

Analysis of the relationship between GDP and life expectancy in six countries

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The Dataset

Data from the World Health Organization and the World Bank was analyzed to examine the relationship between a country's observed GDP and life expectancy. The data includes observations from six different countries from the years 2000 to 2015.

Variables

Country - nation

Year - the year for the observation

Life expectancy at birth - life expectancy value in years

GDP - Gross Domestic Product in U.S, dollars

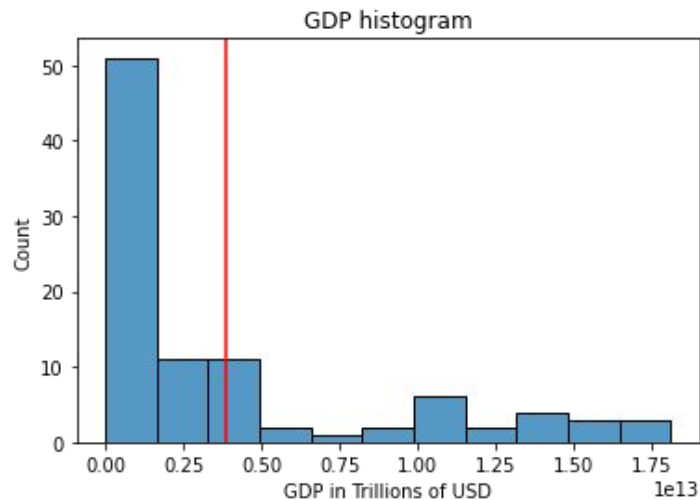
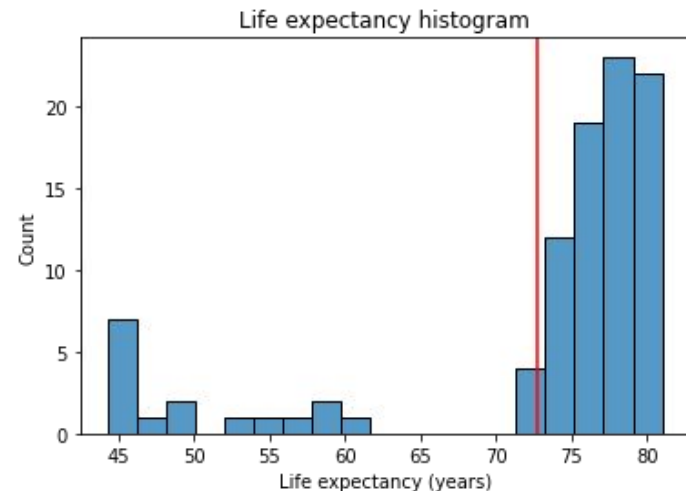
GDP as an indicator for life expectancy at birth

Encyclopedia Britannica (Bondarenko, 2017) defines Gross Domestic Product or GDP as **the total market value of the goods and services produced by a country over a specific period**. GDP acts as a standard measure of a country's economic activity. Previous research suggests there is a strong positive relationship between GDP and life expectancy (Guo 2016). These increases in life expectancy relative to income could be due to factors such as greater access to housing, safe water, health care, and education with increased wealth (Freeman et al., 2020).

The guiding question for this analysis is: do citizens from wealthier countries tend to live longer lives?

