Netflix Boot Camp-Data science :Project 1

Coronavirus Vaccination Rates Analysis.

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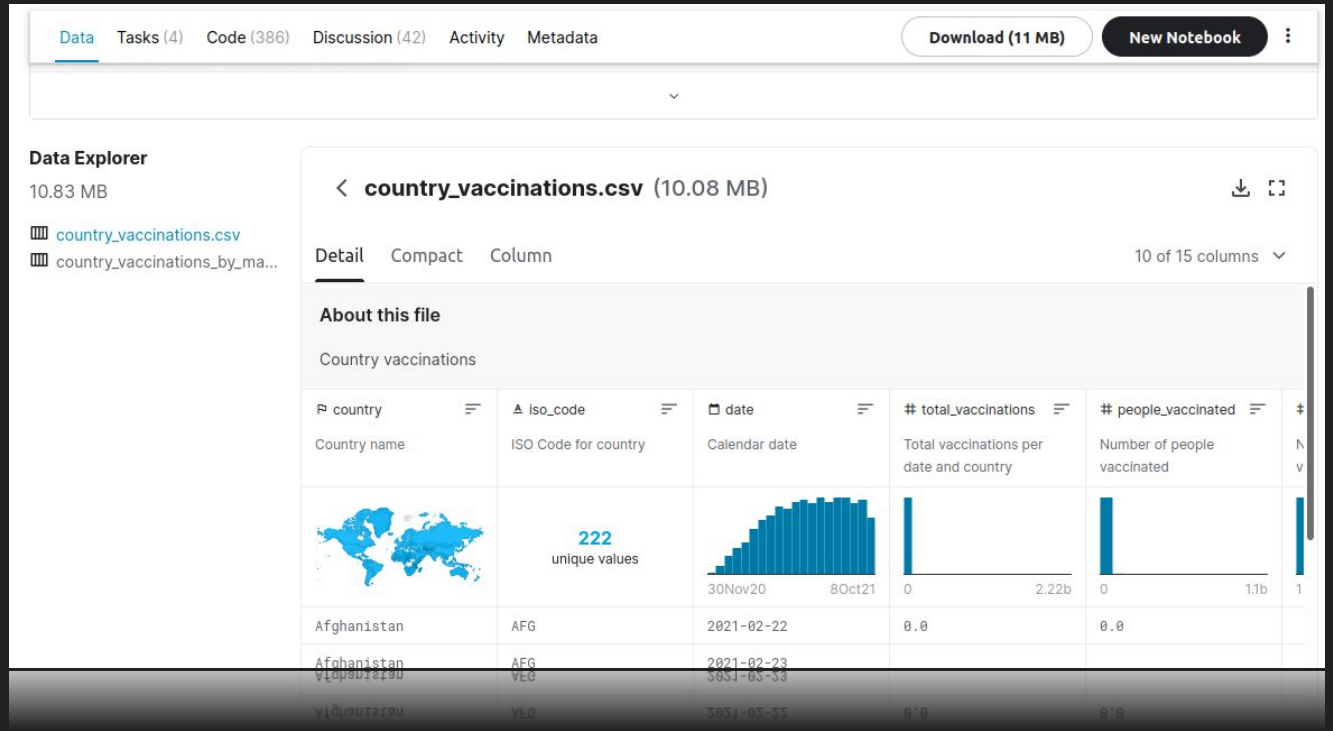
Data Acquired

https://www.kaggle.com/gpreda/covid-world-vaccination-progress



Data Details for Dataset 1

- Location - Countries 221
- Date- November 2020 to September 2021
- Vaccine types
- Total number of vaccinations - total number of vaccinations per current time.
- Population of countries.

Data Details for Dataset 2

- Location - Countries 38
- Date - November 2020 to September 2021
- Total number of vaccinations
- Type of vaccine administered

Questions

1. What is the progress and rate of vaccination worldwide from November 2020 to 30 September 2021?
2. How many people were vaccinated daily per country? Is this number consistent, or is the rate changing?
3. What is the ratio of fully vaccinated people to population? At what rate is it changing?
4. Are there any anomalies in vaccine distribution on a country-wide basis that we can explain or analyze for trends?

