Assignment report- Data Analytics using Python

Analyse COVID-19 data: UK case

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Observations and recommendations

In order to increase the fully vaccinated people, UK government should focus with their marketing campaigns in particular on Bermuda, as the number of deaths are rapidly increasing. Isle of Man requires also attention, as not only it demonstrates an increasing death trend, but also the number of recoveries is relatively low and the number of individuals having received only the first doze is high. Gibraltar is another State of interest, as it has the highest number of people with only the first doze received and higher number of deaths. However, the death trend looks stable and starts dropping after October 2021, as well as the recoveries are quite high. These indications would make us consider excluding this State from initial campaign runs. Covid19 is a topic of high concern, as reflected by the high volume of relevant hashtags on Twitter.

Initial insights from datasets

- The two files (i.e. cases and vaccinated) seem to refer to the same records with cases and vaccinations the only difference
- Looking at the mean, the number of deaths is high
- Vaccinated are the ones who had the 2nd dose
- 8 values are missing from 2 records in Bermudas on dates 21 and 22 Sep 2020
- High number of hospitalized versus the number of cases

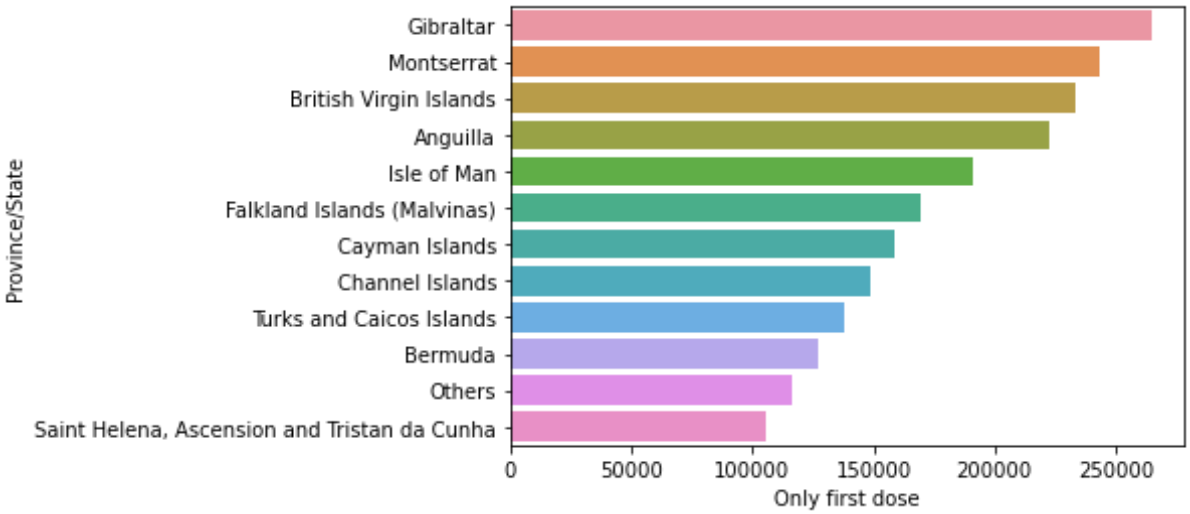
Merge and Analyse by Province/State

- Roughly 2.1 million individuals (4.5%) took only the first and not the second dose in the UK. This means UK had 95.5% full vaccination coverage (Fig.1 – UK vaccinations).
- The UK started the vaccinations in January 2021, possibly that's when the vaccine was received. Between January and March people who were getting the first dose were more than the ones taking the second dose, whereas the opposite trend is observed from April until September. In October 2021 individuals taking the first dose exceeded the ones taking the second dose (Fig.2 – First minus Second doze per month).
- Gibraltar has the highest number of individuals (Fig.3 – Only first doze by State), and Turks and Caicos Islands the highest percentage of individuals (Fig.4 – Only first doze ratio by State) who received the first but not the second dose among the UK states.

