can increase accessibility of a bar graph. I got

666666

CÉDRIC SCHERER

BLOG GALLERY PORTFOLIO ABOUT ME LINKS

DATAVIZ TUTORIAL R TIDYVERSE GGPLOT2

A GGPLOT2 TUTORIAL FOR BEAUTIFUL PLOTTING IN R

Posted by Cédric on Monday, August 5, 2019

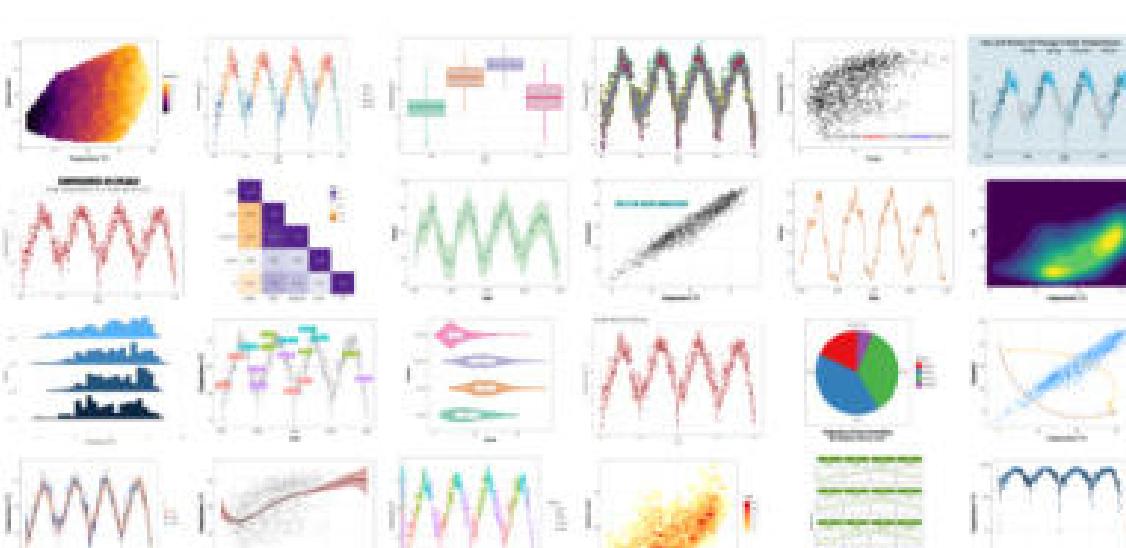
Last update: 2021-02-09

Introductory Words

I don't care, just show me the content!

Back in 2016, I had to prepare my PhD introductory talk and I started using `ggplot2` to visualize my data. I never liked the syntax and style of base plots in R, so I was quickly in love with ggplot. Especially useful was its faceting utility. But because I was short on time, I plotted these figures by trial and error and with the help of lots of googling. The resource I came always back to was a blog entry called [Beautiful plotting in R: A ggplot2 cheatsheet](#) by Zev Ross, updated last in January 2016. After giving the talk which contained some decent plots thanks to the blog post, I decided to go through this tutorial step-by-step. I learned so much from it and directly started modifying the codes and over the time I added additional code snippets, chart types and resources.

Since the blog entry by Zev Ross was not updated for some years and step by step this became a unique version of a tutorial, I decided to host the updated version on my GitHub. Now it finds its proper place on this homepage! (Plus I added a ton of other updates—just to name a few: The fantastic `patchwork`, `ggtext` and `ggforce` packages. How to deal with custom fonts and colors. A collection of R packages tailored to create interactive charts. And several other chart types including pie charts because everyone looooves pie charts!)



CÉDRIC SCHERER

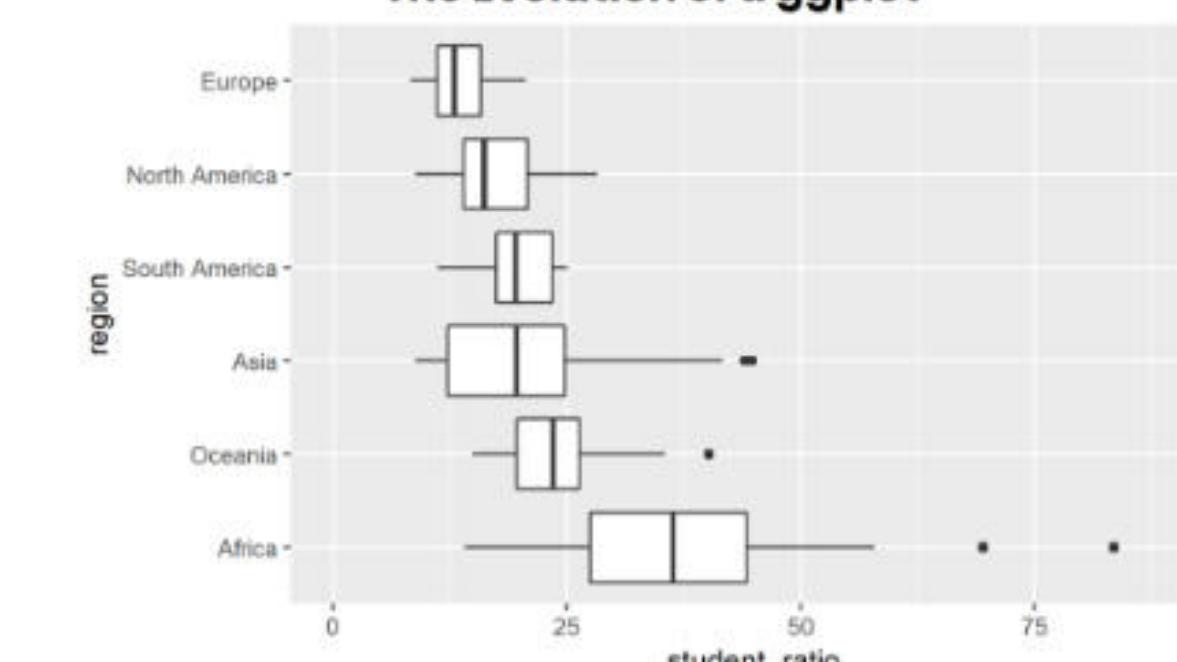
BLOG GALLERY PORTFOLIO ABOUT ME LINKS

DATAVIZ TUTORIAL ANIMATIONS GGPLOT EVOLUTION R GGPLOT2 TIDYVERSE TIDYTUESDAY

THE EVOLUTION OF A GGPLOT (EP. 1)

Posted by Cédric on Friday, May 17, 2019

The Evolution of a ggplot



region

student_ratio

Data: UNESCO Institute for Statistics
Visualization by Cédric Scherer

- Aim of this Tutorial
- Data Preparation
- The Default Boxplot
- Sort Your Data!
- Let Your Plot Shine—Get Rid of the Default Settings
- The Choice of the Chart Type
- More Geoms, More Fun, More Info!
- Add Text Boxes to Let The Plot Speak for Itself
- Bonus: Add a Tile Map as Legend
- The Final Evolved Visualization
- Complete Code for Final Plot
- Post Scriptum: Mean versus Median

Aim of this Tutorial

In this series of blog posts, I aim to show you how to turn a default ggplot into a plot that visualizes information in an appealing and easily understandable way. The goal of each blog post is to provide a step-by-step tutorial explaining how my visualization have evolved from a typical

Datenvisualisierung

ist die grafische Darstellung von
Informationen und Daten.



Datenvisualisierung

wandelt Daten in visuelle Formen als
quantifizierbare Merkmale um.



Datenvisualisierung

hilft Einsichten zu gewinnen, zu entdecken, erklären und zu entscheiden.



Datenvisualisierung

ist einerseits Kunst und
andererseits Wissenschaft.





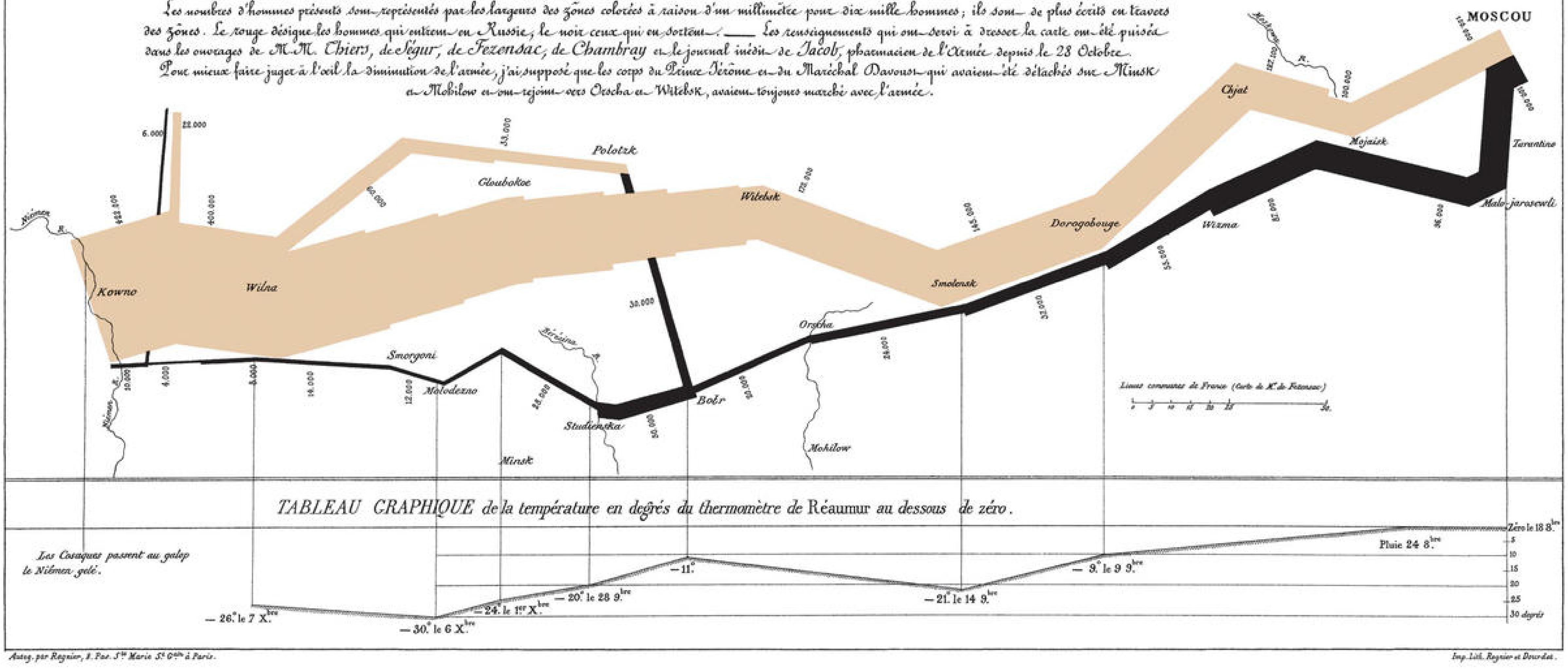
Quelle: eazybi.com

Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813.

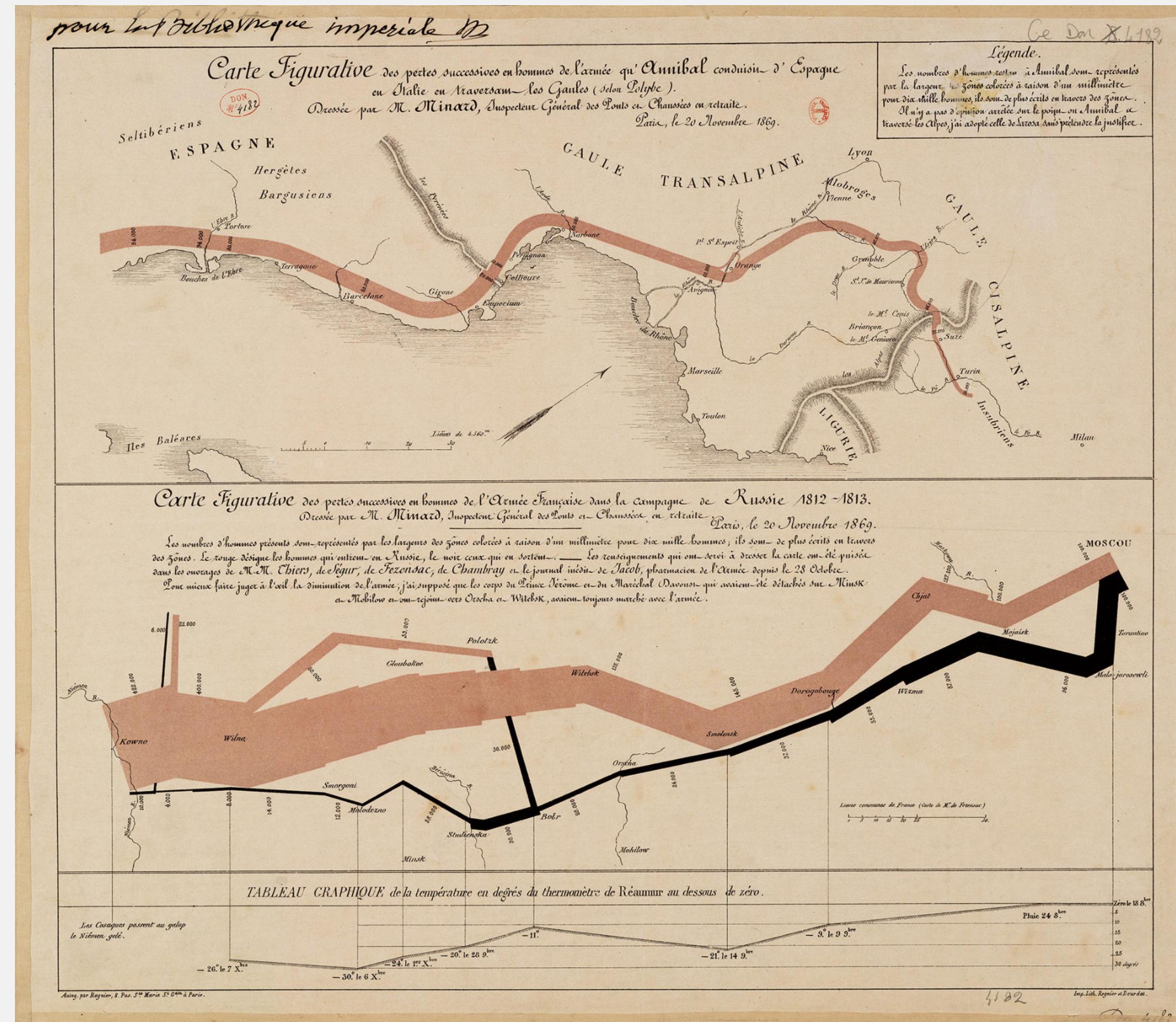
Dessiné par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite Paris, le 20 Novembre 1869.

Les nombres d'hommes perdus sont représentés par les larges des zones colorées à raison d'un millimètre pour dix mille hommes; ils sont de plus écrits en tracés des zones. Le rouge désigne les hommes qui entrent en Russie, le noir ceux qui en sortent. — Les renseignements qui ont servi à dresser la carte ont été puisés dans les ouvrages de M. M. Chier, de Segur, de Fezensac, de Charnbray et le journal inédit de Jacob, pharmacien de l'Armée depuis le 28 Octobre.

Pour mieux faire juger à l'œil la diminution de l'armée, j'ai supposé que les corps du Prince Jérôme et du Maréchal Davout, qui avaient été détachés de Minsk au Mohilow et qui rejoignirent Osscha et Wilcok, avaient toujours marché avec l'armée.



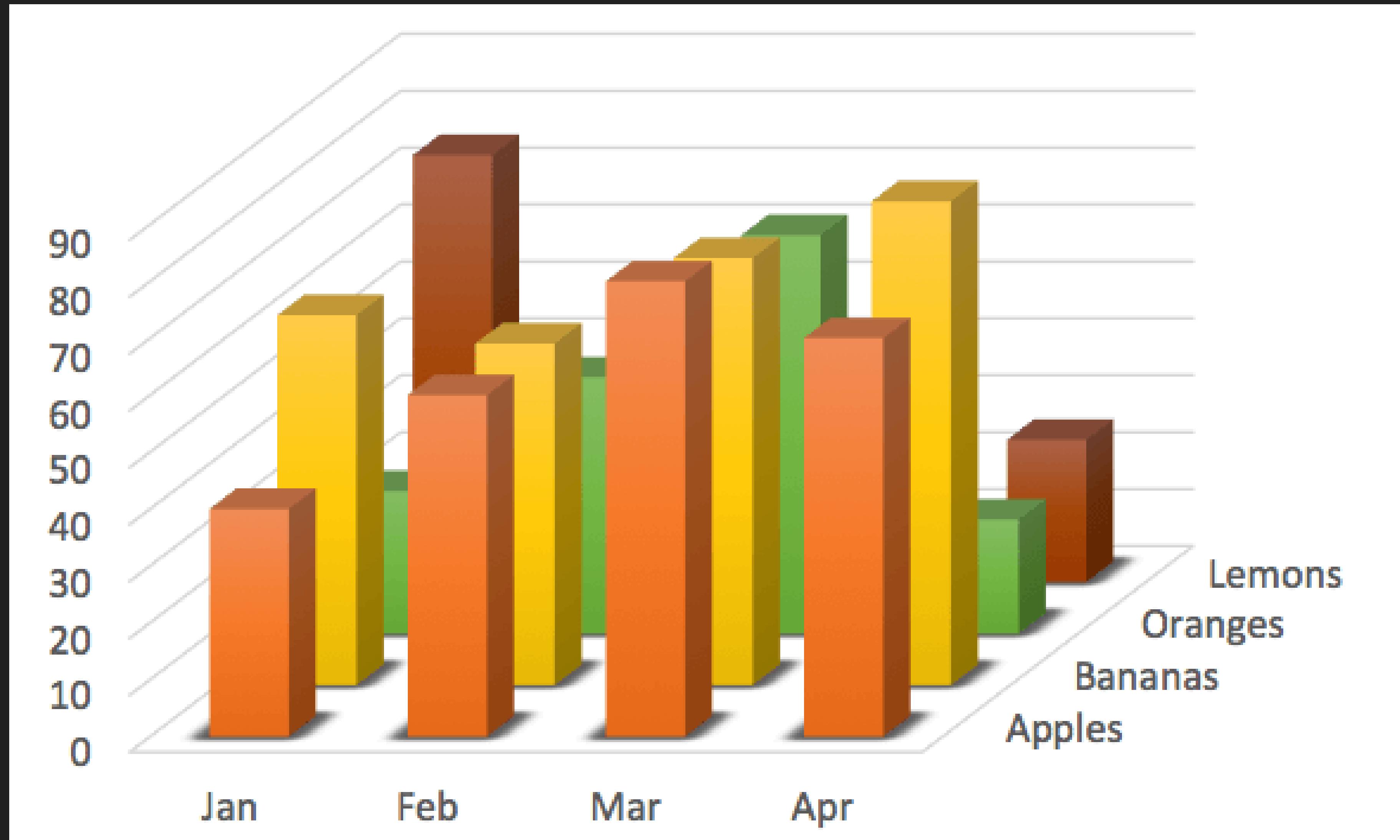
Carte figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813 von Charles Joseph Minard



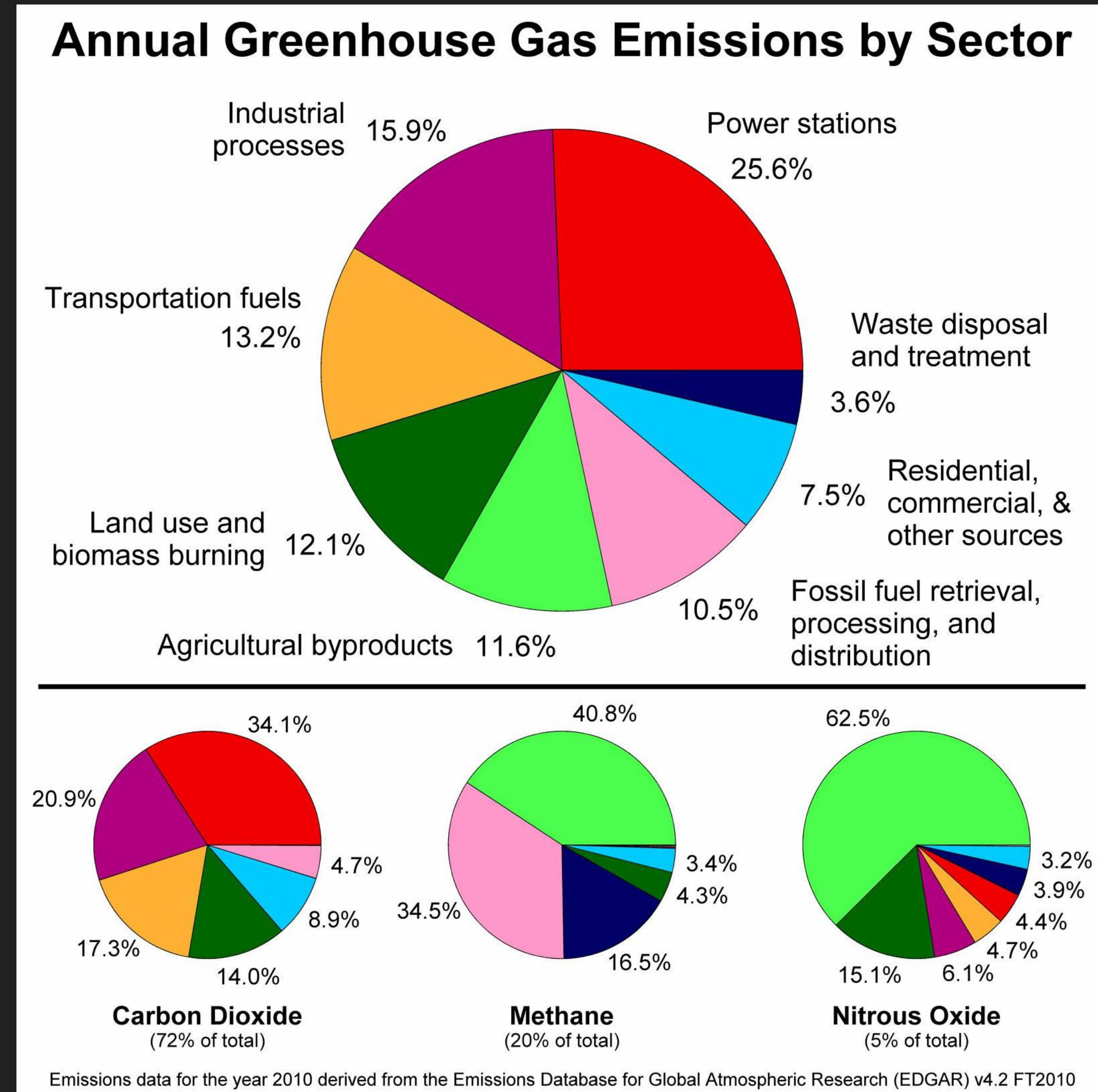
Carte figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813 and Carte figurative des pertes successives en hommes de l'Armée qu'Annibal conduisit d'Espagne en Italie en traversant les Gaules (selon Polybe) von Charles Joseph Minard

- zeigt das Vorrücken der Truppen von **Hannibal** (218 v. Chr.) und **Napoleon** (1812-1813)
- wird oft als **die beste jemals gezeichnete statistische Grafik** bezeichnet

Was macht es zu einer schlechten Grafik?



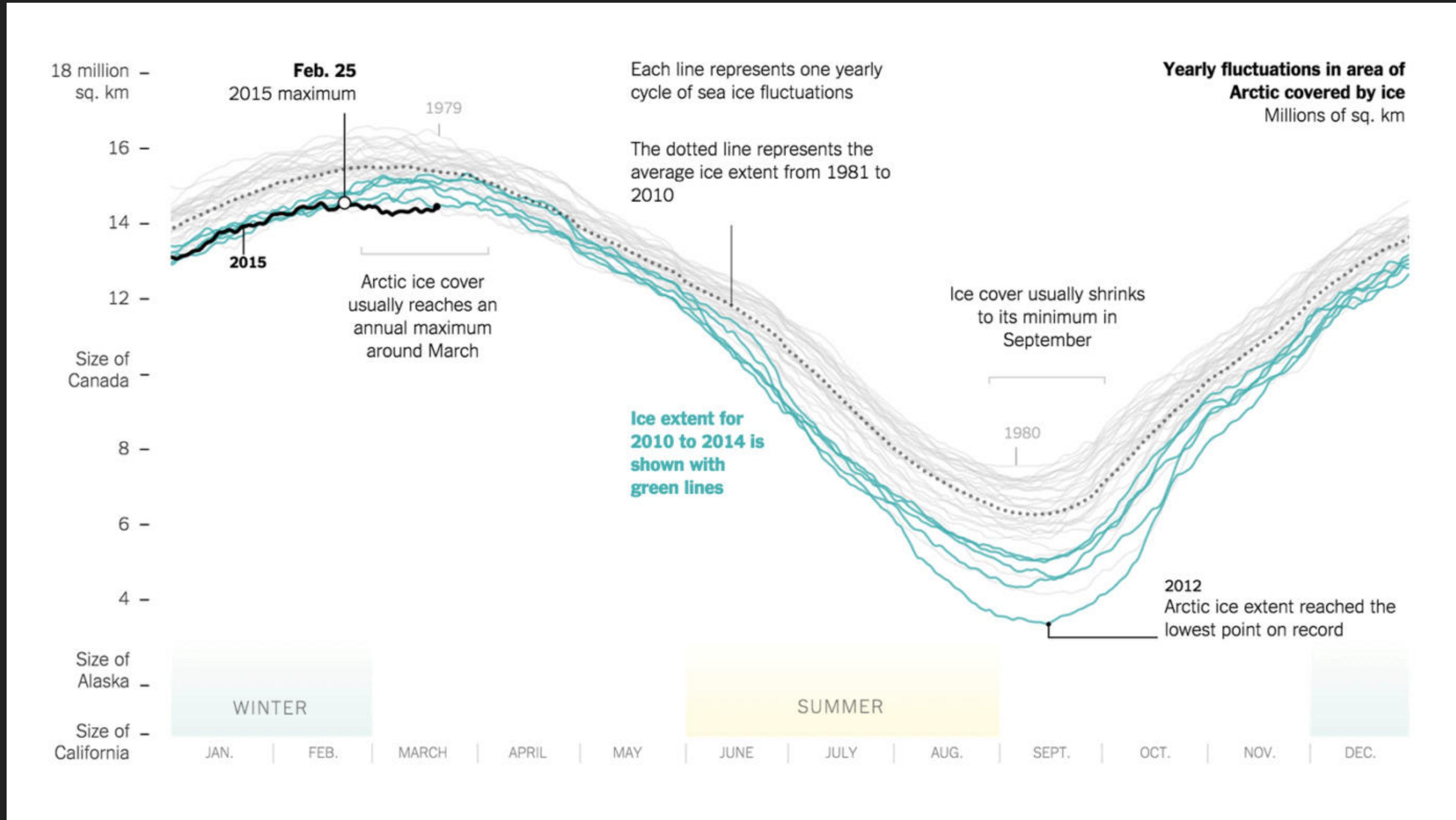
Was macht es zu einer schlechten Grafik?



Was macht es zu einer schlechten Grafik

- 👉 **substantive Probleme** (schlechte Daten)
- 👉 **aesthetische Probleme** (schlechtes Design)
- 👉 **perzeptionelle Probleme** (schlechte Codierung)

Was macht es zu einer guten Grafik?



“Yearly Fluctuations in Area of Arctic Covered by Ice” by Derek Watkins (New York Times)

Was macht es zu einer guten Grafik

☞ **INFORMATION** (Korrektheit)

☞ **STORY** (Bedeutsamkeit)

☞ **GOAL** (Zweckmäßigkeit)

☞ **VISUAL FORM** (Schönheit)

What Makes a Good Visualization?

explicit (implicit)



David McCandless
InformationisBeautiful.net

taken from new book
Knowledge is Beautiful

find out more
bit.ly/KIB_Books

INFORMATION

Verstehe deine Daten und sei genau



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How to Steer Clear of Common Blunders When Working
with Data and Presenting Analysis and Visualizations

AVOIDING DATA PITFALLS



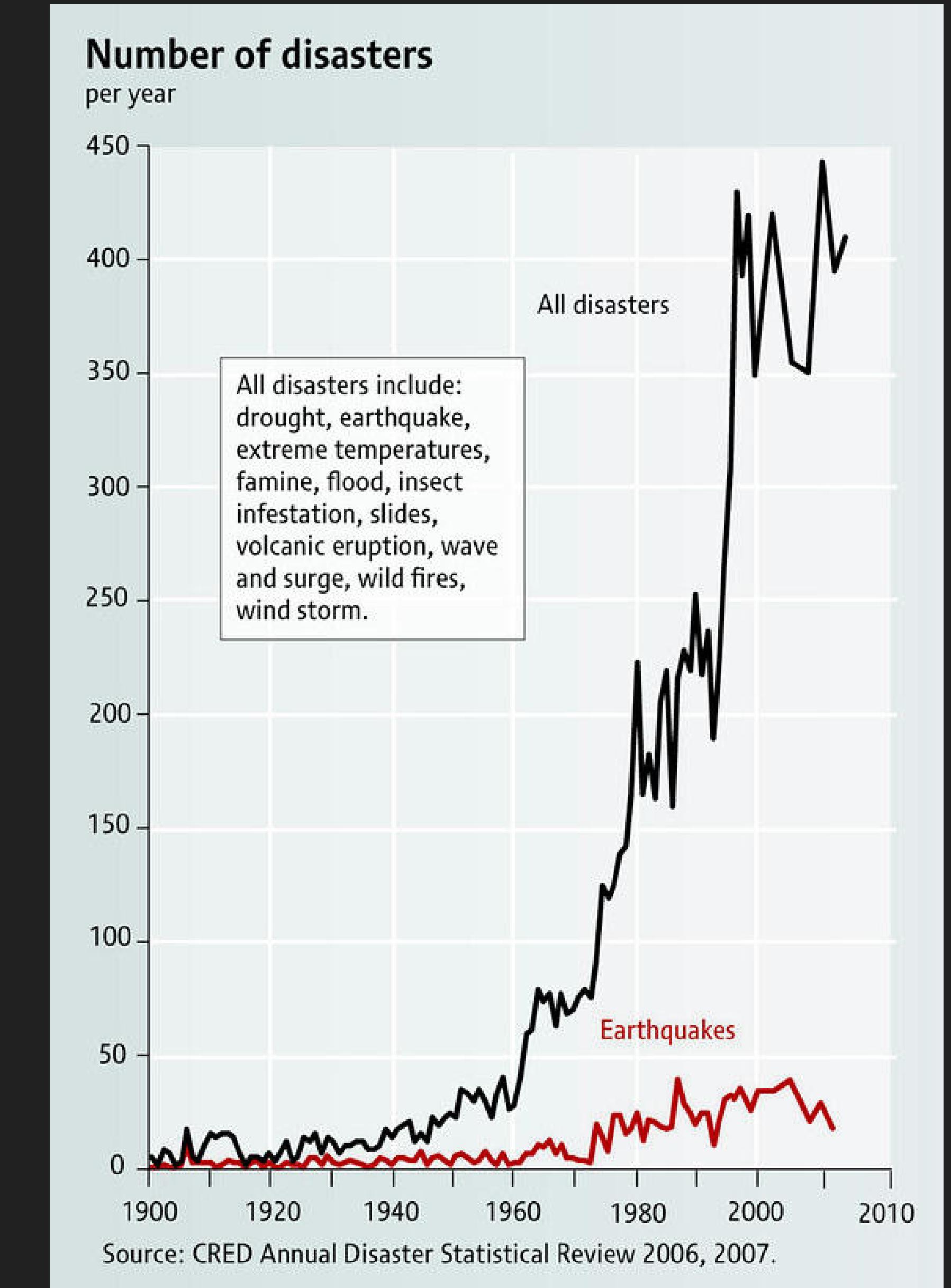
BEN JONES

Founder and CEO, Data Literacy

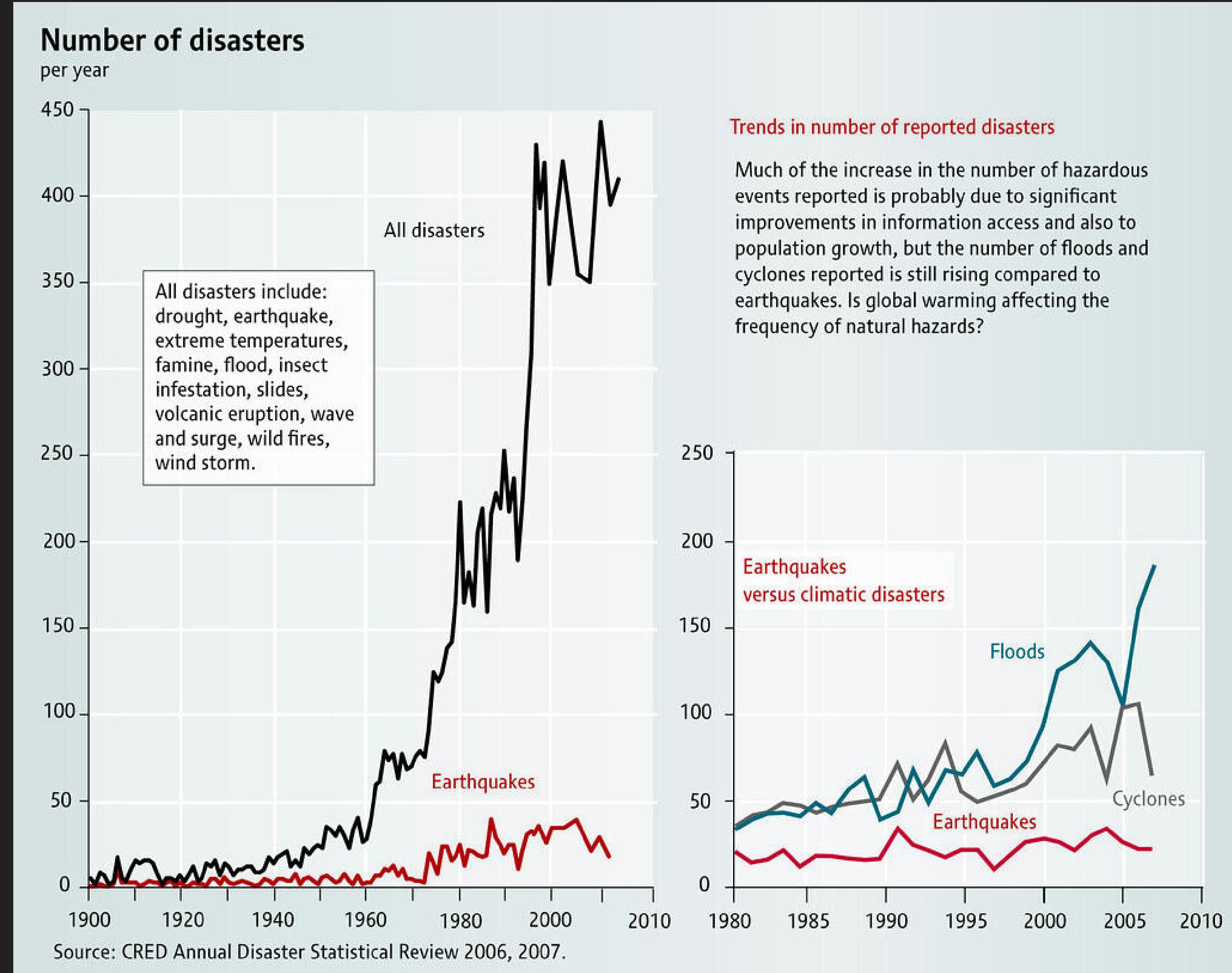
WILEY

Unsere Daten sind nie ein perfektes Abbild der realen Welt.

