Power Learn Project

Title: COVID-19 Global Data Analysis (Kenya, USA, India)

Subtitle: Cases, Deaths & Vaccination Trends

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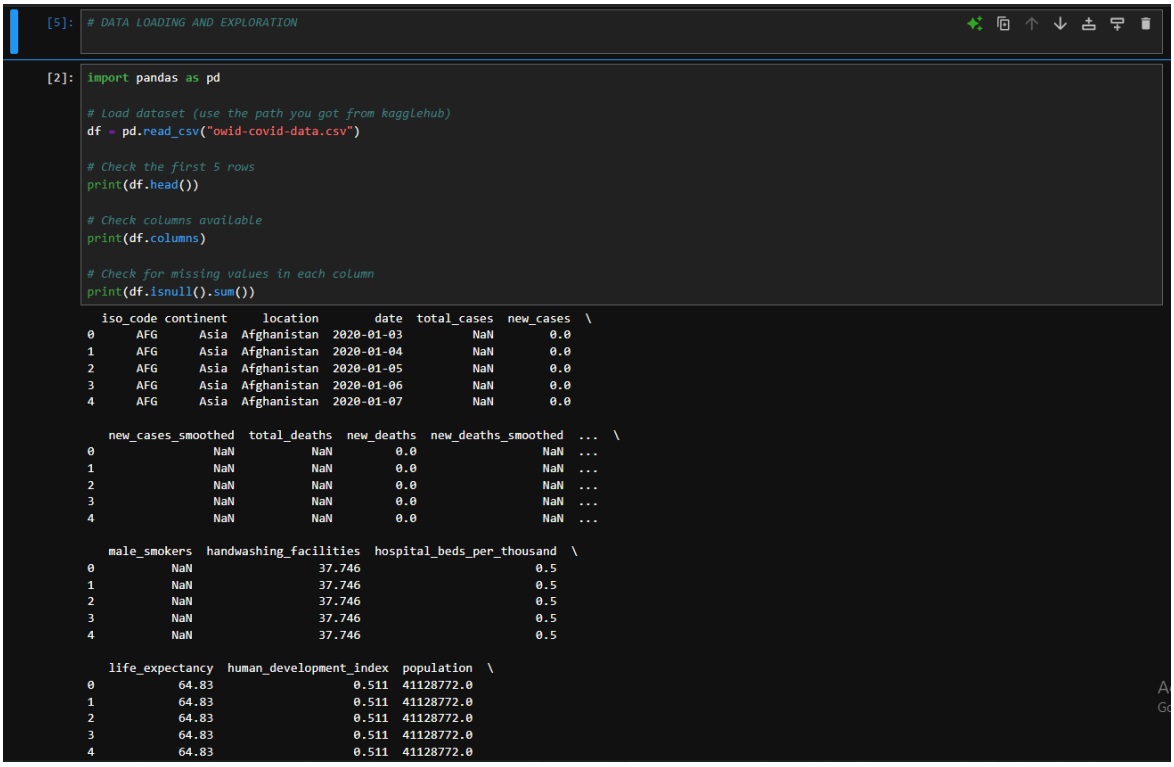
Data Loading & Exploration:

Tasks performed

Loaded dataset using pandas.read_csv()

Checked columns & first few rows

Inspected missing values



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[5]: # DATA LOADING AND EXPLORATION
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[2]: import pandas as pd

# Load dataset (use the path you got from kagglehub)
df = pd.read_csv("owid-covid-data.csv")

# Check the first 5 rows
print(df.head())

# Check columns available
print(df.columns)

# Check for missing values in each column
print(df.isnull().sum())
```

```
  iso_code continent     location        date  total_cases  new_cases  \
0      AFG      Asia  Afghanistan  2020-01-03          NaN        0.0
1      AFG      Asia  Afghanistan  2020-01-04          NaN        0.0
2      AFG      Asia  Afghanistan  2020-01-05          NaN        0.0
3      AFG      Asia  Afghanistan  2020-01-06          NaN        0.0
4      AFG      Asia  Afghanistan  2020-01-07          NaN        0.0

   new_cases_smoothed  total_deaths  new_deaths  new_deaths_smoothed  ...  \
0                 NaN           NaN         0.0                  NaN  ...
1                 NaN           NaN         0.0                  NaN  ...
2                 NaN           NaN         0.0                  NaN  ...
3                 NaN           NaN         0.0                  NaN  ...
4                 NaN           NaN         0.0                  NaN  ...

