

Life Expectancy Factors

Introduction

Our Team

Ayannah
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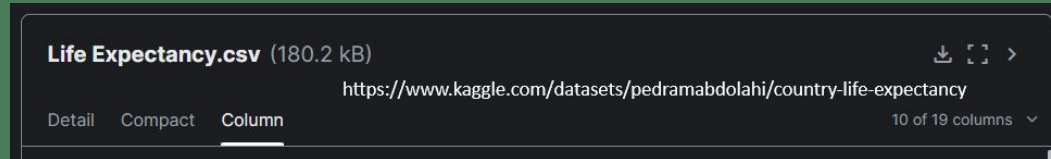
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Tebbe

Sarah
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Spencer
Garrett

Stephen
Ferrier

Our Dataset



WHAT IS THE DEFINITION OF LIFE EXPECTANCY?

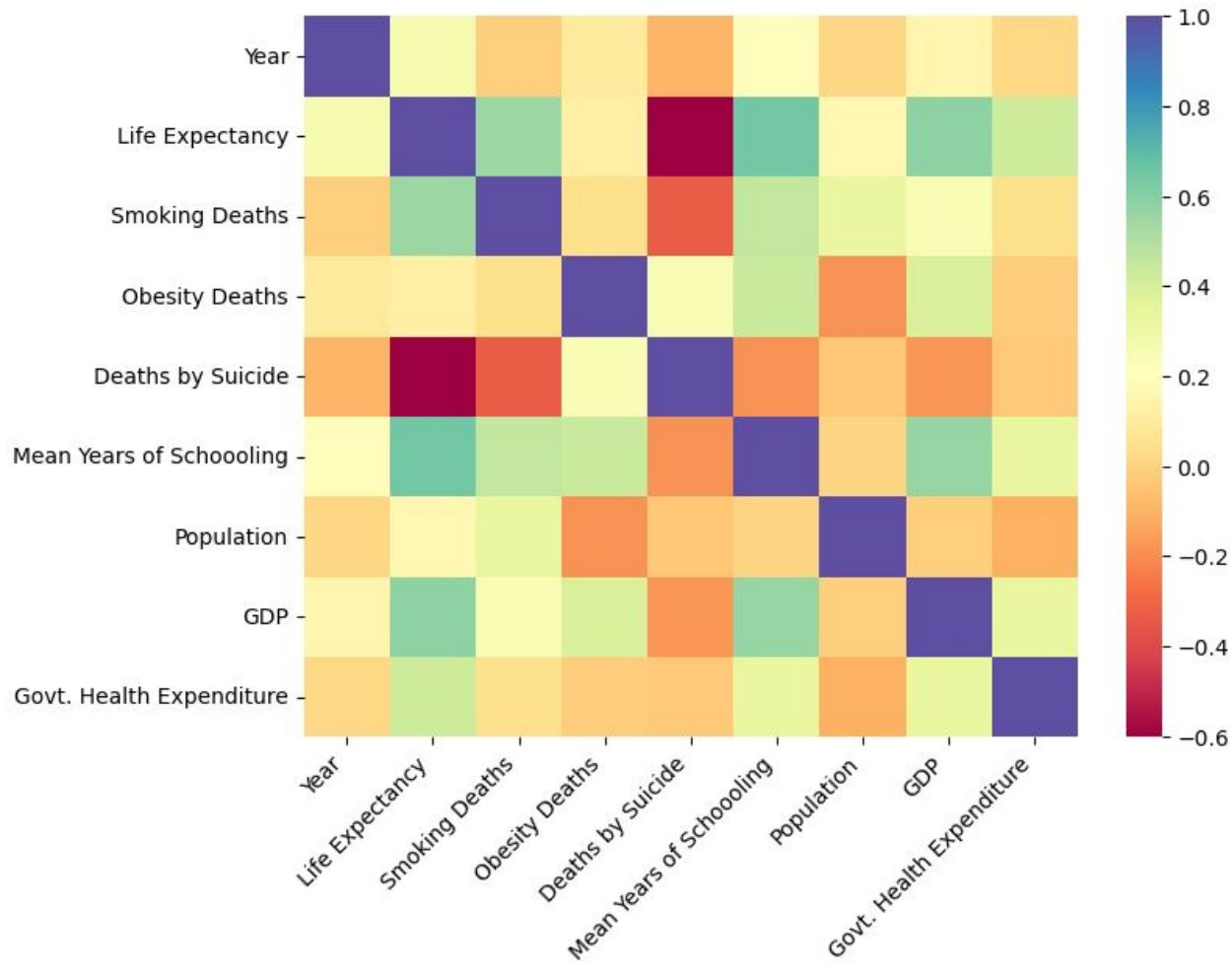
The estimate of the average number of additional years that a person of a given age can expect to live. Life expectancy is a hypothetical measure. The estimate, in effect, projects the age-specific mortality rates for a given period over the entire lifetime of the population born during that time. The measure differs considerably by sex, age, race, and geographic location. Therefore, life expectancy is commonly given for specific categories, rather than for the population in general.

How does the country you live in
impact your life expectancy?