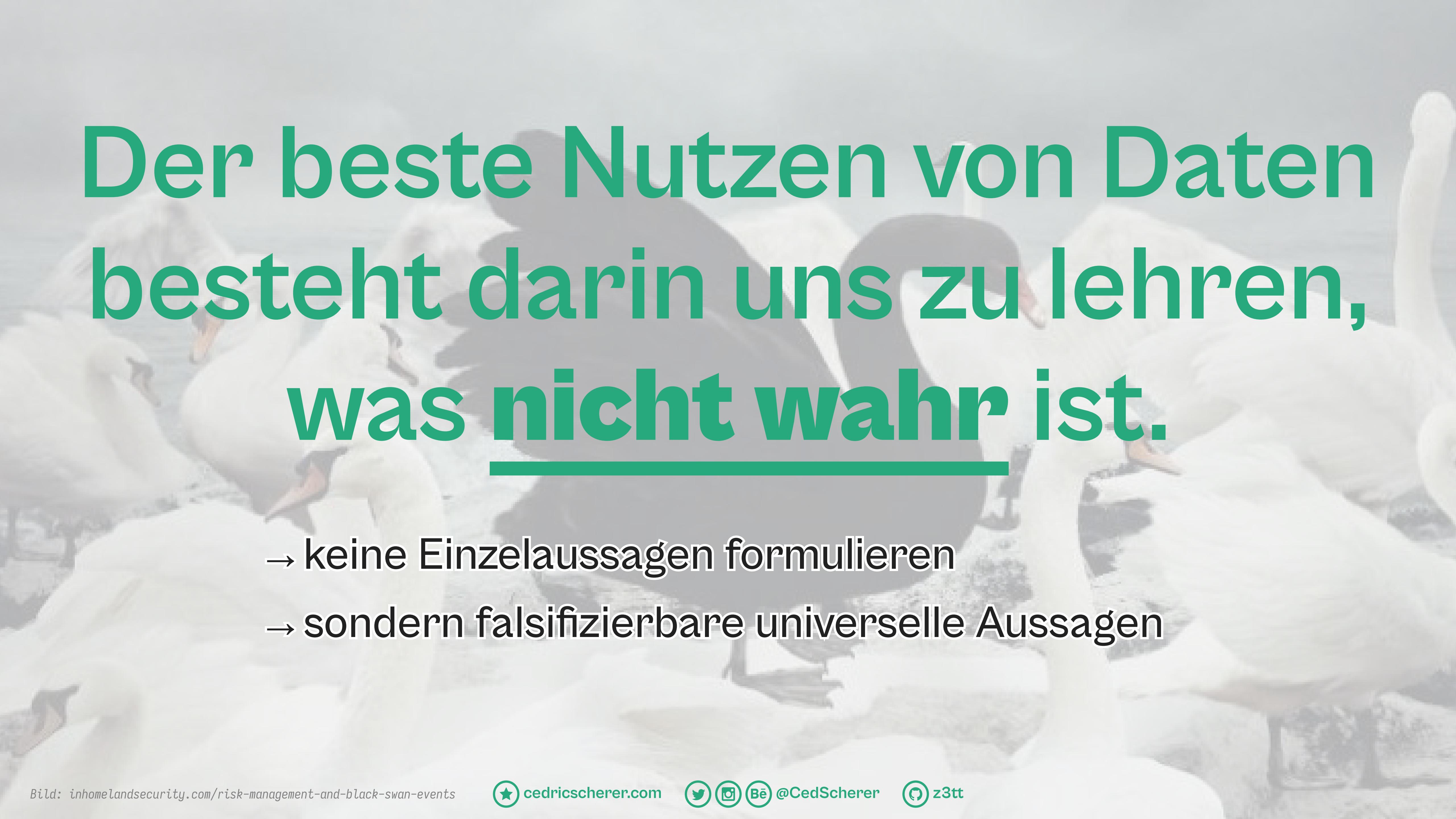
- nur eine Teilmenge: gemeldete Verbrechen
- von Menschen erhoben: Schätzungen, Genauigkeit & Fehler
- maschinell erfasst: Genauigkeiten & Fehler



“Ein Großteil des Anstiegs der **gemeldeten gefährlichen Ereignisse** ist wahrscheinlich auf den erheblich **verbesserten Zugang zu Informationen** zurückzuführen.”



Der beste Nutzen von Daten
besteht darin uns zu lehren,
was nicht wahr ist.



Der beste Nutzen von Daten
besteht darin uns zu lehren,
was nicht wahr ist.

- keine Einzelaussagen formulieren
- sondern falsifizierbare universelle Aussagen



Der beste Nutzen von Daten
besteht darin uns zu lehren,
was nicht wahr ist.

- "Der Schwan ist weiß."
- "Alle Schwäne sind weiß."

STORY

Sei dir über die Botschaft der Daten im Klaren



cedricscherer.com



@CedScherer



z3tt

Wer ist mein Zielpublikum?

Welche Geschichte ist für sie interessant?

Wer ist mein Zielpublikum?

Welche Geschichte ist für sie **interessant**?

Was sind wirklich **relevante** Details?

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Welche Variablen sind für sie **bedeutsam**?

Wie werden sie der Grafik begegnen?

Wer ist mein Zielpublikum?

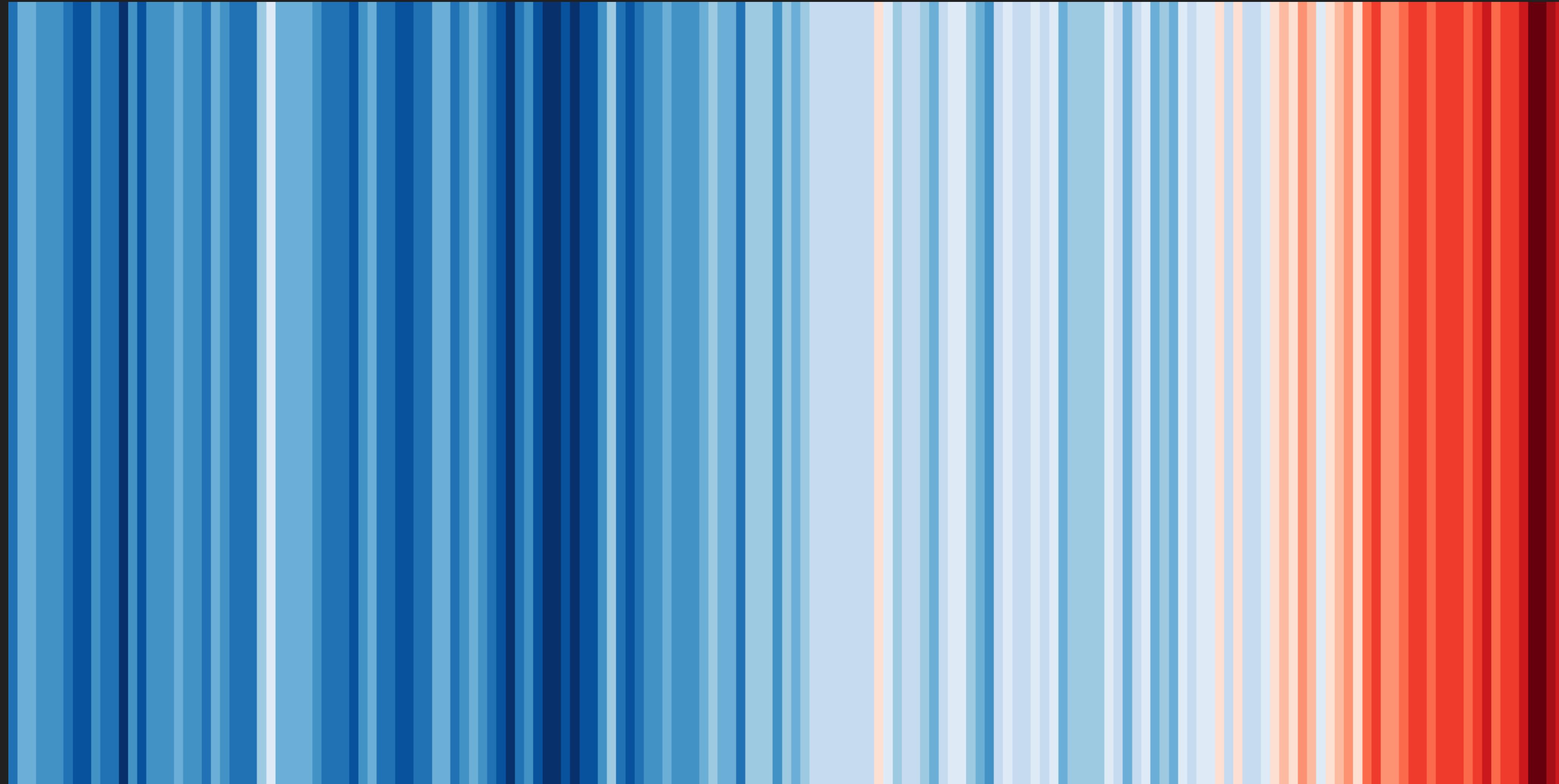
Welche Geschichte ist für sie **interessant**?

Was sind wirklich **relevante** Details?

Welche Variablen sind für sie **bedeutsam**?

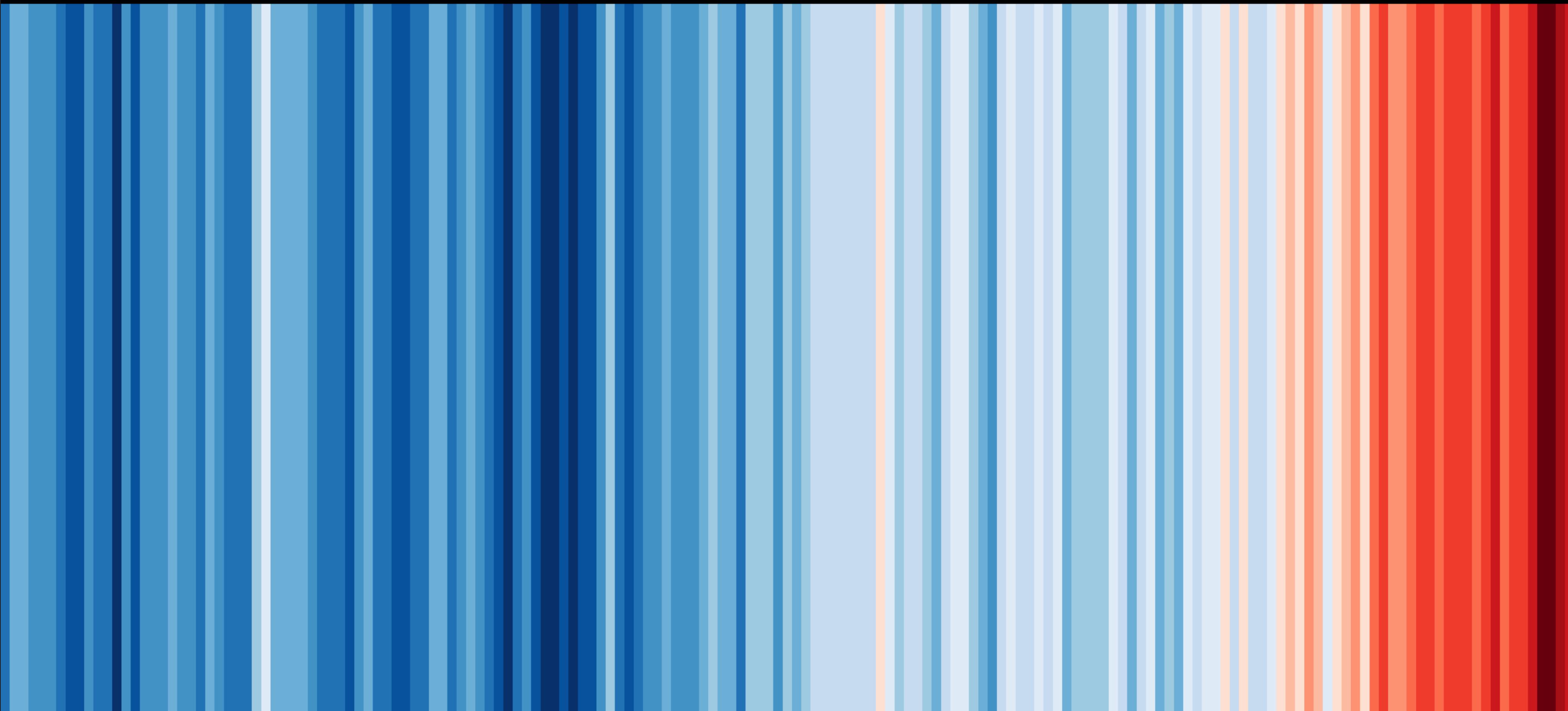
Wie werden sie der Grafik begegnen?

Brauche ich überhaupt eine Visualisierung??



Warming Stripes von Ed Hawkins

Global temperature change (1850-2019)



Warming Stripes von Ed Hawkins

FAQ : Frequently asked questions

What are these graphics? ▼

What do the graphics show? ▼

Why are there no numbers on the graphics? ^

» These graphics are specifically designed to be as simple as possible, and to start conversations about our warming world and the risks of climate change. There are numerous sources of information which provide more specific details about how temperatures have changed, so these graphics fill a gap and enable communication with minimal scientific knowledge required to understand their meaning.

1

0

showyourstripes.info/faq

Diese Grafiken sind speziell dafür
konzipiert um Gespräche anzuregen
über die sich erwärmende Welt und
die Risiken des Klimawandels.

» These graphics are specifically designed to be as simple as possible, and to start conversations about our warming world and the risks of climate change. There are numerous sources of information which provide more specific details about how temperatures have changed, so these graphics fill a gap and enable communication with minimal scientific knowledge required to understand their meaning.



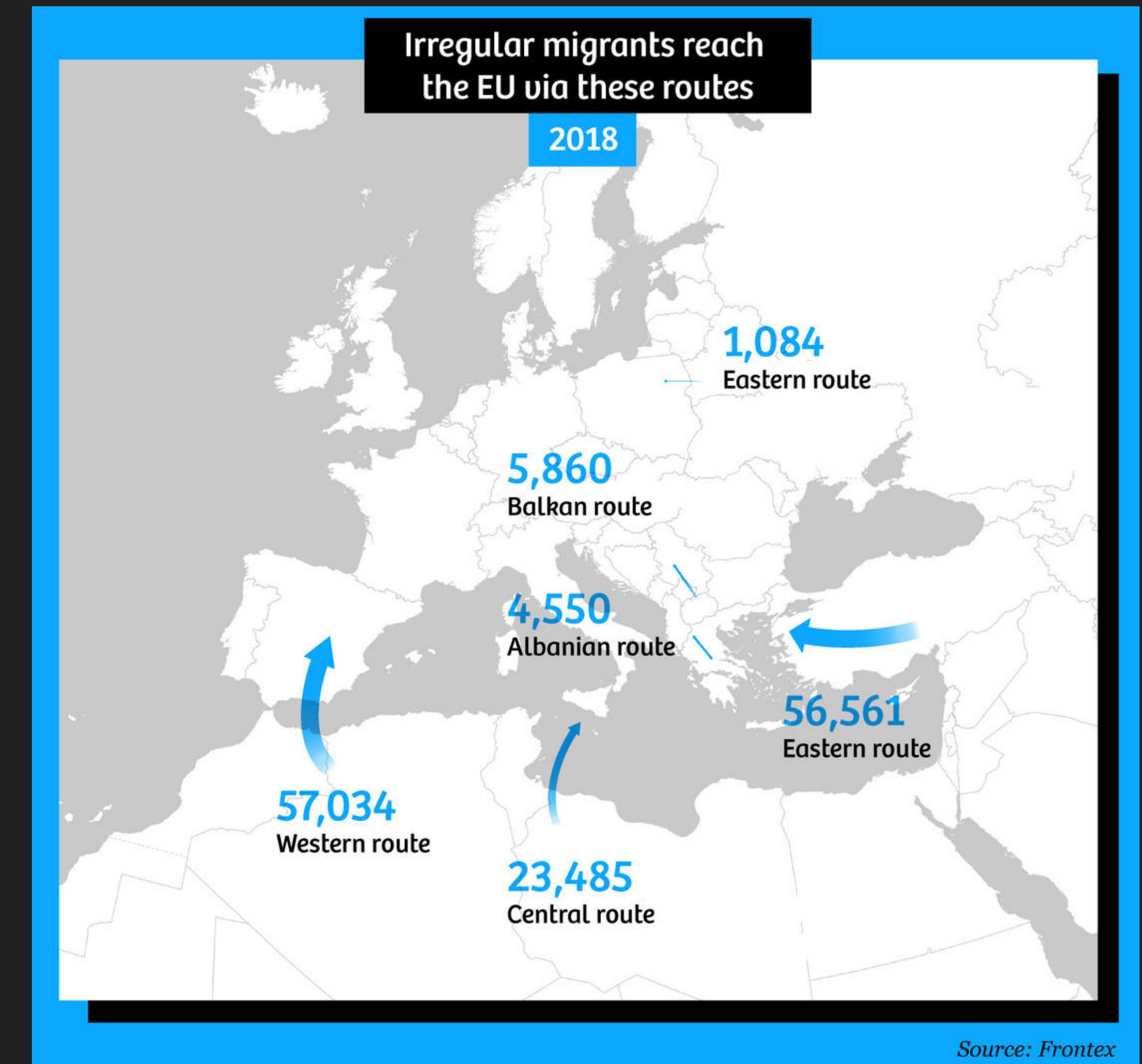
Visualiser Control

Viewer Control

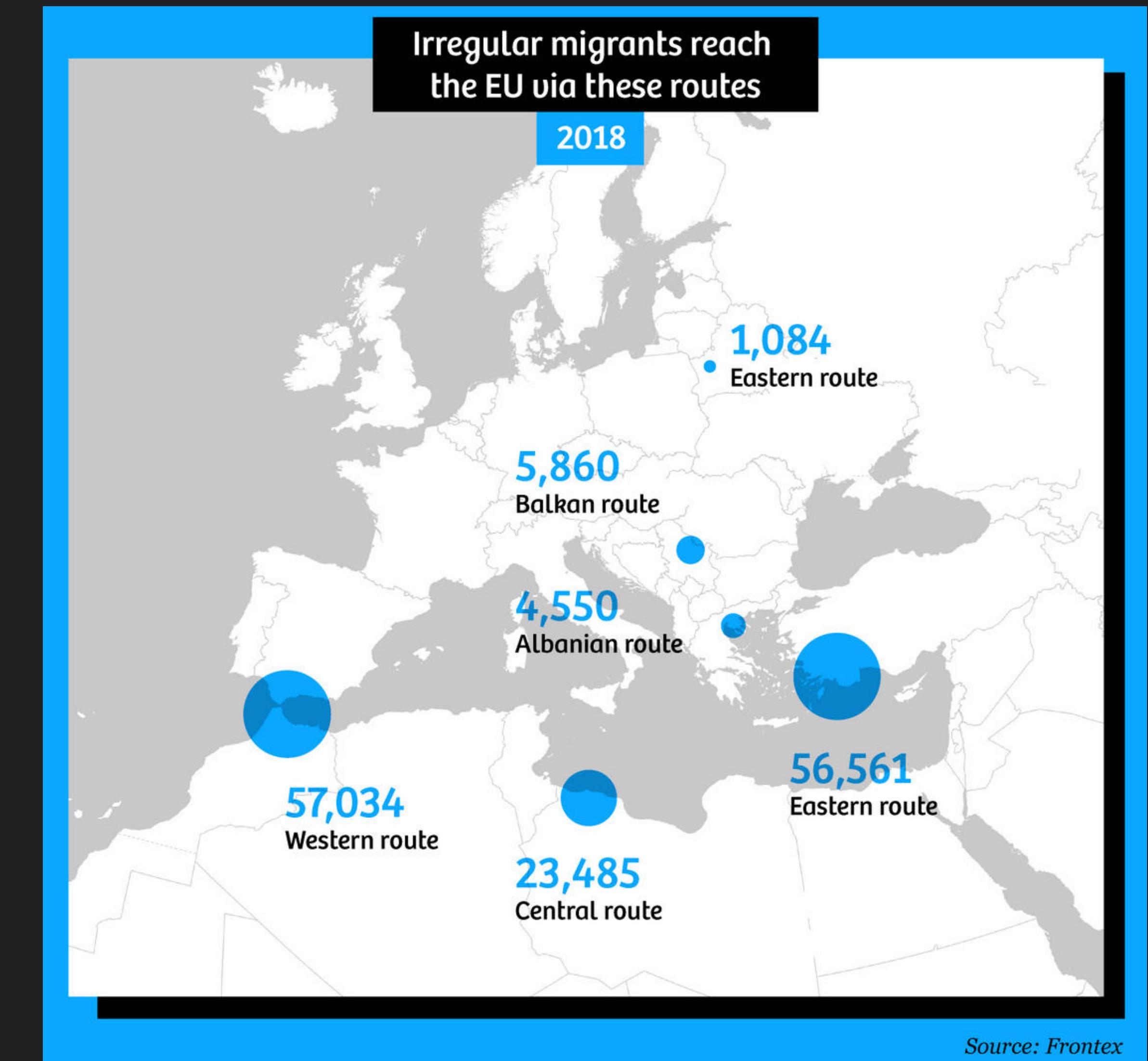
Schema von Andy Kirk



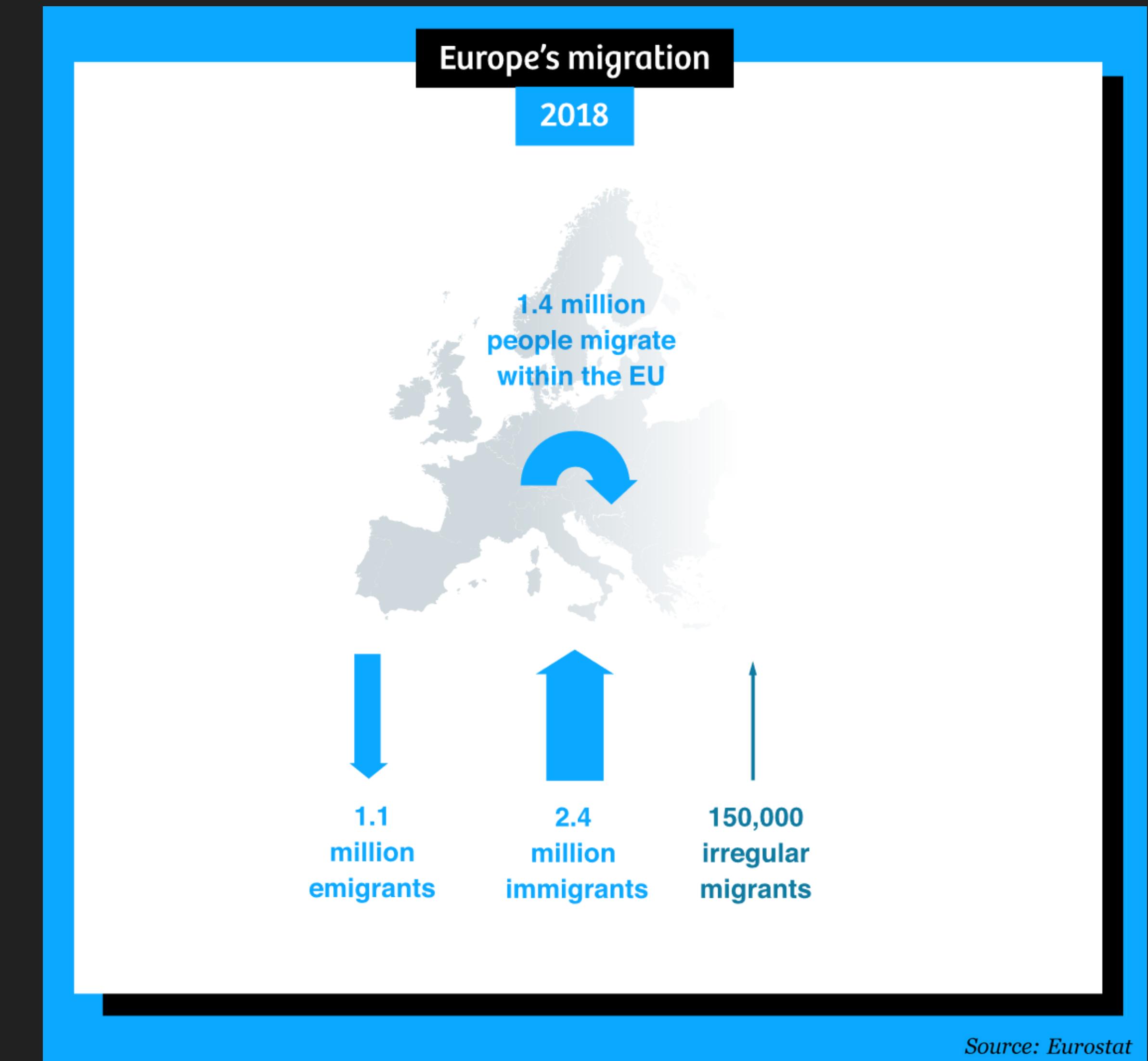
“How maps in the media make us more negative about migrants” by Maite Vermeulen, Leon de Korte & Henk van Houtum



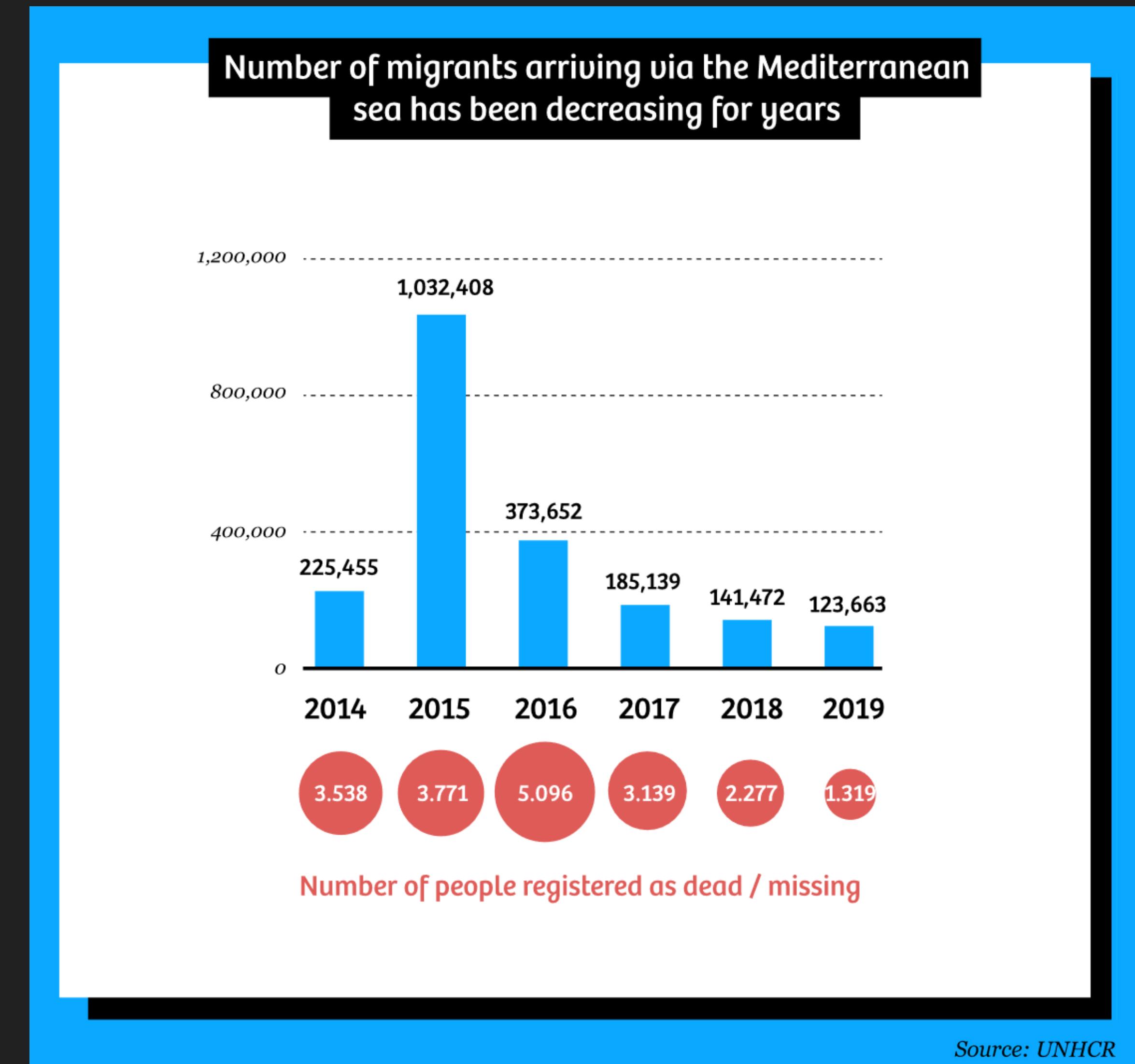
“How maps in the media make us more negative about migrants” by Maite Vermeulen, Leon de Korte & Henk van Houtum



“How maps in the media make us more negative about migrants” by Maite Vermeulen, Leon de Korte & Henk van Houtum



“How maps in the media make us more negative about migrants” by Maite Vermeulen, Leon de Korte & Henk van Houtum



“How maps in the media make us more negative about migrants” by Maite Vermeulen, Leon de Korte & Henk van Houtum

GOAL

Wähle geeignete Grafiken, um die Geschichte zu erzählen



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z3tt

Typologie von Informationsgrafiken

nach Juuso Koponen & Jonatan Hildén, "Data Visualization Handbook" (2020), Seite 25

Sind die **Informationen** konzeptionell oder messbar?

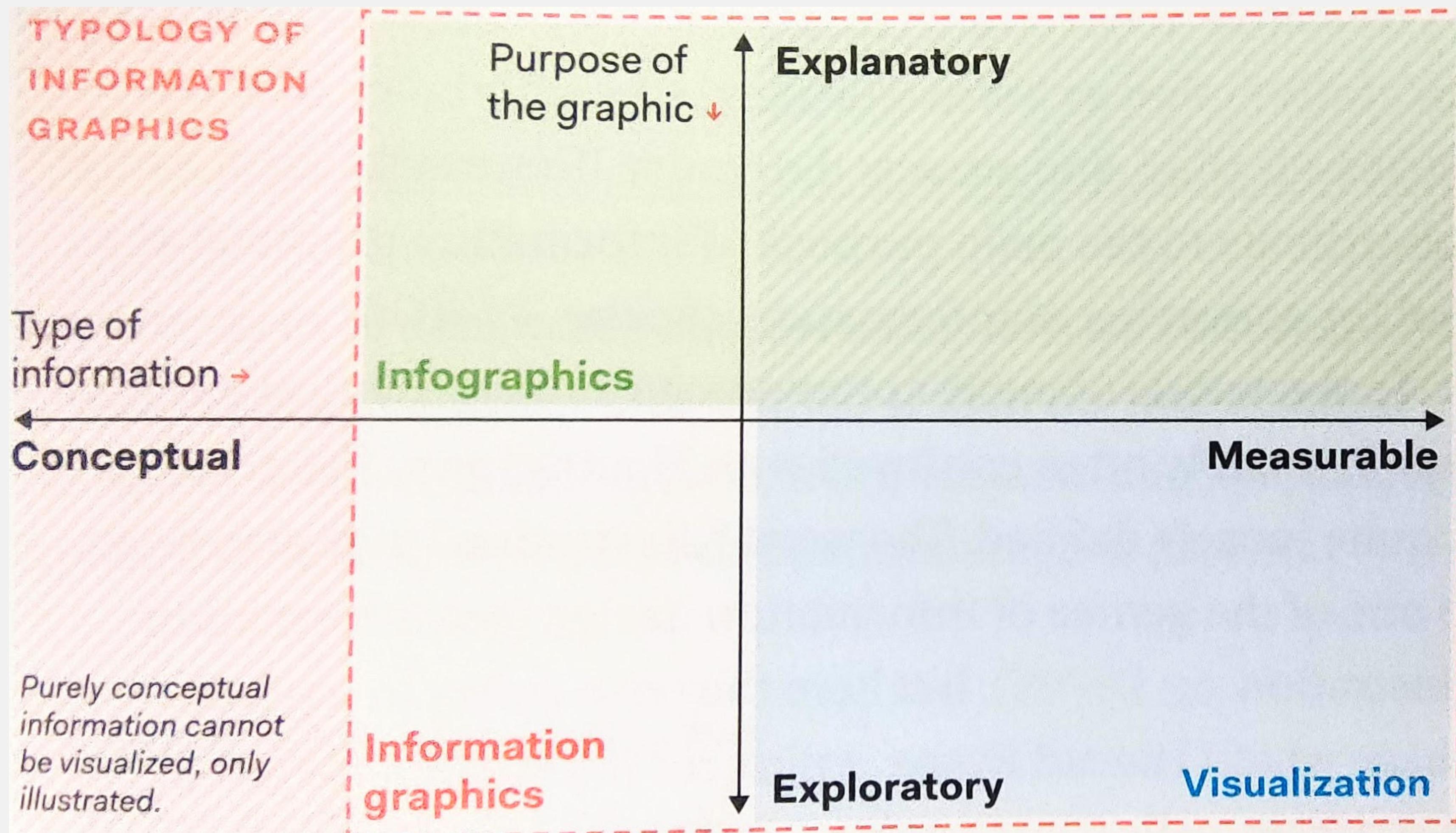
☞ **Art der Information:** Darstellung von Konzepten <> Umwandlung von Daten in visuelle Formen

Ist der **Zweck** Informationen zu erkunden oder zu erklären?

