

# Chart types and core charts





# Chart types



# Chart types



How many chart types do we know?

# The Data Visualisation Catalogue

[About](#) • [Suggest](#) • [Shop](#) • [Resources](#)

Search by Function

View by List



Arc Diagram



Area Graph



Bar Chart



Box & Whisker Plot



Brainstorm



Bubble Chart



Bubble Map



Calendar



Chord Diagram



Choropleth Map



Circle Packing



Connection Map



Donut Chart



Dot Map



Dot Matrix Chart



Flow Map



Histogram



Illustration Diagram



Search by Function

View by List








Arc Diagram

Area Graph

Bar Chart

Box & Whisker Plot

Brainstorm

Bubble Chart








Bubble Map

Bullet Graph

Calendar

Candlestick Chart

Chord Diagram

Choropleth Map








Circle Packing

Connection Map

Density Plot

Donut Chart

Dot Map

Dot Matrix Chart








Error Bars

Flow Chart

Flow Map

Gantt Chart

Heatmap

Histogram








Illustration Diagram

Kagi Chart

Line Graph

Marimekko Chart

Multi-set Bar Chart

Network Diagram








Nightingale Rose Chart

Non-ribbon Chord Diagram

Open-high-low-close Chart

Parallel Coordinates Plot

Parallel Sets

Pictogram Chart








Pie Chart

Point & Figure Chart

Population Pyramid

Proportional Area Chart

Radar Chart

Radial Bar Chart








Radial Column Chart

Sankey Diagram

Scatterplot

Span Chart

Spiral Plot

Stacked Area Graph








Stacked Bar Graph

Stem & Leaf Plot

Stream Graph

Sunburst Diagram

Tally Chart

Timeline








Timetable

Tree Diagram

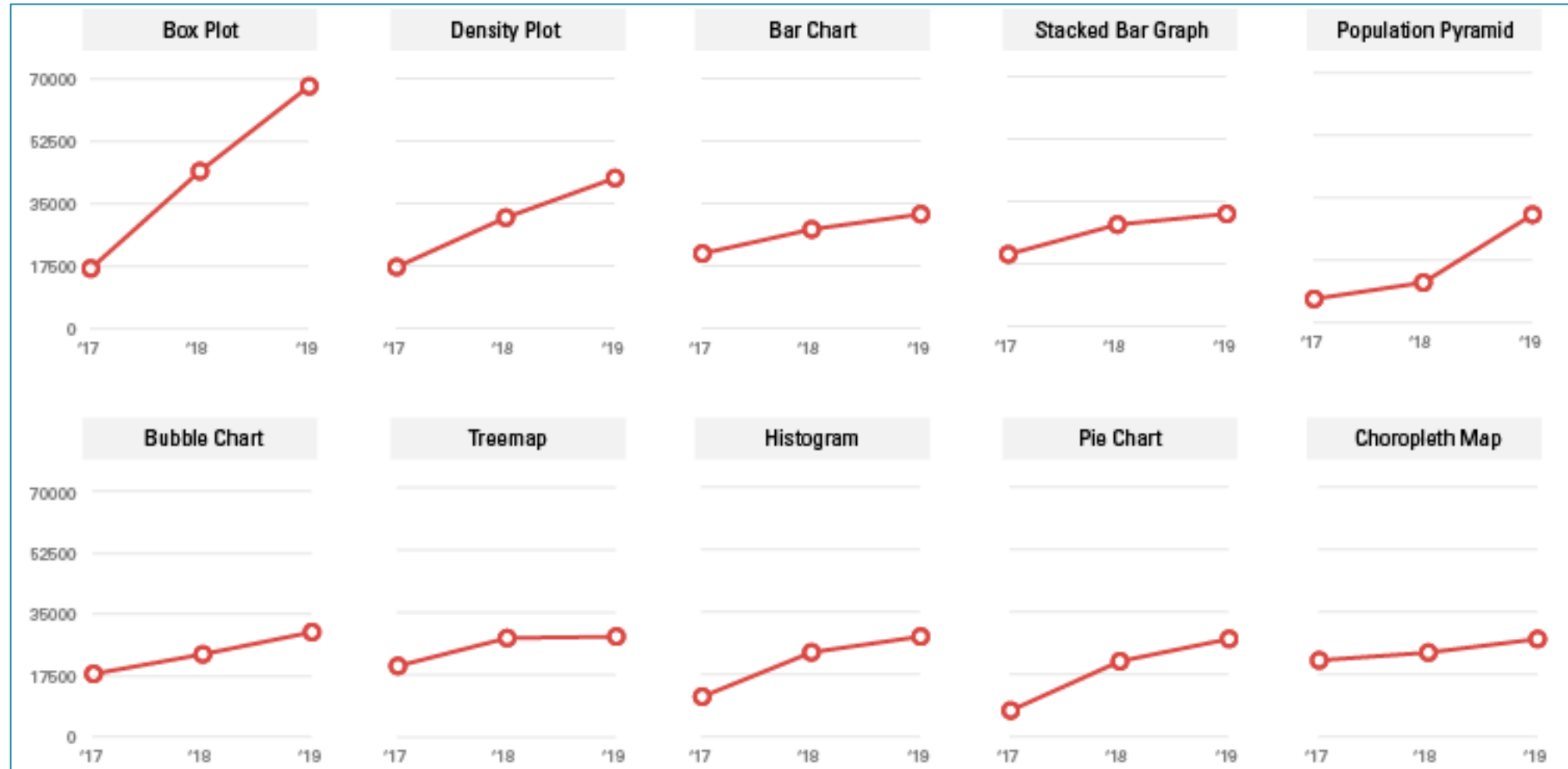
Treemap

Venn Diagram

Violin Plot

Word Cloud

# Top 10 Charts in 2019



# The 4 chart segments

**Core Charts**

**Common Charts**

**Rare Charts**

**Risky charts**



# Core Charts



# Core charts

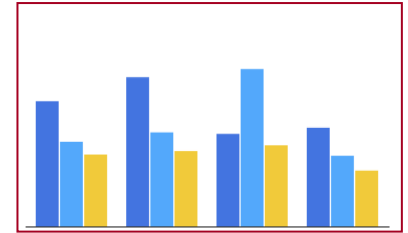


What are the core charts?

# Bar charts

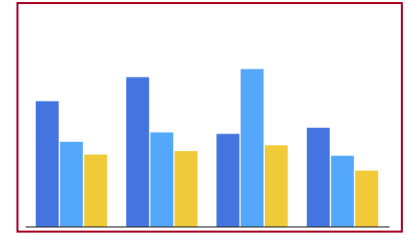
# Bar charts

- Bar charts use a **categorical (discrete)** main variable and one or more **numerical** variables
  - Show the total **Sales** by **Product category**
  - Show the **Plan** vs **Budget** by **Department**
- Each categorical value shown as a separate bar and the length of bar encodes the numerical variable
- Bar charts have many use cases and variations



# Bar charts

- Bar chart use cases
  - Time series
  - Ranking
  - Comparison
  - Proportion of parts (Whole-to-part)
  - Dispersion

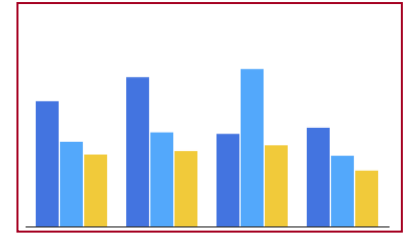




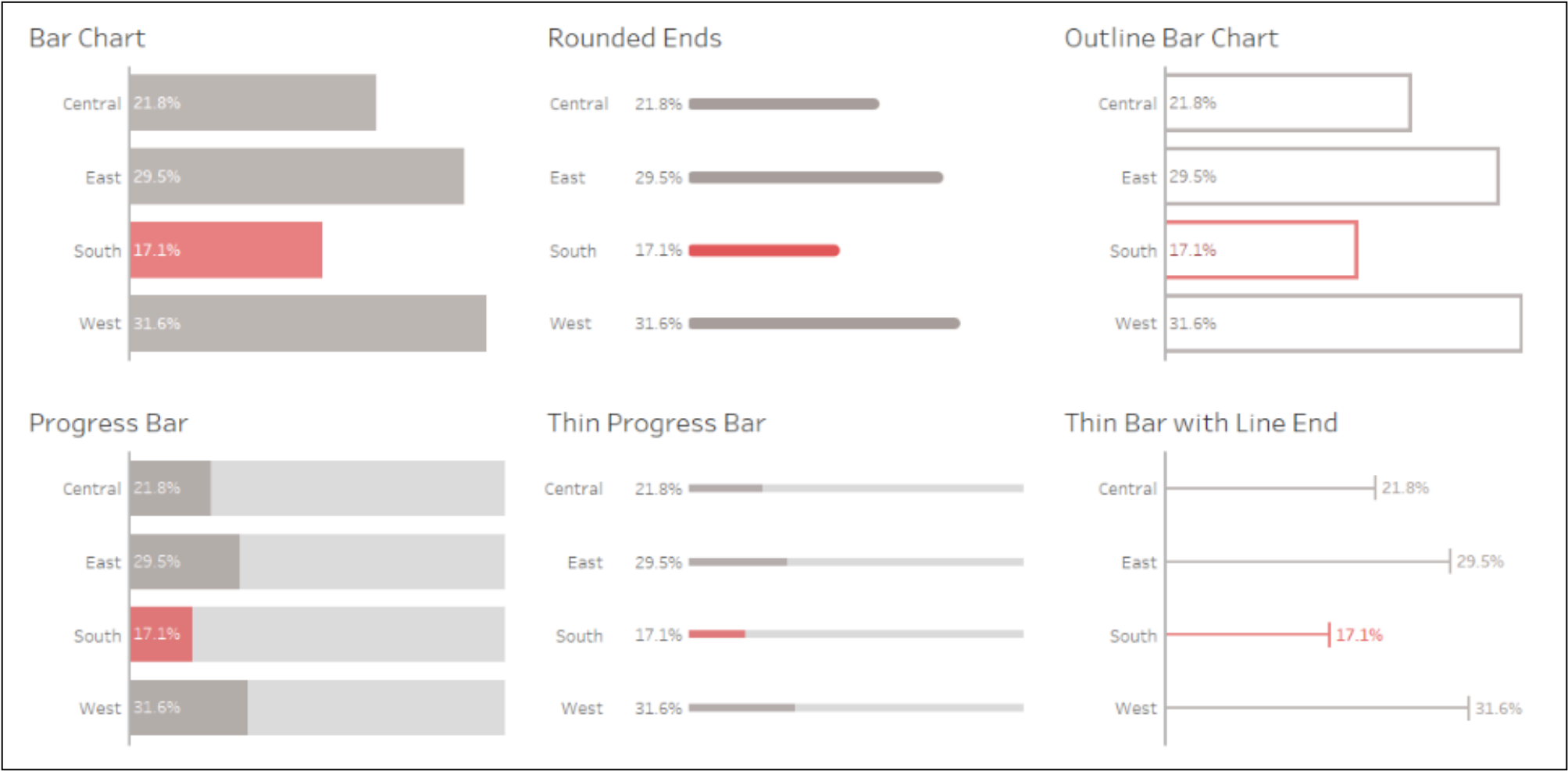
# Bar charts

- Bar chart variations

- Standard bar chart (single category and measure)
- Grouped bar chart (multiple category/measure side by side)
- Cumulative (stacked) bar chart
- 100% cumulative (stacked)



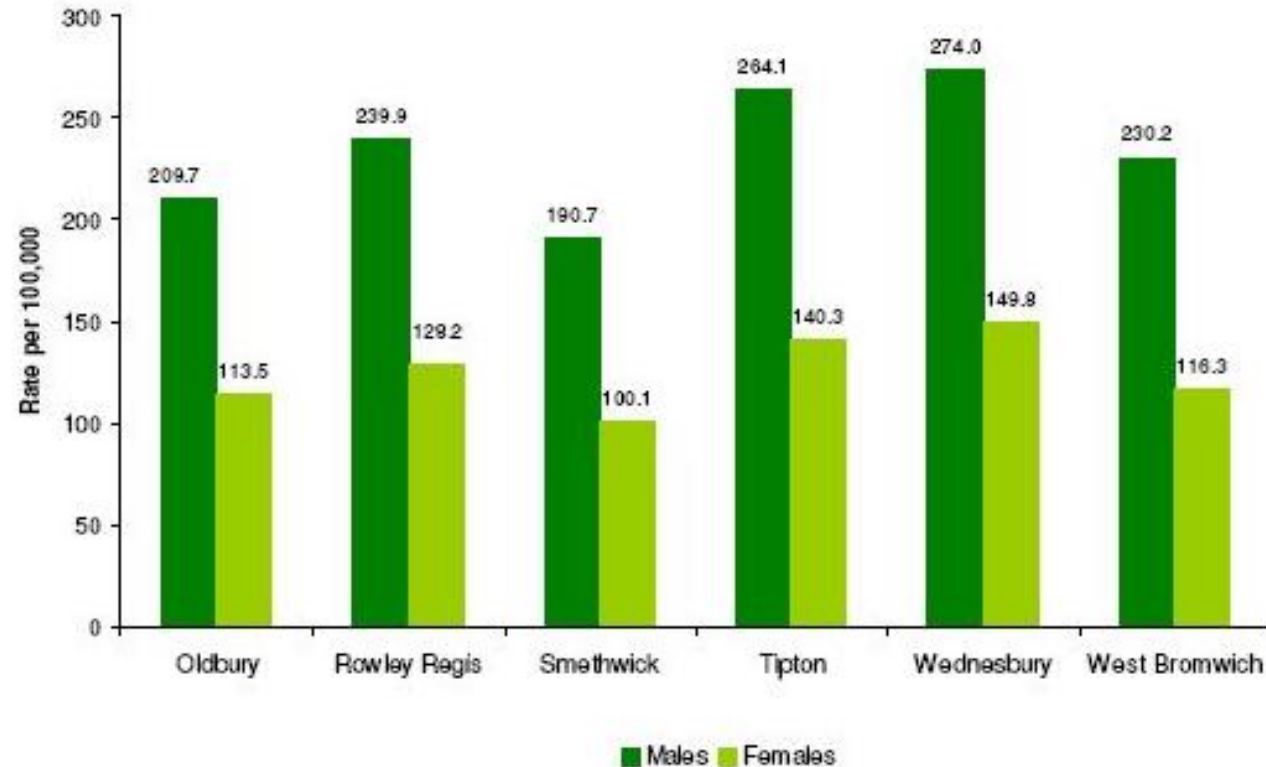
# Bar chart visual variations





# What chart is it?

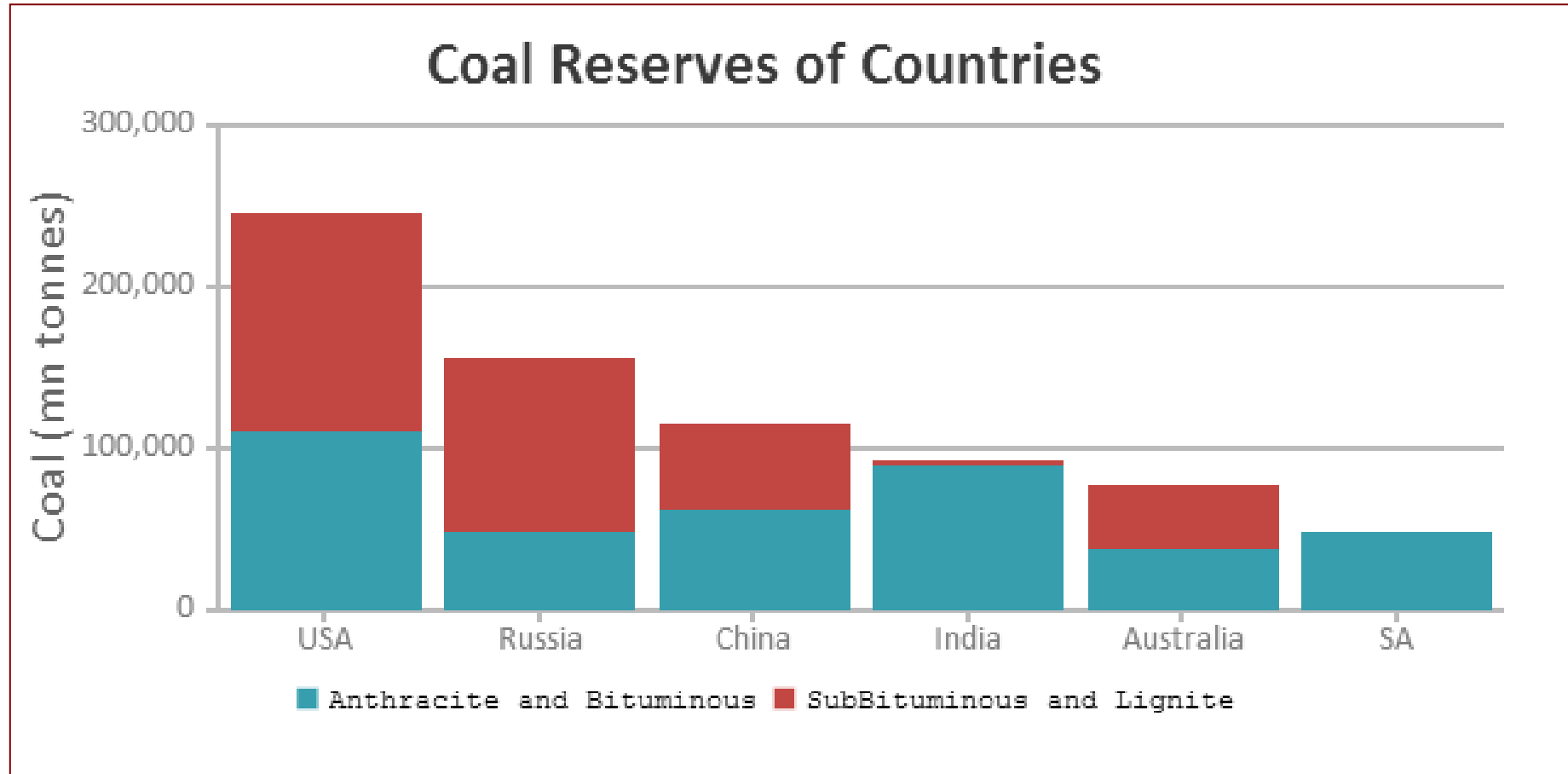
Figure 4:11 Deaths from smoking across the six towns, 2002-6 average annual rate per 100,000