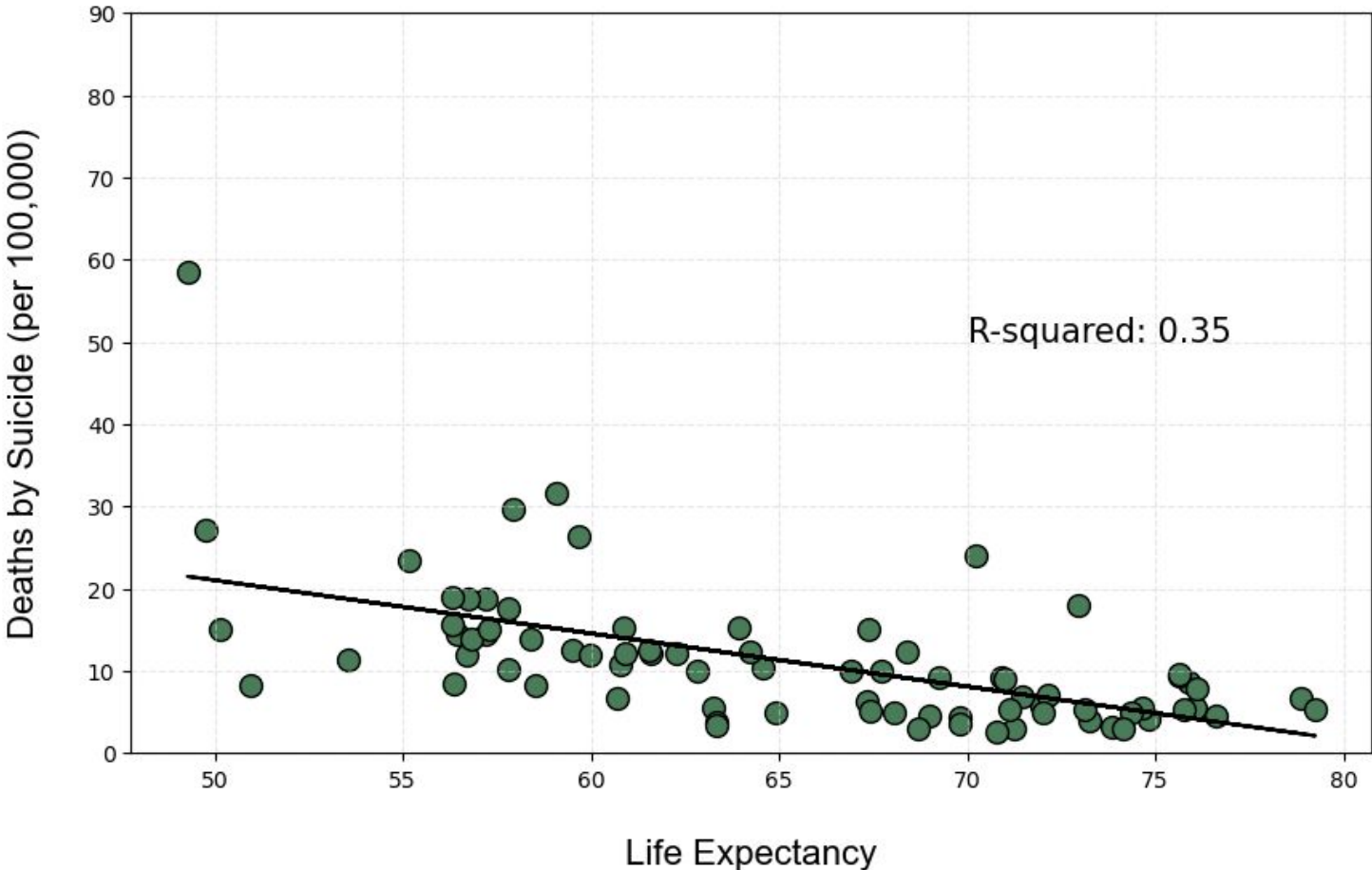
Data Cleaning

- We started with is a csv file (from Kaggle) containing life expectancy data from 79 countries from 2002 to 2019.
- Our data did not have missing values.
- Our data did not have misaligned data types
- We cut out extraneous columns from the original dataset; i.e., we omitted the columns that we did not use during our data exploration. These columns were:
Polio incidence, tuberculosis deaths, tuberculosis incidence, malaria deaths, malaria incidence, alcohol deaths, cardiovascular disease incidence, cardiovascular disease deaths, and undernourishment.
- We renamed the columns using a list comprehension that changed spaces to underscores, and capital letters to lowercase letters (Life expectancy → life_expectancy).

