

UK Government's COVID-19 Cases and Vaccinations

Analysis

Executive Summary

This Data Analysis project is based on analysing data for government regarding COVID-19 cases, recovery, hospitalisations, vaccination status for people across Province/States. The analysis will help UK Government's Marketing Team direct their vaccination campaigns to boost COVID-19 vaccinations. A deep analysis will help in determining vaccination status, death rate, hospitalisation cases, recovery rate, etc. across various Province/States over time. Python will be the preferred language during this project for the purpose of Data Analysis.

Problem Statement

Currently, we hold above mentioned data and task is to analyse it to reach a decision/recommendation to help marketing team understand which Province/State has higher need of vaccination campaigns to boost number of vaccinated people.

Goal

Analysing data and exploring questions like: Which state has highest/lowest percentage of fully vaccinated people? What has been the Death rates across various regions over time? How many hospitalisation cases across regions over time? Need to exclude any region/regions if they are skewing the data? Validating the accuracy of the recorded data?

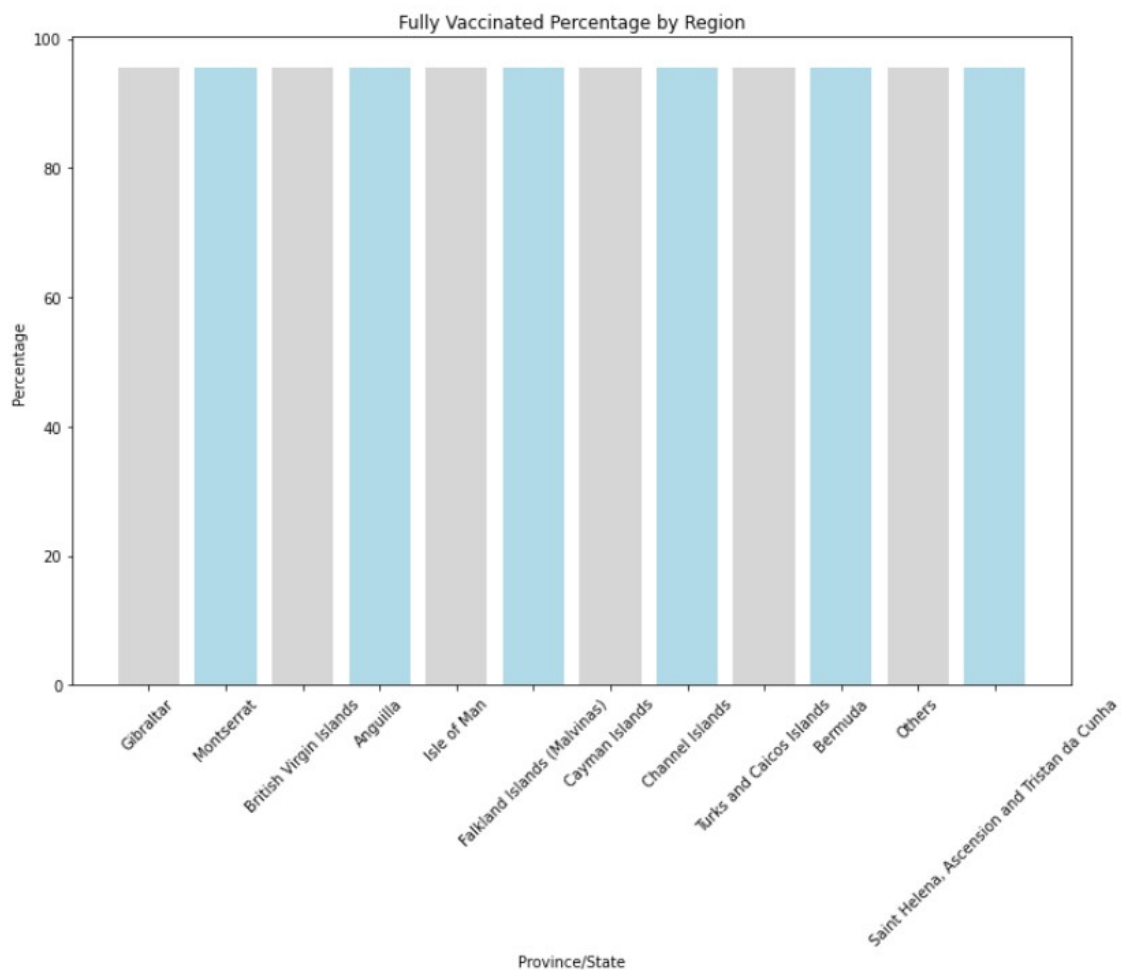
Goal is to answer all above questions and more, as need arises to conclude recommendations for marketing team.