Grouped bar chart – Towns and Gender  
Comparison within groups / categories

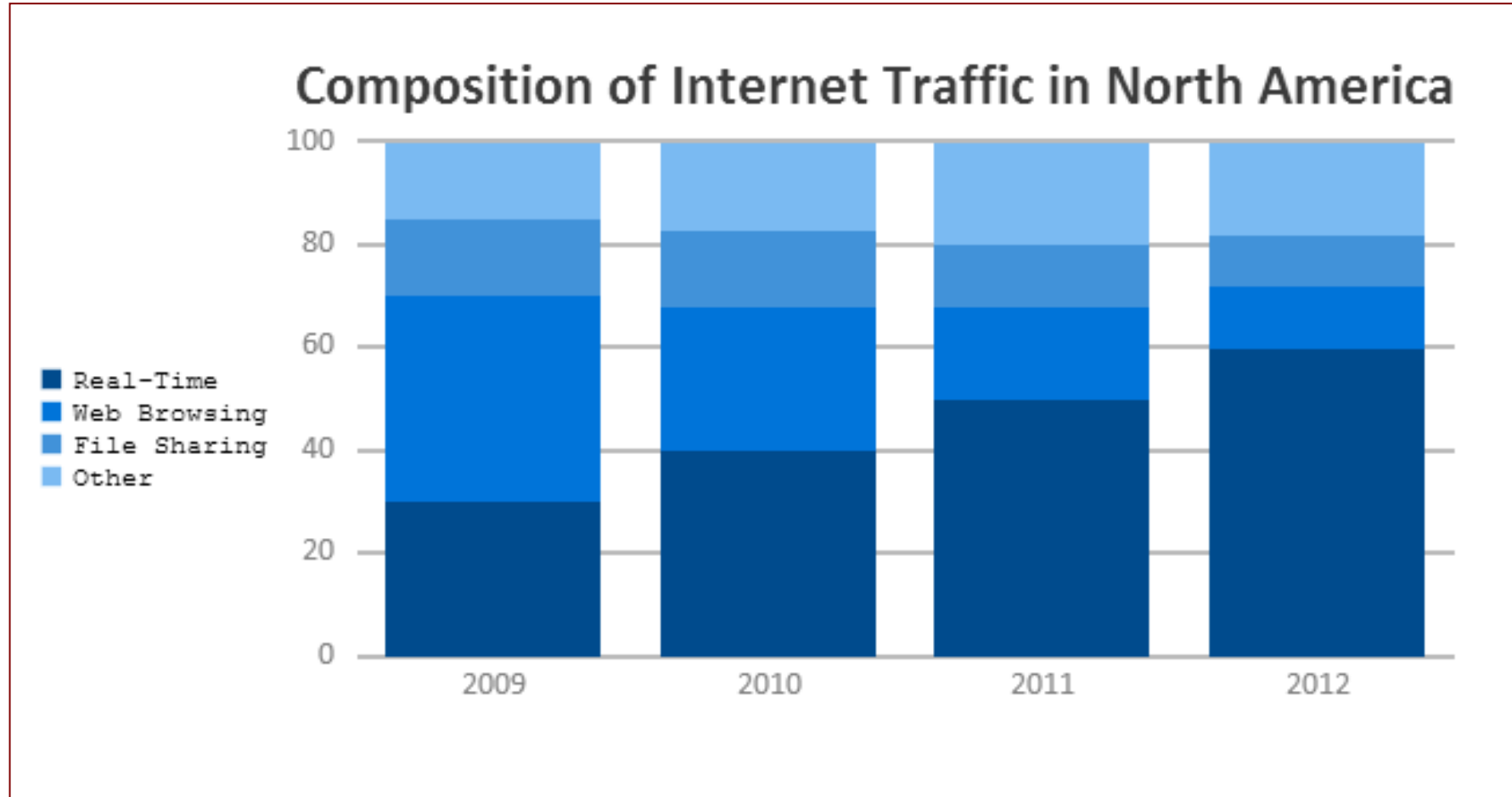


# What chart is it?



Stacked bar with ordered categorical axis

# What chart is it?

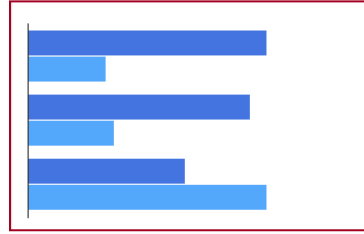


100% stacked bar chart showing whole-to-part ratios

# Horizontal bar chart

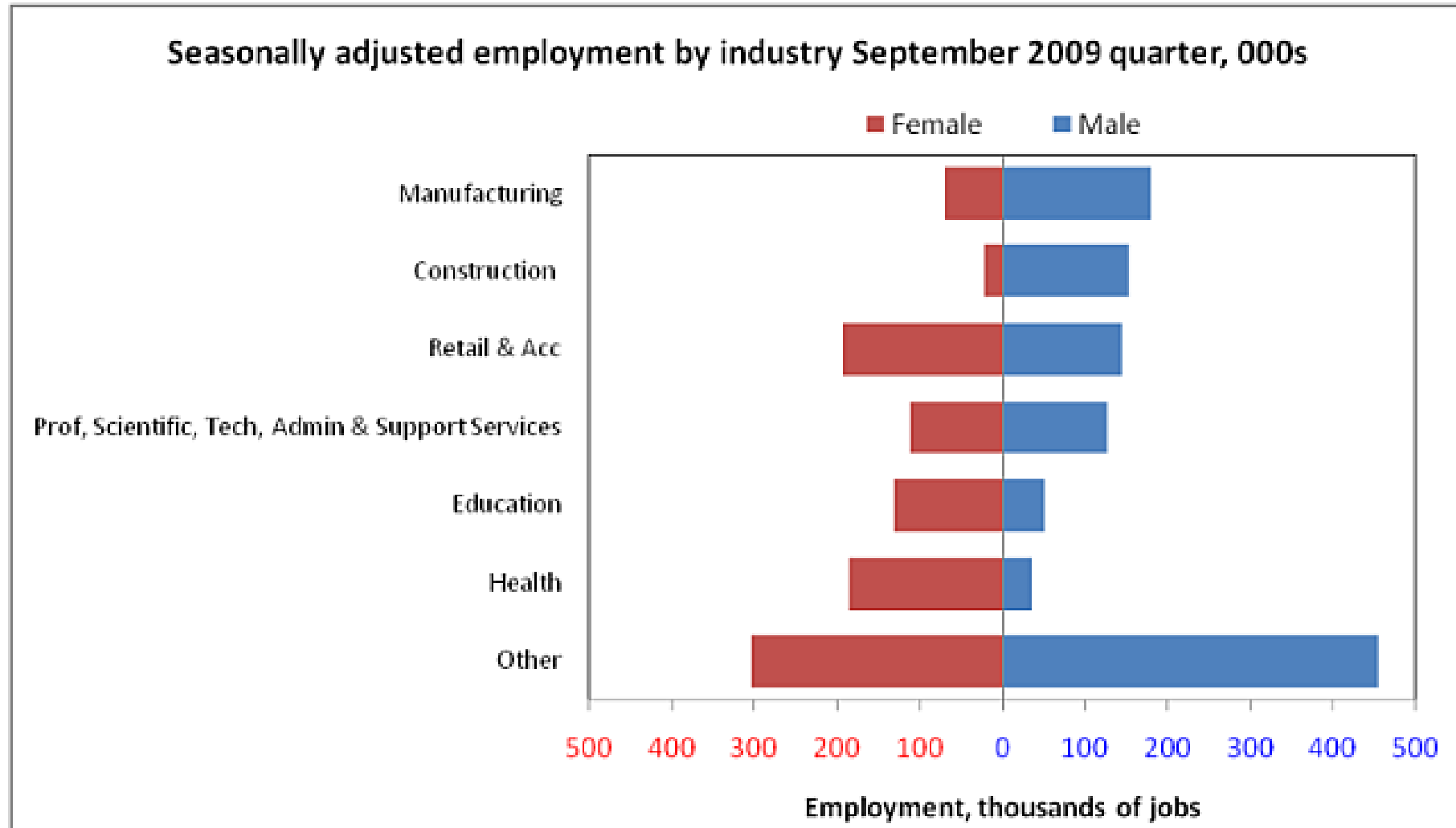
# Horizontal bar chart

- Use cases are similar to vertical, except:
  - Ranking
  - Proportion of parts
  - Comparison
  - Dispersion
  - ~~Time series~~
- Text labeling is easier
  - Text labels are naturally horizontal
  - Displays often are wider than tall

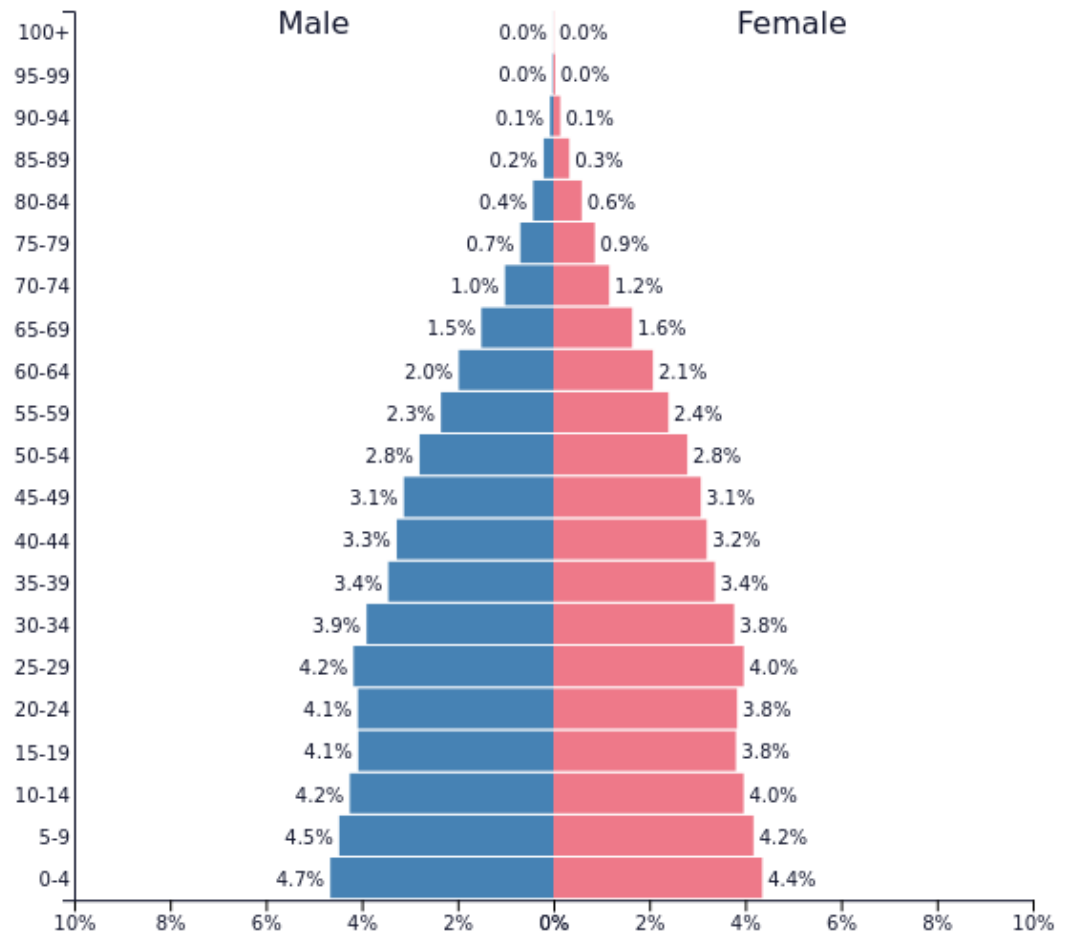




# Horizontal bar chart



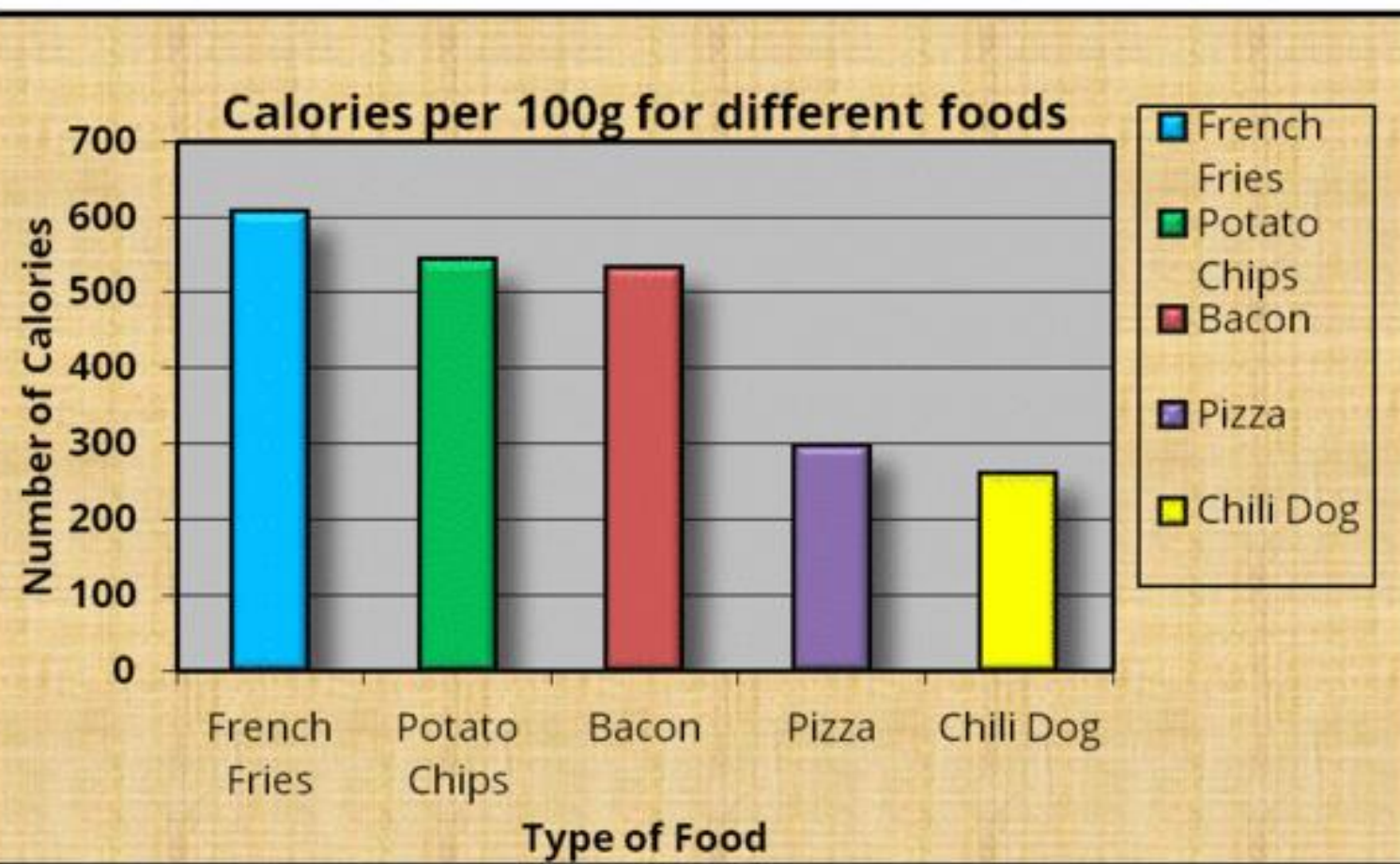
# Horizontal bar chart



# Bar chart best practices







Created by Darkhorse Analytics

[www.darkhorseanalytics.com](http://www.darkhorseanalytics.com)

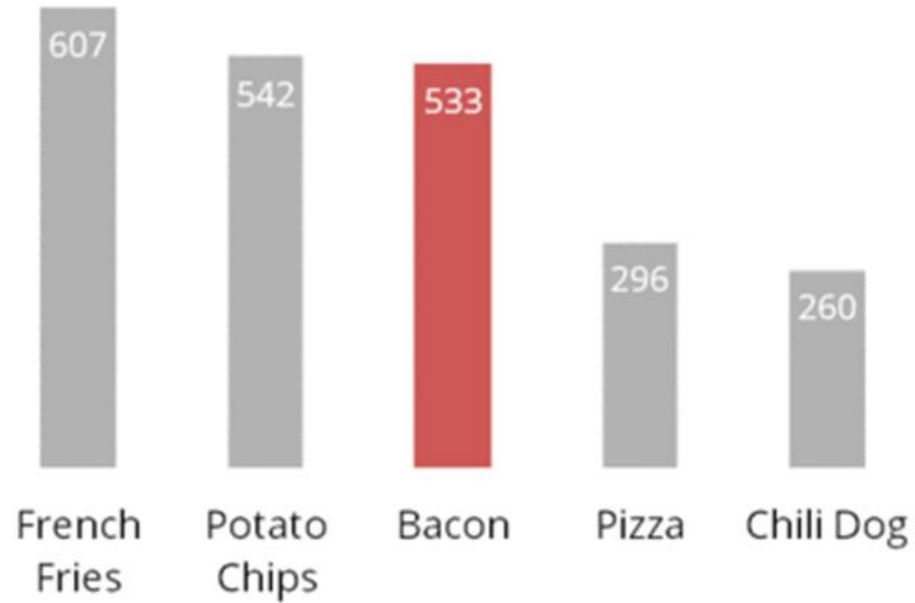
**Remove**  
to improve  
(the **data-ink** ratio)

Created by Darkhorse Analytics

[www.darkhorseanalytics.com](http://www.darkhorseanalytics.com)

# After

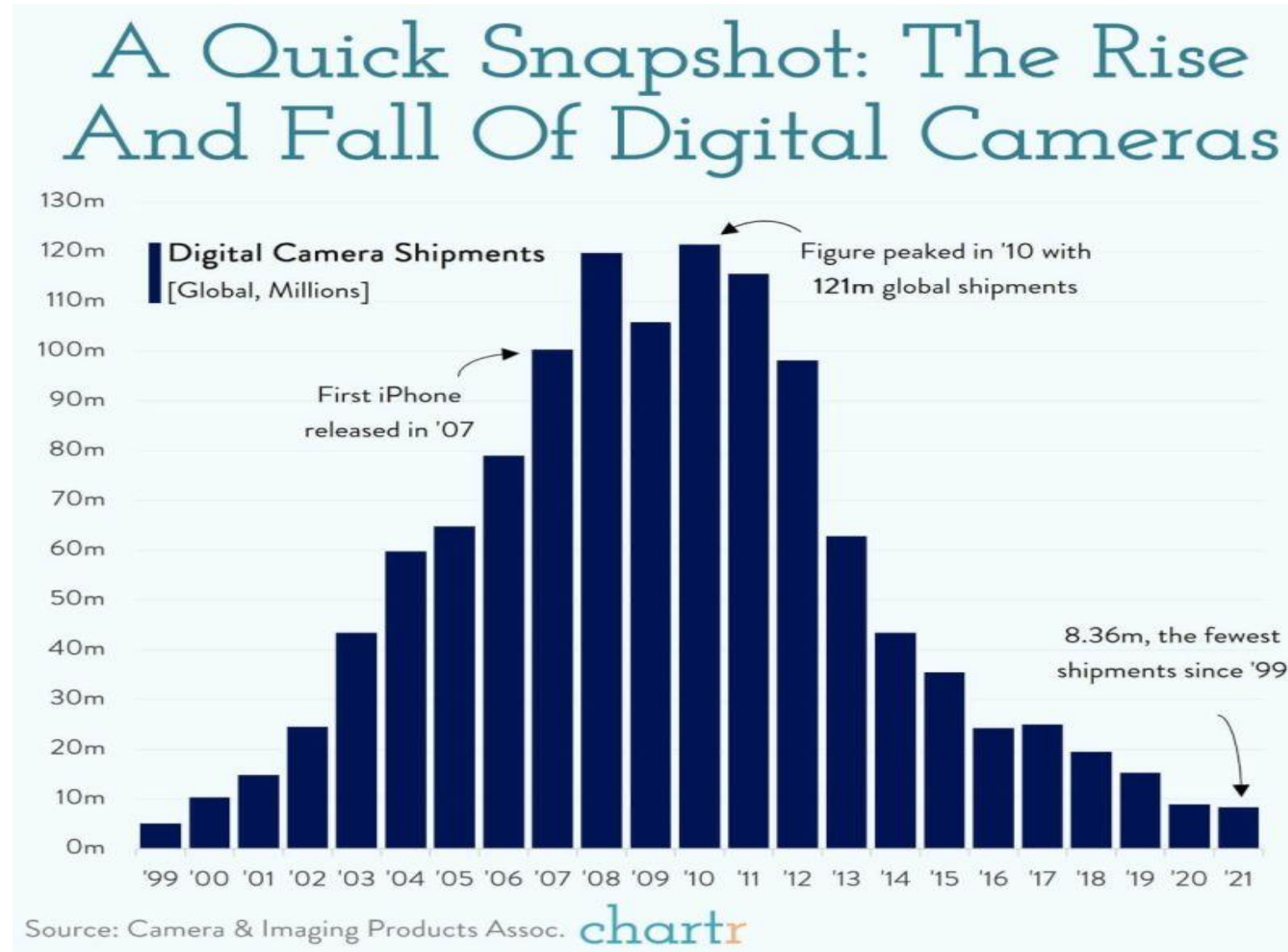
Calories per 100g



Created by **Darkhorse Analytics**

[www.darkhorseanalytics.com](http://www.darkhorseanalytics.com)