Life Expectancy Data Set

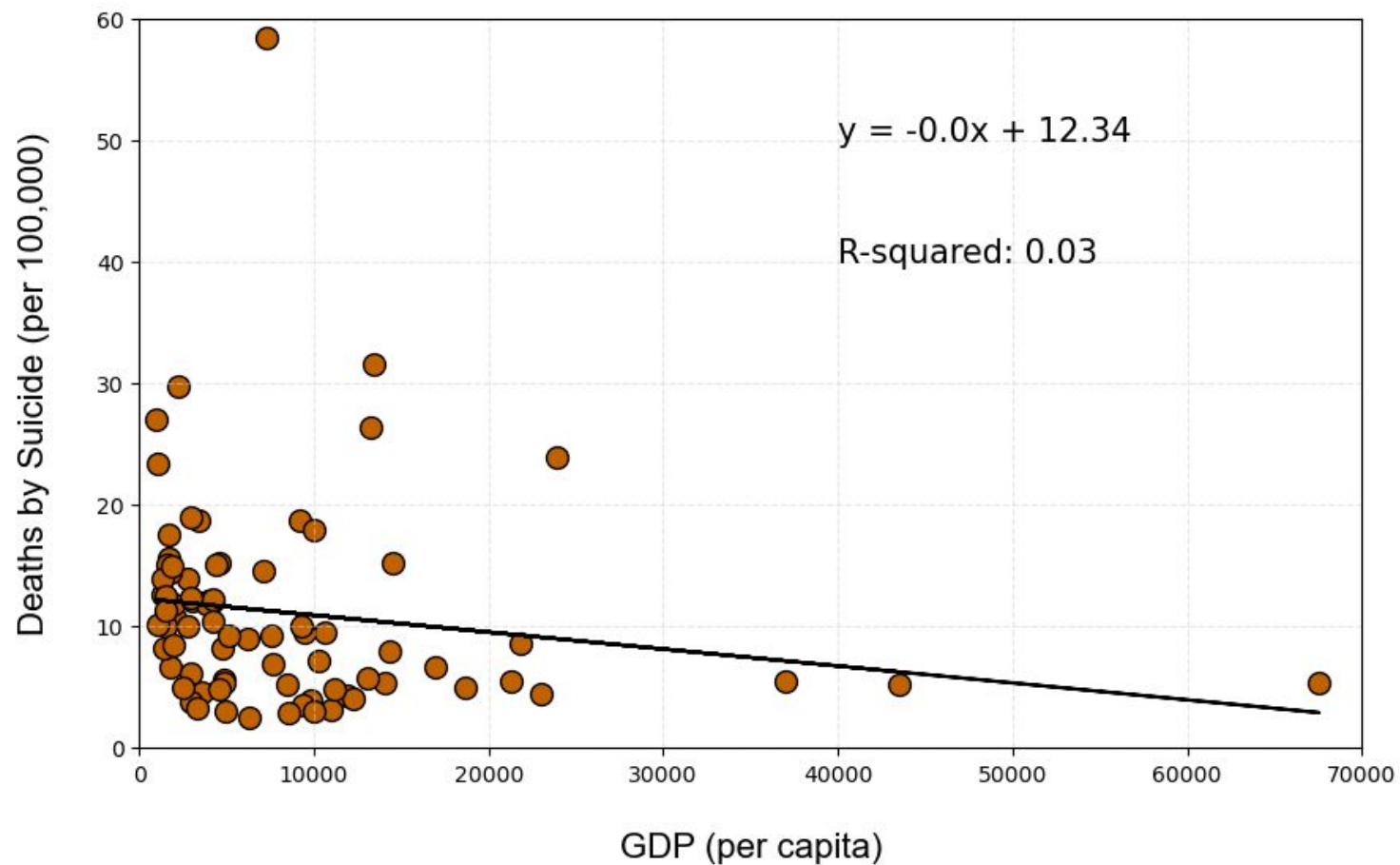


Deaths by Suicide vs Life Expectancy

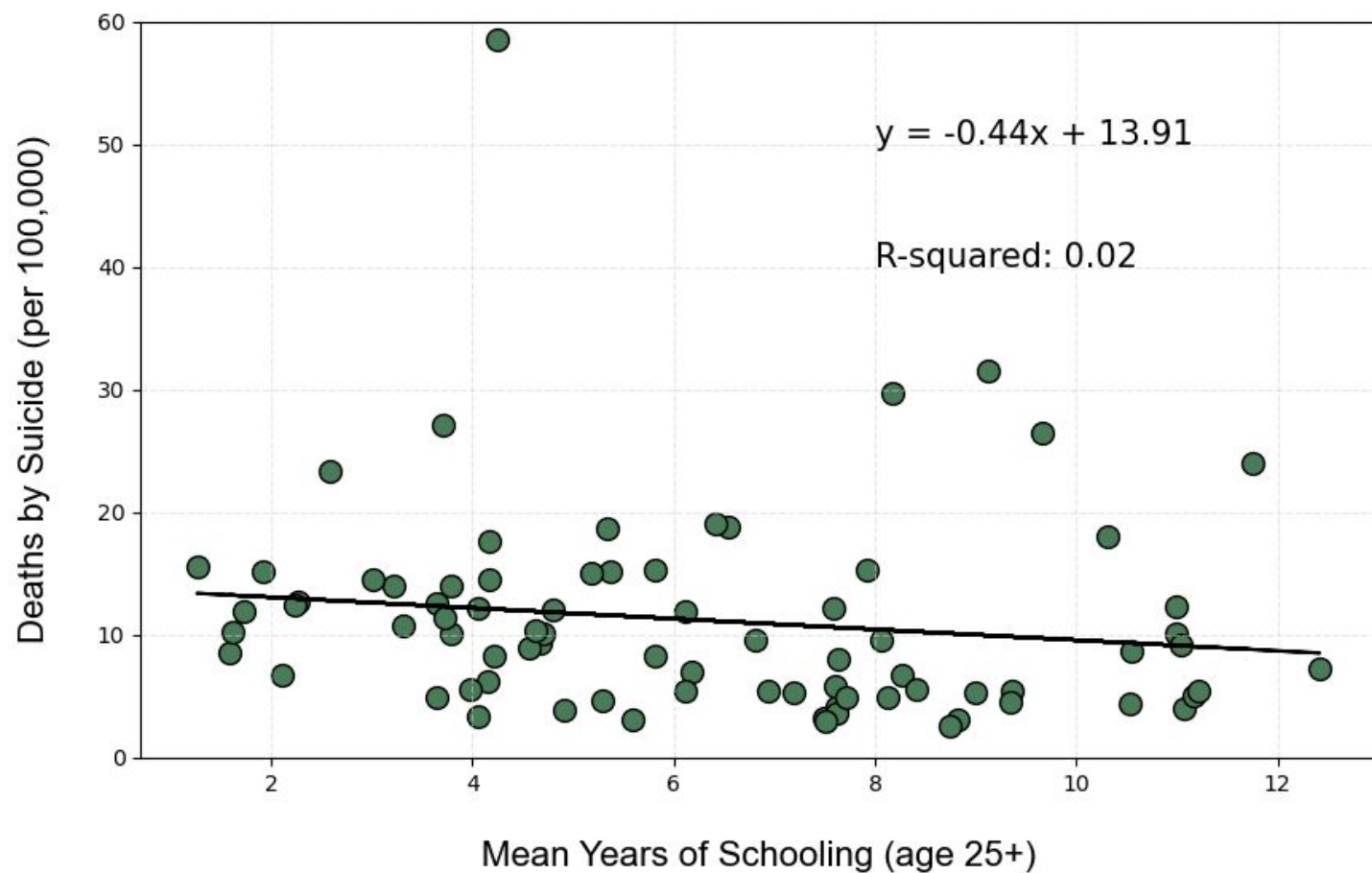


- **Is there a relationship between deaths by suicide and Gross Domestic Product (GDP)?**
- **Is there a relationship between deaths by suicide and mean years of schooling?