

Analysis of Life Expectancy and GDP: An Introductory Data Science Project

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Abstract

This report shows a beginner-level exploratory analysis of the relationship between life expectancy and GDP across several countries. The approach aims to demonstrate learning and basic analytical skills rather than provide deep expertise. All figures referenced use image files produced during the project.

1 Introduction

Understanding how economic conditions relate to public health is an important topic in data science. In this project, the relationship between life expectancy and GDP for six countries (Chile, China, Germany, Mexico, USA, Zimbabwe) over fifteen years was studied. The goal is to learn how to handle real-world data, visualize results, and make basic observations.

2 Data and Methodology

The data used consists of life expectancy and GDP values collected from public datasets for the years 2000 to 2015. Python and libraries like Pandas and Matplotlib were used for basic analysis and visualization. The project focuses on descriptive statistics and plotting, without complex modeling.

3 Results

3.1 Life Expectancy Trends

The life expectancy values for the six countries over time are visualized in Figure 1. Most countries show steady improvement, but Zimbabwe starts very low and then increases quickly. This shows differences between developed and developing countries.

3.2 GDP and Life Expectancy Comparison

Summary statistics reveal that developed countries have both higher life expectancy and GDP. A bar plot of average life expectancy (Figure 2) visualizes these differences clearly.

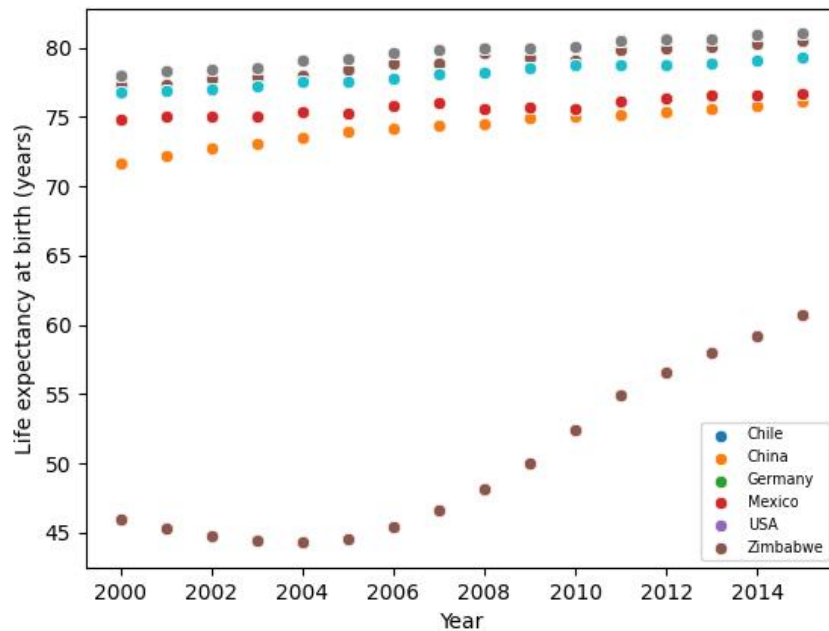


Figure 1: Scatterplot of Life Expectancy at Birth (2000-2015) for Six Countries. Source: scatterplot.jpg

3.3 Time Series Analysis

To better understand trends, GDP and life expectancy for each country are plotted as time series (Figure 3). These graphs show that while GDP and life expectancy both generally increase over time, the correlation is not always strong in each country.

3.4 Case Study: Zimbabwe

Zimbabwe stands out with very low life expectancy at the start, but a dramatic increase over time, possibly linked to social and humanitarian changes. Figure 1 and Figure 3 both demonstrate this unique pattern.

4 Discussion

The analysis confirms that richer countries tend to have higher and more stable life expectancy, but other factors (e.g., political change, policy) can have strong impact as seen in Zimbabwe. The beginner-level approach did not control for confounding variables or advanced analytics, which is a limitation.

5 Challenges and Learning

During this project, it was challenging to clean data and fix inconsistencies. Getting the plots to show clear trends took several attempts with code. The process improved basic skills in coding, visualization, and interpreting results.

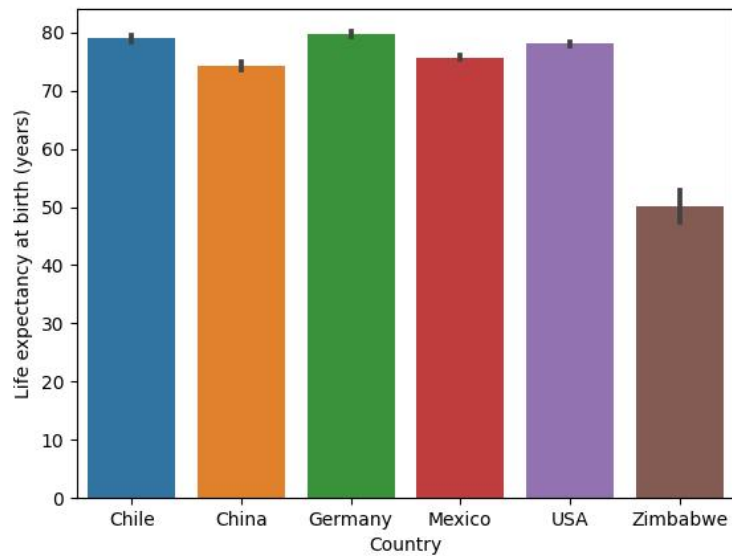


Figure 2: Average Life Expectancy for Each Country. Source: barplot.jpg

6 Conclusion

This project provides an introductory analysis showing how economic indicators and health outcomes can be explored using simple tools. Differences between countries are visible, and the practice of presenting data visually helps to communicate results even at a beginner level.

