Money can’t buy you love but it seems it might buy you (a little) life

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Mock blog created for Codecademy Course (Data Visualization with Python)

The impact of economic growth on life expectancy has been well explored and well established [1]. However, many factors play a role in the growth of both of these measures and these will vary by country. We therefore investigated how the relationship varies between developing and developed countries to see whether the starting point in the level of both measures makes any difference to their growth rates relative to each other. This has potential implications for social policy in terms of where to invest and focus efforts with a view to improving life expectancy within countries.

We analysed the latest data from the World Health Organisation on life expectancies at birth together with gross domestic product (GDP) figures from the World Bank, as a measure of the economy, to explore the relationship between the growth in life expectancy and GDP across countries at different stages of development. Data from six countries (Chile, China, Germany, Mexico, United States of America and Zimbabwe), at various levels of development, has been analysed across the years 2000-2015. This has been supplemented by insights from existing research which focused on some of the countries to better understand the trends observed and outliers.

Many, different, countries have similar life expectancy distributions

Most of the countries had life expectancies at birth within a relatively small range between 75 to 80 and most of them saw gradual but steady increases of 2-4 years across the period, as shown in Figure 1. The one exception to this was Zimbabwe, which is a special case (see below), with extremely low life expectancy that actually fell initially during the period before picking up again to finish significantly higher than the starting point but still well short of the other countries surveyed.

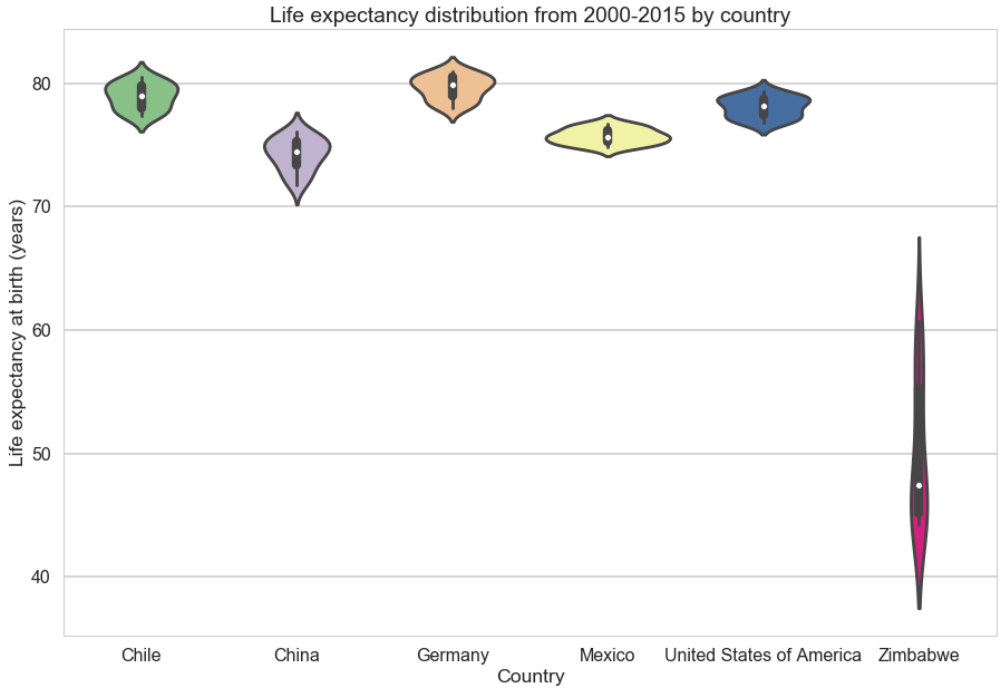

Figure 1

Life expectancy does show some correlation with GDP, but many factors are at play

Figure 2 shows, by year, how life expectancy at birth relates to GDP for each of the countries. This clearly shows Zimbabwe moving up the charts over the period, showing the greatest relative increase in life expectancy, but not a corresponding movement across the charts for GDP. Instead it is China that shows the greatest movement on relative GDP growth. However, the link between life expectancy and GDP is difficult to ascertain from this figure alone.

