1 Introduction

Covid-19 is the worst pandemic world has ever seen. Not only has it affected the entire world and disrupted the normal lives across the globe but has killed over 1 Lakh people. The main objective of my visualisation is to detect whether a person has been infected by Covid-19 or not based on some pre-defined symptoms. The results of this visualisation could be taken as medical advice.

2 Description

The dataset has been taken from Kaggle[1]. It depicts the data of people who are infected with Covid-19 in India alongside with some important parameters. The severity of Covid-19 has been visualised w.r.t Age and Symptoms being shown by a person. It also depicts the data of people who have travelled from other continents to India. It relates the continent w.r.t Age Group of a person.

The data has been divided as follows: **Continents** are classified as Asia(Except India), Europe, America, Africa and Others; **Age Groups** as A1(0-9 years of age), A2(10-19 years of age), A3(20-24 years of age), A4(25-59 years of age), and A5(60+ years of age); **Severity** as None, Mild, Moderate, Severe and Extreme Severe; **major symptoms** as Fever, Tiredness, Difficulty in breathing, Dry Cough and sore throat.

I have visualised the dataset in the form of four visualisations. All of the four visualisations together depict **interactive manipulation** by the user, **animated views** and **simultaneous views**. Note that the figures represented in number have been divided by 1000 that is the visualisation depicts per thousandth of a category.

2.1 Visualising Percentage of Females and Males with travel history to Continents

The first visualisation has been depicted in the form of **pie of a pie** chart. This visualisation depicts the percentages of people who are infected in India who have been to other continents. The continents listed are America, Africa, Asia (excluding India), Europe and others. There have been lines drawn around all the slices of the pie to list the name of the continent alongside with the percentage of people belonging to that category. This is an **interactive visualisation** since whenever the user clicks on any slice of the pie chart there pops up another smaller pie chart depicting the classification of population in terms of male and female. Whenever the user hovers over the slices of smaller pie chart it pops up the percentage and number of Males and females infected. This visualisation helps to analyse that out of the people infected in India with a travel history, most of them have a travel history of Europe accounting to 26.9 percent. Out of those 40 percent are females and 60 percent are males. This visualisation can be termed as **analyst centric** as it depicts important information necessary to make predictions about Covid-19.

2.2 Visualising Age groups across Continents

The second visualisation of Covid-19 is an **interactive radical histogram** where user can interact with it. It represents the number of people belonging to different age groups who are infected by Covid-19 who have visited to other continents. Age groups have been classified as A1(0-9 years of age), A2(10-19 years of age), A3(20-24 years of age), A4(25-59 years of age), and A5(60+ years of age). Just above the radical visualisation is a slider has been placed which helps user to zoom in a certain element in the visualisation. When the user zooms in via the slider a blue button appears just below towards the right end of the slider which helps the user to zoom out of the visualisation and view it as it is. Another element of this visualisation which is **interactive** is that the mouse click on the element of visualisation helps to zoom in. This way one can certainly calculate the number of people belonging to a certain age group who are infected in the continent. One can calculate that there are 82,000 people who belong to A3(Age group 20-24 years) are infected in India and have travel history of America. This also helps to visualise that the most probable age group which is infected in India who have travel history of America constitutes of people above 60 years of age. Therefore, one can certainly classify this visualisation as **analyst centric** as it depicts the important and useful information.

2.3 Visualising symptoms w.r.t. severity of Covid-19

The third visualisation predicts the severeness of Covid-19 w.r.t the symptoms displayed by a person. According to WHO and Ministry of Health and Family Welfare India, there are 5 major symptoms of Covid-19, Fever, Tiredness, Difficulty in breathing, Dry Cough and sore throat. Severeness has been classified in 5 different groups named None, Mild, Moderate, Severe and Extreme Severe. I have used a **chord Diagram** for this visualisation to depict relationship between the two factors, degree of severeness and Symptoms. The arcs of Chord diagram are arranged in such a fashion that they form a complete circle. There are several

chords joining these arcs to one another. Th chord represents the number of people exhibiting that particular relationship. There are small bullets which are travelling from one arc to another. These moving animated bullets take the colour of the arc from which they emerge. Further this visualisation is an **interactive visualisation**. User can click on an arc to show/hide it in the visualisation. The visualisation's orientation can be changed by the user by dragging the arcs/elements. This visualisation helps to predict what is the level of severeness if a person is showing one of the 5 symptoms. E.g. 80,000 people who have dry cough have been detected with the extreme severe condition of Covid-19. Also 35,000 people who have breathing difficulties have been detected with severe condition of Covid-19. This visualisation can be termed as **analyst centric** as it depicts important information necessary to make predictions about Covid-19. The visualisation also depicts the animated view of the dataset.

2.4 Visualising age group w.r.t. severity of Covid-19

The fourth visualisation predicts the severeness of Covid-19 w.r.t. the age-group of a person. Severeness has been classified in 5 different groups named None, Mild, Moderate, Severe and Extreme Severe. Age groups have been classified as A1(0-9 years of age), A2(10-19 years of age), A3(20-24 years of age), A4(25-59 years of age), and A5(60+ years of age). I have chosen a **Chord Diagram** to represent the relationship but is very different from the one previously used. Arcs have been used which depicts the type of Severity and the age group. The arcs have been arranged in such a manner that they form a circle. Also initially these arcs are grey and chords light in color. But once the user hovers over any of the arc it is white in color. And the color of the chord darkens up also representing the relationship of the arc with other arcs. Popups further appear when the user hover over depicting the totally number of people exhibiting that relationship. Hence this visualisation is **interactive** and can be **manipulated** by the user. This visualisation helps to analyse that there are total 2,15,000 people having age 60+ are infected with Covid-19. Out of those people, maximum number of people have extreme severe condition of Covid-19 that is 88,000 in number. This visualisation can be termed as **analyst centric** as it depicts important information necessary to make predictions about Covid-19.

R scripts were used on the original uncleaned data in R studio. It filtered out all of the necessary information being used in the visualisations.

3 Citing third party resources

amCharts 4 Library is a JS library used for the visualisations alongside with basic HTML and CSS. [2] The CDN of the library has been included in HTML.

References

[1] Covid-19 `https://www.kaggle.com/iamhungundji/covid19-symptoms-checker`

[2] Amcharts. `https://www.amcharts.com/`