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POWER BI PROJECT ON:

GLOBAL HEALTH EXPENDITURE ANALYSIS

Overview:

In this Power BI project, we will analyze global health expenditure data to gain insights into different aspects of health spending across countries and regions. The dataset used in this project will contain information on health expenditure, GDP, population, and other relevant metrics.

Objective:

The objective of this Power BI project is to analyze global health expenditure data to gain valuable insights into various aspects of health spending across countries and regions. The primary goal is to provide a comprehensive and data-driven view of health expenditure trends, its relationships, and identify key patterns. The analysis aims to answer critical questions and support decision-making in the field of global healthcare.

Data Source: We will use a dataset that includes the following key columns:

- ***CountryID:*** It contains unique identifiers to different countries
- ***Country:*** Name of the country or region.
- ***YearID:*** It contains unique identifiers to different years
- ***Year:*** Year of the data record.
- ***Health Expenditure:*** Total health expenditure in US dollars.
- ***GDP:*** Gross Domestic Product in US dollars.
- ***Population:*** Total population of the country or region.

DATA LOADING AND MODELING:

1. Imported the Dataset in Power BI Desktop

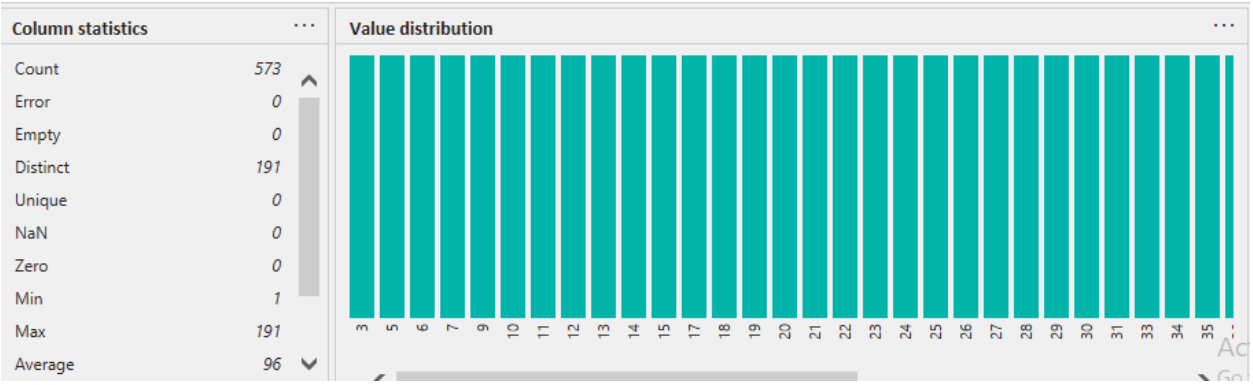
2. Data Cleaning and Transformation

2.1) Removed Blank Rows

