



# **COVID-19 Pandemic and the Role of Vaccinations**

## **A Cross-Country Comparative Analysis**

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# Abstract

- Motivations
- Methodology
  - Statistical analysis
  - Linear regressions
  - Statistical Test
- Global Overview
- UK & Kenya Comparison Analysis
- Conclusions



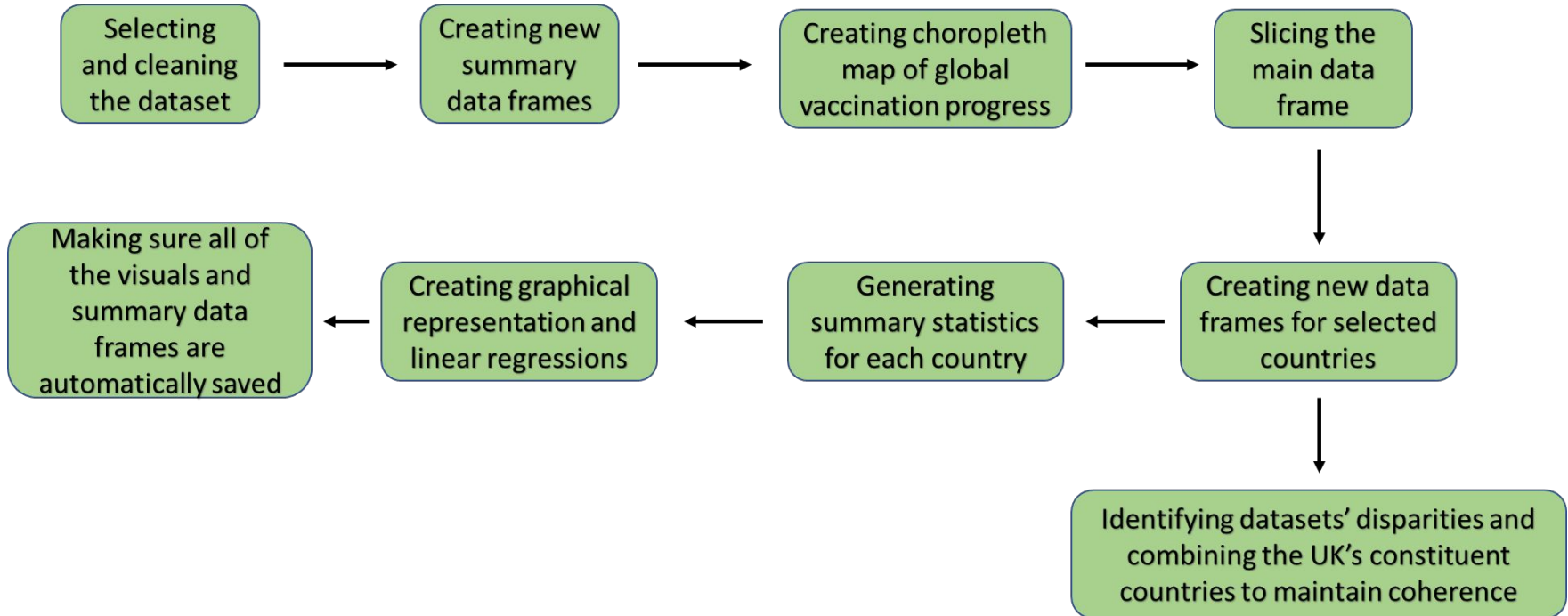
# Motivations of the Project Analysis

The COVID-19 pandemic has been at the forefront of international news, affecting all countries with differing levels of severity.

The following analysis evaluates the international responses to COVID-19 and provides a summary of worldwide vaccination progress.

In order to maintain a balanced and objective evaluation, the focus was put on two economically contrasting countries, the United Kingdom and Kenya.

# Methodology



# Questions



Is COVID-19 a deadly disease? Would it be an infectious disease in a short-time period?

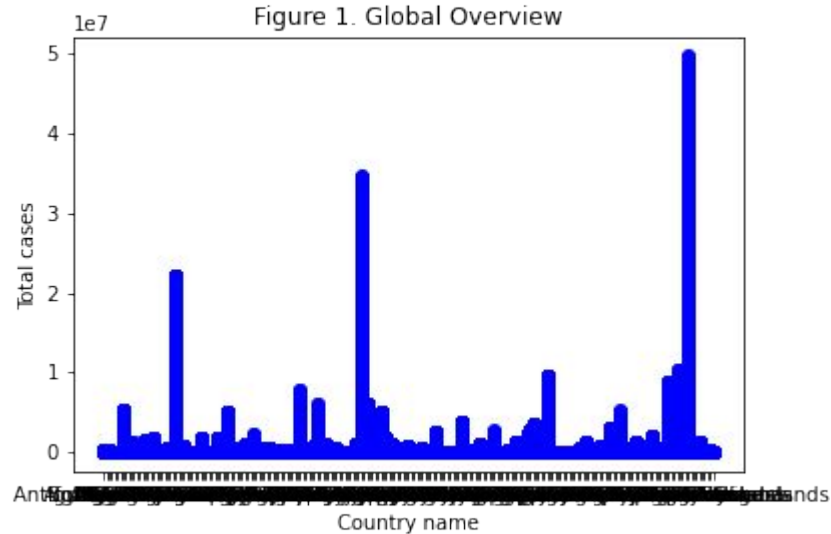
Is COVID-19 a strong infectious disease? Are our econometric results statistically significant?

Which countries are the most efficient in distributing the COVID-19 vaccination programme?