Data Pipeline

Vaccinations (overall):

- Merge between population and by_manufacturer is difficult
  - 221 countries represented versus 38
- Calculated rates based on cumulative data
- Correlation and Math analysis

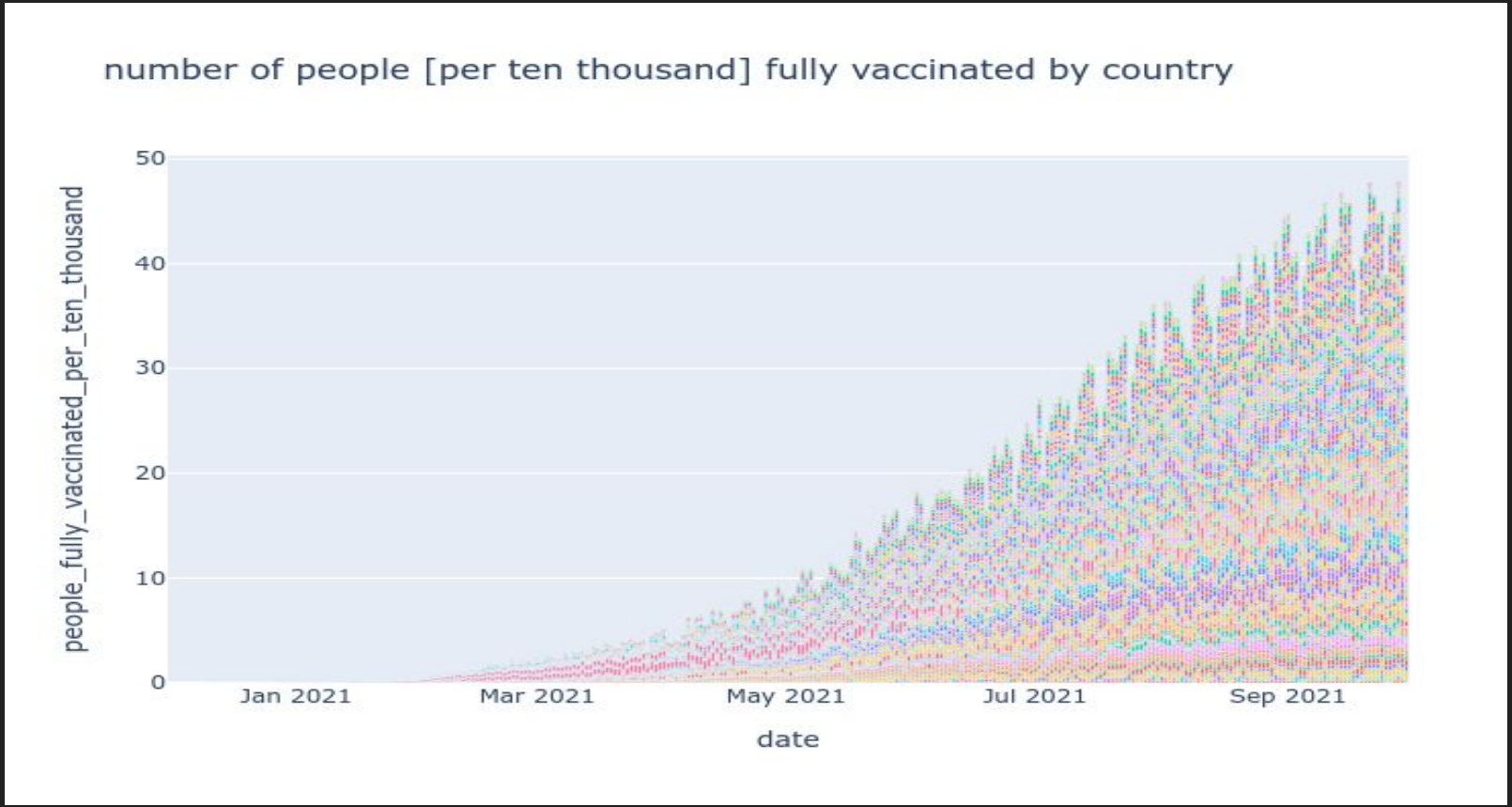
Vaccinations By Manufacturer:

- Broken into dataframe of individual vaccine doses per date (breakdown_by_manufacturer.csv)
- Blank data filled in as 0 for the specific day
- Data is cumulative over dates/countries
- For bar charts, dates are dropped

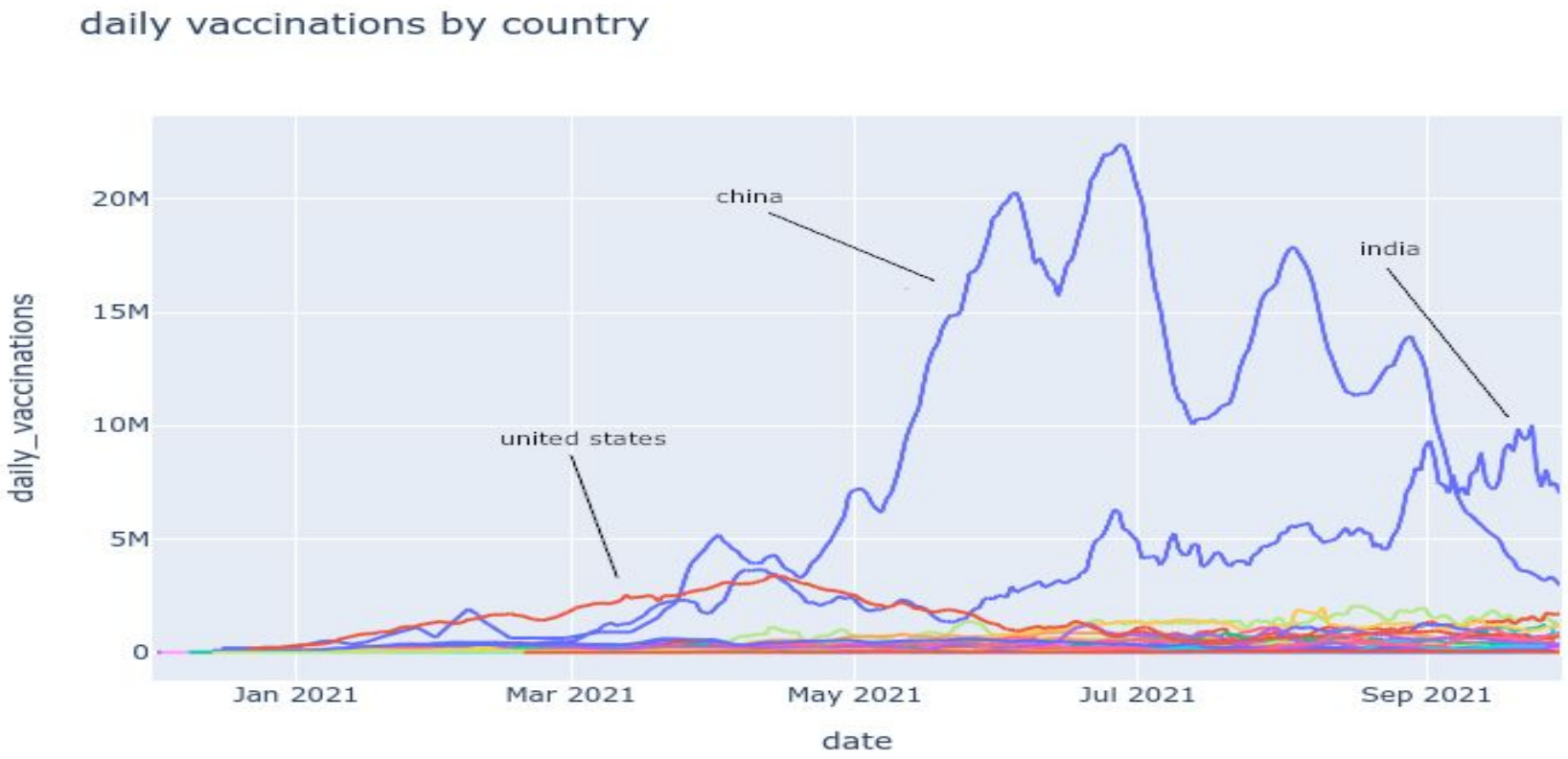
Vaccination and Rates by Countries

What is the current status of vaccination progress worldwide?

