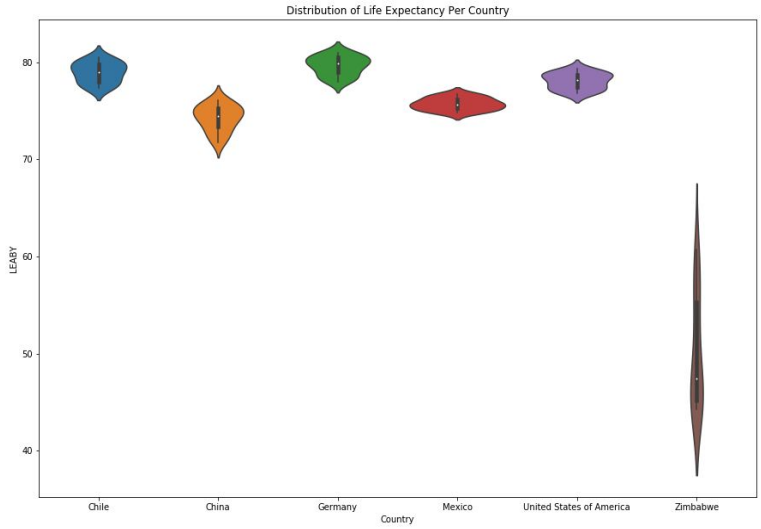
Does Economic Output Lead to a Longer Life: Investigating Potential Links Between GDP and Life Expectancy

The desire to live for as long as possible is almost a universal one. Oftentimes though, the length of our lives is determined by a multitude of external variables out of our control. Without a doubt genetics play a role, but so do political and economic pressures. Using data published by the World Health Organization (WHO), we will explore the possible link between average life expectancy of six countries with their respective Gross Domestic Product (GDP) output. GDP is the total monetary value of all goods and services produced by a nation, and is seen as a good indicator of overall economic productivity.

For his analysis, we will be comparing data from Chile, China, Mexico, Germany, The United States, and Zimbabwe that spans 15 years, from 2000 to 2015. The GDP figures are represented in values of US Dollars ($).

Overall Life Expectancy

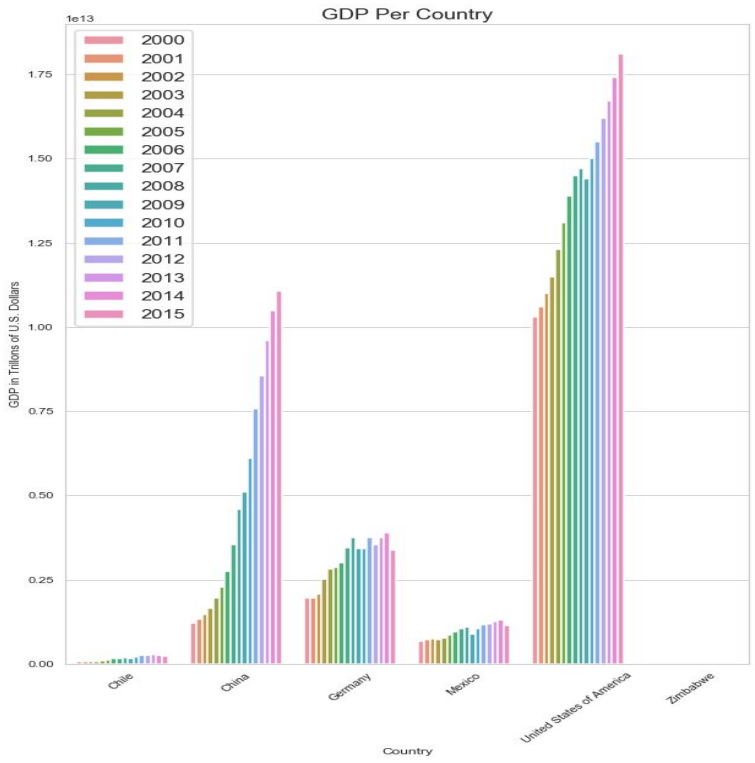
Looking at the distribution of the life expectancy data plotted against their respective countries, it is clear that Zimbabwe has a much wider spread in its data. More specifically, Zimbabwe's life expectancy values range from 35 to 60 years. In comparison, the other five countries have much more concise ranges, with values in general alignment with each other. The life expectancy range for these countries is 70 to 82 years.



