

# A Deep Dive into Poverty, Life Expectancy and GDP (Gross Domestic Product) across African Countries

**Data Analytics Hackathon** 13-14 May 2023

(Henry Okeoma)



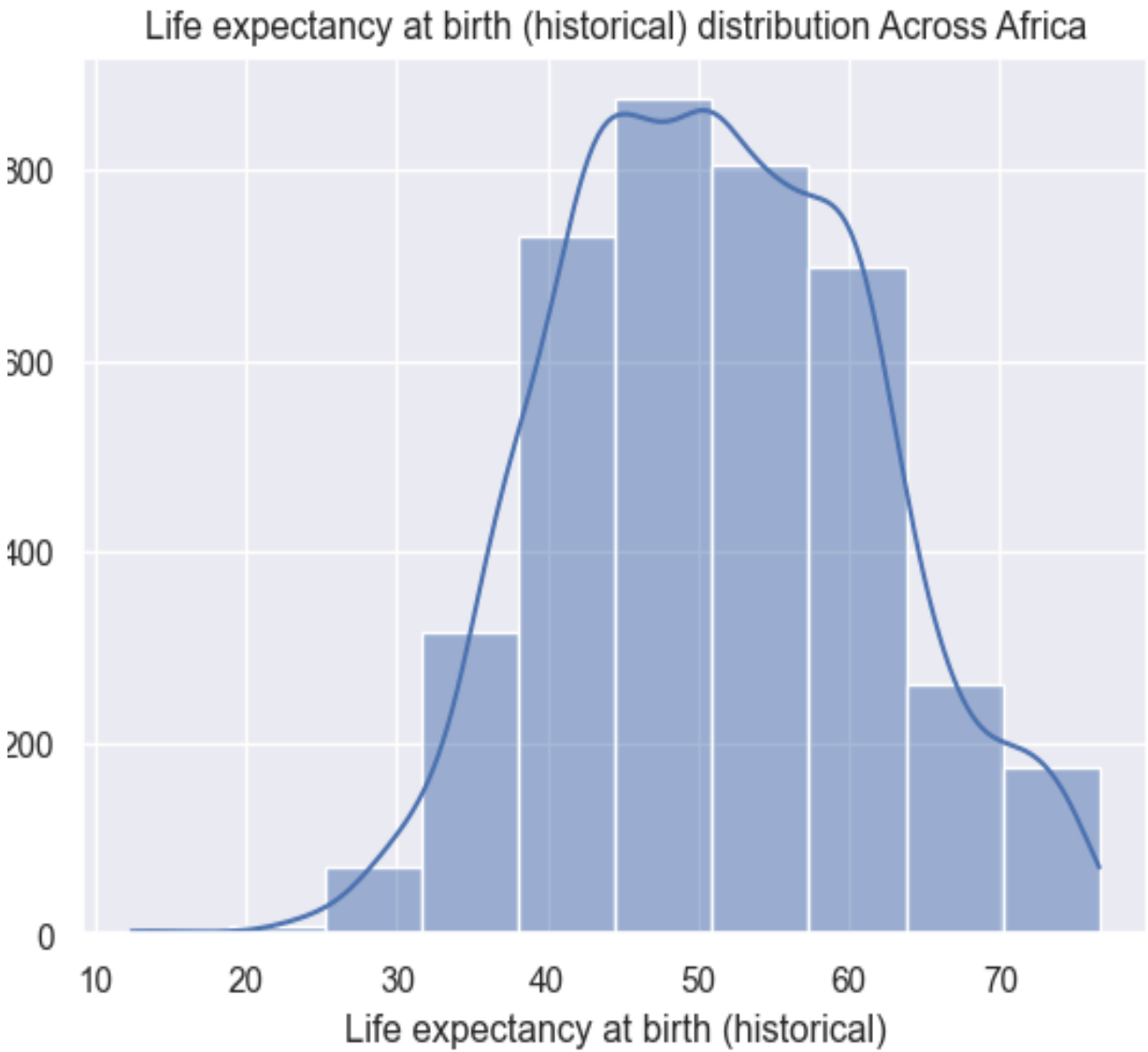
# **Terms:**

- **Poverty:** is a state or condition in which one lacks the financial resources and essentials for a certain standard of living
- **Life expectancy:** is a statistical measure of the estimate of the span of a life.
- **GDP:** Gross domestic product is a monetary measure of the market value of all the final goods and services produced and sold in a specific time period by a country or countries. GDP is most often used by the government of a single country to measure its economic health.

# Introduction

- Africa is a continent that is rich in natural resources, but despite this, it remains one of the most economically and socially challenged regions of the world.
- Poverty, poor healthcare, and low life expectancy are some of the critical issues that African countries face. Although Africa has made some progress in recent years, these challenges remain persistent and require urgent attention.
- Poverty, life expectancy, and Gross Domestic Product (GDP) are three critical indicators that reflect a country's economic and social conditions. In Africa, these indicators vary widely between countries, making it challenging to understand the complex relationship between poverty, life expectancy, and GDP.
- This case study aims to provide a deep dive into the correlation between these indicators in African countries. Through a data-driven approach, participants will develop insights and recommendations for key government stakeholders on how to improve economic and social conditions in their respective countries.
- The hackathon will provide a unique opportunity for participants to collaborate, exchange knowledge, and develop innovative solutions to some of the most pressing issues facing African countries today.
- The results of this hackathon will provide valuable insights into the complex relationship between poverty, life expectancy, and GDP in African countries. It will highlight best practices and successful strategies that can be implemented to improve economic and social conditions across the continent. Ultimately, the goal is to promote sustainable economic growth and improve the quality of life for all citizens in Africa.

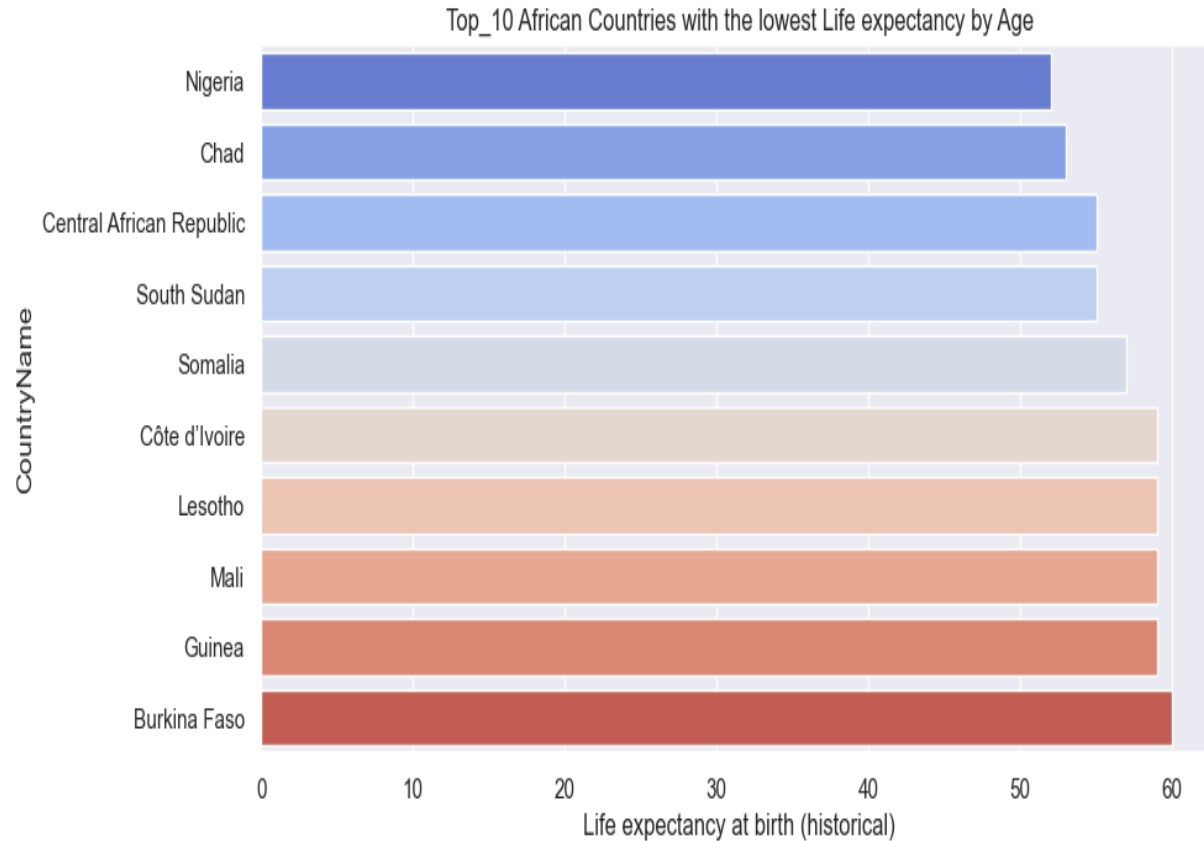
# Histogram of Life Expectancy Across African Regions