Aggregate statistics

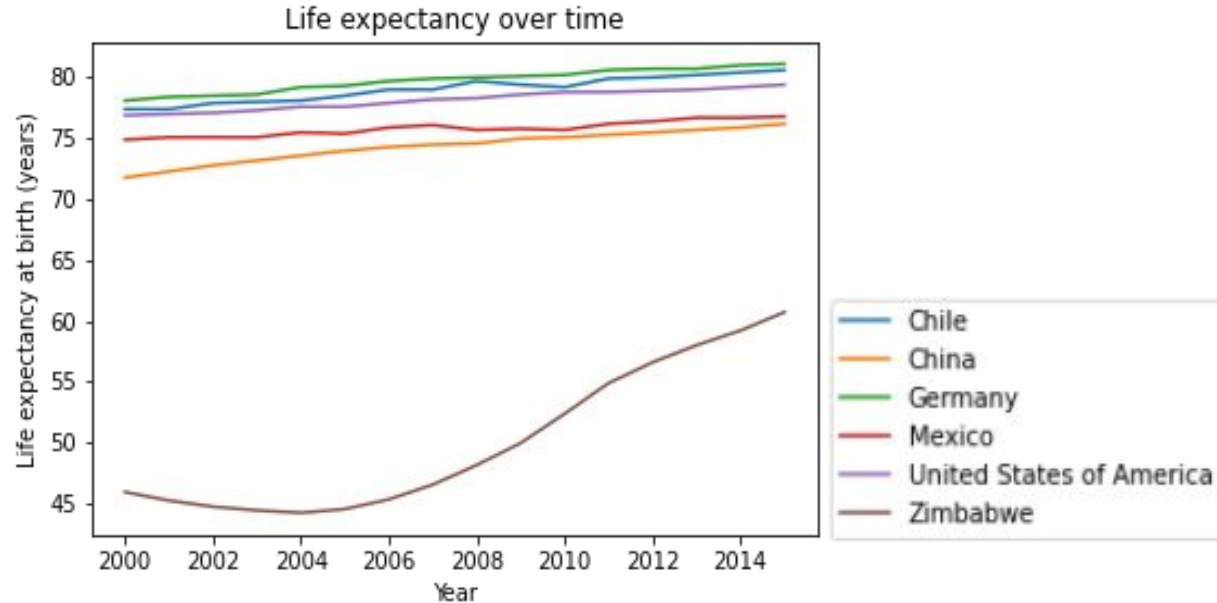
- Average life expectancy of the dataset: 72.78 years old
- Average GDP of the dataset: 3.88 trillion USD



Disparities between life expectancy in Zimbabwe vs. in other countries (1)

Citizens of Chile, China, Germany, Mexico, and the US had similar life expectancies ranging from approximately 70 to 80 years.

On the other hand, citizens of Zimbabwe had a lower life expectancy overall. Notably, there was a substantial increase in life expectancy (44 to 60 years) in Zimbabwe from 2000 to 2014.

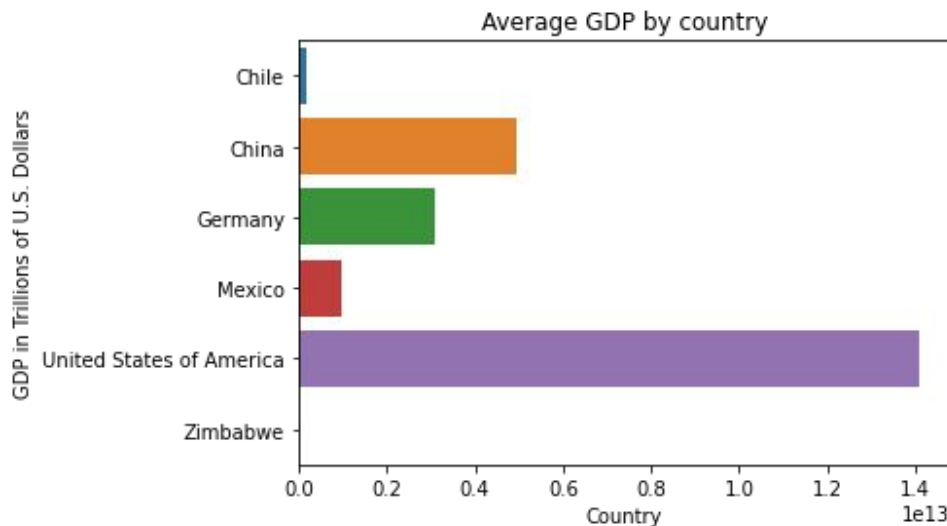
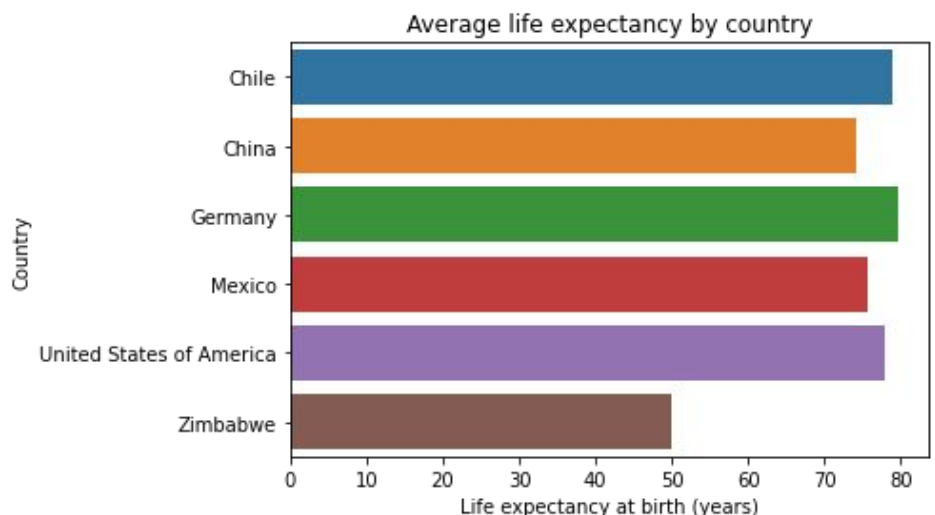


