# Data Visualization

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Recommendation

- Do not obfuscate
    - Do not create something that is overly complex
    - Do not oversimplify, do not over complicate

- Be creative, but also be skeptical of creativity
    - Try to be extremely creative
   - Be careful with creativity

Do not over complicate

Brain Drain

- Can be extremely complex for a general reader
- Difficult to interpret information
- Being overly creative does not help in understanding the information
- Graphic forms used to represent the data should be less complicated
- Aesthetics are extremely dangerous in data visualization
- The visualization needs to be functional first
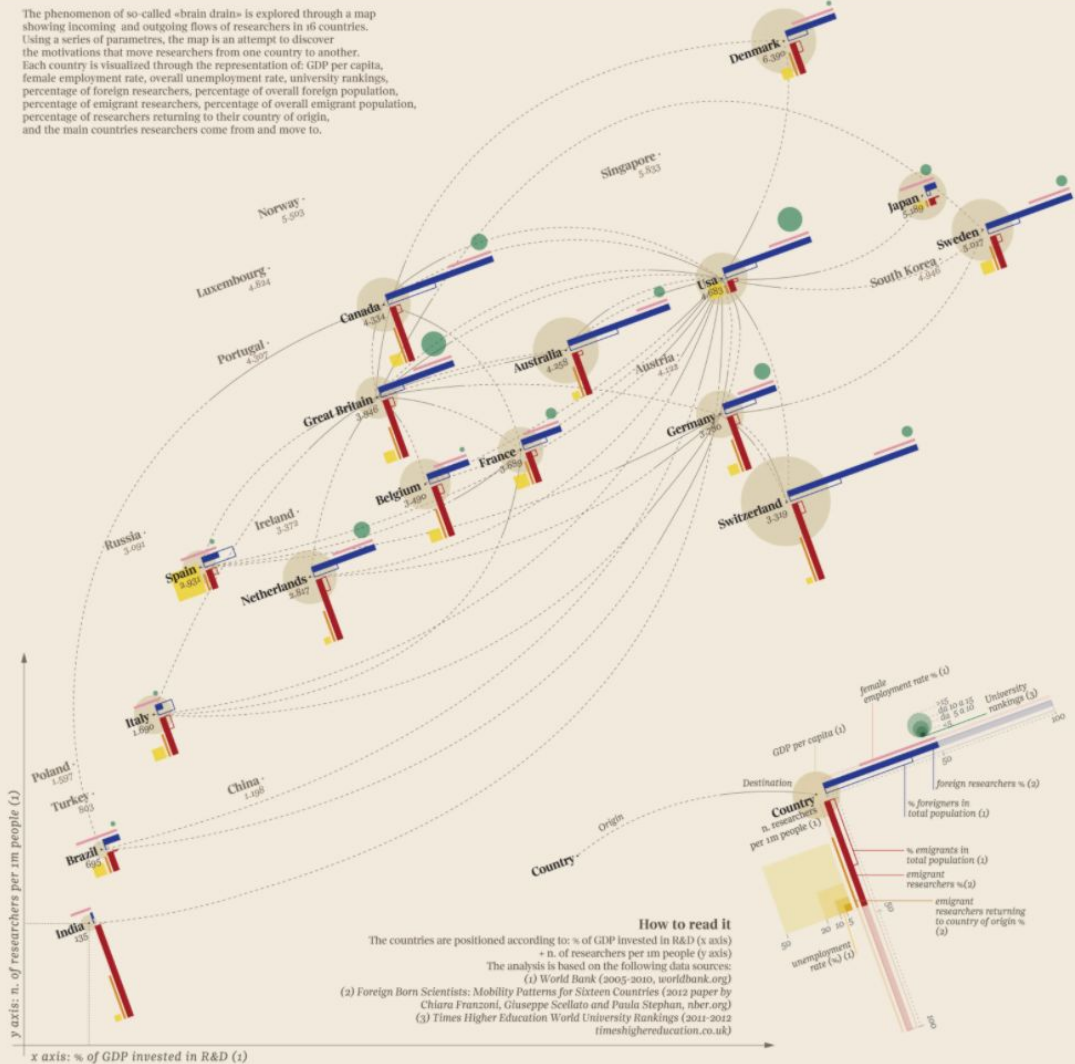
Be creative, but also be skeptical of your creativity
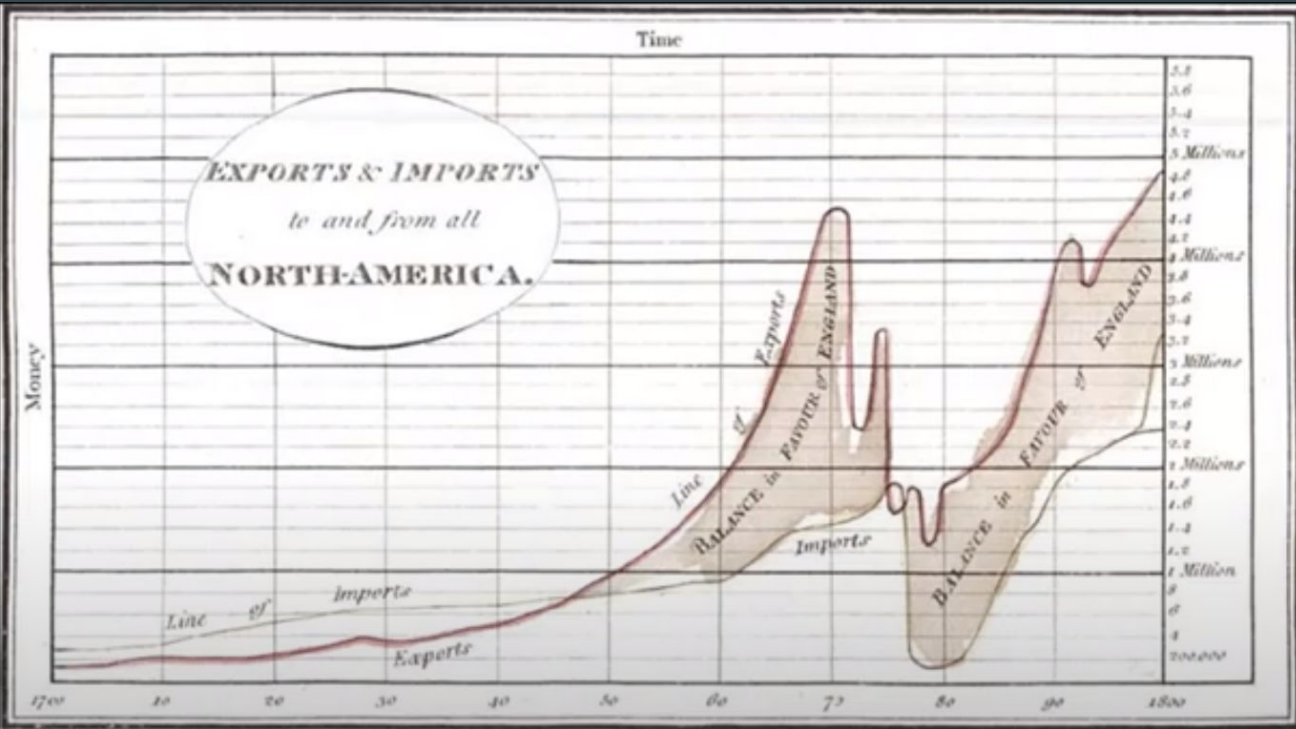
- William Playfair invented statistical graphics
- Represent data like a map
- Use quantitative variables and cartesian coordinates
- Identify patterns and trends in data

