

# Data Storytelling

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Data Storytelling or Data Narrative is the art  
of telling stories with data

# *The Importance of Data Storytelling*



Data storytelling is about more than just communicating data



Good data storytelling requires a mix of art and science



Art comes in finding the right story, while science understands how to use data to support that story

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# *Why Should You Use Data Storytelling?*



Focus on the message you want to communicate and make data more understandable and relatable



Communicate your findings to others in a way that is clear and convincing



Connect with your audience on an emotional level, which makes them more likely to take action



Make better decisions by helping you understand your data more deeply

# How Is Data Storytelling Different From Data Visualization?

Data visualization is primarily concerned with **presenting data** in a way that is easy to understand, usually through charts and graphs

Data storytelling helps analysts to communicate their findings in a way that is both **engaging** and **informative**, while also helping the audience understand a problem in a new way and see the potential solutions more clearly



Actors involved in a data story


**DATA**



**DATA  
STORYTELLER**



**AUDIENCE**



## DATA STORYTELLER



Analyzes Data



Communicates a message to the audience



Storyteller



**INFORMING**



Audience

\* Effective Data Storytelling by **Brent Dykes**, 2020, Wiley



Storyteller



Audience

**COMMUNICATING**

\* Effective Data Storytelling by **Brent Dykes**, 2020, Wiley

# Who is the audience?

Identify the audience

- **Geographic location** (target country, region, city, or neighborhood)
- **Demographic information** (age, gender, income, occupation, education level, and family size)
- **Psychographic factors** (personality type, values, interests, and lifestyle)
- **Behavioral factors** (purchase history, web browsing behavior, and media consumption habits)
- **Knowledge level** on the topic being presented (whether they are experts or not)

# Your story is for your Audience

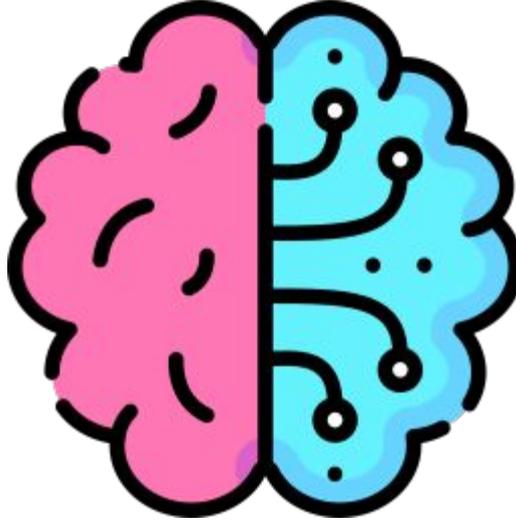
Purpose of your story:

- Entertaining the audience
- Informing the audience
- Teaching something to the audience.

**The effect of your story should be calling the audience to action!**

## **EMOTIONS**

Includes sentiments  
and emotions.



## **LOGIC**

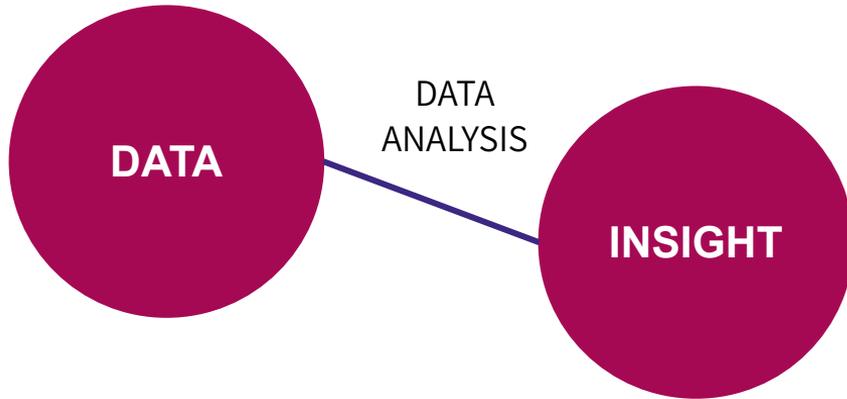
Includes reasoning  
and thoughts

When you build a story, consider both logic and emotions!

# The DIKW Pyramid

Data Storytelling is communicating insights in a way that  
inspires the audience to act.

Data Storytelling is communicating **insights** that inspires the audience to act.



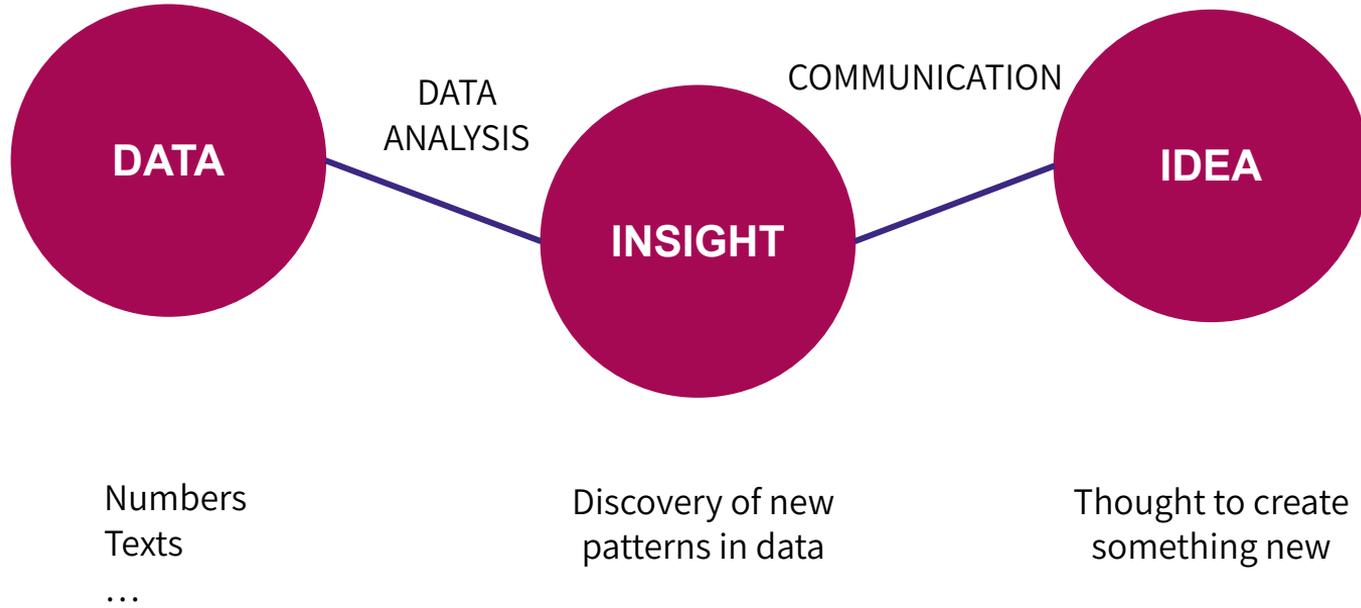
Numbers  
Texts  
...

Discovery of new  
patterns in data

Insight **IS NOT**  
data

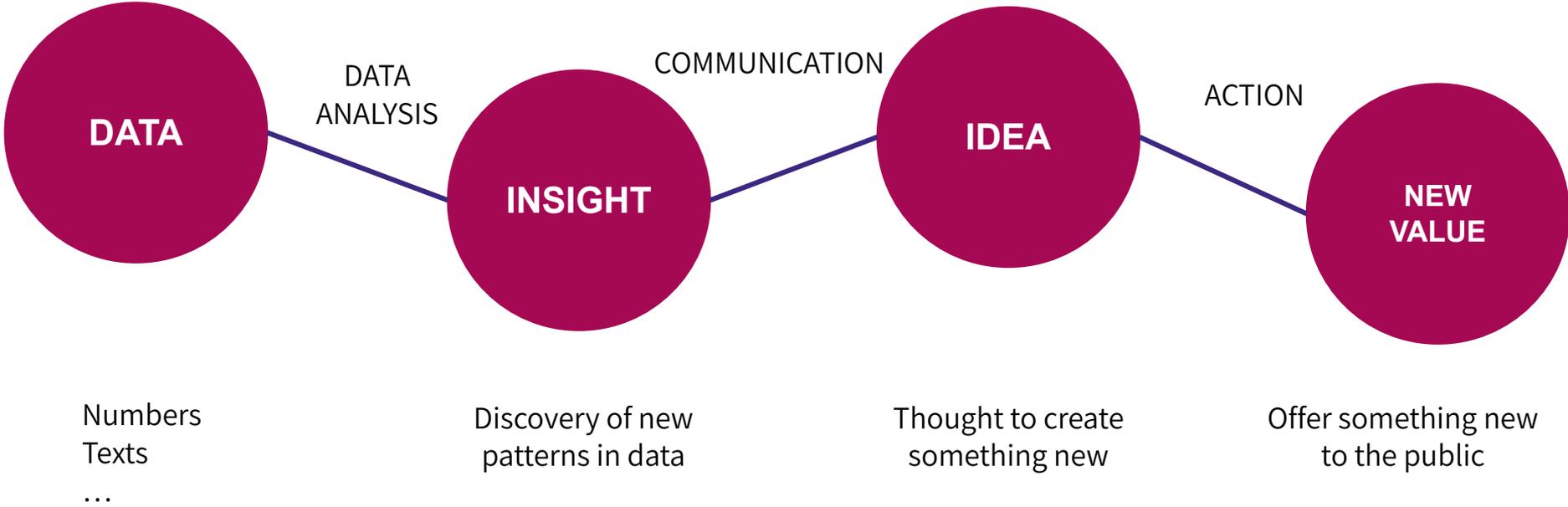
Insight **IS NOT**  
intuition

Data Storytelling is **communicating** insights in a way that inspires the audience to act.

