SNS COLLEGE OF ENGINEERING

Kurumbapalayam (po), Coimbatore – 641 107

Accredited by NAAC-UGC with 'A' Grade

Approved by AICTE & Affiliated to Anna University, Chennai

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

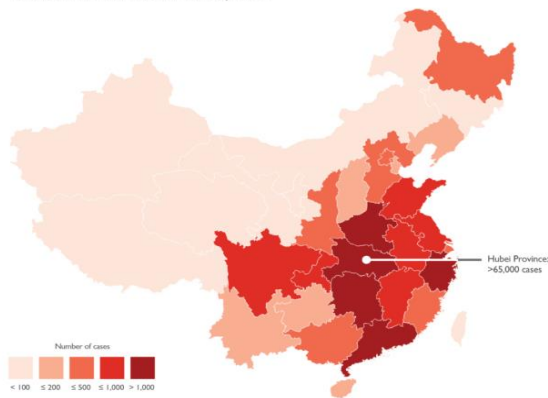# 19AD504 – DATA VISUALIZATION

UNIT - 4

4.1 Designer's Perspective

- Designers think very carefully about both aesthetics and language, working not to only transmit the information as clearly as possible, but also to relay the gravity of the message described by the data.
- When dealing with a general audience, it's the designer's responsibility to ensure that the visualizations used inform instead of incite panic, and encourage discussion rather than mislead.
- Through our work as part of the Unofficial Committee, a collective of artists and scientists striving to inform and empower others, we often find ourselves wrestling with ideas about how to present complex data in a clear and coherent way.
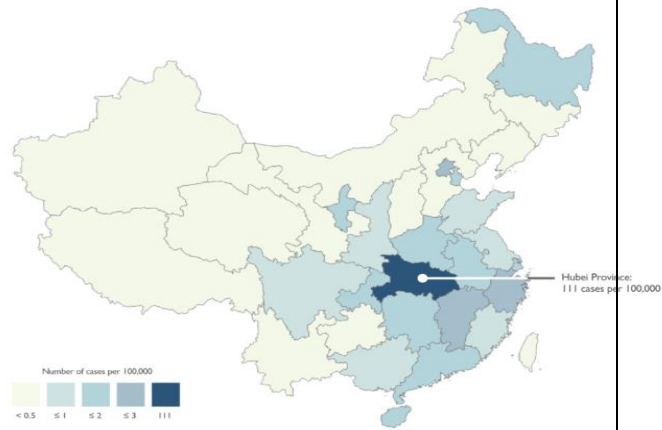
Part 1: Design choices influence the perception of data.

- The COVID-19 crisis has provided a wealth of examples of responsible data visualizations within the media.
- These visualizations showcase COVID-19 counts across China on February 24, 2020. Two figures were created with the same dataset, but their aesthetic choices provide readers with different pictures of the underlying data.

Coronavirus in China: 24th February 2020

Number of cases
< 100   ≤ 200   ≤ 500   ≤ 1,000   > 1,000

Hubei Province:
>65,000 cases

Coronavirus in China: 24th February 2020

Number of cases per 100,000
< 0.5   ≤ 1   ≤ 2   ≤ 3   111

Hubei Province:
111 cases per 100,000

If you guessed that the blue version was more reliable, you're right:

Color

Color impacts our perception of objects: red conveys urgency and alarm, while blue conveys a sense of calm and trust.

In the already stressful context of COVID-19, the blue version allows viewers to evaluate the data more neutrally.

 Scale

Inspecting the COVID-19 counts in the red figure reveals that the case number in Hubei province (>65,000) is several times greater than the next most highly infected province (>2,000) – yet they have the same color.

The numerical scale here stops at 1000, giving the impression that five provinces share similar counts to Hubei.

On the other hand, the blue figure **uses a more sensitive scale**, allowing us to see how Hubei stands out.

Presentation

Showing count data on choropleth maps (maps showing data distributions over predefined areas), as is done on the red figure, can deceive observers.