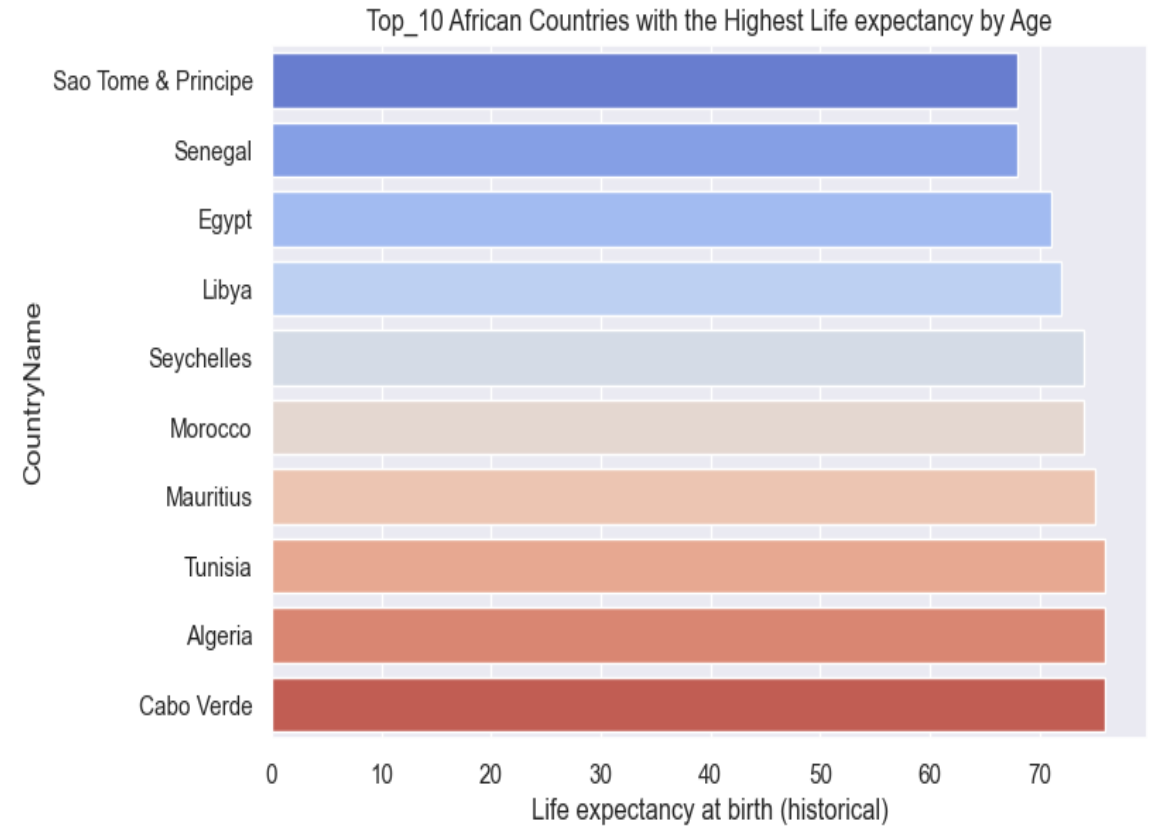
We have almost a normal distribution with the maximum age of life expectancy between 45 – 55years. This sharply reduces at 60s and as age progresses with very few of the population in their 70s.

Statistically, the Skew = 0.1 and; Kurtosis = -0.373 (Platykurtic) with slight outliers in the left.

# The top 10 countries with the lowest & Highest life expectancy

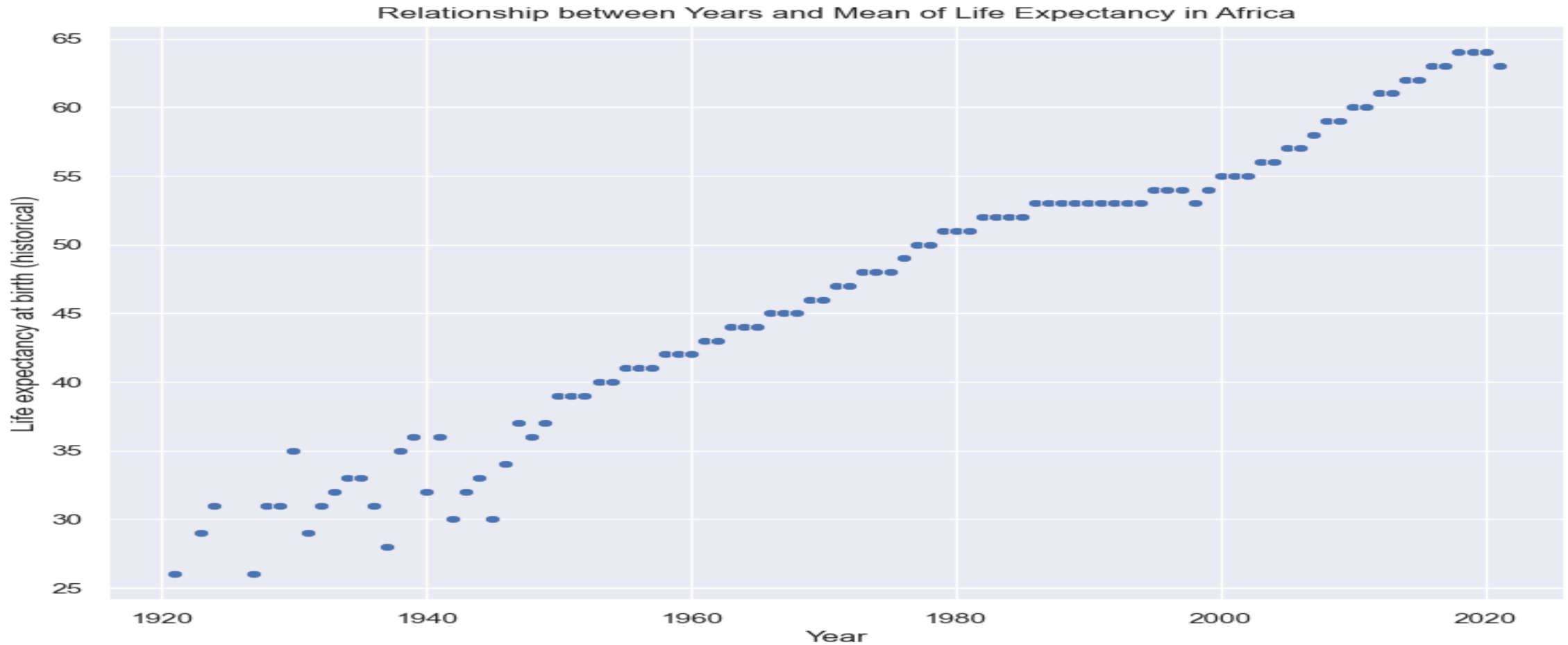


**Insight:** Nigeria to Burkina Faso are the top 10 countries with the least life expectancy. it is worthy to note that 5 of these countries are in western region, with 2 in middle Africa and only 1 in Southern region.



**Insight:** Cape Verde, Algeria and Tunisia are leading, while STP, Senegal and Egypt are trailing. A good of number (5) of the top\_10 are in North Africa while the rest is shared among the other regions

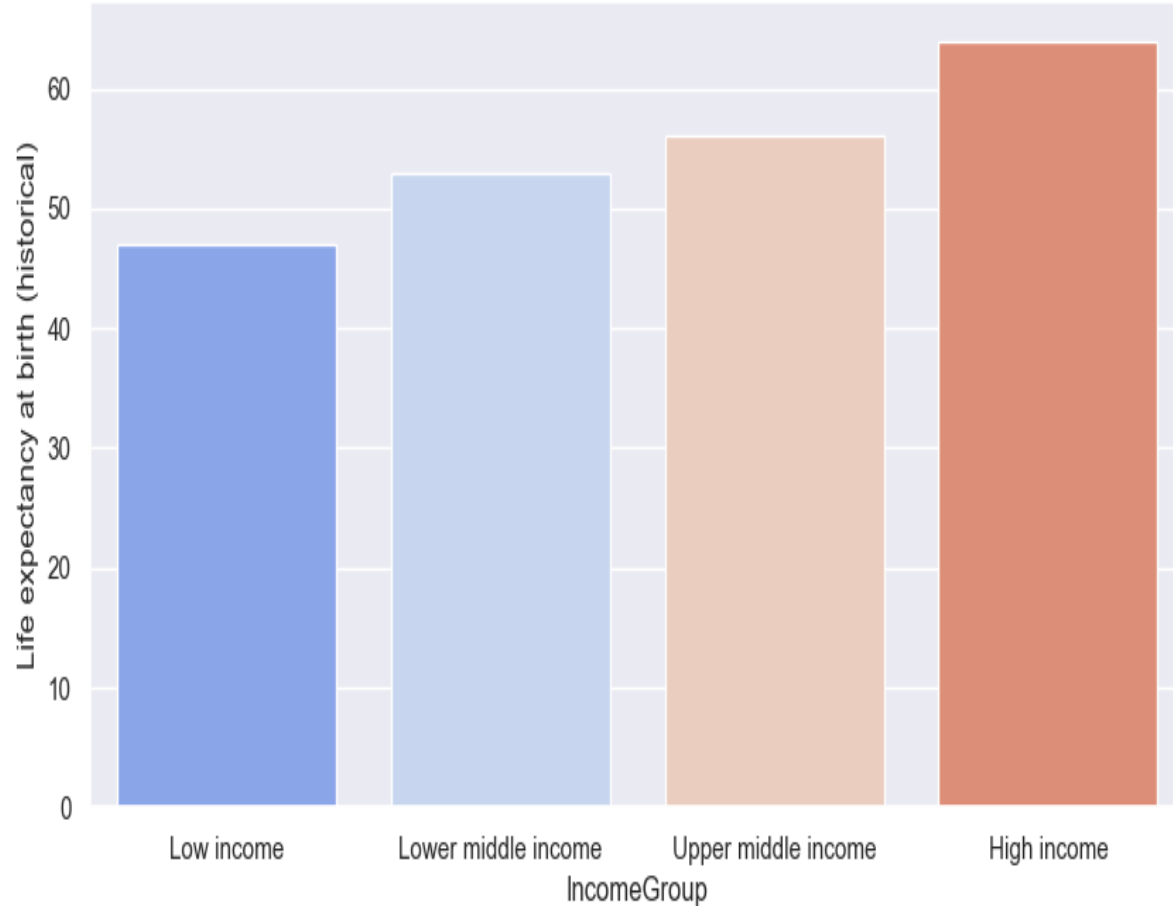
# Mean of the life expectancy over the years