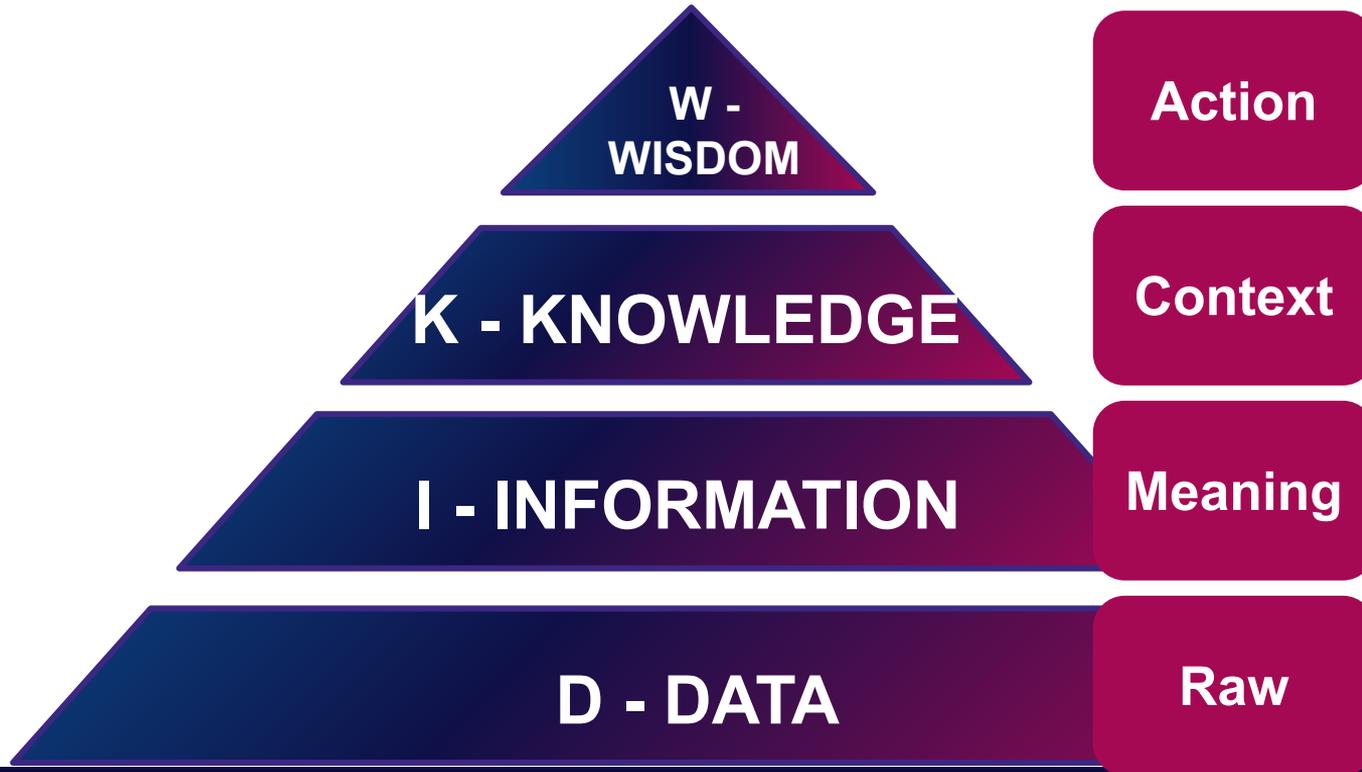


Communicating  
**IS NOT**  
Informing

Data Storytelling is communicating insights in a way that inspires the audience to **act**.



# The **DIKW** Pyramid



\* **Introduction to Data Visualization & Storytelling: A Guide For The Data Scientist** by Jose Berengueres and Marybeth Sandell. Independently published, 2019

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## *Using the DIKW pyramid for Data Storytelling*



Data is the building block at the bottom of the pyramid



Information contains cleaned and filtered data, which contain something meaningful



Knowledge is information interpreted and understood through a context



Wisdom is the knowledge enriched with specific ethics that invites you to act in some way

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## *From Data to Information*



Who is the audience of my story?



What information do they want?



Are all the data relevant to answer the previous questions?

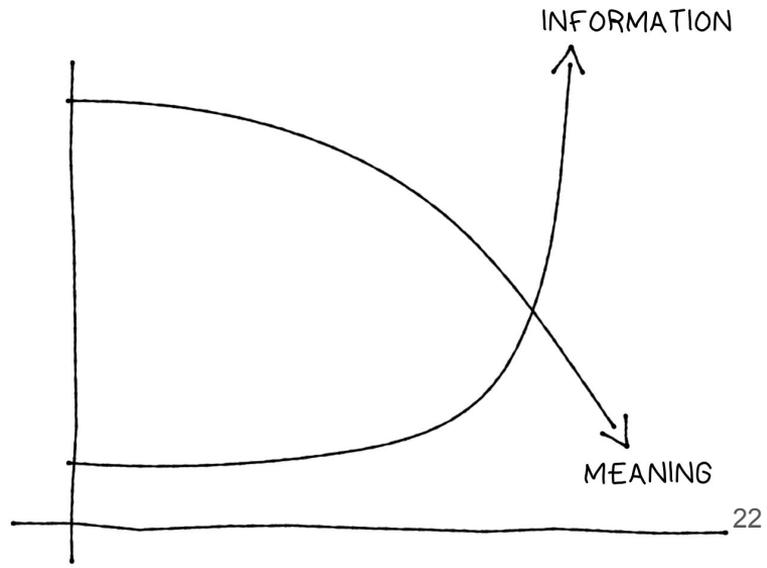
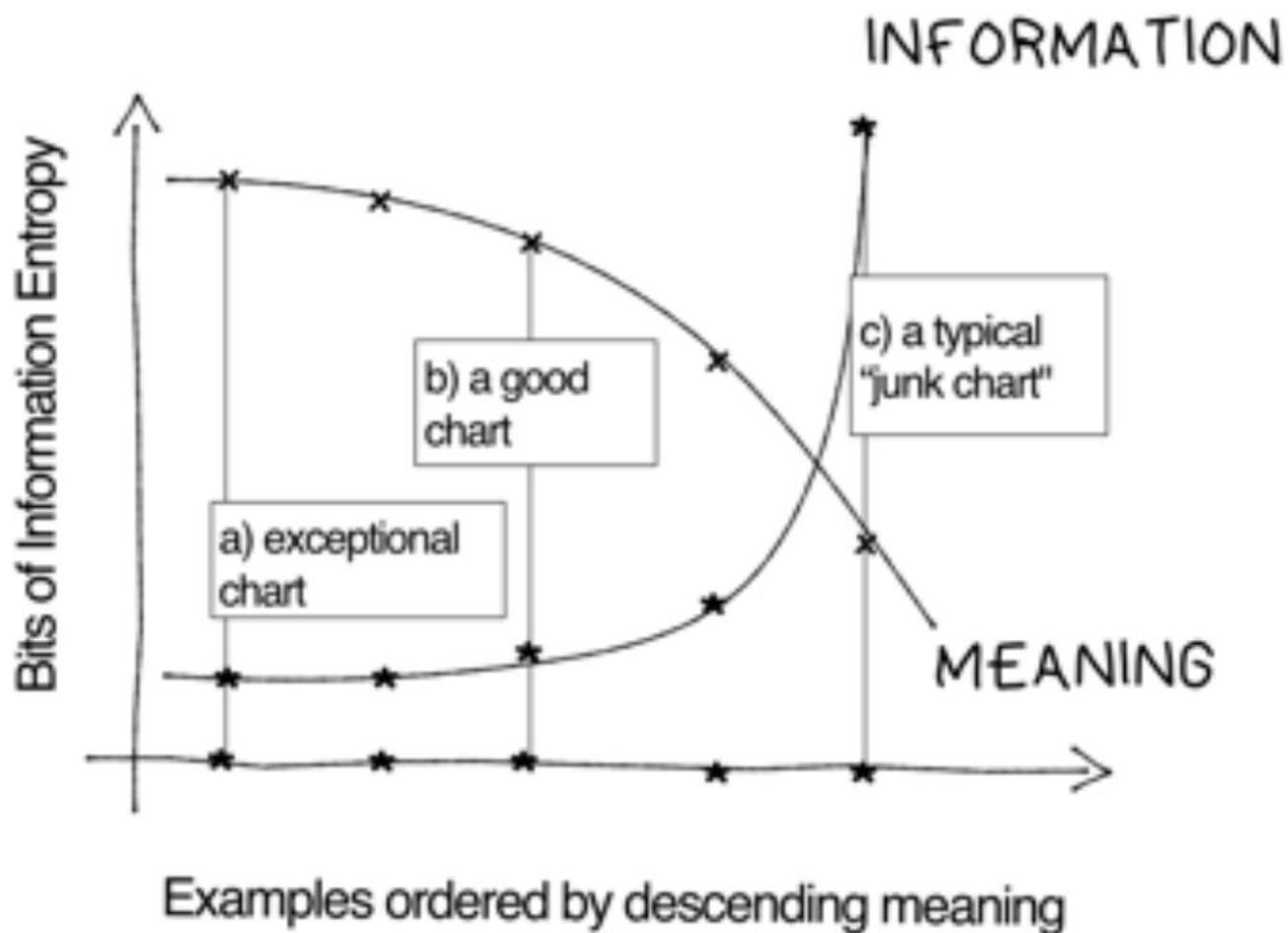


Exhibit A



## 2 possible strategies

**Focus on a single message** – If your message brings everything, it brings nothing.

**Simplify** – avoid all the details relating to the data and abstract the data as much as possible.

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## *From Information to Knowledge*



Add context. Context involves all circumstances around data, such as events, situations, etc.

# What is context?

- **Events** – something that happens.
- **Environment** – an external or internal constraint.
- **Time** – a chronological order in the data.

## 3 possible strategies to add a context

- Define communication goals
- Choose only information that permits to achieve your communication goals and remove all the other information.
- Add annotations

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# *From Knowledge to Wisdom*



What changes can we make?



What opportunities do we have?



What advantages does our story offer?



What scenarios can we outline?



What are some examples of scenarios?

# Call to action depends on the ethical evaluation framework

- **Virtues** – the best choice follows a set of predefined values.
- **Fairness** – the best choice optimizes equity.
- **Common good** – the best choice optimizes the well-being society.
- **Utilitarian** – the best choice optimizes global happiness.



