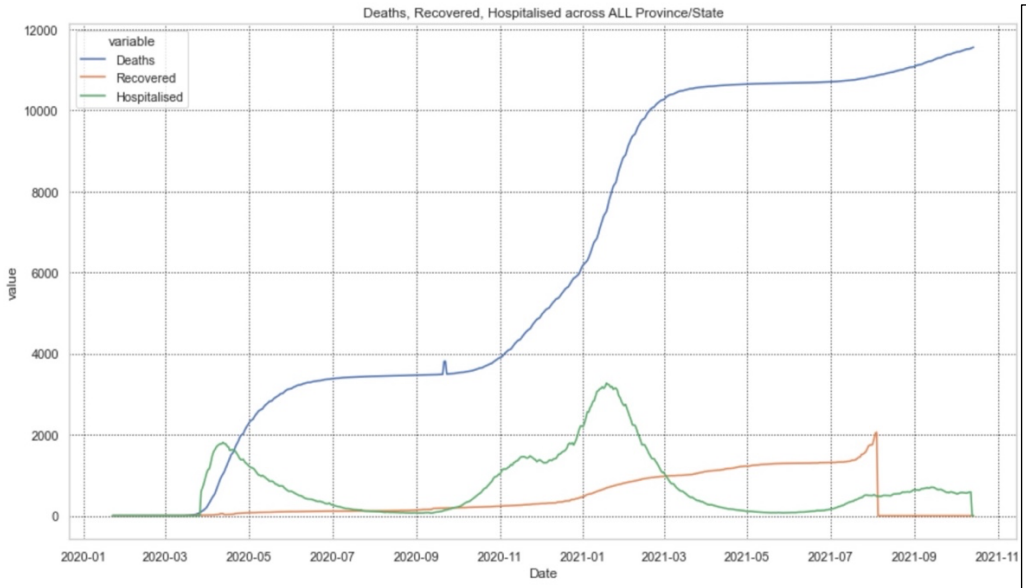
Context and Problem Statement

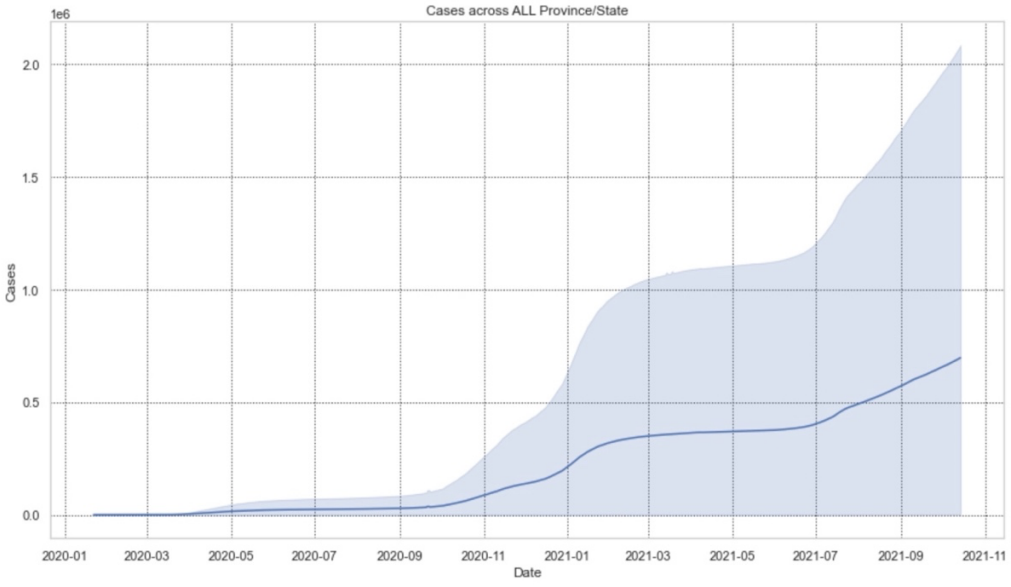
I am a Data Analyst working with the UK government to analyse COVID-19 data (from January 2020 to October 2021). As part of its goal to increase the number of fully vaccinated individuals (people who have received a first and second dose of the vaccine), the government is planning to launch a series of marketing campaigns to promote the vaccine. The government wants to identify trends and patterns that can be used to inform its marketing approach to increase the number of fully vaccinated people.