**Insight:** The Life expectancy in Africa have increased over the years, with good correlation between the year and age; looking at the mean values. There has been a good and steady improvement

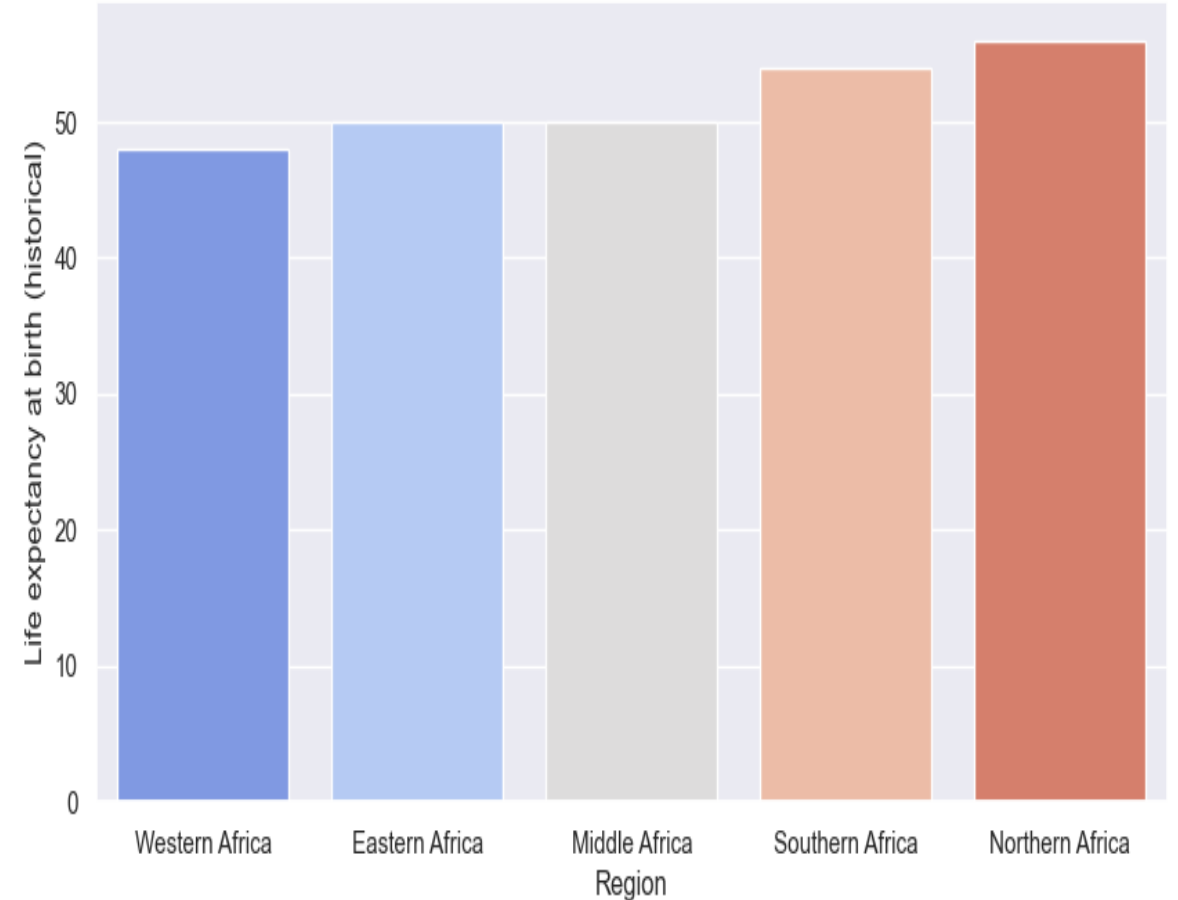
# Mean life expectancy by Income-Group & Regions

Mean Life Expectancy by Incomegroup in Africa



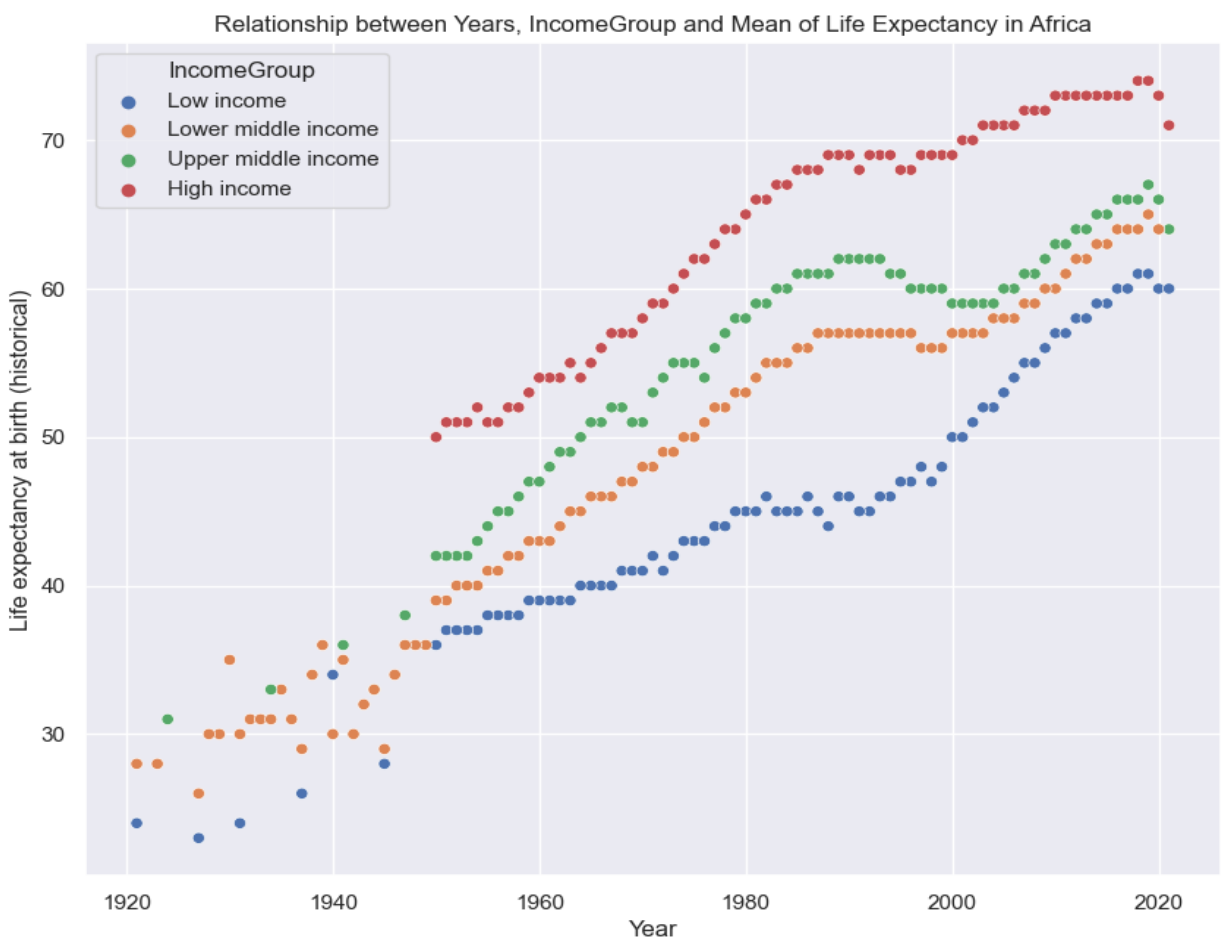
**Insight:** People with higher income appear to record a higher life expectancy overall, and the life expectancy change with a change in the income.