Figure taken from "The A-Z of Social Justice Physical Education: Part 1",  
Journal of Physical Education Recreation & Dance 91

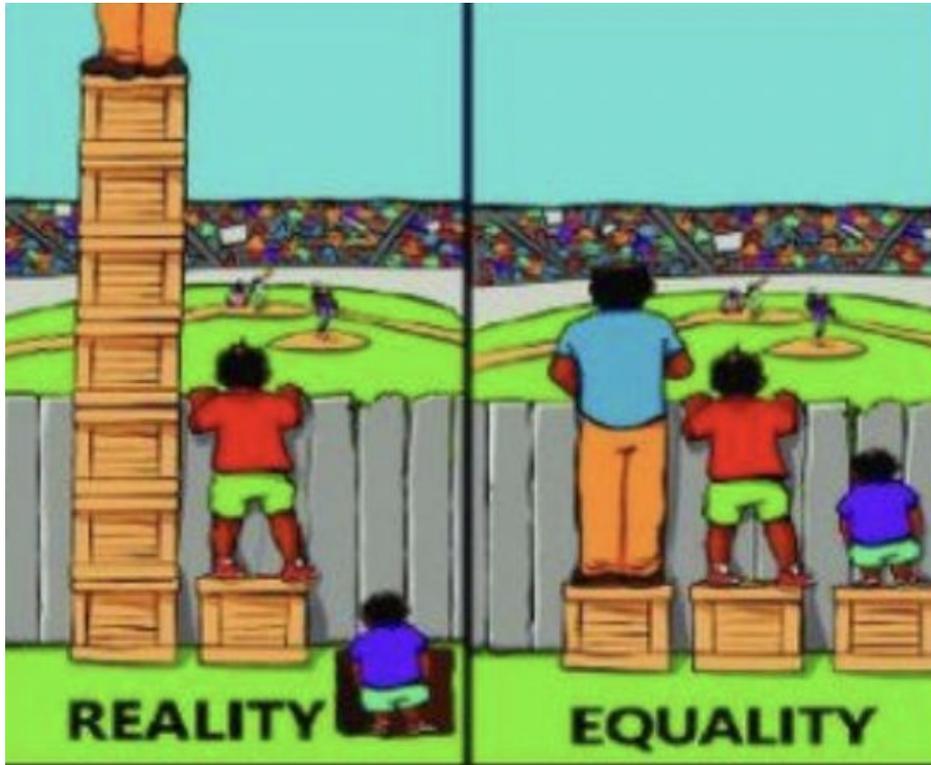


Figure taken from "The A-Z of Social Justice Physical Education: Part 1",  
Journal of Physical Education Recreation & Dance 91

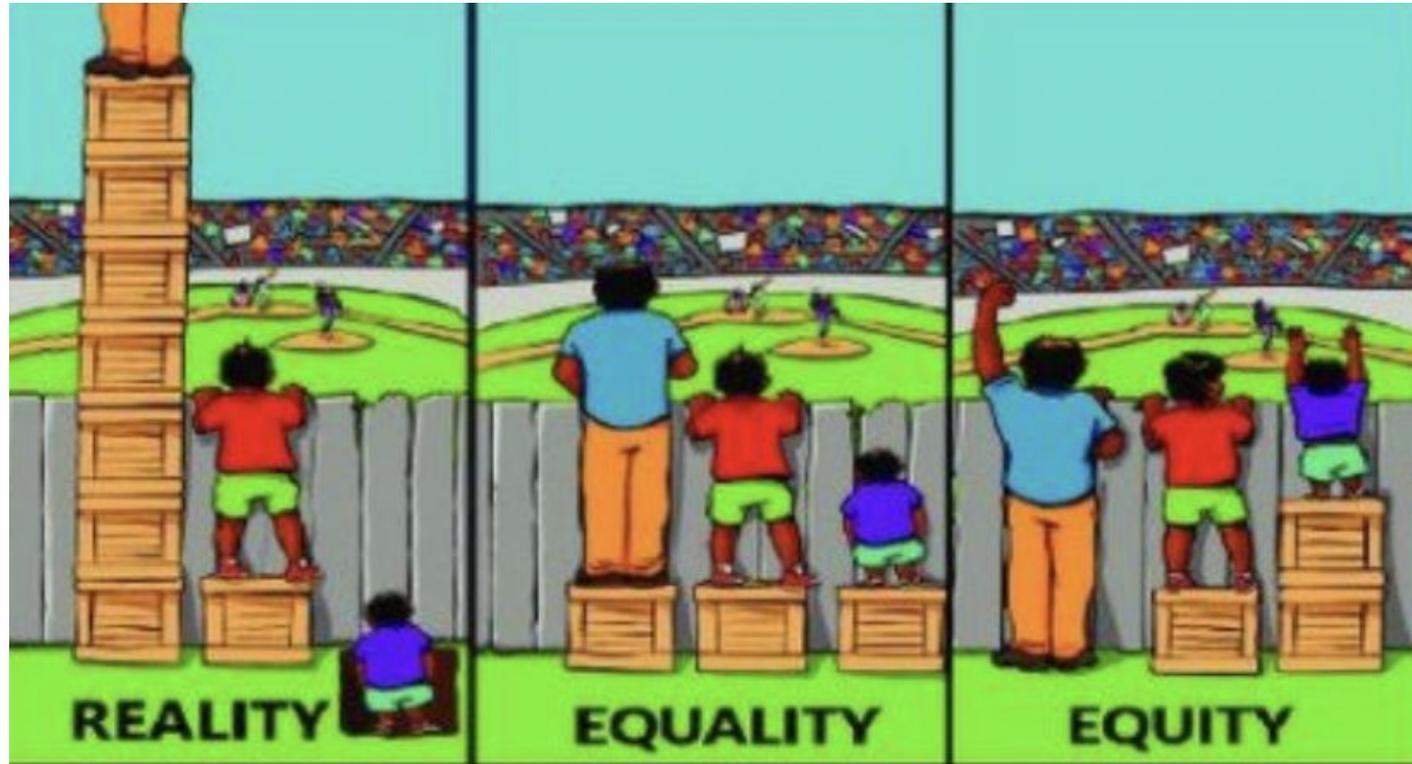


Figure taken from "The A-Z of Social Justice Physical Education: Part 1",  
Journal of Physical Education Recreation & Dance 91

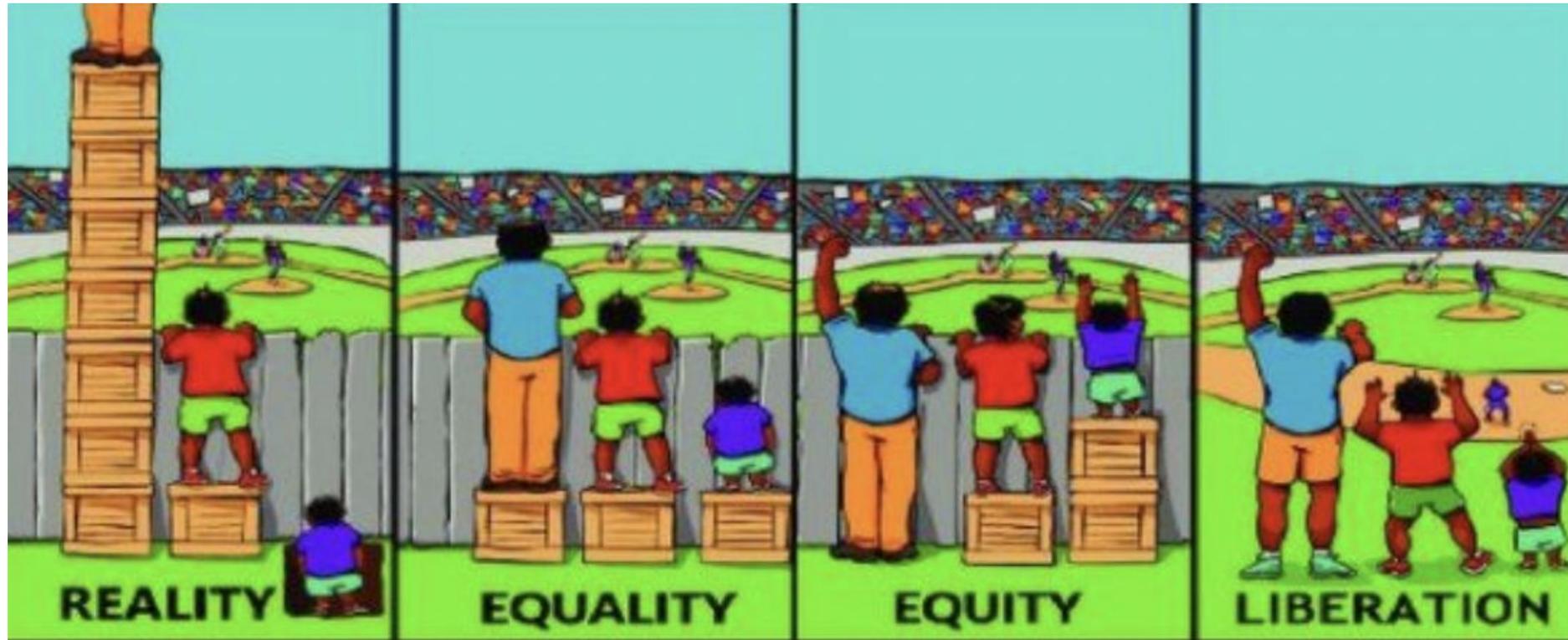


Figure taken from "The A-Z of Social Justice Physical Education: Part 1",  
Journal of Physical Education Recreation & Dance 91

Where are:

The Data ?

The Story ?

The Narrative ?

The call to action ?