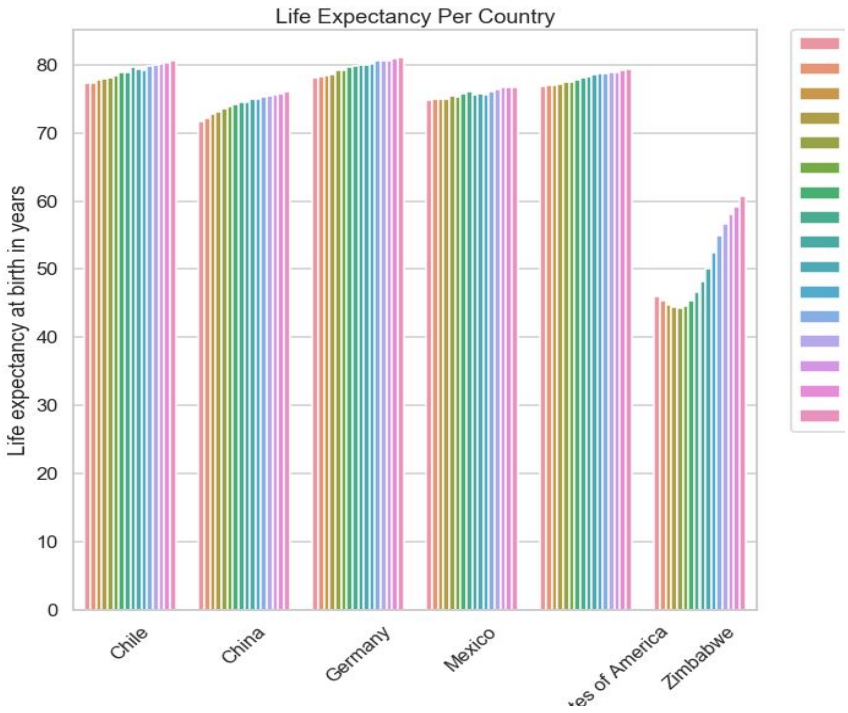
Now that we have a cursory understanding of the life expectancy averages per country, let's explore how GDP has changed in the same timeframe.

Trends Over the Years

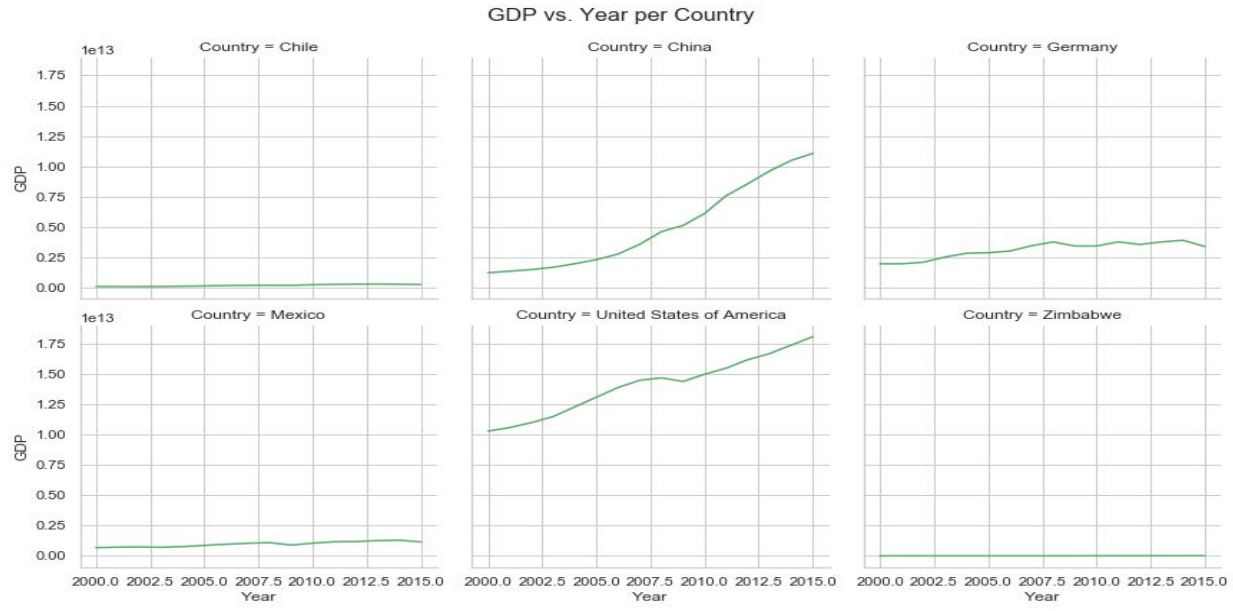
The graphic to the right gives us an insight into the overall GDP figures per country for each year. The developed countries (The United States, China, Germany) represented in the data unsurprisingly have the both the highest GDP figures and the fastest economic growth from year to year. In contrast, the "poorer" developing countries (Chile, Mexico, Zimbabwe) show a less rapid and more subdued increase in economic productivity. In the case of Zimbabwe, it's overall GDP figures are so low that they can't even be seen, given the scaling on this graphic.

