

# UK Covid Analysis

**Author:** Matt Rose

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## **Version**

Author	Version	Date	Comments
Matt Rose	0.1	7 <sup>th</sup> July 2022	Initial Draft
Matt Rose	0.2	7 <sup>th</sup> July 2022	Added citations to tables and figures
Matt Rose	1.0	7 <sup>th</sup> July 2022	Final Version

## Table of Contents

<b>Version .....</b>	<b>2</b>
<b>Scenario .....</b>	<b>3</b>
<b>Approach &amp; Insights .....</b>	<b>3</b>
Data Summary .....	3
Vaccination Uptake .....	4
Cases and Deaths .....	4
Recoveries .....	6
Social Media .....	6
<b>Additional Exploration.....</b>	<b>7</b>

## **Scenario**

The UK government have requested an analysis of data to help with a marketing campaign with the intention of increasing uptake of the vaccination. As part of this analysis, the government wants to review trends and patterns that will help with the successful outcome of the marketing campaign.

The key outputs that the government is looking for are:

- **Total** vaccinations (1st dose, 2nd dose) in total and overtime per region
- Where they should target the first marketing campaign based on:
  - Largest area with 1st dose but no 2nd dose.
  - area which has the greatest number of recoveries so that they can be excluded from the campaign.
  - whether deaths have been increasing across all regions or if a peak has been reached.
- Which regions have experienced a peak in hospitalisation numbers and if there are regions which have not yet peaked.
- What other Twitter data points and tweets have both #coronavirus and #vaccinated hashtags.

## **Approach & Insights**

### **Data Summary**

Three DataFrames were created to review the COVID data provided, focusing mainly on the number of cases, the vaccination statuses and the twitter posts which included hashtags based around covid tags.

There were some interesting insights of the cases data, whereby, the column headers are inferring an infection (Cases, Hospitalised) and a resolution (Recovered or Death). However, there would be an expected aggregated correlation between the hospitalised and cases (either they match, or the aggregated number of cases is higher to account for those who have either died or have recovered). In the Gibraltar case, on 27/03/2020 - there were 908 hospitalisations but only 216 total cases, of which 57 had recovered, so there is further investigation required as to whether the 908 were hospitalised with Covid or for other reasons.

Similarly, within the Gibraltar data, there is a wave like pattern for hospitalisations. This potentially coinciding with the vaccination drive leading to lower admissions, before the

introduction of a new variant strain. The last two records provide interesting reading, potentially indicating a failure to record rather than a sudden drop to 0 for hospitalisations.

## Vaccination Uptake

It is noted that uptake of the second dose is high, with all areas of the UK having a second dose uptake ratio of above 95% against the take up of the first dose. What the figures don't show us is the total population of the province and therefore, whilst the data shows us that those who have taken the first dose, the uptake of the second dose amongst them is high. It cannot currently be compared against the population which should be the next investigative route.

The highest Province take up of the vaccination is Gibraltar but as previously mentioned, without a total population, it is not clear as to whether this number is high for the Province or not. It also has the biggest variance between the first and second dose with a difference of 264,745.

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

*Table 1 : Summary of Dose Uptake across all Provinces*

## Cases and Deaths

The number of cases across the entire United Kingdom territory shows that the number of deaths has not peaked but also that those Provinces which are categorised as 'Other' skew the data significantly, so as to make the visualisation of all of the other Provinces difficult to show anything meaningful. Interestingly, we see that most Provinces follow the same trajectory, an initial spike, followed by a levelling off, before a further spike and a second levelling off.

