Global health expenditure analysis

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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,

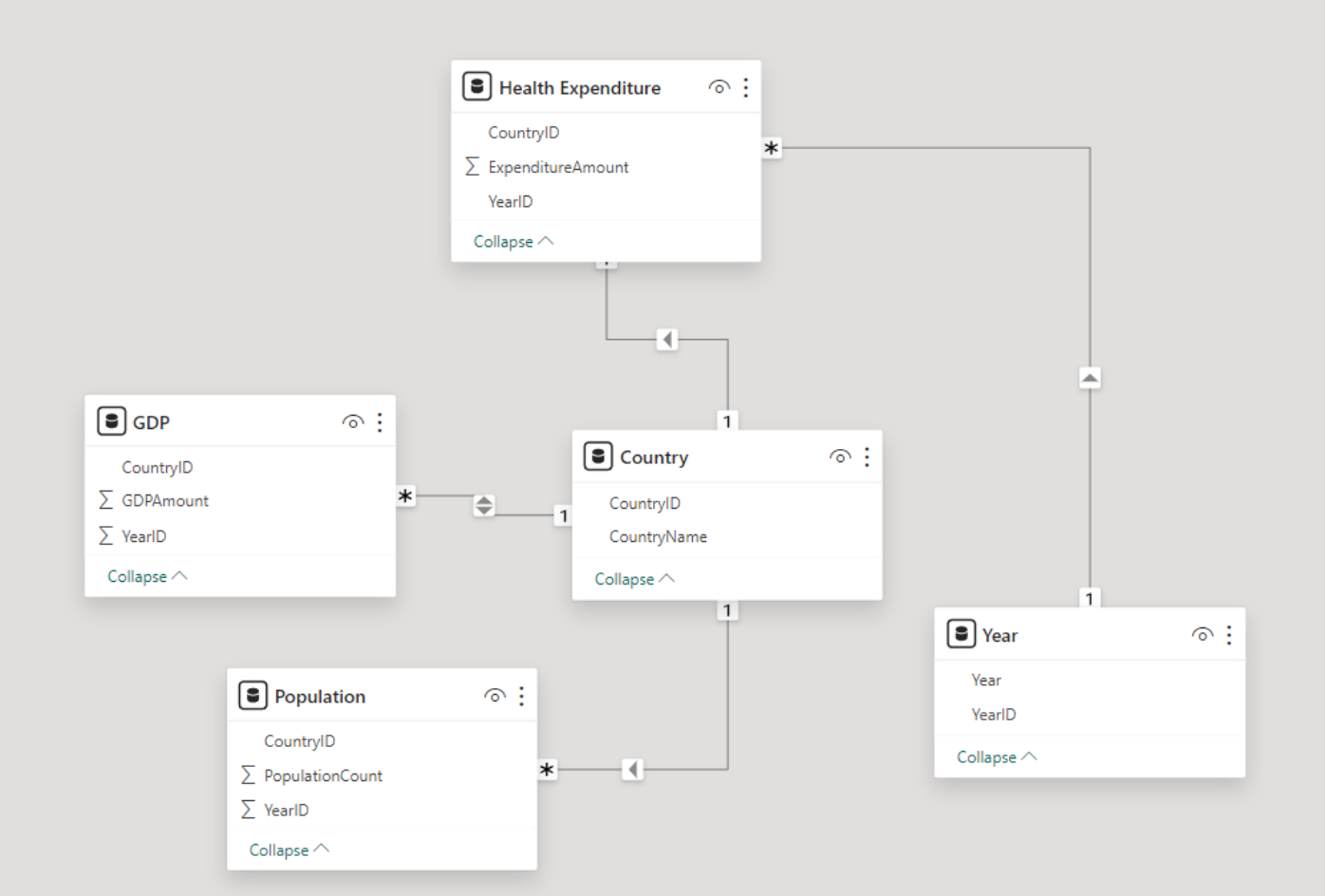
Key Learnings: This project was a hands-on learning experience that enhanced my Power BI skills and analytical abilities. I gained proficiency in using Data Visualization tool to explore and analyse large datasets, extract relevant information, and draw valuable insights.

