Worldwide Analysis of Impact of Lifestyle Diseases towards Life Expectancy

Analysis of World Health Data for Lifestyle Diseases over a decade and its Impact on Life Expectancy and Probability of Death.

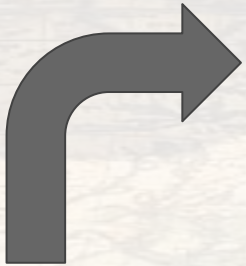
Gabriel Kunkel
Poonam Tashildar
Joyita Roy

What the Project is About

Hypothesis: The levels of tobacco and alcohol use in a population will be visibly correlated with the probability of an early death due to lifestyle diseases such as cancer, cardiovascular disease and diabetes.

We attempted to determine a global relationship over a span of 15 years.

Lifestyle Diseases



CAD/CVD - Coronary Artery Disease/Cardiovascular Disease

Diabetes - Body's Blood Glucose Level is abnormally high

Carcinoma - Cancer (abnormal cell division and invasion into nearby tissues)

Indicators:

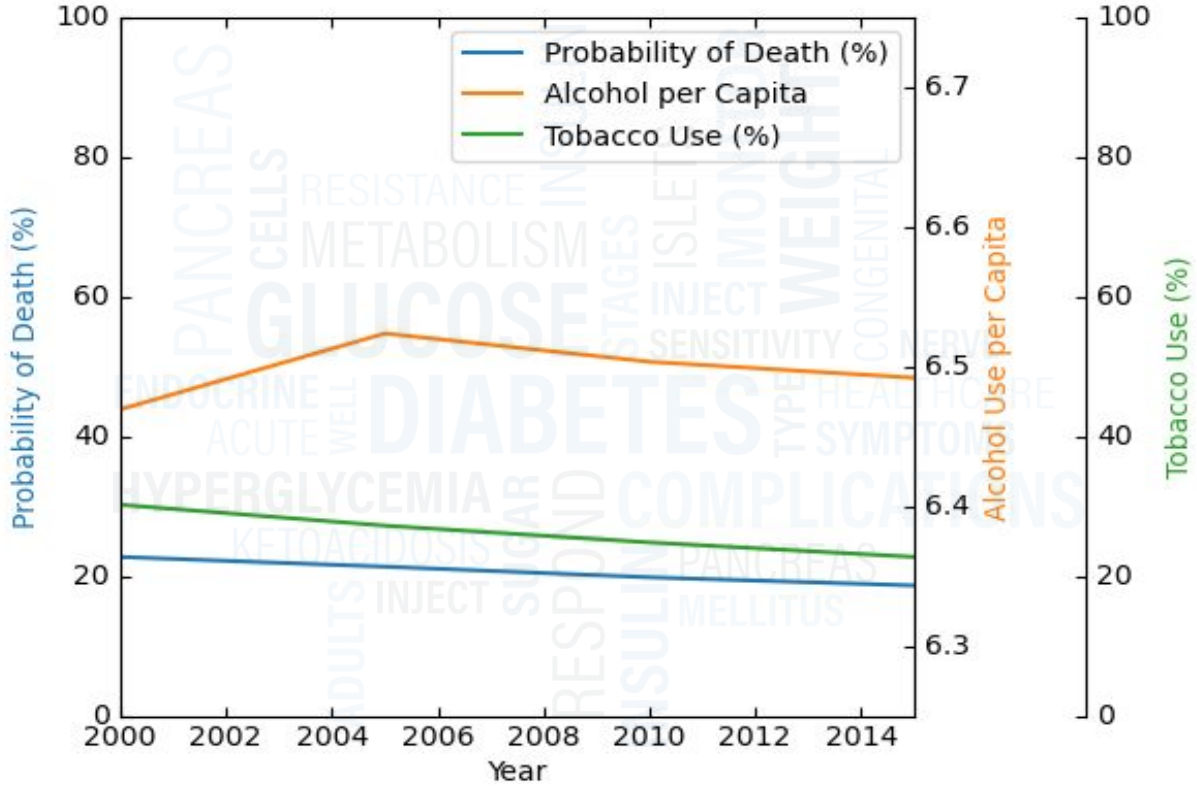
Here, we are using “Probability of Death (%)” to refer to:

“Percent of 30-year-old-people who would die before their 70th birthday from any of cardiovascular disease, cancer, diabetes, or chronic respiratory disease, assuming that s/he would experience current mortality rates at every age and s/he would not die from any other cause of death (e.g., injuries or HIV/AIDS)”

