

Covid Visualization

Software development - HMMA238

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Introduction

The goal is to produce an animated map using covid data and to produce various charts linked to the analysis of the covid crisis.

To this aim we create a covidviz module you can find here :

► [Github covidviz](#)

Dependencies and import

Package importation :

```
>>> import covidviz as cvz
```

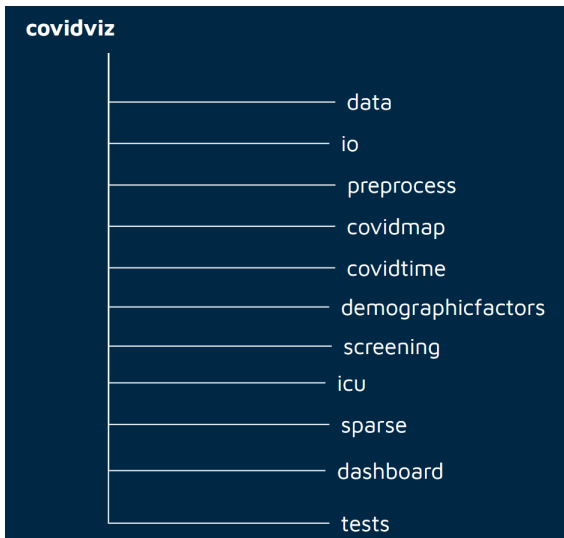
Specific dependencies

- 1 pyDeck
- 2 ipywidget
- 3 folium
- 4 plotly
- 5 pandas_alive
- 6 networkx
- 7 geopandas
- 8 dash

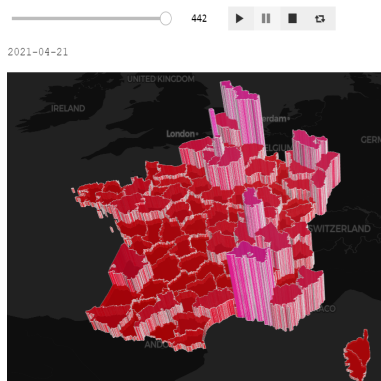
Data used

	Usage	Informations
data.gouv.fr	animated maps gif stats sparse matrix graph	covid deaths covid hospitalized patient transfers intensive care unit (ICU) screening epidemiology analysis vaccine data
France GeoJSON	animated maps	geometry for french departments and regions
Santé Public France	statistics	age, gender

Module structure



Animation Map



- 1 Main code in `covidviz/covidmap`
- 2 A *Map_covid* class
- 3 pyDeck package
- 4 ipywidget package
- 5 Parameters :
 - departments or regions;
 - deaths or hospitalized;
 - time slider.

Gif Animation

Main code in `covidviz/covidtime`.

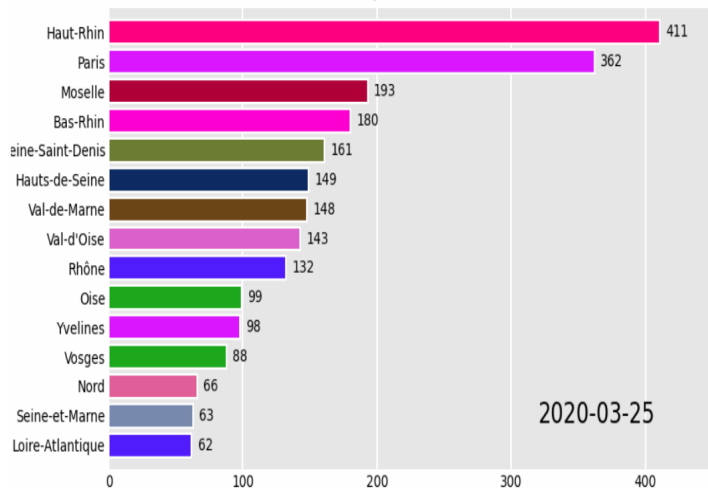
We used the `pandas_alive` package.

The main function for generating gif visualizations is :

- 1 `covidtime/time_gif/plot_animation` with parameters :
 - regions or departments;
 - deaths or hospitalized.

