Why visualise?

To tell a story

To illustrate a story

To explore the data - to find a story

What can a chart do?

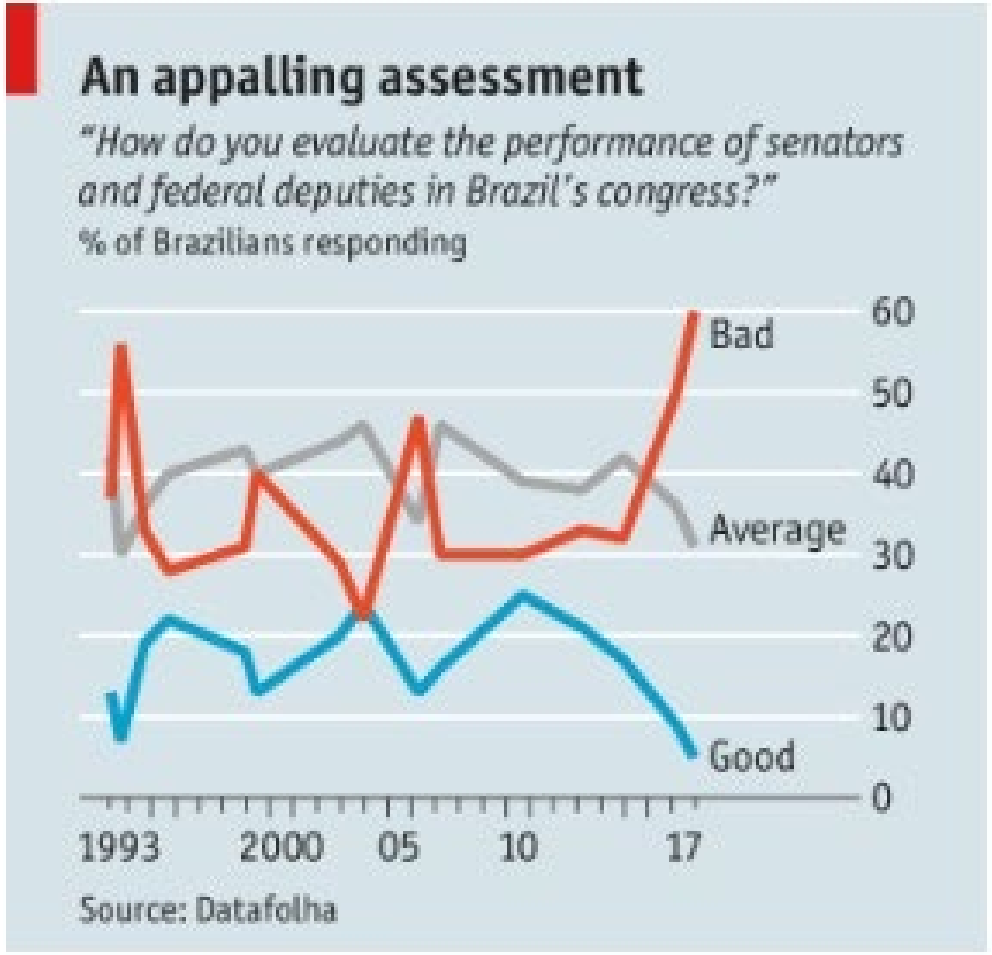
- “A great chart or map can often achieve something that words cannot. They can make concepts that are difficult to grasp suddenly clear and comprehensible. ….A great data visualisation … should tell a story with a single graphic.”

Marie Seggers, The Economist

Why visualise?

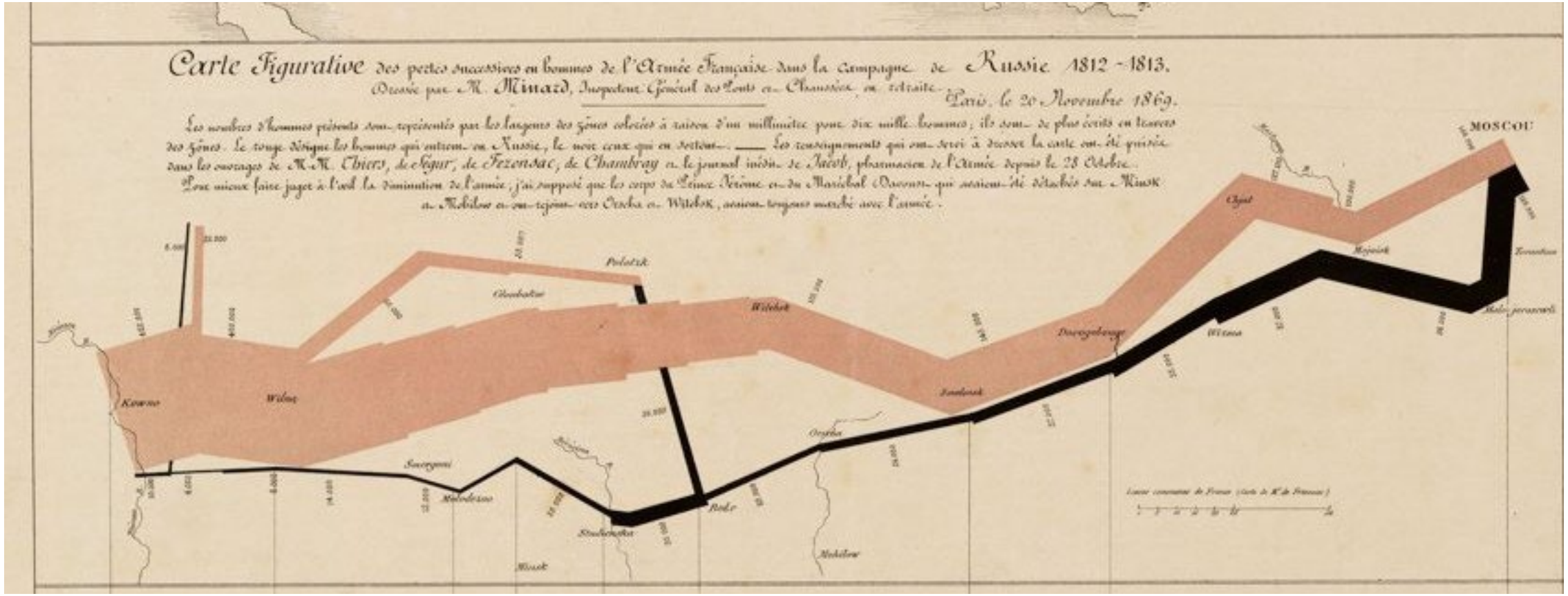
"A graph is an argument" (Alberto Cairo)

"<u>Change</u> is where the stories are" (Heather Krause)

