**Executive Summary**

**Overview**

The COVID-19 pandemic significantly impacted Nigeria’s public health, economy, and societal activities. This analysis provides insights into the progression of COVID-19 across the 37 states of Nigeria, including the Federal Capital Territory, by leveraging data science tools to examine case trends, state vulnerability, economic impacts, and budgetary changes.

This project analyzes the impact of the COVID-19 pandemic in Nigeria using data science techniques. The analysis explores confirmed cases, recoveries, deaths, and the socio-economic effects of the pandemic. Data was collected from multiple sources, including the Nigeria Centre for Disease Control (NCDC), Johns Hopkins University, and other repositories.

Key objectives include identifying trends, comparing regional impacts, and understanding the economic consequences of the pandemic.

**Data Sources**

1. Nigeria Centre for Disease Control (NCDC)

* Method: Web scraping and file downloads.
* Metrics: State-wise confirmed cases, deaths, and recoveries.

2. Johns Hopkins University Repository

* Method: Downloaded CSV files from GitHub.
* Metrics: Daily global COVID-19 cases, including Nigeria-specific data.

3. Community Vulnerability Index

* Source: Provided in the project materials.
* Metrics: Vulnerability scores based on socio-economic, epidemiological, and healthcare factors.

4. Economic Data (Real GDP)

* Source: Reports from PwC and Al Jazeera.
* Metrics: Pre- and during-COVID GDP values for Nigeria.

5. State Budgets

* Source: Provided dataset.
* Metrics: Budget adjustments due to COVID-19's economic impact.

**Methodology**

The analysis was conducted using Python and included the following key steps:

Data Collection and Cleaning: Combined datasets from multiple sources, including COVID-19 case numbers, state vulnerability indices, and economic indicators. Cleaned missing values and ensured consistency across state names and dates.

Exploratory Data Analysis (EDA): Plotted time series data for confirmed, recovered, and death cases to track trends. Analyzed state-level case distributions and their correlation with vulnerability indices.

Economic Analysis: Compared Real GDP figures pre-COVID and during COVID to assess the pandemic’s economic impact. Reviewed state budget changes to measure fiscal adjustments due to the pandemic.

Visualization: Developed insightful graphs, including time series trends, heatmaps, and bar charts, for a visual representation of findings.

**Key Findings**

COVID-19 Trends: Nigeria experienced multiple peaks of infection, with certain states such as Lagos, Kano, and the FCT contributing to a significant portion of cases. Recovery rates improved over time, though fatalities remained concentrated in highly vulnerable states.

Vulnerability Index: States with higher vulnerability scores exhibited higher infection and fatality rates. Factors such as population density and healthcare access were critical.

Economic Impact: Nigeria's GDP contracted significantly during the pandemic, driven by reduced economic activity and falling oil prices. State budgets were slashed, with some states reducing allocations for education and healthcare, potentially exacerbating long-term recovery challenges.

Lagos recorded the highest number of confirmed cases and deaths. Economic data revealed a significant GDP contraction during the pandemic. States with higher vulnerability scores faced greater COVID-19 challenges.

**Recommendations**

Public Health: Enhance healthcare infrastructure in vulnerable states to reduce future risks. Strengthen testing and vaccination campaigns, focusing on high-density and high-vulnerability areas.

Economic Recovery: Prioritize budget allocations for healthcare and education to mitigate the impact of the pandemic. Invest in economic diversification to reduce reliance on oil revenue.

Data Utilization: Establish robust systems for real-time data collection and analysis to improve response strategies during future pandemics.

**Future Improvements**

* Incorporate mobility data to study the effectiveness of lockdown measures.
* Analyze vaccination rates and their impact on case trends.
* Integrate global COVID-19 data to compare Nigeria’s response with other nations.

This analysis provides a foundation for informed decision-making in pandemic management and economic recovery strategies for Nigeria.