**

Deaths by Suicide vs GDP



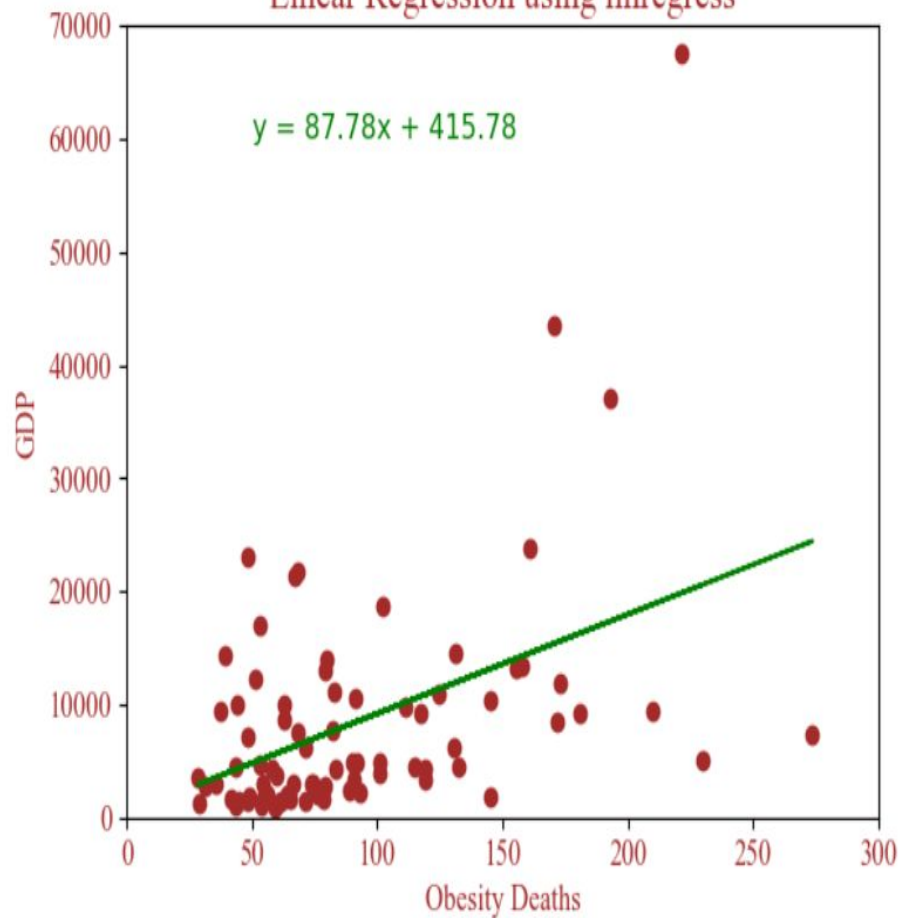
Deaths by Suicide vs Mean Years of Schooling



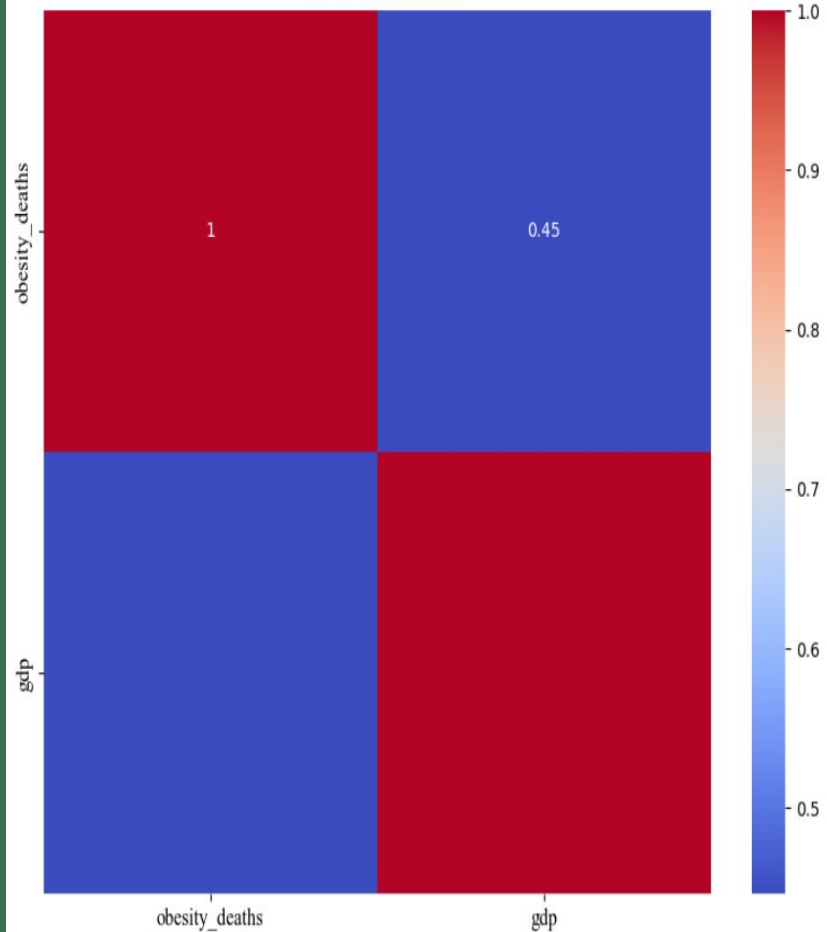
Is there any correlation between a country's obesity death rate and their GDP?



