**Analyzing Global Trends in Cardiovascular Decease Mortality**

Data Visualization final project |Shalabh Singh Yadav|02130778

Project Overview: Interactive World Map - Cardiovascular Disease Death Rates

What: This project is an interactive web-based visualization that displays age-standardized cardiovascular disease death rates across the world from 1990 to 2019. The visualization consists of three main components:

1. An interactive world map that shows the cardiovascular disease death rates for each country using a color scale. Users can change the year using a slider and hover over countries to see detailed information.
2. A line chart that displays the trend of cardiovascular disease death rates for a selected country over time. Users can click on a country on the map to update the line chart.
3. A bubble chart that allows users to compare cardiovascular disease death rates among countries for a selected year. Each bubble represents a country, with the size of the bubble corresponding to the death rate.

Why: The purpose of this project is to raise awareness about the global burden of cardiovascular diseases and provide an accessible and engaging way for users to explore and understand the data. By presenting the information in a visual and interactive format, the project aims to:

* Highlight the disparities in cardiovascular disease death rates across different countries and regions.
* Show the trends in cardiovascular disease death rates over time, allowing users to identify countries that have made progress or those that need more attention.
* Facilitate comparisons among countries, enabling users to quickly identify nations with the highest or lowest death rates.
* Encourage users to explore the data and draw their own conclusions about the factors that may contribute to the observed patterns.

How: The project is implemented using modern web technologies, following these key steps:

1. Data Preparation: The cardiovascular disease death rates data is obtained, cleaned, and formatted for use in the visualization.
2. World Map: The interactive world map is created using D3.js and Topojson, with color-coding, a year slider, and tooltips for country-specific information.
3. Line Chart: The line chart, built with D3.js, displays the trend of cardiovascular disease death rates for a selected country over time, with axes, labels, gridlines, and a hover effect.
4. Bubble Chart: The bubble chart, also created using D3.js, allows comparison of cardiovascular disease death rates among countries for a selected year, with each bubble representing a country and its size proportional to the death rate.
5. User Interface and Styling: HTML and CSS are used to create a clean, intuitive, and responsive user interface.
6. Interaction and Animation: D3.js transitions and animations are leveraged to create smooth and engaging interactions, such as changing the year, clicking on countries, and hovering over elements.
7. Performance Optimization: The project is optimized for performance through efficient data loading, processing, and rendering techniques.
8. Documentation and Deployment: The codebase is well-documented, and the project is deployed to a web server or hosting platform for easy access through a web browser.

World map:

This visualization presents an interactive world map displaying the age-standardized death rates from cardiovascular disease across various countries from 1990 to 2019. Each country is colour-coded according to the death rate, allowing for immediate visual interpretation of data. The map features a slider for selecting different years and tooltips that provide detailed death rate statistics when users hover over individual countries.

**A screenshot of a computer screen

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World map

Line chart:

The line chart offers a dynamic view of the cardiovascular disease death rates over time for a specific country, selected via the interactive world map. It features detailed axes with gridlines and labels, and a hover effect that displays precise data points as users move their cursor along the graph. This chart is instrumental in tracking the progress or deterioration of a country's health outcomes over the observed period.

A graph with a line

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line chart

Bubble chart:

This bubble chart allows for the comparison of cardiovascular disease death rates among different countries for a selected year. Each country is represented by a bubble, with the size of the bubble proportional to the death rate, providing a clear comparative scale. This visualization helps identify outliers and draws attention to countries with exceptionally high or low mortality rates from cardiovascular diseases.

A screenshot of a computer

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bubble chart

Conclusion:

By merging interactive visualizations with comprehensive data, this project provides a powerful tool for understanding and analyzing global cardiovascular disease death rates, helping to inform public health decisions and increase awareness of cardiovascular health issues.