Gif animation

Covid-19 : French departments' number of deaths



Covid Statistics

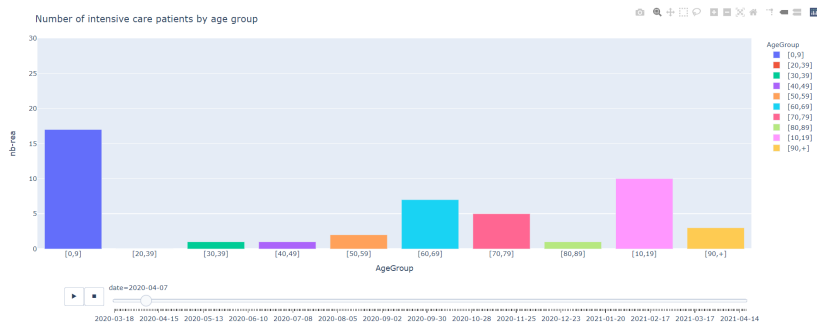
Main code in `covidviz/demographicfactor`.

We used the `plotly` package.

One of the functions for generating charts is :

- 1 `demographicfactor/utils_plot/df_plot_hosp`
- 2 parameters :
 - group age
 - date
 - number of people hospitalized
- 3 time slider:

Covid Statistics



Covid Statistics

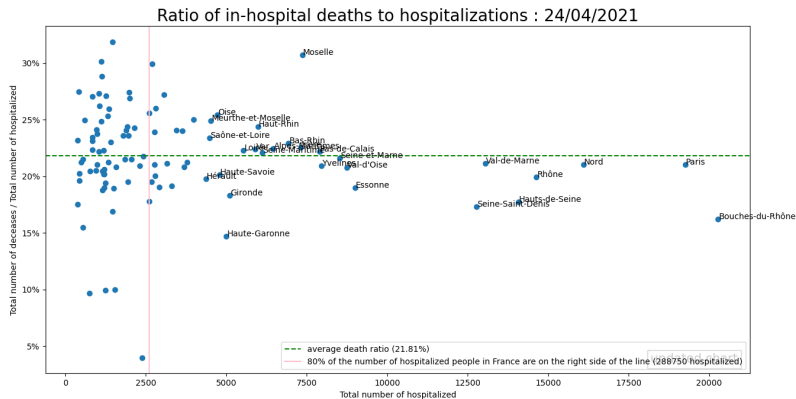
Main code in covidviz/covidtime.

We used the matplotlib package.

The function used for generating the chart :

- 1 covidtime/plot_covidtracker/ratio
- 2 parameters :
 - several lists for variables in df_covid such as name locations ,number of hospitalizations;
 - current date.

Covid Statistics



ICU Statistics

Main code in `covidviz/icu`.

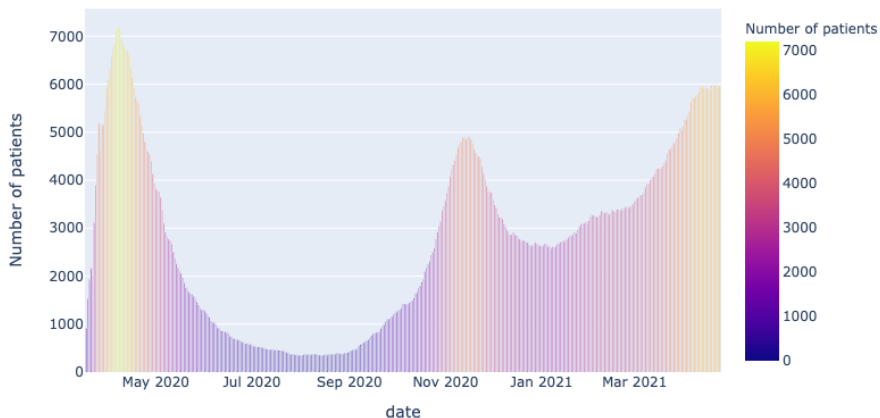
We used the `plotly` package.