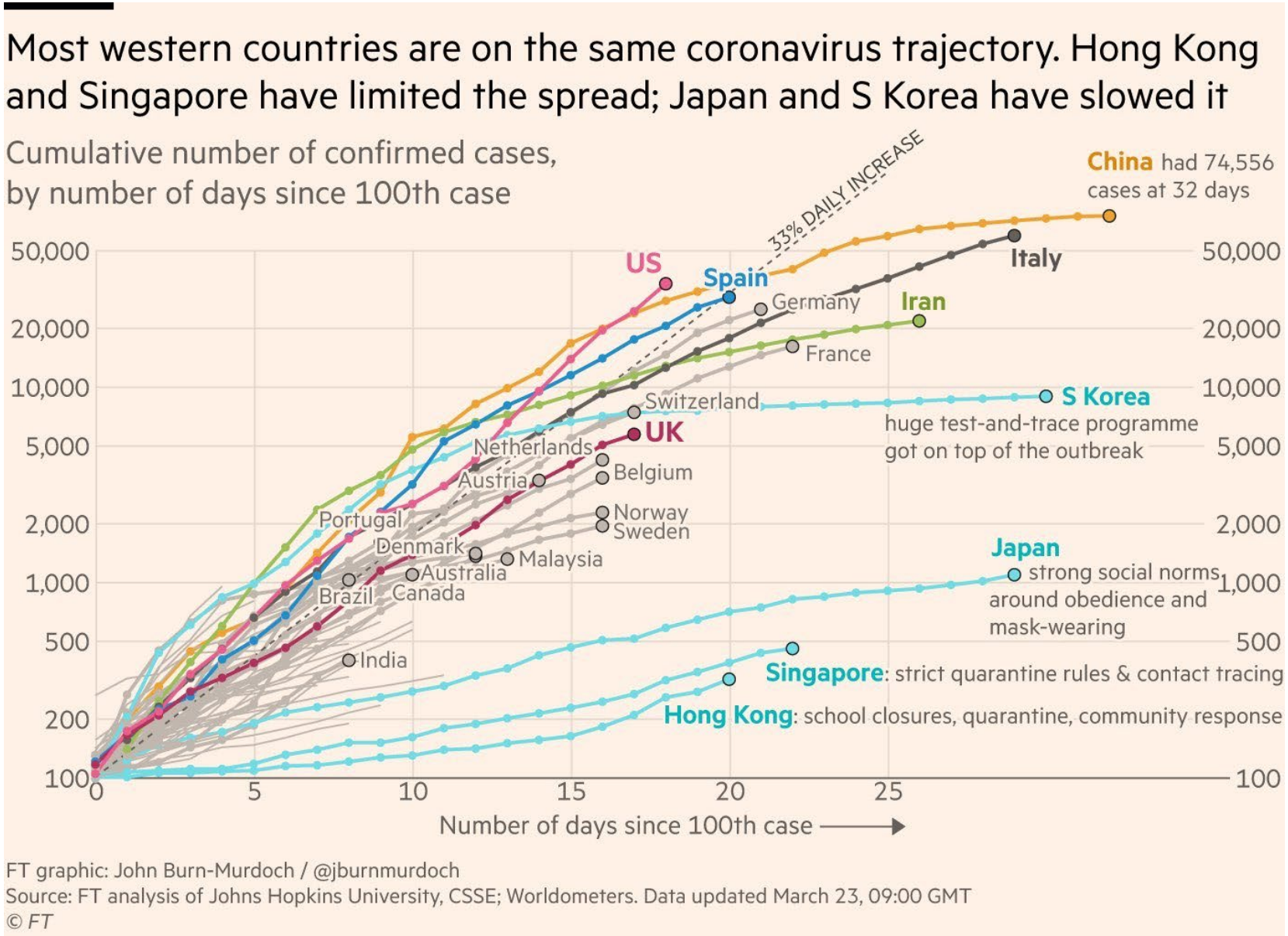


A **clear** story

Context is vital



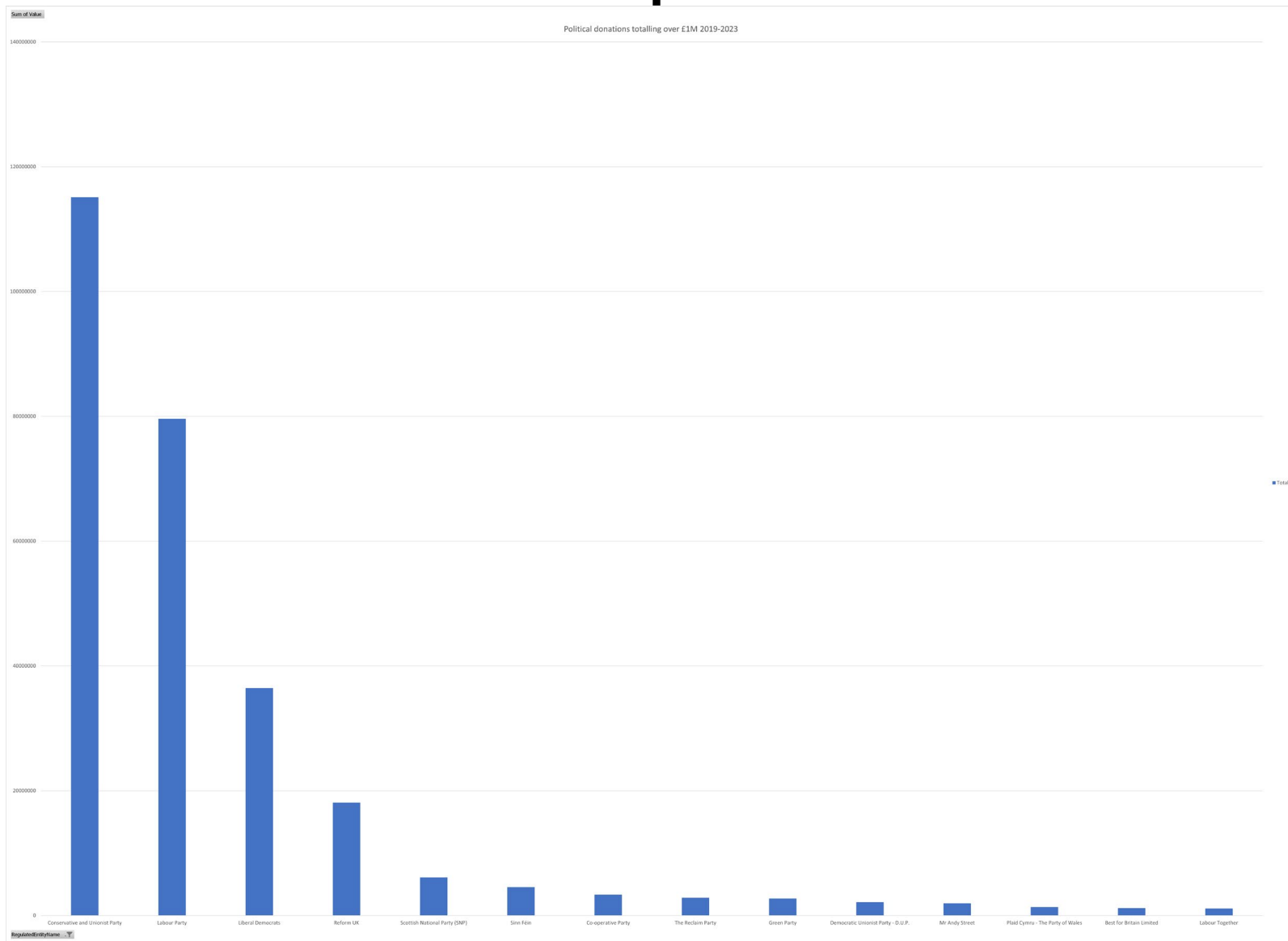
Context (and some explanation)



What can you visualise?

Comparison
Composition
Distribution
Relationships

Comparison


Sum of Value
Political donations totalling over £1M 2019-2023
140000000
120000000
100000000
80000000
60000000
40000000
20000000
0
Conservative and Unionist Party
Labour Party
Liberal Democrats
Reform UK
Scottish National Party (SNP)
Sinn Féin
Co-operative Party
The Reclaim Party
Green Party
Democratic Unionist Party - D.U.P.
Mr Andy Street
Plaid Cymru - The Party of Wales
Best for Britain Limited
Labour Together
Total
RegulatedEntityName

Comparison

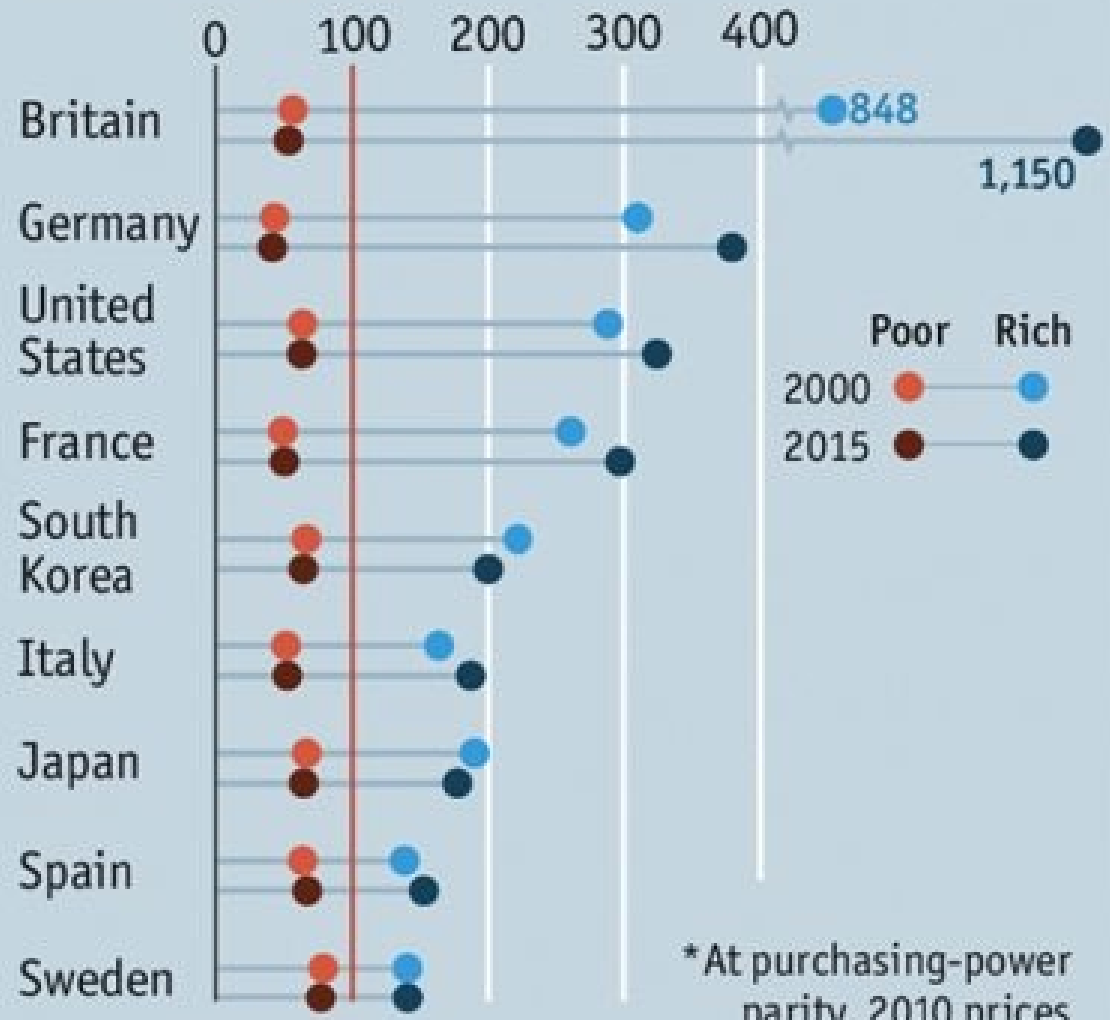

Global airline deaths*
Cause: accident hijacking bombing
Aircraft passengers carried, bn
3,500
3,000
2,500
2,000
1,500
1,000
500
0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0
1970
75
80
85
90
95
2000
05
10
15†
Sources: World Bank; Aviation Safety Network; The Economist
*Passengers and crew on aircraft of ≥14 passengers, excluding military and corporate
†To November 8th. Includes air crash of October 31st in Egypt as a bombing