How did the UK do during the COVID-19 pandemic from March 2020 to November 2021? (cases vs deaths)

How did Kenya do during the COVID-19 pandemic from March 2020 to November 2021? (cases vs deaths)

# COVID-19 at global glance



- Numbers of countries were found Covid-19
- The number of infections varied across the country
- There are some countries with much higher number than others

Figure 1. The Covid-19 case distributed at global level

# Correlations between death and COVID cases



Figure 2. Correlations between total cases and total death

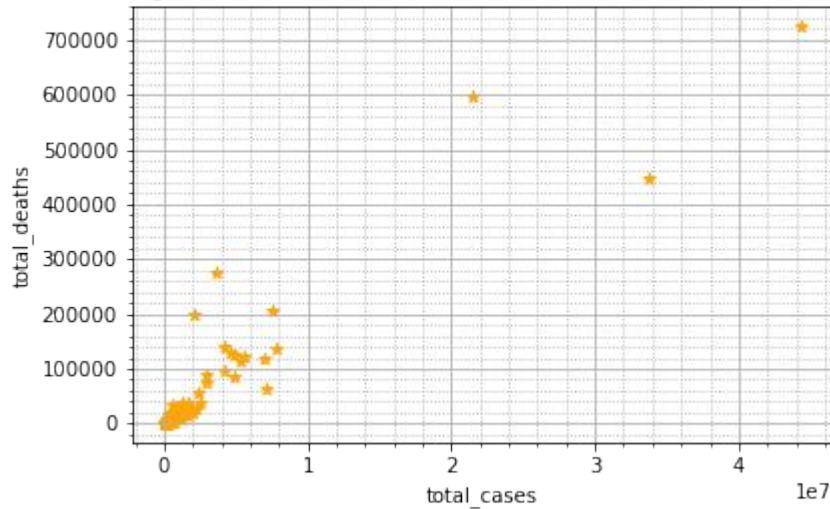
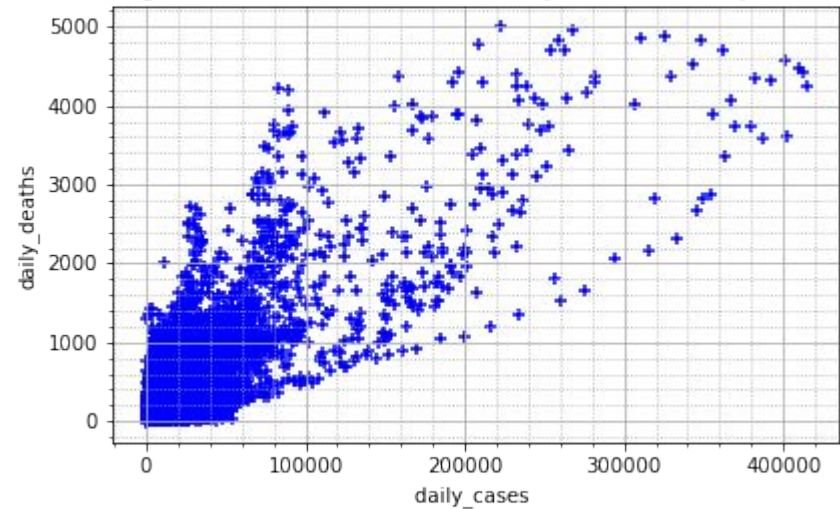


Figure 3. Correlations between daily cases and daily death



- A significant upwards trends can be observed between both cumulated cases and deaths and daily values.

# Correlations in dynamics



Figure 4. Correlations between daily cases and daily death

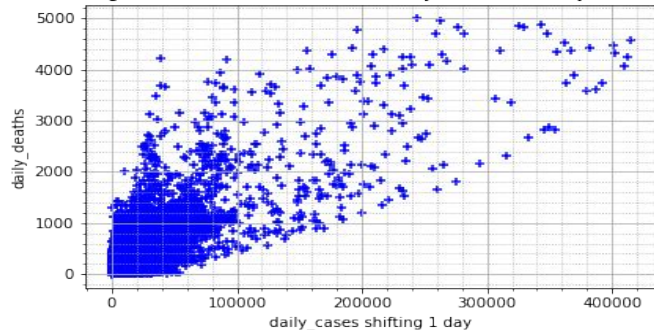


Figure 5. Correlations between daily cases and daily death

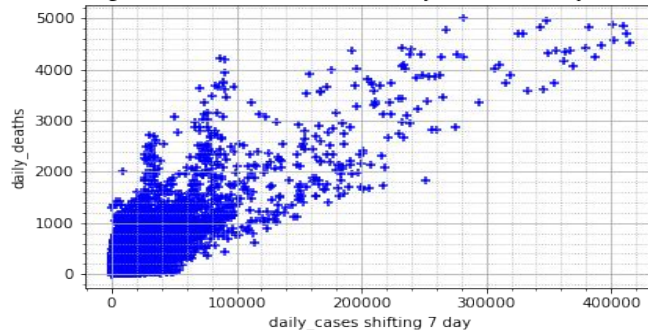


Figure 6. Correlations between daily cases and daily death

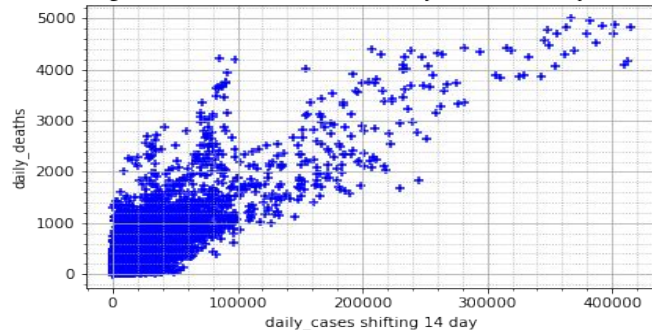
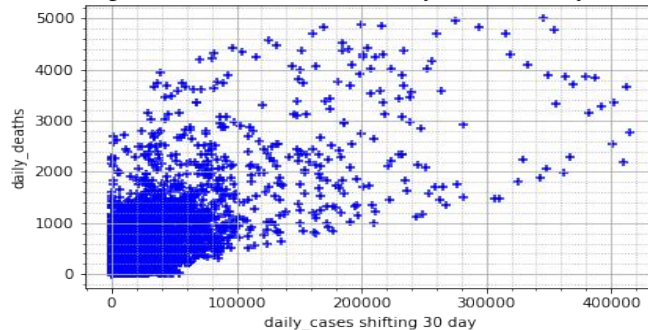


