CS5346
Information Visualization

Many more happy returns! - Life Expectancy and You

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Overview

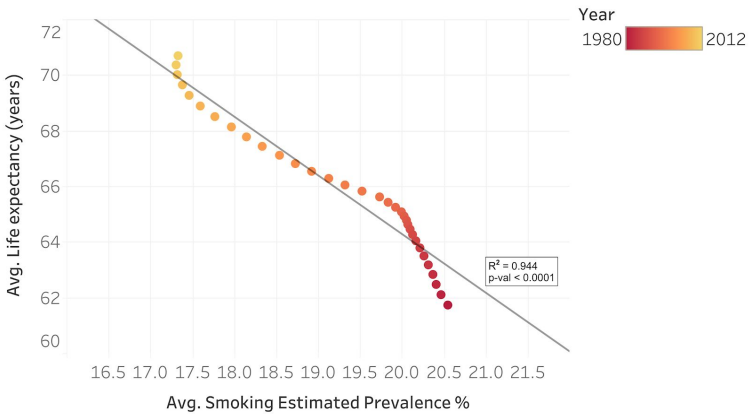
In order to understand the factors that contribute to one's lifespan, one needs to look for patterns and indicators of correlation in a population in addition to analyzing the human body biologically. This project attempts to introduce readers to several potential factors that may impact life expectancy.

We have considered four factors: Obesity, Smoking and Substance Abuse, Food Habits and Employment. We attempt to introduce some attributes of these factors and their association with life expectancy (LE).

Smoking and Alcohol-and-Drug Abuse

Smoking, Alcohol, and Drugs are often termed as "vices" and are often related to several diseases and reduced lifespan. We run 4 explorations on the effect of these vices on Life Expectancy across the globe.

- Geographical distribution of smoking, alcohol & drug-related disorders and LE
- Temporal patterns in Smoking and Alcohol & drug-related disorders for individual countries
- Distribution of Smoking, Alcohol & Drug-related disorders and LE across the 6 Continents
- Correlation between Smoking and LE



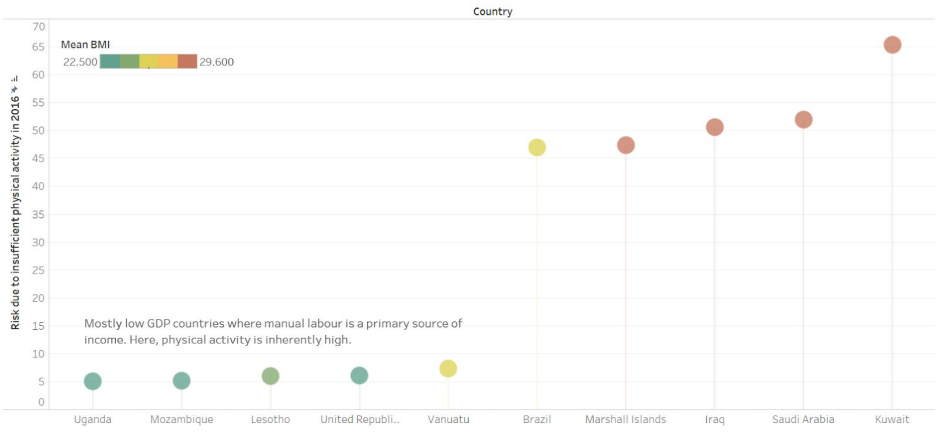
We found that over the years, the global smoking % has reduced to a significant extent and there is a surge in the global average LE. There is a strong negative correlation between smoking % and LE ($R^2 = 0.944$, $p < 0.0001$).

Figure 1: Avg. Life Expectancy vs Avg. Smoking Prevalence

Obesity, BMI and Fitness

Adult obesity has been shown to substantially heighten the risk of adverse health outcomes. Several chronic diseases have been associated with obesity, including Type 2 diabetes, cardiovascular disease, and cancer, to name a few. Death rates have been found to have a correlation to body mass index(BMI). To unravel the patterns and give an introduction to some obesity measures which correlate with LE, we explore four questions

- How can we quantify the effects of Obesity-related Diseases on our potential life spans?
- How does the mean BMI of the world in 2016 compare to that in 1975?
- Which are the most and least physically active countries of the world?
- How do different intensities in physical activities affect us?



A glimpse of our work in this area: WHO (World Health Organization) reports the prevalence of insufficient physical activity among adults for countries. The visualization shown in figure 2 points to the five least and most active countries of the world.

Figure 2: Countries ranked according to the prevalence of insufficient physical activity

Work and Employment

Given that most of our lives are spent working, it is natural to ask whether our jobs have any bearing on life expectancy. Indeed, there are many ways to analyze employment indices and their relation to life expectancy. We selected several country-level statistics that encompass different perspectives to answer aspects of the following questions:

- How do the GDP and different types of jobs correlate to life expectancy?
- Does the number of working hours have any bearing on life expectancy?
- How has retirement age been affected by life expectancy?

A stacked bar chart of the economic sector by percentage, with countries ranked from left to right using GDP per capita. Life expectancy is overlayed on the same scale to show the patterns. It is apparent that GDP per capita has a positive correlation with life expectancy. We also see how as a country develops through the economic value chain, it shifts from a primarily agriculture-based economy to more value-added secondary and tertiary sectors, ultimately resulting in a higher GDP per capita value.

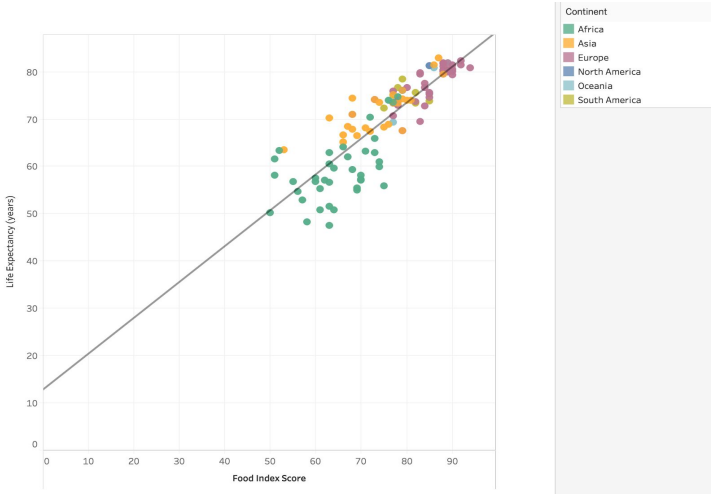
Figure 3: Economic sector breakdown of countries by GDP per capita, with a line plot of life expectancy

Diet

A healthier diet can have a big impact on life expectancy, as shown in various studies. In our work, we visualized the following:

- Correlation between Food Index and life expectancy, 2010
- Correlation between Food Index measures and life expectancy, 2010
- Food index breakdown per continent
- Correlation between meat consumption and life expectancy

A glimpse of our work in this area is shown below.



The Food Index of a country is a measure consisting of the availability of food (data about undernourishment and number of underweight children), affordability of food (data about price level and price inflation volatility), food quality (data about nutritional diversity and access to safe water) and healthy diet (data about obesity and diabetes).

Figure 4: The measures contributing to the Food Index correlate with the life-expectancy of a country.