The rich get richer

1

GDP per person* of poorest and richest regions†

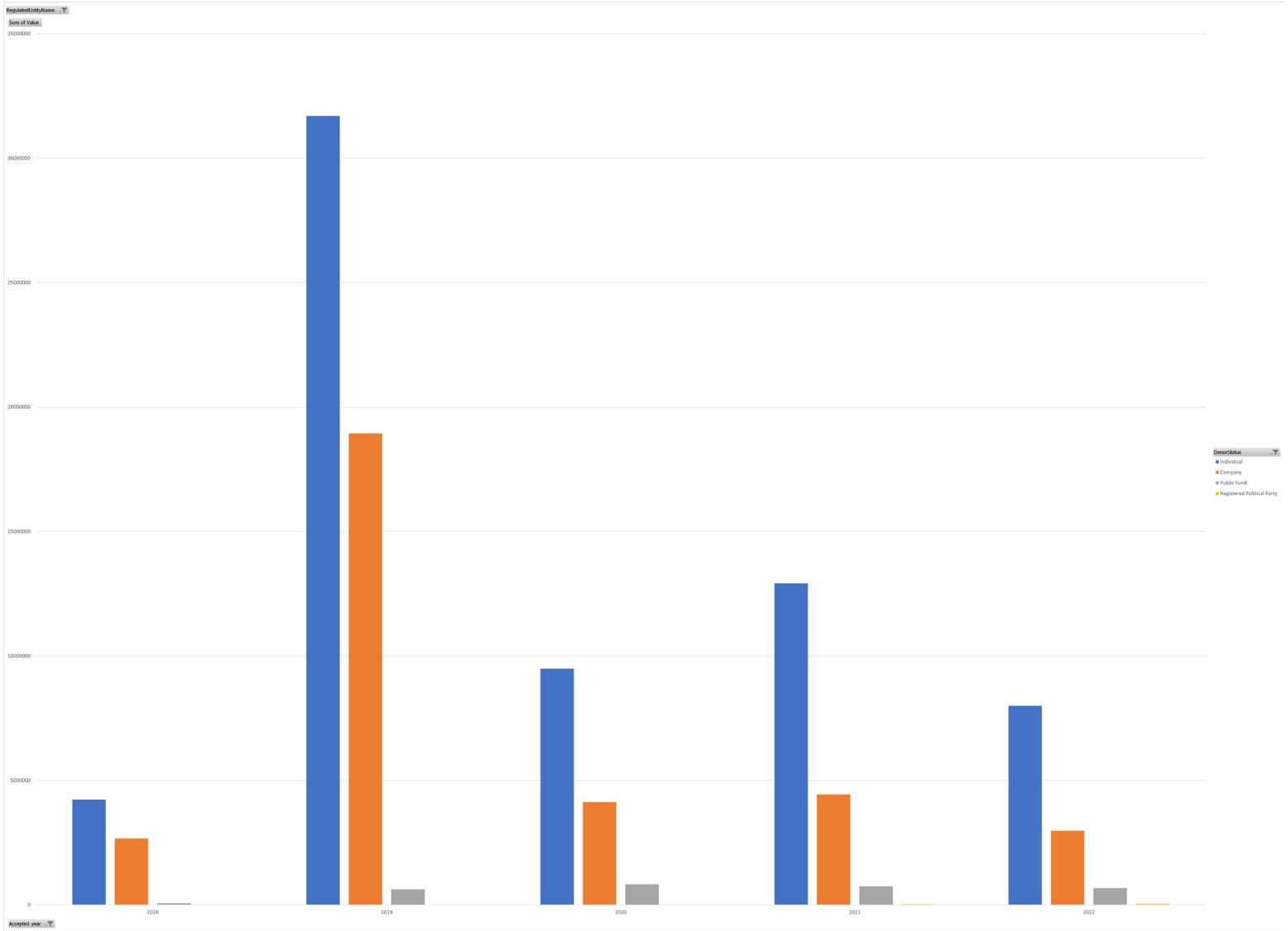
National average =100



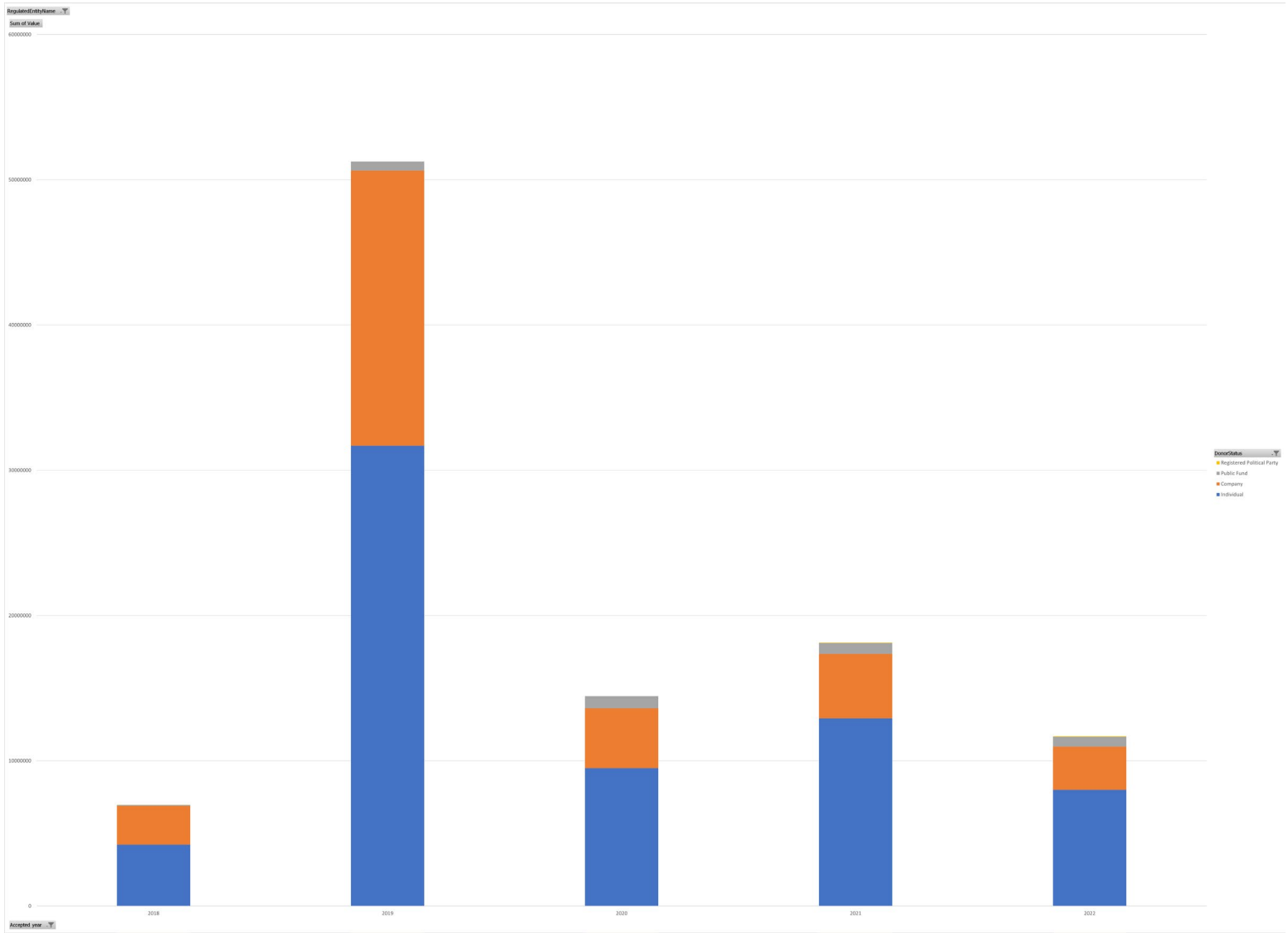
Sources: OECD; *The Economist*

*At purchasing-power parity, 2010 prices
†OECD lower-level regions and US states