2.2) Used First Row As Header

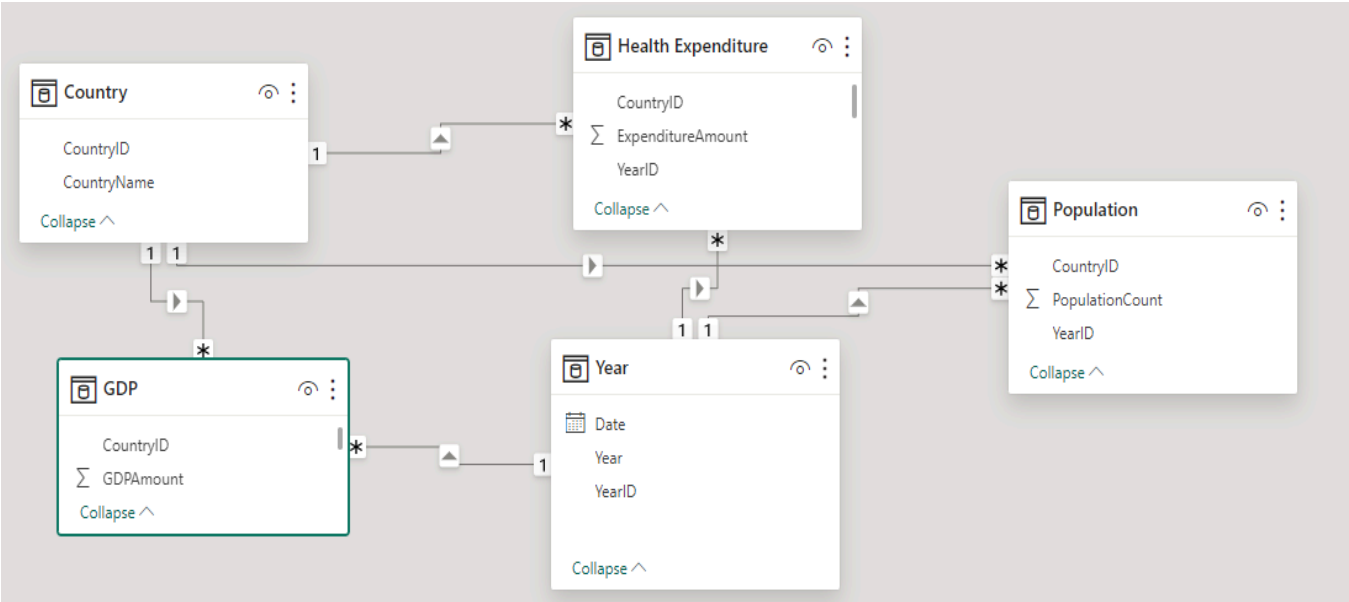
2.3) Rows With Error Values Removed

2.4) Checked Column Quality,Distribution & Profile



3. Created Data Model and Relationships With Tables

3.1) Joined Tables With Common Columns



4. Ensured All The Columns Have Appropriate Data Type

Data Analysis Using DAX:

Q1) Create a new table that consolidates information from multiple tables using DAX.
Created the table using Summarize Function

```
1 New_Table_consolidation = SUMMARIZE(Country,Country[CountryName],"GDP",AVERAGE(GDP
  [GDPAmount]),"Health Expenditure",AVERAGE('Health Expenditure'[ExpenditureAmount]),
  "Population",AVERAGE(Population[PopulationCount]))
```

Q2) Find the countries with highest and lowest health expenditure for all years.

- Calculated Max and Min health expenditure using Max & Min Functions.
- Filtered the visualization as Top 1 value placing Country Name in the column field to display country name
- Used Text Card for visualization

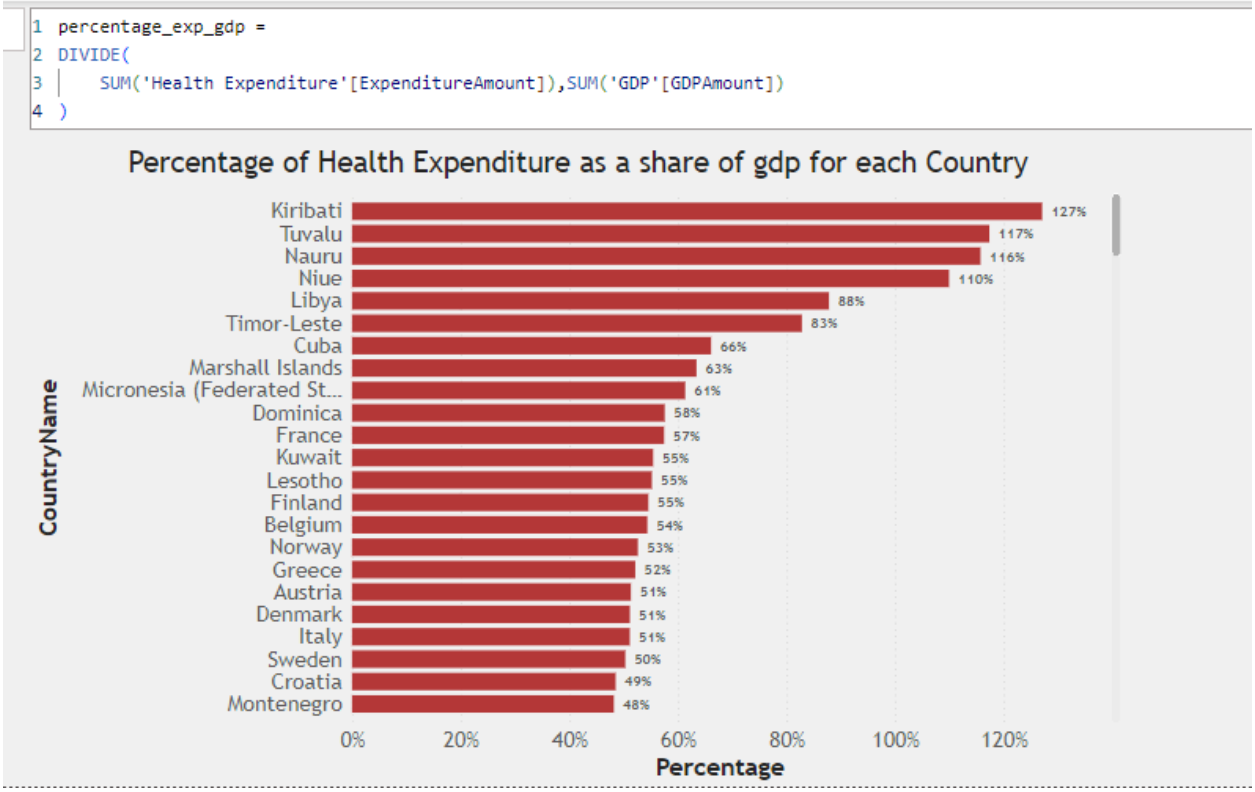
Max Health Expenditure in the year 2018	Max Health Expenditure in the year 2019	Max Health Expenditure in the year 2020
Luxembourg	Luxembourg	Monaco
49877	49020	55875

Min Health Expenditure in the year 2018	Min Health Expenditure in the year 2019	Min Health Expenditure in the year 2020
Democratic Republic of the Congo	Democratic Republic of the Congo	Democratic Republic of the Congo
60	72	54

Q3)Determine the percentage of health expenditure as a share of GDP for each country.