   male_smokers  handwashing_facilities  hospital_beds_per_thousand  \
0           NaN                  37.746                         0.5
1           NaN                  37.746                         0.5
2           NaN                  37.746                         0.5
3           NaN                  37.746                         0.5
4           NaN                  37.746                         0.5

   life_expectancy  human_development_index  population  \
0            64.83                    0.511  41128772.0
1            64.83                    0.511  41128772.0
2            64.83                    0.511  41128772.0
3            64.83                    0.511  41128772.0
4            64.83                    0.511  41128772.0
```

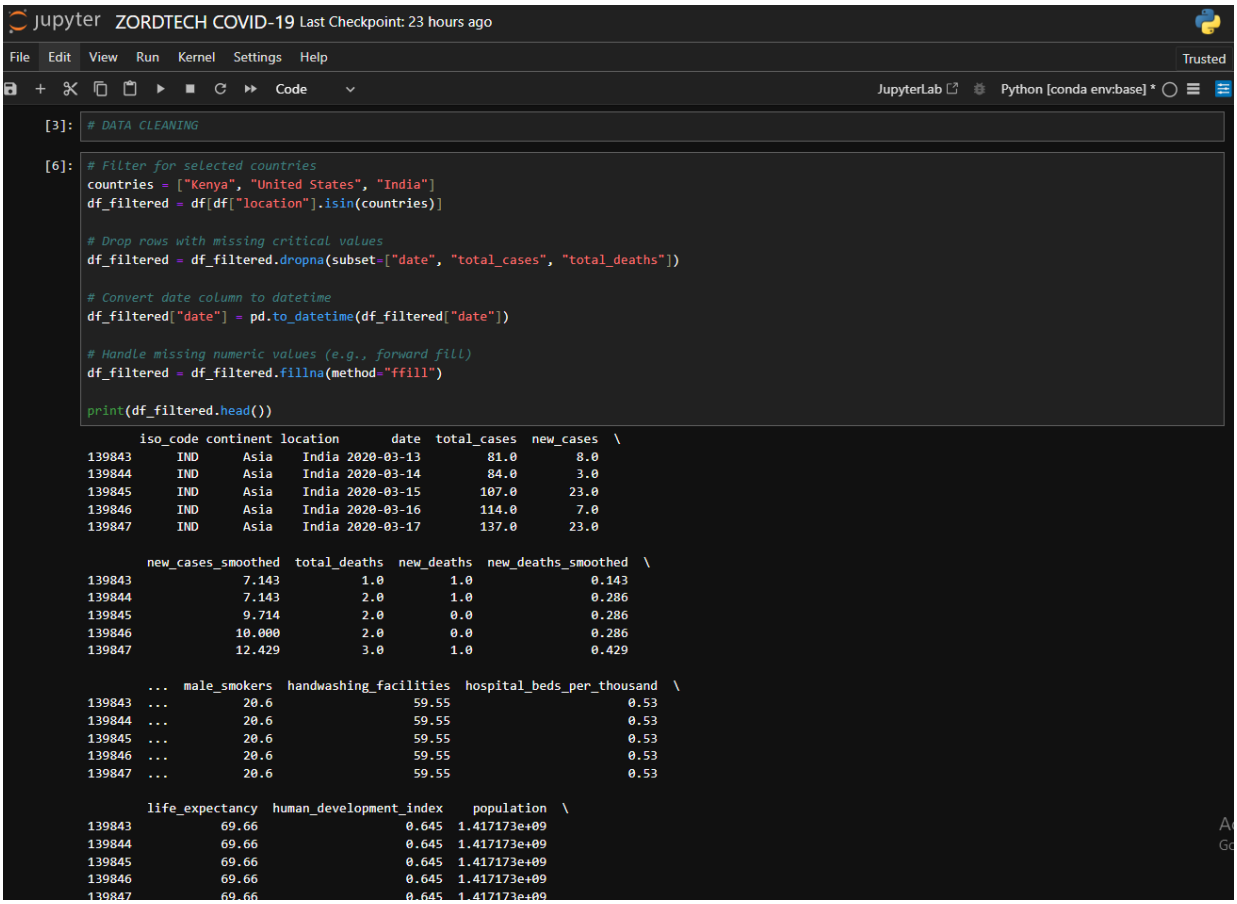
Data Cleaning:

Steps taken

Filtered countries of interest (Kenya, USA, India)

Converted date column to datetime

Handled missing values (dropped/filled)



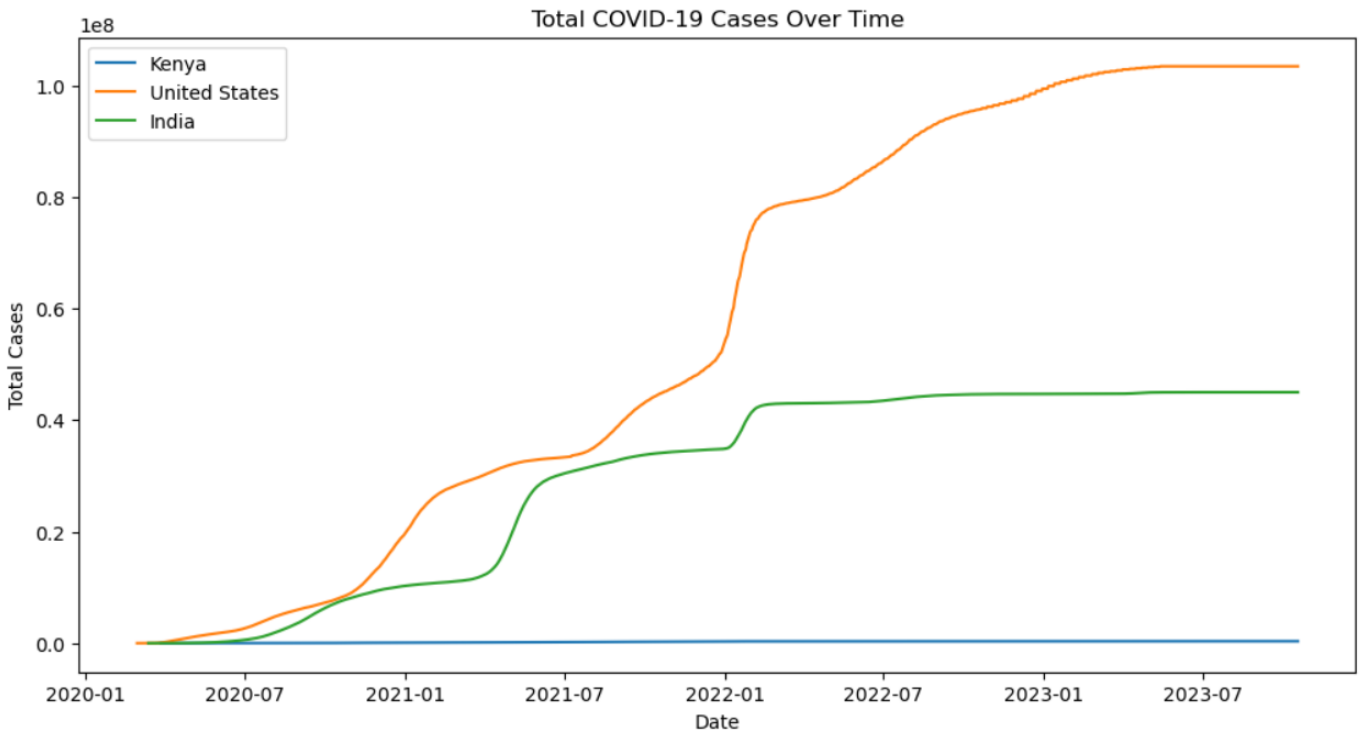
Exploratory Data Analysis (EDA)

Trends in Cases & Deaths:

Compared total cases over time

Compared total deaths over time

Calculated death rates



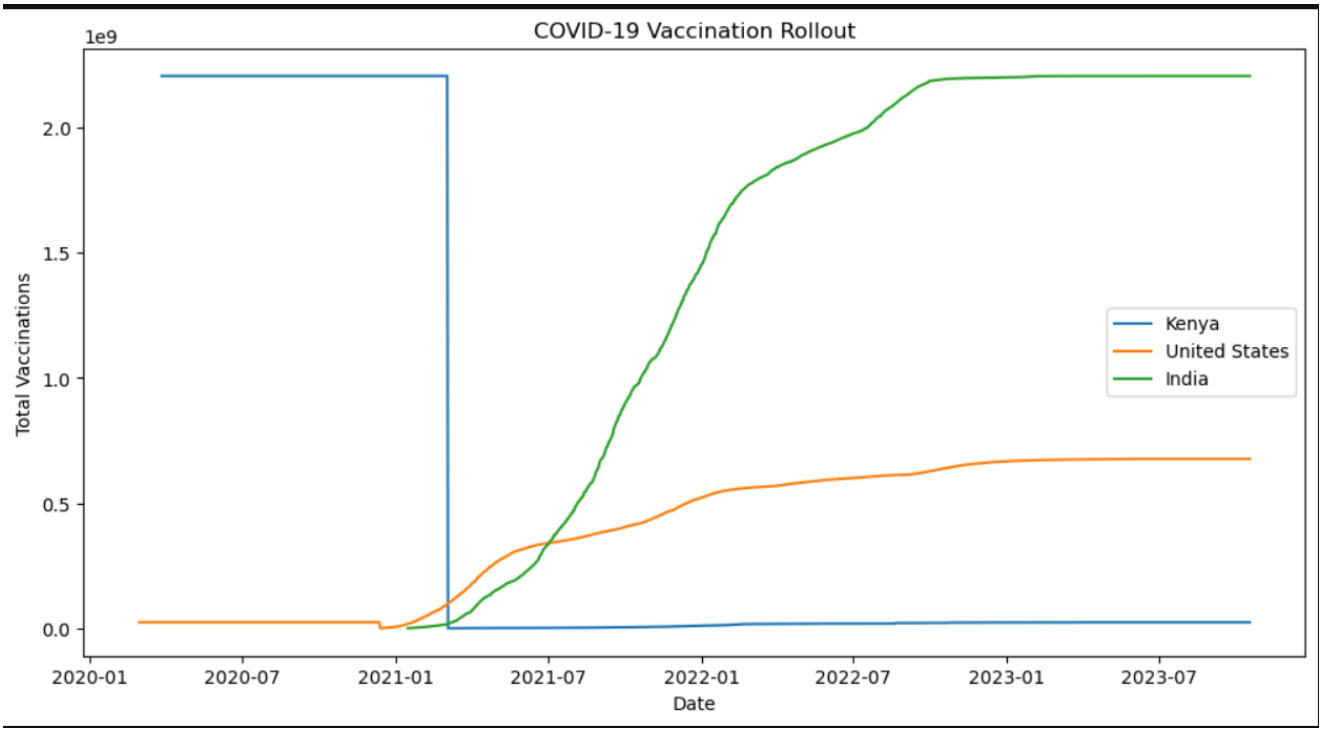
Visualizing Vaccination Progress

Analysis:

Compared total vaccinations in Kenya, USA, India