Actions/ Solutions/ Analysis

Throughout this analysis, Bar charts are used to draw out comparison, Line charts to show changes over time and tables to present actual figures for better understanding. Analysing the data set and while checking its width and length, observations that surfaced are:

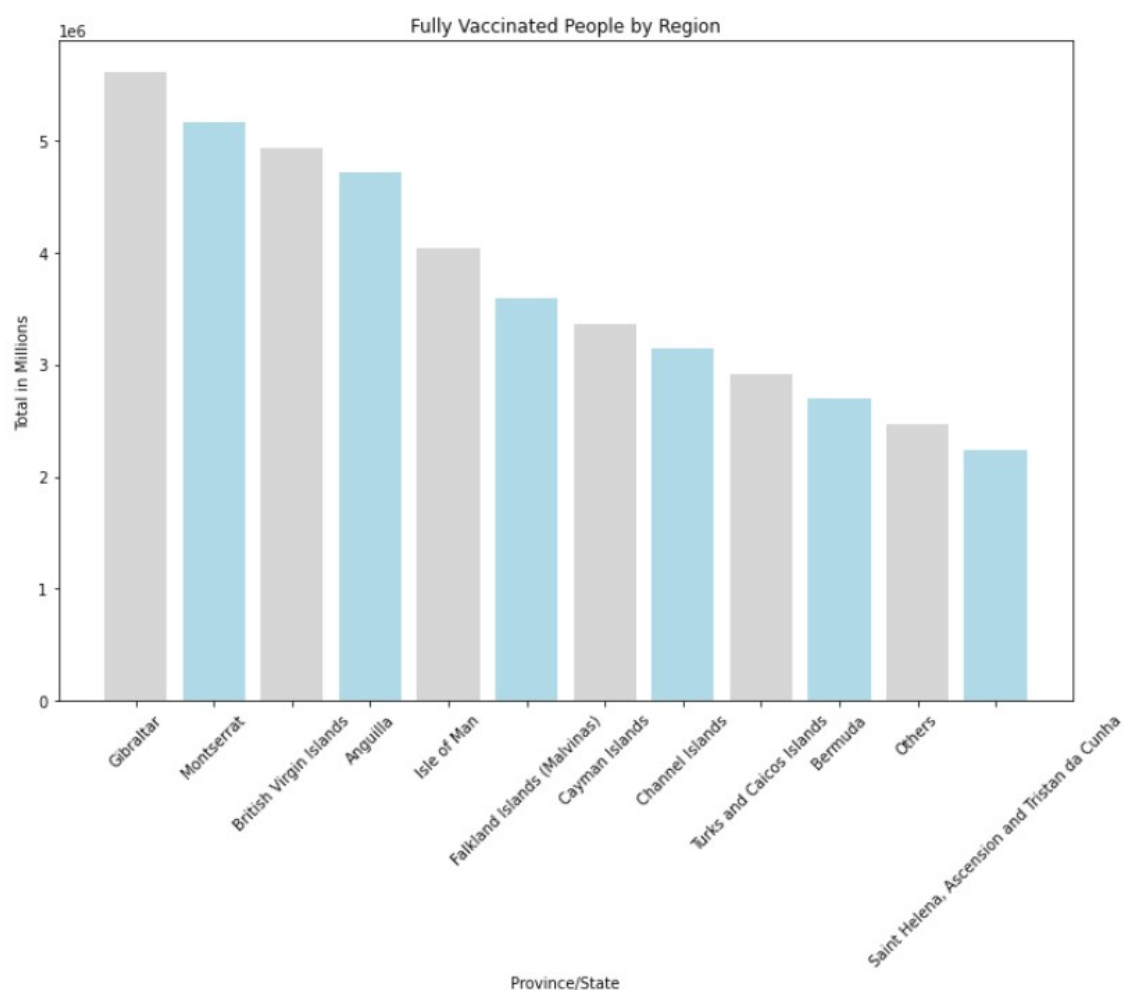
- Death, Cases, Recovery and Hospitalisation Data is missing for two days i.e., 21/09/20 and 22/09/20 for Bermuda Region.
- For every Province/State, Hospitalisation cases seem to be far more than the Total Cases. Are these total hospitalisation cases or total COVID-19 related hospitalisation cases? Are people from other regions coming to get hospitalised in these researched regions?
- As soon as the Vaccination Data begins to appear, there are records of 'Fully Vaccinated' people. They couldn't have received both their doses on same day. That implies Vaccination Data is either missing prior to this point.

