**COVID Vaccines Analysis**

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**Phase 1: Problem Definition and Design Thinking**

**Problem Definition:**

The problem is to conduct an in-depth analysis of Covid-19 vaccine data, focusing on vaccine efficacy, distribution, and adverse effects. The goal is to provide insights that aid policymakers and health organizations in optimizing vaccine deployment strategies. This project involves data collection, data preprocessing, exploratory data analysis, statistical analysis, and visualization.

**Design Thinking:**

This project proposes to conduct an in-depth analysis of COVID-19 vaccine data, focusing on vaccine efficacy, distribution, and adverse effects. The goal is to provide insights that aid policymakers and health organizations in optimizing vaccine deployment strategies. The project will involve the following steps:

1. **Data collection**: The project will collect COVID-19 vaccine data from various sources, including government agencies, public health organizations, and research institutions. The data will include information on vaccine efficacy, distribution, and adverse effects.

Dataset link: <https://www.kaggle.com/datasets/gpreda/covid-world-vaccination-progress>

1. **Data preprocessing**: The data will be cleaned and pre-processed to ensure that it is consistent and in a format that can be easily analysed. Every missing data and irregular data will be modified to make the dataset cleaner and easier to work on.
2. **Exploratory data analysis**: Exploratory data analysis will be performed to identify patterns and trends in the data. This will help to generate hypotheses about the relationships between vaccine efficacy, distribution, and adverse effects.
3. **Statistical analysis**: Statistical analysis will be performed to test the hypotheses generated in the exploratory data analysis. This will help to identify statistically significant relationships between the variables of interest.
4. **Visualization**: The results of the statistical analysis will be visualized using charts and graphs to make them easier to understand and interpret.

* **Time series plot:** We create time series line plots for each country to visualize the daily cases and decide about deployment of vaccines
* **Bar Charts**: We generate bar charts to compare the mean values of daily cases and vaccine production for different countries.
* **Error Bars**: We use error bar charts to visualize standard deviations, showing the variability around the mean for cases and death

1. **Insight generation:** We analyse the visualizations to draw meaningful insights. Look for patterns, variations, and correlations in the data:

* Based on the analysis, we can provide any recommendations or actionable insights that can help in addressing or mitigating the COVID-19 situation in the EU/EEA.
* Since the COVID-19 situation is dynamic, we can consider setting up a system for continuous monitoring and updating your analysis regularly to track changes over time.

The findings of this project will be disseminated to policymakers and health organizations through a variety of channels, including peer-reviewed journals, conference presentations, and policy reports. The goal is to provide policymakers and health organizations with the information they need to make informed decisions about vaccine deployment strategies.

This project has the potential to make significant contributions to the field of public health. By providing insights into the relationships between vaccine efficacy, distribution, and adverse effects, the project can help policymakers and health organizations to develop more effective vaccine deployment strategies. This can lead to a reduction in the number of COVID-19 cases, hospitalizations, and deaths.

**Potential impacts of the project:**

* The project can help policymakers and health organizations to develop more effective vaccine deployment strategies. This can lead to a reduction in the number of COVID-19 cases, hospitalizations, and deaths.
* The project can help to identify and address vaccine equity issues. For example, the project can be used to identify areas with low vaccination rates and to develop strategies to increase vaccination coverage in these areas.

Overall, this project has the potential to make a significant contribution to the fight against COVID-19.