Mean Life Expectancy by Regions in Africa

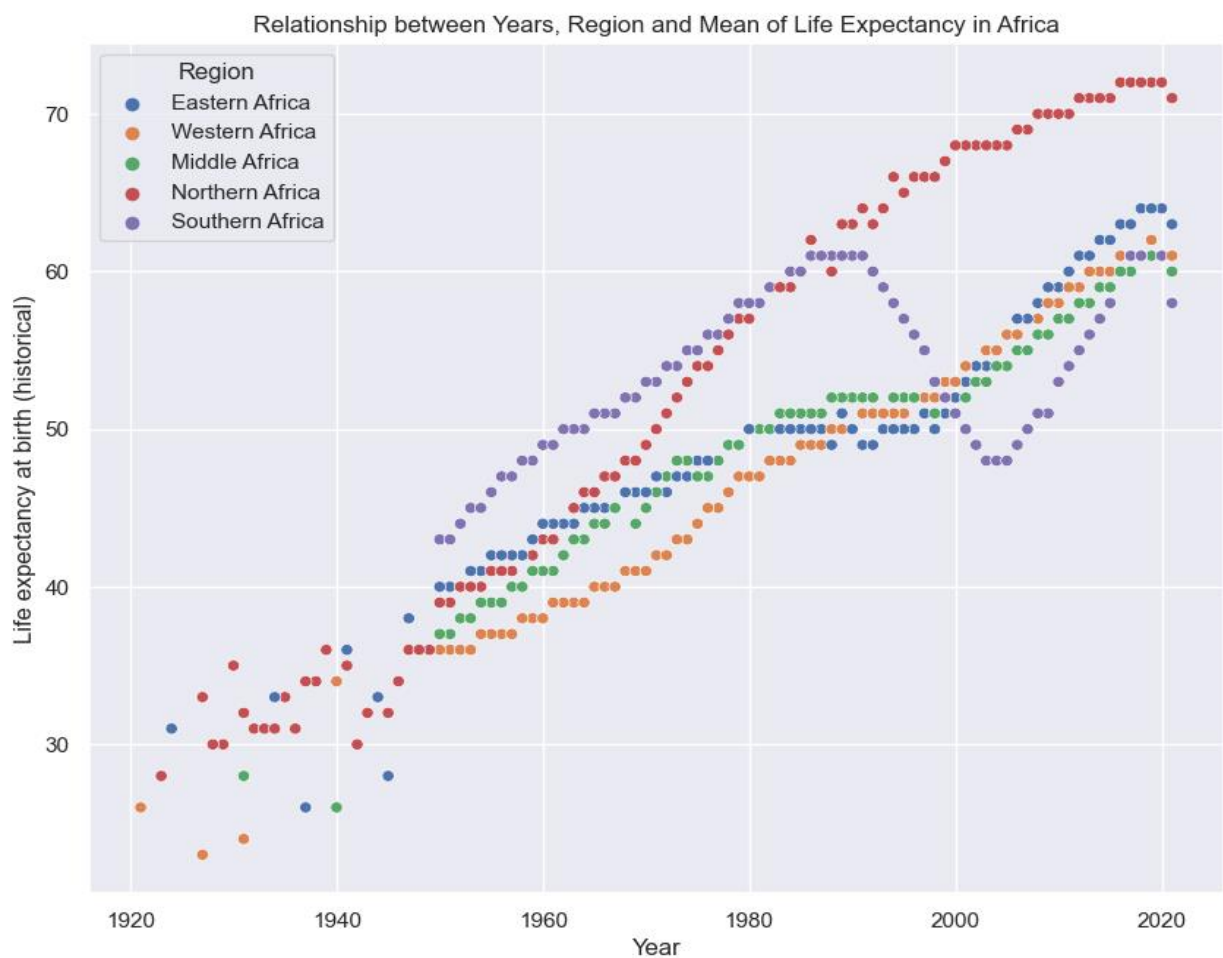


**Insight:** Northern Africa and Southern Africa have the highest Figures while the Western region have lowest mean ages.

# Relationship between life expectancy/years with Income Group & Regions



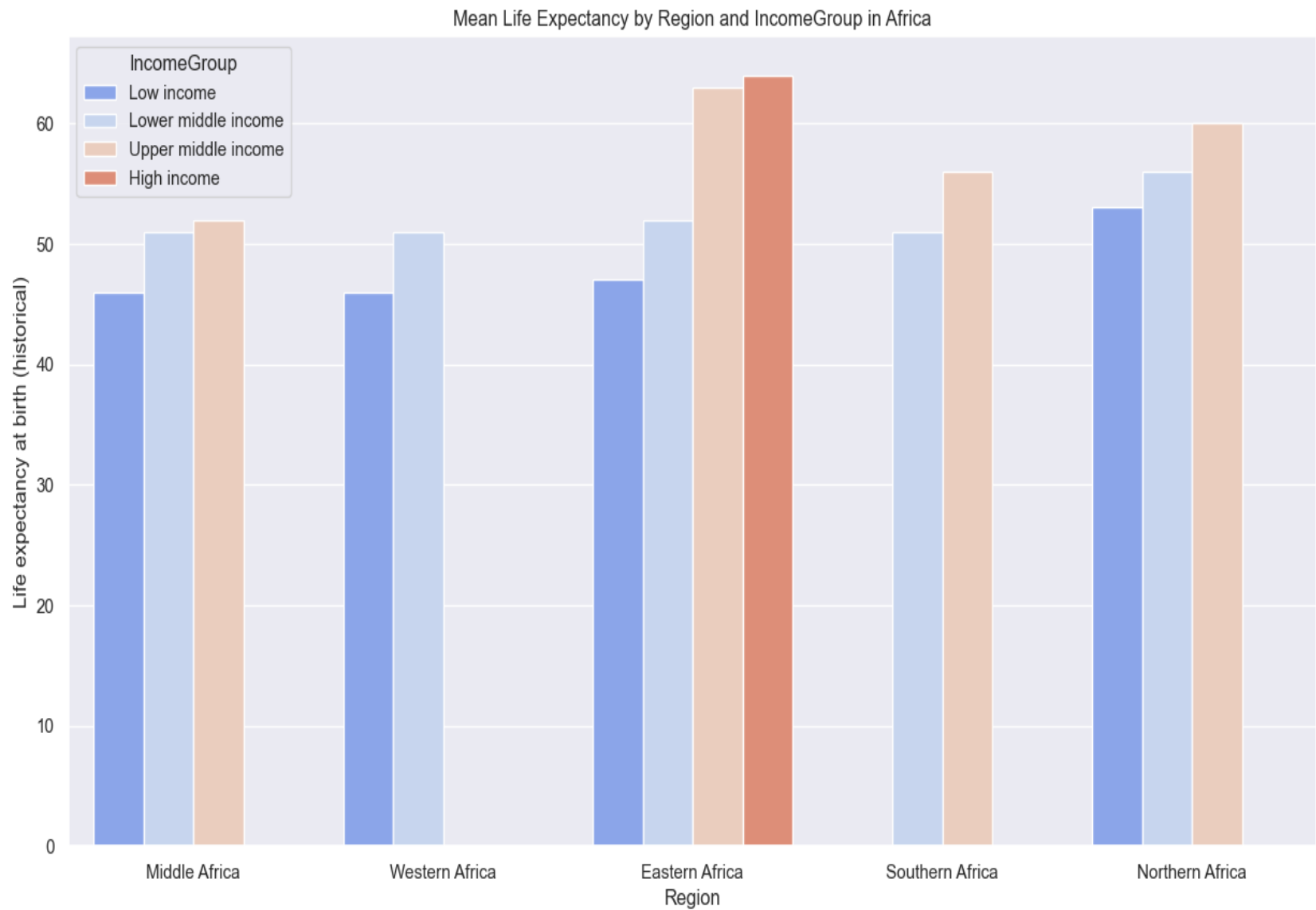
**Insight:** Life expectancy in general is at its lowest in 1920's and 1940's for both the Low and Lower middle-income earners. From 1950s, the segregation between the various income class became distinct. Although steady progressively, the low income still have the lowest life expectancy.



**Insight:** All regions have experienced a consistent growth in life expectancy with southern Africa higher in the 60s before the sharp decline in 90s up till 2005 (approx). The Sharp decline is worthy of further investigations, but by research the region experienced a sudden drop beginning after 1995, as the HIV/AIDS epidemic spread throughout the region, till 2005, this also affected the GDP, see later.



# Multivariate Plot of Region and Income Group against mean Life expectancy



**Insight:** Only one region in Africa recorded a 'High Income Class', and the income is also widely distributed which is the Eastern Region.

Worthy to Note that low-income class have an average life expectancy of 45years across Middle, western and Eastern region, except the Northern region.

Across all regions, as the income class increase, life expectancy also increase

SEYCHELLES is the only country in Africa recorded as 'High income class'

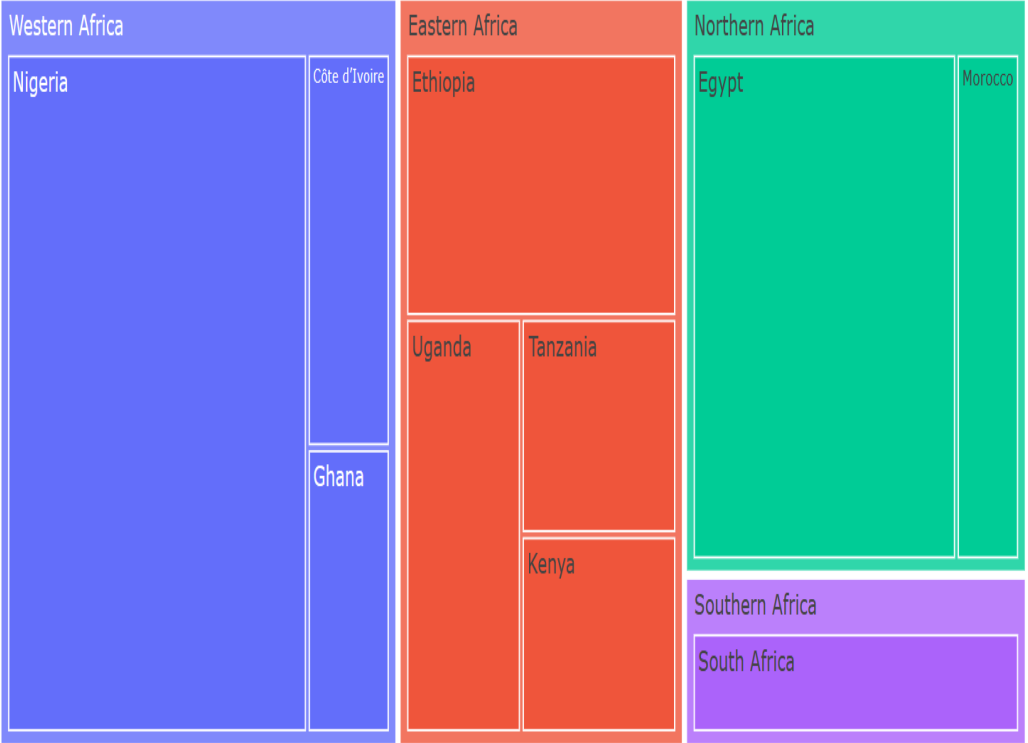
# Overview of Top\_10 GDP by country & Top\_10 countries with populations between poverty line (30 – 2.15 USD)