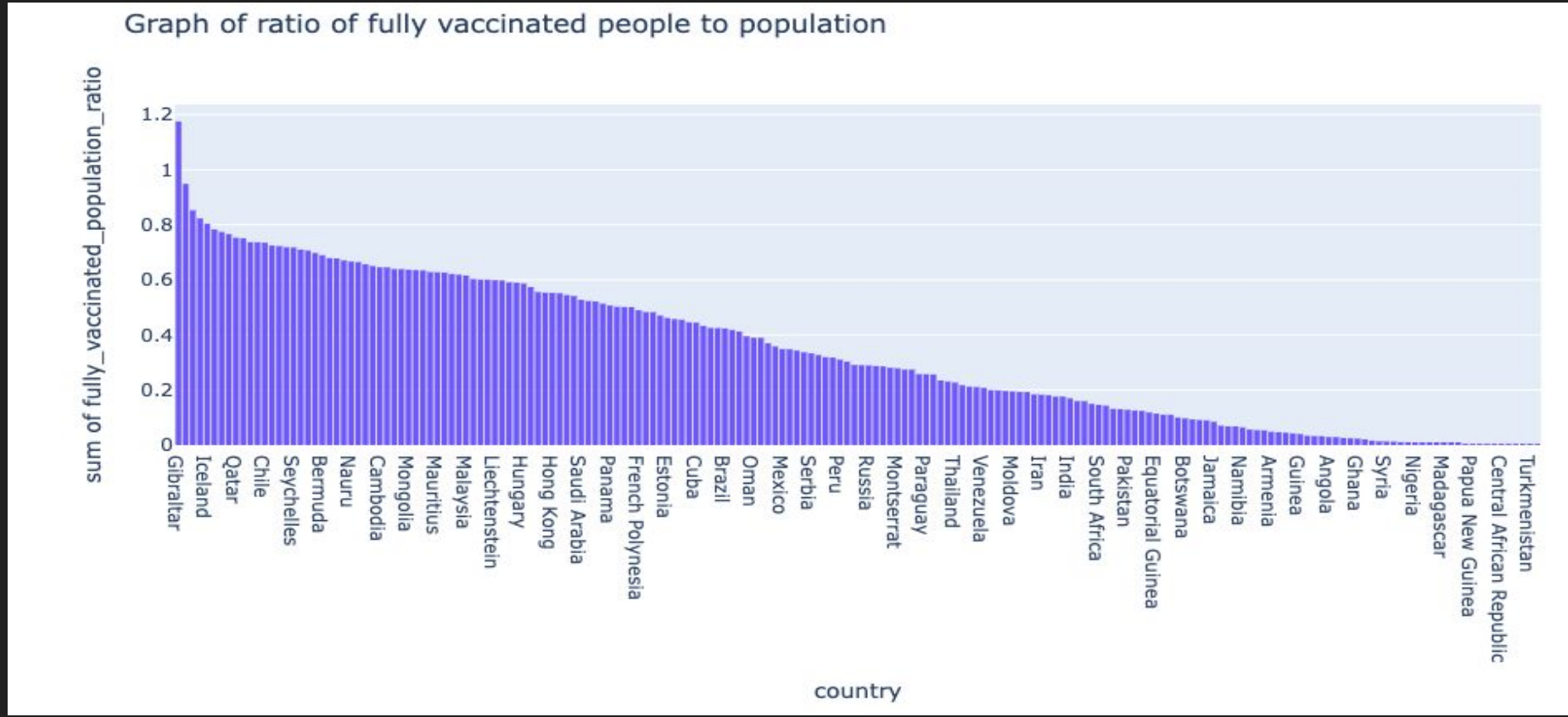
Vaccination Progress



Daily Vaccination Rate by Country