I am expected to analyse the data to identify patterns and trends that could help inform its marketing strategy to promote the vaccine and ultimately increase the vaccination rate.

General statistics



Graph 1.



Graph 2.

Supplied data enables us to visually present data in the Graphs 1 and 2 for top level overview.

Covid-19 analysis here shows deaths, recoveries, hospitalisations and cases in all provinces from Jan 2020 to Oct 2021.

Concerningly, cases and most importantly deaths are still continuing to rise hence vaccination marketing campaign is vital to save lives and Government must spread vaccination and its benefits message.

Although, strangely hospitalisations are higher than cases rates from Nov 2020.

Hospitalisations peaked in Feb 2021, now also began to drop almost plateau, whereas recoveries peaked in Aug 2021 then suddenly dropped and plateaued which looks unusual hence requires further data investigation.

Business Objectives addressed with data analysis

1. **What the total vaccinations (first dose, second dose per region, total and overtime) are for a particular region.**

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Province/State	First Dose	Second Dose	Outstanding Dose	Difference_per_region	First_Percentage	Ratio_of_interest
Saint Helena, Ascension and Tristan da Cunha	2348310	2242421	105889	105889	4.509158	95.490842
Others	2583151	2466669	116482	116482	4.509299	95.490701
Bermuda	2817981	2690908	127073	127073	4.509363	95.490637
Gibraltar	5870786	5606041	264745	264745	4.509532	95.490468
Falkland Islands (Malvinas)	3757307	3587869	169438	169438	4.509560	95.490440
Montserrat	5401128	5157560	243568	243568	4.509577	95.490423
Channel Islands	3287646	3139385	148261	148261	4.509640	95.490360
Cayman Islands	3522476	3363624	158852	158852	4.509669	95.490331
British Virgin Islands	5166303	4933315	232988	232988	4.509763	95.490237
Anguilla	4931470	4709072	222398	222398	4.509771	95.490229
Isle of Man	4226984	4036345	190639	190639	4.510048	95.489952
Turks and Caicos Islands	3052822	2915136	137686	137686	4.510122	95.489878

Table 1.

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Total 1st dose in GBR: 46966364
Total 2nd dose in GBR: 44848345
Difference between 1st and 2nd dose in GBR: 2118019
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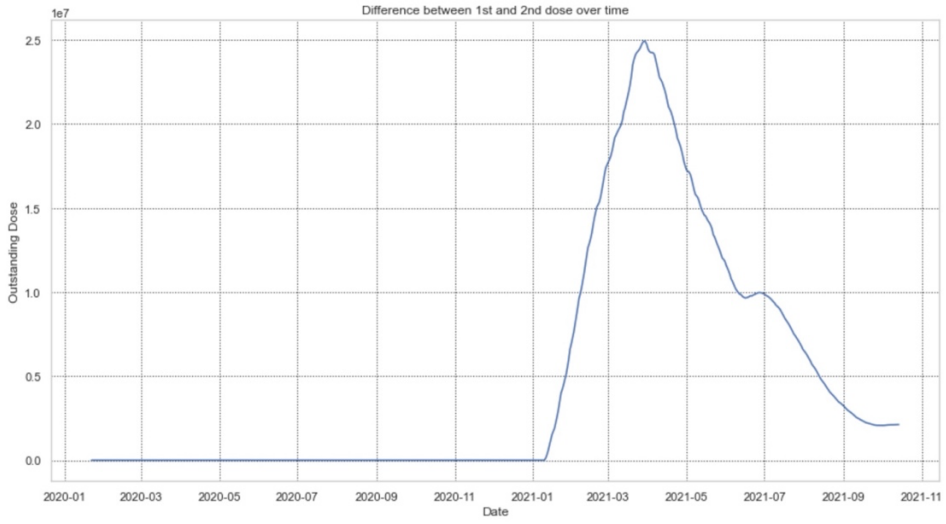
Gibraltar has highest 1st and 2nd vaccination doses; Saint Helena has lowest vaccination doses amongst all provinces. However, population data has not been provided for this analysis purposes hence vaccination versus population ratio cannot be calculated.