- Created a measure which divides the sum of health expenditure with gdp.
- Kiribati tends to have the highest percentage of health expenditure as a share of gdp resulting in 127%.
- Haiti has the lowest percentage resulting in 10%
- Used a Clustered bar chart for visualizations

```
1 percentage_exp_gdp =
2 DIVIDE(
3     SUM('Health Expenditure'[ExpenditureAmount]),SUM('GDP'[GDPAmount])
4 )
```

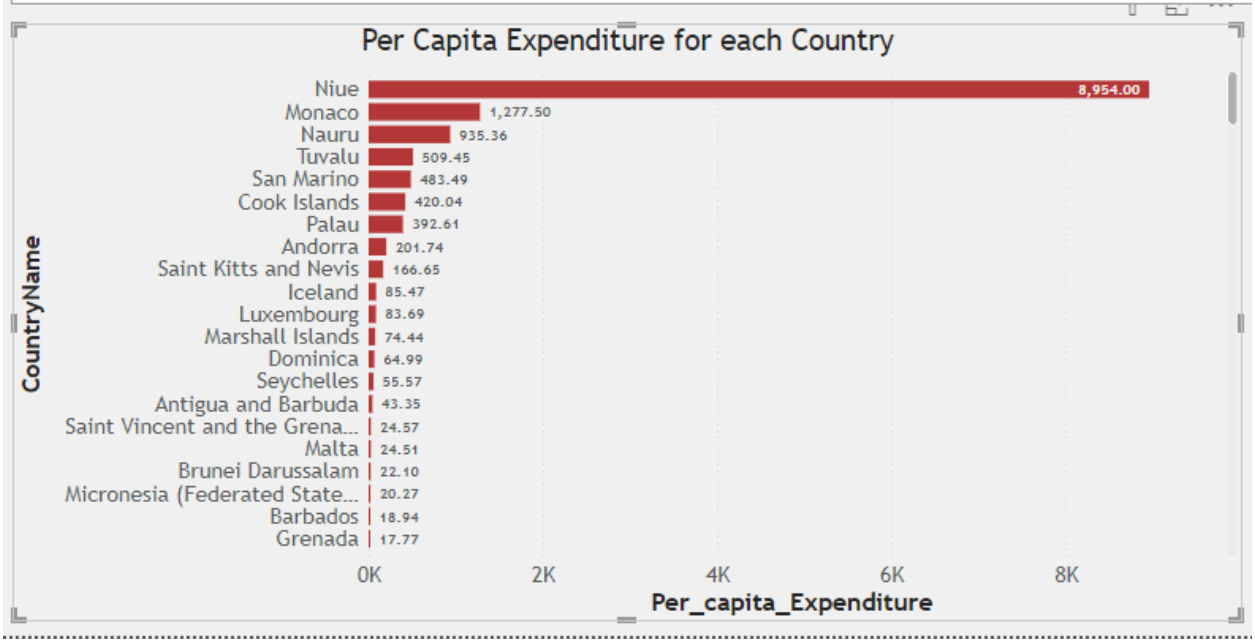


Q4) Calculate the average health expenditure per capita for each country.

- Created a measure which divides total expenditure with total population of each country.
- Niue has the highest per capita health expenditure amounting to $8954.
- India has the lowest per capita health expenditure.

- Used a clustered Bar chart for visualizations.

```
Per_capita_Expenditure =
DIVIDE(
    SUM('Health Expenditure'[ExpenditureAmount]),
    SUM('Population'[PopulationCount])
)
```