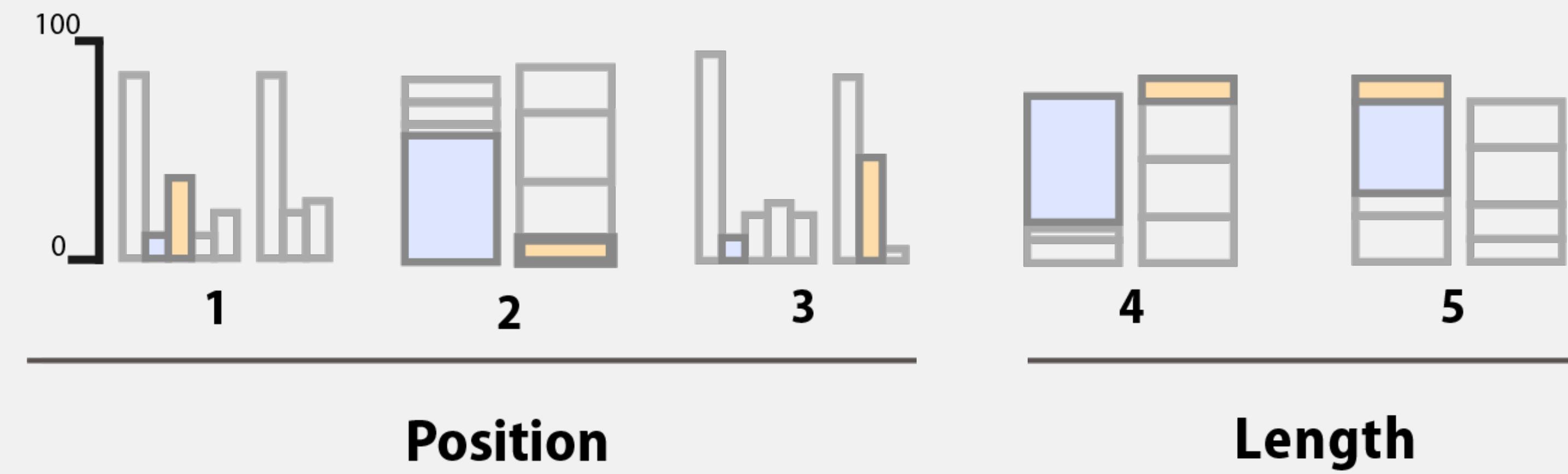
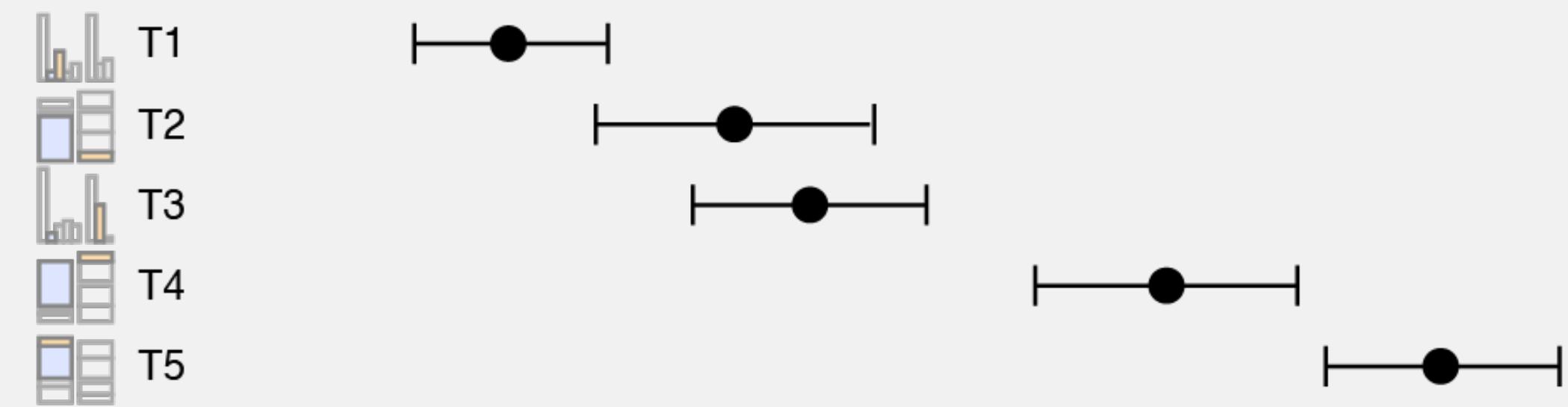
☞ **Zweck der Grafik:** Erleichterung der Entdeckung <> Vermittlung von Informationen

Typologie von Informationsgrafiken

nach Juuso Koponen & Jonatan Hildén, "Data Visualization Handbook" (2020), Seite 25

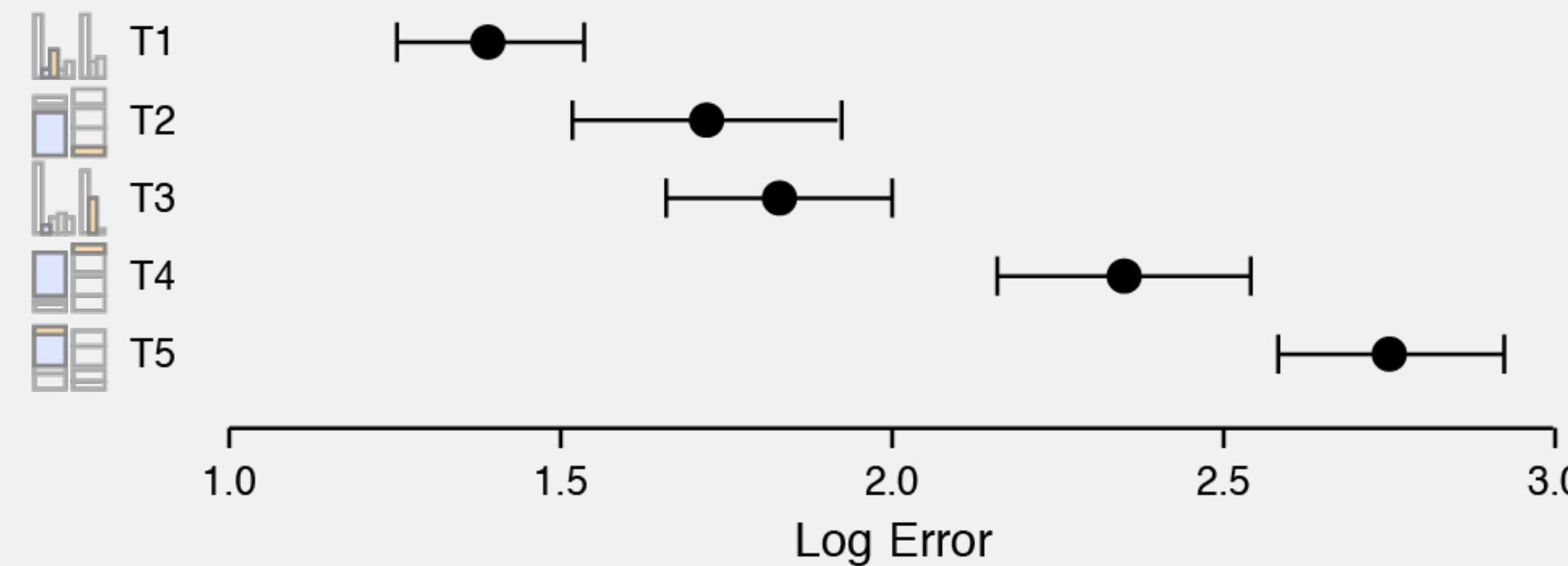


Cleveland & McGill's Results

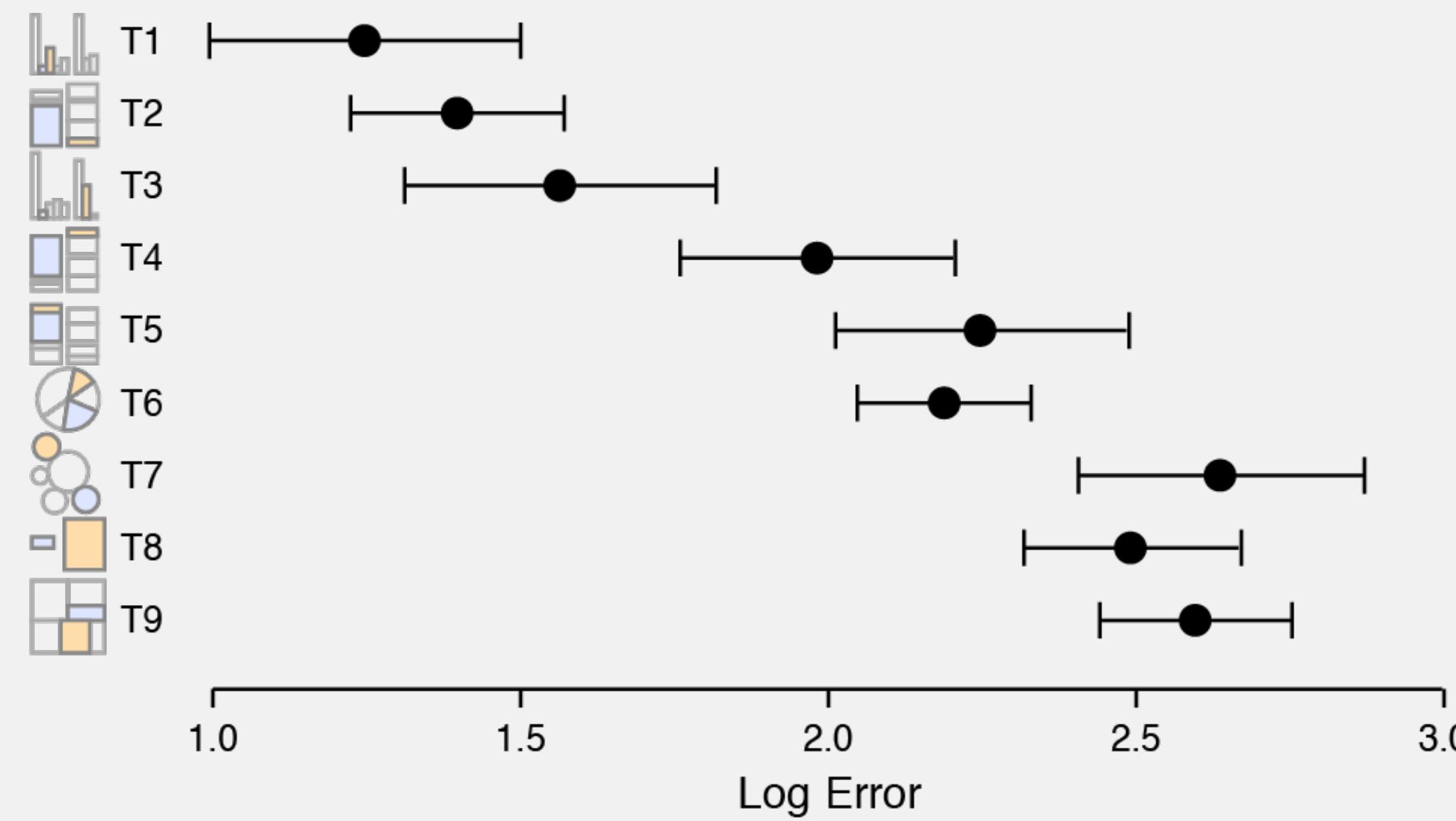


Quelle: Kieran Healy's ["Data Visualization: A Practical Introduction"](#); Ergebnisse basierend auf Heer & Bostock sowie Cleveland & McGill

Cleveland & McGill's Results

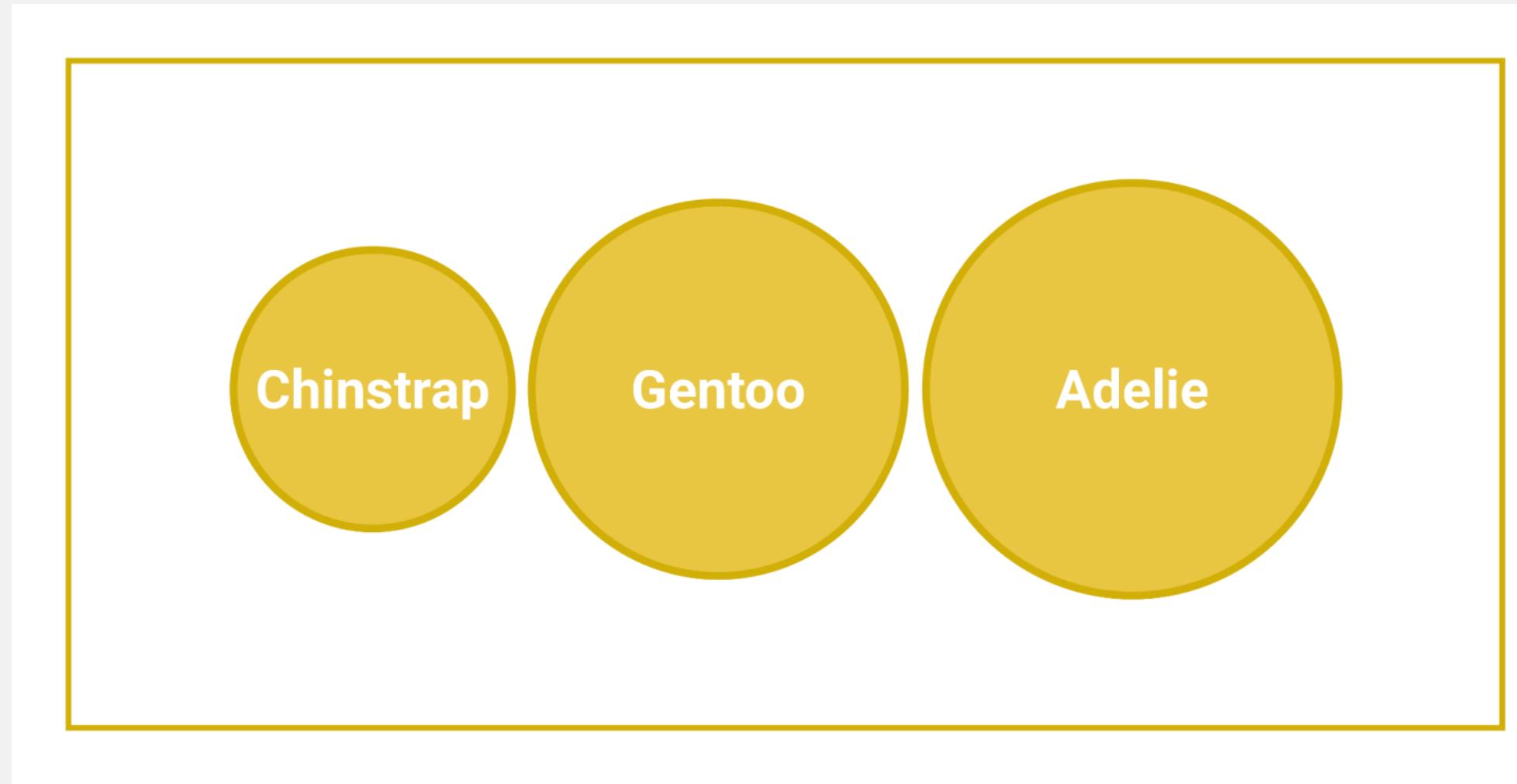


Crowdsourced Results

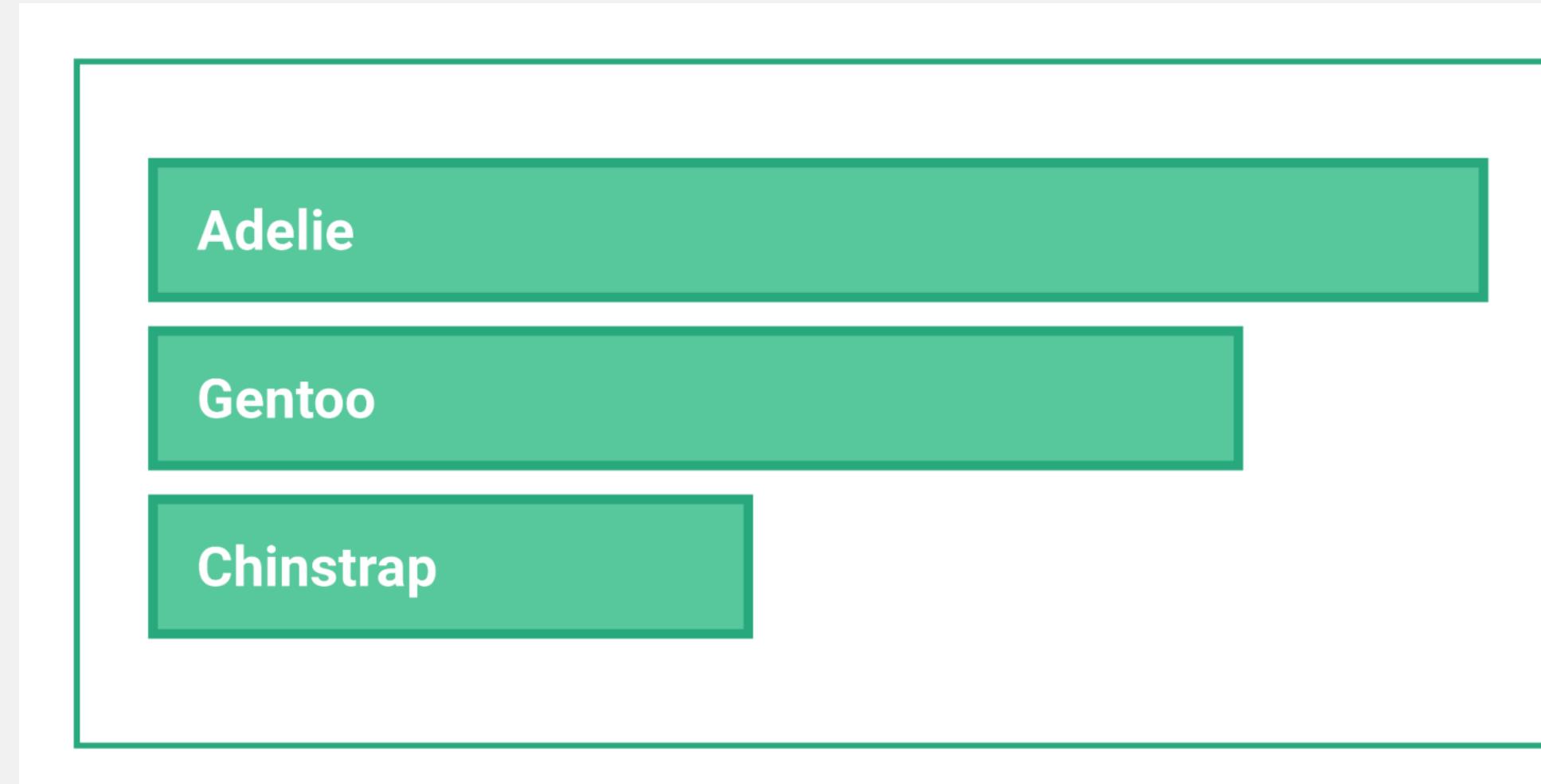
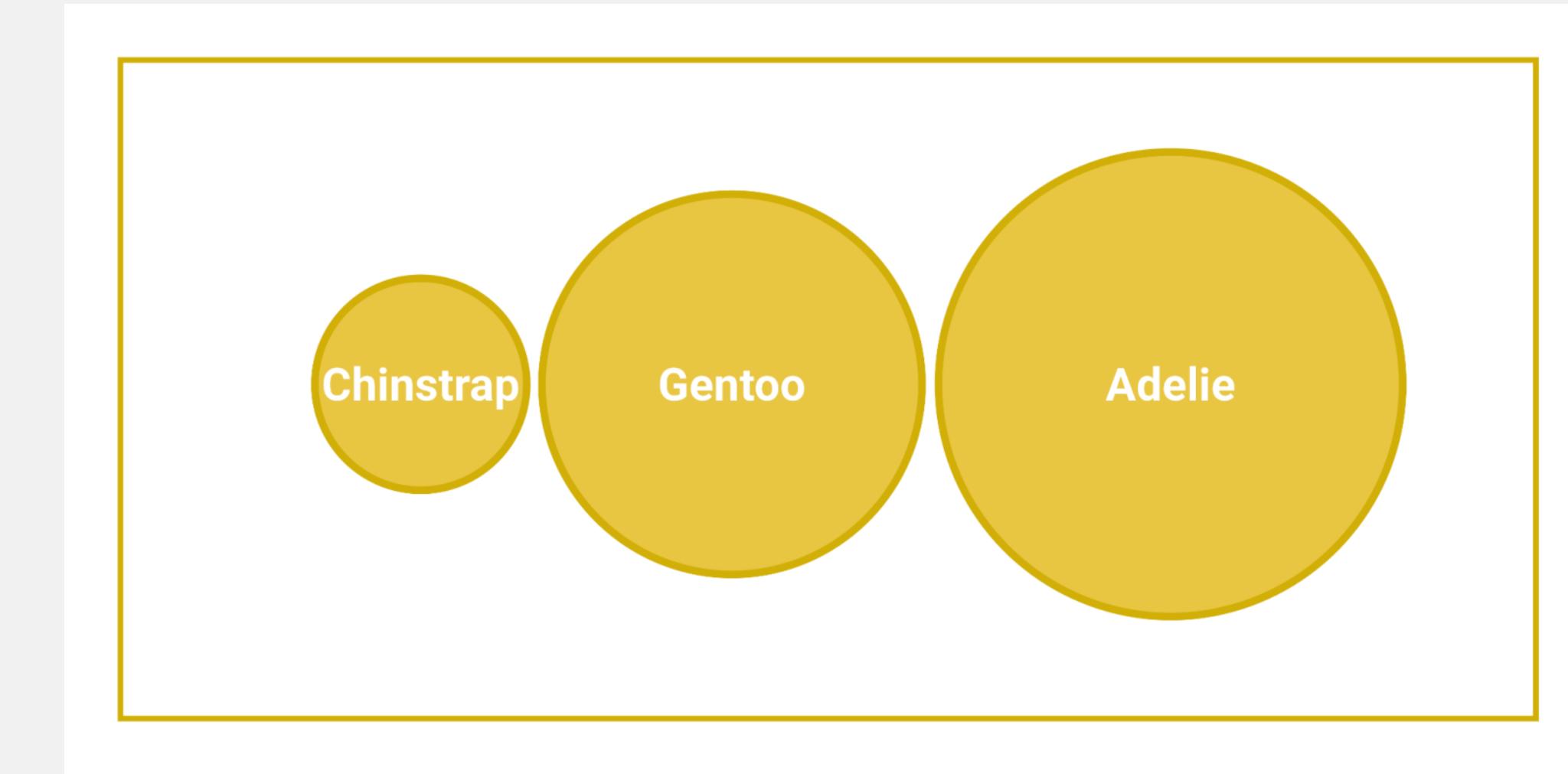


Quelle: Kieran Healy's ["Data Visualization: A Practical Introduction"](#); Ergebnisse basierend auf Heer & Bostock sowie Cleveland & McGill

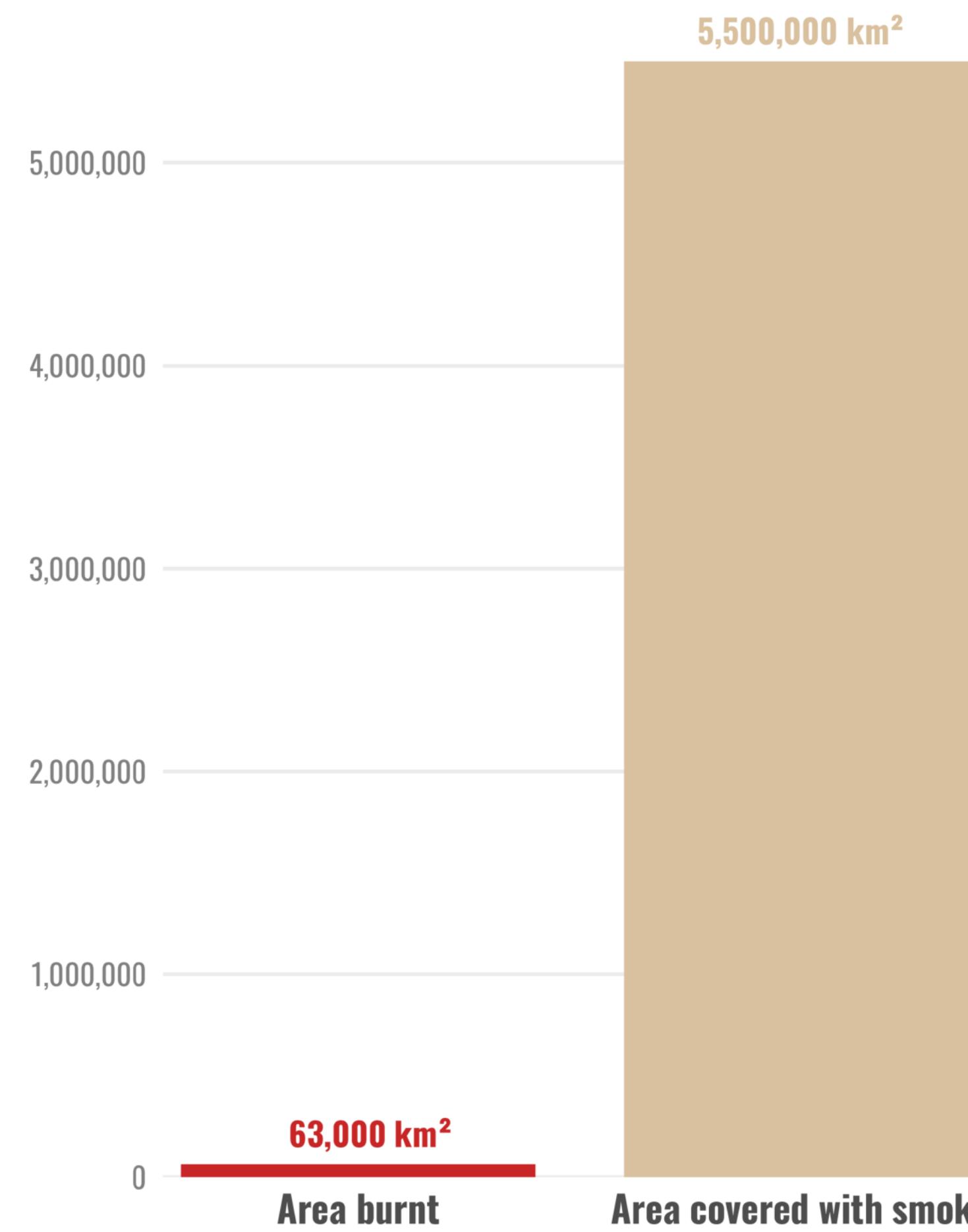
Nutze immer Fläche.



Nutze niemals Radius!



**Burnt land and plume of smoke caused
by the Australian bushfires in 2019/20**
(as of 6th of January 2020)

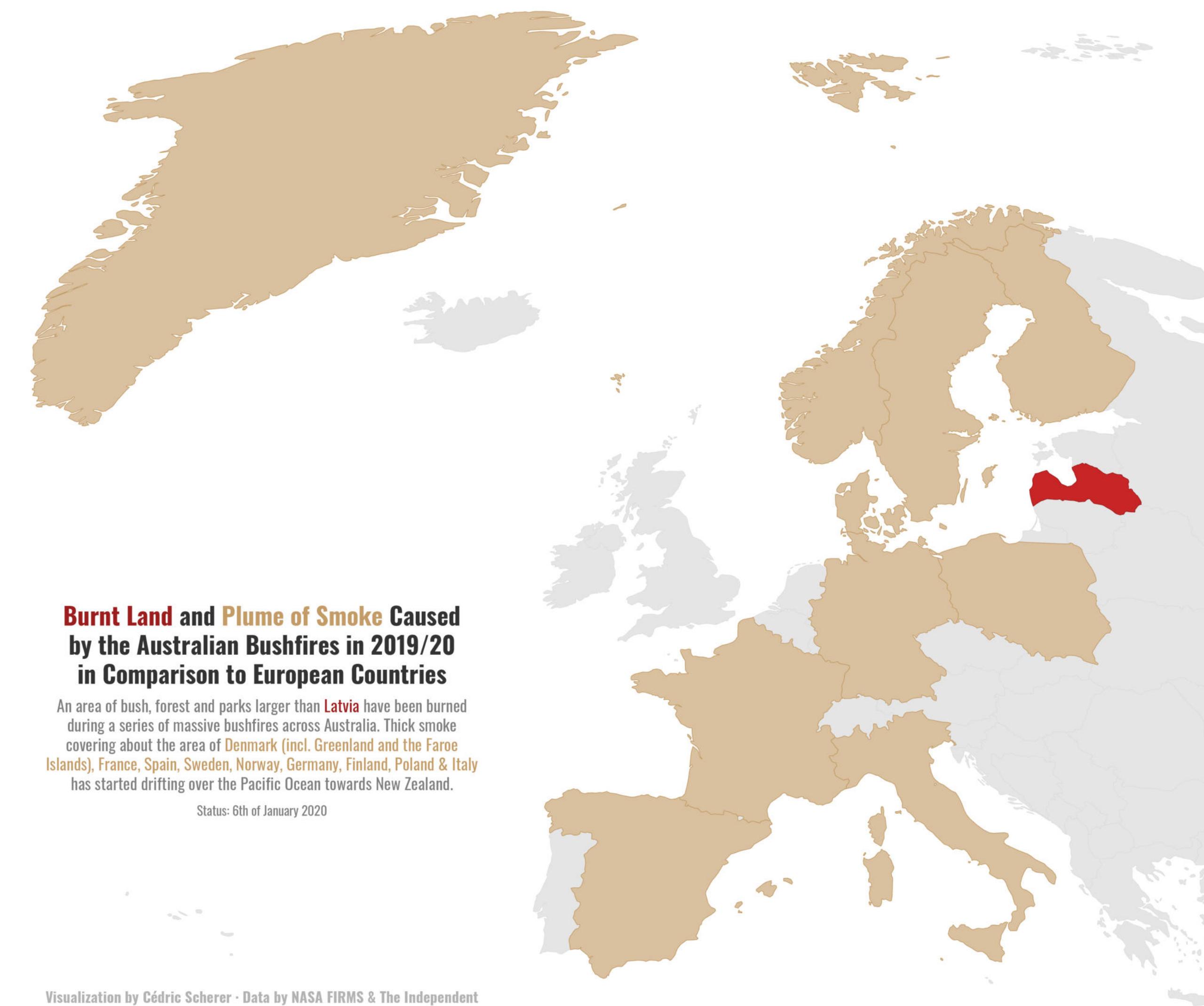


**Burnt Land and Plume of Smoke Caused
by the Australian Bushfires in 2019/20
in Comparison to European Countries**

An area of bush, forest and parks larger than Latvia have been burned during a series of massive bushfires across Australia. Thick smoke covering about the area of Denmark (incl. Greenland and the Faroe Islands), France, Spain, Sweden, Norway, Germany, Finland, Poland & Italy has started drifting over the Pacific Ocean towards New Zealand.

Status: 6th of January 2020

Visualization by Cédric Scherer · Data by NASA FIRMS & The Independent



PERSPECTIVE

Beyond Bar and Line Graphs: Time for a New Data Presentation Paradigm

Tracey L. Weissgerber¹*, Nataša M. Milic^{1,2}, Stacey J. Winham³, Vesna D. Garovic¹

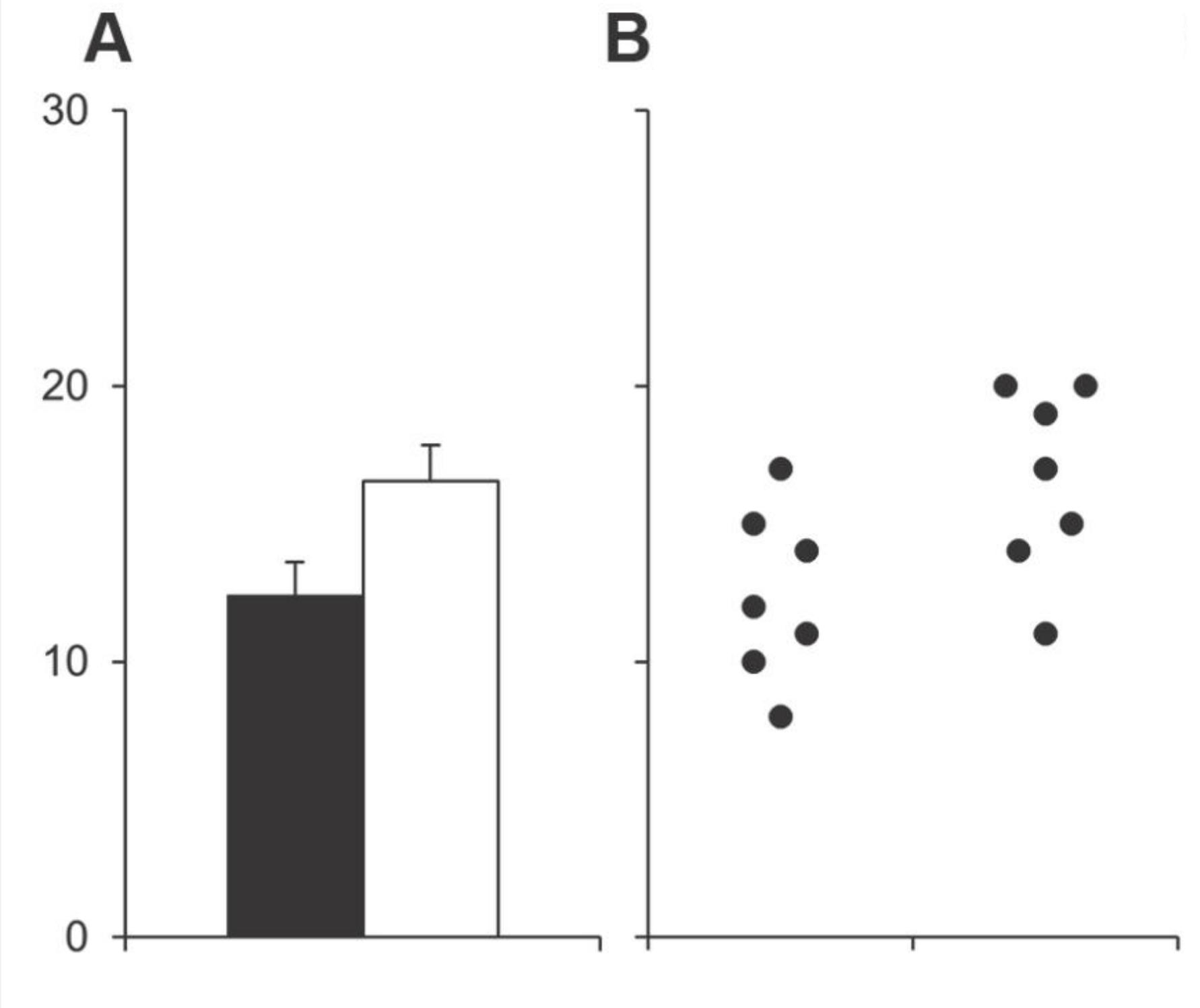
1 Division of Nephrology & Hypertension, Mayo Clinic, Rochester, Minnesota, United States of America,

2 Department of Biostatistics, Medical Faculty, University of Belgrade, Belgrade, Serbia, **3** Division of Biomedical Statistics and Informatics, Mayo Clinic, Rochester, Minnesota, United States of America