Outstanding Dose column indicates people still need 2nd dose in that province. Government should focus marketing campaign on lowest vaccinated provinces such Saint Helena, other provinces, Bermuda and Turks, Caicos Islands and Channel Islands. Recommendation: target Saint Helena, other provinces, Bermuda and Turks, Caicos Islands and Channel Islands with initial marketing campaign.

First_Percentage i.e. not fully vaccinated among people who had 1st vaccine, and Ratio_of_Interest i.e. fully vaccinated (%), all provinces have 95% fully vaccinated and 4.5% Ratio_of_Interest among vaccinated people. Conclusion: all provinces trend is similar due to synchronised vaccination roll-out drive, but rate of 1st dose vaccination is higher than rate of 2nd dose vaccination. However, Turk and Caicos Island have lowest Ratio_of_Interest. Recommendation: target Turks and Caicos with initial marketing campaign.



Graph 3.

Graph 4.

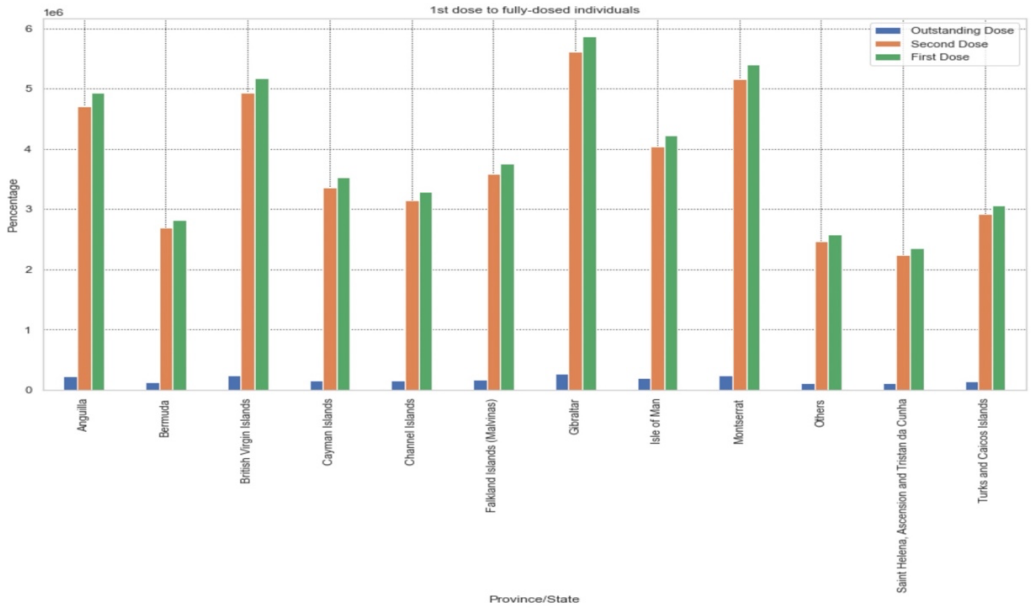
Graph 3 shows the difference between 1st and 2nd dose administration over time. Vaccines were slow to roll-out due to scepticism and phobia surrounding vaccines. Hence, data indicates between Jan 2021, peak in Apr 2021 and almost Jul-Aug 2021 huge difference between 1st and 2nd dose administration. It began to plateau in Sept 2021.

Graph 4 shows huge fluctuations in administering vaccines between 1st, 2nd and Outstanding doses for all provinces over time.

Insight: people who received the 1st vaccine dose are receiving the 2nd dose as well.