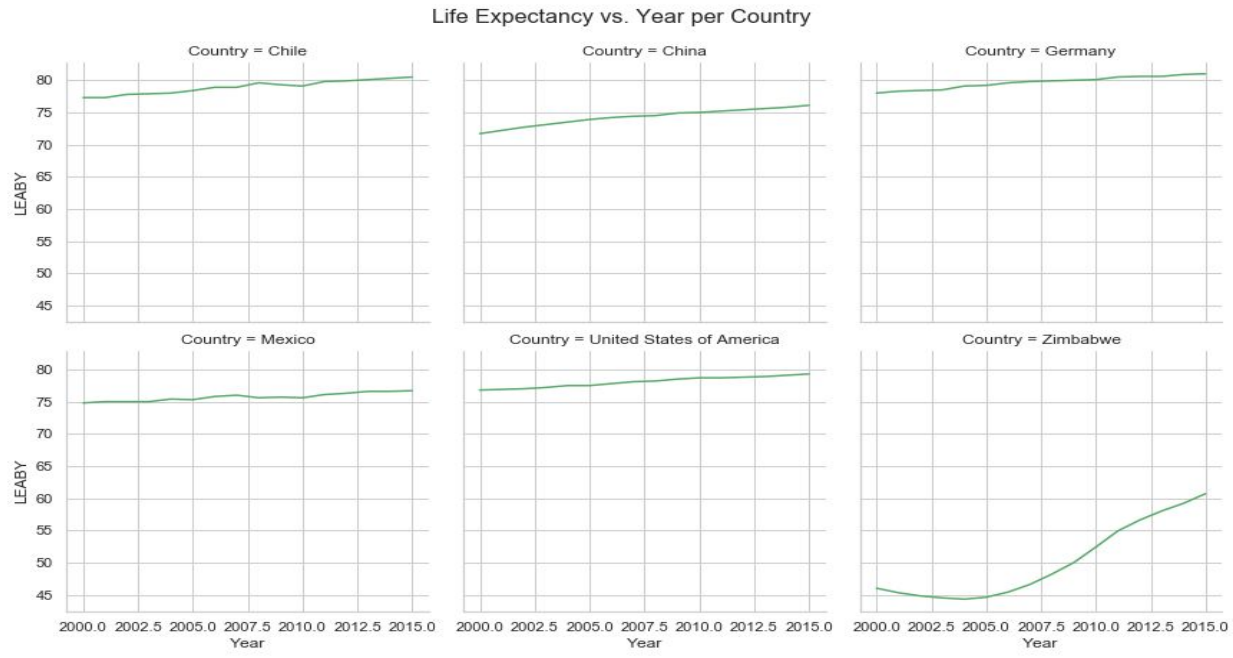


When we take a look at how the life expectancy per country has changed over the same time period, an upwards trend is apparent. While the absolute values vary from country to country, each experiences positive growth in getting their

