Report of visualizing life expectancy project

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[a] *Website*
[a] *GitHub repo*

Abstract—This is the report of the final project for the course Data visualization instructed by Professor Annalisa Barla.

Contents

1. Abstract

This project visualizes a comprehensive and interactive view of global life expectancy trends using data from the United Nations Population Division. The interactive web application aims to highlight changes in life expectancy across different regions and time periods, providing valuable insights for users. The frontend is built with React, while Echarts is utilized for our charting needs, ensuring dynamic and responsive visualizations. The application is deployed on Github Pages for easy access and sharing. This report outlines our project's goals, data sources, technical framework, and design considerations, offering a thorough overview of the development process and intended impact.

2. Context

In the first slide, an engaging illustration of life expectancy is presented, serving as an introductory visual to acquaint the audience with the core concept of the website and underscore its significance in exploring global health trends. Subsequently, the presentation delves deeper into the data with the integration of detailed world maps and informative bar charts. These visual aids are thoughtfully employed to provide a comprehensive analysis of the dataset, allowing for nuanced insights into regional disparities, temporal trends, and other pertinent factors shaping life expectancy worldwide.

3. The story

3.1. Slide 1

The first slide presents an overview of the average life expectancy worldwide, offering a baseline understanding.

Figure 1. Slide 1

3.2. Slide 2

The following slide showcases the evolution of life expectancy over the years, highlighting the top 10 countries with the highest life expectancy in each decade.

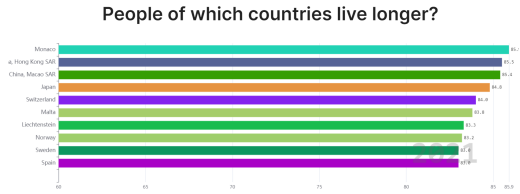

Figure 2. Slides 2

3.3. Slide 3

The subsequent slide compares life expectancy between genders and age groups, providing insights into disparities.

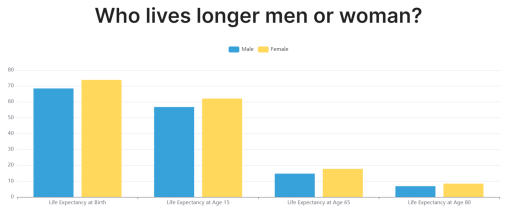

Figure 3. Slides 3

3.4. Slide 4

This slide illustrates the growth in life expectancy from 1950 to 2021, As a result of medical advancements. A comparison by gender is also provided.

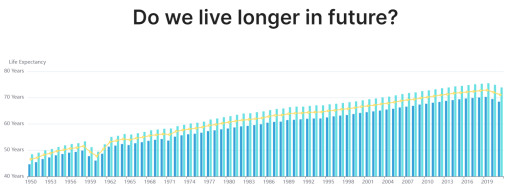

Figure 4. Slides 4

3.5. Slide 5

Lastly, a world map with color coding is utilized to compare life expectancy across countries, facilitating a clear visual comparison.

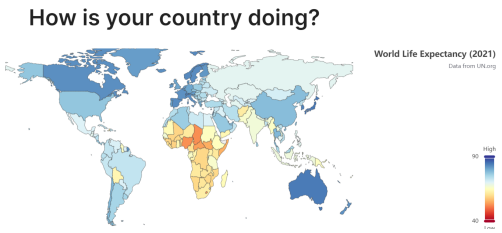

Figure 5. Slide 5

4. Dataset

The data comes from the United Nations Population Division instead of life expectancy dataset. This dataset includes the data of continent, countries, percentage of life expectancy for male and female and both of them, in years from 1950 - 2021. By using this rich dataset, we aim to analyze and visualize trends and factors affecting life expectancy globally.

4.1. Preprocessing

Here is the snapshot of dataset.

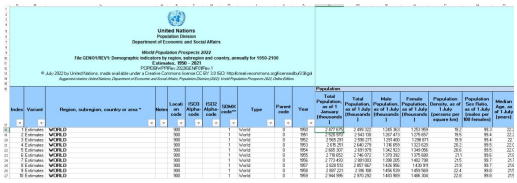

Figure 6. Dataset

Fig. The initial dataset was approximately 24 MB, but not all of it was useful for the story.

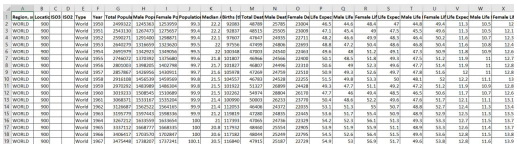

Figure 7. Processed Dataset

Fig. Although extensive data cleaning was not necessary, removing some columns allowed for a more efficient version, making the process much easier. This is the version we used for our project.

5. Description

5.1. Why bar chart

We use bar charts here because the data is linear and not related in a hierarchical way to each other. Bar charts are ideal for comparing discrete categories or groups, making it easy to visualize differences and trends in the data. A line chart is also used to provide a clearer comparison over time, as line charts are effective for illustrating trends and changes in continuous data.

5.2. Scripts

Only the slide number 2 needs scripting, which filters and groups the data by year and country, sorts the entries by life expectancy, selects the top 10 for each year, and writes the results to a new JSON file.

6. Technical Details

- Language: JavaScript
- UI Framework/Library: React
- Deployment: Github Pages
- Charting Library: Apache Echarts

7. Contact me

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