2. **Where they should target the first marketing campaign(s) based on:**

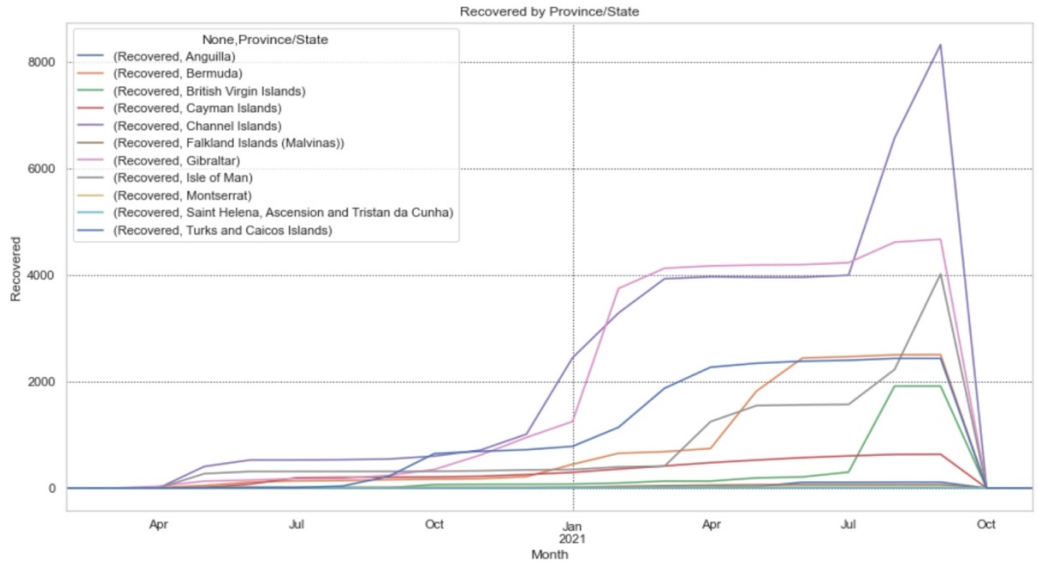
   a. **areas with the largest number of people who have received a 1st dose but no 2nd dose**



Graph 5.

The highest difference between 1st, 2nd and Outstanding doses is in Gibraltar, Monserrat and British Virgin Islands. The Government must focus initial marketing campaigns in these provinces (see Graph 5).

   b. **which area has the greatest number of recoveries so that they can avoid this area in their initial campaign runs**



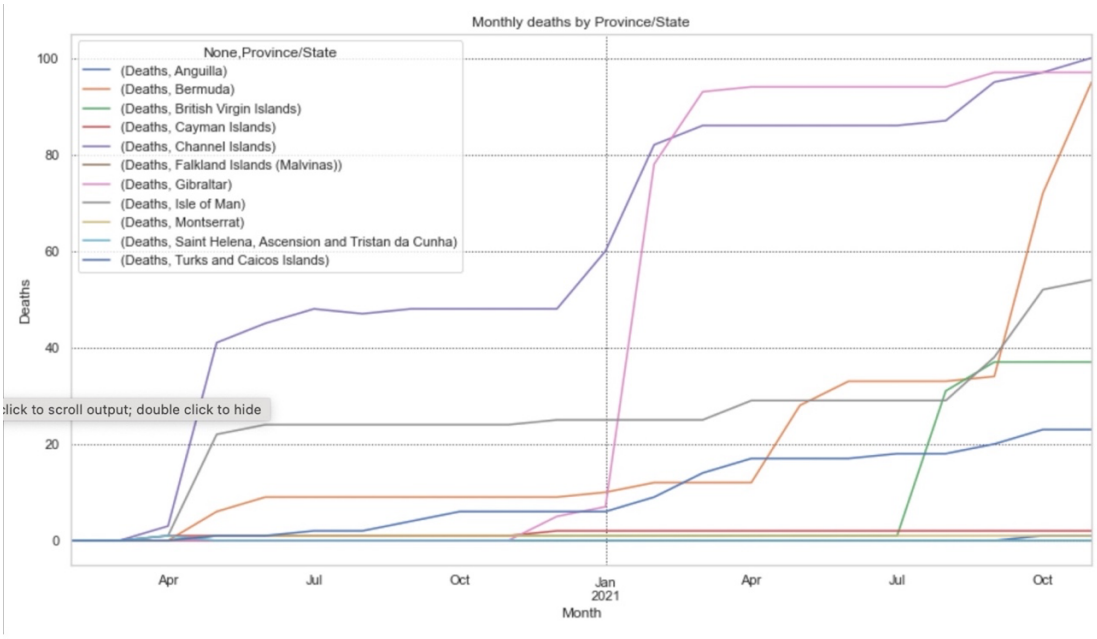
Graph 6.