- After 04/08/2021 there isn't any record of Recovered people across regions. Is this by error or need wasn't felt to maintain the records. 'Other' province does not have any records of Recovered people after 12/04/2020, did no one recover post that or a glitch in records?
- Between 18/03/2020 and 21/03/2020 Saint Helena had 4 cases, 4 recovered and 4 Deaths. How is this even possible? Either people recovered or died, they surely couldn't have done both.
- All the Province/States seem to be on par with each other when it comes to percentage of population fully vaccinated. Graph showing the same:

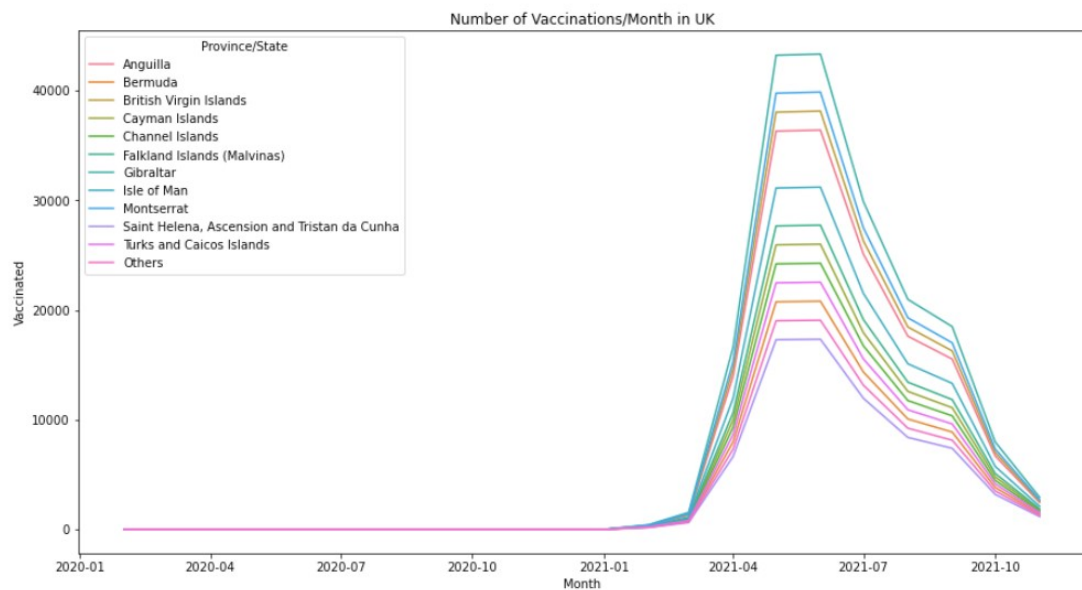


- However, number of people vaccinated differs across regions due to the population size. Table and graph showing the same:

