



Life Expectancy Across Nations

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Our Data

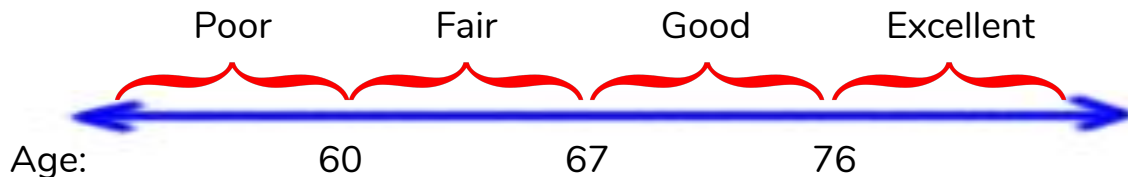
2015

2014

2000

- Collected by the World Health Organization (WHO)
- Information on nations' immunization rates, mortality, economy, and health-related factors
- Average life expectancy for each country → 4 levels

Response Variable:
life_expectancy_cat

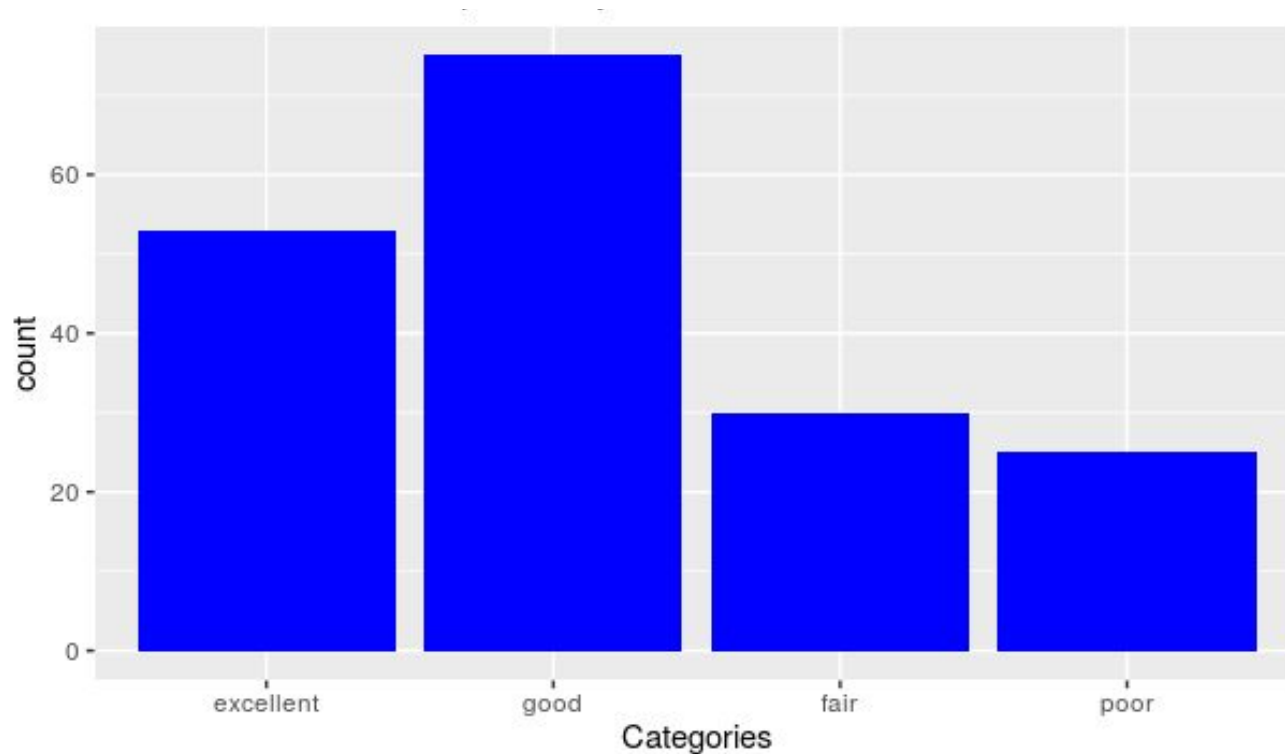


Our Research Question

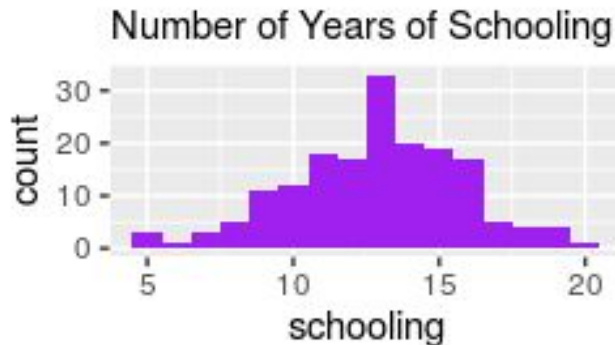
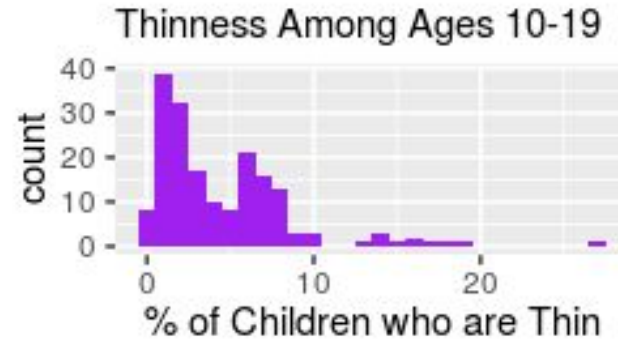
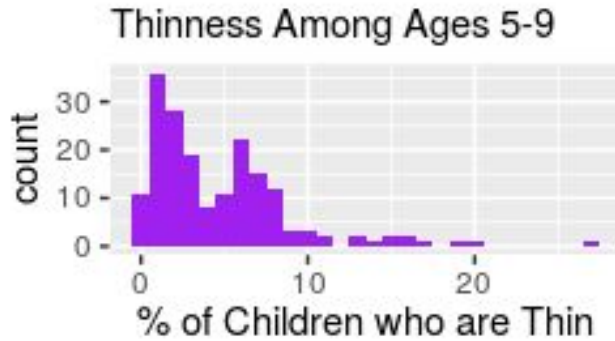
- Our aim was to investigate which country characteristics are the **best predictors** of life expectancy in a given country in the year 2014
- We also explored the potential relationship between the life expectancies of countries classified as "**developed**" versus countries classified as "**developing**"