Gibraltar, Channel Islands and Turks & Caicos has the highest recovery rates.

Sharp increase in recoveries in Aug 2021 must be attributed and related to vaccination

Montserrat, Saint Helena, Anguilla, Falkland Islands have lowest recovery rate, therefore should be included in initial marketing campaign (see Graph 6).

c. whether deaths have been increasing across all regions over time or if a peak has been reached.

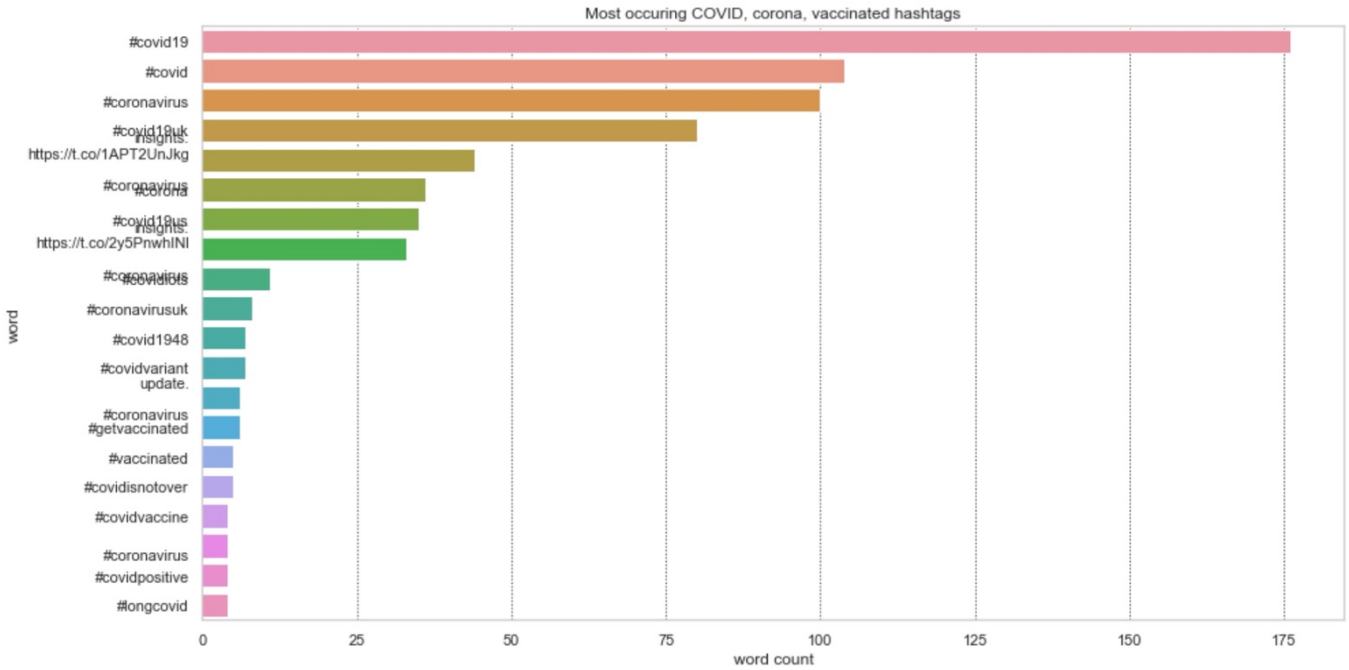


Sharp increase in deaths in Channel Islands, Bermuda, Anguilla and Isle of Man in Apr 2020. Whereas in Gibraltar, Cayman Islands, Saint Helena, Turks & Caicos deaths start in Nov 2020. Deaths in British Virgin Islands start in Jul 2021 (Graph 7).