# Provide context

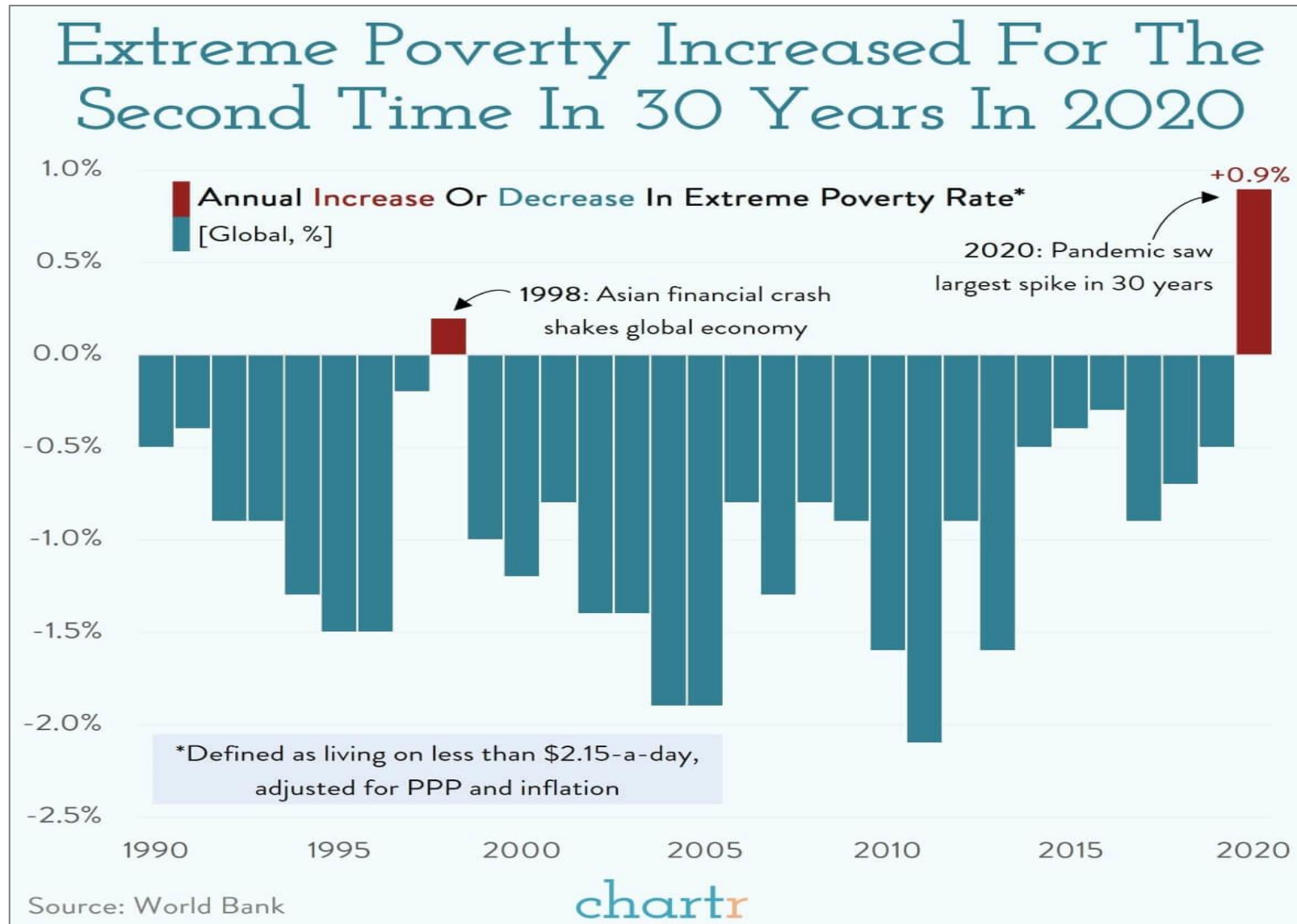


# Never truncate the Y axis





# Visualize the change



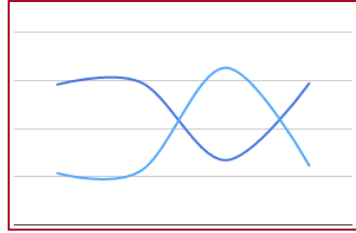
# Best practices for bar charts

- Sensible formatting
  - Reduce clutter
  - Direct labelling of data points
- Provide context
  - Title and subtitle
  - Axis and data labels
  - Annotations
- Never truncate the Y axis
  - Visualize the change
- Order the X axis by Y values
  - Except when natural order exists, e.g monthly data series

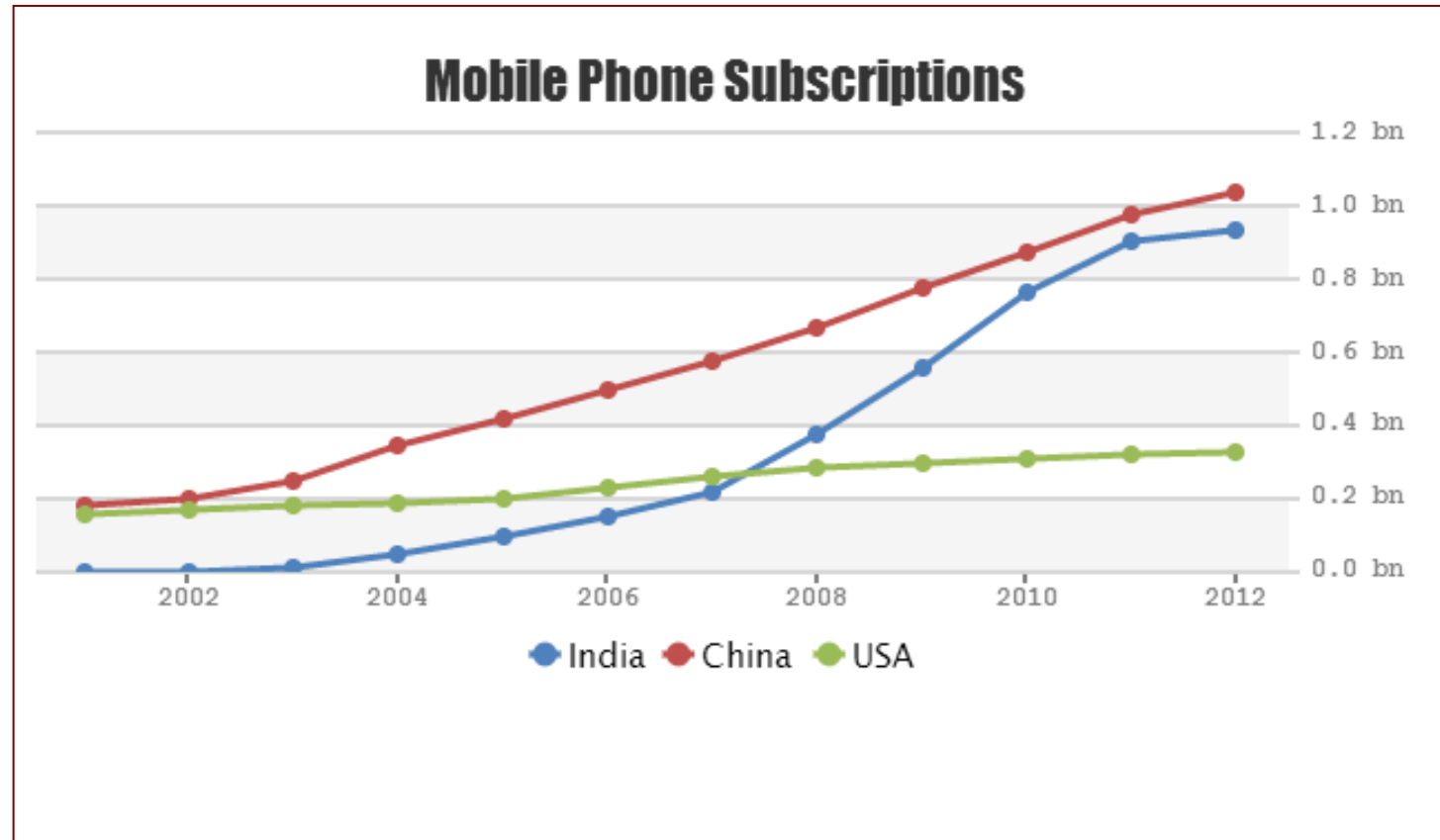
# Line charts

# Line chart

- Line chart use cases
  - Time series
  - Trends evolution
  - Interaction of several variables over time
- Variations
  - Classic line chart
  - Step Chart
  - Jump Chart

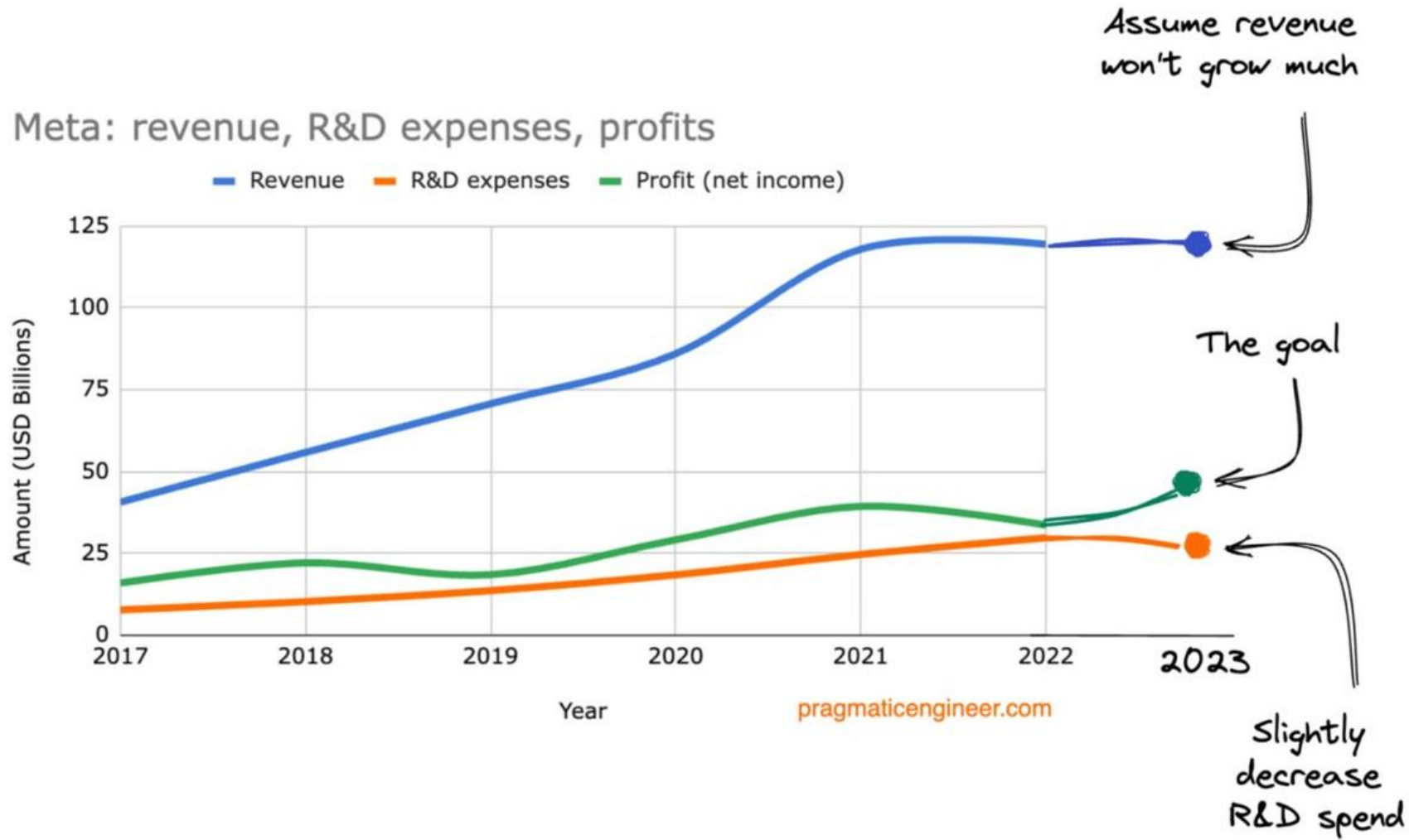


# Classic line chart





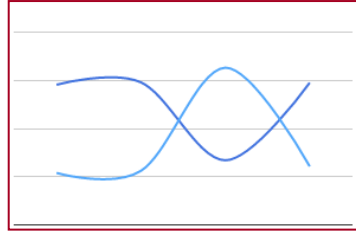
# Classic line chart



# Line chart variations

# Line chart variations

- The standard line chart imply continuous change between the data points
- This is true and valid in many cases
  - Temperature charts or stock exchange price charts do represent continuous changes
- But there are exceptions, when change events are infrequent and irregular
  - Petrol prices are a good example