References

Figures and data plots:

- scatterplot.jpg: Life expectancy scatter plot (Figure 1)
- barplot.jpg: Bar plot average life expectancy (Figure 2)
- six_countries.jpg: GDP and life expectancy time series (Figure 3)

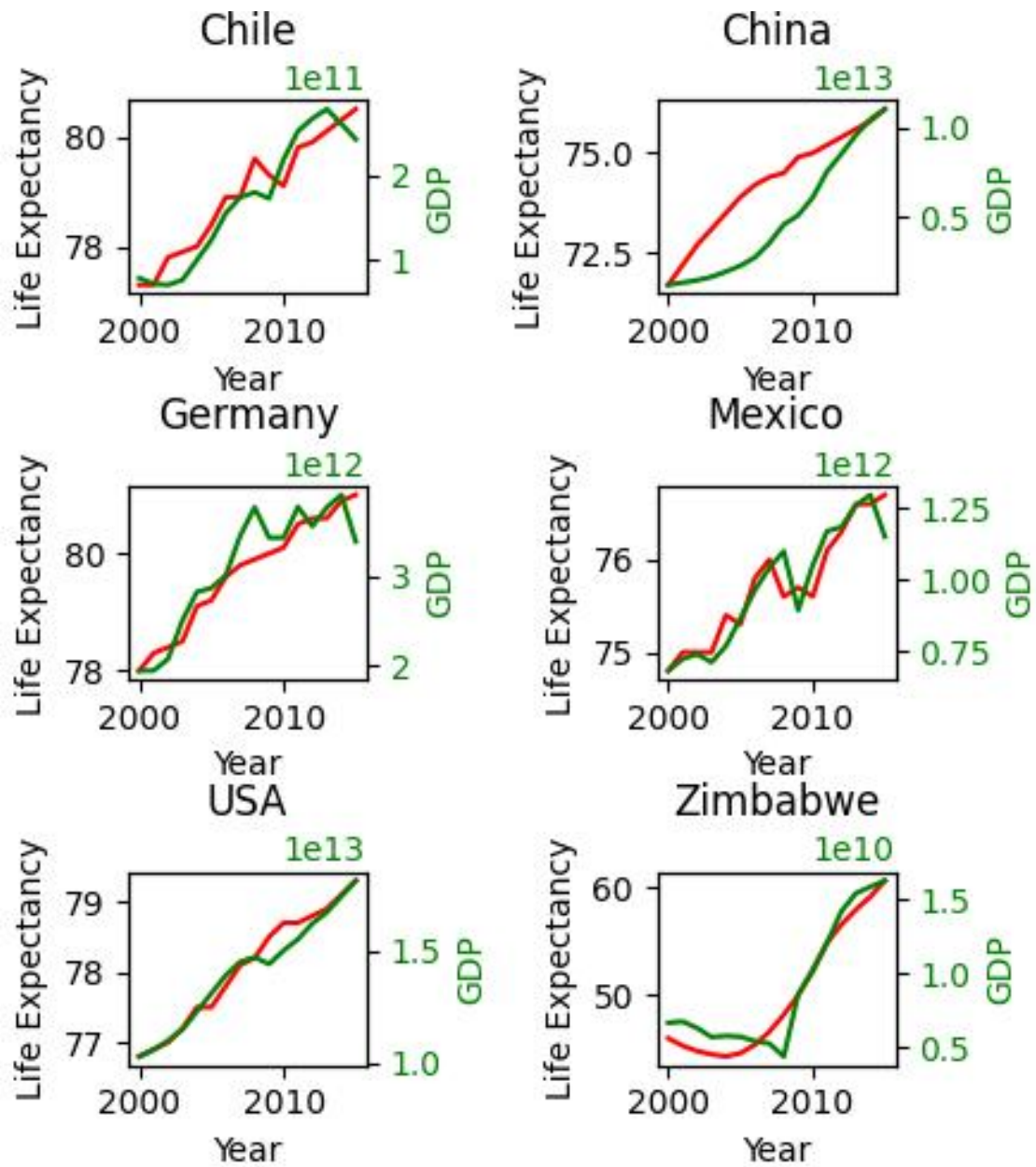


Figure 3: GDP and Life Expectancy Time Series for Each Country. Source: six_countries.jpg