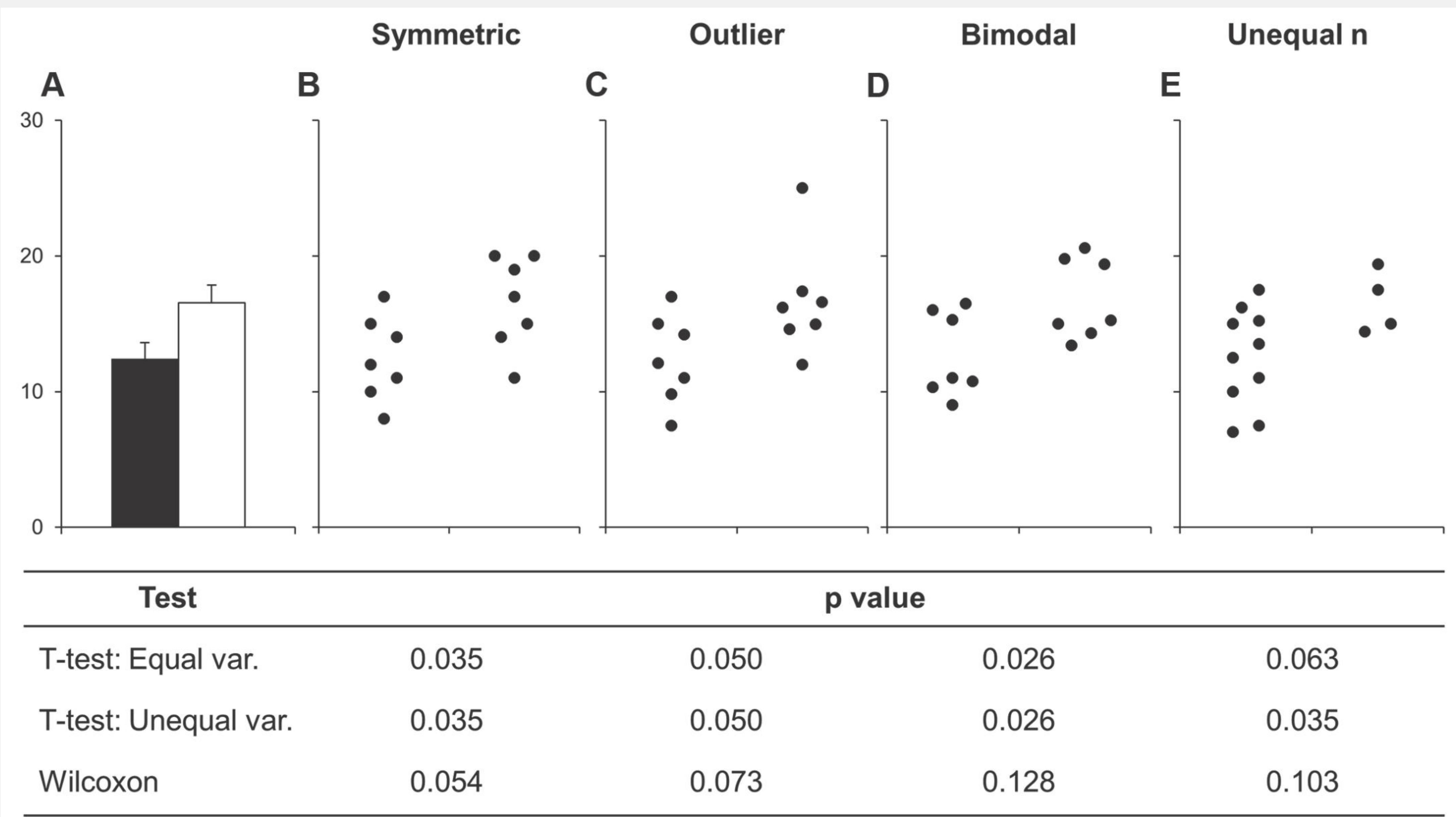
* weissgerber.tracey@mayo.edu

Weissgerber et al. (2015) PLoS Biology

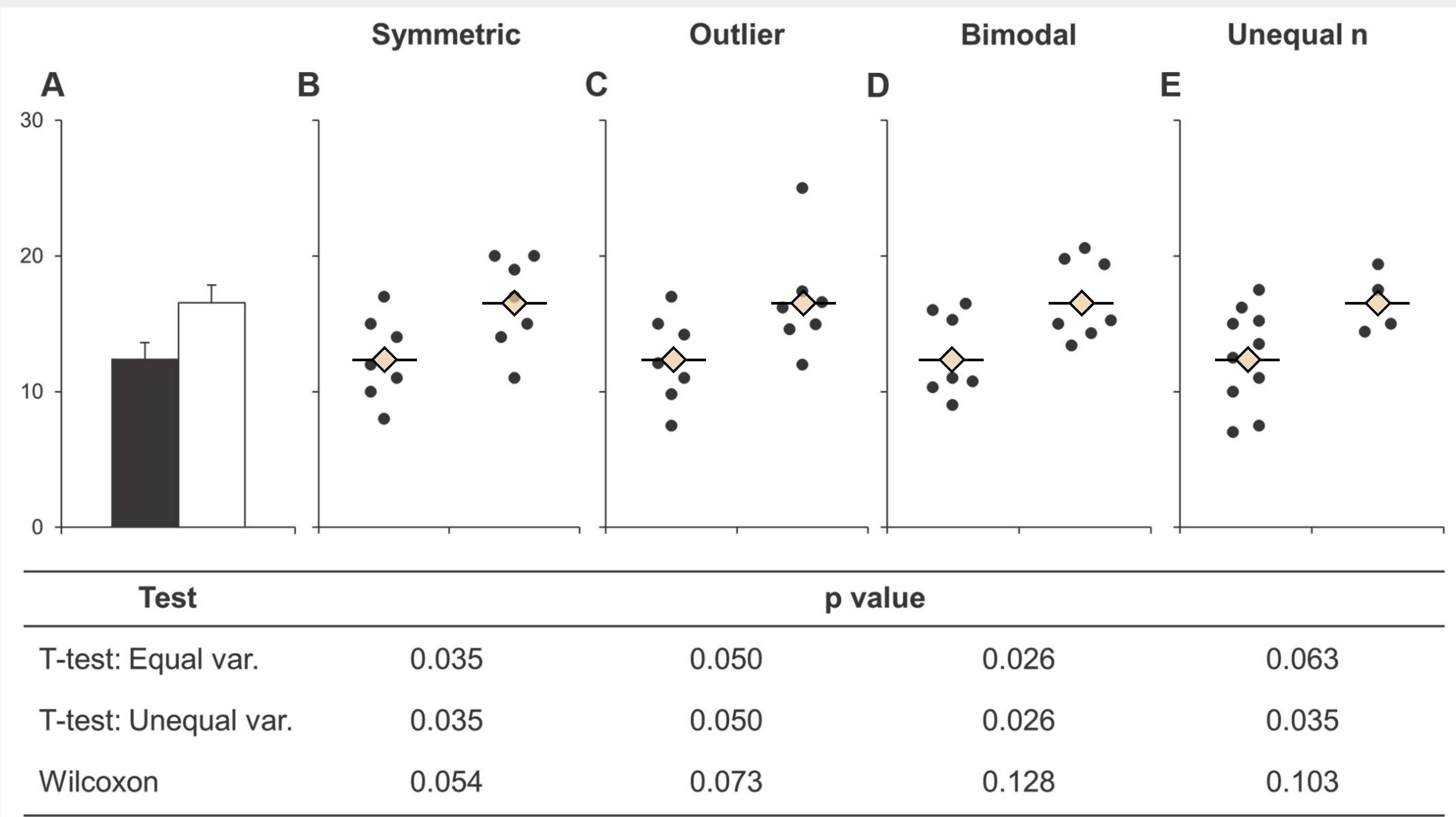
Symmetric



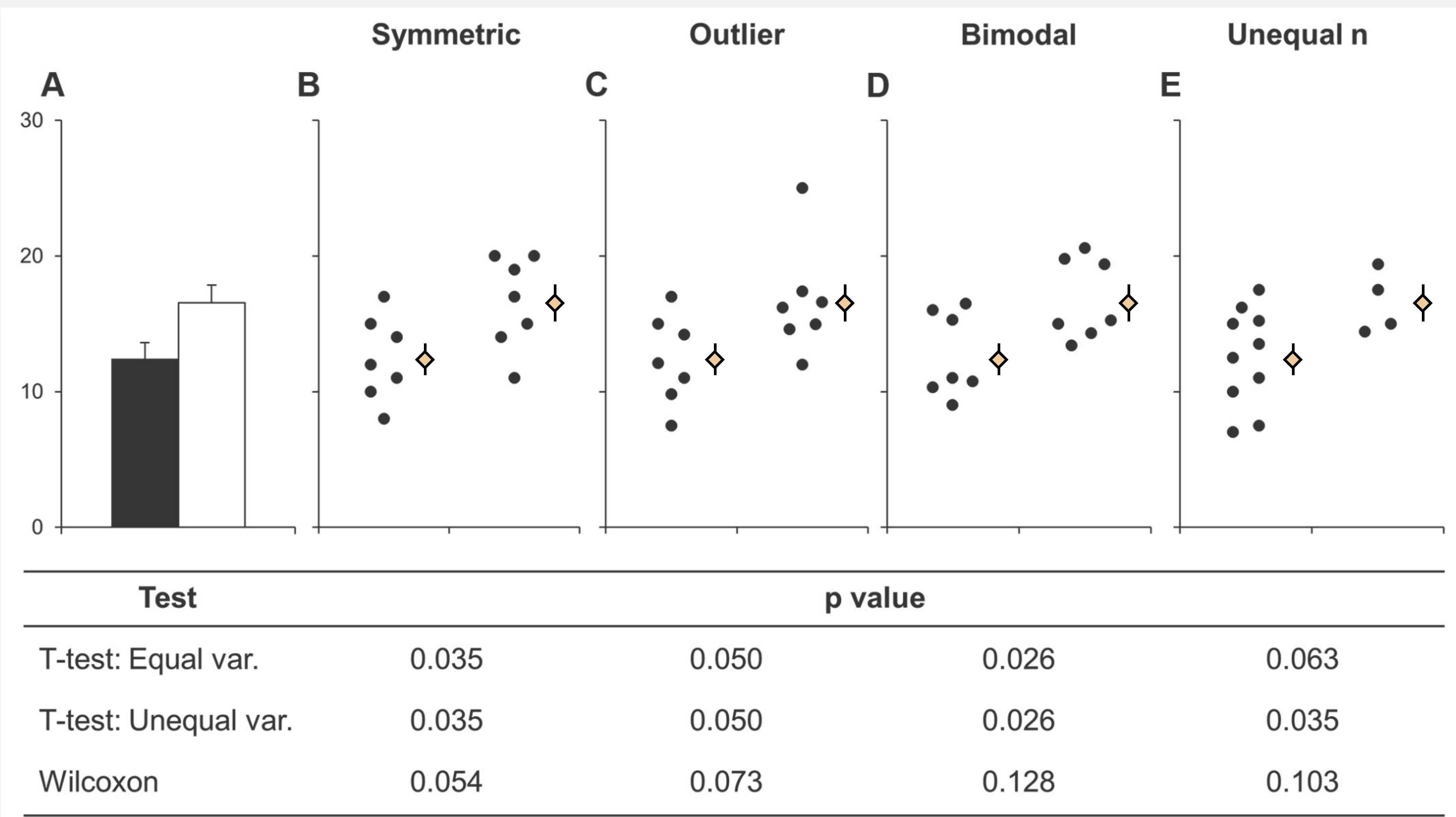
Weissgerber et al. (2015) PLoS Biology



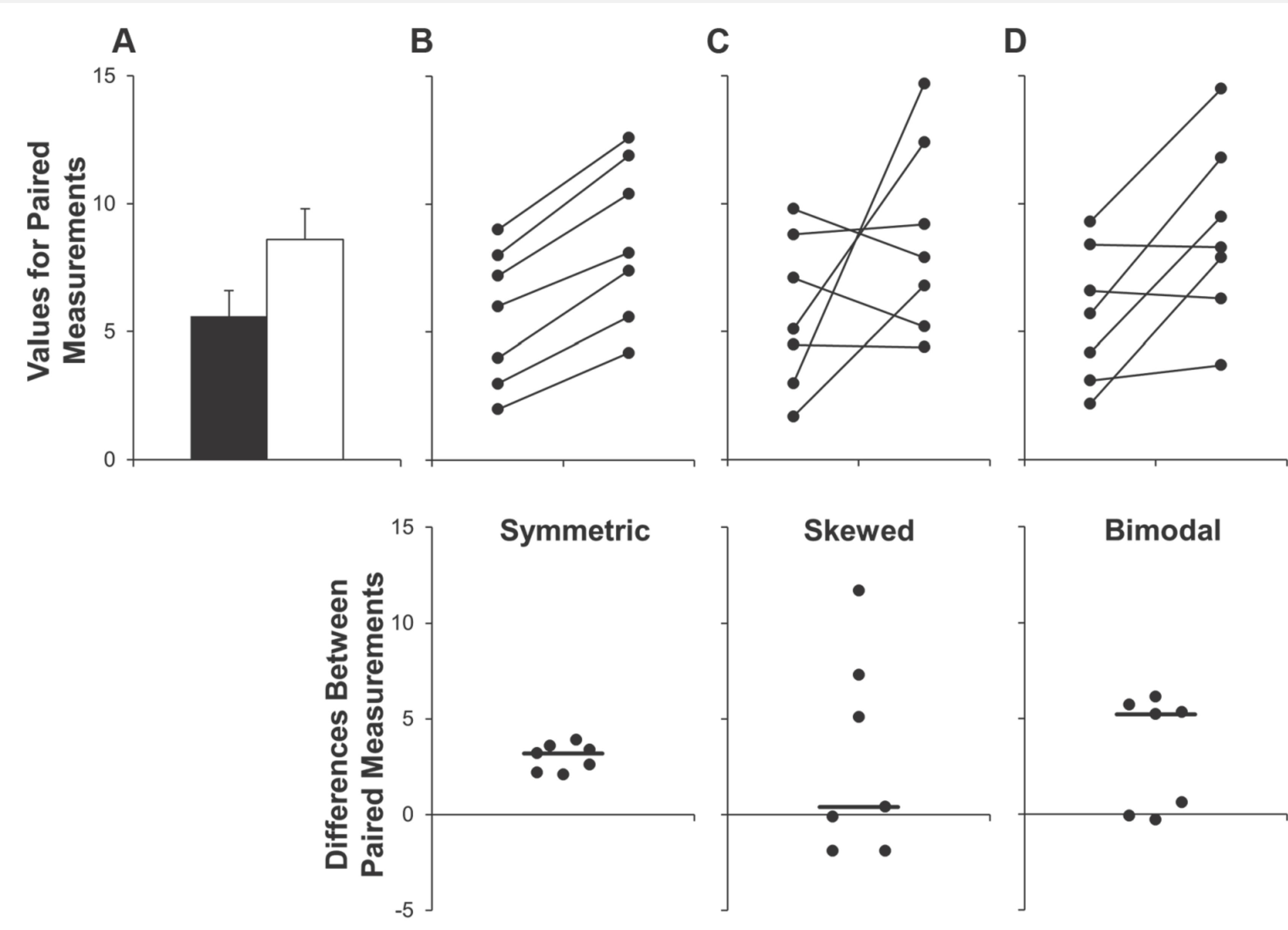
Weissgerber et al. (2015) PLoS Biology



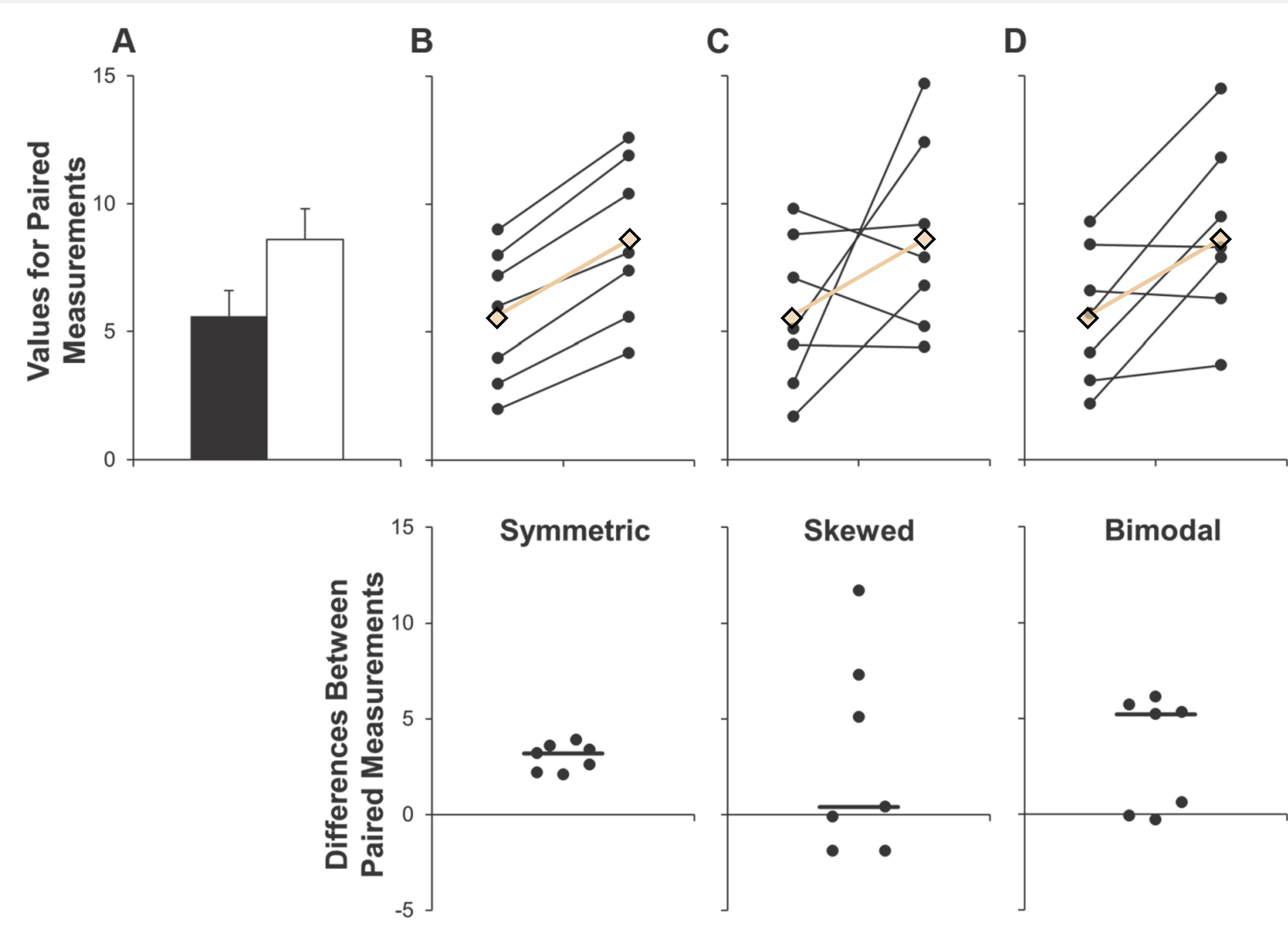
Modified from Weissgerber et al. (2015) PLoS Biology



Modified from Weissgerber et al. (2015) PLoS Biology



Weissgerber et al. (2015) PLoS Biology

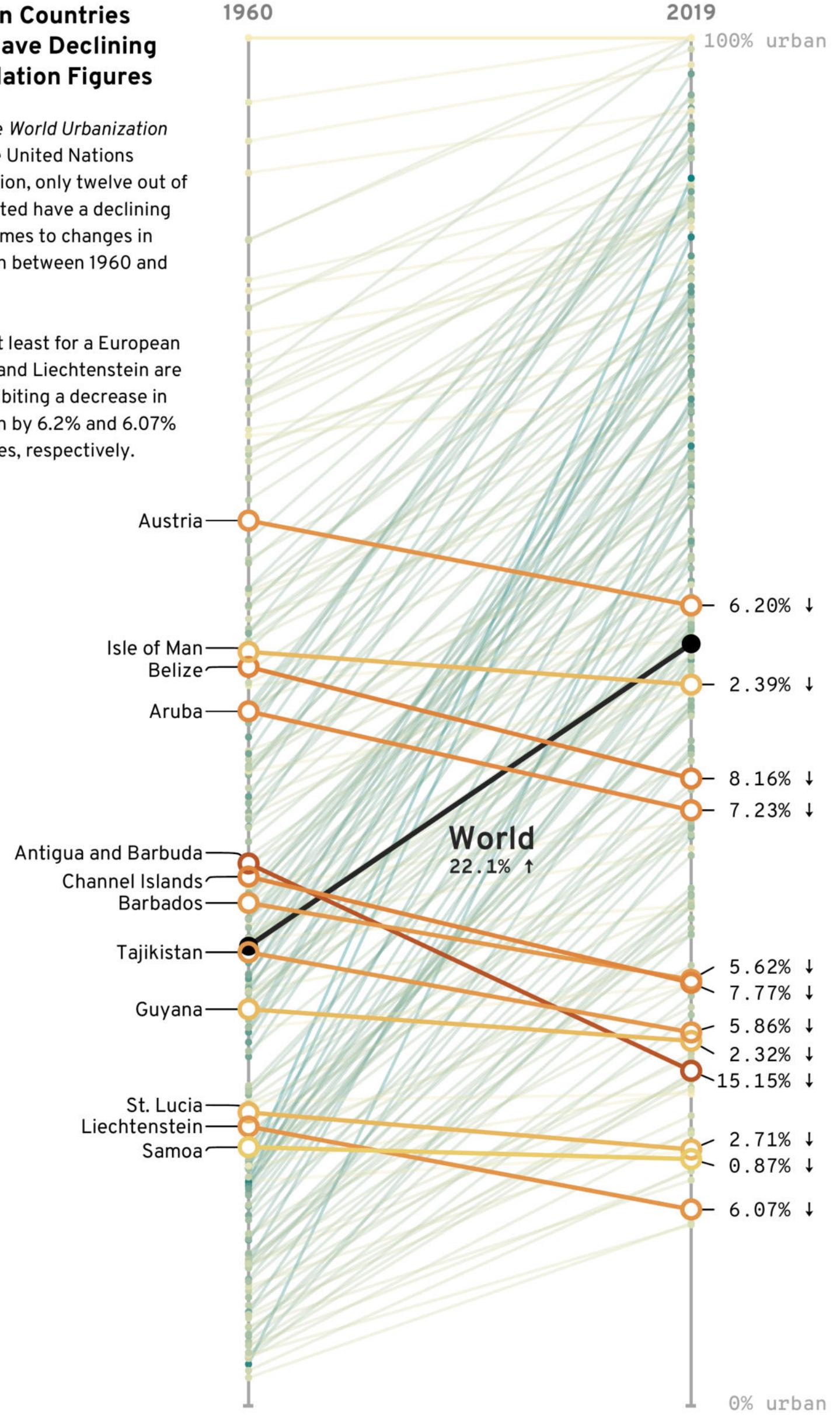


Weissgerber et al. (2015) PLoS Biology

Only a Dozen Countries Worldwide have Declining Urban Population Figures

According to the *World Urbanization Prospects* by the United Nations Population Division, only twelve out of 218 countries listed have a declining trend when it comes to changes in urban population between 1960 and 2019.

Surprisingly—at least for a European citizen—Austria and Liechtenstein are among those exhibiting a decrease in urban population by 6.2% and 6.07% within six decades, respectively.



Visualization by Cédric Scherer | Data: United Nations Population Division. World Urbanization Prospects: 2018 Revision. | #30DayChartChallenge 2021 Day 5: Slope

Not my cup of coffee...

Each dot depicts one coffee bean rated by Coffee Quality Institute's trained reviewers. In addition, the multiple interval stripes show where 25%, 50%, 95%, and 100% of the beans fall along the rating gradient from 0 to 100 points. The rated coffee beans range from 59.8 points (Guatemala) to 89.9 (Ethiopia). Only countries of origin with 25 or more tested beans are shown. The red empty triangle marks the minimum rating, the black filled triangle indicates each country's median score.

Visualization by Cédric Scherer



The coffee bean with the lowest rating has its origin in Guatemala.



One bean from Nicaragua got a bad rating, too.

NICARAGUA

△ 63.1 POINTS



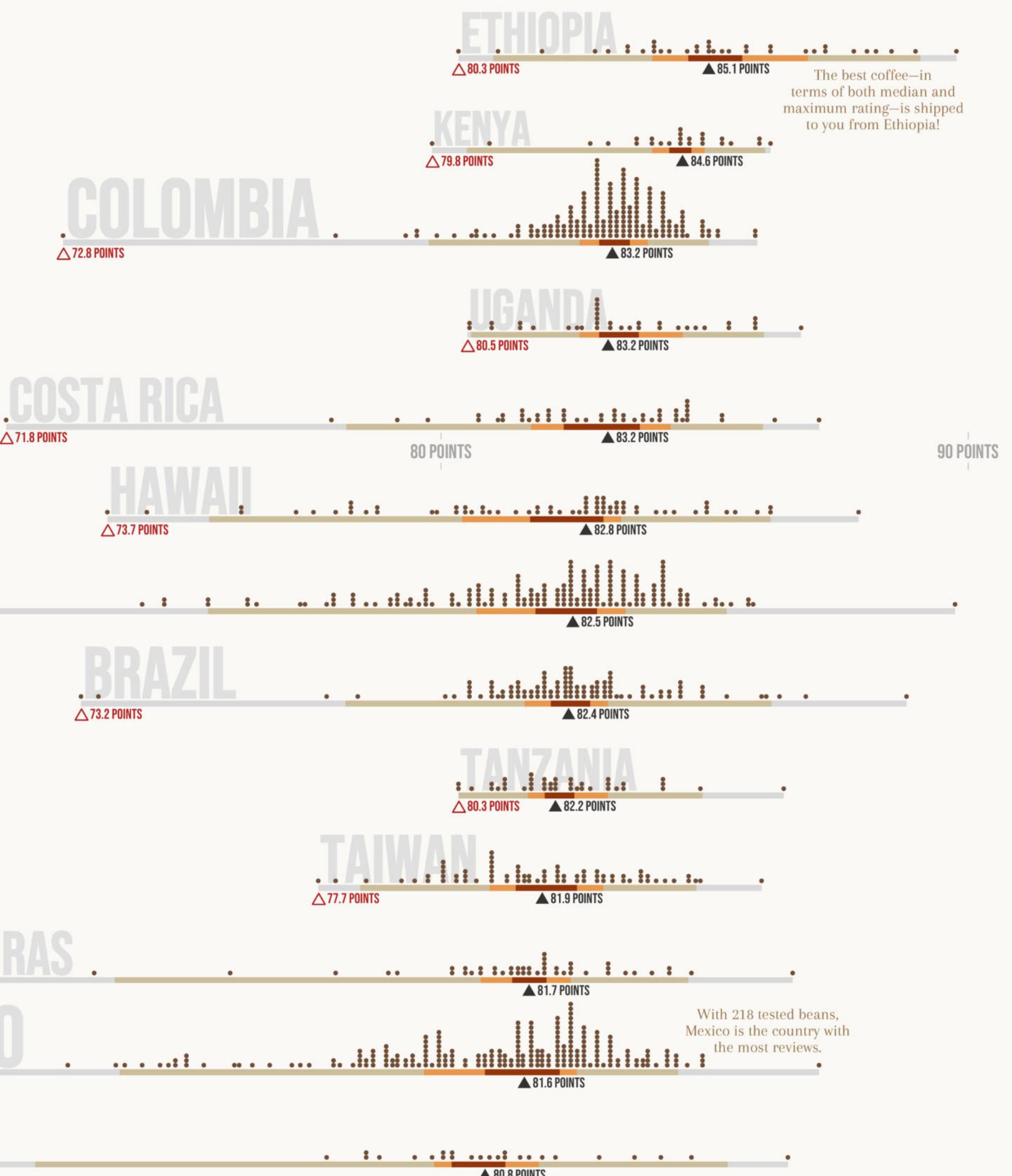
HONDURAS

△ 69.2 POINTS



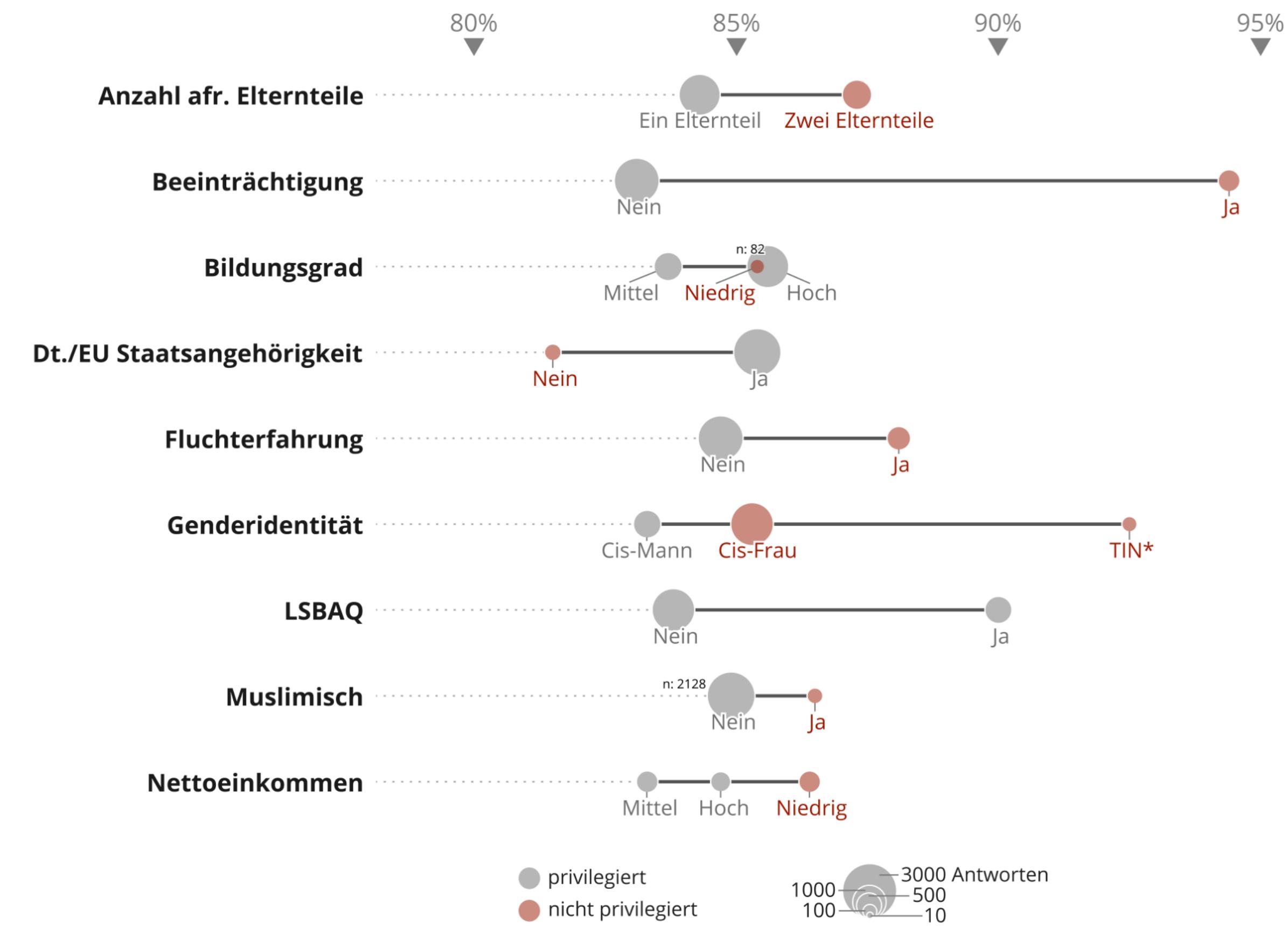
MEXICO

△ 68.3 POINTS



“Not my cup of coffee”, #TidyTuesday Contribution

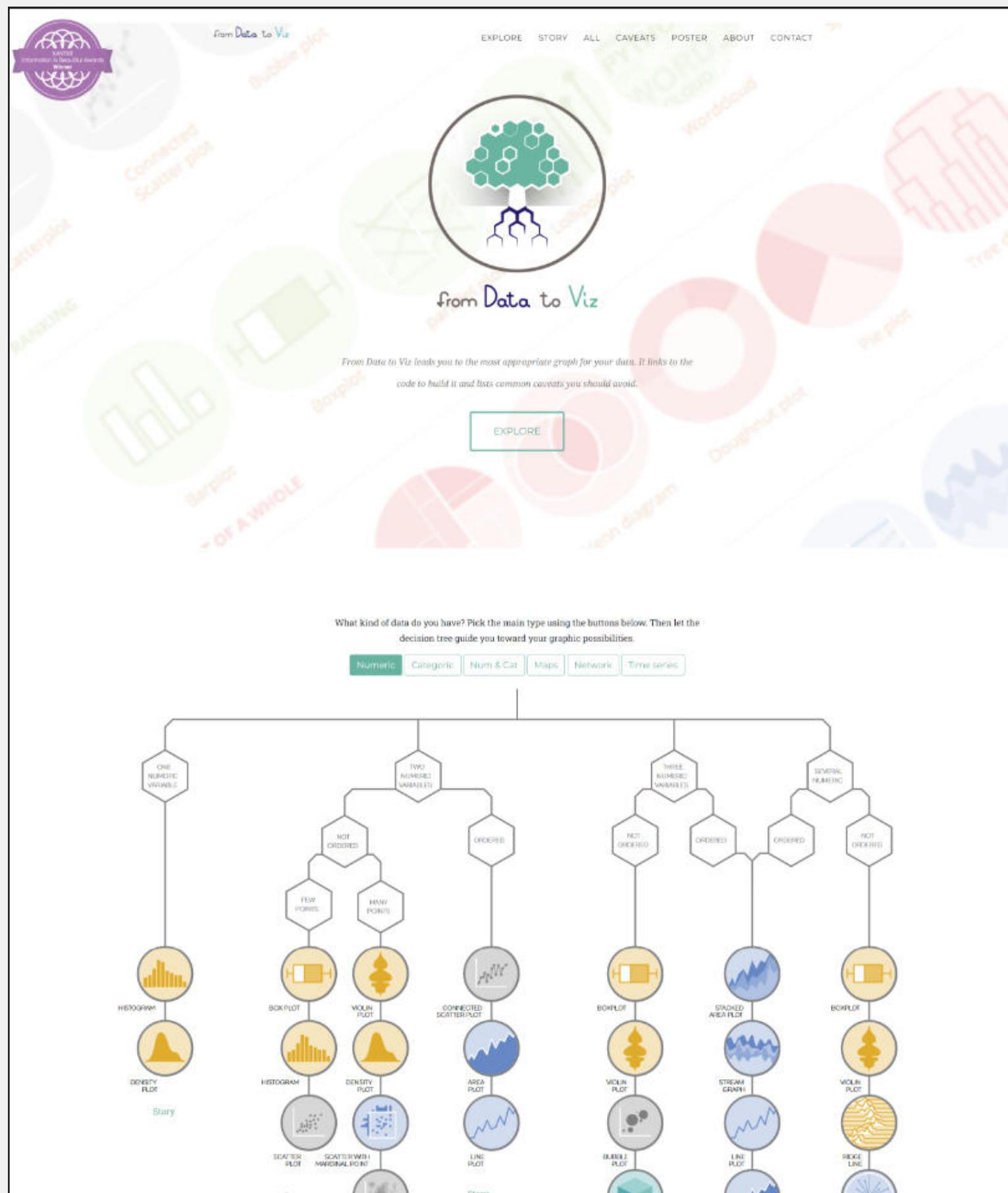
Häufigkeit von Diskriminierungserfahrungen entlang ausgewählter Vielfaltsdimensionen im Lebensbereich „Medien und Internet“



Lesebeispiel: LSBAQ-Befragte des Afrozensus geben im Vergleich mit heterosexuellen Afrozensus-Befragten häufiger an, im Lebensbereich „Medien und Internet“ in den letzten zwei Jahren Diskriminierung erlebt zu haben.

Quelle: Abb. 46 in Aikins, M A; Bremberger, T; Aikins, J K; Gyamerah, D; Yıldırım-Caliman, D (2021): Afrozensus 2020 | Datenteam: Reiber, L; Vivanco, J | Design: Scherer, C
Lizenz: CC-BY-NC by EOTO & CFE | afrozensus.de

Abb. 46 „Afrozensus 2020“ von Citizens For Europe & EOTO e.V.



data-to-viz.com

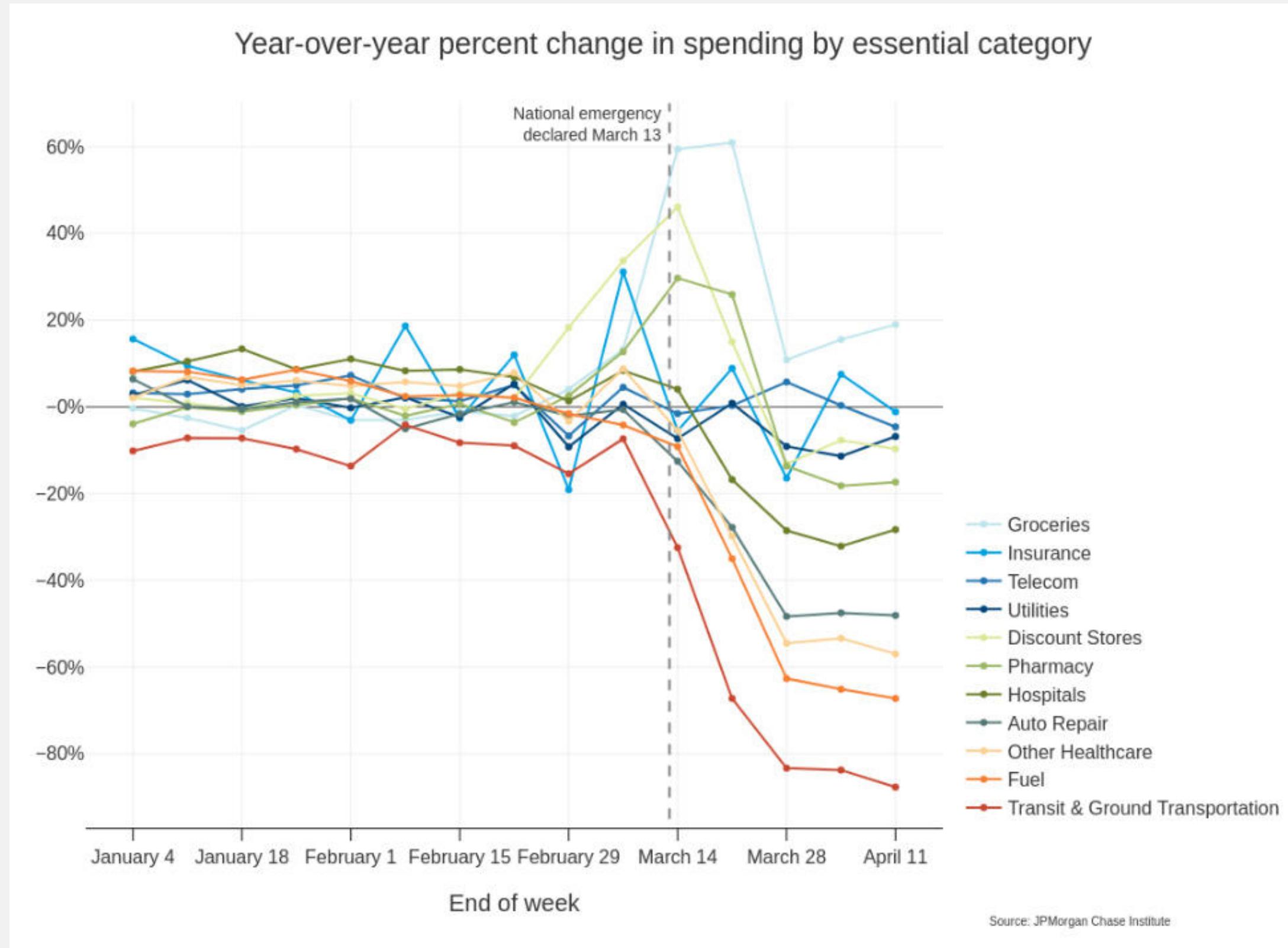


datavizproject.com

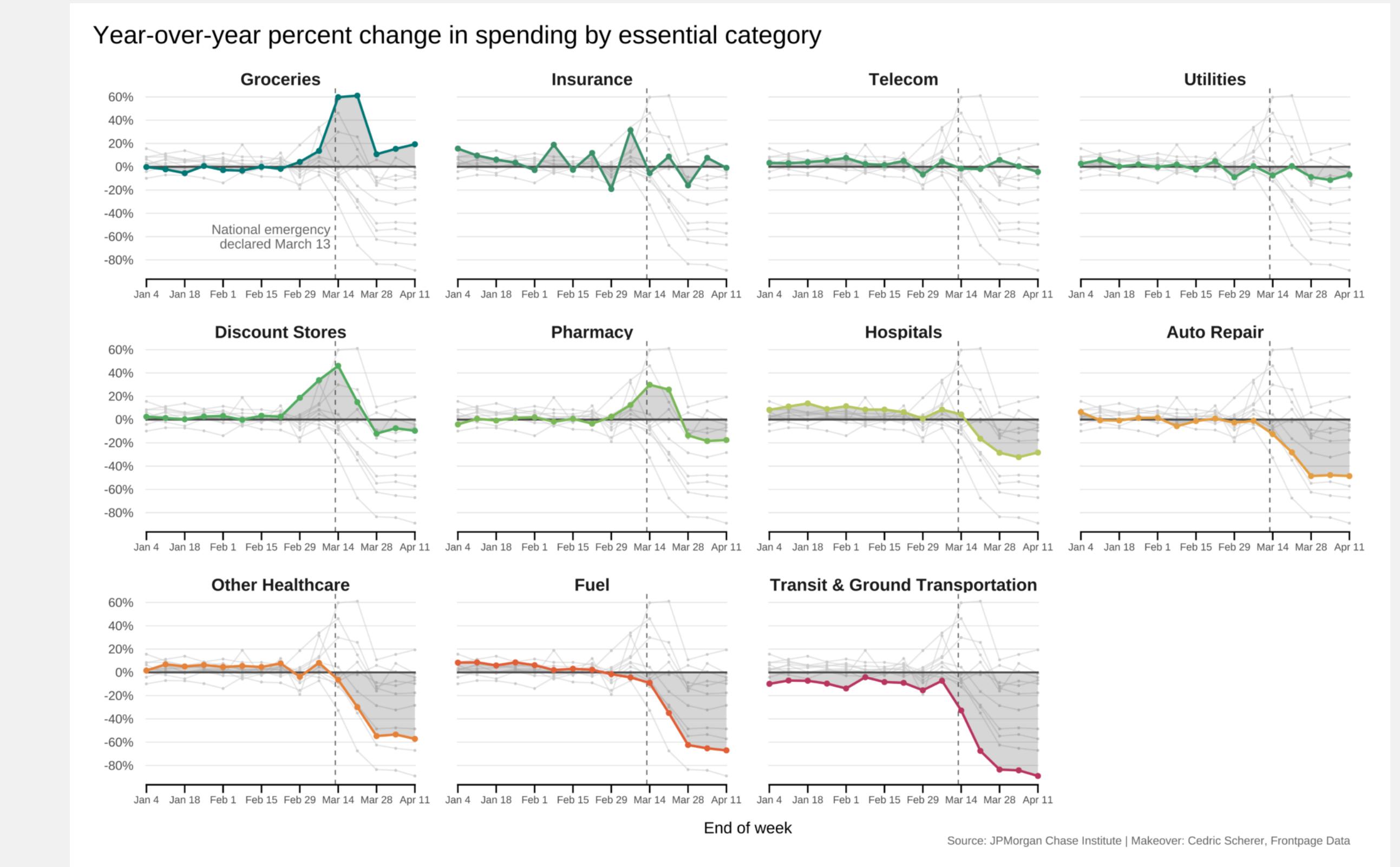


visualizationuniverse.com

Die Wirkung von “Small Multiples”



Originalgrafik vom JPMorgan Chase Institut



Umgestaltung mit “Small Multiples”

GRAPHIC SCIENCE

Text by Clara Moskowitz | Graphic by Cédric Scherer and Georgios Karamanis

Escalating Drought

Climate change is intensifying periods of extreme dryness, particularly in the U.S. West

For more than 20 years the National Drought Mitigation Center (NDMC) has been monitoring dozens of indices of drought around the country, including satellite measurements of evaporation and color in vegetation, soil-moisture sensors, rainfall estimates, and river and streamflow levels. Although the agency's weekly assessments have identified periods of exceptional drought before, lately dryness has been ramping up. "The changing climate is definitely contributing to more natural disasters, drought being one of them," says Brian Fuchs, a climatologist who oversees the weekly report at the NDMC. "We're seeing more frequent and high-intensity episodes. This year some of these areas in the West have been in drought more than they have been without drought."



