GLOBAL HEALTH EXPENDITURE ANALYSIS

Overview: In this Power BI project, we will analyse 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 analyse 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 5 tables namely Country, Year, GDP, Population, Health Expenditure. Key Columns are:

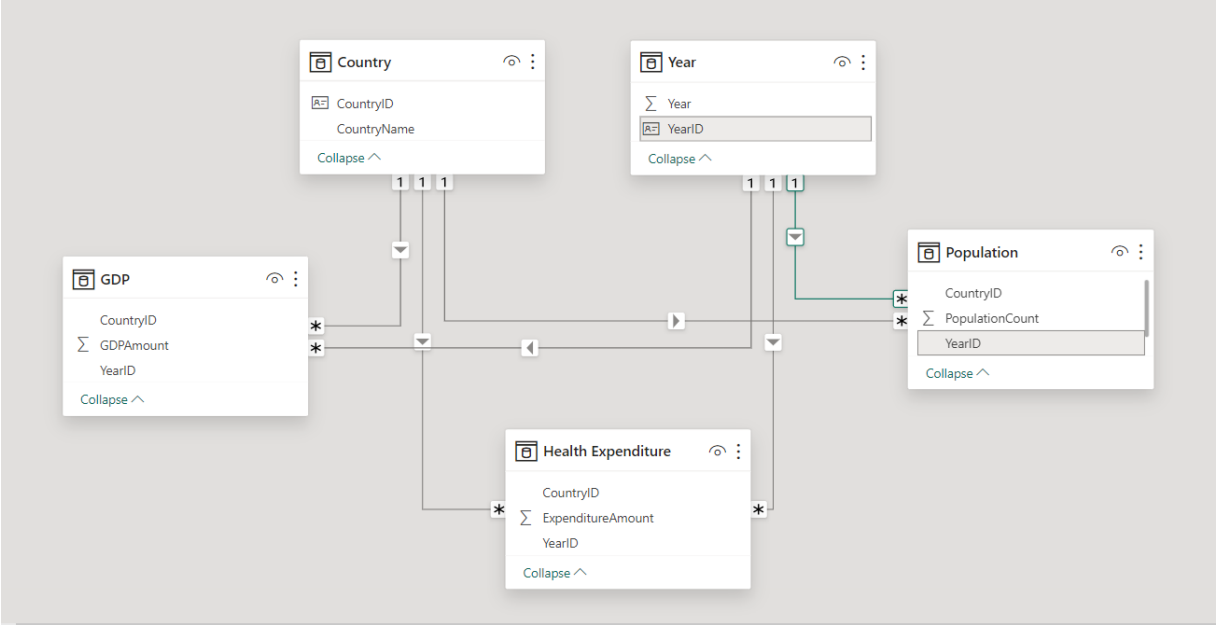
CountryID: It contains unique identifiers to different countries
Country: Name of the country or region.
YearID: It contains unique identifiers to different years
Year: Year of the data record.
Health Expenditure: Total health expenditure in US dollars.
GDP: Gross Domestic Product in US dollars.
Population: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

Project Steps:

a. **Data Loading**
   Data is in .CSV Format. Imported the dataset into Power BI.

b. **Data Transformation**
   Performed data cleaning and transformation which includes removing null values, removing errors, removing duplicates, checking for data types.

c. **Data Modelling**
   There are 2 Fact Tables - GDP, Health Expenditure and 3 Dimension Tables i.e. Country, Population and Year.



d. **Data Analysis using DAX Functions:**

Create a new table that consolidates information from multiple tables using DAX

```
Health Expenditure Summary = SUMMARIZE(
    'Health Expenditure',
    Country[CountryID],
   'Year'[YearID],
   "country", MAX(Country[CountryName]),
   "GDPamount", SUM(GDP[GDPAmount]),
   "HealthExp", SUM('Health Expenditure'[ExpenditureAmount]),
   "Populationcount", SUM(Population[PopulationCount]),
   "Year", SUM('Year'[Year])
)
```

// This DAX function creates a table Health Expenditure Summary. The preview of this table is shown below.

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CountryID	YearID	country	GDPamount	HealthExp	Populationcount	Year
1	1	Algeria	4184	1582	41927	2018
2	1	Angola	3241	667	31274	2018
3	1	Botswana	6948	2494	2451	2018
4	1	Burkina Faso	788	189	20393	2018
5	1	Burundi	264	69	11493	2018
6	1	Benin	1193	198	11941	2018
7	1	Cabo Verde	3443	1063	571	2018
8	1	Cameroon	1594	286	25077	2018
9	1	Central African Republic	447	79	5095	2018
10	1	Chad	707	94	15604	2018
11	1	Comoros	1518	291	776	2018
12	1	Congo	2507	483	5441	2018
13	1	Côte d'Ivoire	2275	403	25494	2018
14	1	Democratic Republic of the Congo	541	60	87087	2018
15	1	Equatorial Guinea	8719	1687	1502	2018
16	1	Eritrea	582	159	3445	2018
17	1	Eswatini	4022	1410	1160	2018
18	1	Ethiopia	722	116	111129	2018
19	1	Gabon	7695	1315	2192	2018
20	1	Gambia	683	142	2445	2018
21	1	Ghana	2180	456	30871	2018