Figure 2

Figure 3 displays this relationship more clearly. This too displays a scatter graph of life expectancy at birth against GDP but for each country individually this time displaying the change in values across the years of the period. The spread of the data for China and the United States, in particular, clearly demonstrates the correlation between the measures as both rise together. But, the gradient of the slope is clearly very different for different countries. Assuming that economic growth is a driver of greater life expectancy (and assuming GDP is a good measure of economic growth) then clearly the impact it has on life expectancy is not the same in different countries where other factors may rise to the fore.

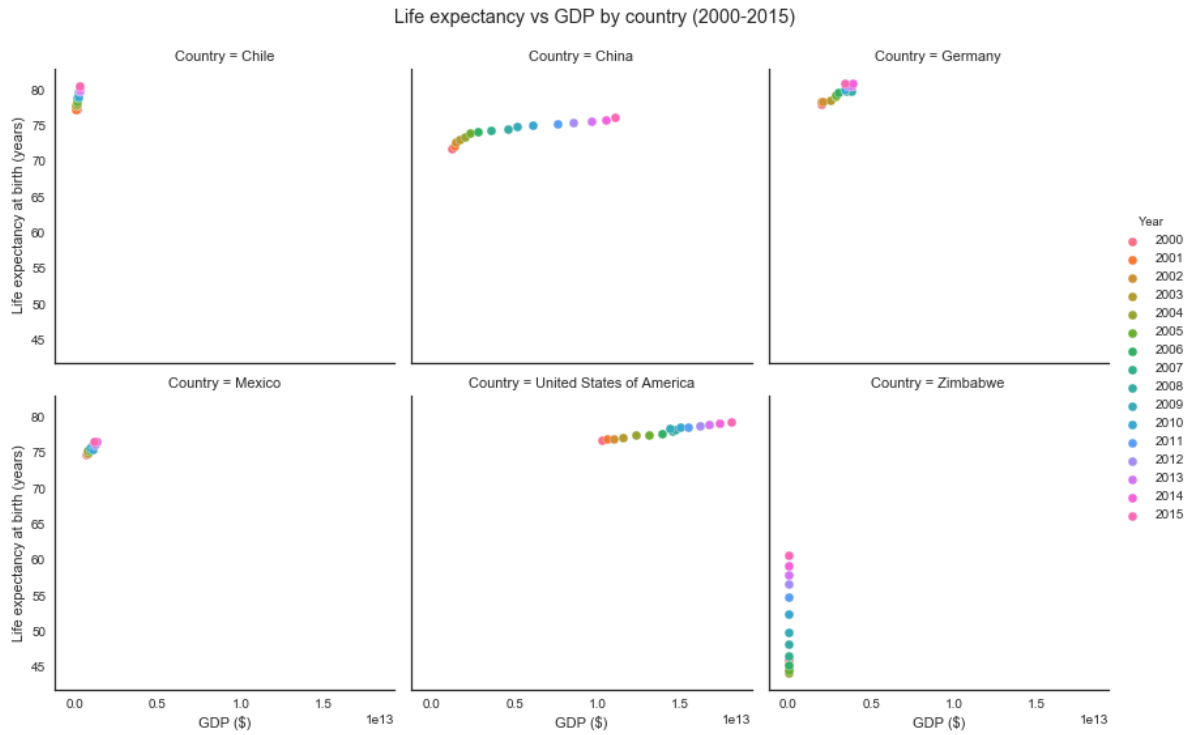

Figure 3

Developed countries show a bigger relative gain in life expectancy versus relative gain in GDP

In Chile, life expectancy rose 4% across the period but GDP grew by 211%. Thus, life expectancy only grew at 2.0% of the rate of GDP growth. Corresponding measures for the other countries are shown in Table 1. Interestingly, despite starting from a higher base of both life expectancy and GDP, it is the developed countries that show the highest overall rate of life expectancy increase versus GDP growth. In fact, the GDP of the developed countries (e.g. Germany and the United States) grow less relatively than that of the developing countries such as China but their relative life expectancy growth is more similar to that of the developing countries.

Country	GDP growth (end vs. start)	Life expectancy growth (end vs. start)	Life expectancy growth / GDP growth
Chile	211%	4%	**2.0%**
China	813%	6%	**0.8%**
Germany	73%	4%	**5.3%**
Mexico	69%	3%	**3.7%**
United States	76%	3%	**4.3%**
Zimbabwe	144%	32%	**22.2%**

Table 1

This suggests that, even for very strong economies where growth in GDP may be at a slower rate than for some developing countries, it is still possible to significantly increase life expectancy, even though that too is at a higher level.