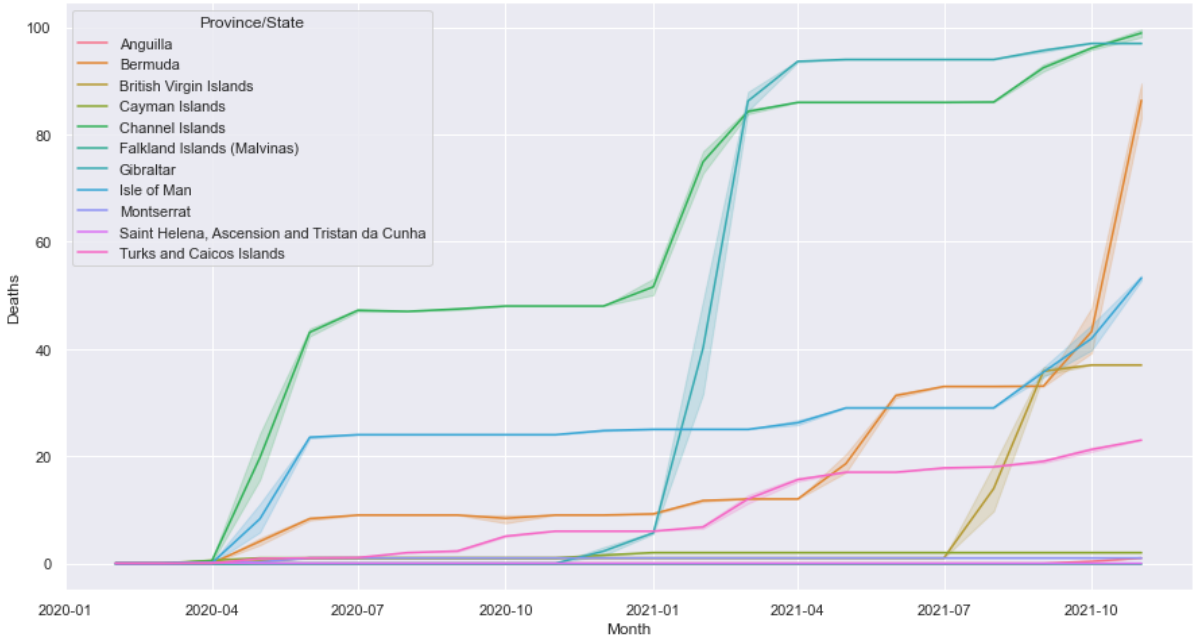
Visualise and identify trends

- The percentage of people who have not been fully vaccinated (i.e. only first and not second dose) is very similar across regions. To assist the UK government and `help as many people as possible, I will focus on the regions where the absolute number of people not being fully

vaccinate is higher: Gibraltar, Montserrat, British Virgin Islands and Anguilla are the States with higher number of people.