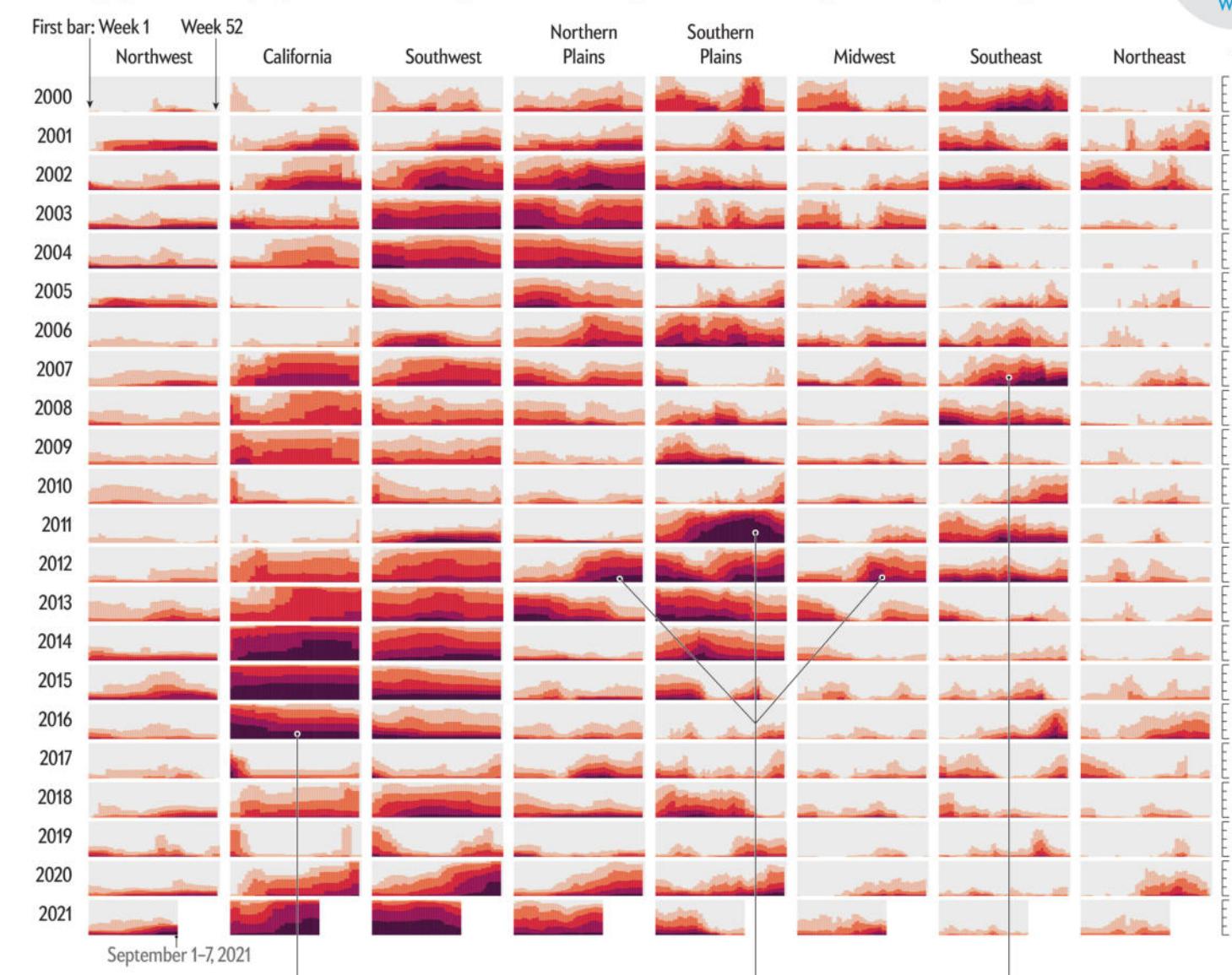
Percent of Region That Experienced Drought Each Week

↓ 100%

0%

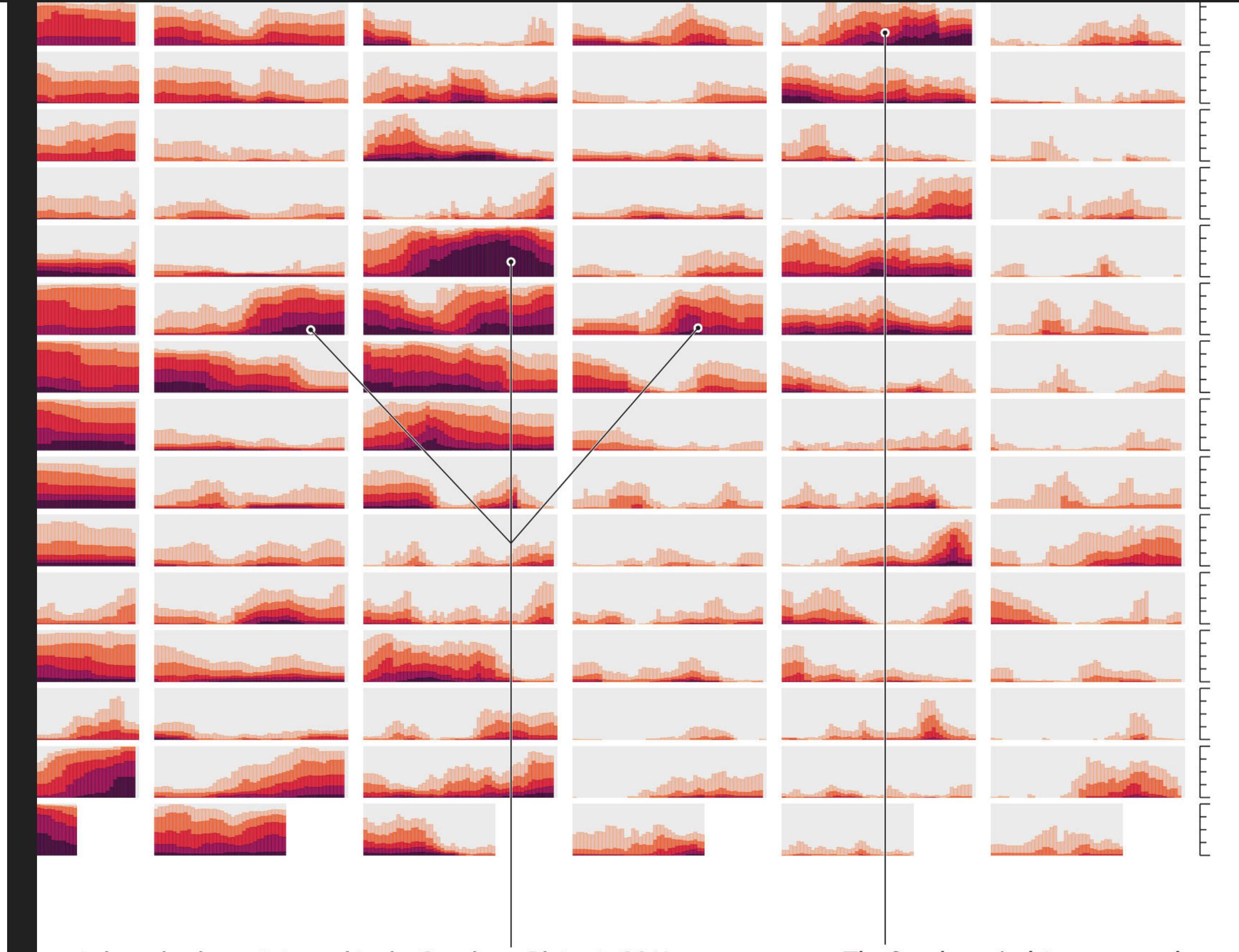
Drought Extent and Intensity by Region over Time

Category: Abnormally Dry Moderate Drought Severe Drought Extreme Drought Exceptional Drought



Source: U.S. Drought Monitor; jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, U.S. Department of Agriculture, and National Oceanic and Atmospheric Administration (data)

74 Scientific American, November 2021



A drought that originated in the Southern Plains in 2011 eventually spread to the Midwest and Northern Plains when the moisture coming in from the Gulf of Mexico was absorbed by the parched South before it could reach the North.

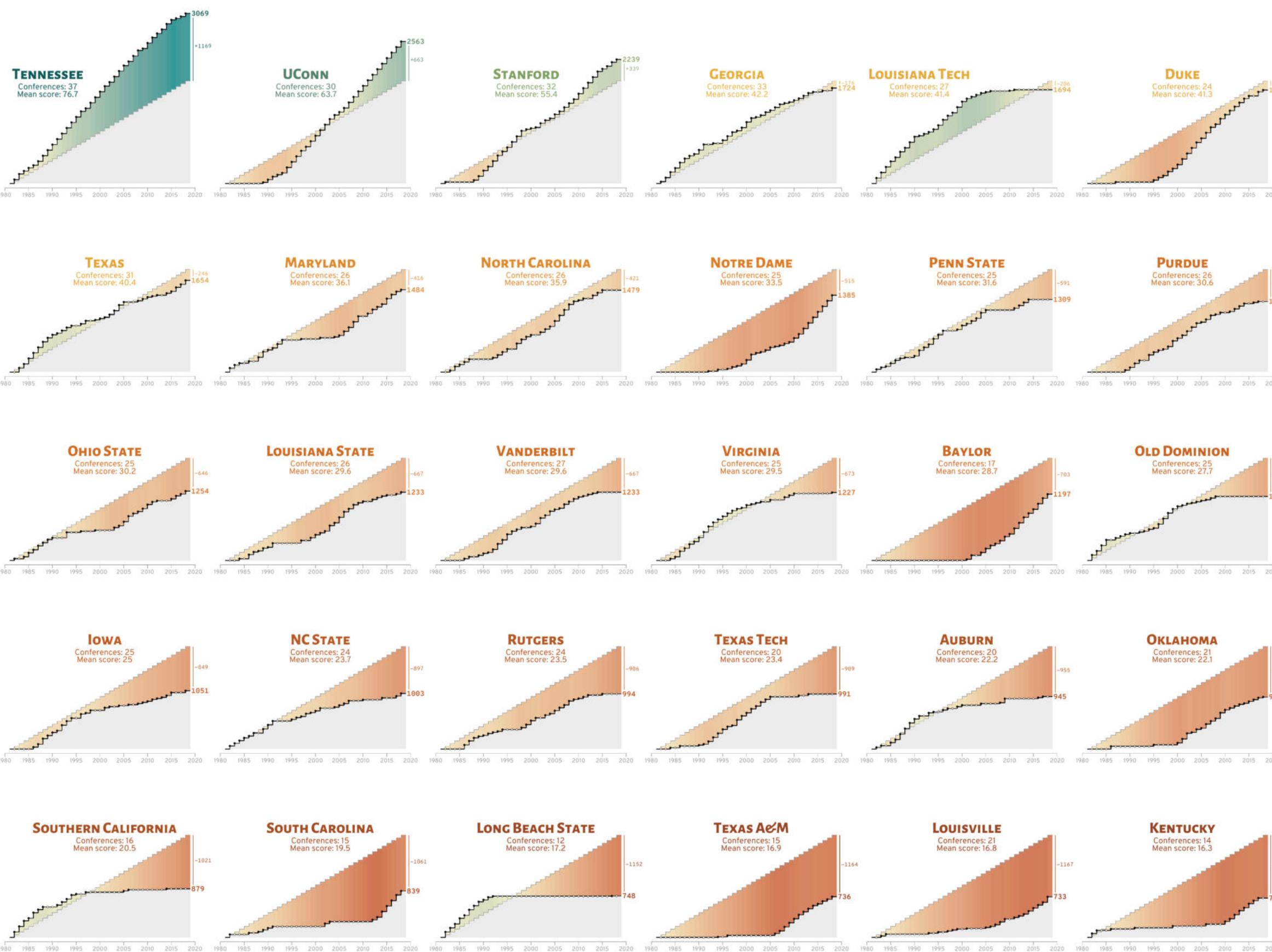
The Southeast's driest year to date was 2007, when only 31.85 inches of rain fell in Atlanta, 62 percent of its average yearly rainfall.

"Escalating Drought", zusammen mit Georgios Karamanis für den Scientific American, Ausgabe Nov 2021

— THE RISE & FALL OF WOMEN'S COLLEGE BASKETBALL DYNASTIES —

A number of teams that were the titans of the early NCAA women's basketball tournament have struggled in recent decades. And in their place, a new ruling class of schools has emerged to become the defining programs of the modern age. FiveThirtyEight estimated the team strength over time based on NCAA Tournament seeds as a proxy in the absence of game-level data. To measure this, FiveThirtyEight awarded "seed points" in proportion to a given seed number's expected wins in the tournament, calibrated to a 100-point scale where the No. 1 seed gets 100 points, No. 2 gets 70 points, and so forth.

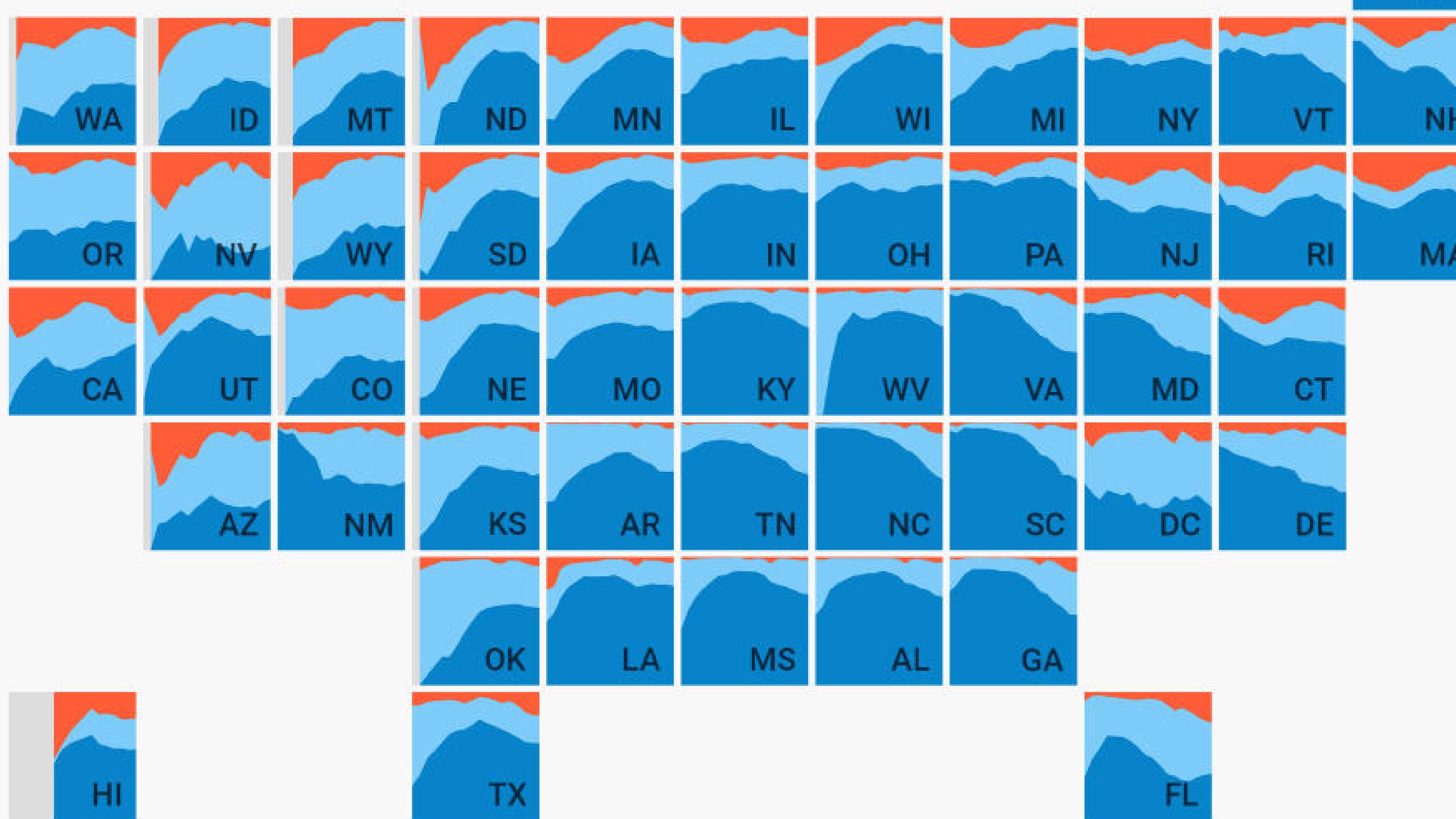
The visualization shows the cumulative sum of awarded seed points on a 100-point scale from the very first women's NCAA basketball tournaments in 1982 until 2018 in comparison to a hypothetical team that participated in all of the 37 conferences and gained half of the points each time (grey line). The curves highlight the fall of yesterday's women's basketball powerhouses such as **Louisiana Tech**, **Long Beach State**, **Southern California**, and **Old Dominion** that have been very good throughout the history of the women's tournament but have experienced big drop-offs in seed points over the last years. At the same time, schools such as **UConn**, **Stanford**, **Notre Dame**, **Baylor**, and **Duke** started slow but picked up steam into the present day. Some teams, such as **Tennessee**, have been relatively consistent throughout the NCAA era gathering always more seed points than an average team. Shown are the top 30 college teams that participated in at least ten conferences between 1982 and 2018, sorted by the cumulative sum of seed points.



VISUALIZATION BY CÉDRIC SCHERER · DATA BY FIVETHIRTYEIGHT

“The Rise and Fall of Women’s College Basketball Dynasties”, #TidyTuesday Contribution

Where are Americans born?



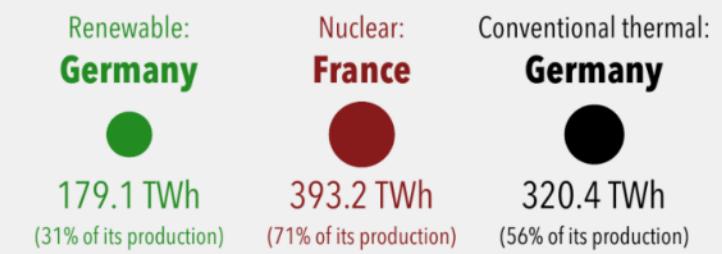
1POINT21
INTERACTIVE

source: Steven Ruggles, Sarah Flood, Sophia Foster, Ronald Goeken, Jose Pacas, Megan Schouweiler and Matthew Sobek.
IPUMS USA: Version 11.0 [dataset]. Minneapolis, MN: IPUMS, 2021. <https://doi.org/10.18128/D010.V11.0>

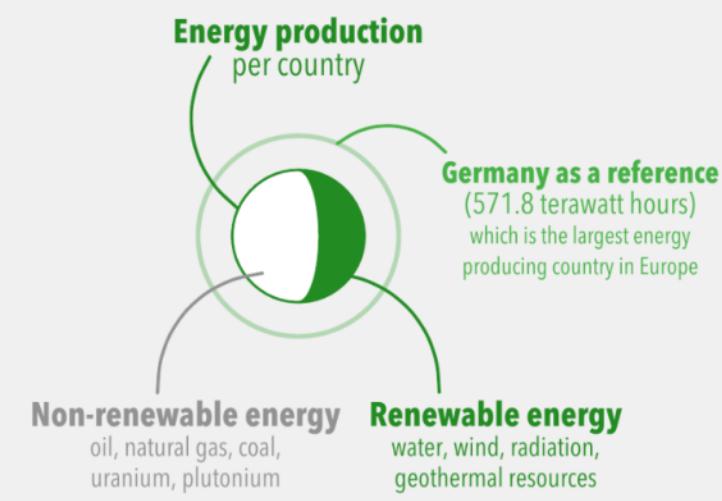
[“Where are Americans born?” von @ErinDataViz](#)

How European countries generated electricity in 2018

Germany is the largest energy producing country in Europe. It generates the most renewable and conventional thermal energy, representing 31% and 56% of its overall production respectively. **France** is the second largest energy European producer and by far the largest nuclear energy provider: 71% of its production is based on nuclear fission to generate heat.

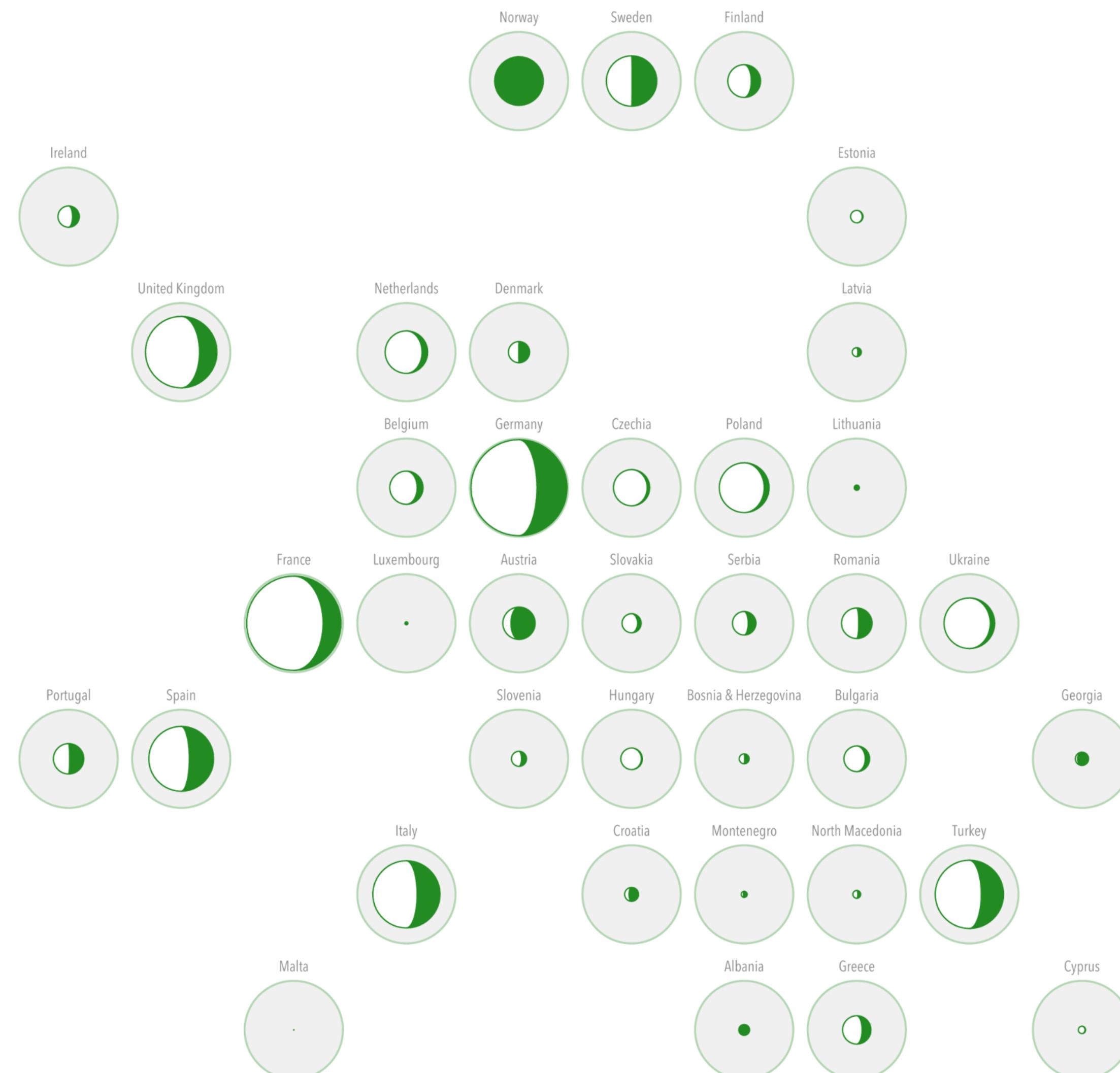


Renewable energy is energy that comes from resources that are naturally replenished such as sunlight, wind, water, and geothermal heat. Unlike fossil fuels, such as oil, natural gas and coal, or nuclear power sources such as uranium and plutonium, renewable energy regenerates naturally in a short period of time.

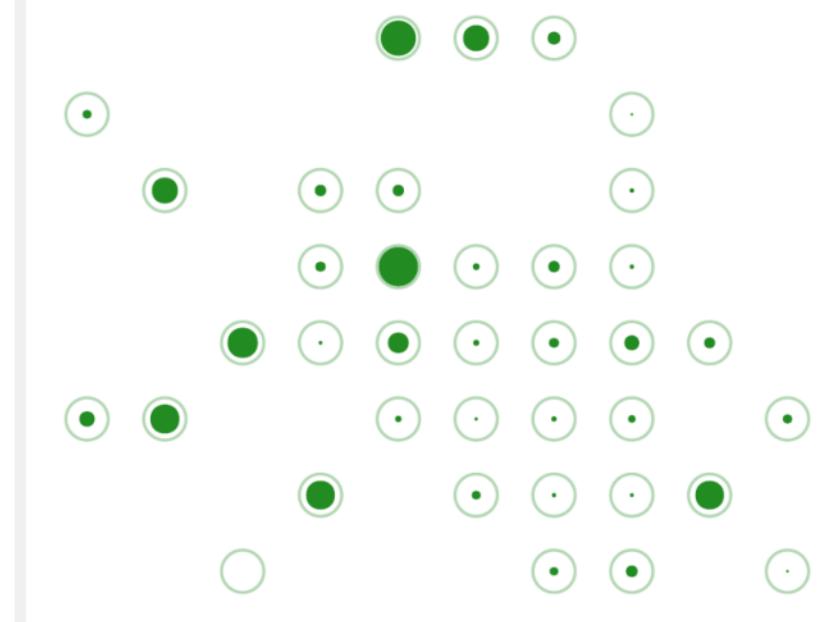


Norway had an electricity production almost entirely made up of renewable energy (98%). This makes Norway the second largest producer of this energy type in Europe. Interestingly, most of the renewable energy is produced by hydro power that take up 95% and only 3% by wind. In contrast, twelve European countries were reported to produce less than 20% of their energy with renewable resources: **Malta** (0%), **Hungary** (5%), **Estonia** (6%), **Czechia** (7%), **Cyprus** (9%), **Ukraine** (9%), **Poland** (10%), **Netherlands** (13%), **Bulgaria** (17%), **Belgium** (18%), **Slovakia** (19%), and **France** (19%).

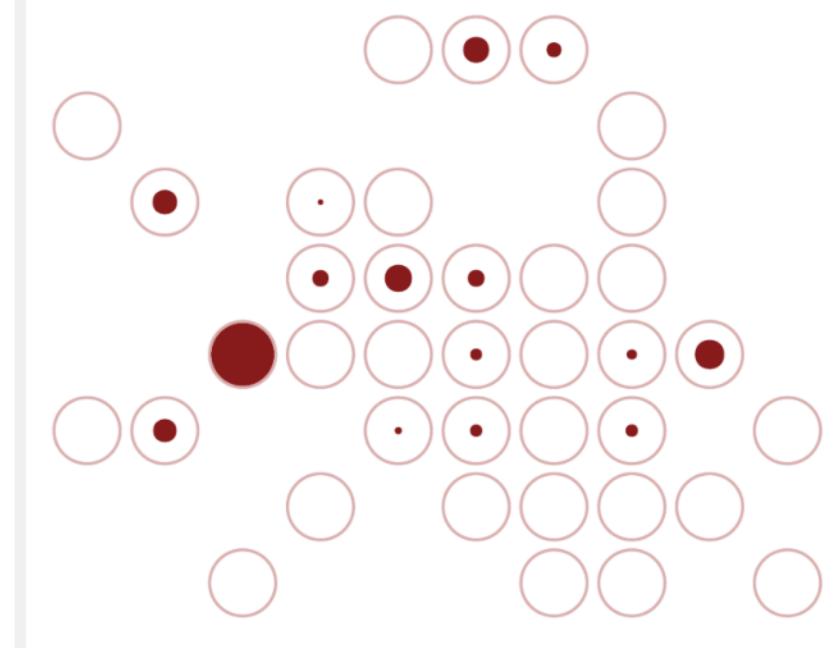
Note: Energy production is mapped to the area of the circles.
Visualization by Cédric Scherer • Data by Eurostat



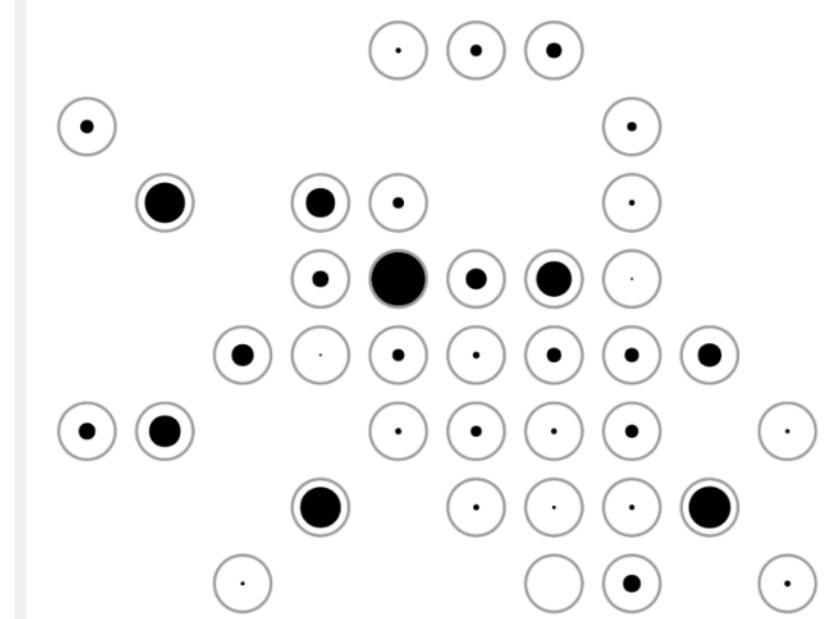
Renewable energy



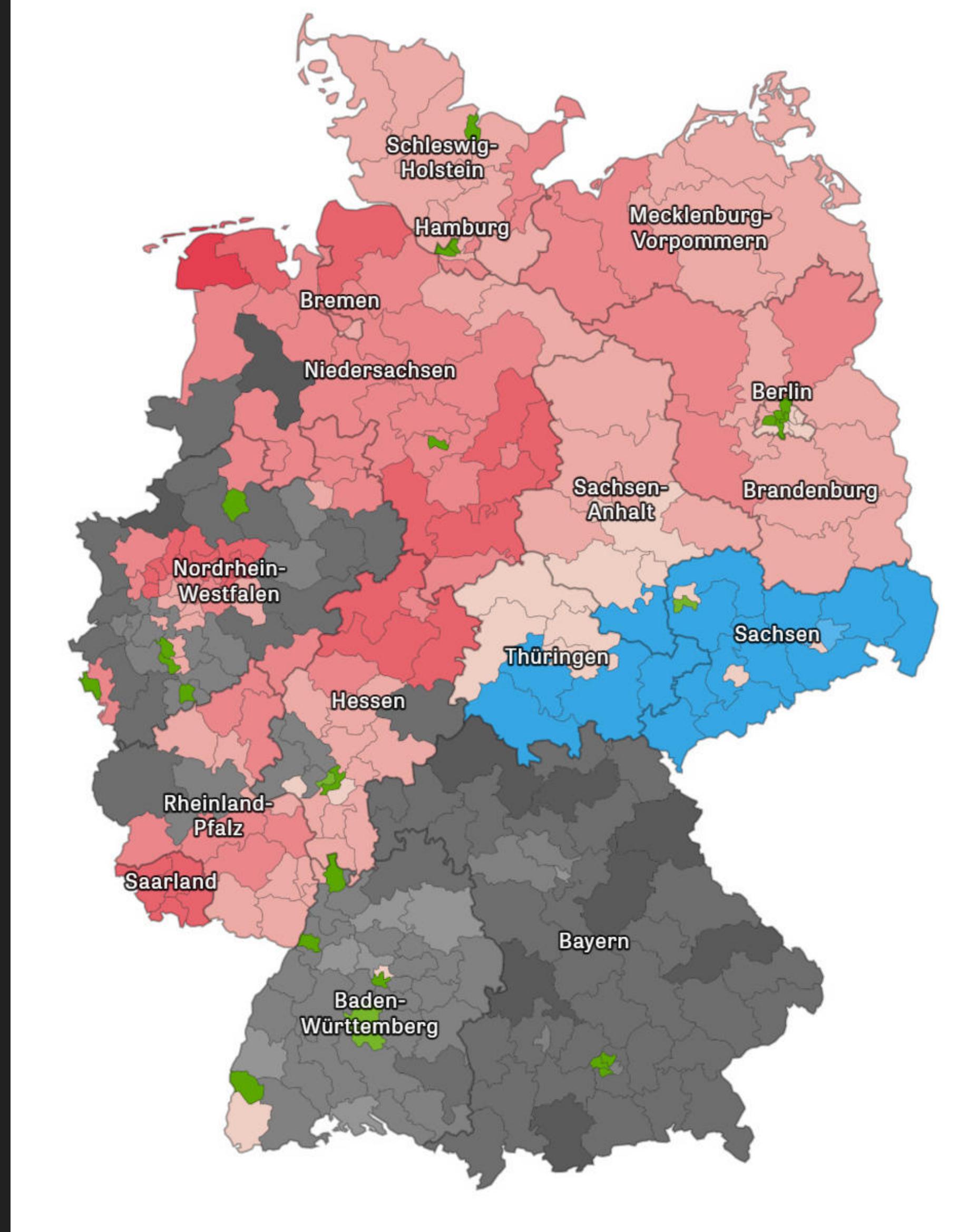
Nuclear energy



Conventional thermal energy

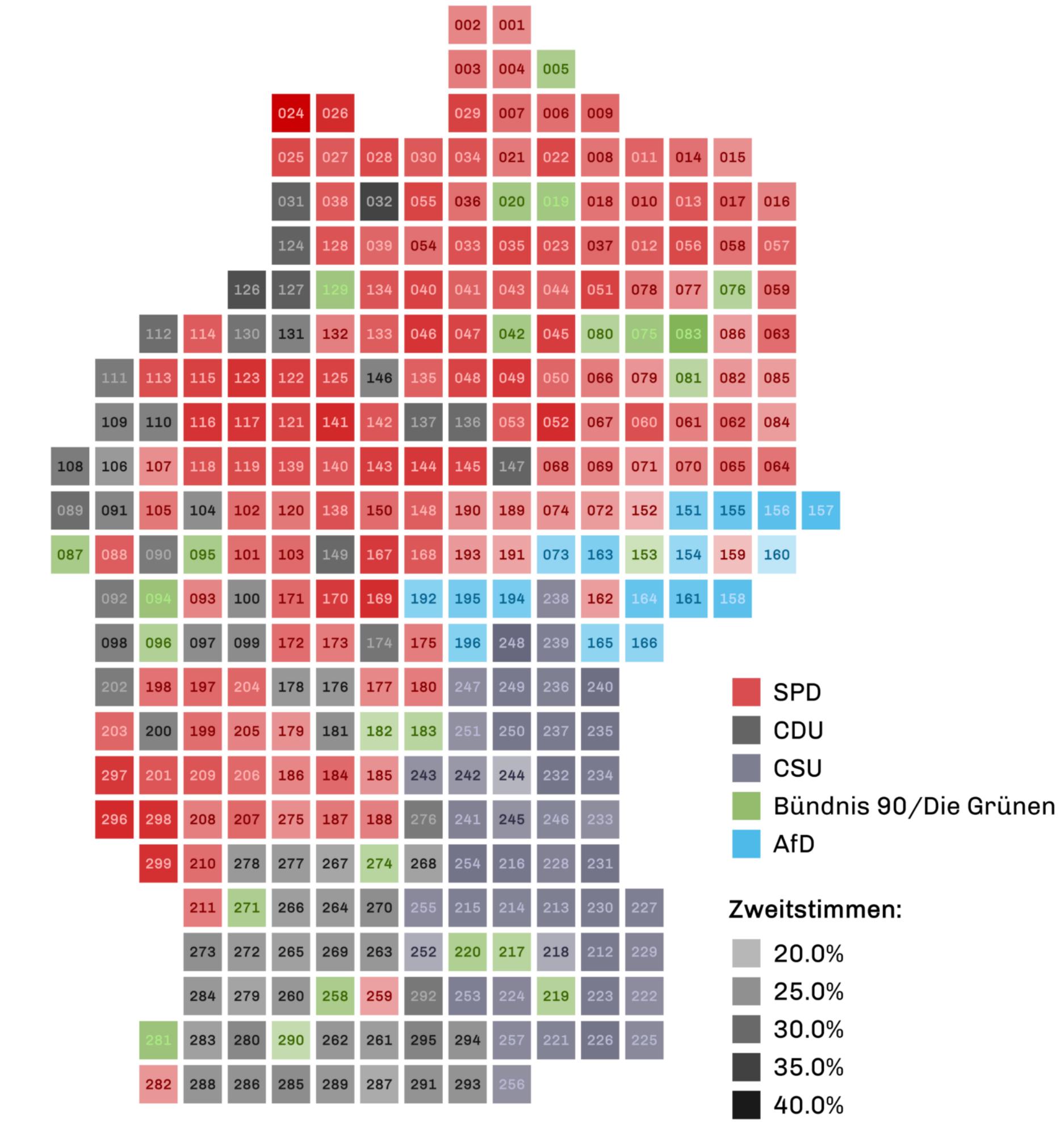


“How European countries generated electricity in 2018”, #TidyTuesday Contribution



Ergebnisse der Bundestagswahl 2021

Die stärksten Parteien nach Prozent der Zweitstimmen.