Data Source: We will use a dataset that includes 5 tables namely Country, Year, GDP, Population, Health Expenditure.

Key Columns are:
Country ID: It contains unique identifiers to different countries
Country: Name of the country or region.
Year ID: 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:

1. **Data Loading**
   Data is in CSV Format. Imported the database into Power BI.
2. **Data Transformation**
   Performed data cleaning and transformation which includes removing null values, removing errors, removing duplicates, checking for data types.
3. **Data Modelling**
   There are 2 Fact Tables - GDP, Health Expenditure and 3 Dimension Tables i.e. Country, Population and Year.



4. **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],
"CountryName", MAX(Country[CountryName]),
"Year", MAX('Year'[Year]),
"TotalExpenditure", SUM('Health Expenditure'[ExpenditureAmount]),
"TotalGDP", SUM(GDP[GDPAmount]),
"TotalPopulation", SUM(Population[PopulationCount]))
```

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

GLOBAL HEALTH EXPENDITURE ANALYSIS

CountryName	CountryID	YearID	Year	TotalExpenditure	TotalGDP	TotalPopulation
Algeria	1	1	2018	$	1	128084
Angola	2	1	2018	$667	$7,396	97056
Botswana	3	1	2018	$2,494	$19,490	7497
Burkina Faso	4	1	2018	$189	$2,357	62868
Burundi	5	1	2018	$69	$771	35588
Benin	6	1	2018	$198	$3,605	36874
Cabo Verde	7	1	2018	$1,063	$9,802	1731
Cameroon	8	1	2018	$286	$4,673	77350
Central African Republic	9	1	2018	$79	$1,330	15647
Chad	10	1	2018	$94	$2,033	48376
Comoros	11	1	2018	$291	$4,532	2373
Congo	12	1	2018	$483	$6,612	16714
Côte d'Ivoire	13	1	2018	$403	$6,802	78454
Democratic Republic of the Congo	14	1	2018	$60	$1,627	269847
Equatorial Guinea	15	1	2018	$1,687	$22,350	4651
Eritrea	16	1	2018	$159	$1,734	10500
Eswatini	17	1	2018	$1,410	$11,230	3511
Ethiopia	18	1	2018	$116	$2,357	342441
Gabon	19	1	2018	$1,315	$21,900	6728
Gambia	20	1	2018	$142	$2,117	7528
Ghana	21	1	2018	$456	$6,478	94573
Guinea	22	1	2018	$151	$3,151	38638
Guinea-Bissau	23	1	2018	$157	$2,243	5911
Kenya	24	1	2018	$451	$5,763	152890
Lesotho	25	1	2018	$607	$3,073	6678
Liberia	26	1	2018	$217	$1,883	14962
Madagascar	27	1	2018	$74	$1,488	82605

TotalExpenditure

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

```
HighestExpenditureCountry = var max_expenditure = MAX(HealthExpenditureSummary[TotalExpenditure])RETURN
CALCULATE(MAX(HealthExpenditureSummary[CountryName]),FILTER(HealthExpenditureSummary,HealthExpenditureSum
mary[TotalExpenditure] = max_expenditure))
```

This DAX function returns the country with the Highest Health Expenditure that is Monaco

```
LowestExpenditureCountry = var min_expenditure = MIN(HealthExpenditureSummary[TotalExpenditure])RETURN
CALCULATE(MIN(HealthExpenditureSummary[CountryName]),FILTER(HealthExpenditureSummary,HealthExpenditureSum
mary[TotalExpenditure] = 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
Total	**3354878**	**8617922**	**38.93**