Overview of Total GDP of the TOP\_10 Countries



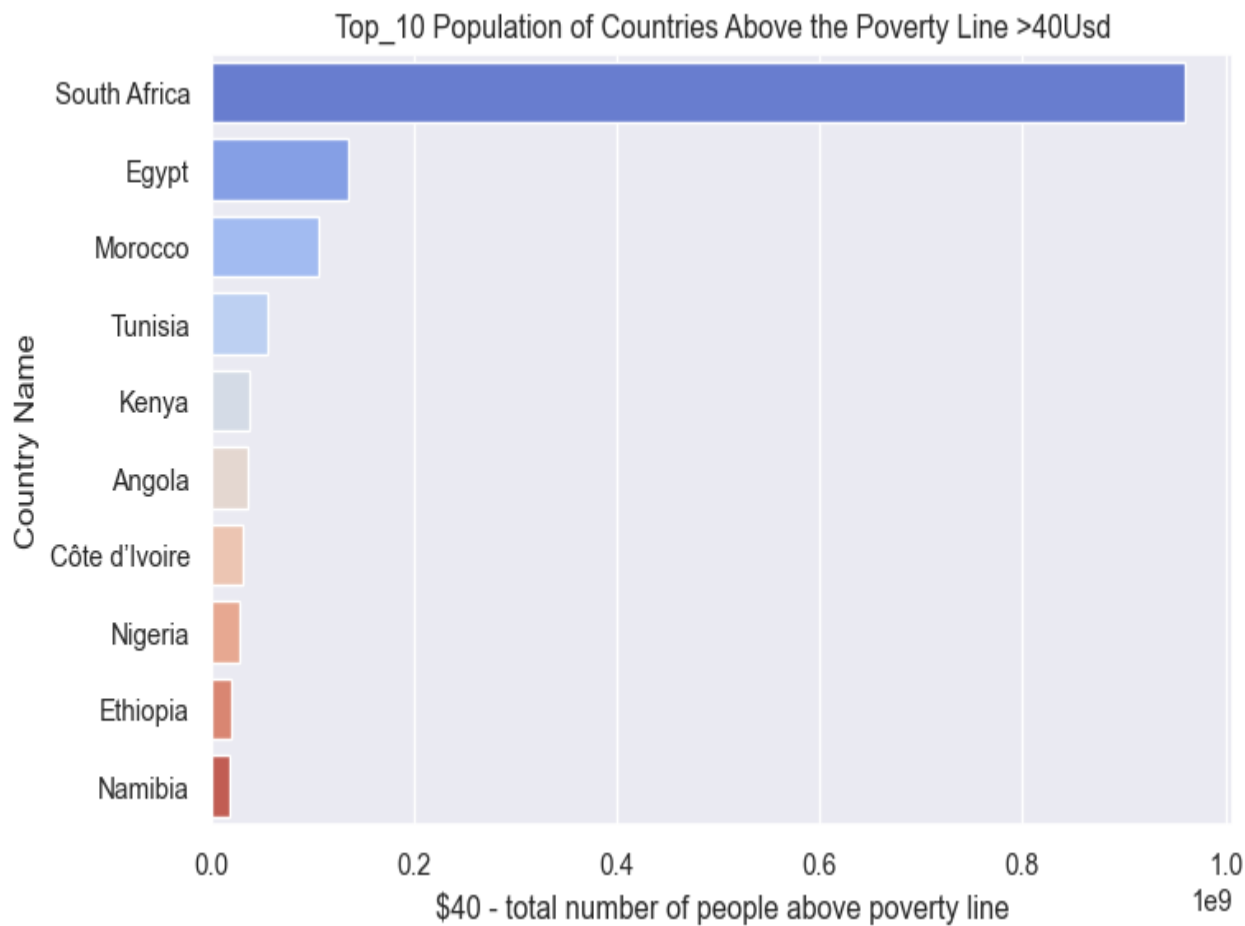
**Insight:** Nigeria, Egypt and South Africa have an outstanding number, but we shall also look at the population of the people in these countries.

Overview of Population of the TOP\_10 Countries between Poverty Lines (Daily income usd30 - usd2.15)

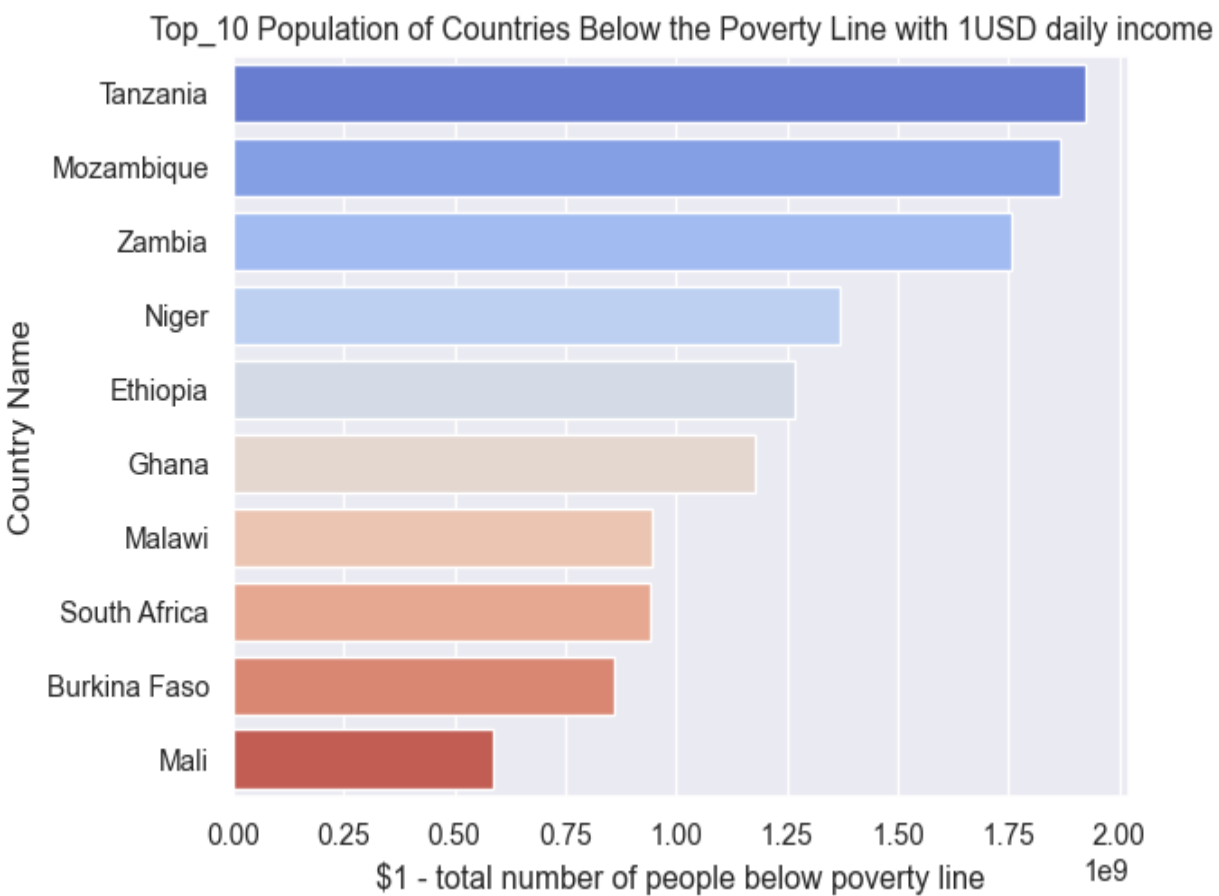


**Insight:** Nigeria and Egypt have also a very good number of people between Poverty Lines and South Africa in comparison with their high GDP have minimum number of people between poverty line.

# Comparison between Top\_10 countries with population above poverty line (>\$40) and Top\_10 countries below poverty line of (<1\$)