Linear Regression using linregress

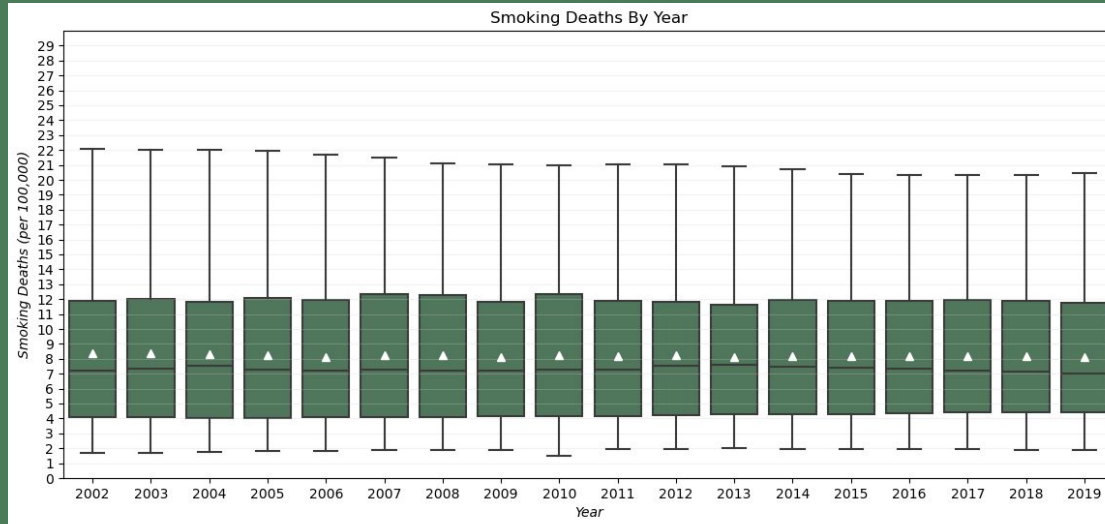


Correlation Matrix



Is there a relationship between life expectancy and smoking deaths?

To answer that: we have to narrow things down from 18 years worth of data points for each country.



There is a slight trend over the entire dataset but it does not hold up upon individual inspection.

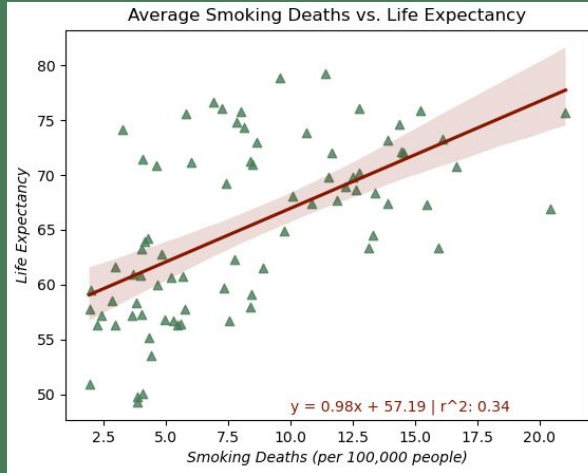
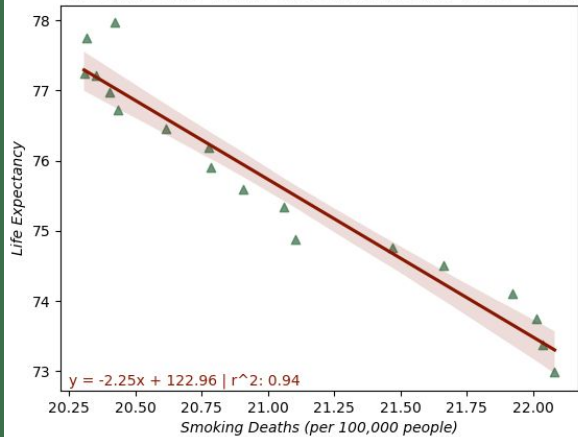
Entire Dataset

Top 5

Smoking Deaths (per 100,000 people)

Country	
China	21.04
Nepal	20.42
Philippines	16.65
Armenia	16.11
Myanmar	15.95

Smoking Deaths vs. Life Expectancy in China (2002 - 2019)



For certain countries: this relationship is strong.

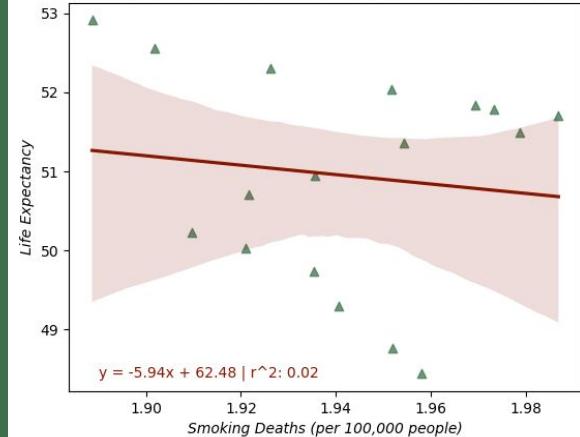
However, this correlation falls apart when looking at other countries.