Find the countries/regions with the highest and lowest health expenditure for all years.

```
Highest Expenditure Country = var max_expenditure =
        MAX('Health Expenditure Summary'[HealthExp])
        RETURN
        CALCULATE(MAX('Health Expenditure Summary'[country]),
        FILTER('Health Expenditure Summary','Health Expenditure Summary'[HealthExp] =
max_expenditure
        )
        )
//This DAX function returns the country with the Highest Health Expenditure that is Monaco

Lowest Expenditure Country = var min_expenditure =
        MIN('Health Expenditure Summary'[HealthExp])
        RETURN
        CALCULATE(MIN('Health Expenditure Summary'[country]),
        FILTER('Health Expenditure Summary','Health Expenditure Summary'[HealthExp] =
min_expenditure
        )
        )
// This DAX function returns the country with the Lowest Health Expenditure that is Democratic Republic
of the Congo.
```

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

```
Total Health Expenditure =
SUM(
   'Health Expenditure'[ExpenditureAmount]
)
// This DAX function returns the sum of the total expenditure.

Total GDPAmount =
SUM(
   GDP[GDPAmount]
```

```
)
// This DAX function returns the sum of the total GDP.

GDP Share =
   DIVIDE(
      [Total Health Expenditure],
      [Total GDPAmount]
) * 100
// This DAX function returns the GDP share.
```

//Further, the below table visualization shows the consolidated result of each DAX Function.

CountryName	Total Health Expenditure	Total GDPAmount	GDP Share
Afghanistan	429	1520	28.22
Albania	4801	15905	30.19
Algeria	4354	11591	37.56
Andorra	46198	121099	38.15
Angola	1598	7596	21.04
Antigua and Barbuda	12007	50634	23.71
Argentina	12058	30588	39.42
Armenia	3639	13727	26.51
Australia	72098	167934	42.93
Austria	77296	150502	51.36
Azerbaijan	4729	13499	35.03
Bahamas	19792	88858	22.27
Bahrain	25376	74789	33.93
Bangladesh	833	5394	15.44
Barbados	15932	53757	29.64
Belarus	7254	19220	37.74
Belgium	75972	139678	54.39
Belize	4881	13955	34.98
Benin	606	3605	16.81
Bhutan	2892	9394	30.79
Bolivia (Plurinational State of)	3705	10012	37.01
Total	**3354878**	**8617922**	**38.93**

Calculate the average health expenditure per capita for each country/region.

```
Health expenditure per capita =
   DIVIDE(
      [Total Health Expenditure],
      [Total Population]
   )
```

// This DAX function returns the health expenditure per capita. This is further represented by following preview.

CountryName	Health expenditure per capita
Afghanistan	0.00
Albania	0.56
Algeria	0.03
Andorra	201.74
Angola	0.02
Antigua and Barbuda	43.35
Argentina	0.09
Armenia	0.43
Australia	0.95
Austria	2.91
Azerbaijan	0.15
Bahamas	16.32
Bahrain	5.69
Bangladesh	0.00
Barbados	18.94
Belarus	0.25
Belgium	2.21
Belize	4.19
Benin	0.02
Bhutan	1.26
Bolivia (Plurinational State of)	0.10
Total	**0.15**

e. **Data Visualization**

Monaco
Highest Expenditure Country

Democratic Republic of the Congo
Lowest Expenditure Country

CountryName	Health expenditure per capita
Afghanistan	0.00
Albania	0.56
Algeria	0.03
Andorra	201.74
Angola	0.02
Antigua and Barbuda	43.35
Argentina	0.09
Armenia	0.43
Australia	0.95
Austria	2.91
Azerbaijan	0.15
Bahamas	16.32
Bahrain	5.69
Bangladesh	0.00
Barbados	18.94
Belarus	0.25
Belgium	2.21
Belize	4.19
Benin	0.02
Bhutan	1.26
Bolivia (Plurinational State of)	0.10
Total	**0.15**

CountryName	Total Health Expenditure	Total GDPAmount	GDP Share
Kiribati	5681	4470	127.09
Tuvalu	16812	14324	117.37
Nauru	33673	29094	115.74
Niue	53724	48863	109.95
Libya	13452	15315	87.84
Timor-Leste	3159	3813	82.85
Cuba	18165	27471	66.12
Marshall Islands	9975	15723	63.44
Micronesia (Federated States of)	6770	11034	61.36
Dominica	13907	24150	57.59
France	69741	121334	57.48
Kuwait	48235	86976	55.46
Lesotho	1697	3073	55.22
Finland	80645	147780	54.57
Belgium	75972	139678	54.39
Norway	118973	225999	52.64
Greece	29466	56488	52.16
Total	**3354878**	**8617922**	**38.93**