# Example 1

Gender	Percentage
Male	78%
Female	21%
Prefer to not say	1%

**DATA:** Percentage of answers to a survey

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Male	78%
Female	21%
Prefer to not say	1%

**DATA:** Percentage of answers to a survey

Gender	Percentage
Male	78%
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**DATA:** Percentage of answers to a survey

Gender	Percentage
Male	80%
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**DATA:** Percentage of answers to a survey

Gender	Percentage
Male	80%
Female	20%



**DATA:** Percentage of answers to a survey

**INFORMATION:** Out of 5 people, 4 are men and one is a woman

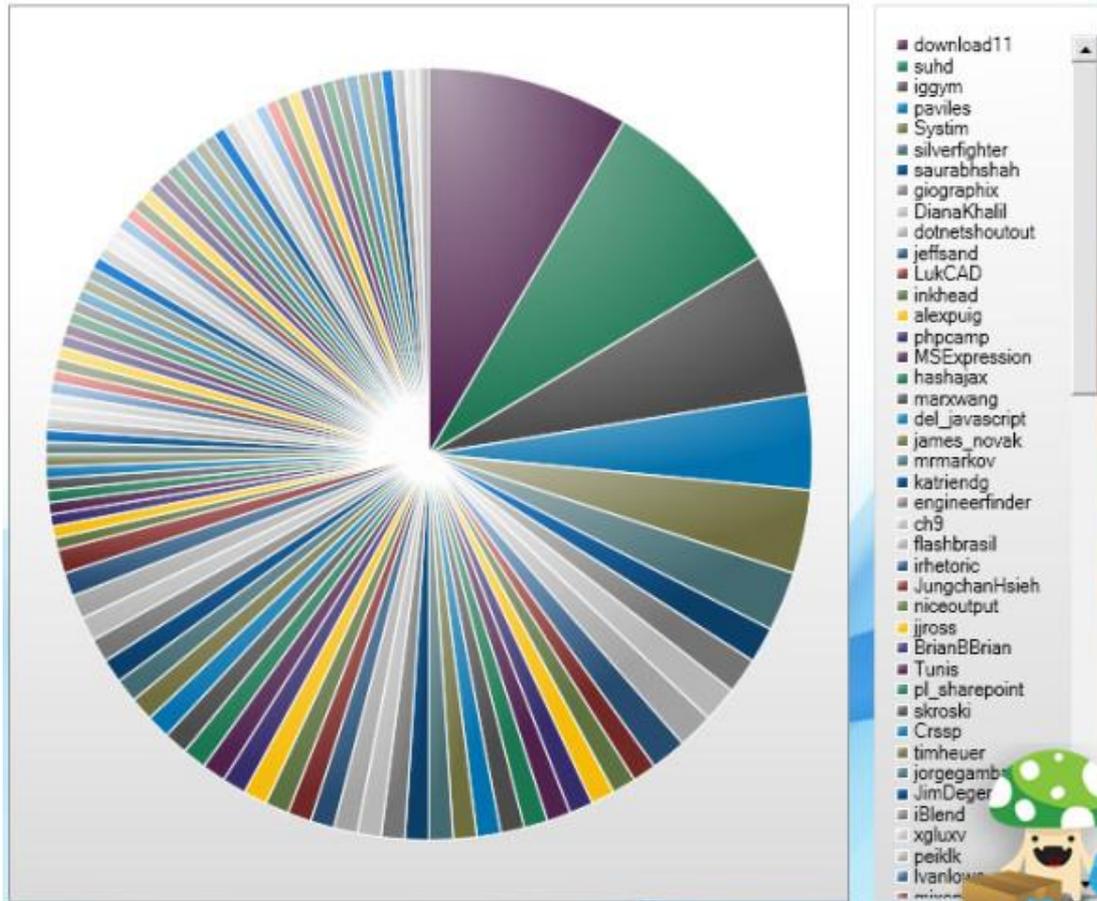
**WISDOM:** Give a reward to women participating in the survey.



**KNOWLEDGE:** At the time of the survey almost 50% of female employees were on maternity leave

# Example 2

# 100 Most Active Tweeters



Code

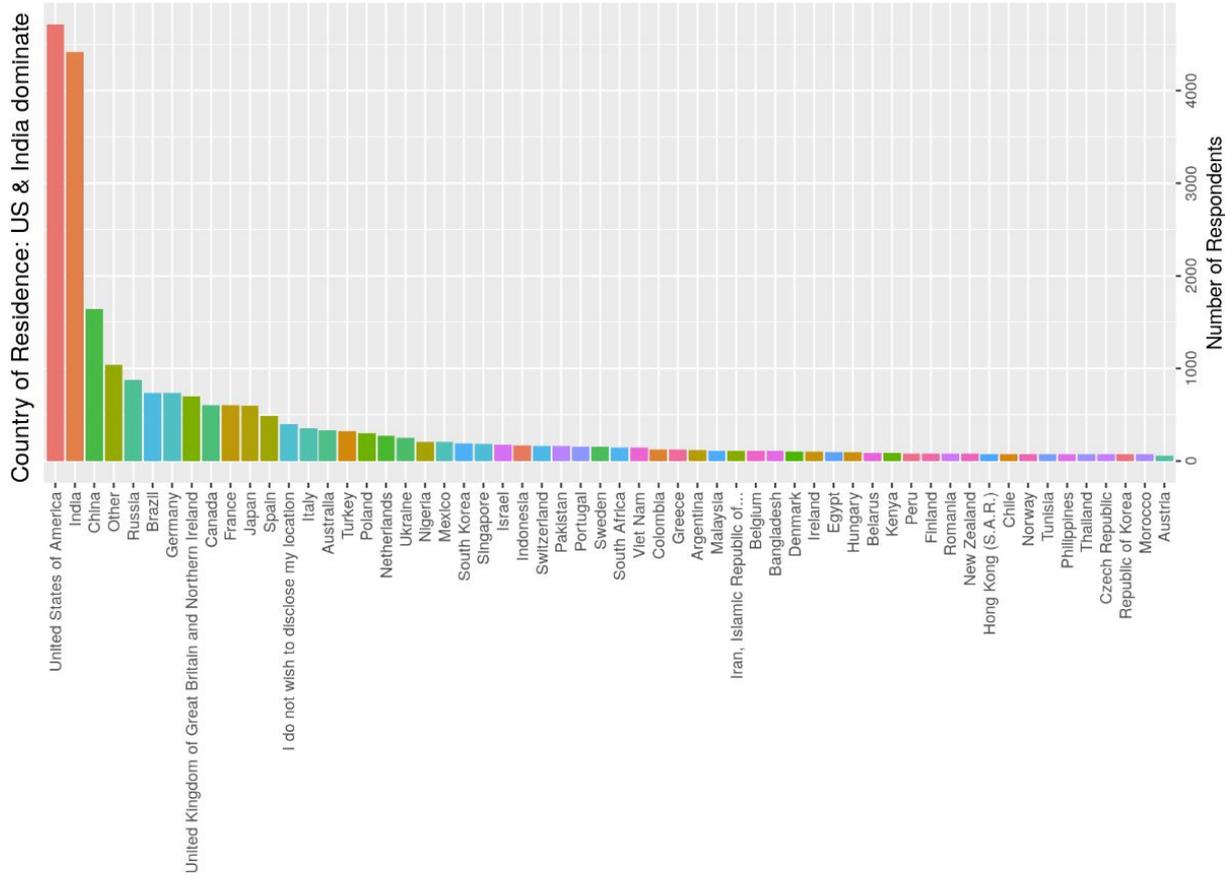
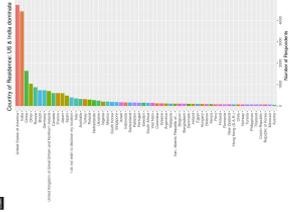