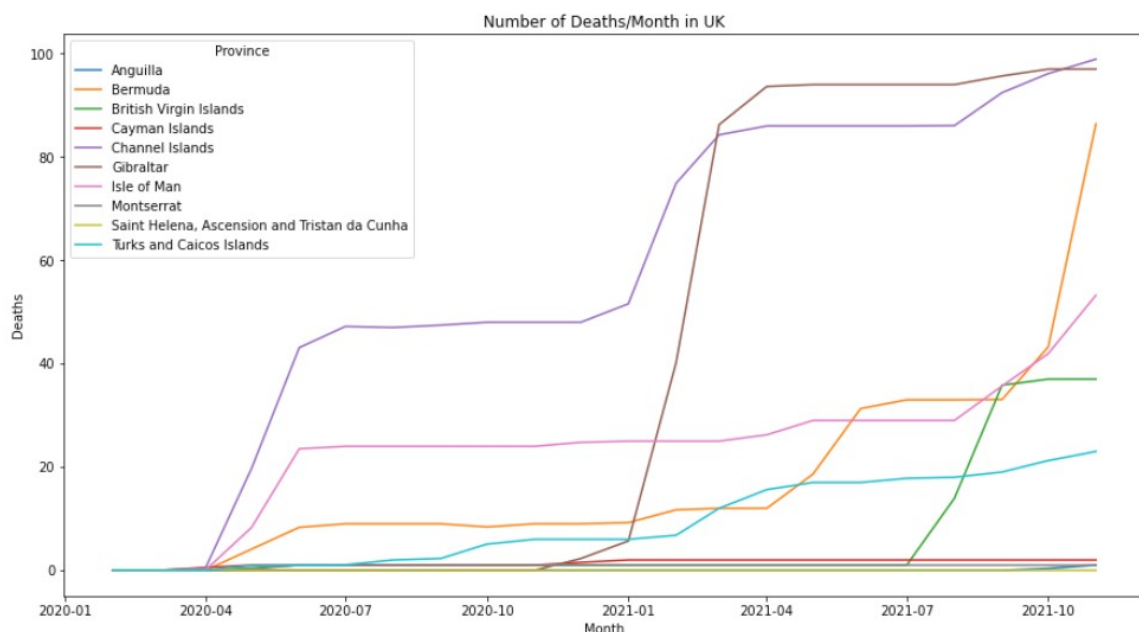
	first_dose_only	Vaccinated	First Dose
Province/State			
Gibraltar	264745	5606041	5870786
Montserrat	243568	5157560	5401128
British Virgin Islands	232988	4933315	5166303
Anguilla	222398	4709072	4931470
Isle of Man	190639	4036345	4226984
Falkland Islands (Malvinas)	169438	3587869	3757307
Cayman Islands	158852	3363624	3522476
Channel Islands	148261	3139385	3287646
Turks and Caicos Islands	137686	2915136	3052822
Bermuda	127073	2690908	2817981
Others	116482	2466669	2583151
Saint Helena, Ascension and Tristan da Cunha	105889	2242421	2348310