Disparities between average life expectancy in Zimbabwe vs. in other countries

Citizens of Zimbabwe had a low average life expectancy and GDP compared to the other countries.

The other countries (Chile, China, Germany, Mexico, and the US) had similar average life expectancies in the 70s.

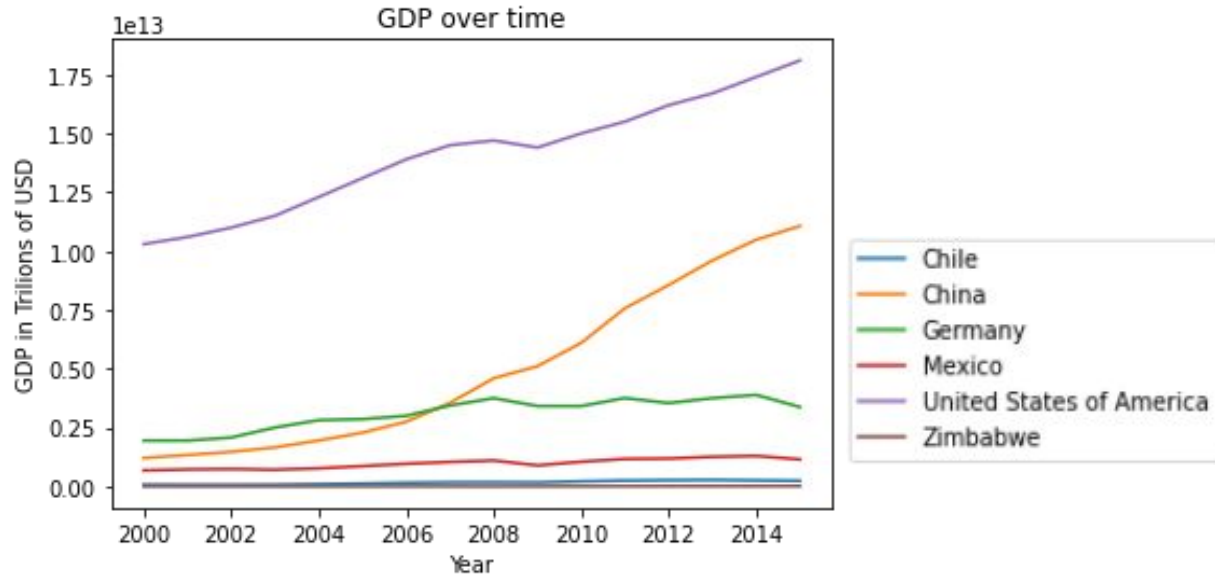
The US had a large GDP compared to the other countries.



In general, the US and China had the highest GDP

The US has the highest GDP of all six countries, maintaining steady economic growth over the years.