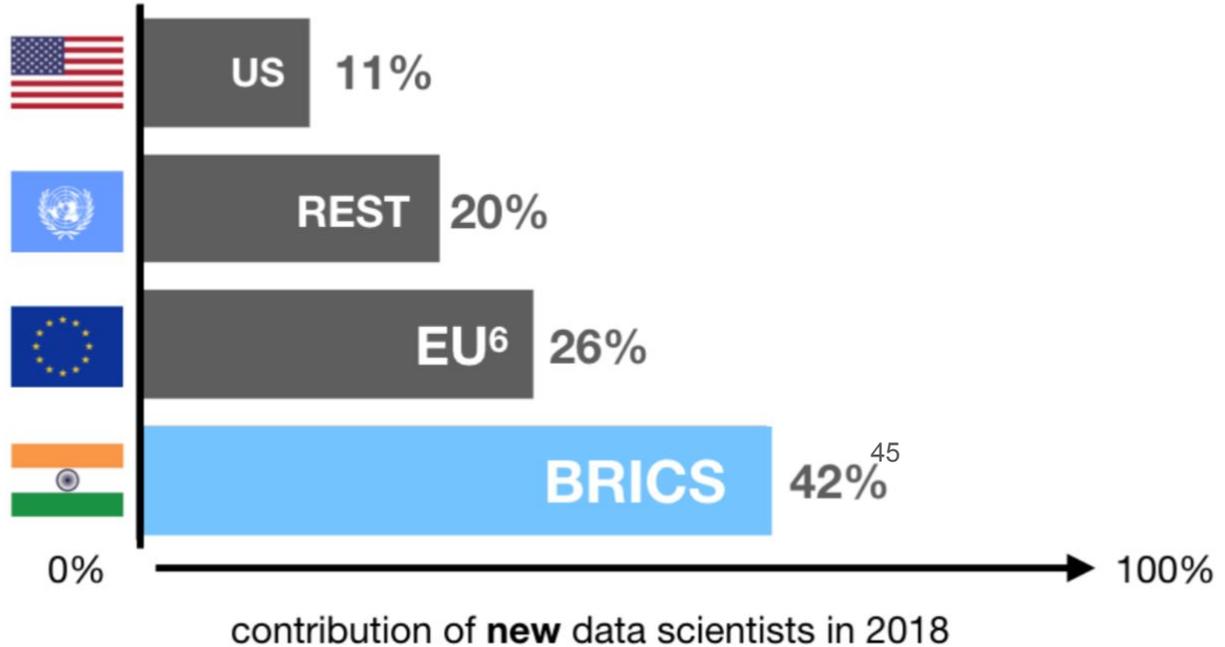
Fig. 5



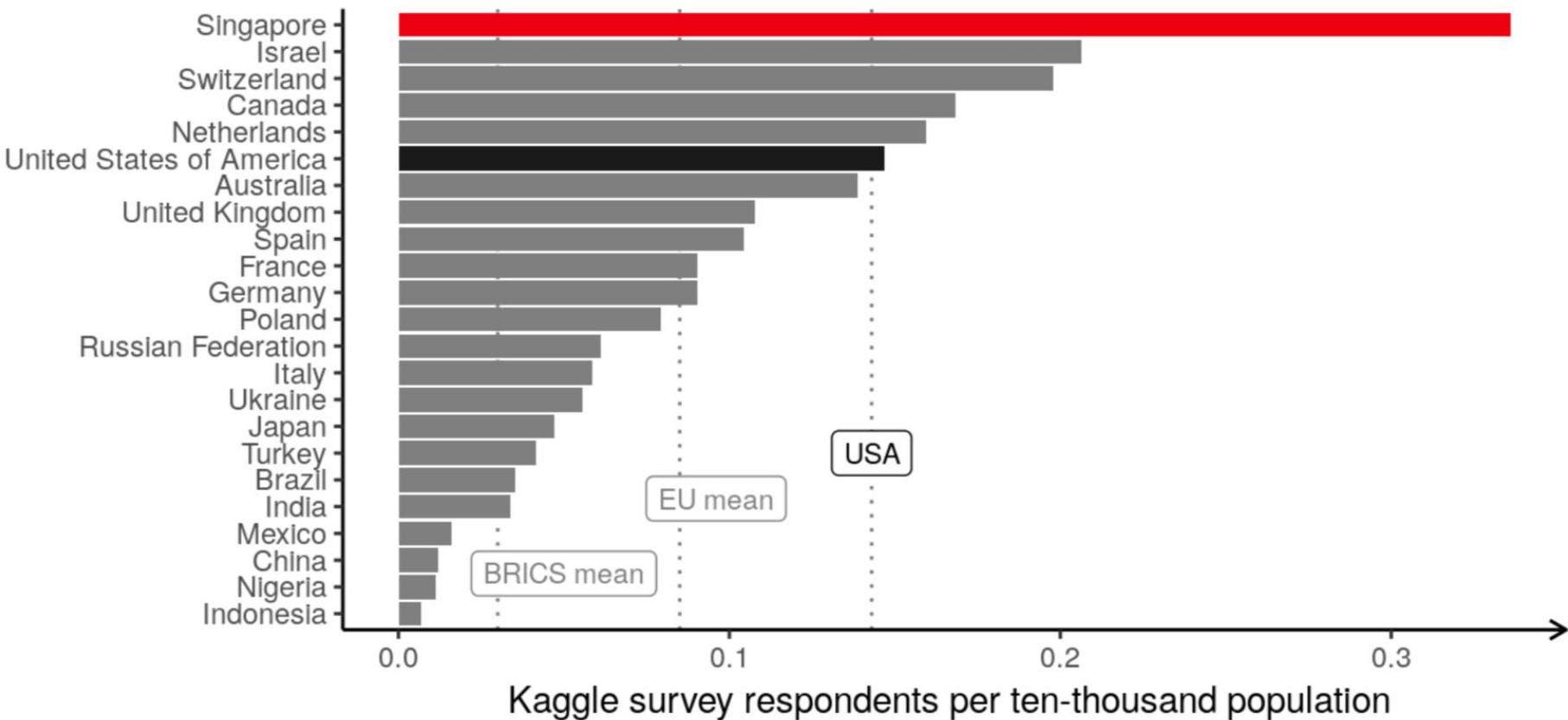
## Solution A



## BRICS growing faster than US, Europe



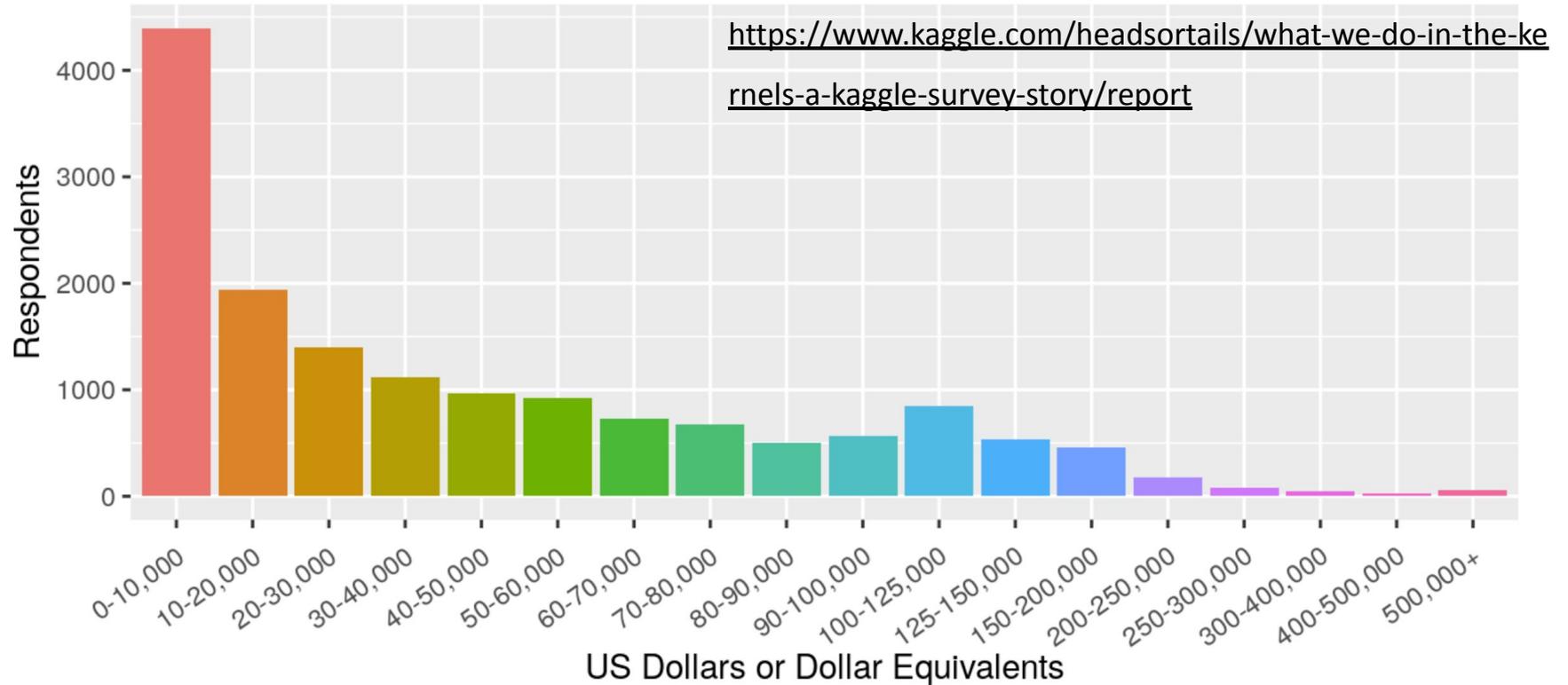
## Solution B

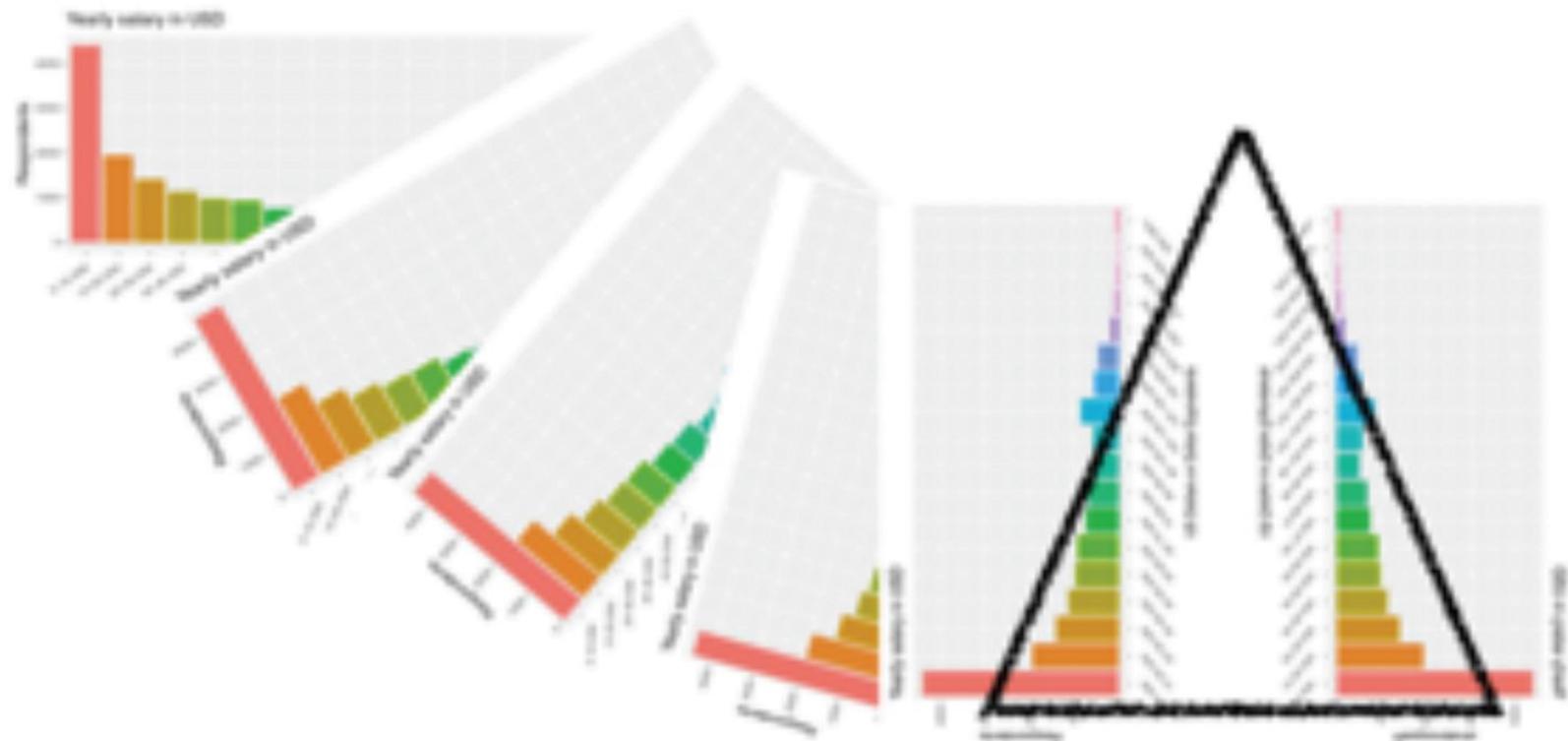


(Data scientist prevalence)