Bottom 5

Smoking Deaths (per 100,000 people)

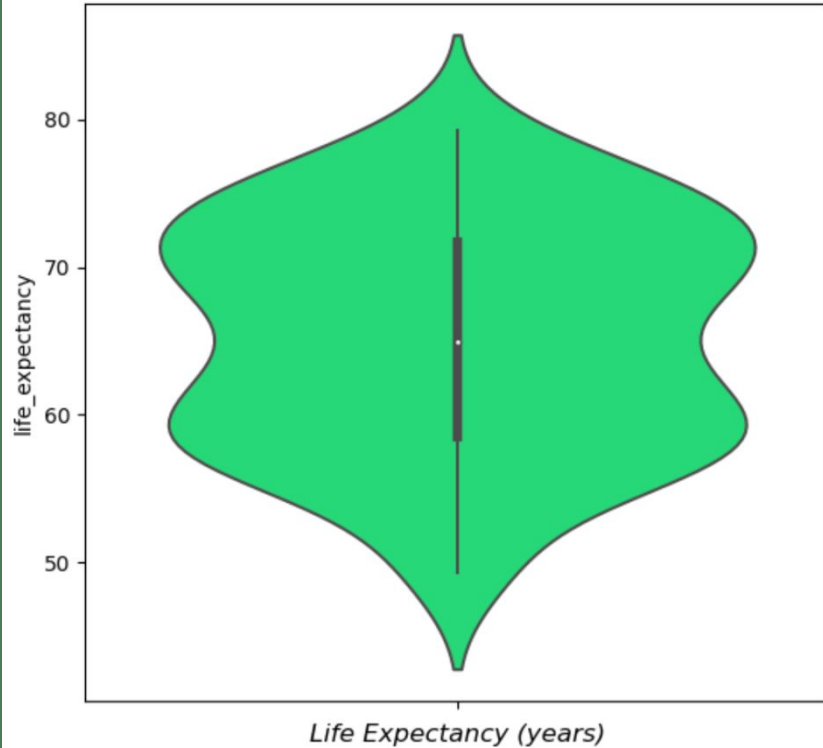
Country	
Nigeria	1.94
Niger	1.96
Ethiopia	2.02
Burkina Faso	2.25
Guinea-Bissau	2.44

Smoking Deaths vs. Life Expectancy in Nigeria (2002 - 2019)



What is the relationship between life expectancy and government health expenditure?

