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1 Introduction & Dataset

The aim of this work is to visualize a novel dataset using methods taught throughout the module. Using more than one static idiom is necessary to complete this exercise. The dataset selected for this task is “Global Burden of Disease Study 2010 (GBD 2010) Mortality Results 1970-2010” [1]. This study estimates the burden of diseases, injury, and risk factors globally for 21 regions. The dataset includes deaths and mortality rates for 187 countries, 21 regions, and globally by age group and sex.

This dataset required no preprocessing as the study was ready to be downloaded in CSV format. There are no existing visualizations of this set that were publicly available.

2 Tools & Technologies Used

This visualization was created using Microsoft's PowerBI, which is a business intelligence tool that allows for interactive and dynamic reports and visualizations. PowerBI comes with many pre-loaded visualization blocks, such as line graphs, bar charts, etc. PowerBI also comes with a public marketplace with other custom-built tools. This visualization used a publicly available PowerBI addition called “Globe Map”, created by the Microsoft Corporation.

Globe Map is an interactive model of the earth with each country included. Mapping the country code from the dataset as well as the mortality rate to the “Bar Height” and “Heat Map” variable allows for the data to be easily visualized in an interactive format.

3 Tasks

The visualization supports many different tasks when being viewed and analysed. These tasks include:

- Geographic Analysis
 - The map visualization displays the death rate on a per country level, which allows the viewer to identify trends across regions, countries, or continents.
 - It is also possible to filter by demographic, which would allow for the viewer to identify demographic trends across countries or regions.
- Trend Analysis Over Time
 - The line chart, which is dynamic based on the input filters, shows the change in the death rate over the selected time period.
- Demographic Comparison
 - The donut chart allows for easy demographic analysis of the data based on the configured filters.
- Top Countries Analysis
 - The dynamic bar chart below the map will display the top five countries with the highest death rates based on the viewers selected filters, allows for an analysis of countries that come in and out of the list over time.

4 Encoding Channels and Idioms

This dashboard visualization of this dataset contains many different encoding channels across the different idioms. These include:

- Map Visual
 - Geographic data is encoded using the countries location by the country code data type. Color saturation at the base of the bar on each country also indicates the death rate.
- Line Chart
 - The line chart shows the year on the x-axis, and the death rate on the y-axis. This encodes trends over time.
- Bar Chart
 - The bar Chart shows the top 5 countries by death rate based on the current filters selected by the viewer.
- Donut chart
 - Color and Segment Size represent the death rate and distribution by age group respectively.

5 Novelty & Complexity

This dataset is complex due to the high dimensionality it contains. The data includes temporal, geographic, and demographic aspects. Each of these dimensions add a layer of analytic complexity, which could make it challenging to interpret trends without visual representation.

It would be very difficult to implement this dataset with only one idiom. Attempting to encode every data type in one chart would make analysis difficult.

The visualization made with PowerBI is unique as in combining multiple idioms into a cohesive dashboard. The interactive elements of the dashboard allow the viewer to dynamically filter by year, country, age group, and sex.

6 Strengths & Weaknesses of the Visualization

This dashboard contains a number of strengths that make this visualization useful:

Strengths:

- Interactivity
 - Filters which allow viewers to filter by different data types.
- Comprehensive View
 - A combination of maps, line charts, bar charts, and donut charts provide a well-rounded view of the dataset.
- Geographic Detail
 - The interactive globe effectively visualizes geographic data in a way the viewer can easily understand.