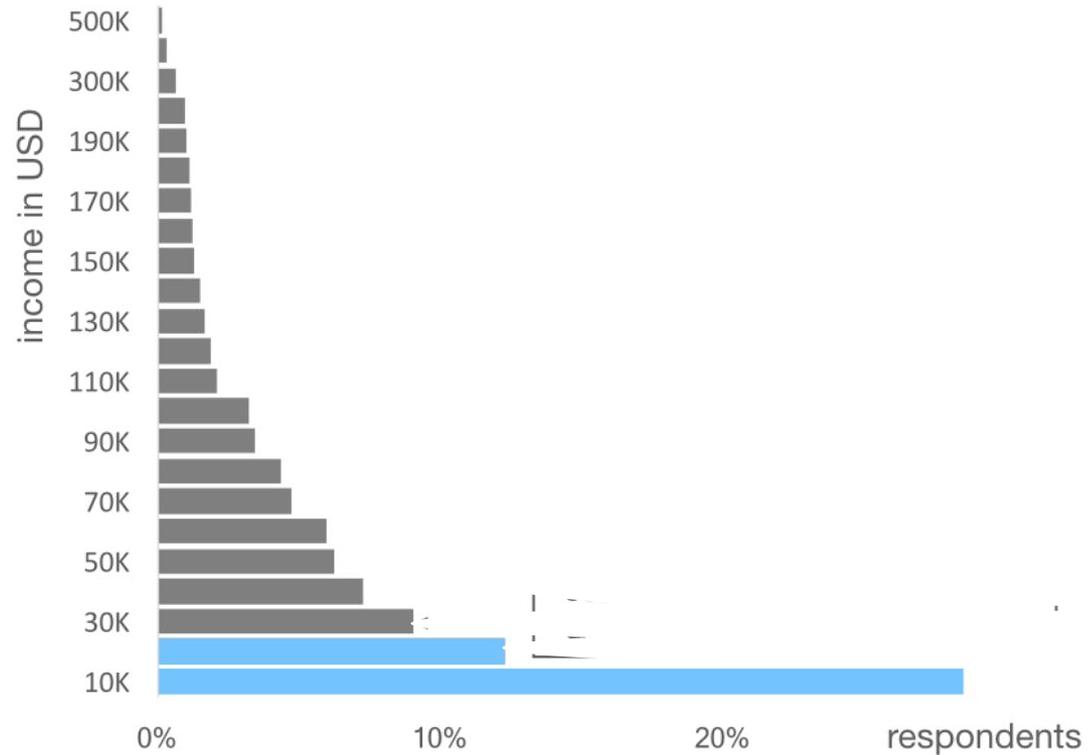
# Example 3

## Yearly salary in USD

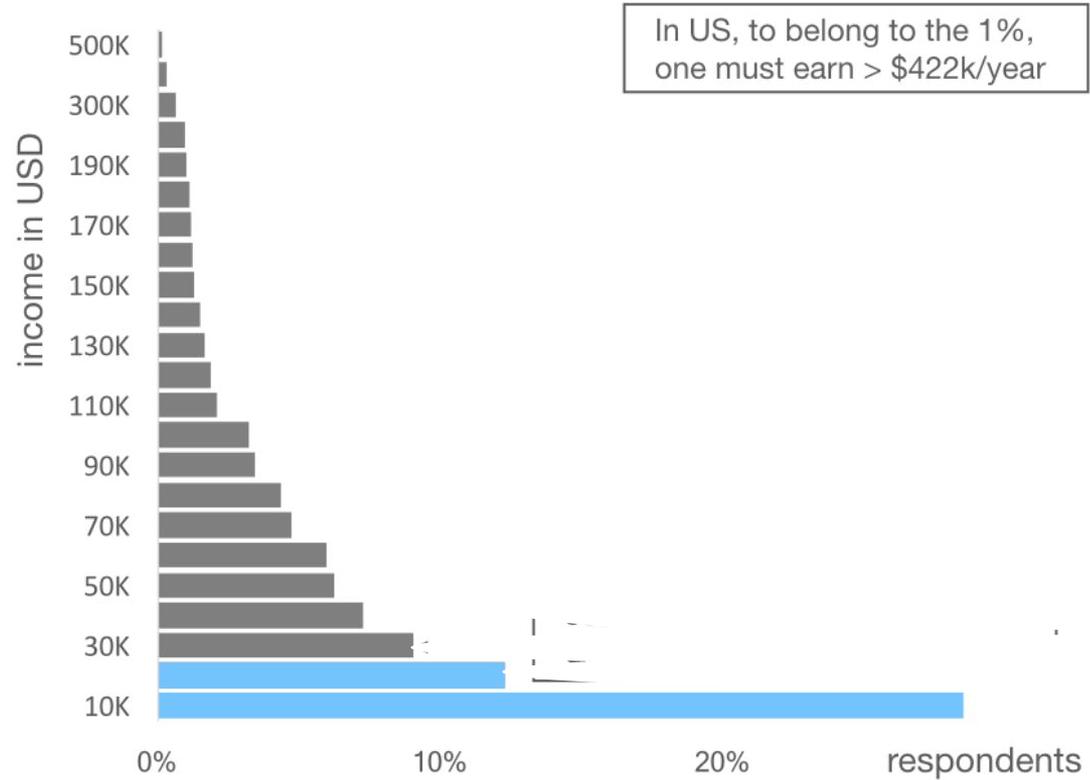




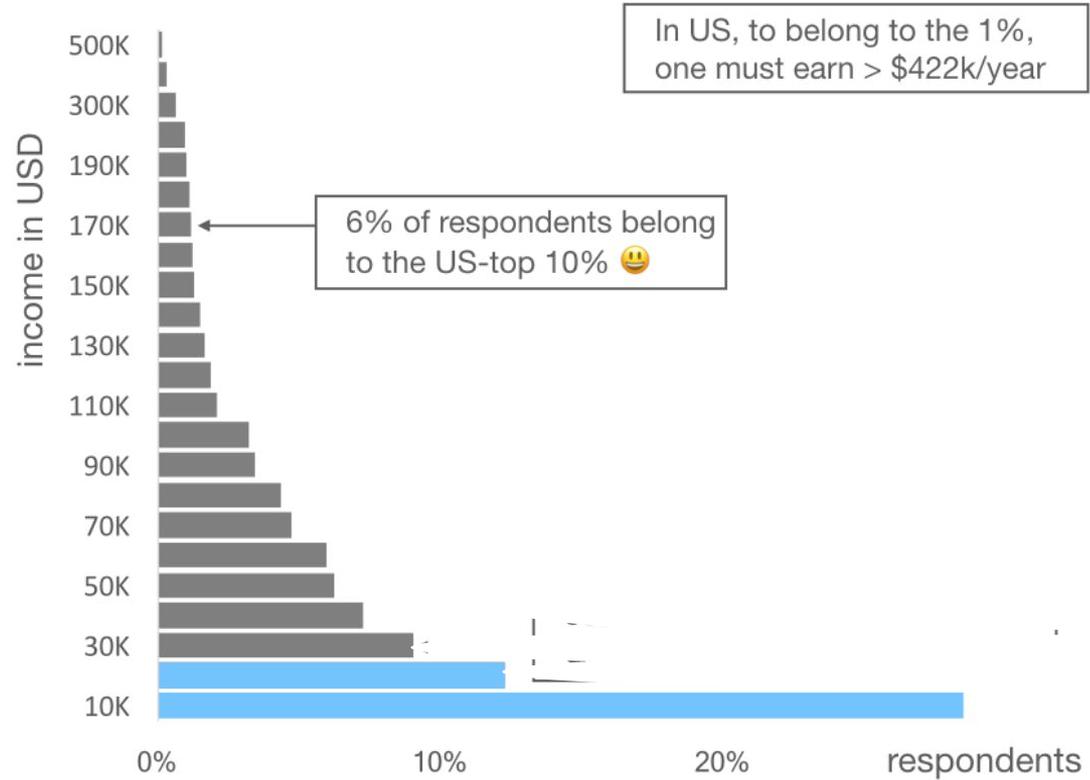
## Inclusion and income



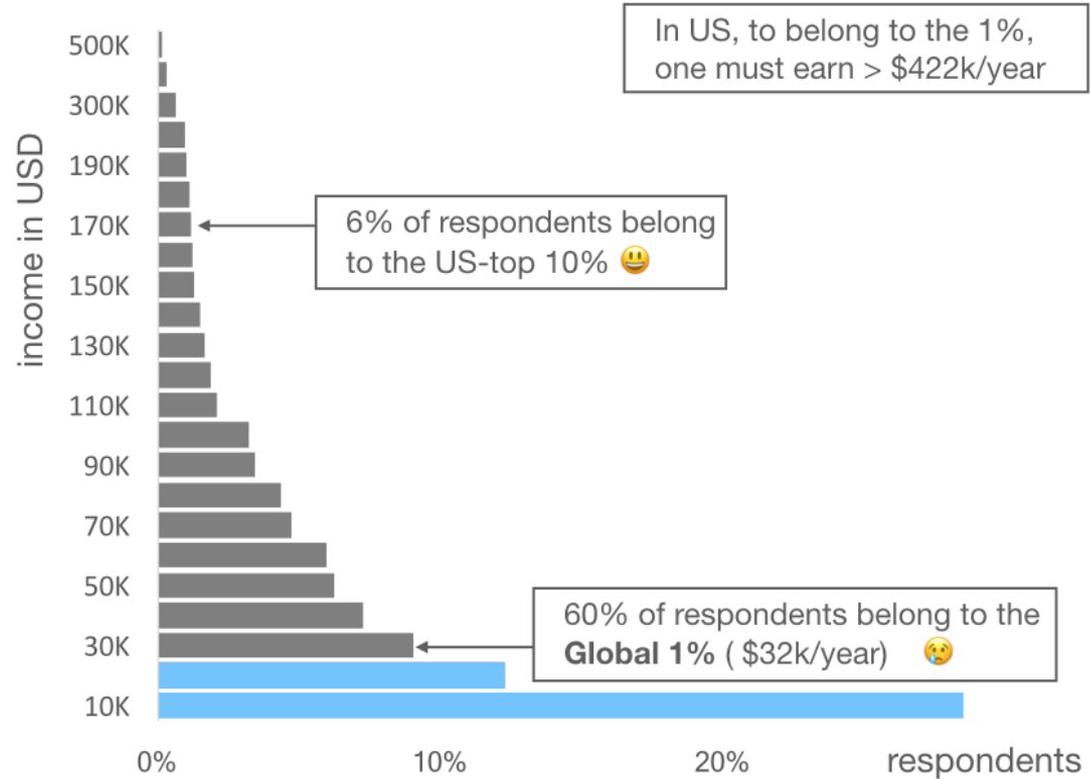
## Inclusion and income



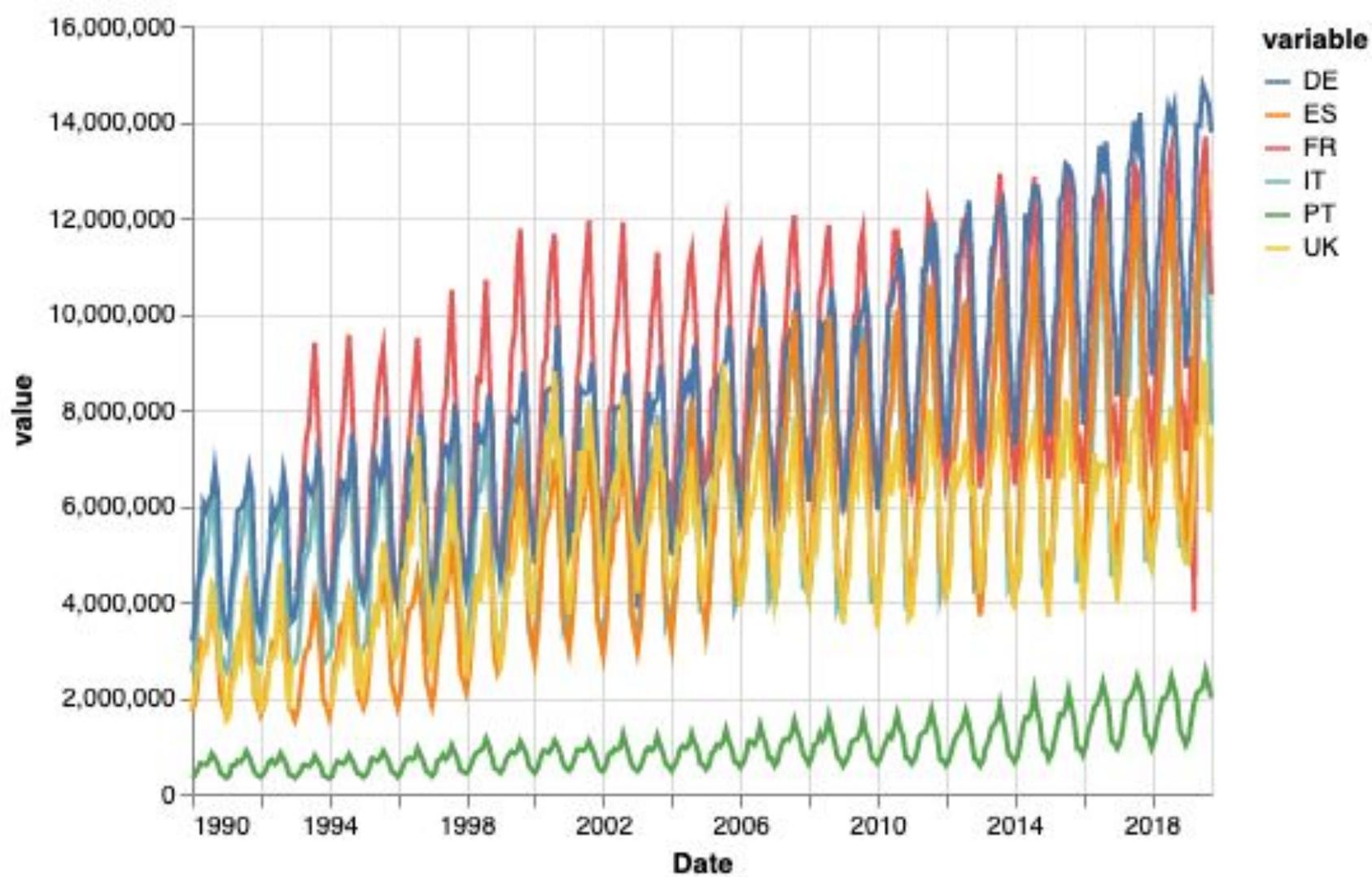
## Inclusion and income



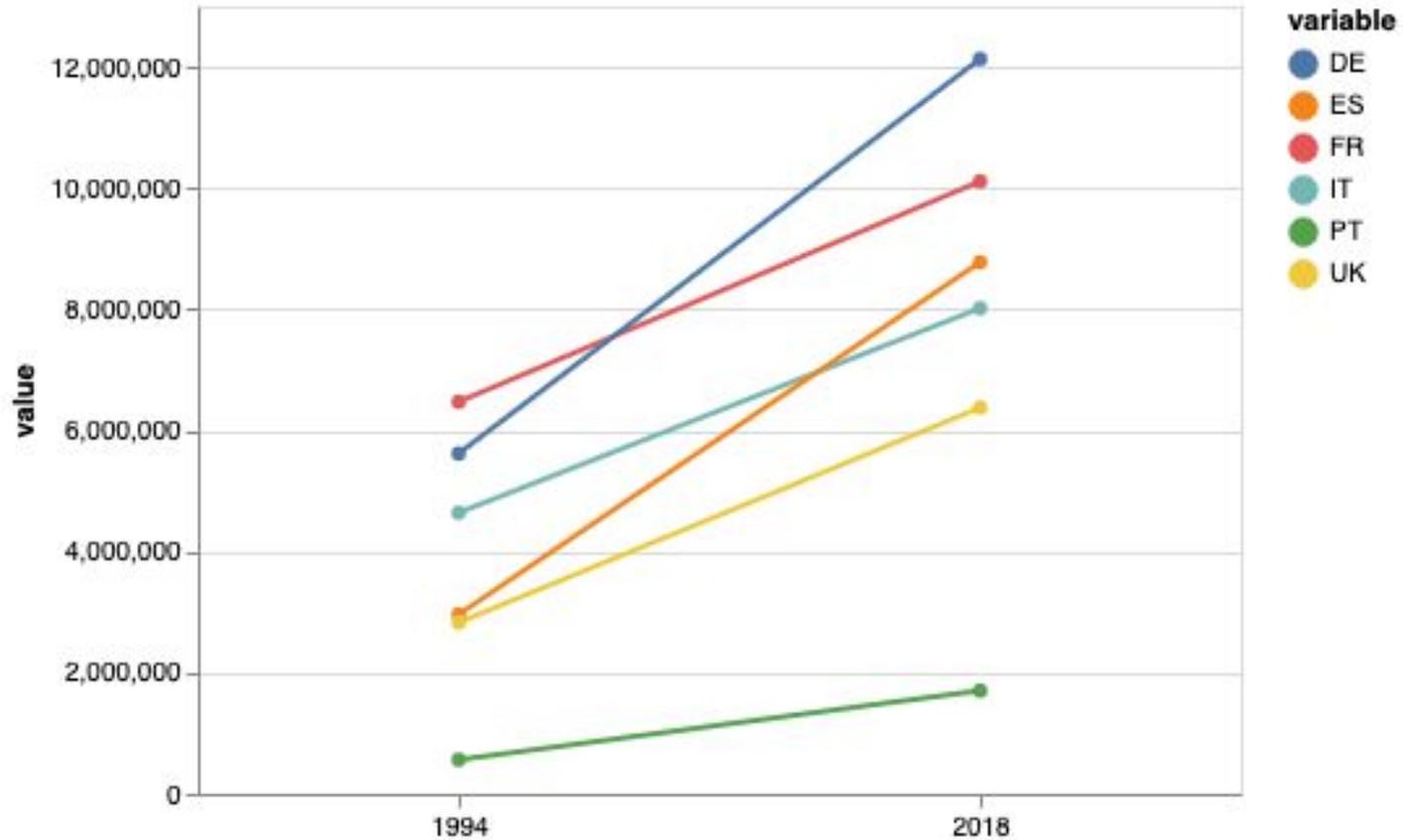