Our EDA: Distribution of Response

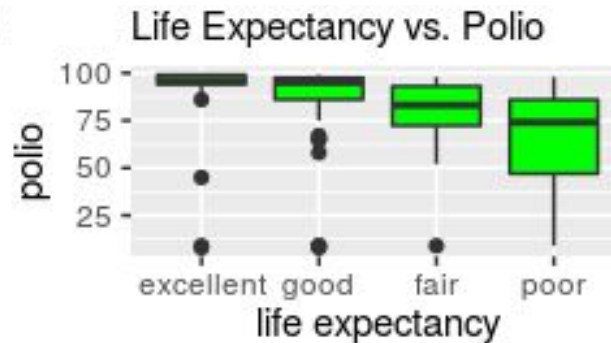
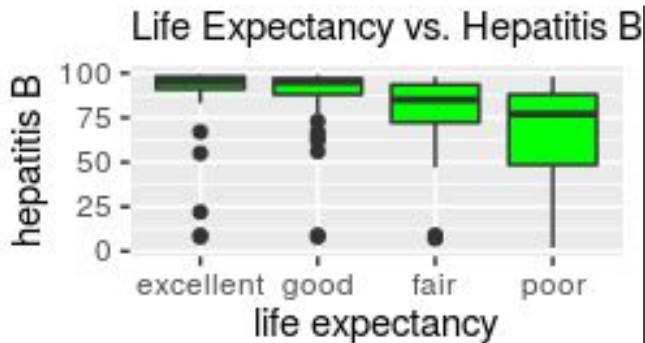


Our EDA: Distributions of Childhood Factors



- Distributions of the two thinness variables very similar
- Thinness_5_9 in final model to represent all childhood thinness
- Schooling roughly symmetrical, mean is 12.89 years

Our EDA: Response vs. Immunizations (%)



- Higher immunization rates, better life expectancy
- Very similar trends between these three variables
- Only Hepatitis B included in final model



Our Model

- Backwards Selection using AIC
- HIV/AIDS x Hepatitis B
 - Likely relationship between diseases, affecting their relationship to life expectancy

life_expectancy_cat <fctr>	excellent <int>	good <int>	fair <int>	poor <int>
excellent	32	7	0	0
good	5	55	1	0
fair	0	0	22	1
poor	0	0	1	20