Graph 7.

Channel Islands, Gibraltar and Bermuda has the highest death rates, not far behind is Isle of Man. Generally speaking, deaths have not peaked yet and are still increasing.

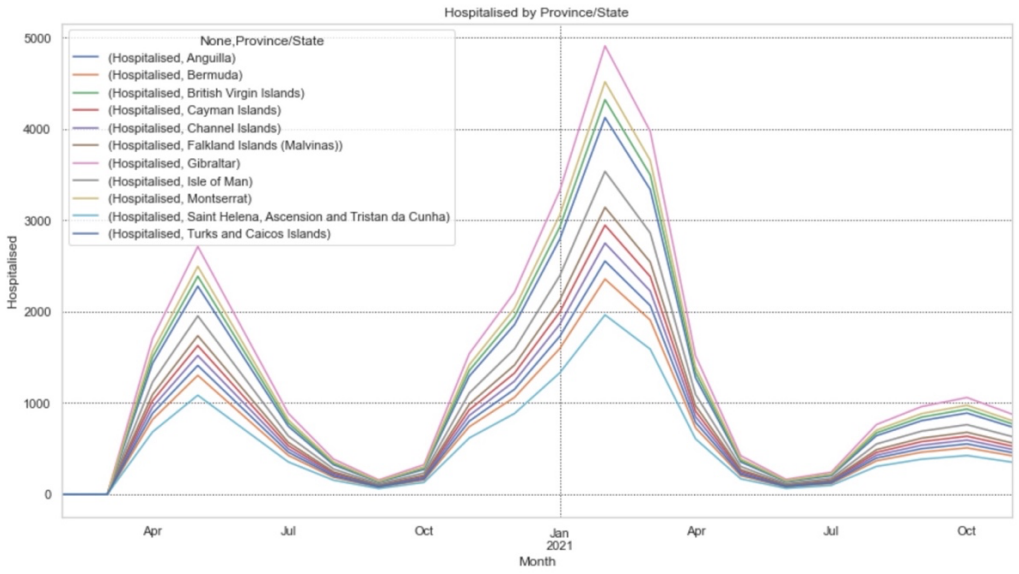
3. What other types of Twitter data points and tweets have both #coronavirus, corona and #vaccinated hashtags.



Graph 8.

Covid19, Covid and Corovirus are being tweeted most. Somewhat vaccination hashtags are not being popular with hashtaging yet, one could speculate, but probably this data is obtained at the begging of Covid-19 pandemic.

4. **Which regions have experienced a peak in hospitalisation numbers and if there are regions that have not reached a peak yet?**



Graph 9.

Graph 9 shows 3 peaks in hospitalisations across all provinces.

From around February 2021 hospitalisations have downward trend, only slightly peak in October 2021 again and almost begin to plateau onwards.

However, confidence in data being accurate is low, because all Provinces follow exactly the same pattern trend suggesting issue with the data – in really world this scenario is most unlikely.

Marketing Campaigns focus

Based on the results of the data analysis, I recommend the Government targets with initial marketing campaigns, because analysis unveiled:

- Montserrat has high death rate
- Saint Helena has low vaccination rates
- Anguilla has low recoveries and high death rates
- Falkland Islands has high death rate

Montserrat, Saint Helena, Anguilla, Falkland Islands have lowest recovery rate, therefore should be included in initial marketing campaign.

Issues

- Hospitalisation numbers are higher than number of cases and do not match the difference between cases and recovered numbers.
- Some recovered numbers are higher than hospitalised.
- Tends of hospitalisation are similar across all provinces which means issues with data collection.

Recommendations

- Investigate the data provided for anomalies in the data.
- Investigate data source.
- Most important for data collection is a single point of data entry or database for data recording. Anomalies, inconsistencies, human errors are prevalent when these are not in place.