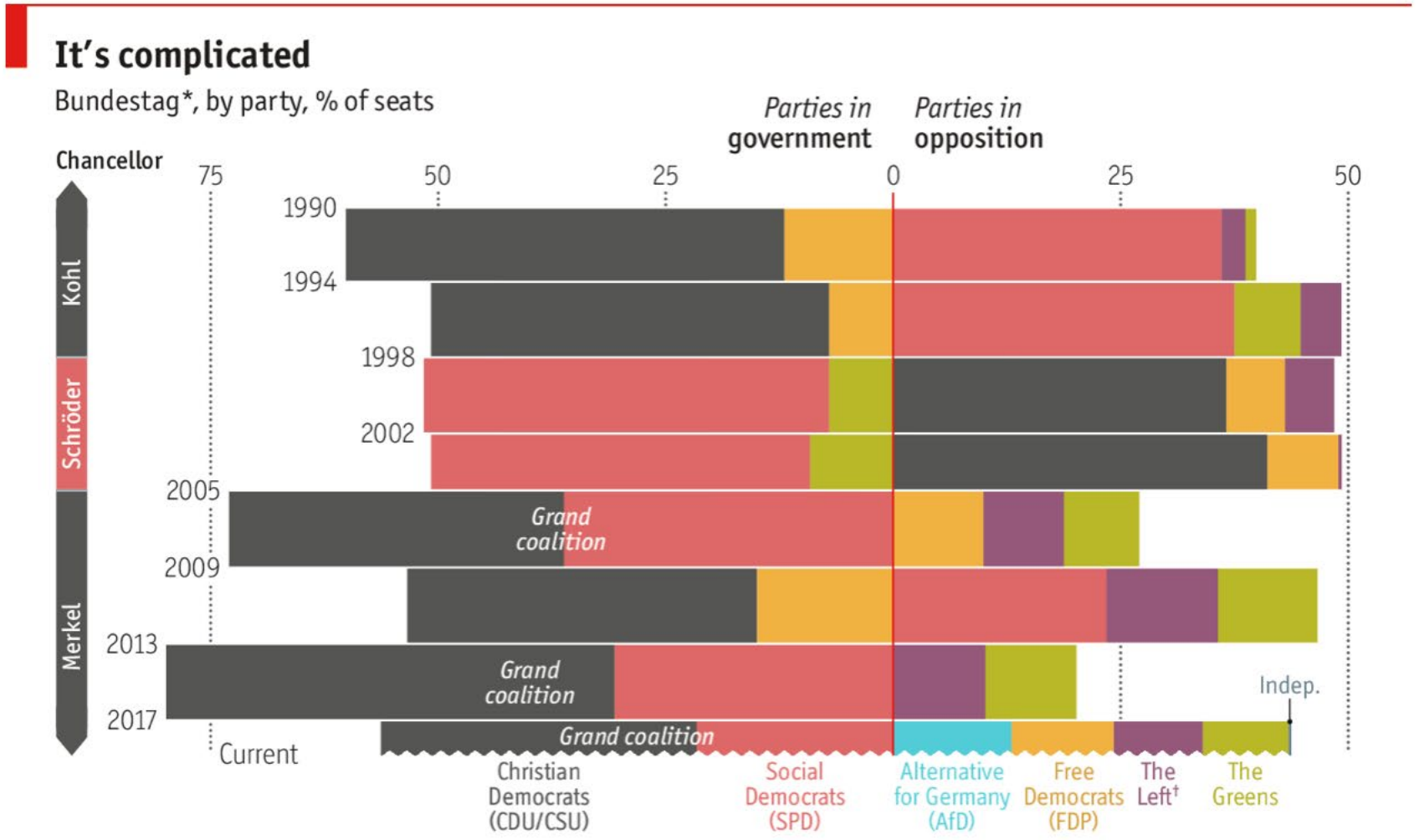
Composition



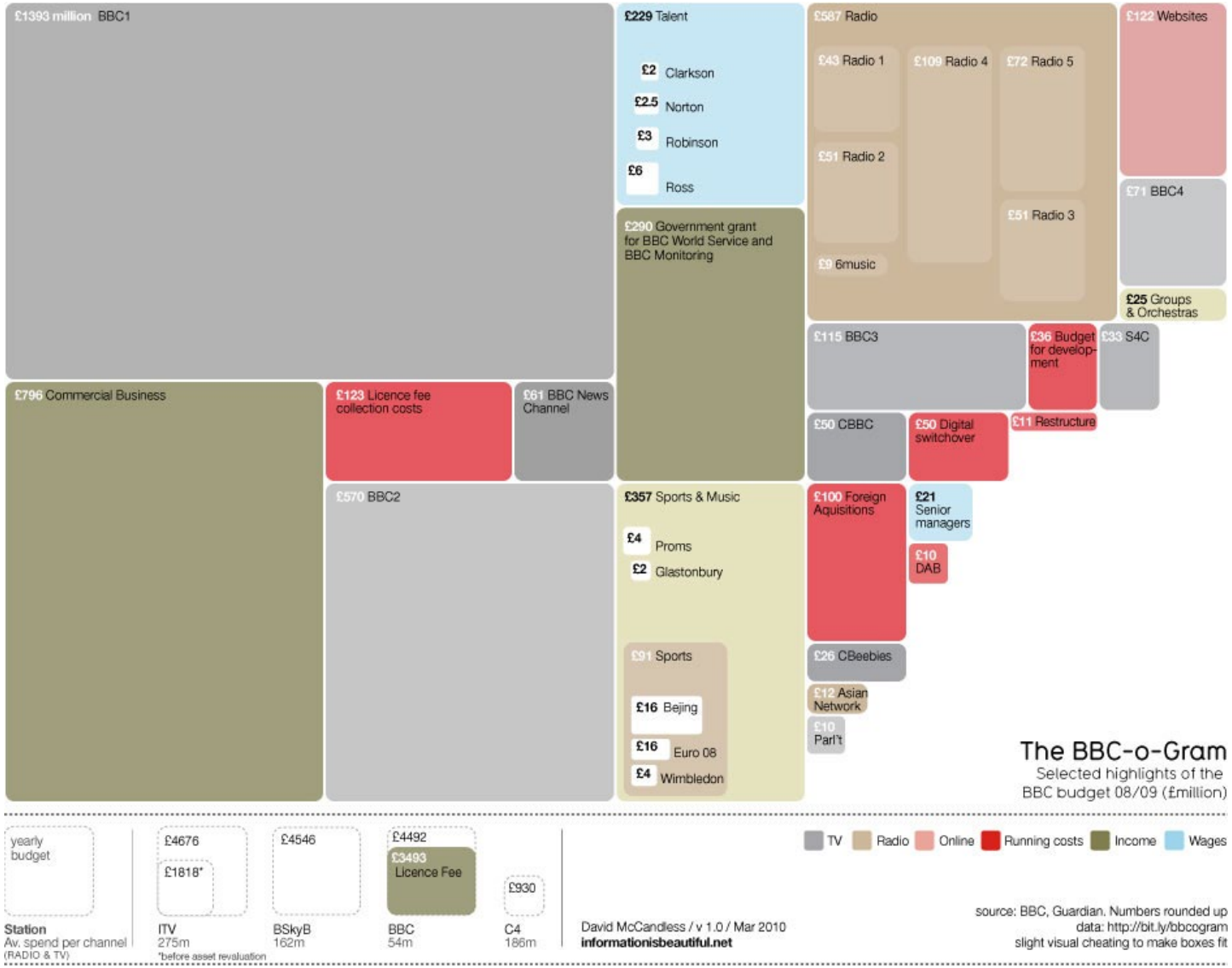
Composition



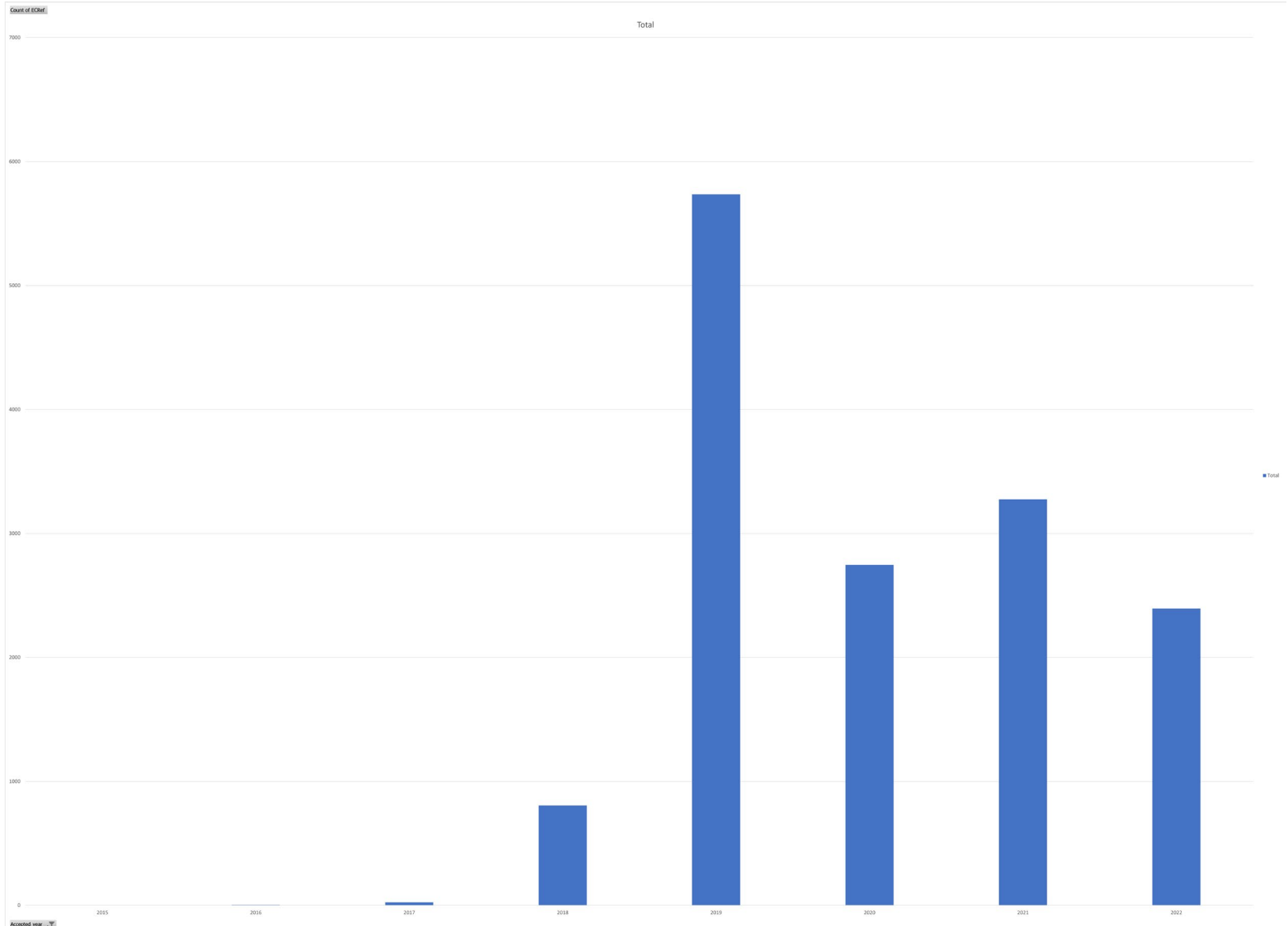
Composition



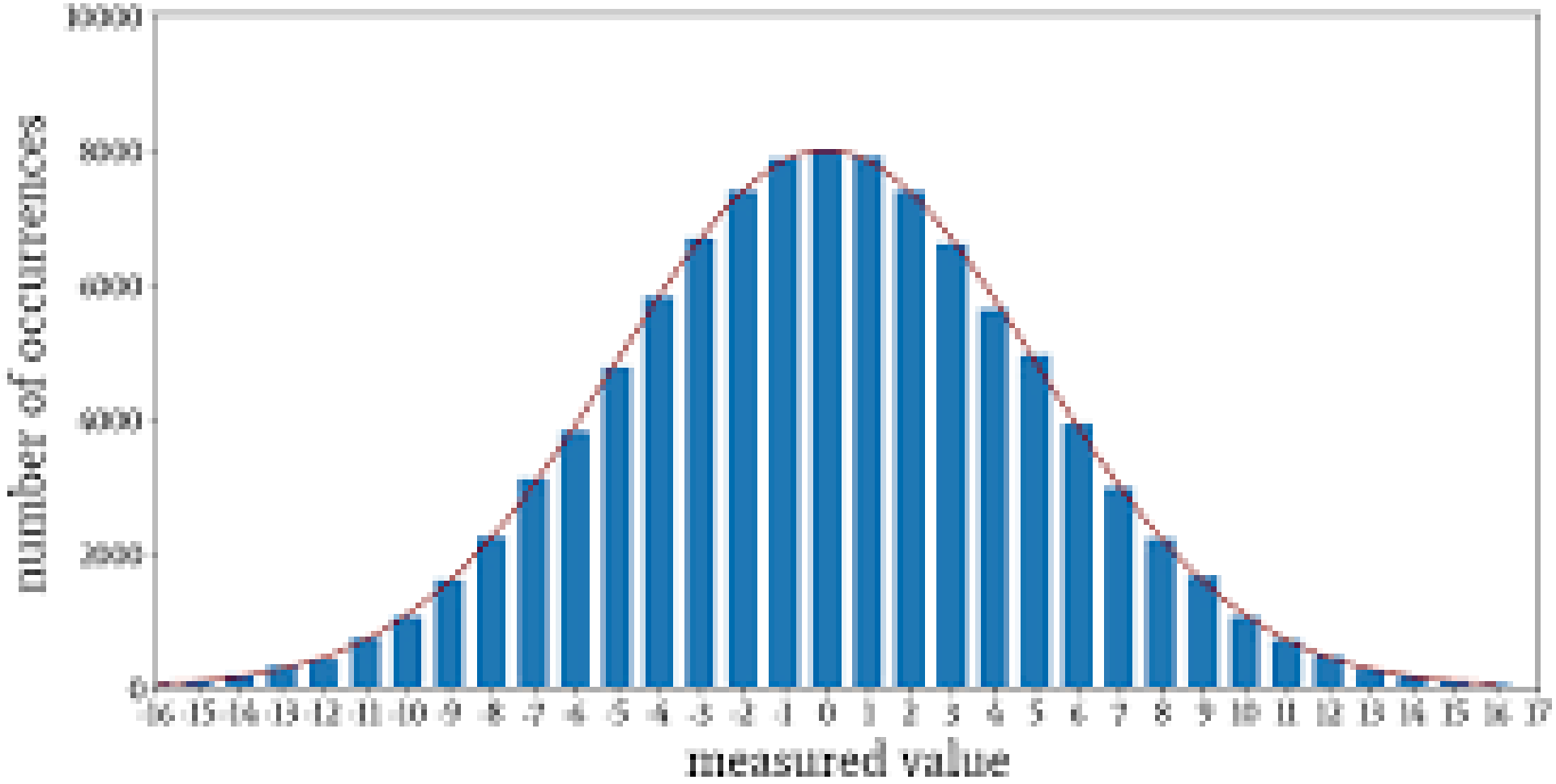
Composition



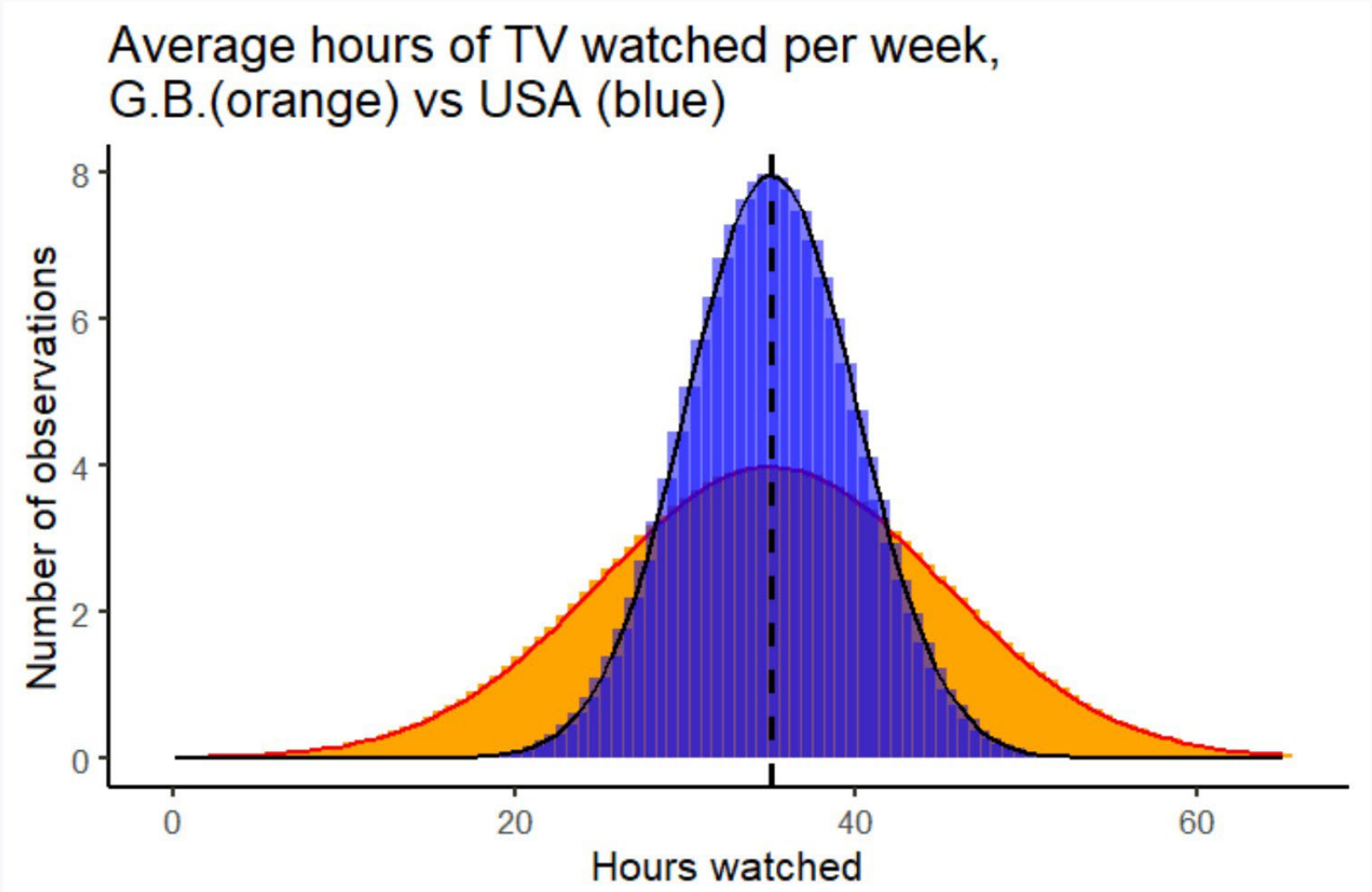
Distribution



Distribution



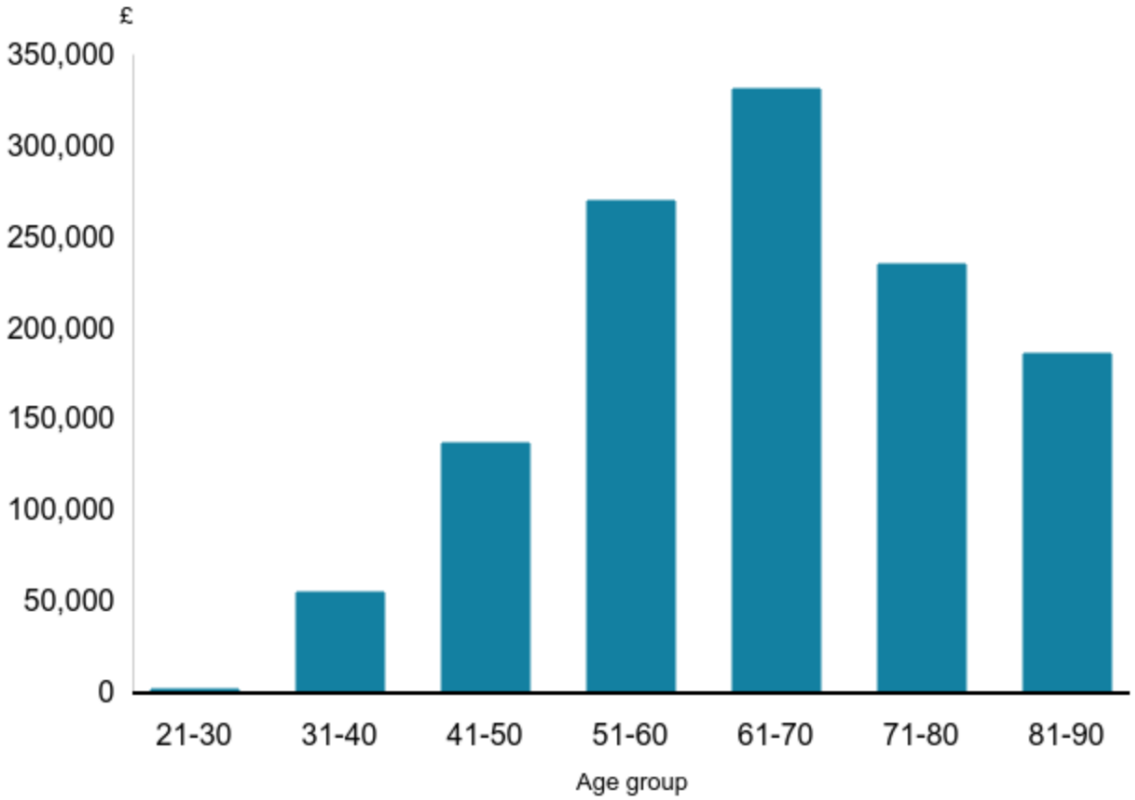
