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, and their 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.

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

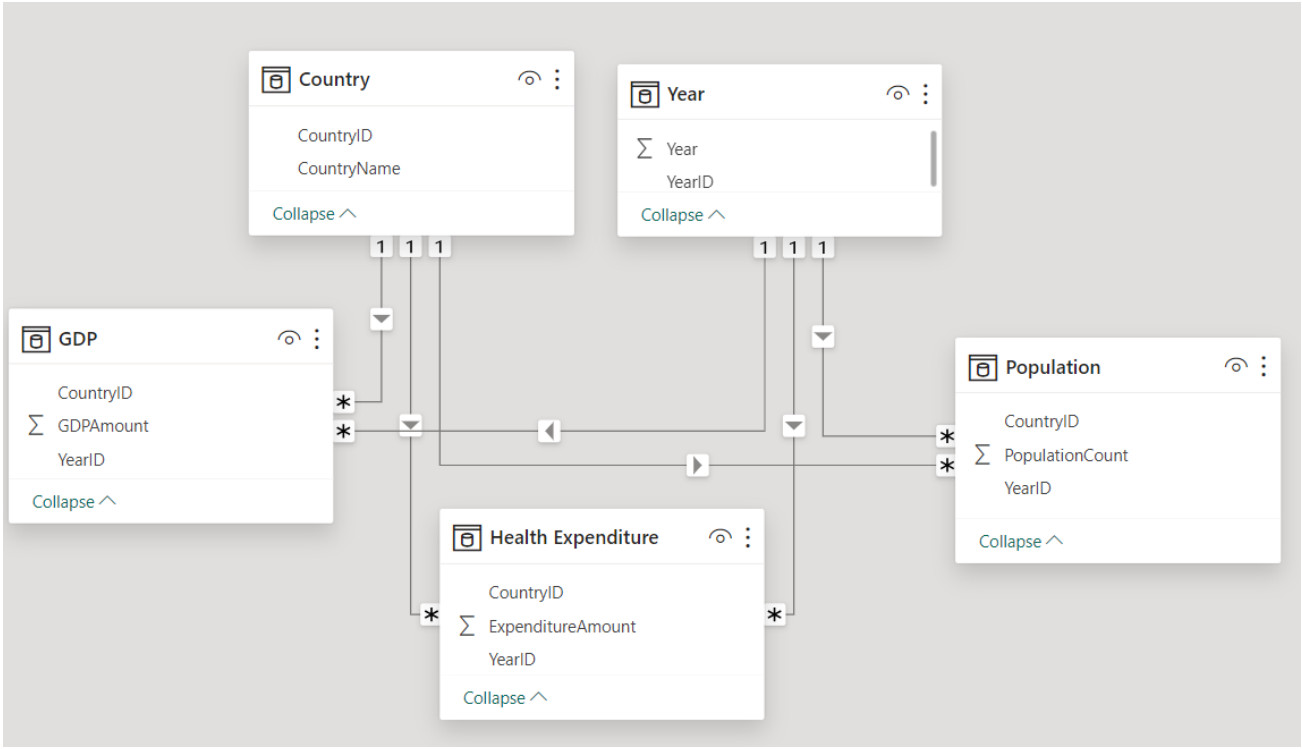


Fig 1: Data Model View

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.

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

● **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
Bosnia and Herzegovina	7631	17957	42.50
Botswana	7184	19490	36.86
Brazil	9657	24761	39.00
Total	**3354878**	**8617922**	**38.93**