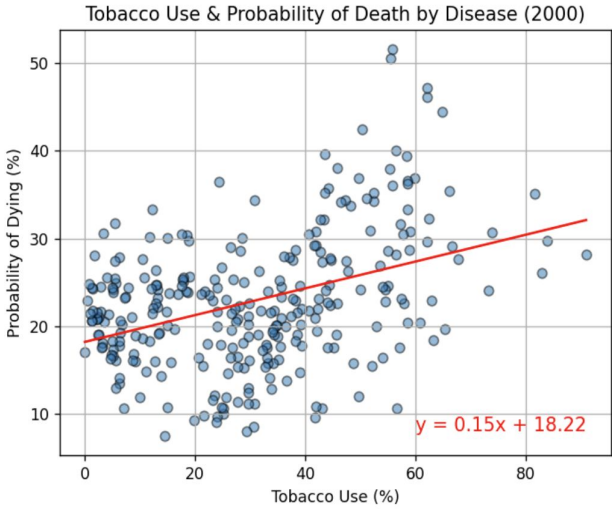
-World Health Organization

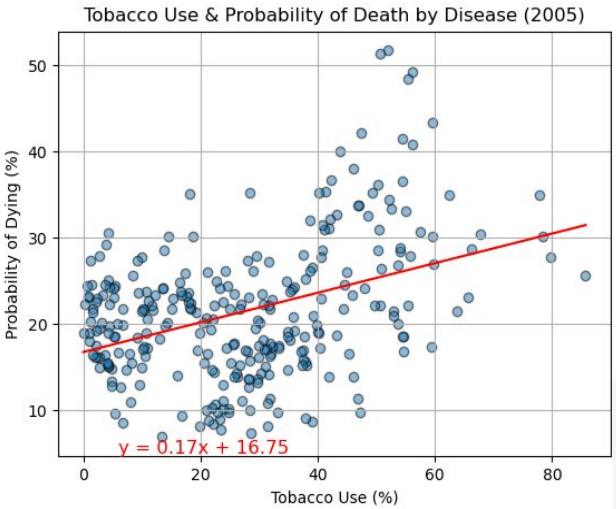
Tobacco Use	Tobacco use is one of the leading cause of preventable disease, disability, and death.	**Method of measurement :** Recorded Tobacco per capita (15+) **Unit of Measure :** Amount of use per person per year.
Alcohol Use	Alcohol Use is directly associated with High blood pressure, heart disease, stroke, liver disease	**Method of measurement :** Recorded alcohol per capita (15+) **Unit of Measure :** Litres of pure alcohol per person per year.
HALE	Healthy Life Expectancy	**HALE** refers to an estimate or an average number of years a person can expect to **live**.

Global year-wise probability of death (cancer, cardiovascular disease, diabetes) and alcohol/tobacco use for 2000, 2005, 2010, 2015



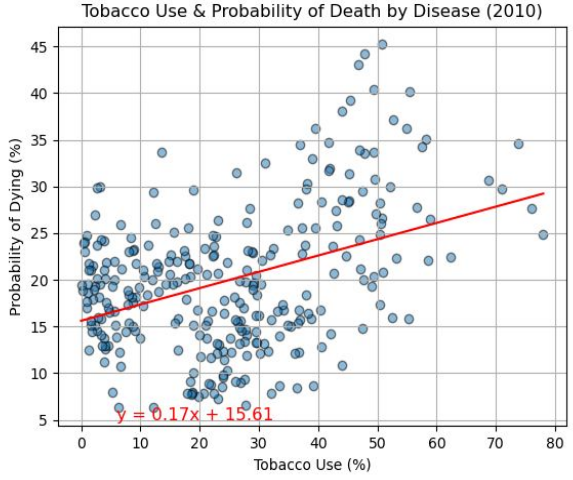
Tobacco use shows a direct correlation, Coefficient of 0.4 with the probability of death and 40% higher chance to get affected by these lifestyle diseases.

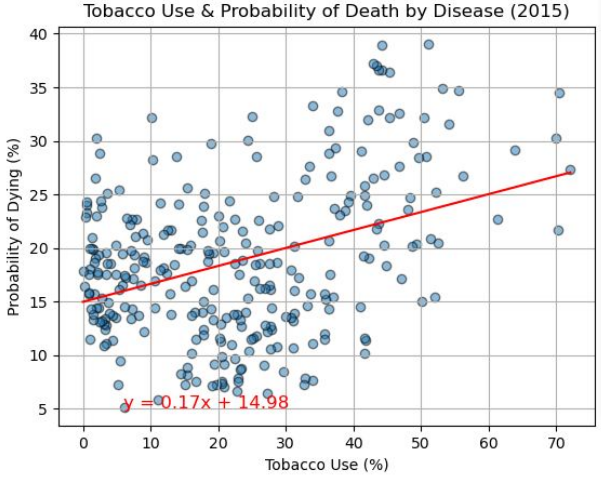




Tobacco Use vs. Probability of Death (%) (2000 - 2015)

