Better data visualizations

Turning complex data into powerful visual stories

Koen Van den Eeckhout - Baryon

All the slides and all the links:

baryon.be/dataviz-resources

Introductions

2004 - 09
Engineering physics

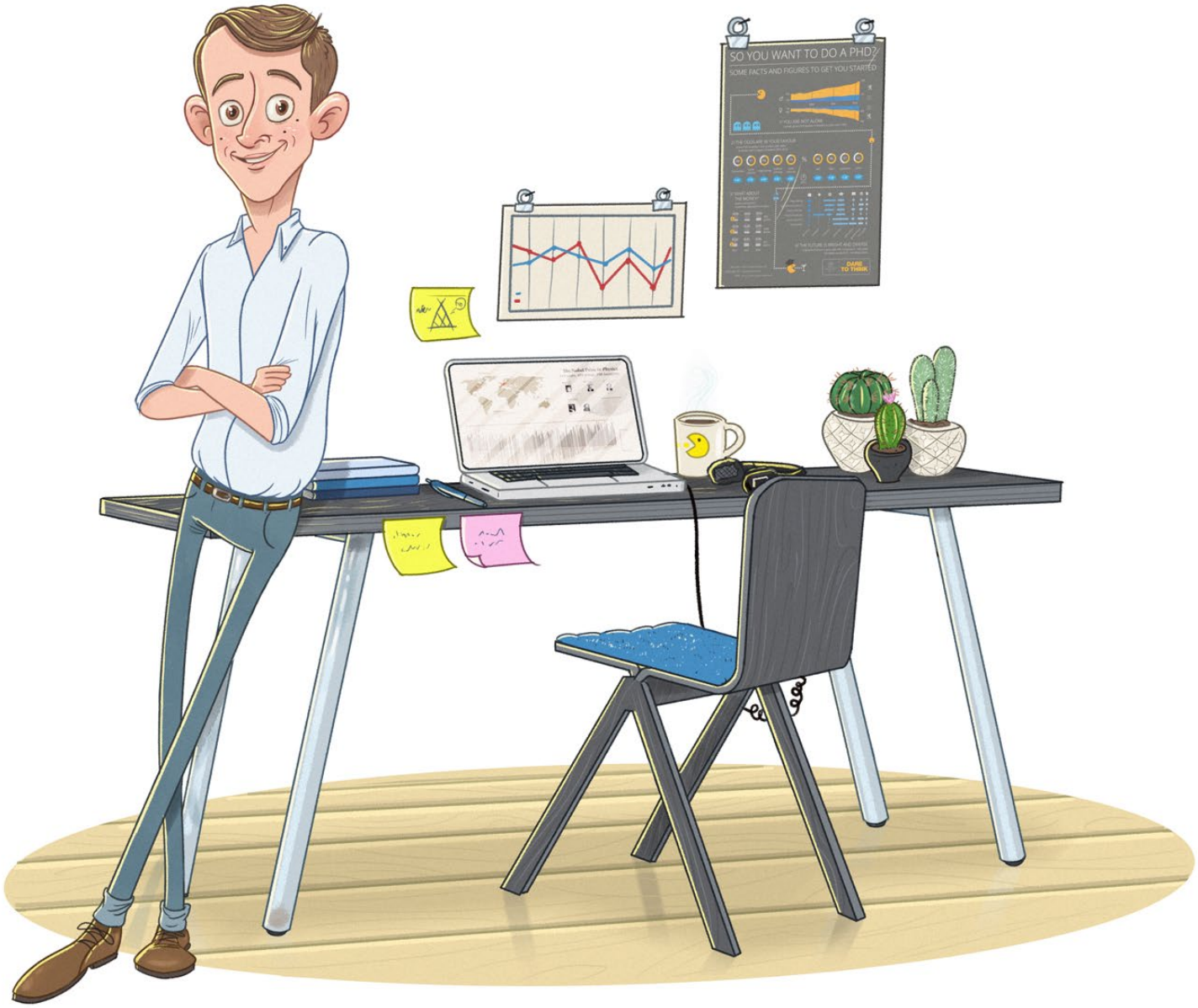
2009 - 13
PhD in physics

2013 - 15
Post-doctoral researcher

2015 - 18
Consultant grants & incentives
Founded Baryon

2019 - now
Full-time information designer
at Baryon

koen@baryon.be



Introduction

The importance of data visualization

Data visualization principles

Signal-to-noise ratio

Encoding

Designing charts

Chart types

Workflow and tools

Components

Case studies

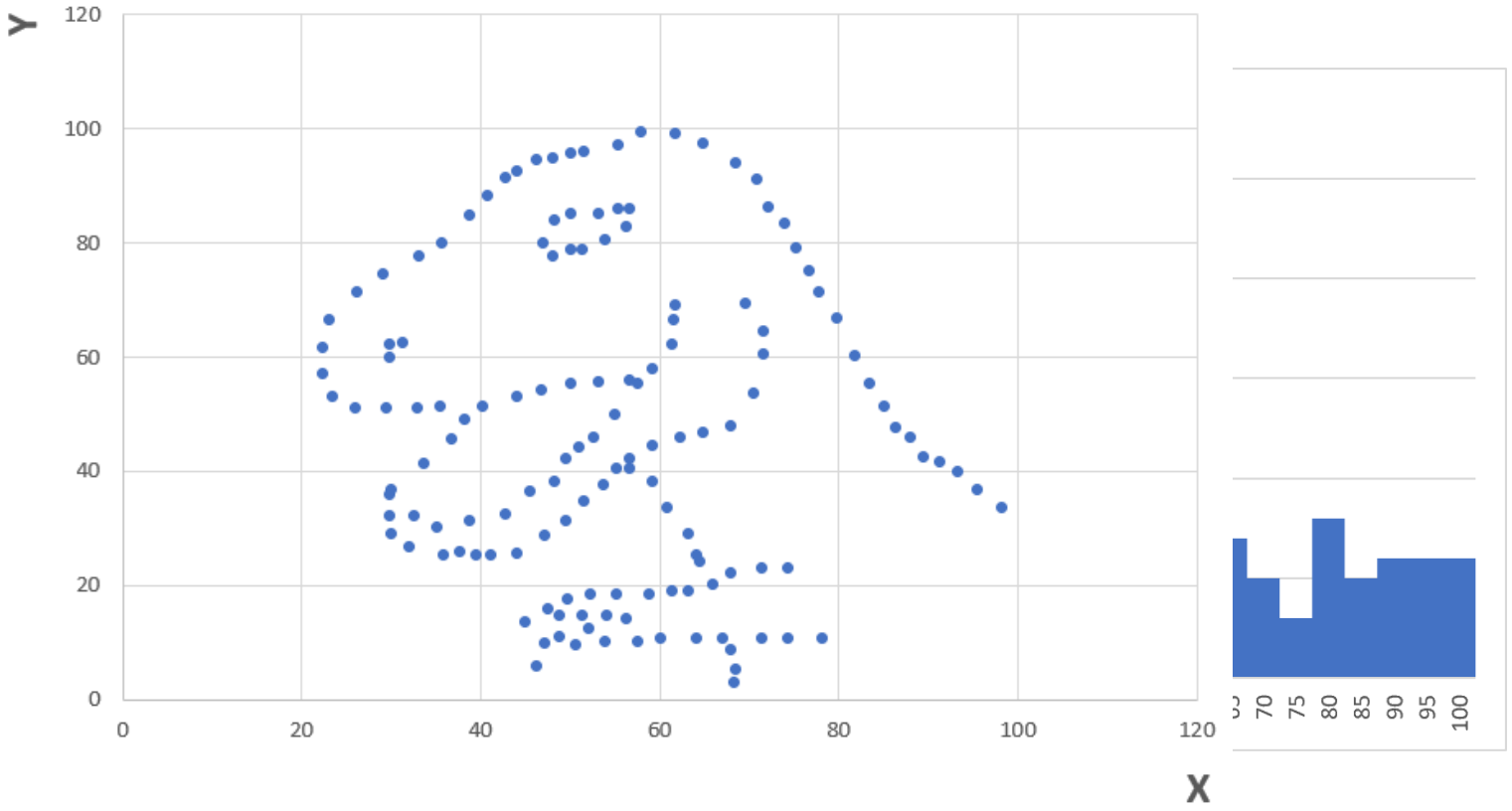
Improving charts

Telling a story

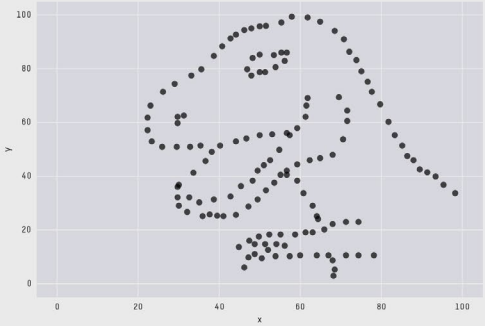
Visualizing uncertainty

x	y
55.3846	97.1795
51.5385	96.0256
46.1538	94.4872
42.8205	91.4103
40.7692	88.3333
38.7179	84.8718
35.641	79.8718
33.0769	77.5641
28.9744	74.4872
26.1538	71.4103
23.0769	66.4103
22.3077	61.7949
22.3077	57.1795
23.3333	52.9487
25.8974	51.0256
29.4872	51.0256
32.8205	51.0256
35.3846	51.4103
40.2564	51.4103
44.1026	52.9487
46.6667	54.1026

```
X Mean:  54.26
Y Mean:  47.83
X SD   :  16.76
Y SD   :  26.93
Corr.  :  -0.06
```



autodeskresearch.com/publications/samestats



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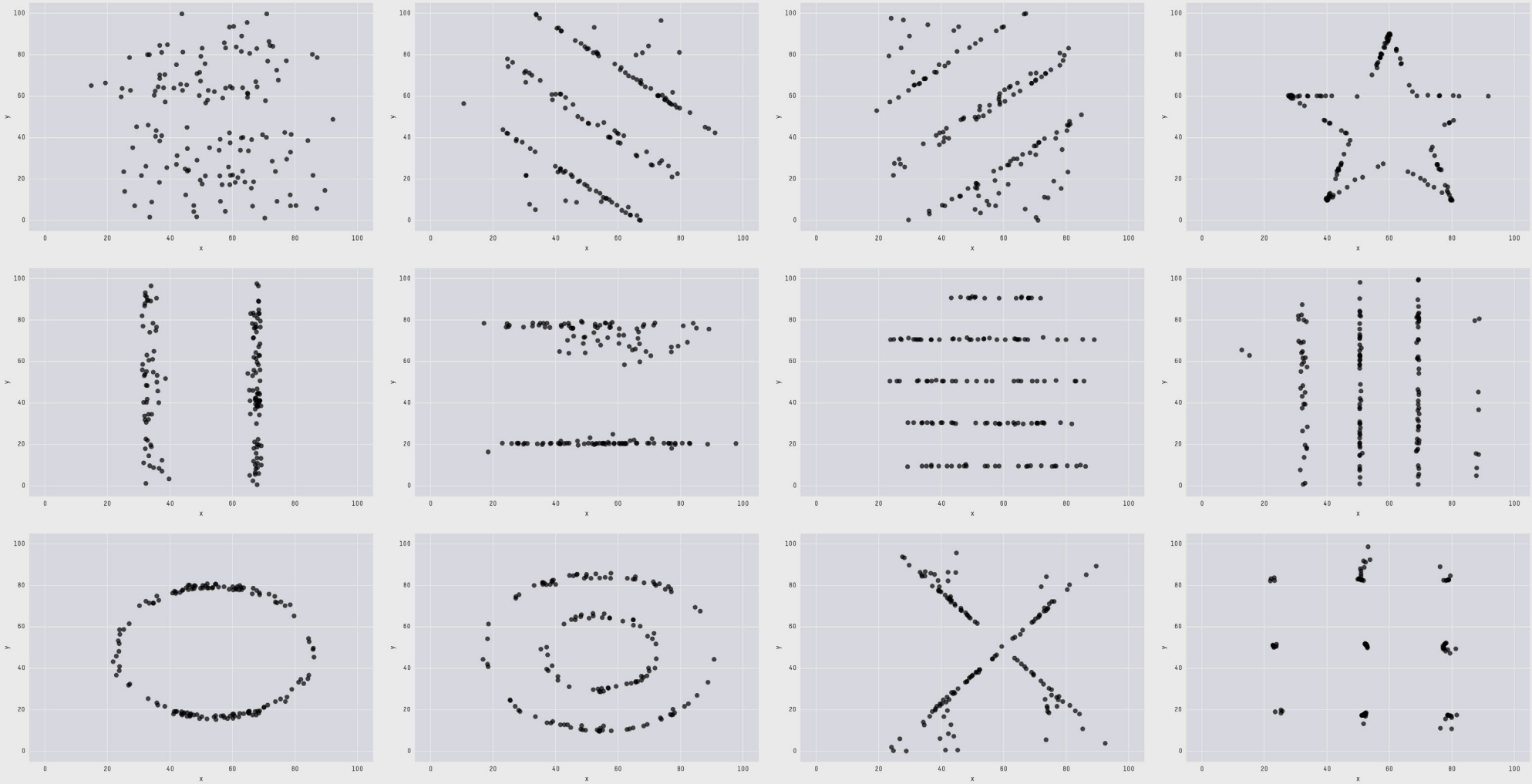


Why visual data communication?

ATTRACTIVE

better at catching the reader's attention

INFORMATION DENSITY

better at summarizing large amounts of information

"All the News That's Fit to Print"

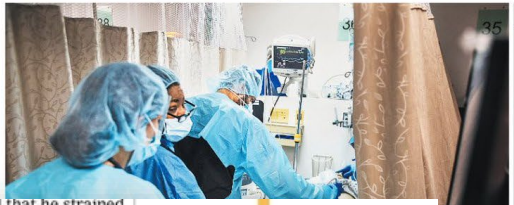
The New York Times

Late Edition

Today, clouds giving way to some sunshine, morning rain, high 63. **Tonight,** clear early, increasing clouds late, low 44. **Tomorrow,** rain, high 52. Weather map appears on Page B16.

VOL. CLXIX . . . No. 58,645 © 2020 The New York Times Company NEW YORK, FRIDAY, MARCH 27, 2020 $3.00

JOB LOSSES SOAR; U.S. VIRUS CASES TOP WORLD



IS FOR THE NEW YORK TIMES

ential cases.

Hospital, sible War

plies Waning, s Soldier On

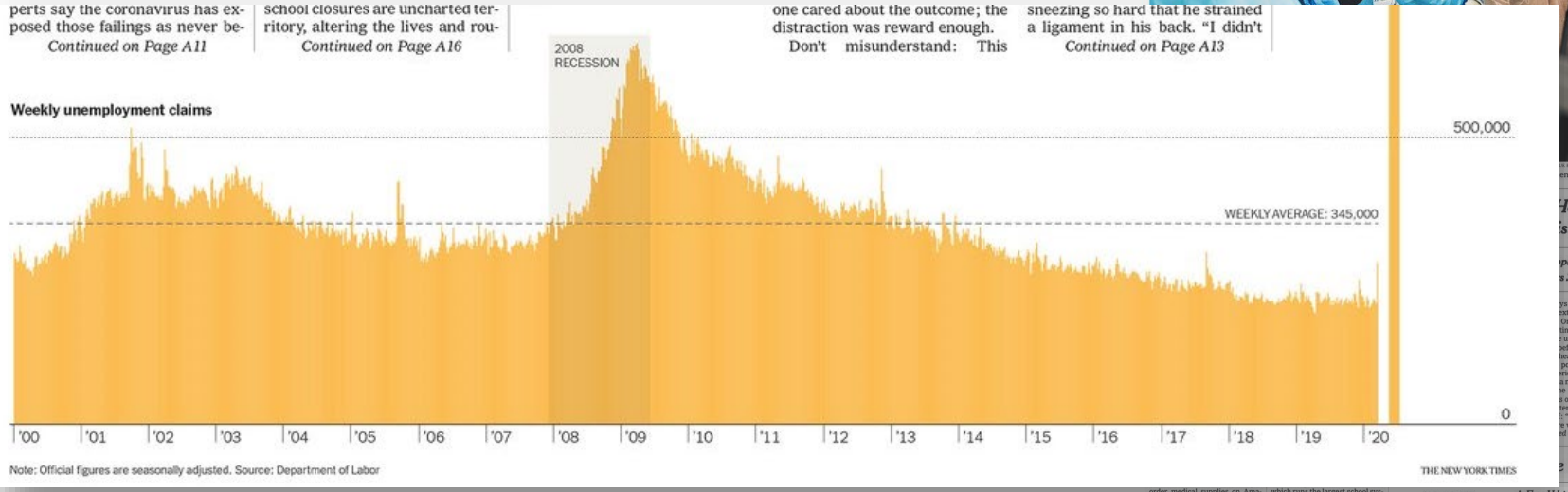
ys arranged one in ext, like a New York One man on a venti- ing for space in the unit. efore paramedics heart attack patient, pointed to beds re- rious emergencies, a newly constructed e suspected virus s our safe area," she er. Then she cor- ." "This is thought to s was really no way d on Page A14

perts say the coronavirus has exposed those failings as never be-
Continued on Page A11

school closures are uncharted territory, altering the lives and rou-
Continued on Page A16

one cared about the outcome; the distraction was reward enough. Don't misunderstand: This

sneezing so hard that he strained a ligament in his back. "I didn't
Continued on Page A13



New Data Shows Staggering Toll of Outbreak

This article is by ***Ben Casselman, Patricia Cohen*** *and* ***Tiffany Hsu.***

More than three million people filed for unemployment benefits last week, sending a collective shudder throughout the economy that is unlike anything Americans have experienced.

The alarming numbers, in a report released by the Labor Department on Thursday, provide some of the first hard data on the economic toll of the coronavirus pandemic, which has shut down whole swaths of American life faster than government statistics can keep track.

Just three weeks ago, barely 200,000 people applied for jobless benefits, a historically low number. In the half-century that the government has tracked applications, the worst week ever, with 695,000 so-called initial claims, had been in 1982.

Thursday's figure of nearly 3.3 million set a grim record. "A large part of the economy just collapsed," said Ben Herzon, executive director of IHS Markit, a business data and analytics firm.

The numbers provided only the first hint of the economic cataclysm in progress. Even comparatively optimistic forecasters expect millions more lost jobs, and with them foreclosures, evictions and bankruptcies. Thousands of businesses have closed in response to the pandemic, and many will never reopen. Some economists say the decline in gross domestic product this year could rival the worst years of the Great Depression.

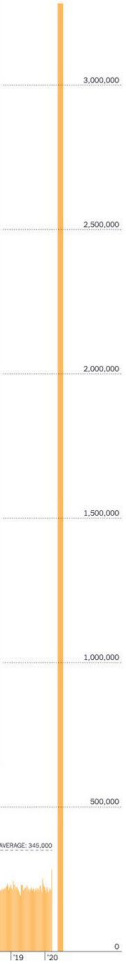
And there was fresh evidence on Thursday of the relentless course of the virus itself. Cases in the United States now exceed 80,000, the most of any nation, even China and Italy, according to a New York Times database. More than 1,000 deaths across the country have been linked to the virus.

At least 160 million people na-
Continued on Page A17

Labeling Regions by Risk

President Trump told governors he planned to classify counties according to the danger of coronavirus infection. Page A11.

Nearly 3.3 million unemployment claims were filed last week, a record number.



e You Out to the Ballgame

game between the New York Gothams and the Cincinnati Greens mattered, but in ineffable ways beyond the columns of wins and losses. It mattered so much that complaints about baseball's slow pace yielded to the universal wish that this game would last forever.

"I could've played into the night," said the redeemed Gothams left fielder Sammy Sosa, who missed part of last season after sneezing so hard that he strained a ligament in his back. "I didn't
Continued on Page A13

order medical supplies on Amazon after its leaders, lacking experience in disaster responses, failed to prepare for the onslaught of patients at its medical centers.

Ever since President Trump came into office, a record high turnover and unfilled jobs have emptied offices across wide sections of the federal bureaucracy. Now, current and former administration officials and disaster experts say the coronavirus has exposed those failings as never be-
Continued on Page A11

which runs the largest school system in the country with more than 1.1 million students, began attempting to teach all students through remote learning this week because schools were closed to slow the spread of the coronavirus.

Shuttering the vast system, which includes 1,800 schools, was a serious challenge for the city, and the large-scale, indefinite school closures are uncharted territory, altering the lives and rou-
Continued on Page A16

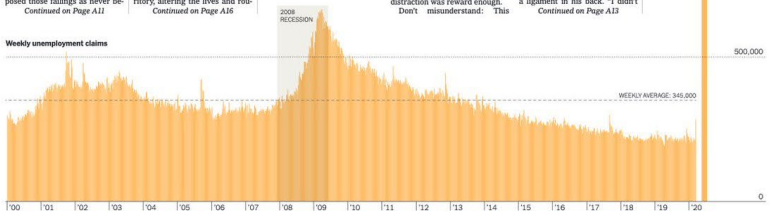
A Fan Writes a Fantasy for Opening Day

By DAN BARRY

Professional baseball greeted a new season this afternoon with an Opening Day game for the ages, an extra-inning masterpiece that vividly unfolded on the sun-dappled field of the imagination. The crack of the bat could almost be heard, the blur of white almost seen, the communal joy nearly felt.

From the moment the first batter tipped his helmet — and a bird flew out — to the walk-off home run by a faltering pinch-hitter, this 11-inning affair redefined what constitutes a perfect game. No one cared about the outcome; the distraction was reward enough.

Don't misunderstand: This



Note: Official figures are seasonally adjusted. Source: Department of Labor THE NEW YORK TIMES

BUSINESS B1-9

Armed With Sewing Machines
With hospitals desperate for masks, people are pulling out their sewing machines to fill the void. PAGE B4

A Gusher Can't Be Contained
A chaotic mismatch between supply and demand for oil means the world is running out of places to store it. PAGE B9

INTERNATIONAL A18-20

Maduro Is Indicted in U.S.
Federal prosecutors accused the Venezuelan president, whom the U.S. no longer recognizes, of participating in a narco-terrorism conspiracy. PAGE A20

Netanyahu Rival Relents
The Israeli prime minister was set to maintain power after his rival reversed course, citing the pandemic. PAGE A19

Brushing Aside a Slaughter
Russia and China, which often revel in grudges against other countries, are employing selective memory to address a massacre that occurred on their border in 1900. PAGE A18

NATIONAL A21-23

New Focus on Health System
The pandemic gives added urgency to a central issue that was already a main talking point for Joseph R. Biden Jr. and other Democrats. PAGE A21

Starting Over on Foster Care
A lawsuit led New Mexico to remake its failing system into one advocates hope will serve as a national model. PAGE A22

SPORTSFRIDAY B11-15

Slow to Embrace a Delay
Athletes question why U.S. Olympic leaders took so long to join calls to postpone the Tokyo Games. PAGE B11

WEEKEND ARTS C1-16

For Pint-Size Paleontologists
Like dinosaurs? Have crayons? Take a peek at two pages reprinted from The New York Times for Kids. PAGE C8

It's Virtually Perfect
Donald Judd's installation, below, at the Gagosian Gallery is impressive, in person or, for now, online. PAGE C13

OBITUARIES A24-25

Chronicler of U.S. History
Richard Reeves's books on Nixon, Clinton and others could be as unsparing as his column. He was 83. PAGE A24

Globetrotters' Dean of Dribble
Fred "Curly" Neal dazzled fans with his ball-handling wizardry in more than 6,000 games. He was 77. PAGE A25

EDITORIAL, OP-ED A26-27

Paul Krugman PAGE A27

Why visual data communication?

ATTRACTIVE

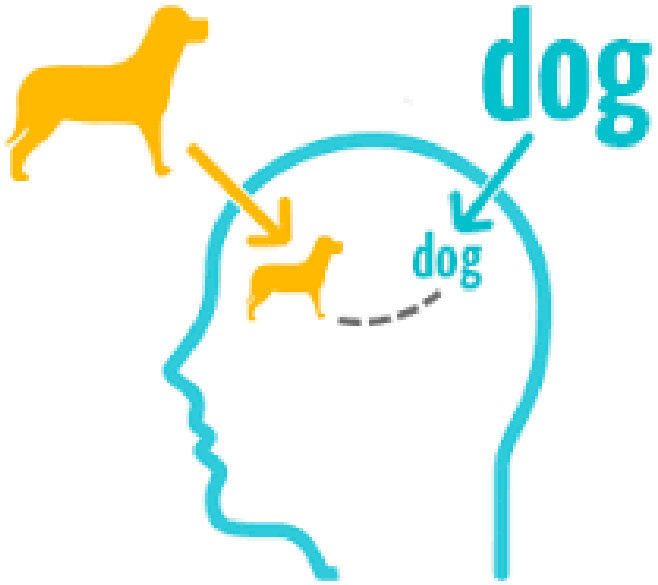
better at catching the reader's attention

INFORMATION DENSITY

better at summarizing large amounts of information

DUAL CODING

better at keeping the reader engaged



DUAL CODING THEORY

a combination of
visual stimuli (pictures) and **verbal stimuli** (words)
stimulates the brain to make connections

SKETCHNOTING

combining simple illustrations
with small amounts of text
= a great way of note-taking

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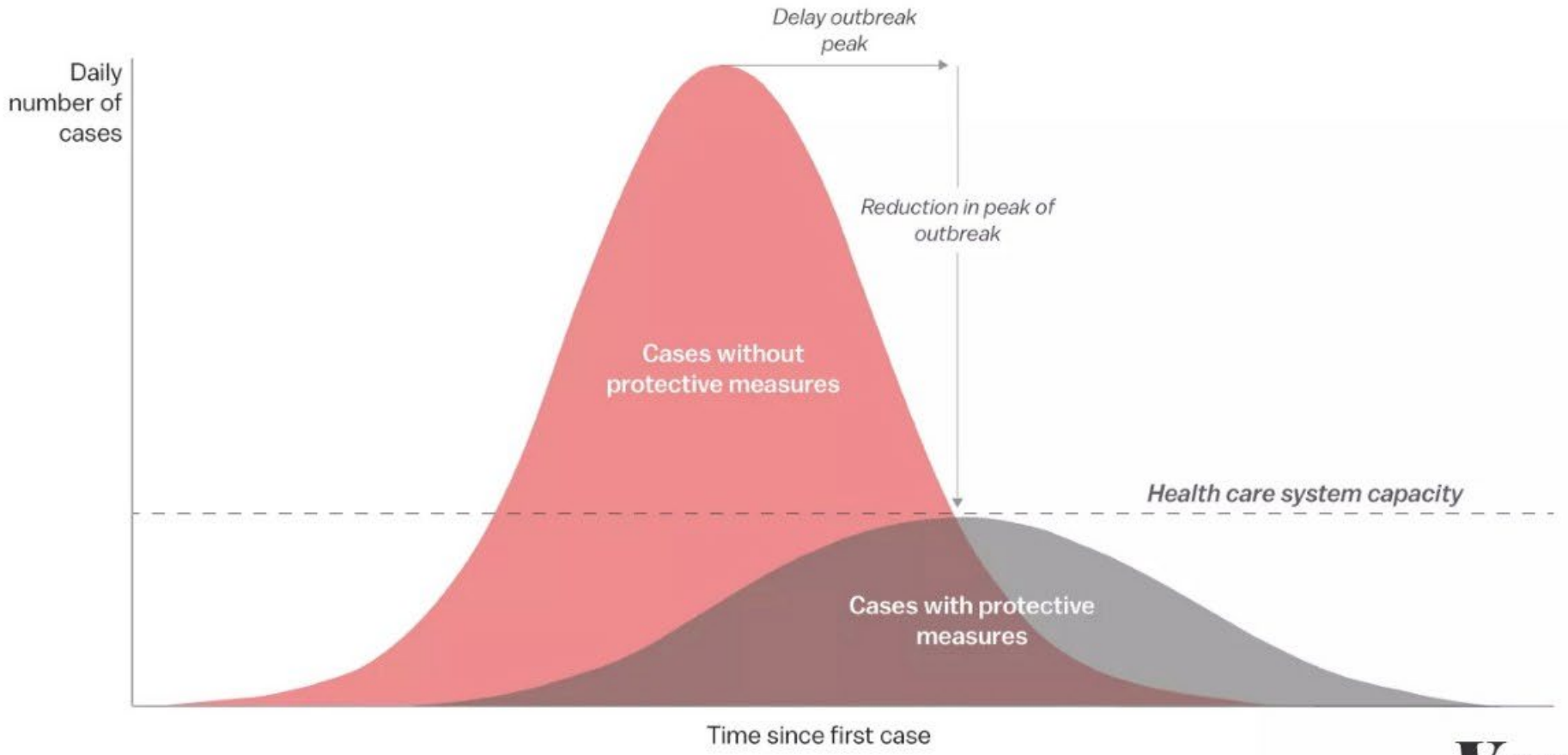
KNOWLEDGE RETENTION

easier to memorize the information

DUAL CODING

better at keeping the reader engaged

Flattening the curve



Source: CDC

Vox

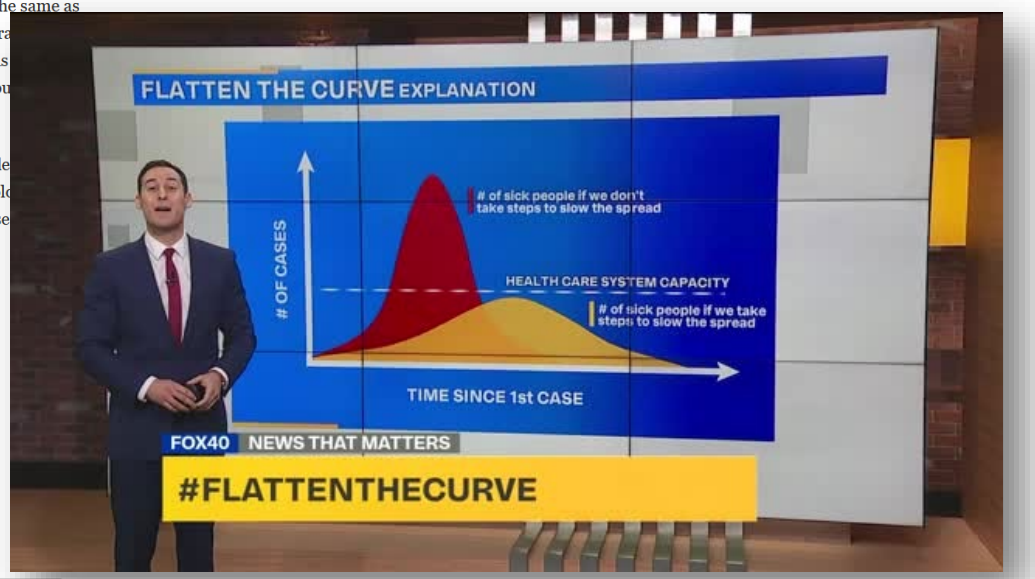
How should I protect myself?

There are some basic precautions you can take, which are the same as what you should be doing every day to stave off other respira diseases. You've seen the guidance before: Wash your hands Cover your nose and mouth when you sneeze. And when you stay home from work or school and drink lots of fluids.

The CDC recommends washing with soap and water for at le seconds after using the bathroom, before eating and after blo nose or sneezing. It also advises not to touch your eyes, nose and to clean objects and surfaces you touch often.

Read more about preparing for coronavirus here.

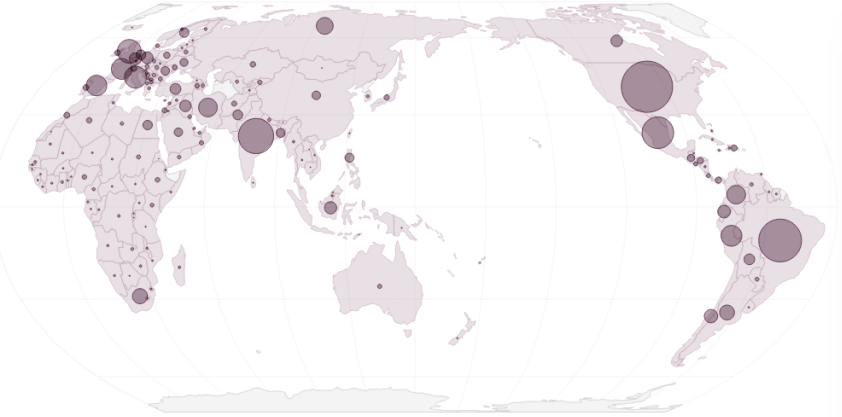
Return to top



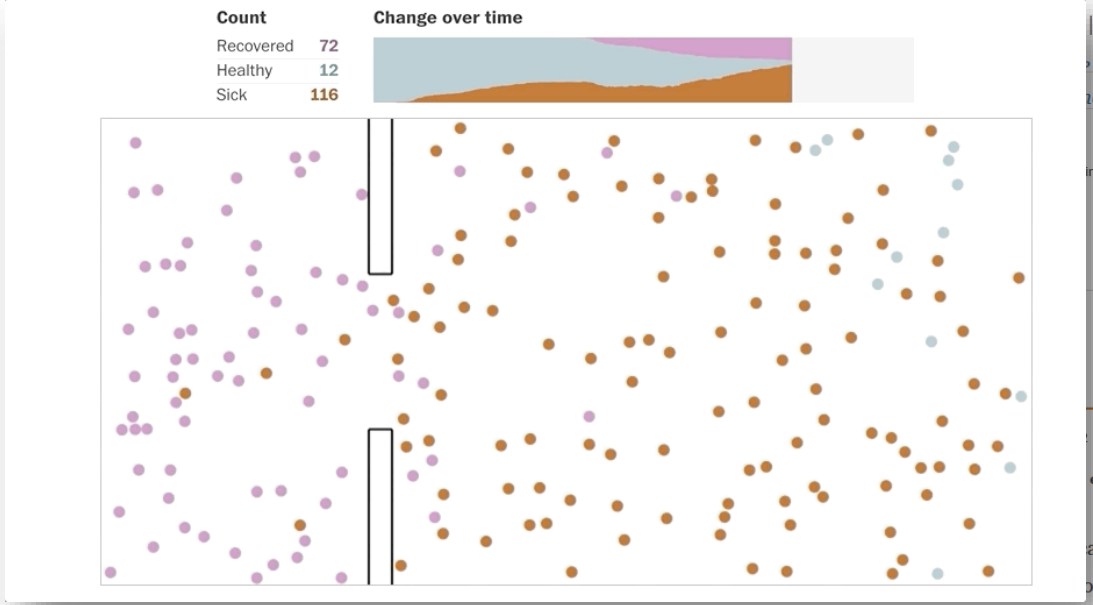
Where has it spread in the world?

Reported deaths 997,000 | Reported cases 33,087,000

Deaths | Cases | Adjusted for population | Raw numbers



Country	Reported cases ▼	Change from Sept. 21 Total	Pct.	Deaths
U.S.	7,082,976	▲272,069	+4%	204,370
India	6,074,702	▲587,122	+11%	95,542
Brazil	4,732,309	▲187,680	+4%	141,741
Russia	1,154,299	▲49,251	+4%	20,299
Colombia	813,056	▲47,980	+6%	25,488
Peru	800,142	▲31,247	+4%	32,142
Mexico	730,317	▲29,737	+4%	76,430



Health

Why outbreaks like coronavirus spread exponentially, and how to "flatten the curve"

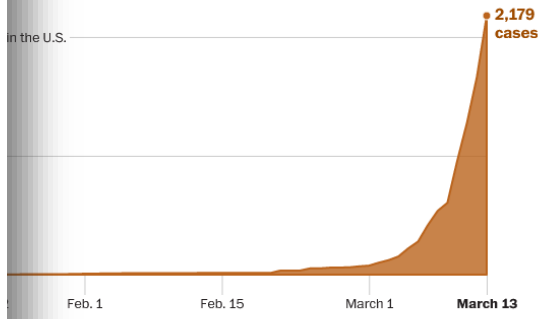
By Harry Stevens March 14, 2020

PLEASE NOTE

The Washington Post is providing this story for free so that all readers have access to this important information about the coronavirus. For more free stories, sign up for our daily Coronavirus Updates newsletter.

After the first case of covid-19, the disease caused by the new strain of coronavirus, was announced in the United States, reports of further infections trickled in slowly. Two months later, that trickle has turned into a steady current.

[Lea en español | Leggi in italiano | اقرأ هذا المقال بالعربية | Lire en | 日本語で読む | به فارسی بخوانید | Leia em português | no русски | Lesen Sie auf Deutsch | Lees in het ds | Prečítajte si po Slovensky | বাংলায় পড়ুন | हिंदी में पढ़ें]

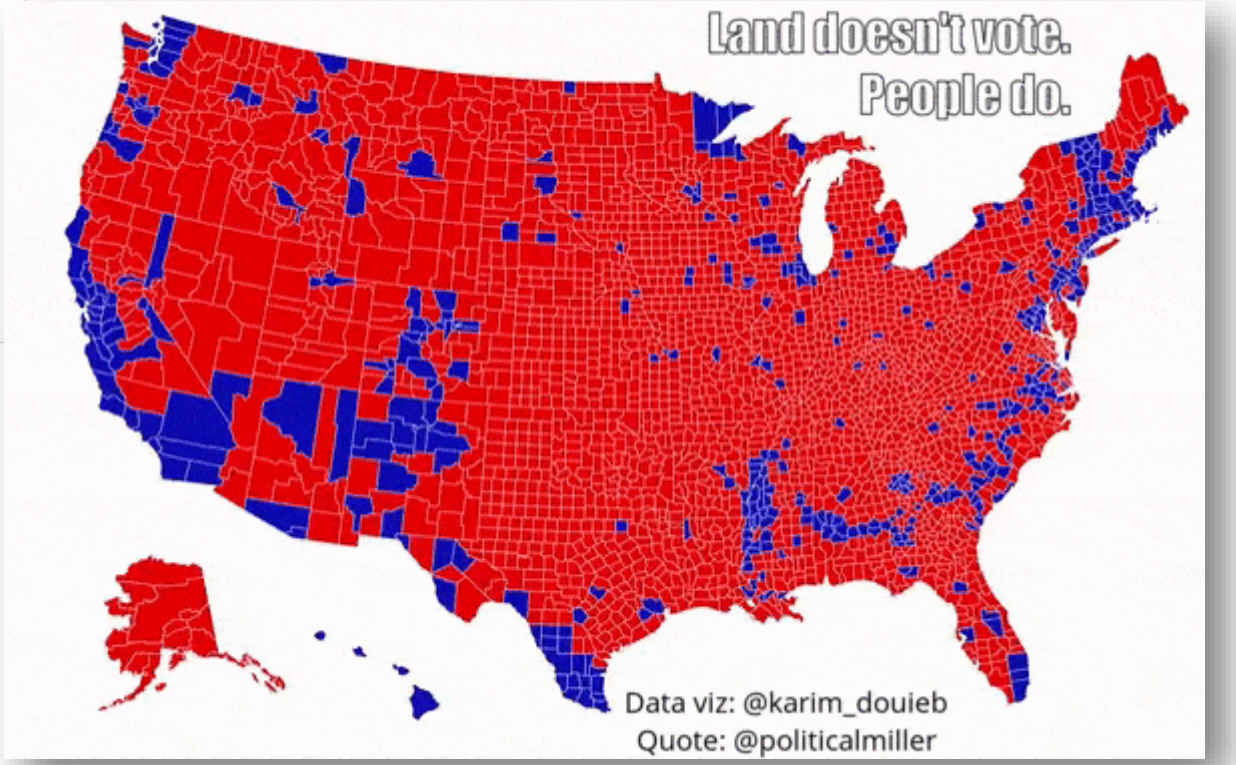


explore the number of cases over time.

alled **exponential curve** has experts worried. If the of cases were to continue to double every three days, there would be about a hundred million cases in the United States by May.

Donald J. Trump
@realDonaldTrump

6:05 AM · Oct 1, 2019



A good chart shows the data,

a great chart tells a story.

Cecil Powell
Facts

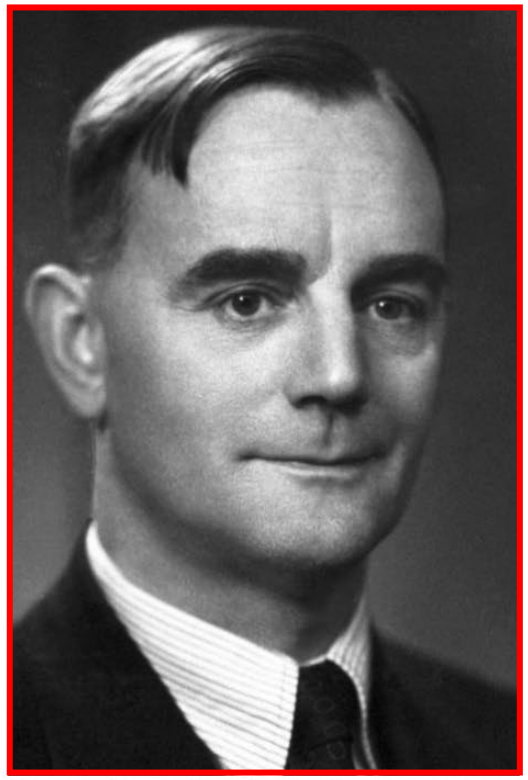


Photo from the Nobel Foundation archive.

Cecil Frank Powell
The Nobel Prize in Physics 1950

Born: 5 December 1903 Tonbridge, United Kingdom

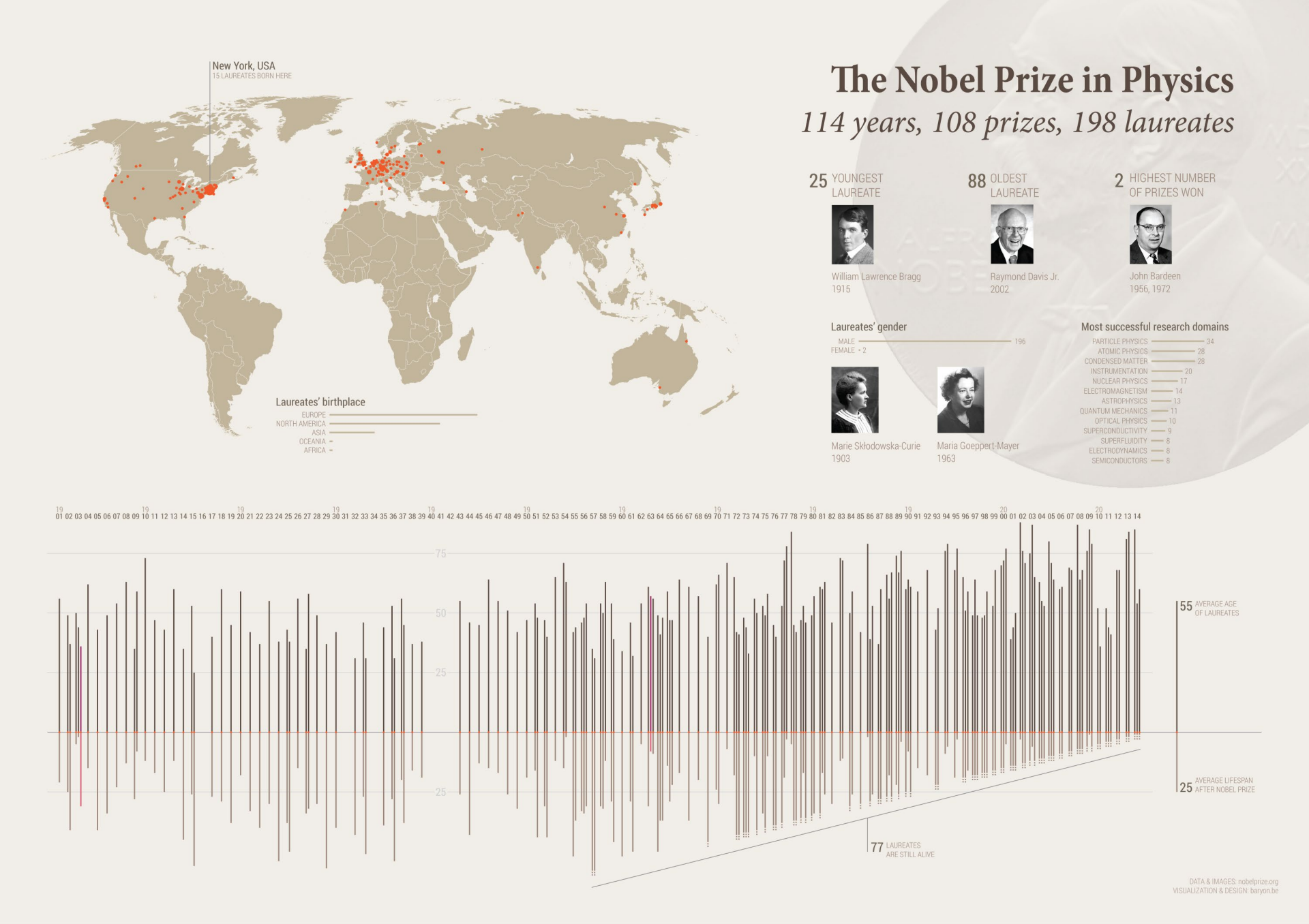
Died: 9 August 1969, Italy

Affiliation at the time of the award: Bristol University, United Kingdom

Prize motivation: "for his development of the photogr method of studying nuclear processes and his discove regarding mesons made with this method."

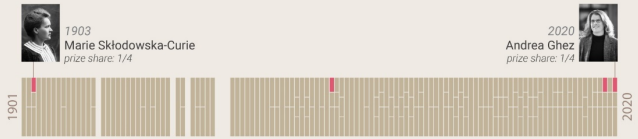
Prize share: 1/1

full name
year of award
date of birth
place of birth
date of death
prize share
picture
--
gender



https://baryon.be/nobelprize

Medicine
210 men, 12 women (5.4%)

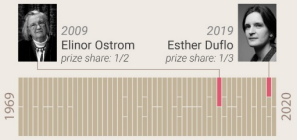


Physics
212 men, 4 women (1.9%)

Chemistry
179 men, 7 women (3.8%)

Literature
101 men, 16 women (13.7%)

Peace
90 men, 28 organisations, 17 women (12.6%)



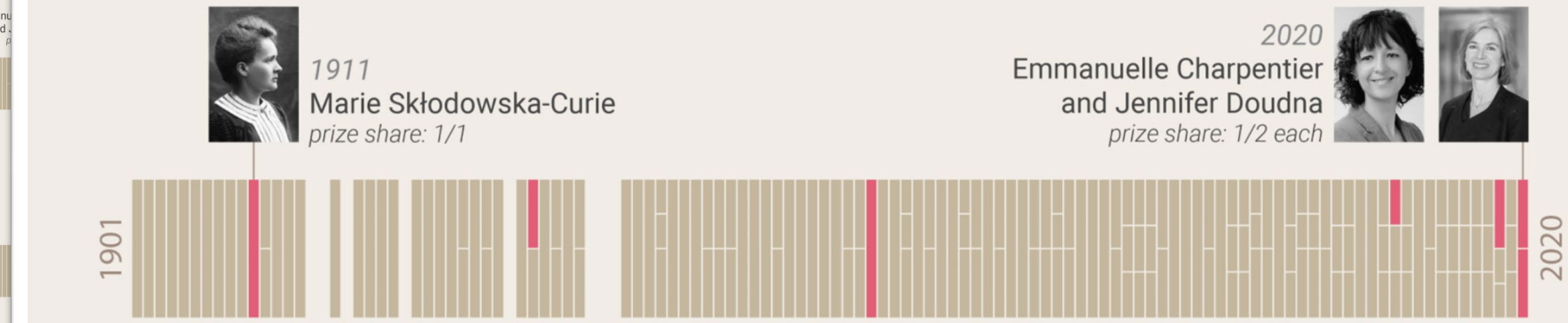
Economics
84 men, 2 women (2.3%)

Women of the Nobel Prize

The Nobel Prize exists since 1901. In those 120 years, the Prize was awarded 876 times to a man, but only 58 times to a woman. 2009 was a record year, with 5 women winning a Prize.

In 2020, 4 women received the Prize: Andrea Ghez won the Physics Prize for the discovery of a super-massive compact object at the centre of our galaxy, Emmanuelle Charpentier and Jennifer Doudna the Chemistry Prize for the development of a method for genome editing (CRISPR), and Louise Glück won the Nobel Prize in Literature.

Source: nobelprize.org
Infographic design: Koen Van den Eeckhout (@koen_vde | www.baryon.be)



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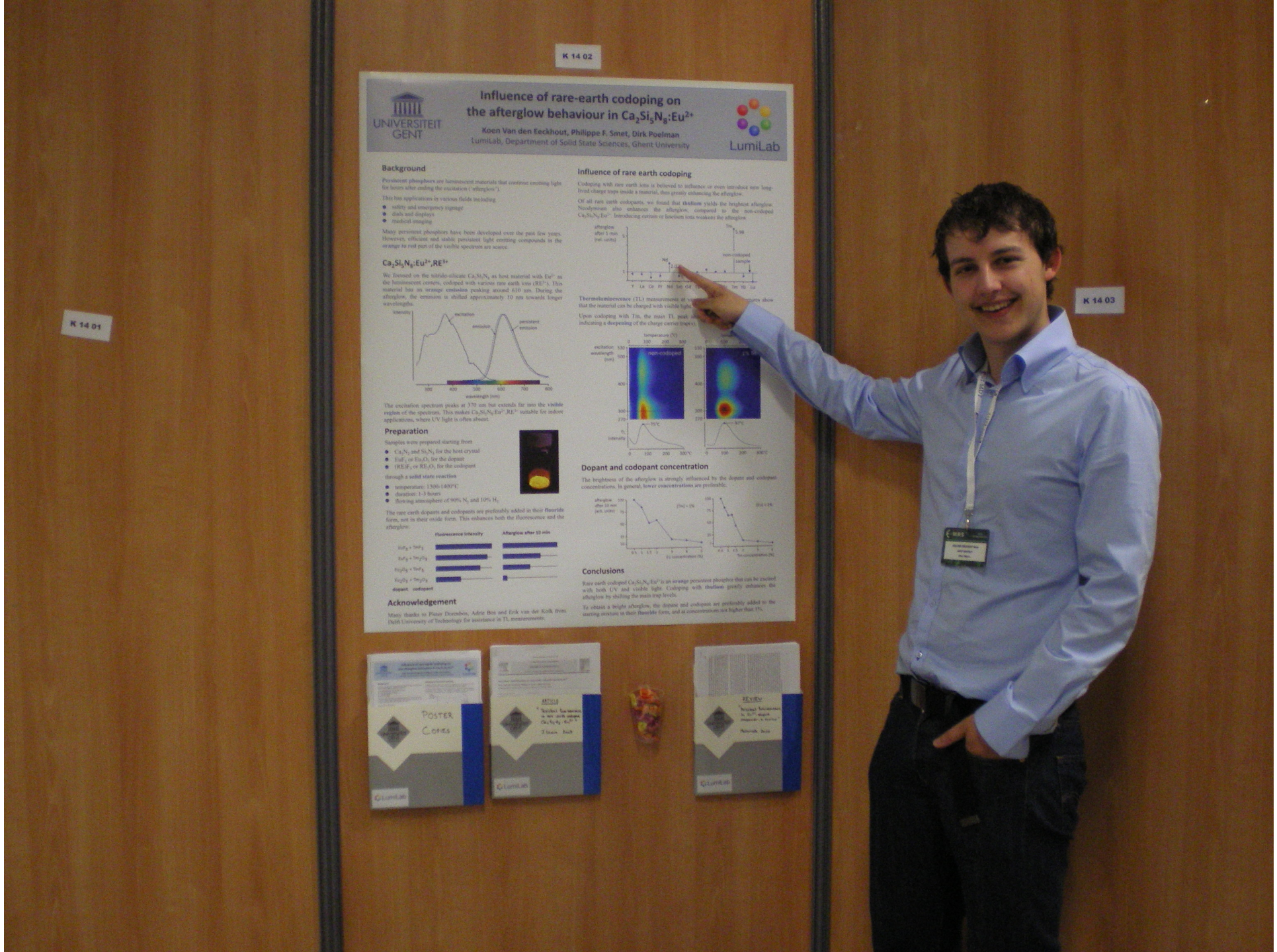
K 14 02
K 14 01
K 14 03
UNIVERSITEIT GENT
Influence of rare-earth codoping on the afterglow behaviour in $Ca_2Si_5N_8:Eu^{2+}$
Koen Van den Eeckhout, Philippe F. Smet, Dirk Poelman
LumiLab, Department of Solid State Sciences, Ghent University
LumiLab
Background
Influence of rare earth codoping
Preparation
Dopant and codopant concentration
Conclusions
Acknowledgement
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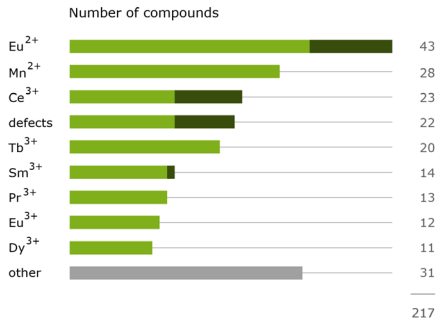
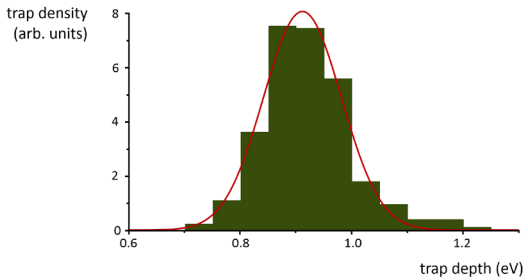
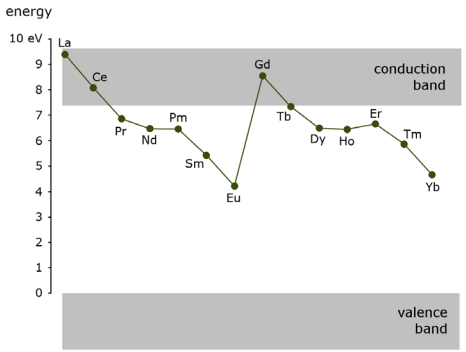
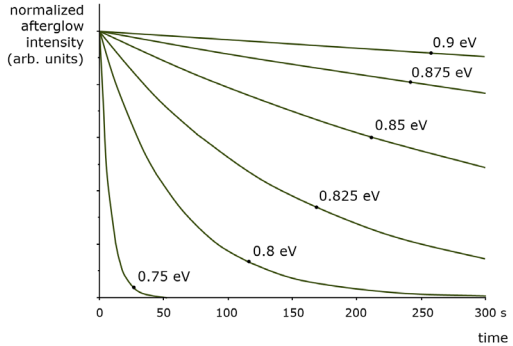
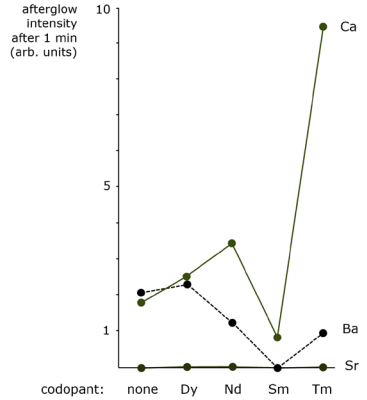
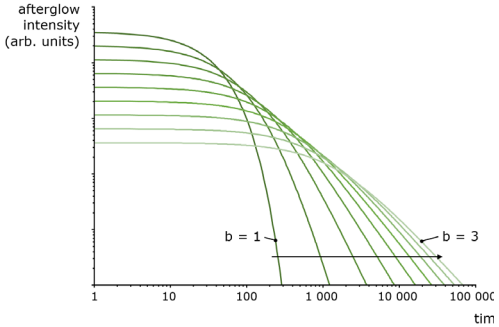

Number of compounds
Eu2+ 43
Mn2+ 28
Ce3+ 23
defects 22
Tb3+ 20
Sm3+ 14
Pr3+ 13
Eu3+ 12
Dy3+ 11
other 31
217

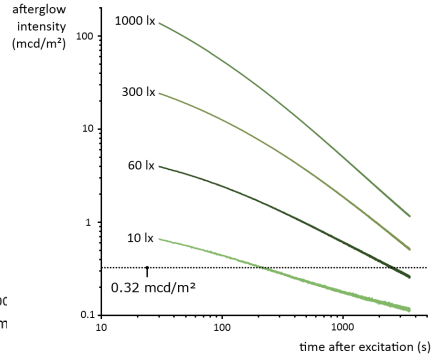

trap density
(arb. units)
trap depth (eV)

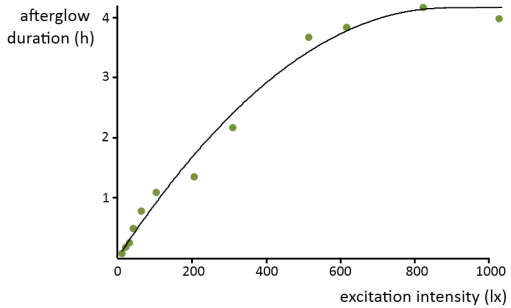

energy
10 eV
La
Ce
Pr
Nd
Pm
Sm
Eu
Gd
Tb
Dy
Ho
Er
Tm
Yb
conduction band
valence band

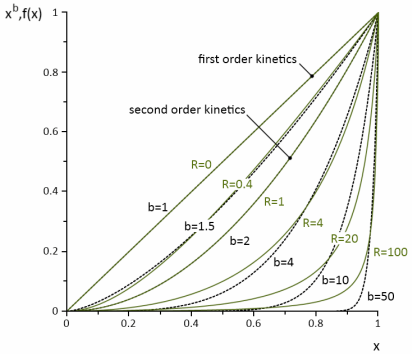

normalized
afterglow
intensity
(arb. units)
0.9 eV
0.875 eV
0.85 eV
0.825 eV
0.8 eV
0.75 eV
time

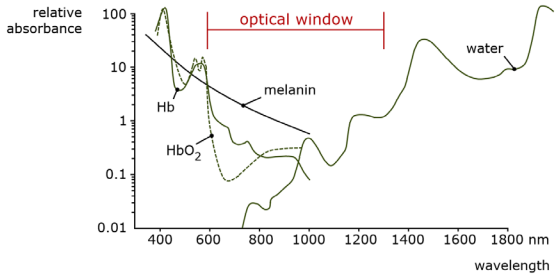

afterglow
intensity
after 1 min
(arb. units)
Ca
Ba
Sr
codopant: none Dy Nd Sm Tm

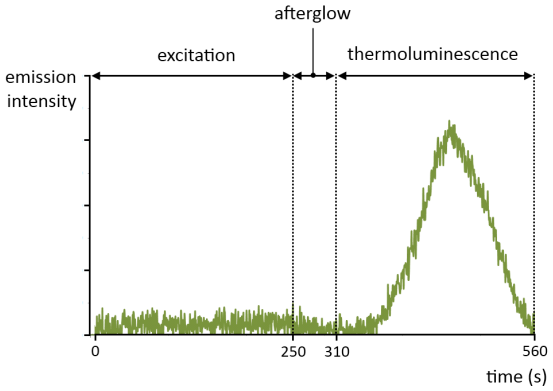

afterglow
intensity
(arb. units)
b = 1
b = 3

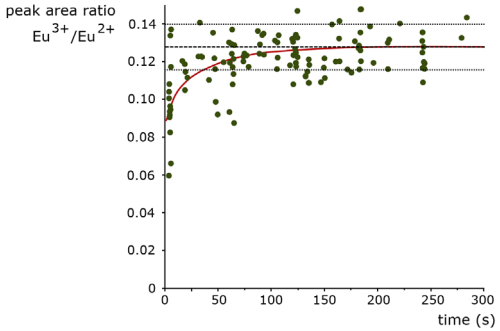

afterglow
intensity
(mcd/m²)
1000 lx
300 lx
60 lx
10 lx
0.32 mcd/m²
time after excitation (s)

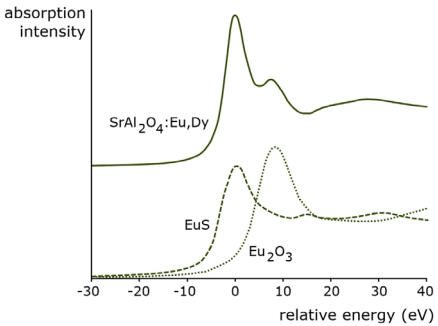

afterglow
duration (h)
excitation intensity (lx)

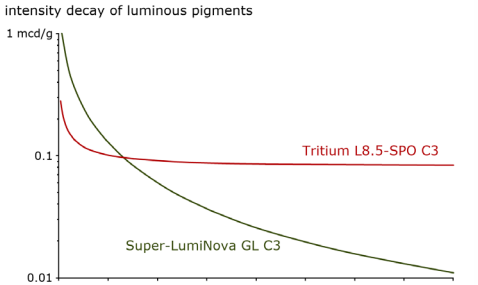

x^b,f(x)
first order kinetics
second order kinetics
R=0
R=0.4
R=1
R=4
R=20
R=100
b=1
b=1.5
b=2
b=4
b=10
b=50
x

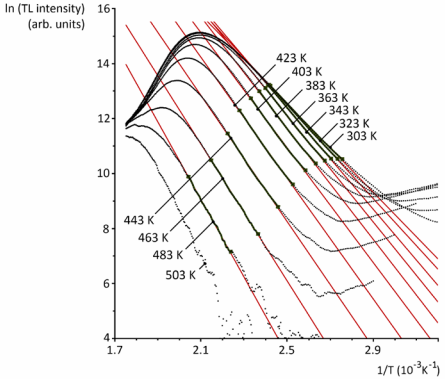

relative
absorbance
optical window
water
melanin
Hb
HbO2
wavelength


afterglow
excitation
thermoluminescence
emission
intensity
0
250
310
560
time (s)


peak area ratio
Eu3+/Eu2+
time (s)


absorption
intensity
SrAl2O4:Eu,Dy
EuS
Eu2O3
relative energy (eV)


intensity decay of luminous pigments
1 mcd/g
Tritium L8.5-SPO C3
Super-LumiNova GL C3
8 hours


ln (TL intensity)
(arb. units)
423 K
403 K
383 K
363 K
343 K
323 K
303 K
443 K
463 K
483 K
503 K
1/T (10-3K-1)

What is a good data visualization?