There was a slight stagnation of GDP growth in 2008, most likely due to the global recession occurring during that time. China, on the other hand, saw a rapid uptick in economic growth starting in 2008.

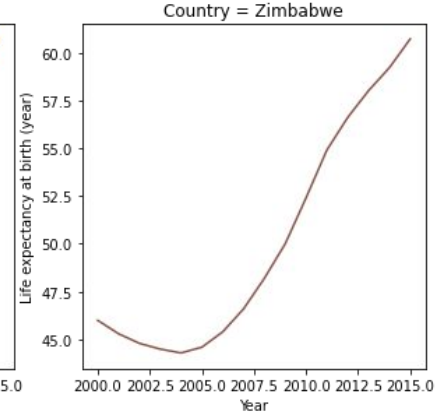
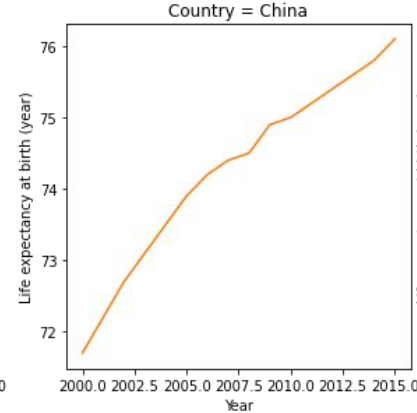
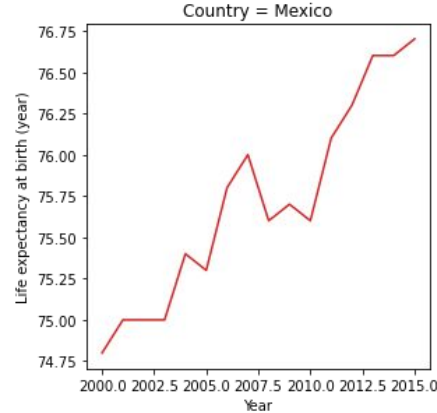
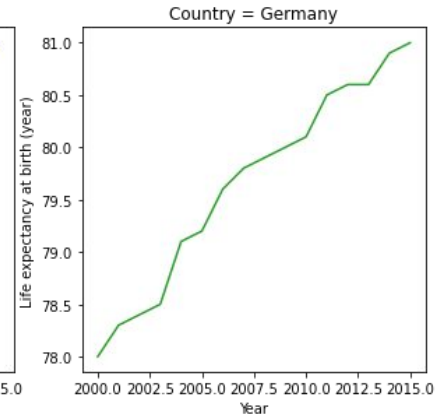
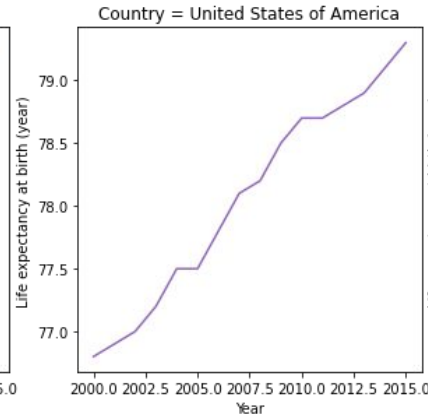
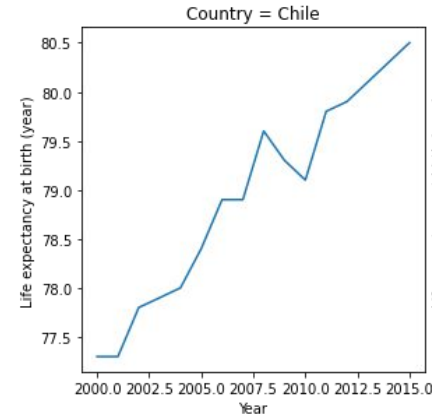


Life expectancy increased over time across all countries

Life expectancy increased over time relatively steadily in the US, Chile, Germany, Mexico, and China.

Mexico and Chile experienced sharp downturns in life expectancy in 2008 and 2010, respectively.

Zimbabwe saw a rapid increase in life expectancy starting in 2005.



