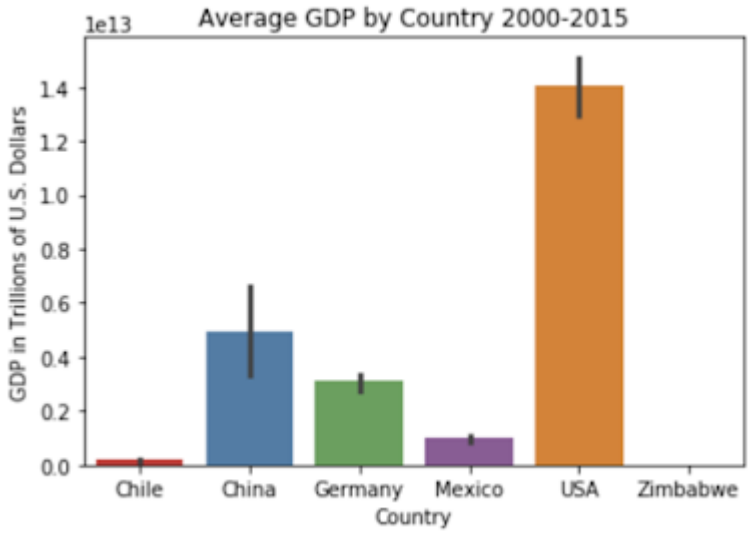
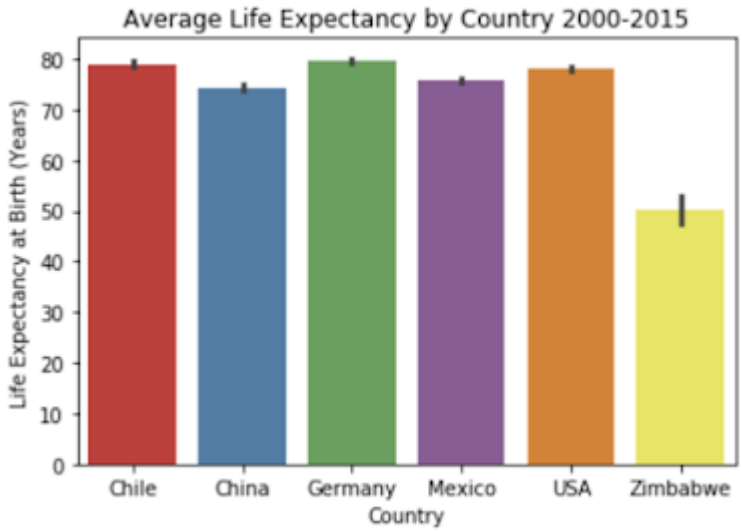
How is life expectancy influenced by gross domestic product (later "GDP") of a country? In this small evaluation, we look at data from six countries including Chile, China, Germany, Mexico, USA and Zimbabwe.

If we look at the average GDP of these countries over 2000-2015, we see significant difference, ranging from USA at 1.4 trillion to 9 billion for Zimbabwe. Also Mexico and Chile has very low GDP averages compared to USA. Also notable is the China is second behind USA, with a strong growing economy in terms of GDP.