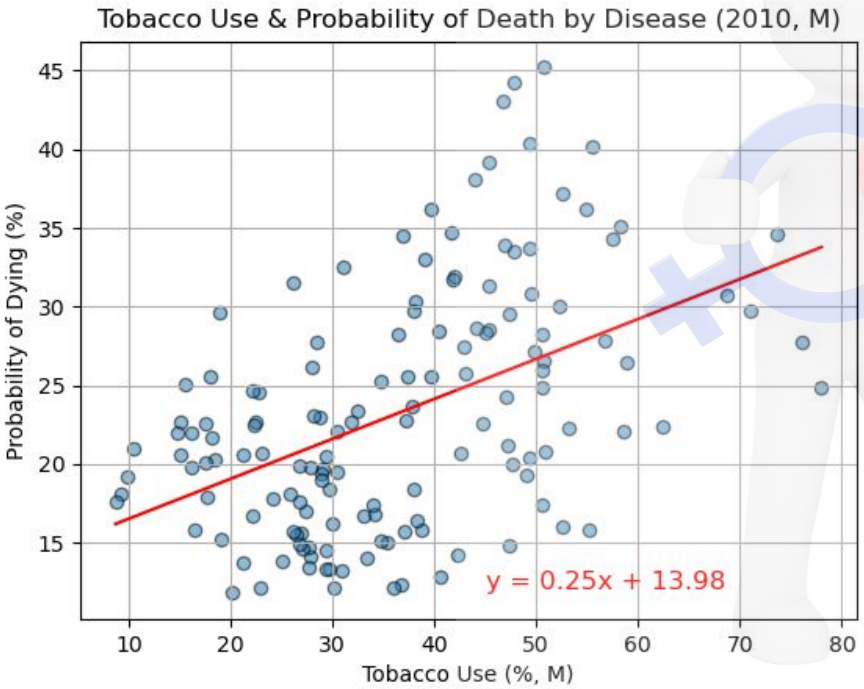
Correlation coeff.: 0.39 to 0.40

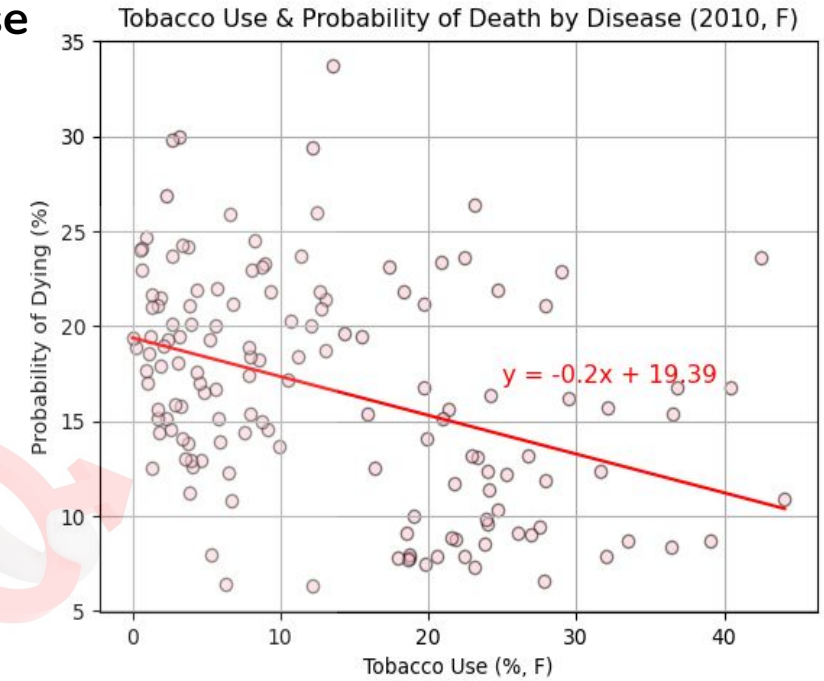




Gender-wise distribution of Tobacco use and Probability of Death

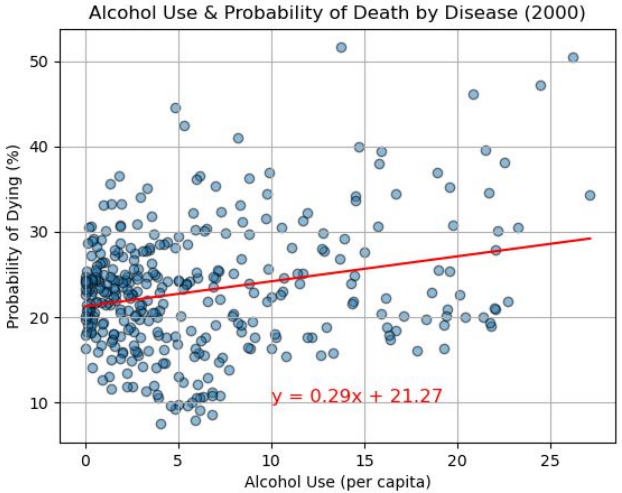
Correlation coeff. = 0.48

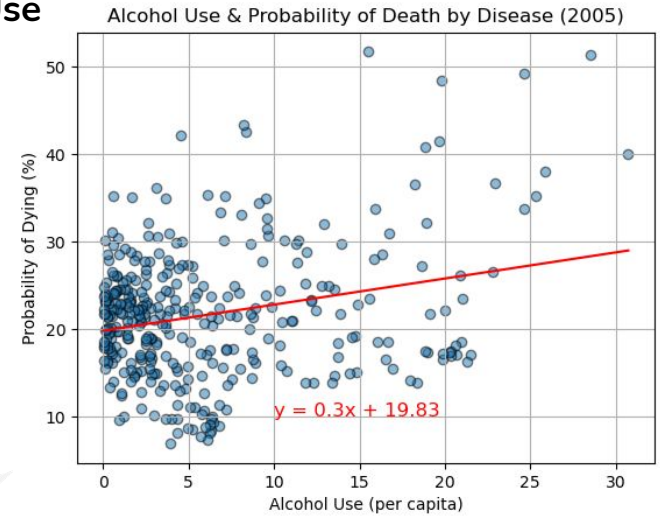


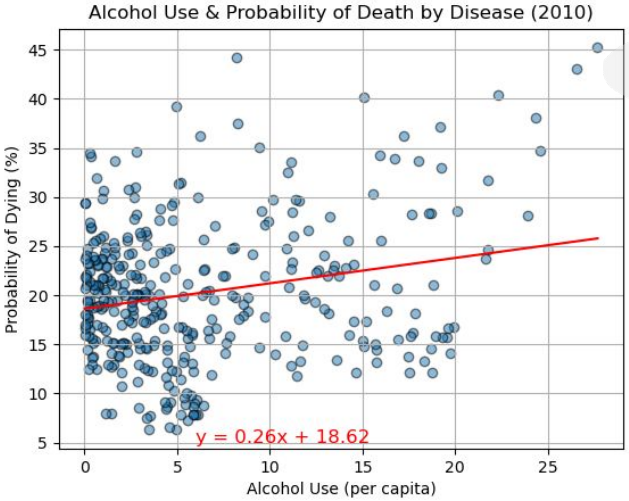


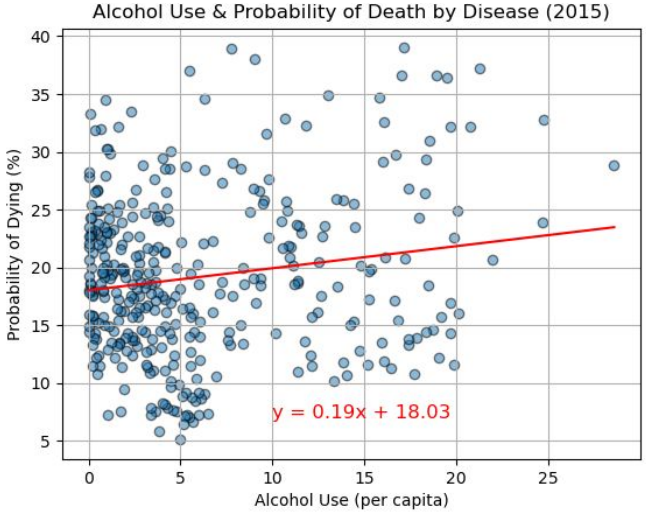