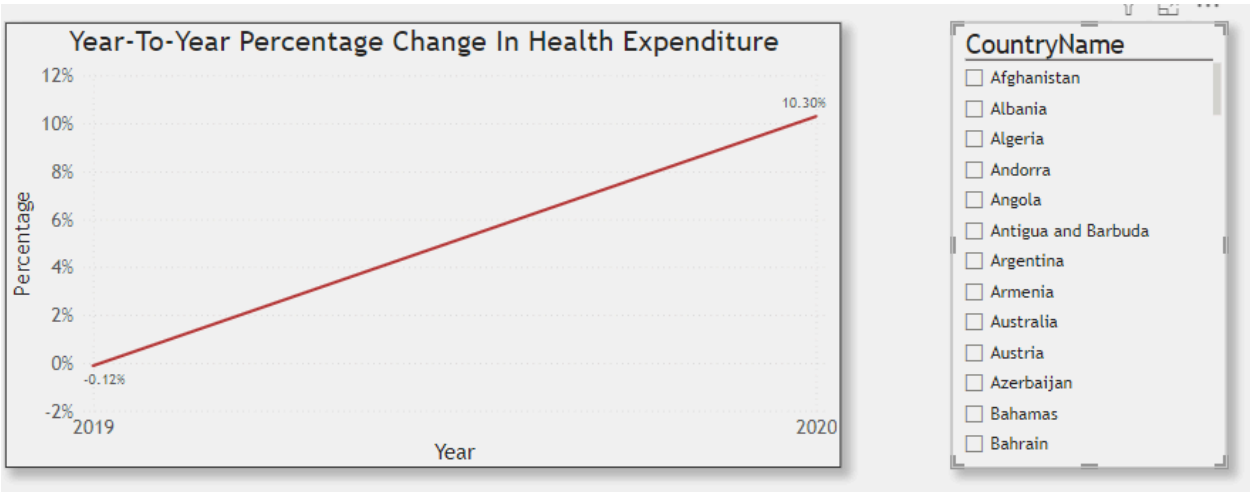


Visualizations:

Q1)Calculate the year-to-year percentage change in health expenditure.

- Created a measure to calculate year-to-year change in percentage.
- Used a line chart to display the change
- As the data contains information for three consecutive years,the visualization displays -0.12% for 2018-to-2019 and 10.3% for 2019-to-2020.
- Placed a slicer for custom filters.

```
YOY ExpenditureAmount YoY% =
IF(
    ISFILTERED('Year'[Date]),
    ERROR("Time intelligence quick measures can only be grouped or filtered by the Power BI-provided date hierarchy or
    primary date column."),
    VAR __PREV_YEAR =
        CALCULATE(
            SUM('Health Expenditure'[ExpenditureAmount]),
            DATEADD('Year'[Date].[Date], -1, YEAR)
        )
    RETURN
        DIVIDE(
            SUM('Health Expenditure'[ExpenditureAmount]) - __PREV_YEAR,
            __PREV_YEAR
        )
)
```



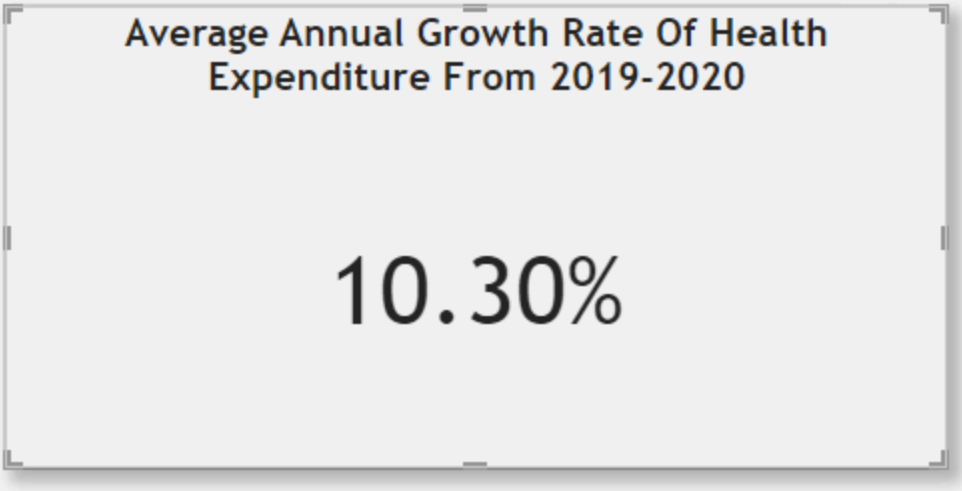
Insights: **Percentage Change from 2018 to 2019 is -0.12% and from 2019 to 2020 is 10.3%.The year 2020 has High expenditure and more change in percentage.**

Q2) Calculate the average annual growth rate of health expenditure over a selected period.