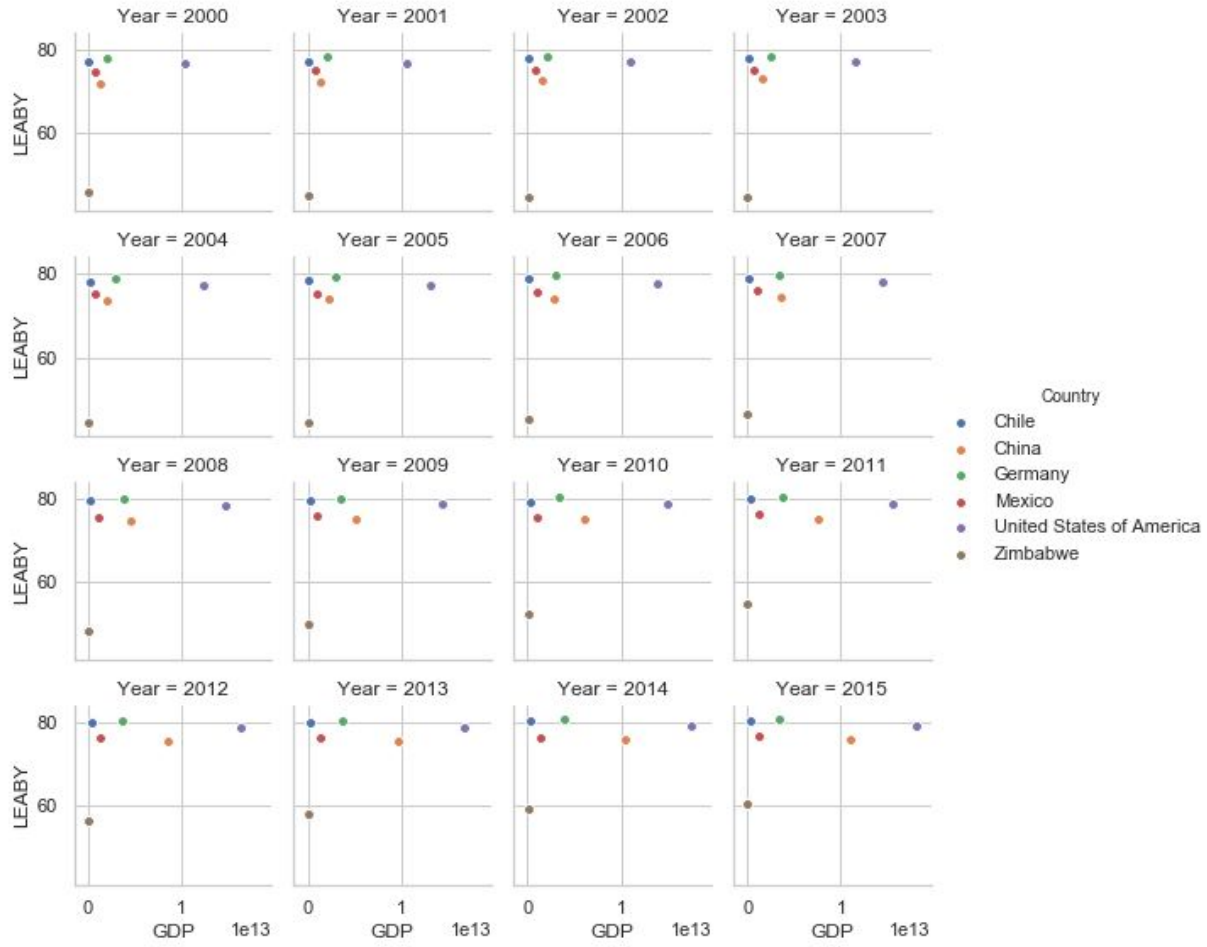


citizens to live longer. The country most worthy of further examination is once again Zimbabwe. Prior to 2003 or so, its average life expectancy actually decreased. Delving into the reasons as to why this might be, one quickly discovers that Zimbabwe has had a turbulent past. In the early 2000s, Zimbabwe was very politically unstable. Economic depressions combined with the president assuming control of the government to punish political opponents, had country-wide ramifications. Hundreds of thousands of people either became unemployed or unfortunately died from malnutrition and starvation. After further political interventions, Zimbabwe has been able to begin the process of recovering, which is evident in its upward swing in average life expectancy around 2003.





Let's look at Chile a bit closer. Based on its GDP data, it's safe to say that Chile does not have a high performing economy, especially in comparison to countries such as the United States and China. What is interesting however, despite this, Chile's average life expectancy is among the highest out of the six nations in this analysis. Mexico is more or less in the same boat here. Both are developing countries with low to moderate national GDP, but even so their citizens can expect to live long lives on average.