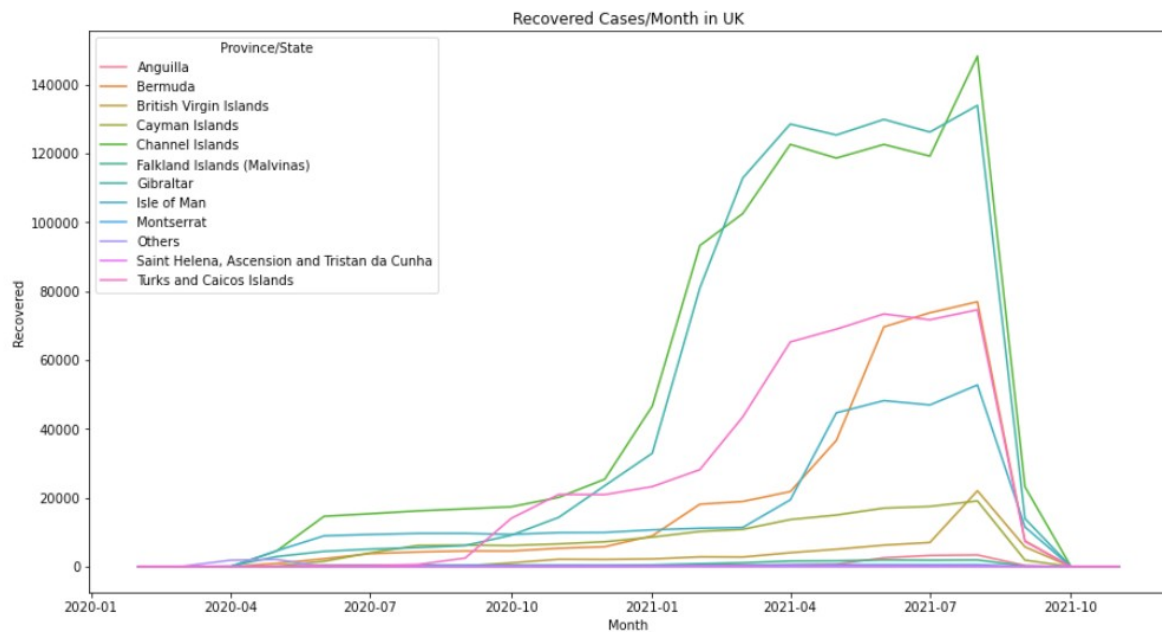
- Vaccination across various regions over time has been consistent. Every region has picked, peaked, and dipped in vaccination rate at similar times.



- Number of deaths over time across different regions has depicted a different trend line. In certain regions deaths have peaked earlier than others. In Bermuda and Isle of Man, it is still showing an upwards trend, although in other regions it seems to have peaked and now stabilised. This can be an important factor in determining where to focus more in terms of vaccination campaigns. Or on the contrary it might be difficult to convince people to get vaccinated as death rates haven't dropped even after achieving over 95% of fully vaccinated status. Trend lines are much cleaner and sharper when dates are converted to month.



- Recovery cases have followed a similar trend line across regions over time. It is more in line with vaccination status in these regions. Although, number of recoveries differ highly across regions, but that is primarily due to population size and number of cases.



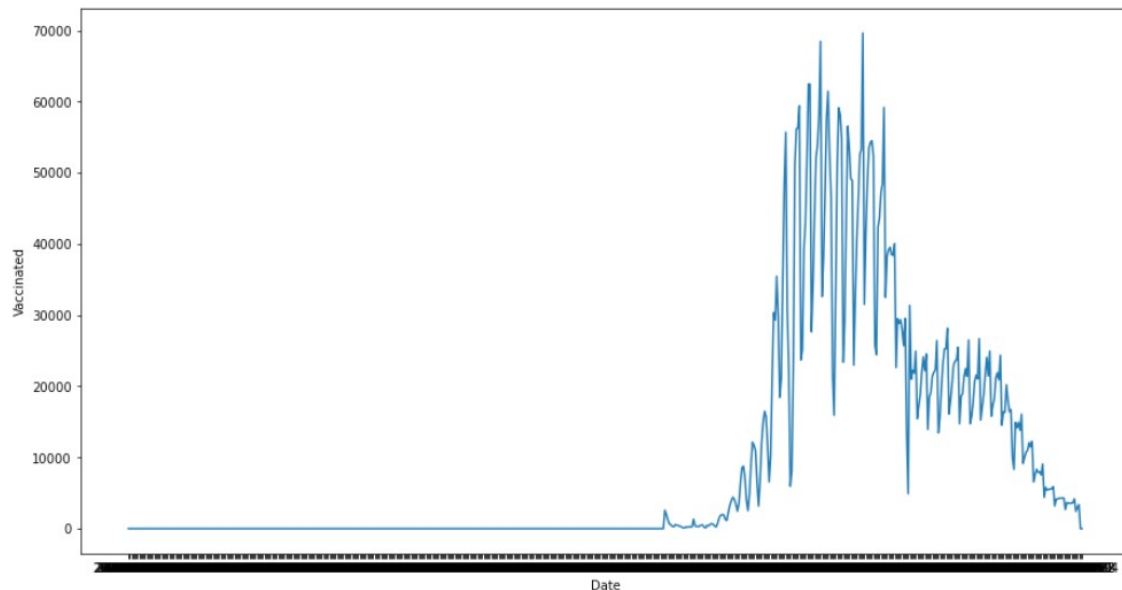
Recovered	
Province/State	
Channel Islands	1027626.0
Gibraltar	956103.0
Turks and Caicos Islands	515923.0
Bermuda	363999.0
Isle of Man	328319.0
Cayman Islands	152052.0
British Virgin Islands	64359.0
Falkland Islands (Malvinas)	14754.0
Anguilla	12708.0
Montserrat	6376.0
Others	4115.0
Saint Helena, Ascension and Tristan da Cunha	1135.0