Assumption: Assuming the period to be 2019 to 2020

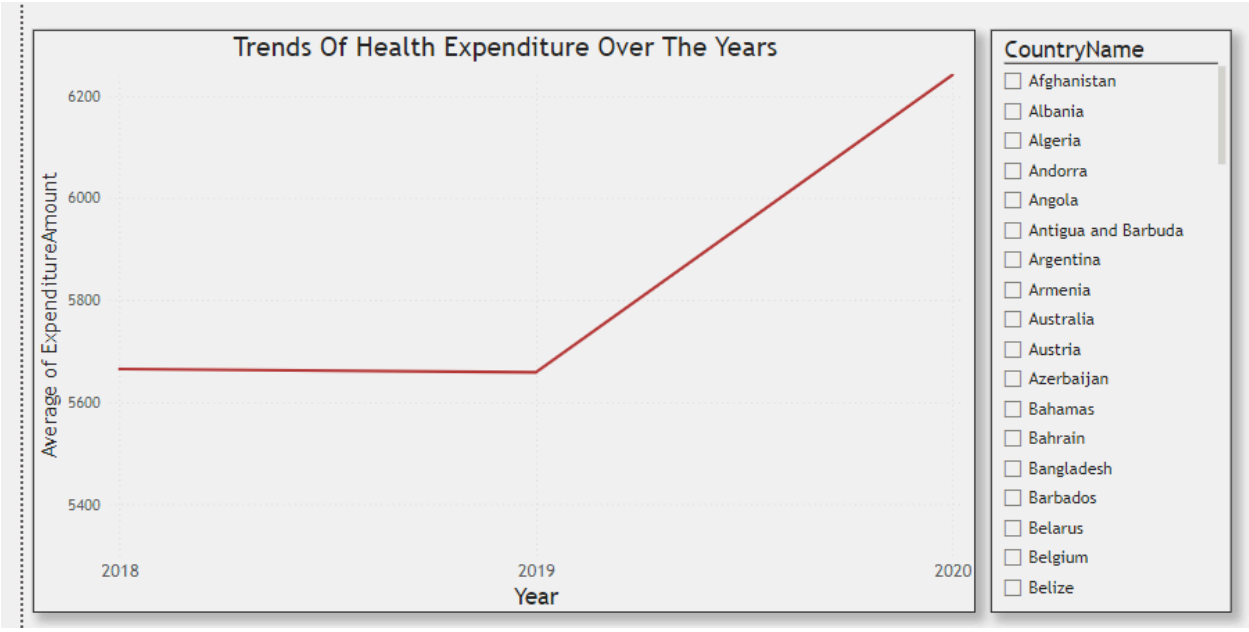
- Created a measure which calculates the % difference from 2019-to-2020
- Used a Text Card to display the value

```
% difference from avg_exp_2019 & 2020 =
VAR __BASELINE_VALUE = [avg_exp_2019]
VAR __VALUE_TO_COMPARE = [avg_exp_2020]
RETURN
    IF(
        NOT ISBLANK(__VALUE_TO_COMPARE),
        DIVIDE(__VALUE_TO_COMPARE - __BASELINE_VALUE, __BASELINE_VALUE)
    )
```



Q3) Create a line chart to visualize the trend of health expenditure over the years for selected countries/regions.

- Used a line chart to display the trend
- Placed year column on the x-axis and average expenditure amount on the y-axis
- Placed a slicer for custom filters.