Figure 7. Correlations between daily cases and daily death





# Regression Results



Figure 8. The linear regression between daily case in 7 days and daily

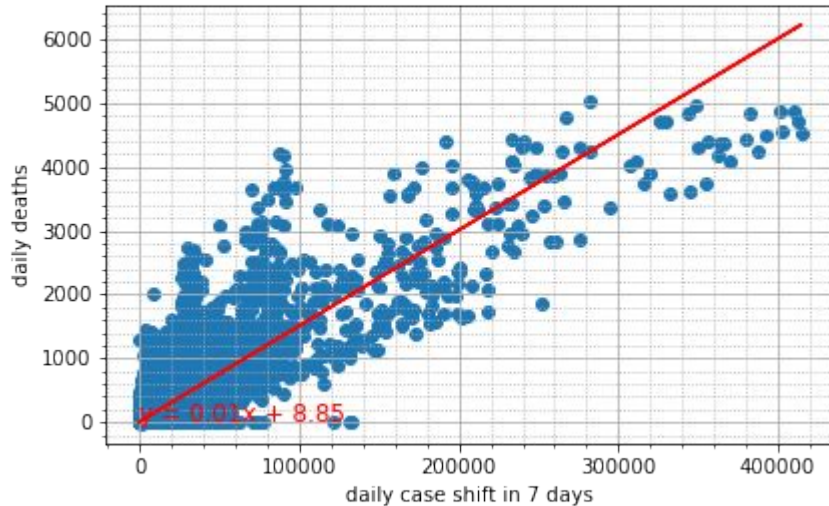
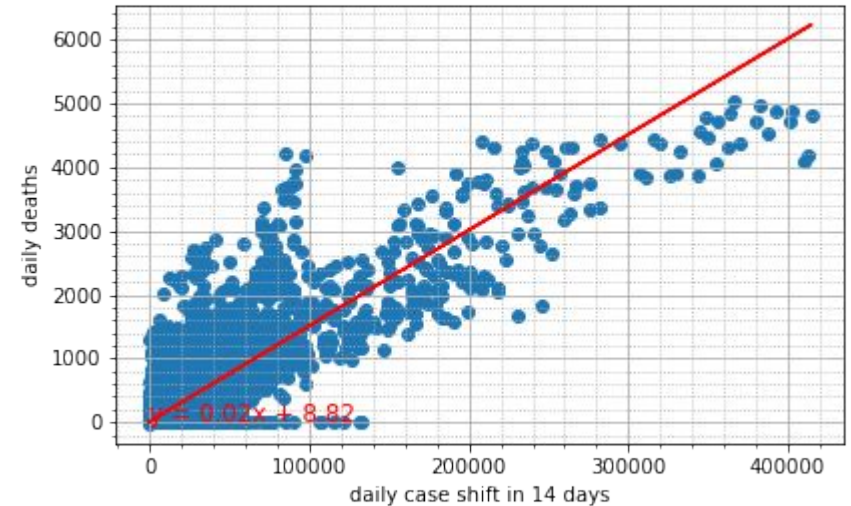
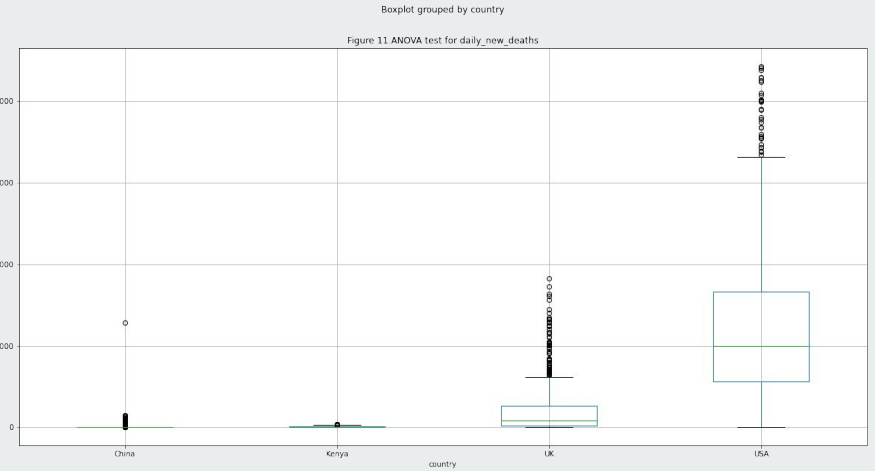
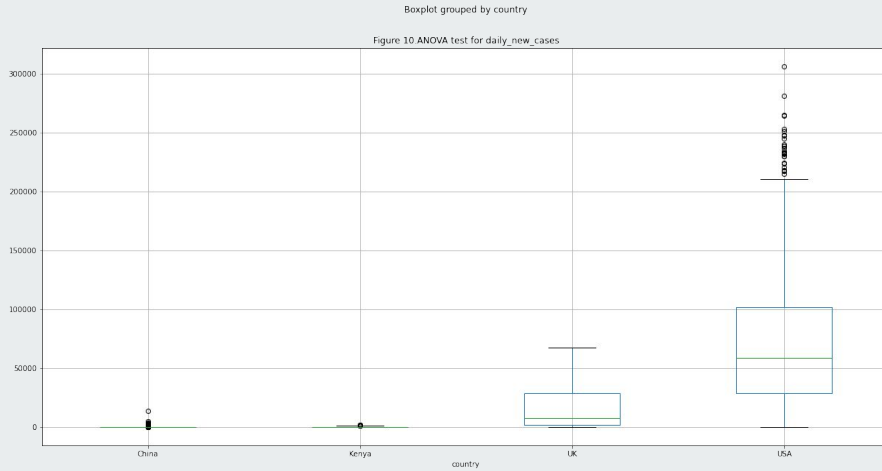


