GROUP SIX (6) - TECH TITANS
Informational Report on Life Expectancy

Introduction :

This Project is based on a dataset provided by WHO and United Nations website to determine and analyze the predicting factors that contribute to a higher or lower value of life expectancy for different countries.

Project description:

The dataset consisted of 22 columns and 2,938 rows with 20 predicting variables.These predicting variables included Immunization related factors , Mortality factors, Economical factors, Social and other Health related factors.The data collected spanned a 15 year period starting from year 2000 to year 2015. Also, the data was taken from 193 countries which were grouped into Developed and Developing Countries. After loading the data into Power BI desktop, certain questions were derived from the predicting variables which had the potential to help us achieve our goal.

These questions were:

1. How does Schooling affect Life expectancy?
2. Does adult mortality rate have an impact on life expectancy?
3. Does life expectancy have positive or negative correlation with certain lifestyles such as drinking of alcohol?
4. What impact does Immunization against Diphtheria and Polio have on life expectancy?
5. What are the effects of some deadly diseases such HIV/AIDS on life expectancy?
6. Should countries below the Average life expectancy increase its Healthcare expenditure inorder to improve its average lifespan.

The Goal:

The goal of this project was to identify the factors that impacted life expectancy in both developed and developing countries and to give suggestions to countries with low life expectancy values on the various areas within their economy that must be given special attention in order to efficiently improve the life expectancy of its population.

THE DATA DESIGN PROCESS

Step 1 : Data exploration

We explored the data on the Power BI Desktop by inspecting all the columns and rows closely. We identified several null values , outliers and also realized 10 countries had only one year of data collection under consideration.

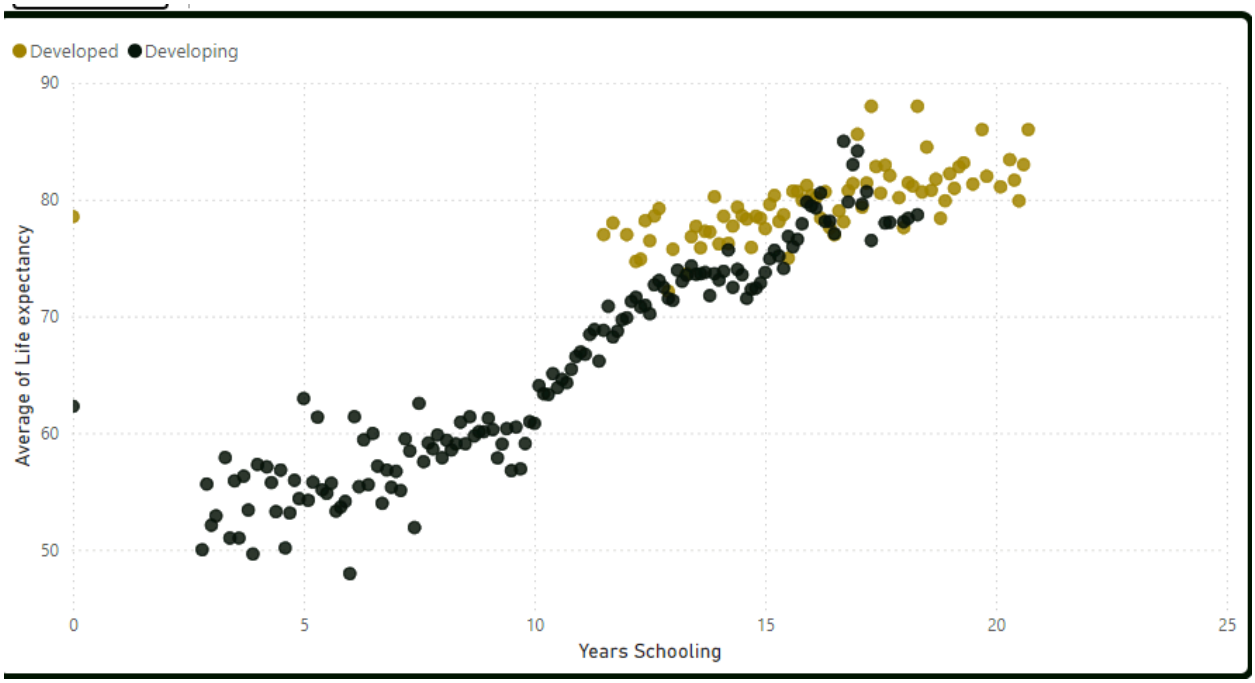
Step 2: Data Cleaning and Transformation

We cleaned the data by changing all the null values to zero. We removed all the countries with only 1 year of recorded data and we had 183 countries with full records to work with. Poland had a null value for most of its field for the year 2013, we replace this null values with the mean of the specific fields.