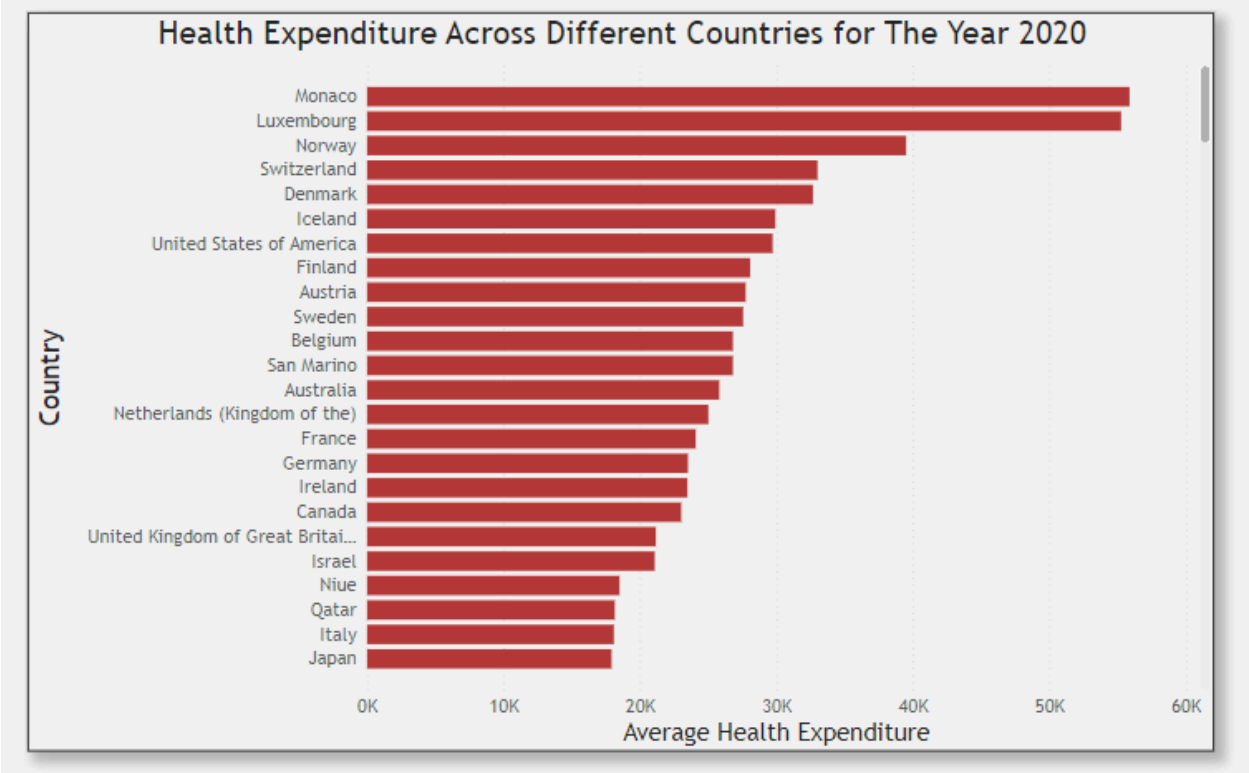


Insights: **2018 had 5,665.03 Average of ExpenditureAmount, 2019 had 5,658.44, and 2020 had 6,241.34**

2020 had the highest Average of ExpenditureAmount at 6,241.34, followed by 2018 at 5,665.03 and 2019 at 5,658.44.

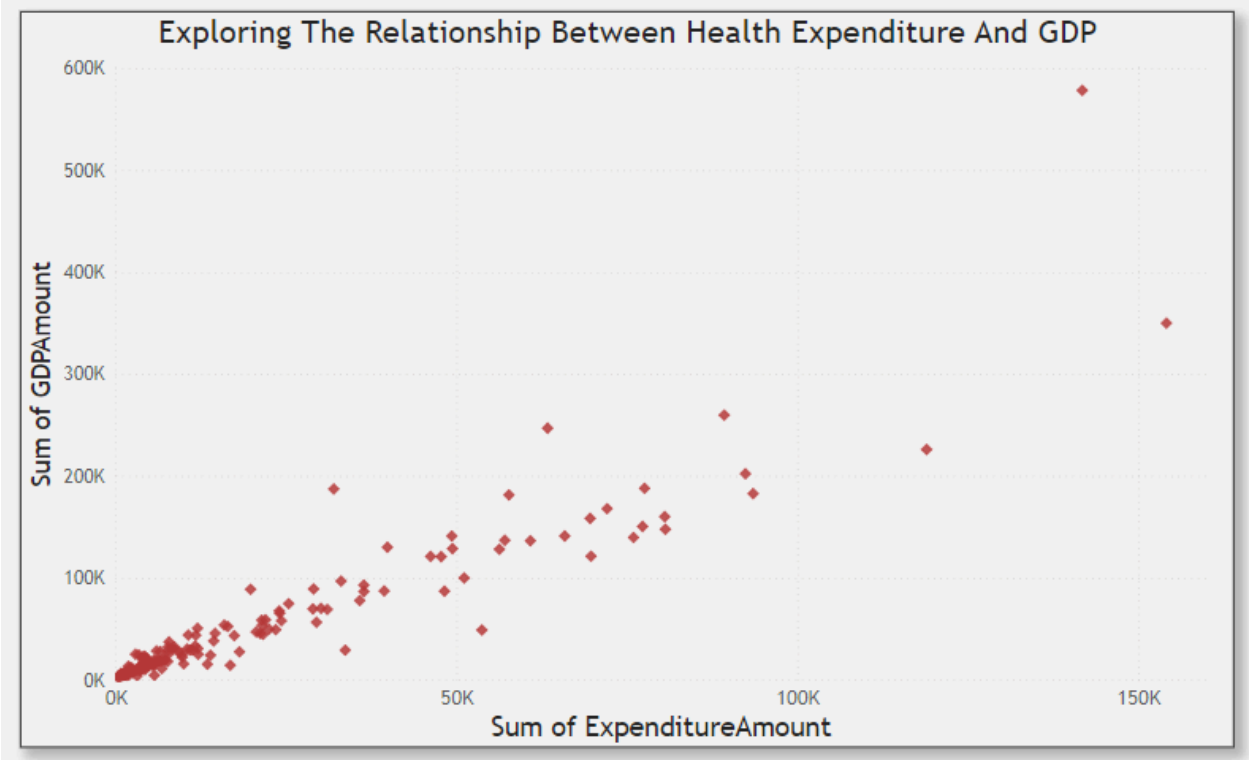
At **6,241.34, 2020 had the highest Average of ExpenditureAmount and was 10.30% higher than 2019, which had the lowest Average of ExpenditureAmount at 5,658.44.**

Q4) Create a bar chart to compare health expenditure across different countries for the year 2020 .