The provinces on the maps clearly have distinct areas, and most likely have distinct population sizes. I

t is unclear if the reason a region has more cases is due to increased infection or increased population. To make fair comparisons between regions, the designer must **normalize the counts by population**, as is done in the blue plot.

The plots above are just one example of how design can alter the perception of the underlying message in data.

**Part 2: Thoughtful design can help diverse audiences understand data.**

Next, we'd like to take you through an example of our design process. This visualization was created as part of an [Instagram campaign](#) to motivate young people to register to vote.

We designed our graphics for a **non-technical audience of all ages**, with an **attention span of 15 seconds or less**. These visualizations were meant to showcase the difference in voting in the 2016 election by gender and age.
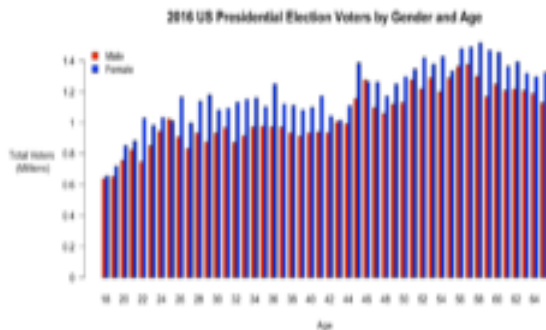
Before
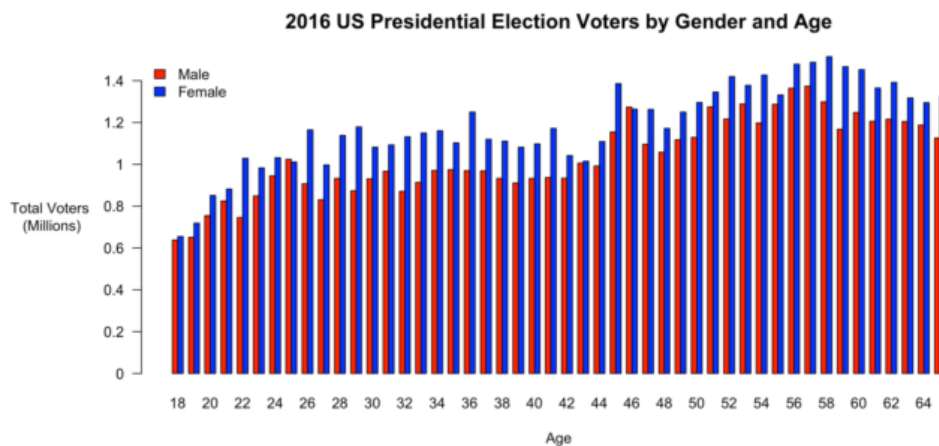
After
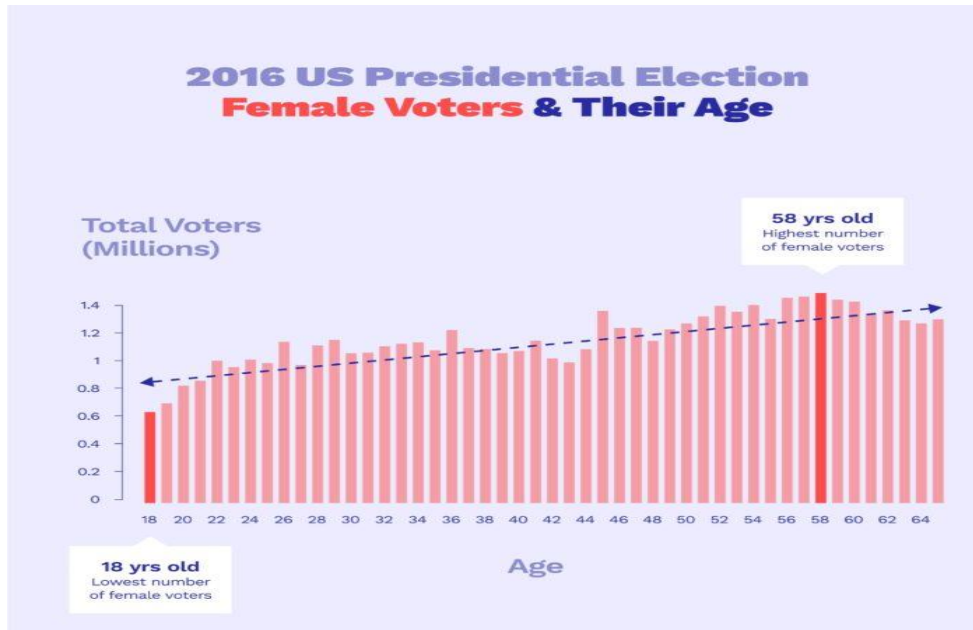
**1. Choose a plot type that can be understood by someone without technical training.**