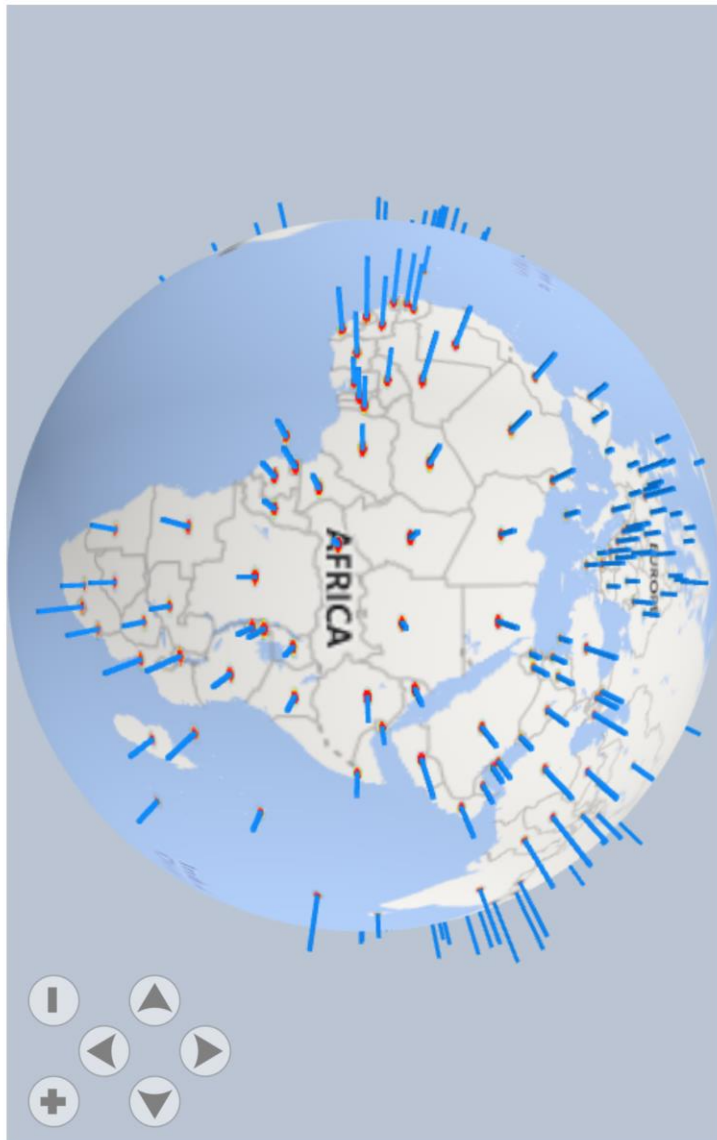
Weaknesses:

- Size
 - The dashboard is very large and leaves no whitespace, which can lead to the viewer feeling overwhelmed.
- Color Saturation on the Globe
 - The color gradient at the base of the globe may be difficult to extrapolate any data from, as it is not clear which colors indicate which data.
- Dataset
 - Since the dataset only includes data points from each decade, it might make it difficult to identify granular trends across decades.

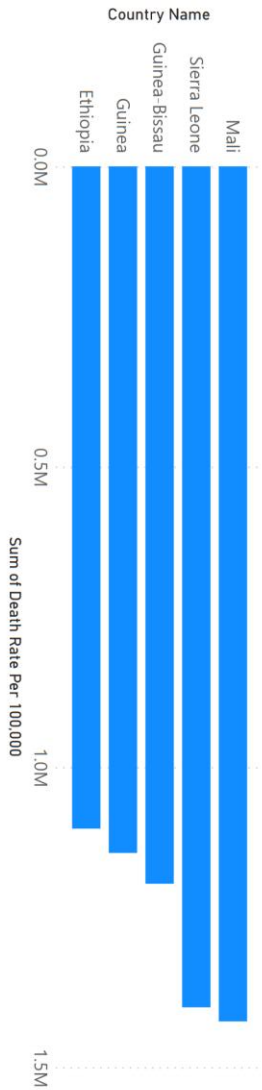
References

- [1] “Global Burden of Disease Study 2010 (GBD 2010) Mortality Results 1970-2010.” *GHDx*, 1 Jan. 1970, ghdx.healthdata.org/record/ihme-data/gbd-2010-mortality-results-1970-2010.

Global Deaths by Country



Top 5 Countries by Deaths



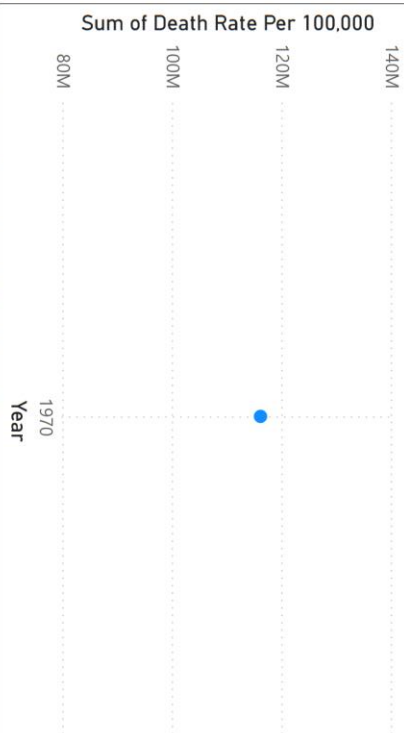
Year & Country

- ☒ Select all
- > ☒ 1970
- > ☐ 1980
- > ☐ 1990
- > ☐ 2000
- > ☐ 2010

Age Group & Sex

- ☐ Select all
- > ☐ 0-6 days
- > ☐ 10-14 years
- > ☐ 1-4 years
- > ☐ 15-19 years
- > ☐ 20-24 years

Global Deaths



Sum of Death Rate Per 100,000 by Age Group