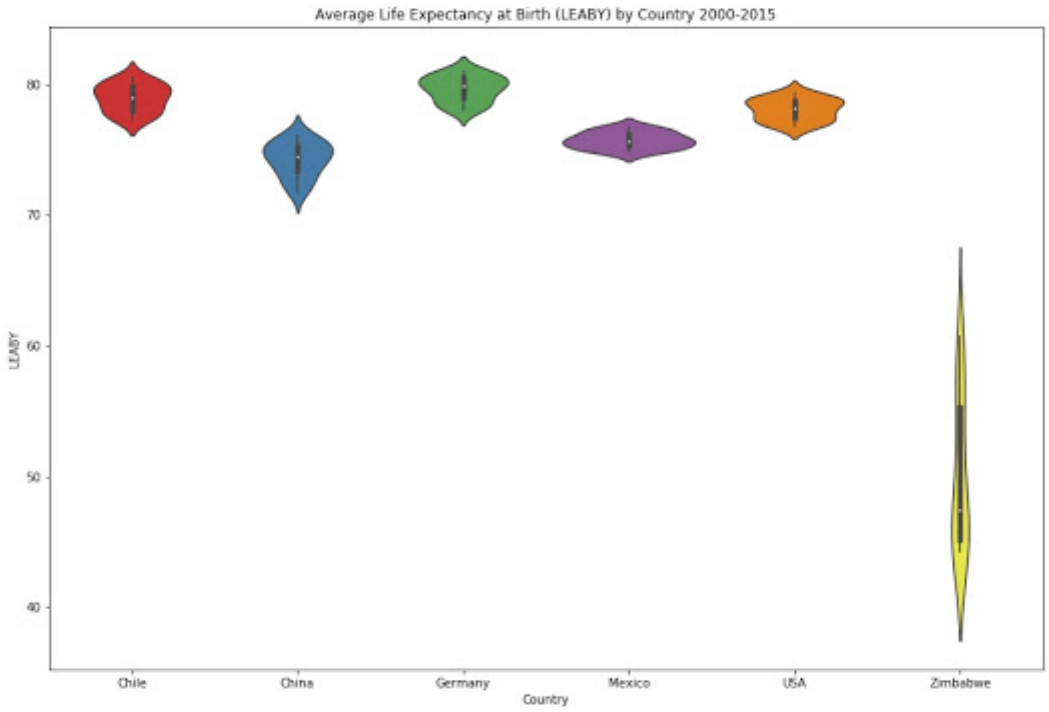
However, when we explore the average life expectancy a birth (later "Life Expectancy") for these countries the picture looks different.



Now, the five countries excluding Zimbabwe, are very similar. This means that total GDP explains very little of Life Expectance if the GDP is over some minimum threshold. Zimbabwe is below this threshold, shown clearly in the Life Expectancy at just around 50 years compared to 75-80 years for other five countries. The reasons behind Zimbabwe's poor Life Expectancy can most likely be explained to some extent through lacking investments into basic healthcare like better hygiene across the country, free vaccination programs, etc.