We gathered data from the 2016 US Census Bureau to make our initial figure. The data shows the counts of people who voted across age and gender. We chose to use bar graphs because they are a familiar and easy way to showcase data holistically.

2. Color can distinguish data elements and highlight the post.
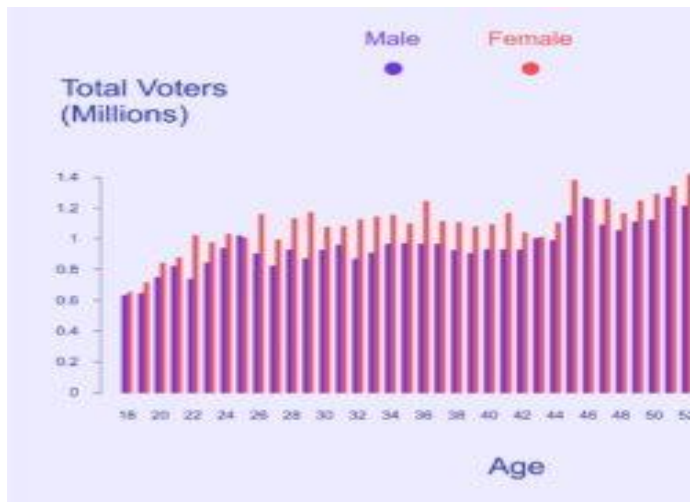
Color changes can inform viewers about the underlying structure within data. Here, we swapped the colors to use typical gender color-coding. We also removed unnecessary colors like the black outlines on the bars. Finally, we changed the background color from white to a color that would make the post stand out from Instagram's white background.

3. Typeface can help you connect with your audience.
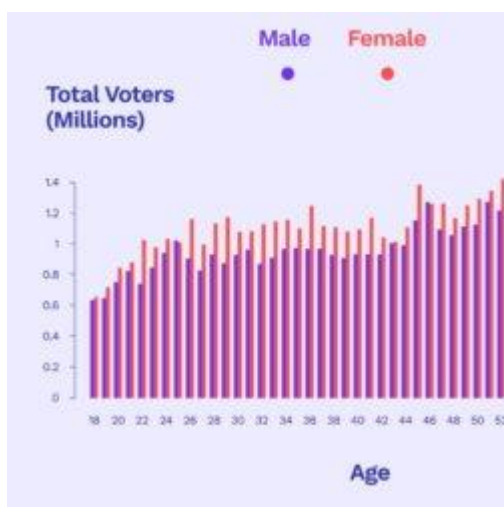
TL;DR: Please think again before using Arial.

Typefaces have a big impact on the psychology of the audience. You can find more info on the topic here. We chose Work Sans to provide a friendlier feeling

over the less-personal default typeface of Arial.

4. Hierarchy can help guide readers through your intended narrative.

Hierarchy refers to the order in which elements are presented to the user. Given the challenge of presenting our information to our users in 15 seconds or fewer, we divided our content into separate sections:

1. Introducing the topic behind the data
2. Showcasing the data in its entirety
3. Highlighting a specific point comparing different age groups of female data.