# Step Chart & Jump Chart

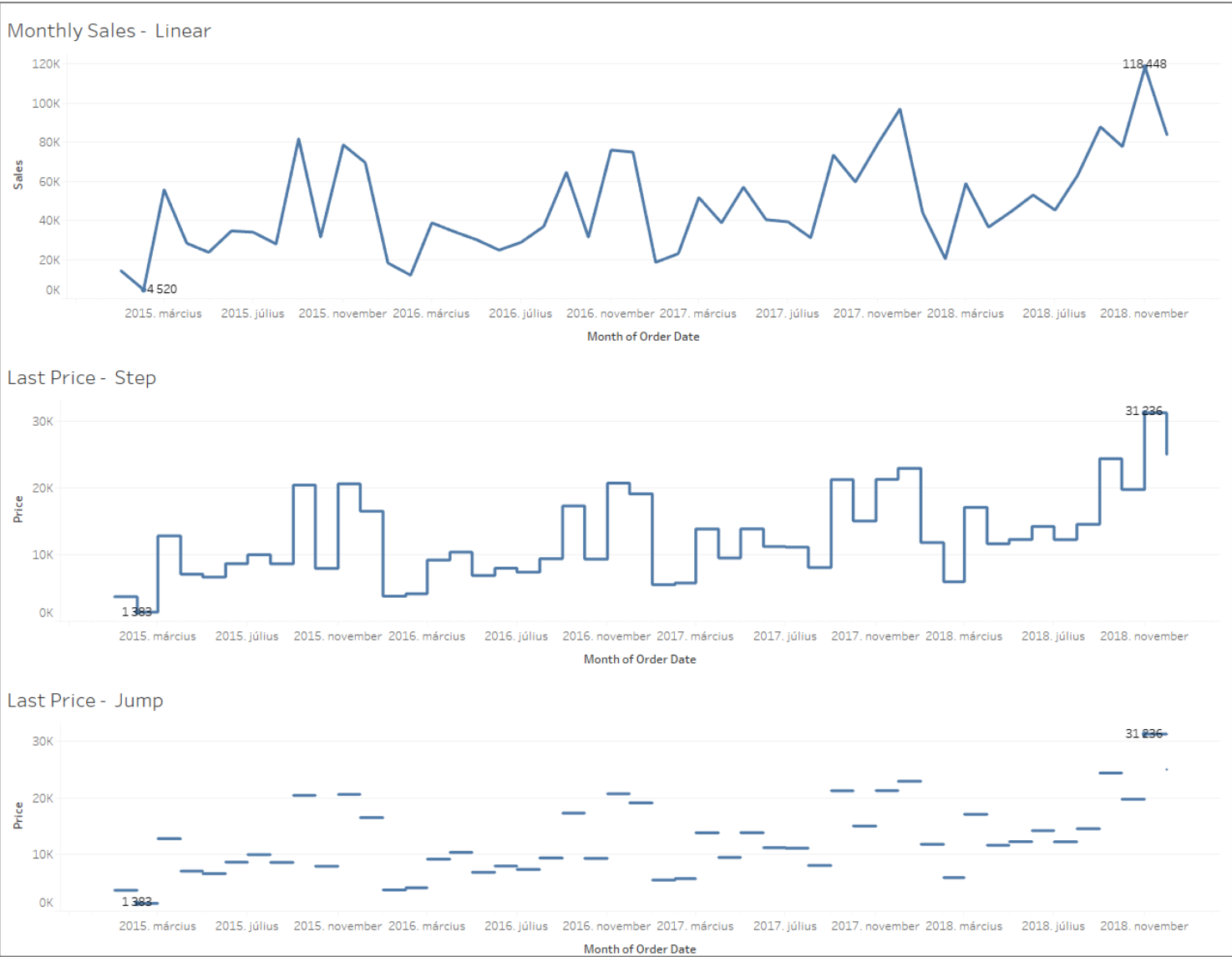
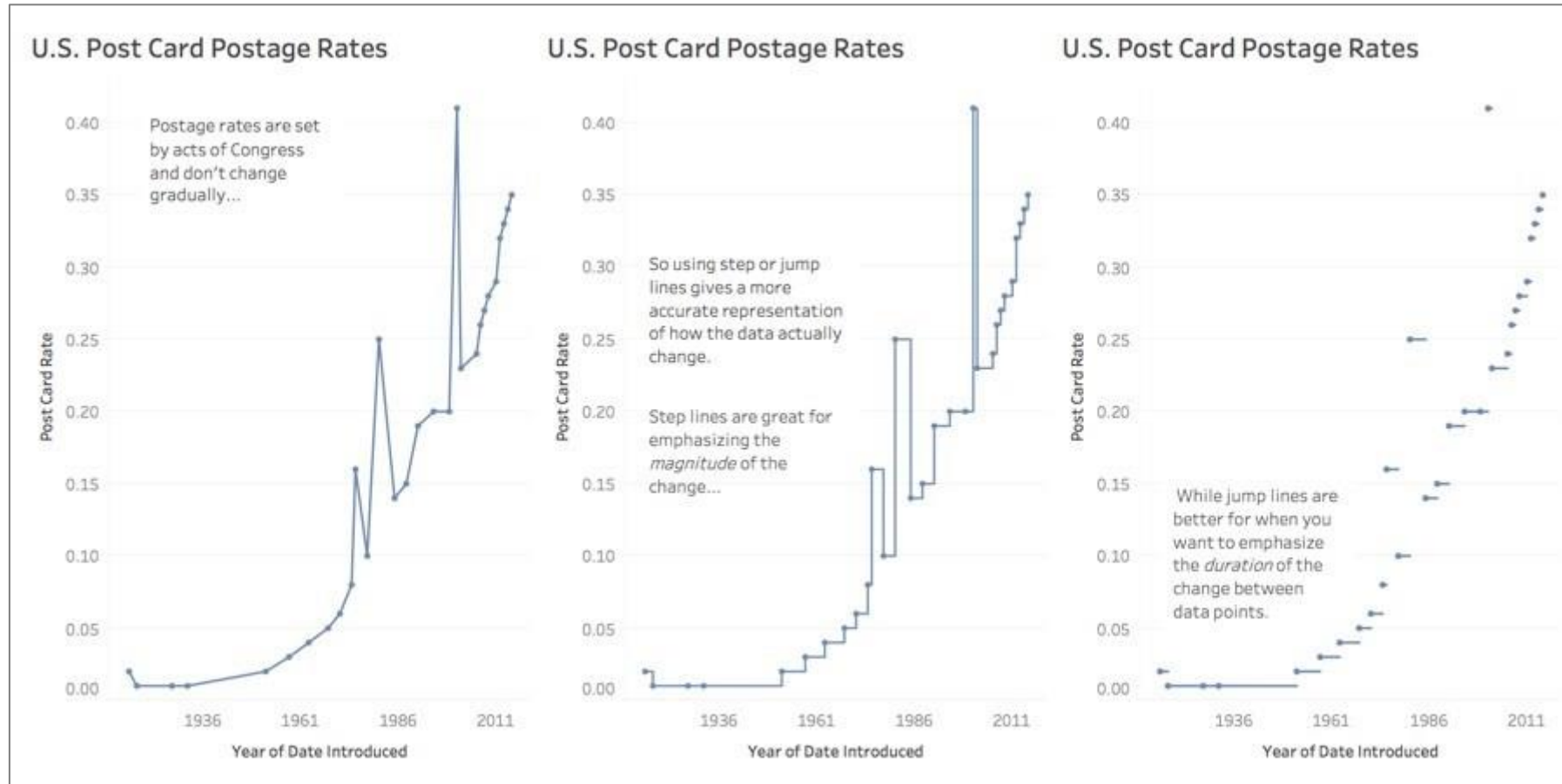
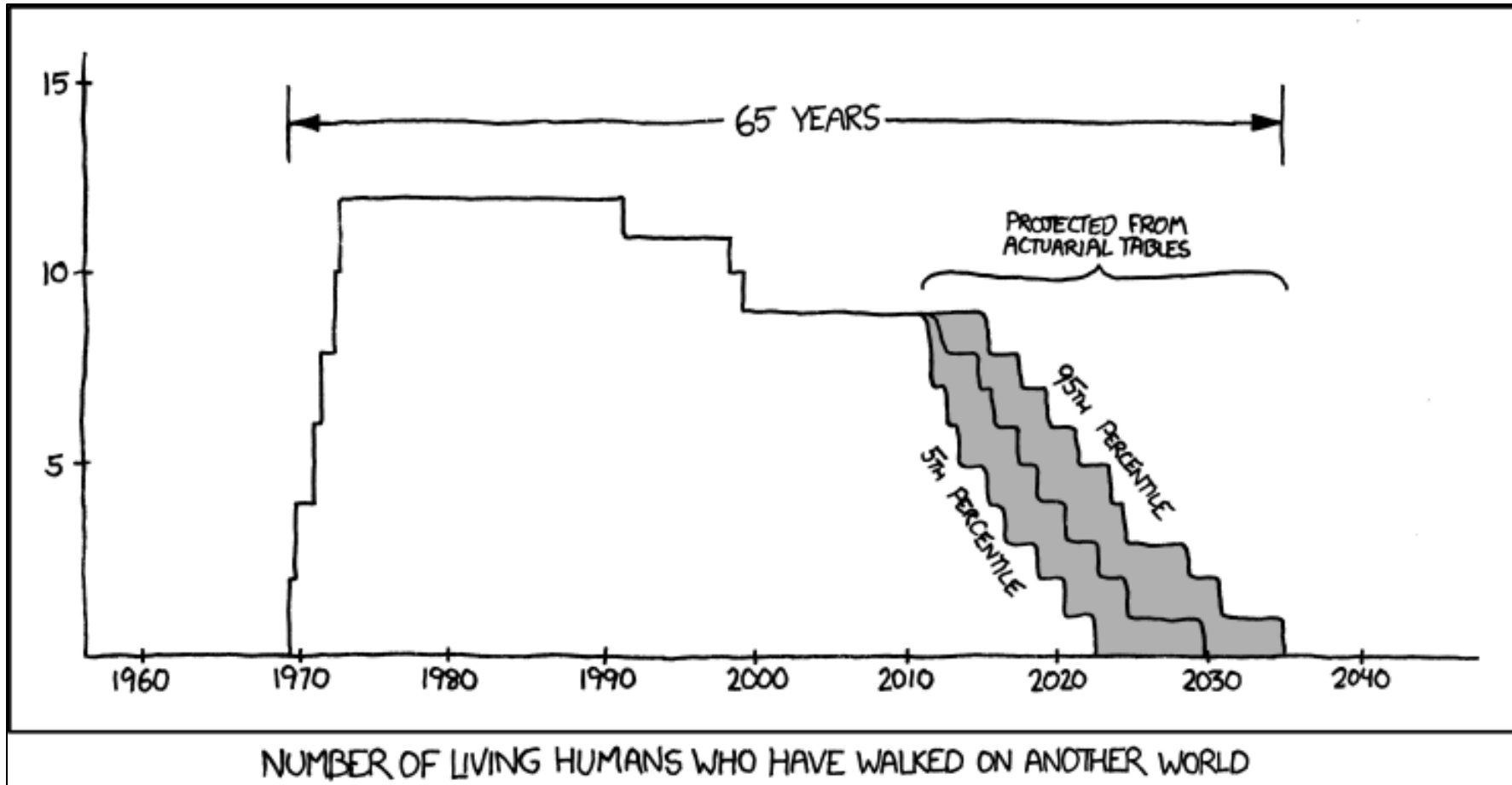


Illustration : Tableau

# Step Chart & Jump Chart

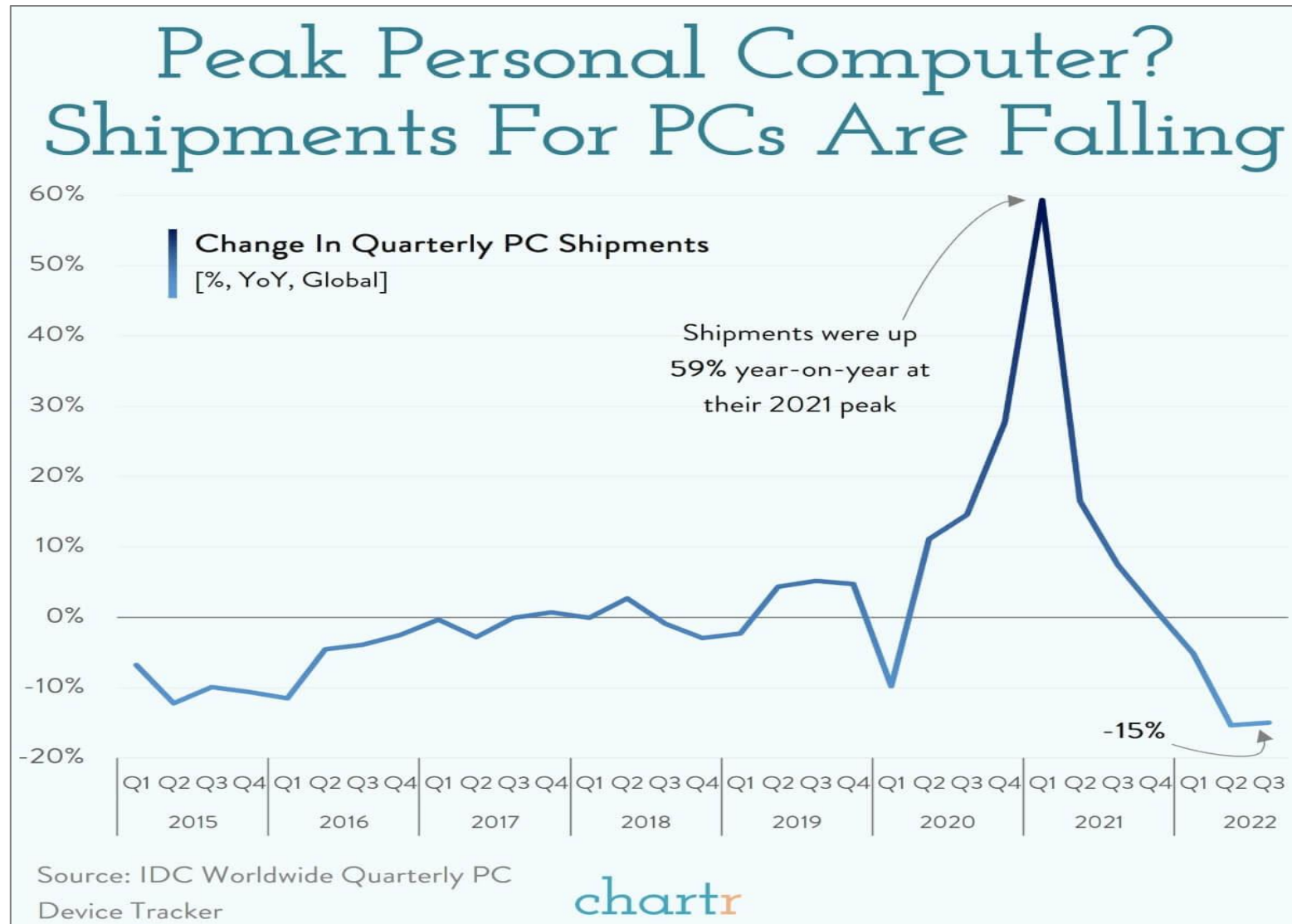






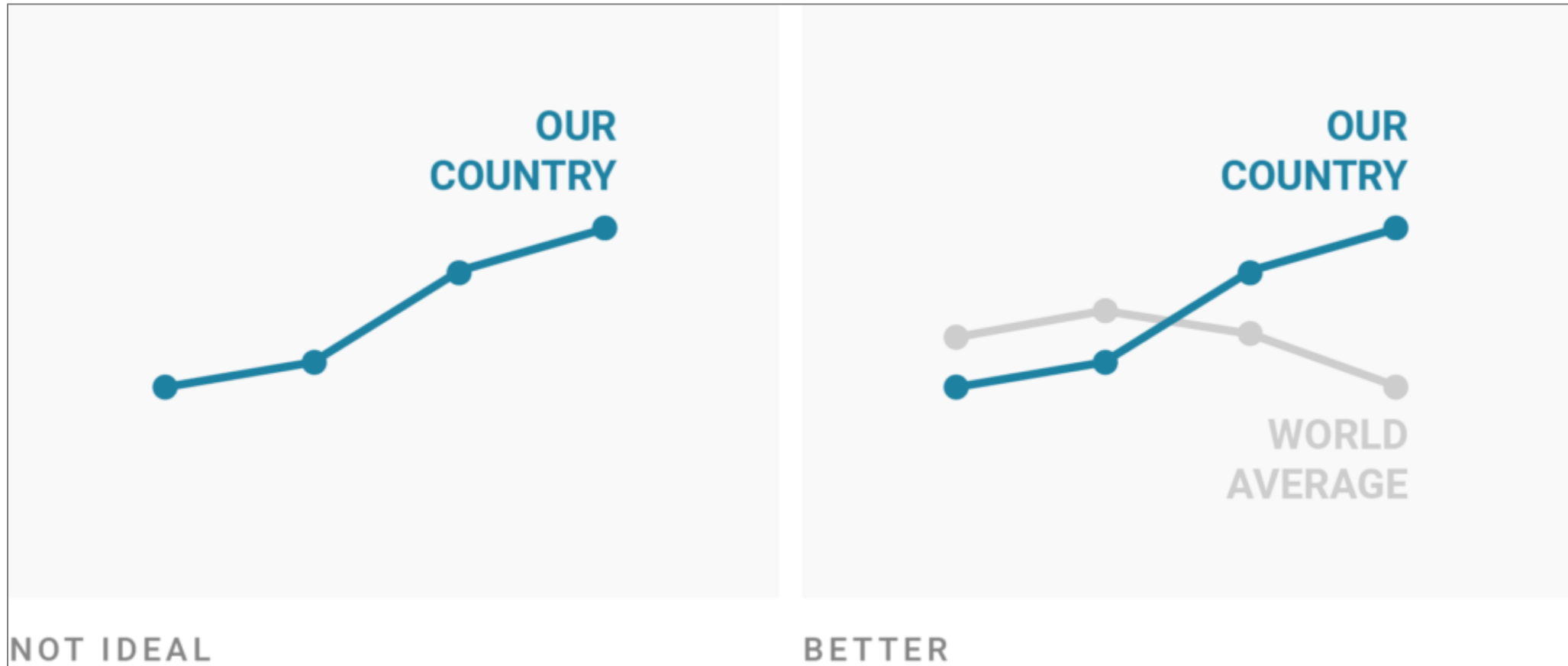
# Line chart best practices

# Provide context



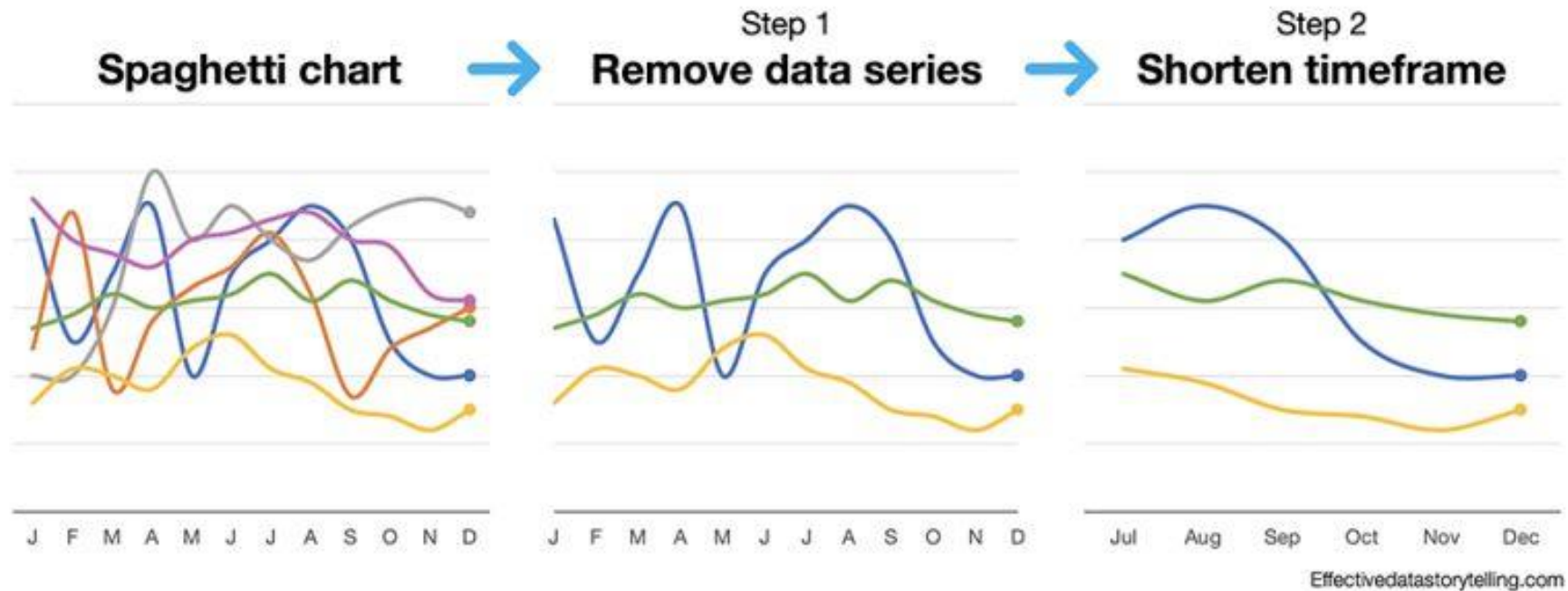
<https://www.chartr.co/stories/2022-10-12-2-peak-personal-computer>