Step 3 : Data Analysis Overview and Visualizations

Power BI was the tool used to create the dashboard for our analysis and Data Analysis Expressions (DAX) was used to create certain measures to enhance its visualization.

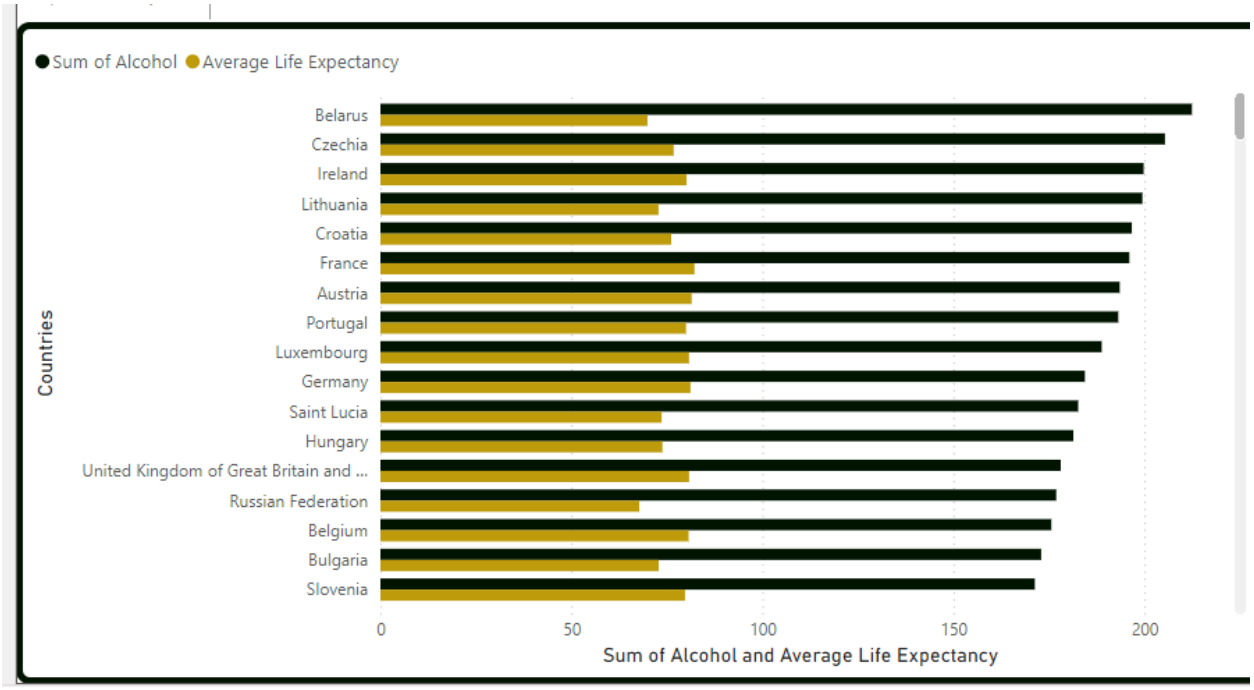
1. Effects of Schooling on Life Expectancy