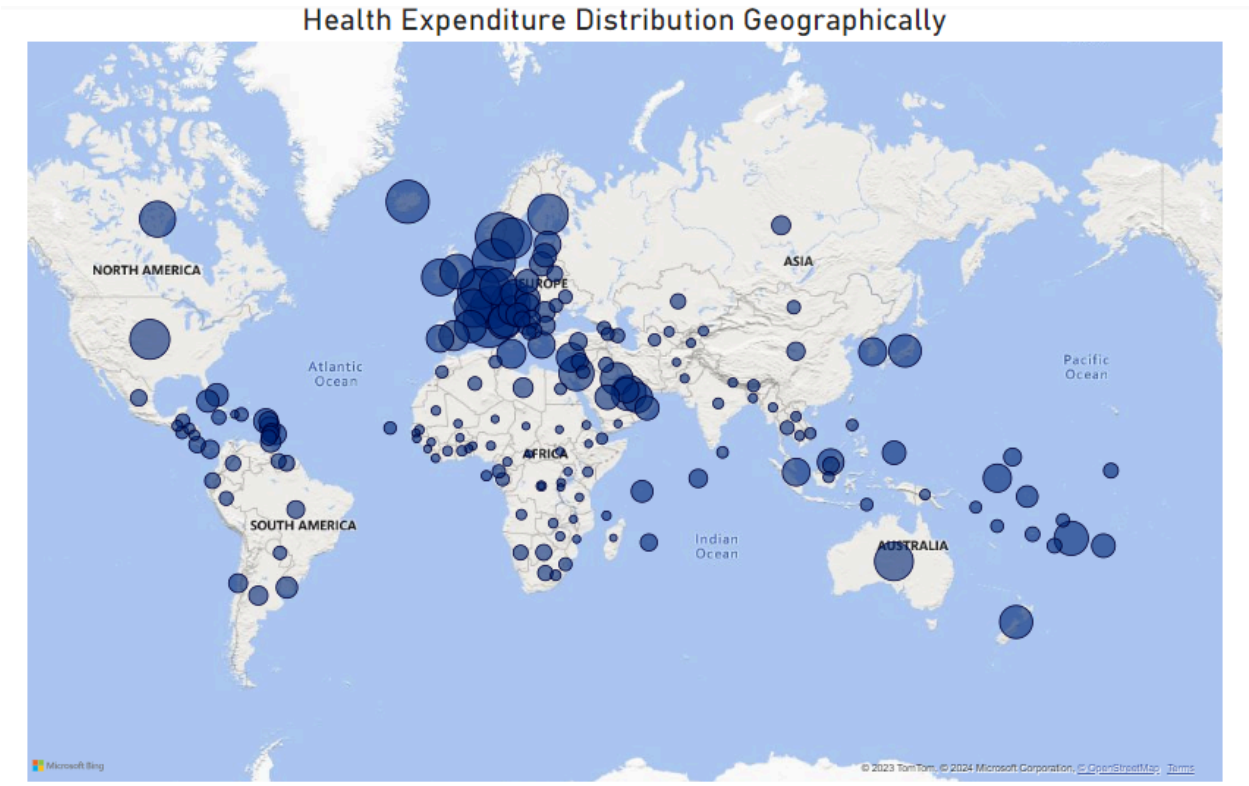
Insights: **Across all 191 CountryName, average expenditure ranged from 54 to 55875. At 55875, Monaco had the highest average expenditure and was 1,03,372.22 higher than Democratic Republic of the Congo, which had the lowest expenditure 54.**

Q5) Use a scatter plot to explore the relationship between health expenditure and GDP.



Insights: **Across all 191 countries Luxembourg had the highest Sum of ExpenditureAmount (154152) and Monaco had the highest Sum of GDPAmount (578282).**
Analyzing the relation between GDP and Expenditure,lower the GDP less is the expenditure so they are directly proportional.

Q6) Map Visualisation to Show Health Expenditure Distribution Geographically.