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

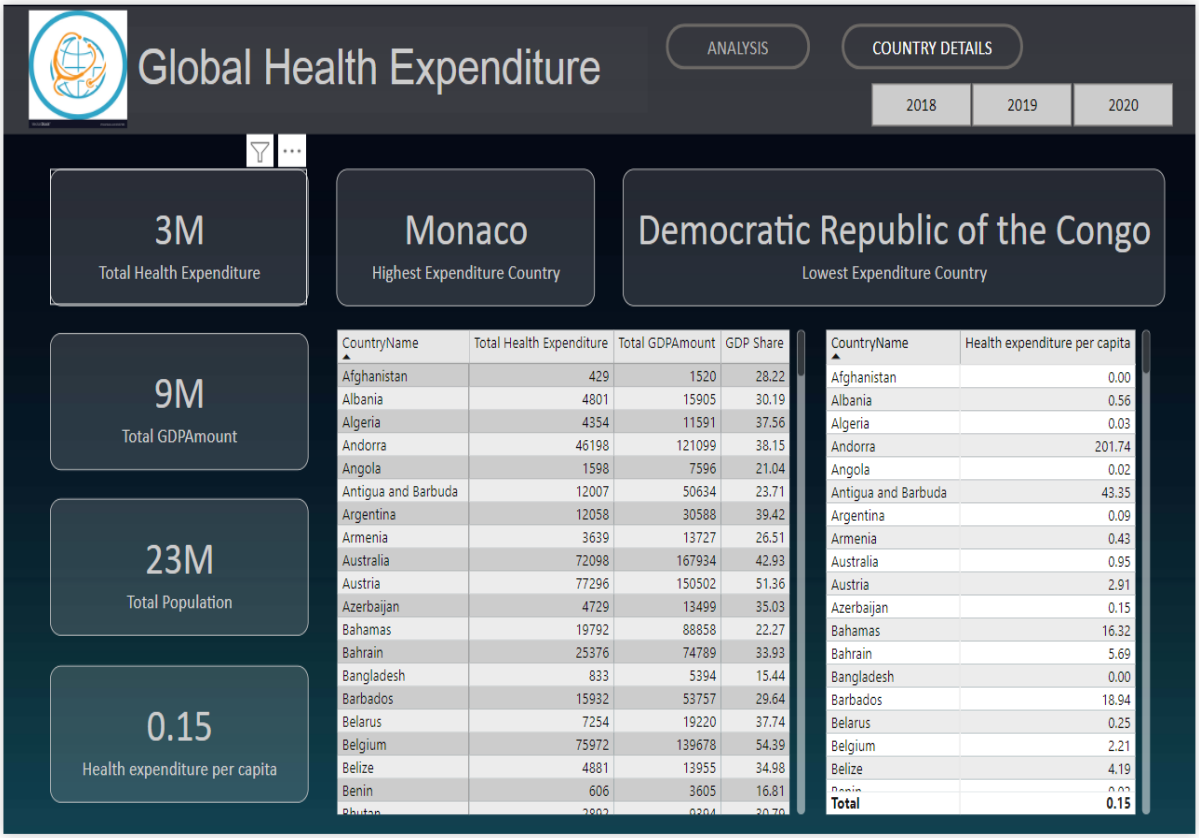
Health expenditure per capita =

```
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
Total	**0.15**

e) Data Visualizations



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f) Insights

- **Total Health Expenditure by Country for year 2020**
  The data regarding the total amount spent on health care in 2020 is displayed in this graph. This shows that the largest spending is in Monaco (56K), followed by Luxembourg (55K) and Norway (40K). The nations with the lowest expenditures are the Democratic Republic of the Congo, Yemen, and the Netherlands.

- **Year to Year percent change in Health Expenditure.**
  The data presented in this graph indicates that there will be a 0.12% decline in expenditure in 2019. In addition, expenditures climbed by 10.3% in 2020.

- **Total Health Expenditure by Country and Year**
  The data in this figure indicates that Luxembourg spent the highest expenditure in 2018 and 2019. Monaco, however, has the highest expenditure in 2020.

- **Total Health Expenditure by Country**
  The information about countries and their health expenditures is provided by the map. The chart's bubble size corresponds to the region's overall healthcare expenditures. Greater the bubble size, greater the money spent in that area on health care.

- **Total GDP and Total Health Expenditure by Country and Year**
  Monaco is the nation with the highest GDP and spending. According to this chart, most of the countries have total expenditures that are less than 5855 and total GDPs that are 15040.

g) Conclusion:

- Haiti has the lowest GDP share whereas Kiribati has the highest GDP share. 2020 has the largest GDP share, while 2018 has the lowest. The average ratio of population to total health expenditure is 0.15, which is extremely low in relation to population. Every nation should raise its health expenditure to keep up with the needs of a growing population.