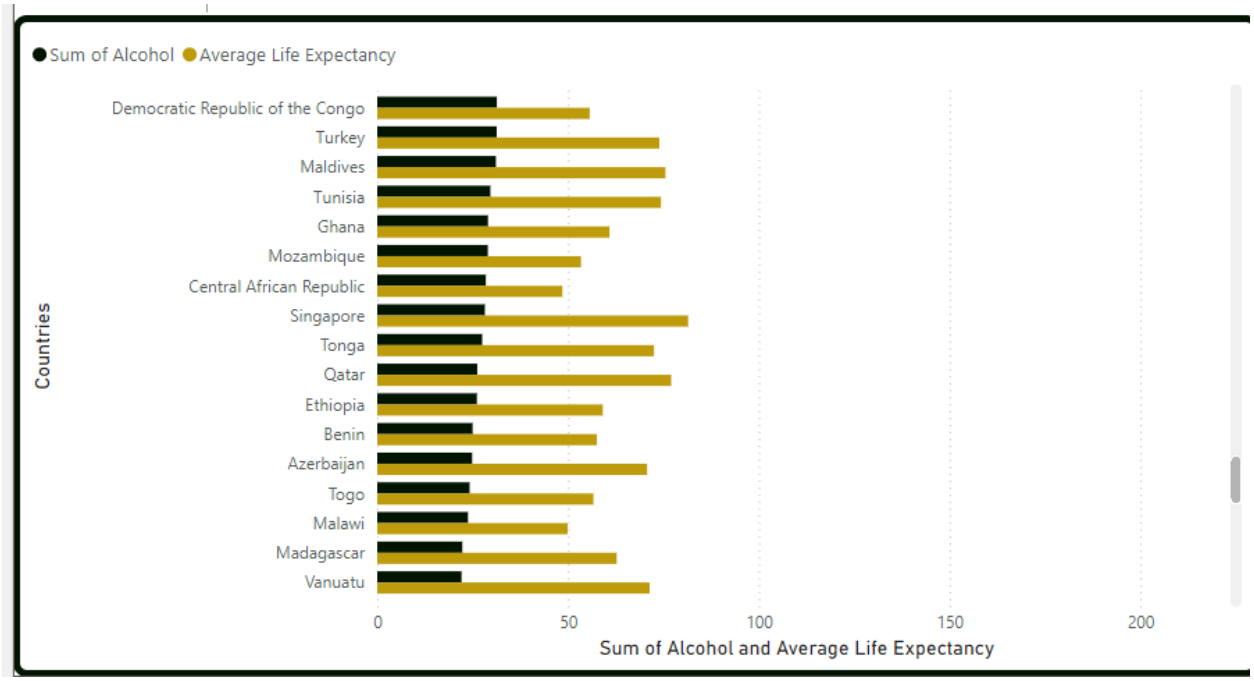


From the visual, a strong correlation exists between education and life expectancy. As individuals become more educated, they tend to adopt healthier lifestyles, make informed health decisions, access better healthcare, etc and as such schooling affects life expectancy positively. Also,.The percentage of schooling in developed countries is higher than the developing

countries and the chart clearly shows most Developed countries having a higher life expectancy rate comparatively.

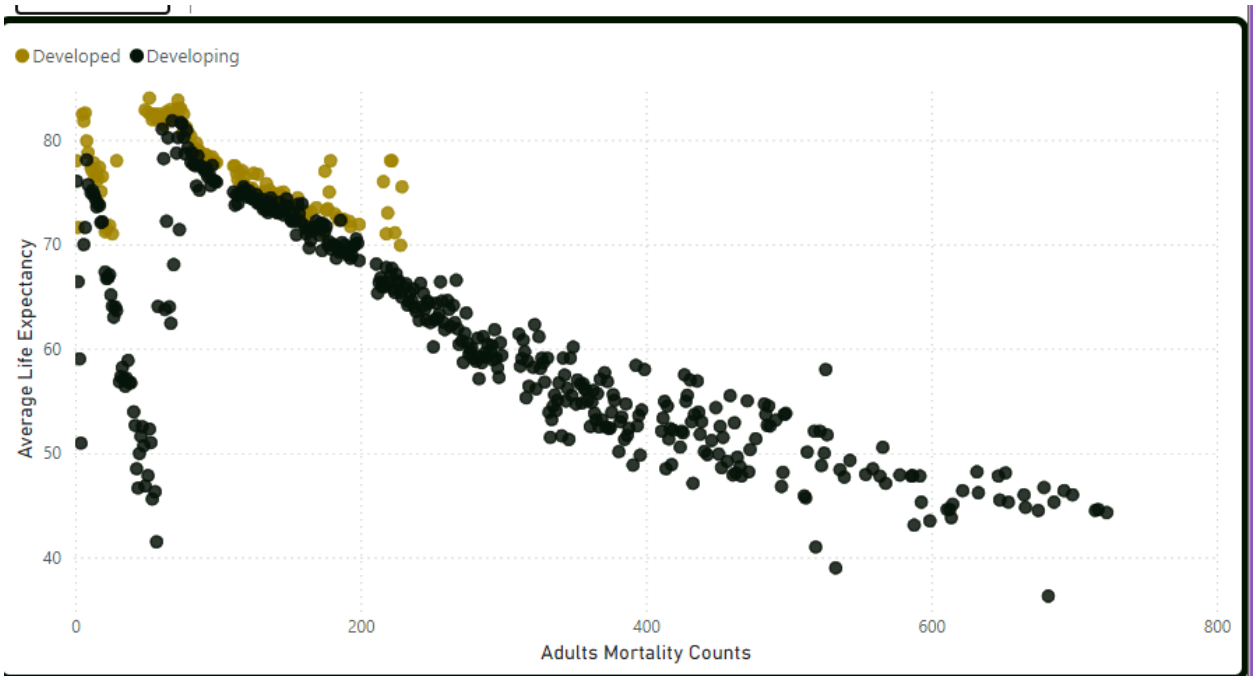
2. Effects of Consuming Alcohol on Life Expectancy