Some functions for many visualizations :

- ➊ `icu_dep_display` with parameters : period, icu in each department.
- ➋ `icu_by_reg_display` with parameters : period, region, icu in each department of the region.
- ➌ `icu_all_reg_display` with parameter : icu in each region.
- ➍ `icu_reg_repartition` with parameter : icu in each region.
- ➎ `heat_map_icu_reg` with parameter : icu in each region.

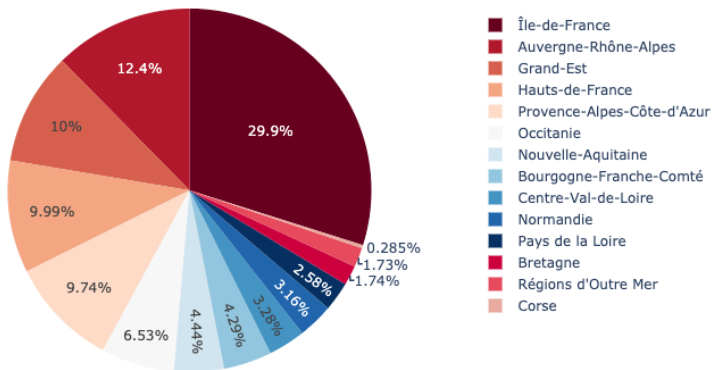
ICU Statistics

ICU flux in France during Covid19 crisis



ICU Statistics

Regional repartition of ICU during Covid19 crisis



Screening Statistics

Main code in `covidviz/screening`.

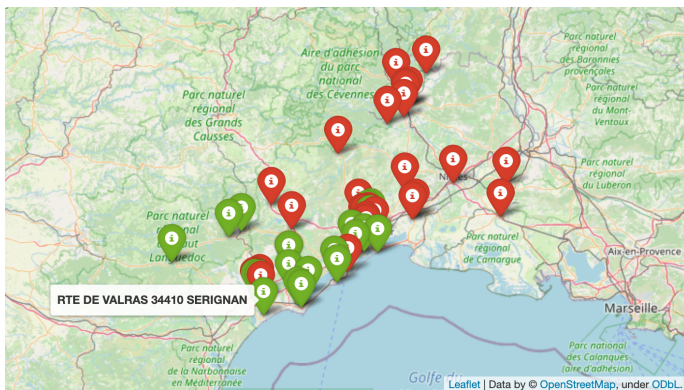
We used `plotly` and `folium` packages.

Screening by different indicators :

- 1 `daily_test` with parameters : department, classe age, tests performed.
- 2 `daily_test_dep` with parameters : department, tests performed.
- 3 `daily_test_age` with parameter : classe age, tests performed.

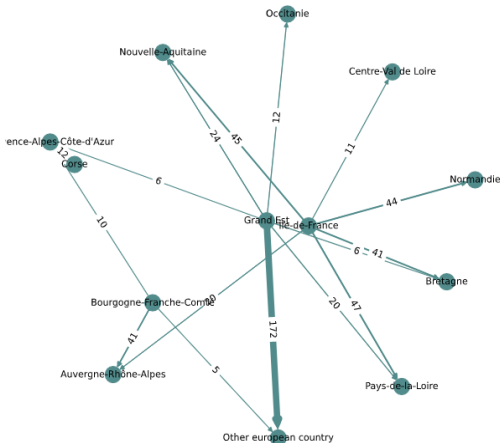
Maps of screening centers : `map_screening` function