Example

https://www.washingtonpost.com/wp-srv/special/sports/2014-olympics/winter-vs-summer-olympics/

are the winter olympics for the rich?
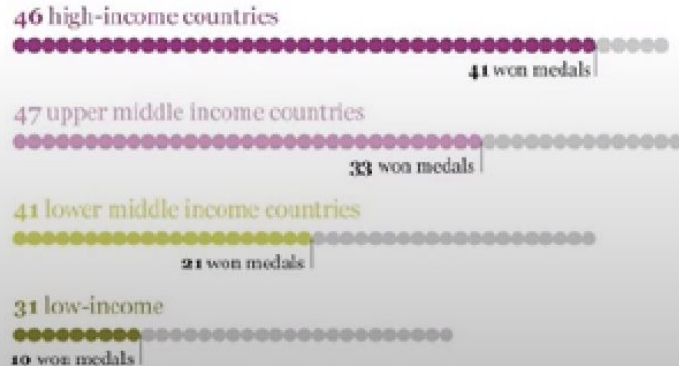
By Kennedy Elliott and Ted Mellnik

Below are 165 of the world's countries that participated in the Summer and Winter Olympics at least one time between 1992 and 2012. Fewer countries participate in the Winter Olympics, and even fewer poor countries — none of the poorest — win medals.

1 2 3 Next▶

Low-income countries are less likely to medal, especially in the Winter Olympics.

SUMMER
165 countries
56,500 participants

46 high-income countries
41 won medals

47 upper middle income countries
33 won medals

41 lower middle income countries
21 won medals

31 low-income
10 won medals

WINTER
86 countries
12,500 participants

39 high-income countries
27 won medals

25 upper middle income countries
4 won medals

16 lower middle income countries
2 won medals

6 low-income
None won medals

- Make your visualization a tool that can be used to extract information
- Make it as clear as possible for your readers
- Consider the task you want to facilitate while creating your visualization
- Only after the functionality is represented, the beauty is important

Interaction between text and visualization

Example 1

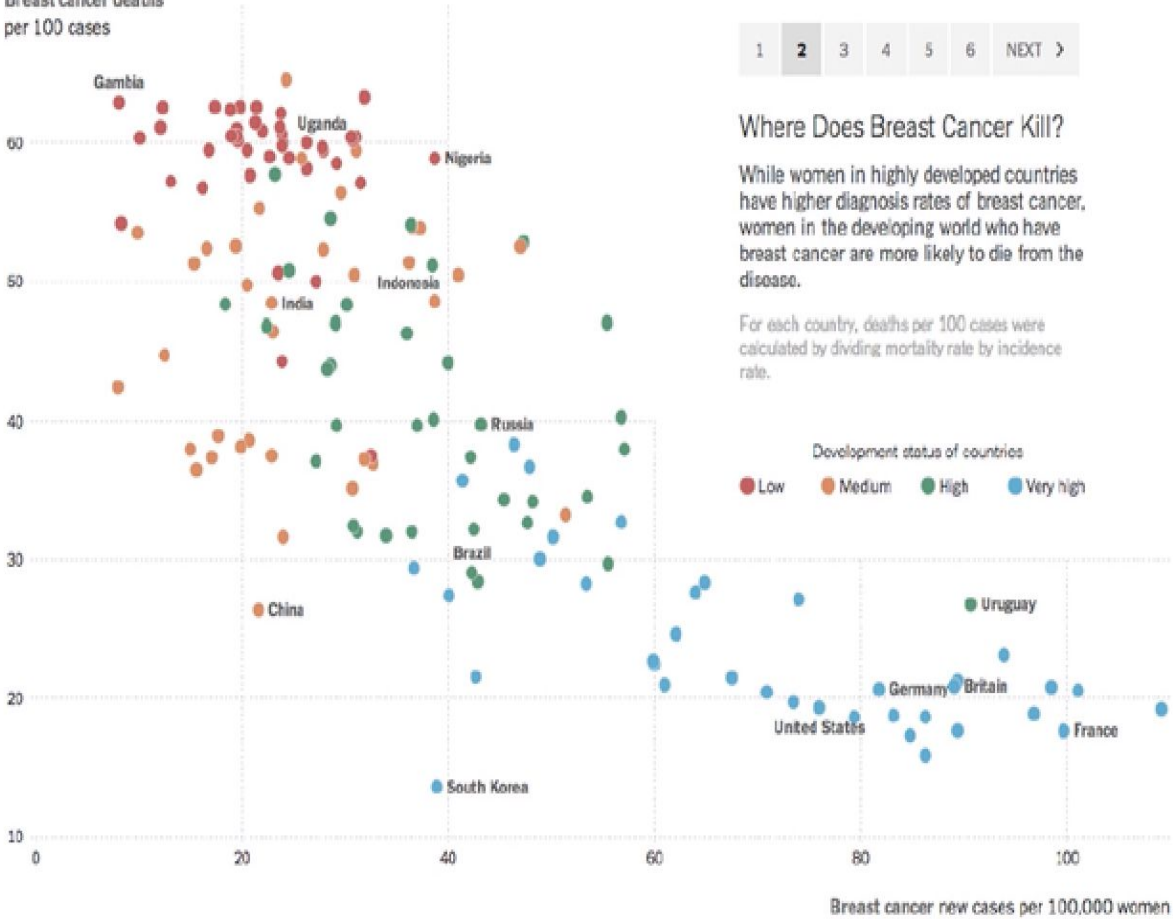Eric Fischer - Language communities of Twitter