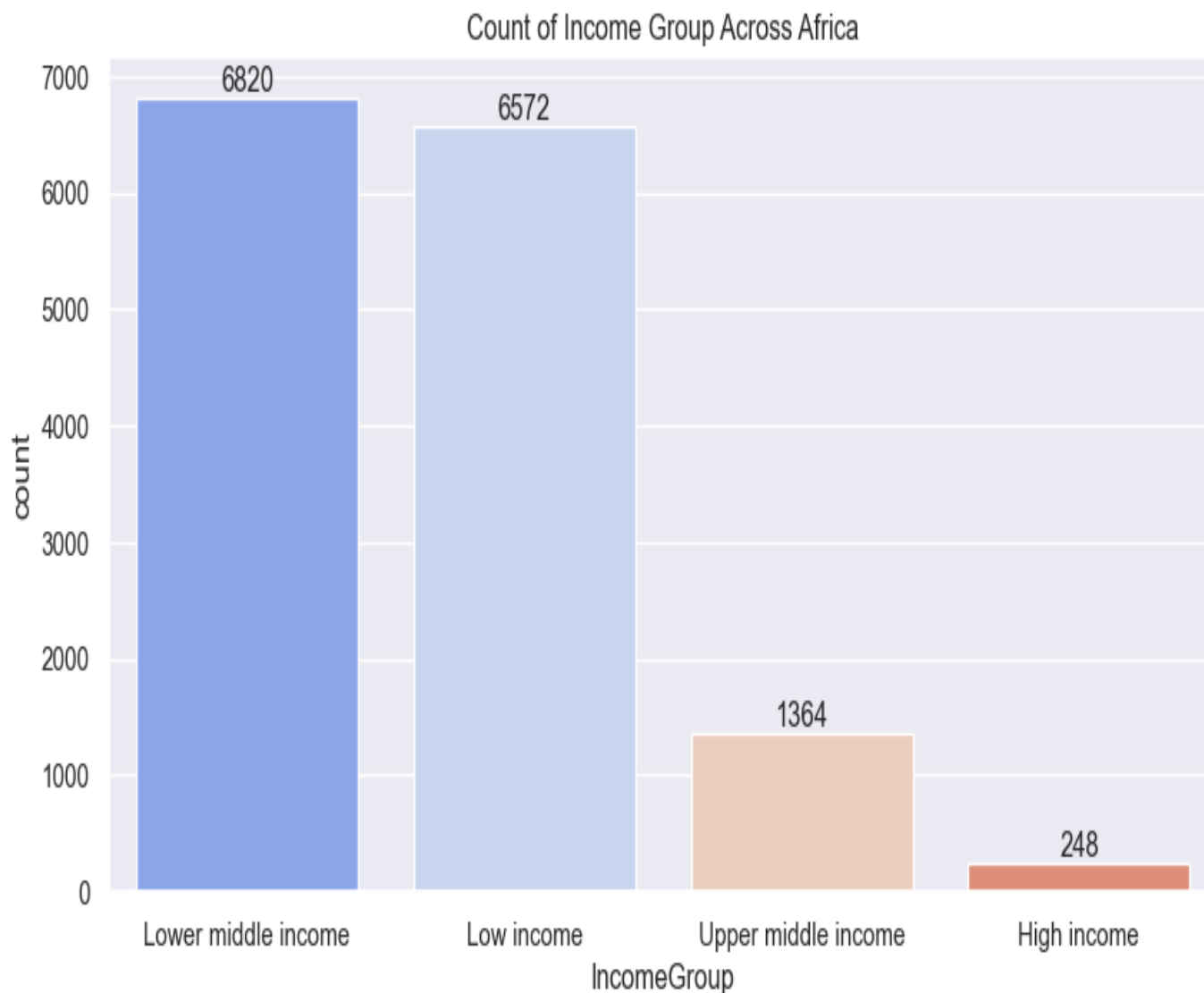


**Insight:** South African have a very distinct population of people above the poverty line, the following 3 countries are of Northern Africa decent.



**Insight:** Top 10 Countries below Poverty line of 1usd per day income, the distribution of the above is between Western and Eastern region of Africa. South Africa also is present here, but compared with the number above poverty line, this becomes infinitesimal.

# Count of Income Group Across African Regions

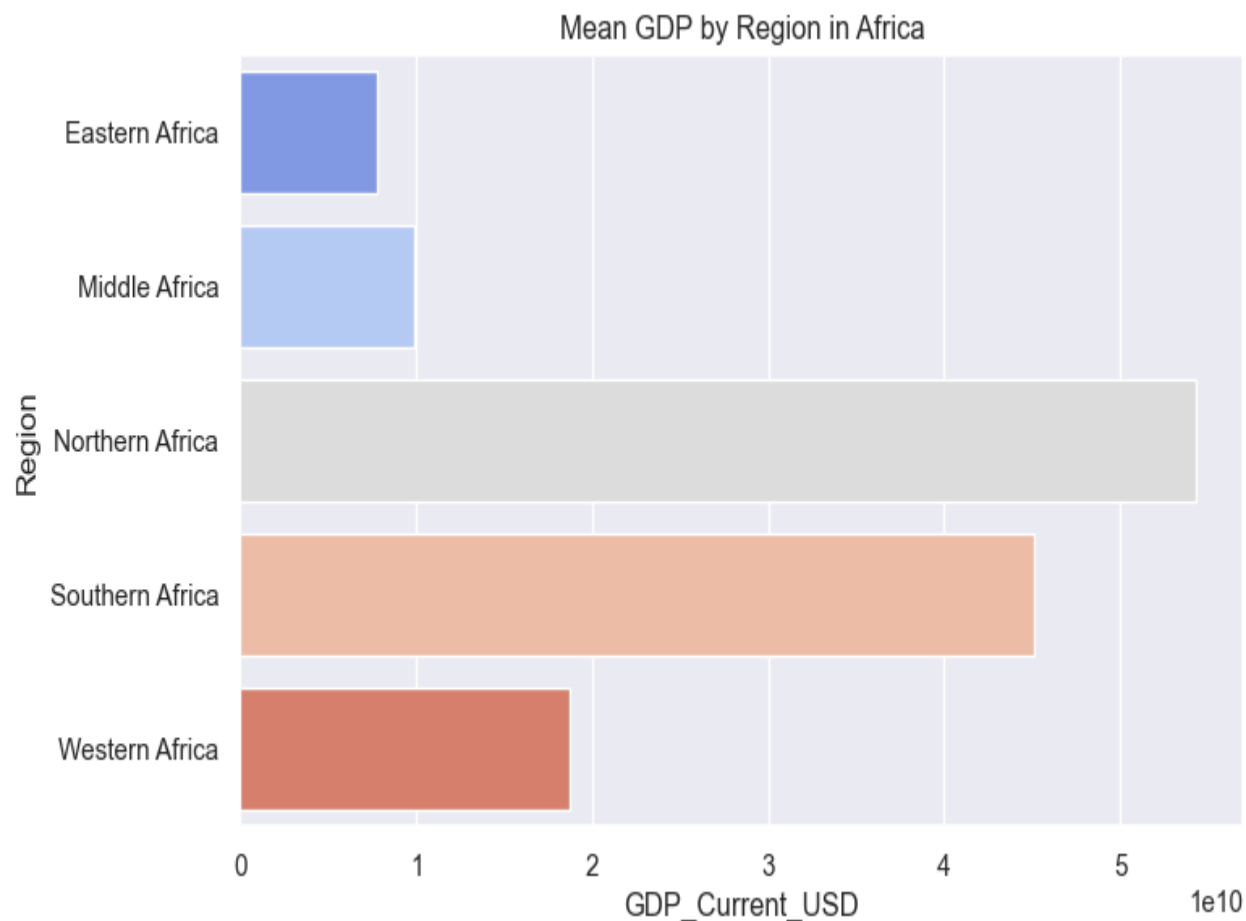


**Insight:** Majority of the African Population are of Low and Lower middle income as shown.

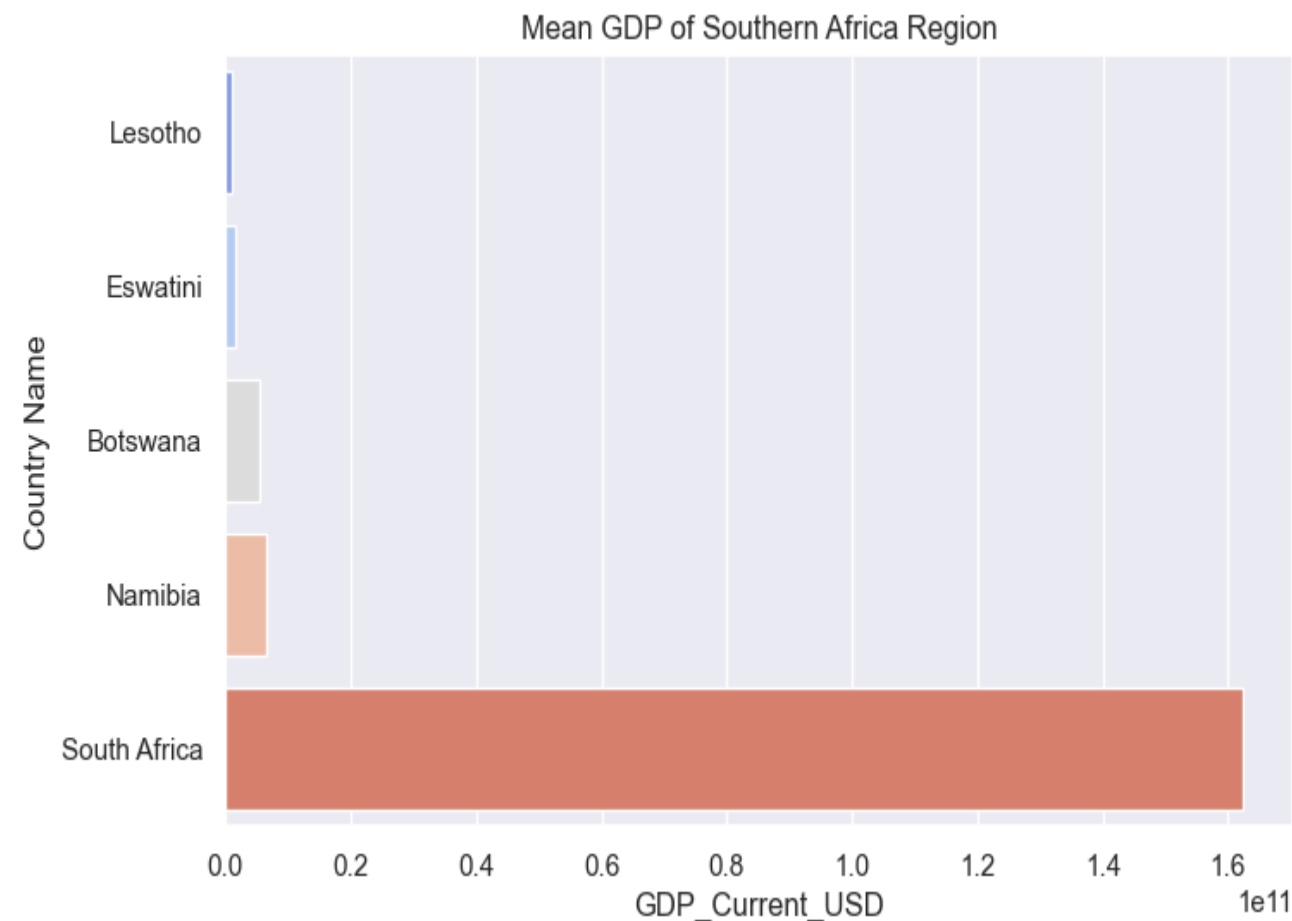
Very few are of the population are in the Upper middle-income class.

For the high come class, we have seen that this is only Seychelles.