Screening Statistics



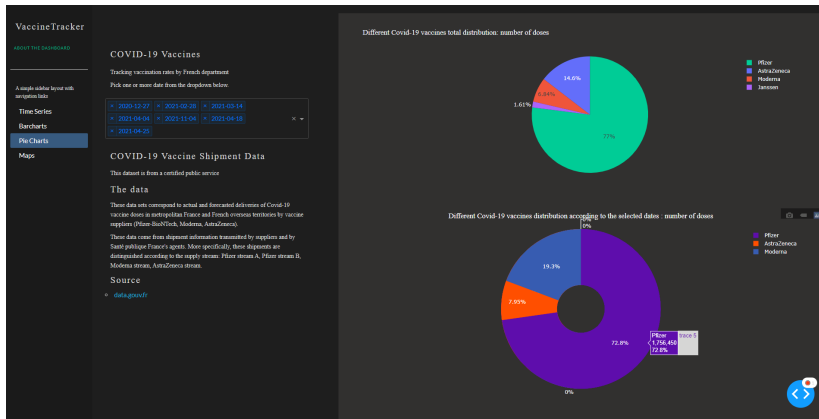
Sparse matrix and graph

French patient transfers graph



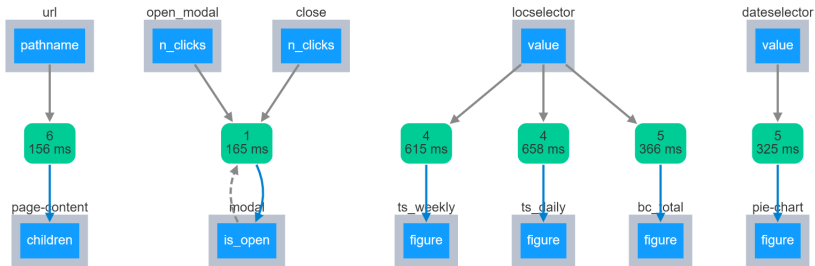
- 1 Main code in `covidviz/sparse`
- 2 `networkx` package

Dashboard : Overview



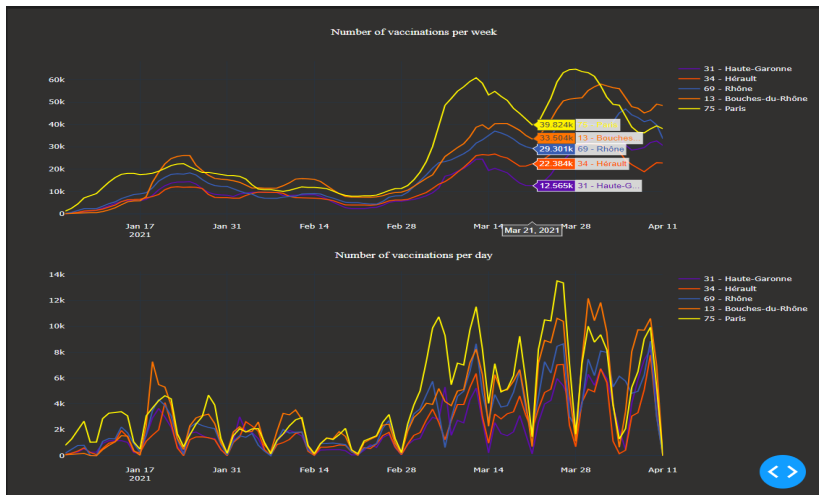
Dash app written in Python with the dash package and Bootstrap
Code available on [covidviz/dashboard](https://covidviz.org/dashboard)

Dashboard : Callbacks

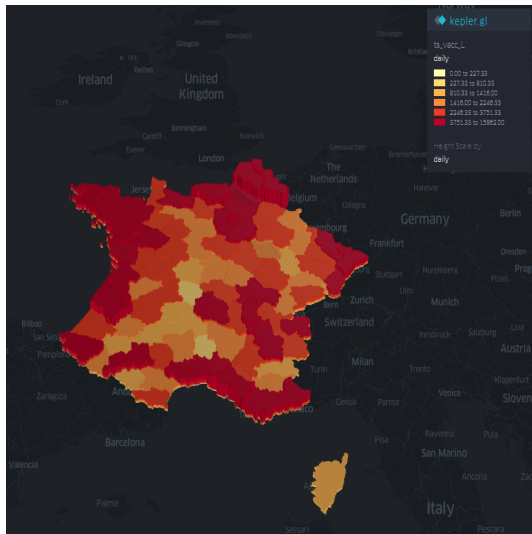


Callbacks : adding interactivity.
Inputs/Outputs are described as the arguments of the
`@app.callback` in the script

Dashboard : Chart Example



Dashboard : 3D interactive map



- 1 Built with Kepler.gl with MapGL render
- 2 Time-series map
- 3 Display with the HTML tag Iframe in the dashboard
- 4 Available on /html files

Covid Visualization

Thank you

For more information: [► Github covidviz](#)