Gibraltar

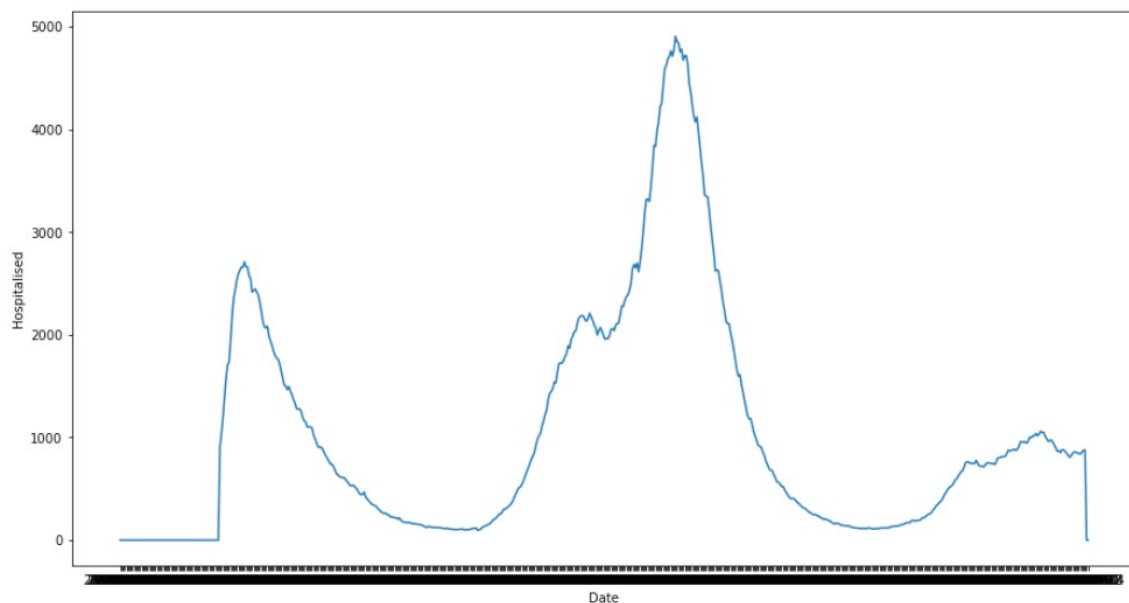
Analysing Gibraltar by its own, certain interesting facts surface:

- First COVID-19 case in region: 04/03/2020, First Recovered: 10/03/2020
- First Hospitalisation appear on 27/03/2020, at that point of time total recorded cases were 55 whereas people hospitalised were 908. Which once again puts the accuracy of data in question.

- First Death case appears 8 months after the first recorded case, on 11/11/2020.
- First Vaccination: First Dose and Fully Vaccinated both appear on 11/01/2021.
- Below figure suggests that vaccinations peaked around April and May 2021 and then gradually drops as majority of population is probably Fully Vaccinated.