- Thousands of data points representing languages used on Twitter
- Missing notation

- Highlight exceptions, interesting stories in data
- Add context to your graphics

Example 2

Where Does Breast Cancer Kill?

While women in highly developed countries have higher diagnosis rates of breast cancer, women in the developing world who have breast cancer are more likely to die from the disease.

For each country, deaths per 100 cases were calculated by dividing mortality rate by incidence rate.

Development status of countries
- Low
- Medium
- High
- Very high

Breast cancer deaths per 100 cases

Breast cancer new cases per 100,000 women

The New York Times: Breast cancer detection and mortality
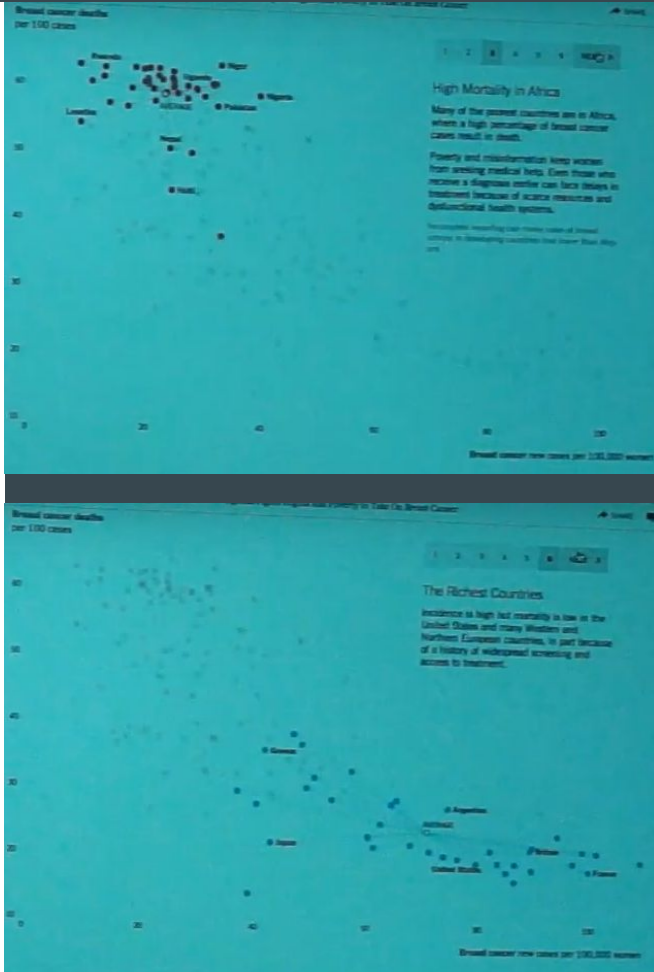
Represent your data more than once

How Different Groups Spend Their Day

The American Time Use Survey asks thousands of American residents to recall every minute of a day. Here is how people over age 15 spent their time in 2008. Related article

Everyone

Sleeping, eating, working and watching television take up about two-thirds of the average day.