Group exercise (20 minutes)

You will be divided into 4 **break-out groups**

Each group receives 8 **data visuals to discuss**

As a group, choose your **most** and **least favorite data visual** and explain **why**

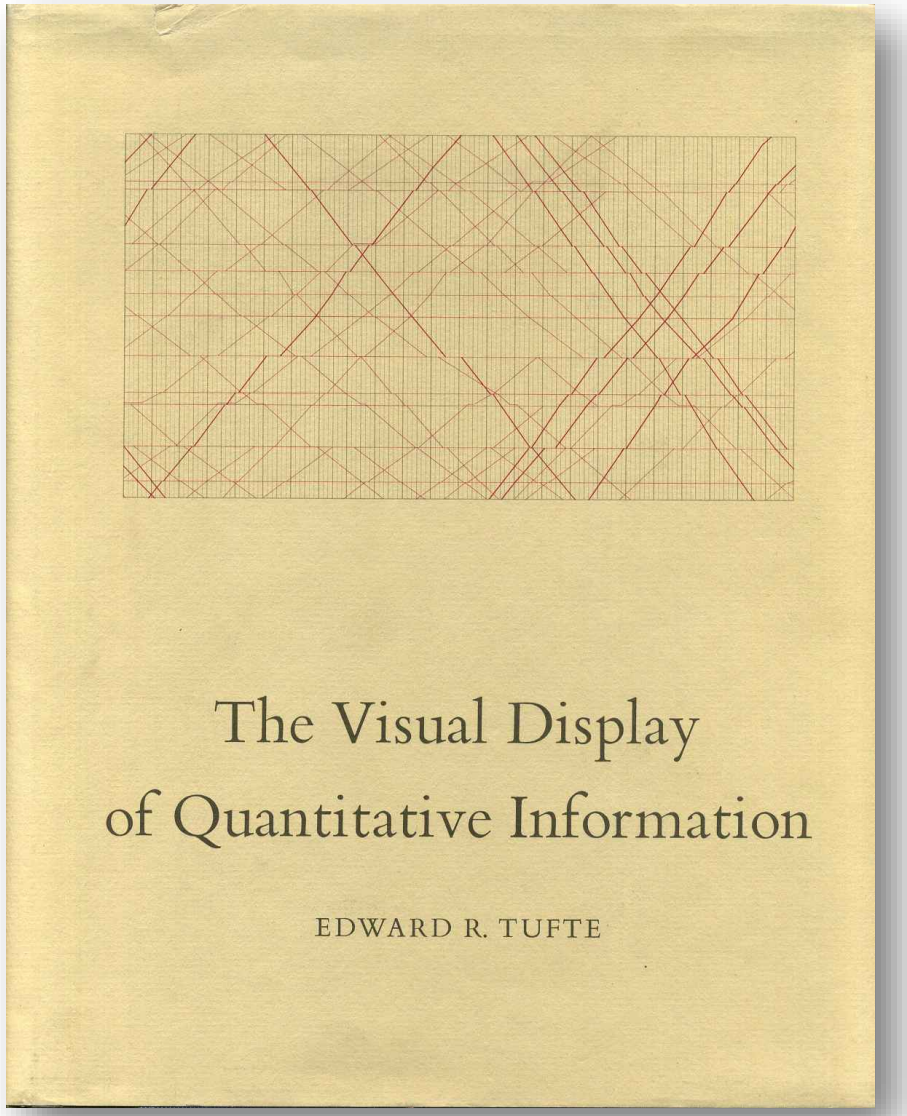
baryon.be/breakout

What is a good data visualization?

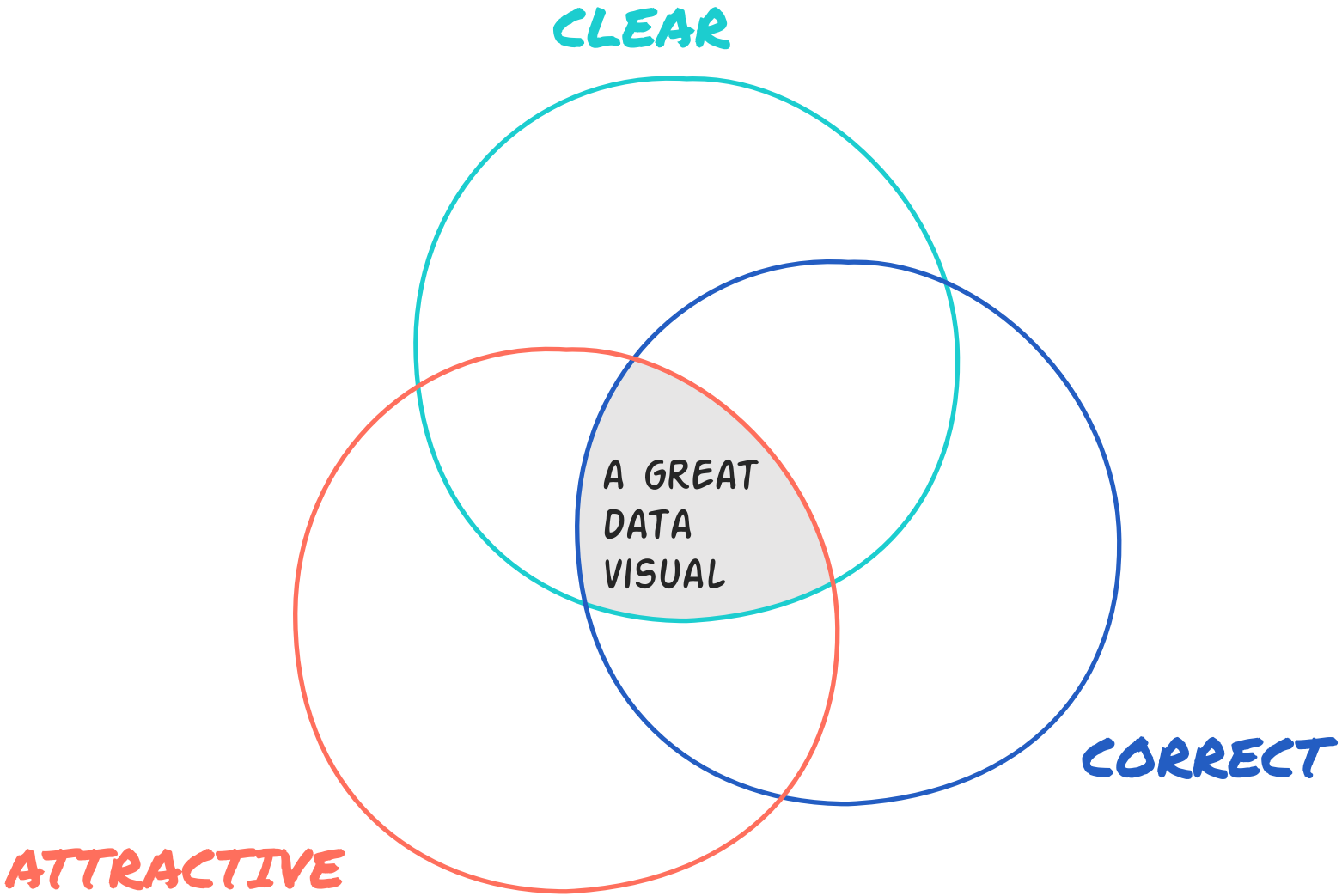
Group discussion

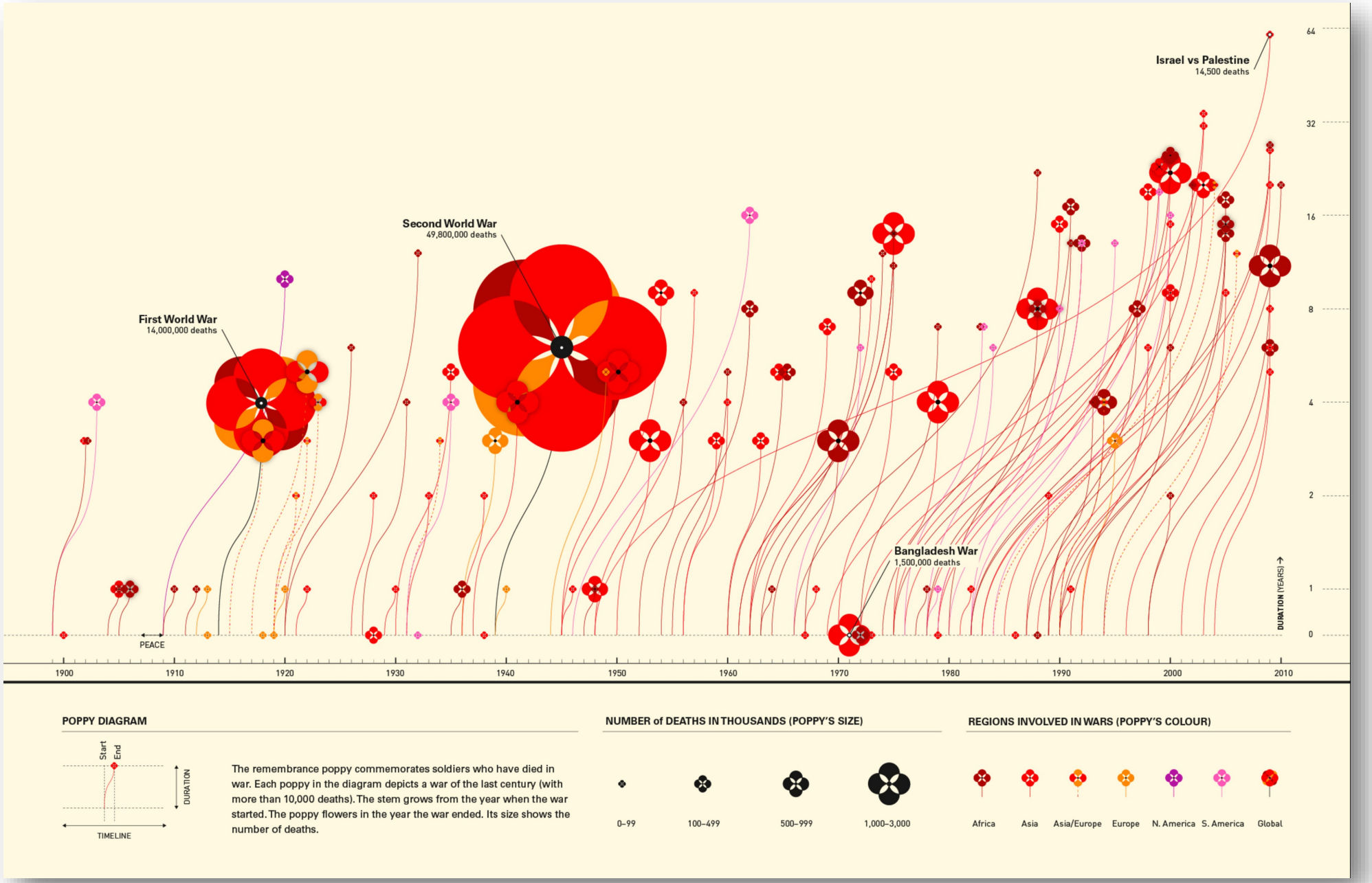
Whimsical board

Clear, correct, and attractive



"Excellence in statistical graphics consists of complex ideas communicated with **clarity**, **precision**, and **efficiency**."


CLEAR
A GREAT DATA VISUAL
CORRECT
ATTRACTIVE

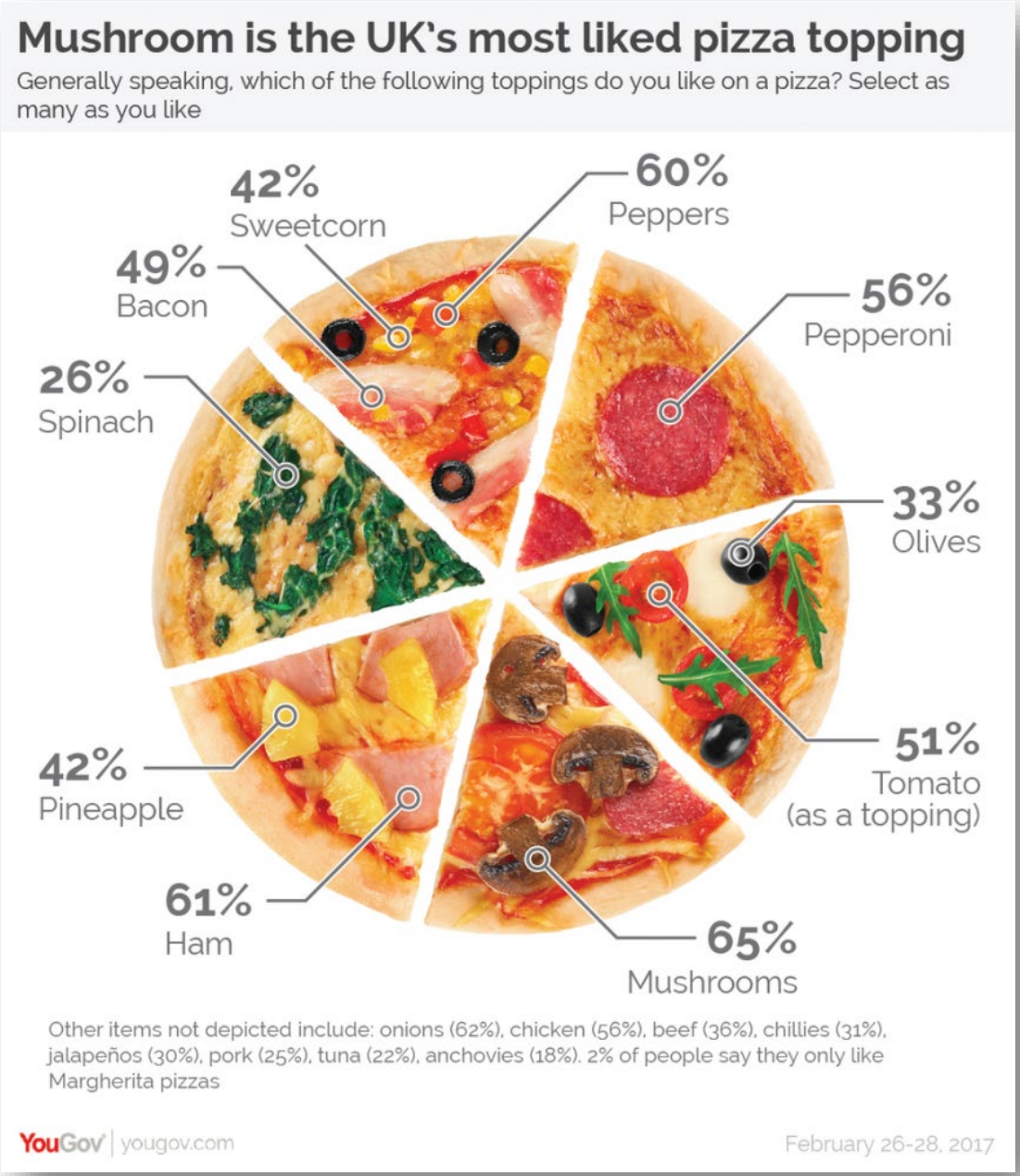


COMPLICATED DATA ART

~~clear~~

correct

attractive



BEAUTIFUL
BUT WRONG

clear

~~correct~~

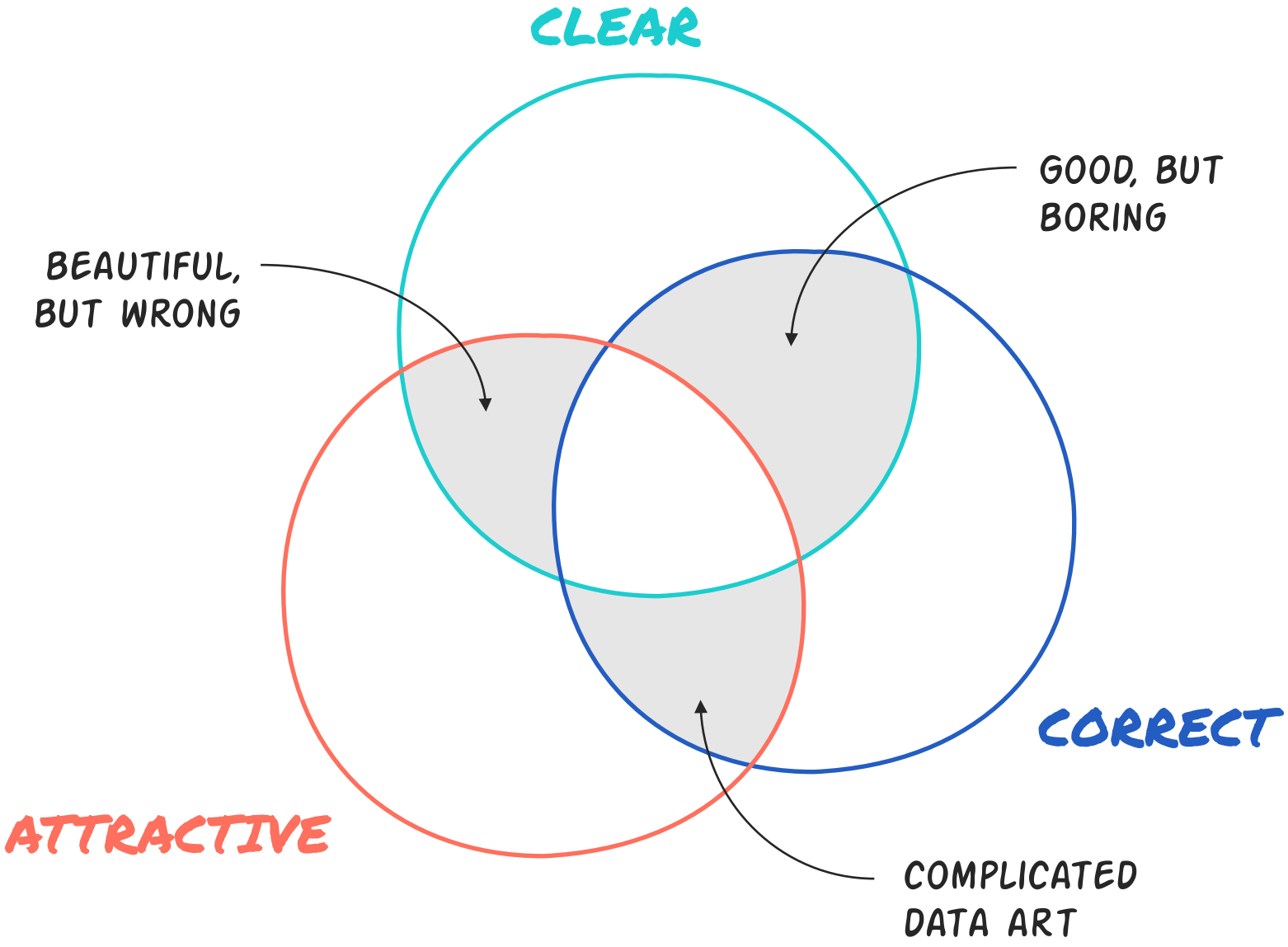
attractive

GOOD,
BUT BORING

clear

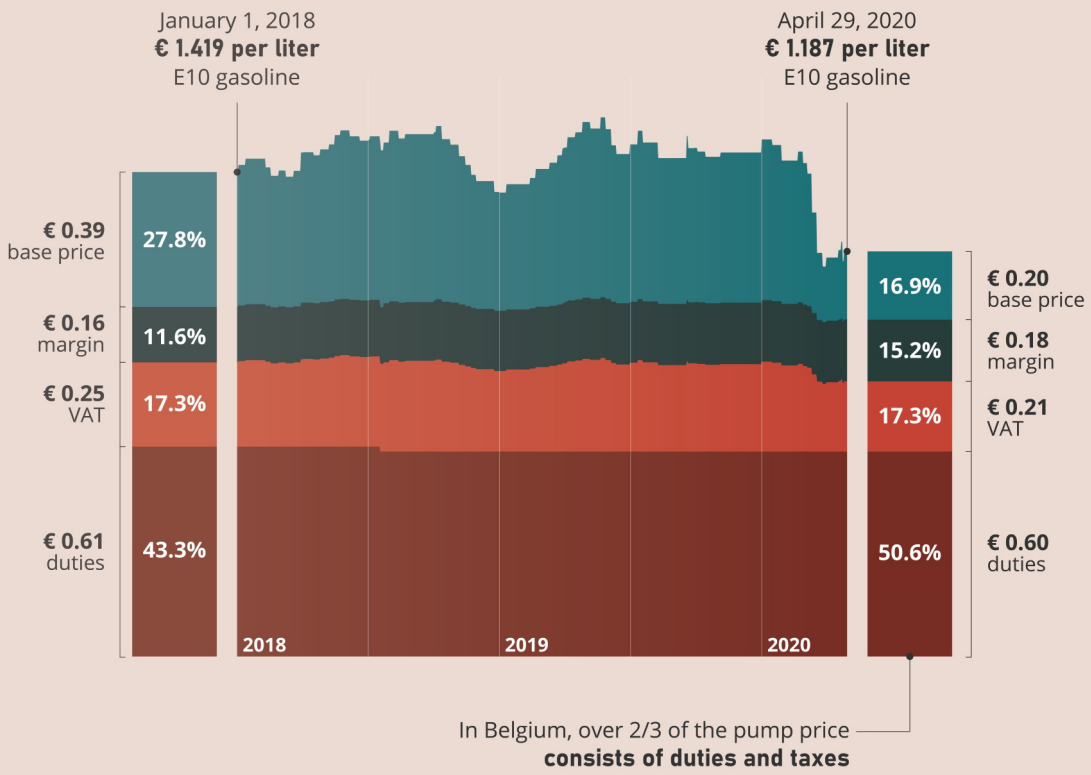
correct

~~attractive~~


CLEAR
GOOD, BUT BORING
BEAUTIFUL, BUT WRONG
CORRECT
ATTRACTIVE
COMPLICATED DATA ART

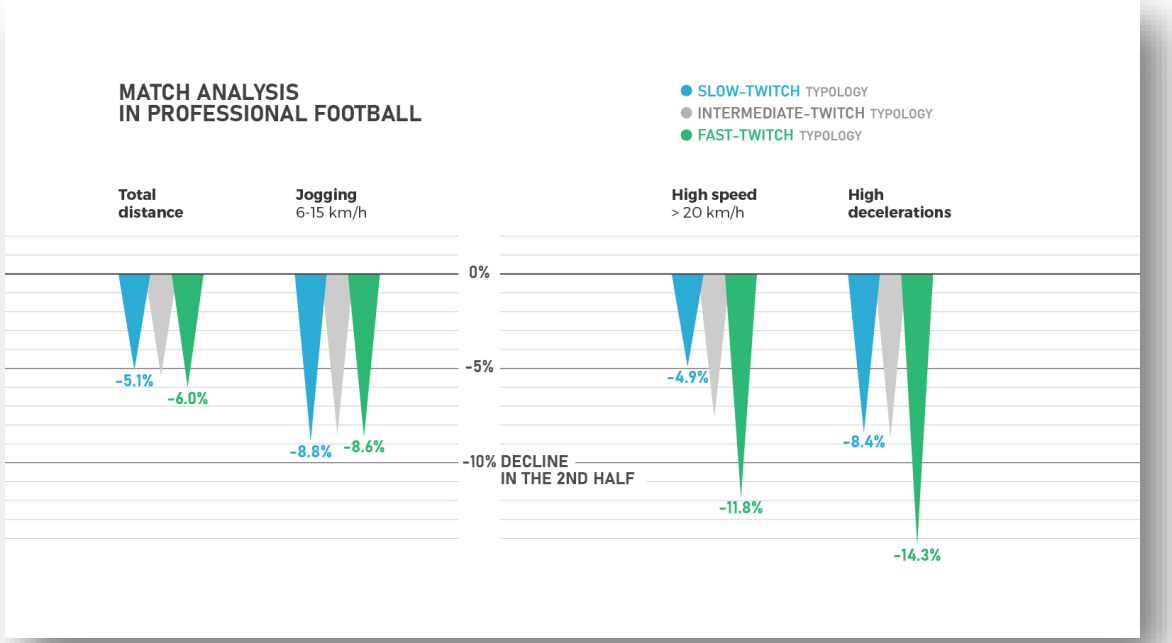
Oil Time Low

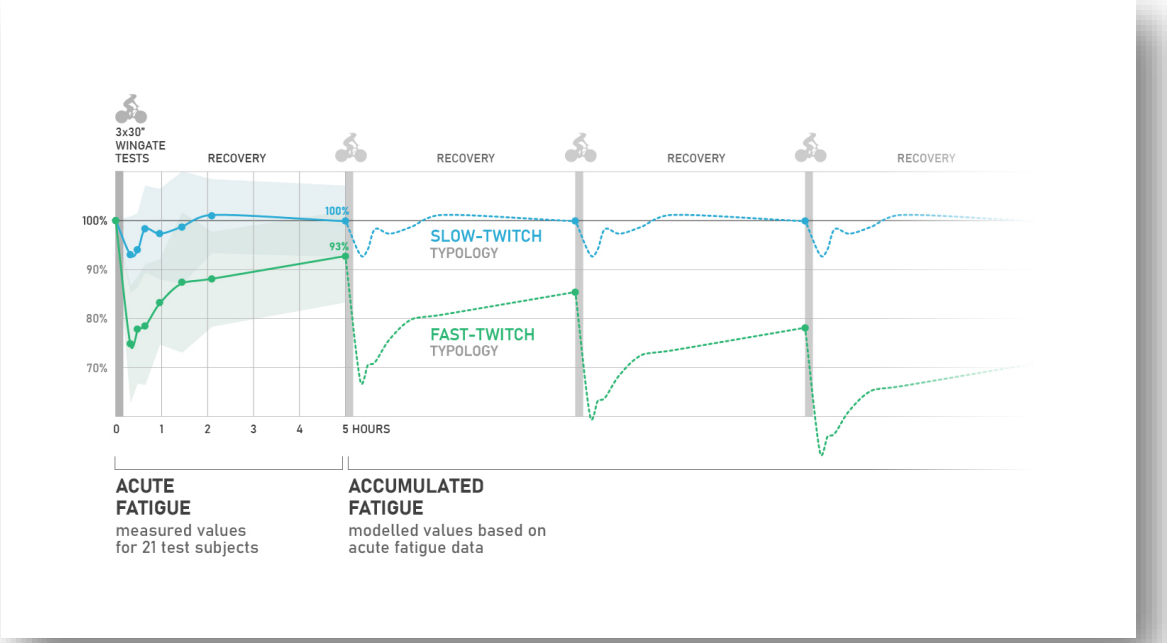
Crude oil prices are at their lowest point since 1998, dropping over 85% in the past few months. But at the pump, we pay for more than just the oil.

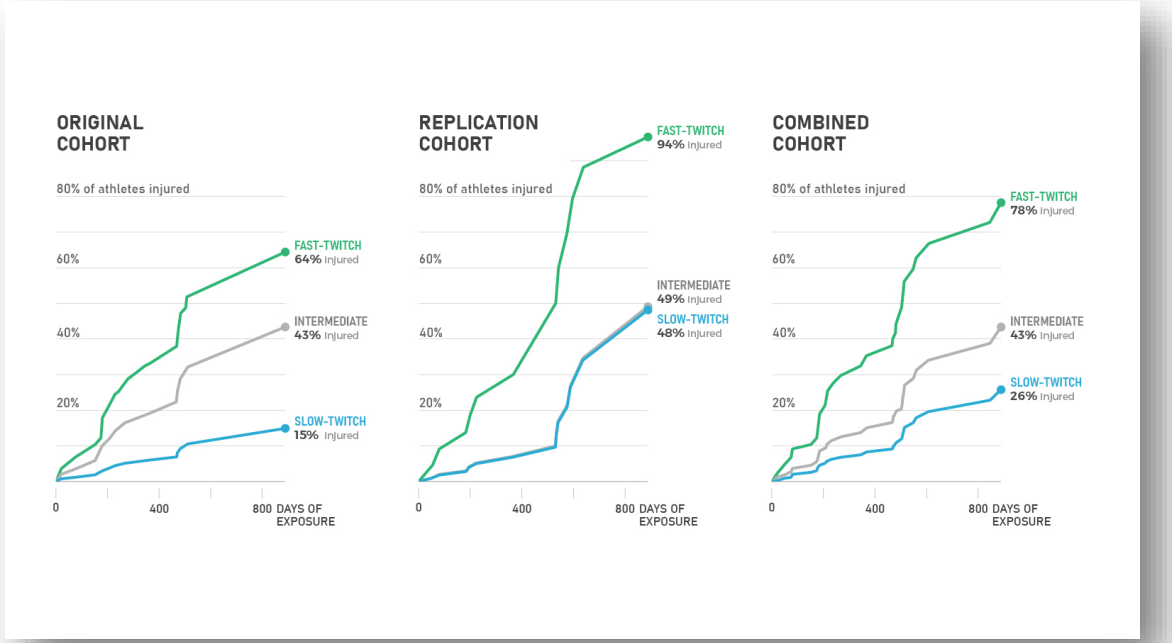


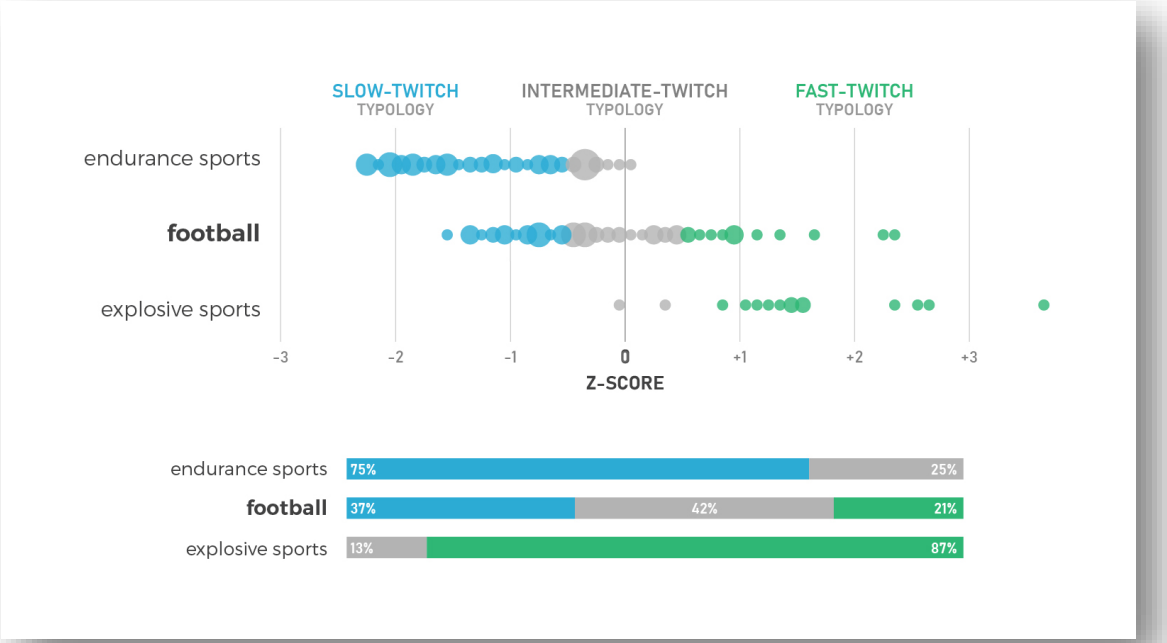
Source: Belgian Petroleum Federation, FOD Economie, Statbel

A #MakeoverMonday visualization by **Koen Van den Eeckhout** (@koen_vde)


MATCH ANALYSIS
IN PROFESSIONAL FOOTBALL
SLOW-TWITCH TYPOLOGY
INTERMEDIATE-TWITCH TYPOLOGY
FAST-TWITCH TYPOLOGY
Total distance
Jogging 6-15 km/h
High speed > 20 km/h
High decelerations
0%
-5%
-10%
DECLINE IN THE 2ND HALF
-5.1%
-6.0%
-8.8%
-8.6%
-4.9%
-11.8%
-8.4%
-14.3%


3x30" WINGATE TESTS
RECOVERY
RECOVERY
RECOVERY
RECOVERY
100%
90%
80%
70%
100%
93%
SLOW-TWITCH TYPOLOGY
FAST-TWITCH TYPOLOGY
0
1
2
3
4
5 HOURS
ACUTE FATIGUE
measured values for 21 test subjects
ACCUMULATED FATIGUE
modelled values based on acute fatigue data


ORIGINAL COHORT
80% of athletes injured
60%
40%
20%
FAST-TWITCH 64% injured
INTERMEDIATE 43% injured
SLOW-TWITCH 15% injured
0
400
800 DAYS OF EXPOSURE
REPLICATION COHORT
80% of athletes injured
60%
40%
20%
FAST-TWITCH 94% injured
INTERMEDIATE 49% injured
SLOW-TWITCH 48% injured
0
400
800 DAYS OF EXPOSURE
COMBINED COHORT
80% of athletes injured
60%
40%
20%
FAST-TWITCH 78% injured
INTERMEDIATE 43% injured
SLOW-TWITCH 26% injured
0
400
800 DAYS OF EXPOSURE

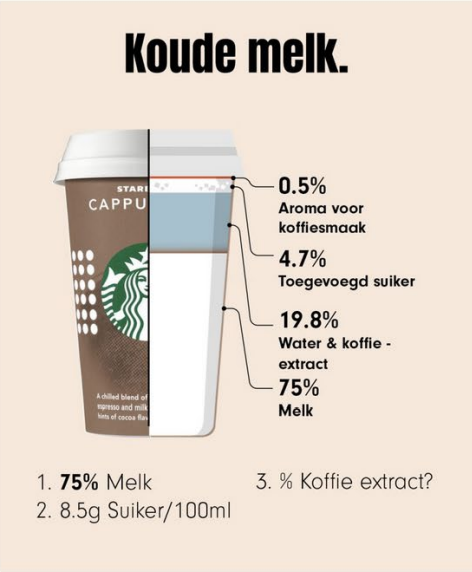

SLOW-TWITCH TYPOLOGY
INTERMEDIATE-TWITCH TYPOLOGY
FAST-TWITCH TYPOLOGY
endurance sports
football
explosive sports
-3
-2
-1
0
+1
+2
+3
Z-SCORE
endurance sports
75%
25%
football
37%
42%
21%
explosive sports
13%
87%

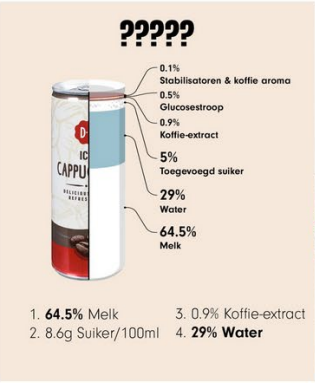
Harro Schwencke • 2nd
Food Innovator | Upfront is Hiring!
1h •

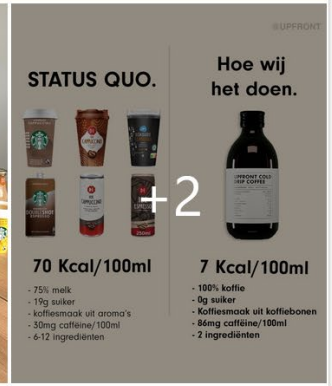
Ijskoffies in 2021, wat een onzin.....

Ooit begonnen als koffie gekoeld met ijsblokjes, inmiddels door Big Foo ...see more

See translation

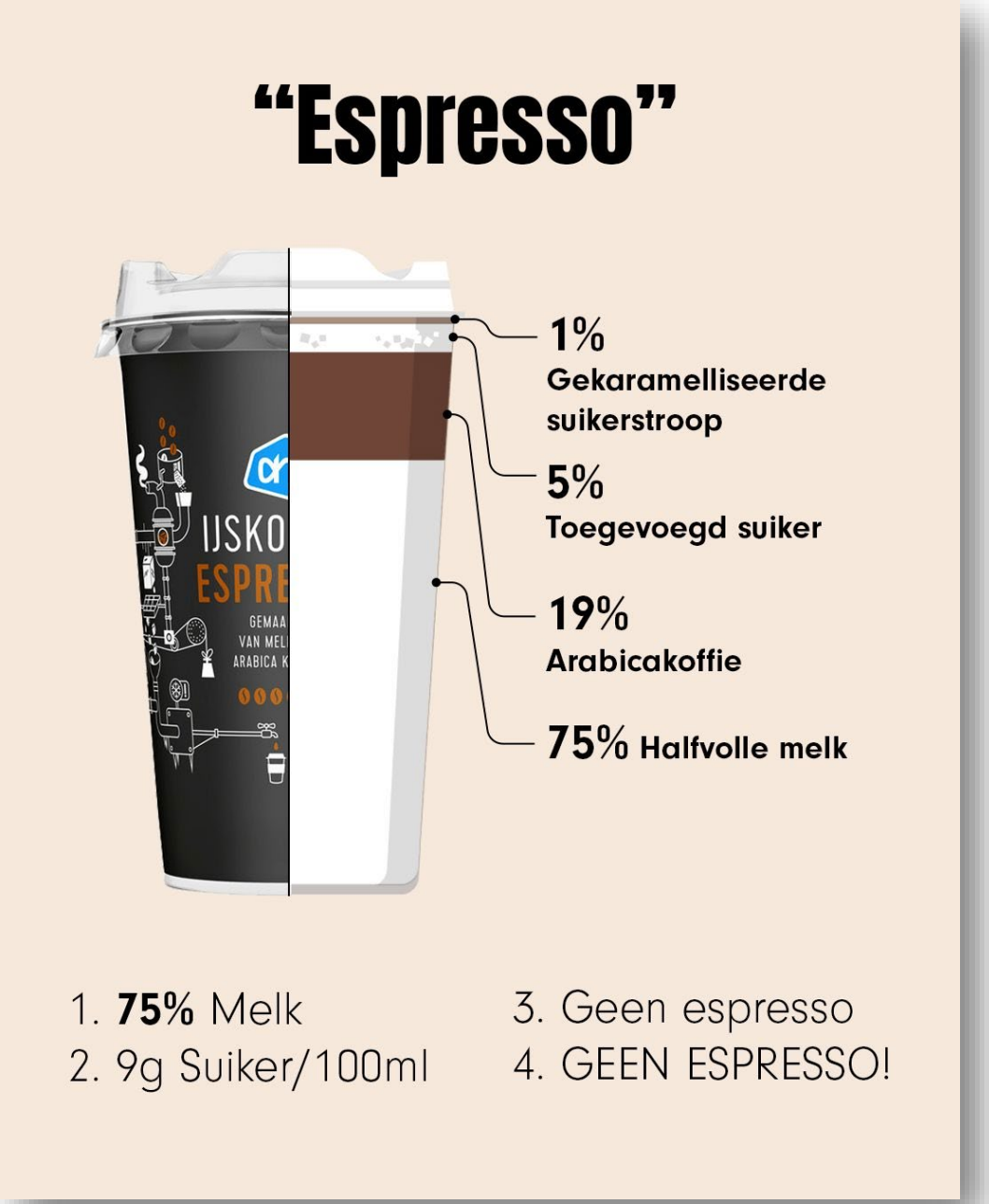






78 • 8 comments

Love Comment Share Send

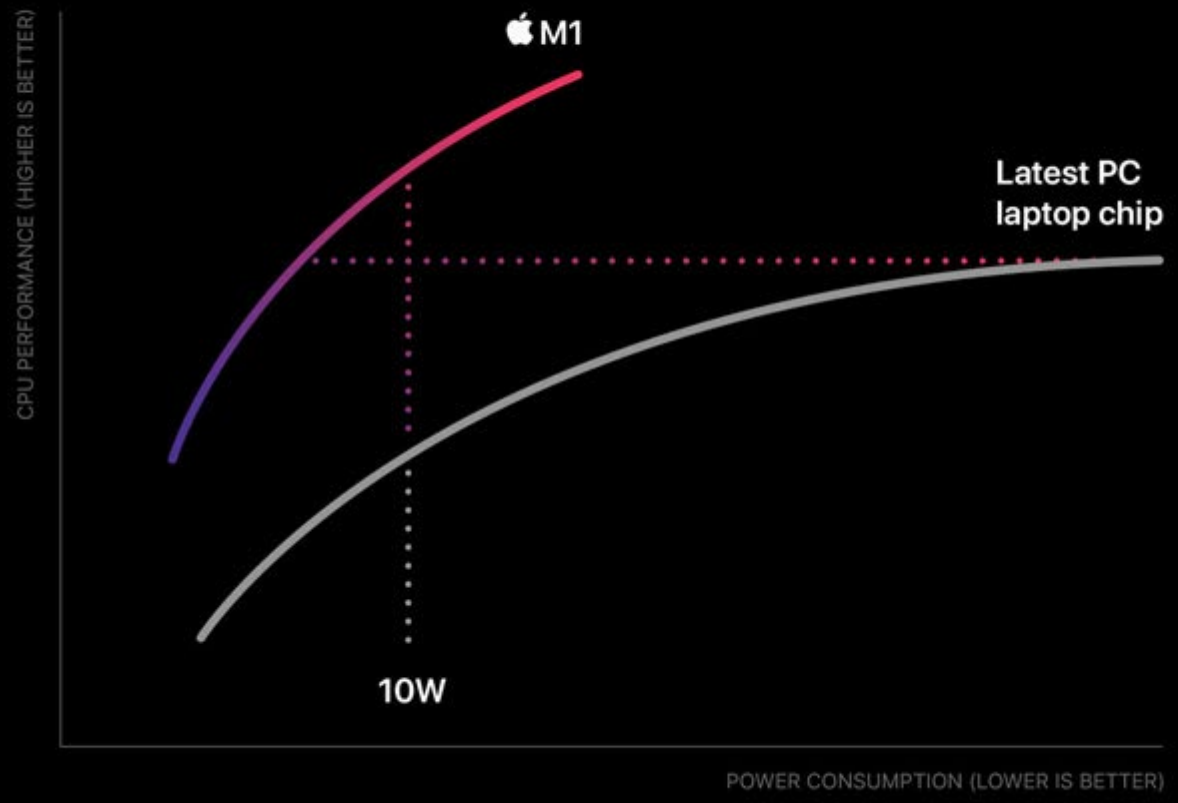


Data visualization principles

Signal-to-noise ratio

GPS

CPU performance vs. power



Up to

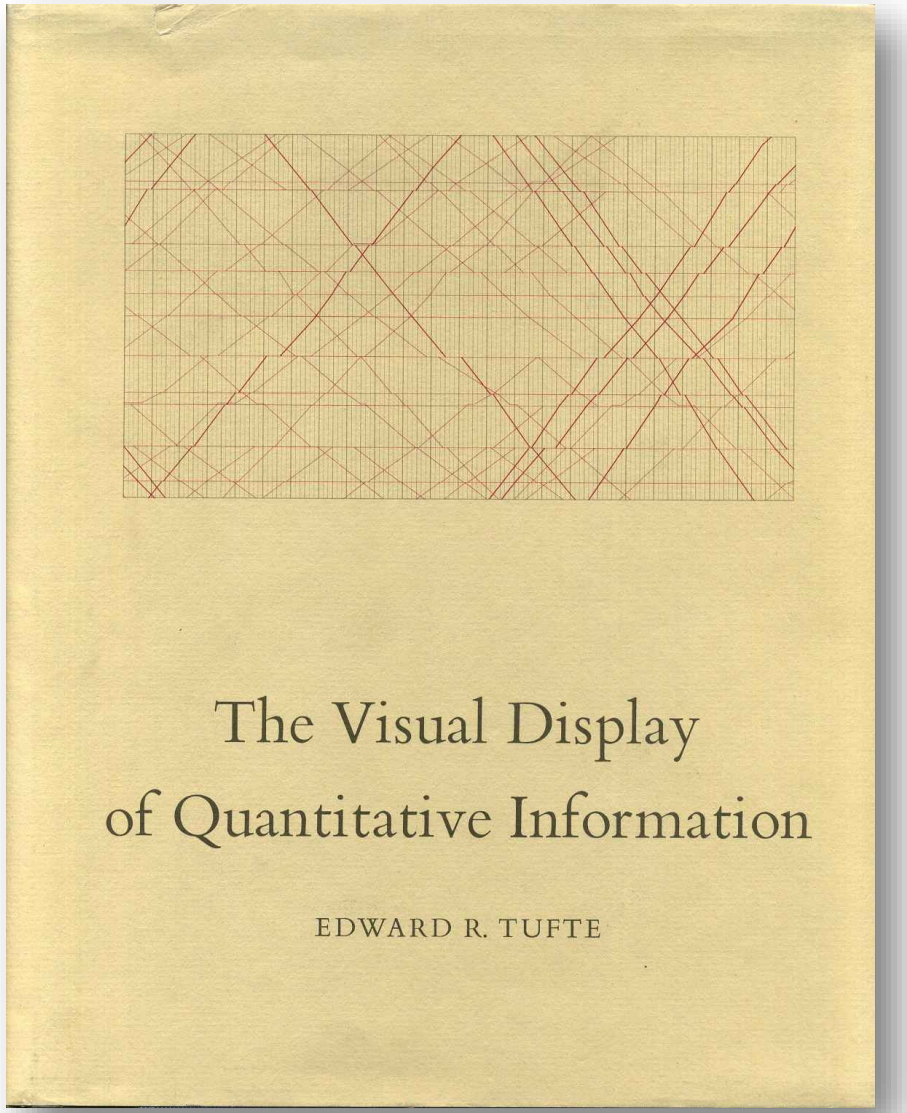
2x

faster CPU performance[1]

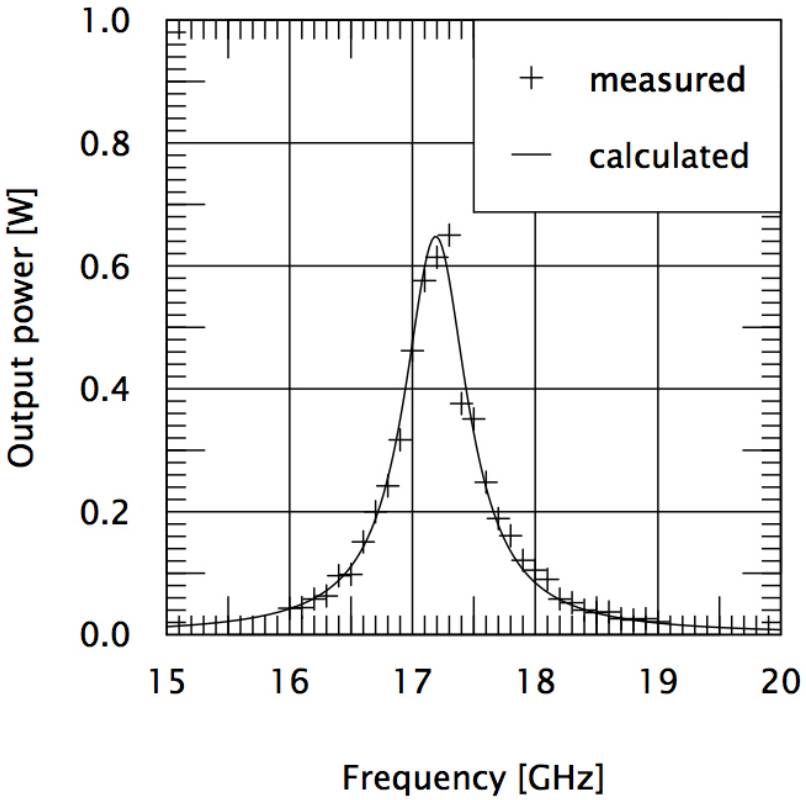
Matches peak PC performance using

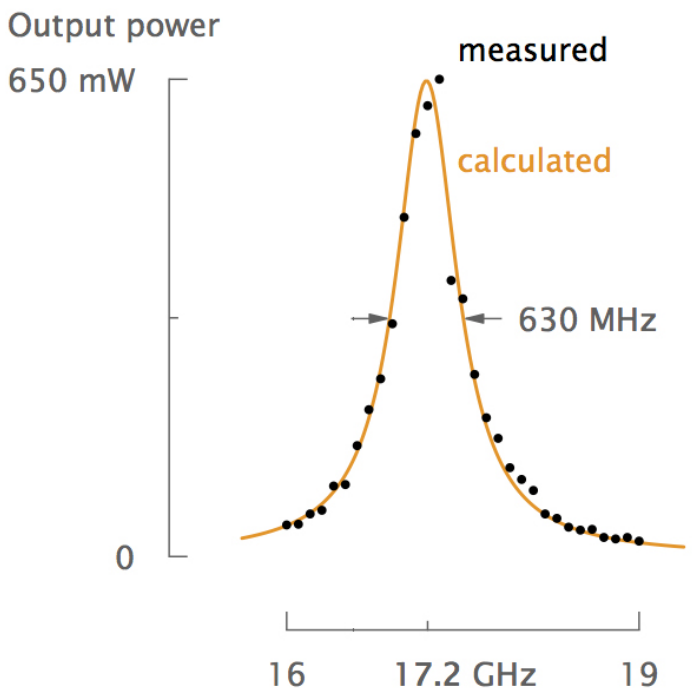
25%

of the power[1]



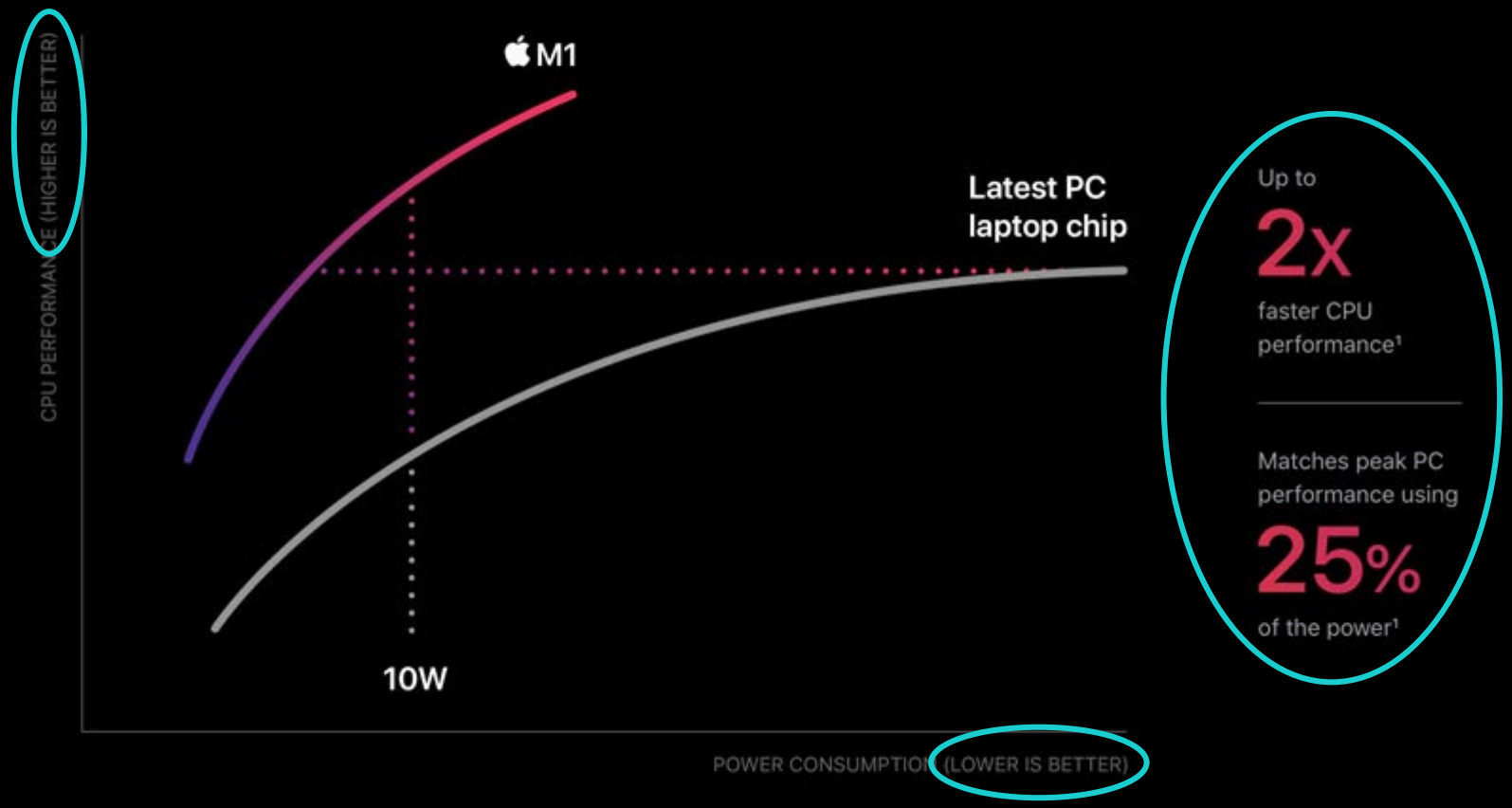
“Maximize the **data-ink ratio**”

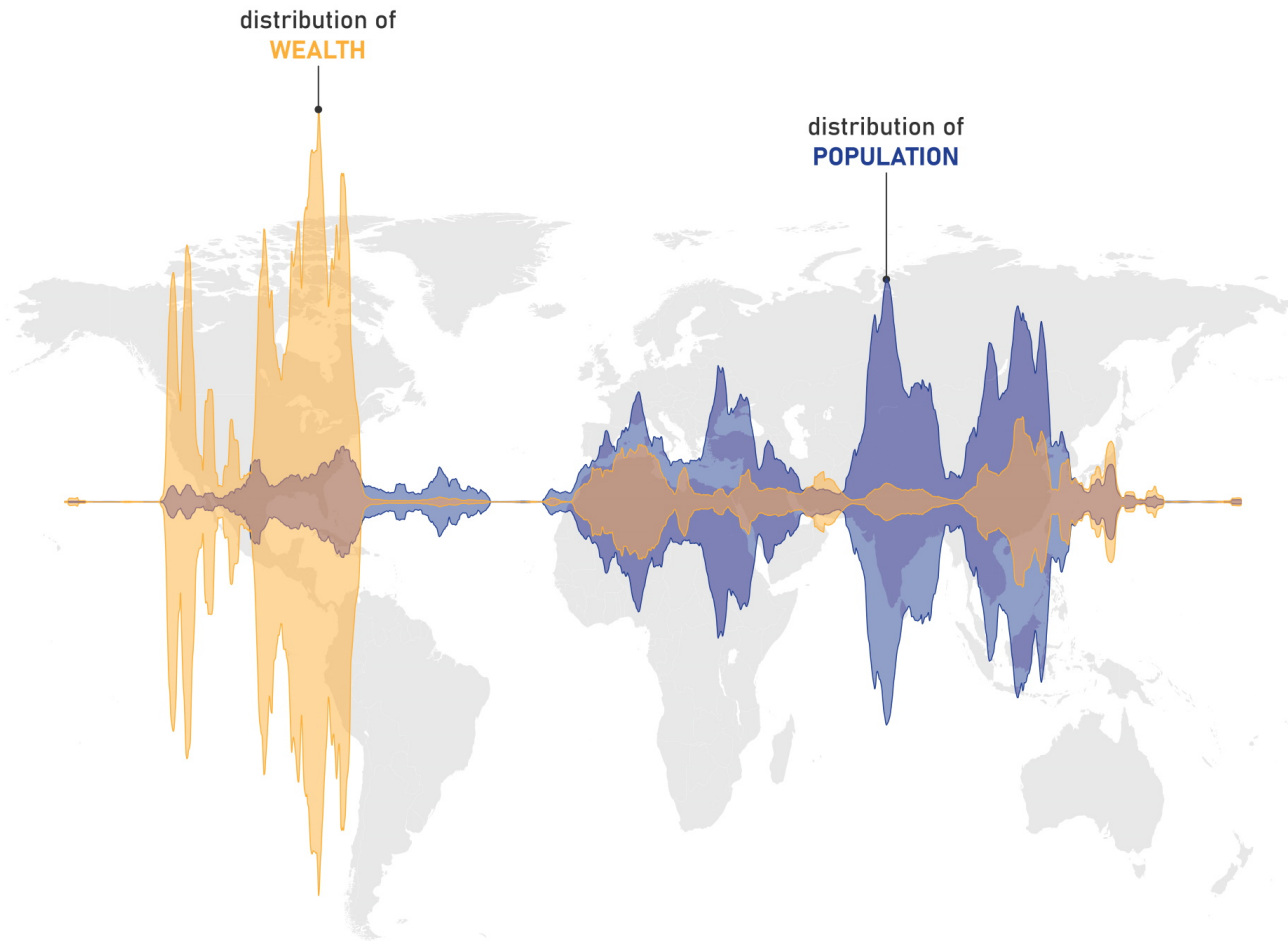




Jean-Luc Doumont, Optics & Photonics Focus 2010

CPU performance vs. power





The Wealthy West

Inequality is not just limited to North versus South

Source: Credit Suisse Global Wealth Report 2019; Socioeconomic Data and Applications Center - Gridded Population of the World v.11

A #MakeoverMonday visualization
by **Koen Van den Eeckhout** (@koen_vde)

anklemeat13 3 points · 14 days ago

Seriously how does this have so many awards it's doesn't even make sense.

Reply Give Award Share Report Save

bodie_ 4 points · 13 days ago

This graph is horrendous. I've read more than a hundred comments and no-one is able to explain how it's supposed to be read.