Figure 9. The linear regression between daily case in 30 days and daily



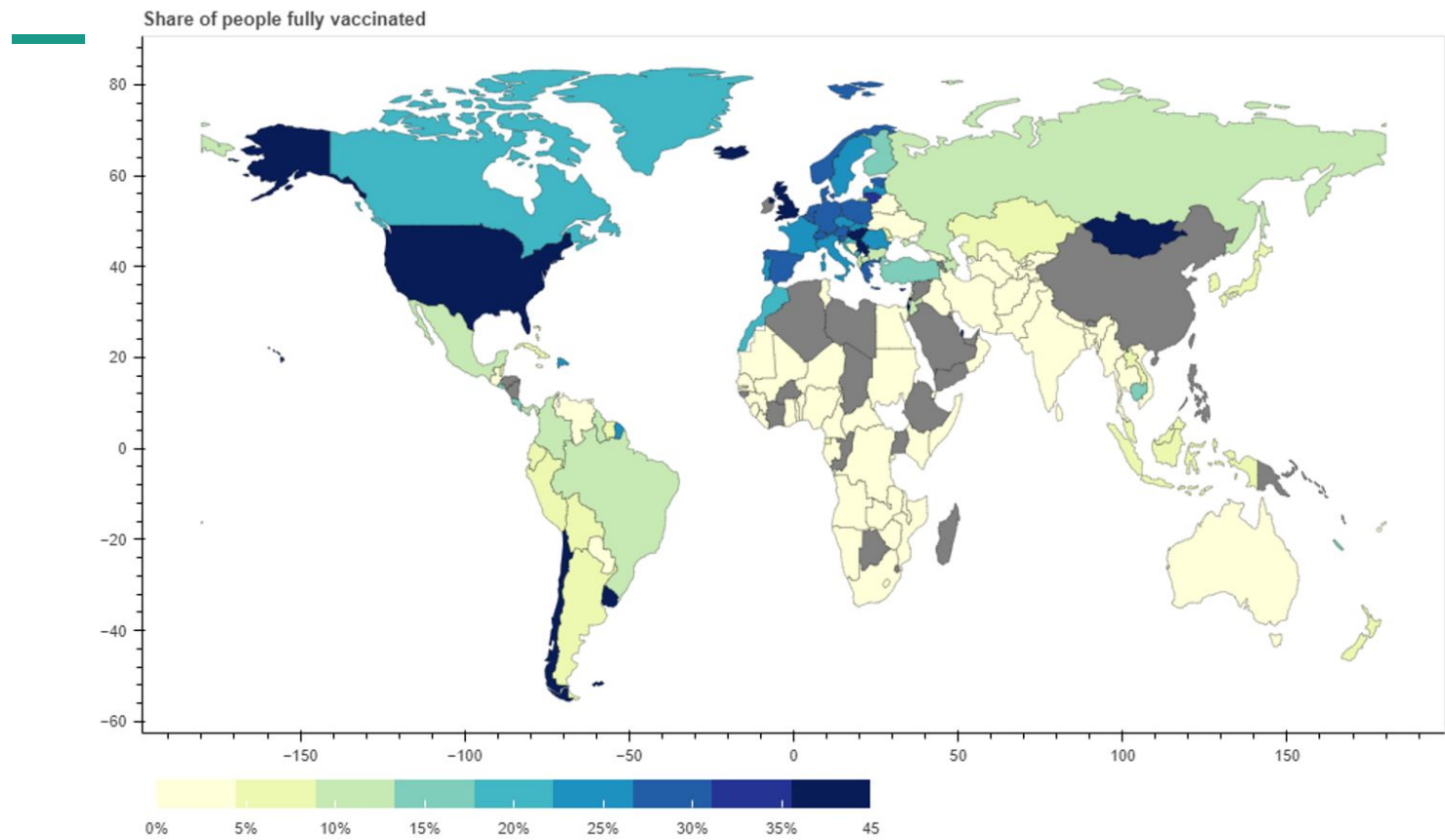
- The linear regression shows an extra unit of case confirmed may leads to 8-9 cases of death after 7 days or 14 days.
- With the adjusted R-square value approximately equals to 0.73, we could conclude that the cumulated case confirmed may explain 73% of reasoning to cases of death.