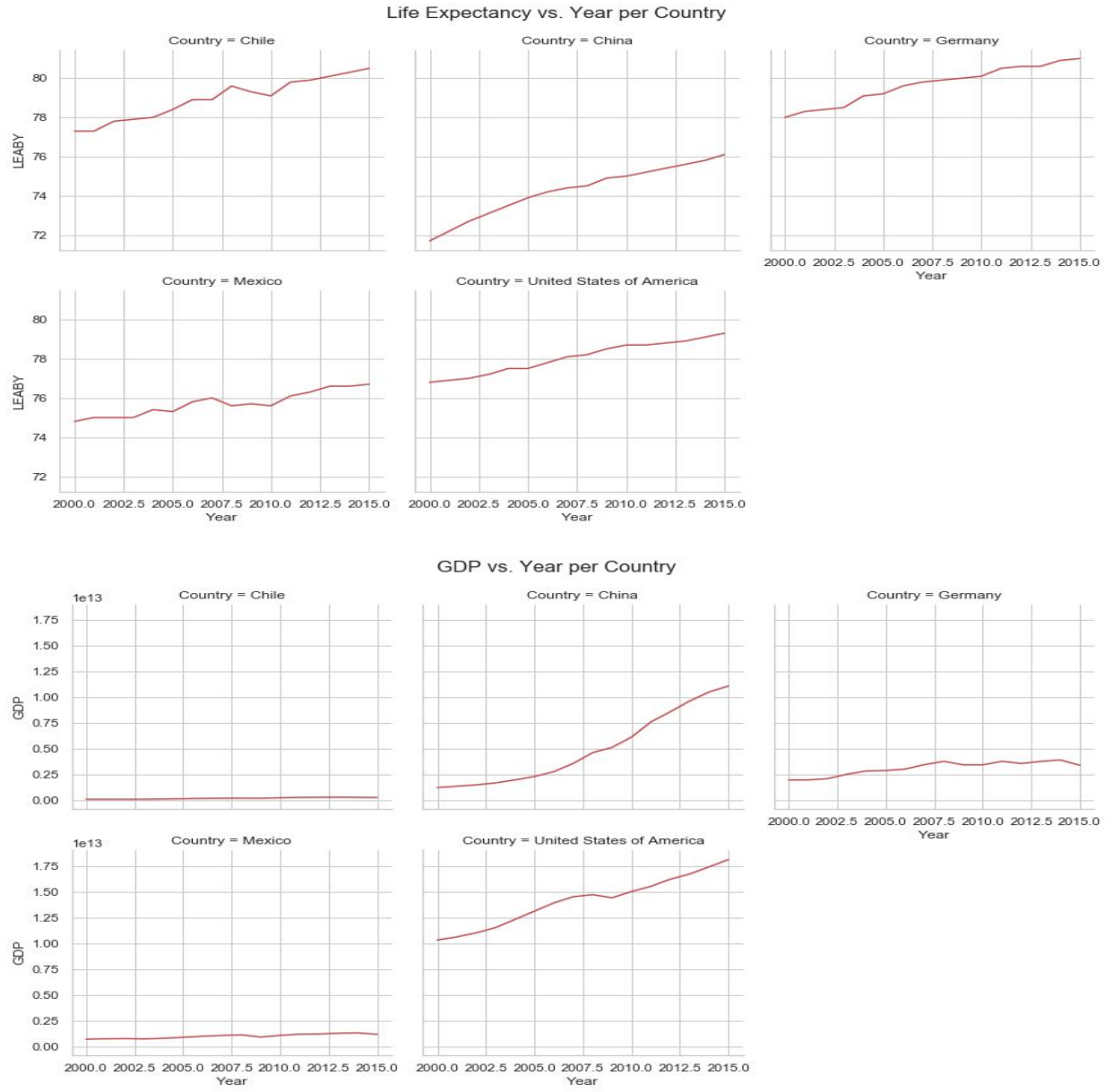


The graphic above is another representation of the same life expectancy and GDP data. Instead of focusing on the lowest economic performers as we have been doing thus far, let's switch gears a bit. China has seen tremendous GPD development for the past couple decades, and is now the world's second largest economy. Even with that incredible increase in national wealth however, its average life expectancy has only marginally increased.

While it's safe to say that life expectancy is a metric that takes numerous complex variables into account, it would appear that it is not directly influenced by GDP. Undoubtedly GDP plays some role in a nation's average life expectancy, as GDP is an indicator of a population's access to better social programs and healthcare. However, it is nowhere near the only factor on how long someone might live.

Does the Analysis Change If Zimbabwe is Removed?

For a little bit of fun, let's see how the data looks with the removal of Zimbabwe from our analysis. Here are the same plot as above, but with Zimbabwe excluded:



Upon first inspection, the data looks slightly noisier. With the absence of Zimbabwe, the range of data is less, which allows the data's small fluctuations to really show through. One very noticeable event in the data is the 2008 financial crisis. This event is most clear in the GDP data from the United States, and to a lesser extent China and Germany. This drop in economic output does not have a corresponding drop in average life expectancy.

While there are small decreases in life expectancy for each country, they don’t appear to in response to a decline in national GDP. So even with Zimbabwe omitted, our overall takeaway from this analysis remains the same: There is not a direct correlation between GDP and average life expectancy.