Reply Give Award Share Report Save

Craigmm114 680 points · 14 days ago

Am I reading this wrong or is this a terrible representation? Europe is completely skewed since it is right above Africa which would definitely mess it up.

Reply Give Award Share Report Save

willjoke4food 256 points · 14 days ago

This is extremely useless visualisation

Reply Give Award Share Report Save

memphi222 1 point · 13 days ago

This graph looks nice but in terms of conveying information it's fucking terrible

Reply Give Award Share Report Save

d80hunter 35 points · 14 days ago

You wasn't supposed to look that hard and notice the fine details, it is a reactionary click bait graph. The keywords "wealth inequality" and "west" with the data shown sure make it seem that way.

Reply Give Award Share Report Save

Specialey 36 points · 14 days ago

I cannot read the graph, it's either that I'm graphically illiterate or this is a terribly made graph

Reply Give Award Share Report Save

BillyBuckets 17 points · 14 days ago

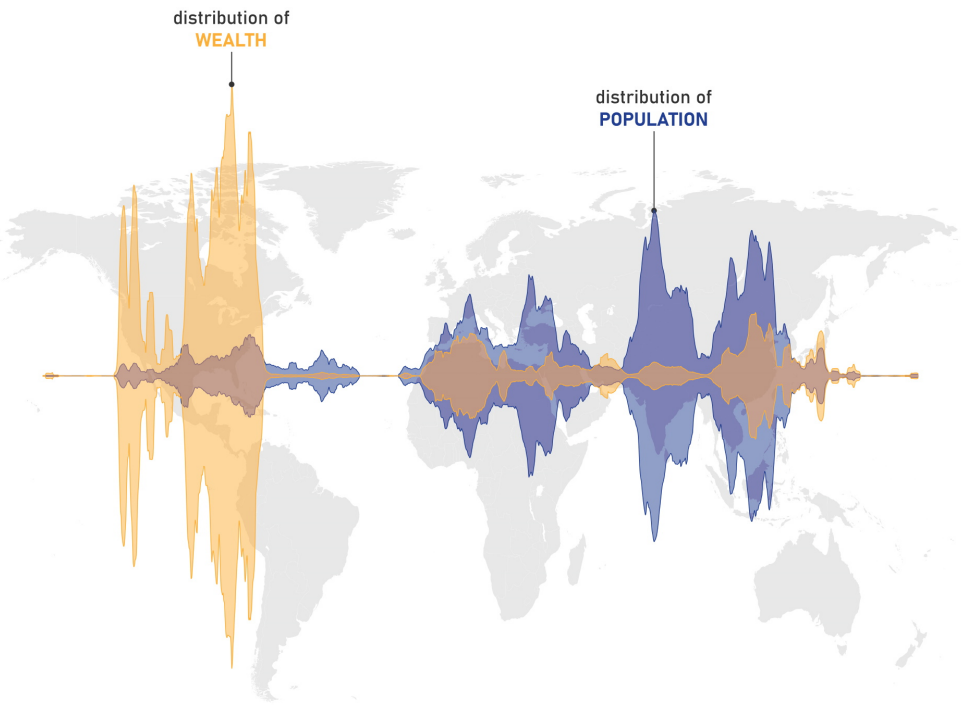
The second one.

Reply Give Award Share Report Save

Pikesmakker 8 points · 14 days ago

This presentation is fucking terrible

Reply Give Award Share Report Save



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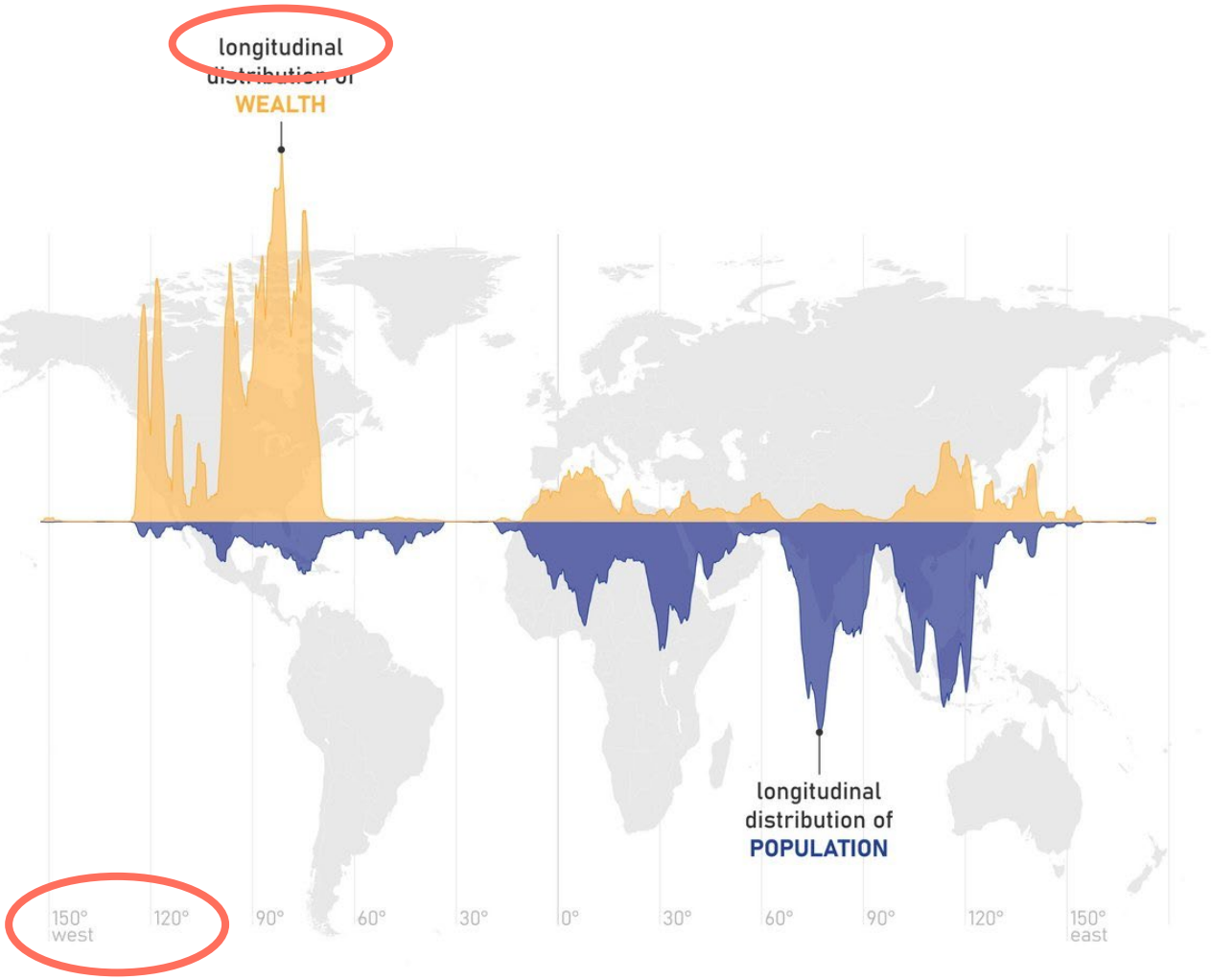

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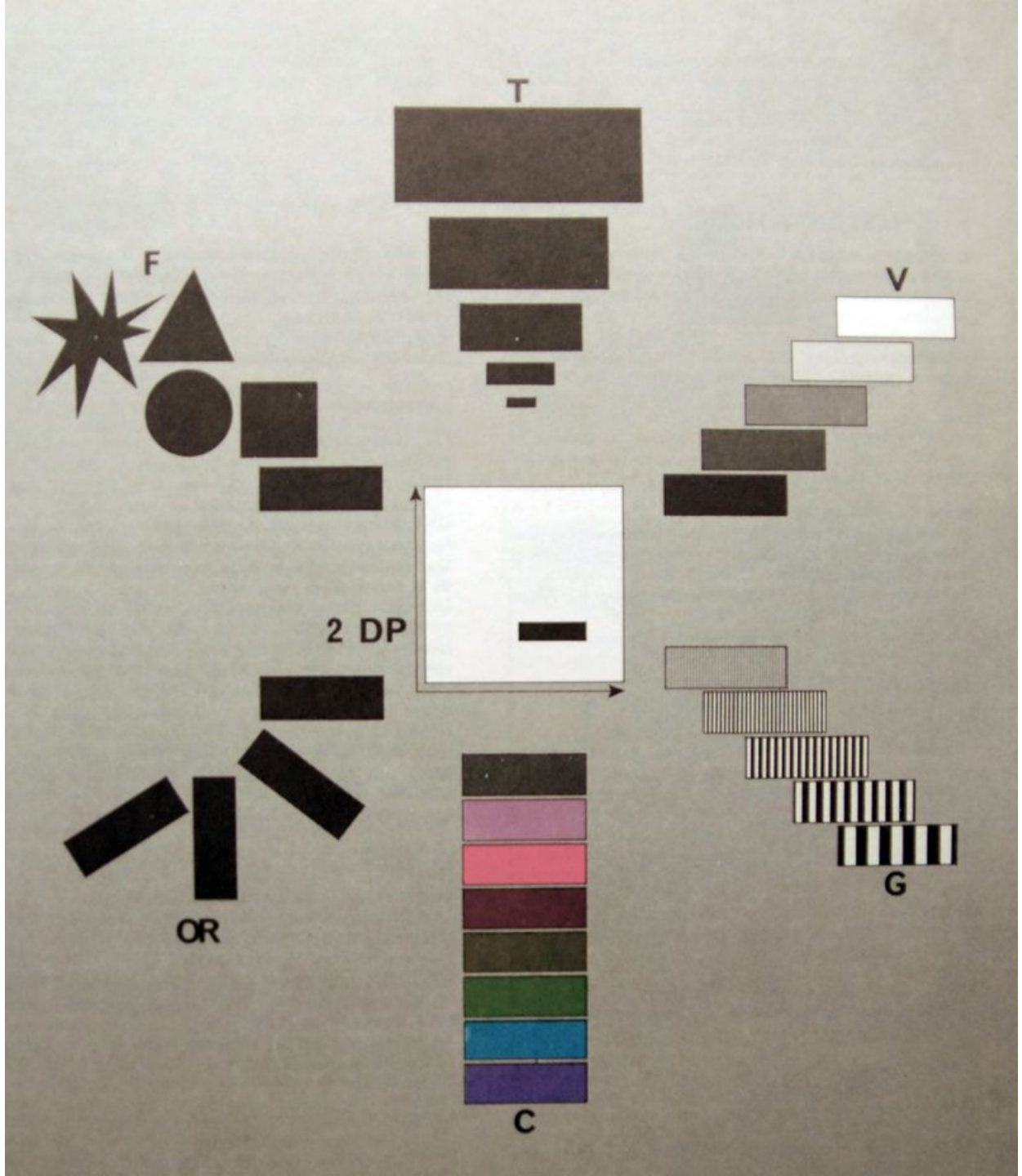
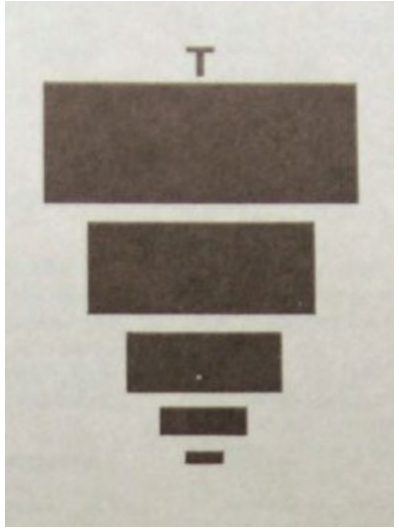
A #MakeoverMonday visualization by **Koen Van den Eeckhout** (@koen_vde)

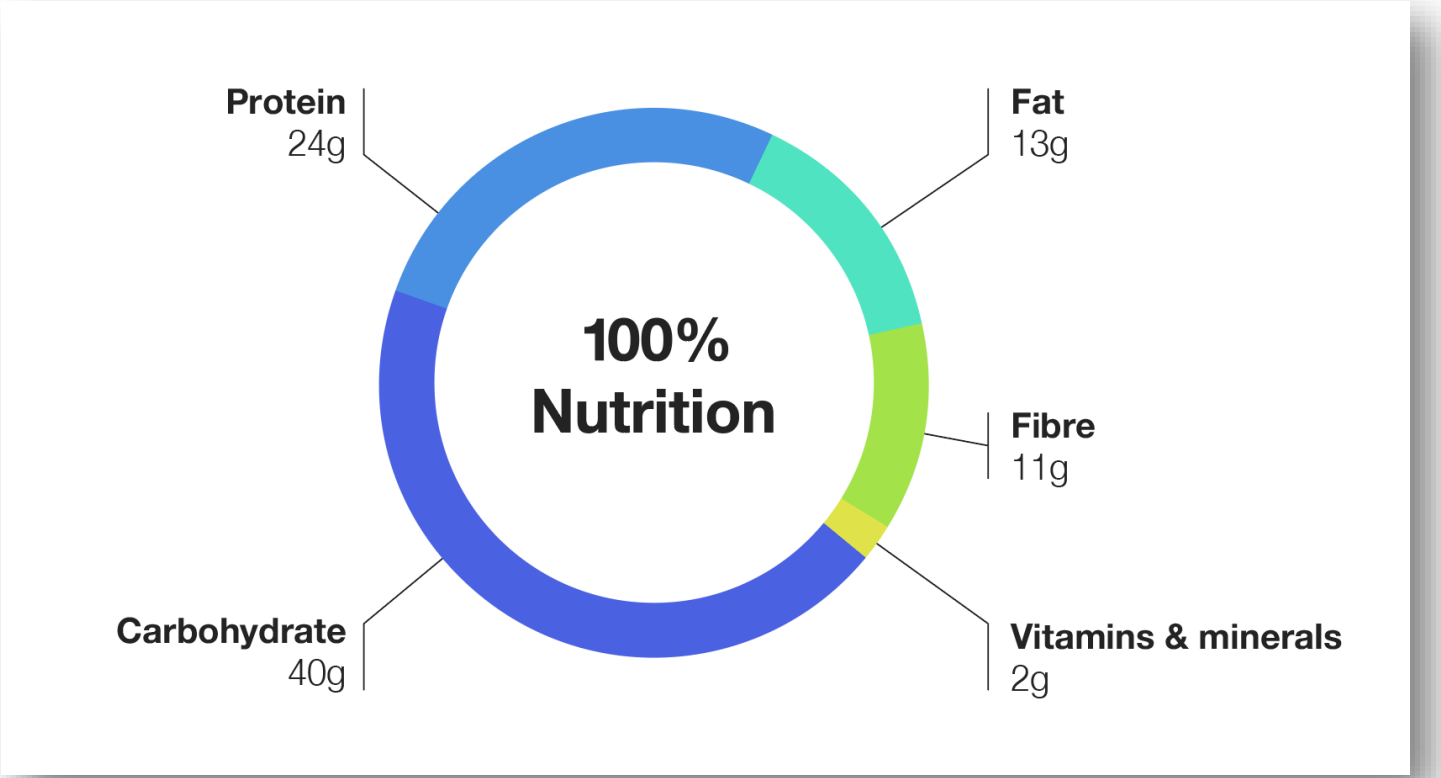
Encoding

The 7 visual variables

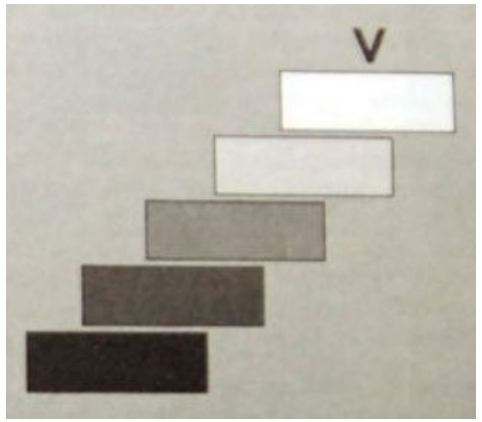


Size


T

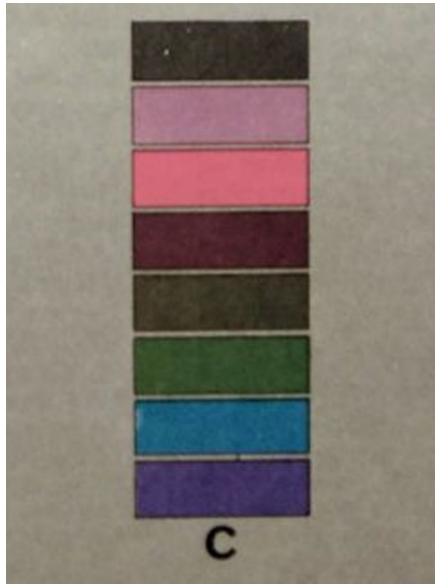

Protein
24g
Fat
13g
100%
Nutrition
Fibre
11g
Carbohydrate
40g
Vitamins & minerals
2g

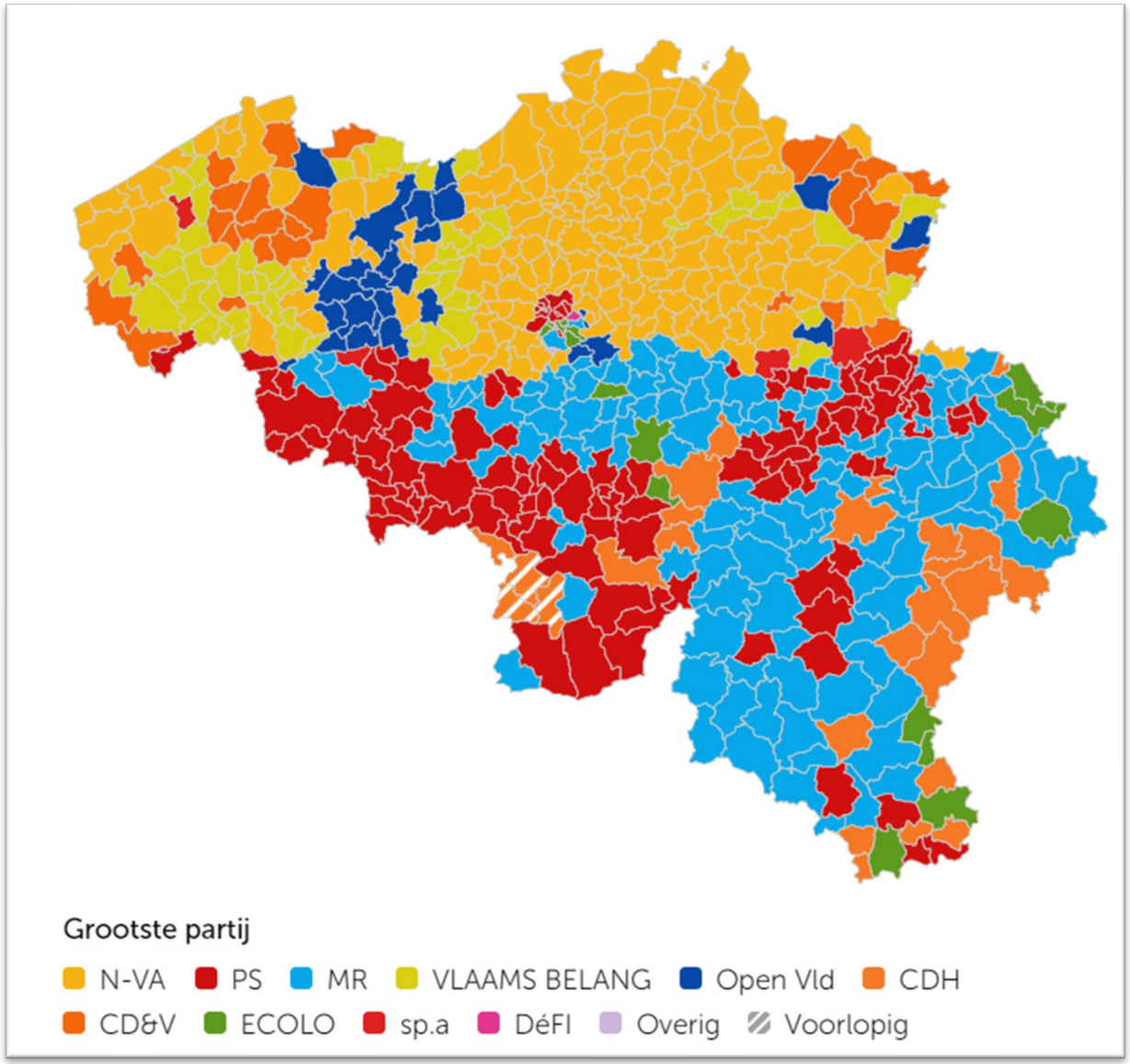
Value



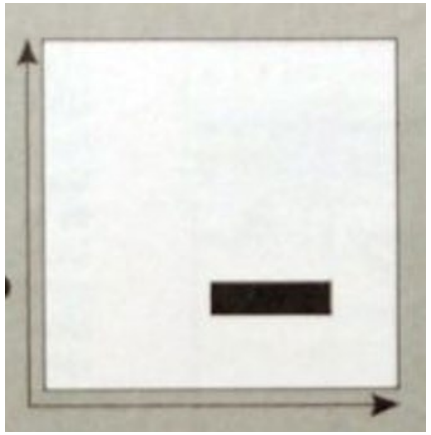
Source: National Health Commission of the PRC. Data correct as of January 26, 08:30 P.M. ET
Graphic: Natalie Leung and Henrik Pettersson, CNN

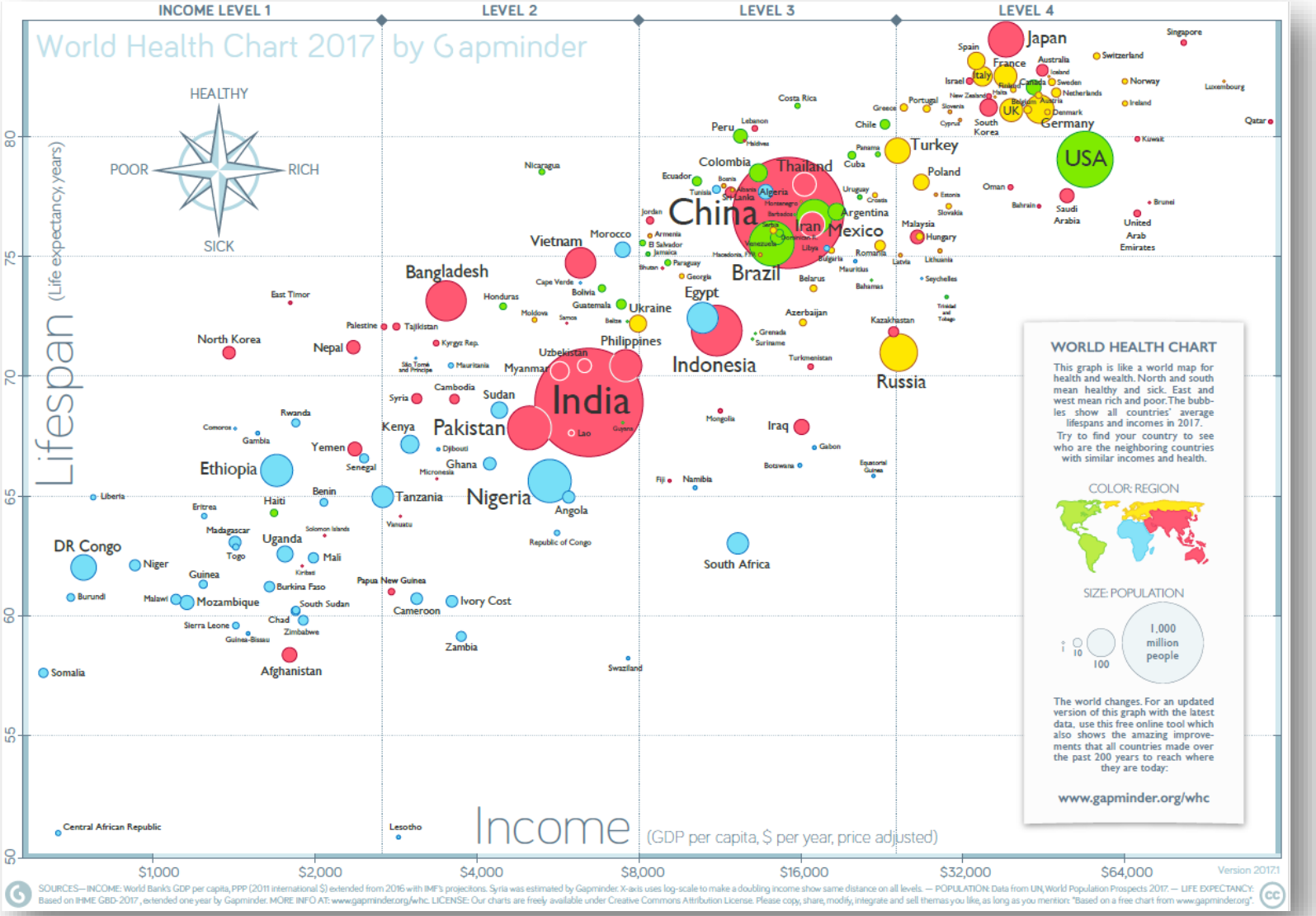
Colour


C

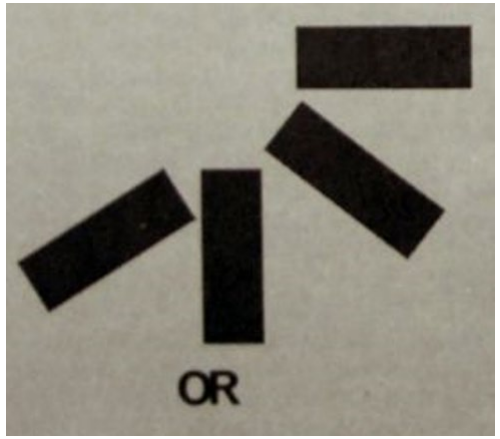

Grootste partij
N-VA
PS
MR
VLAAMS BELANG
Open Vld
CDH
CD&V
ECOLO
sp.a
DéFI
Overig
Voorlopig

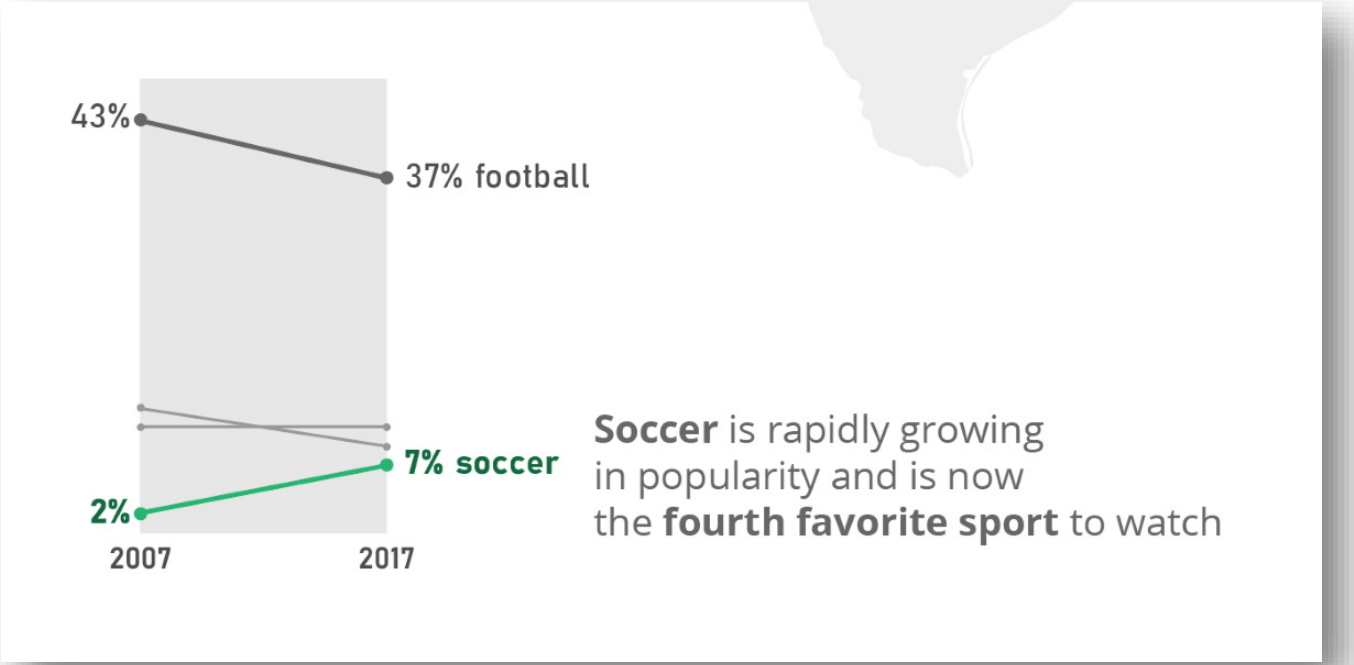
Position



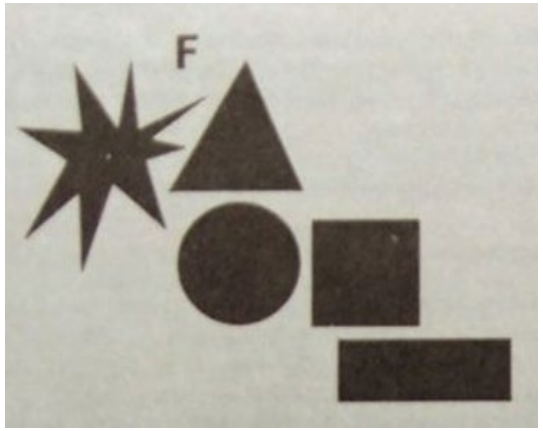

INCOME LEVEL 1
LEVEL 2
LEVEL 3
LEVEL 4
World Health Chart 2017 by Gapminder
HEALTHY
POOR
RICH
SICK
Lifespan (Life expectancy, years)
Income (GDP per capita, $ per year, price adjusted)
$1,000
$2,000
$4,000
$8,000
$16,000
$32,000
$64,000
Japan
France
Italy
Spain
Germany
UK
USA
Turkey
Poland
China
Thailand
Iran
Mexico
Argentina
Brazil
Egypt
Indonesia
Russia
India
Pakistan
Bangladesh
Vietnam
Philippines
Ukraine
Nigeria
Ethiopia
DR Congo
South Africa
WORLD HEALTH CHART
This graph is like a world map for health and wealth. North and south mean healthy and sick. East and west mean rich and poor. The bubbles show all countries' average lifespans and incomes in 2017.
Try to find your country to see who are the neighboring countries with similar incomes and health.
COLOR: REGION
SIZE: POPULATION
1,000 million people
The world changes. For an updated version of this graph with the latest data, use this free online tool which also shows the amazing improvements that all countries made over the past 200 years to reach where they are today:
www.gapminder.org/whc
Version 2017.1

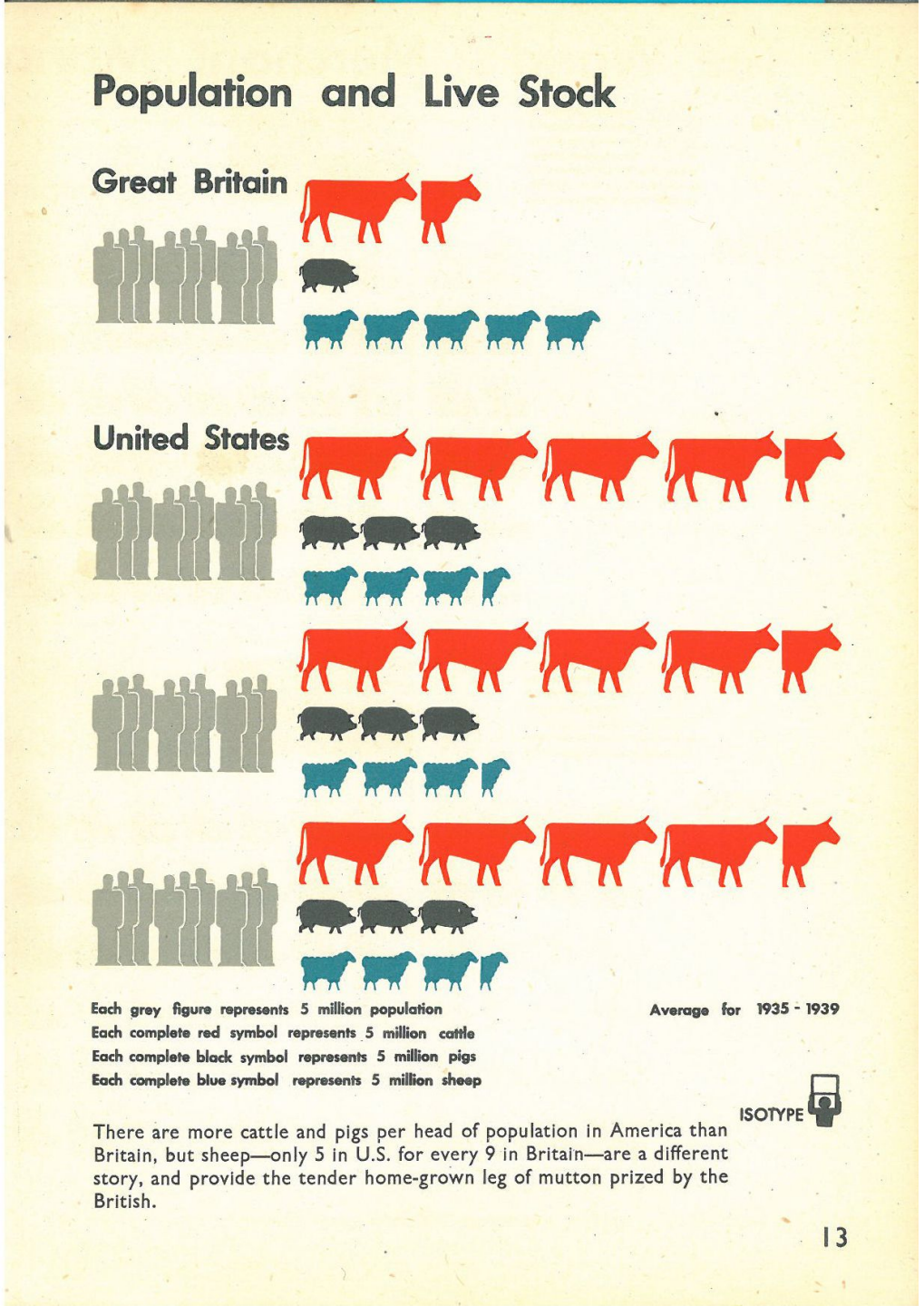
Orientation





Shape





Population and Live Stock

Great Britain

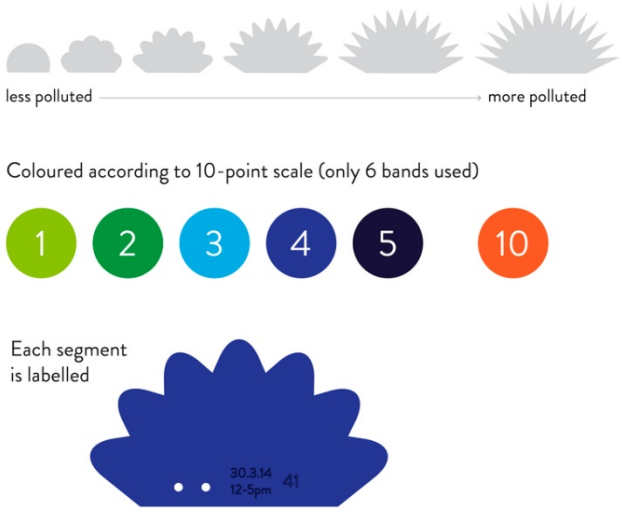
United States

Each grey figure represents 5 million population
Each complete red symbol represents 5 million cattle
Each complete black symbol represents 5 million pigs
Each complete blue symbol represents 5 million sheep

Average for 1935 - 1939

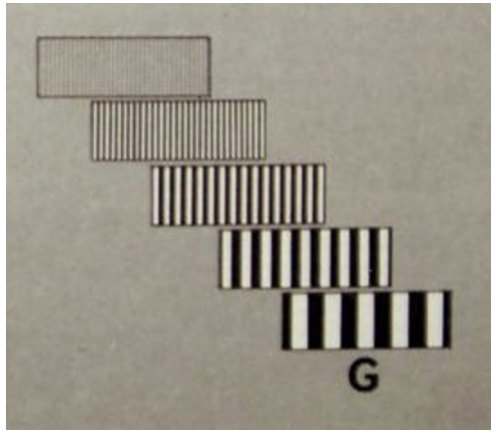
ISOTYPE

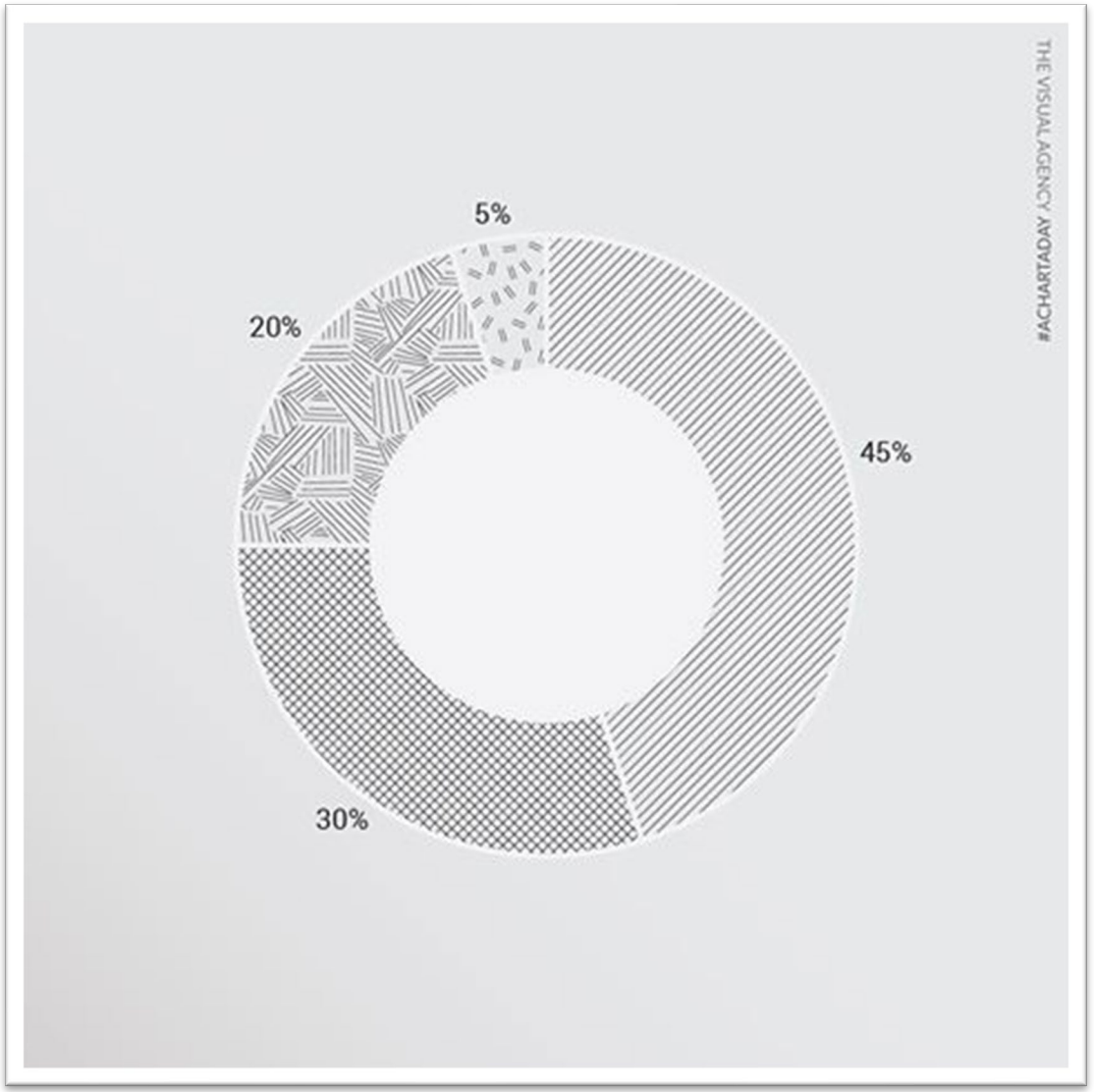
There are more cattle and pigs per head of population in America than Britain, but sheep—only 5 in U.S. for every 9 in Britain—are a different story, and provide the tender home-grown leg of mutton prized by the British.



http://www.stefanieposavec.com/airtransformed

Texture



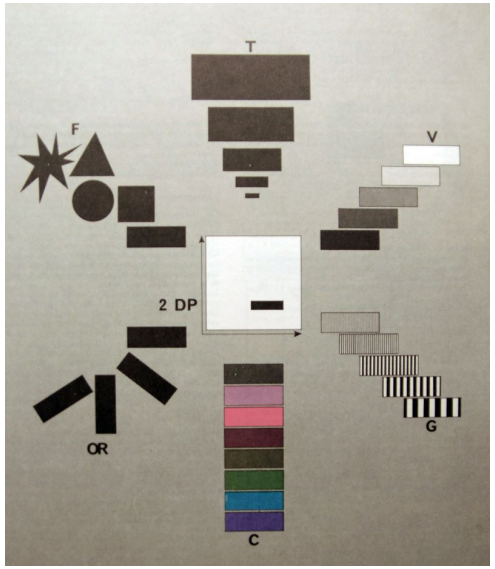


Visual variable brainstorming

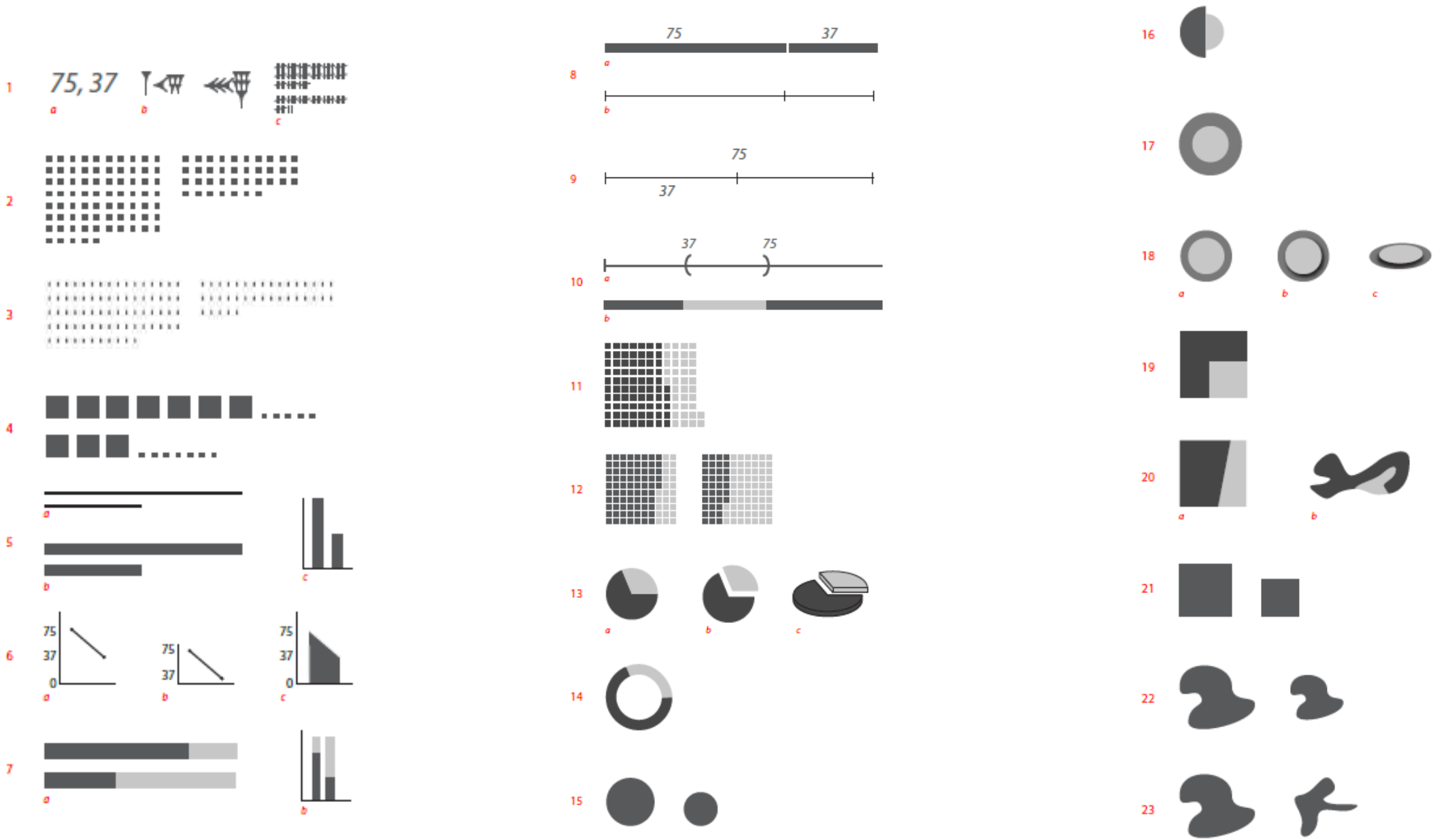
Individual exercise

Using **visual variables,** think of as many ways as possible to visualize the following two-number dataset:

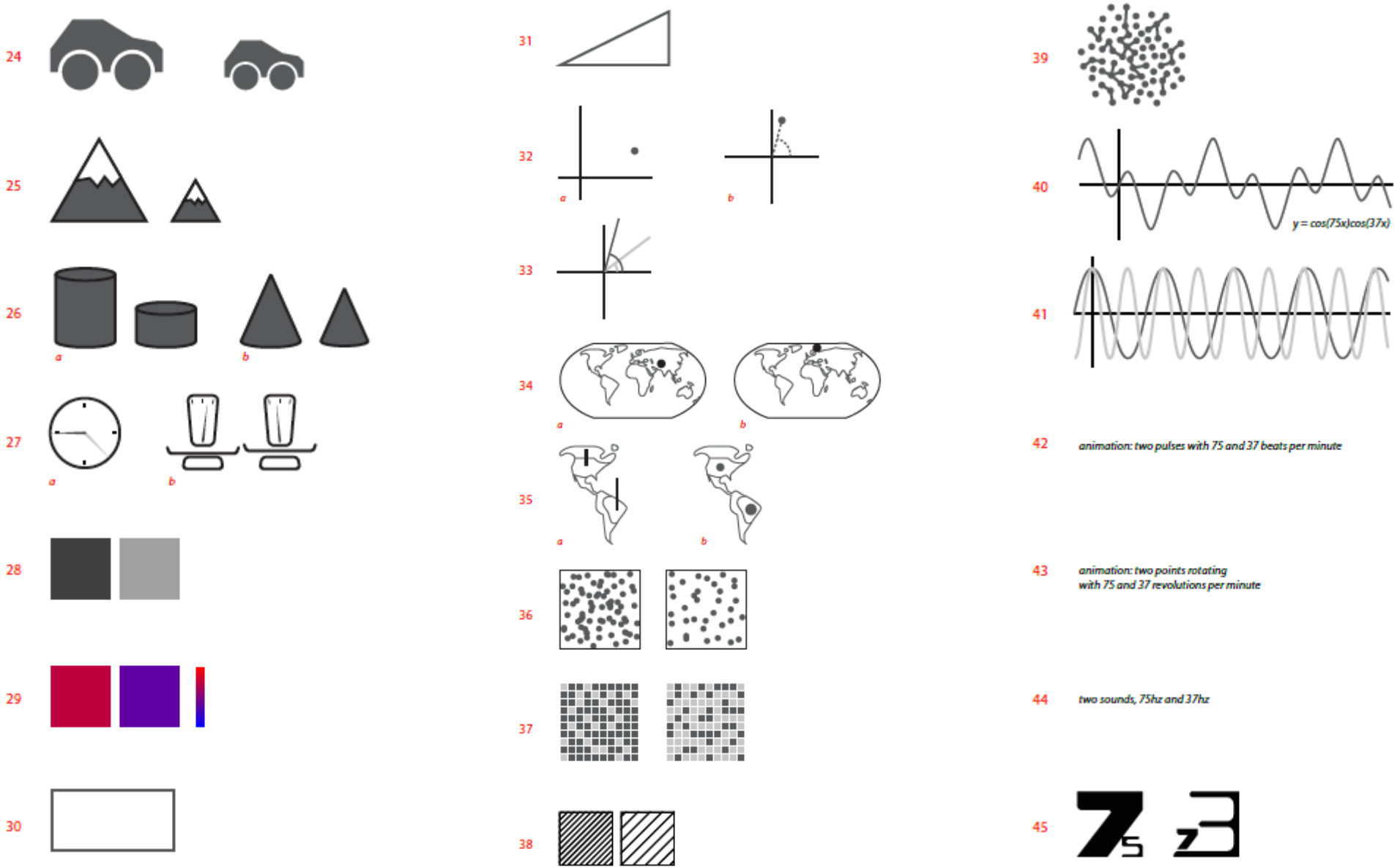
75 37



Visual variables
size
value
shape
orientation
colour
position
texture



Santiago Ortiz 2012, from the post: http://blog.visual.ly/45-ways-to-communicate-two-quantities

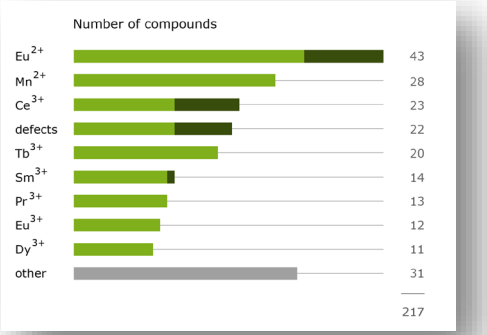


Santiago Ortiz 2012, from the post: http://blog.visual.ly/45-ways-to-communicate-two-quantities

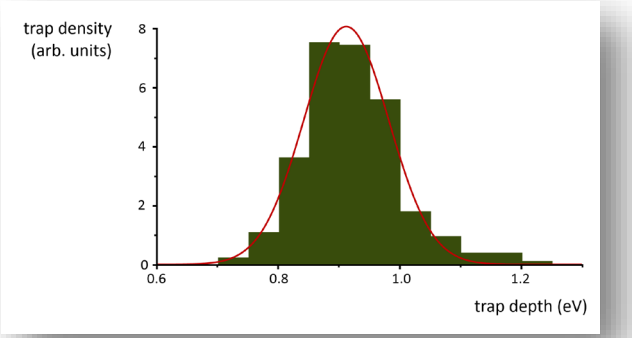
Designing charts

Graphic representation categories

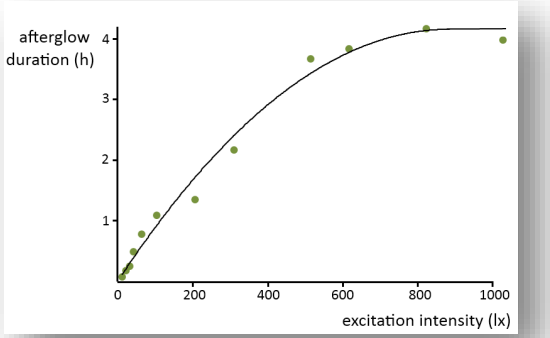
comparison



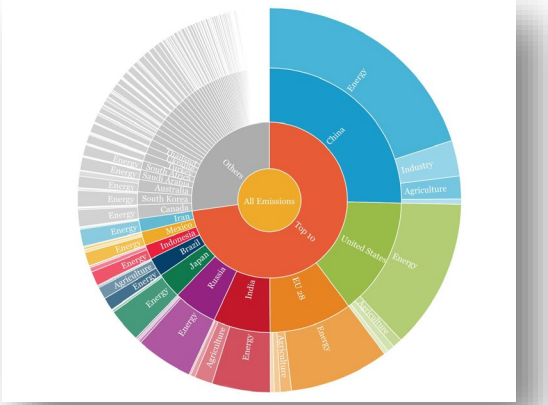
distribution



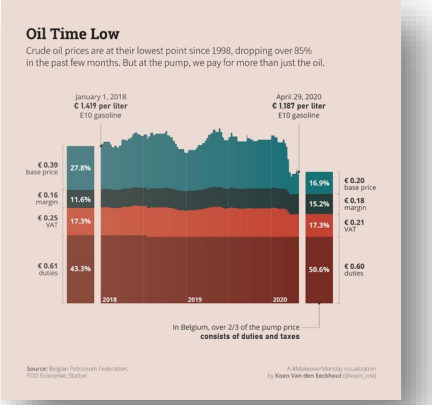
correlation



hierarchy



evolution



spatial

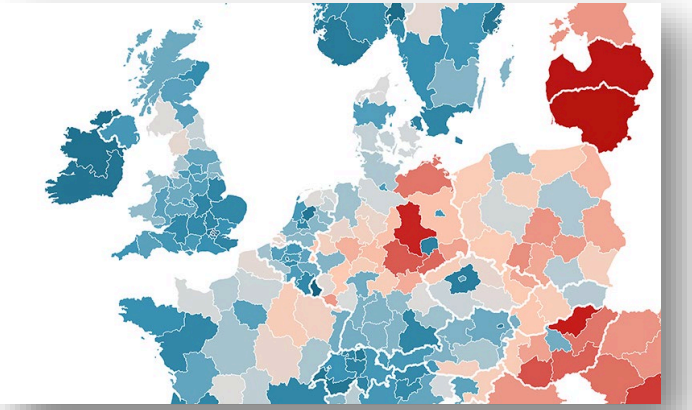
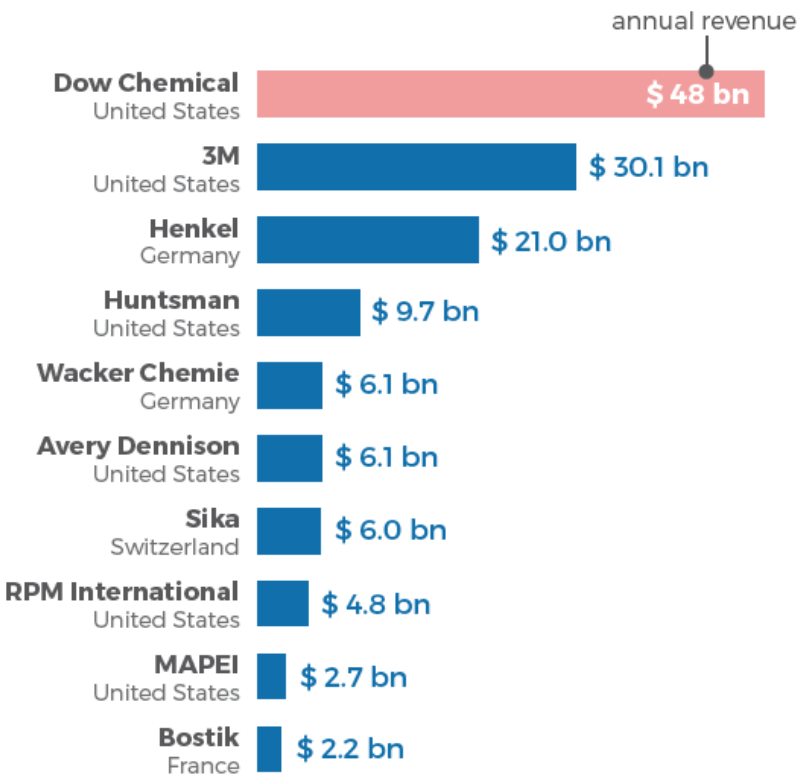


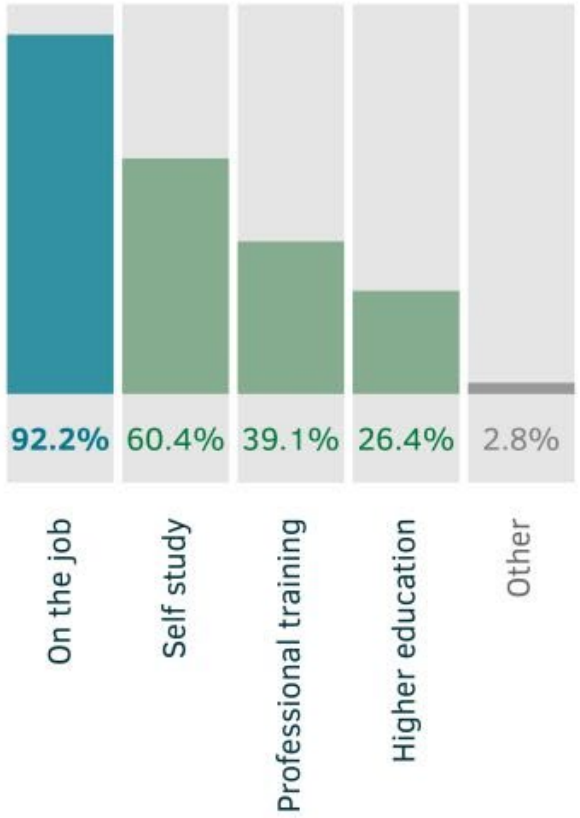
Chart types

Common chart types

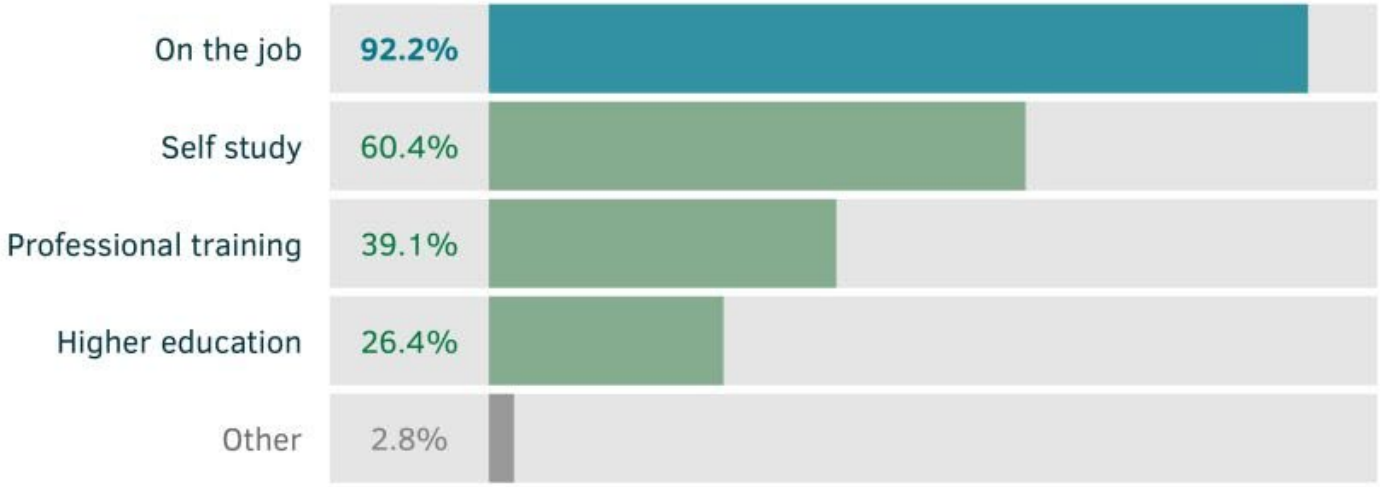
Bar charts: **comparison** using **size**



Where did you learn your skills?