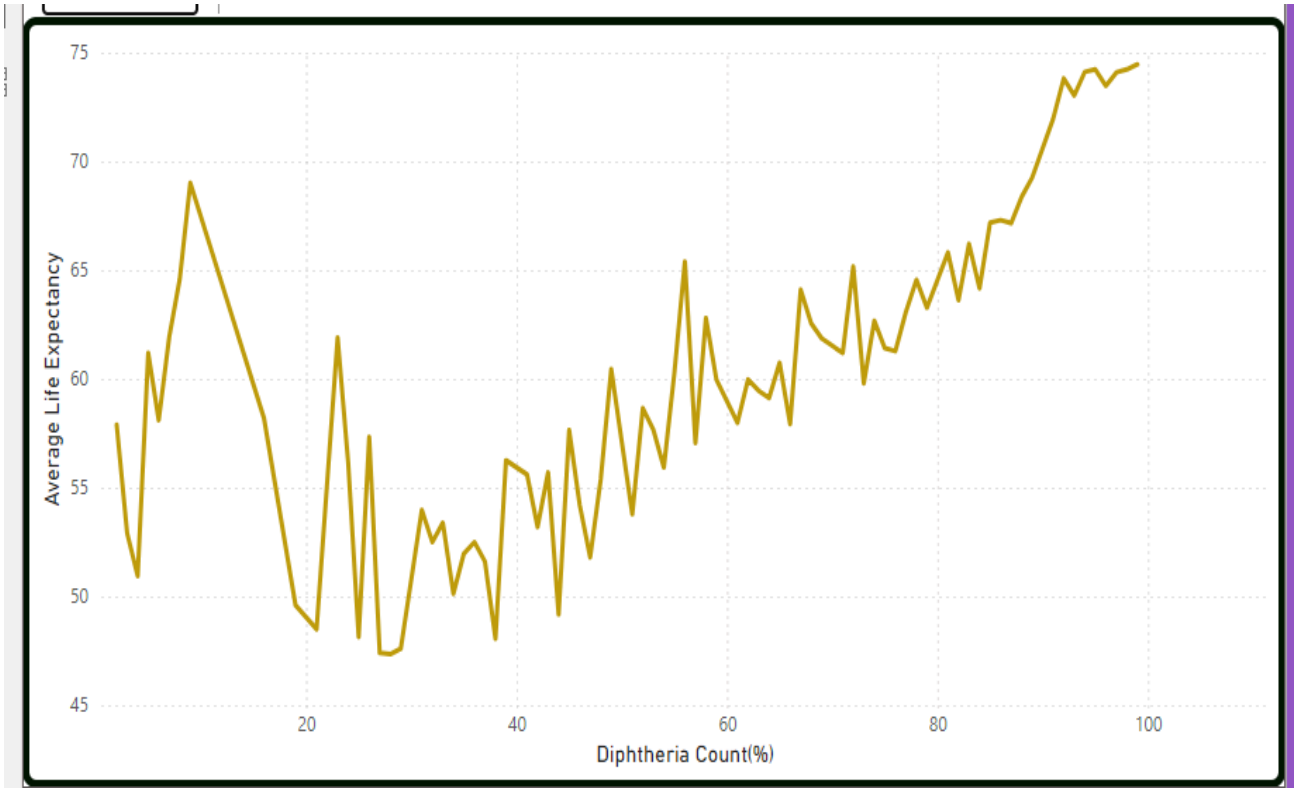


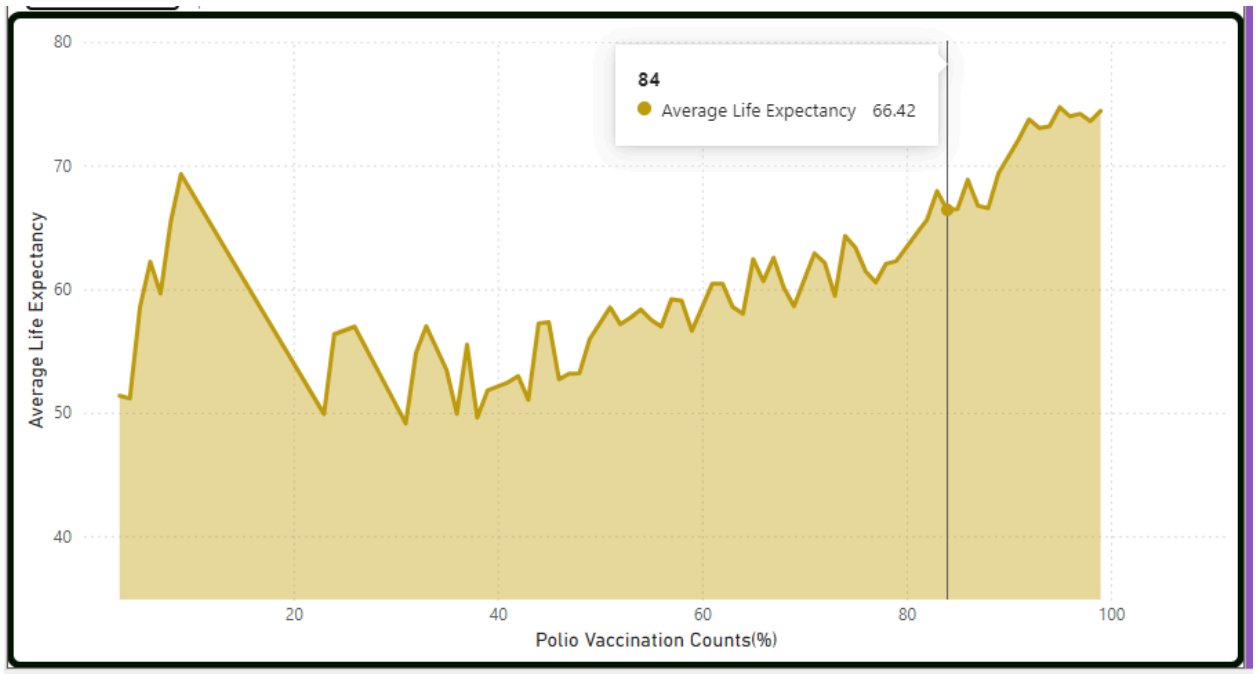
As countries are educated, they tend to know the effects of alcohol on their life. From the visual, alcohol has a negative correlation on life expectancy. As the value for alcohol consumption increases life expectancy decreases respectively. The chart shows that Belarus, Ireland, etc comsume alcohol at a hihger rate and they have low life expectancy values. However, countries like Togo and Malawi are able to live longer because the alcohol consumption is low.