Distribution



Distribution

People in their 60s have the highest average wealth

Net family wealth per adult, 2014-16

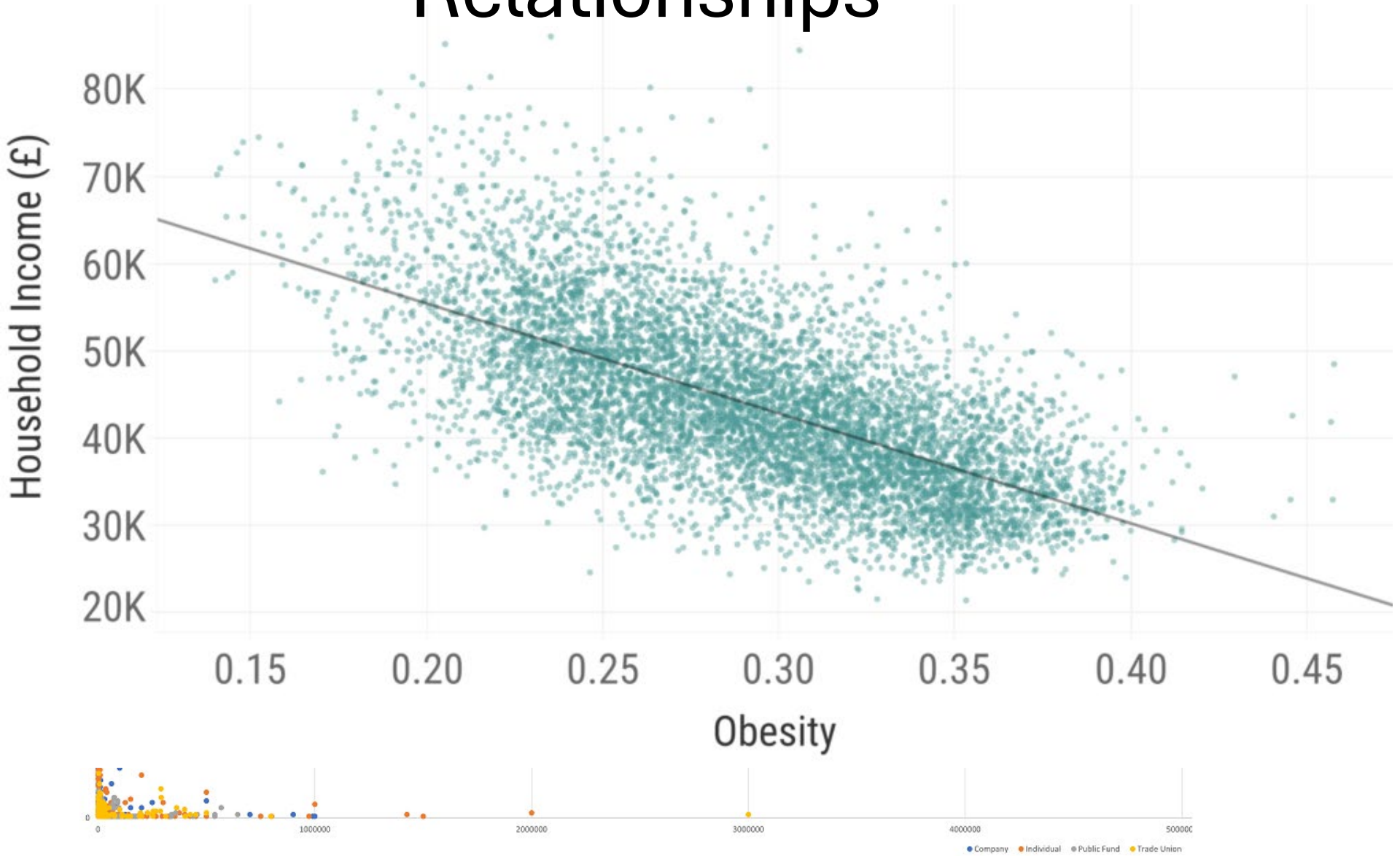


Median figure used. Adjusted for inflation.

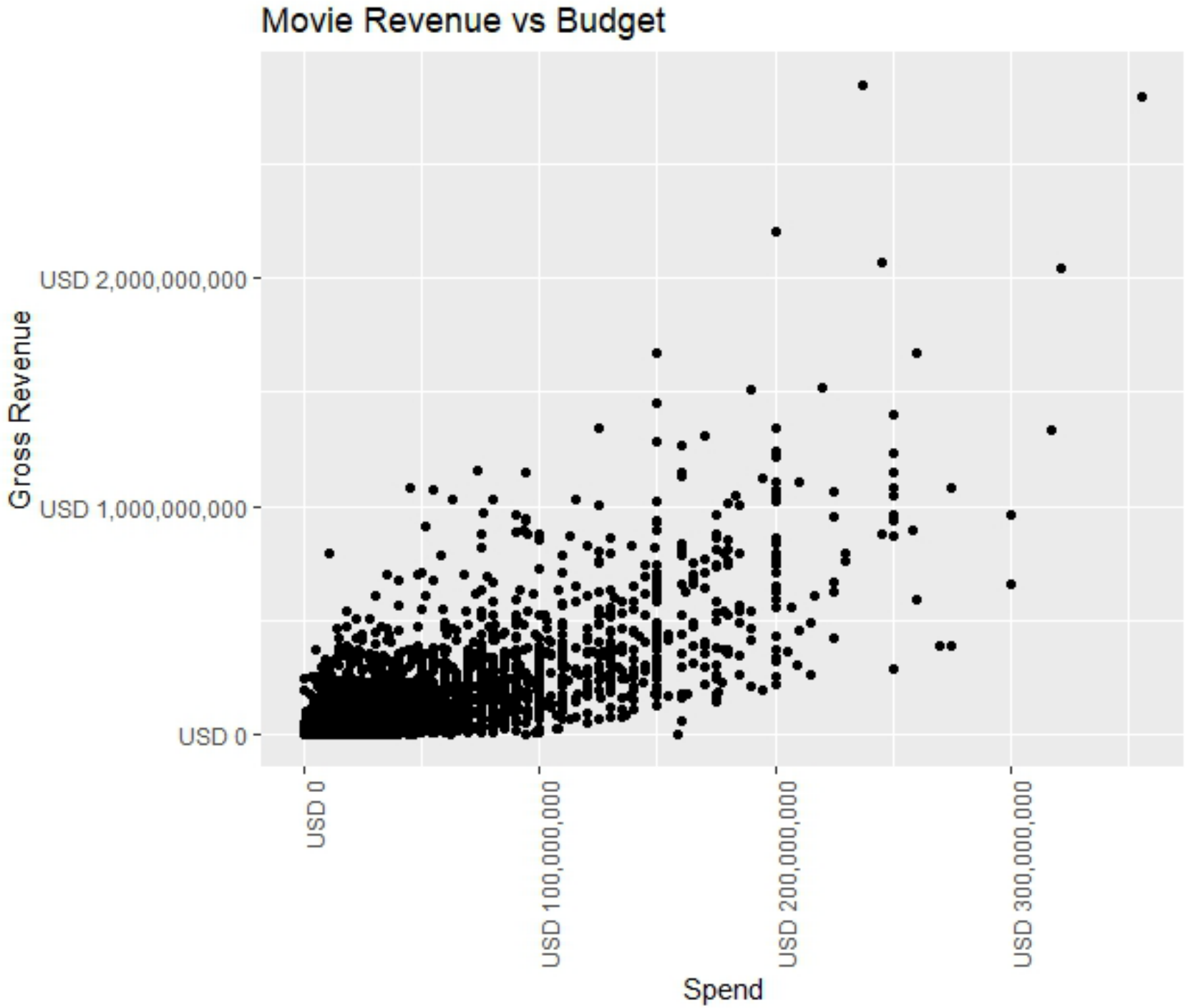
Source: Resolution Foundation/ONS Wealth and Assets Survey