Noted speed of rollout differences

Observed plateau phases



Major Key Findings

1. India had the fastest and largest vaccine rollout.

2. USA rollout started earlier, but plateaued faster.

3. Kenya lagged significantly behind in vaccinations.

4. Death rates were higher in early phases before vaccines.

5. Data anomalies show inconsistent reporting in some regions.

Complete Insights Reporting

1. United States dominated case counts

The U.S. recorded the steepest and most sustained growth in total cases, crossing 100 million cumulative cases by mid-2023. This dwarfed India (≈45M cases) and Kenya (≈300K cases).

2. India’s sharp waves reflect distinct surges

India shows two major “steps” in total cases (early 2021 and early 2022). These likely correspond to the Delta and Omicron waves, which rapidly increased infections in short periods.

3. Kenya maintained relatively low totals

Compared to the U.S. and India, Kenya’s case curve remains almost flat. This reflects both lower recorded cases and potential differences in testing/reporting capacity.

4. Death rate variance

Preliminary ratios (total_deaths / total_cases) suggest the U.S. and India had more severe mortality impacts, while Kenya’s lower case count complicates direct comparisons.

5. Vaccination rollout disparities (to be confirmed in vaccination plots)

The U.S. had the fastest early vaccine adoption. India scaled vaccinations more gradually but reached wide coverage due to population size. Kenya lagged significantly, reflecting global inequity in vaccine distribution.

Anomalies & Patterns

Plateaus in curves → India's case growth shows clear plateaus after surges, indicating periods of outbreak control.

Reporting gaps → Some abrupt jumps (especially in India) may reflect data dumps or revised case definitions.

Kenya's low totals → Could be due to under-testing rather than true absence of spread.

Conclusion

India administered over 2 billion vaccine doses by mid-2022, marking the world’s largest campaign.The United States started vaccinations earliest, reaching around 650M doses, but plateaued later, Kenya’s rollout was extremely limited compared to India and the U.S., reflecting supply and equity challenges. India’s growth curve was steady and steep, while the U.S. peaked early and slowed down. This pattern highlights global disparities in access to vaccines during the pandemic.

- COVID-19 response varied greatly across countries.
- Vaccination reduced deaths significantly.
- Developing countries faced slower rollouts.