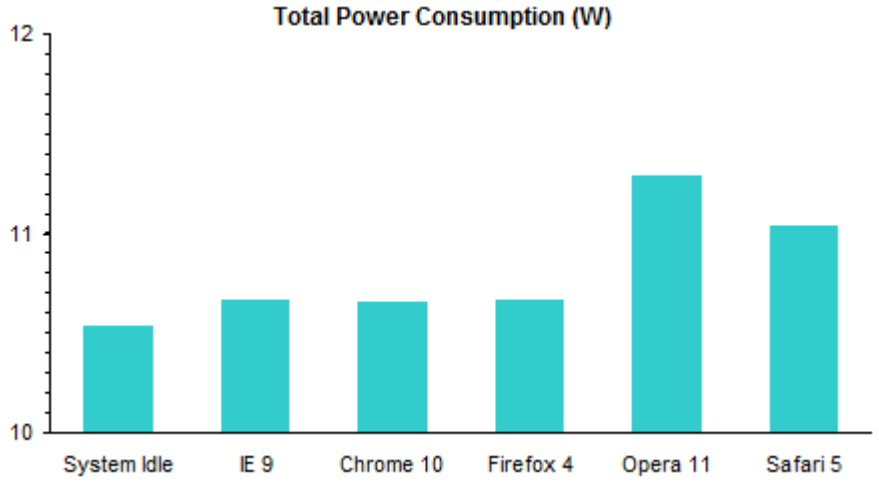


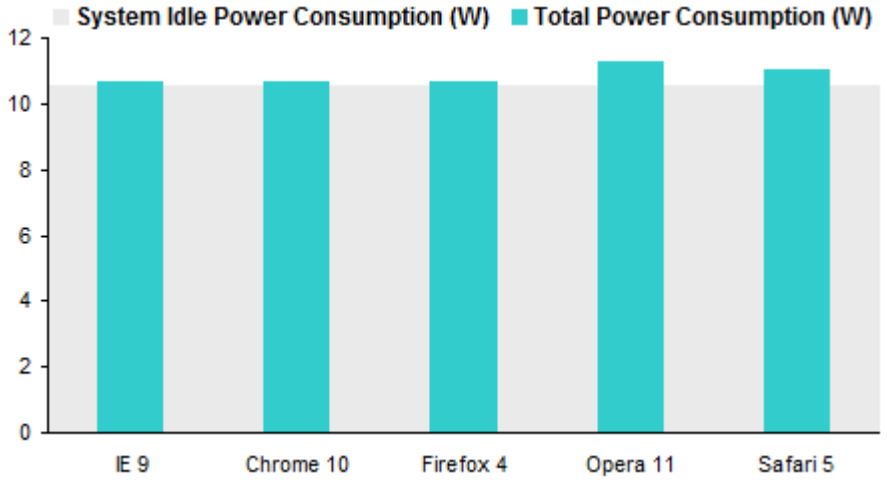
Where did you learn your skills?



Pitfall

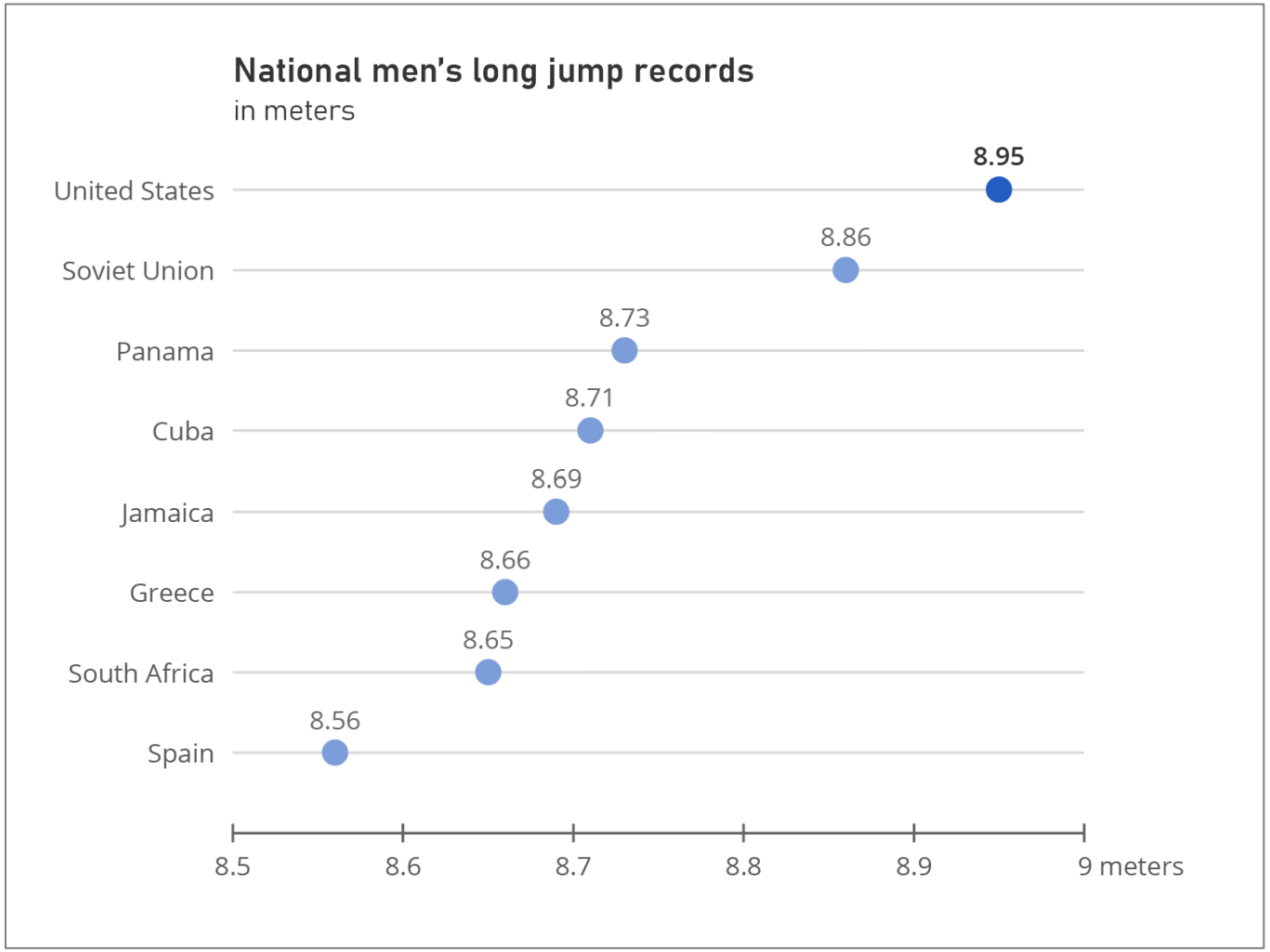
Bar chart not starting from zero





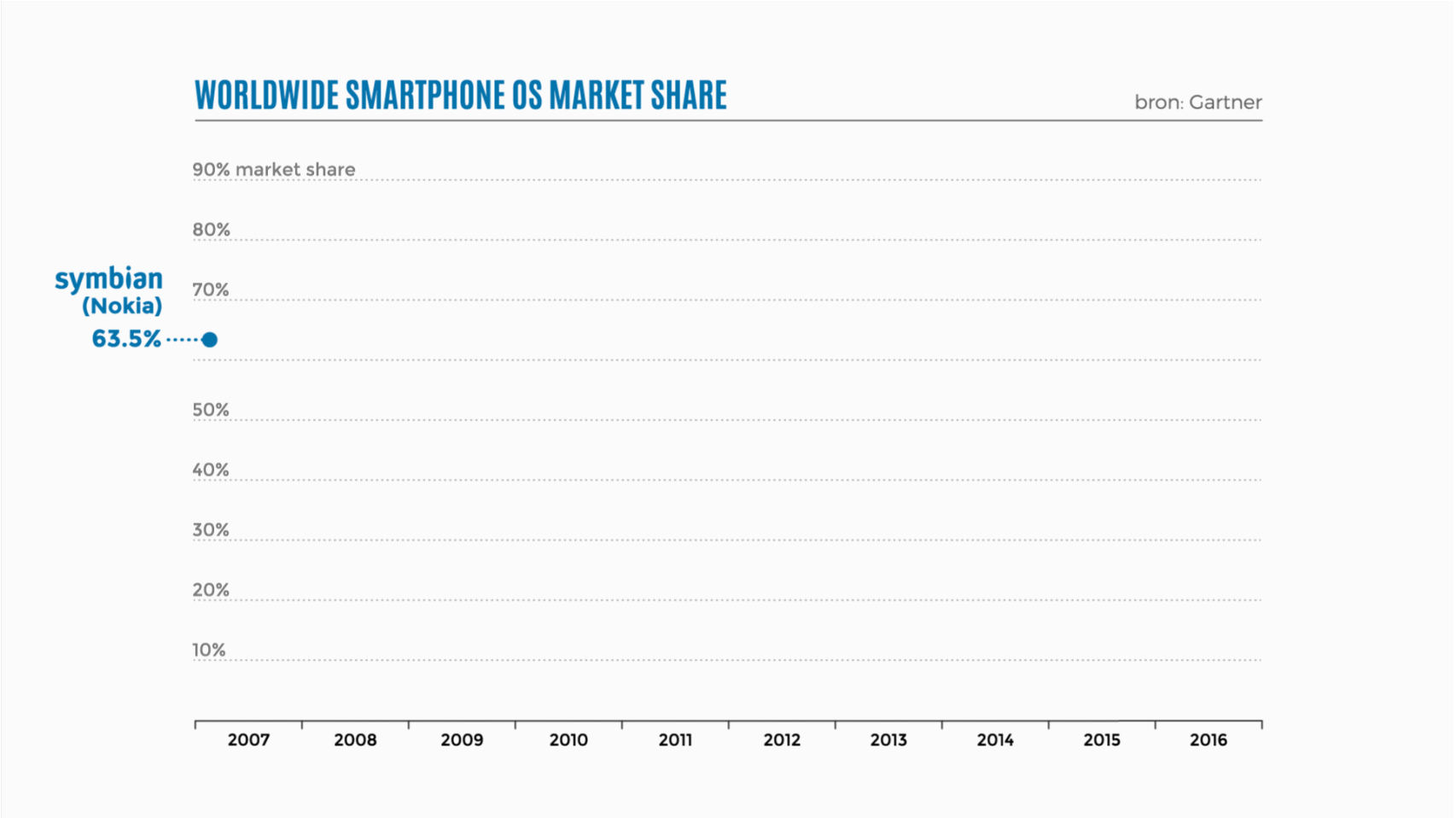
Alternative solution

Use a dot plot



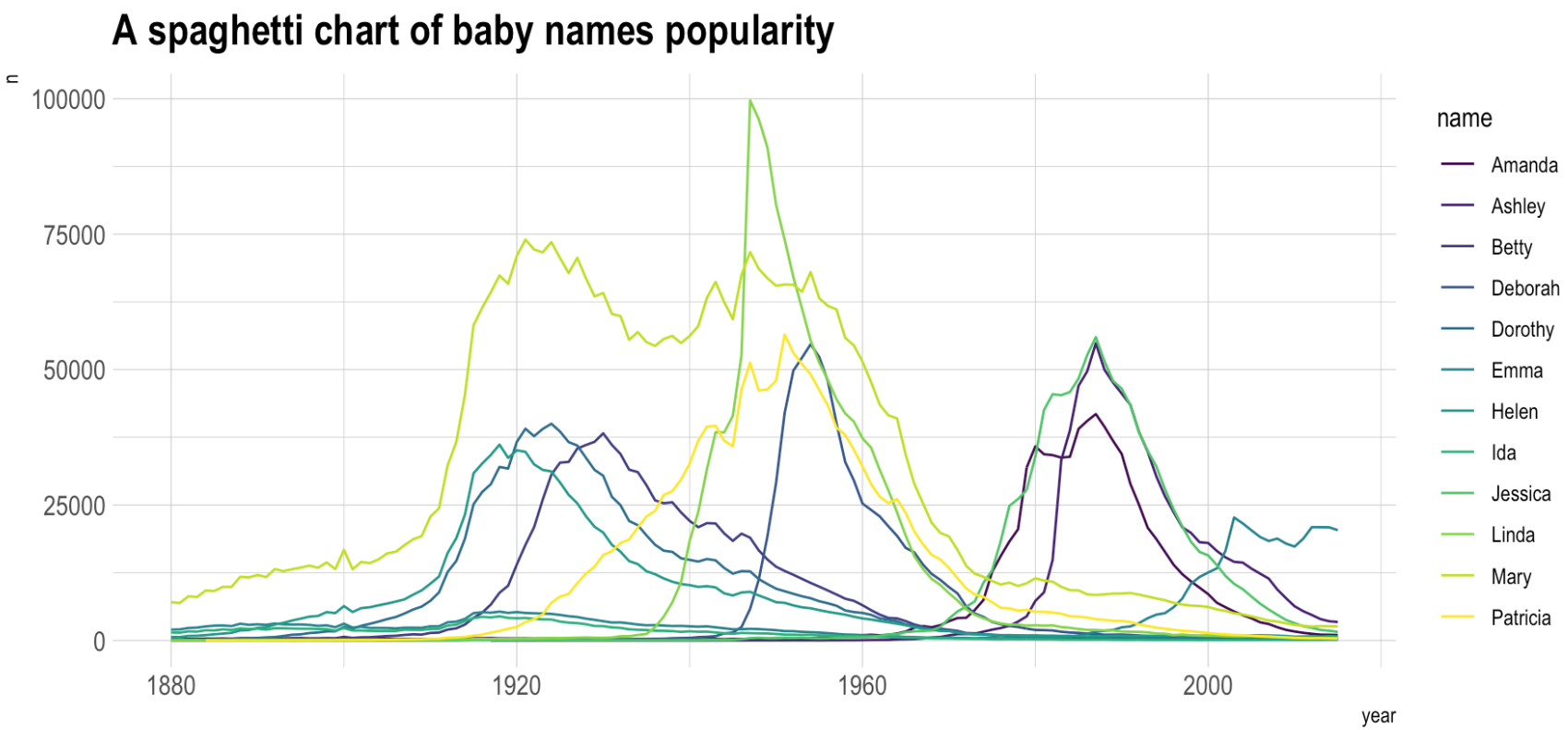
Common chart types

Line charts: **evolution** using **position** and **orientation**



Pitfall

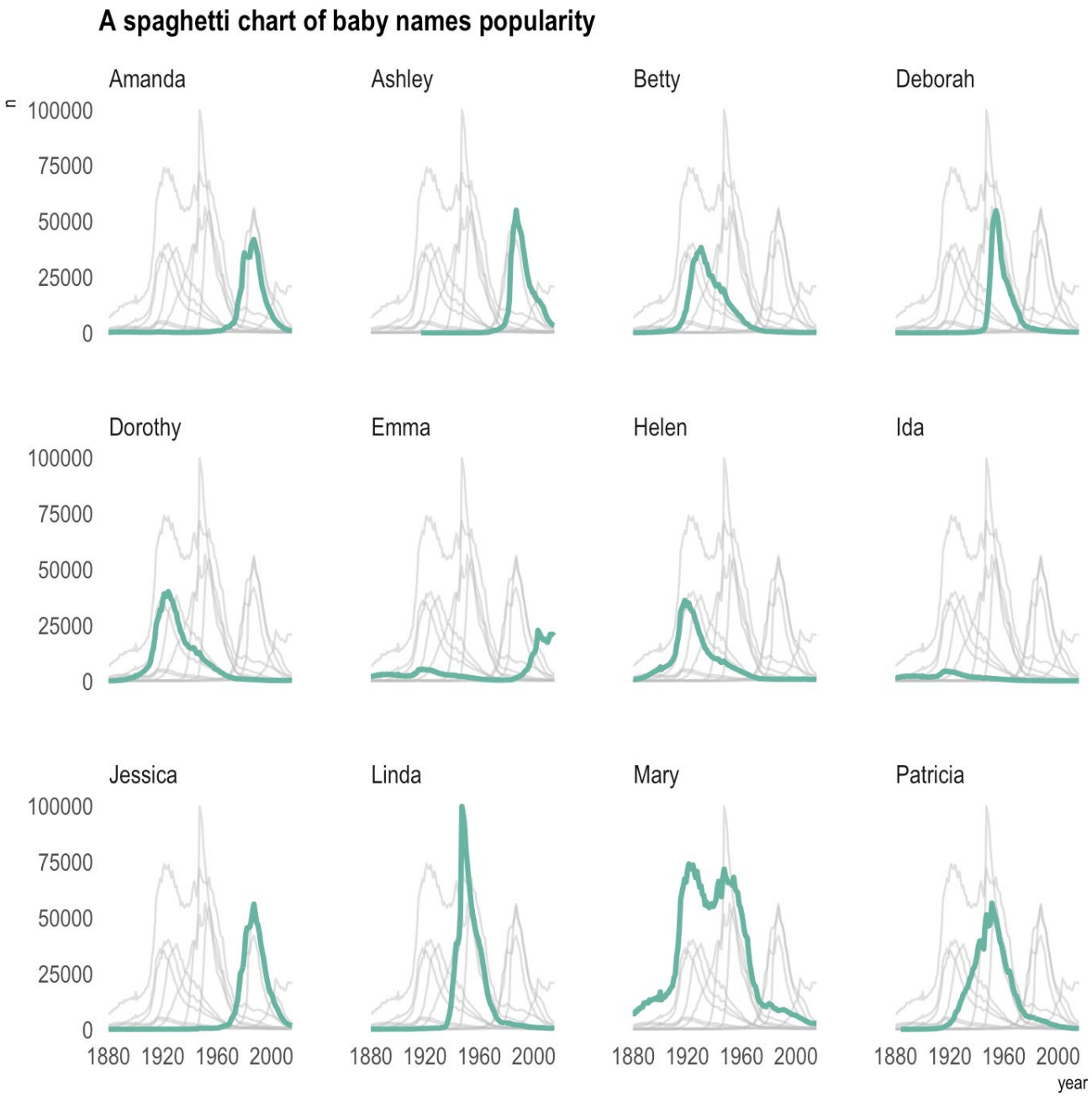
Line chart spaghetti



https://itsmecevi.github.io/dataviz/caveat/spaghetti.html

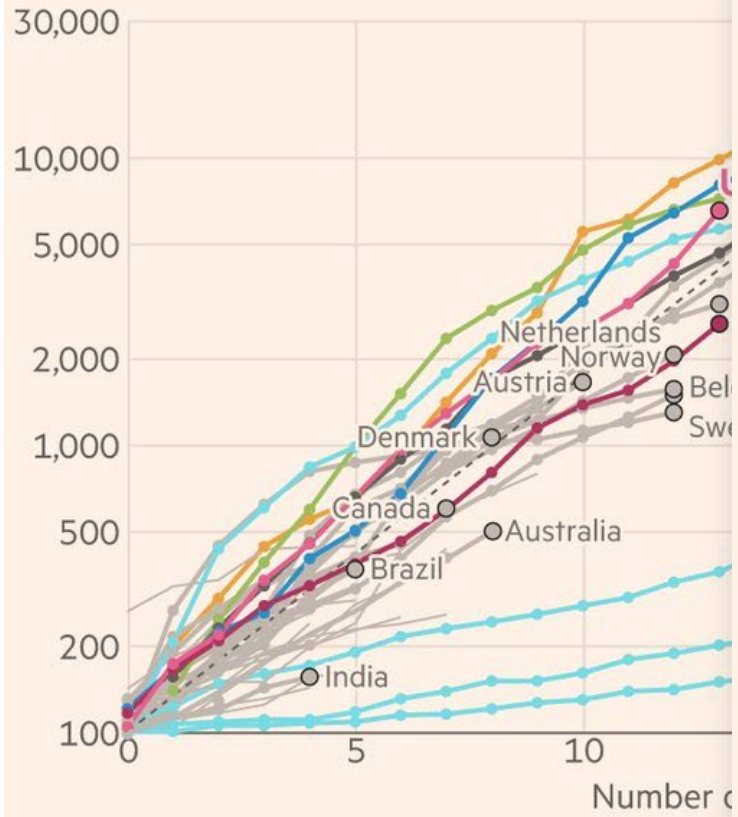
Alternative solution

Make one line stand out



Most western countries are on t
and Singapore have limited the s

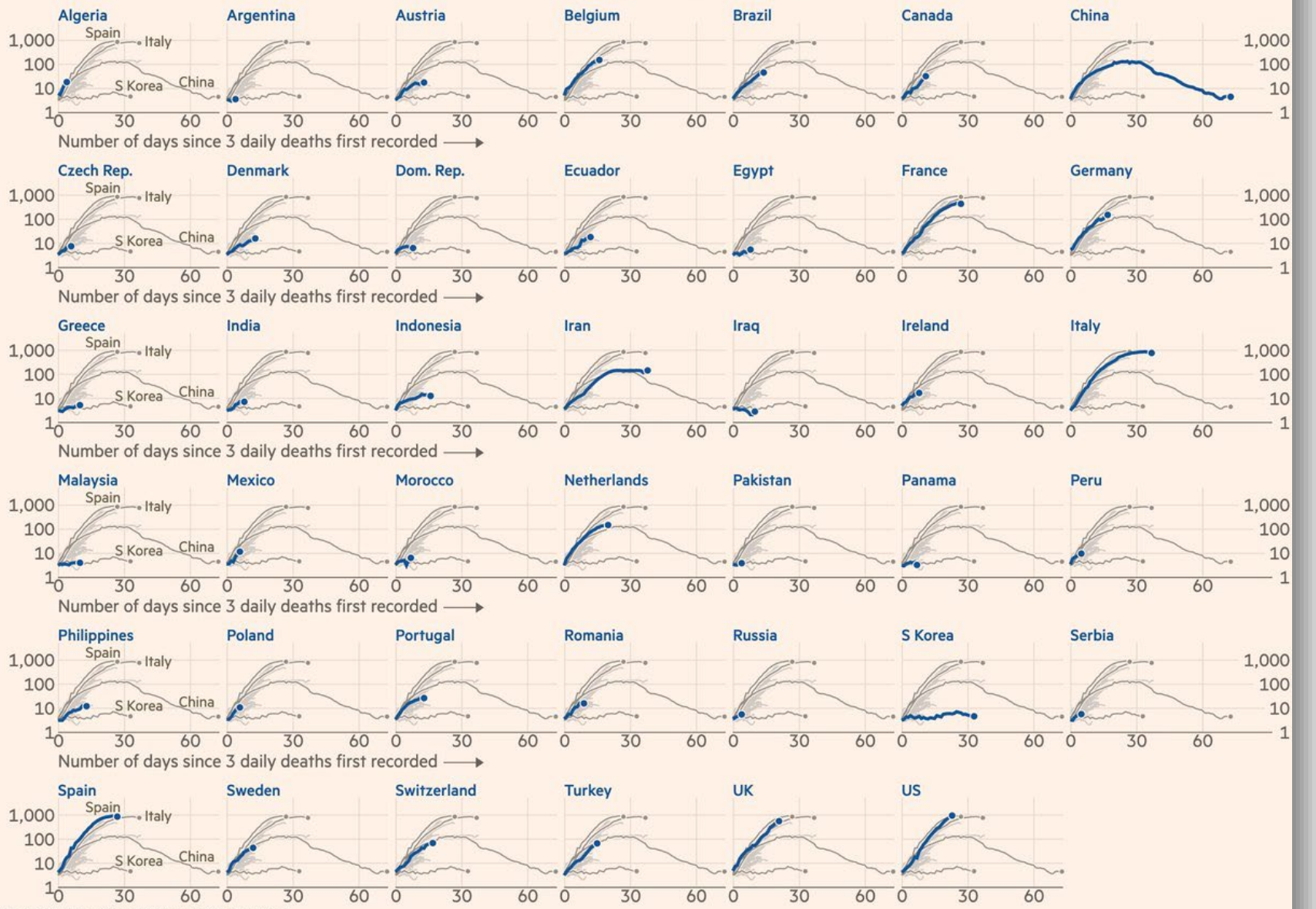
Cumulative number of cases, by number of



FT graphic: John Burn-Murdoch / @jburnmurdoch
Source: FT analysis of Johns Hopkins University, CSSE; Wor
© FT

Daily death tolls are still accelerating in most countries

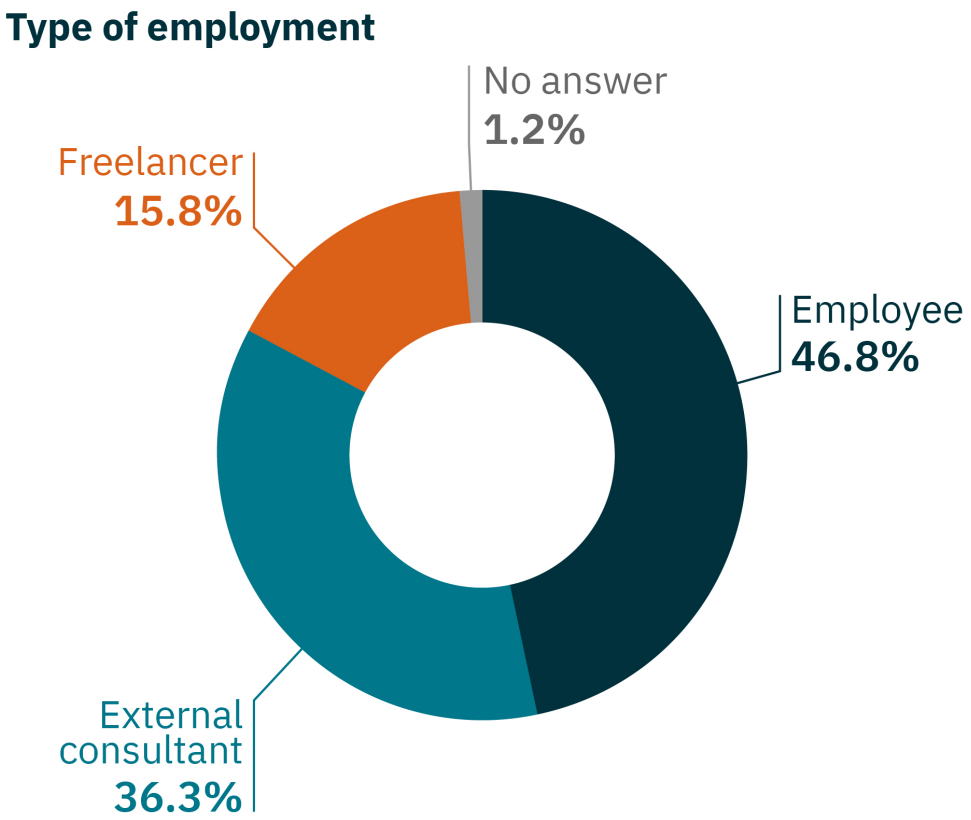
Daily deaths with coronavirus (7-day rolling average), by number of days since 3 daily deaths first recorded



FT graphic: John Burn-Murdoch / @jburnmurdoch
Source: FT analysis of European Centre for Disease Prevention and Control; Worldometers; FT research. Data updated April 05, 19:00 GMT
© FT

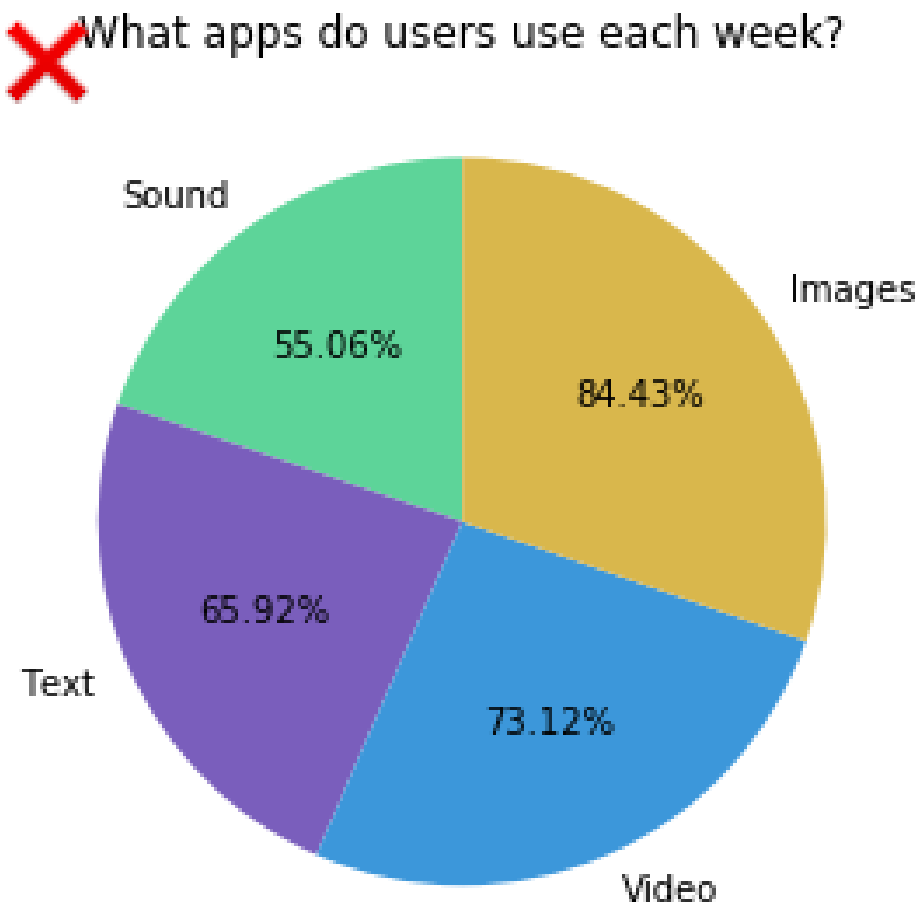
Common chart types

Pie charts: **distribution** using **size**



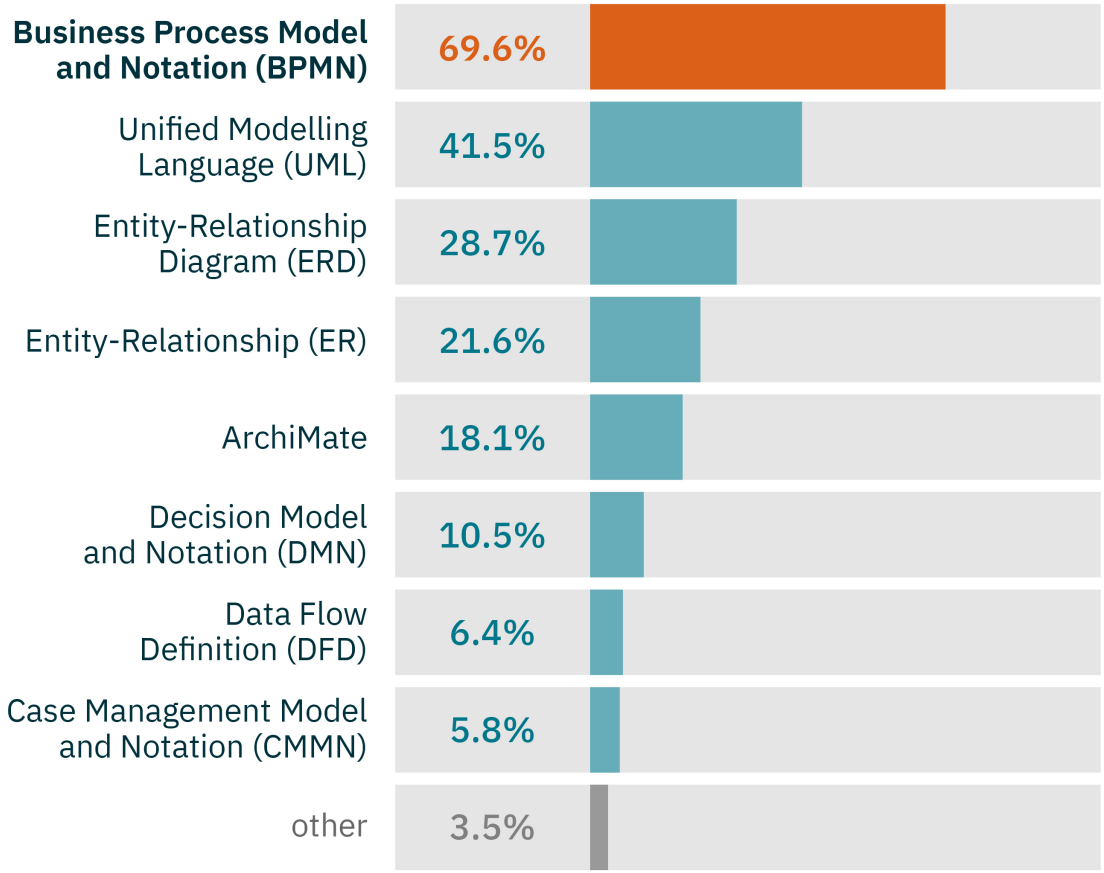
Pitfall

It doesn’t add up



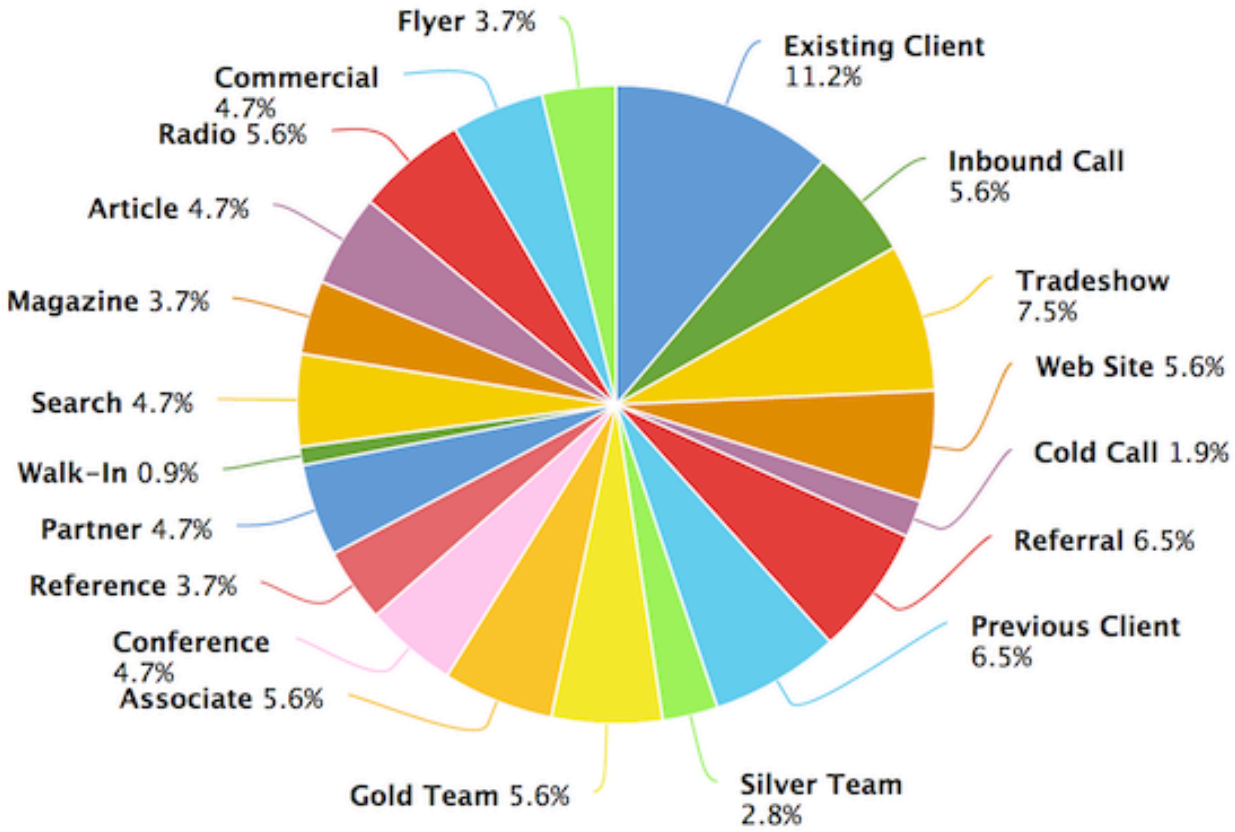
Alternative solution

Use a bar chart



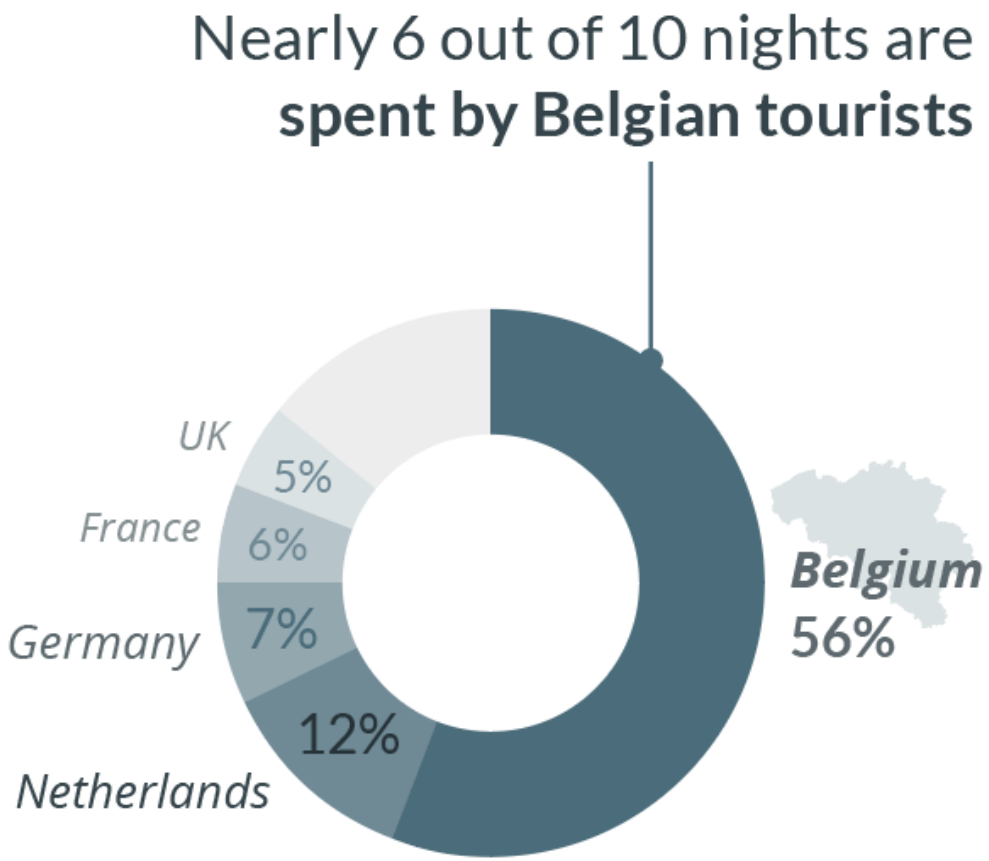
Pitfall

Too many categories



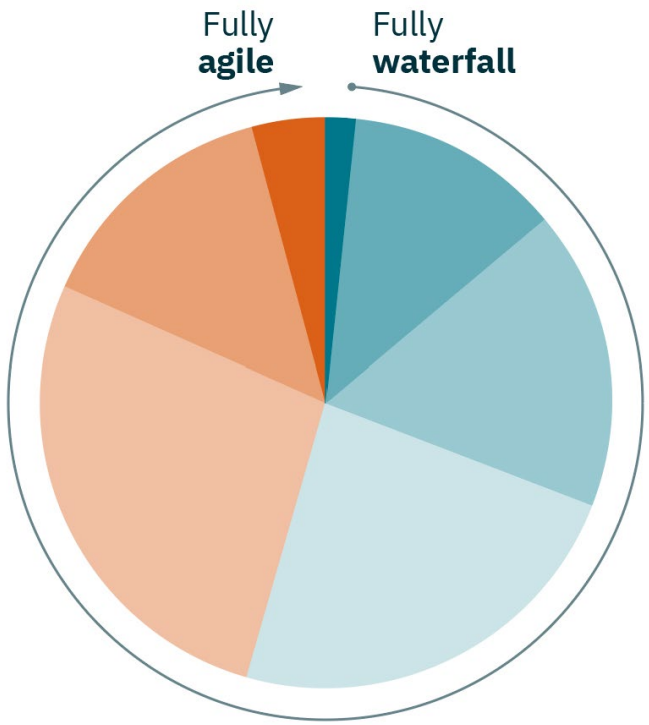
Alternative solution

Group categories together



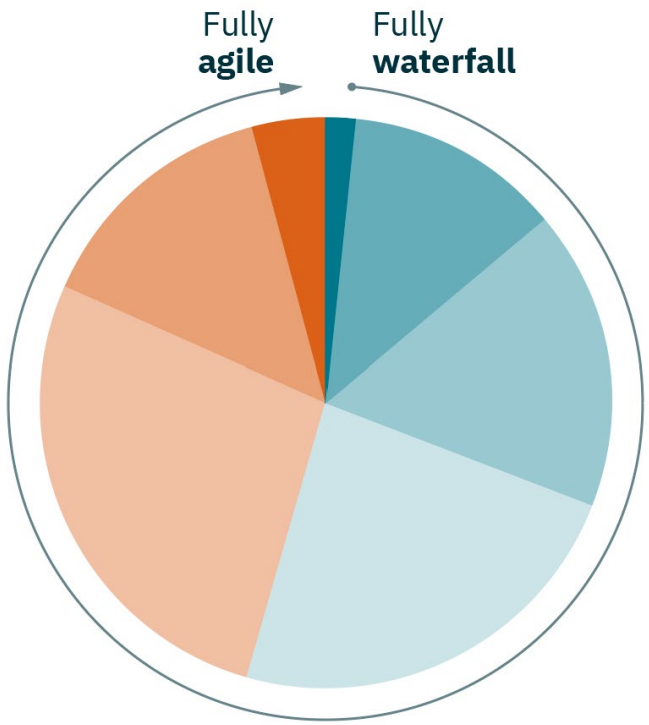
Pitfall

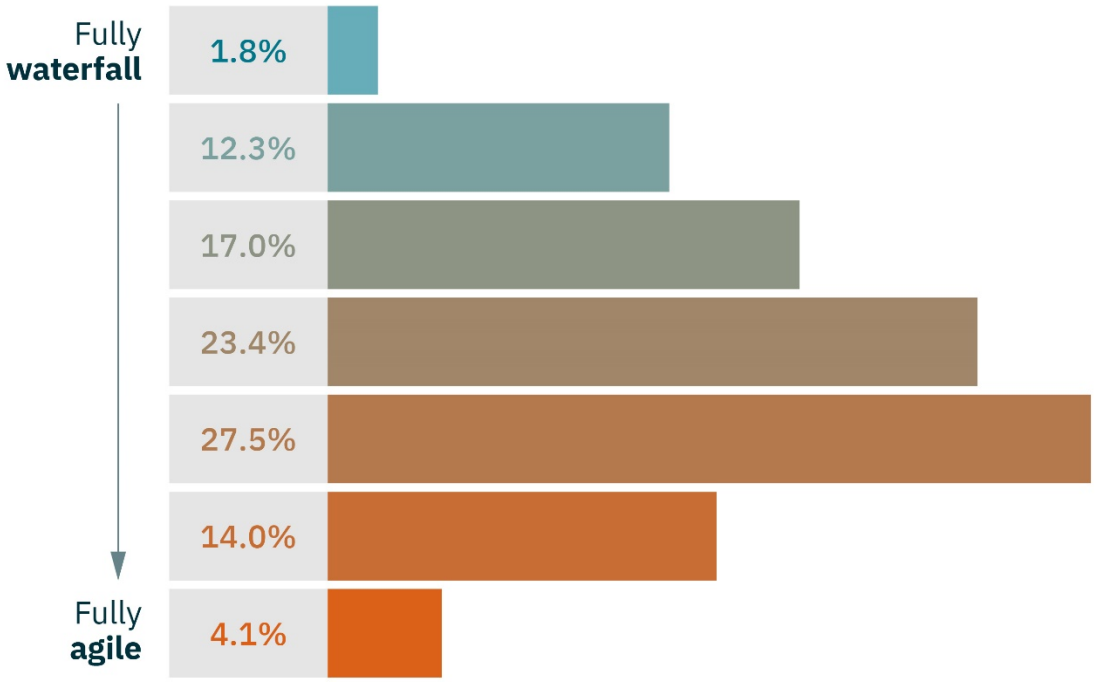
Difficult to compare



Alternative solution

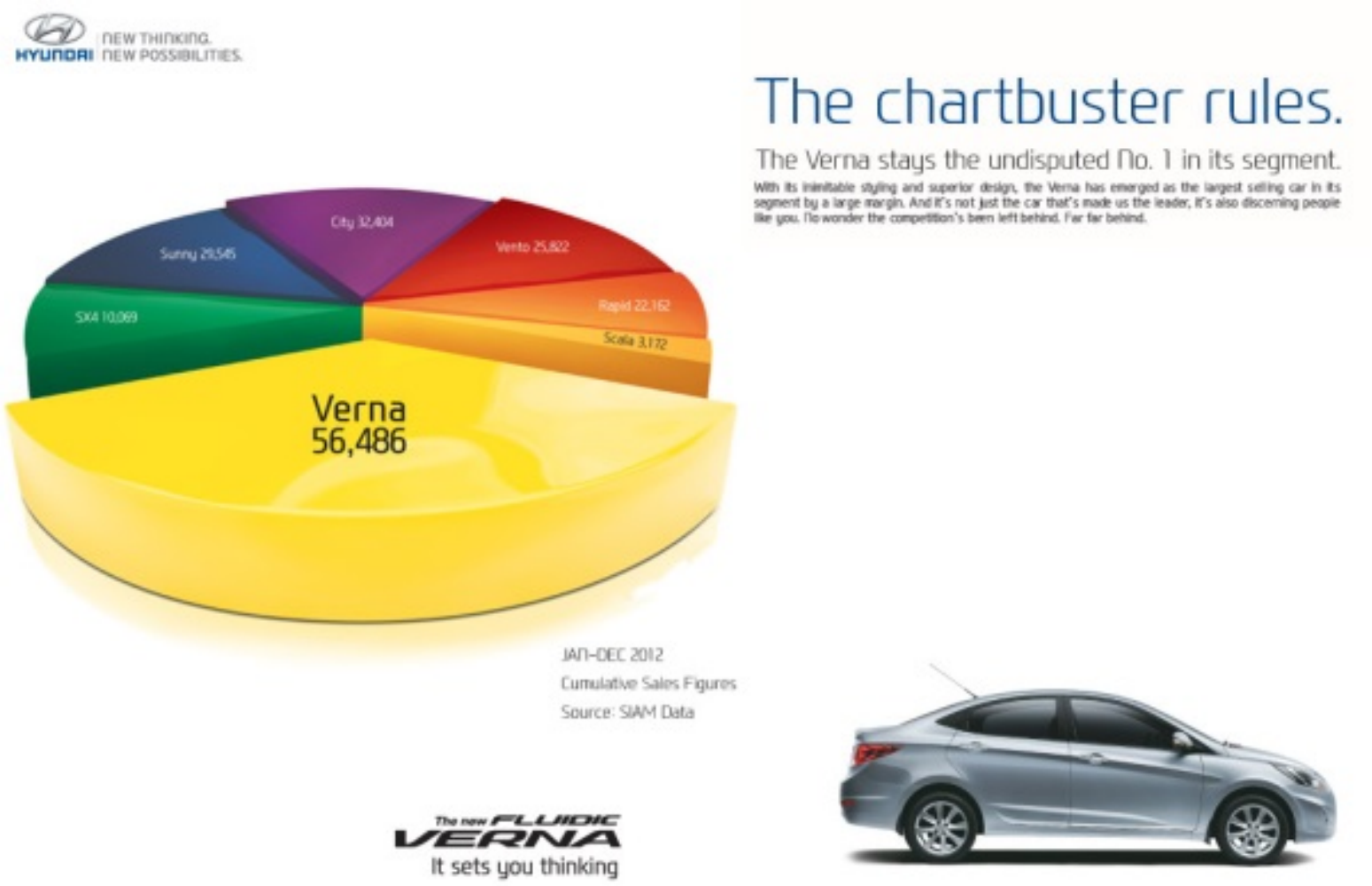
Use a bar chart





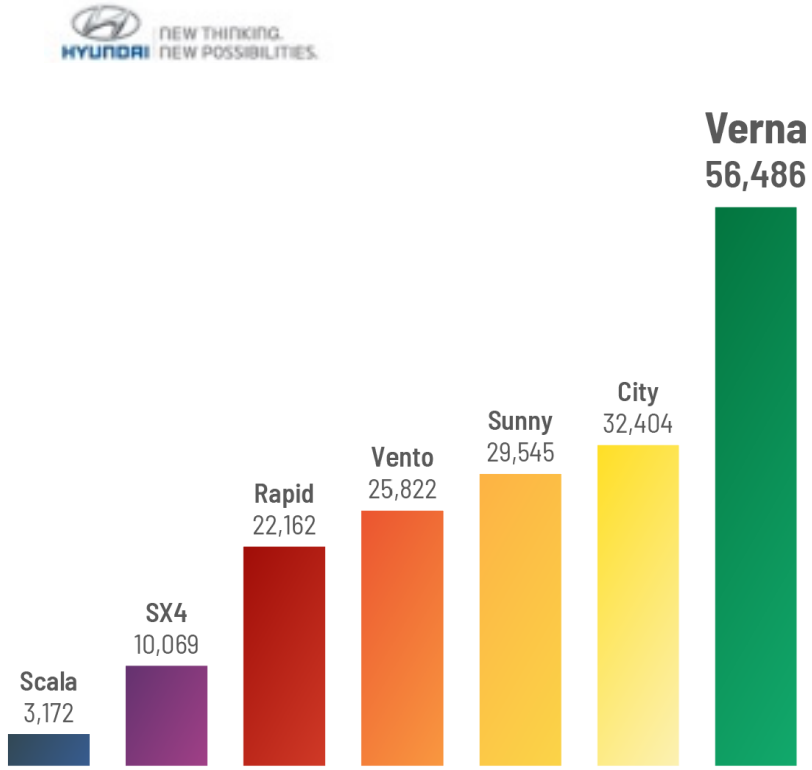
Pitfall

3D pie charts



Alternative solution

Use a bar chart



The new FLUIDIC VERNA
It sets you thinking

The chartbuster rules.

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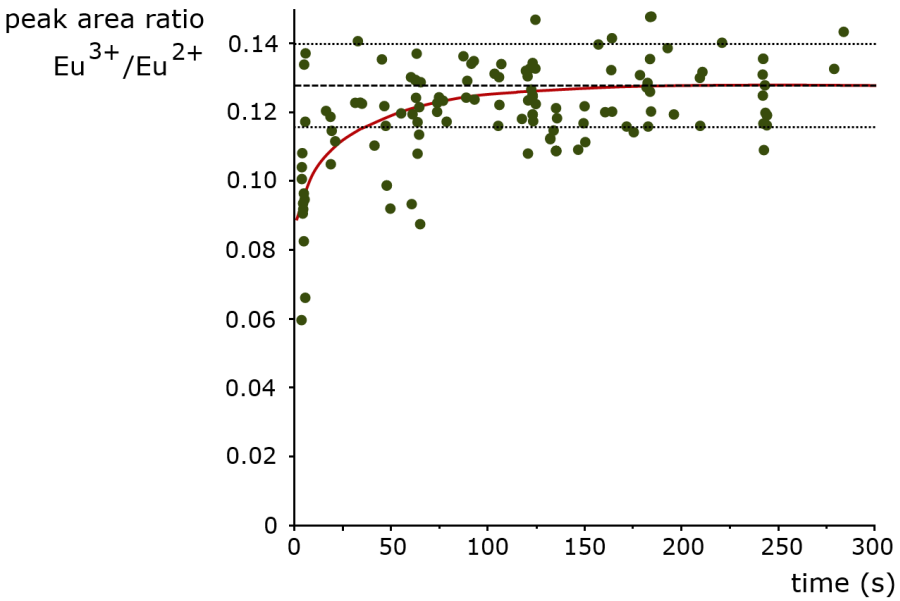
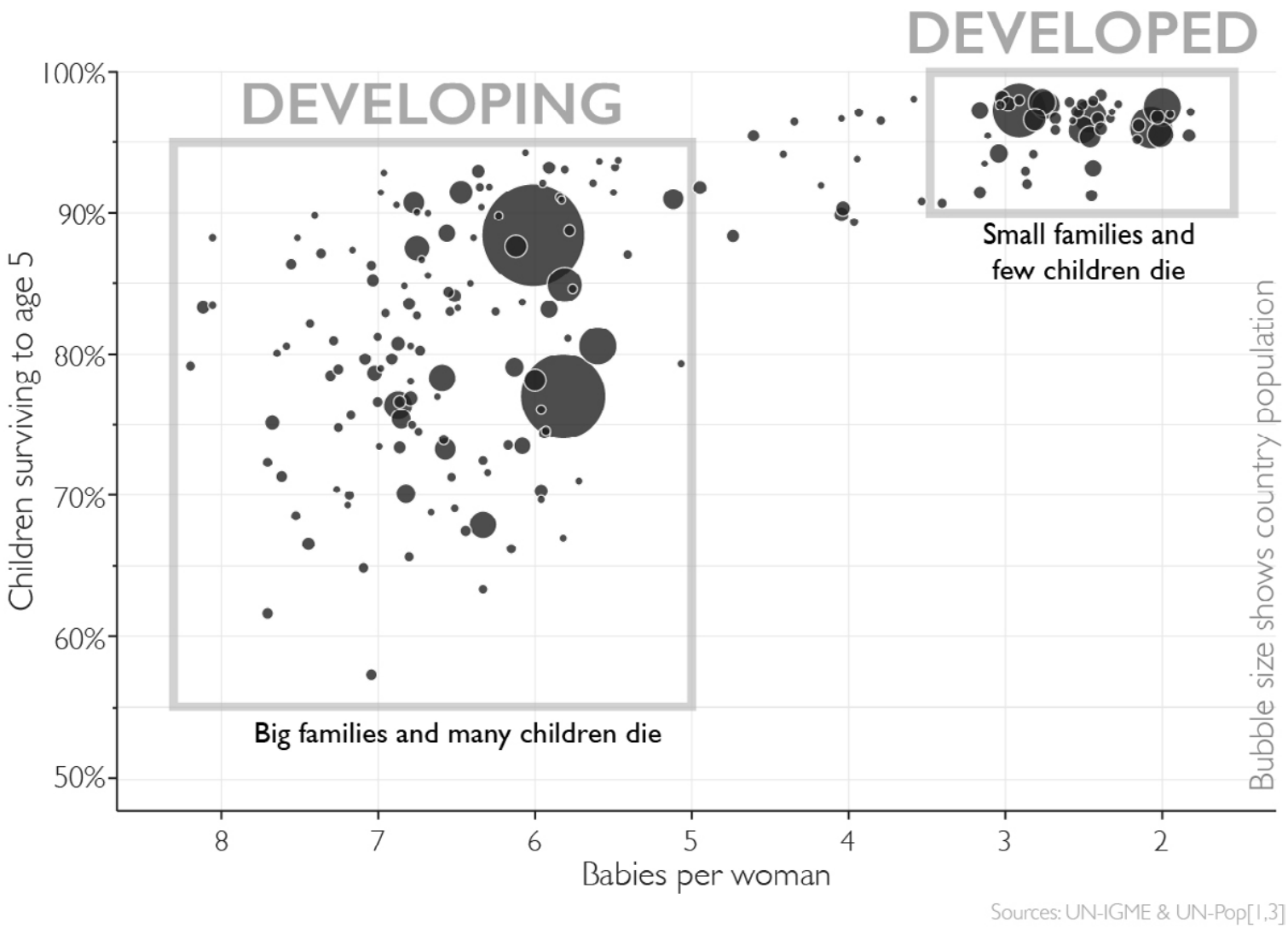
With its inimitable styling and superior design, the Verna has emerged as the largest selling car in its segment by a large margin. And it's not just the car that's made us the leader, it's also discerning people like you. No wonder the competition's been left behind. Far far behind.