BBC

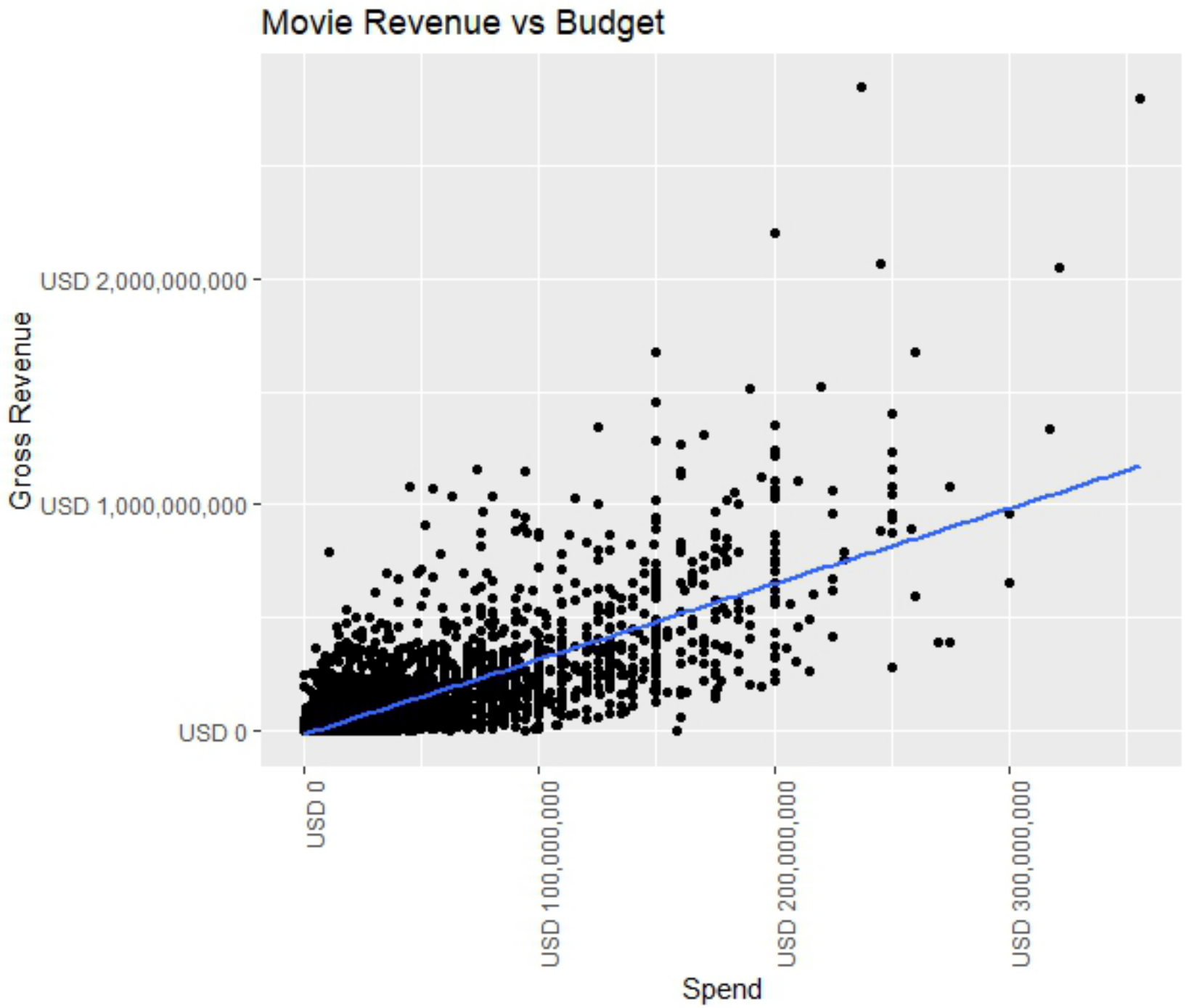
Relationships



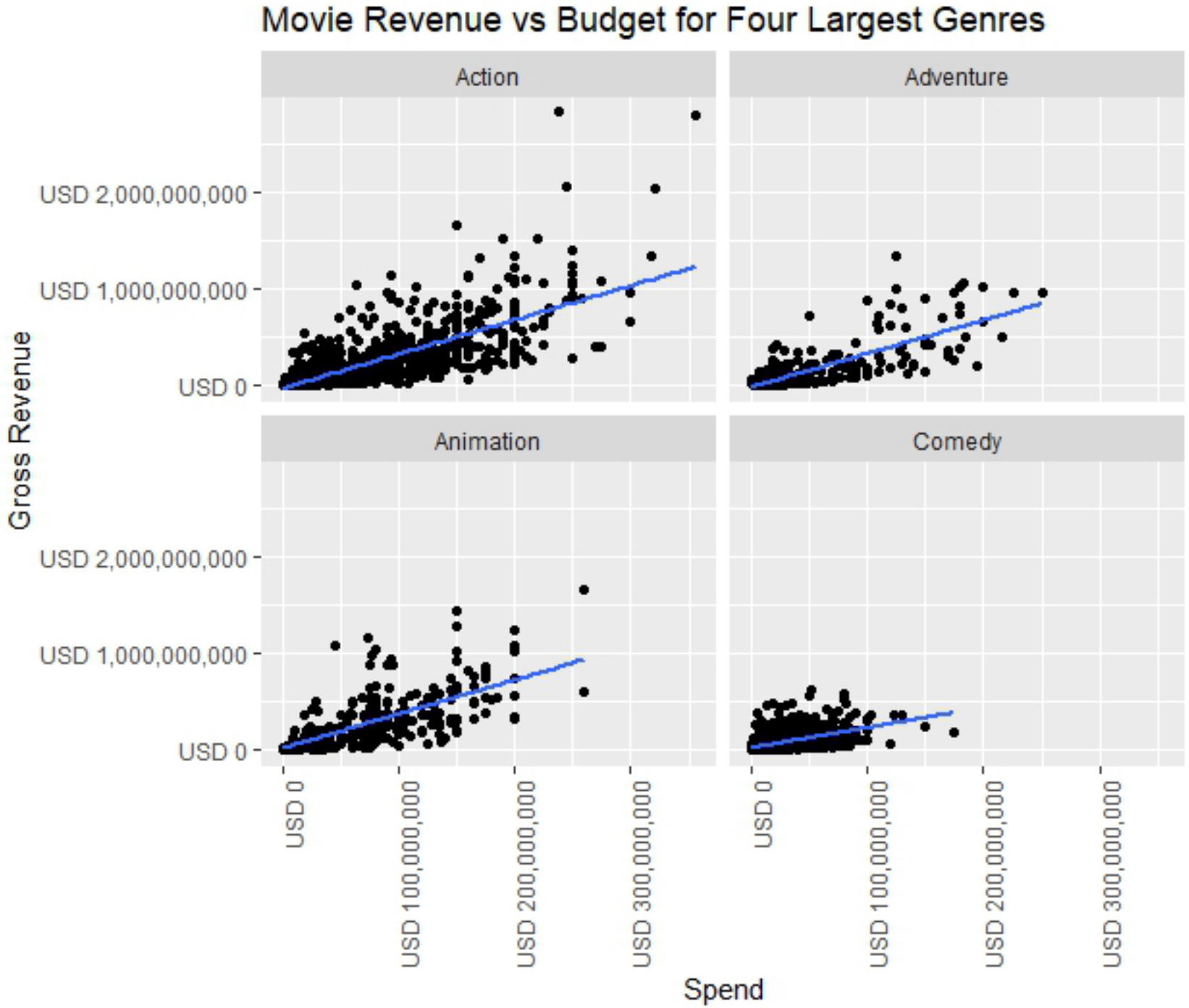
Relationships



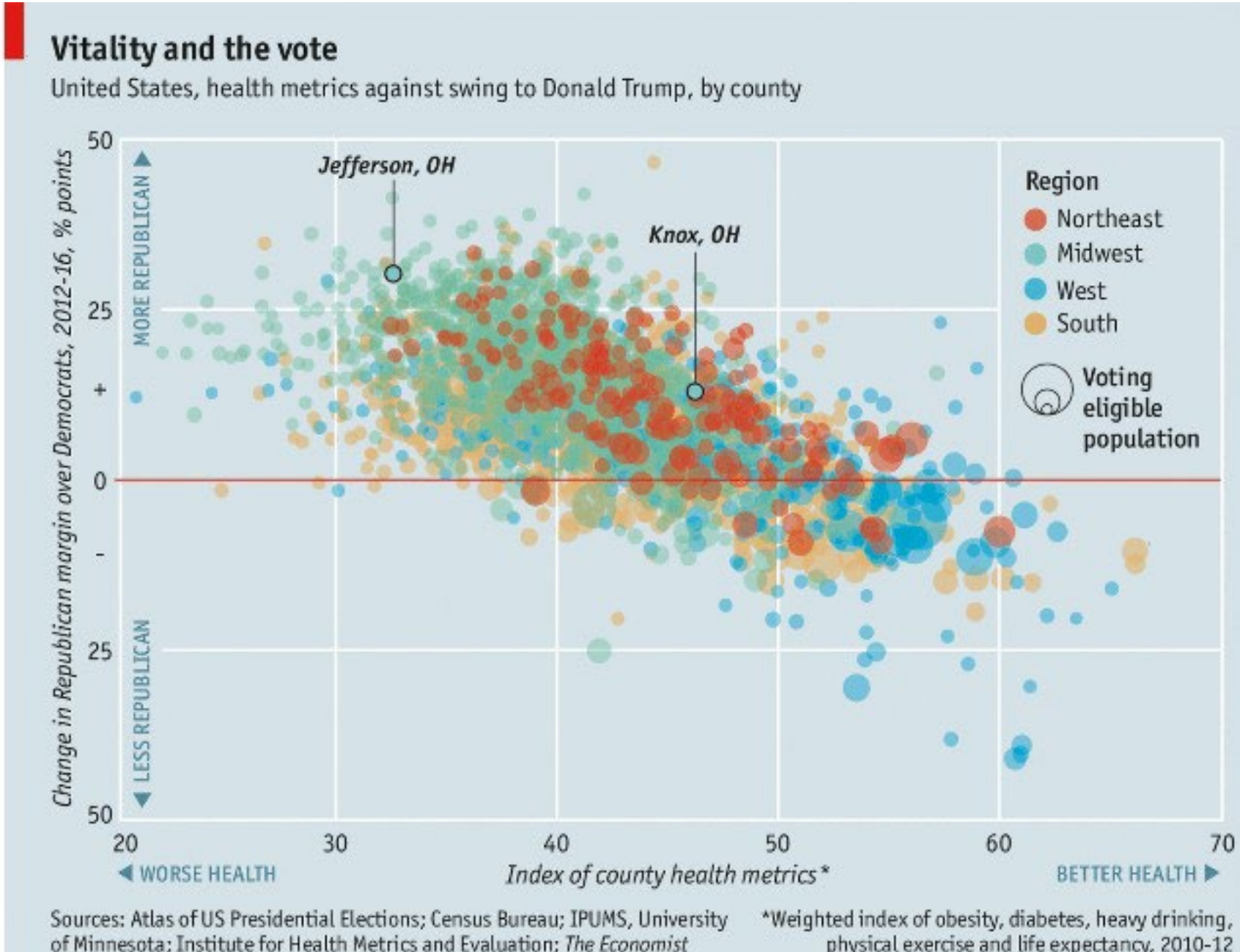
Relationships



Relationships



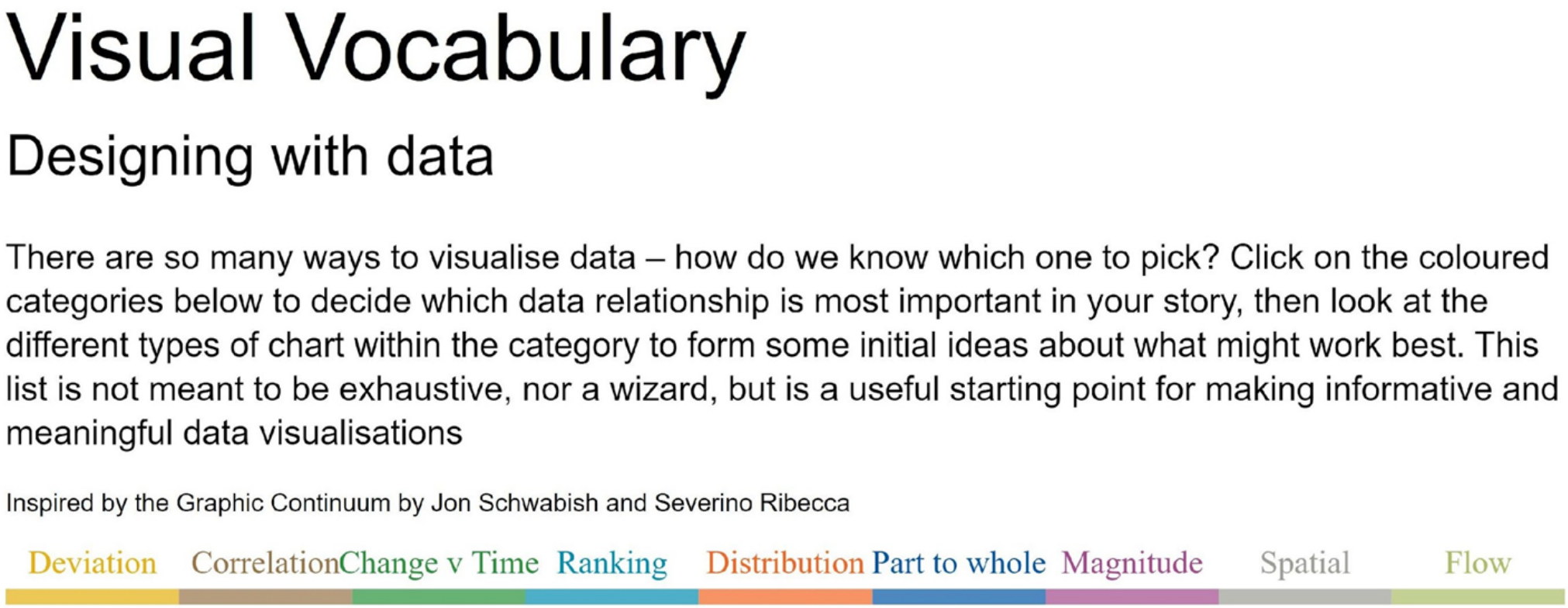
Relationships



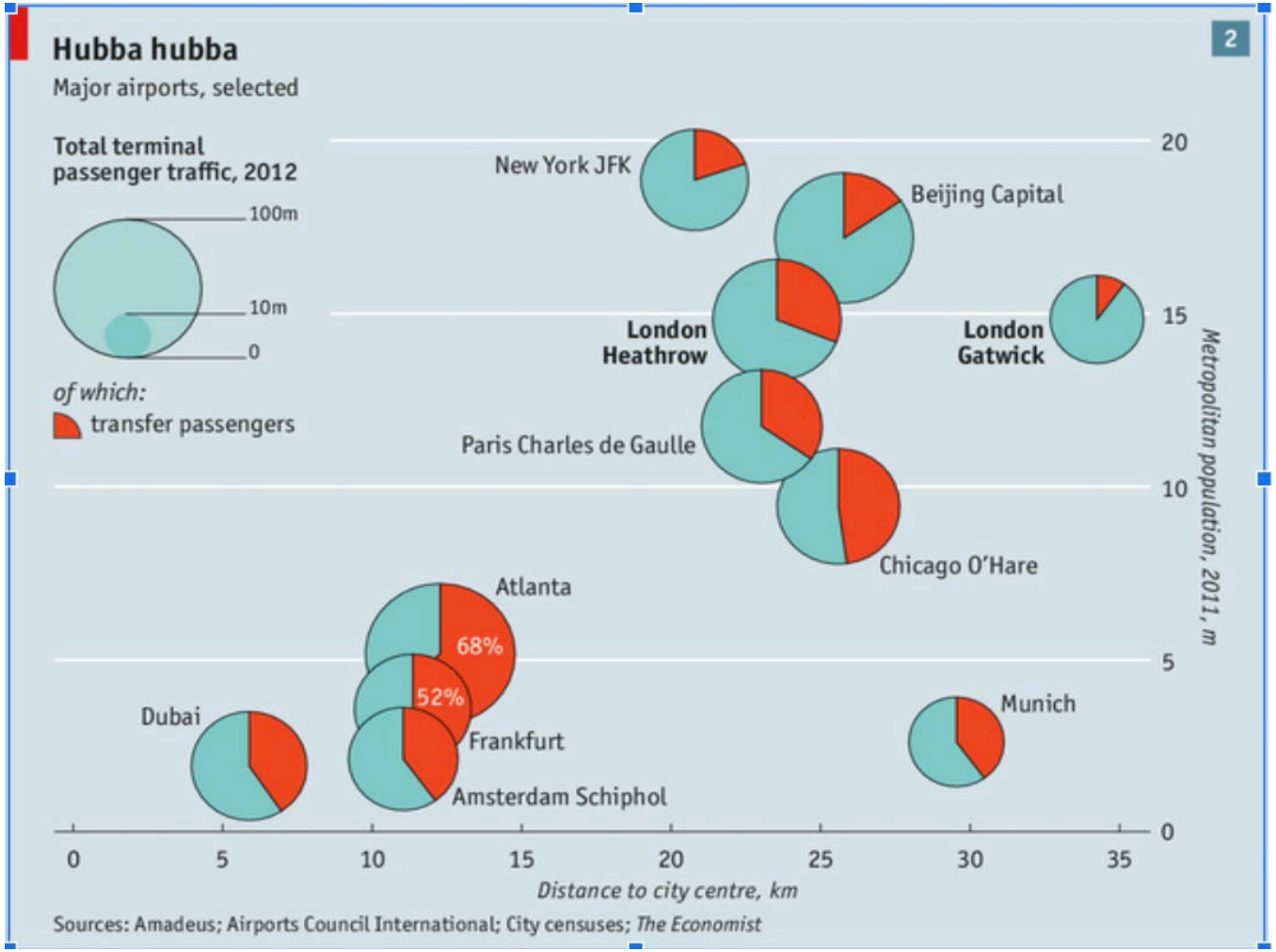
Gapminder


INCOME LEVEL 1
LEVEL 2
LEVEL 3
LEVEL 4