3. Effects of Adults Mortality on Life Expectancy



4. Effects of Immunization on Diphtheria and Polio on Life Expectancy

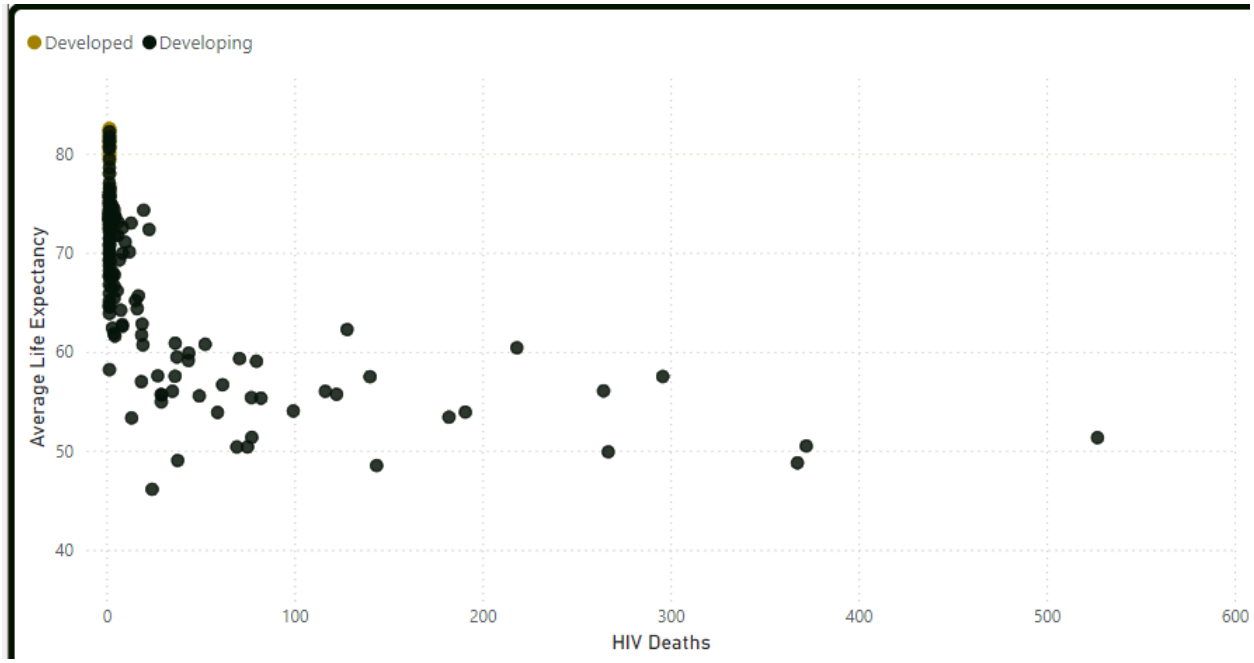




Looking closely at the number of Immunizations against Diphtheria, it can be observed that countries with a higher rate of Diphtheria Immunization have higher life expectancy except for exceptional cases which could be due to incorrect data and some outliers.

It can be concluded that as the number of immunizations is increased per population over time their life expectancy also increases showing a positive correlation.

5. **Effects of HIV/ AIDS against Life expectancy**



This report aims to analyze Life Expectancy data from WHO to uncover key trends and provide insights to improve life expectancy and health situations. The data used in this analysis comes from a dataset with 22 columns and 2,938 rows relating to 193 countries in total, covering the period from 2000 to 2015.
The Correlation between HIV/AIDS cases and life expectancy chart is a scatter plot that shows whether HIV/AIDS cases are a contributing factor to the average life expectancy of the countries captured in the dataset for the period analyzed. It highlights a movement from the upper left towards the right, showing a negative correlation. This means an increase in one will lead to a decrease in the