Misclassification Rate: 10.4%

Best Predictors of Life Expectancy:

Status

Adult Mortality Rate

Alcohol Consumption

Hepatitis B Immunization

Average BMI

Polio Immunization

Total Expenditure on Health

Diphtheria Immunization

Average Schooling

Thinness Ages 10-19

Thinness Ages 5-9

HIV/AIDS Deaths

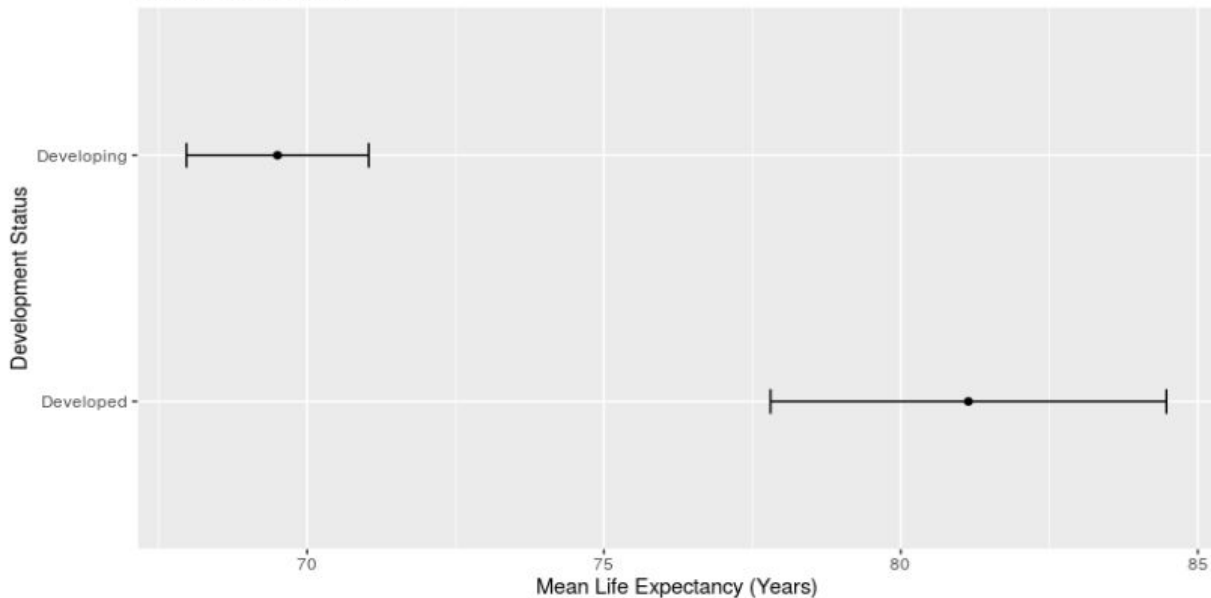
GDP Per Capita



Our Findings

The life expectancy of a developed country is, on average, much higher than that of a developing country.

99% confidence interval for the mean value of life expectancy (years)
by development status



Developing-Developed

estimate	lower	upper
-11.64	-14.87	-8.405



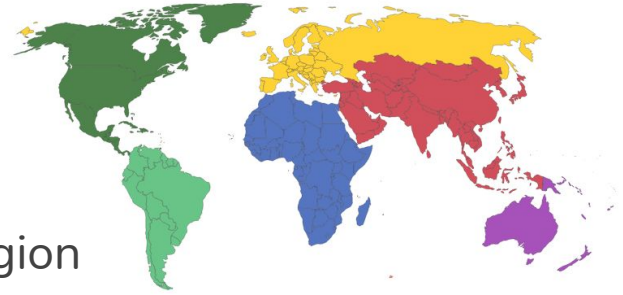
Our Findings

There is a significant interaction between HIV/AIDS and Hepatitis B.

Model	Resid. df	Resid. Dev	Test	Df	LR stat.	Pr(Chi)
hepatitis_b + thinness_5_9 + total_expenditure + hiv_aids + gdp + schooling + adult_mortality + hiv_aids * hepatitis_b	405	87.654		NA	NA	NA
hepatitis_b + thinness_5_9 + gdp + diphtheria + total_expenditure + schooling + adult_mortality + hiv_aids + hiv_aids * hepatitis_b	402	76.889	$\frac{1}{2}$ vs	3	10.764	0.013



Our Findings



- In a subsequent analysis, the variable Region could be created to account for spatial correlation
- Government spending, schooling, and health all affect a country's life expectancy