## Inclusion and income



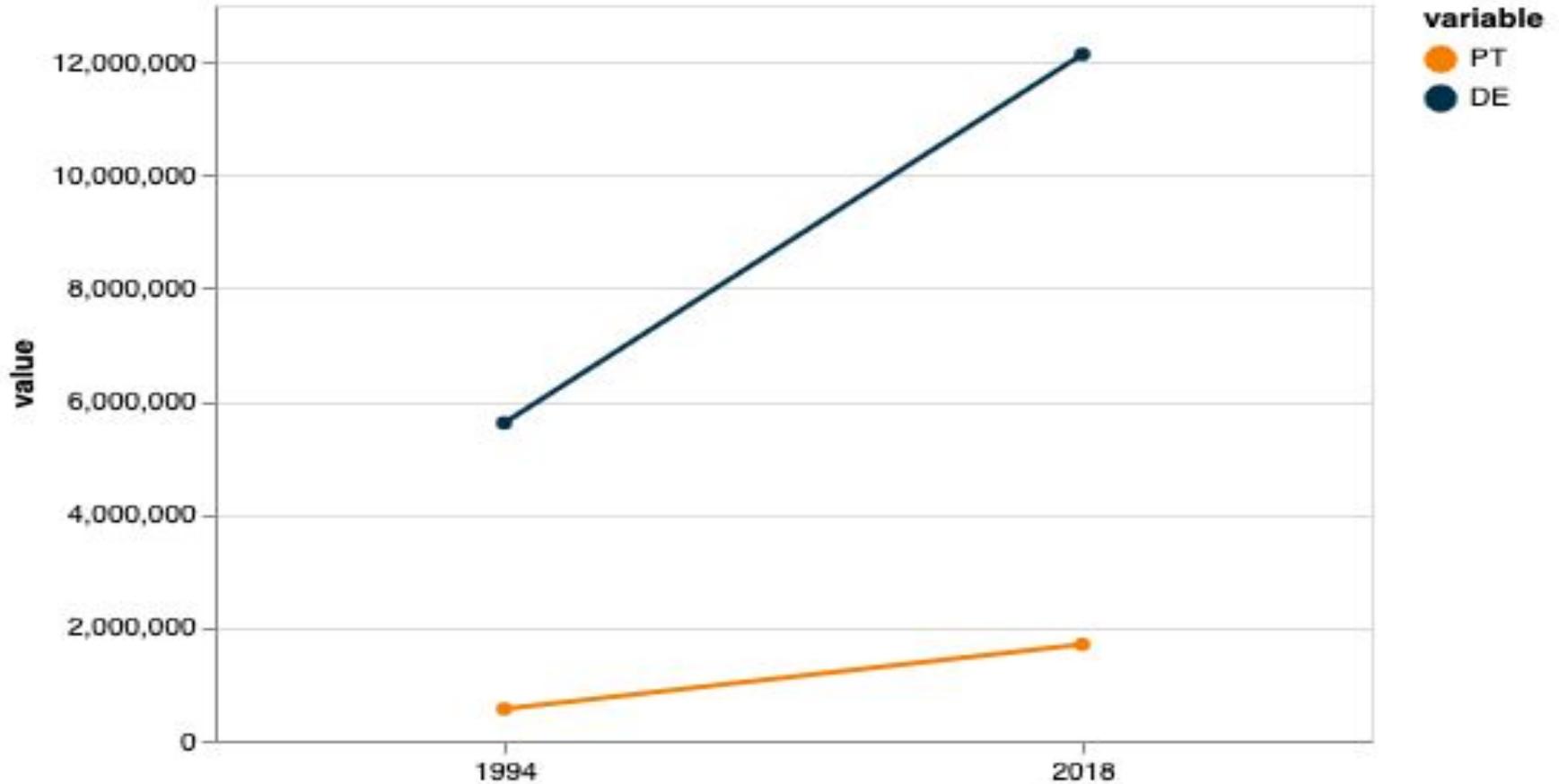
# Example 4



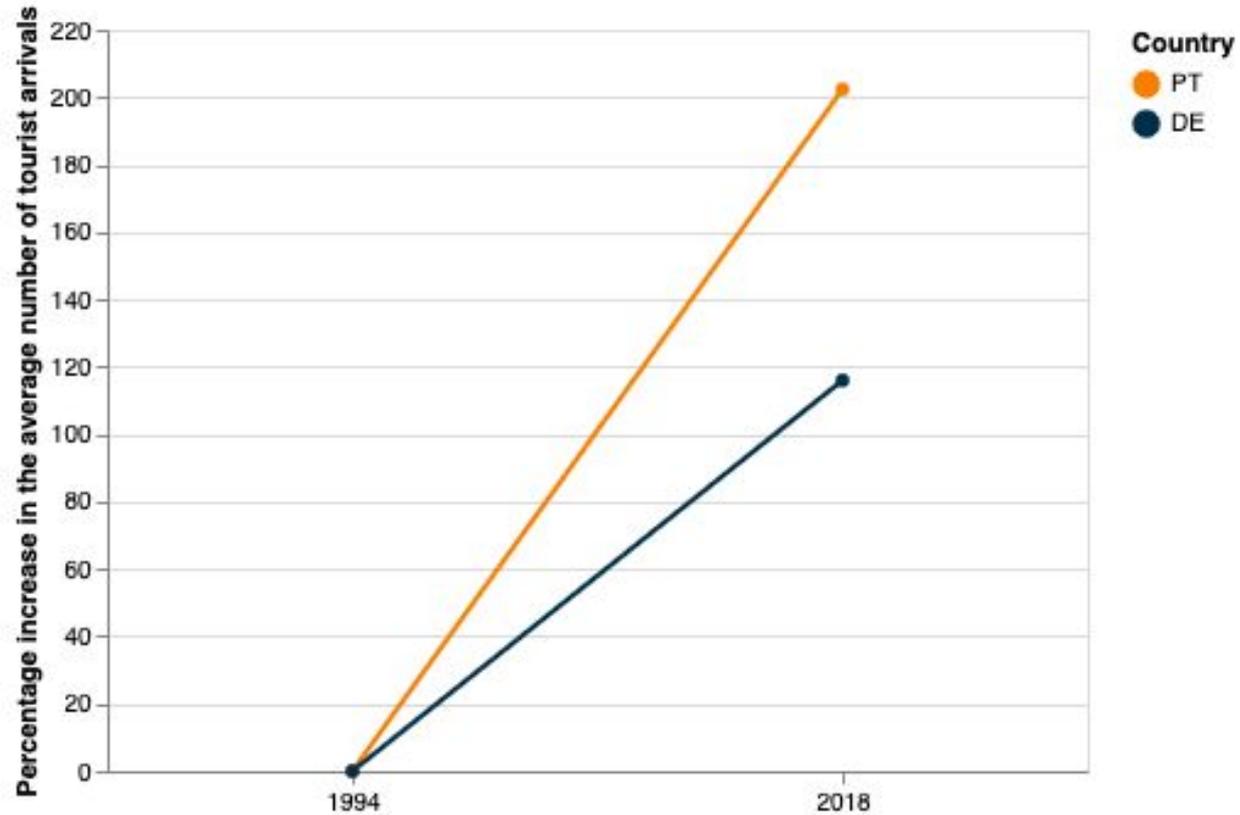
Consider only the first and the last year



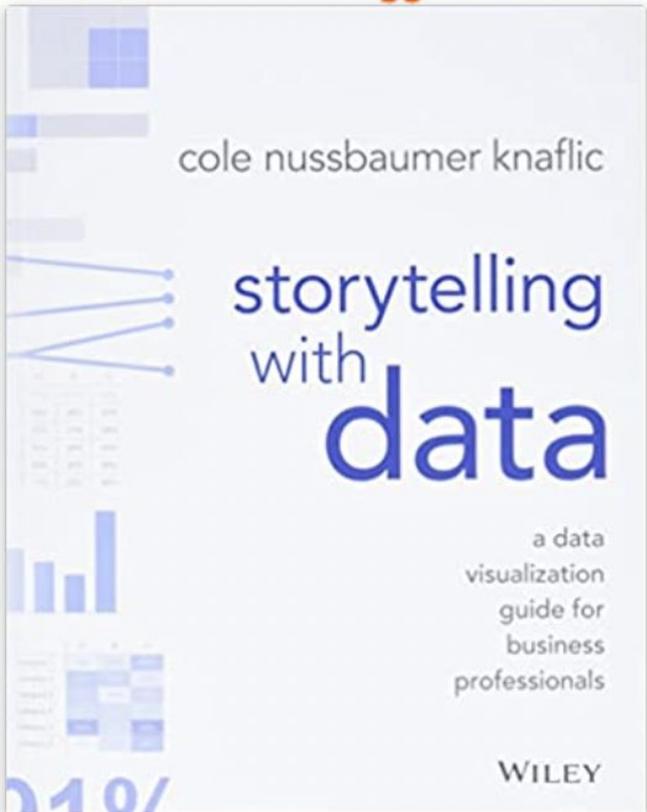
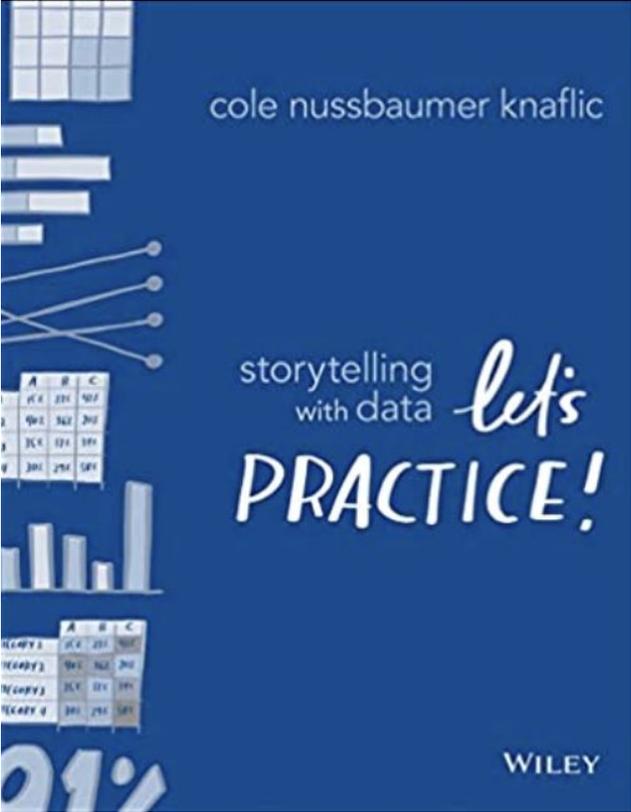
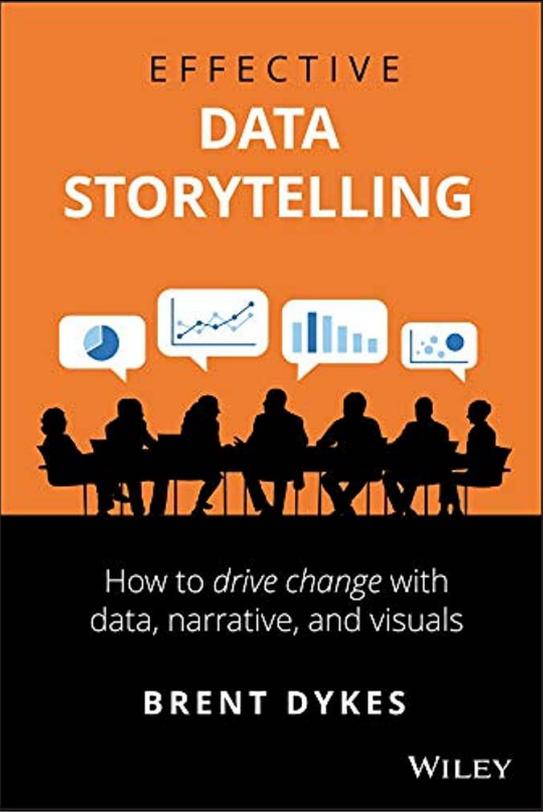
Focus only on a country (PT) and compare it with the best-performing country (DE)