# Statistical Test

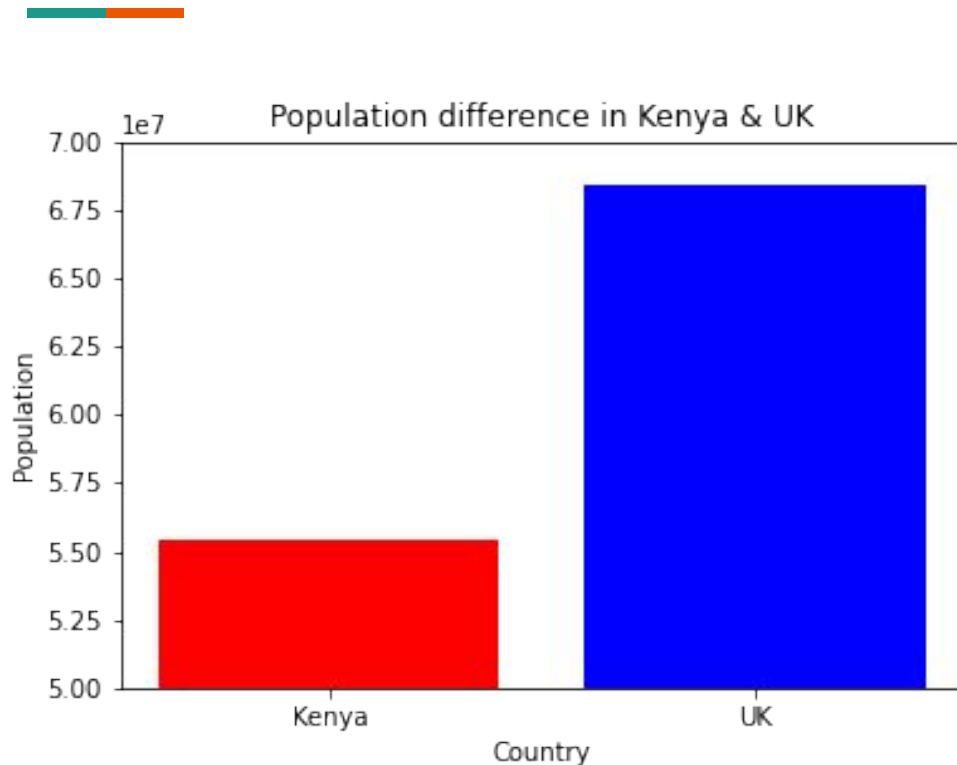


- Mean value of the cumulated case confirmed and cases of death varied across the Country.
- US with the largest case and death number is different from China, UK and Kenya
- UK and Kenya are representative country to OECD country and low income country group

# Which countries are the most efficient in distributing the COVID vaccination programme?



# UK vs Kenya Overview



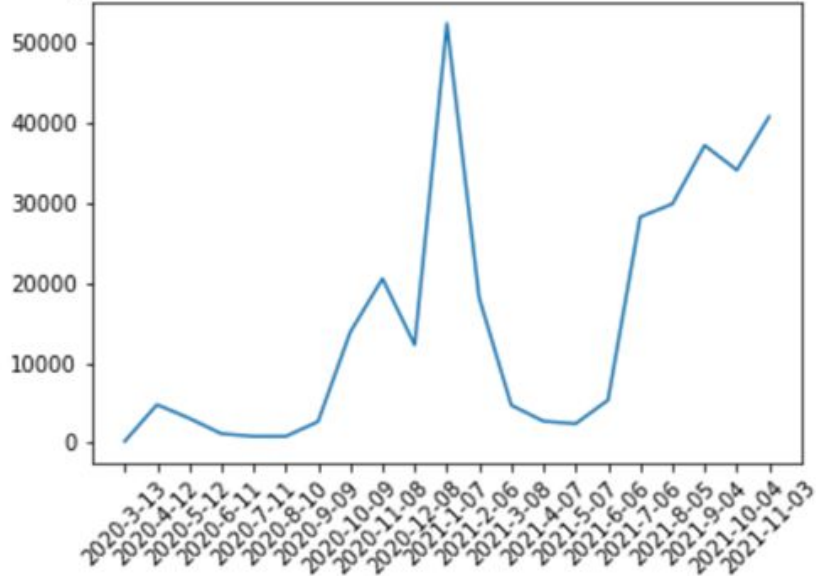
Population:  
Kenya - 55.45m  
UK - 68.39m

Population Percentage  
Difference: 20.9%

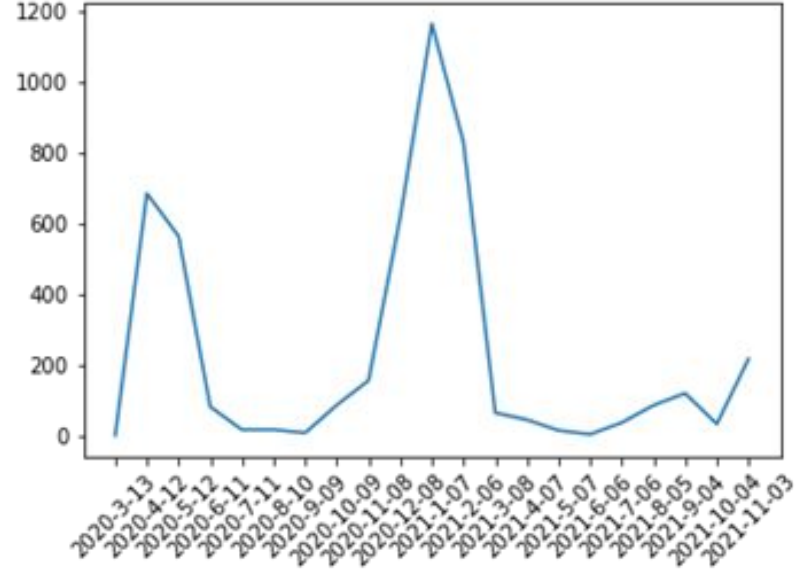
Kenya is 2.4 times bigger than  
the UK!