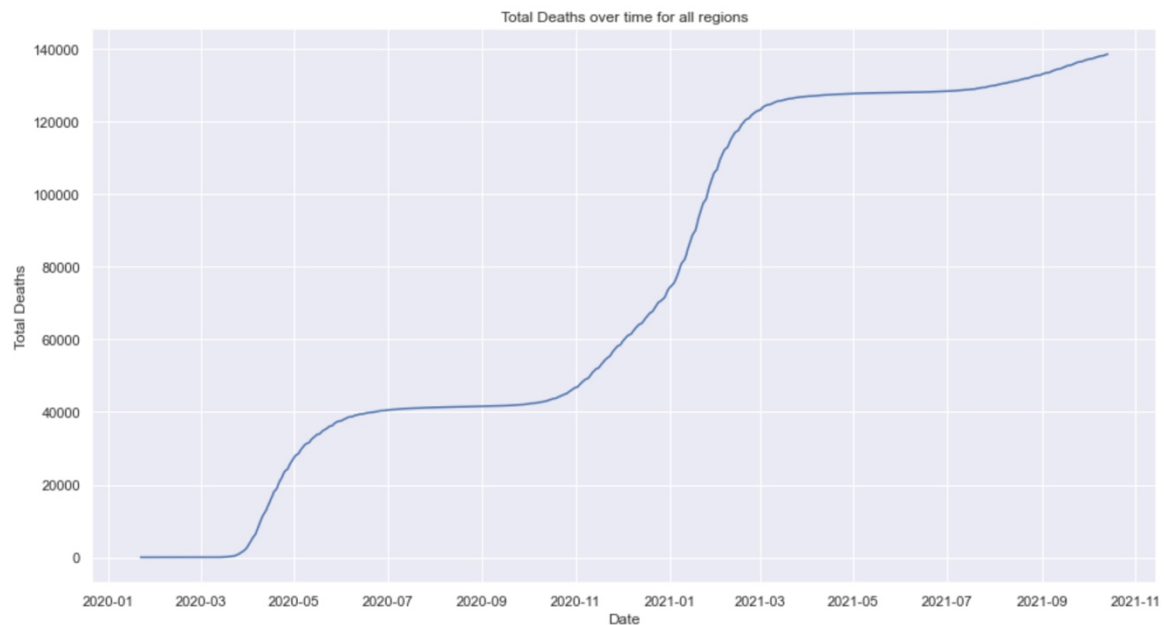


Figure 1: Cumulative Deaths over time for all UK provinces

When the 'Others' province is removed, we gain the ability to review the deaths for the other provinces in a more granular level of detail. It is important to note that the downward trend in November 2021 would appear to be due to a lack of data rather than evidence of a downturn in deaths.

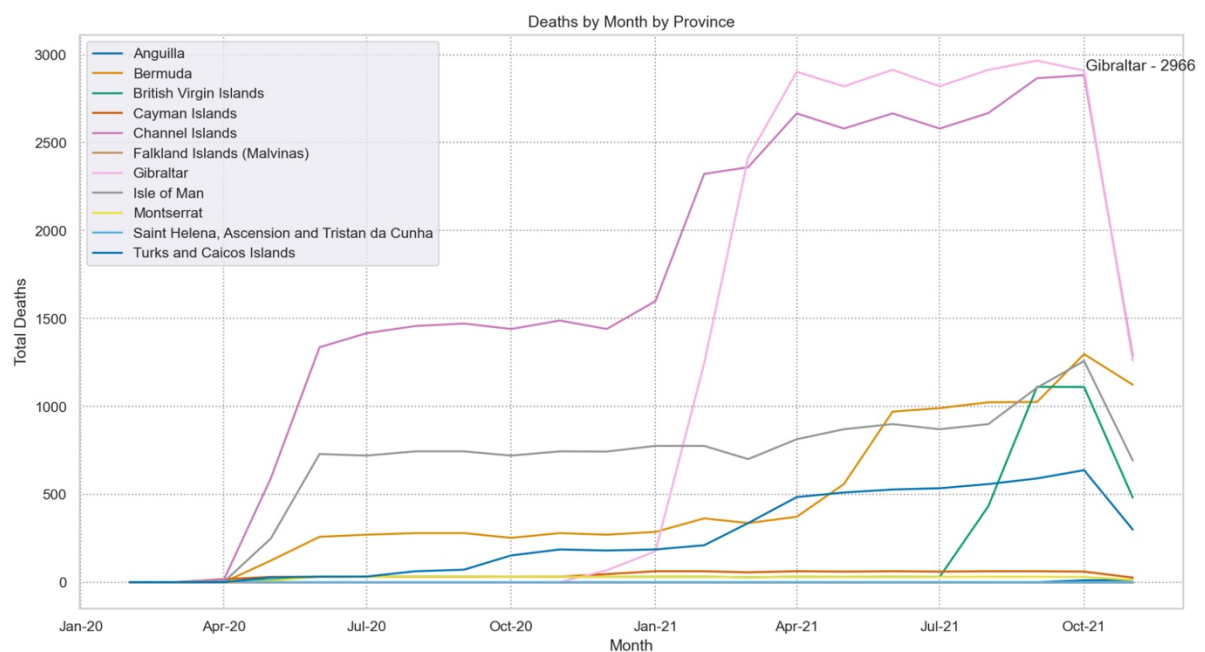


Figure 2: Deaths by month by Province - excl. Others

## Recoveries

The number of recoveries per Province is also showing as would be expected for an unknown virus of this kind. A slow rise in number of those recovering whilst authorities are trying to identify the best way to treat those who have been infected, then a high rise in recoveries after the vaccinations are introduced to the Populus and more is known on the best way to treat. It would be good to overlap the death rates with the recovery rates to see if the deaths and recoveries counter each other i.e. we see the death rates fall whilst recoveries increase.