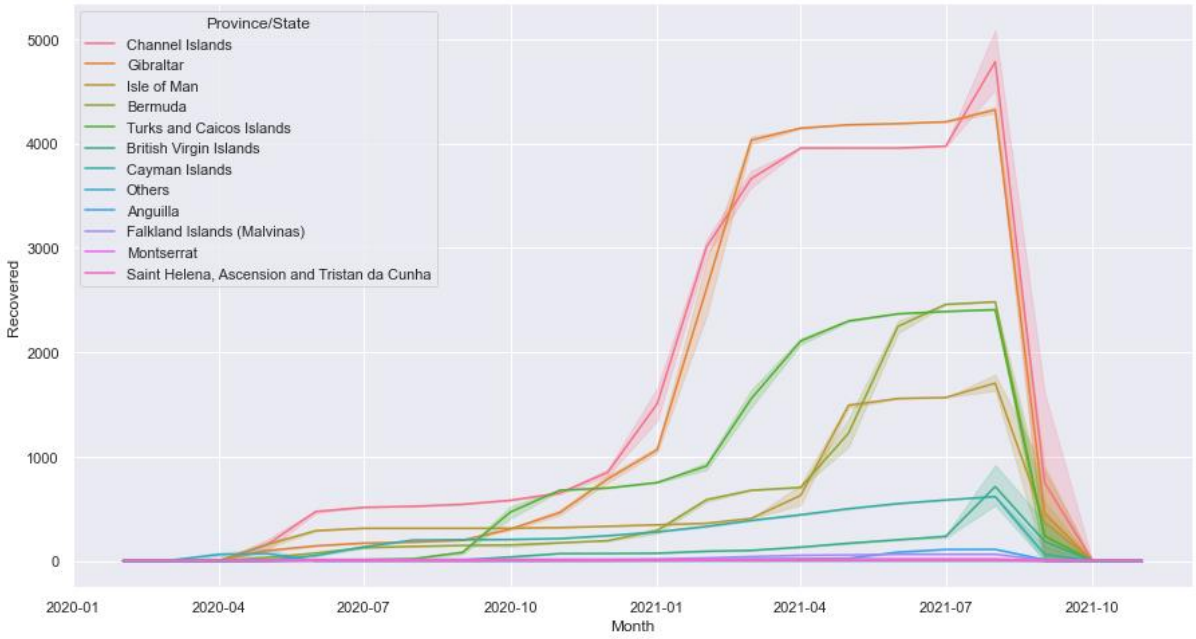


- Below we can see the trend of death counts per region over time. Bermuda and Isle of Man show a rapid increasing death trend since September and August 2021. Gibraltar and British Virgin Islands seem to have passed their peak and death count is stable. Considering their trend last few months, Channel islands and Turks and Caicos Islands might have not reached their pick and increase even further. The rest of the states' death counts remain stable and very low that should be from this analysis.



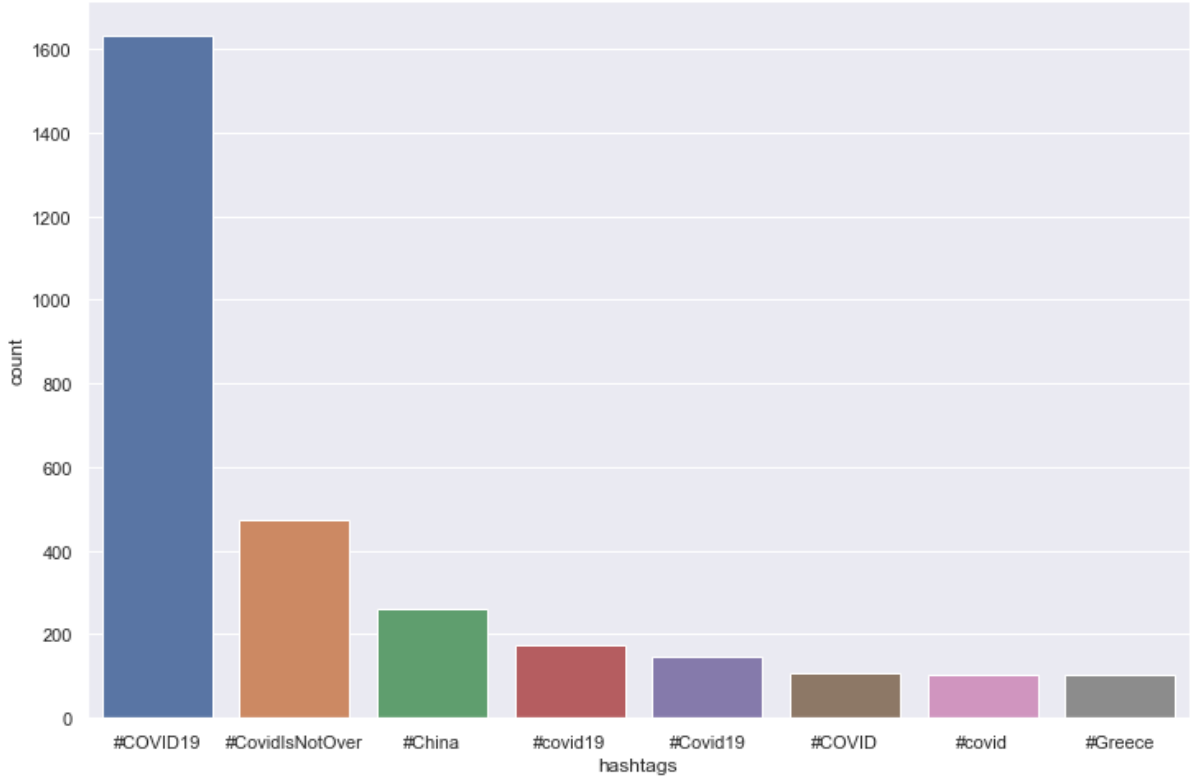
- Below we can see the trend of recovery counts per region over time. Although Channel Islands and Gibraltar are the States with the higher number of deaths, they also demonstrate the highest number of recoveries, 1m and 956k respectively. The number of