other. Insight: HIV/AIDS cases negatively impact life expectancy and from the scatter plot, it can be seen that the majority of the countries have a higher average life expectancy because they have few to no HIV/AIDS cases. And it shows that these cases are being managed well, health wise. Another insight drawn was in relation to how only 1% of HIV/AIDS cases could be attributed to Developed countries, telling us that 99% were from Developing countries. Recommendation: The countries that fall in the extreme can be assisted with resources to help minimize HIV/AIDS cases and increase life expectancy.

Adult mortality rate is the probability of dying between the ages of 15 and 60 years(per 1,000 population).

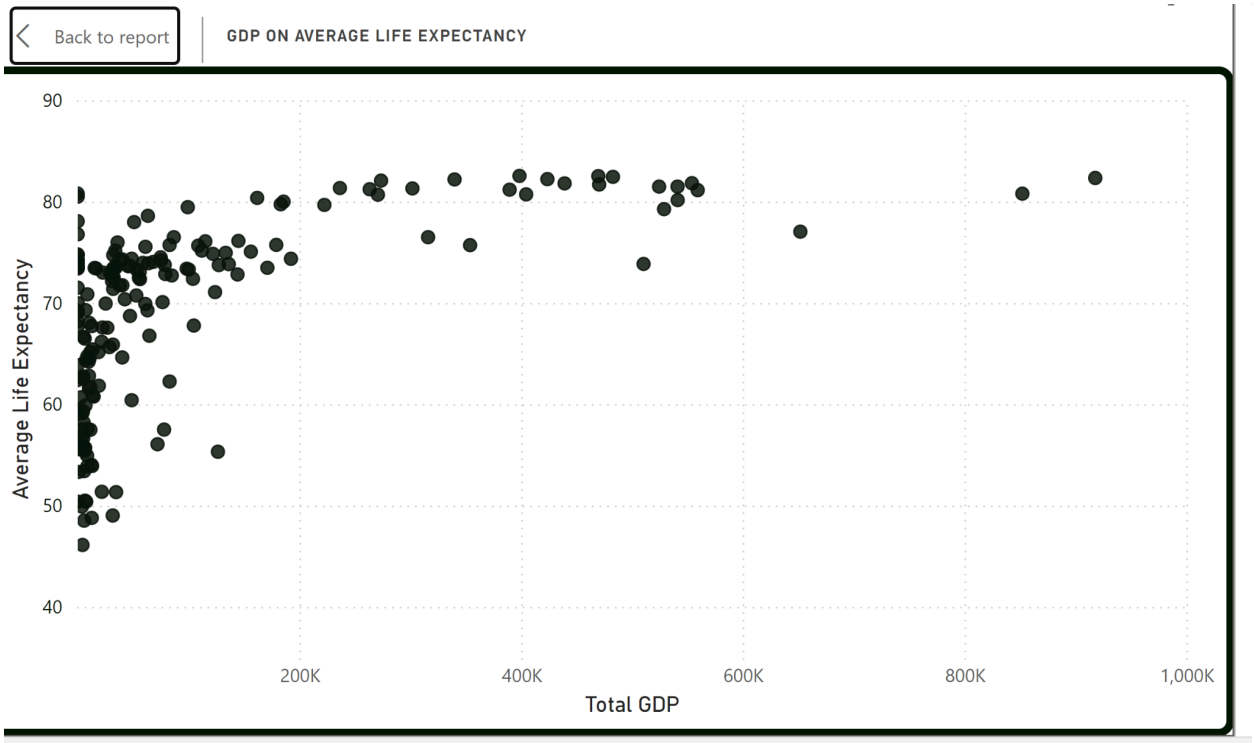
Key Insights: Adult mortality has a negative correlation with life expectancy, hence, the more people we have dying in a particular country, the less their life expectancy. From the scatter plot, it is seen that adult mortality rate is a great contributor to low life expectancy. It was also observed that even though there is a correlation, in some cases, a country like Niger for instance, had a record of 223 adult mortality in 2014 and a life expectancy of 61.4. whereas in 2015, when there was a major decrease in adult mortality (22), there was no significant increase in life expectancy(61.8).