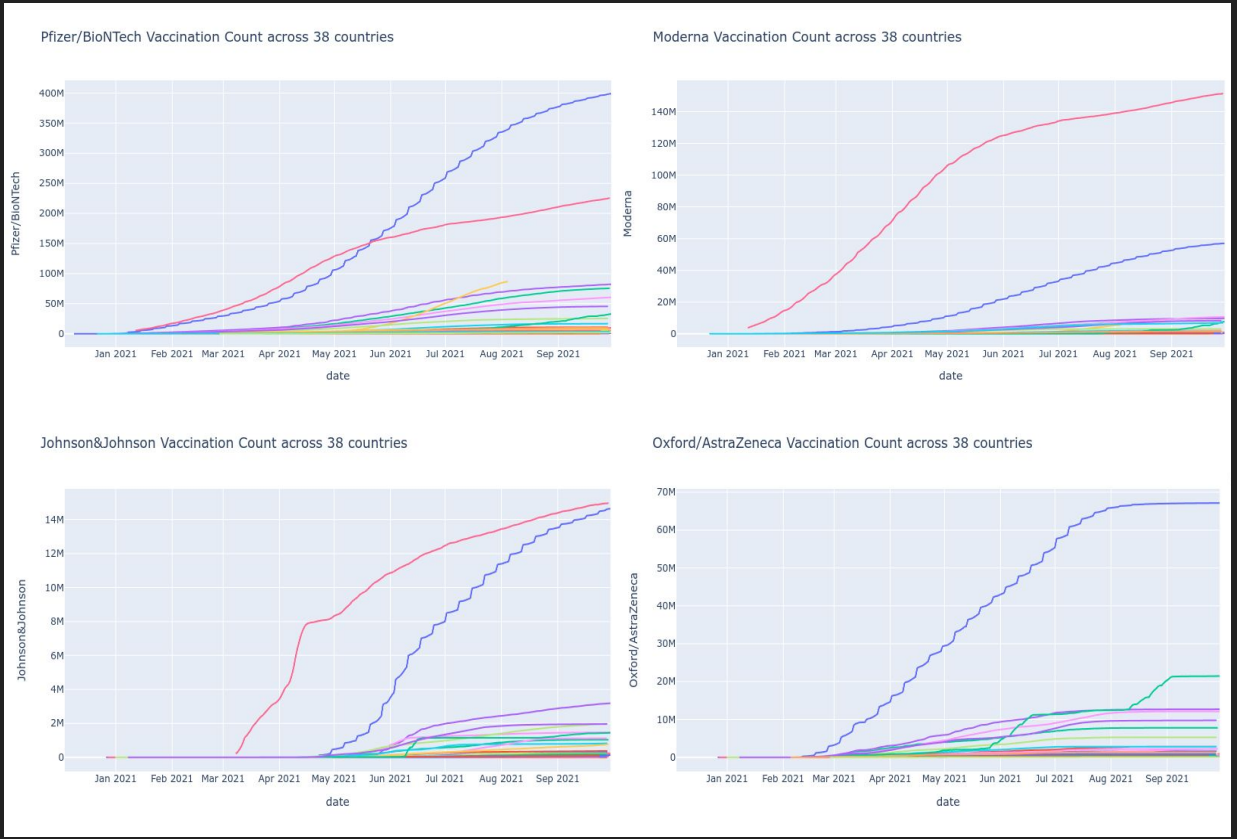
Total number of Vaccinated people per country population ratio