# Mean GDP of regions in African & GDP of African Region only

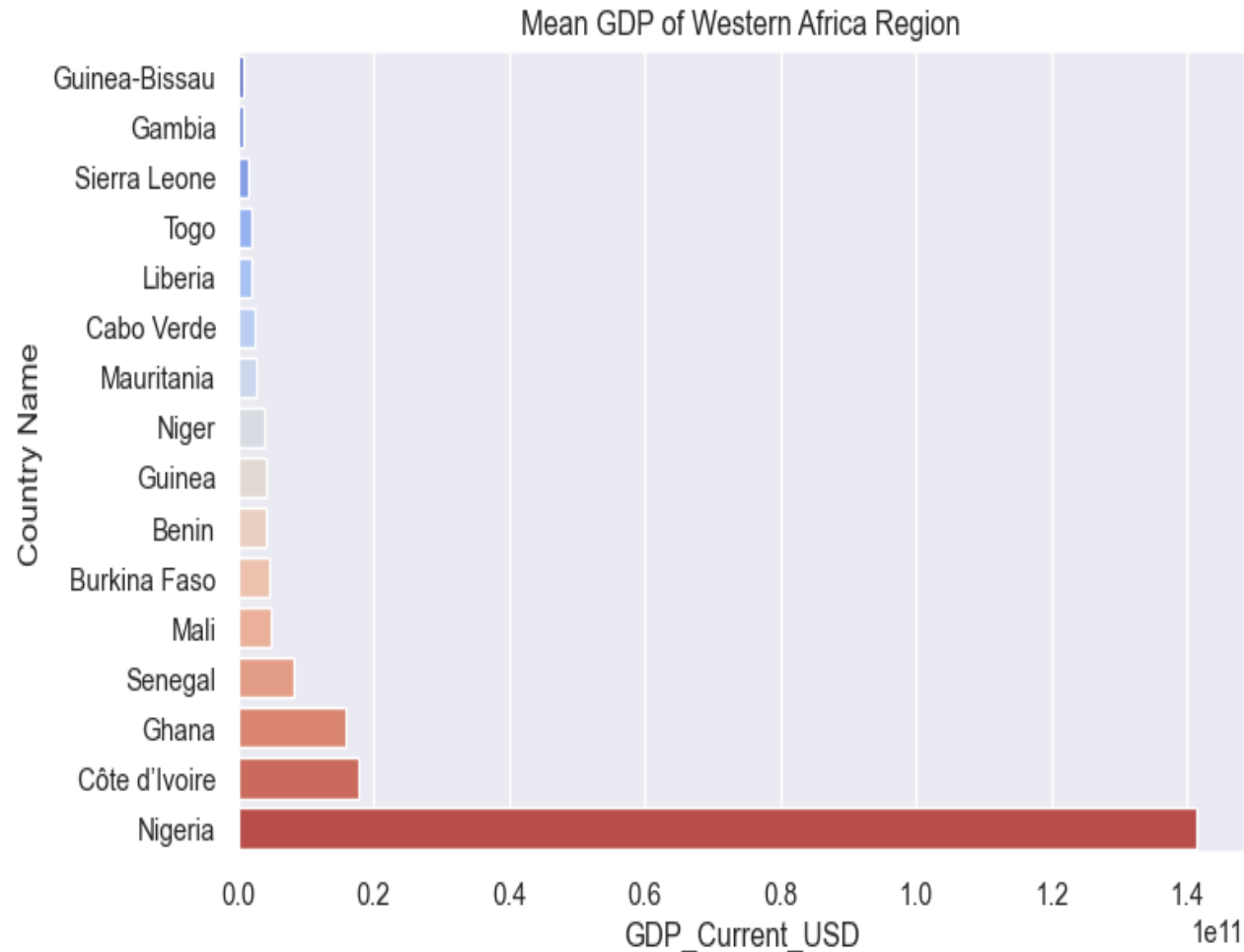


**Insight:** Northern Africa & Southern Africa are the top performing Regions by GDP. Eastern Africa and Middle Africa have the least GDP. Western Africa also marginal, but mostly Nigerias' as we shall see later for individual countries contributios.

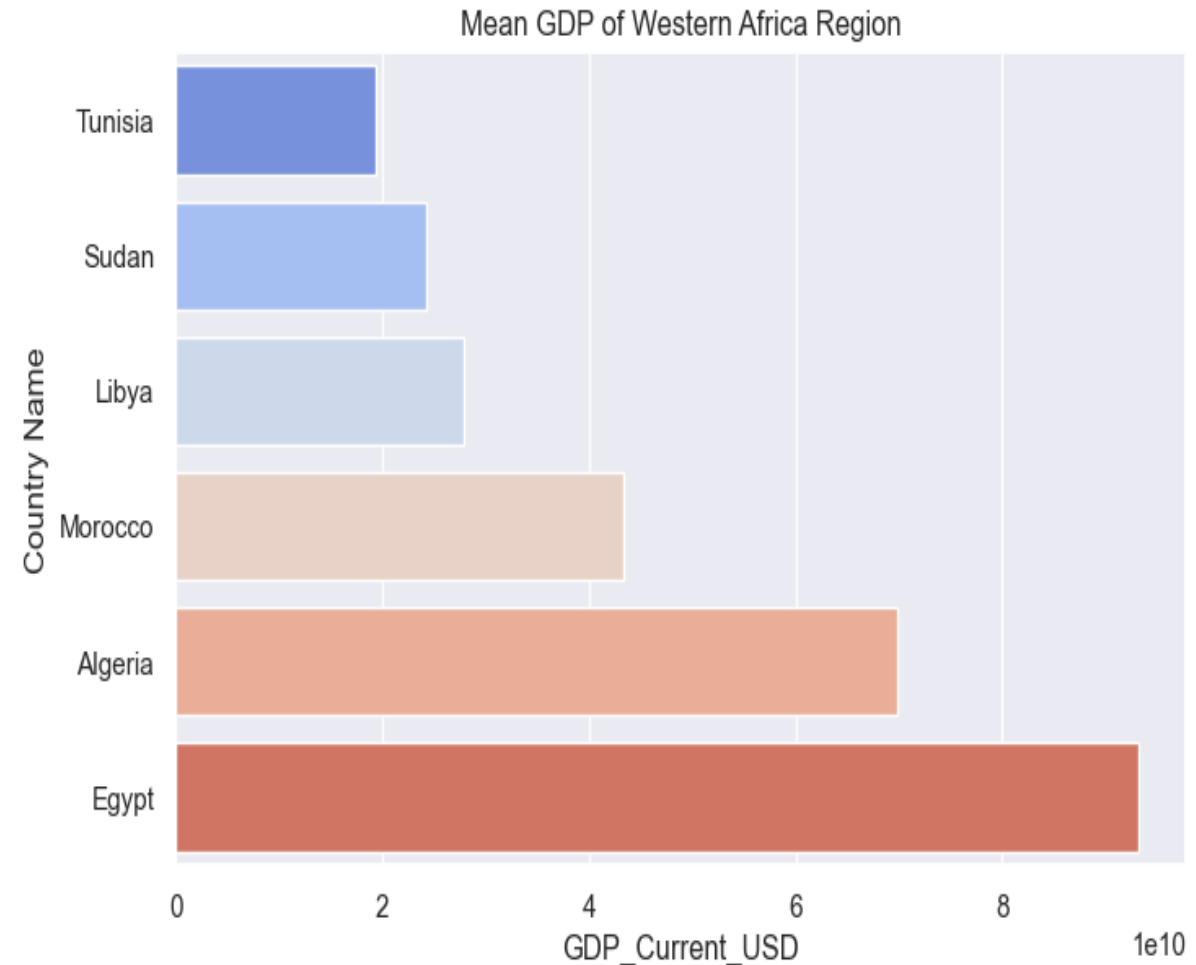


**Insight:** The contributions of the other countries in the southern regions are infinitesimal, South Africa is the main contributor for the entire region by GDP.