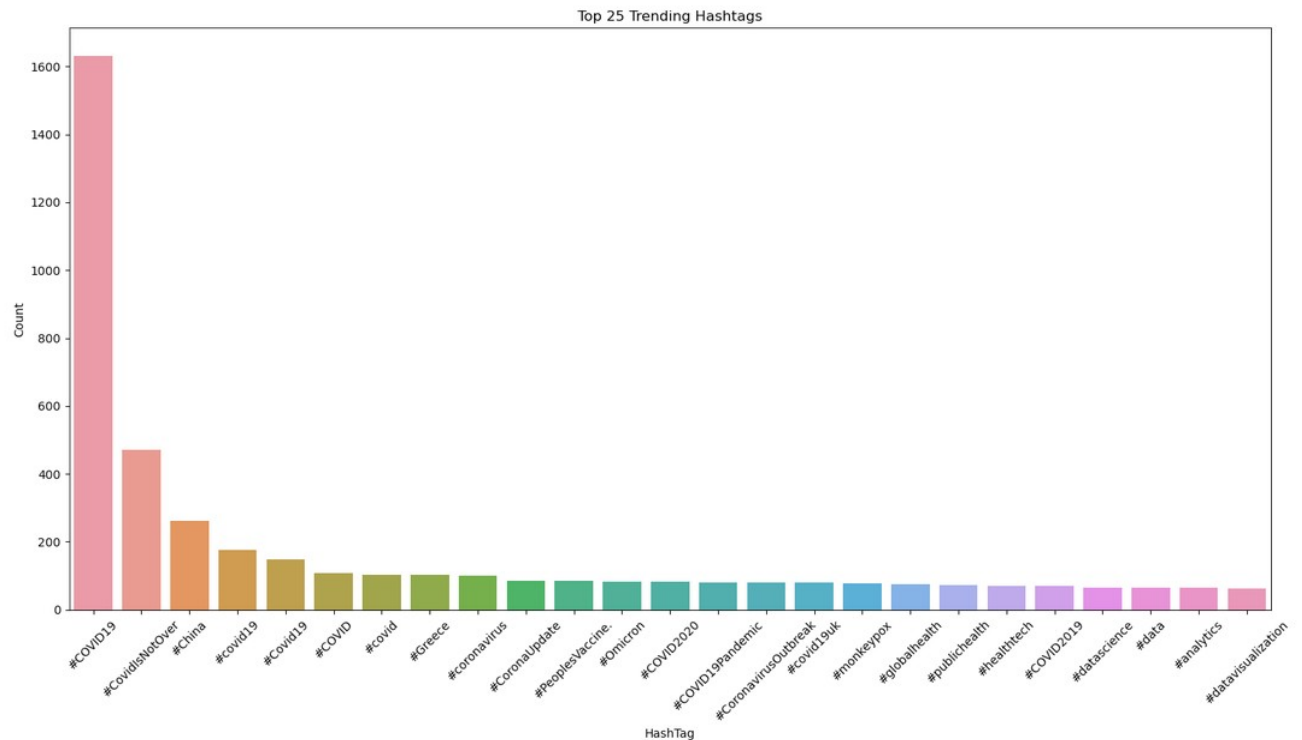
- Hospitalisation cases saw a decline post peak in Fully Vaccination status. Which is good reason for people to get vaccinated as this proves that Fully Vaccinated are less likely to get hospitalised.



