

# Predictors of Life Expectancy at the Country Level

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## ABSTRACT

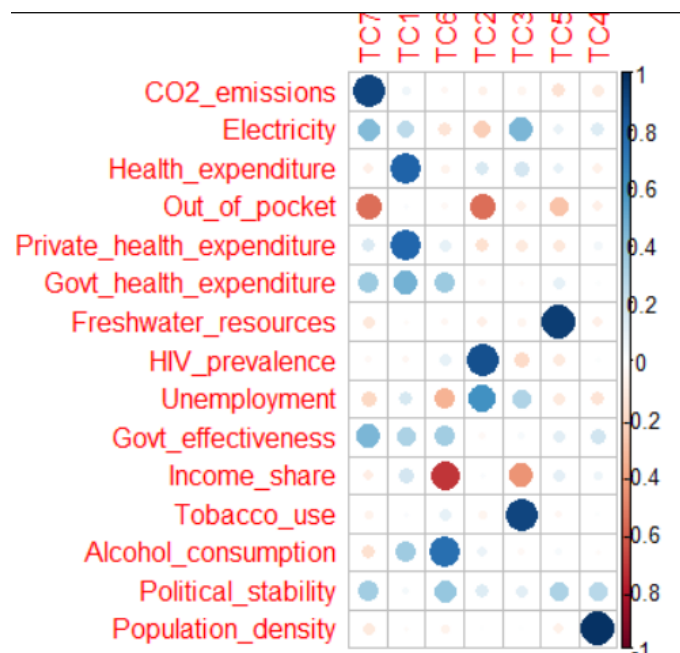
### Introduction:

Life expectancy, a key non-monetary indicator, gauges a nation's population health. Analyzing life expectancy data is crucial for shaping healthcare policies, allocating public resources, and identifying healthcare disparities among countries. Our research aimed to identify socioeconomic and cultural predictors of life expectancy worldwide.

### Methods:

We extracted country-level data from the World Bank DataBank from 2019, encompassing sixteen indicators across 217 countries. This dataset, comprised of World Development Indicators (WDI), was chosen for its global coverage, its inclusion of life expectancy data, and healthcare indicators. Although the data extended to 2022, we opted for 2019 to ensure consistency across all variables.

In analyzing factors, we created a seven-factor model based on eigenvalues from the correlation matrix. This was an average of Kaiser's and Jolliffe's criterion, suggesting five and eight factors respectively. Using principal component analysis, we found that an oblique rotation to our seven-factor loading matrix was necessary since there was covariability among several of our factors.



We retained single-dimensional factors as variables including CO2 Emissions, Freshwater Resources, Tobacco Use, and Population Density. We also had several complex dimensions including Government Health Expenditure, Political Stability, Out-of-pocket cost, Electricity Access, Unemployment, Income Inequality, and Alcohol Consumption. Our two main factors were named “Healthcare Spending” (comprising of Current Healthcare expenditure and Private Healthcare expenditure) and “Socio-economic health” (comprising of HIV prevalence and Unemployment).

From these seven factors and retained variables we created a structural equation model to examine the complex relationships among them.

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SocioEconomicHealth	-0.138	-1.896
Healthcare_Spending	0.012	0.375
CO2_emissions	-0.021	-0.436
Electricity	0.609	8.383
Govt_health_expenditure	0.169	2.630
Tobacco_use	0.087	1.967
Alcohol_consumption	-0.107	-2.084
Political_stability	0.232	3.063
Freshwater_resources	-0.015	-0.542
Out_of_pocket	-0.203	-3.672
Govt_effectiveness	0.104	1.084

## Results:

Our analysis revealed significant insights into life expectancy predictors. Electricity Access, Political Stability, and Government Healthcare Expenditure emerged as significant predictors that had a positive relationship with Life Expectancy. Notably Out-of-pocket cost, and Alcohol Consumption had a significant negative relationship.

In terms of effect size, Electricity Access had the largest substantial effect on Life Expectancy. And interestingly, Out-of-pocket cost had the largest substantial negative effect where for a single unit increase would result in a  $-0.203$  decrease in Life Expectancy.

## Conclusion:

To elevate life expectancy, countries should prioritize key factors such as providing access to reliable electricity and addressing socio-economic health. By investing in health care and reducing out-of-pocket costs for insurance, countries will be able to reduce health disparities.

Through strategic decision making, nations will be able to make effective changes to increase life expectancy.