Grafik: Cédric Scherer & Ansgar Wolsing • Daten: DIE ZEIT

Links: Choropleth-Karte von Die Zeit | Rechts: Kachel-Karte (“Tile Grid Map”) von Cédric Scherer & Ansgar Wolsing

VISUAL FORM

Folge Grundsätzen aus Design und Datenvisualisierung



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@



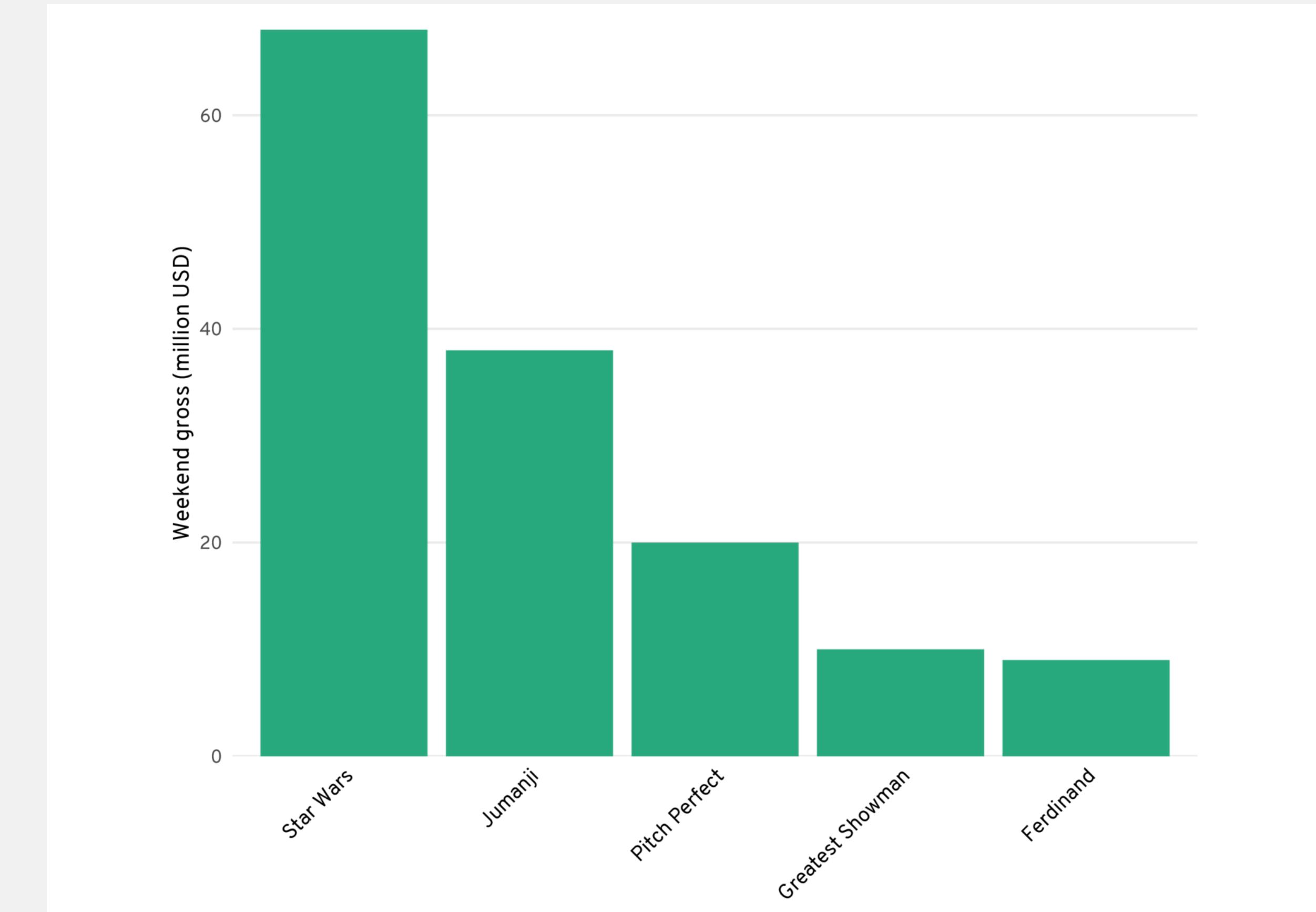
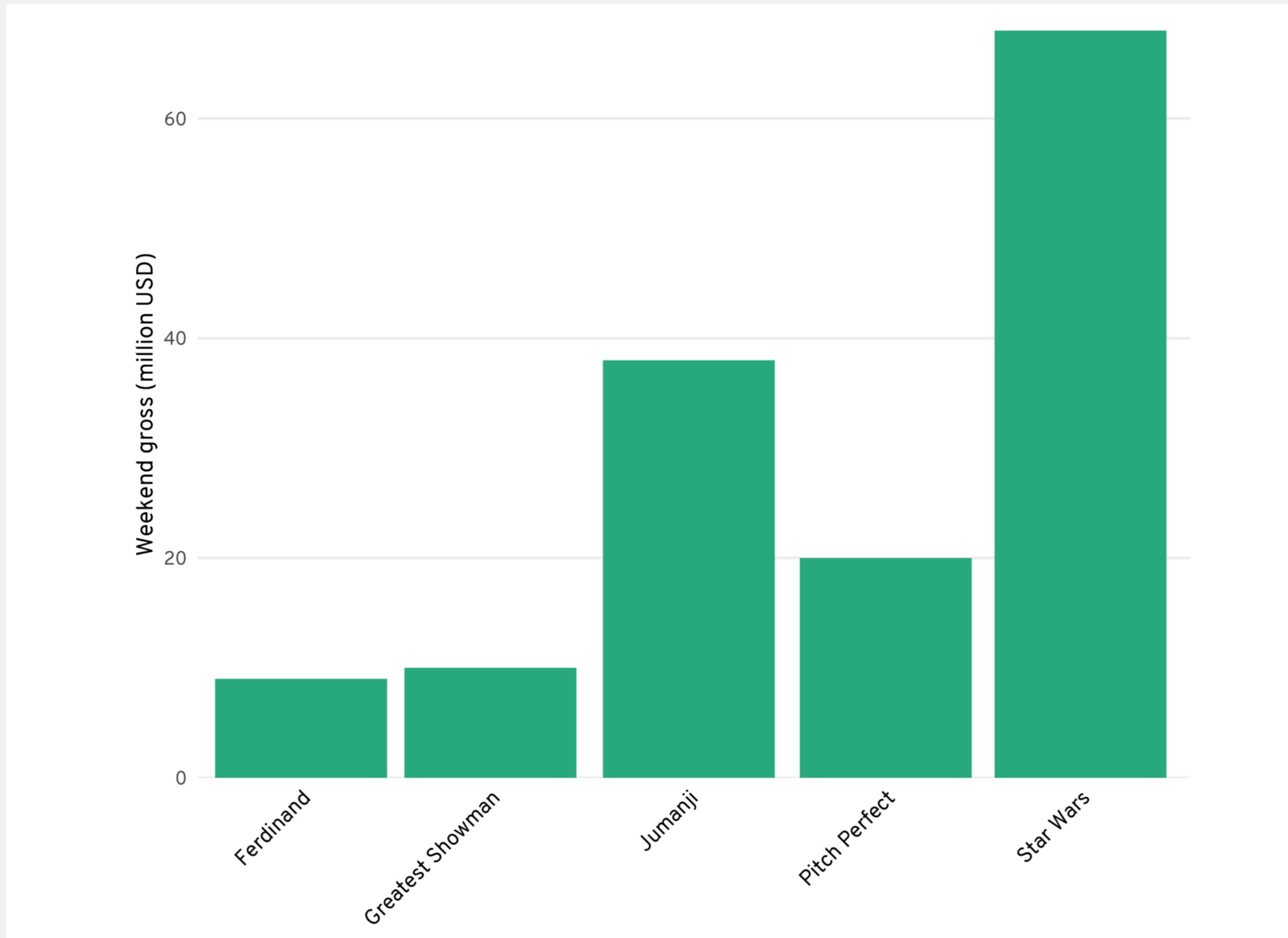
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@CedScherer

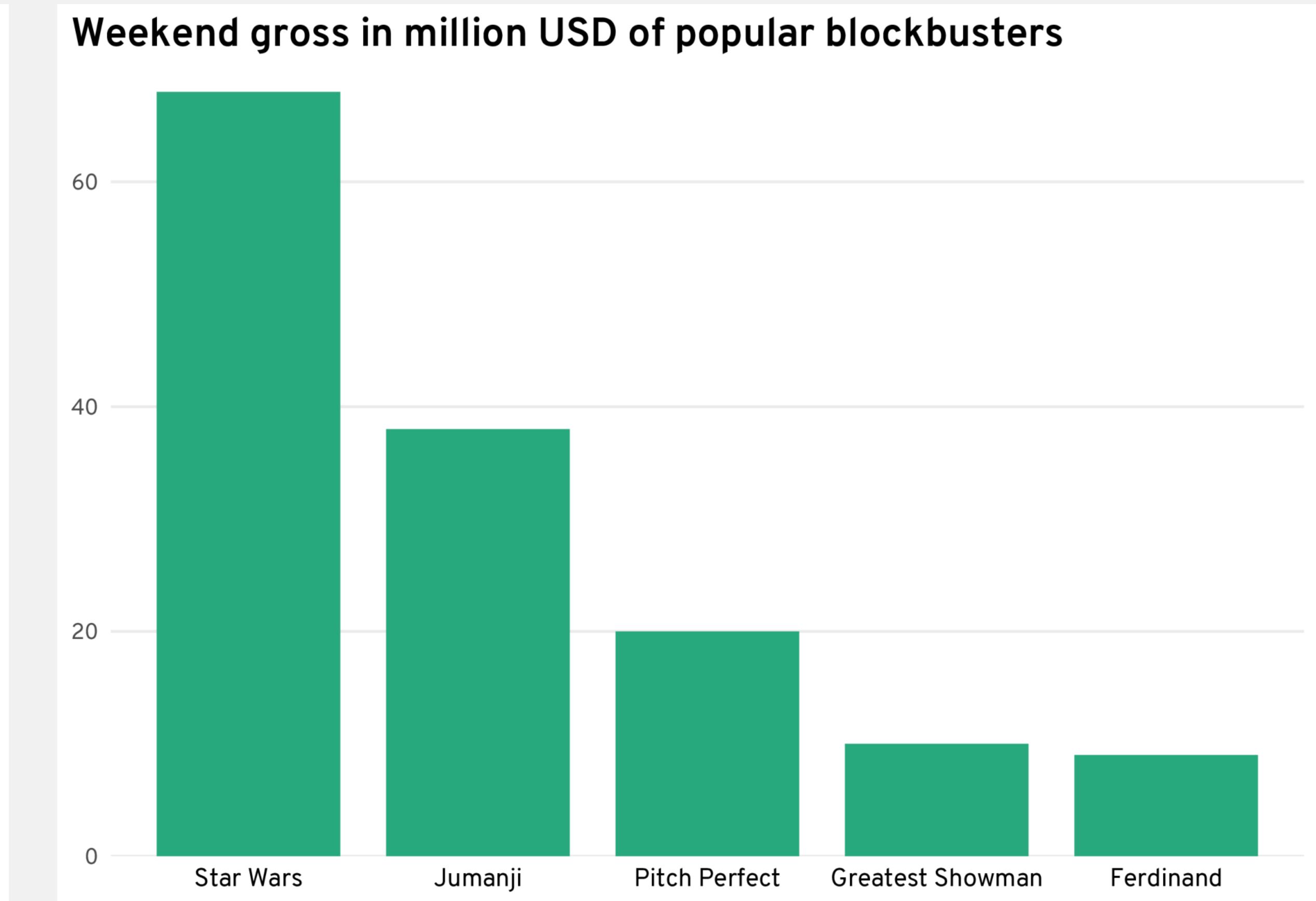
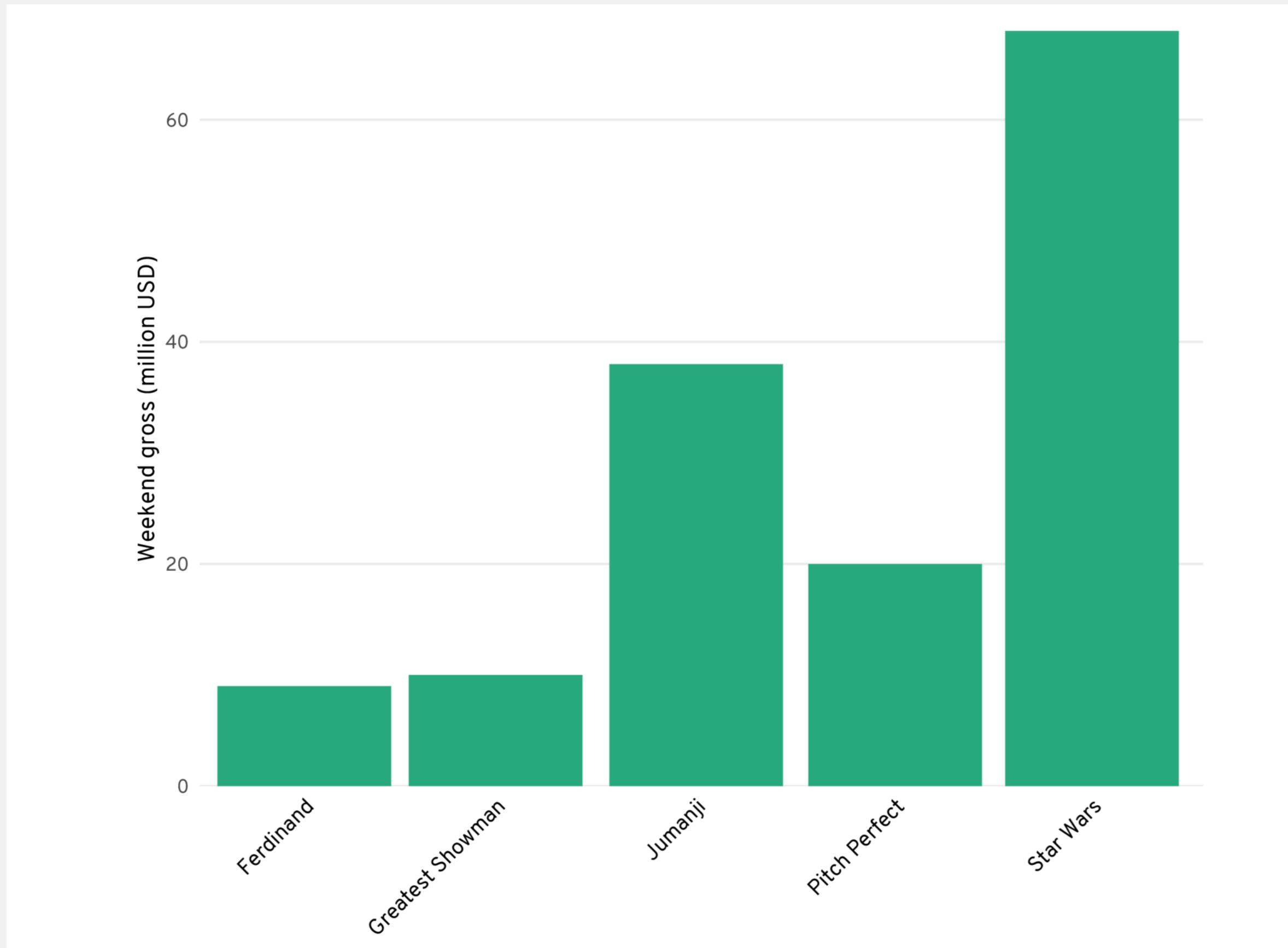


z3tt

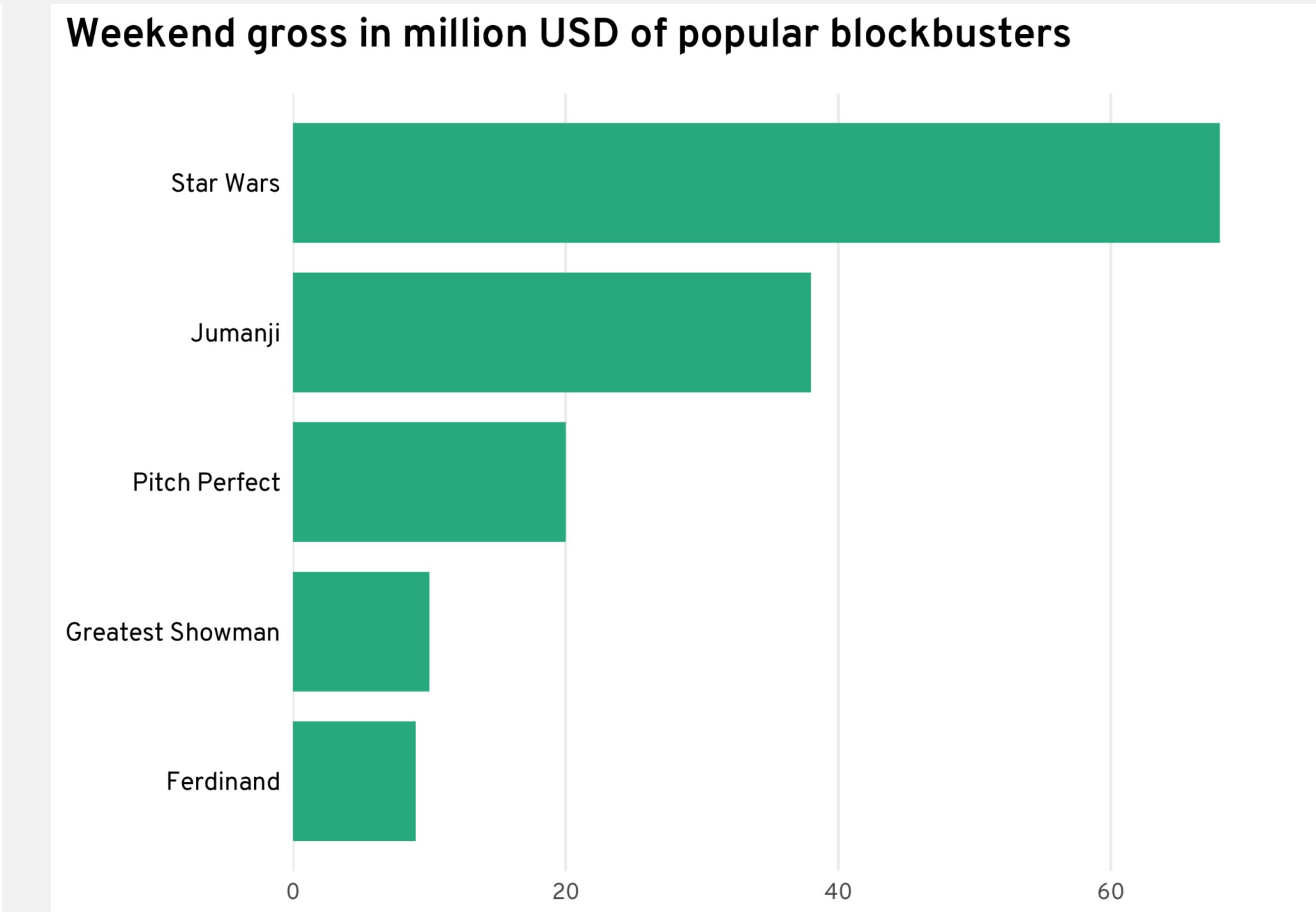
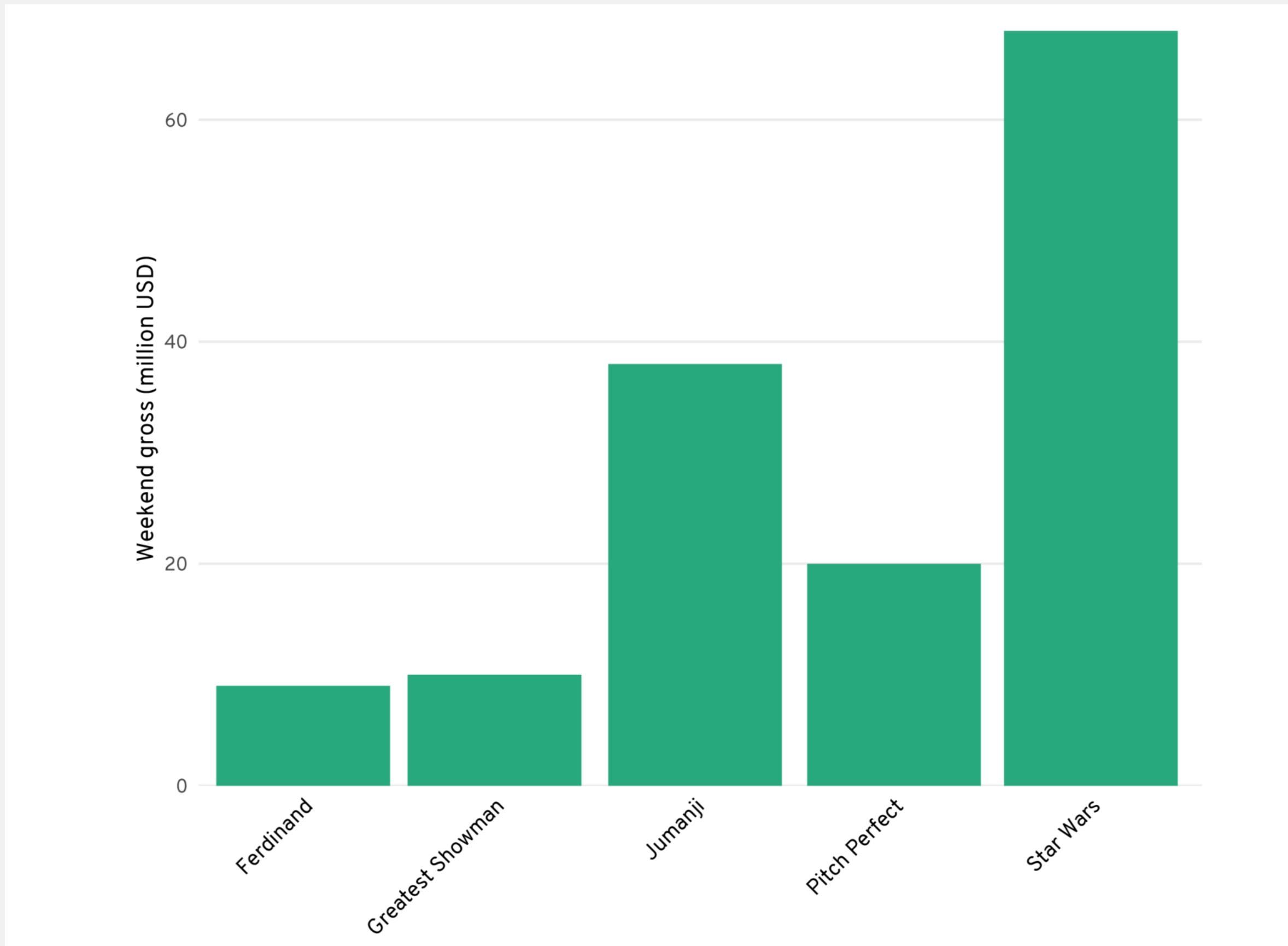
Daten sortieren



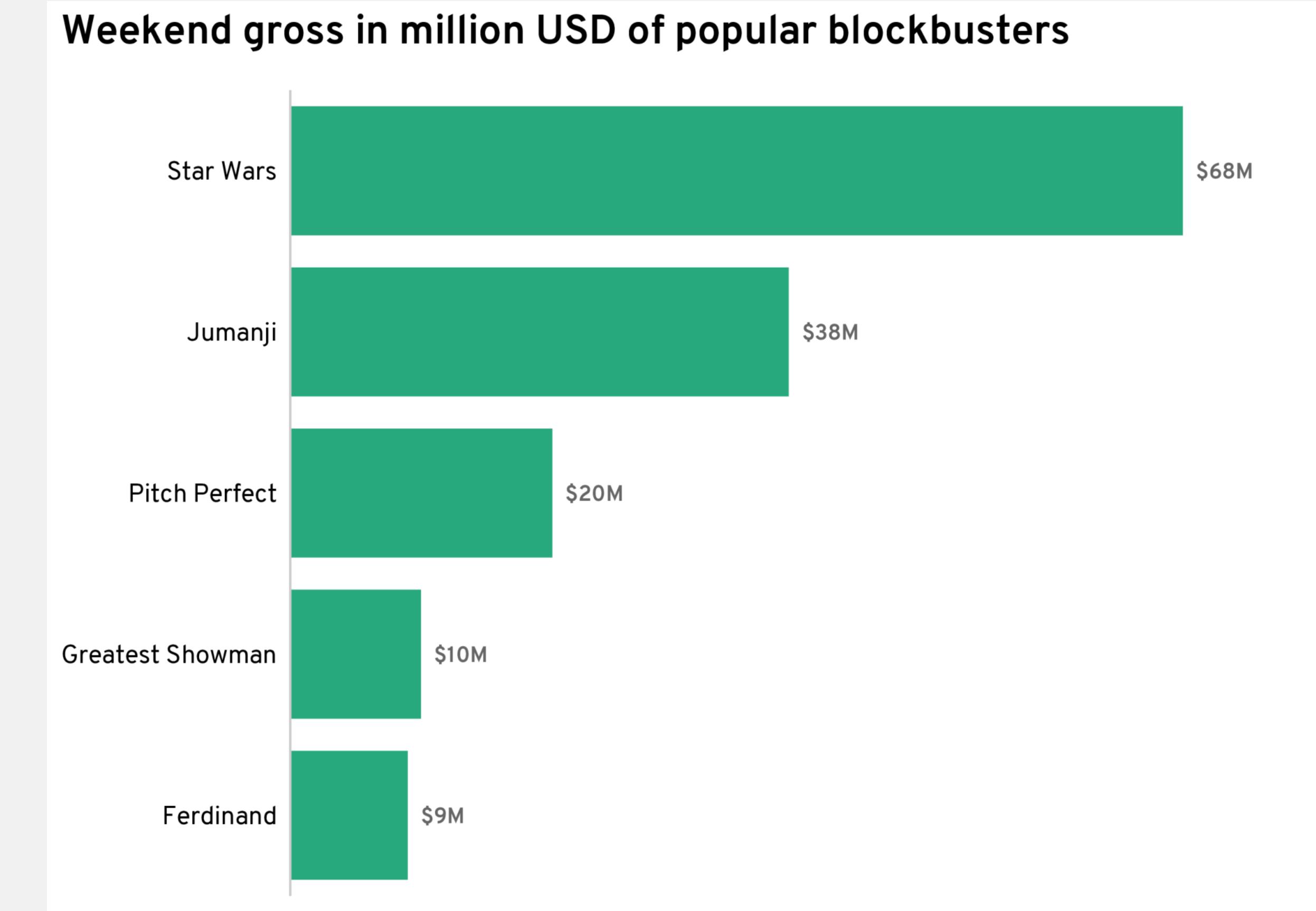
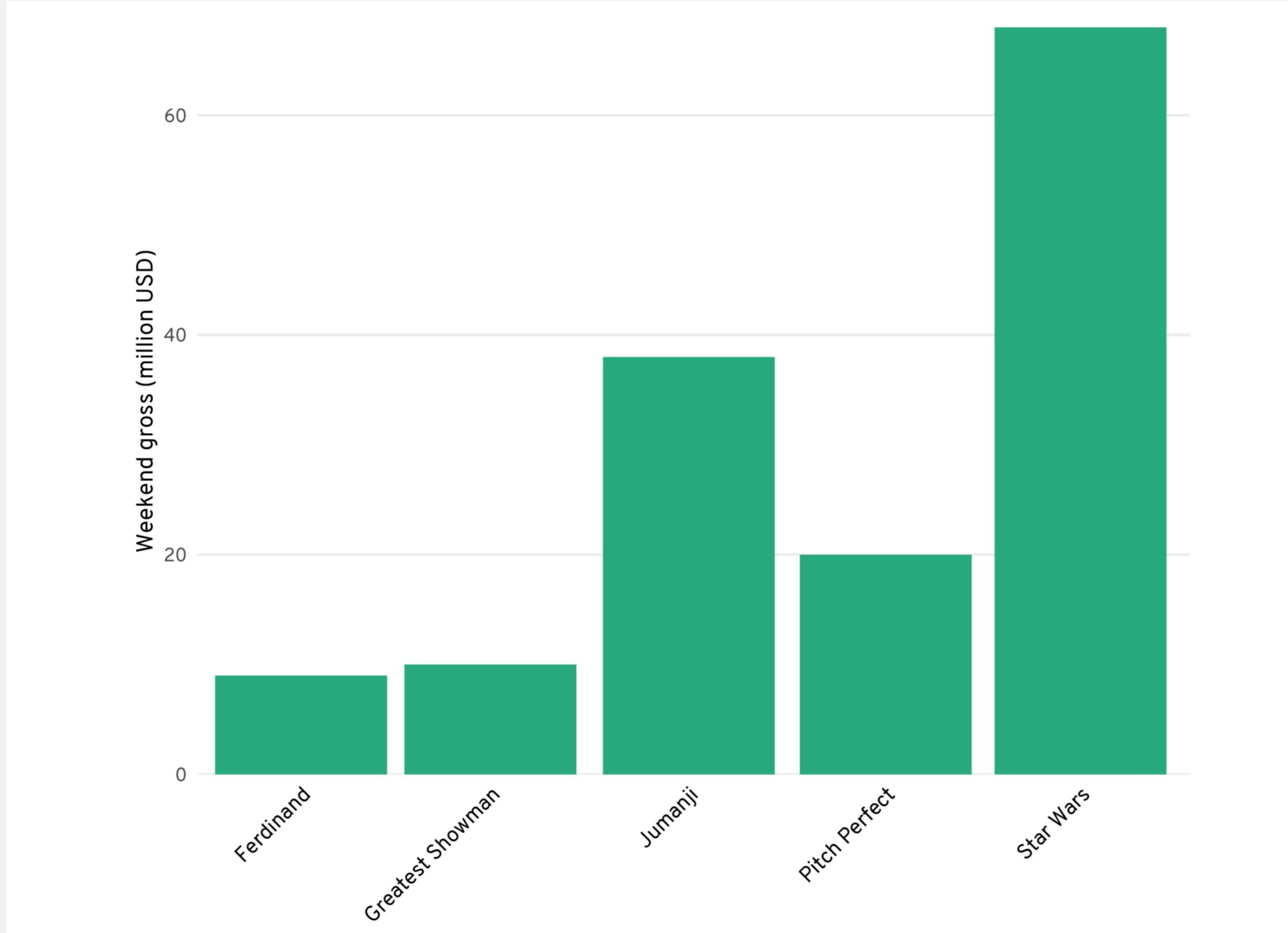
Textdrehung vermeiden



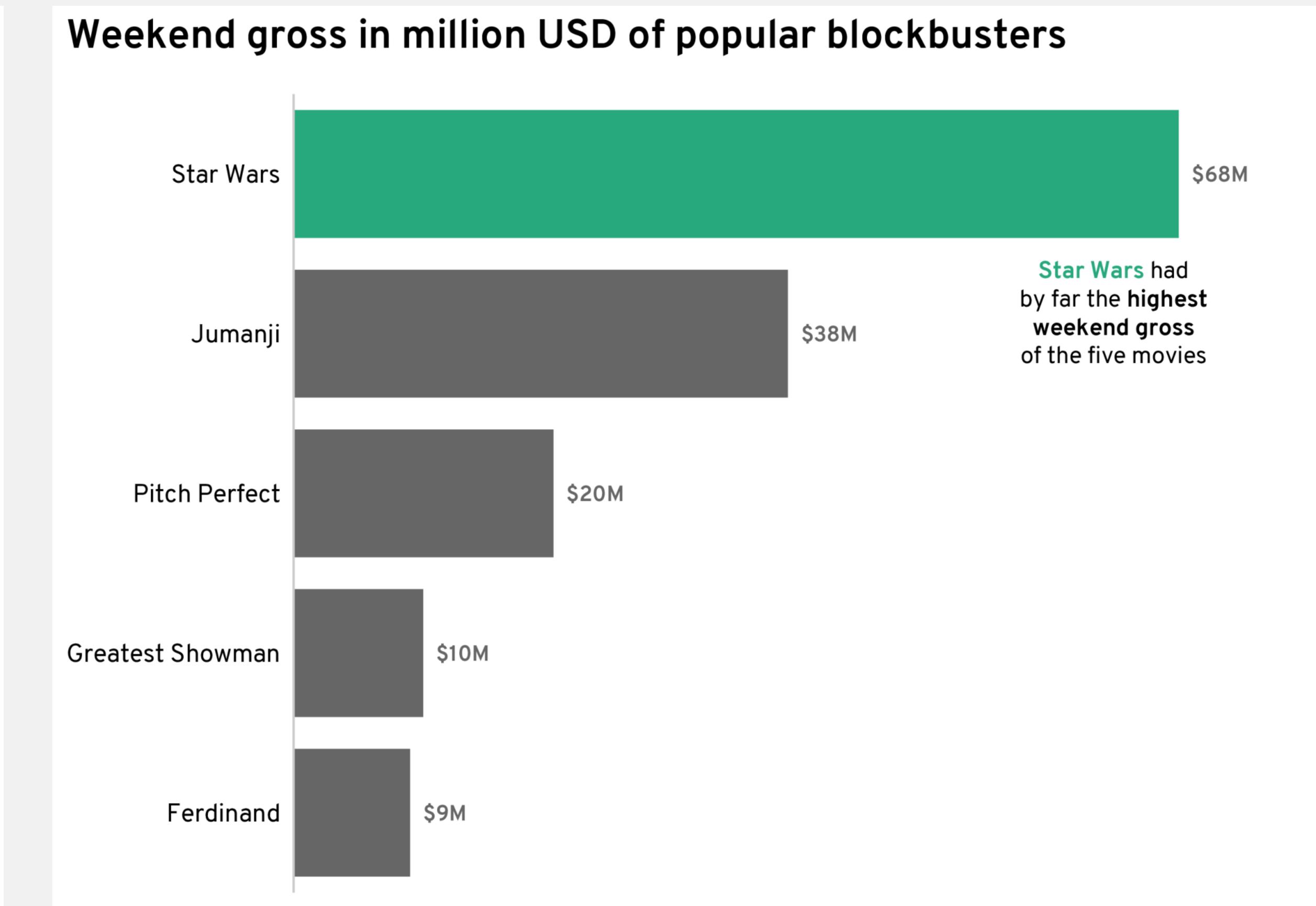
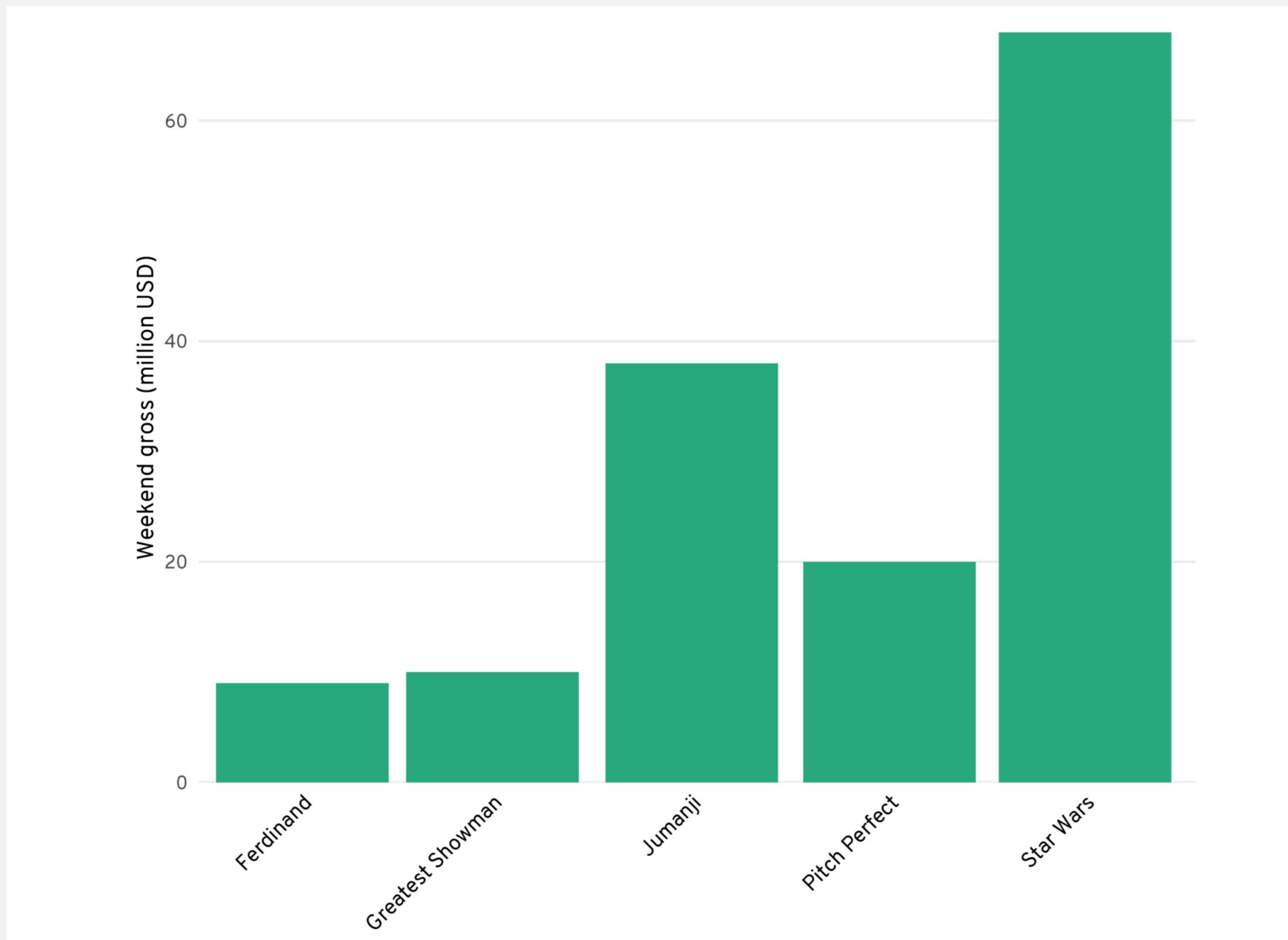
Textdrehung vermeiden



Direktbeschriftungen hinzufügen



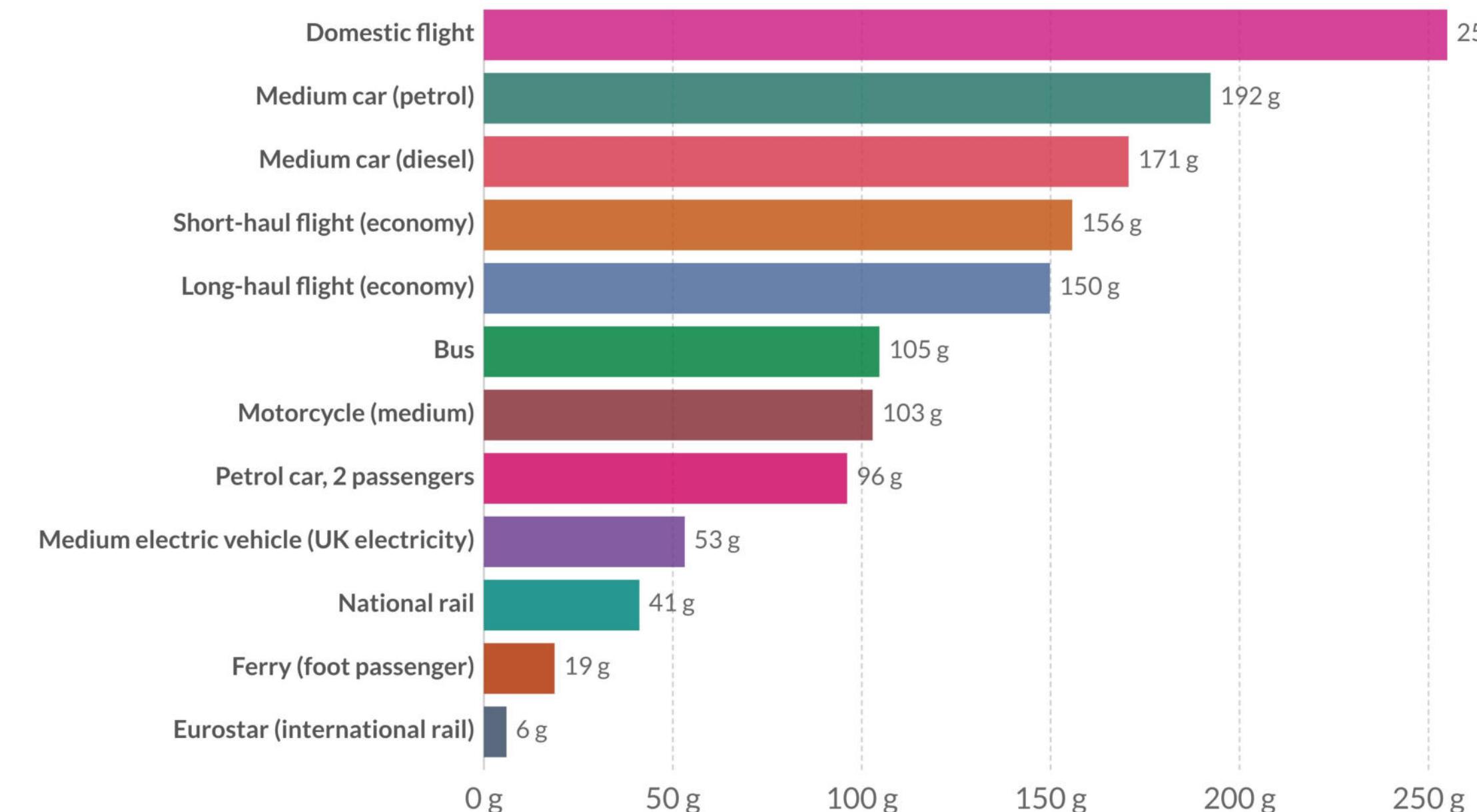
Farben + Anmerkungen nutzen



Farben (korrekt) nutzen

Carbon footprint of travel per kilometer, 2018

The carbon footprint of travel is measured in grams of carbon dioxide equivalents per passenger kilometer. This includes carbon dioxide, but also other greenhouse gases, and increased warming from aviation emissions at altitude.