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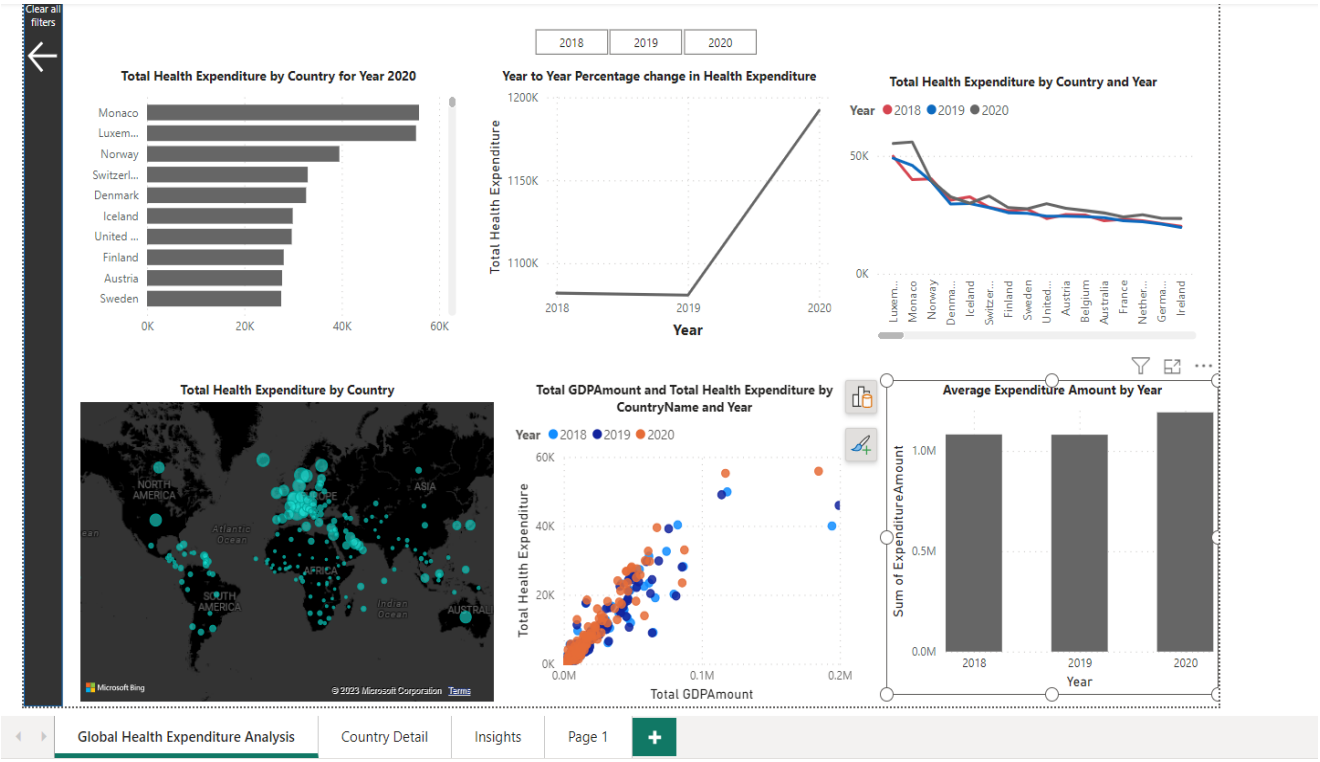

f. **Insights**

Total Health Expenditure by Country for year 2020

This graph gives the information about total health expenditure for year 2020. Here, we can see that Monaco has the highest expenditure followed by Luxembourg and Norway. Countries like Democratic Republic of Congo, Yemen, Netherlands are the countries with least expenditure.

Year to Year percent change in Health Expenditure

This graph gives the information that in the year 2019, the expenditure decreases at a rate of 0.12%. Also, in year 2020 expenditure got increased at the rate of 10.3%.

Total Health Expenditure by Country and Year

This chart gives the information that in the year 2019 and 2019, Luxembourg has the highest expenditure. But in year 2020, Monaco has the highest expenditure.

Total Health Expenditure by Country

Map gives us the information of countries and their health expenditure

Total GDP and Total Health Expenditure by Country and Year

Monaco is the country with highest GDP and Expenditure. This graph shows the total expenditure for the majority of countries is below 5855 and the total GDP for the majority of countries is 15040.

g. **Conclusion**

Country with highest GDP Share is Kiribati and Country with lowest GDP Share is Haiti. The GDP Share is highest in 2020 and lowest in 2018.

The average ratio of total health expenditure and population is 0.15, which is very less as compared to population. Each country should increase their health expenditure to meet the needs of rising population.