Health Expenditure Distribution Geographically
NORTH AMERICA
EUROPE
ASIA
Atlantic Ocean
Pacific Ocean
AFRICA
SOUTH AMERICA
Indian Ocean
AUSTRALIA
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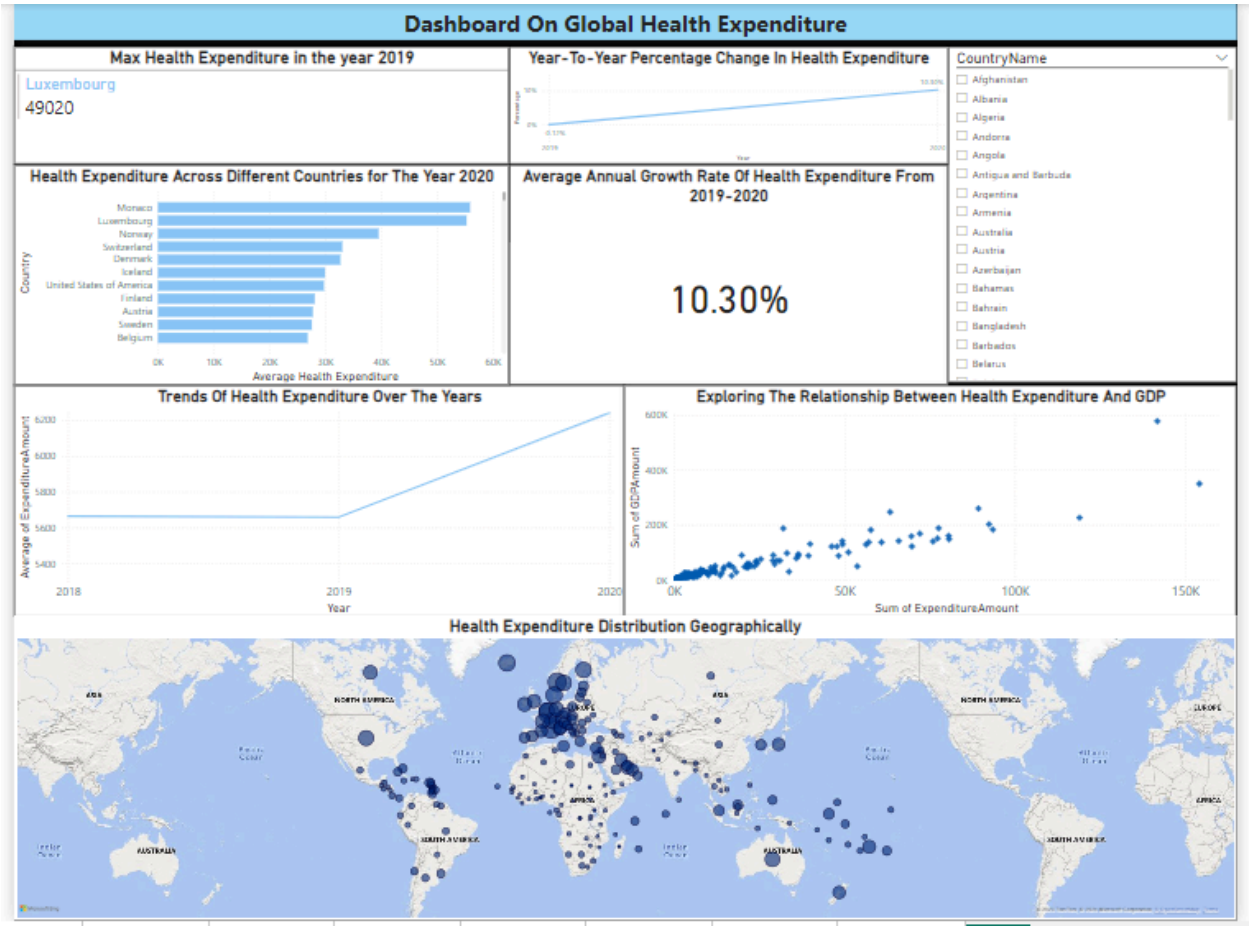
Dashboard:



Summarizing:

There are a total 191 countries.Luxembourg is the country with maximum health expenditure amounting to 55875 dollars and Democratic Republic Of Congo has the lowest health expenditure amounting to 54 dollars among all the years.

We can analyze that there is a direct relationship between GDP and Health Expenditure.More the government spend on Health then more is the rise in gdp.
We can clearly see this trend in the above chart ‘Trends Of Health Expenditure Over The Year’ and ‘Exploring The Relationship Between Health Expenditure and Gdp’.

The growth rate on the sum of health expenditure from the year 2018 to 2019 was negative resulting in -0.12%,while the sum from 2019 to 2020 was positive resulting in the increase of 10.3%.

Looking at per capita expenditure of each country, At 8,954.00, Niue had the highest Per capita Expenditure and was 2,06,25,03,337.42 higher than India, which had the lowest Per capita Expenditure 0.00.
Looking at the percentage of health expenditure as a share of gdp, At 127%, Kiribati had the highest percentage and was 1,120.74 higher than Haiti, which had the lowest percentage i.e. 10%.

Visualizing the data,In all the three years Monaco has the highest GDP,followed by Luxembourg and switzerland.All the European countries tend to have higher gdp.
Burundi has the lowest GDP for all the three years,followed by the Central African Republic.All the African Countries tend to have lowest gdp.
Norway,Luxembourg and Monaco have high health expenditure and Burundi,Democratic Republic Of Congo tend to have low health expenditure.