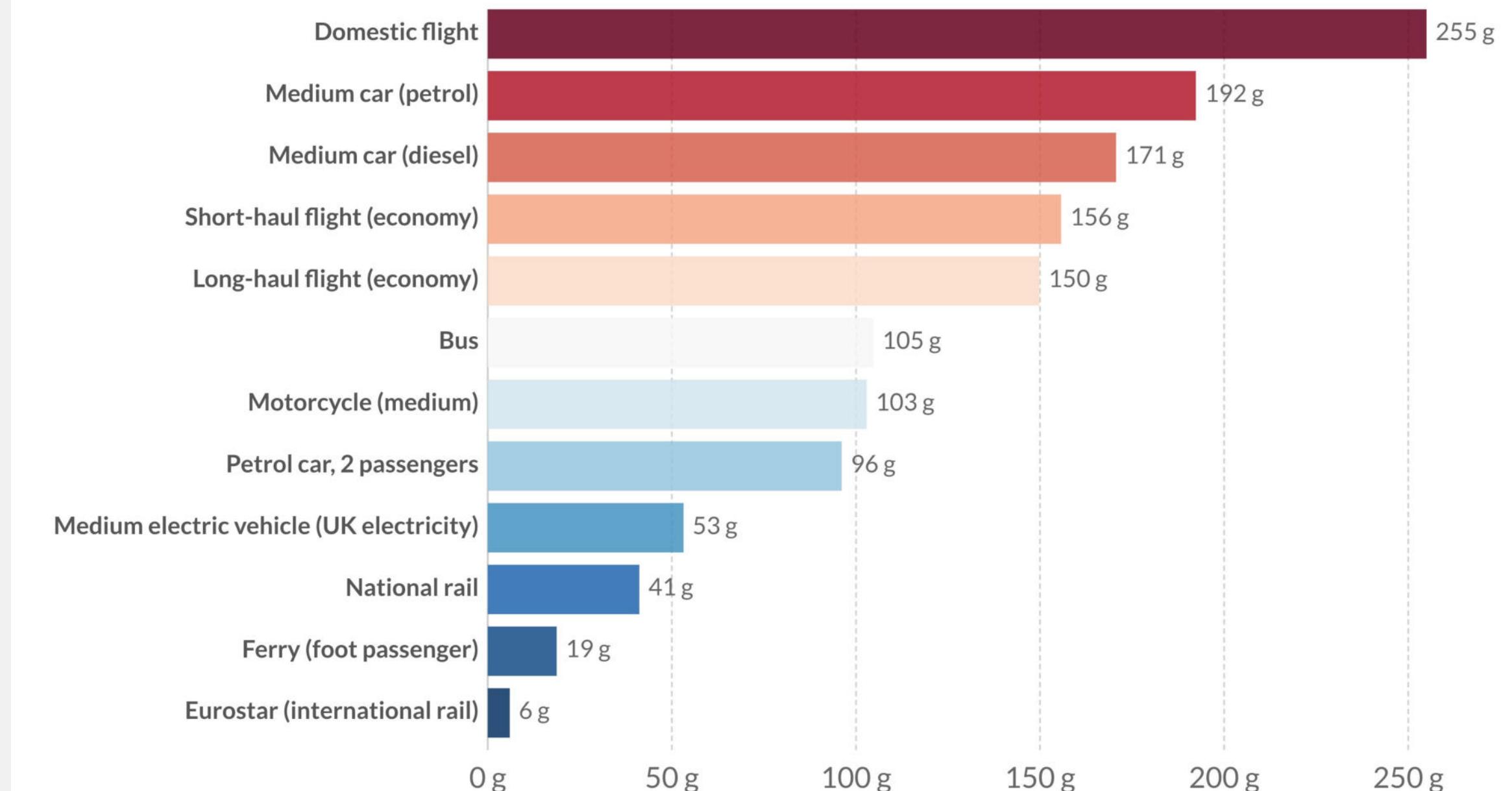
Source: UK Department for Business, Energy & Industrial Strategy. Greenhouse gas reporting: conversion factors 2019.
Note: Data is based on official conversion factors used in UK reporting. These factors may vary slightly depending on the country.

Our World
in Data

CC BY

Carbon footprint of travel per kilometer, 2018

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Source: UK Department for Business, Energy & Industrial Strategy. Greenhouse gas reporting: conversion factors 2019.
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Our World
in Data

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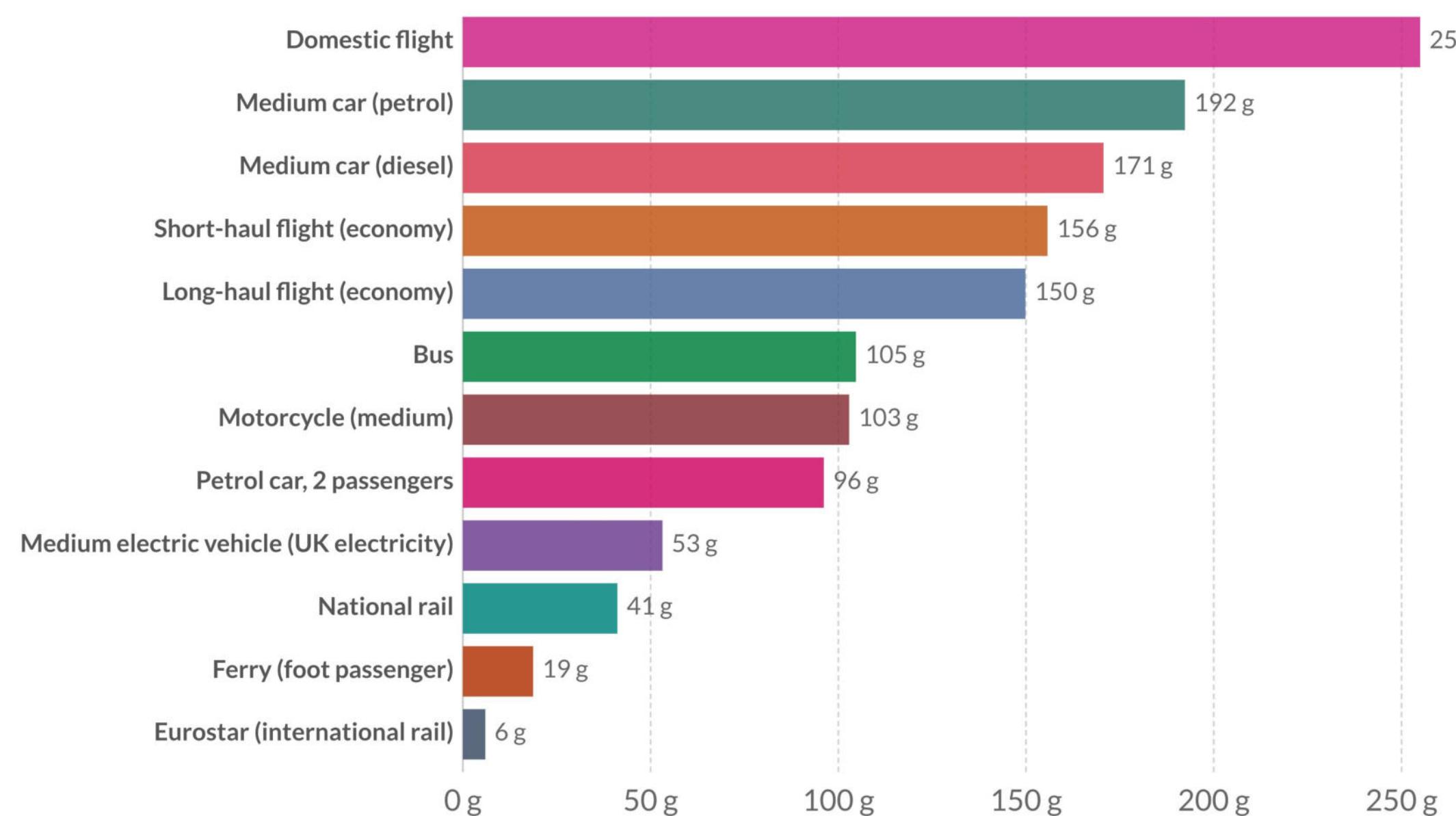
Originalgrafik mit einer zufälligen kategoriellen Farbpalette

Überarbeitete Grafik mit einer divergierenden Farbpalette

Farben (korrekt) nutzen

Carbon footprint of travel per kilometer, 2018

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Source: UK Department for Business, Energy & Industrial Strategy. Greenhouse gas reporting: conversion factors 2019.

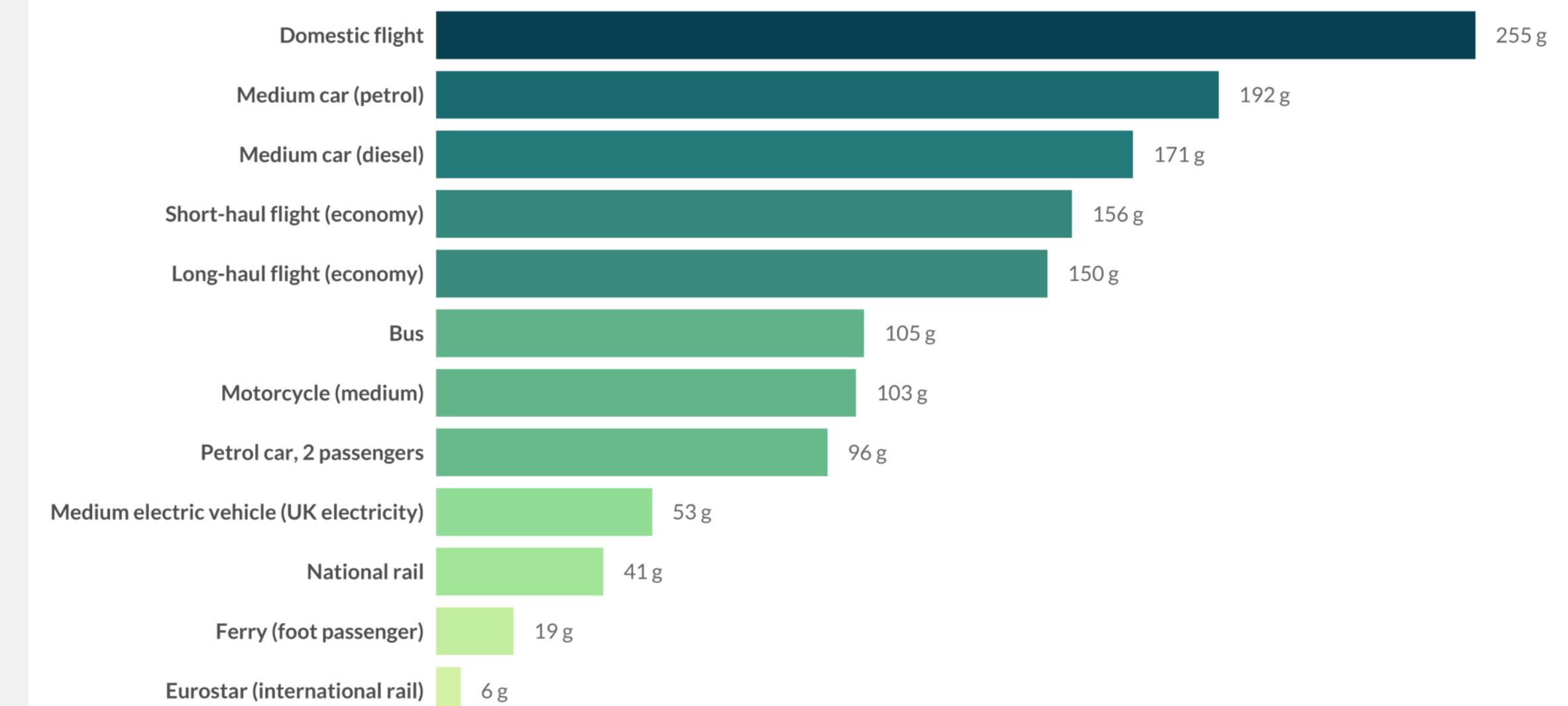
Note: Data is based on official conversion factors used in UK reporting. These factors may vary slightly depending on the country.

Our World
in Data

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Source: UK Department for Business, Energy & Industrial Grenhouse gas reporting: conversion factors 2019.

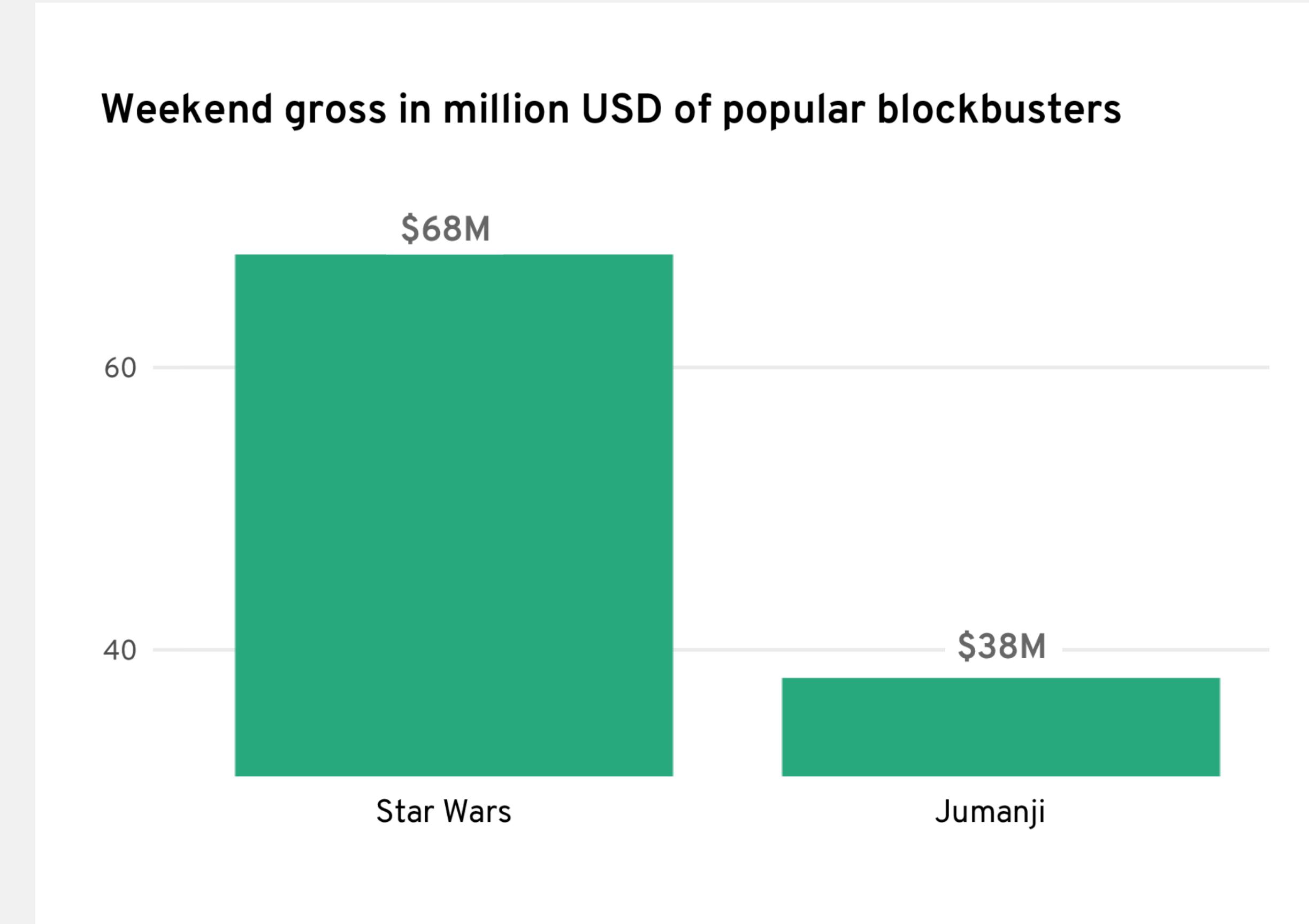
Note: Data is based on official conversion factors used in UK reporting. These factors may vary slightly depending on the country.

Original visualization by Hannah Ritchie, OurWorldInData.org | Makeover by Cédric Scherer

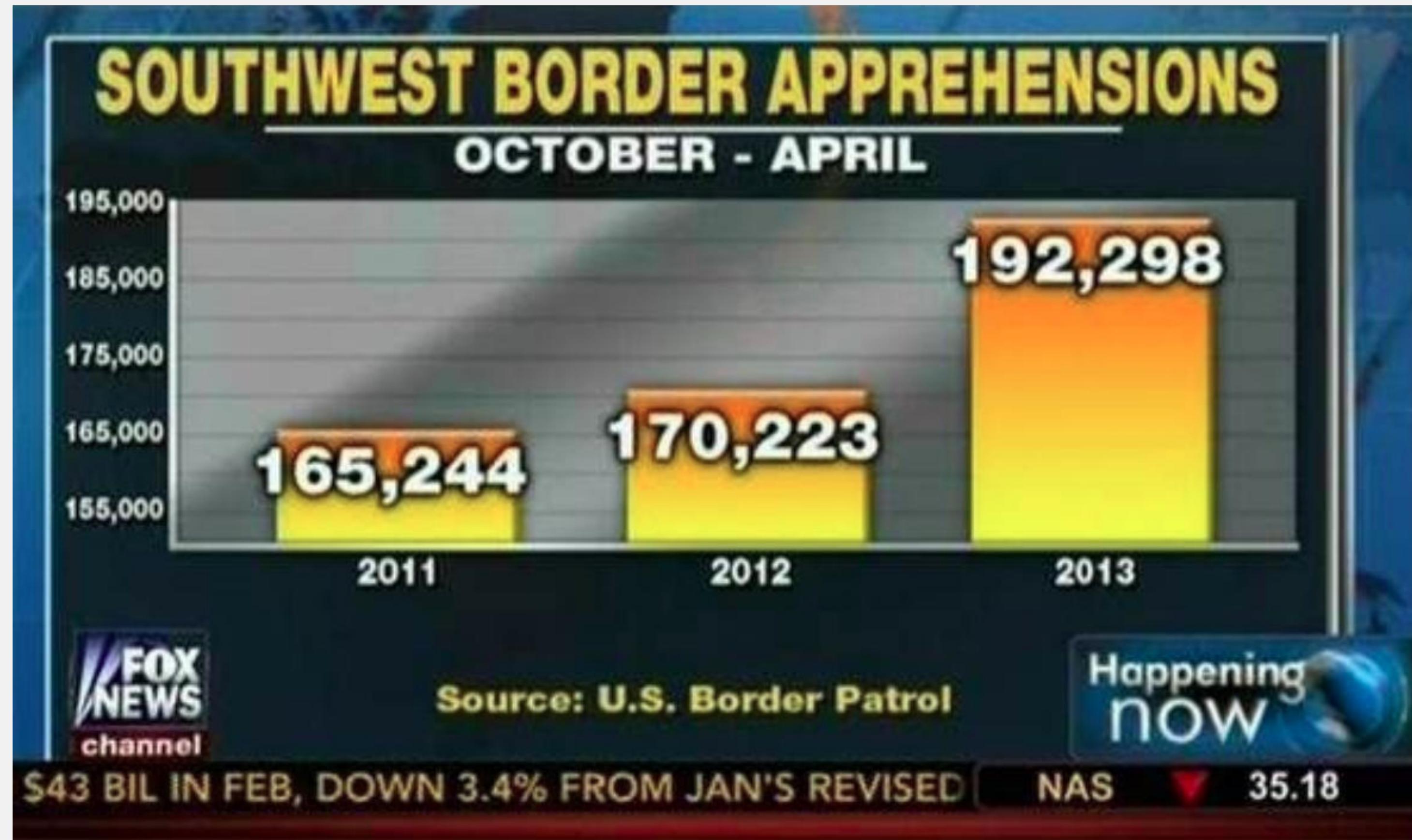
Original graphic with a random categorical palette

Makeover using a continuous palette

Immer bei Null starten



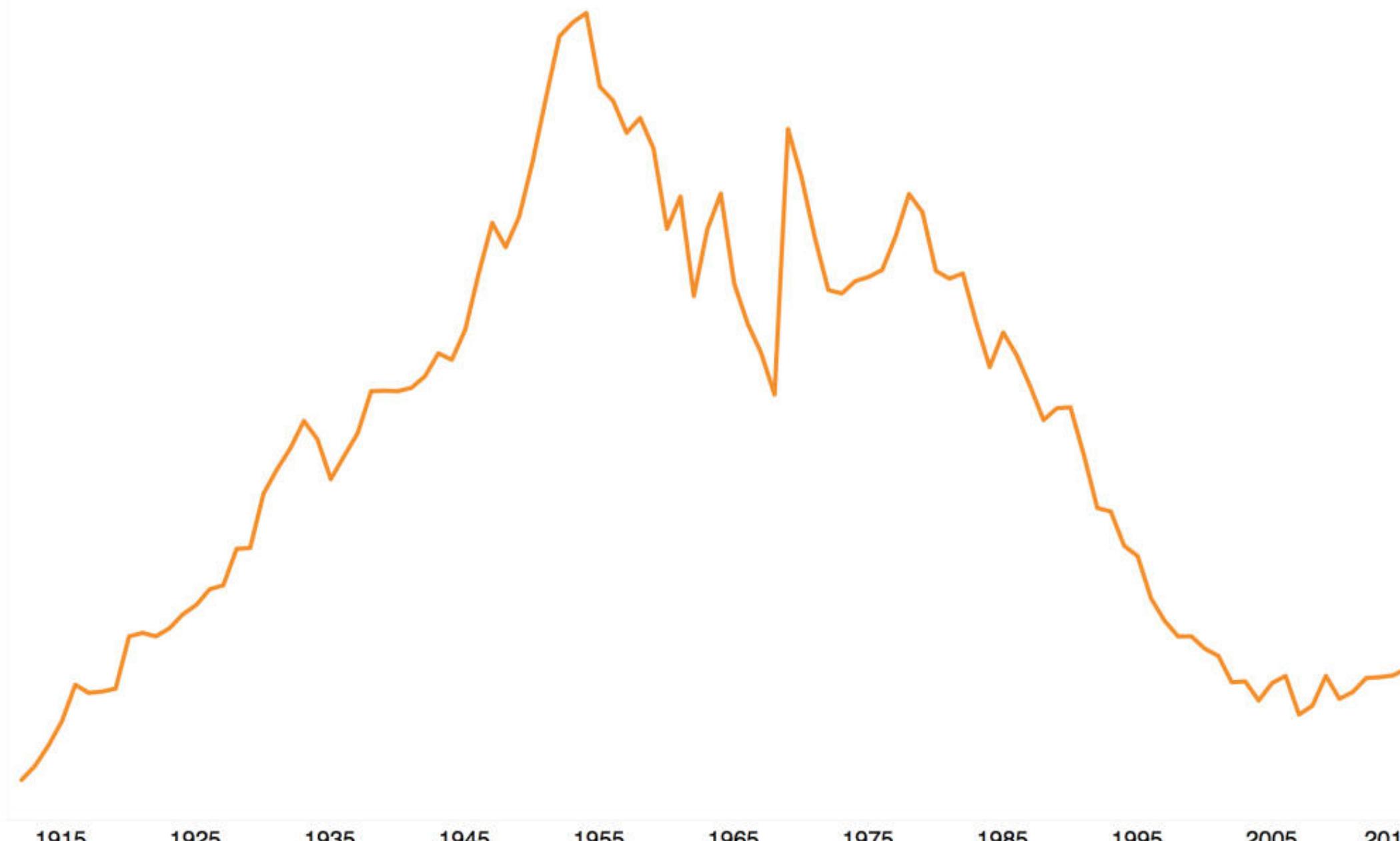
Immer bei Null starten



Die Wirkung von Beschriftungen

Rise and Fall of the name **Neil** in the USA
Births 1912-2015

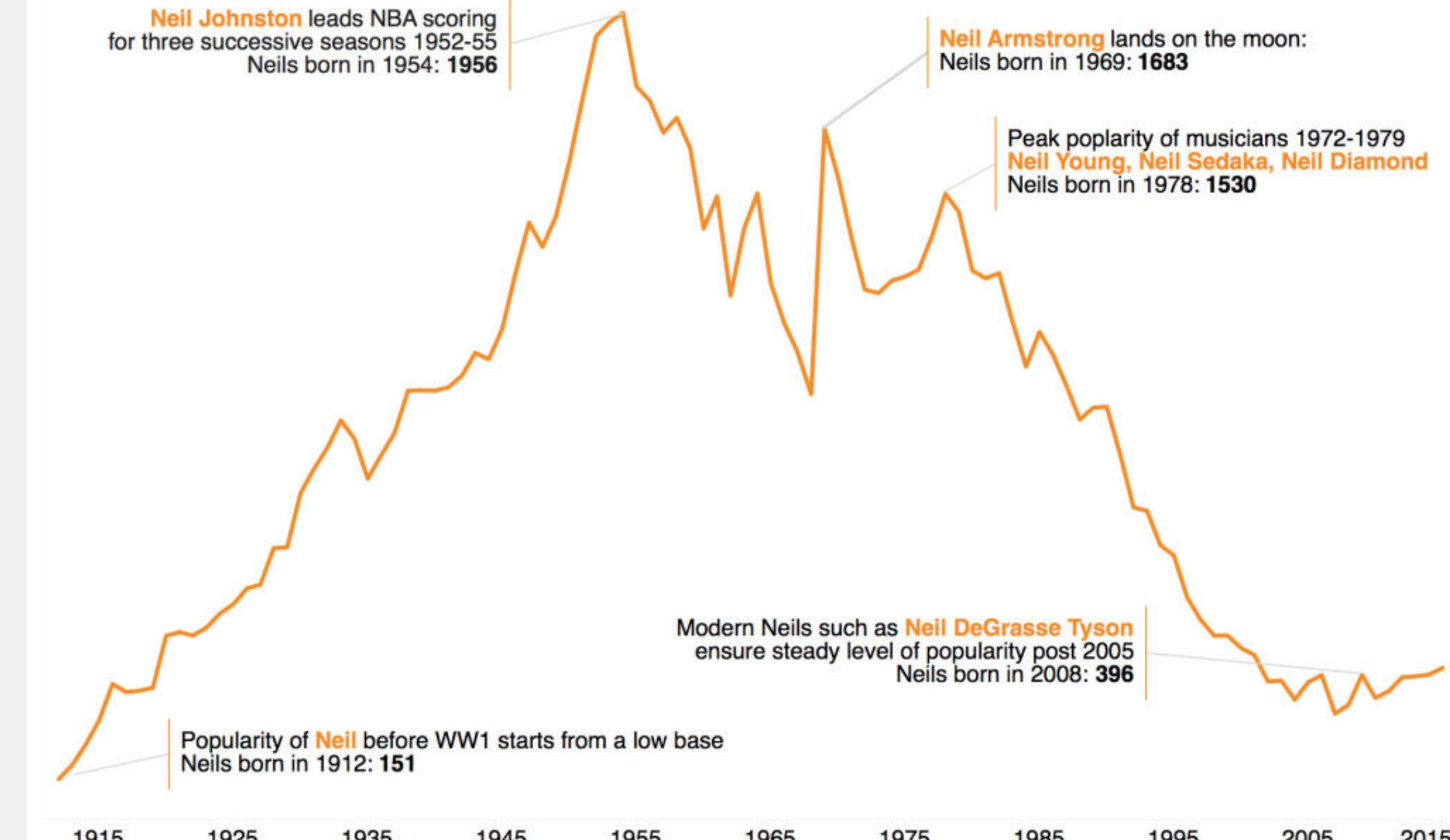
Source: data.gov



Visualisation: [@theneilrichards](#)

Rise and Fall of the name **Neil** in the USA
Births 1912-2015

Source: data.gov

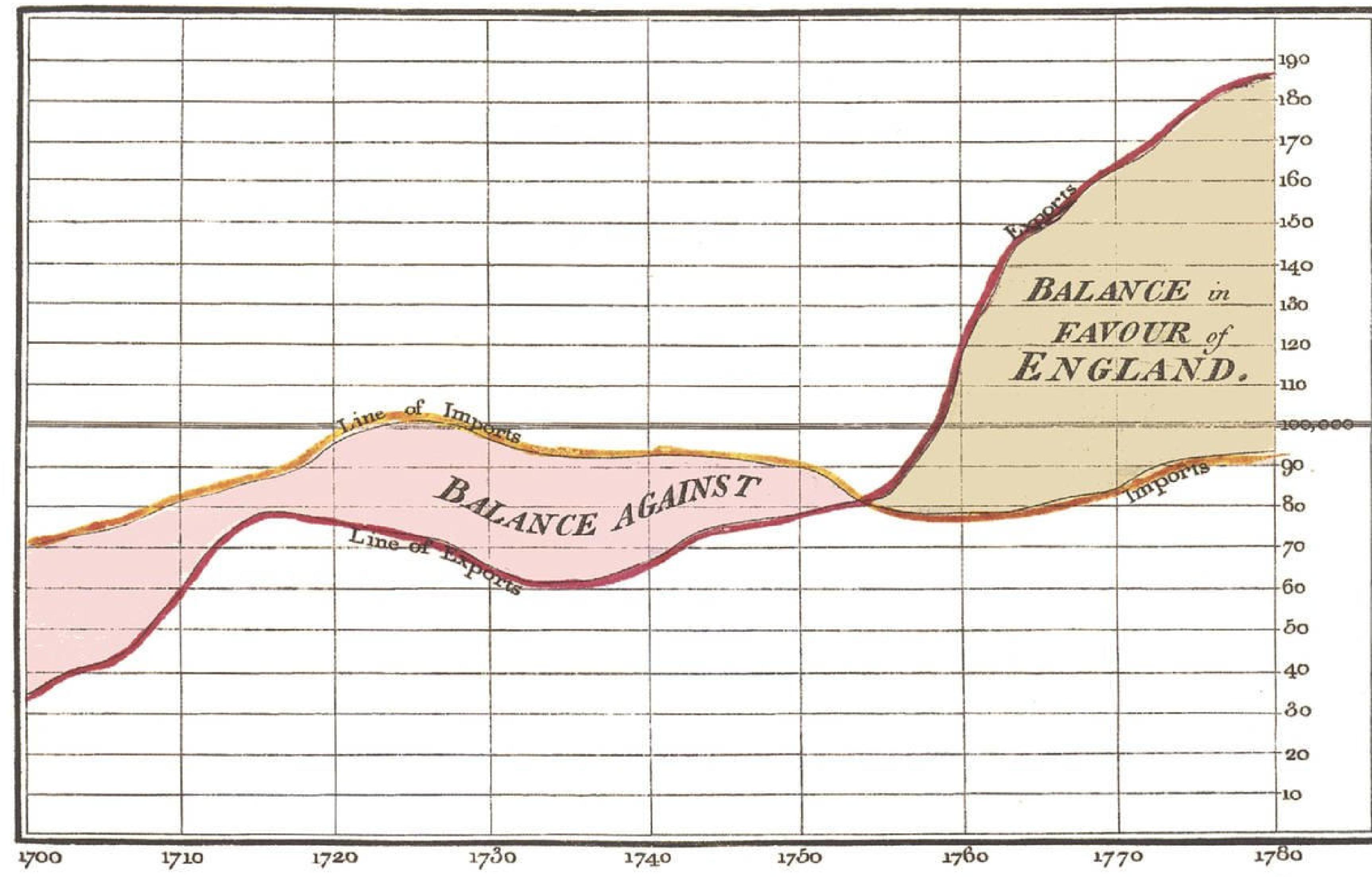


Visualisation: [@theneilrichards](#)

#SWDChallenge

“Is white space always your friend?” von Neil Richards

Exports and Imports to and from DENMARK & NORWAY from 1700 to 1780.