Correlation coeff. = -0.38

Year wise trend for Alcohol Use & Probability of Death





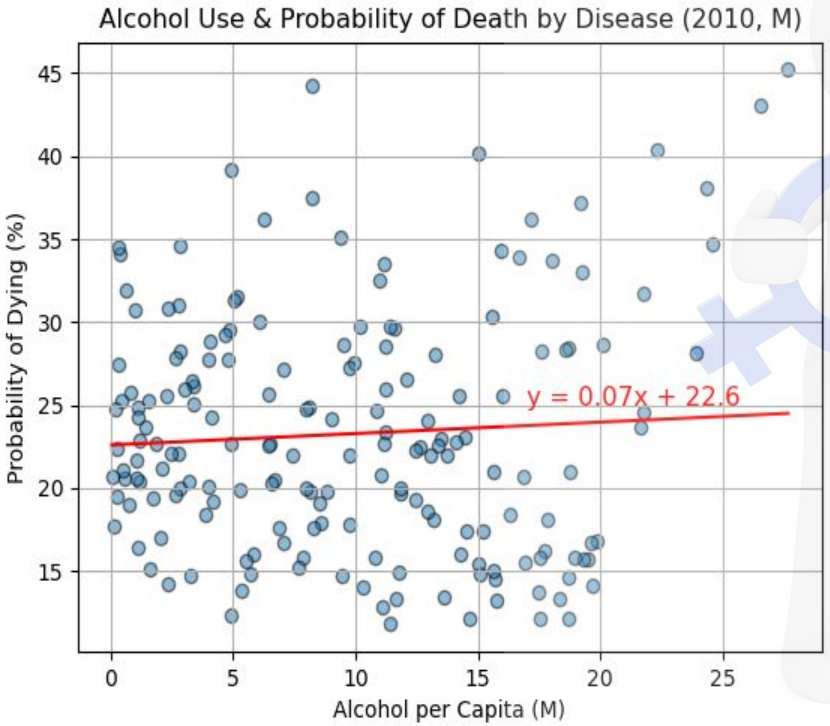


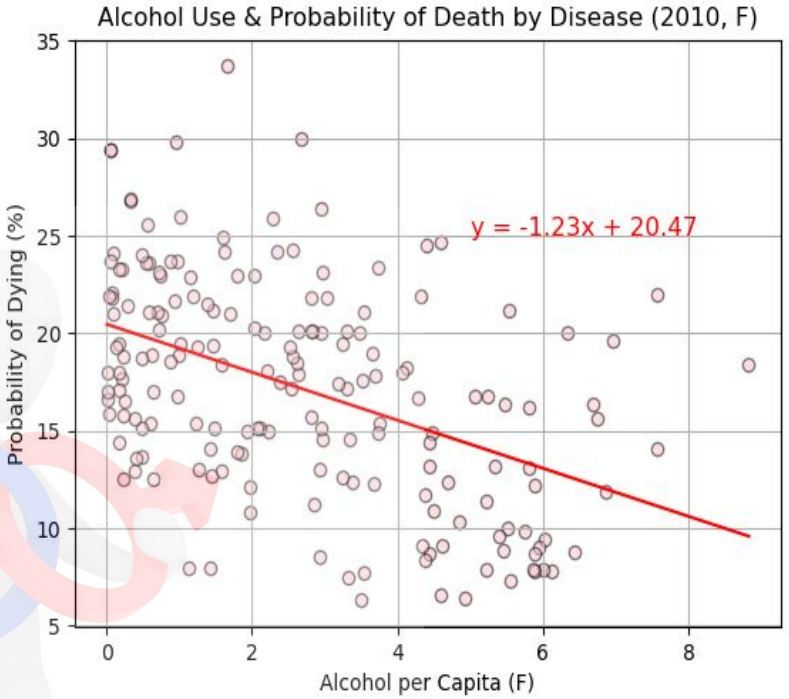


Correlation coeff.: 0.22 to 0.25

Gender-wise distribution of Alcohol Use and Probability of Death

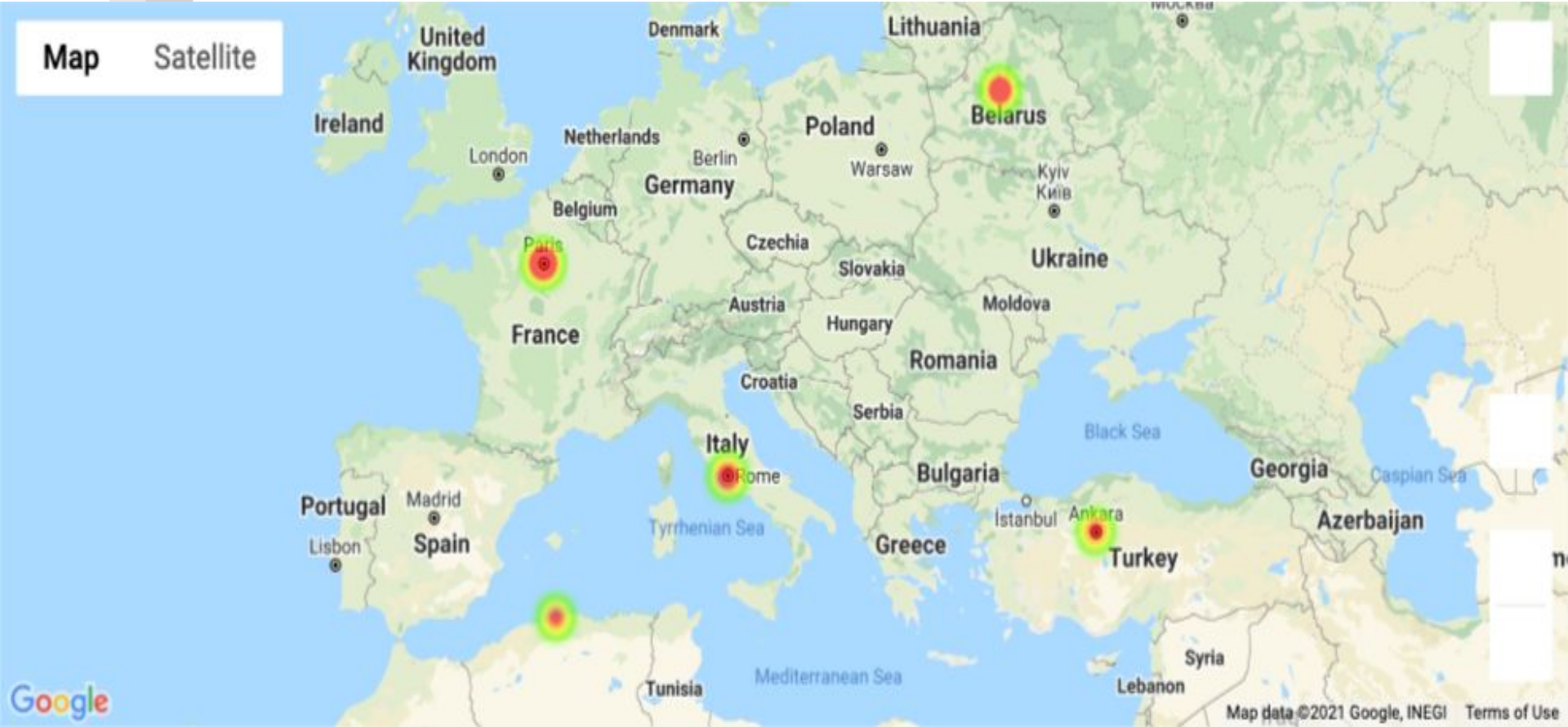
Correlation coeff. = 0.06

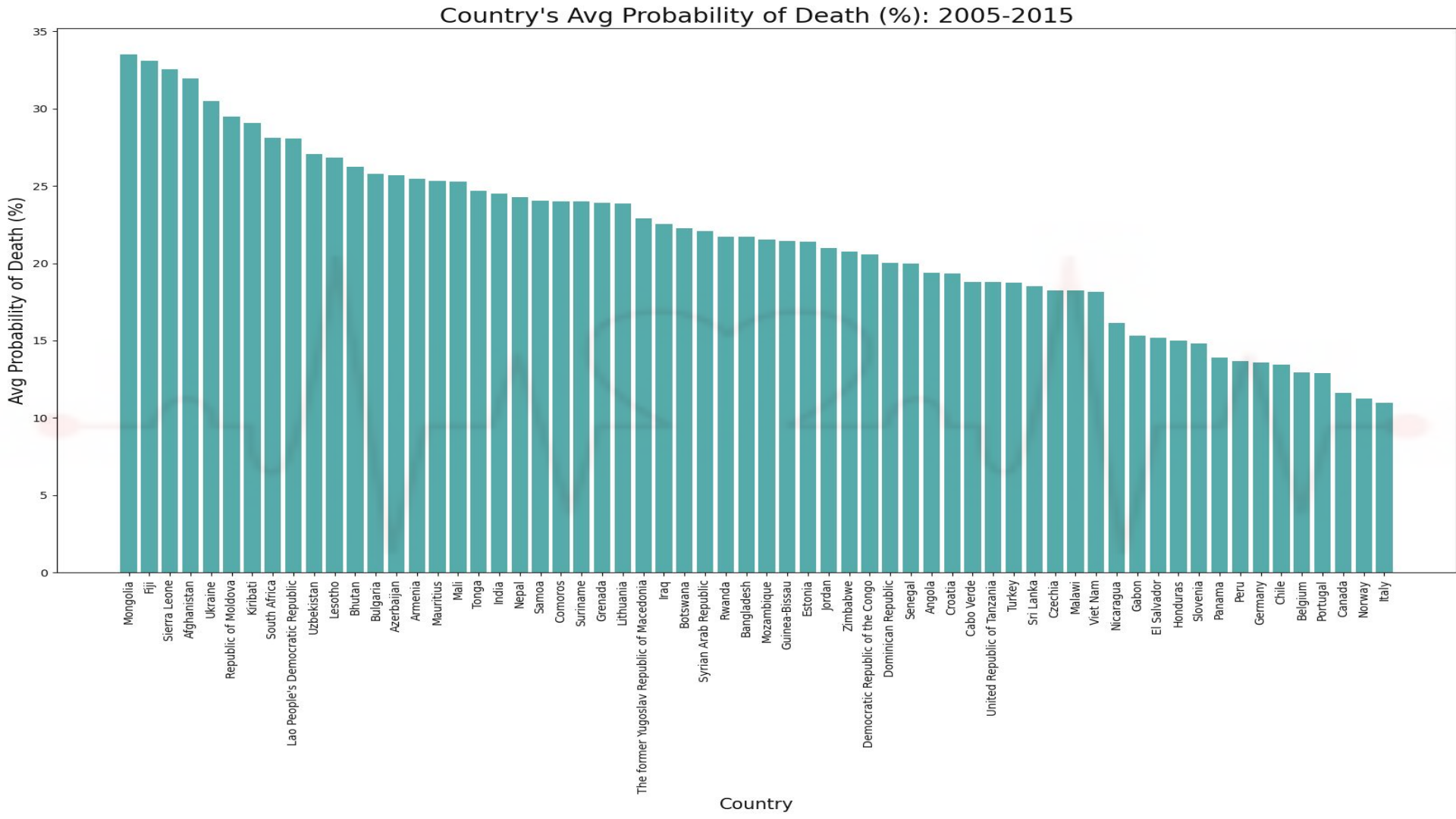