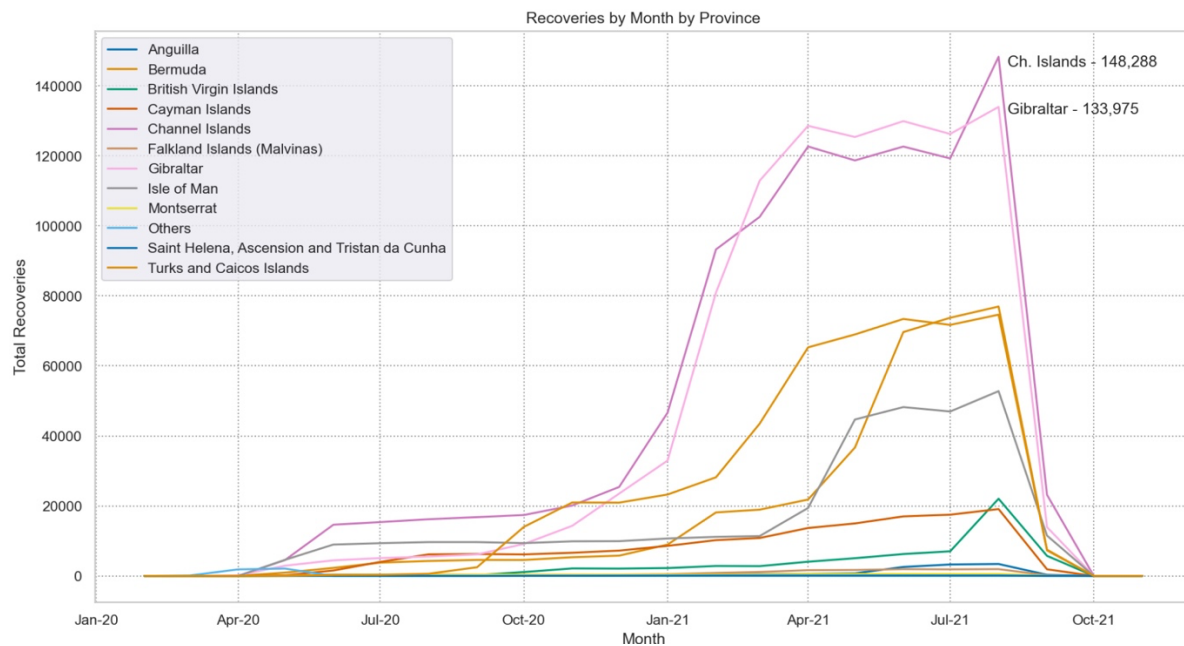


Figure 3: Total Recoveries by Province over time

## Social Media

Social media understandably has formed part of governmental strategy to update the population on vaccination progress, deaths, recovery and policy. Interestingly, the top trending twitter hashtags all have COVID or a variation of, in them. It is interesting that there are not any hashtags which refer to government decisions, lockdowns or the NHS which might have been expected. It would be interesting to find out how the public perceive the government response to COVID as this would form part of the input into deciding where to focus their next vaccination drive but also determine if there are actions to take to improve the perception, resulting in a higher uptake.

	hashtag	word 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	#PeoplesVaccine.	84
10	#CoronaUpdate	84
11	#Omicron	83
12	#COVID2020	82
13	#covid19uk	80
14	#CoronavirusOutbreak	80
15	#COVID19Pandemic	80
16	#monkeypox	77
17	#globalhealth	76
18	#publichealth	72
19	#healthtech	69
20	#COVID2019	69

Table 2: Top 20 most used hashtags

## Additional Exploration

To further the analysis, it would also be good to identify some of the following:

- If the data being provided was a rolling aggregated number of cases or if it was the number of cases reported that day.
- If recoveries and deaths overlapped by region.
- The influence of social media on vaccination uptake by exploring other trending hashtags.
- More granular level detail of the 'Other' province to better see if there is one specific province which has been hit hardest and therefore needs the focus for vaccination drive.