recoveries peak in August 2021 for all the States.



Analyse the Twitter data

Extracting all the hashtags from the tweeter dataset provided by the UK government, we can conclude that the volume of references to COVID is very high. Not only COVID related hashtags have the highest number of references (e.g. #COVID19, #CovidIsNotOver, #covid19), but there are also many more hashtags in the list that relate to COVID in different ways and are reference relatively many times (e.g. #coronavirus, #CoronaUptdate). This should be consolidated and investigated further. Below you can see a graph with the hashtags referenced more than 100 times.



Appendix

Fig.1 – UK vaccinations

Country/Region	First Dose	Second Dose	Only First Dose
United Kingdom	46966364	44848345	2118019

Fig.2 – First minus Second doze per month

Country/Region	Year/Month	Diff First/Second Dose	Vaccinated
United Kingdom	**2020-01**	0	0
	2020-02	0	0
	2020-03	0	0
	2020-04	0	0
	2020-05	0	0
	2020-06	0	0
	2020-07	0	0
	2020-08	0	0
	2020-09	0	0
	2020-10	0	0
	2020-11	0	0
	2020-12	0	0
	2021-01	6906984	102807
	2021-02	10657478	321611
	2021-03	7174358	3697646
	2021-04	-7229099	10443858
	2021-05	-5662444	10777396
	2021-06	-1929658	7313473
	2021-07	-3318574	5273975
	2021-08	-3316289	4587807
	2021-09	-1216262	1991847
	2021-10	51525	337925

Fig.3 – Only first doze by State

Province/State	Diff First/Second Dose
Gibraltar	264745
Montserrat	243568
British Virgin Islands	232988
Anguilla	222398
Isle of Man	190639
Falkland Islands (Malvinas)	169438
Cayman Islands	158852
Channel Islands	148261
Turks and Caicos Islands	137686
Bermuda	127073
Others	116482
Saint Helena, Ascension and Tristan da Cunha	105889

Fig.4 – Only first doze ratio by State

Province/State	First Dose	Second Dose	Only First Dose %
Turks and Caicos Islands	3052822	2915136	4.510122
Isle of Man	4226984	4036345	4.510048
Anguilla	4931470	4709072	4.509771
British Virgin Islands	5166303	4933315	4.509763
Cayman Islands	3522476	3363624	4.509669
Channel Islands	3287646	3139385	4.509640
Montserrat	5401128	5157560	4.509577
Falkland Islands (Malvinas)	3757307	3587869	4.509560
Gibraltar	5870786	5606041	4.509532
Bermuda	2817981	2690908	4.509363
Others	2583151	2466669	4.509299
Saint Helena, Ascension and Tristan da Cunha	2348310	2242421	4.509158