**COS30045 data visualization**

Chronic Diseases and Risk Factors

Process Book

Mohamed Usaidh Abdul Razzaq – 105017157

# Introduction

**Background and Motivation**

Chronic diseases like asthma, diabetes, and cardiovascular conditions are growing global health concerns, with increasing hospitalization rates due to these conditions. The goal of this project is to provide meaningful insights into these chronic disease trends and their associated risk factors. This visualization project aims to enable public health officials, policymakers, and the public to make data-driven decisions about health interventions by exploring the prevalence and distribution of chronic diseases across different countries.

**Purpose of the Visualization**

This interactive visualization platform provides a way to explore hospital admissions due to chronic diseases across various countries. By understanding these trends, stakeholders can identify regions with the highest burdens and areas where intervention strategies could be most effective.

**Key Questions Answered**

1. What are the hospitalization rates for chronic diseases across different countries?
2. How do diseases like asthma, diabetes, heart failure, and hypertension affect populations in distinct geographic regions?
3. How can this data inform public health interventions and policy adjustments?

# Data

**Data Sources**

The primary dataset used in this project is from the OECD Health Statistics Database, focusing on hospital admissions related to chronic diseases, such as asthma, diabetes, heart failure, and hypertension. Supplementary datasets were consulted to validate and enhance the comprehensiveness of the analysis.

**Data Processing**

Data transformation and cleaning steps included:

* Filtering data to include only the year 2020 to maintain a consistent timeframe.
* Standardizing country codes to align with the GeoJSON file used for map visualization.
* Removing missing or inconsistent values to ensure clarity in visualizations.

**Data Types and Encoding**

The dataset contains quantitative data on hospital admission rates (per 100,000 inhabitants). Each disease type is color-coded on the map with a sequential colour scale, representing admission ranges. For example, countries with high hospitalization rates appear in darker colours, while those with lower rates are lighter. Other visualizations (like donut charts) use categorical colour encodings to differentiate factors such as alcohol and tobacco consumption levels.

# Visualization Designs

**Design Process**

* **Initial Sketches**: The project began with sketches to plan an intuitive layout for the global map visualization. The sketches outlined buttons for toggling between diseases (e.g., asthma, diabetes) and a color-coded map to represent the severity of hospital admissions across countries.

**Prototyping and Iteration**

Several iterations were made based on peer feedback to enhance readability and interactivity:

* **Colour Scheme**: An initial colour palette with too many gradients was simplified to reduce visual clutter. The final colour scale has fewer, clearer categories to distinguish hospitalization rates effectively.
* **Tooltips and Interactivity**: Tooltips were added to provide additional information on hover, showing the country name and specific admission rates for the selected disease. Interactive elements, such as clickable buttons, allow users to switch between visualizations for different chronic diseases seamlessly.

**Design Guidelines**

Key principles followed include:

* **Clarity**: Using a simplified colour scheme to avoid overwhelming the user.
* **Simplicity**: Intuitive layout with clear headings, legends, and tooltips.
* **Accessibility**: Ensuring the design is colourblind-friendly and responsive for different screen sizes.

**Justification of Choices**

* **World Map**: Provides a comprehensive view of global hospitalization rates by country, showing geographic trends.
* **Cancer Survival Chart**: Shows year-over-year survival rates, allowing users to see progress or declines in survival for specific cancers by country.
* **Donut Charts for Health Risk Factors**: Displays risk factors like alcohol and tobacco consumption and obesity percentages, with easy-to-read sections and hover details for each segment.

# Website

**Coding Practice**

The project utilizes D3.js for dynamic data visualization, combined with HTML and CSS for structure and design. The D3 library enabled the creation of interactive charts that update based on user input, such as selecting different diseases.

**Interactivity and Design**

* **Country Filtering**: The world map includes filters for various diseases, allowing users to switch between visualizations for asthma, diabetes, heart failure, and hypertension with a single click.
* **Hover Effects**: Tooltips with additional details on each country’s data make the visualization more informative without overcrowding the display.

**Aesthetic Design**

The website is designed for readability and usability, with a responsive layout that adapts across devices. The simple navigation, organized by tabs (e.g., map, cancer survival rates, risk factors), makes it easy for users to explore data by category.

# Reflection

# References

[https://data-explorer.oecd.org/vis?tm=Diabetes%20&pg=0&snb=21&df[ds]=dsDisseminateFinalDMZ&df[id]=DSD\_HCQO%40DF\_HCQO&df[ag]=OECD.ELS.HD&df[vs]=1.0&dq=.A.CCLUNTSR%2BCC...\_T.OBS%2BVALUEW&pd=2000%2C2020&to[TIME\_PERIOD]=false&vw=tb](https://data-explorer.oecd.org/vis?tm=Diabetes%20&pg=0&snb=21&df%5bds%5d=dsDisseminateFinalDMZ&df%5bid%5d=DSD_HCQO%40DF_HCQO&df%5bag%5d=OECD.ELS.HD&df%5bvs%5d=1.0&dq=.A.CCLUNTSR%2BCC..._T.OBS%2BVALUEW&pd=2000%2C2020&to%5bTIME_PERIOD%5d=false&vw=tb)

[https://data-explorer.oecd.org/vis?tm=Cancer%20rate&pg=0&snb=4&df[ds]=dsDisseminateFinalDMZ&df[id]=DSD\_HEALTH\_STAT%40DF\_HEALTH\_STATUS&df[ag]=OECD.ELS.HD&df[vs]=1.0&dq=.A..CS\_10P5PS.........&pd=2000%2C2020&to[TIME\_PERIOD]=false&vw=tb](https://data-explorer.oecd.org/vis?tm=Cancer%20rate&pg=0&snb=4&df%5bds%5d=dsDisseminateFinalDMZ&df%5bid%5d=DSD_HEALTH_STAT%40DF_HEALTH_STATUS&df%5bag%5d=OECD.ELS.HD&df%5bvs%5d=1.0&dq=.A..CS_10P5PS.........&pd=2000%2C2020&to%5bTIME_PERIOD%5d=false&vw=tb)

<https://github.com/holtzy/D3-graph-gallery/blob/master/DATA/world.geojson>

<https://www.oecd.org/en/data/indicators/daily-smokers.html?oecdcontrol-b84ba0ecd2-var3=2023>

<https://www.oecd.org/en/data/indicators/alcohol-consumption.html>