Zeitreihe mit Beschriftungen von William Playfair from "The Commercial and Political Atlas and Statistical Breviary" (1786)

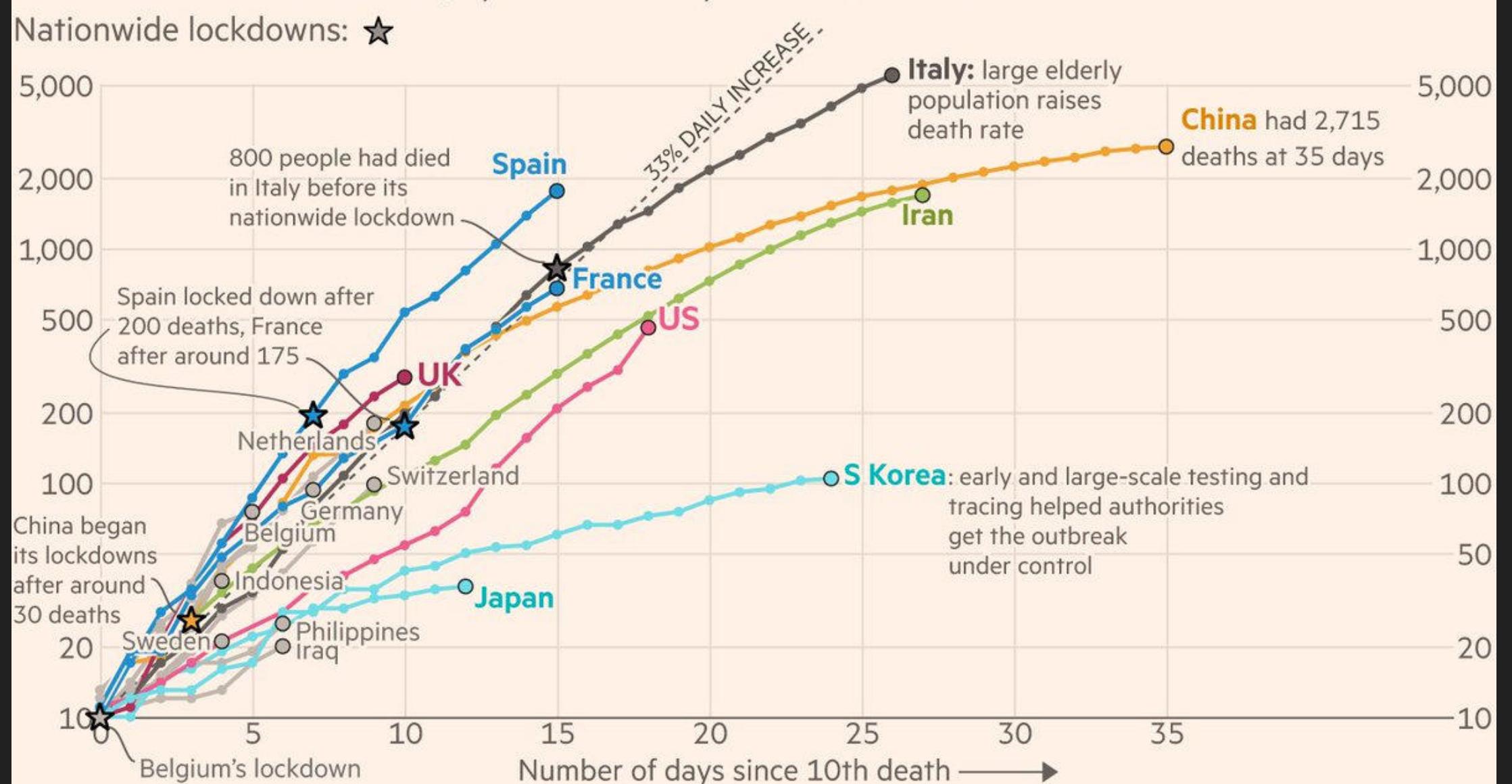
“The key thing we do is to add a title to the chart, as an entry point and to explain what is going on. **Text and other annotations add enormous value for non-chart people.**”

~ John Burn-Murdoch, Financial Times

Coronavirus deaths in Italy, Spain and the UK are increasing much more rapidly than they did in China

Cumulative number of deaths, by number of days since 10th death

Nationwide lockdowns: ★



FT graphic: John Burn-Murdoch / @jburnmurdoch

Source: FT analysis of Johns Hopkins University, CSSE; Worldometers; FT research. Data updated March 23, 09:00 GMT

© FT

Covid has grown gradually less lethal over the pandemic, mainly due to immunity, but it remains more dangerous than flu on average

Evolution of Covid-19's infection fatality ratio* in England, relative to seasonal flu



*Covid IFR calculated using ONS death cert. mentions and ONS infection survey. **IFR for seasonal flu as calculated for New Zealand in BMJ

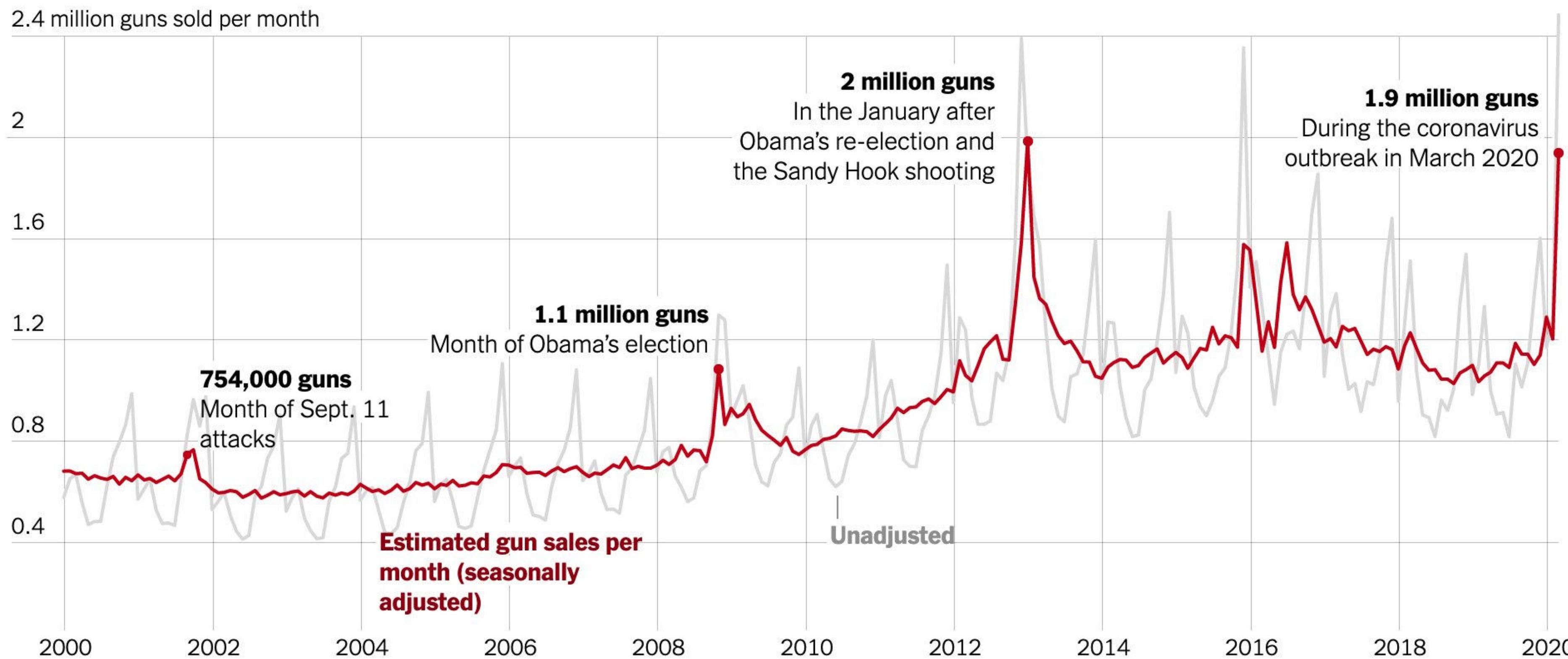
Source: ONS. Based on prior work by Dan Howdon

FT graphic: John Burn-Murdoch / @jburnmurdoch

© FT

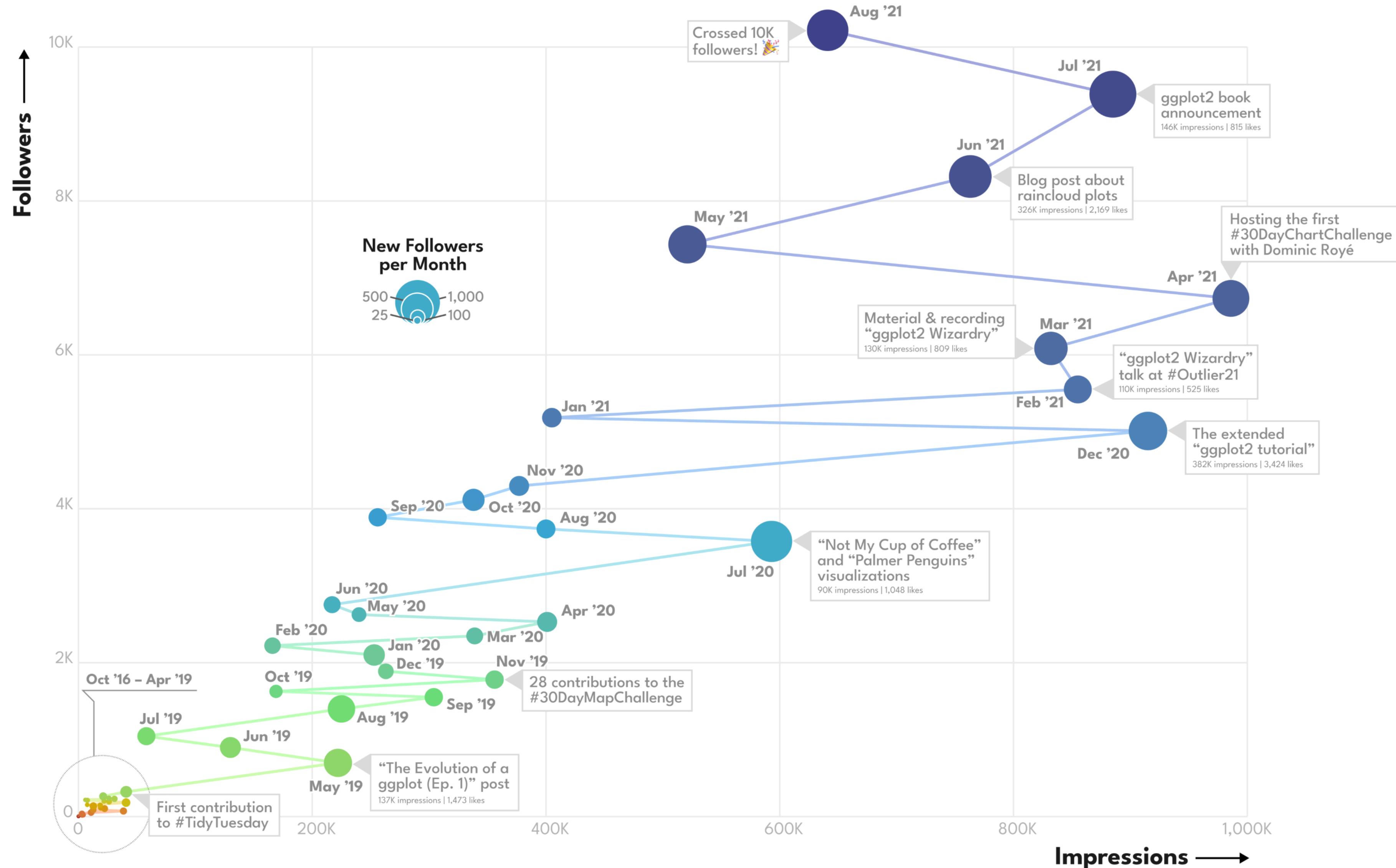
About 2 Million Guns Were Sold in the U.S. as Virus Fears Spread

By Keith Collins and David Yaffe-Bellany April 1, 2020



“About 2 Million Guns Were Sold in the U.S. as Virus Feats Spread” von Keith Collins und David Yaffe-Bellany (New York Times)

My Road to 10K on Twitter – Thank You All for Following!



Graphic: Cédric Scherer • Data: Twitter Analytics for @CédScherer

ZUSAMMENFASSUNG



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z3tt

Information

Verstehe deine Daten und sei genau.

Story

Sei dir über die Botschaft der Daten im Klaren.

Goal

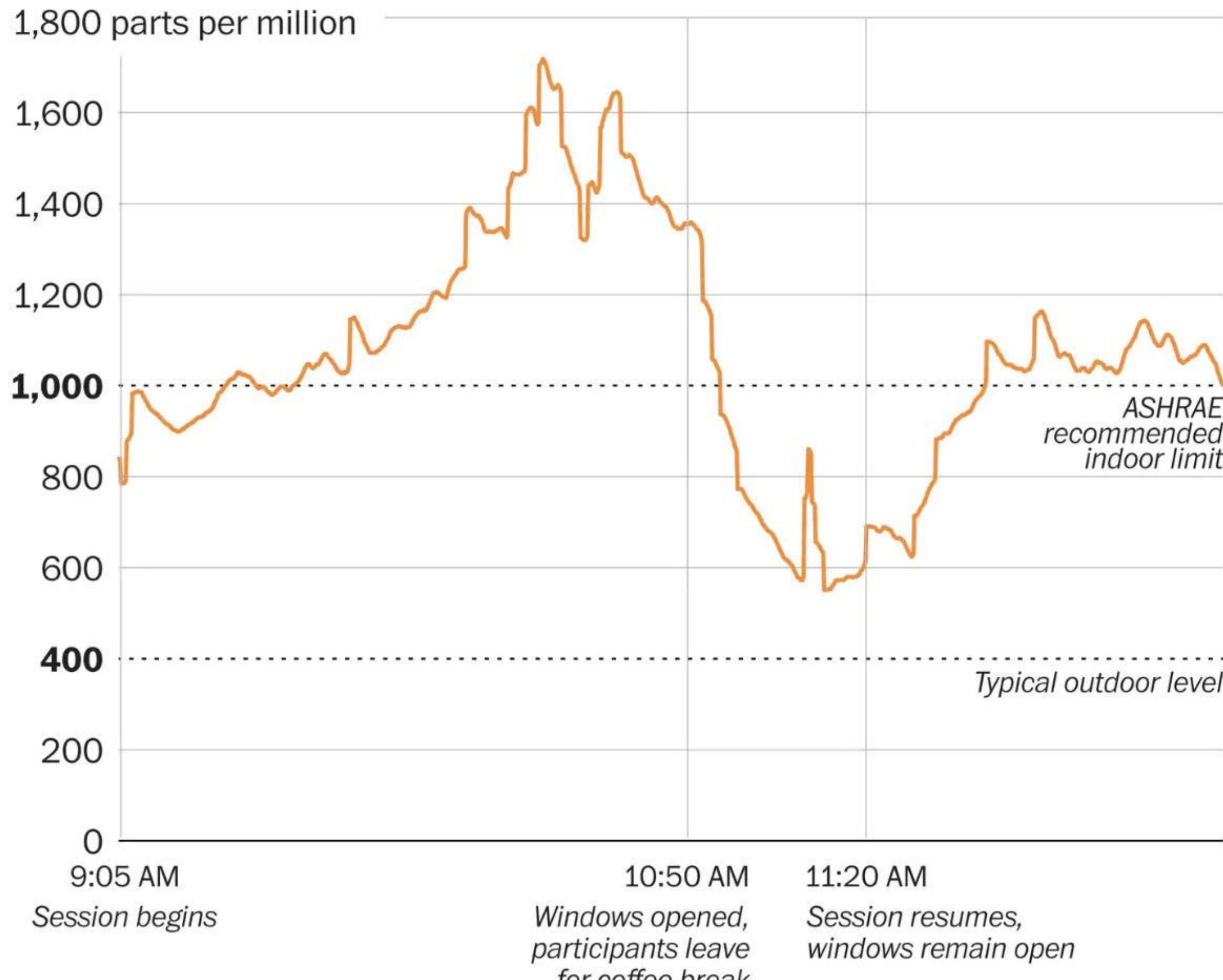
Wähle geeignete Grafiken, um die Geschichte zu erzählen.

Visual Form

Folge Grundsätzen aus Design und Datenvisualisierung.

Clearing the air

CO₂ levels in an occupied conference room on June 4, 2019



Source: Adam Ginsburg

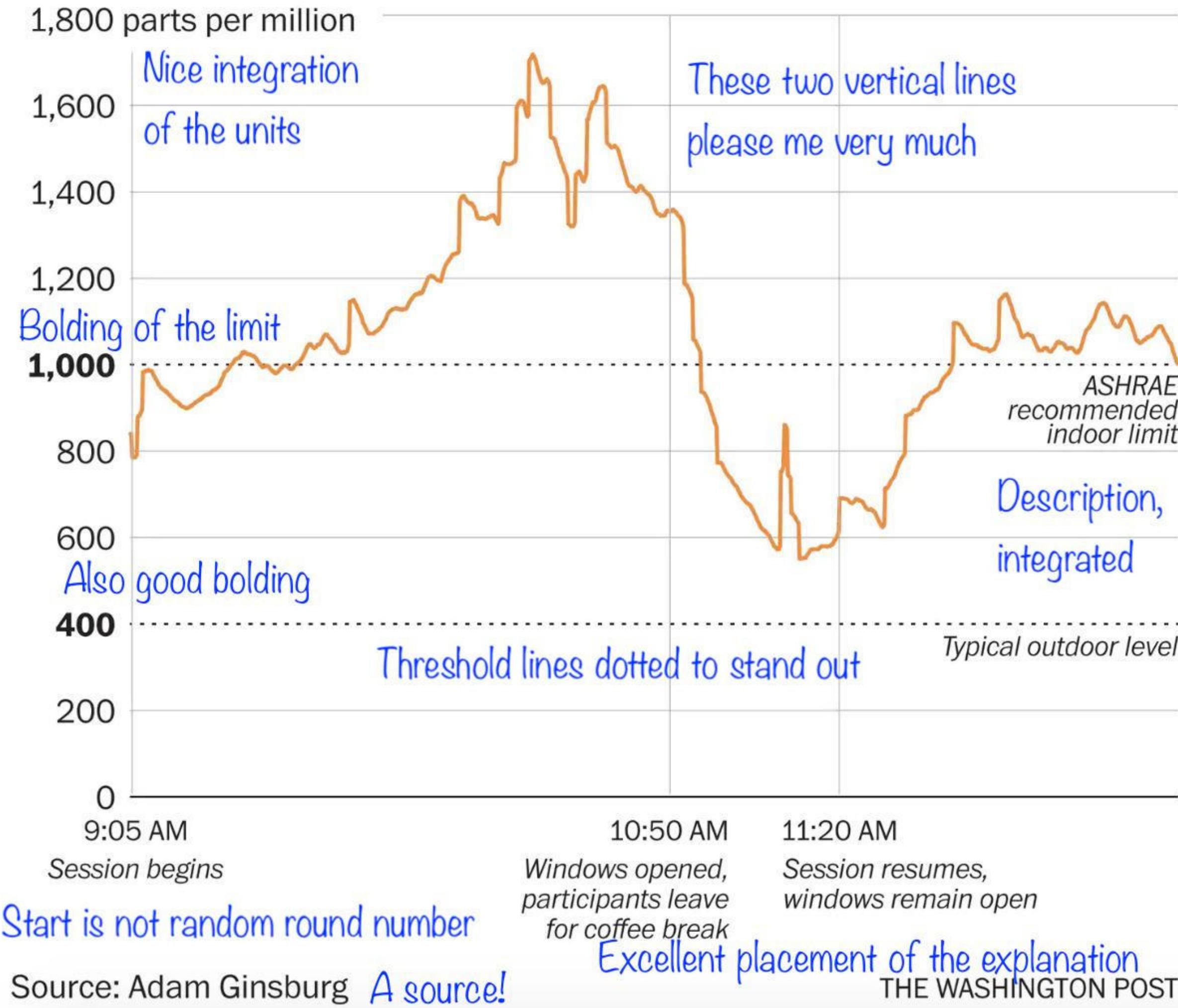
THE WASHINGTON POST

[“Clearin the Air” von Adam Ginsburg \(Washington Post\)](#)

Clearing the air

Fun and helpful title

CO₂ levels in an occupied conference room on June 4, 2019
Units and metho in a subtitle, NOT in vertical text on the side



... mit Gedanken von Francis Gagnon (Voilà)

Gestaltung für das Zielpublikum

- Wähle von Diagrammen nach dem Ziel aus und nicht (nur) nach Tradition oder Neuartigkeit.
- Stelle sicher, dass die Grafiken für jeden zugänglich sind (Farben, Lesbarkeit, ALT-Text).
- Verwende visuelle Kontraste, um wichtige Informationen hervorzuheben.
- Füge aussagekräftige Beschriftungen hinzu.

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Ehrlichkeit zählt

- Zeige wann immer möglich die Verteilung der Rohdaten.
- Schneide Balkendiagramme nicht ab, füge abgeschnittenen Achsen Abstände hinzu.
- Achte auf eine einheitliche Achsenkalierung (insbesondere bei “Small Multiples”).

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- Achte auf eine einheitliche Achsenkalierung (insbesondere bei “Small Multiples”).

Hilfestellung leisten

- Verwende direkte Anmerkungen anstelle von/zusätzlich zu Beschriftungen und Legenden.
- Ordne Daten, entweder nach ihrem Wert oder nach ihrer intrinischen Ordnung.
- Konzentriere dich auf die Hauptaussage und versuche die Datenkomplexität zu reduzieren.
- Decke Informationen Schritt für Schritt auf (falls möglich).

vielem Dank!



cedricscherer.com



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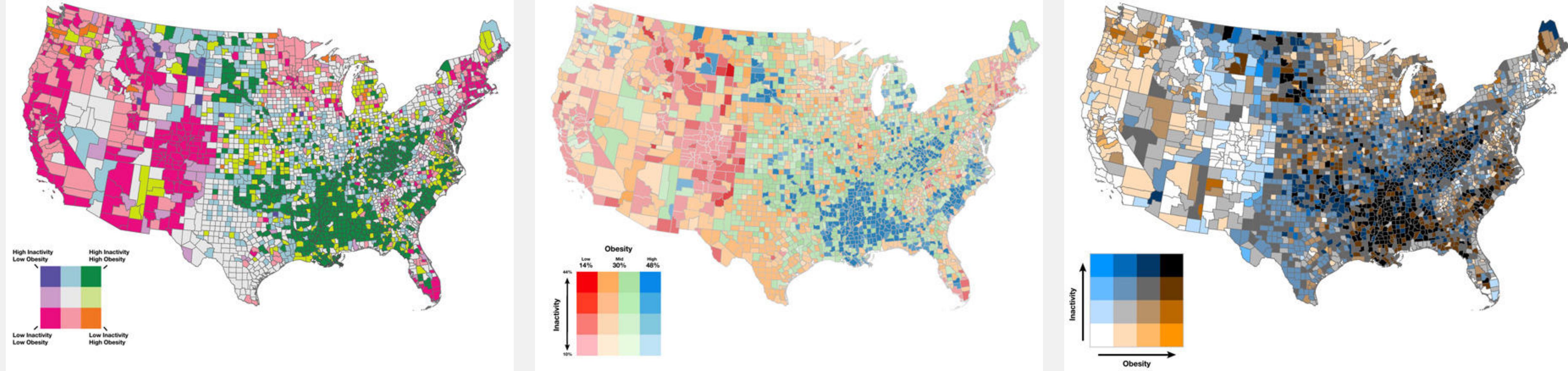
[z3tt](#)



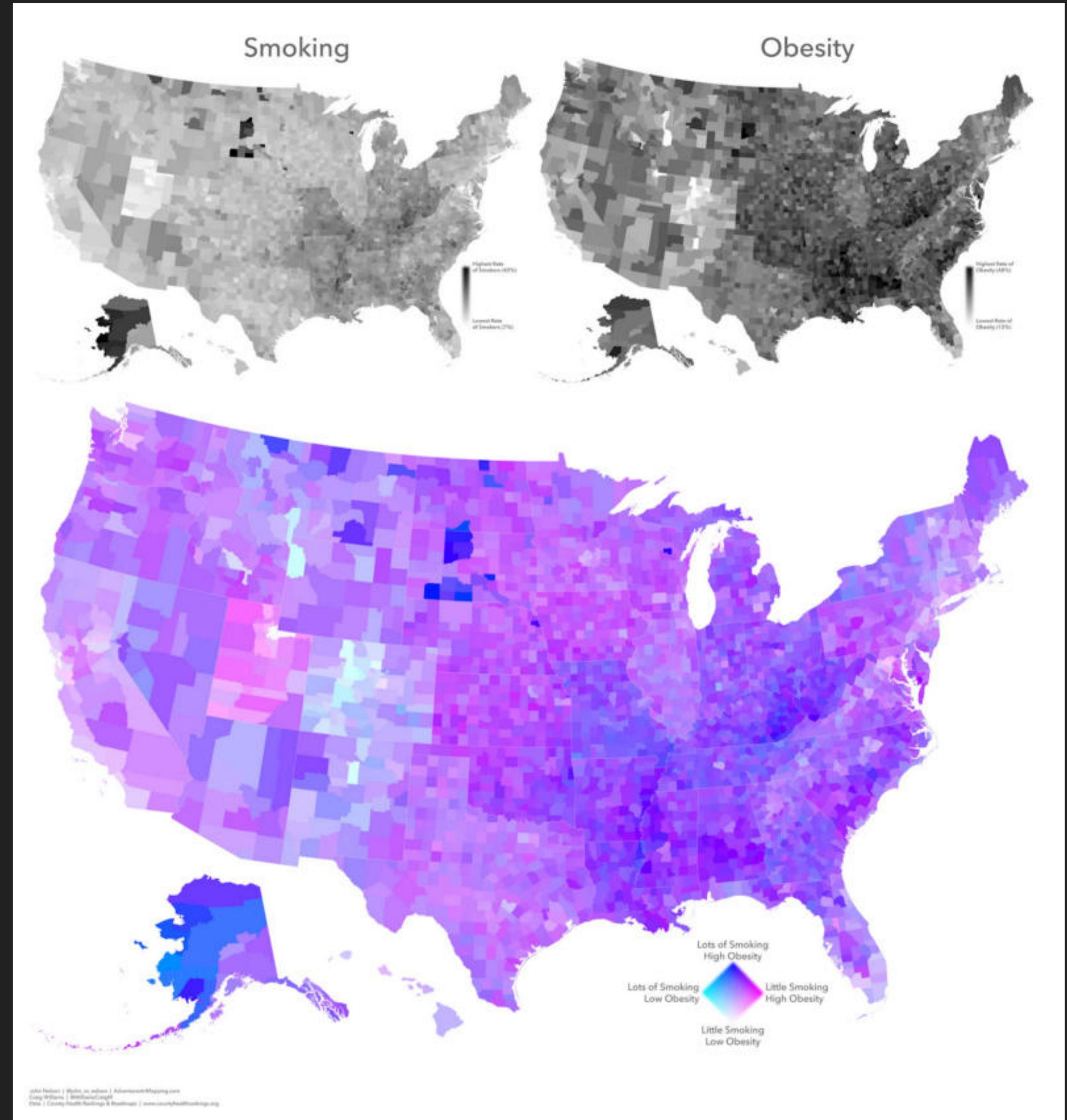
Buy me a coffee

www.buymeacoffee.com/z3tt

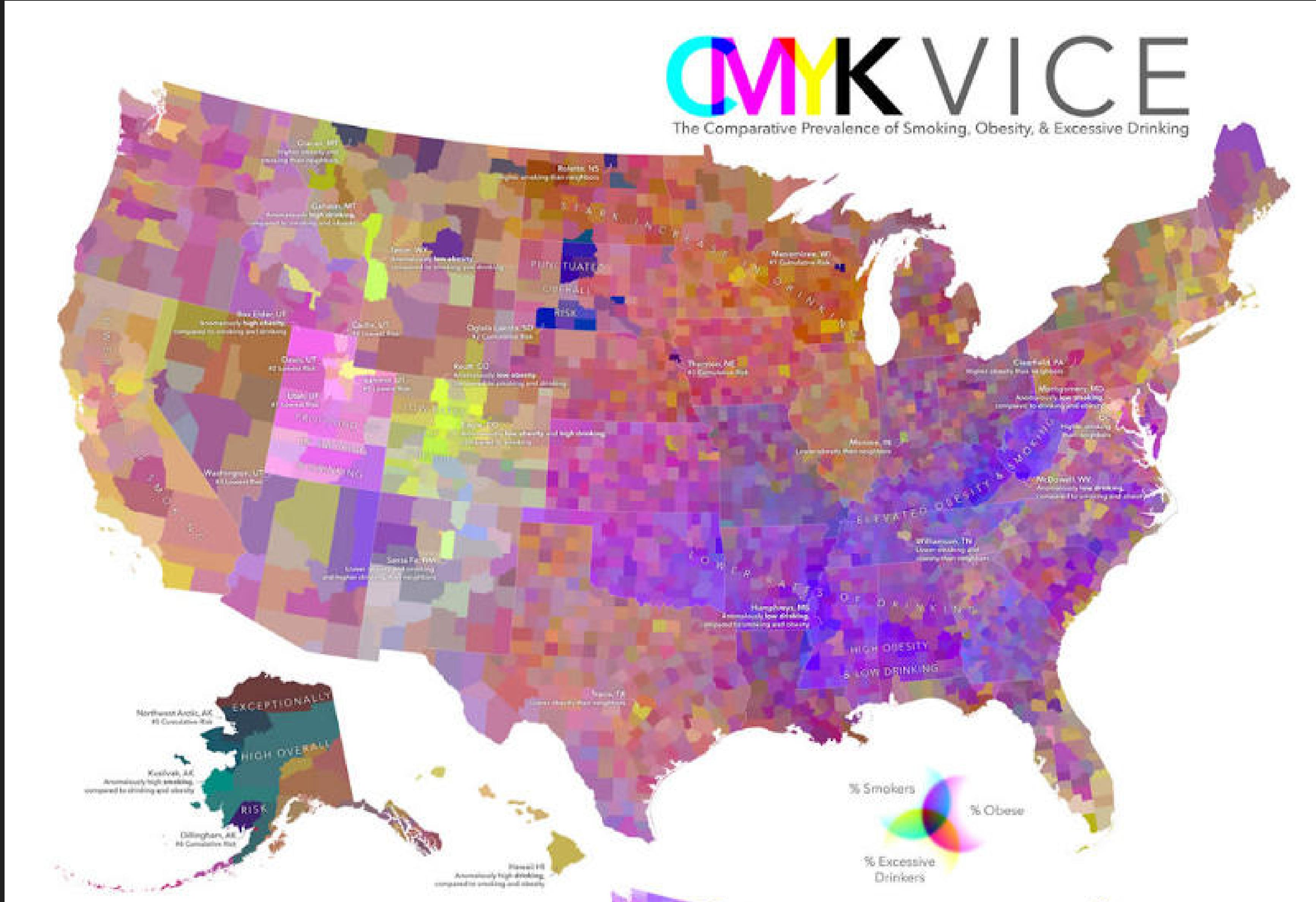
Bivariate Farbpaletten



Strode et al. (2020) ["Operationalizing Trumbo's Principles of Bivariate Choropleth Map Design"](#)

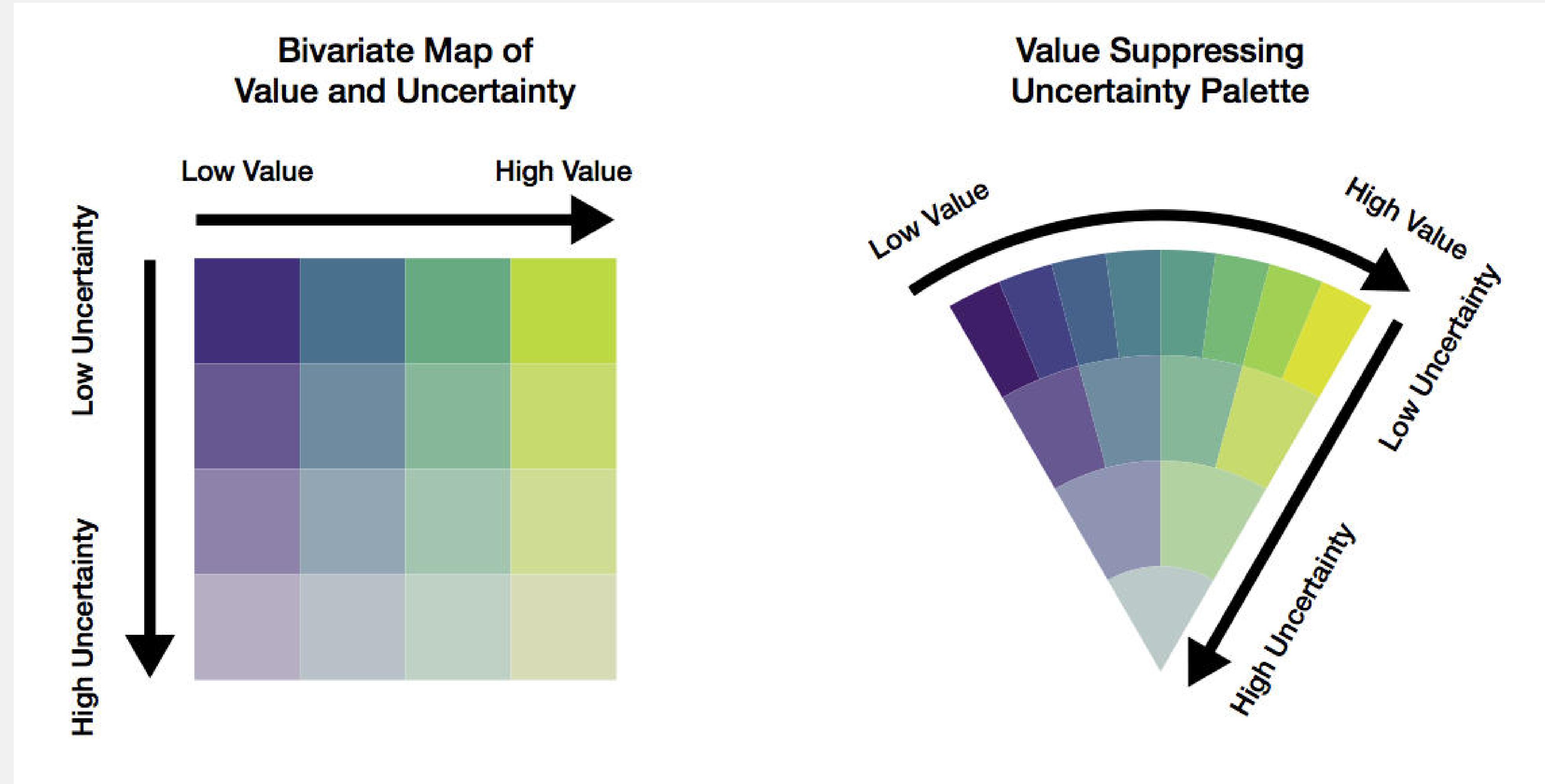


"CMYK Vice Map" von John Nelson & Craig Williams

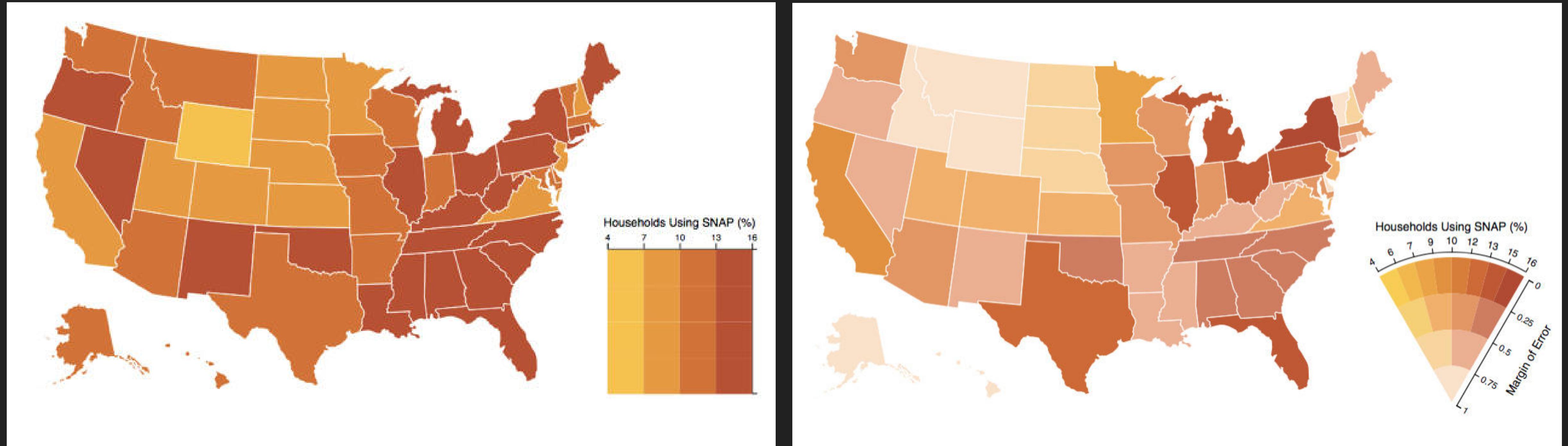


“CMYK Vice Map” von John Nelson & Craig Williams

“Wertunterdrückende Ungewissheitspaletten”



Correll, Moritz & Heer (2018) “Value-Suppressing Uncertainty Palettes”



Correll, Moritz & Heer (2018) ["Value-Suppressing Uncertainty Palettes"](#)