# Add comparison



# Focus on the important

## Cognitive Load: Remove unnecessary noise

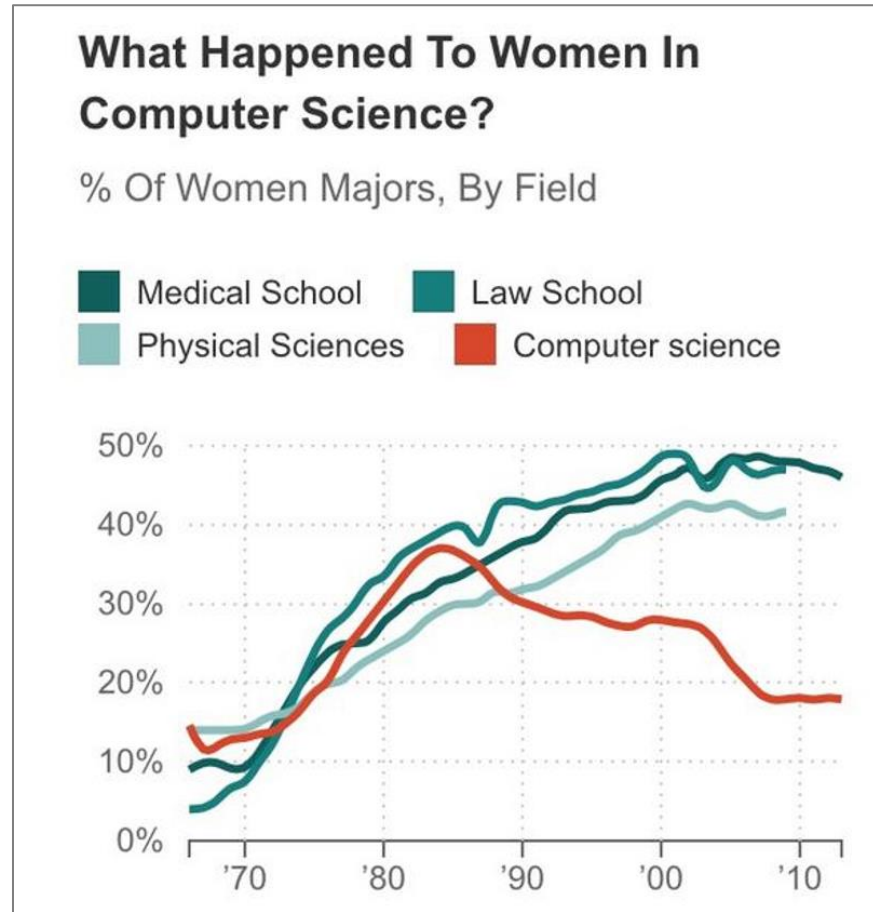


Brent Dykes

<https://www.linkedin.com/feed/update/urn:li:activity:6986412883442114560/>



# Direct Labeling

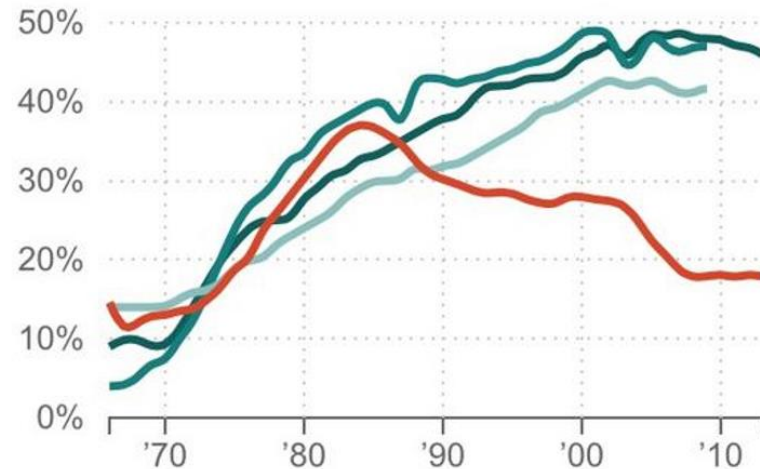


# Direct Labeling

## What Happened To Women In Computer Science?

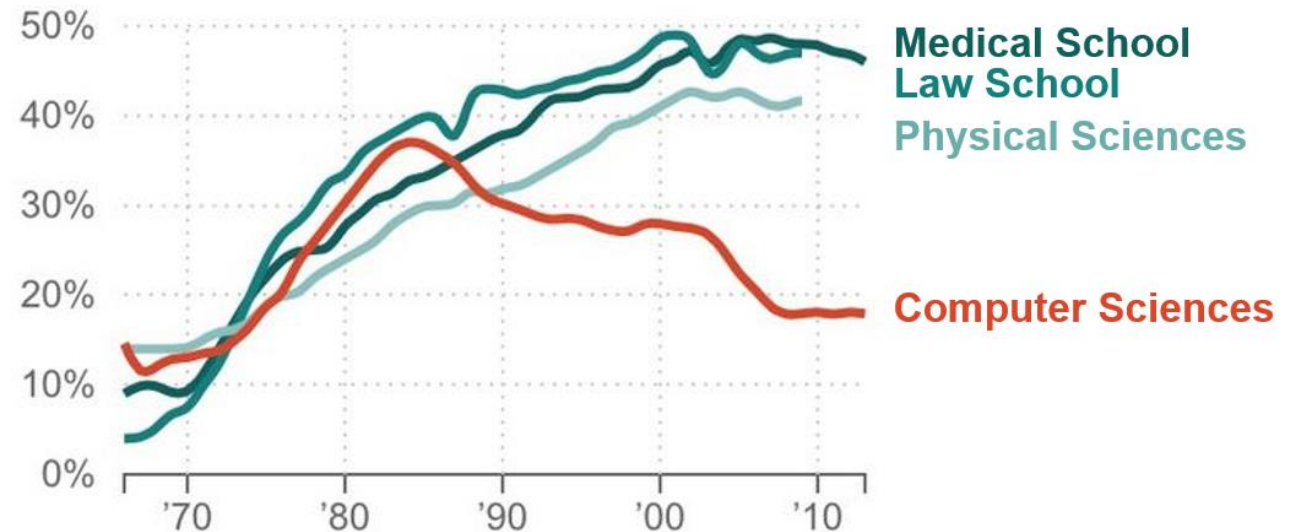
% Of Women Majors, By Field

Medical School    Law School  
Physical Sciences    Computer science



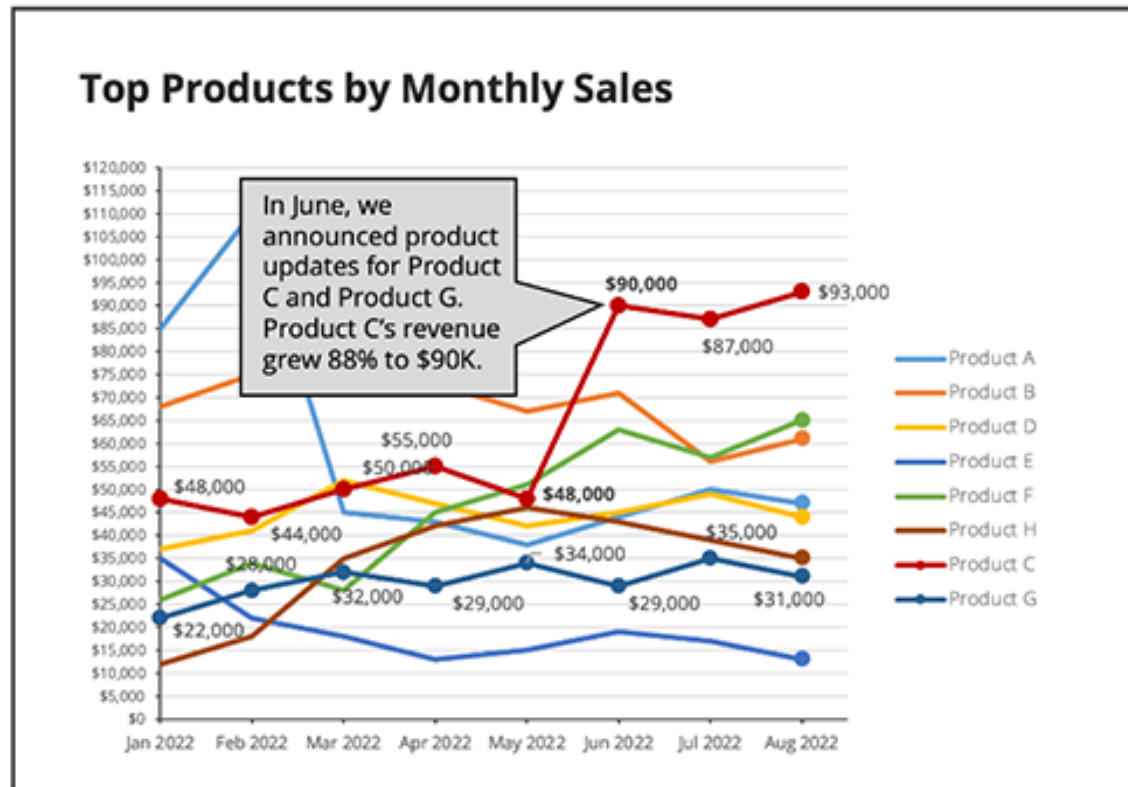
## What Happened To Women In Computer Science?

% Of Women Majors, By Field

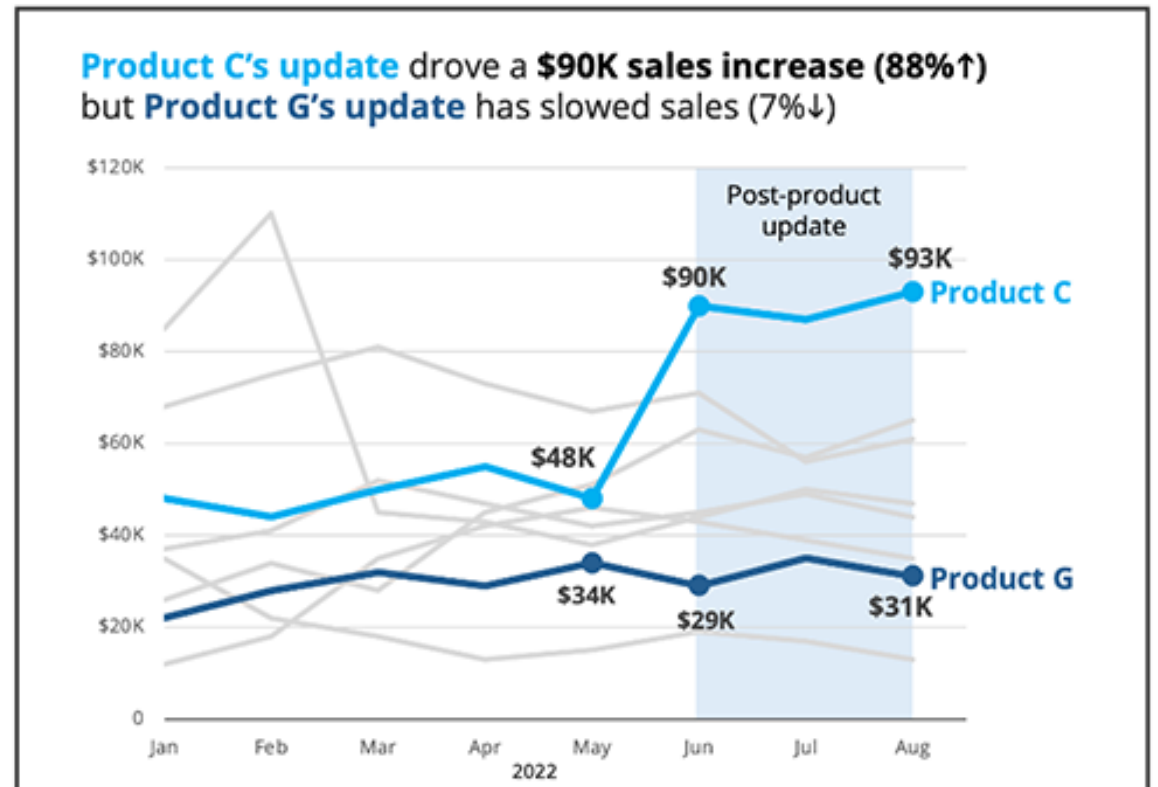


# Declutter

## With Clutter



## Without Clutter



Effectivedatastorytelling.com

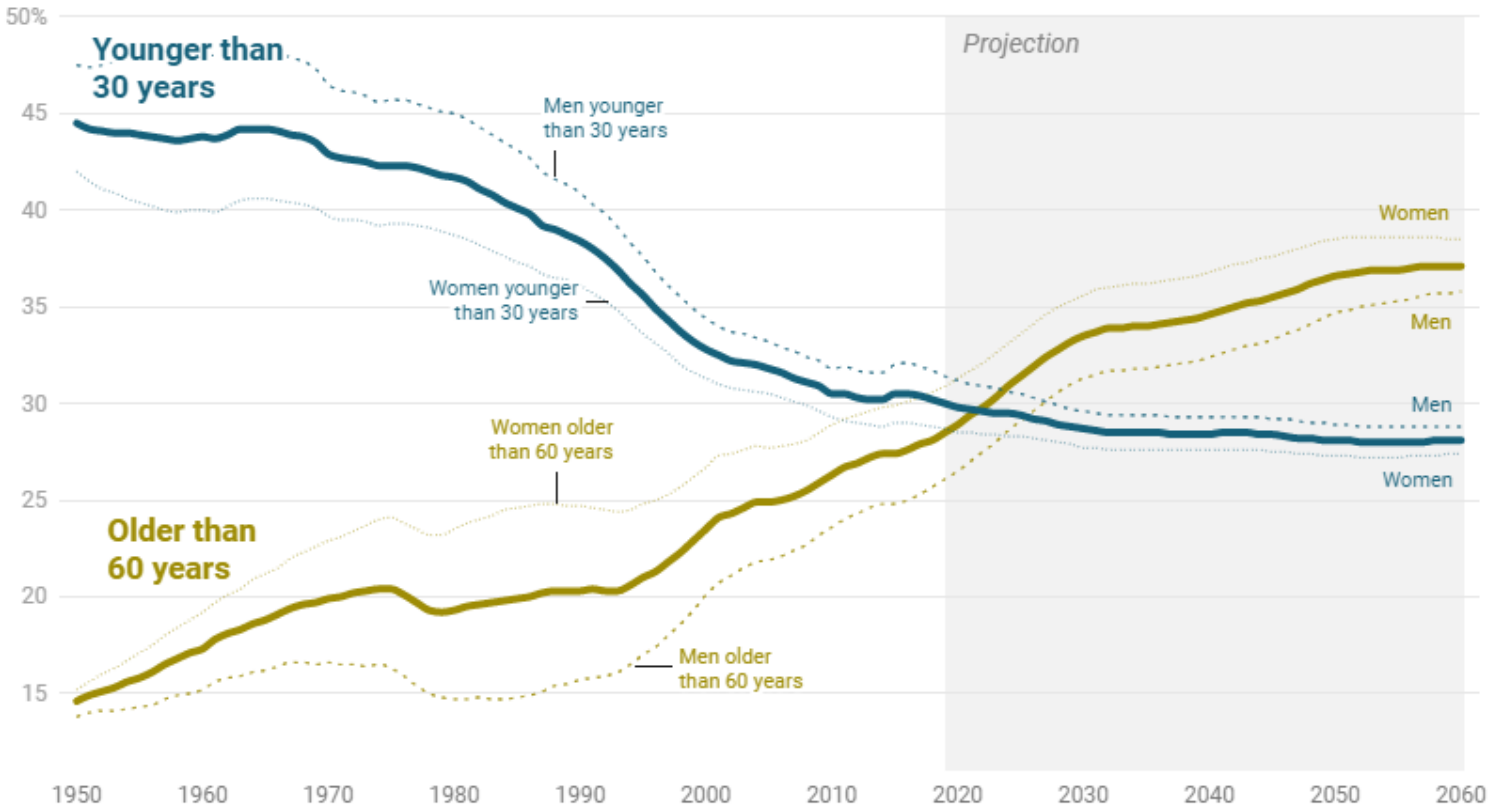
# Best practices for line charts

- Sensible formatting
  - Reduce clutter
  - Direct labelling of series
- Provide context
  - Title and subtitle
  - Axis and data labels
  - Annotations
- Add comparison
  - Visualize the change
- Focus on the important

# Showcase

Starting in 2019, the number of Germans older than 60 will surpass those younger than 30. For women, that's already the case.

Share of Germans younger than 30 and older than 60 years.

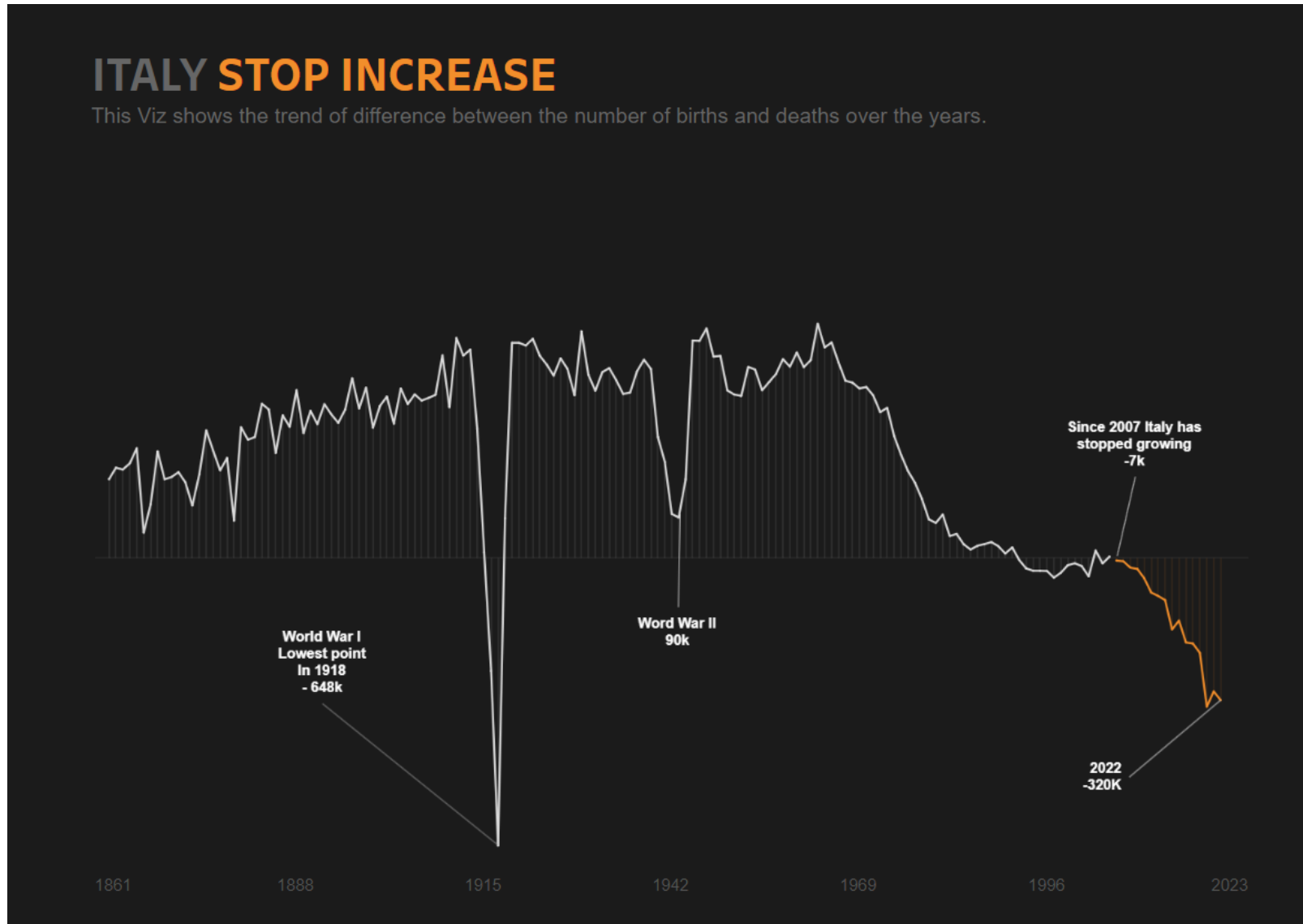


Projections are from 2019

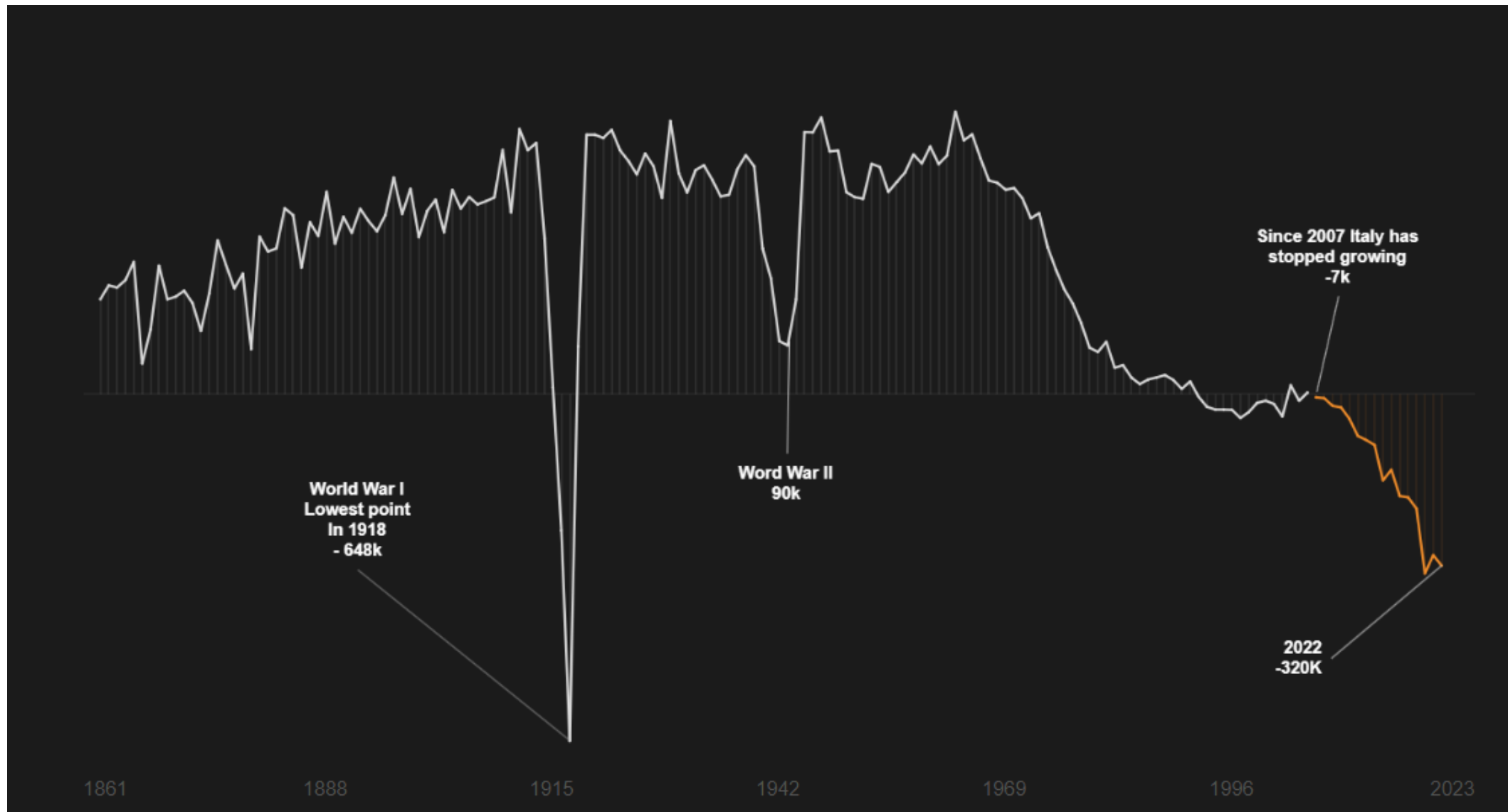
Chart: Lisa Charlotte Rost, Datawrapper • Source: [Destatis](#), April 2015 • [Get the data](#)