# Individual GDPs of Countries in the Western & Northern Region

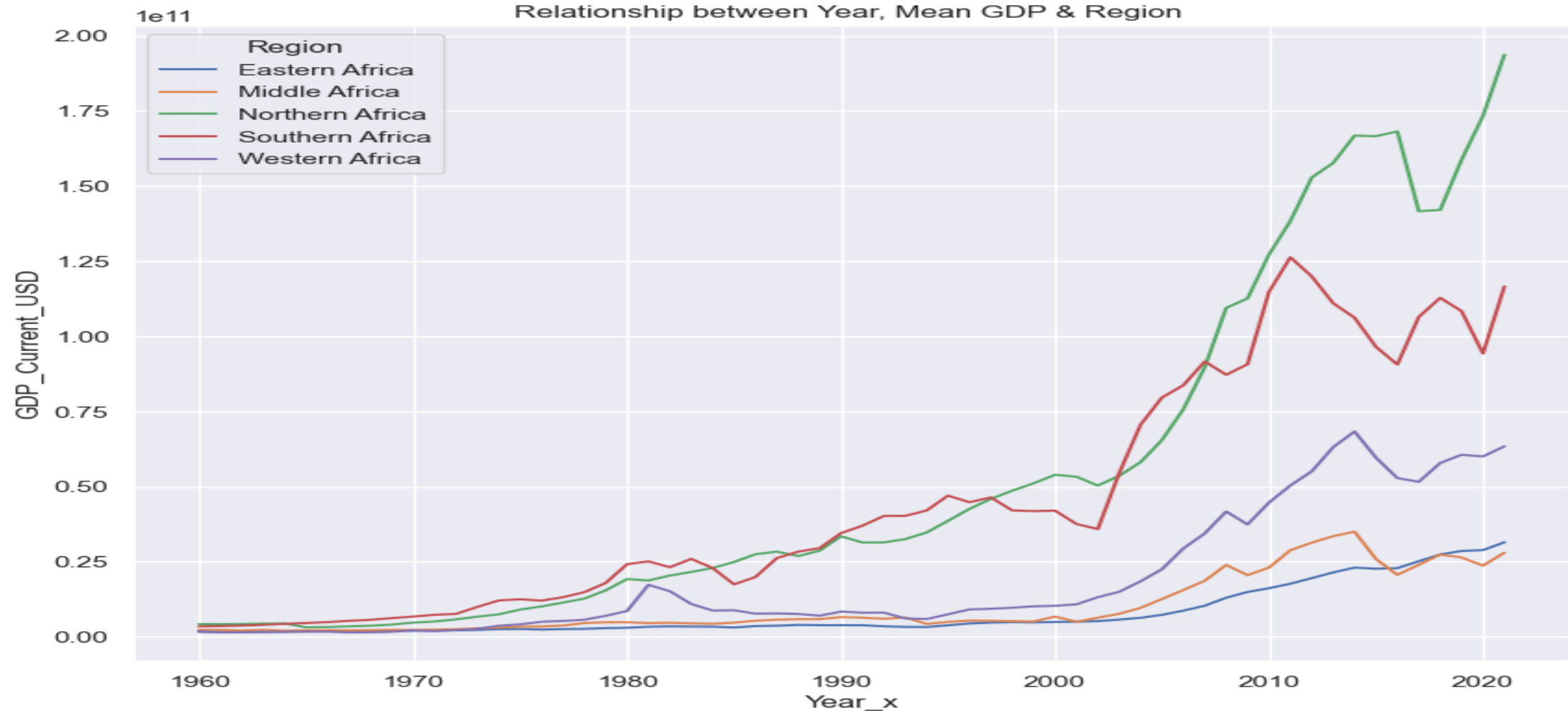


**Insight:** Nigeria is contributing most of the GDP in the region of western Africa



**Insight:** Egypt is leading in the Northern Region, but also Algeria, Morocco and the rest are also contributing some good measures.

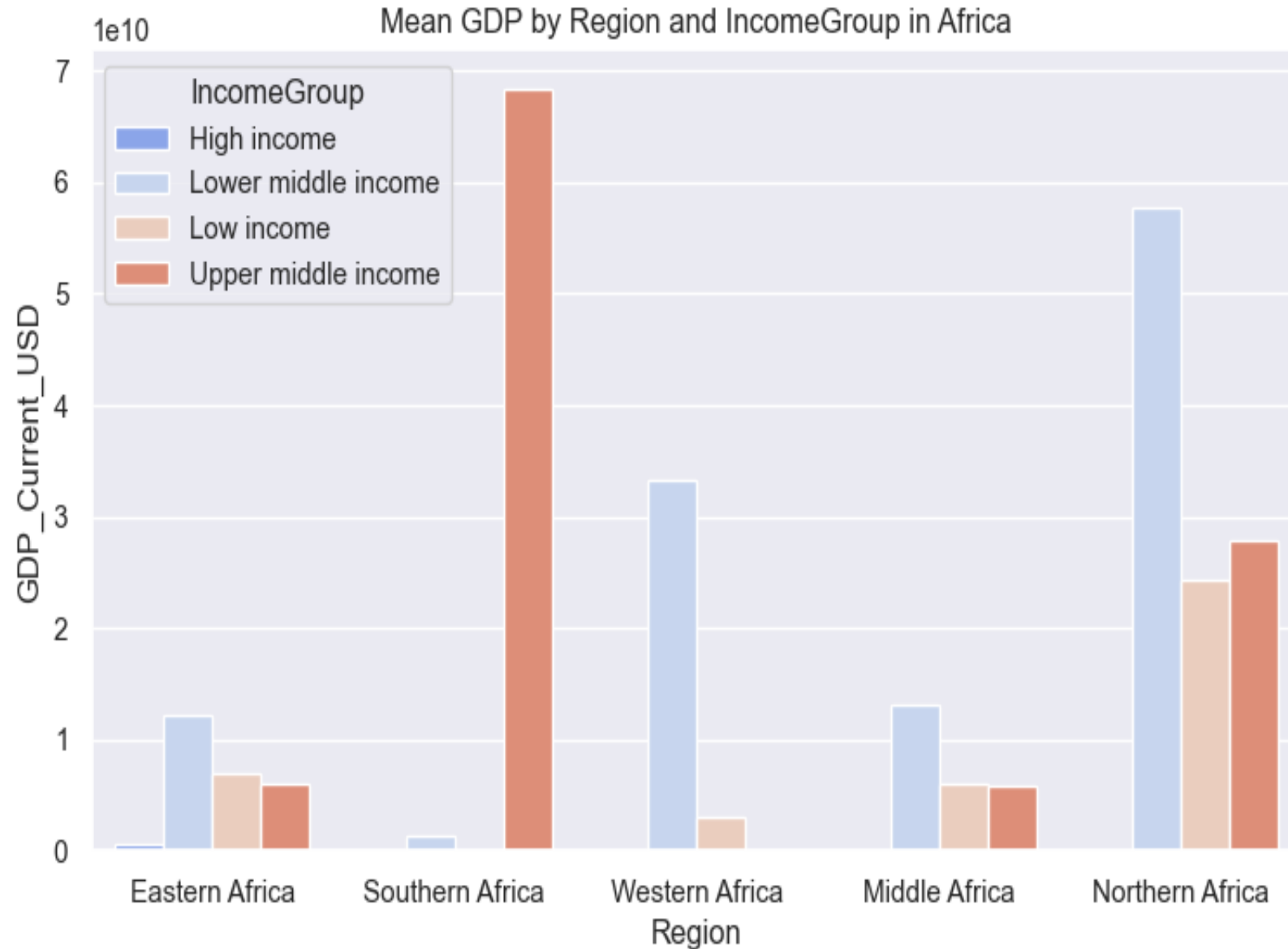
# Relationship between the years and the mean GDP across Regions



**Insight:** There has been an upward trend from 1970s for Southern and Northern Africa, which preceded a sharp rise in GDP in the years 2000s. Observe a decline in Southern Africa's GDP during 1995 - 2003 (approx) which also coincided with the period of the HIV/Aids Epidemic during the time. Recall, the life expectancy during those years were also reduced as shown earlier.

Other regions have experienced crawling growth, however after 2002, they was an upward trend

# Relationship between the years and the mean GDP across Regions



**Insight:** Southern African have the highest GDP but no distribution in income groups but only the upper middle income.  
Northern Africa have a good distribution of incomegroups in the GDP

Western African where Nigeria is the most contributor have only low and lower middle-income class.



# Insights and Recommendations

## INSIGHTS on GDP and Income

*- Poverty, life expectancy, and Gross Domestic Product (GDP) are three critical indicators that reflect a country's economic and social conditions.*

Based on analysis, I have the below insights:

- 1. GDP of Africa have increased over the years with the least recorded in Equatorial Guinea \$9,122,751 (nine million, one hundred twenty-two thousand, seven hundred fifty-one - USD) and the maximum recorded in Nigeria at \$574,183,825,592 (five hundred seventy-four billion, one hundred eighty-three million, eight hundred twenty-five thousand, five hundred ninety-two) . By research, this would appear to be an all-time high figure achieved in 2014 (Figures also online)
- 2. We clearly saw from analytics, that GDP is distributed across, but certain regions recorded the cumulative highest in GDP such as in Northern African and Southern Africa, but breaking the southern region, we saw South African was just outstanding. in comparison to the rest of the countries in that region. Also, the income group is higher in this regions
- 3. The count of income distribution across Africa, Low-income and lower middle-income earner are majority. The upper income is limited followed by a very scanty High-Income earners. The only country where this exist is SEYCHELLES.
- 4. Income is more distributed in North Africa, Middle Africa and East Africa, but Western and Southern African where we recorded countries with very high GDP (Nigeria and South Africa), income is not distributed. S.A had mostly upper middle income while Nigeria have mostly lower middle income. If we are to exclude these 2 countries from the analysis, then Northern African will be most prominent across the entire Africa.

# Insights and Recommendations

## INSIGHTS on Life Expectancy

- 1. The average life expectancy in Africa is between 45 – 55 (approx.) as we used the histogram to visualise
  - 2. According to the Data, Western Africa have most population with the least life expectancy, surprisingly having Nigeria with the least recorded figure even with high GDP as seen above.
  - 3. Northern Africa countries recorded the majority in higher life expectancy which was also seen in their cumulative GDP as well as their income distribution among the population.
  - 4. Life expectancy have increased over the years from 25yrs to about 76yrs as the maximum recorded figure Cape Verde.
  - 5. We also saw that life expectancy increases as the income group increases which is a good insight into our data.
- Also, worthy to note that Life expectancy in general was at its lowest in 1920's and 1940's for both the Low and Lower middle-income earners.

1960s saw an increase of life expectancy from all regions

Further, western Africa is still the least with income distribution and least in life expectancy

# Insights and Recommendations

Outlier: Nigeria has the highest GDP, but this was not relatable to their income group of the population as well as the life expectancy, perhaps this needs a deeper study how Nigeria, with a high GDP, but recorded the least Life expectancy, and mostly low-income group in the population (btw poverty) with a Daily income  $\text{USD } 30 - \text{USD } 2.15$

## CONCLUSION

GDP have a direct relationship with income of the population (except Nigeria) as well as their life expectancy and from the data we have seen that those regions where we have higher GDP, also recorded high income as well higher life expectancy.

All countries in Africa basically have a lot to do in terms of increasing their GDP, through Government policies, local contents, and investments as this has shown to affect the overall wellbeing of people/population

## RECOMMENDATION

Many regions in African needs help and support to improve their income earnings. Perhaps the good way to start will be from Countries with low income such as Western Africa can learn what Northern Africa is doing in terms of wealth distribution across the populace. While the government of Africa needs to come together to help one another to lift more people above the poverty line by growing their GDP as this has shown to have a direct relationship with the life expectancy.