

Data Visualisation

Milestone 2 Report

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1 Project Description

In this report we will describe the visualisations included in the website as well as the tools we need in order to execute them.

The whole screen website is separated in two parts as shown in Figures 1, 2, 3. The map on the left part of the website plays a key role in the visualisation part. As it can be seen from the figures, on the right hand part of the website, plots in agreement with the map will be shown to the user. This plotting section has a scroll bar in order to add as many charts as needed.

The key thing in our visualisation is that if the user wants to know more about a country, the user has to click on it on the map and the information of that country will be added on the plots.

Furthermore the data and consequently the way the data is shown on the map can be changed by clicking on one of the 5 buttons:

- **Cases** which displays the number of cases per country on the map (represented by red dots, see Figure 1). On the plot section, we'll display visualisation of the most affected countries, a line chart with the number of cases per continent and a Sankey diagram the cases according to the gender and the age.
- **Deaths** which displays the number of death per country in a similar fashion as the Cases map. Same plots as **Cases** are displayed in the corresponding section, but for the number of deaths.
- **Recovered** which the number of recovered people per country (represented by dots as in figure 1). Same plots as **Cases** and **Deaths** are displayed in the corresponding section, but for the number of recovered persons.
- **Compare** in which selected countries by the user are compared in the corresponding plot section. Selected countries are colored on the map (see Figure 2). For example clicking on the United States, France, China adds the green, blue and red lines respectively on the charts. On the plot section we will displays the cases, deaths, recovered for each date (line plots) and finally the fatality rate of the corona virus.
- **Measures** which displays a choropleth map to show the intensity of the government measures for each country (see Figure 3). Clicking on a country will this time overwrite the choropleth country color with a distinct color and will represent the color for that country on the charts. On the plot side, we will show the the number of tests conducted for each selected country(line plot) and then we will use line plots with annotation to show the impact of the mitigation measures on the number of cases.

2 Sketches and used tools

The resulting desired website is sketched on the different figure below. We will mainly use d3.js to implement our visualisations. For the creation of the maps, we will start from scratch and only use the d3.js library in order to customize the maps. To be more specific and give some examples on how the d3 library can be used to generate the map, we will use d3-geo to define the projection and the path generator, d3-zoom to enable the zoom option, and panning to let the user move around the map. Other options such as the timeline, the selection of a country with the mouse will also be created using the d3.js library.

Concerning the plot section on the right side, these plots should be general plots and do not need to be as customized as the map. Hence, we will use libraries based of d3.js. The table 1 below describe the library used for each visualisation.

Plot	Library Used based on D3.js
Line or Multi-Line plot	Britecharts
Bar plot with timeline	Crossfilter
Line with annotations	MetricsGraphics.js
Sankey diagram	D3plus

Table 1: Library used for each visualisation

3 Independent pieces to implement

Regarding the implementation, we'll begin by independently focus on :

- The perfect display of the map with its features which are the panning and the zoom.
- The generation of the different plots using general-use charting libraries.

After the implementation of those two parts, we'll jointly work on linking the map data to an interactive timeline on the map previously done.

We will then work on the selection of several countries by clicking on the map which generate their charts on the right side in order to compare their evolution (see figure 2) or the timeline of government measures taken between selected countries (see figure 3).

Finally, a work focused on the design of the website (graphics, typography, backgrounds...) will be done.

4 Challenging parts

The challenging and optional part would be to double click on a country on the map. Instead of having a world representation, after the double click we would only have the clicked country representation with regional data.

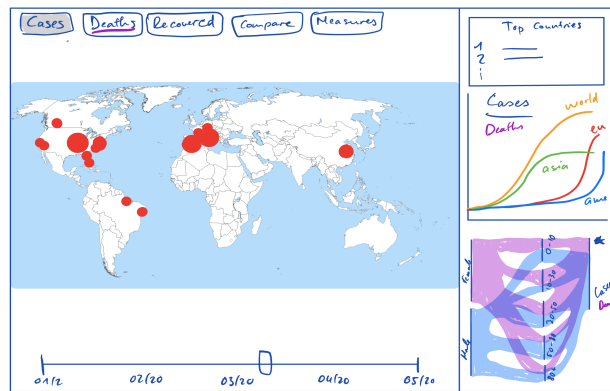


Figure 1: Visualisation for COVID-19 cases

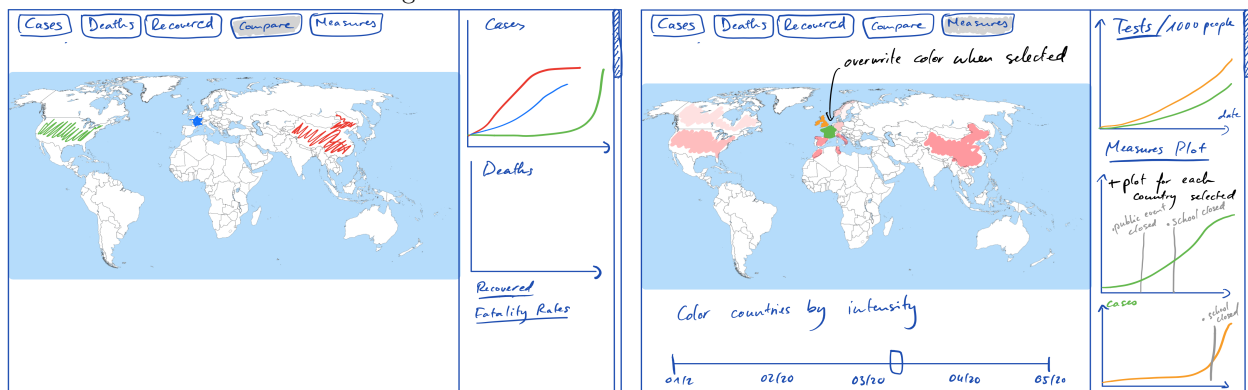


Figure 2: Visualisation for the comparison of data of Figure 3: Visualisation for the measures taken by the countries affected by the COVID-19