# Showcase



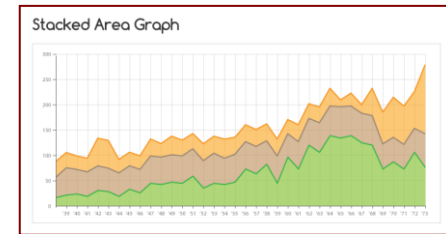
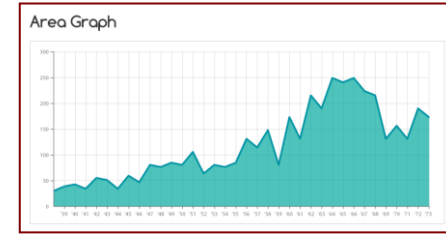
# Showcase



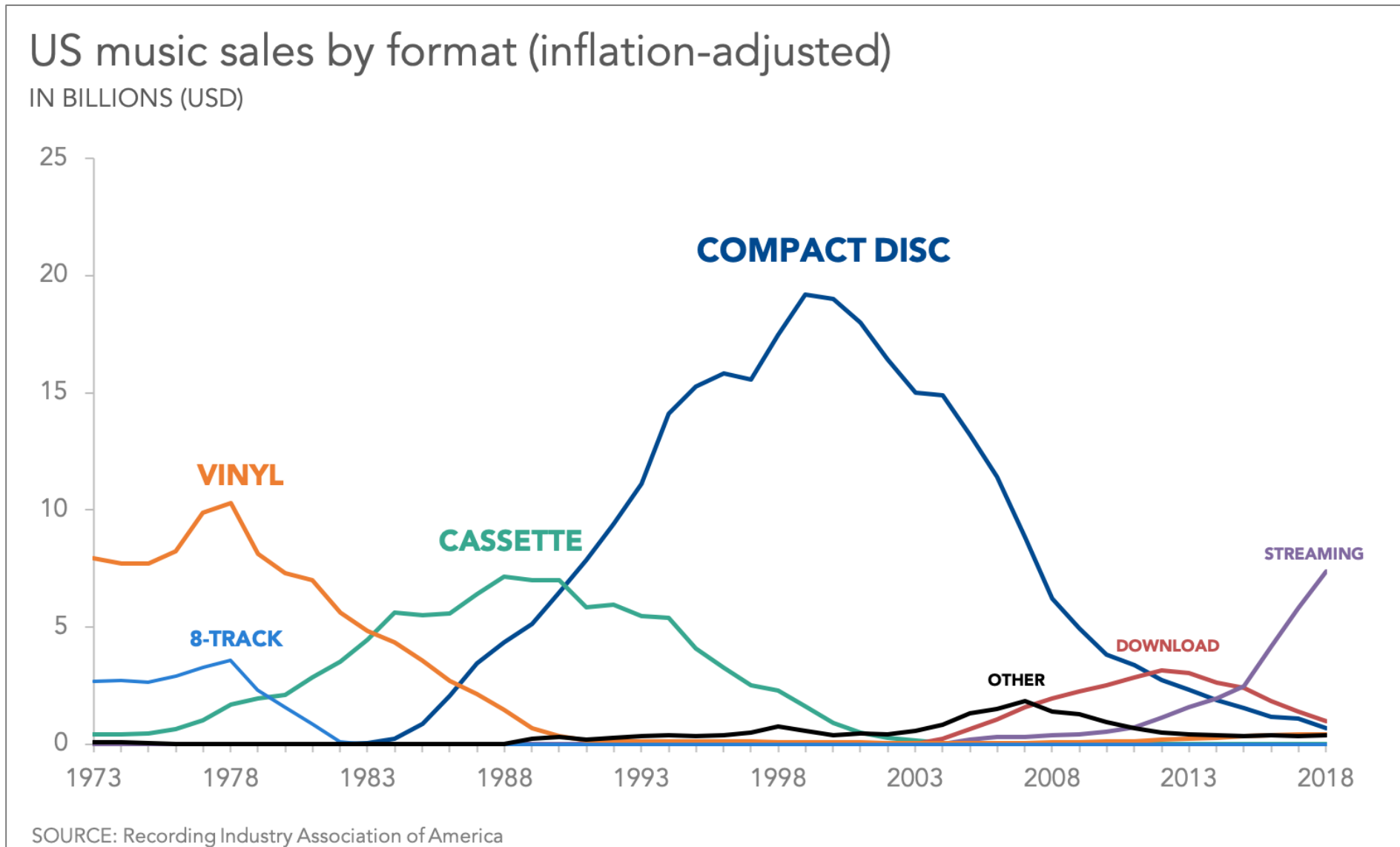
# Area chart

# Area Charts

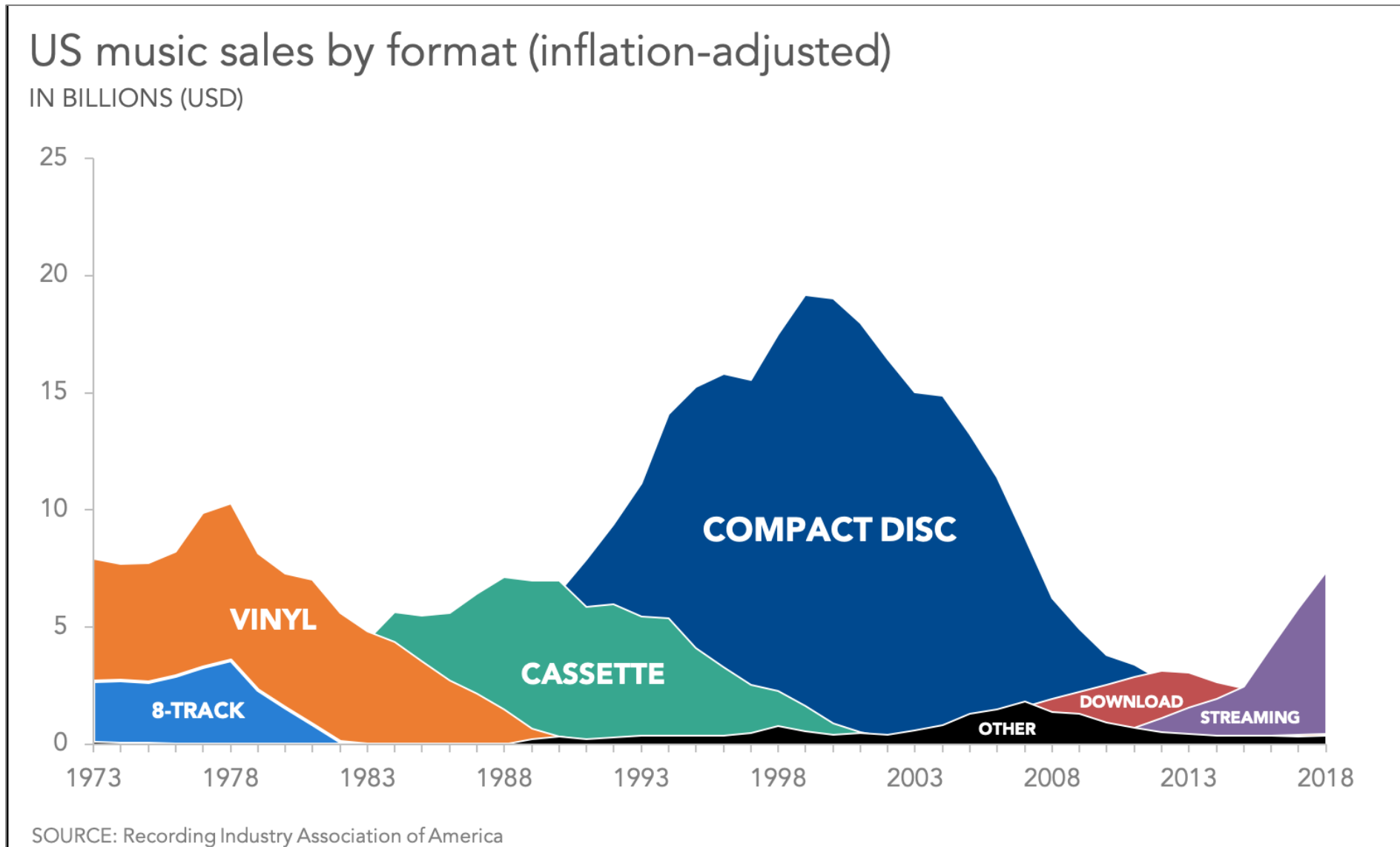
- Special variation of the line chart, focusing on the „volume” of the data instead of the relative change
- Share several properties with line charts
  - Single or multiple data series
  - Standard or stacked representation
- Opacity and ordering can be used to enhance readability for multiple series



# Area Charts

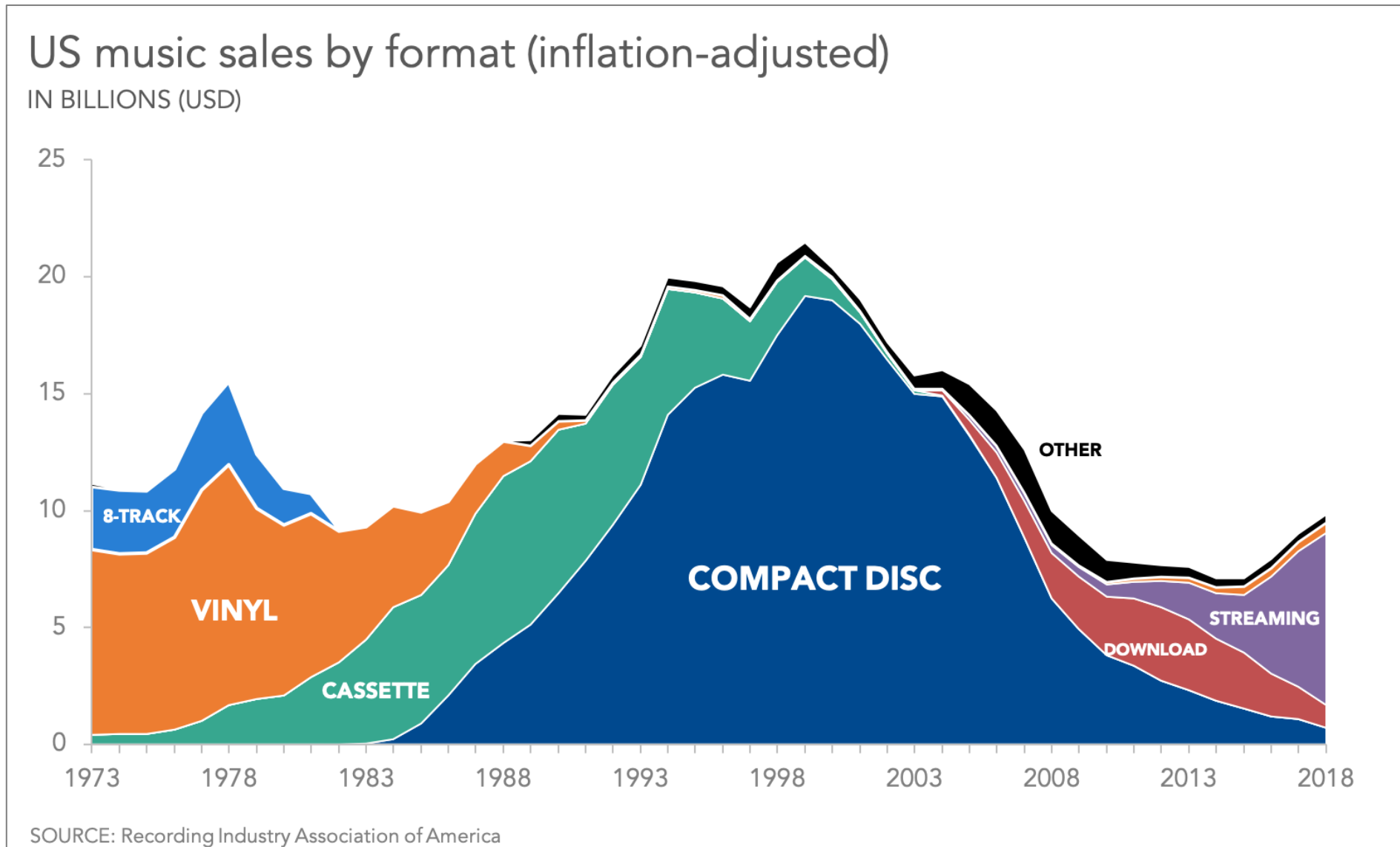


# Area Charts





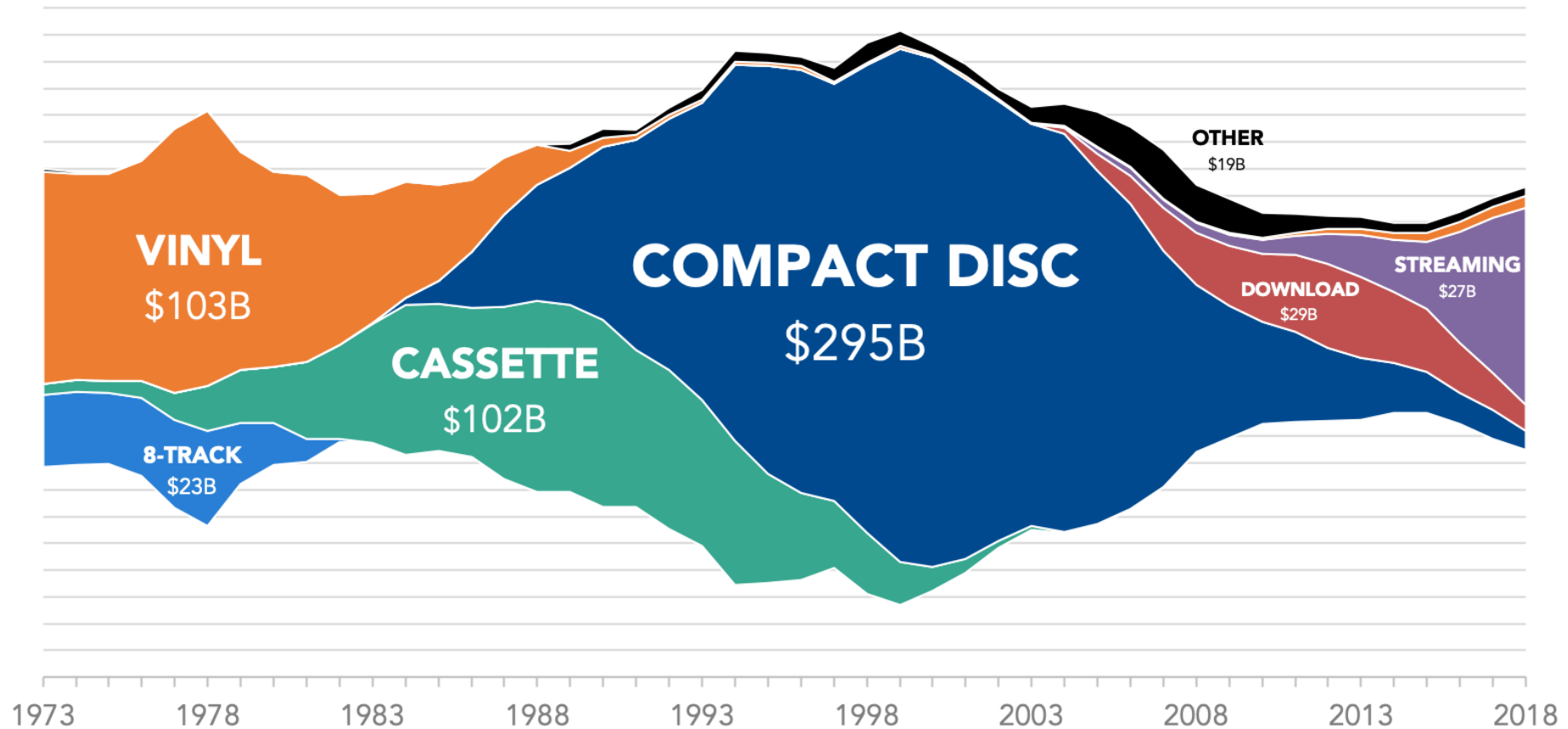
# Area Charts - Stacked



# Area Charts - Stacked

US music sales by format (inflation-adjusted)

EACH INTERVAL = \$1 BILLION (USD)



SOURCE: Recording Industry Association of America

# Stacked Area Chart - Absolute

## World population living in extreme poverty, 1820-2015

Extreme poverty is defined as living at a consumption (or income) level below 1.90 "international \$" per day. International \$ are adjusted for price differences between countries and for price changes over time (inflation).