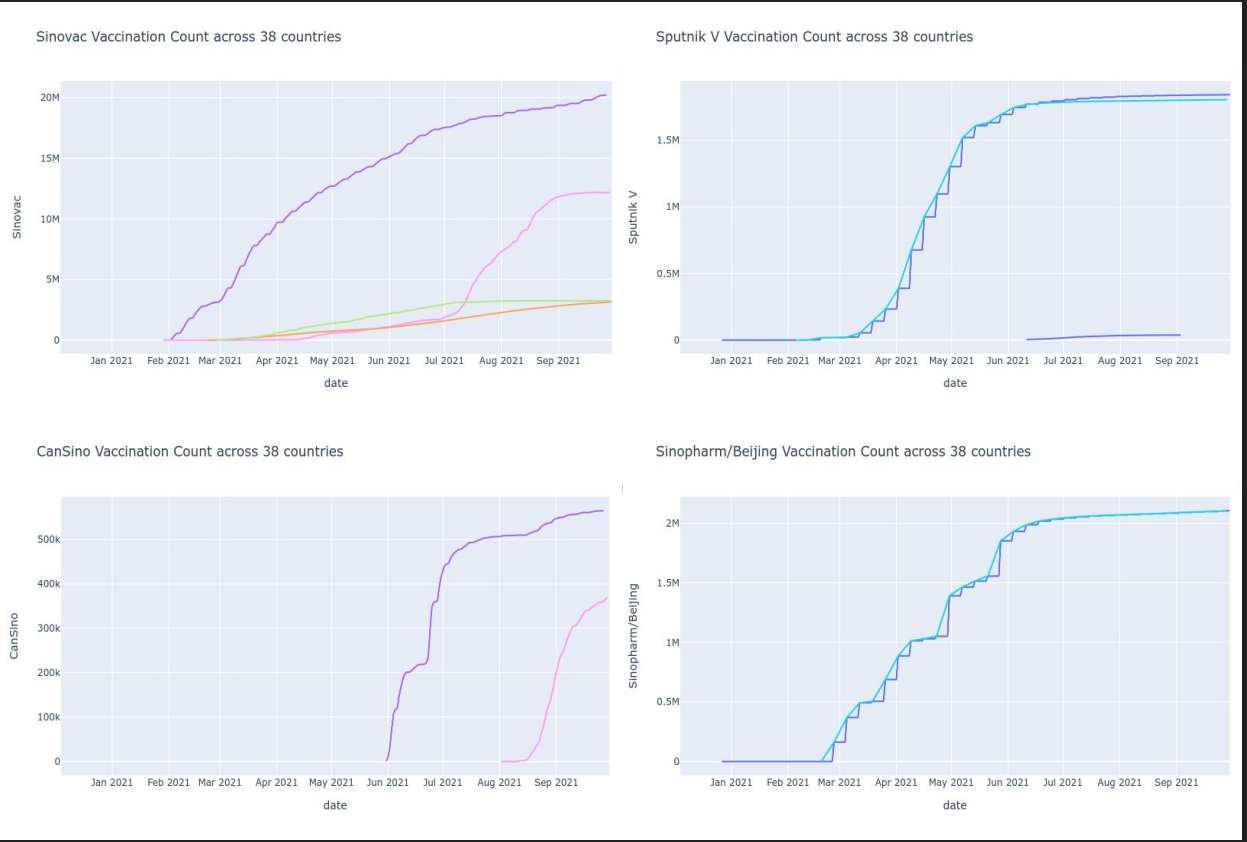
Breakdown by Vaccination Vendor

Are there any distinguishable trends among different vaccine distributions?