Recommendations: If countries experiencing low life expectancies tailor their attention to the underlying causes of adult mortality through improved healthcare systems, healthier lifestyles and maternal health, overtime their life expectancy is expected to increase.

Effects of Economic factors on Life Expectancy

A. GDP & Life Expectancy

The scatter plot shows a positive correlation between GDP and average life expectancy, with life expectancy rising as GDP increases, particularly at lower GDP levels. However, the relationship plateaus around a GDP of 200K-400K, where life expectancy stabilizes near 80 years. This suggests that beyond a certain GDP threshold, additional increases in wealth have diminishing returns on life expectancy.



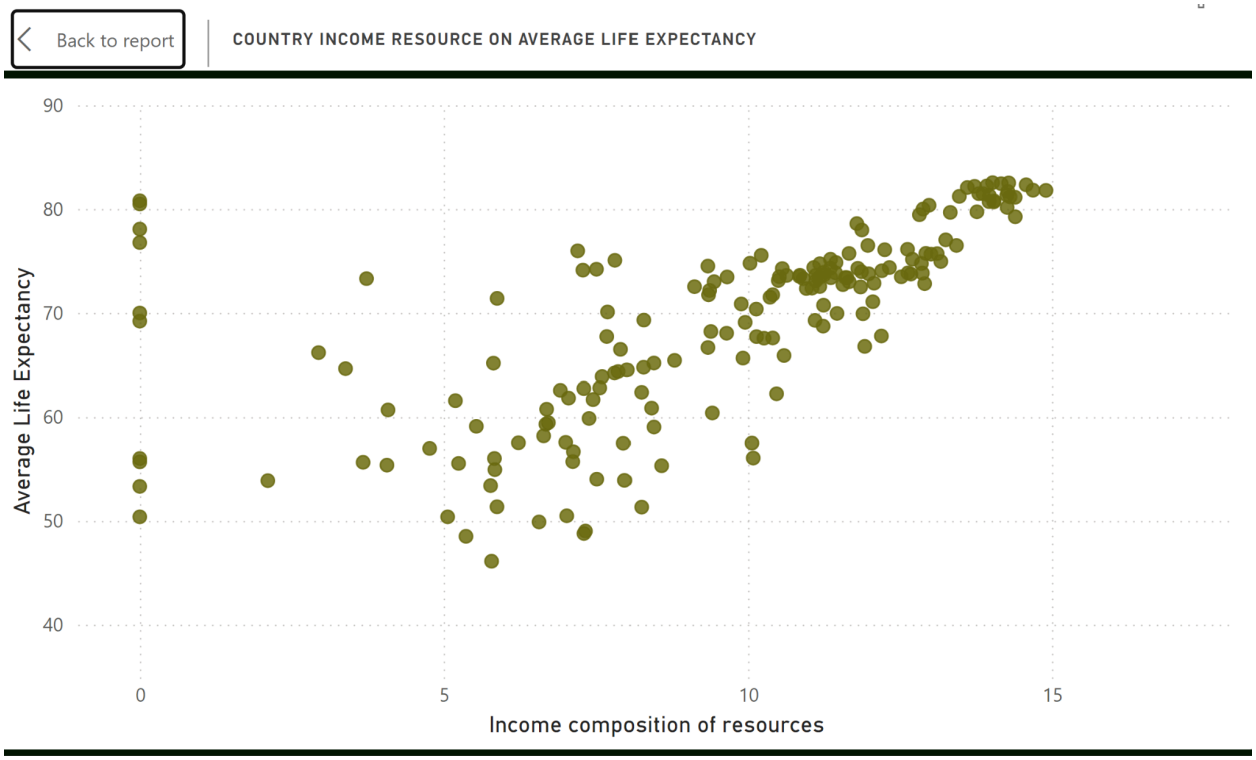
B.Expenditure & Life Expectancy

The image below shows a weak and scattered relationship between total expenditure and average life expectancy. While some clusters suggest that higher expenditures may slightly

correlate with increased life expectancy (around 70-80 years), the data points are widely spread, indicating a less consistent pattern. This suggests that factors other than expenditure may play a significant role in determining life expectancy.