CHART

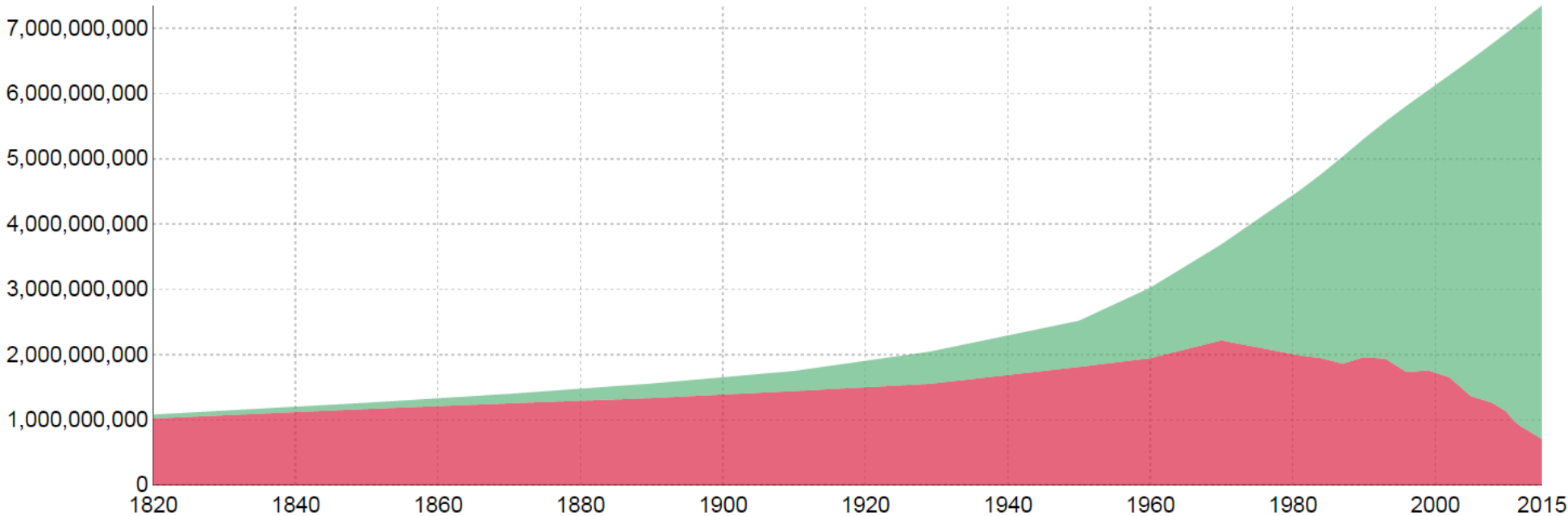
DATA

SOURCES

Number of people living in extreme poverty

Number of people not in extreme poverty

● Absolute ○ Relative



Data source: World Poverty in absolute numbers (Max Roser based on World Bank and Bourguignon and Morrisson (2002))

[OurWorldInData.org/world-poverty/](https://OurWorldInData.org/world-poverty/) • CC BY-SA

# 100% Stacked Area Chart - Relative

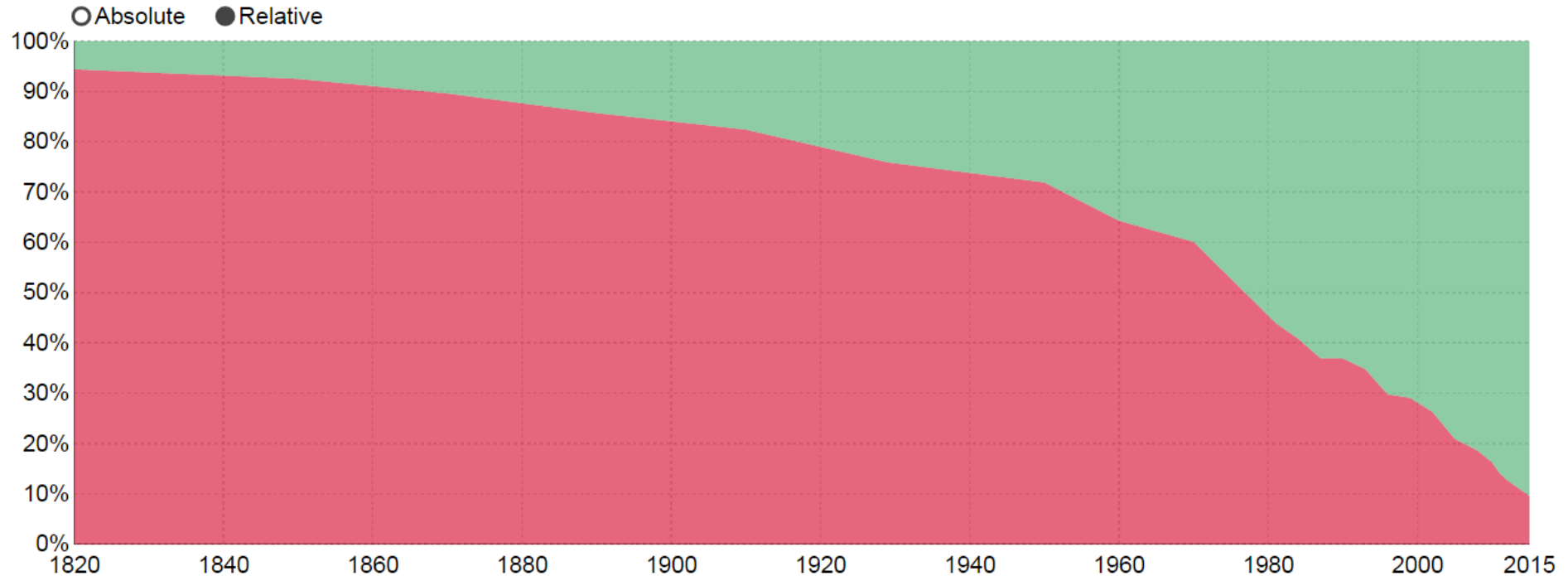
## World population living in extreme poverty, 1820-2015

Extreme poverty is defined as living at a consumption (or income) level below 1.90 "international \$" per day. International \$ are adjusted for price differences between countries and for price changes over time (inflation).

[CHART](#)[DATA](#)[SOURCES](#)

Number of people living in extreme poverty

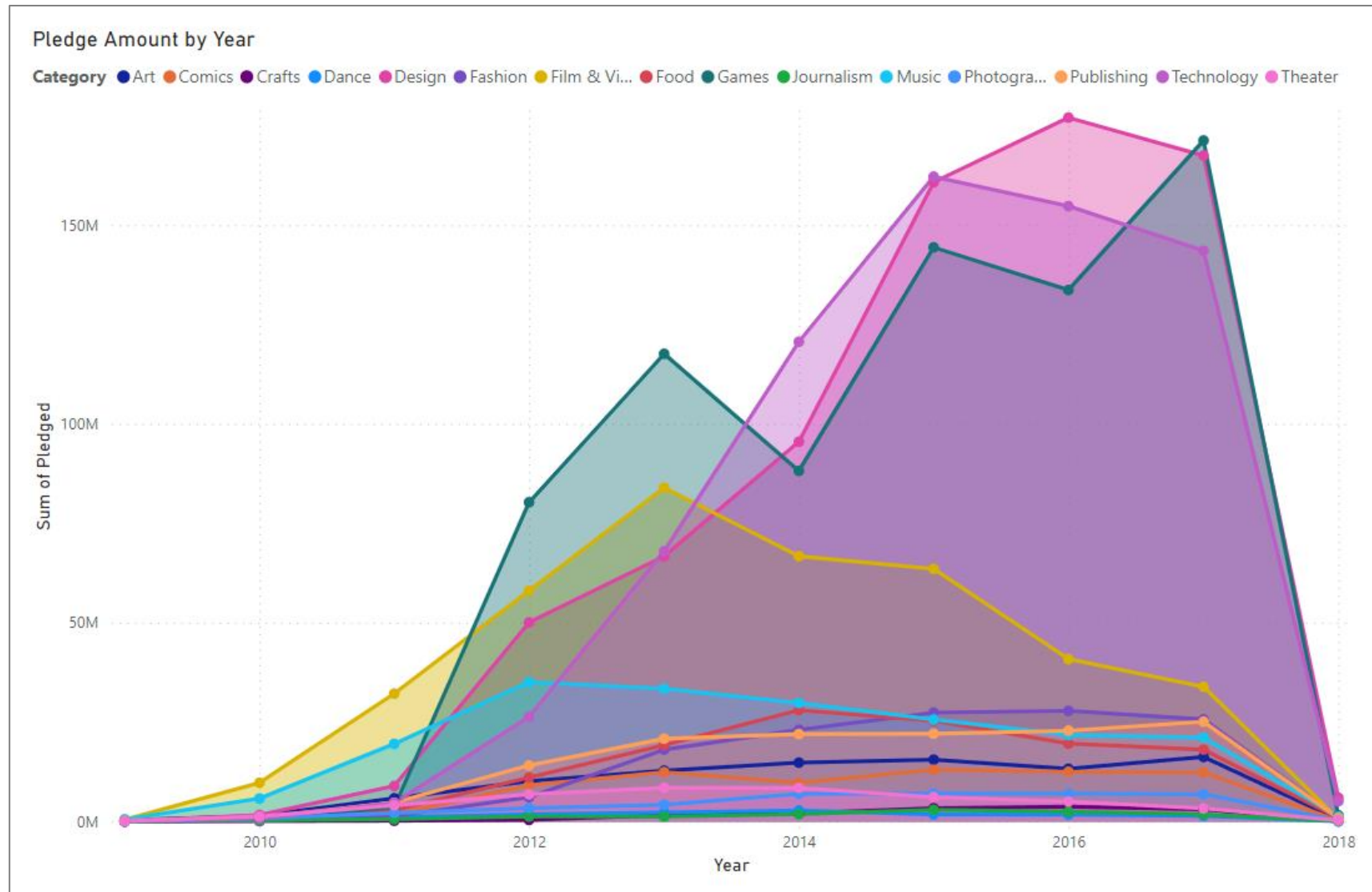
Number of people not in extreme poverty



Data source: World Poverty in absolute numbers (Max Roser based on World Bank and Bourguignon and Morrisson (2002))

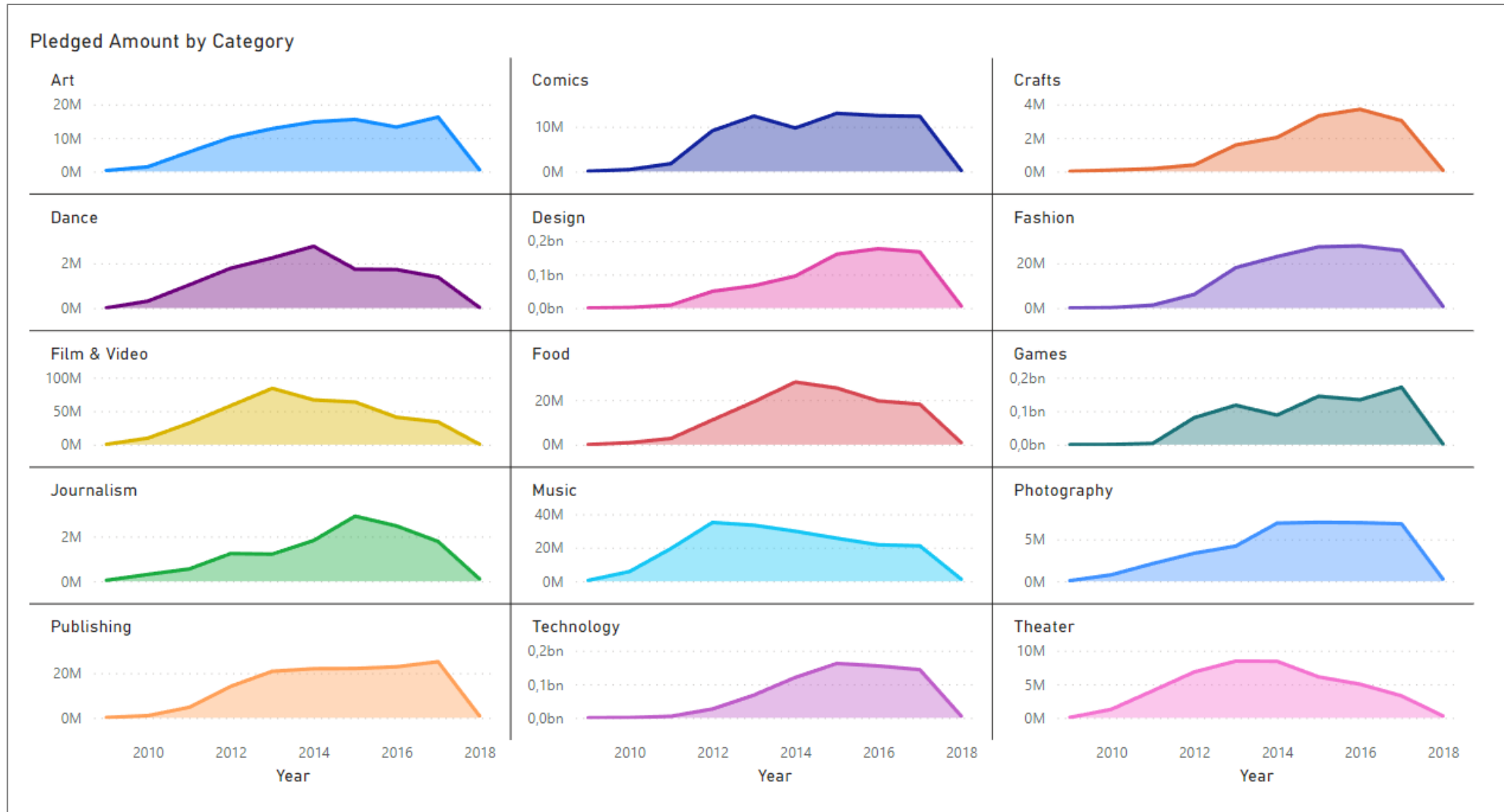
[OurWorldInData.org/world-poverty/](https://OurWorldInData.org/world-poverty/) • CC BY-SA

# Area chart with multiple series



Power BI chart based on the Kickstarter projects dataset

# Area chart with multiple series



Power BI chart using small multiples based on the Kickstarter projects dataset



# Best practices for area charts

# Best practices for area charts

- Effective usages
  - Long time series with many changes
  - Part-to-whole during time, especially when one part is large
  - Multiple series in small multiple format
- Visual best practices
  - Use zero-based y-axis
  - Limit the number of series displayed in the same chart
  - Consider the order series, bring the „main” forward

# Best practices for area charts

- But use with caution
  - Uses lot more „ink” than line chart
  - Multiple series can be quite confusing
  - Comparison can be hard as areas are hard to judge
  - Does not fit well in dashboards

# Showcase

# Name charts

## How popular was your name?

Search 22 million English birth records since the 1840s.  
Compare your friends or family, or see some interesting examples.

Mary ×

John ×

William ×

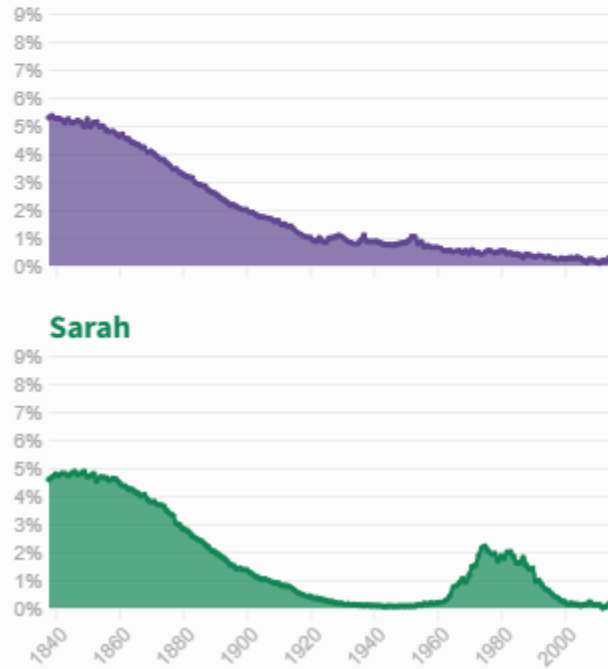
Elizabeth ×

Thomas ×

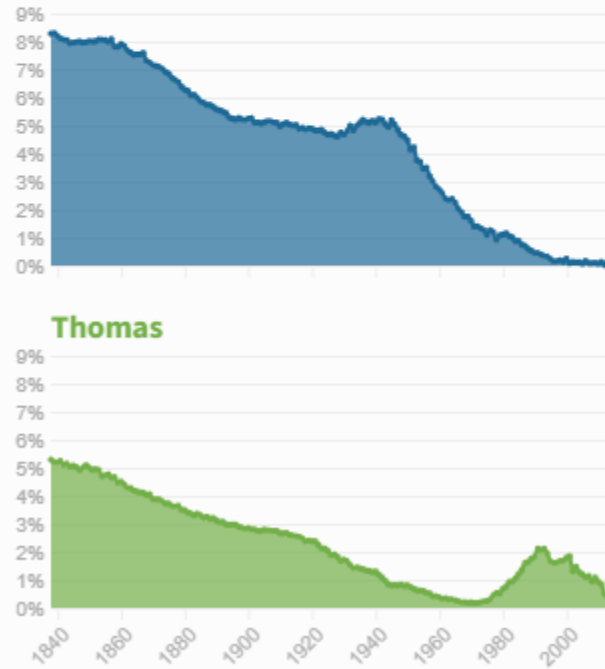
Sarah ×

Add names!

