GLOBAL COVID-19 DYNAMIC: OVERVIEW AND ANALYSIS REPORT (2020-2025)

RESEARCH QUESTIONS

1. How do cumulative COVID-19 cases, deaths, and recoveries vary across continents?
2. What is the relationship between median age and COVID-19 death rates?
3. How do weekly intensive care unit (ICU) admissions per million differ by country and continent?
4. Is there an association between diabetes prevalence and total COVID-19 cases?
5. How did vaccination coverage influence recovery rates and death rates across continents?
6. Which continents recorded the highest testing, vaccination, and recovery outcomes?
7. How does population health structure (age and chronic disease prevalence) affect COVID-19 outcomes?
8. How does reproduction rate affect the continent during the pandemic?
9. How does positive rate affect median age and country?
10. How did new vaccination rates per million evolve across continent from 2020-2025?

ANALYSIS STEPS

1. On 10th November, 2025, I downloaded the COVID-19 dataset in CSV format from reliable and trusted sources.

2. I imported the CSV file into Power BI Desktop using the CSV connector. After loading the data, I carefully reviewed each column and assigned the correct data types, such as Date for date fields, Decimal Number for numerical values, and Text for descriptive fields.

3. For columns containing numerical values, I replaced missing or null values with zero.

4. I cleaned the country-related columns by correcting inconsistencies, removing duplicate country names, fixing spelling errors, and excluding entries that were not actual countries. This step improved data accuracy and consistency.

5. I designed a structured data model in Power BI by creating separate dimension tables. Duplicate records were removed from these tables to improve performance and maintain data integrity.

6. I created key measures in Power BI, including cumulative cases, total deaths, total recoveries, total vaccinated, total tested, death rate, cumulative population and total fully vaccinated. These measures supported meaningful analysis and answered the research questions.

7. Finally, I built an interactive dashboard with multiple connected visualizations. The dashboard allows users to filter and explore the data by year, country, and continent, making it easier to identify trends and patterns.
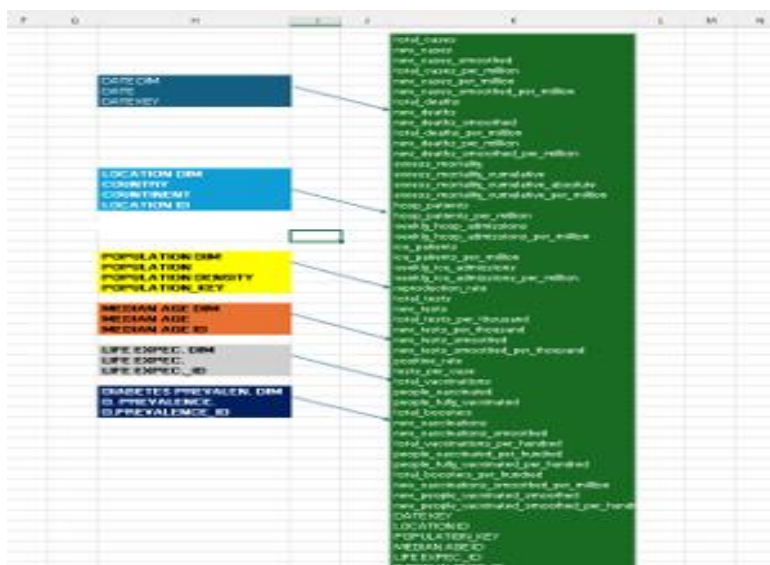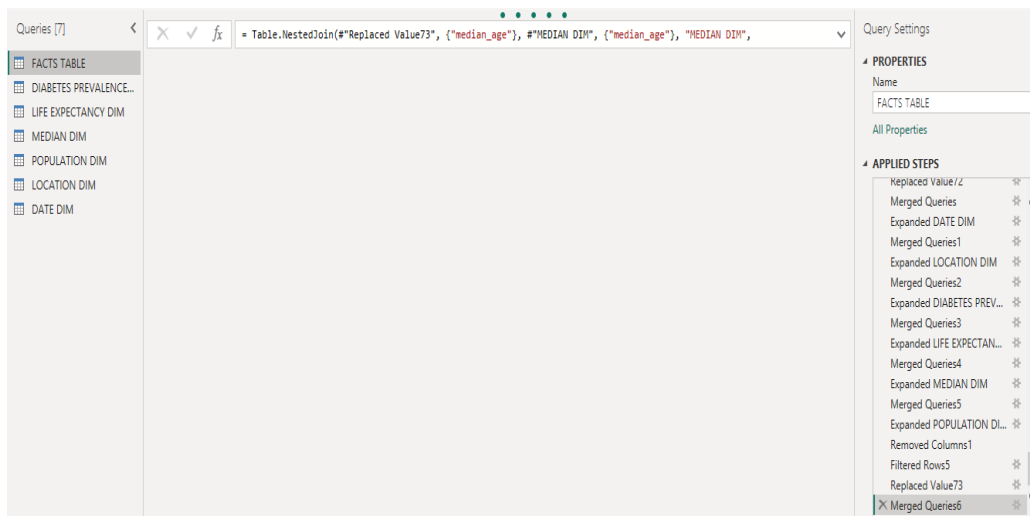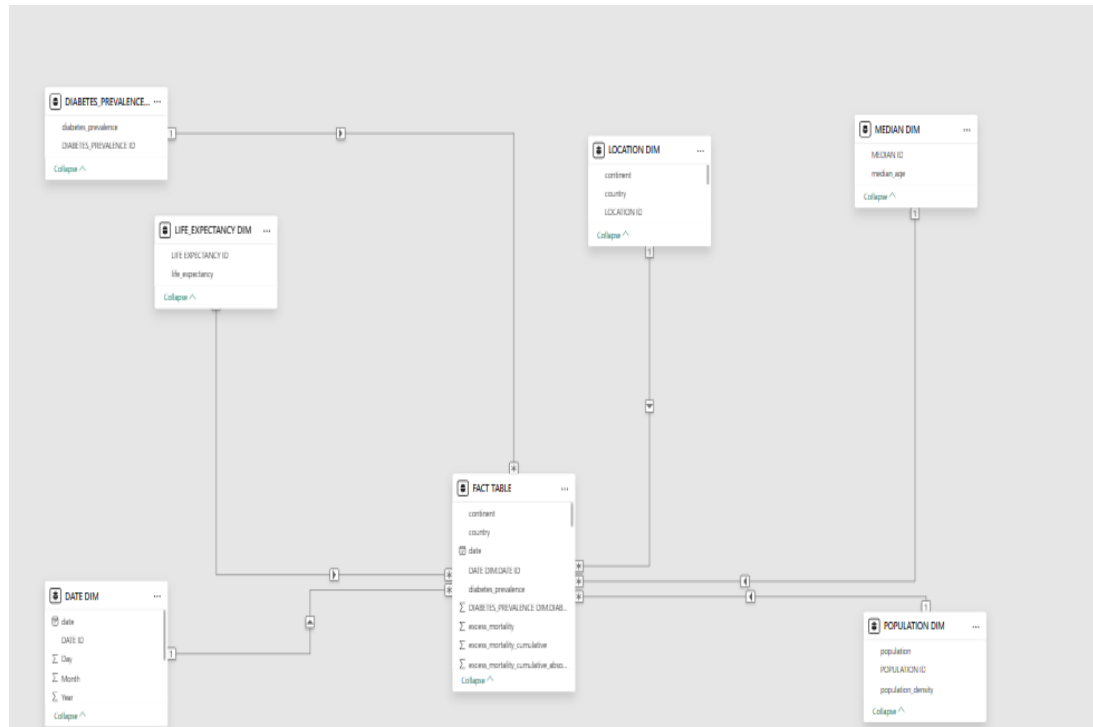
FINDINGS