Everyone	Employed	White	Age 15-24	H.S. grads	No children
Men	Unemployed	Black	Age 25-64	Bachelor's	One child
Women	Not in lab...	Hispanic	Age 65+	Advanced	Two+ children
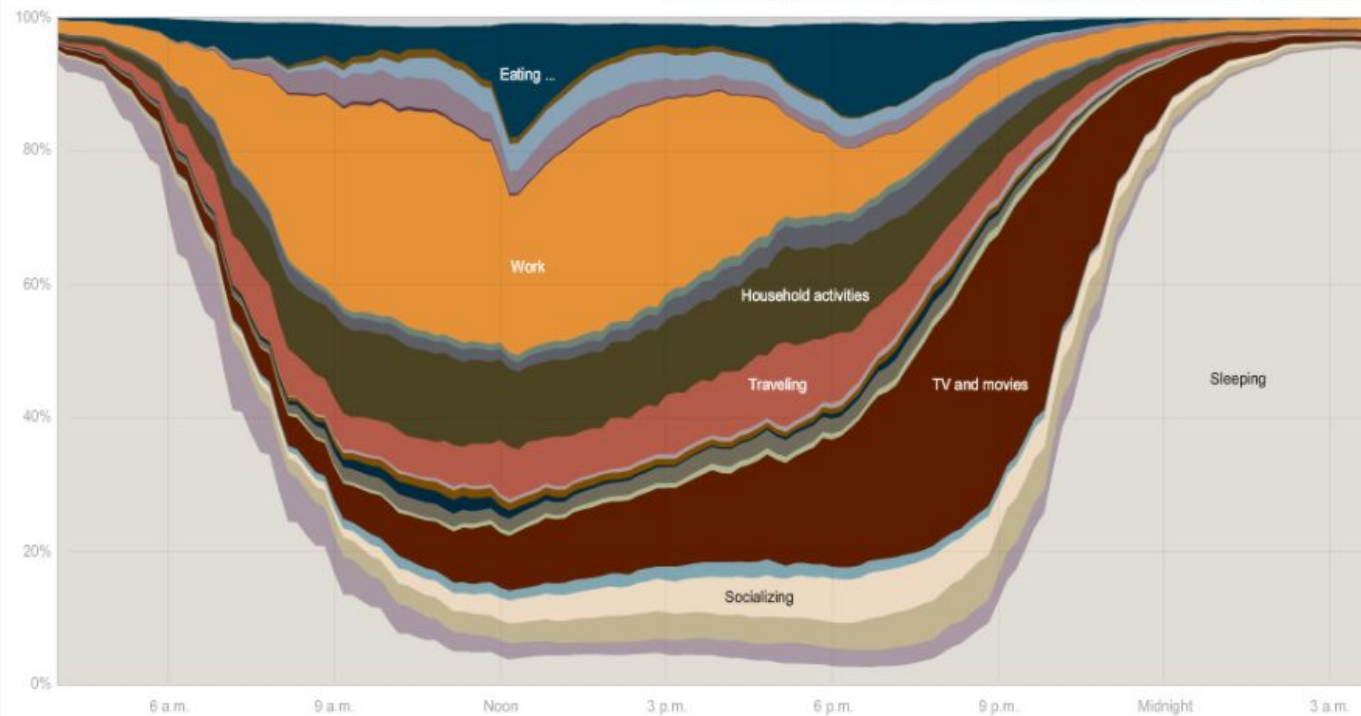