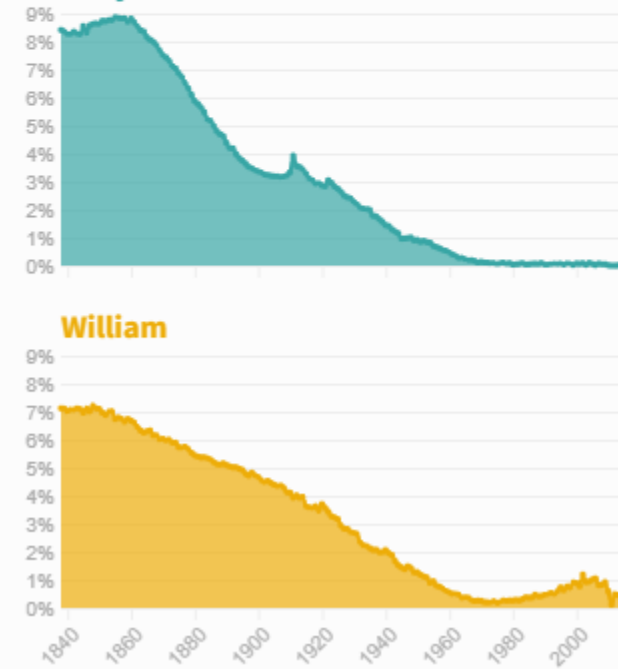
Elizabeth



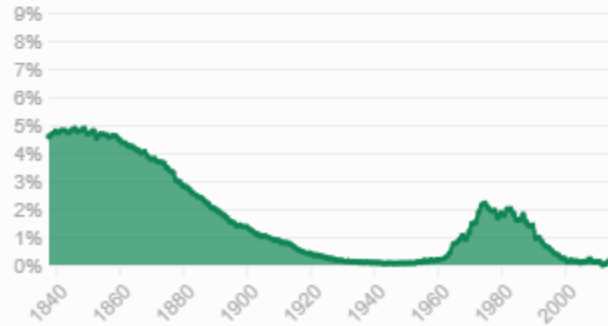
John



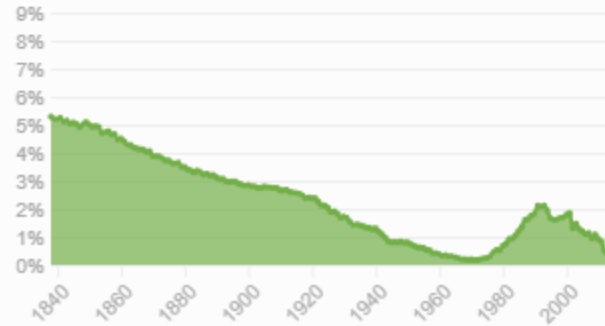
Mary



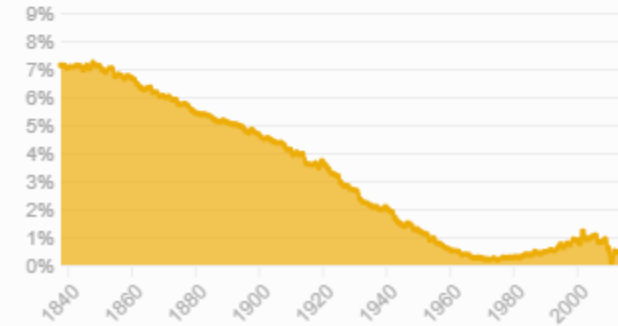
Sarah



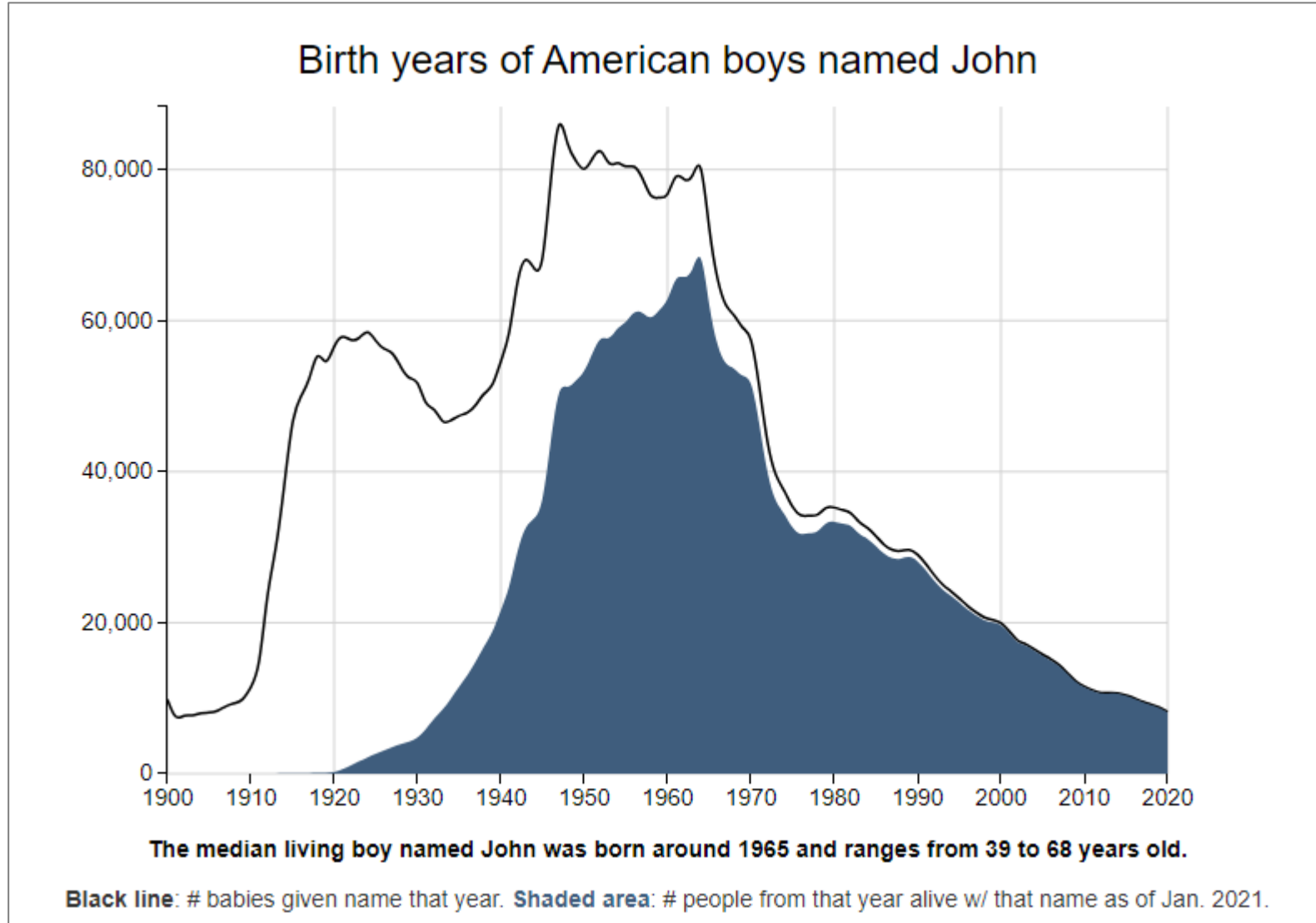
Thomas



William

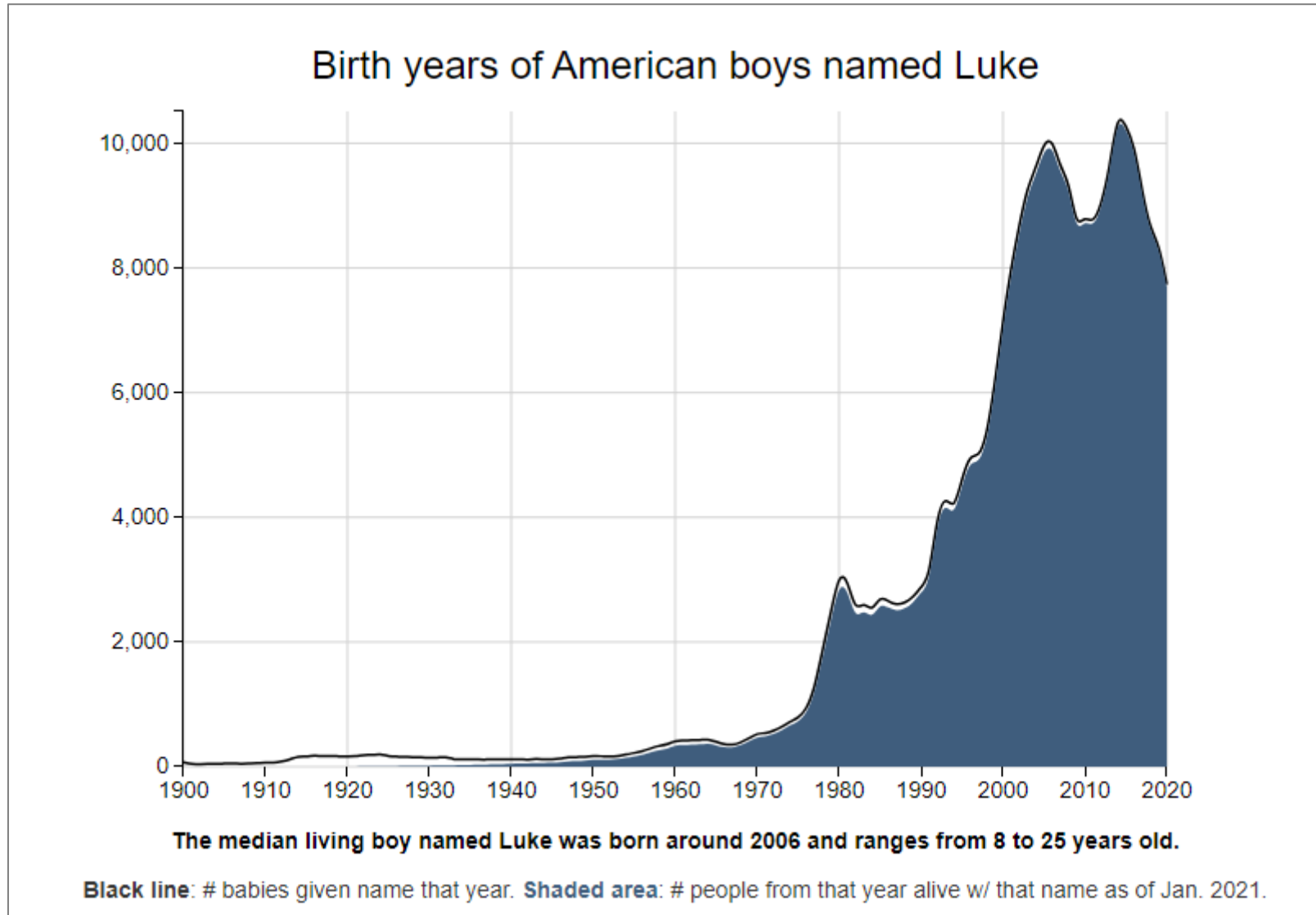


# Name charts

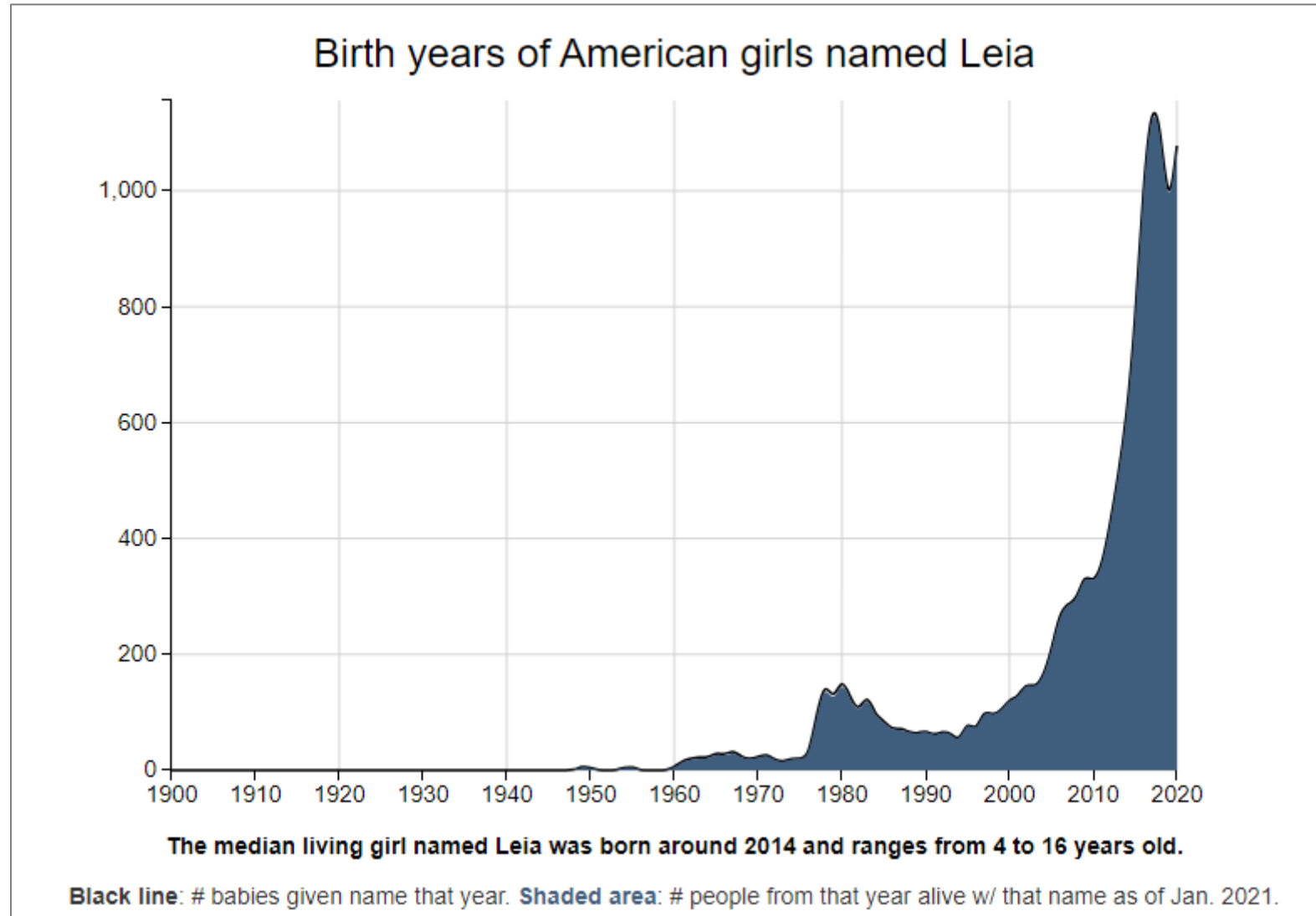




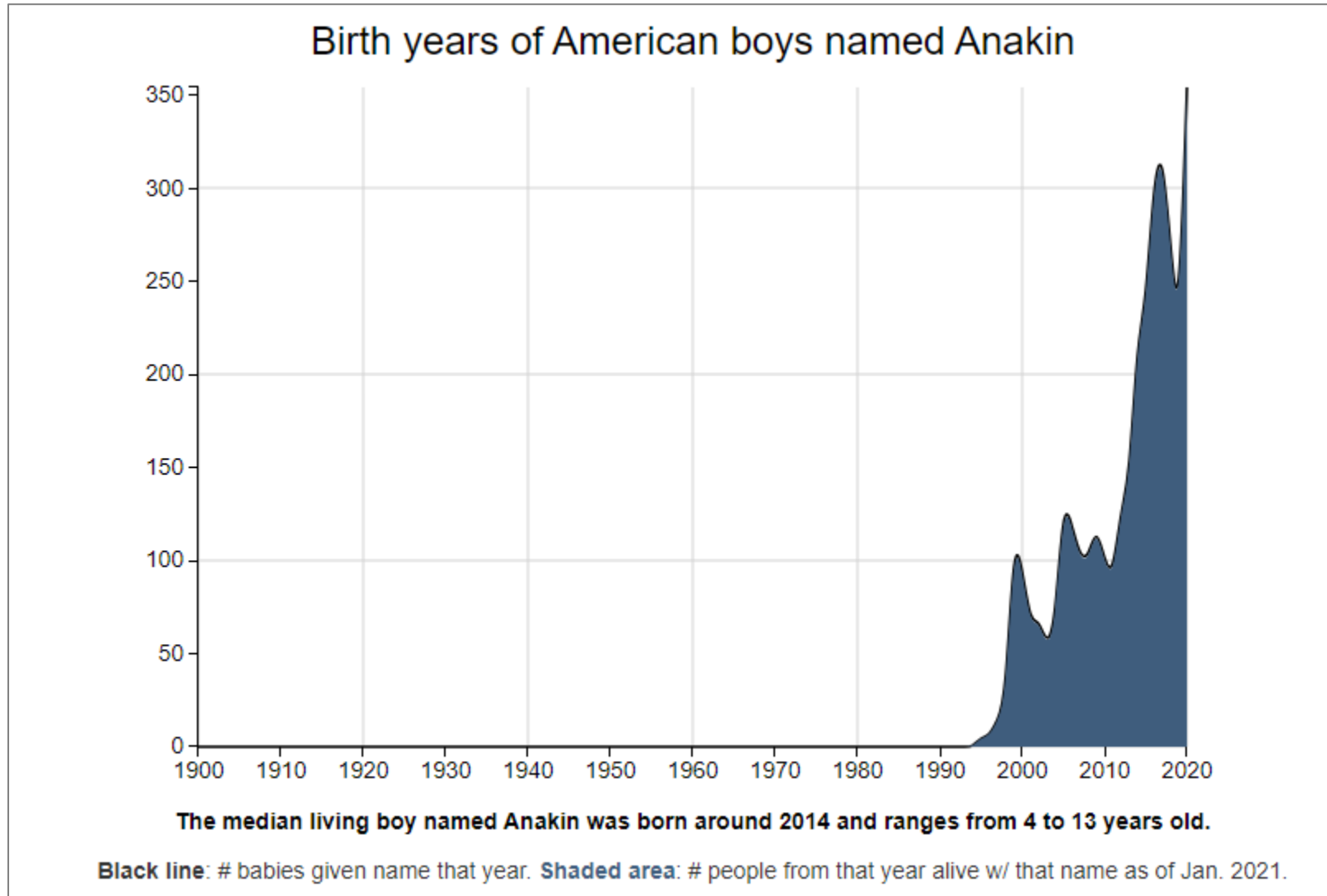
# Name charts



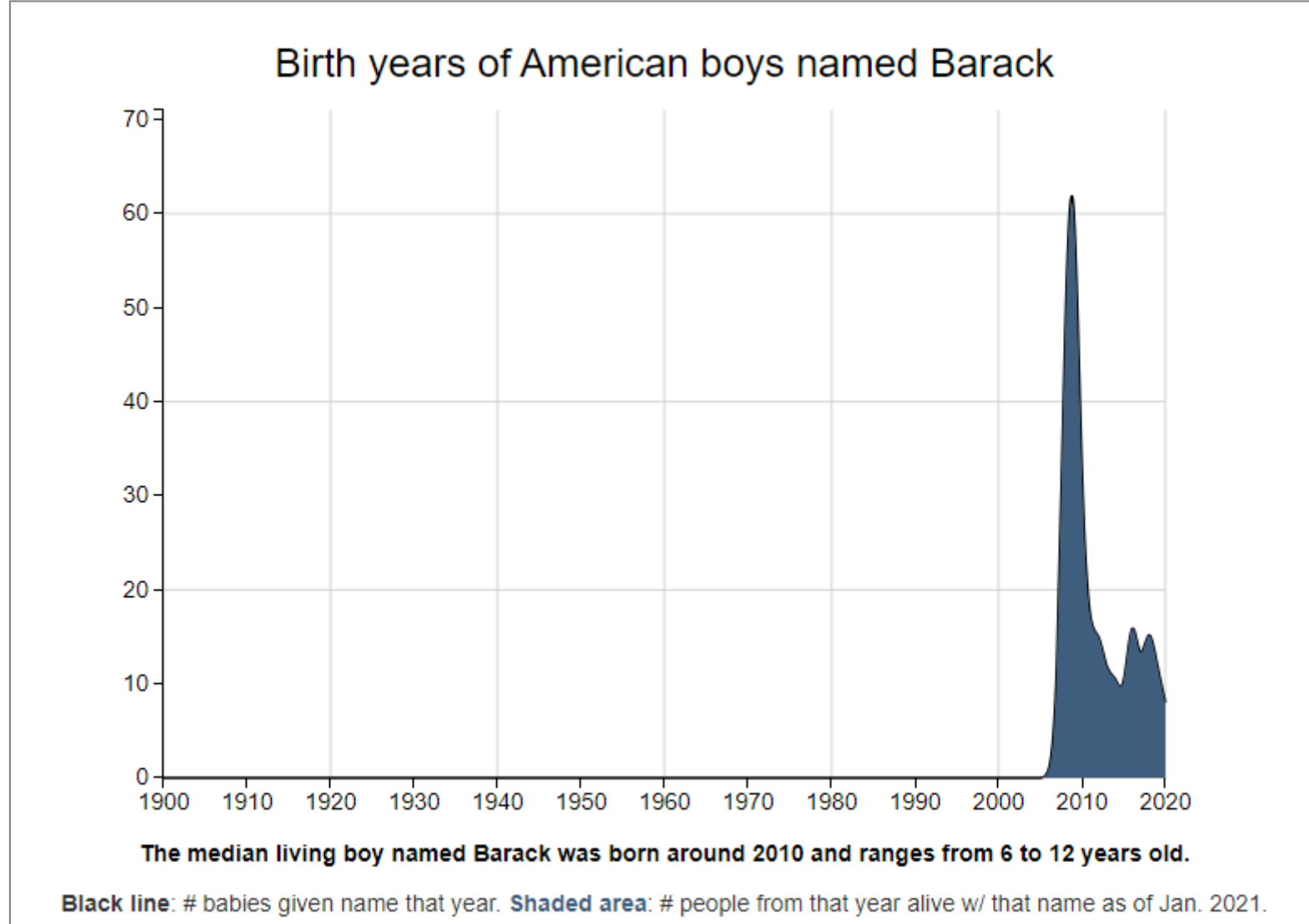
# Name charts



# Name charts



# Name charts



# Thank You