# Daily New Cases & Daily New Deaths in the UK

Daily New Covid Cases in UK from March 2020 to November 2021



Daily New Deaths in UK from March 2020 to November 2021

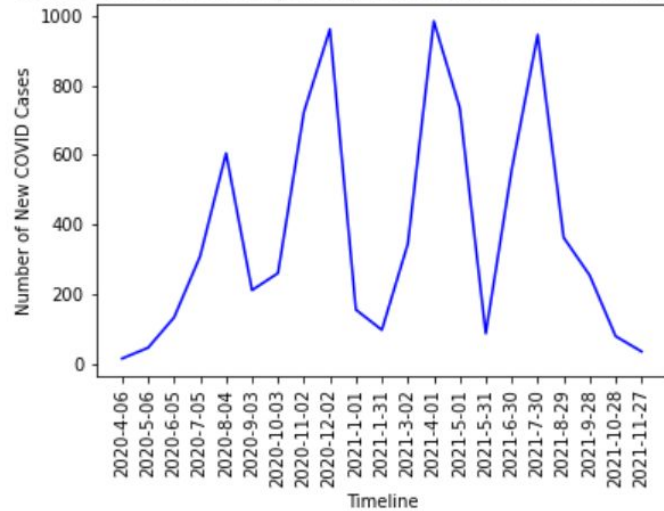


## Key Points:

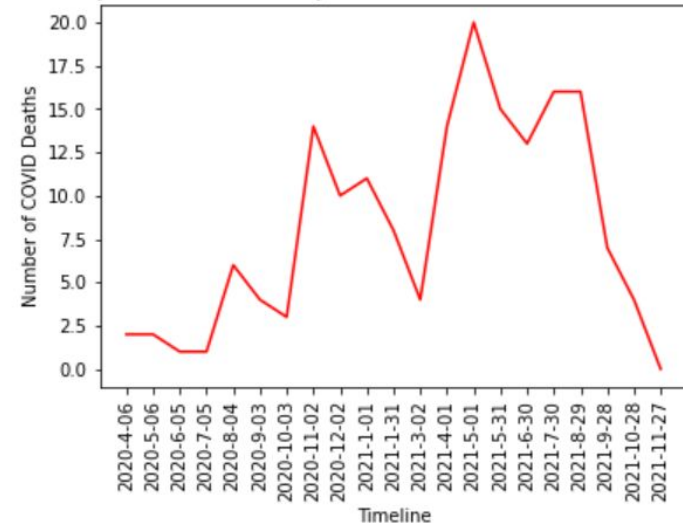
- UK is the most hard hit country following the US, India and Brazil
- The first national lockdown took place to slow the number of cases and new deaths in March 2020.
- Between March 2020 and May 2020 numbers of new cases going down to 1500.
- A top record of daily cases topped 54000 in January 2021 and deaths peaking to 1000 causing a second national lockdown!

# Daily New Cases vs Daily New Deaths in Kenya

New COVID Cases in Kenya Daily from March 2020 to November 2021



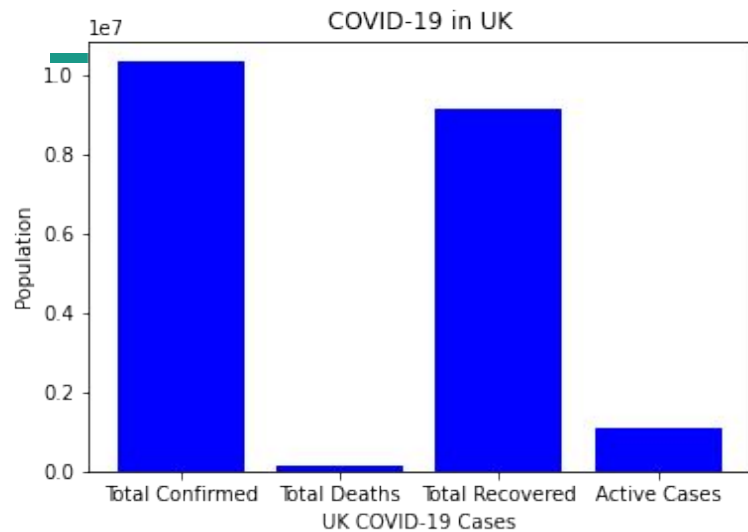
Daily New Deaths in Kenya from March 2020 to November 2021



## Key Points:

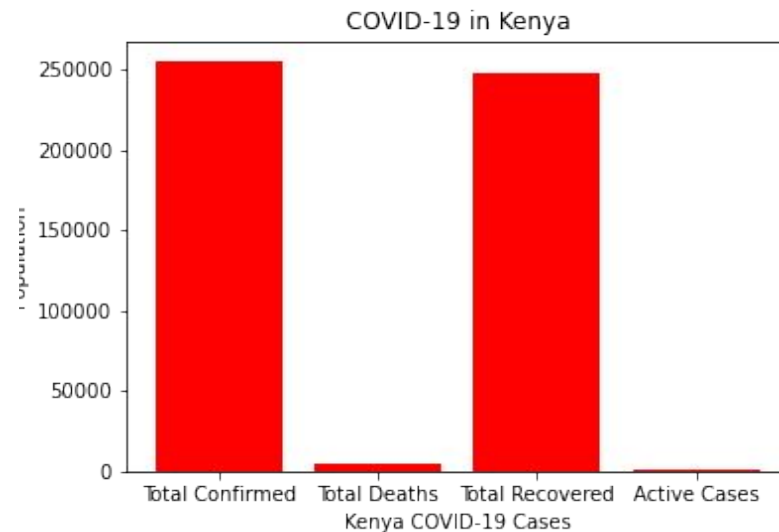
- Periodical peaks for daily new cases across the timeline
- April 2021 recorded 984 new cases in the country
- Gradual increase however relatively low number of COVID-related deaths: highest peaking in May 2021 with 20 deaths

# UK vs Kenya - Overview



UK:

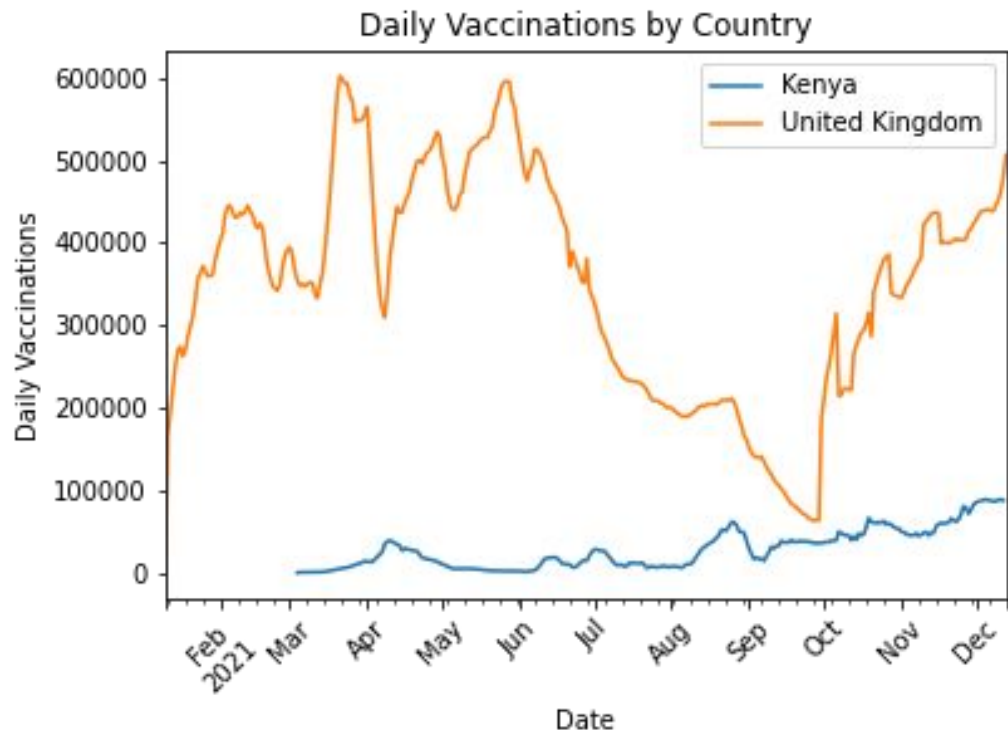
- Total Confirmed: 10,379,647
- Total Deaths: 145,424
- Total Recovered: 9,156,066
- Active Cases: 1,078,157