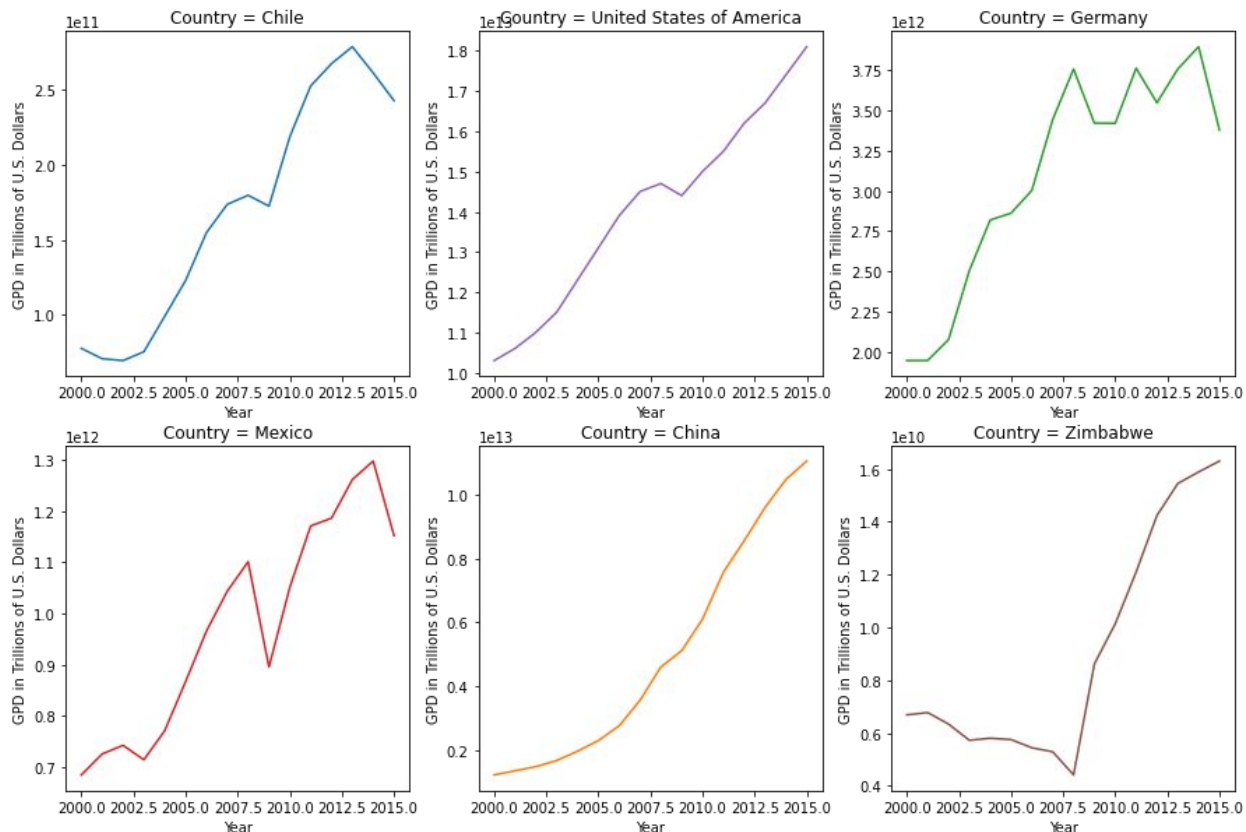
GDP increased over time across all countries

The GDP in all countries increased over time.

In Germany, after rising steadily, the GDP was unstable starting in 2008, and then GDP fluctuated year after year.

Chile, Mexico, and the US had a notable drop in GDP in 2009.

China's GDP increased steadily over the years, indicating a healthy economy.