Breakdown by Vendor (1/2)



Breakdown by Vendor (2/2)

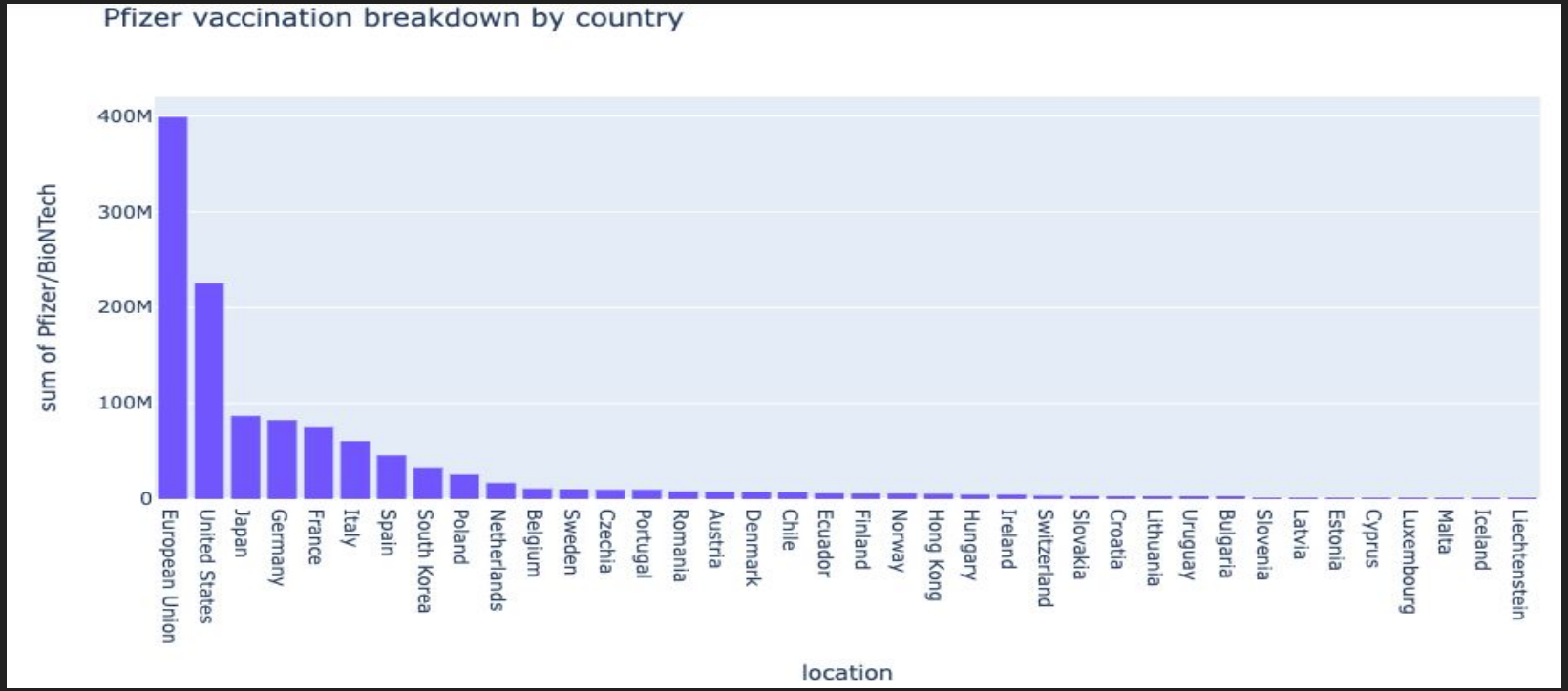


Vaccine Popularity by Population

	CanSino	Johnson&Johnson	Moderna	Oxford/AstraZeneca	Pfizer/BioNTech	Sinopharm/Beijing	Sinovac	Sputnik V
count	2.000000	3.000000e+01	3.400000e+01	3.300000e+01	3.800000e+01	2.0	4.000000e+00	2.000000e+00
mean	467153.000000	1.525550e+06	8.445792e+06	4.812900e+06	3.087982e+07	2106111.0	9.707282e+06	1.823756e+06
std	138283.216342	3.691468e+06	2.711857e+07	1.216302e+07	7.394617e+07	0.0	8.203591e+06	2.662893e+04
min	369372.000000	0.000000e+00	3.075200e+04	8.660300e+04	1.370500e+04	2106111.0	3.148675e+06	1.804926e+06
25%	418262.500000	6.104875e+04	2.683048e+05	2.729060e+05	1.996838e+06	2106111.0	3.221615e+06	1.814341e+06
50%	467153.000000	2.142840e+05	9.715950e+05	8.479980e+05	5.971054e+06	2106111.0	7.719986e+06	1.823756e+06
75%	516043.500000	1.100403e+06	5.023679e+06	2.800983e+06	1.531214e+07	2106111.0	1.420565e+07	1.833170e+06
max	564934.000000	1.497704e+07	1.513109e+08	6.713712e+07	3.989710e+08	2106111.0	2.024048e+07	1.842585e+06