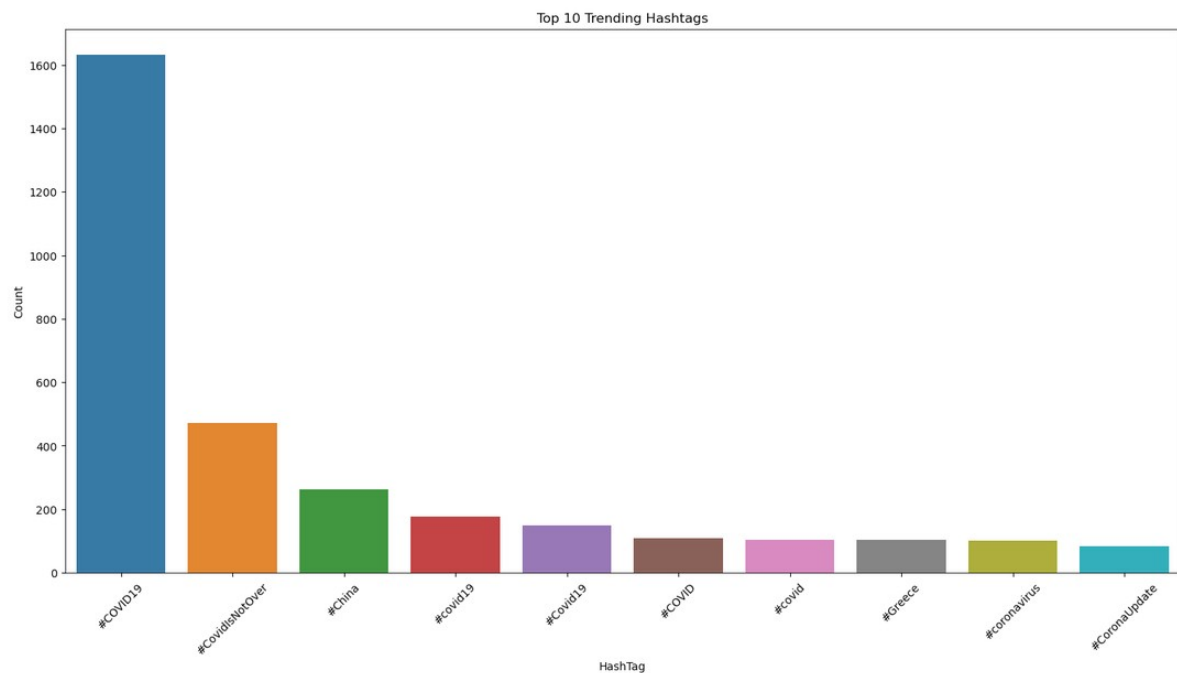
Twitter

Analysis of twitter trends have highlighted that COVID-19 related hashtags were most trending in UK during the week these tweets were captured i.e., 15/05/22 – 23/05/22. Various COVID-19 related hashtags trending on twitter are portrayed through following bar charts:

- First graph showing the Top 25 trends. Highlight is that out of Top 25, 15 are related to COVID-19 and the topmost trend which is '#COVID19' was trending more than twice the next best trend 'CoronaIsNotOver', which again is COVID related. Third most popular was China (not considered as covid related) could possibly be in trend due to COVID-19 as well.



- Second graph shows the Top 10 trends, just to make it easier for visualisation. Also, the table showing trends and number of times they have been tweeted.



	hashtag	count
0	#COVID19	1632
1	#CovidIsNotOver	472
2	#China	262
3	#covid19	176
4	#Covid19	148
5	#COVID	108
6	#covid	104
7	#Greece	103
8	#coronavirus	100
9	#CoronaUpdate	84

It will be interesting to see how these trends were, few weeks before and after this data set as well, to get a better understanding of any reasons behind why COVID-19 still trending in 2022 or has it just been a hot topic since its arrival. Moreover, are these tweets coming from across the country or is there a specific Province/State where COVID is trending more than others.

Conclusion

All the regions have depicted similar trend lines when it comes to Vaccinations and Recoveries. Death trends are somehow different across regions. As a result, Death rate can be used to differentiate between regions to determine where to focus on vaccinations with marketing campaigns. There have been concerns regarding collection and recording accuracy of data. Is this data complete? Is still a big question. Inconsistency in Data makes it difficult to reach a decision. Now it entirely depends on if we want to use Death trend line to decide or not, we still need to consider the population size and vaccination status (which is similar across the regions) of these regions. Regions with peaking death rates are Bermuda and Isle of Man. We can also consider regions with most 'First Dose Only' to push them to get fully vaccinated. Also, do we really need a campaign when the fully vaccinated percentage is over 95% across regions?