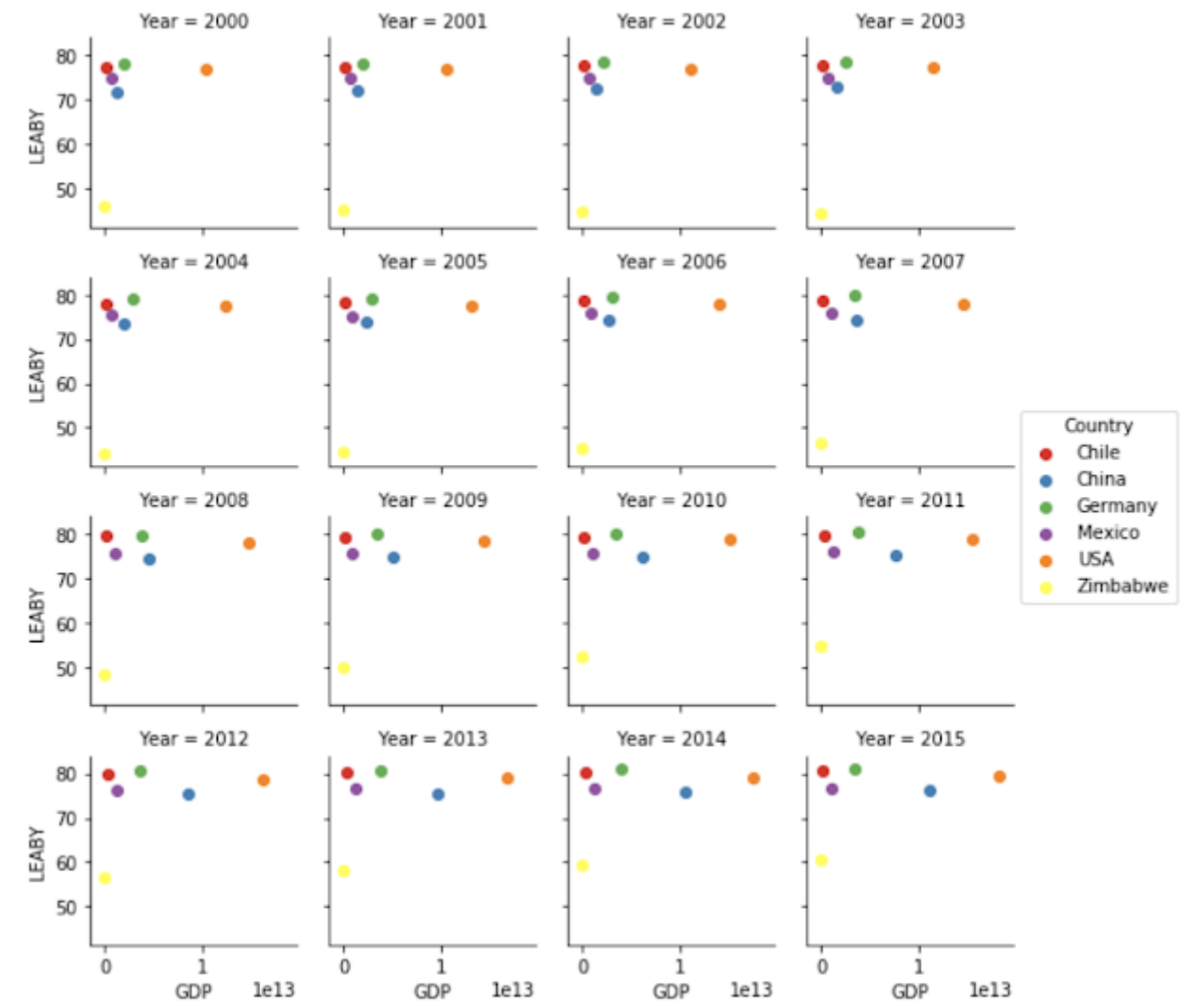
It should be also noted that the Life Expectancy for Zimbabwe is driven by HIV/AIDS where is ranked #4 in the world, as well as violence and road traffic accidents when Zimbabwe ranks #4 and #1 in the world. Zimbabwe has initiated a free HIV/AIDS treatment program for eligible citizens in 2003 which will impact death rate among adult population in the long run. The impact violence and road accidents is likely to be tied more to overall standard of living and infrastructure - and so to GDP.

This change of GDP is shown better on a violin plot, which shows clearly how Zimbabwe's Life Expectancy has changed during the period, while others - especially Germany - has stayed relative constant.