Example 1
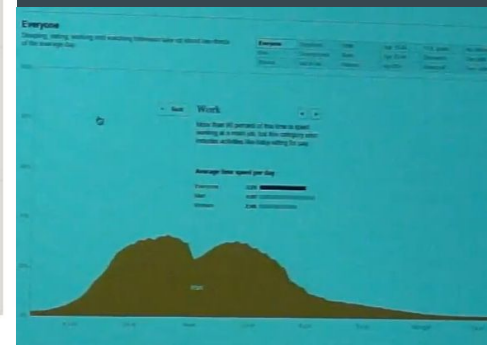
Example 2
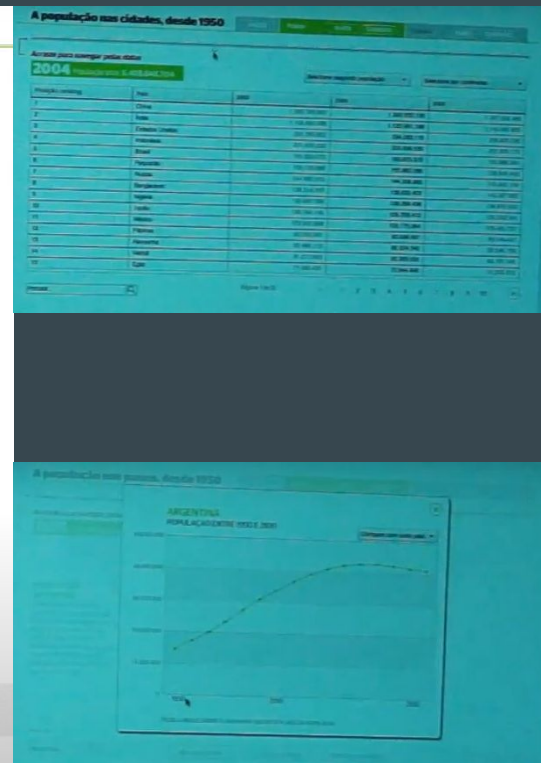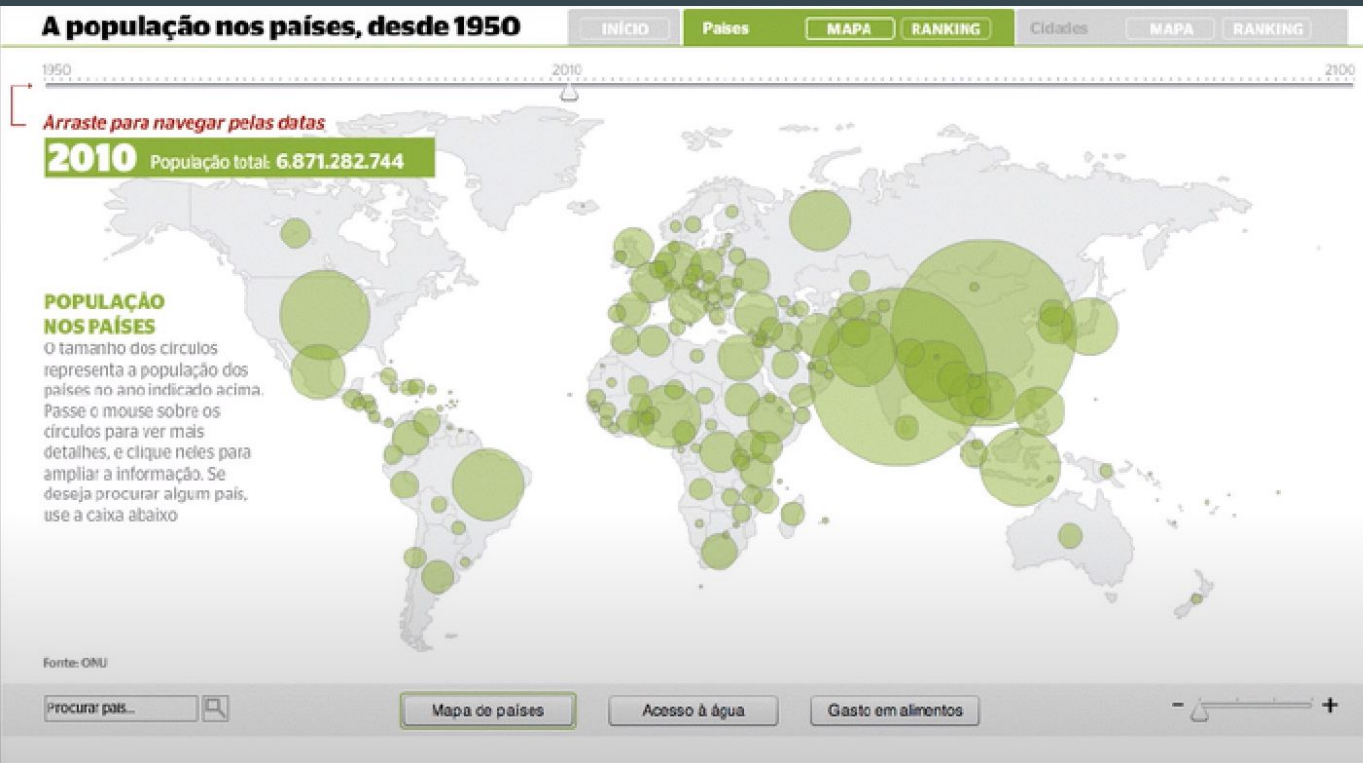
Population of different countries