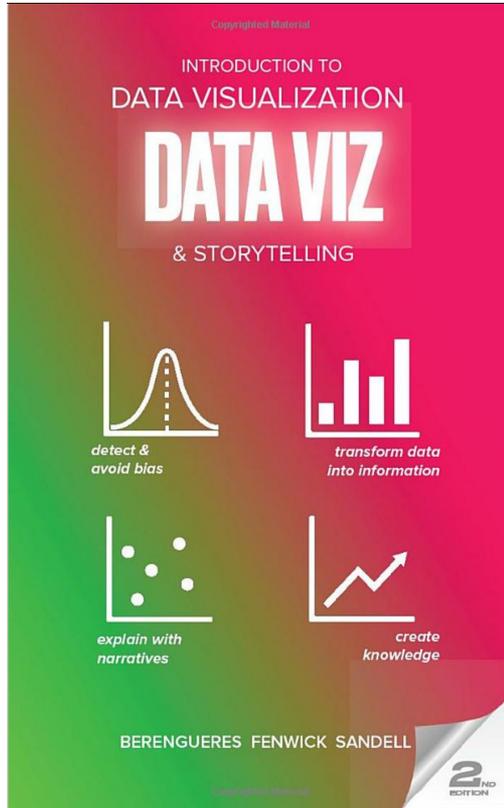
Calculate percentage increase from 1994



# References



# References



Andy Kriebel • Eva Murray



# #Makeover Monday

Improving How We Visualize and Analyze Data,  
One Chart at a Time

WILEY

# Interesting websites

- <https://www.storytellingwithdata.com/>
- <https://www.makeovermonday.co.uk/>