Correlation coeff. = -0.46

Probability of Death (%) in Sample Countries



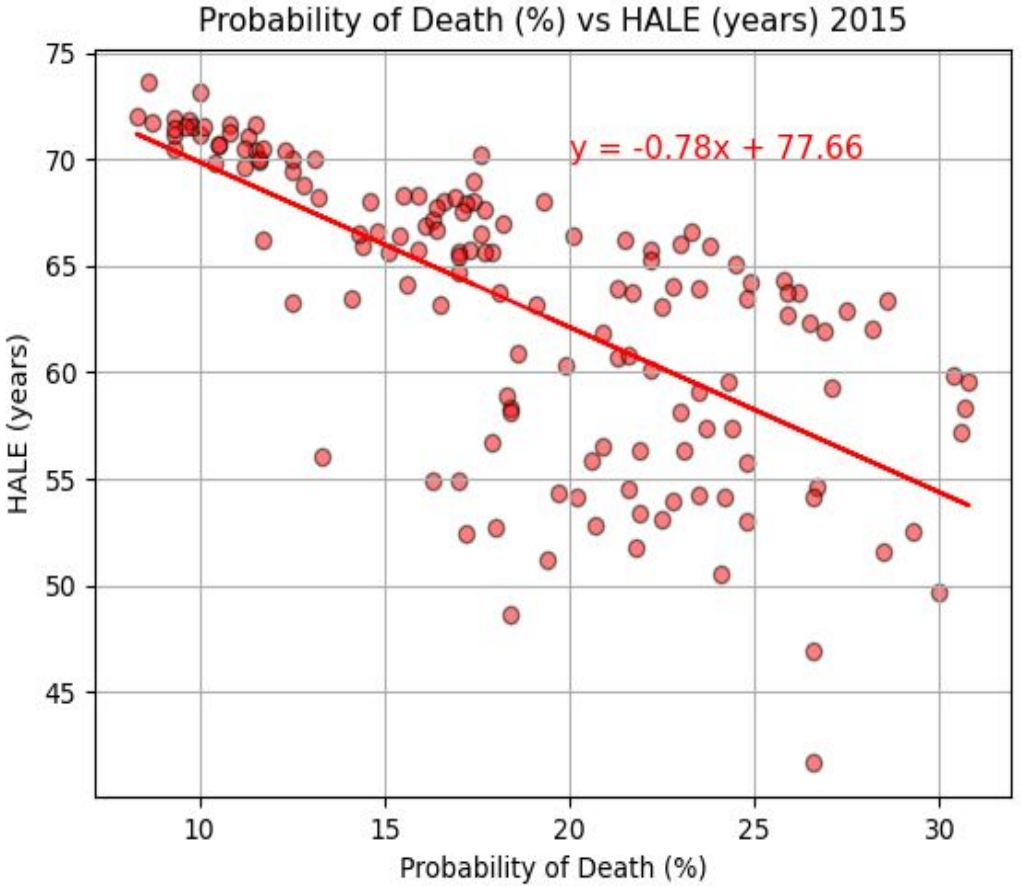

Country's Avg Probability of Death (%): 2005-2015
Avg Probability of Death (%)
0
5
10
15
20
25
30
35
Mongolia
Fiji
Sierra Leone
Afghanistan
Ukraine
Republic of Moldova
Kiribati
South Africa
Lao People's Democratic Republic
Uzbekistan
Lesotho
Bhutan
Bulgaria
Azerbaijan
Armenia
Mauritius
Mali
Tonga
India
Nepal
Samoa
Comoros
Suriname
Grenada
Lithuania
The former Yugoslav Republic of Macedonia
Iraq
Botswana
Syrian Arab Republic
Rwanda
Bangladesh
Mozambique
Guinea-Bissau
Estonia
Jordan
Zimbabwe
Democratic Republic of the Congo
Dominican Republic
Senegal
Angola
Croatia
Cabo Verde
United Republic of Tanzania
Turkey
Sri Lanka
Czechia
Malawi
Viet Nam
Nicaragua
Gabon
El Salvador
Honduras
Slovenia
Panama
Peru
Germany
Chile
Belgium
Portugal
Canada
Norway
Italy
Country

Probability of Death vs. Healthy Life Expectancy

Correlation coeff. = -0.68

This graph depicts a negative correlation between Probability of Death and HALE

- Supports the idea that avoiding preventable lifestyle diseases improves healthy life expectancy