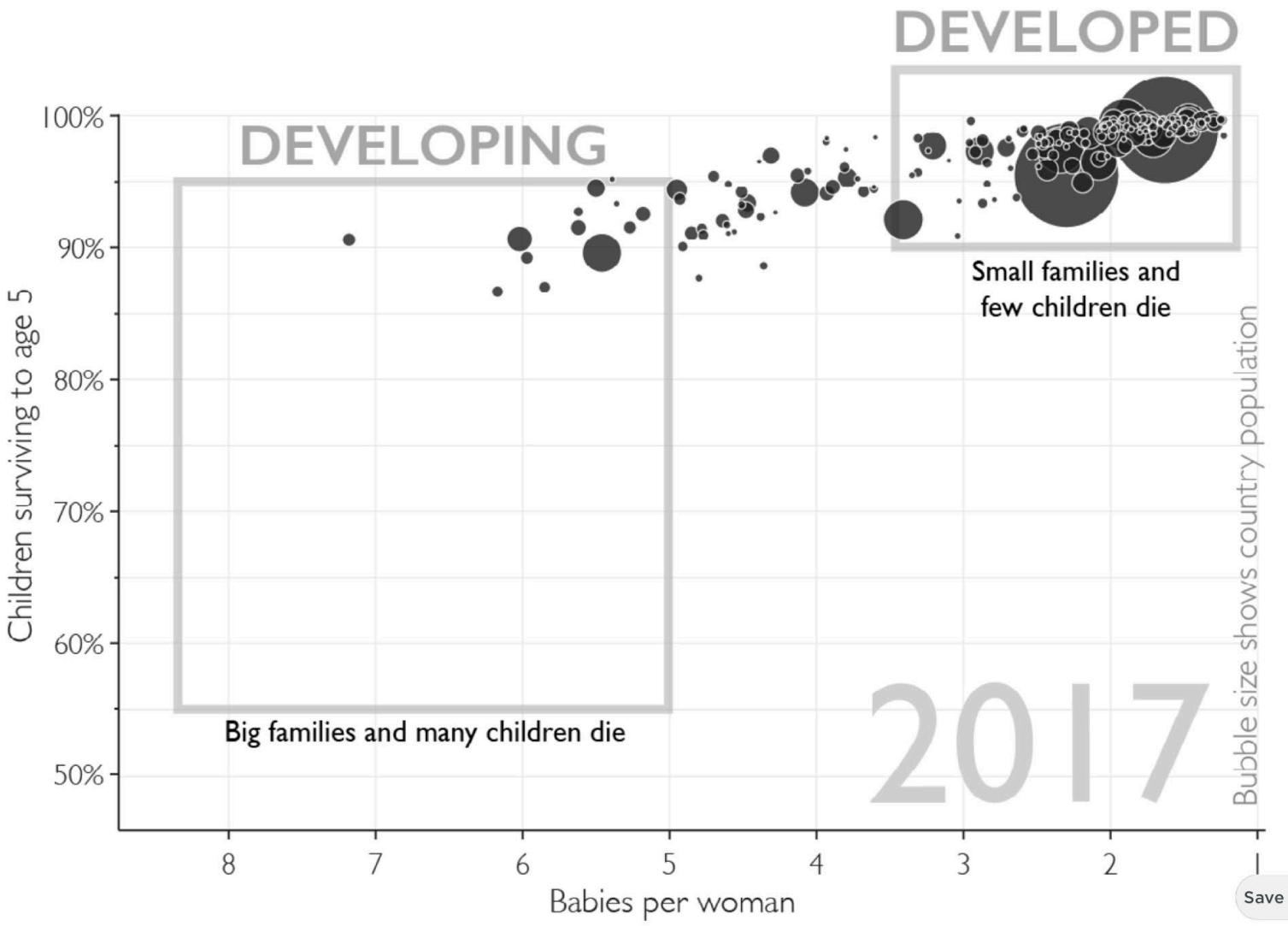
Common chart types

Scatter plots: **correlation** and **distribution** using **position**



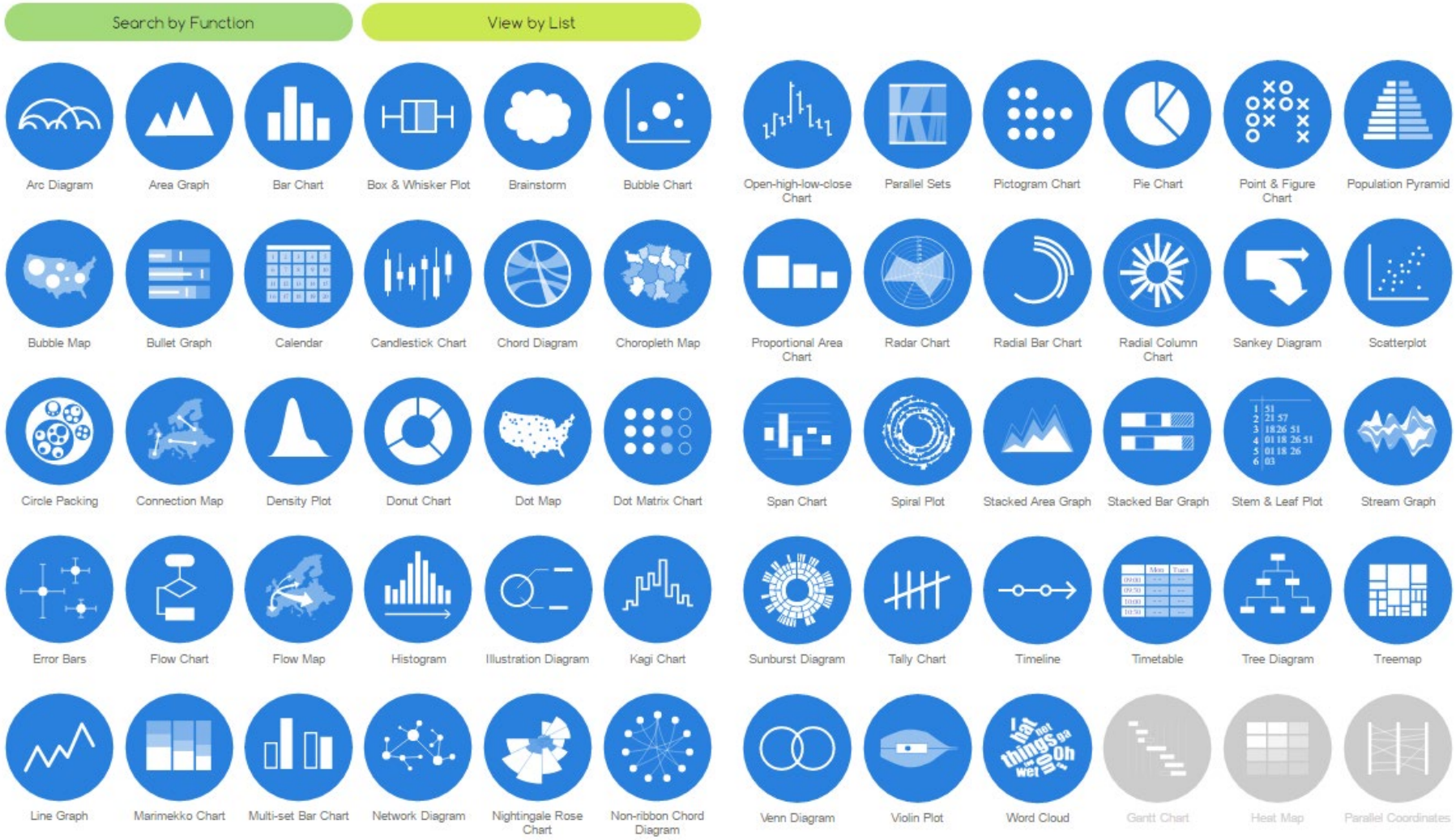


Hans Rosling, Factfulness



Sources: UN-IGME, UN-Pop[1,3] & Gapminder[6]

Save PDF to Evernote



www.datavizcatalogue.com

Treemap

Description

Treemaps are an alternative way of visualising the hierarchical structure of a Tree Diagram while also displaying quantities for each category via area size. Each category is assigned a rectangle area with their subcategory rectangles nested inside of it.

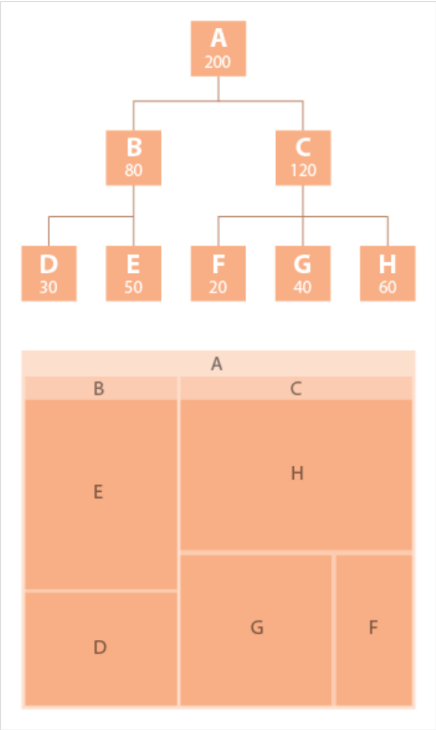
When a quantity is assigned to a category, its area size is displayed in proportion to that quantity and to the other quantities within the same parent category in a part-to-whole relationship. Also, the area size of the parent category is the total of its subcategories. If no quantity is assigned to a subcategory, then it's area is divided equally amongst the other subcategories within its parent category.

The way rectangles are divided and ordered into sub-rectangles is dependent on the tiling algorithm used. Many tiling algorithms have been developed, but the "squarified algorithm" which keeps each rectangle as square as possible is the one commonly used.

Ben Shneiderman originally developed Treemaps as a way of visualising a vast file directory on a computer, without taking up too much space on the screen. This makes Treemaps a more compact and space-efficient option for displaying hierarchies, that gives a quick overview of the structure. Treemaps are also great at comparing the proportions between categories via their area size.

The downside to a Treemap is that it doesn't show the hierarchal levels as clearly as other charts that visualise hierarchal data (such as a Tree Diagram or Sunburst Diagram).

Anatomy



Functions

Comparisons | Hierarchy | Part-to-a-whole | Proportions

Similar Charts

Circle Packing

Marimekko Chart

Sunburst Diagram

Tools to Generate Visualisation

AnyChart (code)
amCharts (code)
D3 (code)
Datamatic
Google Charts (code) or Google Docs
Infogram
jChartFX (JavaScript plugin)
JSCharting (JS Library)
RAWGraphs
Slemma
Vega (code)
Vizzlo
ZingChart (code)

Examples

Region-wise Literacy Rates in 2015, World Population - FusionCharts

Top 10 Chinese Exports to the World - AnyChart

Treemap - Datamatic

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THE CHARTMAKER DIRECTORY

ABOUT

Filter by chart name or AKA

Reference Type: ○ Example ● Solution | Chart Families: Categorical Hierarchical Relational Temporal Spatial

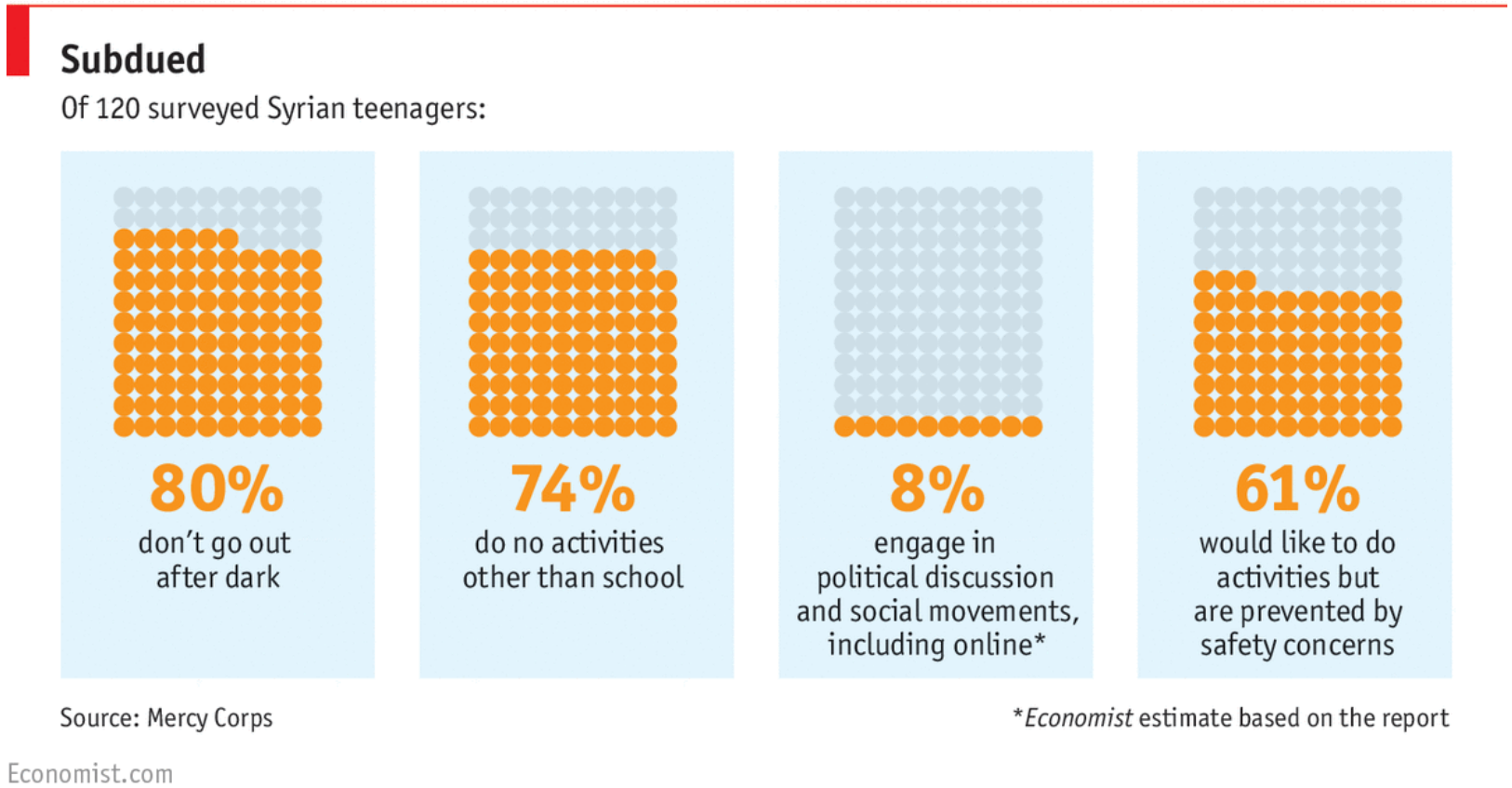
	Amazon QuickSight	ArcGIS	ChartJS	Charticulator	D3.js	Data Illustrator	Datawrapper	Flourish	FusionCharts	Gephi	Google Charts	Google Data Studio	Highcharts	Infogram	JetPack Data	JMP	Keshif	Kibana	Leaflet.js	Mapbox	Matplotlib
Bar chart	●			●	●○●	○	●○●	○	○		●●	○	●○●	○○	●○	●	●	●			●○○
Clustered bar chart	●				●	○	●○●○●	○	○		●●				○○	●	●	●			●
Bullet chart				●	●		●●		○							●					
Waterfall chart				●	●				○		●		○	○							
Radar chart			○		●				○				○								○
Polar chart			●	●	●								○○								○○
Connected dot plot					●●	○	●○●○●	●													
Pictogram					○									○				●			
Proportional shape chart					○●○●●	○		●○○	○		●										
Word cloud					●									○	●			●			●●
Heat map	●			●	○○○●●	○			○				○○			●		●			●●
Matrix chart				●	○			○				○					●				
Dot plot					●		●○●	●								●●		○			

http://chartmaker.visualisingdata.com

https://chart.guide/

Less common chart types

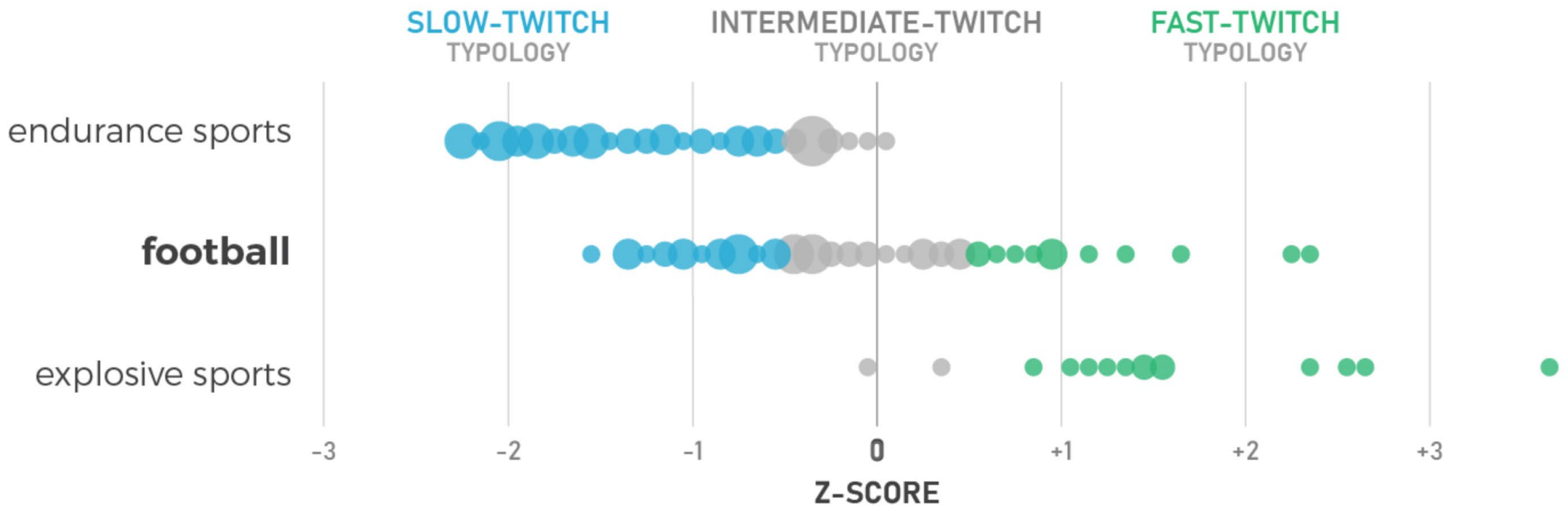
Waffle charts



economist.com

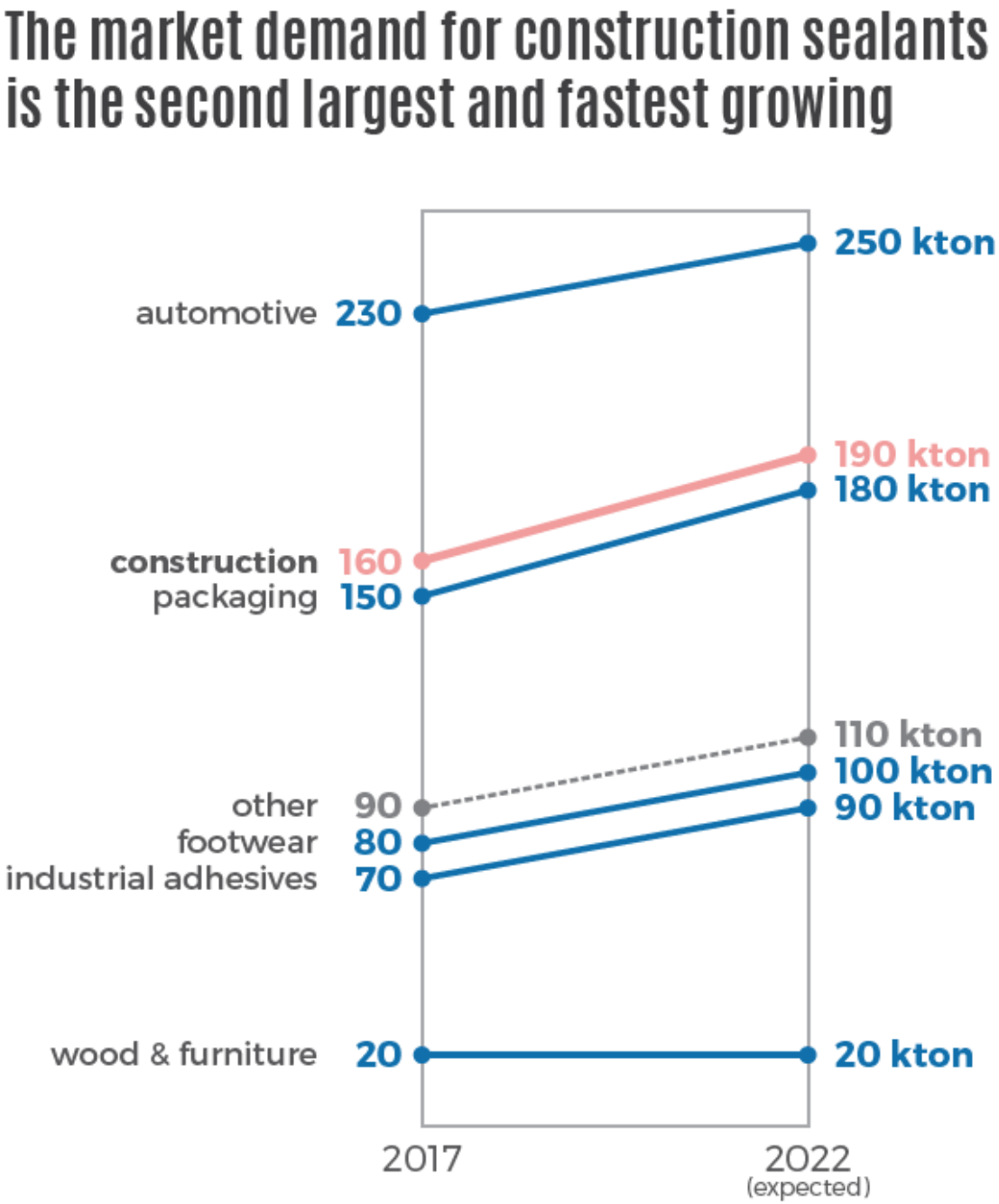
Less common chart types

Strip charts

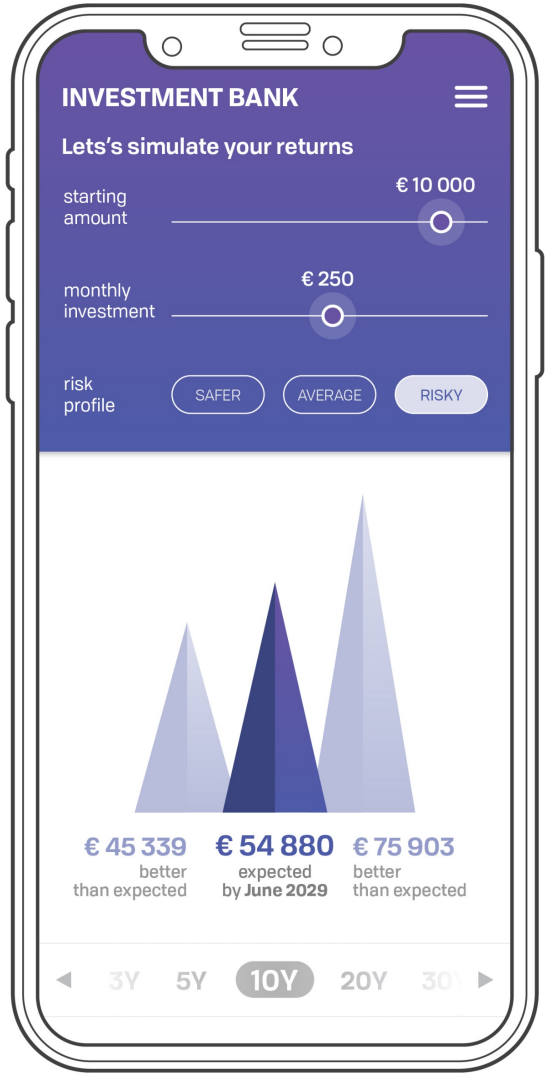


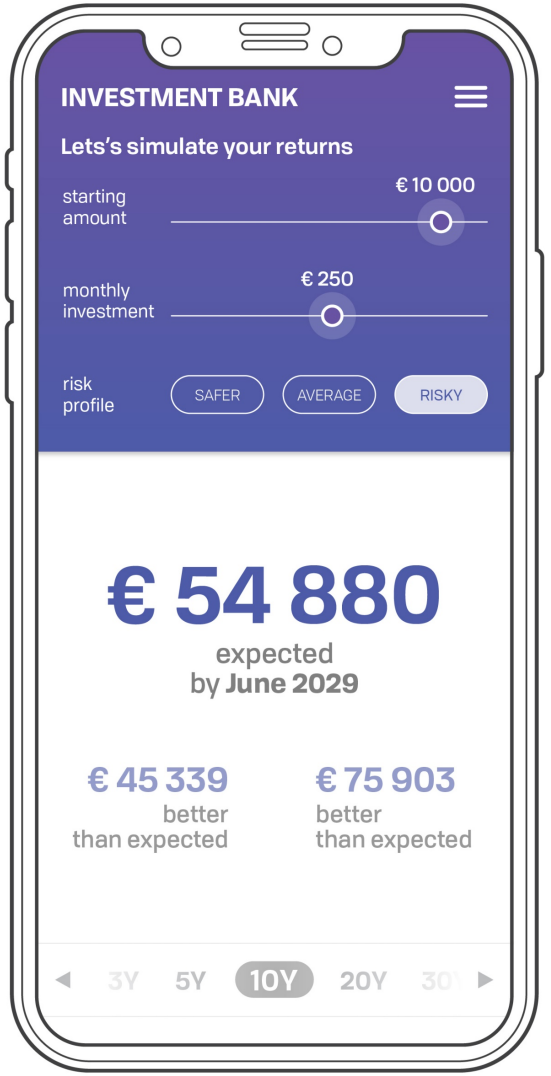
Less common chart types

Slopegraphs



Do I really need a chart?





Maybe a table is sufficient?

UPDATED JAN. 12, 2021, AT 12:03 AM

Club Soccer Predictions

Forecasts and Soccer Power Index (SPI) ratings
for 39 leagues, updated after each match.

See also: How this works Global club soccer rankings

England: Premier League **Standings** Matches

PREMIER LEAGUE
2020-21

England
Updated Jan. 4, 2021, at 4:56 p.m.

	TEAM RATING			AVG. SIMULATED SEASON		END-OF-SEASON PROBABILITIES			
TEAM	SPI	OFF.	DEF.	GOAL DIFF.	PTS.	EVERY POSITION	RELEGATED	QUALIFY FOR UCL	WIN PREMIER LEAGUE
Man. City 29 pts	93.7	2.9	0.2	+49	83	↓20th 1st↓	<1%	97%	69%
Liverpool 33 pts	88.6	2.6	0.4	+36	74		<1%	80%	15%
Man. United 33 pts	84.5	2.5	0.6	+23	72		<1%	70%	10%
Tottenham 29 pts	81.6	2.3	0.6	+23	65		<1%	39%	2%
Chelsea 26 pts	85.8	2.4	0.5	+25	64		<1%	33%	1%
Leicester 32 pts	79.1	2.1	0.6	+14	64		<1%	29%	1%
Aston Villa 26 pts	78.5	2.2	0.7	+16	60		<1%	18%	<1%
Everton 29 pts	74.5	2.0	0.7	+3	58		<1%	10%	<1%
Arsenal 23 pts	80.5	2.2	0.6	+8	57		<1%	8%	<1%

More info: fivethirtyeight.com

Company	LatestWeek Volume	PriorWeek Volume	Change	% Change	Volume Trend Last 31 days as of 31-10-2018
	16,356,600	8,707,400	7,649,200	87.85%	
	195,375,400	103,700,700	91,674,700	88.40%	
	198,068,600	174,145,400	23,923,200	13.74%	
	60,965,900	29,933,500	31,032,400	103.67%	
	6,393,500	8,870,600	2,477,100	27.92%	
	288,745,200	199,505,500	89,239,700	44.73%	
	52,925,900	50,509,900	2,416,000	4.78%	
	228,612,200	161,738,200	66,874,000	41.35%	

Unemployment rate in selected countries

January-August 2020, sorted by the unemployment rate in January.

country	Jan ▲	Feb	Mar	Apr	May	Jun	Jul	Aug
Japan	2.4%	2.4%	2.5%	2.6%	2.9%	2.8%	2.9%	3.0%
Netherlands	3.0%	2.9%	2.9%	3.4%	3.6%	4.3%	4.5%	4.6%
Germany	3.4%	3.6%	3.8%	4.0%	4.2%	4.3%	4.4%	4.4%
Mexico	3.6%	3.6%	3.2%	4.8%	4.3%	5.4%	5.2%	5.0%
US	**3.6%**	**3.5%**	**4.4%**	**14.7%**	**13.3%**	**11.1%**	**10.2%**	**8.4%**
South Korea	4.0%	3.3%	3.8%	3.8%	4.5%	4.3%	4.2%	3.2%
Denmark	4.9%	4.9%	4.8%	4.9%	5.5%	6.0%	6.3%	6.1%
Belgium	5.1%	5.0%	5.0%	5.1%	5.0%	5.0%	5.0%	5.1%
Australia	5.3%	5.1%	5.2%	6.4%	7.1%	7.4%	7.5%	6.8%
Canada	**5.5%**	**5.6%**	**7.8%**	**13.0%**	**13.7%**	**12.3%**	**10.9%**	**10.2%**
Finland	6.8%	6.9%	7.0%	7.3%	7.5%	7.8%	8.0%	8.1%

Source: OECD • Get the data • Created with Datawrapper

Day	Fat	Carbs	Protein
Monday	70g	94g	81g
Tuesday	65g	85g	95g
Wednesday	88g	71g	105g
Thursday	57g	102g	78g
Friday	73g	96g	84g
Average	74g	85g	88g

Name (Symbol)	Div	Vol	Yld	P/E	Day Last	% Change
SkyHighCorp (SHC)	--	3143	--	76	21.25	+.25
LowDownInc (LDI)	2.35	2735	5.7	18	41.00	–.50
ValueNowInc (VNI)	1.00	1894	4.5	12	22.00	+.10
DoinBadlyCorp (DBC)	--	7601	--	--	33.50	–.75

Proportional	Tabular
390,209,000	390,209,000
112,371,000	112,371,000

56px

Invoice	Invoice date	Due date	Status	Amount
#09293	05/10/2019	05/10/2019	Unpaid	$2,350.00
#98273	05/10/2019	05/10/2019	Paid	$750.83
#19293	05/10/2019	05/10/2019	Pending	$1,200.00
#12839	05/11/2019	05/11/2019	Paid	$2,500.00
81727	05/11/2019	05/11/2019	Unpaid	$3,200.00

More info: [The Ultimate Guide to Designing Data Tables]

Break

All the slides and all the links:

https://baryon.be/dataviz-resources

Introduction

The importance of data visualization

Data visualization principles

Signal-to-noise ratio

Encoding

Designing charts

Chart types

Workflow and tools

Components

Case studies

Improving charts

Telling a story

Visualizing uncertainty

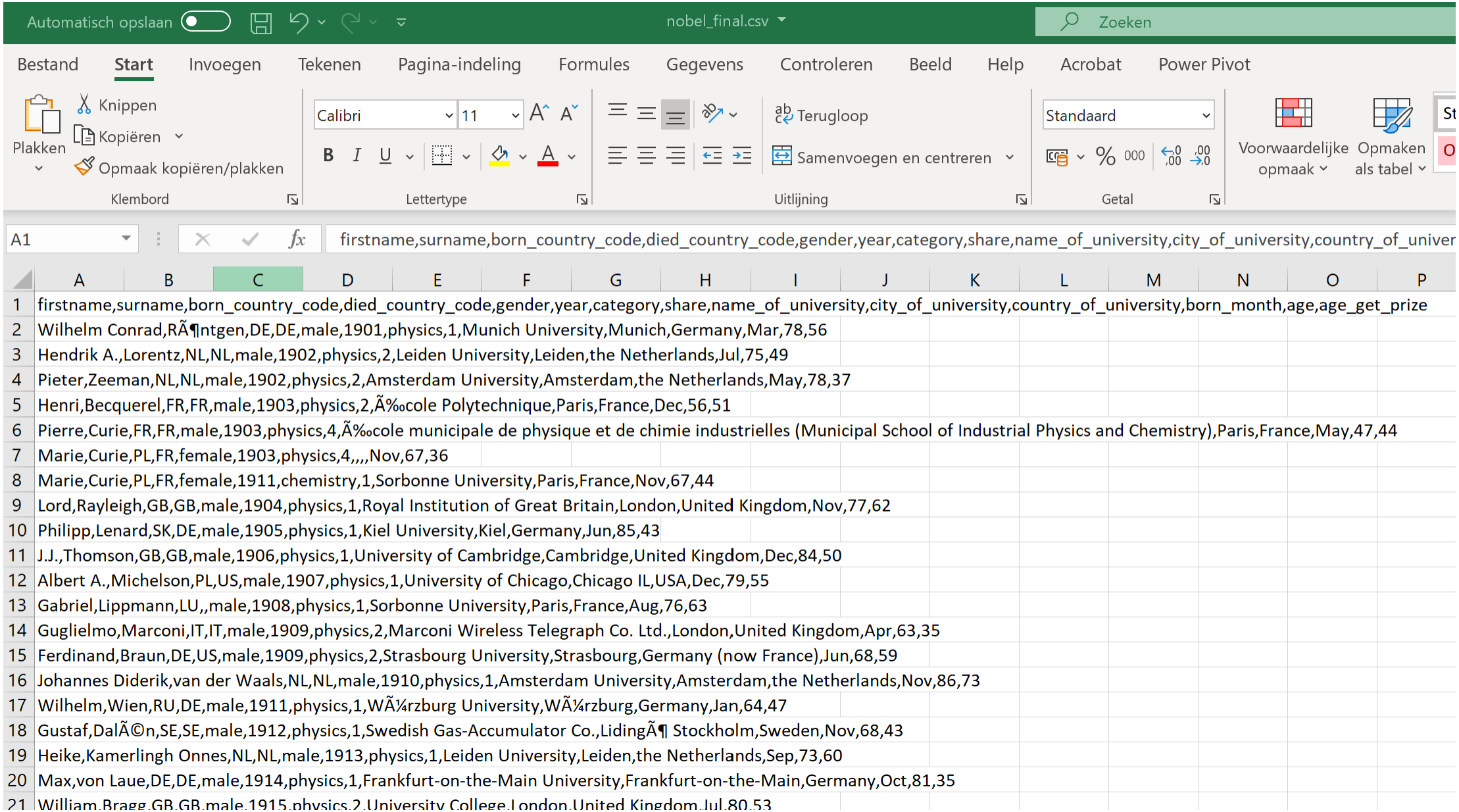
Workflow and tools

Workflow

clean up your data

create the chart

improve the design



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2	Wilhelm Conrad,RÃ¶ntgen,DE,DE,male,1901,physics,1,Munich University,Munich,Germany,Mar,78,56
3	Hendrik A.,Lorentz,NL,NL,male,1902,physics,2,Leiden University,Leiden,the Netherlands,Jul,75,49
4	Pieter,Zeeman,NL,NL,male,1902,physics,2,Amsterdam University,Amsterdam,the Netherlands,May,78,37
5	Henri,Becquerel,FR,FR,male,1903,physics,2,Ã‰cole Polytechnique,Paris,France,Dec,56,51
6	Pierre,Curie,FR,FR,male,1903,physics,4,Ã‰cole municipale de physique et de chimie industrielles (Municipal School of Industrial Physics and Chemistry),Paris,France,May,47,44
7	Marie,Curie,PL,FR,female,1903,physics,4,,,,Nov,67,36
8	Marie,Curie,PL,FR,female,1911,chemistry,1,Sorbonne University,Paris,France,Nov,67,44
9	Lord,Rayleigh,GB,GB,male,1904,physics,1,Royal Institution of Great Britain,London,United Kingdom,Nov,77,62
10	Philipp,Lenard,SK,DE,male,1905,physics,1,Kiel University,Kiel,Germany,Jun,85,43
11	J.J.,Thomson,GB,GB,male,1906,physics,1,University of Cambridge,Cambridge,United Kingdom,Dec,84,50
12	Albert A.,Michelson,PL,US,male,1907,physics,1,University of Chicago,Chicago IL,USA,Dec,79,55
13	Gabriel,Lippmann,LU,,male,1908,physics,1,Sorbonne University,Paris,France,Aug,76,63
14	Guglielmo,Marconi,IT,IT,male,1909,physics,2,Marconi Wireless Telegraph Co. Ltd.,London,United Kingdom,Apr,63,35
15	Ferdinand,Braun,DE,US,male,1909,physics,2,Strasbourg University,Strasbourg,Germany (now France),Jun,68,59
16	Johannes Diderik,van der Waals,NL,NL,male,1910,physics,1,Amsterdam University,Amsterdam,the Netherlands,Nov,86,73
17	Wilhelm,Wien,RU,DE,male,1911,physics,1,WÃ¼rzburg University,WÃ¼rzburg,Germany,Jan,64,47
18	Gustaf,DalÃ©n,SE,SE,male,1912,physics,1,Swedish Gas-Accumulator Co.,LidingÃ¶ Stockholm,Sweden,Nov,68,43
19	Heike,Kamerlingh Onnes,NL,NL,male,1913,physics,1,Leiden University,Leiden,the Netherlands,Sep,73,60
20	Max,von Laue,DE,DE,male,1914,physics,1,Frankfurt-on-the-Main University,Frankfurt-on-the-Main,Germany,Oct,81,35
21	William,Bragg,GB,GB,male,1915,physics,2,University College,London,United Kingdom,Jul,80,53

https://datasetsearch.research.google.com/

firstname	surname	born_country_code	died_country_code	gender	year	category	share	name_of_university	city_of_university	country_of_university
Wilhelm Conrad	Röntgen	DE	DE	male	1901	physics	1	Munich University	Munich	Germany
Hendrik A.	Lorentz	NL	NL	male	1902	physics	2	Leiden University	Leiden	the Netherlands
Pieter	Zeeman	NL	NL	male	1902	physics	2	Amsterdam University	Amsterdam	the Netherlands
Henri	Becquerel	FR	FR	male	1903	physics	2	École Polytechnique	Paris	France
Pierre	Curie	FR	FR	male	1903	physics	4	École municipale de physique et de chimie industrielles (Municipal School of Industrial Physics and Che	Paris	France
Marie	Curie	PL	FR	female	1903	physics	4			
Marie	Curie	PL	FR	female	1911	chemistry	1	Sorbonne University	Paris	France
Lord	Rayleigh	GB	GB	male	1904	physics	1	Royal Institution of Great Britain	London	United Kingdom
Philipp	Lenard	SK	DE	male	1905	physics	1	Kiel University	Kiel	Germany
J.J.	Thomson	GB	GB	male	1906	physics	1	University of Cambridge	Cambridge	United Kingdom
Albert A.	Michelson	PL	US	male	1907	physics	1	University of Chicago	Chicago IL	USA
Gabriel	Lippmann	LU		male	1908	physics	1	Sorbonne University	Paris	France
Guglielmo	Marconi	IT	IT	male	1909	physics	2	Marconi Wireless Telegraph Co. Ltd.	London	United Kingdom
Ferdinand	Braun	DE	US	male	1909	physics	2	Strasbourg University	Strasbourg	Germany (now France)
Johannes Diderik	van der Waals	NL	NL	male	1910	physics	1	Amsterdam University	Amsterdam	the Netherlands
Wilhelm	Wien	RU	DE	male	1911	physics	1	Würzburg University	Würzburg	Germany
Gustaf	Dalén	SE	SE	male	1912	physics	1	Swedish Gas-Accumulator Co.	Lidingö Stockholm	Sweden
Heike	Kamerlingh Onnes	NL	NL	male	1913	physics	1	Leiden University	Leiden	the Netherlands
Max	von Laue	DE	DE	male	1914	physics	1	Frankfurt-on-the-Main University	Frankfurt-on-the-Main	Germany
William	Bragg	GB	GB	male	1915	physics	2	University College	London	United Kingdom
Lawrence	Bragg	AU	GB	male	1915	physics	2	Victoria University	Manchester	United Kingdom
Charles Glover	Barkla	GB	GB	male	1917	physics	1	Edinburgh University	Edinburgh	United Kingdom
Max	Planck	DE	DE	male	1918	physics	1	Berlin University	Berlin	Germany
Johannes	Stark	DE	DE	male	1919	physics	1	Greifswald University	Greifswald	Germany
Charles Edouard	Guillaume	CH	FR	male	1920	physics	1	Bureau International des Poids et Mesures (International Bureau of Weights and Measures)	Sèvres	France
Albert	Einstein	DE	US	male	1921	physics	1	Kaiser-Wilhelm-Institut (now Max-Planck-Institut) für Physik	Berlin	Germany
Niels	Bohr	DK	DK	male	1922	physics	1	Copenhagen University	Copenhagen	Denmark
Robert A.	Millikan	US	US	male	1923	physics	1	California Institute of Technology (Caltech)	Pasadena CA	USA
Manne	Siegbahn	SE	SE	male	1924	physics	1	Uppsala University	Uppsala	Sweden
James	Franck	DE	DE	male	1925	physics	2	Goettingen University	Göttingen	Germany
Gustav	Hertz	DE	DE	male	1925	physics	2	Halle University	Halle	Germany
Jean Baptiste	Perrin	FR	US	male	1926	physics	1	Sorbonne University	Paris	France
Arthur H.	Compton	US	US	male	1927	physics	2	University of Chicago	Chicago IL	USA
C.T.R.	Wilson	GB	GB	male	1927	physics	2	University of Cambridge	Cambridge	United Kingdom
Owen Willans	Richardson	GB	GB	male	1928	physics	1	London University	London	United Kingdom
Louis	de Broglie	FR	FR	male	1929	physics	1	Sorbonne University Institut Henri Poincaré	Paris	France
Sir Chandrasekhara Venkata	Raman	IN	IN	male	1930	physics	1	Calcutta University	Calcutta	India
Werner	Heisenberg	DE	DE	male	1932	physics	1	Leipzig University	Leipzig	Germany

Automatisch opslaan data-clean.xlsx - Opslaan...

Bestand Start Invoegen Tekenen Pagina-indeling Formules Gegevens Controleren Beeld Help Acrob

Plakken Knippen Kopiëren Opmaak kopiëren/plakken Klembord

Calibri 11 Lettertype

Teruggloop Samenvoegen en centreren Uitlijning

Standaa

M19

	A	B	D	E	F	G	J	K	L
1	**firstname**	**surname**	**gender**	**year**	**category**	**share**	**age_get_prize**		
2	Wilhelm Conrad	Röntgen	male	1901	physics	1	56		
3	Hendrik A.	Lorentz	male	1902	physics	2	49		
4	Pieter	Zeeman	male	1902	physics	2	37		
5	Henri	Becquerel	male	1903	physics	2	51		
6	Pierre	Curie	male	1903	physics	4	44		
7	Marie	Curie	female	1903	physics	4	36		
8	Marie	Curie	female	1911	chemistry	1	44		
9	Lord	Rayleigh	male	1904	physics	1	62		
10	Philipp	Lenard	male	1905	physics	1	43		
11	J.J.	Thomson	male	1906	physics	1	50		
12	Albert A.	Michelson	male	1907	physics	1	55		
13	Gabriel	Lippmann	male	1908	physics	1	63		
14	Guglielmo	Marconi	male	1909	physics	2	35		
15	Ferdinand	Braun	male	1909	physics	2	59		
16	Johannes Diderik	van der Waals	male	1910	physics	1	73		
17	Wilhelm	Wien	male	1911	physics	1	47		
18	Gustaf	Dalén	male	1912	physics	1	43		
19	Heike	Kamerlingh Onnes	male	1913	physics	1	60		
20	Max	von Laue	male	1914	physics	1	35		
21	William	Bragg	male	1915	physics	2	53		
22	Lawrence	Bragg	male	1915	physics	2	25		
23	Charles Glover	Barkla	male	1917	physics	1	40		
24	Max	Planck	male	1918	physics	1	60		
25	Johannes	Stark	male	1919	physics	1	45		
26	Charles Edouard	Guillaume	male	1920	physics	1	59		
27	Albert	Einstein	male	1921	physics	1	42		
28	Niels	Bohr	male	1922	physics	1	37		
29	Robert A.	Millikan	male	1923	physics	1	55		
30	Manne	Siegbahn	male	1924	physics	1	38		
31	James	Franck	male	1925	physics	2	43		
32	Gustav	Hertz	male	1925	physics	2	38		
33	Jean Baptiste	Perrin	male	1926	physics	1	56		
34	Arthur H.	Compton	male	1927	physics	2	35		
35	C.T.R.	Wilson	male	1927	physics	2	58		
36	Owen Willans	Richardson	male	1928	physics	1	49		
37	Louis	de Broglie	male	1929	physics	1	37		

Workflow

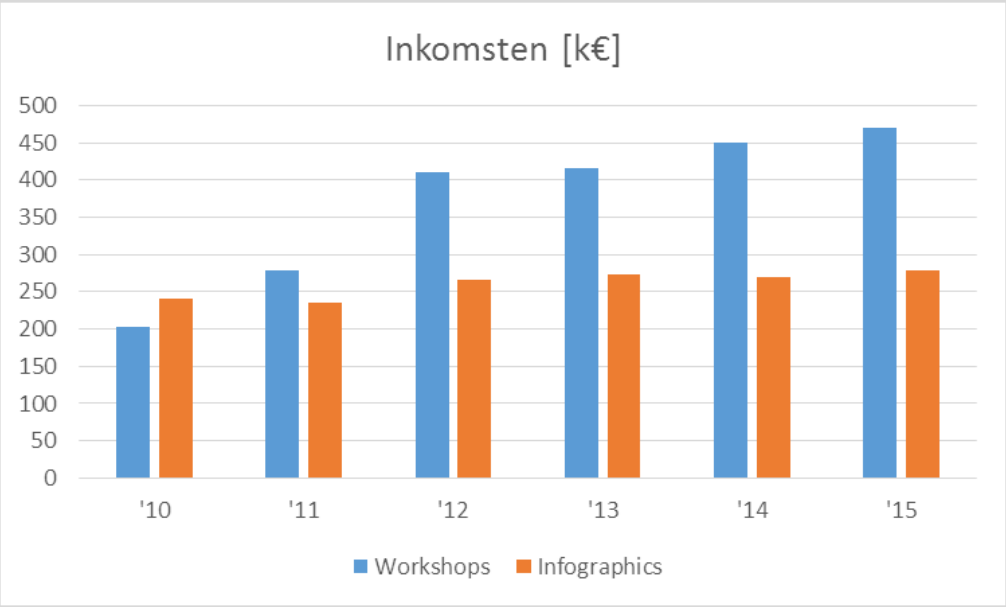
clean up your data

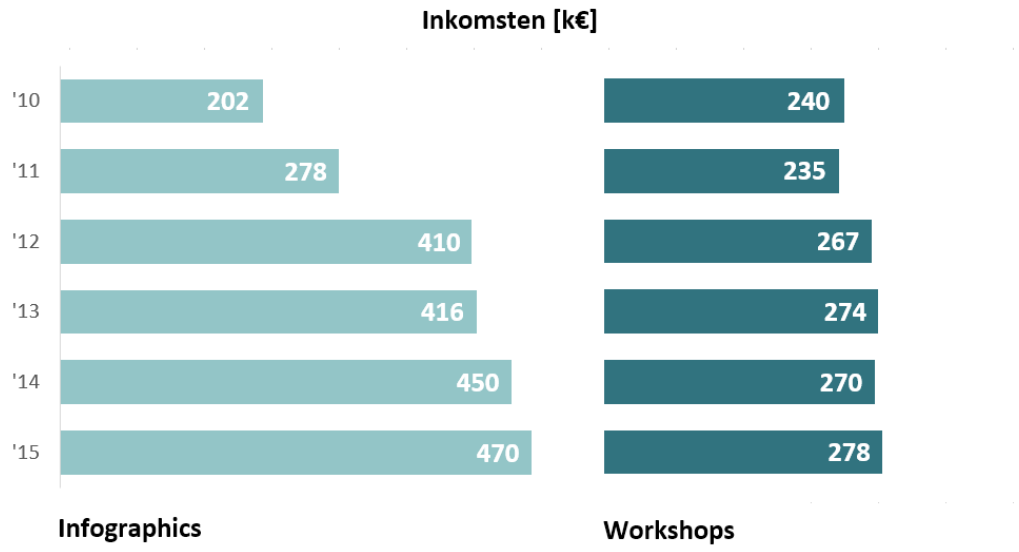
create the chart

improve the design

Available tools

Excel





Available tools

Online

Canva
canva.com

Infogram
infogram.com

Piktochart
piktochart.com

Visme
visme.co

Canva

- lots of templates, fonts, images,... - also in free version
- easy to use – drag and drop
- very limited chart options

Infogram

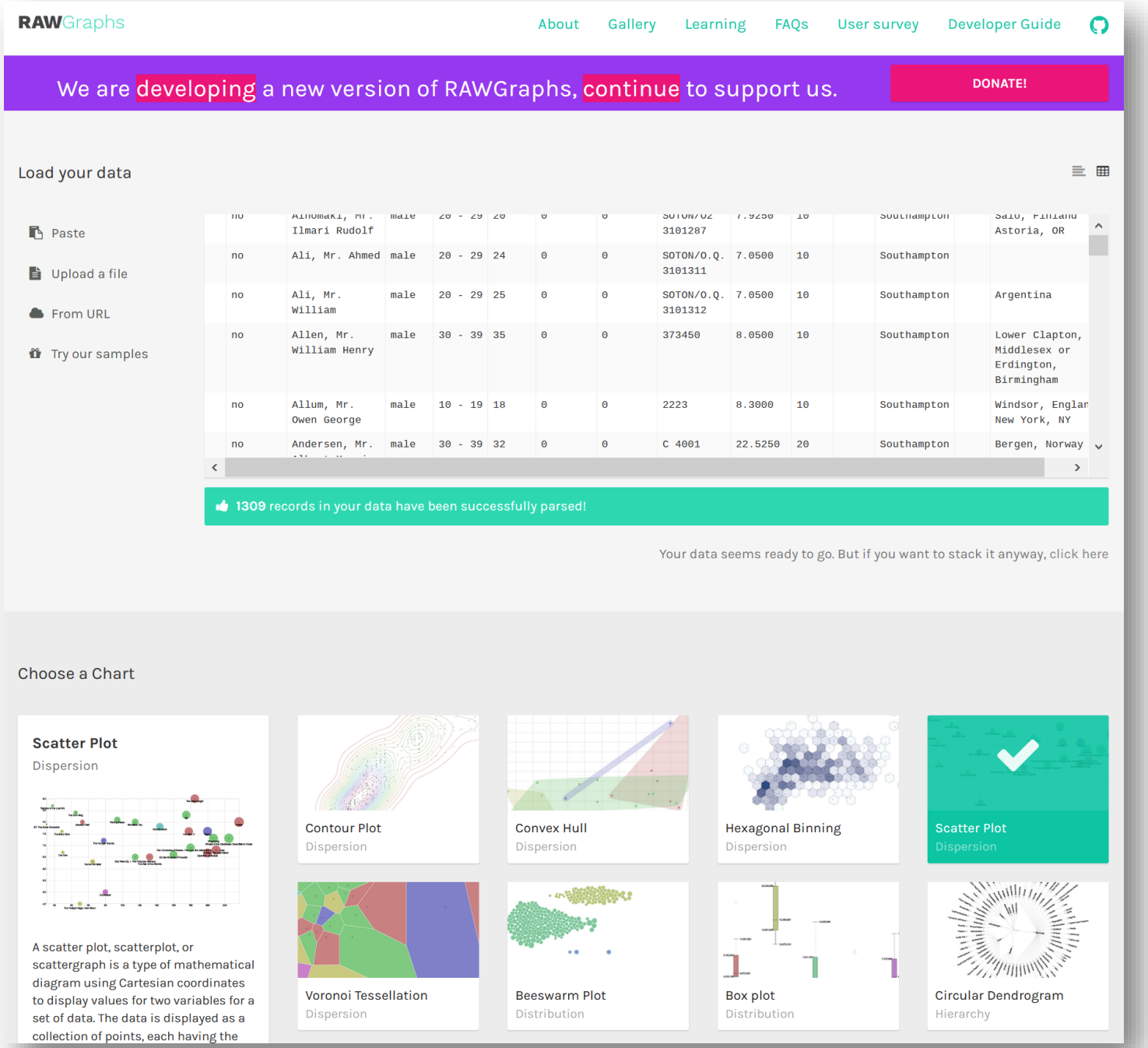
- better for charts, even real-time/interactive
- no downloads in free version

Piktochart

- pretty complete for starters, good chart options
- limited number of visuals in free version

Visme

- not too expensive, similar options to Piktochart
- limited number of visuals in free version



https://app.rawgraphs.io/

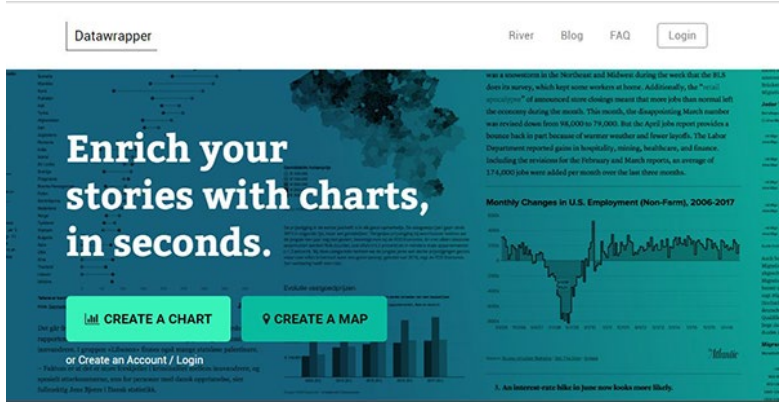
Available tools

Python, R, d3.js,...

Interactivity

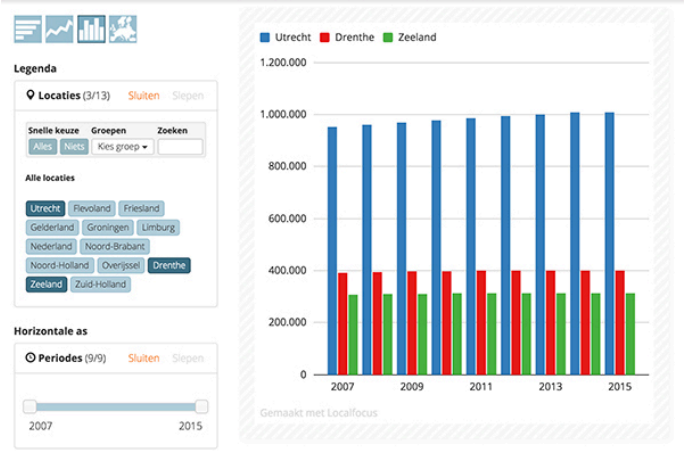
Datawrapper

datawrapper.de



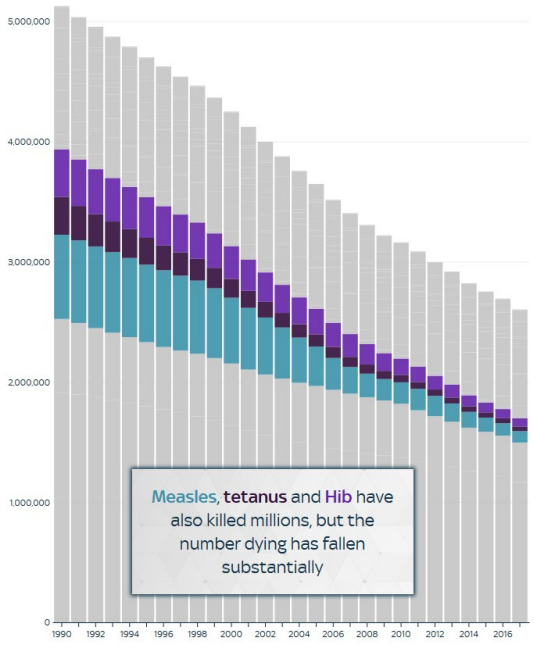
LocalFocus

localfocus.nl



Flourish

flourish.studio



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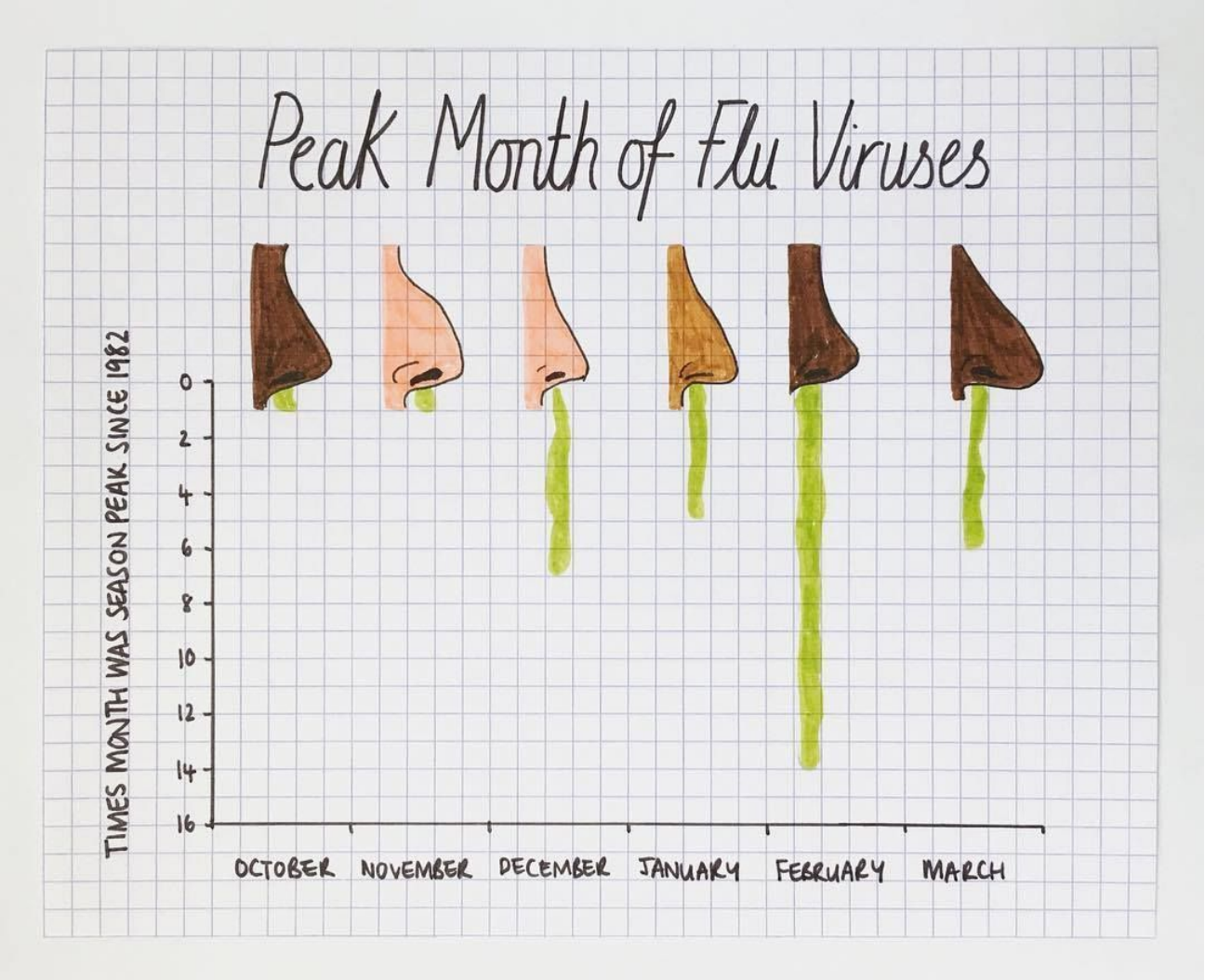
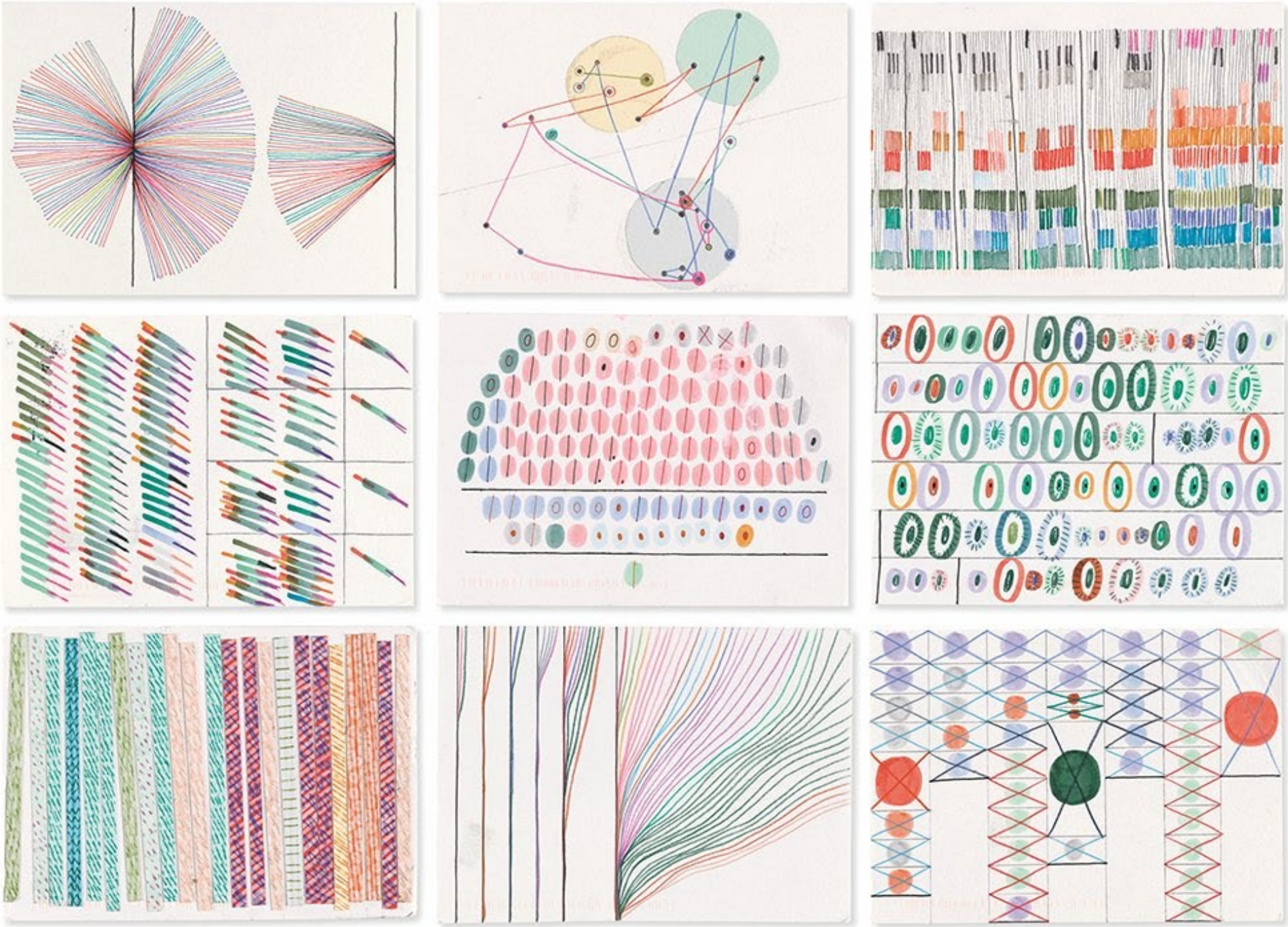
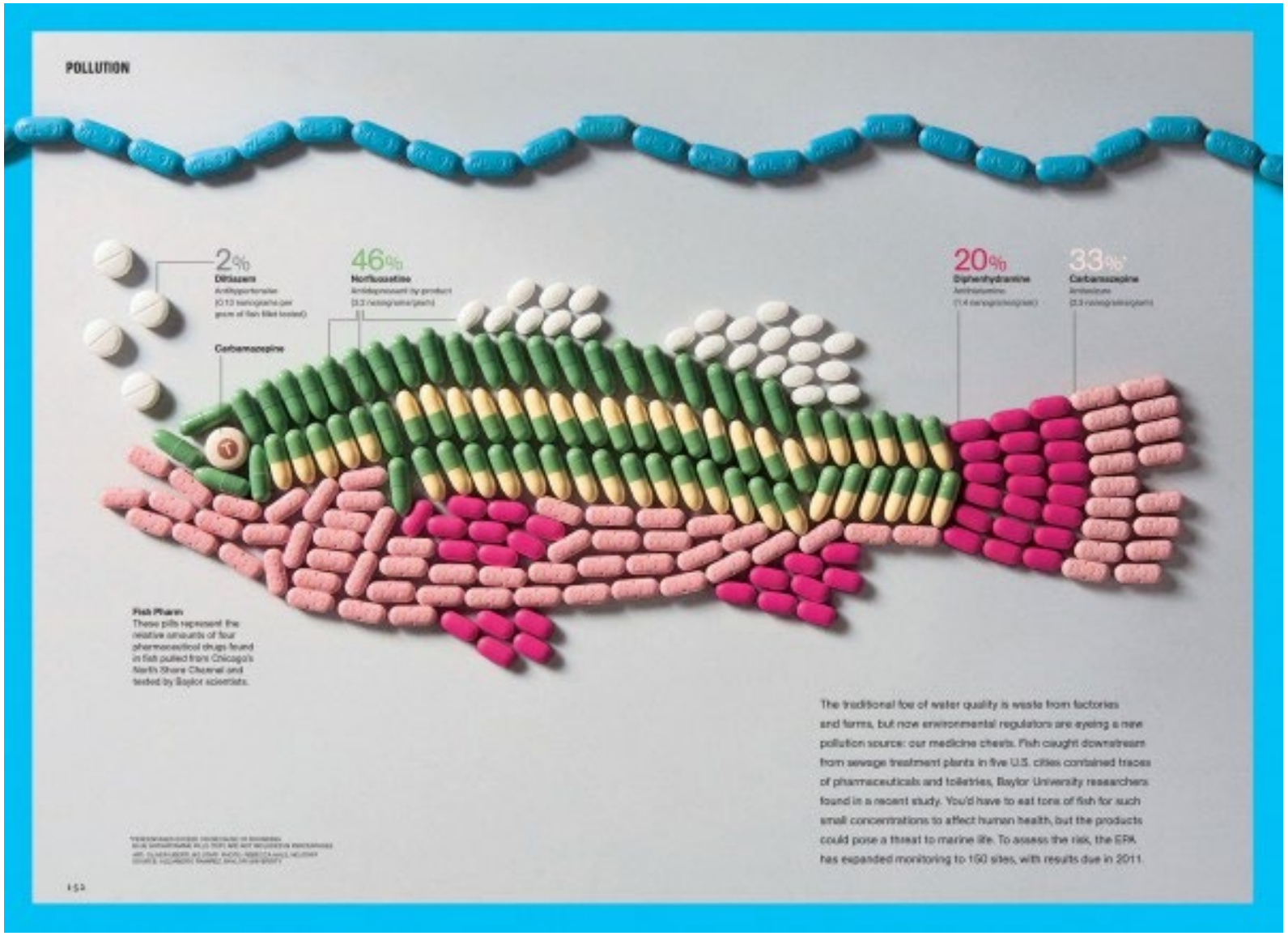
https://baryon.be/data-visualization-tools-datawrapper/