- Do not stick to just one graphic form
- An effective visualization should give you the opportunity to explore data in different forms

Recommendation: Focus on what matters

Example 1

- Focus on visualizations that matter, are useful, and relevant

City Bike Rides: September 17th and 18th, 2013

Example 2
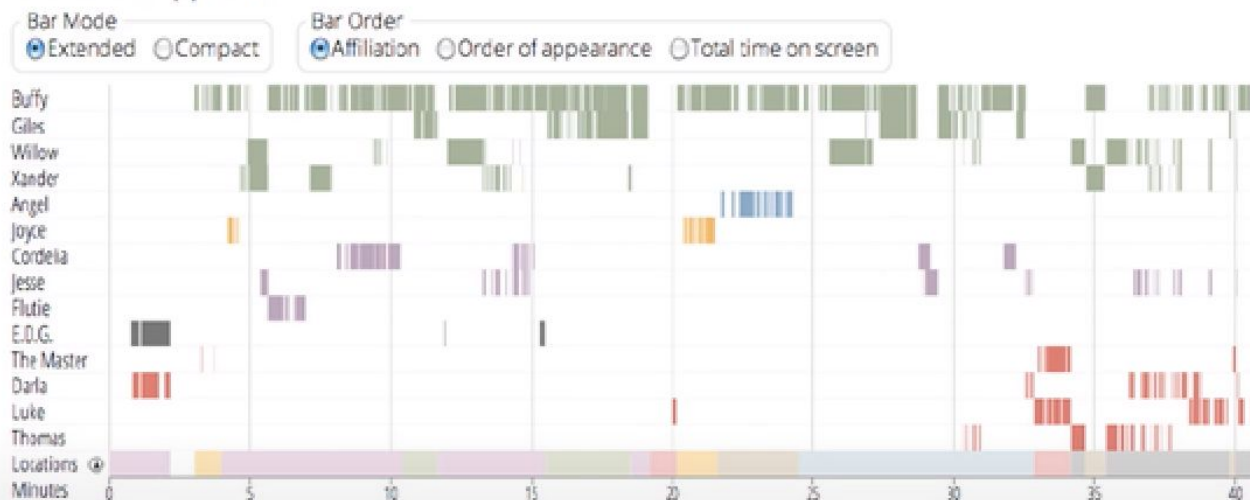
Visualizing Buffy

Example 3

The Wall Street Journal: Healthcare plans of the United States