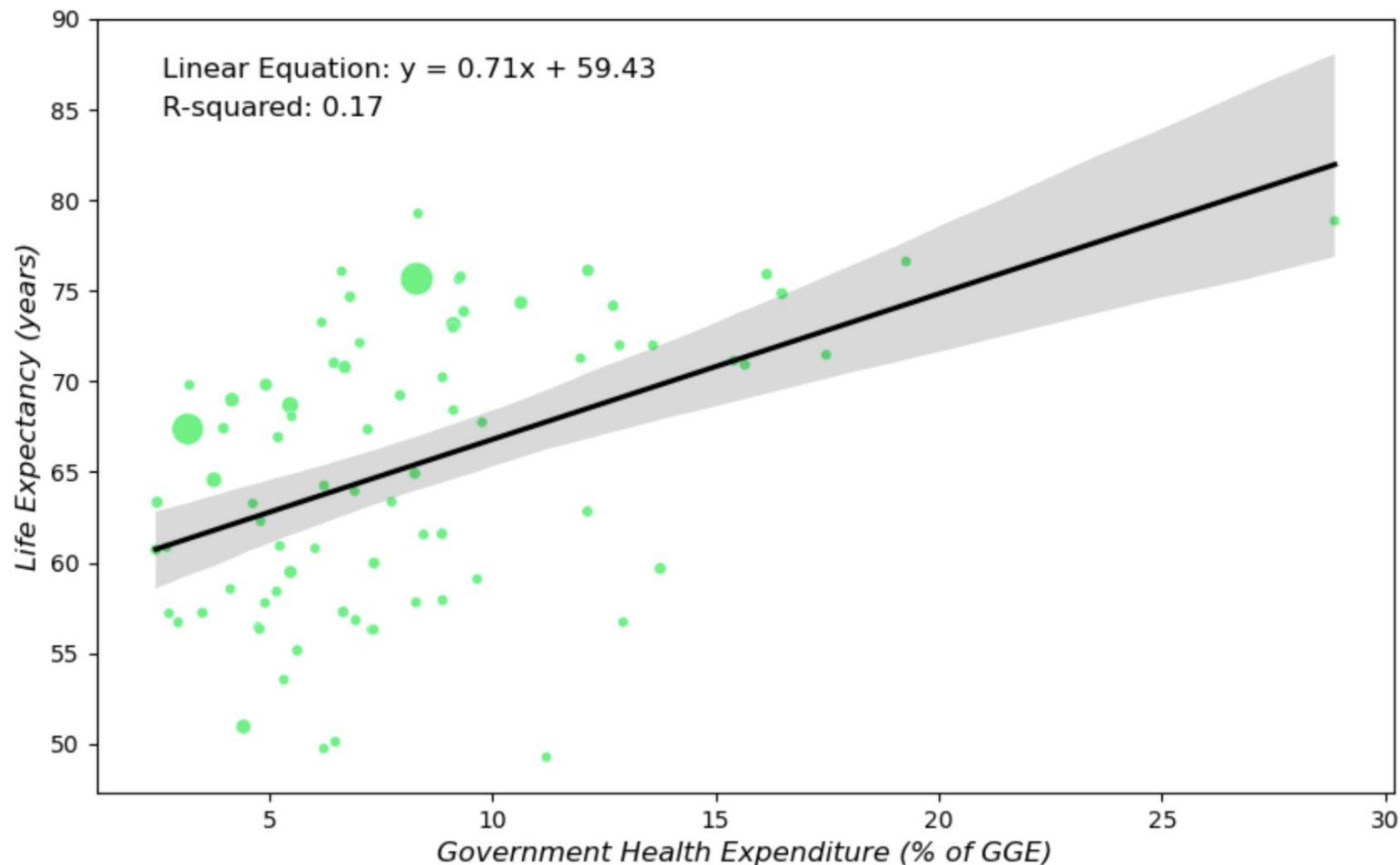
Violin Plot of Life Expectancy



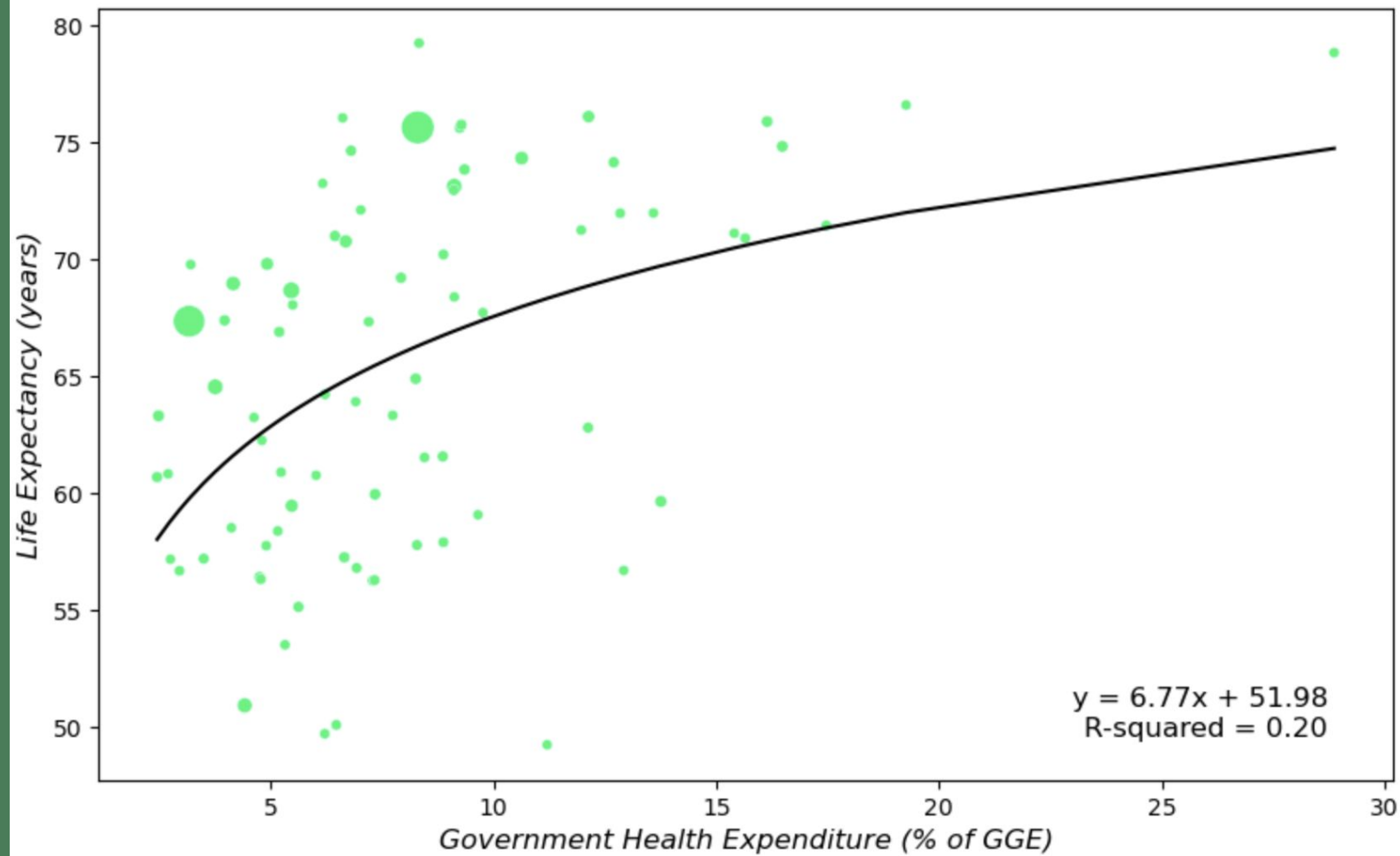
Violin Plot of Government Health Expenditure



Life Expectancy vs. Government Health Expenditure (Bubble Size = Population)