Mona Chalabi



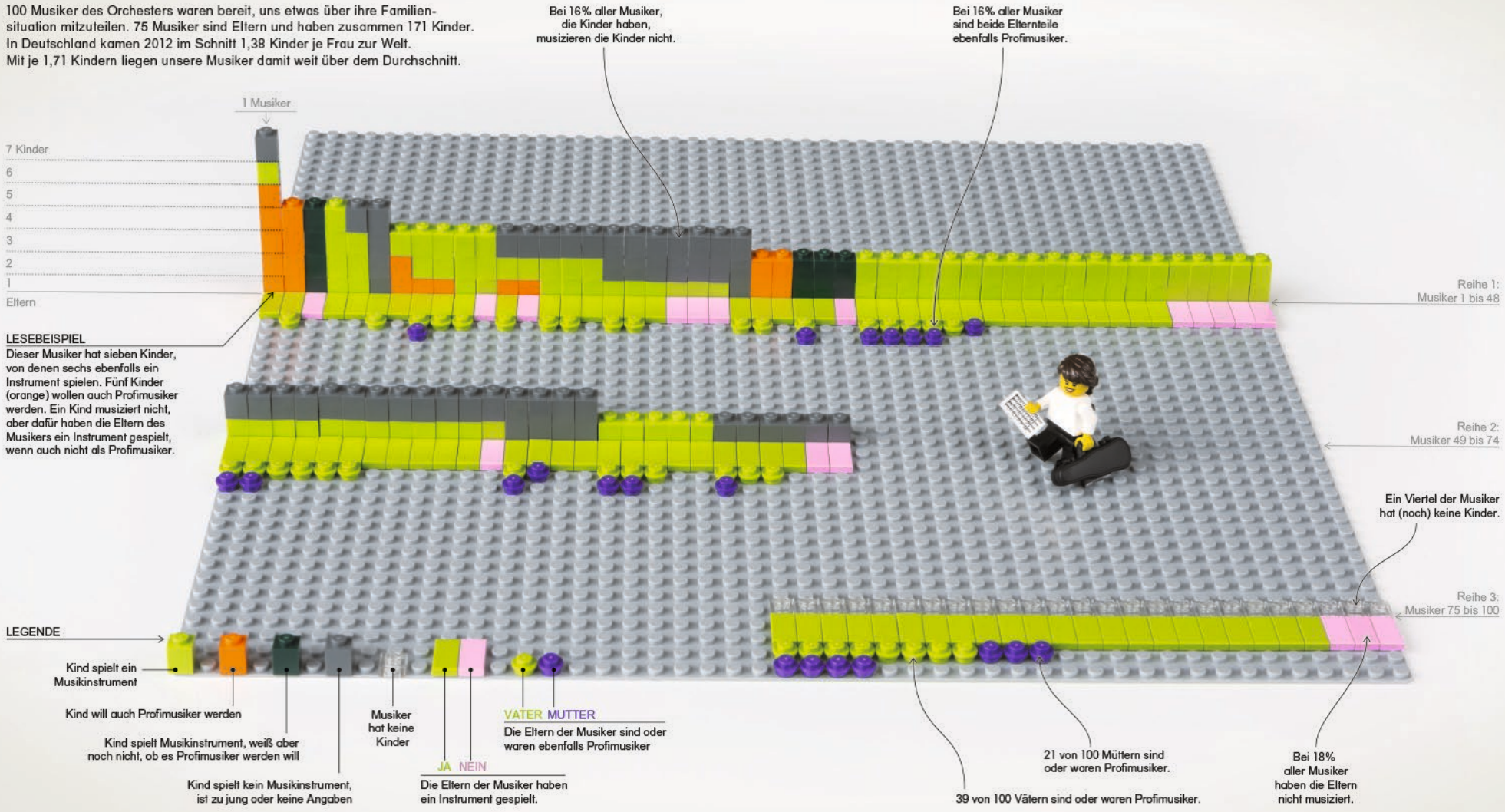
dear-data.com



National Geographic Magazine, 2010

Die Kinder und Eltern der Musiker

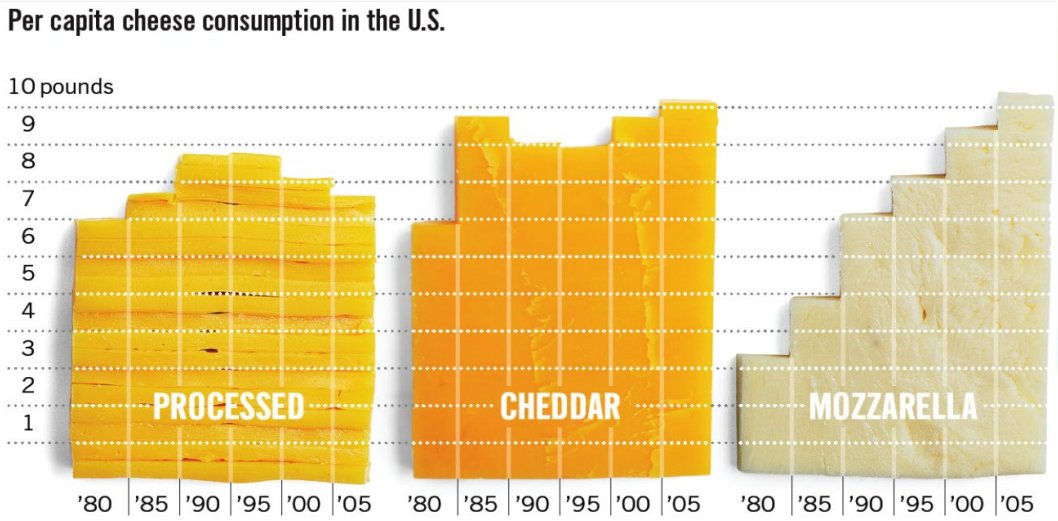
100 Musiker des Orchesters waren bereit, uns etwas über ihre Familiensituation mitzuteilen. 75 Musiker sind Eltern und haben zusammen 171 Kinder. In Deutschland kamen 2012 im Schnitt 1,38 Kinder je Frau zur Welt. Mit je 1,71 Kindern liegen unsere Musiker damit weit über dem Durchschnitt.



Jan Schwochow

Pie I have eaten
Pie I have not yet eaten

REASONS I LOVE CHEESE BURGERS
BREAD
MEAT
KETCHUP
CHEESE


Per capita cheese consumption in the U.S.
10 pounds
9
8
7
6
5
4
3
2
1
PROCESSED
CHEDDAR
MOZZARELLA
'80 '85 '90 '95 '00 '05
'80 '85 '90 '95 '00 '05
'80 '85 '90 '95 '00 '05

Workflow

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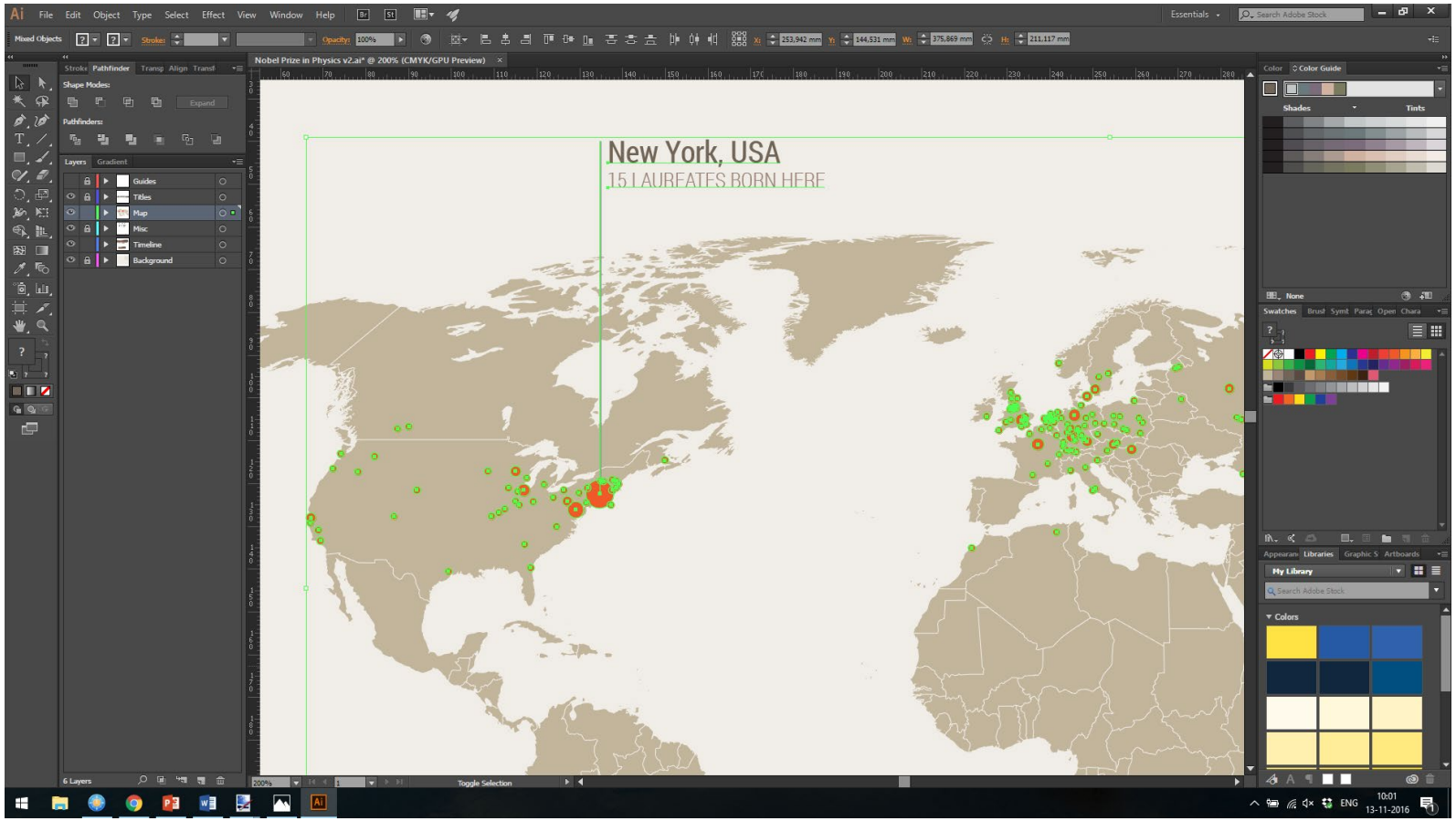
create the chart

improve the design



Adobe Illustrator

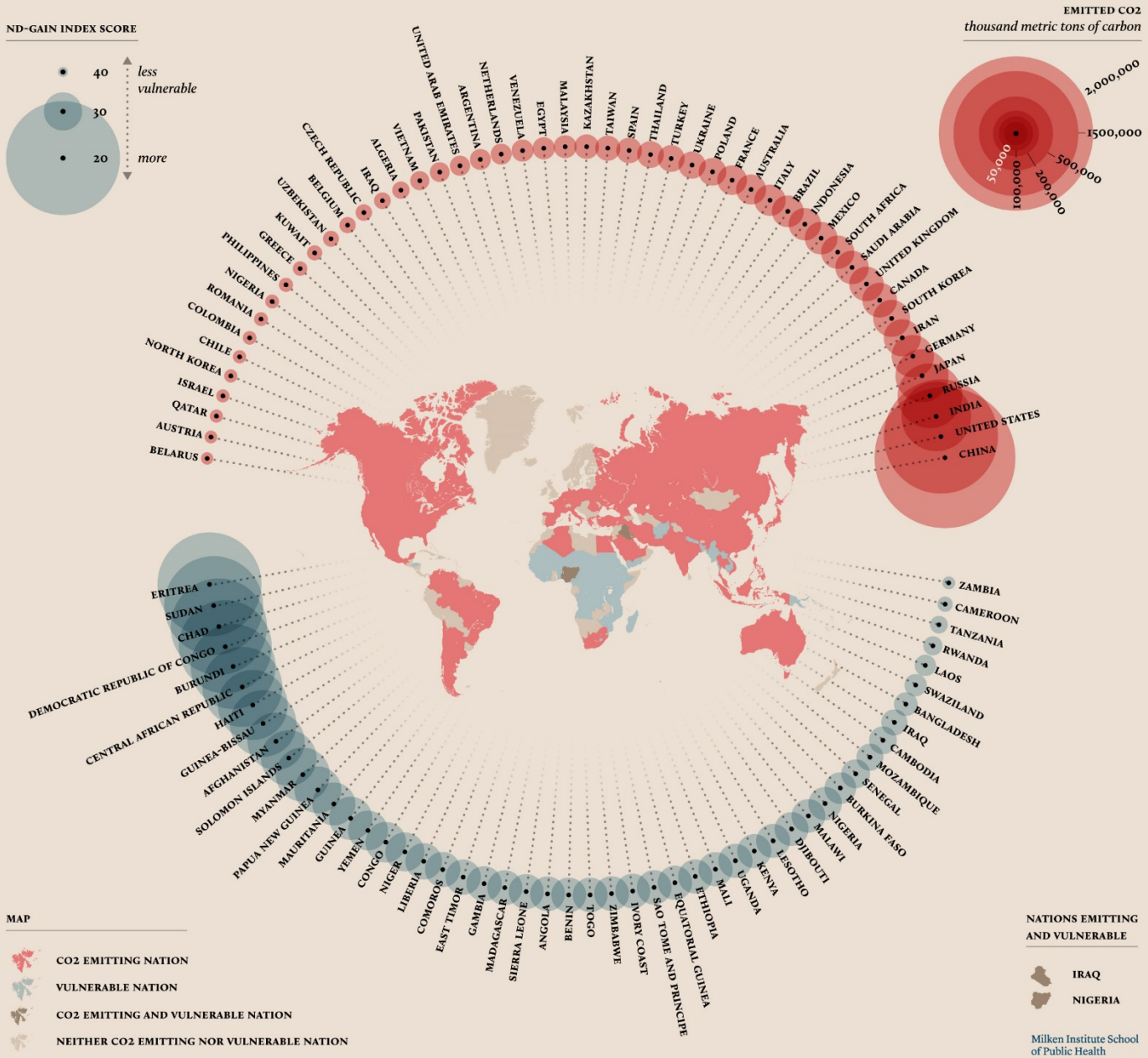
“industry standard”

extremely powerful

steep learning curve

expensive subscription

CO2 EMISSION VS. VULNERABILITY TO CLIMATE CHANGE, BY NATION (2010)



SOURCES: CARBON DIOXIDE INFORMATION ANALYSIS CENTER; RESEARCH INSTITUTE FOR ENVIRONMENT, ENERGY AND ECONOMICS; ND-GAIN INDEX

Milken Institute School of Public Health
THE GEORGE WASHINGTON UNIVERSITY

MHA@GW

AFFINITY
Designer

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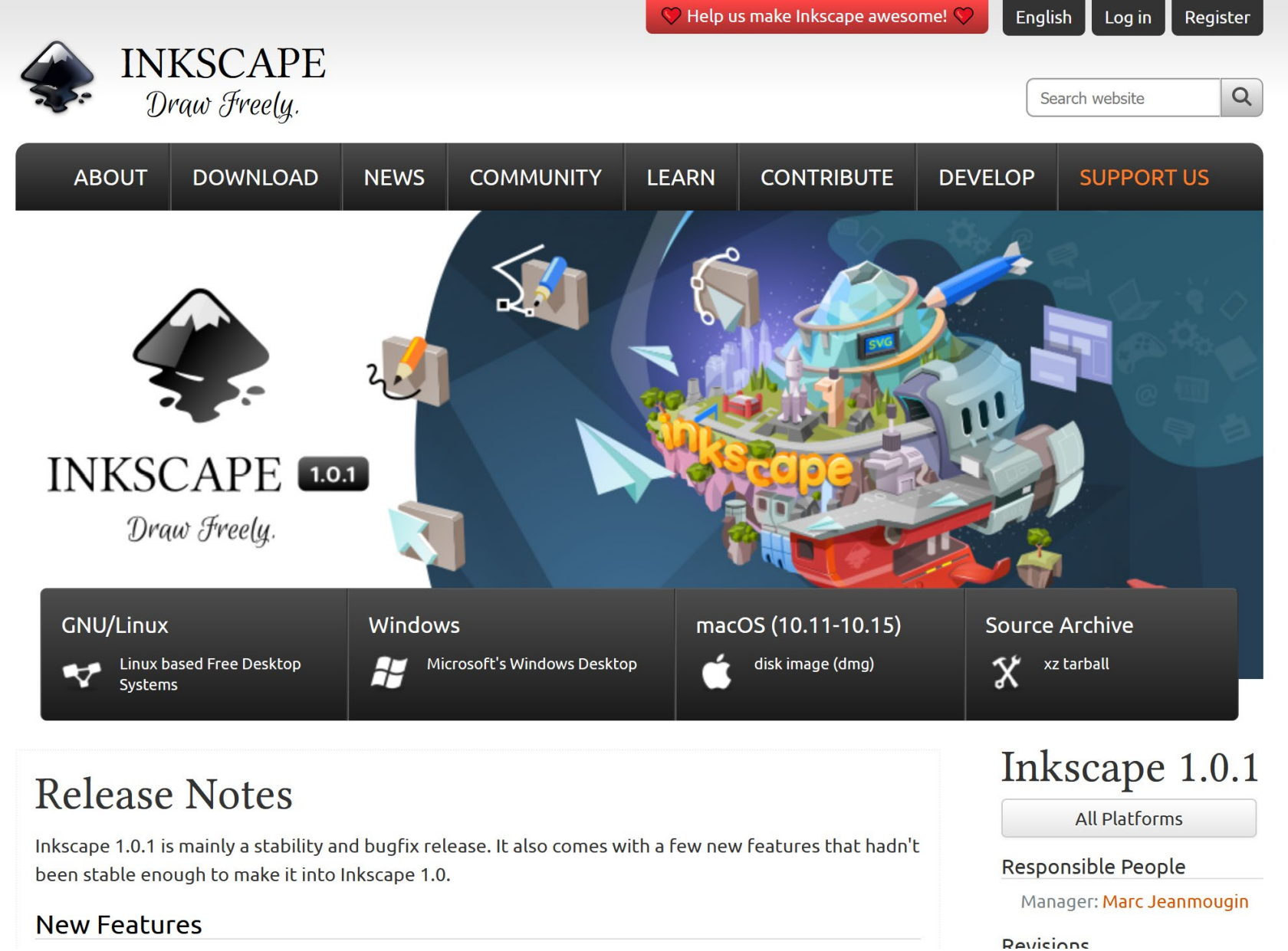
Alternative: **Affinity Designer**

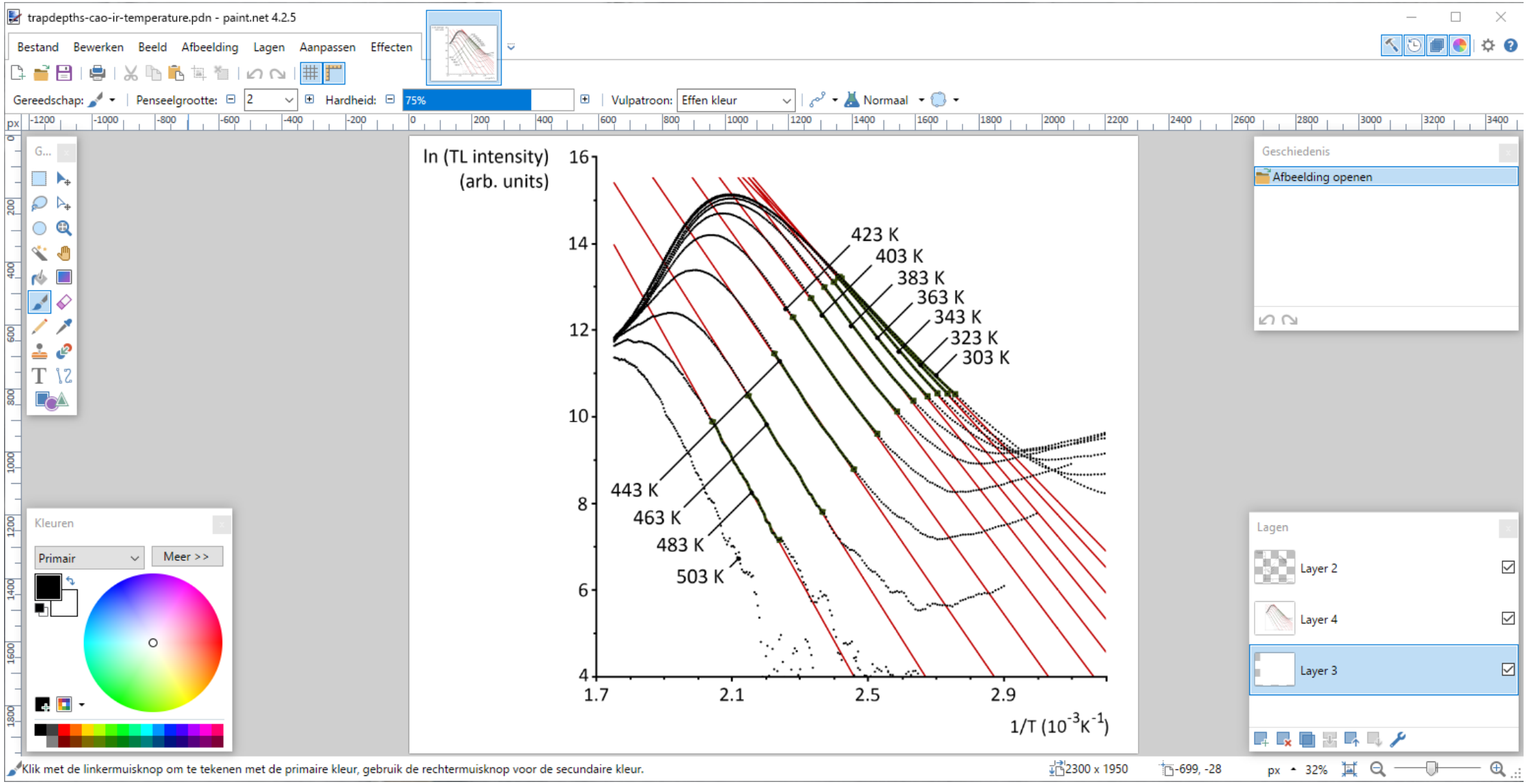
nearly as powerful as Adobe Illustrator

still a steep learning curve

one-off payment (approx. €55)

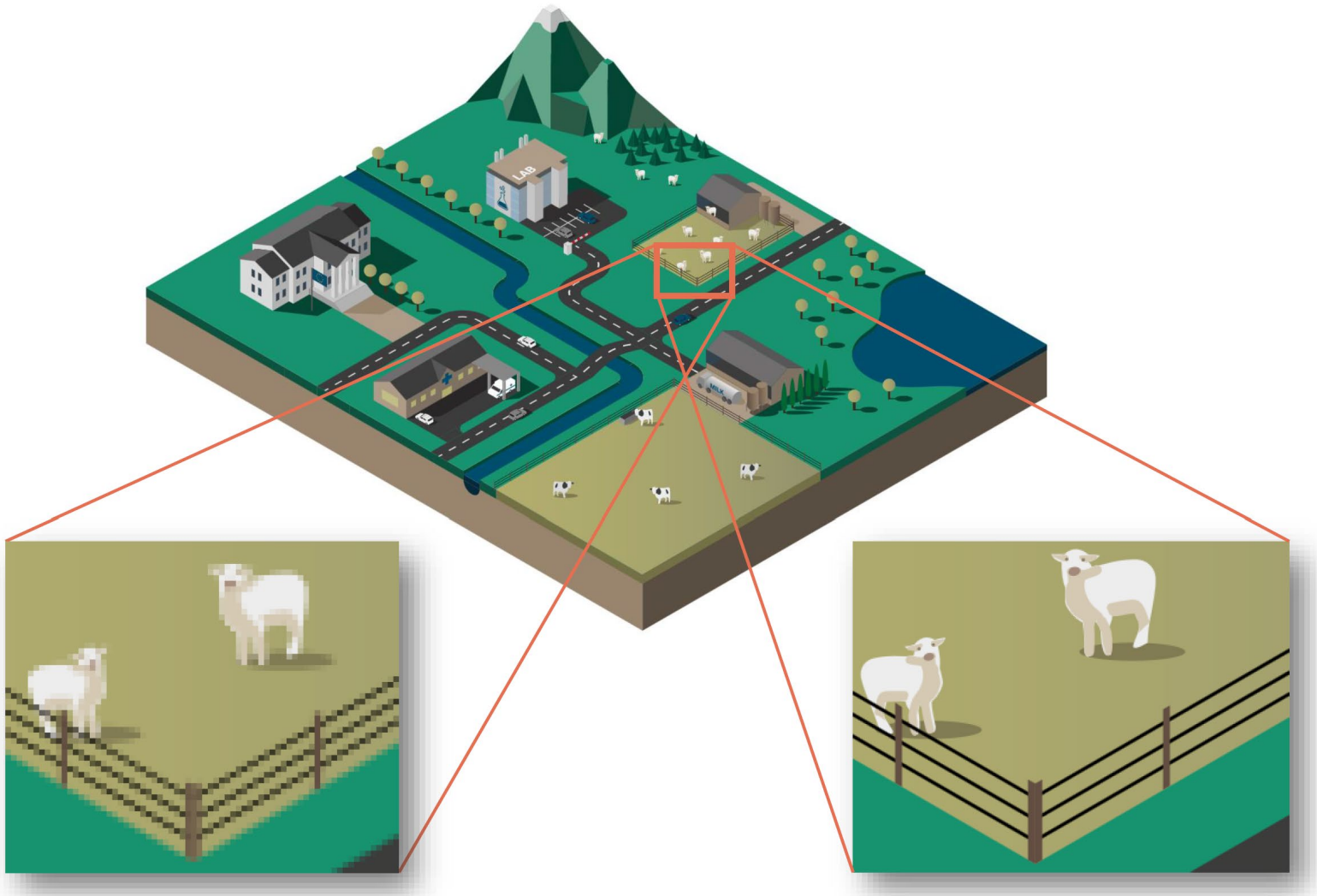


Alternative: **Inkscape** https://inkscape.org/release/inkscape-1.0.1/



Alternative: **Paint.NET** or similar

https://www.getpaint.net/

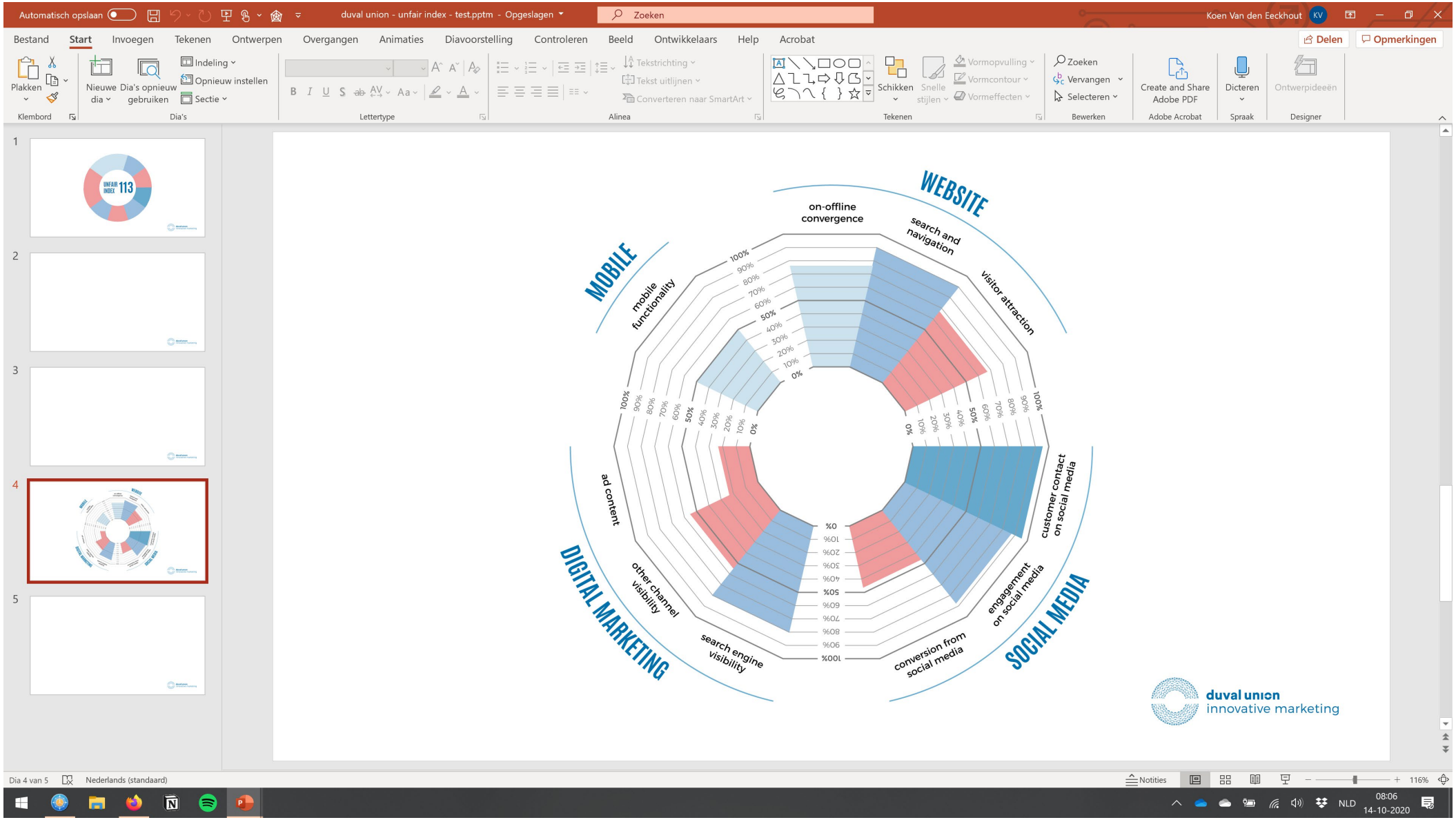


bitmap image

JPG, PNG, BMP, TIFF,...

vector image

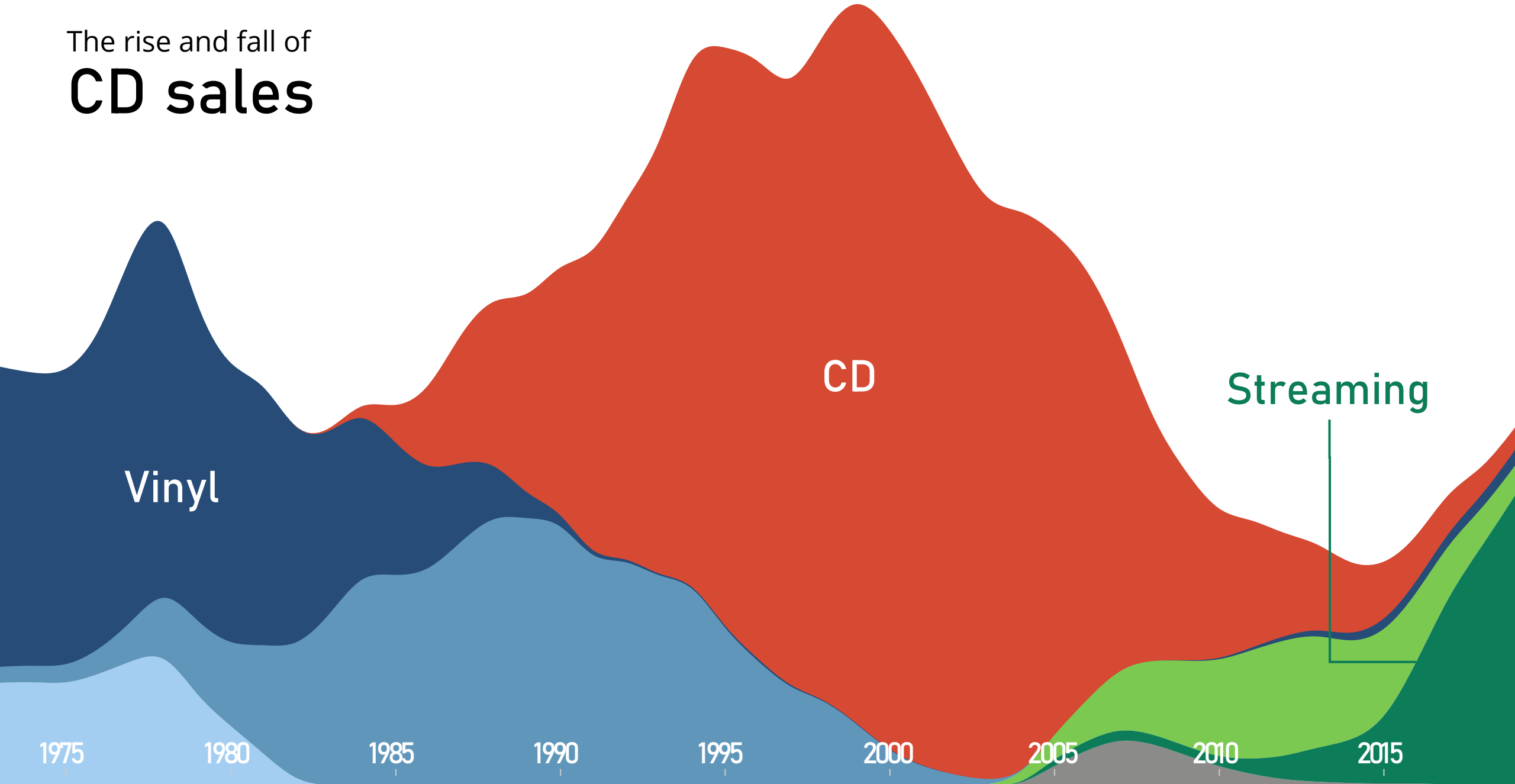
SVG, PDF, AI,...



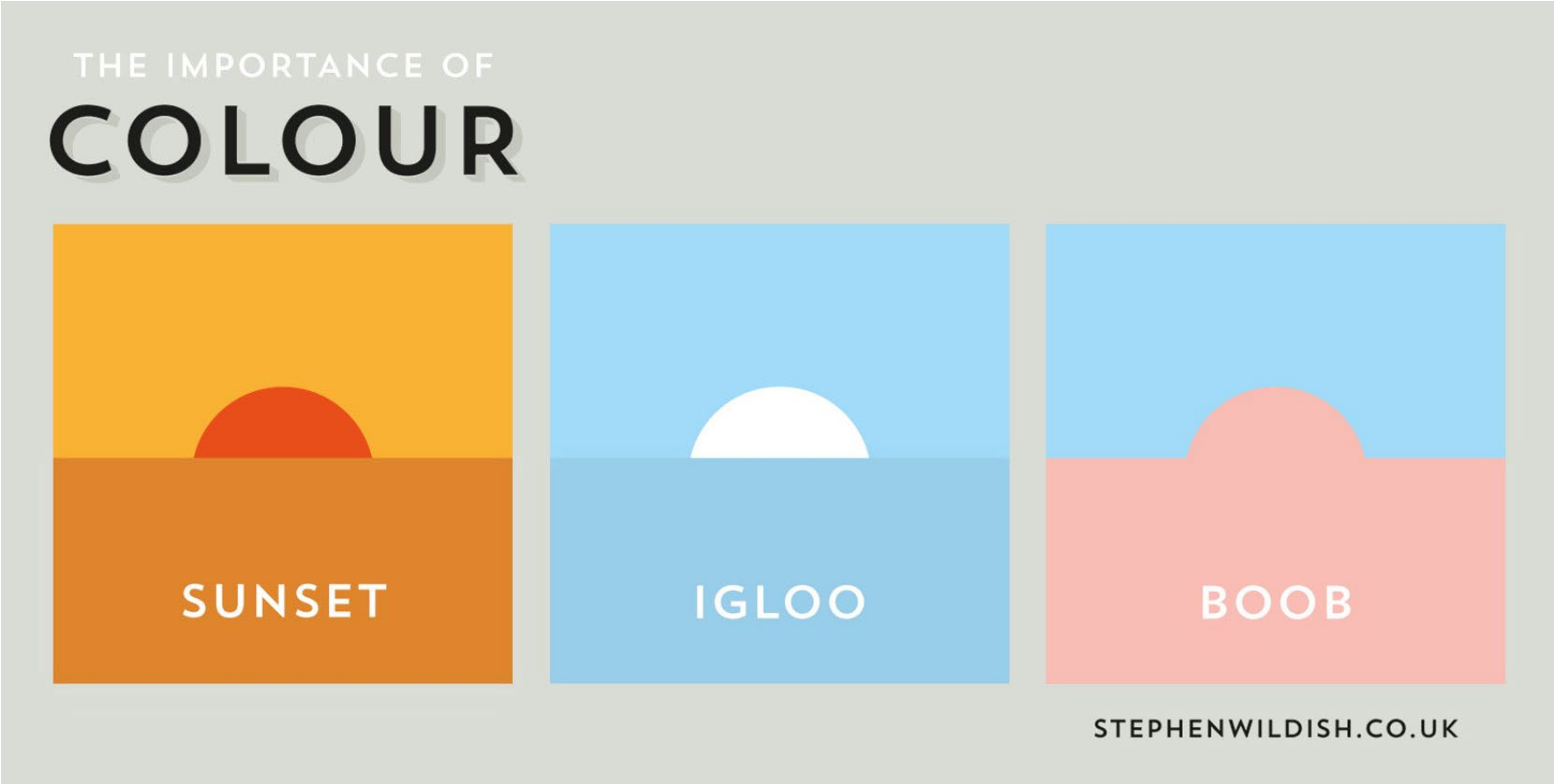
Alternative: **PowerPoint** or similar

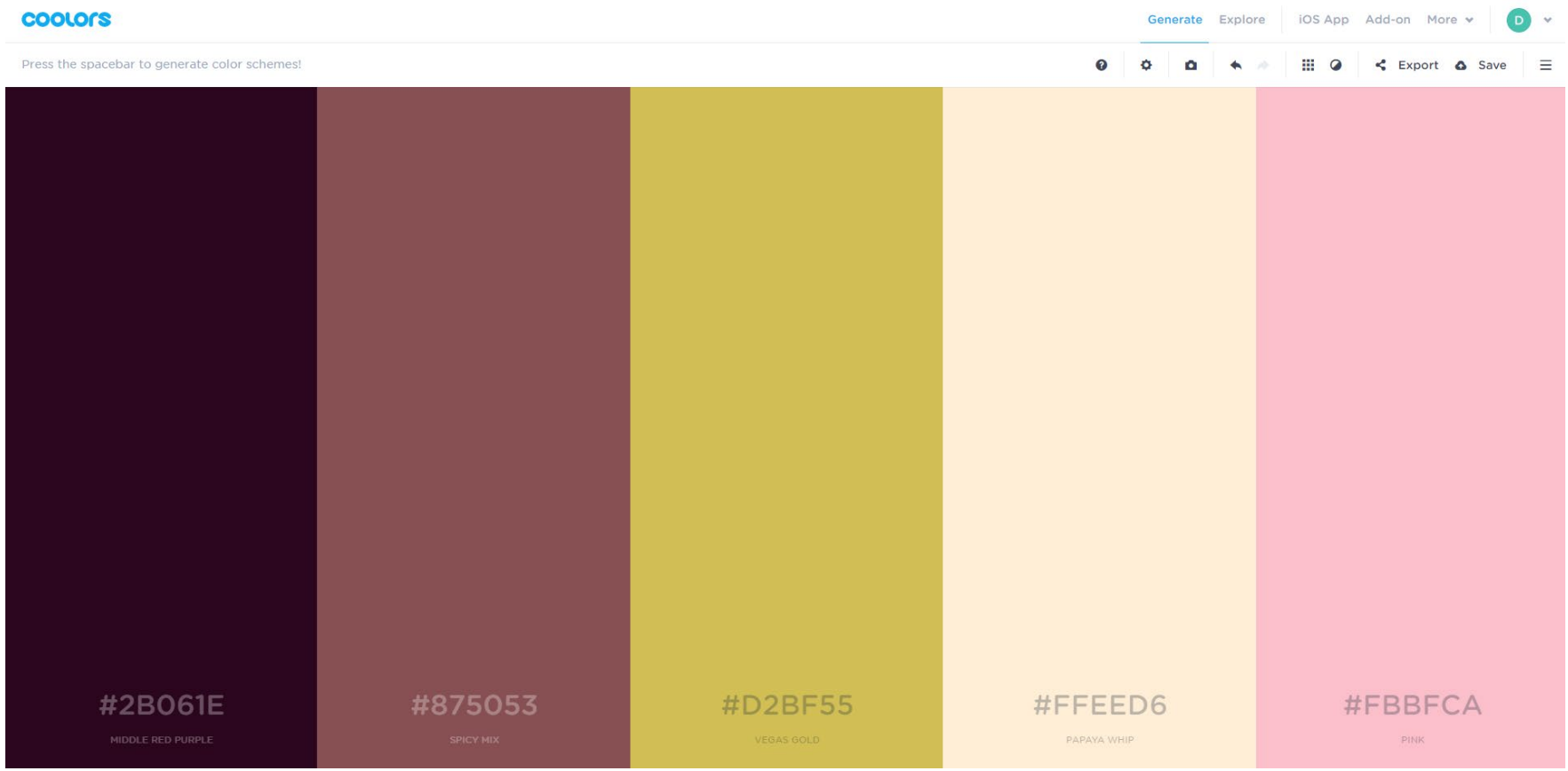
The rise and fall of

CD sales



Components


THE IMPORTANCE OF
COLOUR
SUNSET
IGLOO
BOOB
STEPHENWILDISH.CO.UK



coolors.co

trust,
stability

happiness,
warmth

energy,
passion

sensitive,
love

friendly,
natural

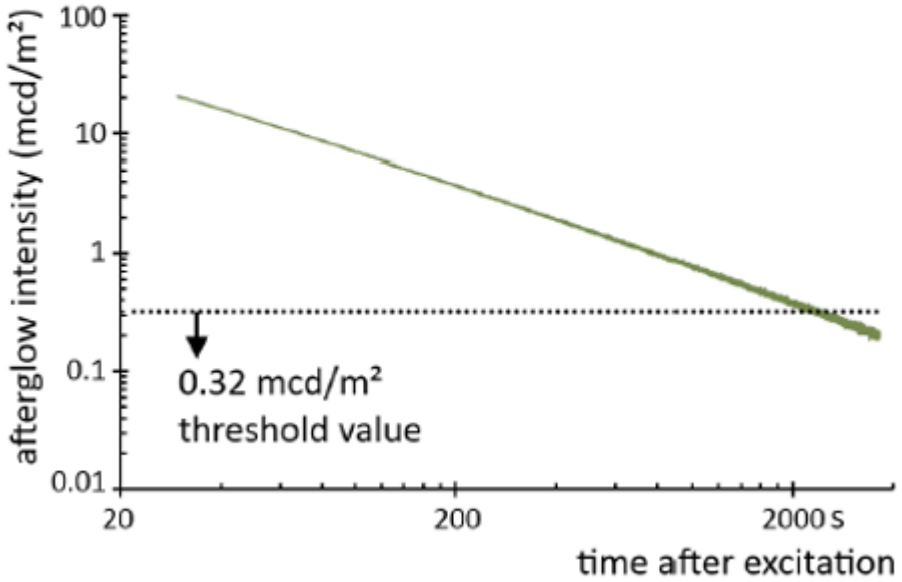
rich,
mystery

history,
intelligence

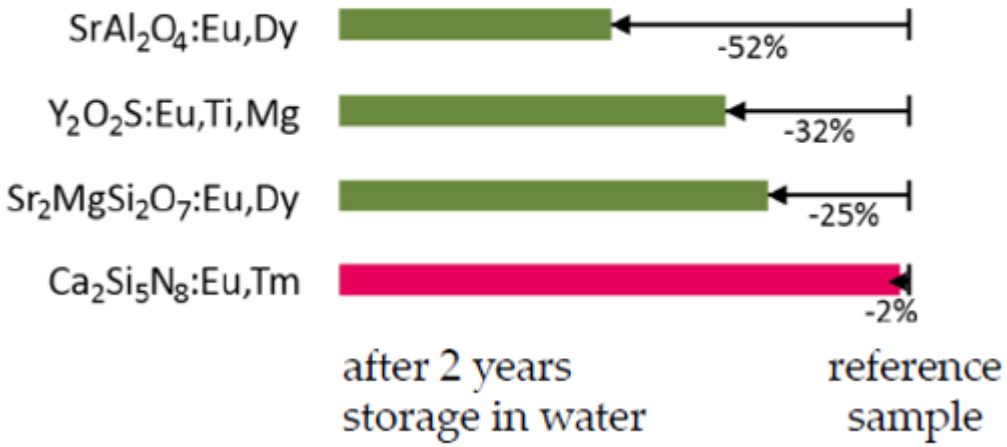
neutral,
calm

Accent colours

The decay of the afterglow follows a power law and lasts around **45 minutes**.



Compared to other common host materials, the nitrido-silicates are **very stable** and hence well suited for *in vivo* applications.



Datawrapper

Home Contact

Search

Welcome!

VISUALIZATION TYPES

Bar Charts

Column Charts

Line & Area Charts

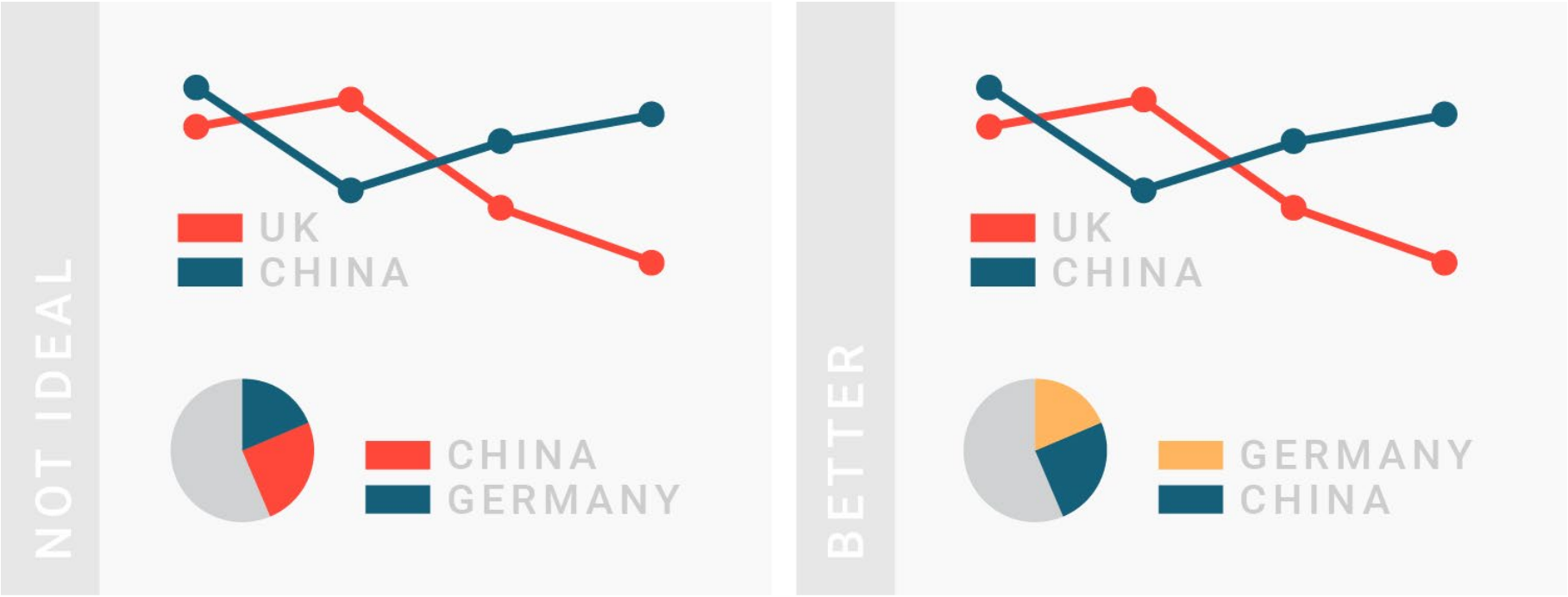
Pie & Donut Charts

Scatterplots

What to consider when choosing colors for data visualization

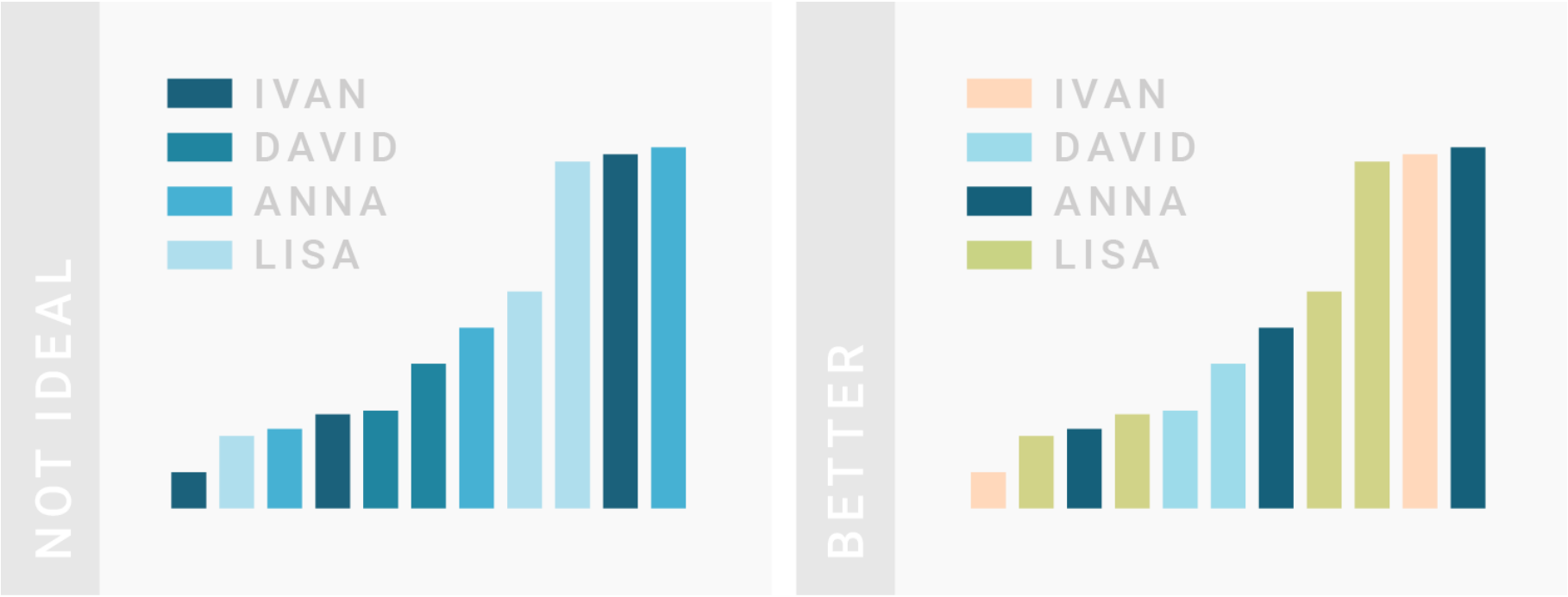
Data Visualisation can be defined as representing numbers with shapes – and no matter what these shapes look like (areas, lines, dots), they need to have a color. Sometimes colors just make the shapes visible, sometimes they encode data or categories themselves. We'll focus mostly on the latter in this article. But we'll also take a general look at colors and what to consider when choosing them:

https://academy.datawrapper.de/article/140-what-to-consider-when-choosing-colors-for-data-visualization