Some notable world events during 2000-2015

2008:

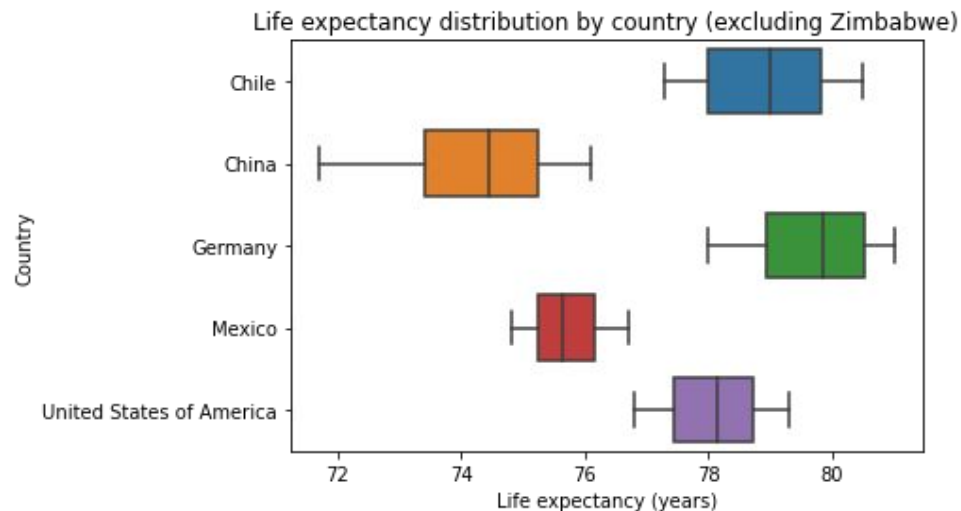
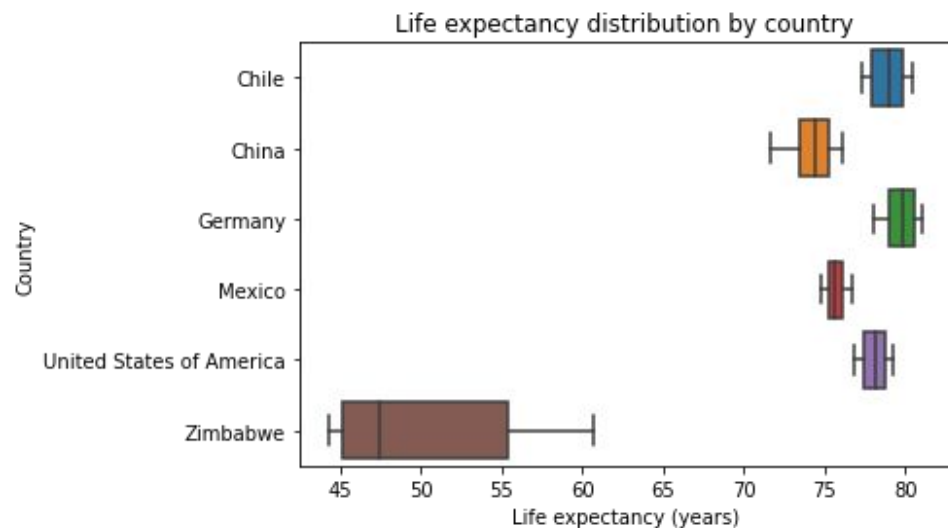
- A economic recession affected many countries worldwide
- China recovered quickly from the recession and bounced back with steady economic growth thereafter (Wong, 2011)
- Zimbabwe faced a peak 231 million per cent hyperinflation (Economic Crisis in Zimbabwe, 2018)

2010:

- A severe earthquake hit central Chile (Pallardy & Rafferty, 2019)

Life expectancy distributions from 2000-2015

Zimbabwe had the greatest life expectancy range during this period. In general, life expectancy had a narrow distribution in most countries.