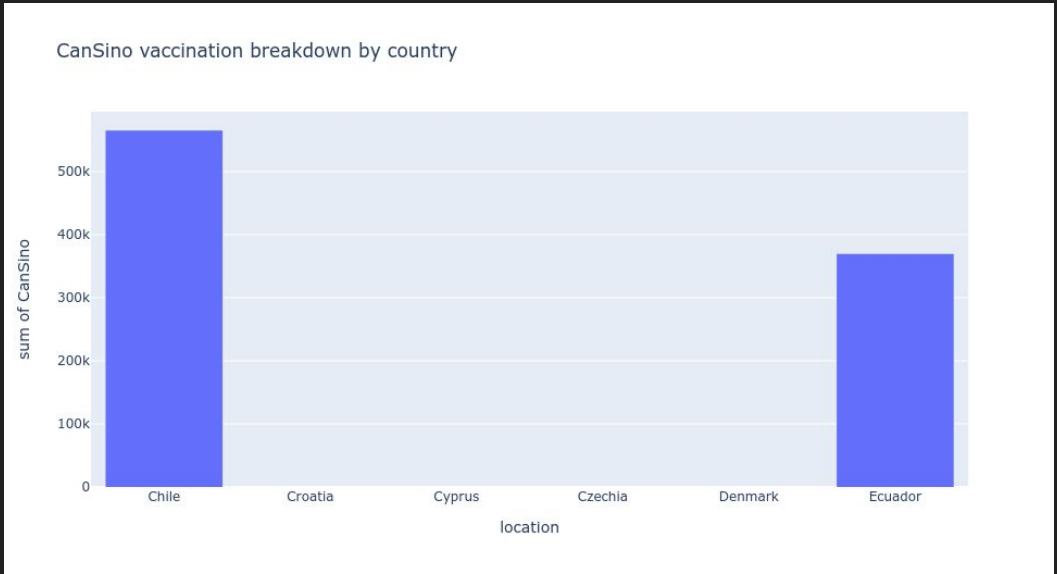
The most used Vaccine

- Pfizer/BioNTech has been used for the majority of vaccinations across the US and EU, among other nations.



The least used Vaccine

CanSino has the least recorded vaccinations across the 38 countries analyzed at 564,934 doses.



Data Limitations

- The dataset for a per-distribution breakdown does not include all nations; there may be some lurking data that can change the breakdown of vaccine distributions
- Glaring omissions: Manufacturer Breakdown data has only 38 countries
  - Many countries consolidated into E.U.
  - Does not include China, India, or Russia
    - This will have a large impact on data as all of these countries have a high population and will cause vaccines such as Sinopharm to be underrepresented

Conclusion

What questions can we answer about the data present?

Gibraltar

- Gibraltar has the highest recorded vaccination rate, at 117.48%
- This >100% anomaly can be explained by a high natural death rate
- Explained by a high senior population

For further reading:

https://www.linkedin.com/pulse/gibraltar-has-100-covid-vaccination-5th-highest-rate-schabinsky-msc

Yemen

- Yemen has the lowest recorded vaccination rate (0.157%)
- This outlier is most likely due to recent conflicts and turbulence

For further reading:
https://www.swissinfo.ch/eng/yemen-and-the-challenge-of-covid-vaccine-rollout-in-conflict-countries/46651534/

Global Vaccination

35.045%