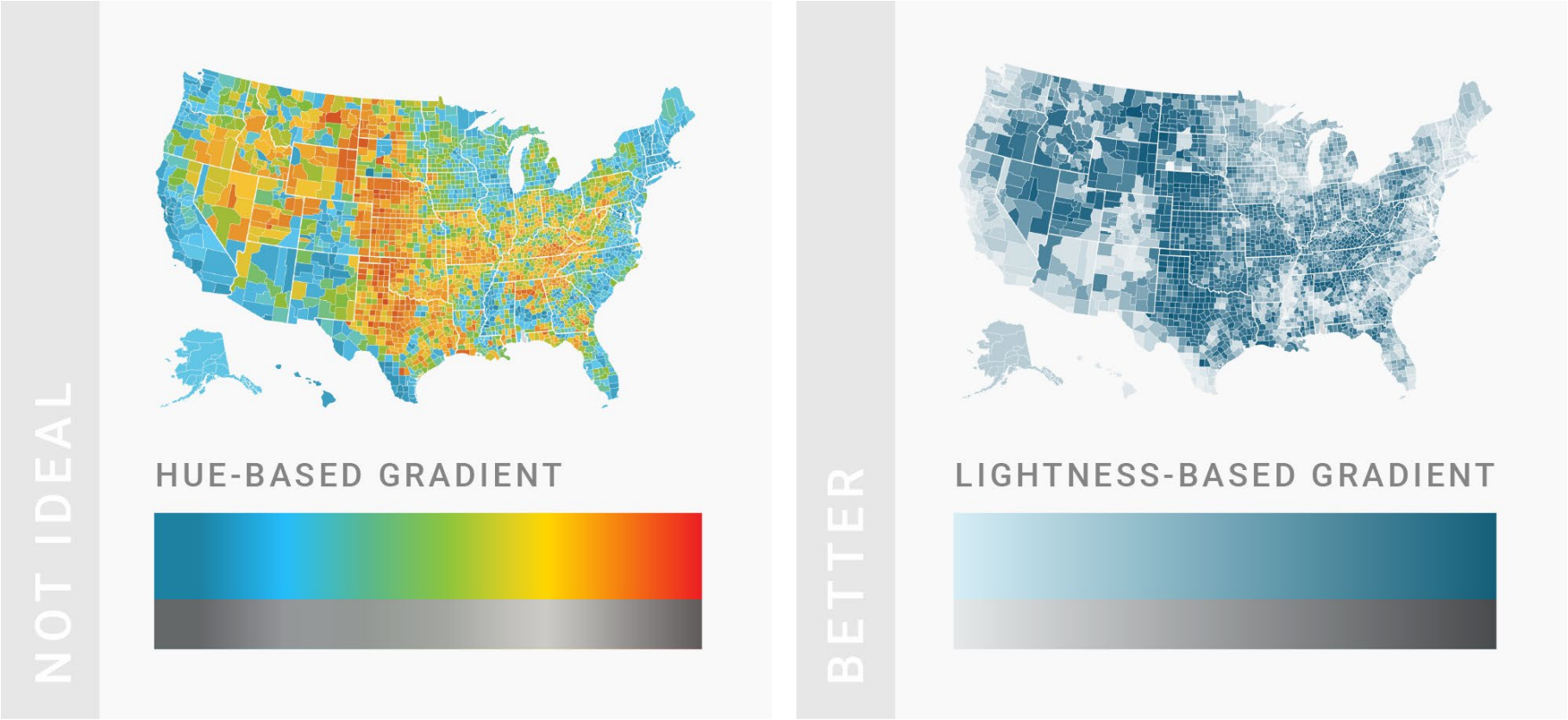


use consistent colors

use logical colors



don’t use gradient colors for categories



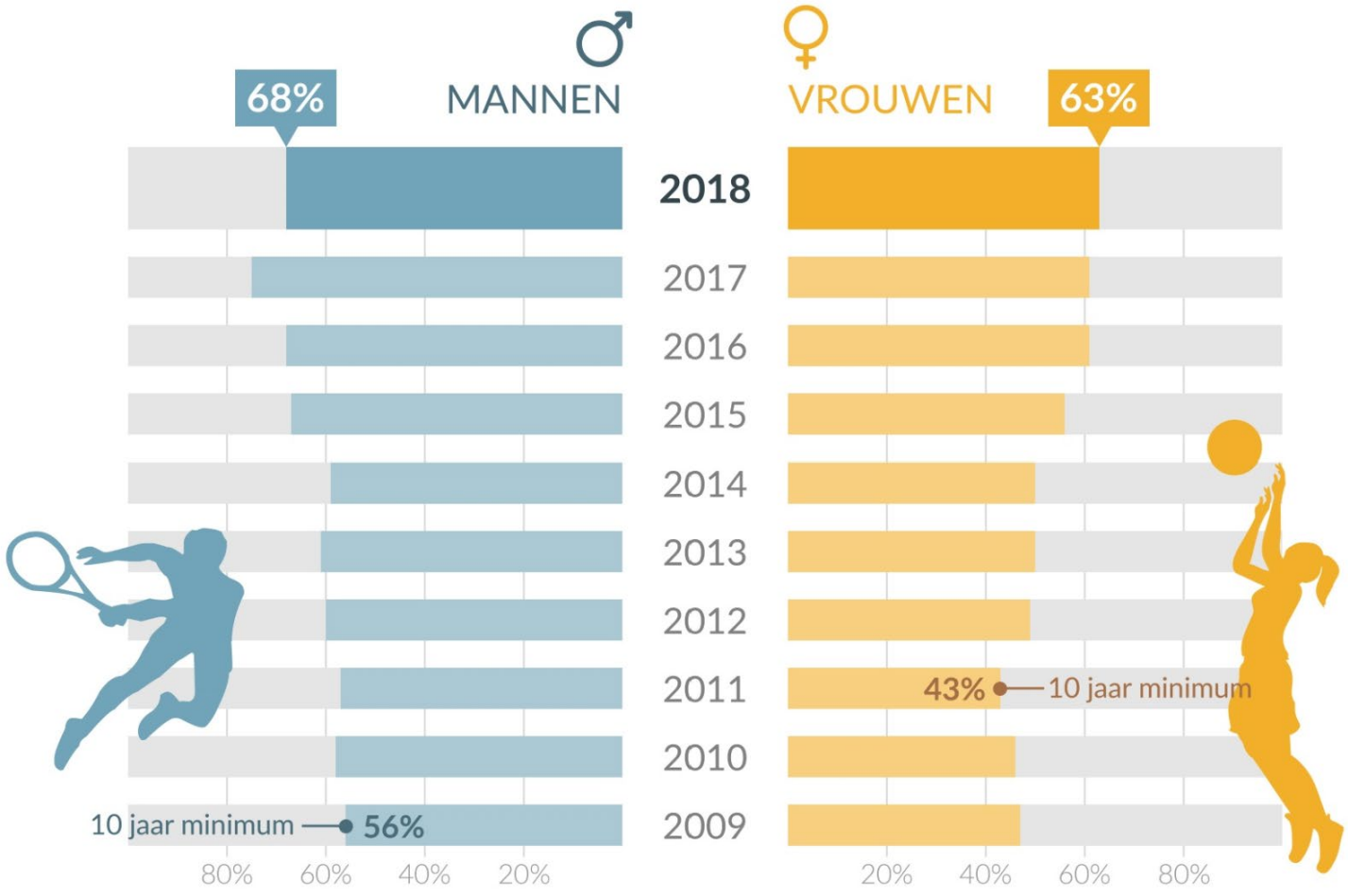
rainbow gradients can confuse readers

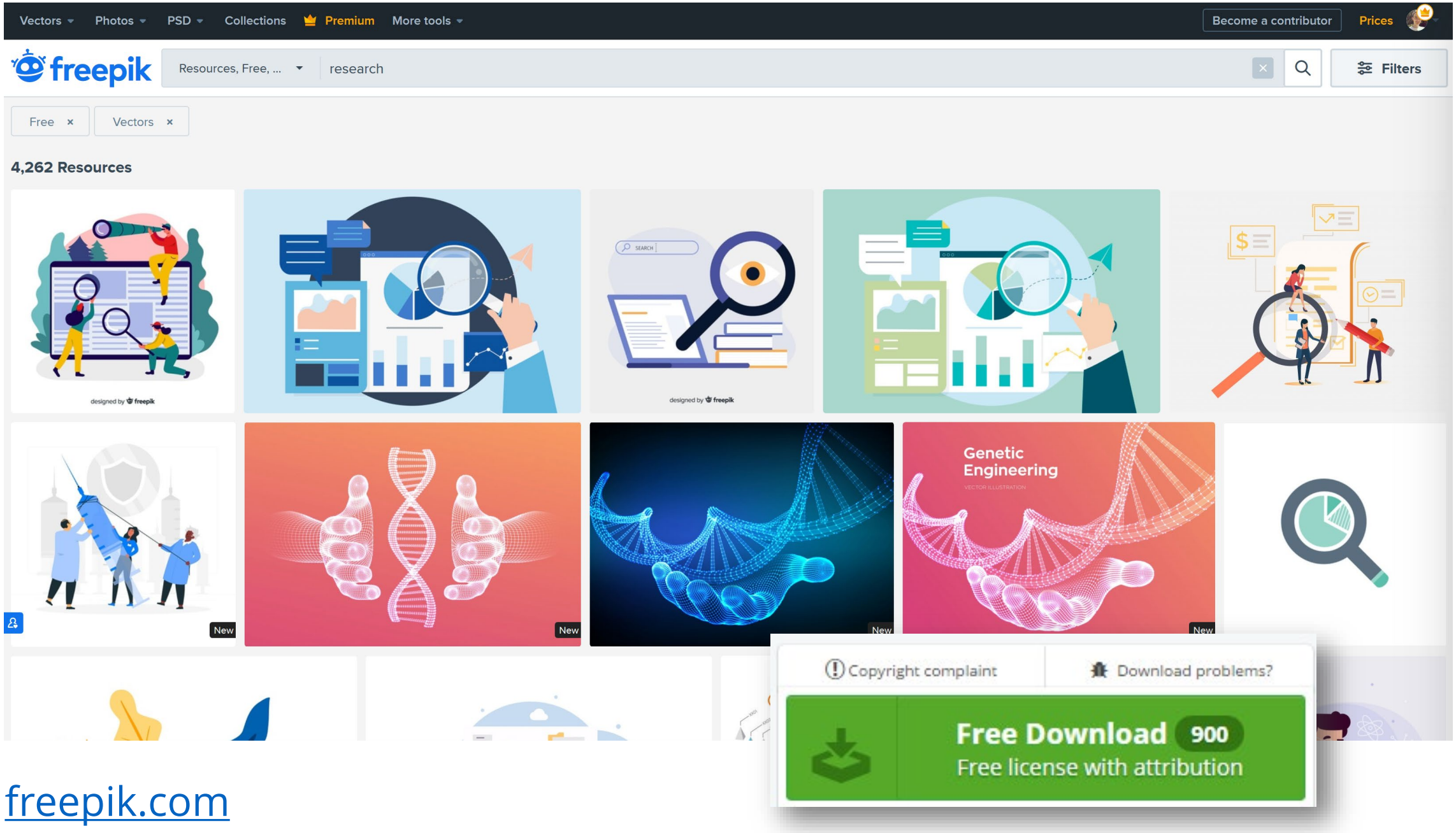
research

Results for “research”

8,721 icons 197 collections

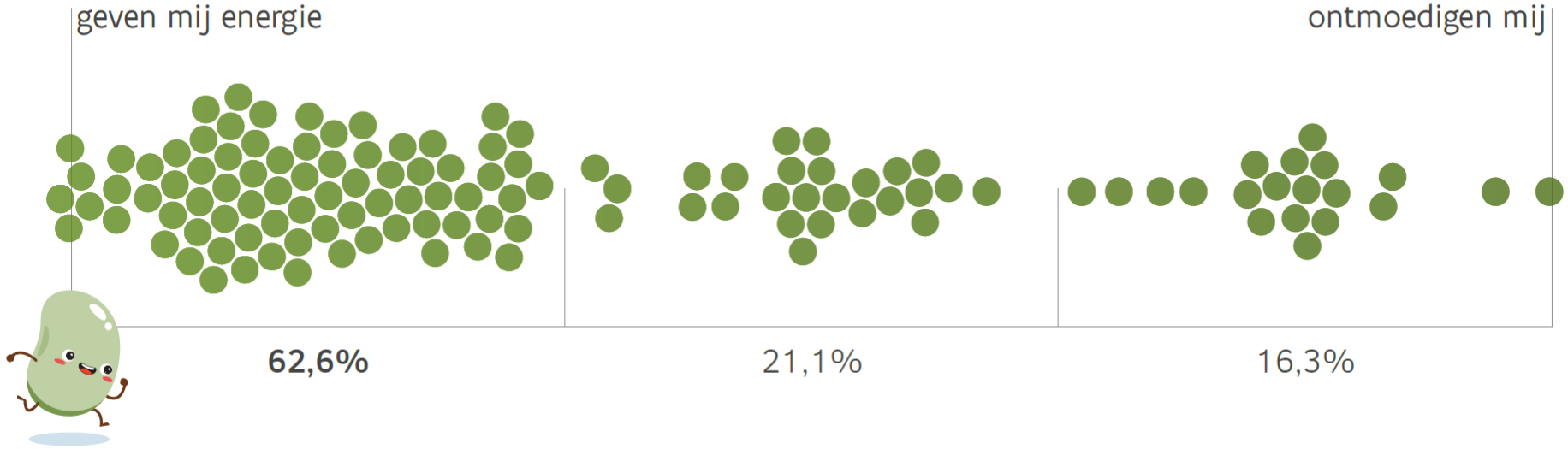
thenounproject.com


MANNEN
VROUWEN
68%
63%
2018
2017
2016
2015
2014
2013
2012
2011
2010
2009
43%
10 jaar minimum
10 jaar minimum
56%
80%
60%
40%
20%
20%
40%
60%
80%



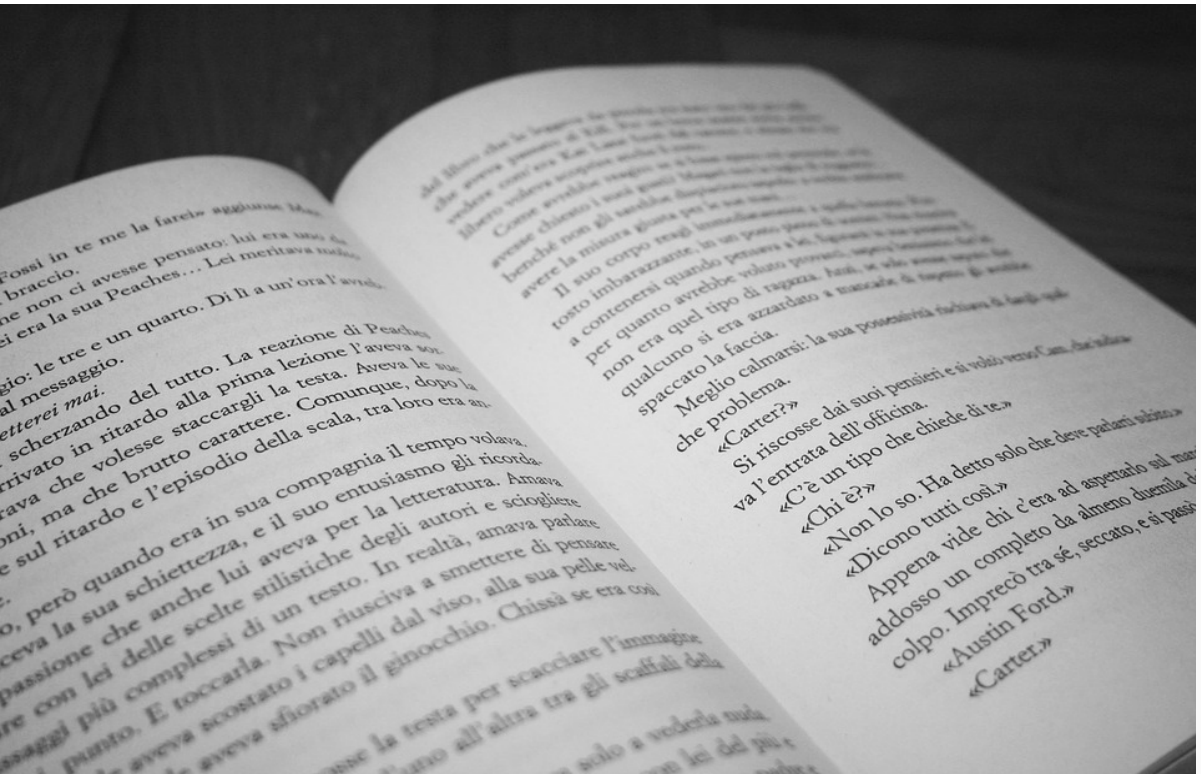
freepik.com

Situaties zoals in mijn verhaal...



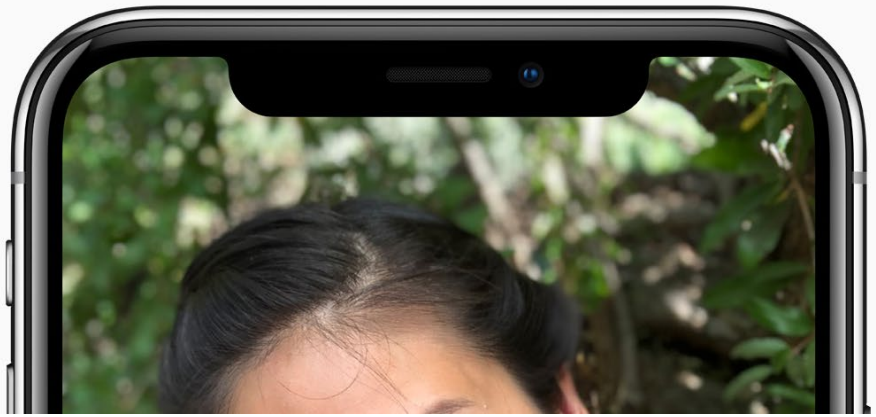
Serif

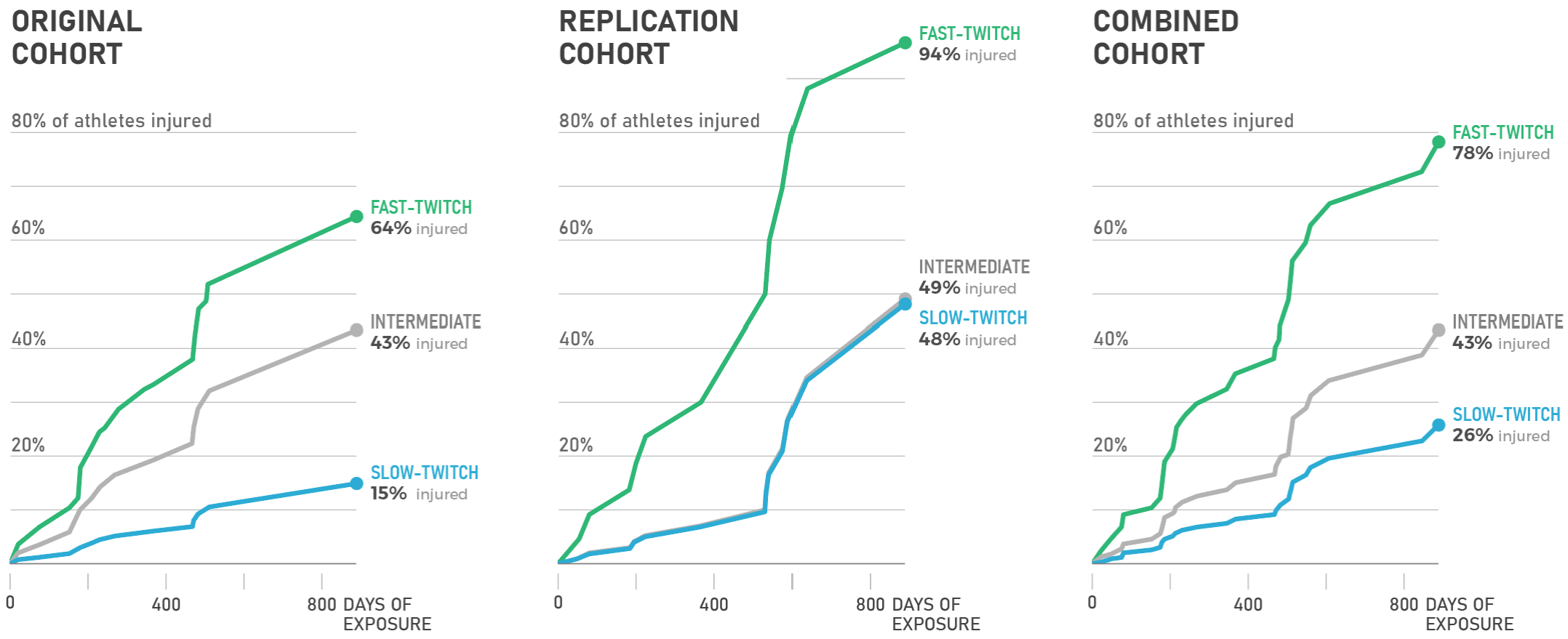
perfect for body text

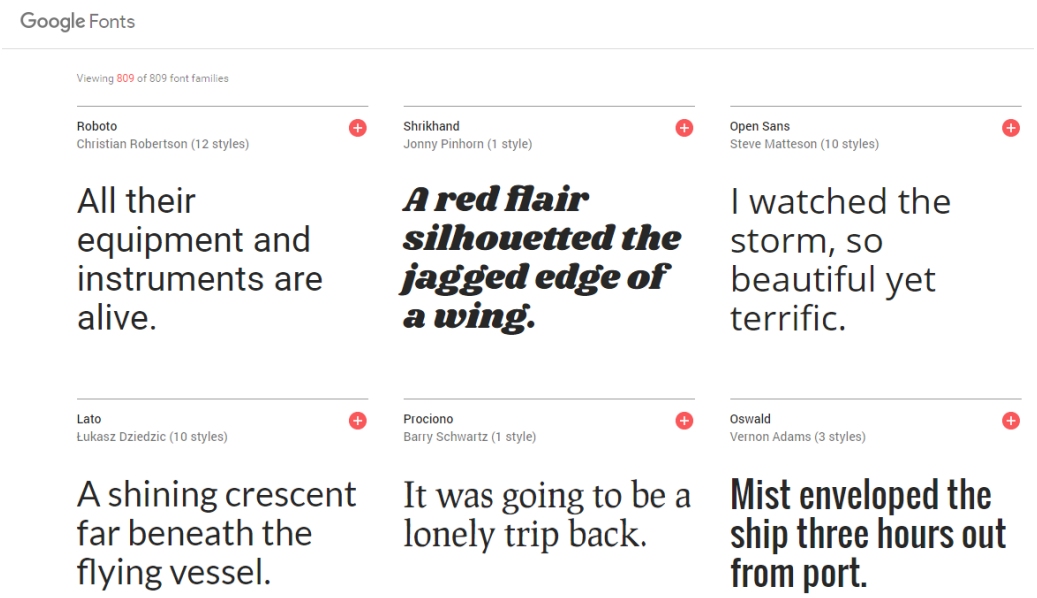


Sans serif

perfect for titles




ORIGINAL COHORT
80% of athletes injured
60%
40%
20%
FAST-TWITCH
64% injured
INTERMEDIATE
43% injured
SLOW-TWITCH
15% injured
0
400
800 DAYS OF EXPOSURE
REPLICATION COHORT
80% of athletes injured
60%
40%
20%
FAST-TWITCH
94% injured
INTERMEDIATE
49% injured
SLOW-TWITCH
48% injured
0
400
800 DAYS OF EXPOSURE
COMBINED COHORT
80% of athletes injured
60%
40%
20%
FAST-TWITCH
78% injured
INTERMEDIATE
43% injured
SLOW-TWITCH
26% injured
0
400
800 DAYS OF EXPOSURE



dafont.com

fonts.google.com

Tool try-out

Individual exercise (10 minutes)

Pick a **tool or resource** you like and try it out

If there's a **burning question** or **something you are struggling with,** drop it in the chat

Introduction

The importance of data visualization

Data visualization principles

Signal-to-noise ratio

Encoding

Designing charts

Chart types

Workflow and tools

Components

Case studies

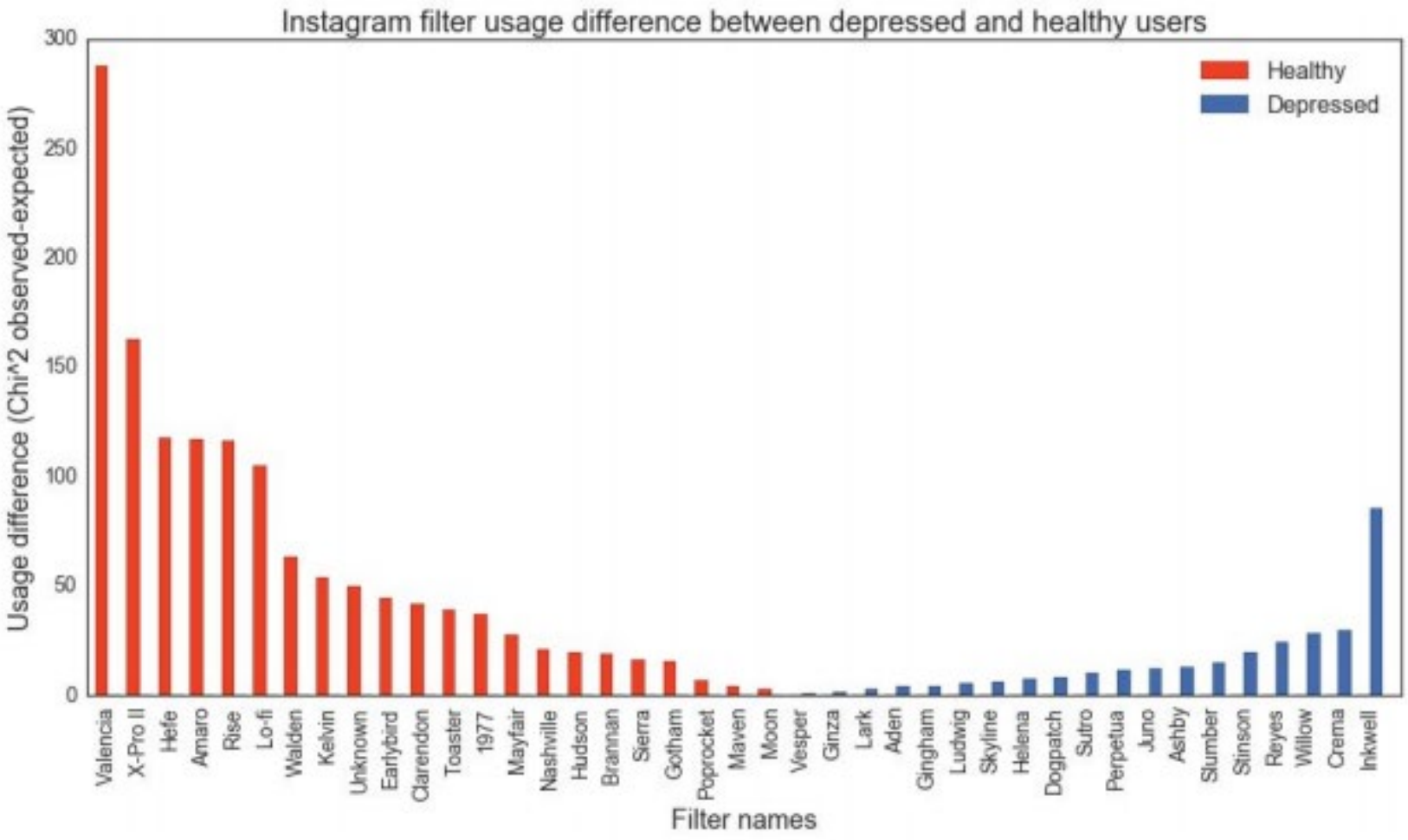
Improving charts

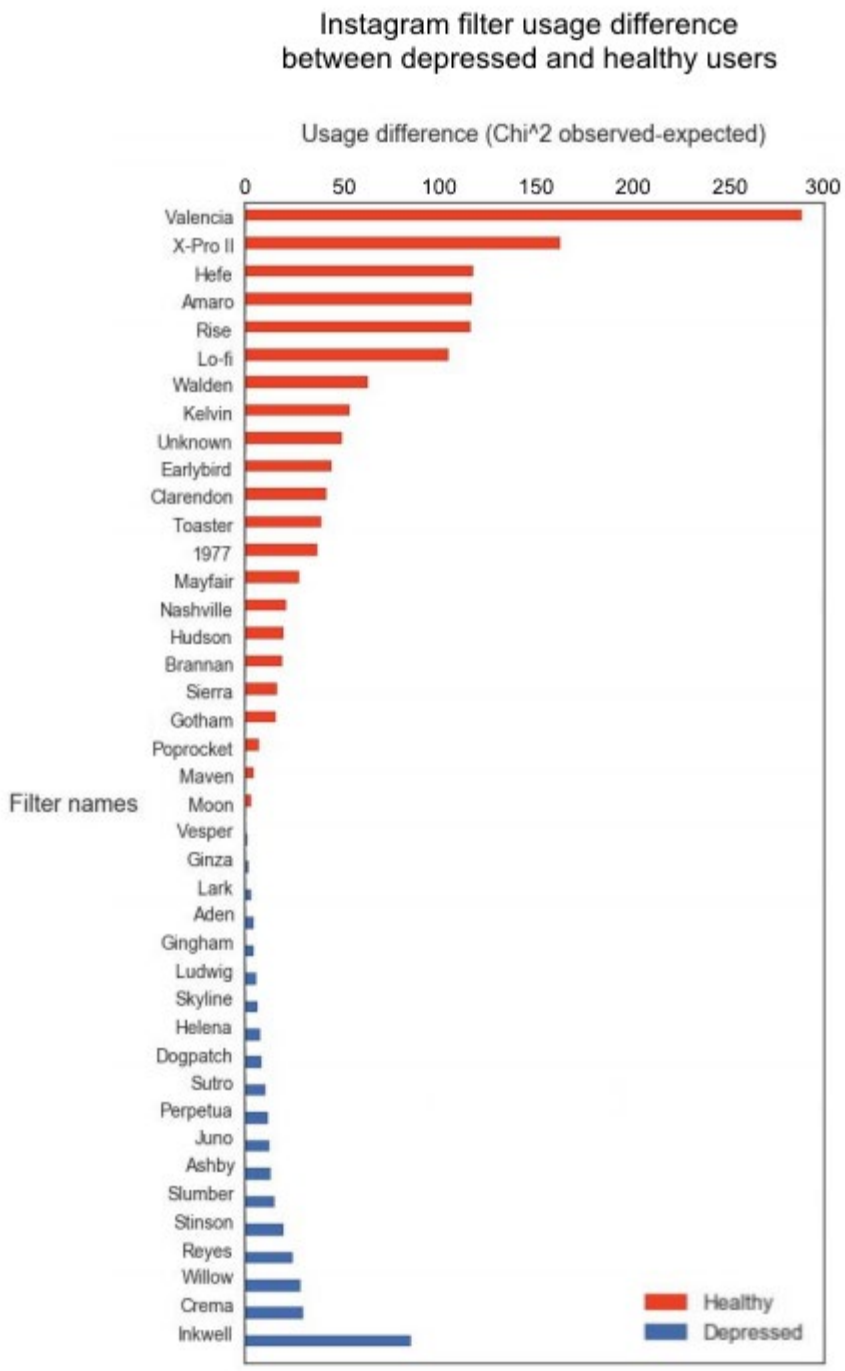
Telling a story

Visualizing uncertainty

Case studies

Improving charts


Instagram filter usage difference between depressed and healthy users
Healthy
Depressed
Usage difference (Chi^2 observed-expected)
300
250
200
150
100
50
0
Valencia
X-Pro II
Hefe
Amaro
Rise
Lo-fi
Walden
Kelvin
Unknown
Earlybird
Clarendon
Toaster
1977
Mayfair
Nashville
Hudson
Brannan
Sierra
Gotham
Poprocket
Maven
Moon
Vesper
Ginza
Lark
Aden
Gingham
Ludwig
Skyline
Helena
Dogpatch
Sutro
Perpetua
Juno
Ashby
Slumber
Stinson
Reyes
Willow
Crema
Inkwell
Filter names


Instagram filter usage difference
between depressed and healthy users
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Filter names
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Skyline
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Ashby
Slumber
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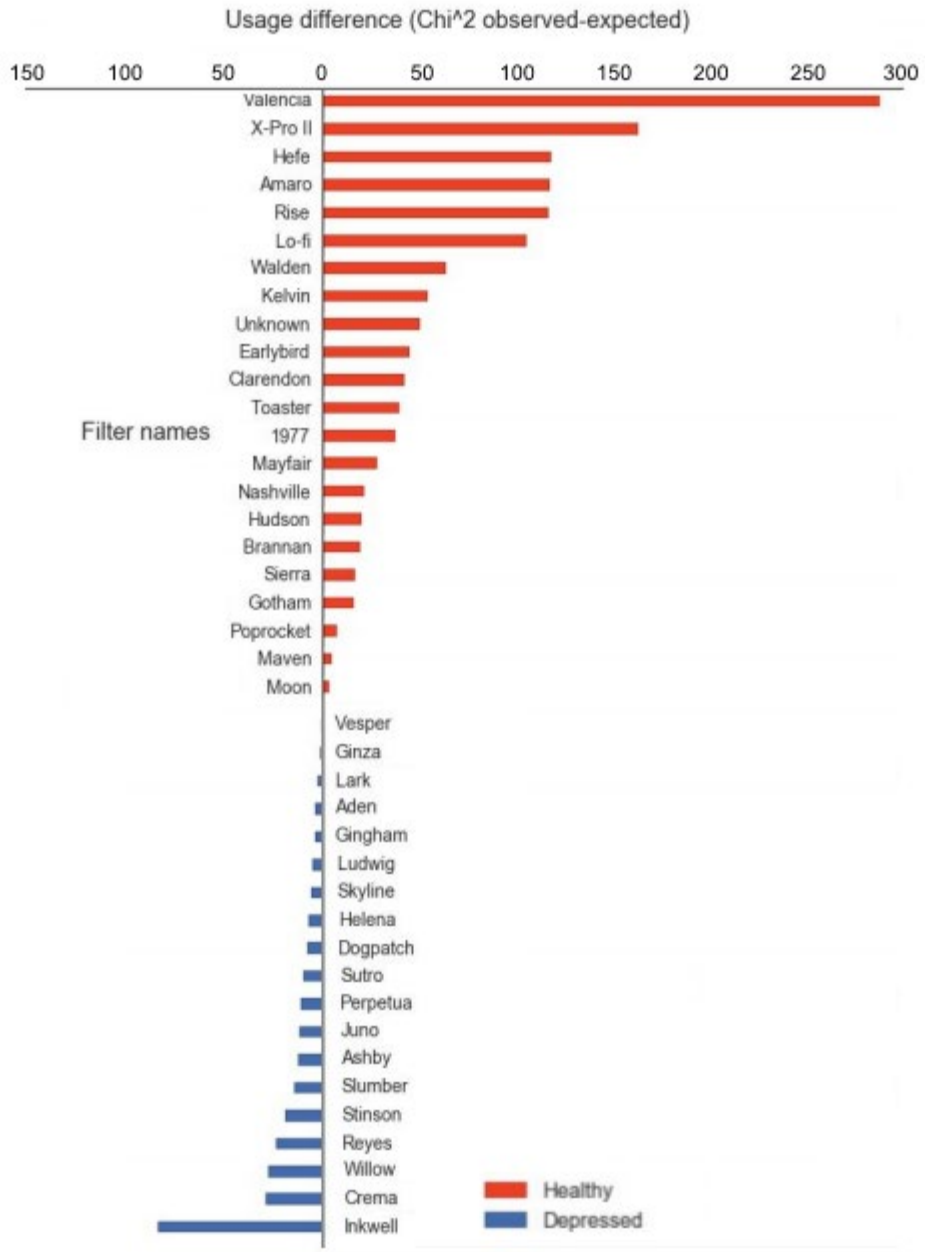
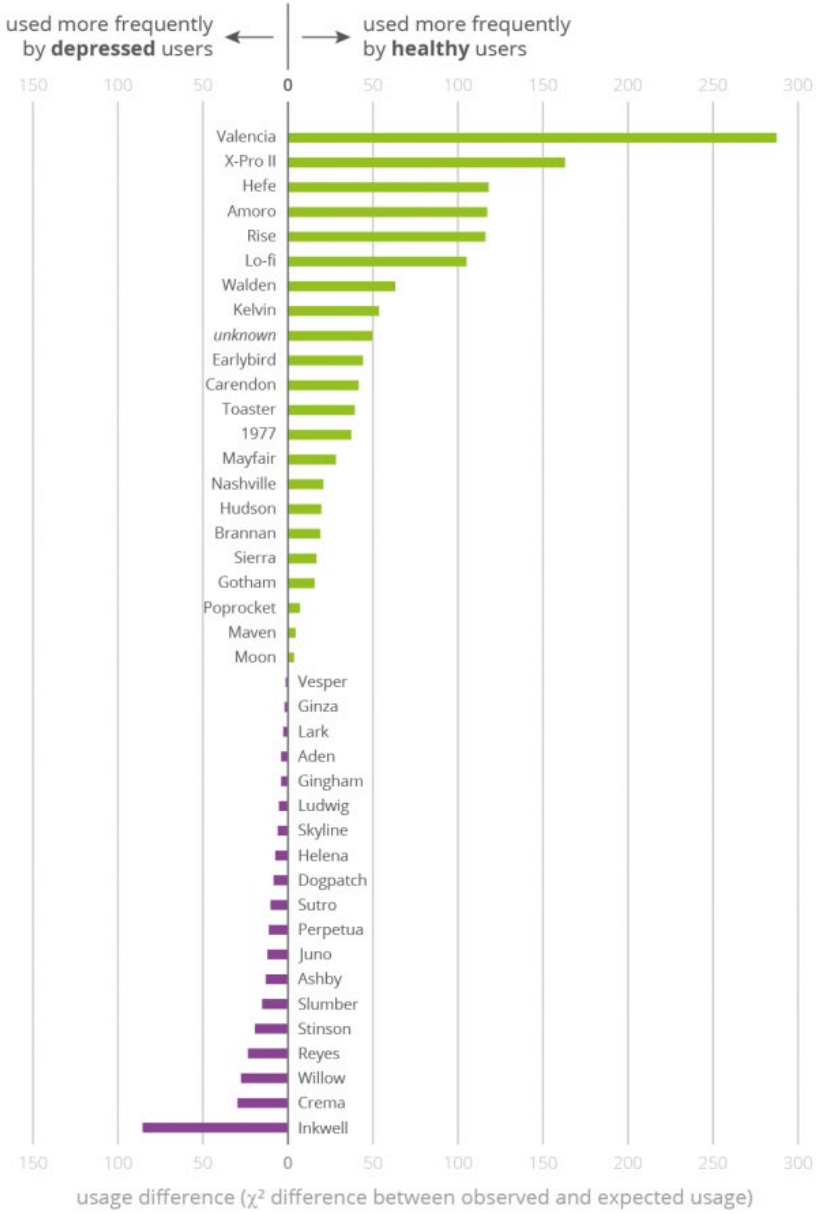
Willow
Crema
Inkwell
Healthy
Depressed

Instagram filter usage difference
between depressed and healthy users

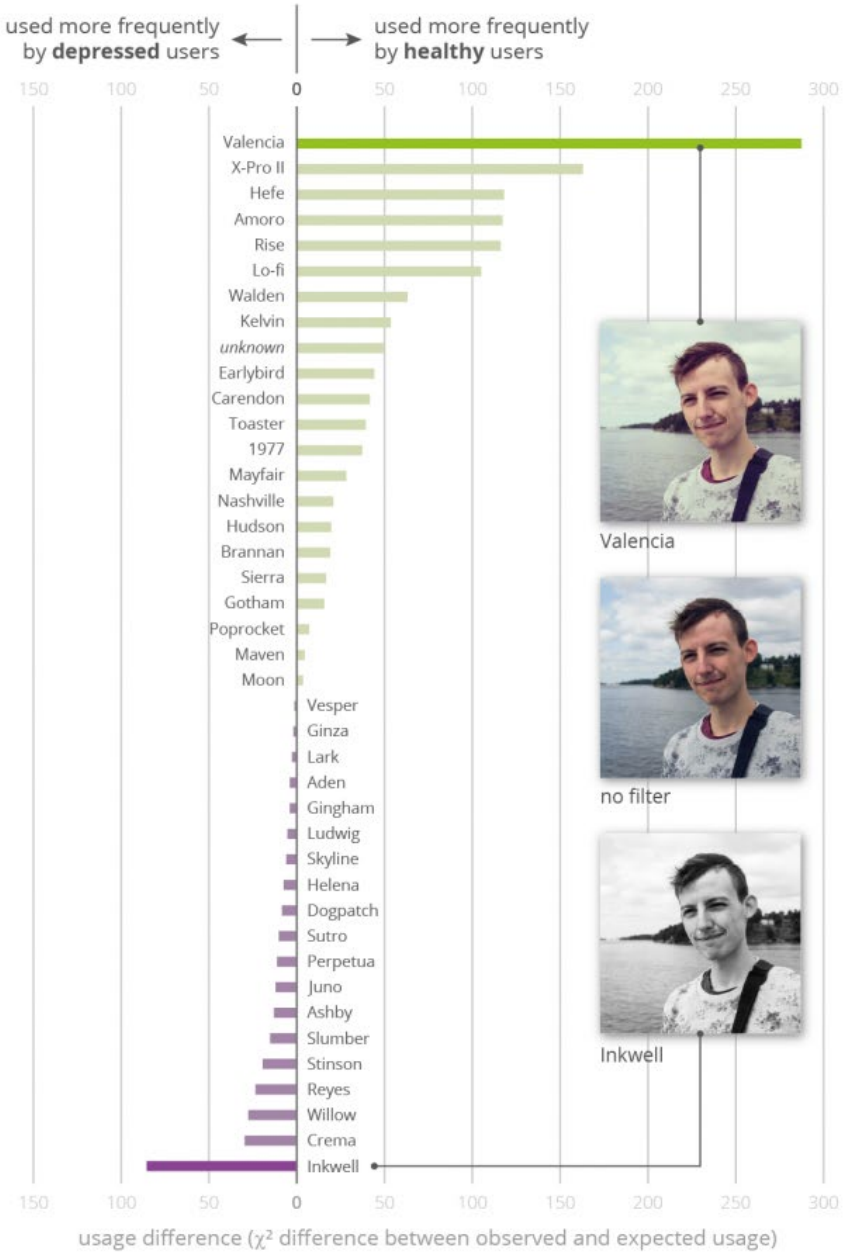


Instagram filter usage difference between depressed and healthy users*

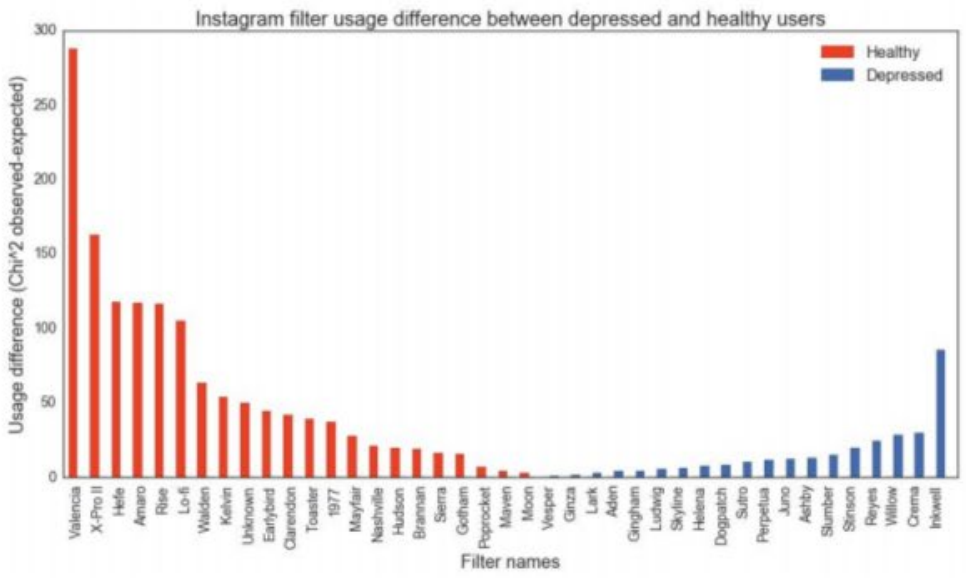


* ***Source:*** *Instagram photos reveal predictive markers of depression, Reece and Danforth, arXiv:1608.03282*

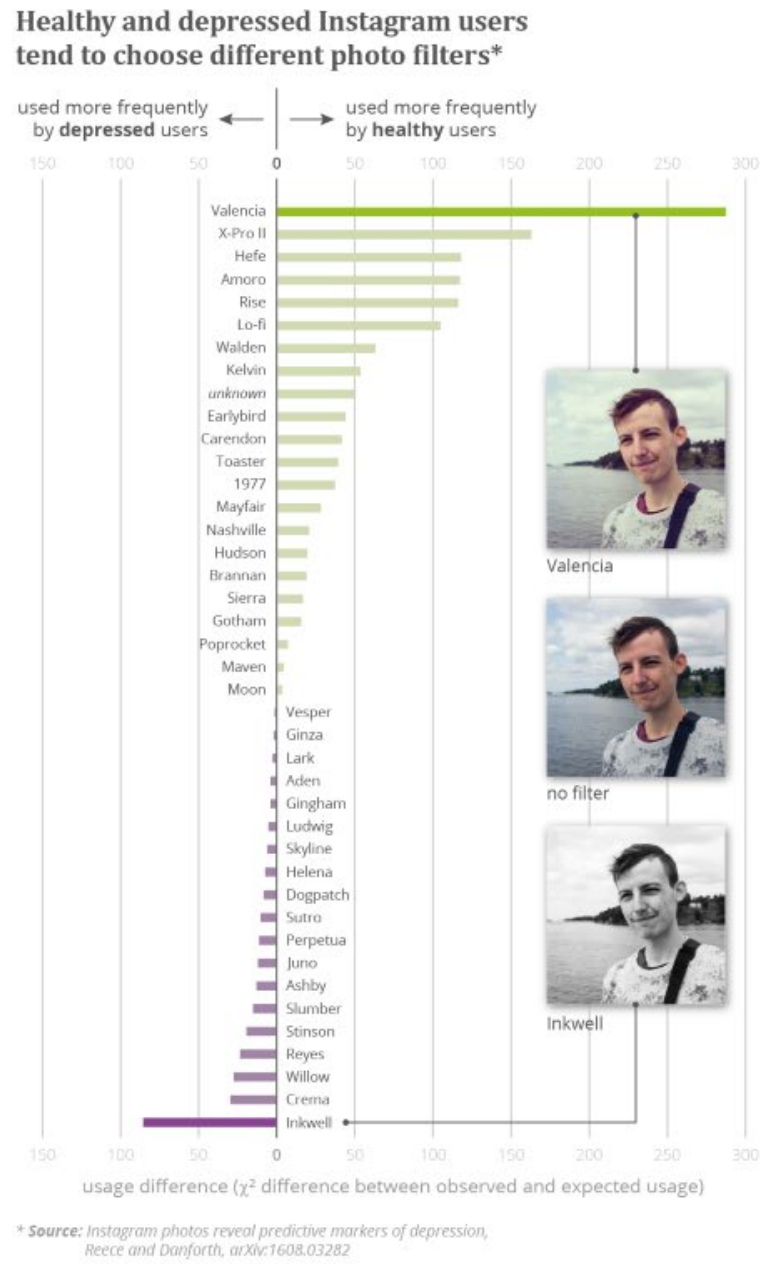
Healthy and depressed Instagram users tend to choose different photo filters*



* ***Source:*** *Instagram photos reveal predictive markers of depression, Reece and Danforth, arXiv:1608.03282*

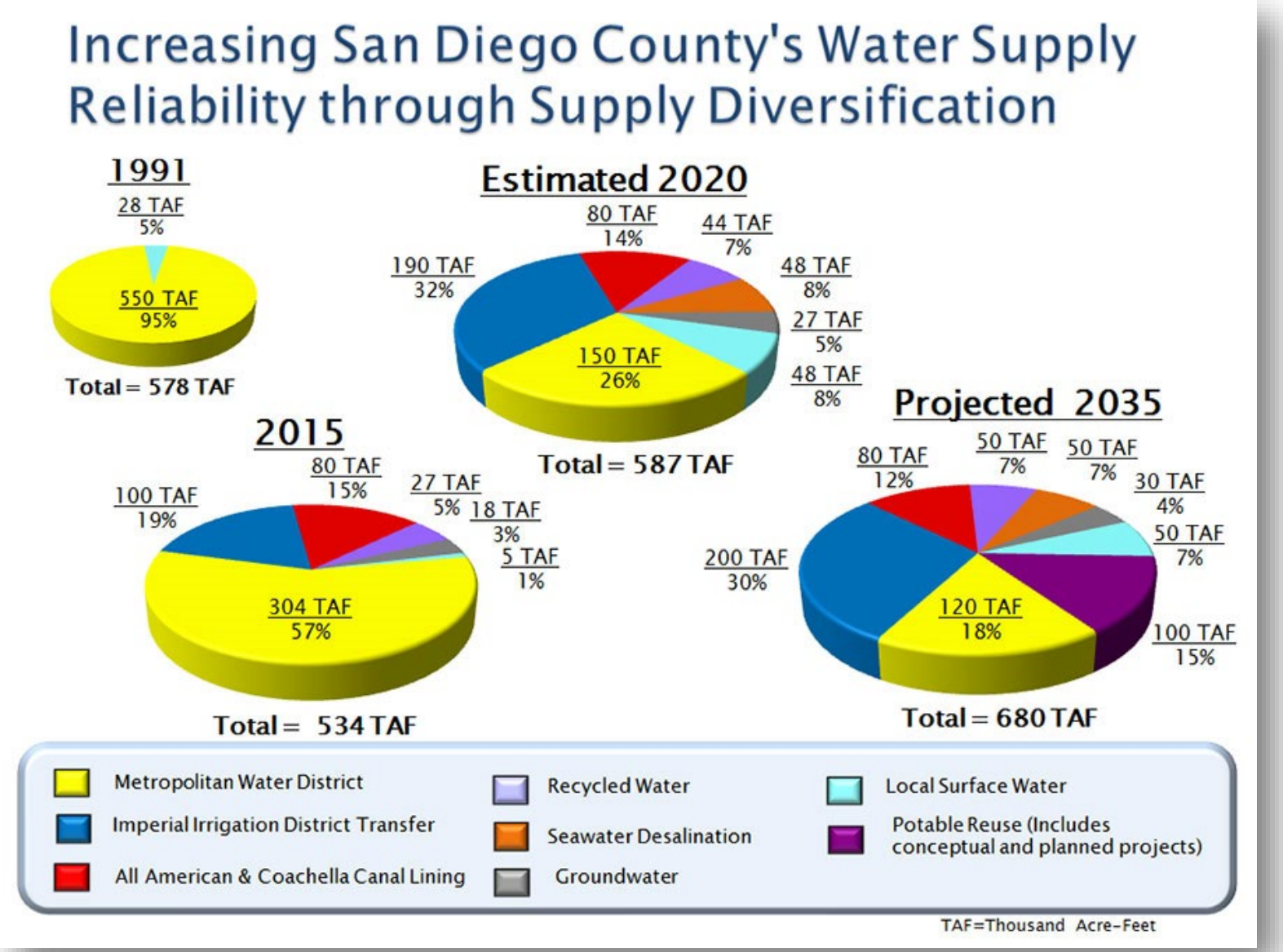


ORIGINAL

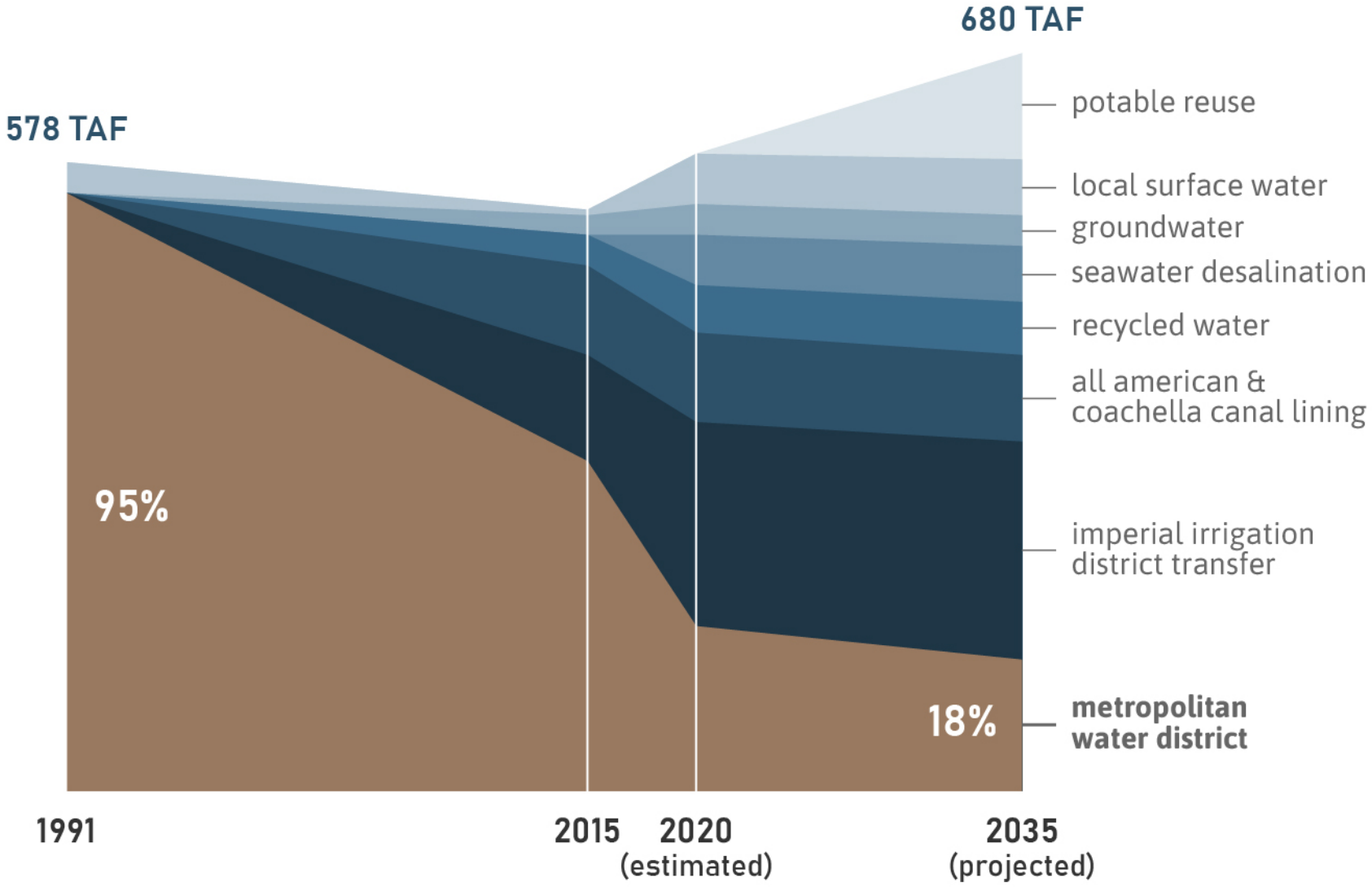


IMPROVED

How would you do it?

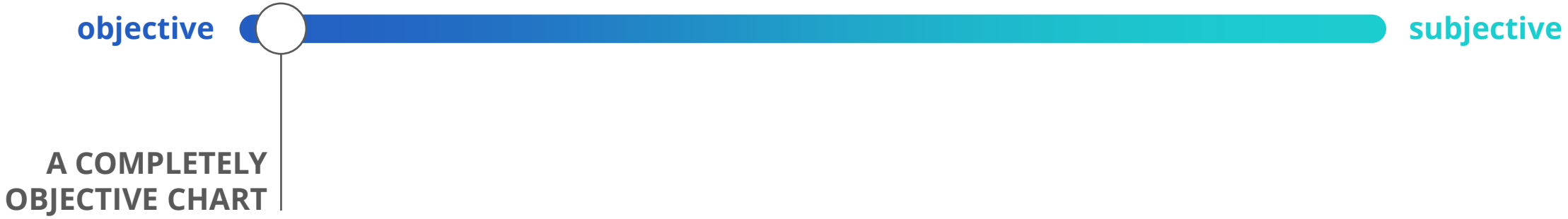


Supply diversification will increase San Diego County's water supply reliability



Objective versus subjective data visuals

Which chart do you want?

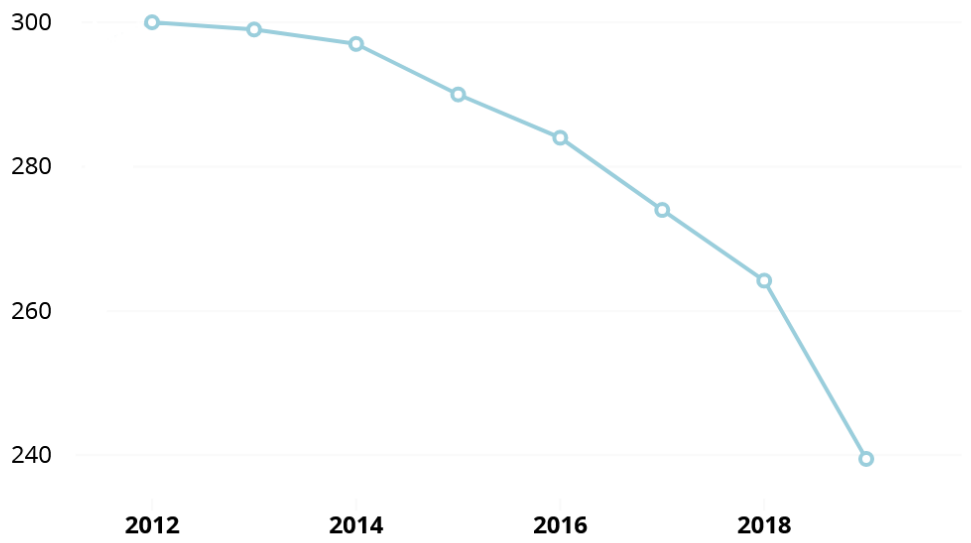


*(number of cash withdrawals from ATMs)

Source: De Standaard, 22 December 2020

close

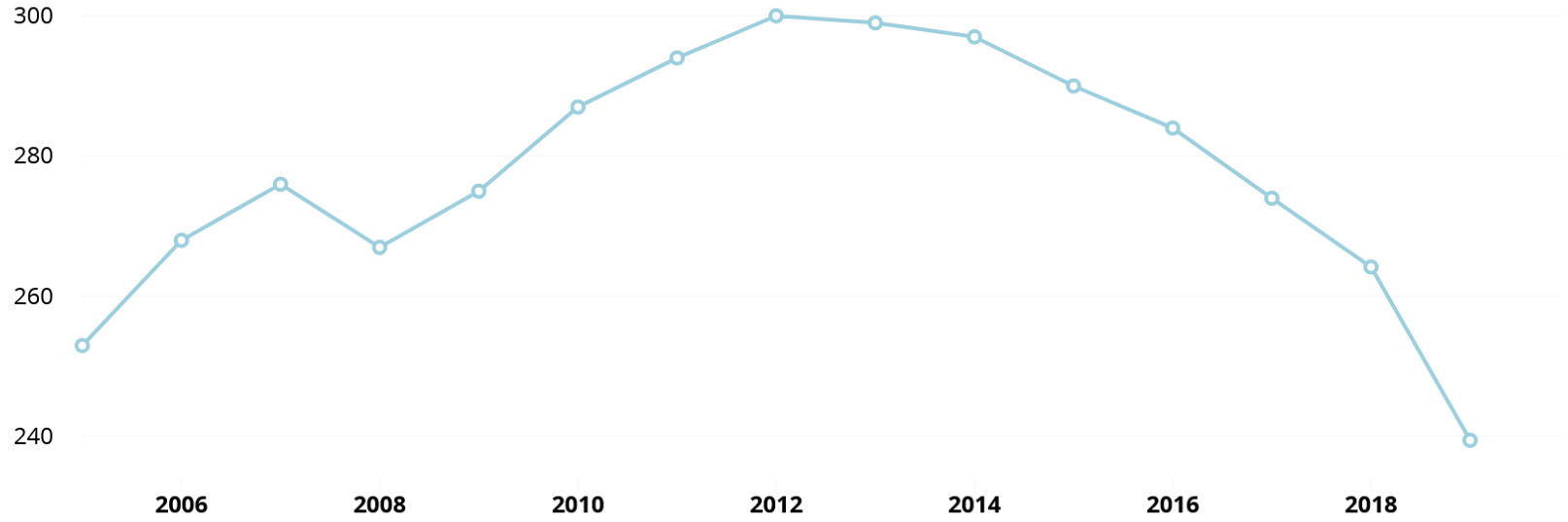
CASH WITHDRAWALS



Febelfin-Enquête / Vademecum T10.5

close

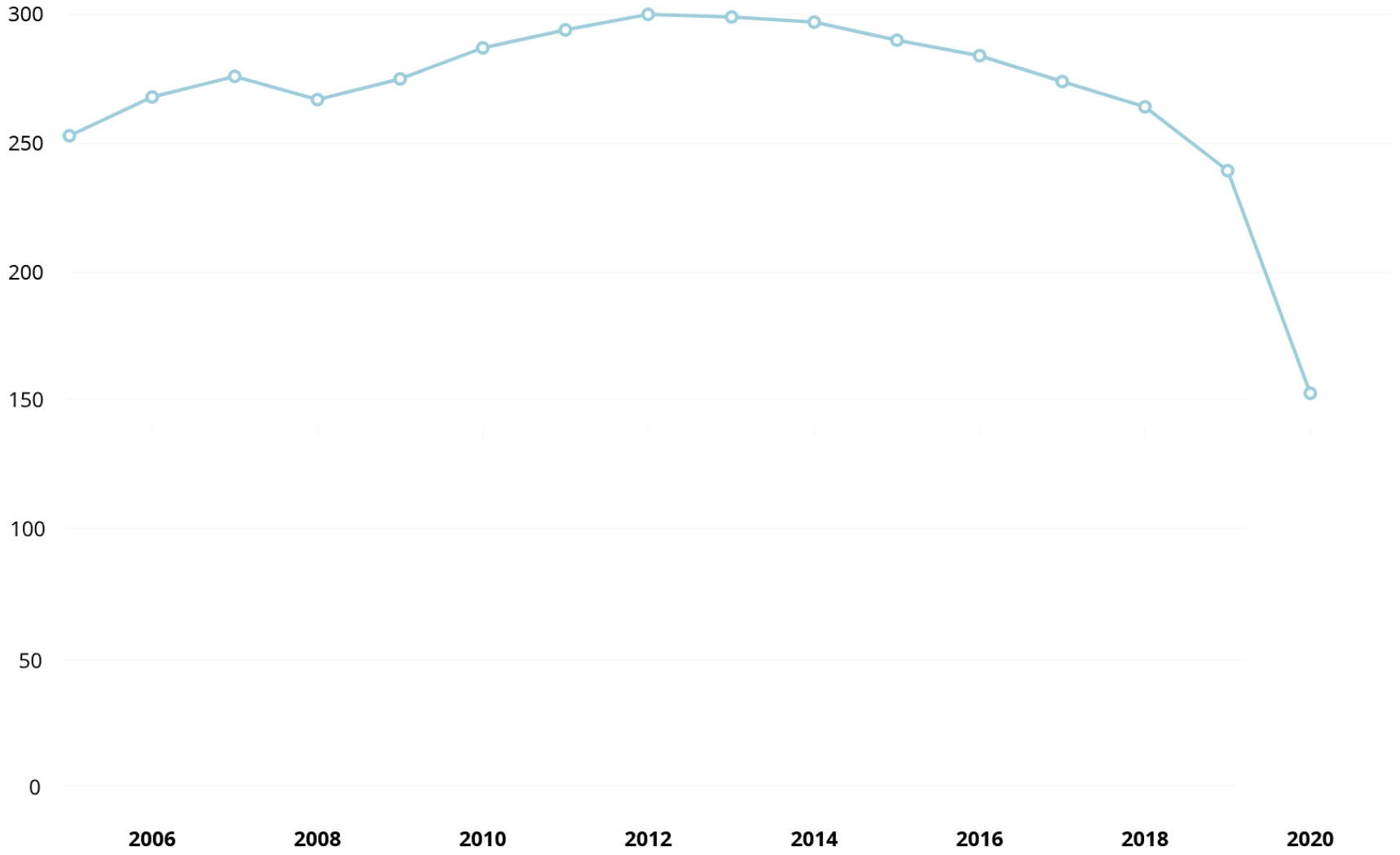
CASH WITHDRAWALS



Febelfin-Enquête / Vademecum T10.5

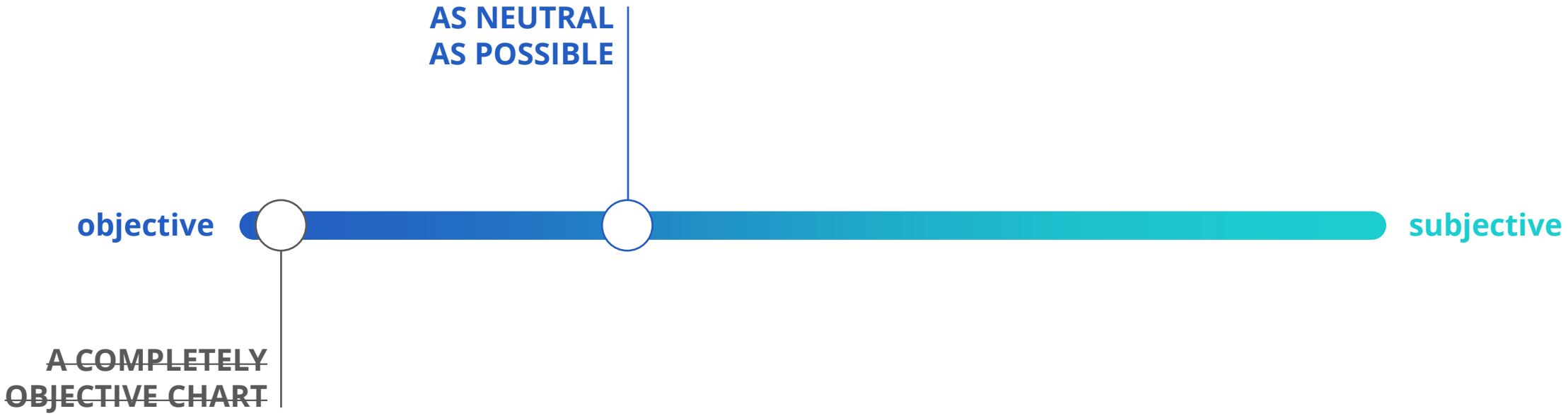
close

CASH WITHDRAWALS



Febelfin Survey / Vademecum

Which chart do you want?