1. Cumulative cases exceed 777 million, indicating widespread global transmission, total deaths (~7.1 million) are significantly lower relative to cases, suggesting improved treatment and vaccination impact and recoveries (~770 million) closely track total cases, indicating high recovery rates globally.

2. Asia and Europe contribute the largest share of cumulative cases and recoveries, while Africa and Oceania show comparatively lower case counts and ICU admissions and North America and Europe display higher ICU admission rates per million, possibly reflecting better reporting and hospital access.

3. Countries with higher median ages (35–50 years) recorded significantly higher COVID-19 death rates, as seen in the "Total Death by Median Age" chart. And younger populations (below 25 years) showed much lower death counts.

4. The death-by-median-age line chart shows mortality rising sharply as median age increases, then tapering at older ages.

5. Countries with higher diabetes prevalence show higher total cases and deaths, indicating diabetes as a significant risk factor.
6. The map visual highlights clustering of higher cases in regions with elevated diabetes prevalence.
7. Continents with higher vaccination coverage (Europe, North America) show: Higher recovery rates, Lower death rate percentages and Global vaccination totals (13.7bn doses) correlate with declining death rates (≈0.9%).
8. Countries with older populations and higher caseloads show higher ICU utilization.

CONCLUSION

The analysis demonstrates that COVID-19 outcomes are strongly influenced by demographic structure, pre-existing health conditions, and vaccination coverage. Continents with older populations and higher diabetes prevalence experienced higher deaths and ICU admissions. However, widespread vaccination significantly reduced mortality and improved recovery rates. The dashboards collectively show that public health preparedness and preventive care play a critical role in managing pandemic outcomes.

RECOMMENDATIONS
1. Vaccination and booster programs should be prioritized, especially in regions with aging populations.
2. Strengthening of early screening and protection for individuals with chronic conditions such as diabetes.
3. Government should invest in preventive healthcare to manage non-communicable diseases before pandemics occur.
4. Health sectors should enhance data reporting systems in low-resource regions to improve global surveillance.
5. Further studies should be conducted on long-term COVID-19 outcomes among diabetic patients.
6. Promotion of equitable access to vaccines, testing, and treatments across continents should be done.