Kenya:

- Total Confirmed: 255,355
- Total Deaths: 5,335
- Total Recovered: 248,398
- Active Cases: 1,622

# Comparison of daily vaccination UK vs Kenya



## Key Points

### UK:

- Vaccines were first rolled out in January 2021
- The highest daily vaccinations administered till date was in March 2021 (600,000)

### Kenya:

- Vaccines were first rolled out in March 2021
- The highest daily vaccinations administered till date was in August 2021 (25,000)

### Interesting fact:

- The UK has donated a total of 817,00 doses to Kenya so far!





## Conclusion

To summarise, Covid-19 has proven to be a fast-killing virus globally however with the intervention of vaccinations ongoing figures show a successful slow of infections and deaths which has been demonstrated in countries like the UK and Kenya.



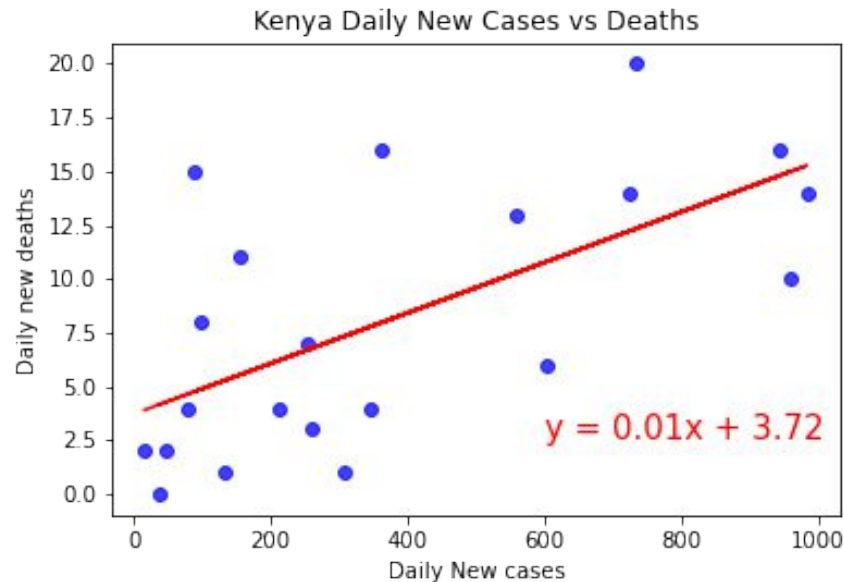
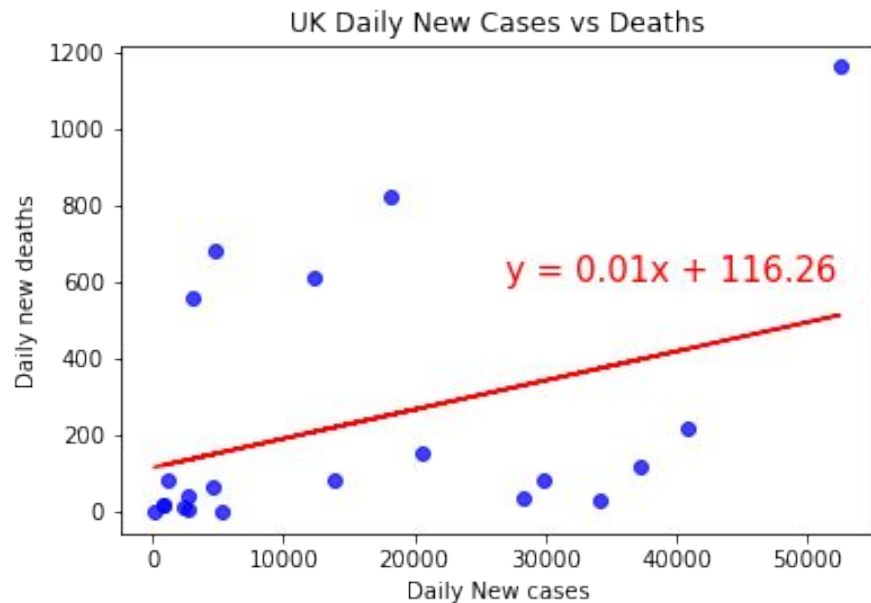
## Go to github repo for more