Life Expectancy vs. Government Health Expenditure

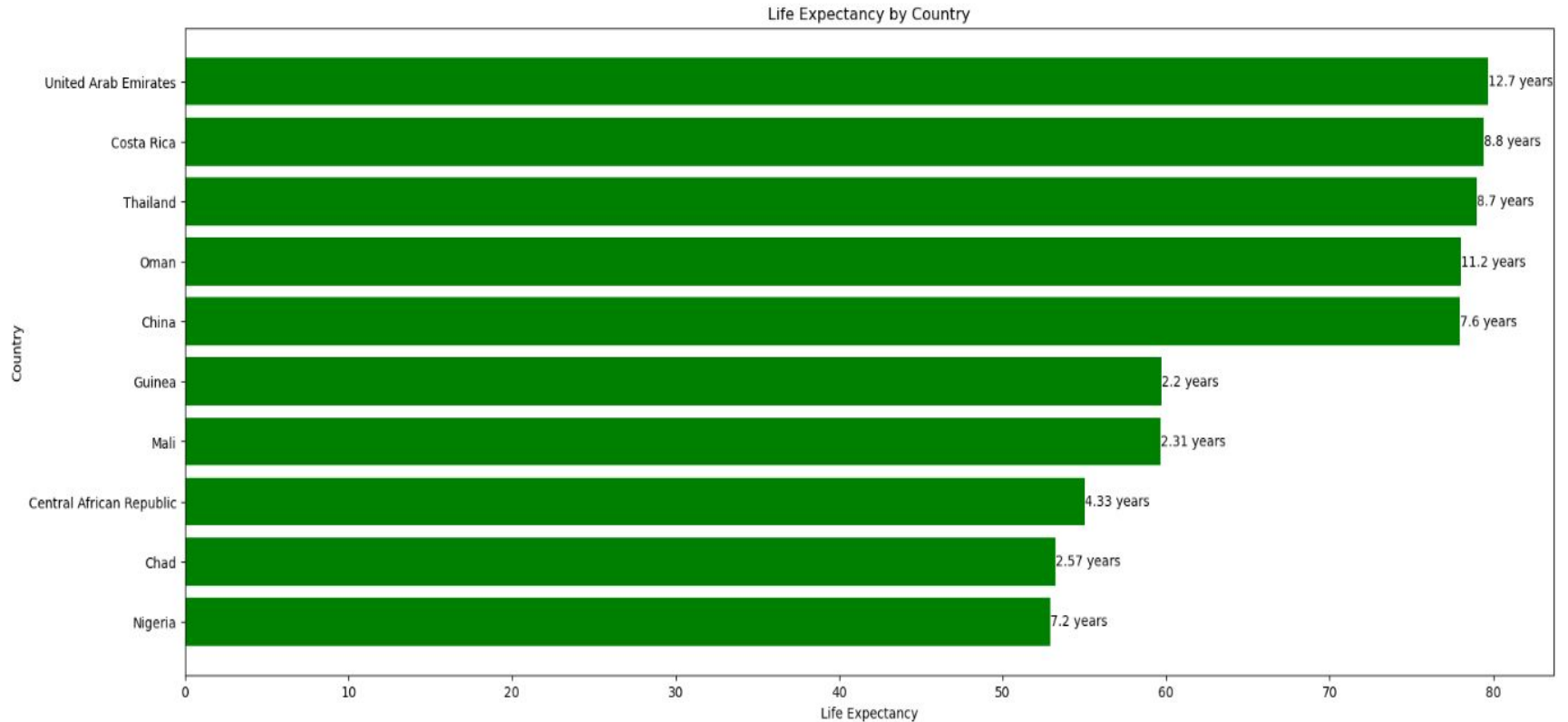


Does schooling impact life expectancy?



	Country	Life Expectancy	Mean Years of Schooling
5	United Arab Emirates	79.7000	12.70
6	Costa Rica	79.4000	8.80
7	Thailand	78.9800	8.70
8	Oman	78.0000	11.20
9	China	77.9680	7.60
4	Guinea	59.7199	2.20
3	Mali	59.6600	2.31
2	Central African Republic	55.0253	4.33
1	Chad	53.2600	2.57
0	Nigeria	52.9000	7.20

Looking deeper into the numbers.



Changes over time and future expectations

Life Expectancy and Schooling Over Time



Call to Action

Start to look at the diverse aspects of life and guide your choices that can lead to a longer life.

Bias and Limitations

- **Data covers 2002 - 2019, so it's not the most recent and might be missing larger trends over a longer time period**
- **Geographic coverage, some countries could have limited data, or not be included at all (only 79 countries included)**
- **Is grouped into categories that do not account for the differences in sex, race, ethnicity, religion, age, employment status or political violence.**

Future Work

- Merge existing datasets or collect additional data related to sex, age, race, ethnicity, religion, etc. to see what relationships we can find with more specific data.

Works Cited

Bezy, Judith Marie. "life expectancy". *Encyclopedia Britannica*, 31 May. 2024, <https://www.britannica.com/science/life-expectancy>. Accessed 9 June 2024.

Bowman, Phil. "Life Expectancy: Exploratory Data Analysis." Kaggle, 2022, <https://www.kaggle.com/code/philbowman212/life-expectancy-exploratory-data-analysis/notebook>. Accessed 9 June 2024.

Khazaei, Salman et al. "Suicide rate in relation to the Human Development Index and other health related factors: A global ecological study from 91 countries." *Journal of epidemiology and global health* vol. 7,2 (2017): 131-134. doi:10.1016/j.jegh.2016.12.002

Meda N, Miola A, Slongo I, Zordan MA, Sambataro F. The impact of macroeconomic factors on suicide in 175 countries over 27 years. *Suicide Life Threat Behav.* 2022 Feb;52(1):49-58. doi: 10.1111/sltb.12773. Epub 2021 May 25. PMID: 34032310; PMCID: PMC9292781.

OpenAI. "ChatGPT." ChatGPT, OpenAI, 2024, <https://chat.openai.com/>. Accessed 2 June 2024 - 9 June 2024.

Q & A