years
90
80
70
60
50
40
30
20
Life expectancy
2019
Size: Population, total, Color: World Regions
per person (GDP/capita, PPP$ inflation-adjusted)
500
1000
2000
4000
8000
16k
32k
64k
Income
DATA DOUBTS
1800
1900
2000

Visual vocabulary – Financial Times



Don’t try too hard!



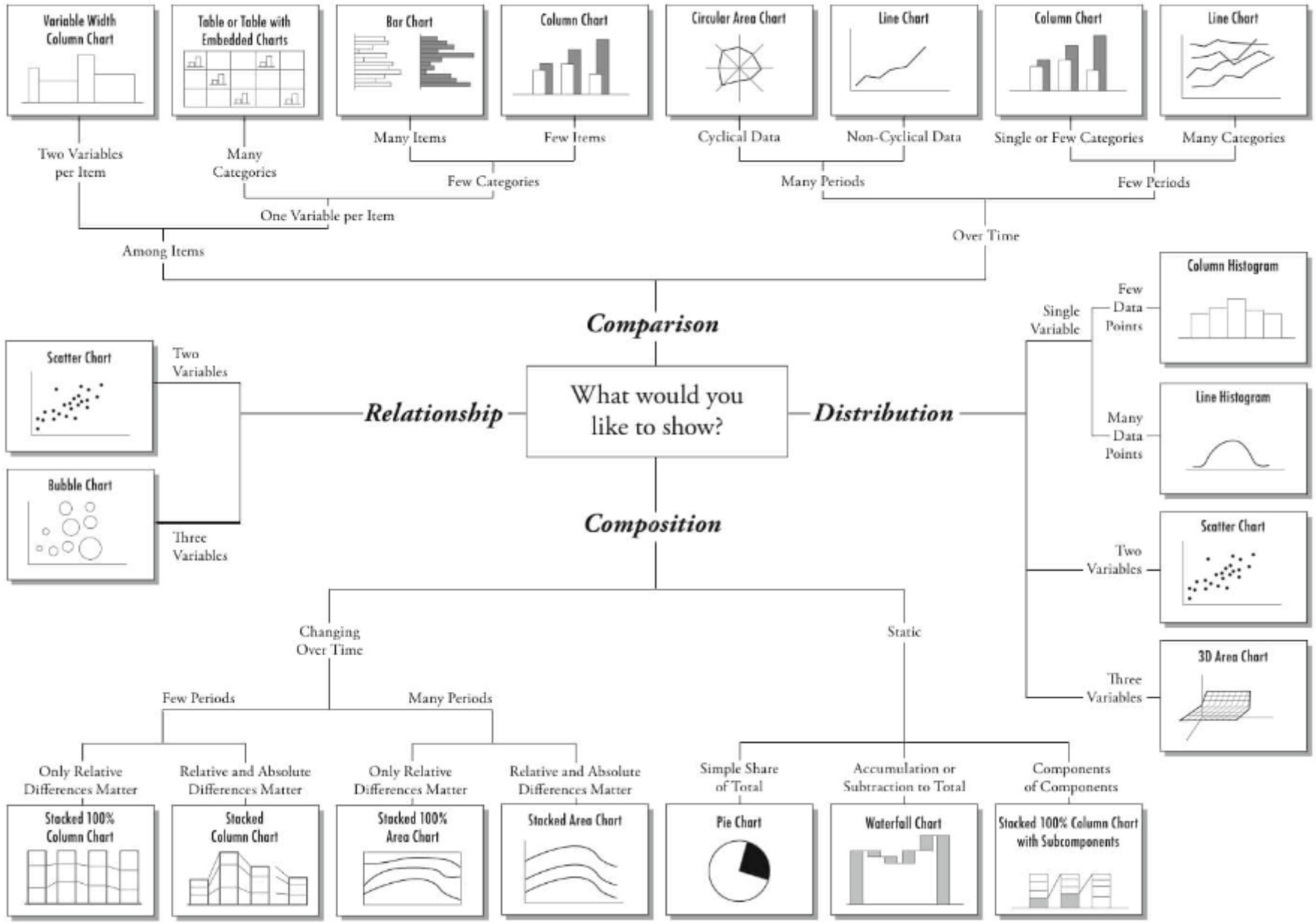
A table? Or a graph?