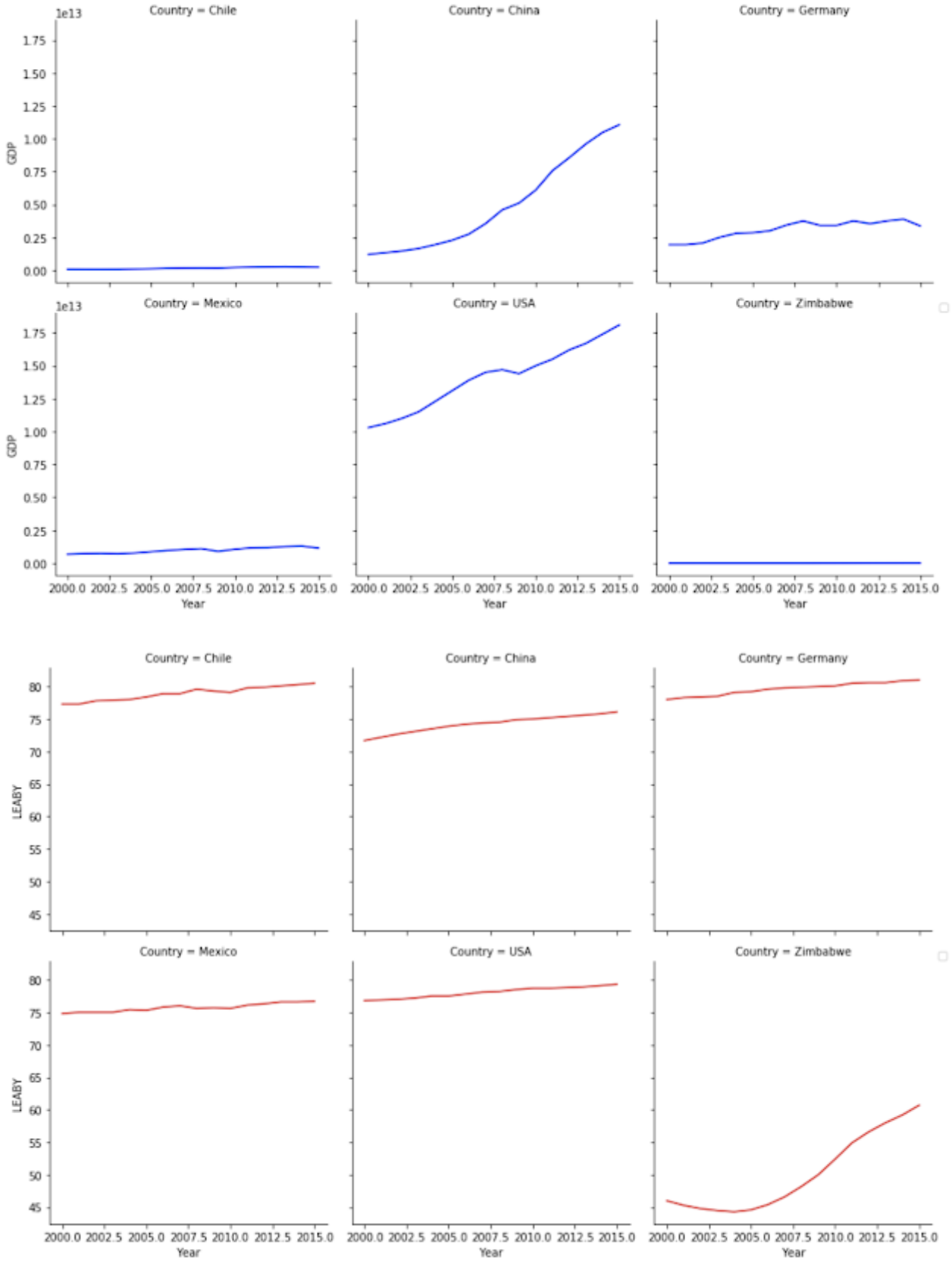
USA has a strong GDP and spends a lot of money on healthcare (per capita). The reason for Life Expectancy being on par with countries investing significantly less, is most likely due to complex healthcare system for which improvement plans are in motion - such as the Affordable Care Act.

We get a better view of correlation between and development of GDP and Life Expectancy in the following visualisation which shows all six countries and their GDP and Life Expectancy in a scatter plot, plotted next to each other for different years.



This visualisation shows that once a minimum threshold is reached, Life Expectancy is expected to rise quickly and then stay relatively stable. We can see Zimbabwe (as the yellow dot) to climb steadily upwards, which China and USA continue to stay at their level, but move towards right as their GDP continues to grow.

Comparing the countries on how GDP and Life Expectancy has developed between 2000 and 2015, we can see their individual development more clearly in the following charts.



We can, for example, see the impact of Zimbabwe's HIV/AIDS treatment starting in 2003 having a strong impact on mortality and thus to Life Expectancy. We can also see extremely strong GDP development in China without the corresponding impact to Life Expectancy. This is similar development than in the USA during the observed period (2000-2015).

Based on the available data in the dataset (only 6 countries), it is impossible to say what are the drivers behind this development in the USA and China. We should include looking at e.g. GDP per capita as well as healthcare investments per capita, to draw any meaningful conclusions. Also,

looking at more than just these six countries would give a clearer view of the possible trends and correlations.

The violin plot of the life expectancy distribution by country
The facet grid of scatter graphs mapping GDP as a function of Life Expectancy by country