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

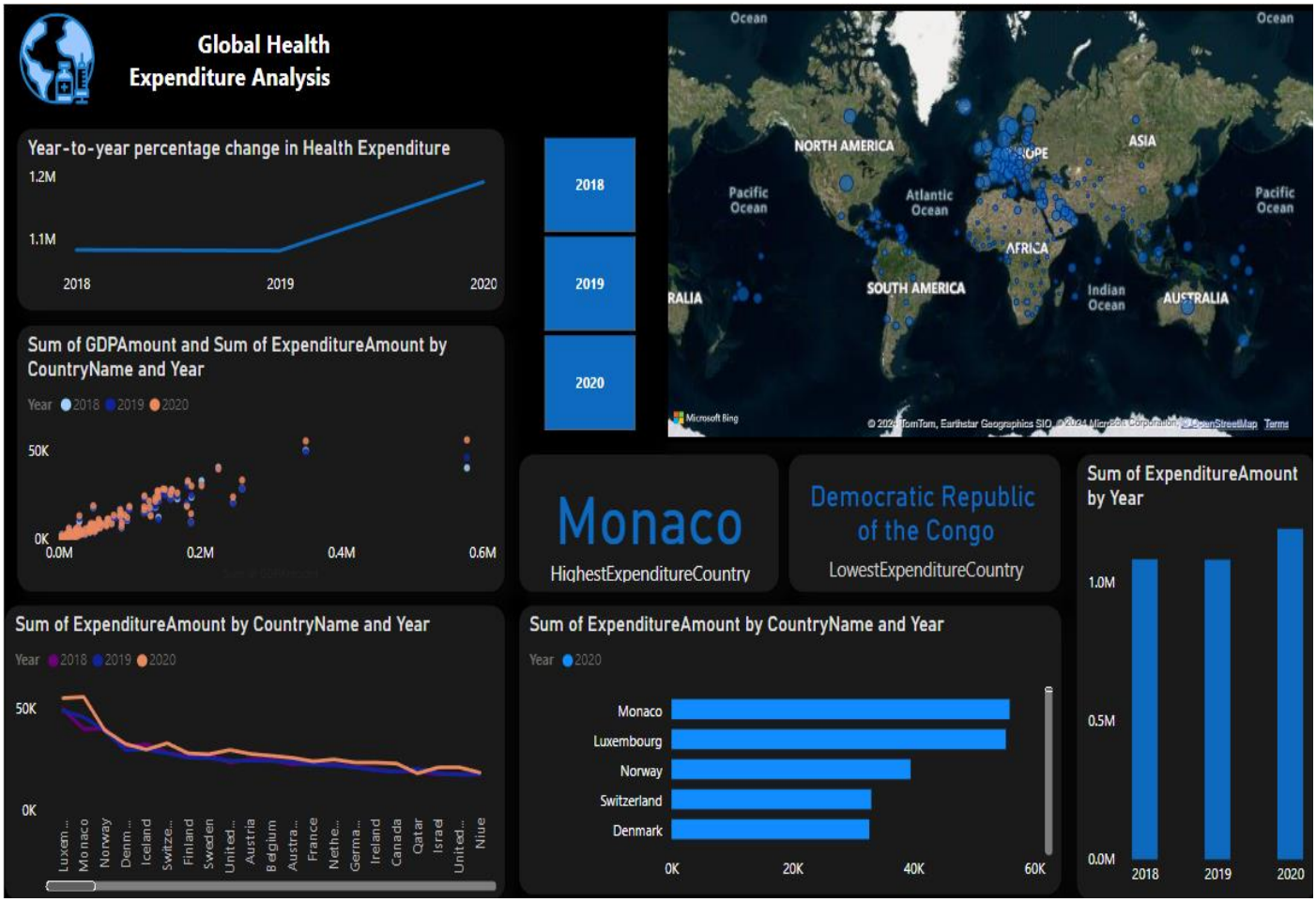
```
AverageHealthExpenditurePerCapita =

DIVIDE(
[Total Health Expenditure],[Total Population]
)
```

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

CountryName	AverageHealthExpenditurePerCapita
Afghanistan	0
Albania	1
Algeria	0
Andorra	202
Angola	0
Antigua and Barbuda	43
Argentina	0
Armenia	0
Australia	1
Austria	3
Azerbaijan	0
Bahamas	16
Bahrain	6
Bangladesh	0
Barbados	19
Belarus	0
Belgium	2
Belize	4
Benin	0
Bhutan	1
Bolivia (Plurinational State of)	0
Bosnia and Herzegovina	1
Botswana	1
Total	**0**

5. Data visualisation



6. **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.

7. **Recommendation**

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.

8. **Conclusion**

I thoroughly enjoyed working on this Global Health Expenditure Analysis Project. It provided a valuable opportunity to apply Power BI skills to real-world data and gain insights into the health industry.