

# COVID-19 Vaccination Impact Analysis

## Project Overview

This project investigates the correlation between COVID-19 vaccination rates and the number of new cases and deaths recorded in various countries during the year 2022. The analysis is essential for understanding the effectiveness of vaccination campaigns and can provide valuable insights for policymakers and public health officials.

## Research Questions

1. How do changes in COVID-19 vaccination rates correlate with changes in new cases among different countries in 2022?
2. How do changes in COVID-19 vaccination rates correlate with changes in deaths among different countries in 2022?

## Methodology

- Data Preprocessing: Involves cleaning and preparing the dataset for analysis.
- Exploratory Data Analysis (EDA): Includes generating descriptive statistics, visualizing relationships, and identifying patterns.
- Regression Analysis: Employs multiple linear regression models to examine the relationship between vaccination rates and COVID-19 outcomes.
- Time-Series Analysis: Utilizes ARIMA models to analyze temporal patterns in the data.

## Dataset

The dataset used for this analysis is the 'owid-covid-data.csv', sourced from Our World in Data.

## Key Results

- Identified significant correlations between vaccination rates and reductions in COVID-19 cases and deaths.
- Highlighted country-specific differences in the effectiveness of vaccination campaigns.

## Conclusion

This analysis provides a data-driven approach to understanding the impact of COVID-19 vaccination on public health outcomes globally. The findings can guide future vaccination strategies and public health policies.

## How to Use This Repository

1. Clone the repository: ``git clone <repository-url>``
2. Install necessary dependencies: ``pip install -r requirements.txt``
3. Run the Jupyter Notebook to reproduce the analysis.

## License

This project is licensed under the MIT License - see the LICENSE file for details.

## Acknowledgments

- Data provided by Our World in Data
- References to previous research and methodologies as detailed in the project's documentation.