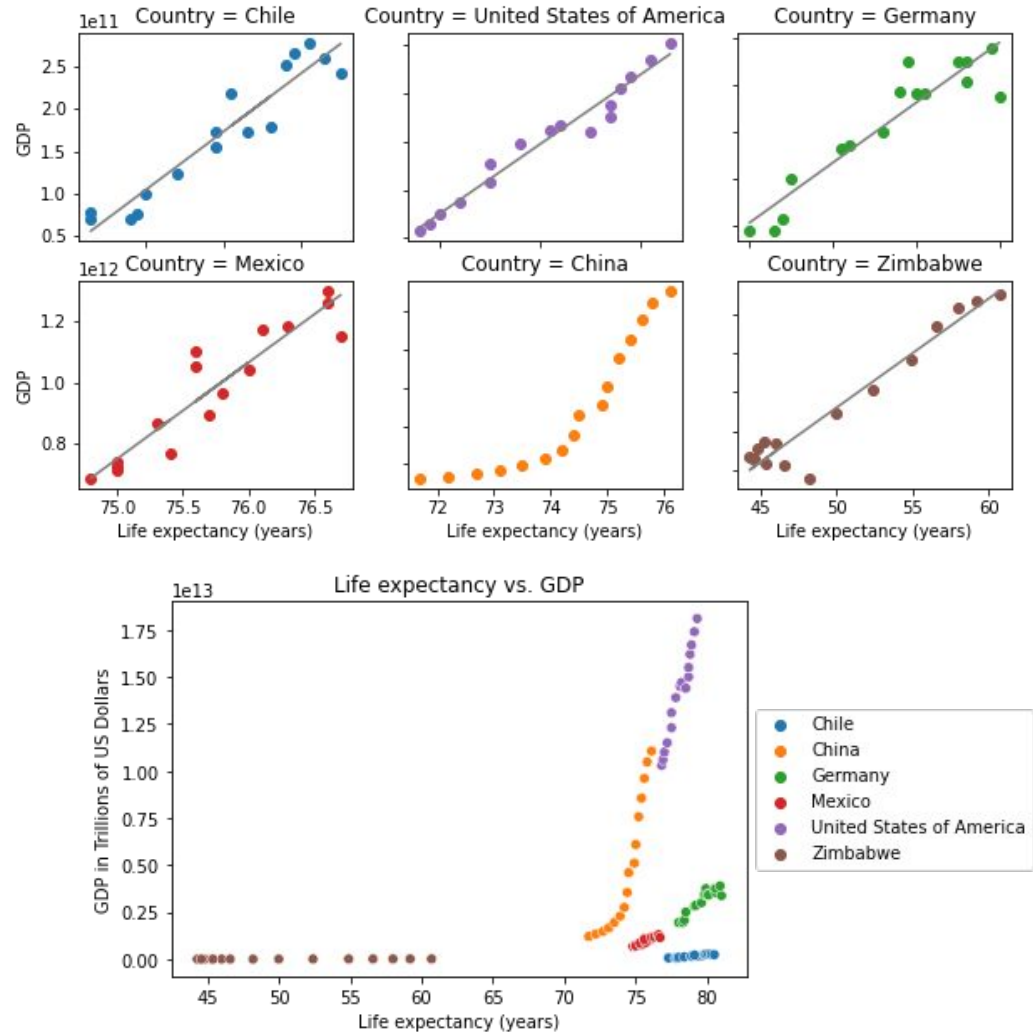


A higher life expectancy is correlated with a higher GDP

In most countries, life expectancy and GDP have a positive linear relationship.

However, the relationship between life expectancy and GDP in China's graph is slightly exponential.

Overall, we can see that GDP increases with life expectancy.



Conclusion

- Through this analysis, we can see that a higher life expectancy is correlated with a higher GDP, meaning that people tend to have a higher chance of living longer lives in prosperous countries.
- With this information, we can expect that economic growth can benefit citizens' lives by giving them access to resources to improve their quality of life.
- The GDP and life expectancy in different years can be representative of the economic state of the country and the well-being of a country's citizens. These metrics can also serve as indicators of impactful events that happened in each country during that year.

Limitations and further research

- Only six countries were analyzed in this study.
 - More insights could be gained by including more diverse countries from around the world
- The dataset was limited to the years 2000 to 2015
 - Data from after 2015 or before 2000 could be gathered to discover the changes over a period of time
- Further analysis could include exploring other variables to determine if they are related to GDP (ex. cost of living, average family size, literacy rate, etc.)
- The consequences of the recession had a noticeable effect on the GDP in most countries during 2008. Further research could include learning more about world events that had a drastic effect on GDP and life expectancy
- It would also be interesting to explore whether or not an individual's life expectancy changes after immigrating to a country with a different GDP

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