Use Tables When	Use Graphs When
• The display will be used to look up individual values	• The display will be used to reveal relationships among whole sets of values
• It will be used to compare individual values	• The message is contained in the shape of the values (e.g., patterns, trends, exceptions)
• Precise values are required	
• Quantitative values include more than one unit of measure	
• Both detail and summary values are included	

Adapted from:

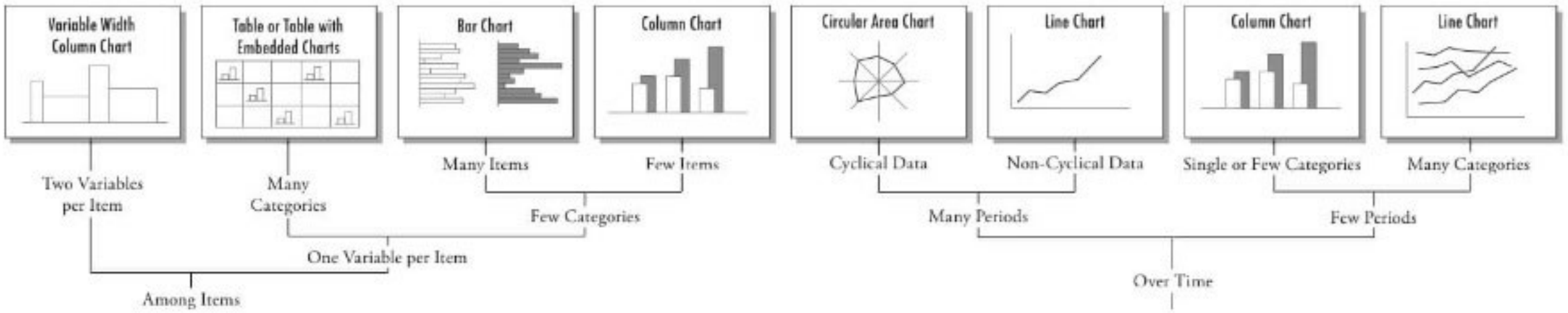
Few, Stephen. (2012). *Show Me the Numbers: Designing Tables and Graphs to Enlighten.*(4)57

Chart Suggestions—A Thought-Starter



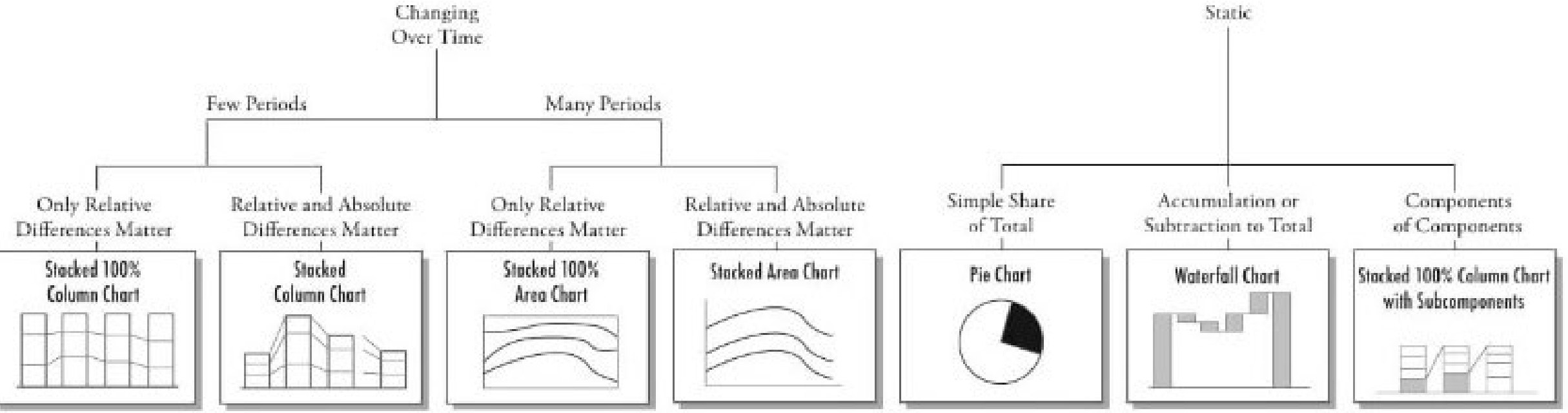
Author - Andrew V Abela Source -- http://extremepresentation.typepad.com/files/choosing-a-good-chart-09.pdf

Comparison* – bigger, more expensive

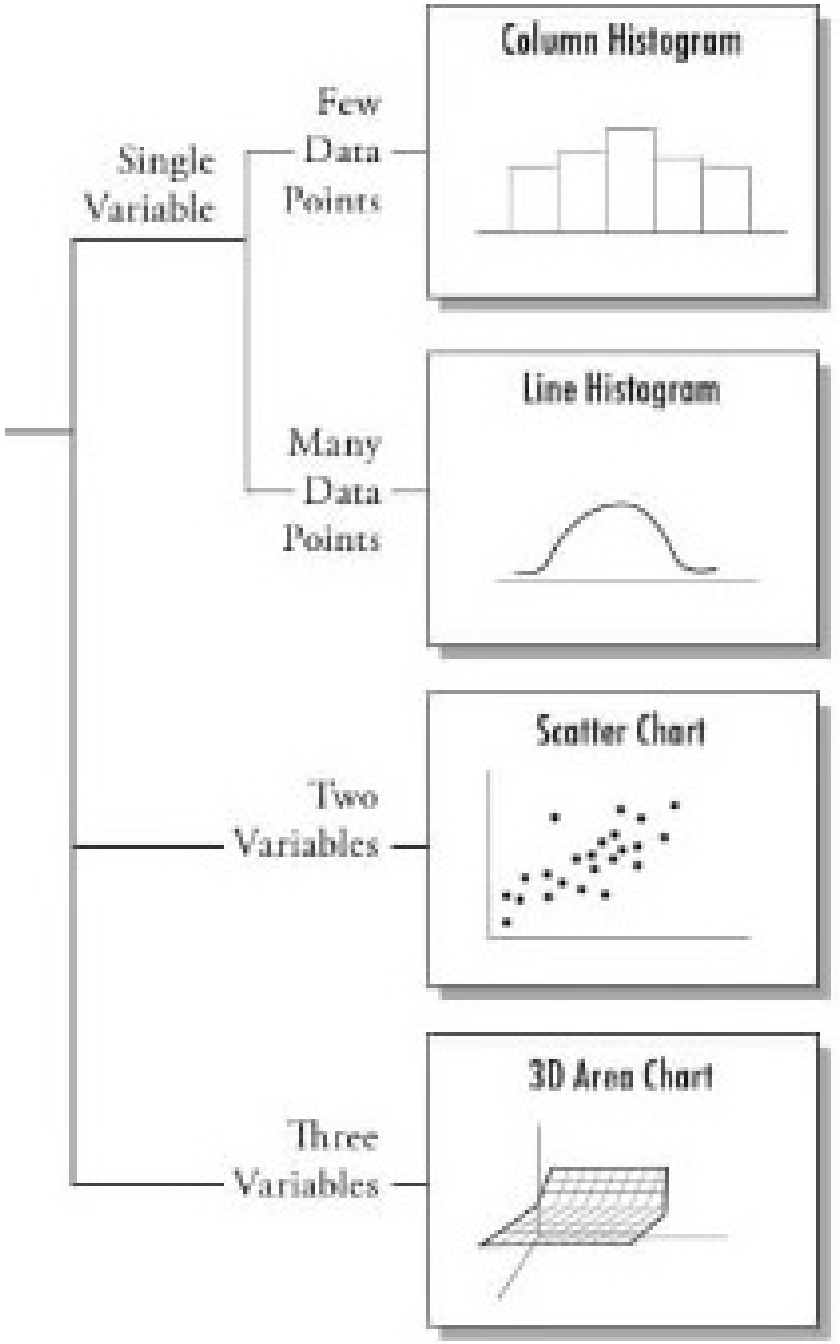


(*to a certain extent almost all graphs involve comparison at their heart)

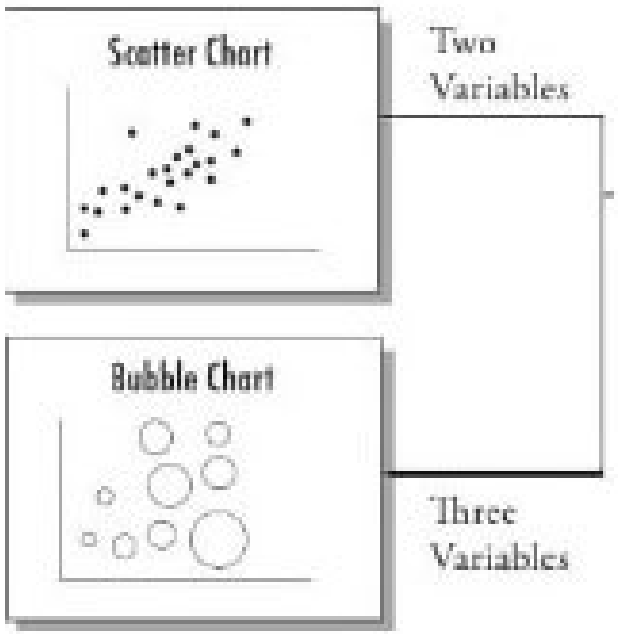
Composition: see the elements which make up the



Distribution
one variable vs another -
eg spend through time,
age and height,
salary and education level



Relationships
very similar to distribution.
eg GDP and infant mortality – perhaps over time, by country.
Also networks



Which Visualization? A Quick Reference

You have the following data (sample):
Discrete Categories,
Ordered categories,
and Continuous Metrics

Here's how to plot them

Categories		*Ordered Cats*		*Continuous Metrics*			
City	Airline	Class	PriceBracket	Month	Distance	FlightTime	Price
Alphaville	XeroTrip	Coach	$	1	300	120	250
Betastan	YoloFly	Business	$$	2	500	185	1,525
Chicago	ZeusAir	First	$$$	3	650	240	4,023
…	…	…	…	…	…	…	…

Discrete Categories ***Ordered Categories*** ***Continuous Metrics***

Metric, grouped by 1 category

Bar (Row)

Sideways layout means readable labels

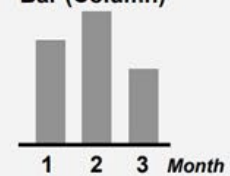
Dot Plot

Benchmark Bar

Bar (Column)

Histogram. Boxes help convey the underlying bins

Bar (Column)

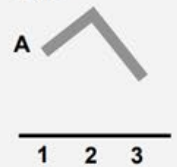


Increasing values move horizontally. So use Column, not Row

Area

Adds continuity to x-axis.

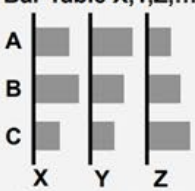
Line



A non-zero y-axis base may be less misleading here

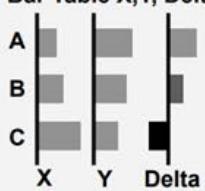
… by 2 categories

Bar Table X,Y,Z,…



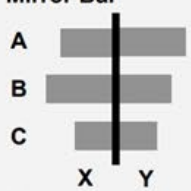
Compare X to Y to Z, 'Small multiples'. Please use this more

Bar Table X,Y, Delta



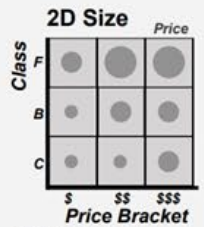
Comparisons are slow. Plot critical Deltas explicitly

Mirror Bar



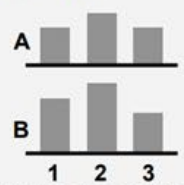
Compare X to Y, leverages human symmetry perception

2D Size



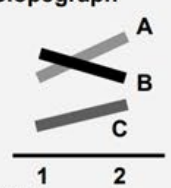
2D Bubble

Bar Table



Compare a metric across an ordered category

Slopegraph

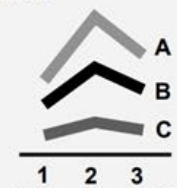


With two values, slope encodes delta

Dual Axis

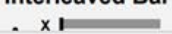
Use (below) instead. Crossings here are salient + meaningless

Lines

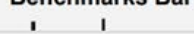


Getting spaghetti? Split into subset or Line-Table (below)

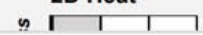
Interleaved Bar



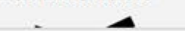
Benchmarks Bar



2D Heat



Bar Line Table



Line Table