Het afgelopen jaar groeide de Vlaamse bevolking met 40.000 inwoners

6.589.069 inwoners
van het Vlaamse Gewest
op 1 januari 2019

Natuurlijke loop

62.420 overlijdens

62.862 geboorten

Internationale migratie

51.912 emigraties

80.423 immigraties

Binnenlandse migratie

22.680 emigraties

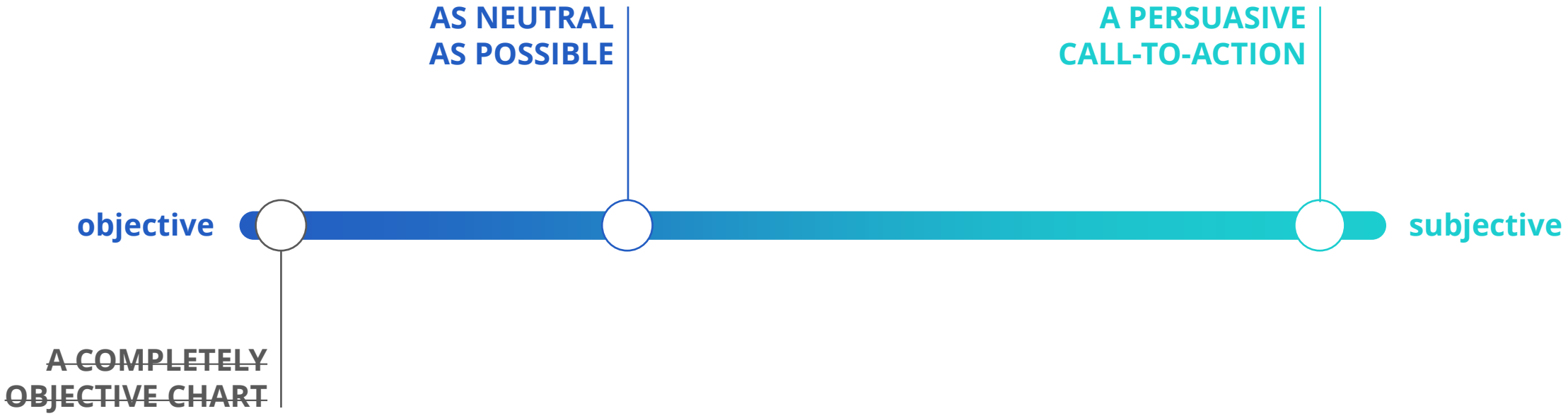
34.520 immigraties

6.629.143 inwoners
van het Vlaamse Gewest
op 1 januari 2020

Bron: Statbel, bewerking Statistiek Vlaanderen

STATISTIEK VLAANDEREN

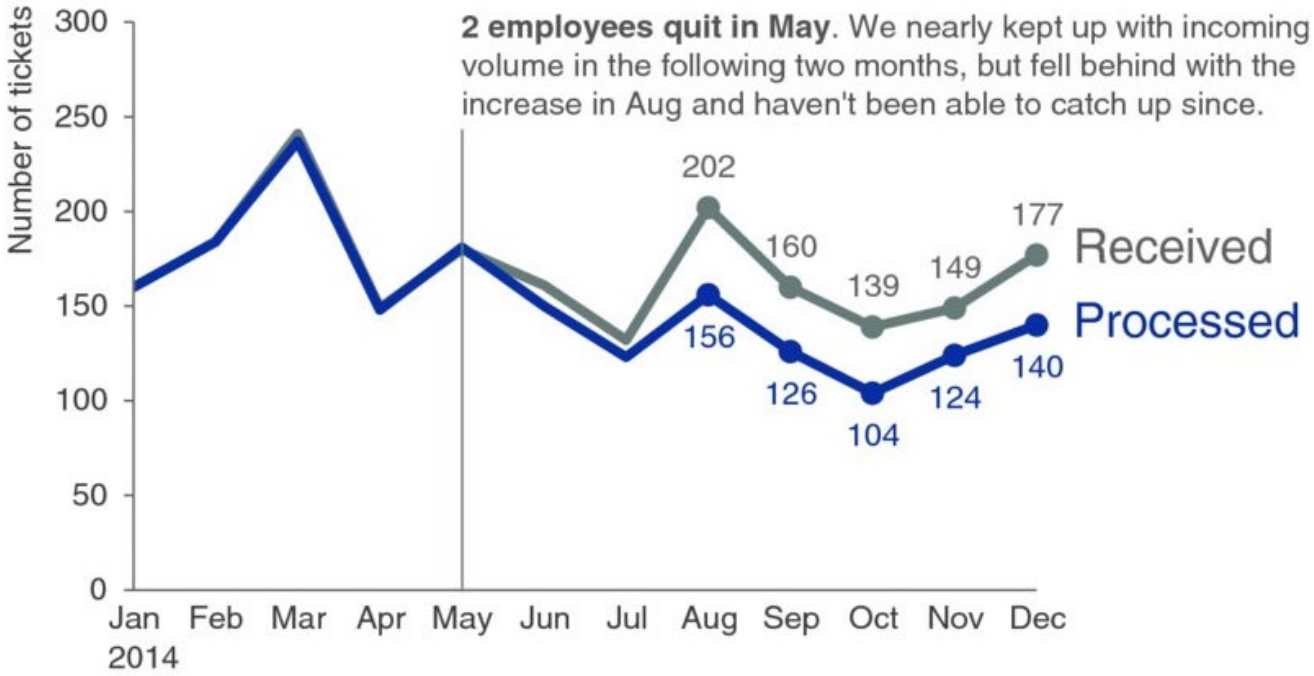
Which chart do you want?



Please approve the hire of 2 FTEs

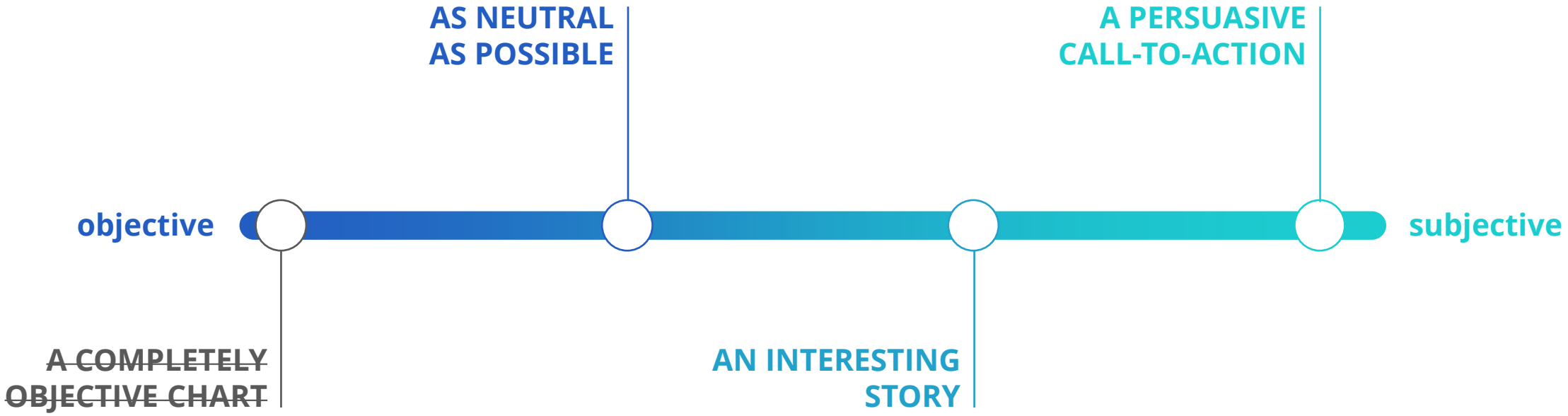
to backfill those who quit in the past year

Ticket volume over time

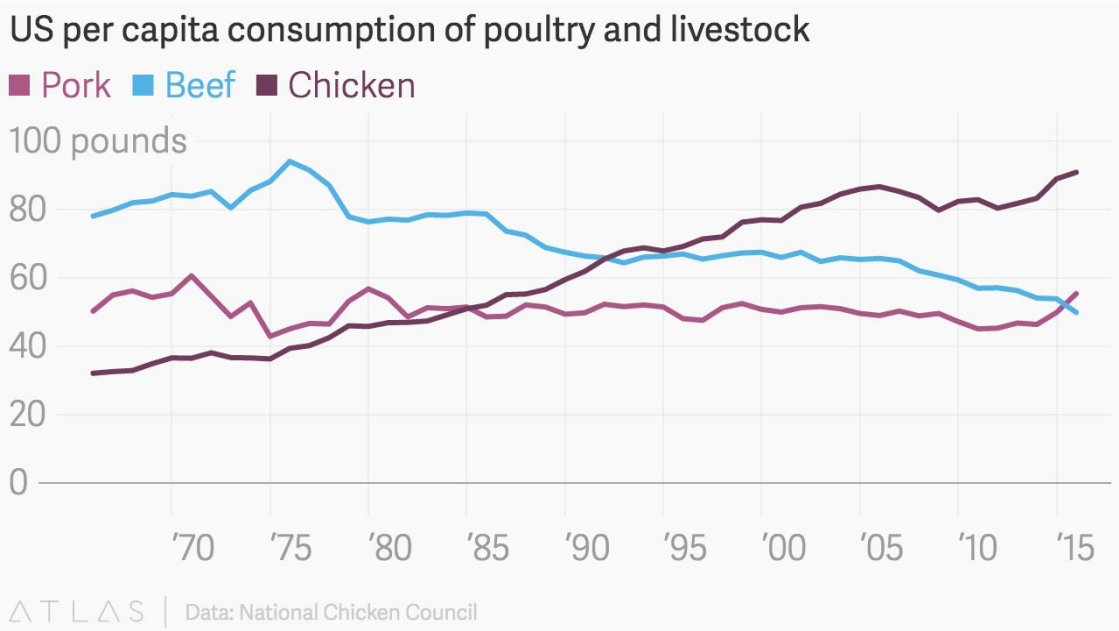


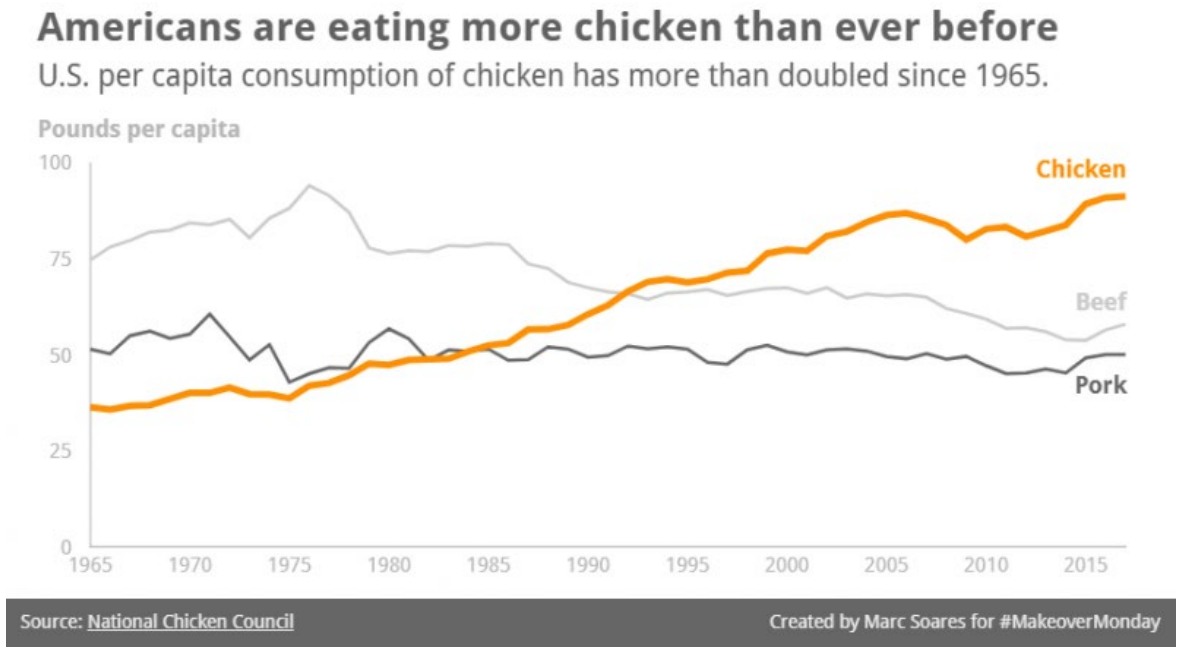
Data source: XYZ Dashboard, as of 12/31/2014 I A detailed analysis on tickets processed per person and time to resolve issues was undertaken to inform this request and can be provided if needed.

Which chart do you want?



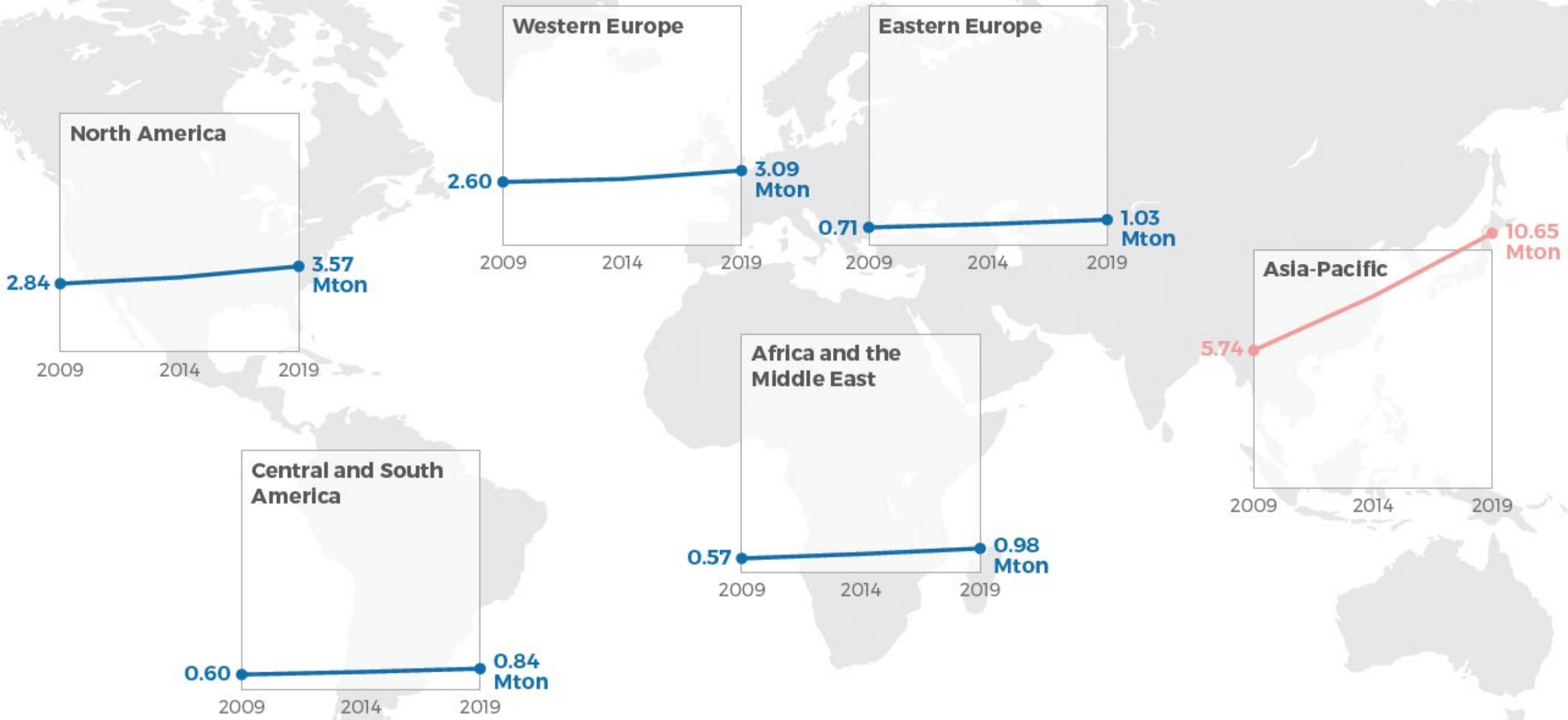
~~data~~ → story





makeovermonday.co.uk

Asia-Pacific will continue to be the biggest demand region



Telling a story

provide context

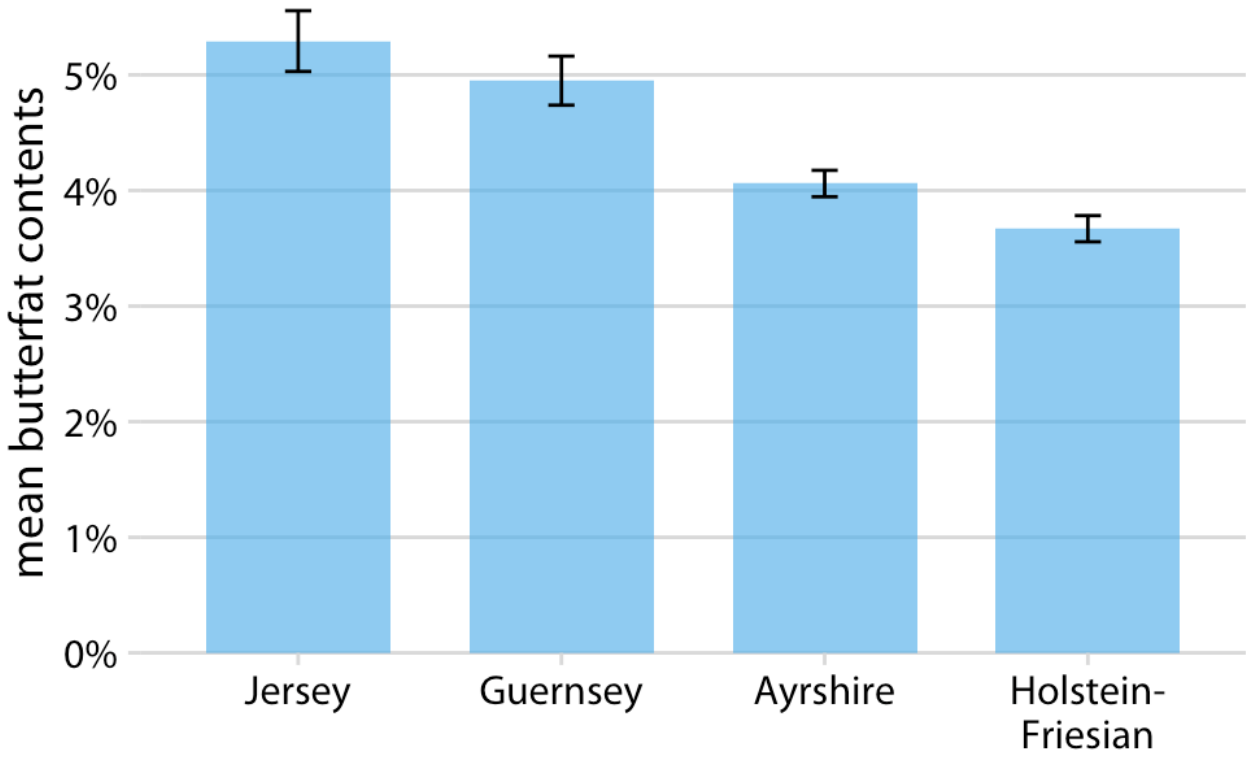
make careful color choices

look for interesting outliers

be selective

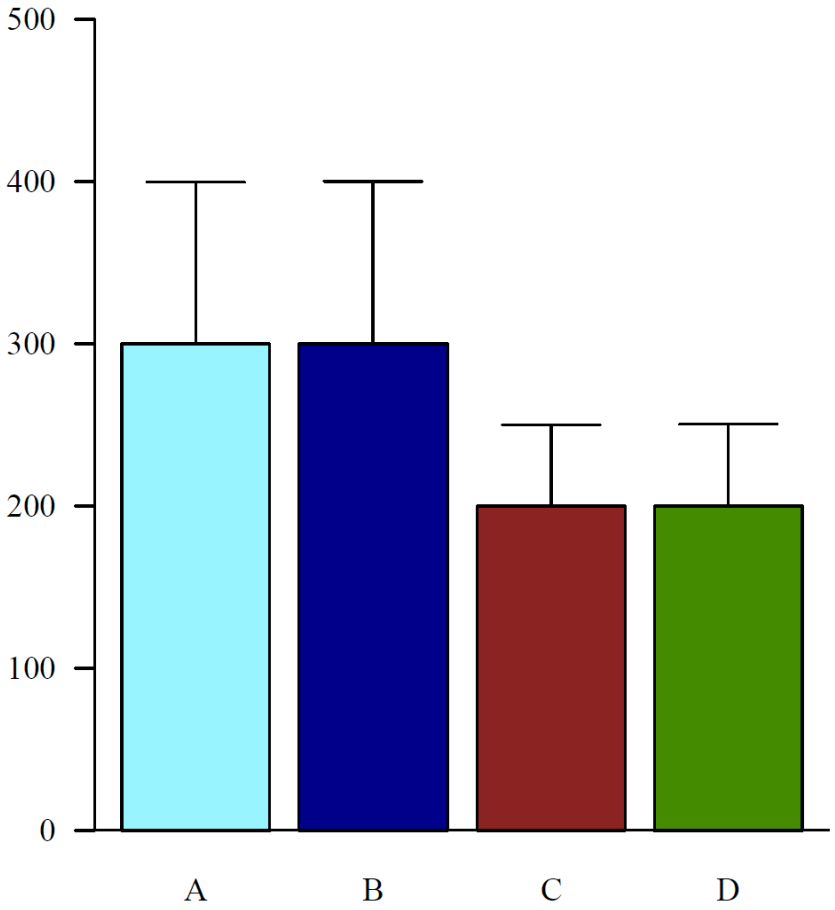
use helpful annotations

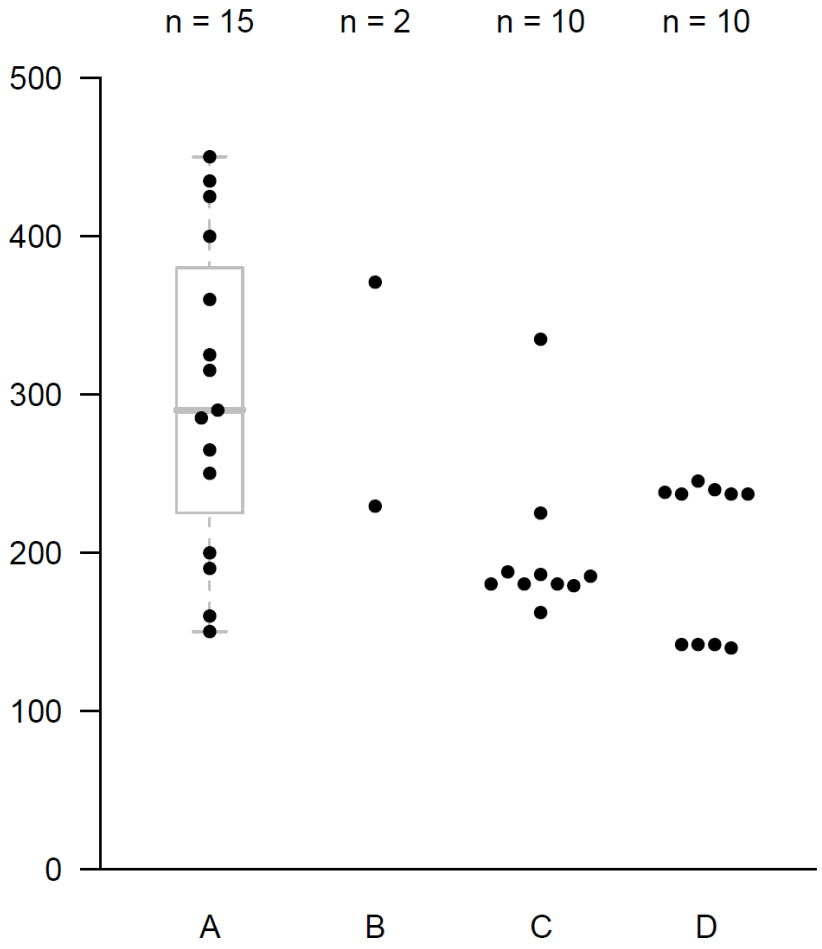
Visualizing uncertainty



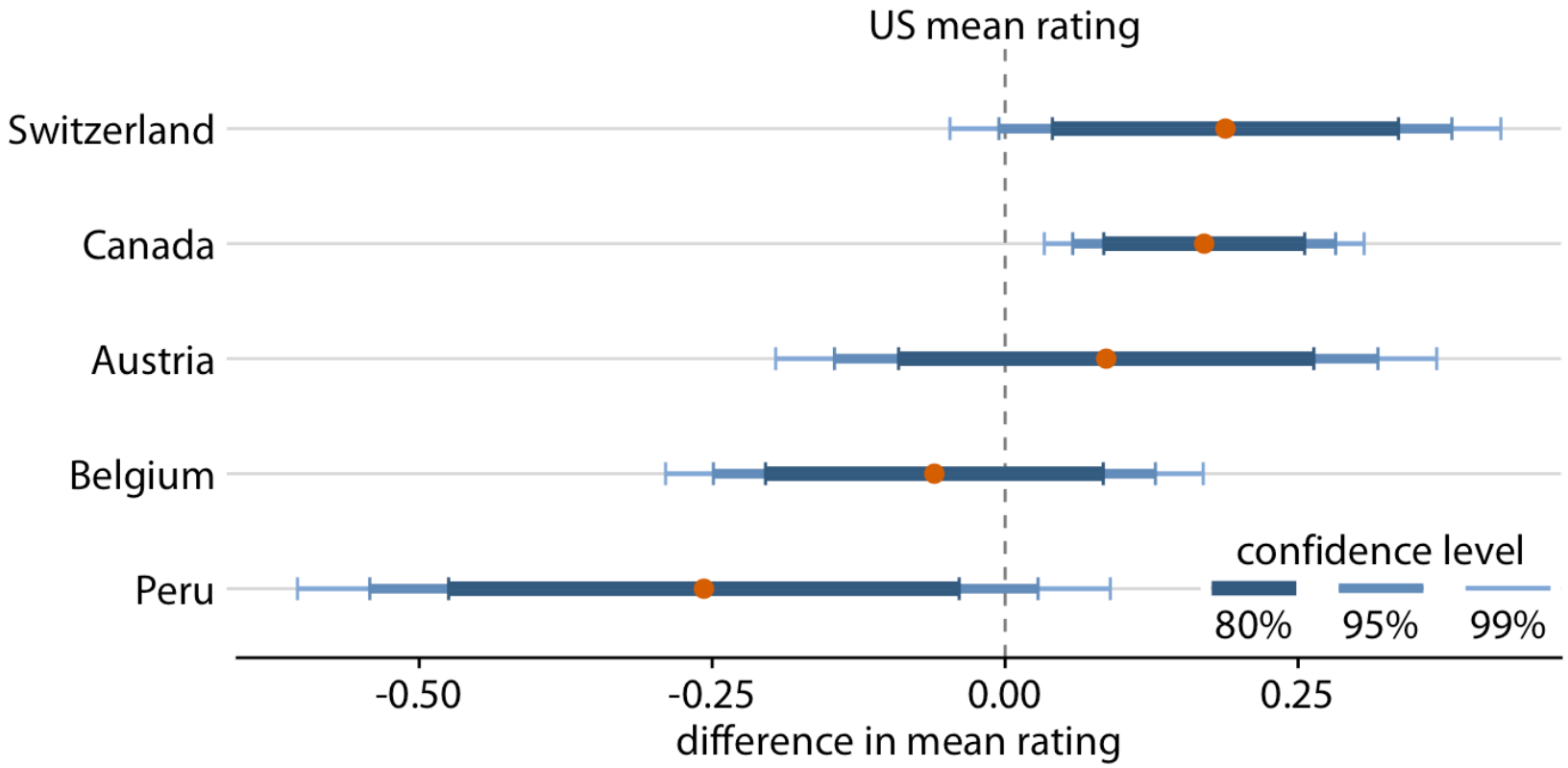
https://clauswilke.com/dataviz/visualizing-uncertainty.html

“dynamite” plot





http://biostat.mc.vanderbilt.edu/wiki/Main/DynamitePlots



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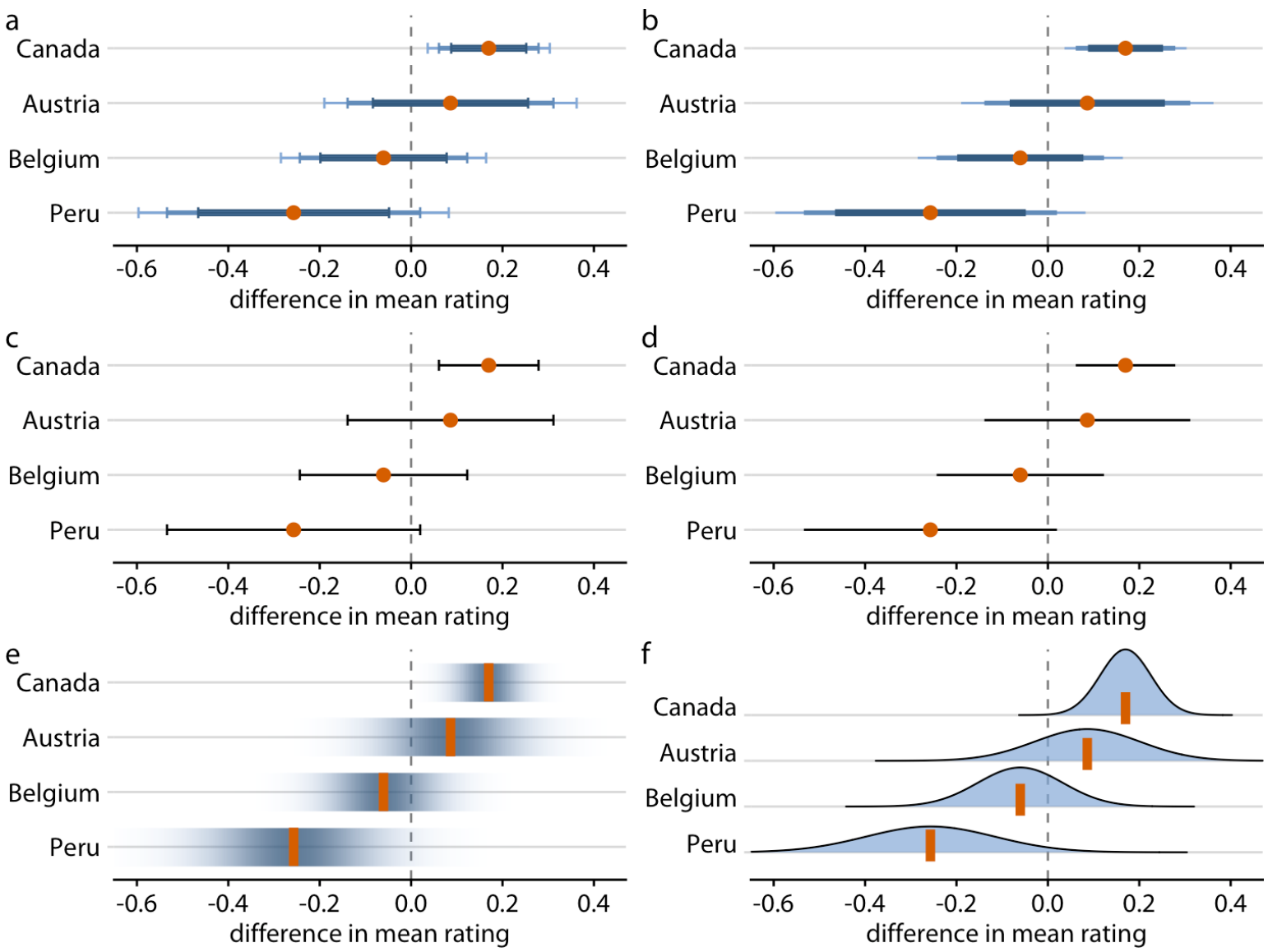
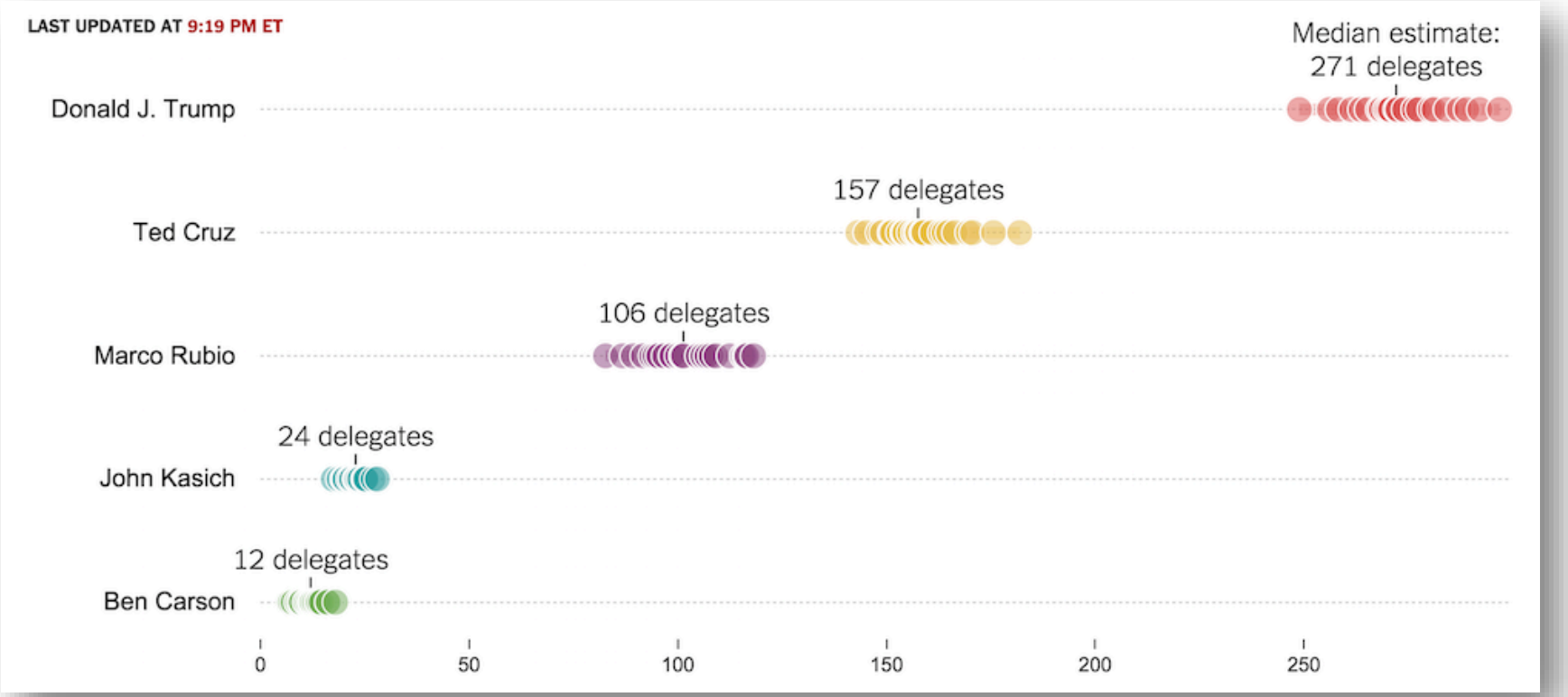
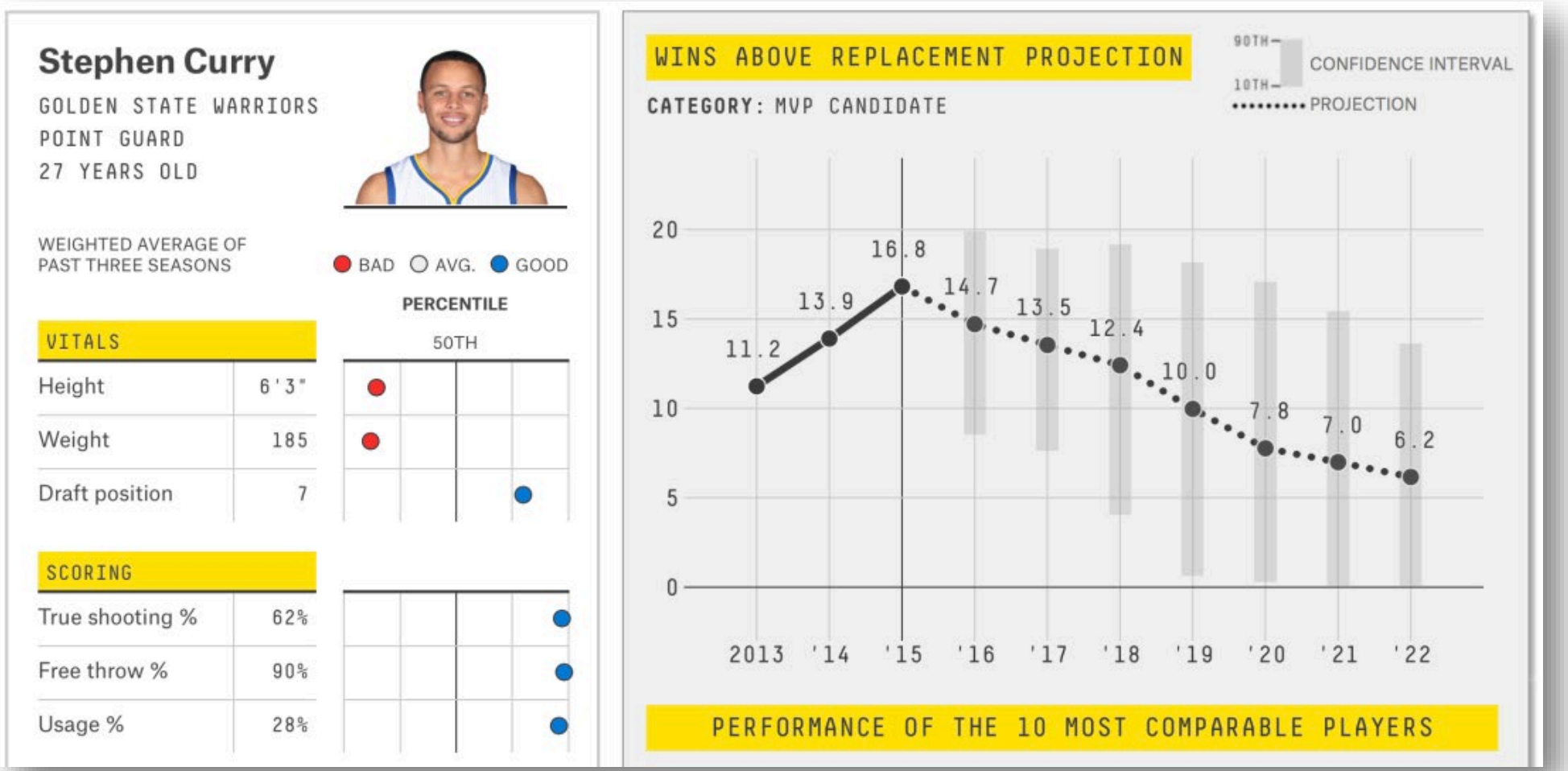


https://clauswilke.com/dataviz/visualizing-uncertainty.html



https://flowingdata.com/2018/01/08/visualizing-the-uncertainty-in-data/



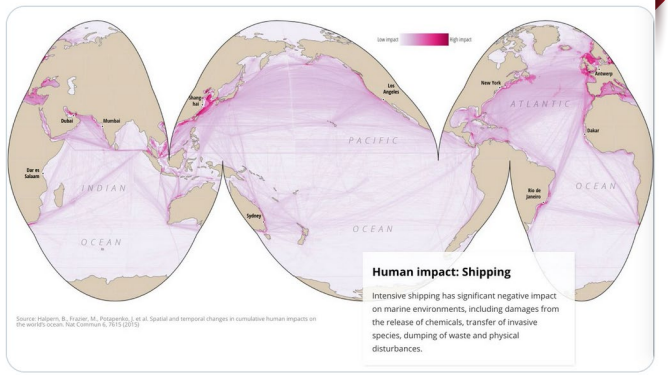
https://flowingdata.com/2018/01/08/visualizing-the-uncertainty-in-data/

Inspiration

Twitter

Maarten Lambrechts @maartenzam · 23 mei
Als antwoord op @pickover
From a work in progress

RECOMMENDED

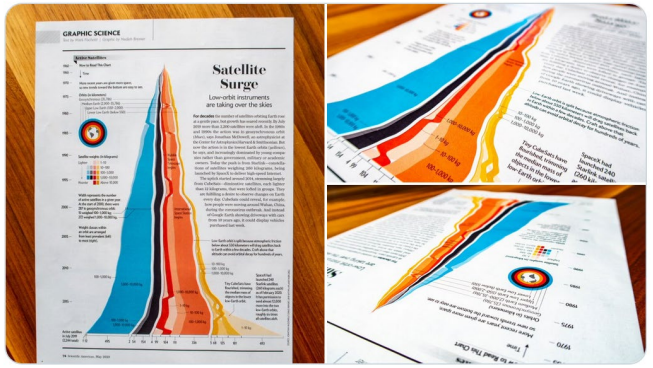


5

Nadieh Bremer @NadiehBremer · 15 u

New!! 🎉 I've created a streamgraph-meets-bump-chart #dataviz to show the rise & sudden surge in the no. of satellites orbiting Earth for @sciam 💫

Huge thanks to @ChristiansenJen for the feedback + layout + sending me 2 issues when my store in NL didn't get them due to covid-19



7 40 368

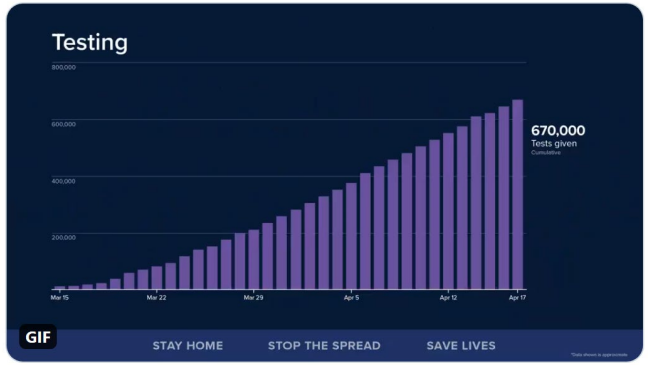
Vastgemaakte Tweet

Giorgia Lupi @giorgialupi · 30 apr.

We ❤️ @NYGovCuomo 's daily briefings. That's why at @pentagram we humbly tried to make his charts even more effective and human.

We talked to @FastCompany about it: fastcompany.com/90498405/andre...

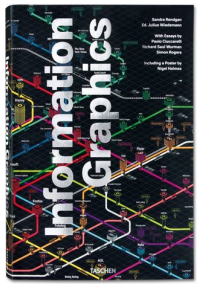
But also check out the full project here: drive.google.com/file/d/1tS-BDR...



13 160 441

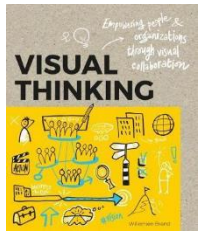
Full **Dataviz World Leaders** list at: twitter.com/Koen_VdE/lists

Books



Information graphics

Taschen



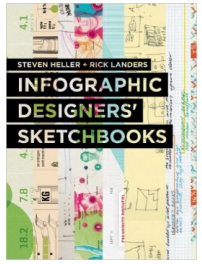
Visual thinking

Willemien Brand

RECOMMENDED

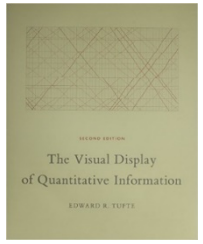
Visual journalism

Gestalten



Infographic designers' sketchbooks

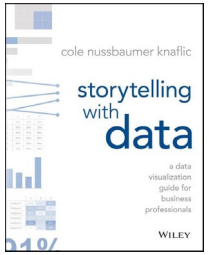
Steven Heller, Rick Landers



The visual display of quantitative information

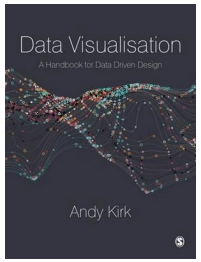
Edward R. Tufte

RECOMMENDED



Storytelling with data

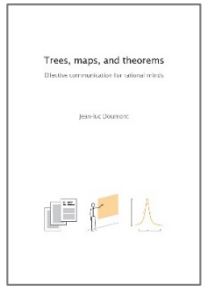
Cole Nussbaumer Knaflic



Data visualisation

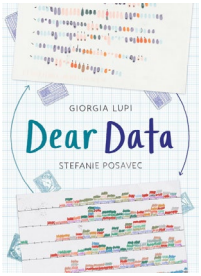
Andy Kirk

RECOMMENDED



Trees, maps and theorems

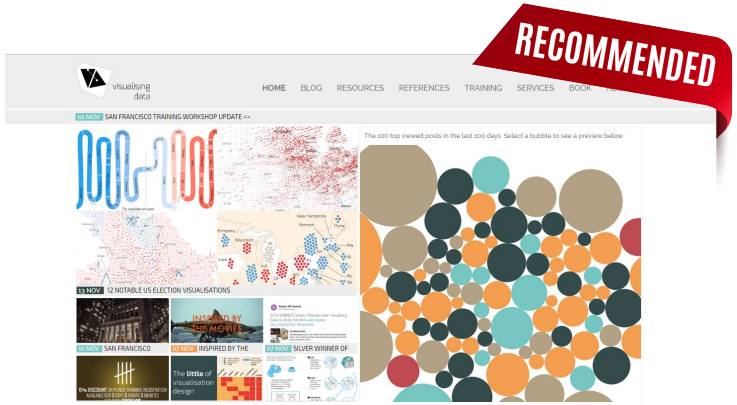
Jean-Luc Doumont



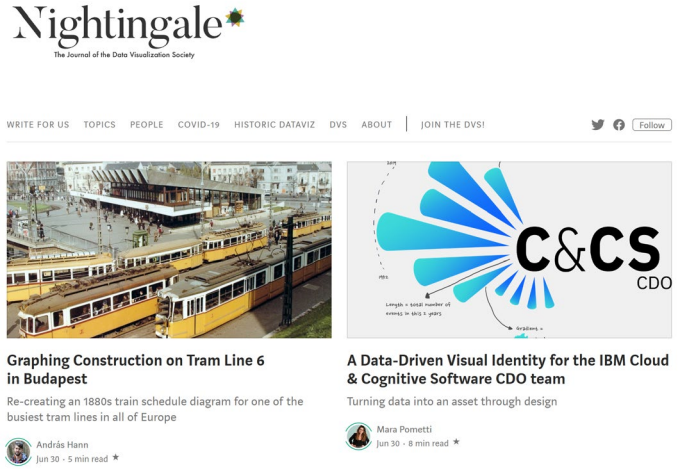
Dear data

Stefanie Posavec, Giorgia Lupi

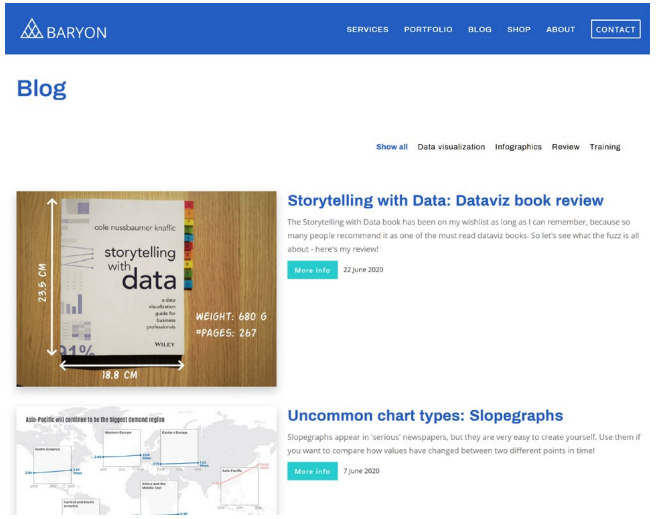
Blogs



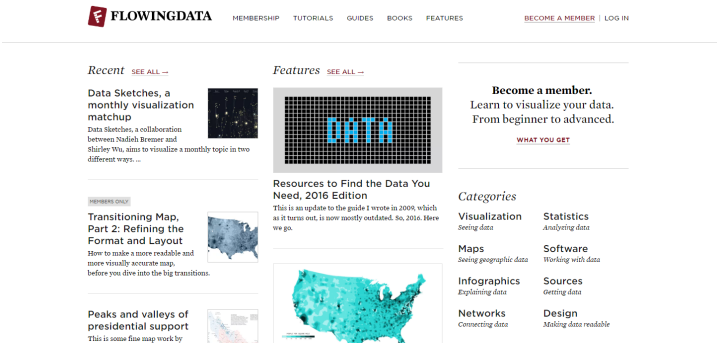
[Visualising Data]



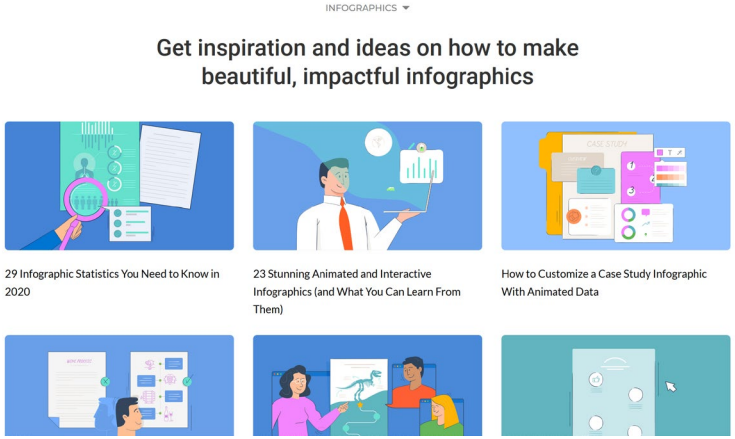
[Nightingale]



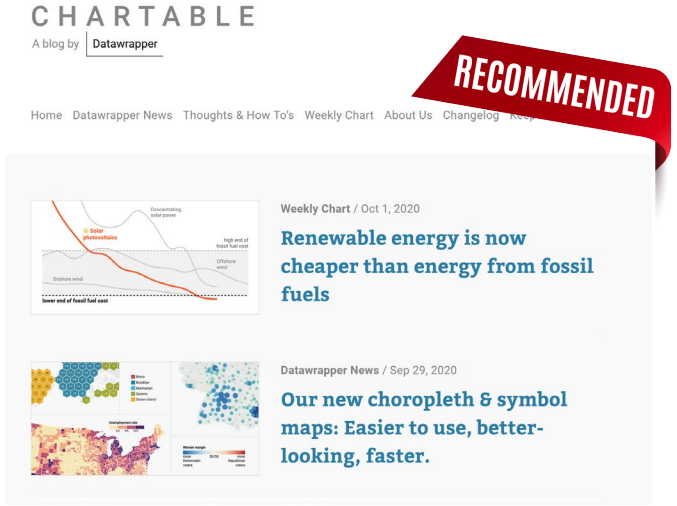
[Baryon blog]



[Flowing Data]



[Visme blog]

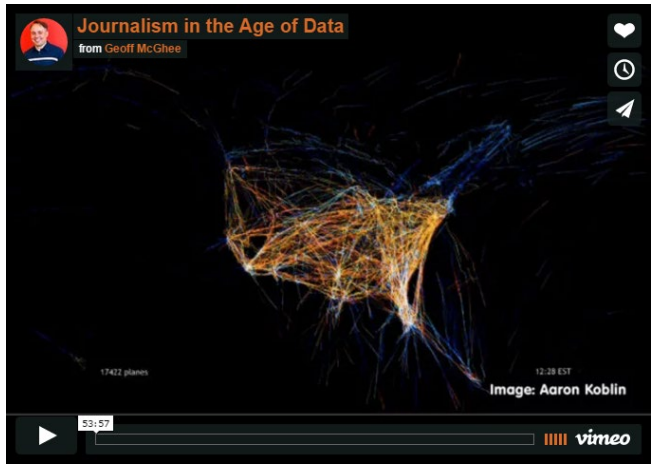


[Chartable]

Videos

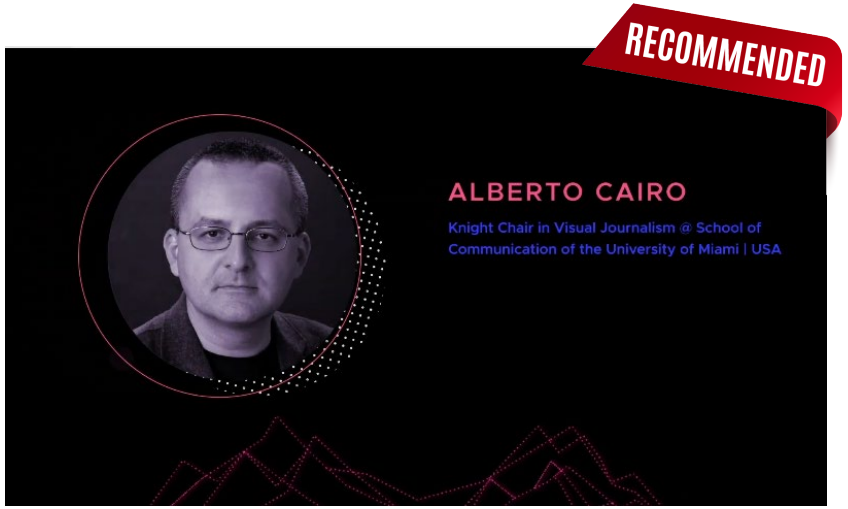
The beauty of data visualization
David McCandless

https://youtu.be/5Zg-C8AAIGg



Journalism in the age of data
Geoff McGhee

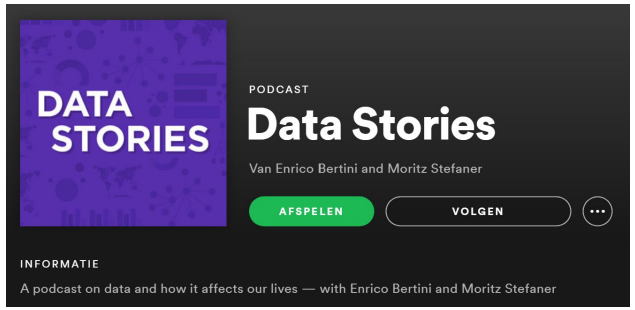
datajournalism.stanford.edu



Datafest online 2020
23 different talks

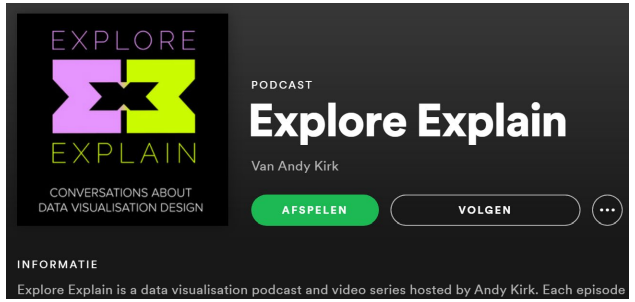
https://www.youtube.com/playlist?list=PLad95_ux5CXnpkUTzXNhz1b8GCgbi_J9L

Podcasts

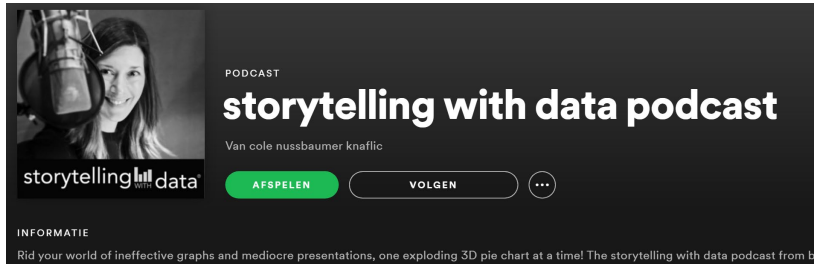


[Data Stories]

[Datasaurus Rex]



[Explore Explain]



[Storytelling with data]

Q&A

All the slides and all the links:

https://baryon.be/dataviz-resources

Koen Van den Eeckhout – koen@baryon.be - @koen_vde