Zimbabwe is really the outliers with these results. However, research published in the International Business & Economics Research Journal by Genius Murwirapachena, Nelson Mandela Metropolitan University, and Courage Mlambo, University of Fort Hare, finds that the trend observed in the life expectancy in Zimbabwe is, at least partly, attributable to economic factors [2]. They attribute the

decline in life expectancy during the 2000-2009 decade to a decline in living standards driven by economic factors such as hyperinflation and "poor economic management policies". This subsequently led to food shortages and a decline in education and health services. Unusually, male life expectancy fell by less than female life expectancy leading to males having a longer life expectancy over the period although the gap appears to be closing again. Having said all this, there was a very significant decline in life expectancy between the 1990s and 2000s in some surrounding countries such as South Africa and Botswana. (This may also be attributable to the aids epidemic in the region.) Their paper notes that economic growth, inflation and population growth all correlate positively with life expectation in Zimbabwe, but other factors are also involved, for example increases in both agricultural land and the dependency ratio have a negative correlation with life expectancy in the country.

Figures 4 and 5 show, individually by country, the change in life expectancy and GDP, respectively, over the period. This shows the incredible economic growth of China, especially starting from the low base, meanwhile the impressive increase in life expectation in Zimbabwe is equally prominent and impressive.

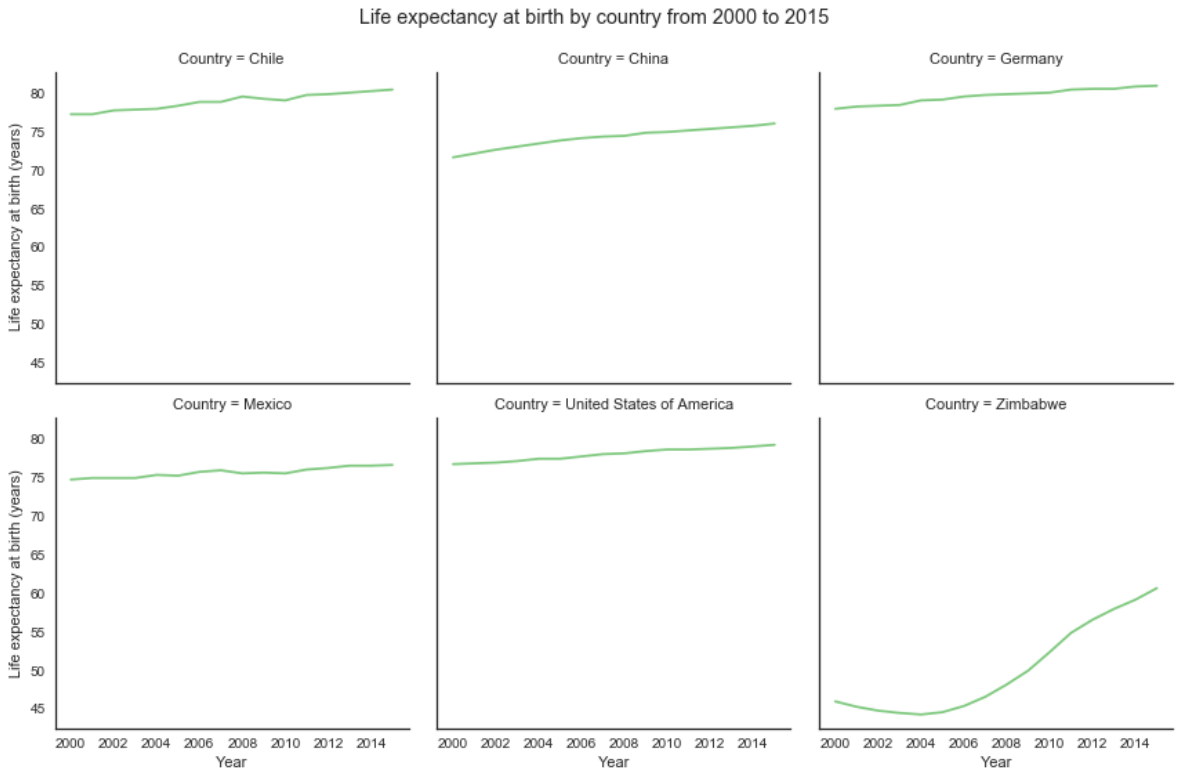

Figure 4

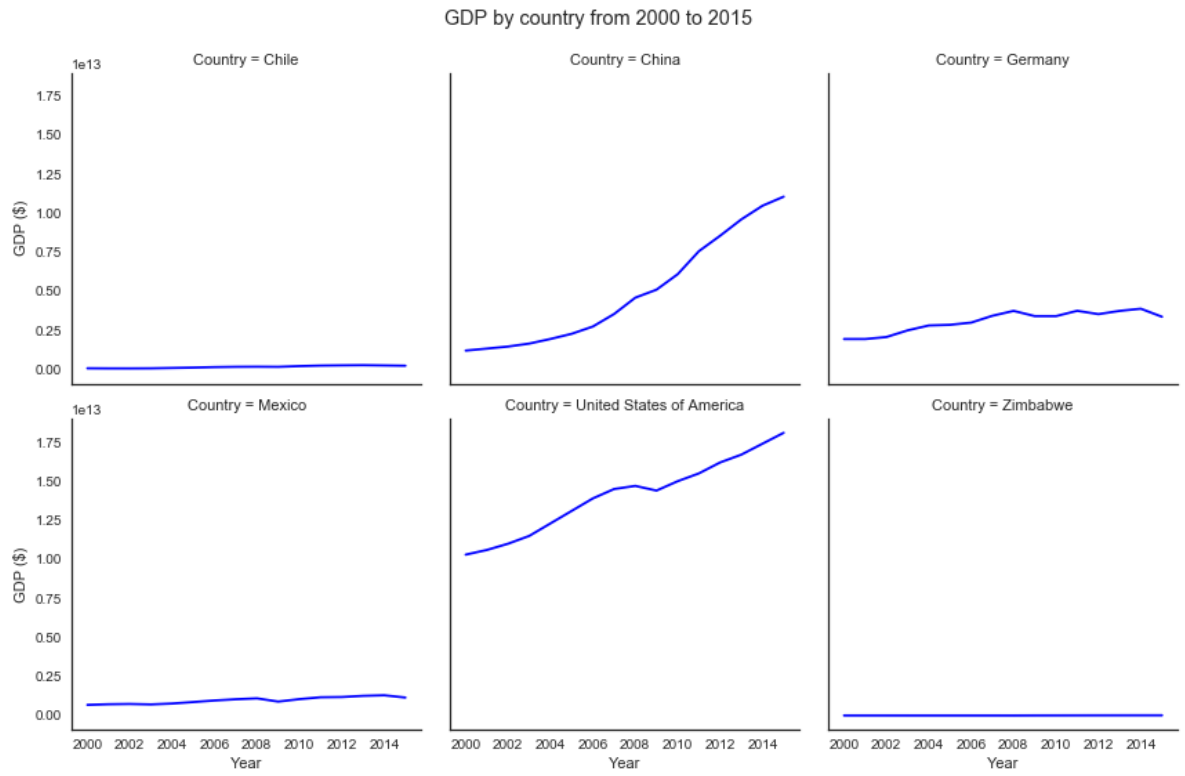

Figure 5

Conclusion

The results have shown a correlation, in general, between economic growth and life expectation. Of course, further work is needed to identify any causation, such as the impact of the economy of health and education and the impact of these factors on life expectation.

However, the exact relationship is unclear and appears weak in some cases. This is likely due to ll of the other factors which influence each of these measures. It does appear that the relationship is stronger in developed countries. It's possible that the growth in GDP in these countries can be better directed towards health and education (or is a better reflection of these) that deliver longer term impacts in terms of longevity. However, further work is needed to investigate the drivers and beneficiaries of economic growth in different countries.

A better dataset to use might be GDP per person as that is probably a better relative measure of actual economic status. Otherwise growth in GDP could be driven by growth in population which might not show the same levels of increase in life expectation. A broader and bigger dataset with more countries and perhaps across more years would be welcome to draw more detailed and robust insights from. Figure 3 gives the best indication of the relationship between life expectation and GDP but the data is still limited.

References

[1] https://blog.euromonitor.com/2014/03/economic-growth-and-life-expectancy-do-wealthier-countries-live-longer.html

[2] https://www.researchgate.net/publication/297750732_Life_Expectancy_In_Zimbabwe_An_Analysis_Of_Five_Decades