The next slides go into a further analysis into

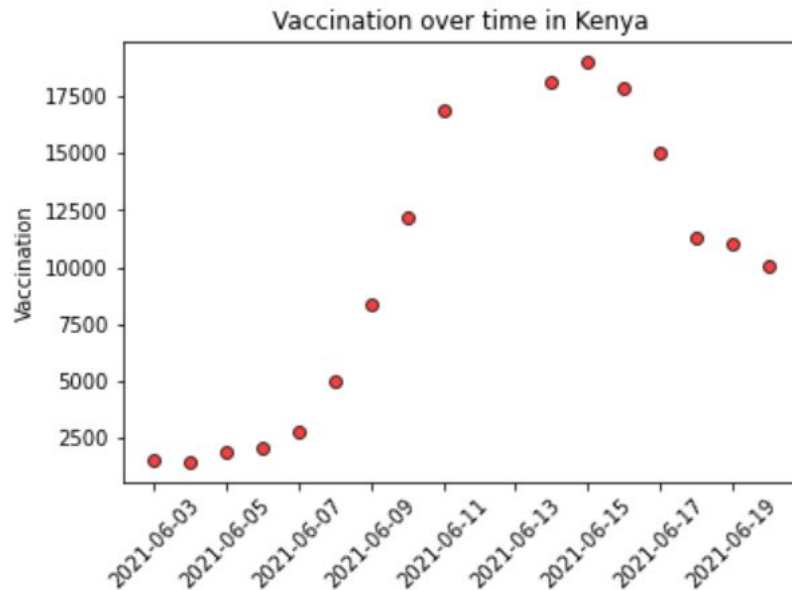
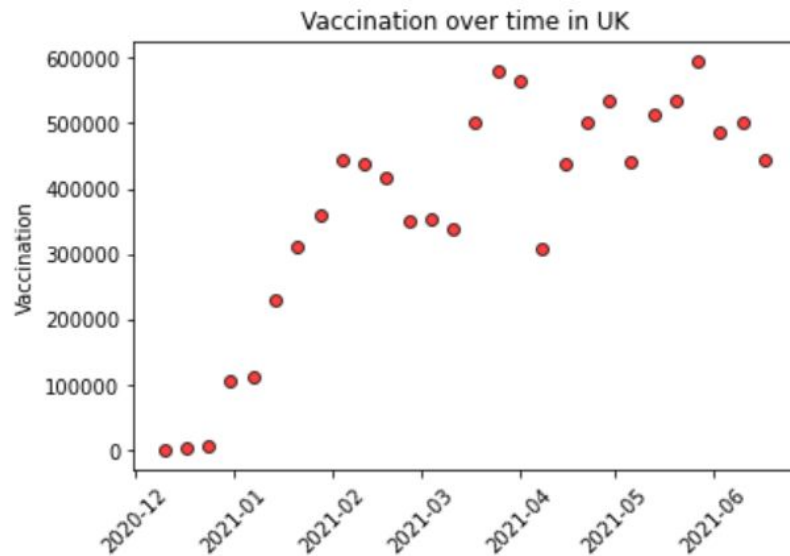
1. UK vs Kenya - daily cases
2. UK vs Kenya - daily deaths
3. UK vs Kenya - vaccinations over time
4. UK vs Kenya - daily vaccinations

[https://github.com/DominikaRzez/Project1\\_CovidVaccinationAnalysis.git](https://github.com/DominikaRzez/Project1_CovidVaccinationAnalysis.git)

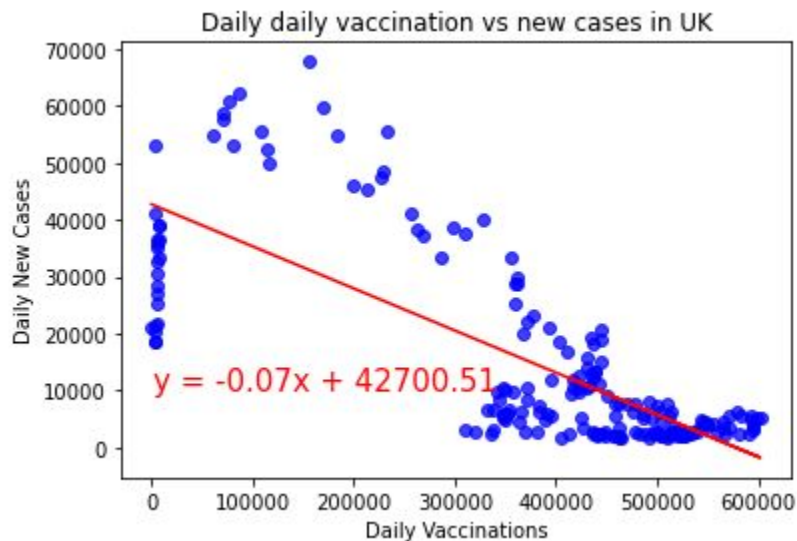
# UK vs Kenya - daily cases vs deaths



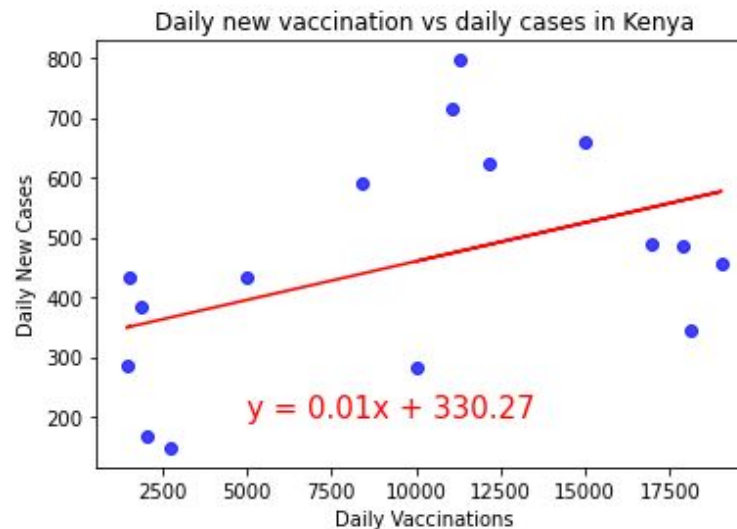
# UK vs Kenya - vaccination



# UK vs Kenya - vaccination



The r-squared is: 0.5845153571046173



The r-squared is: 0.2037173491309611