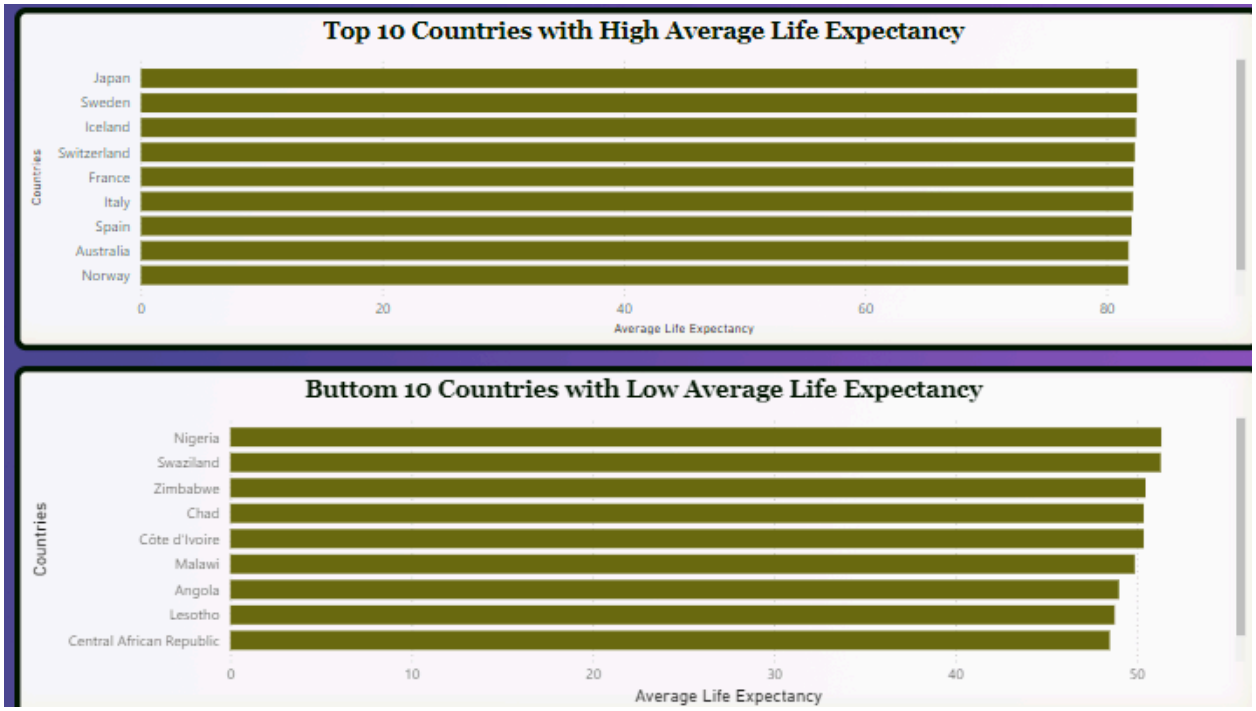
C.Income composition of Resource & Life Expectancy

The scatter plot below shows a positive correlation between income composition of resources and average life expectancy. As the income composition increases, there is a general upward trend in life expectancy, indicating that countries with higher income resources tend to have longer life expectancies. However, the relationship becomes more distinct at higher levels of income composition, with fewer outliers.



In summary, economic factors, such as total expenditure and income composition of resources, positively impact life expectancy, as shown by the upward trends in both graphs. Countries with higher expenditures and better income resources generally experience longer life expectancies.

RECOMMENDATIONS :


Top 10 Countries with High Average Life Expectancy
Countries
Japan
Sweden
Iceland
Switzerland
France
Italy
Spain
Australia
Norway
0
20
40
60
80
Average Life Expectancy

Buttom 10 Countries with Low Average Life Expectancy
Countries
Nigeria
Swaziland
Zimbabwe
Chad
Côte d'Ivoire
Malawi
Angola
Lesotho
Central African Republic
0
10
20
30
40
50
Average Life Expectancy