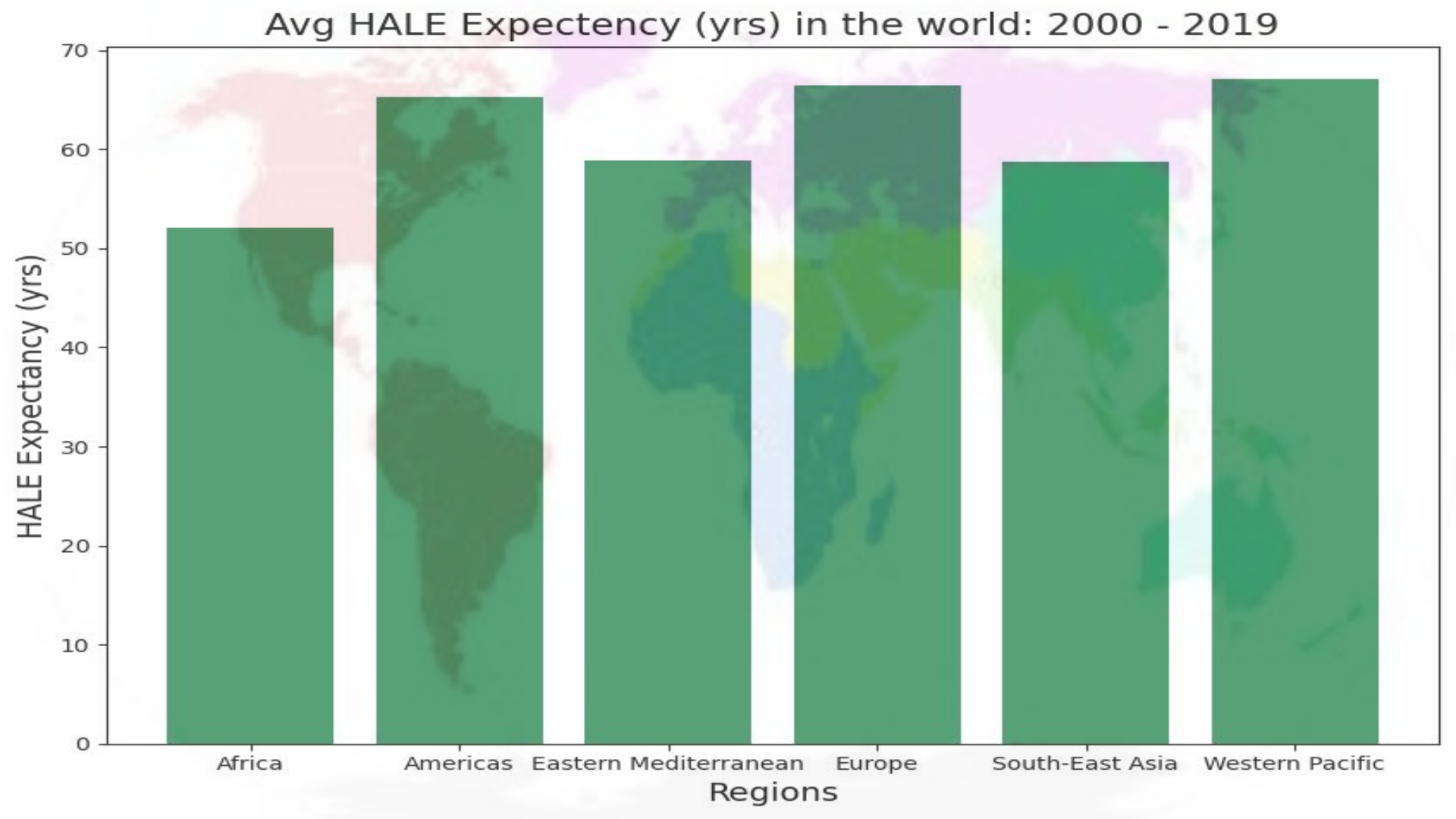


HALE Observation

Healthy life expectancy displays a strong negative correlation (coeff. = -0.68) with probability of death caused by lifestyle diseases.

The encouraging news is that between 2000 and 2016, HALE increased globally by 8% from 59 years to 63.

HALE for USA: **78.9 years.**


Avg HALE Expectency (yrs) in the world: 2000 - 2019
HALE Expectancy (yrs)
70
60
50
40
30
20
10
0
Africa
Americas
Eastern Mediterranean
Europe
South-East Asia
Western Pacific
Regions

Conclusions

There is a very weak correlation between alcohol use and probability of death (both genders).

1. Large discrepancies in correlation coefficients emerged when grouping alcohol and tobacco data by gender
2.
3. HALE has a directly negative correlation with the prevalence of lifestyle diseases

The COVID-19 pandemic has underscored the need for global cooperation to improve population health.

As COVID has put the population in the back foot with increased level of anxiety and stress, potentially leading to increased use of alcohol and tobacco use. In our analysis we were able to conclude that less use of tobacco and alcohol has the potential to increase the healthy life expectancy for an individual.

Let's go to HALE

Source of our Data :

https://www.kaggle.com/

World Health Statistics 2020 | Complete | Geo-Analysis

CSV files:

- 30-70cancerChdEtc.csv
- HALElifeExpectancyAtBirth.csv
- TobaccoAge15.csv
- alcoholSubstanceAbuse.csv