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# STAT 579 Project Presentation

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— Human Development Index —  
Pattern Discovery

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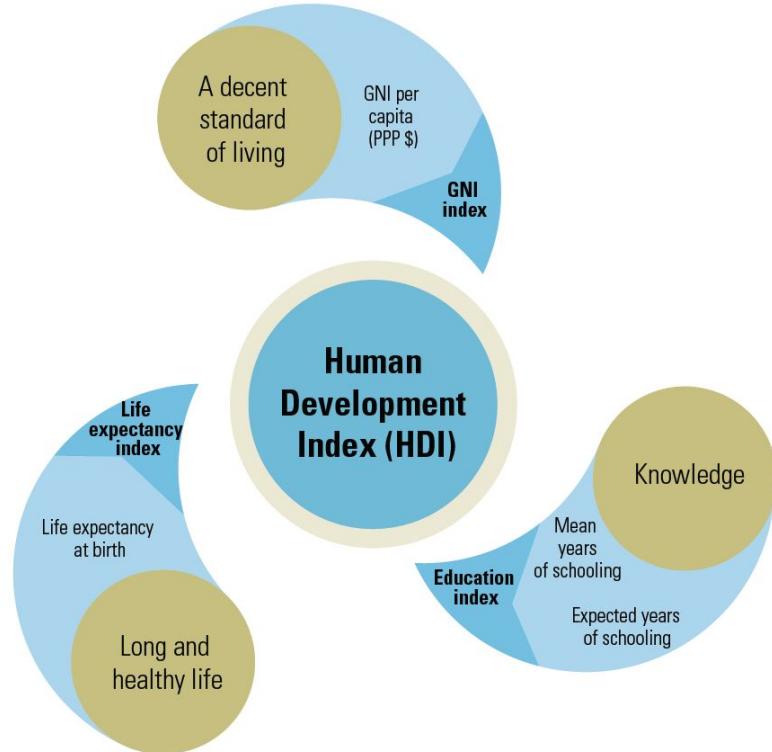
**Team Members:**

Nancy Manchanda, Yurui Li, Xiaoshi Guo, Farzaneh Faramarzi

# Introduction

## ❖ What is HDI?

The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a **long and healthy life**, being **knowledgeable** and have a **decent standard of living**.



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# HDI and Gender Inequality

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In 189 Countries

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*Nancy Manchanda*

# HDI and Gender Inequality

- ❖ Gender inequality major barrier to human development
- ❖ Higher the disparity greater the loss to human development
- ❖ Women and girls are discriminated against the health, education, political representation, labour market etc -- with negative influence on development of their capabilities.
- ❖ These components highlight need of critical policy intervention to reduce gender gap

# HDI and Gender Inequality

Measures of gender inequality using three dimensions: reproductive health, empowerment and the labour market.

- ❖ Reproductive health indicators:

- Maternal mortality ratio in 2015 - (deaths per 100,000 live births)
- Adolescent birth rate (2015 - 2020) - (births per 1,000 women ages 15–19)

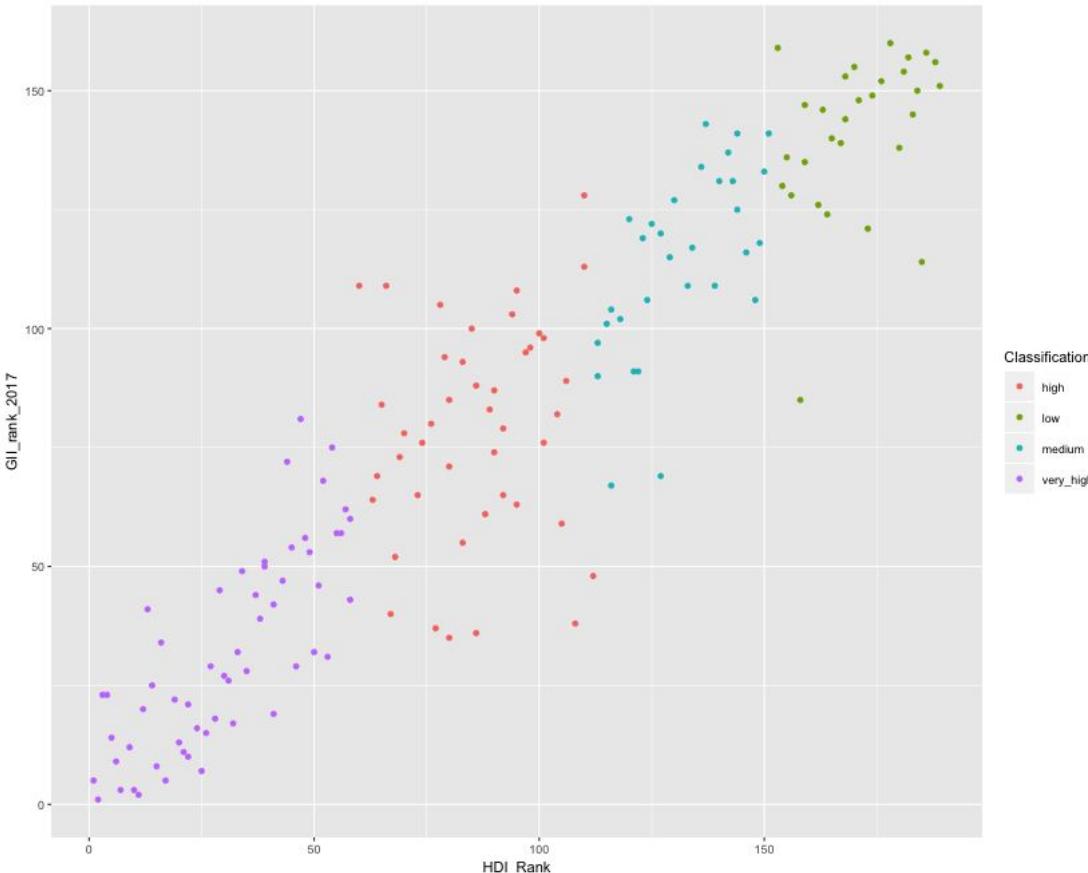
- ❖ Empowerment indicators:

- Share of seats in parliament in 2017 (% held by women)
- % Population with at least some secondary education (2010 - 2017) - Male and Female - age 25 years and older

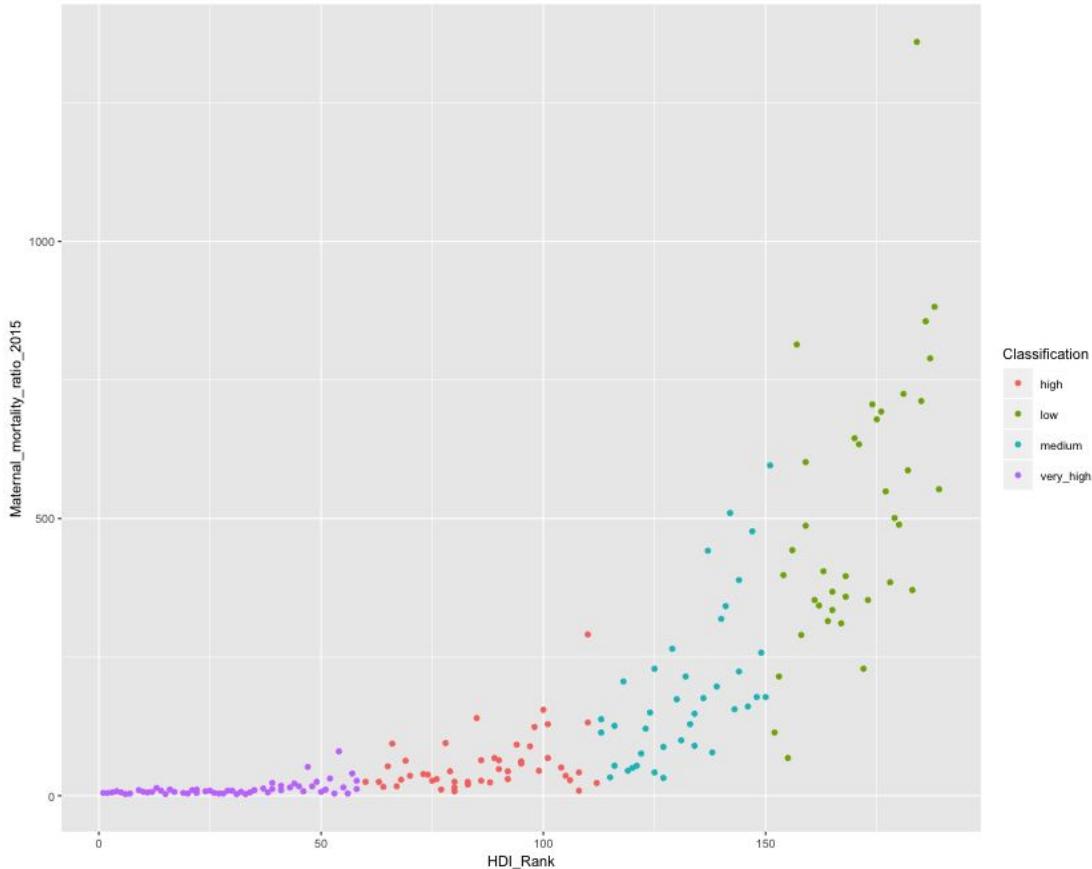
- ❖ Labour market indicator:

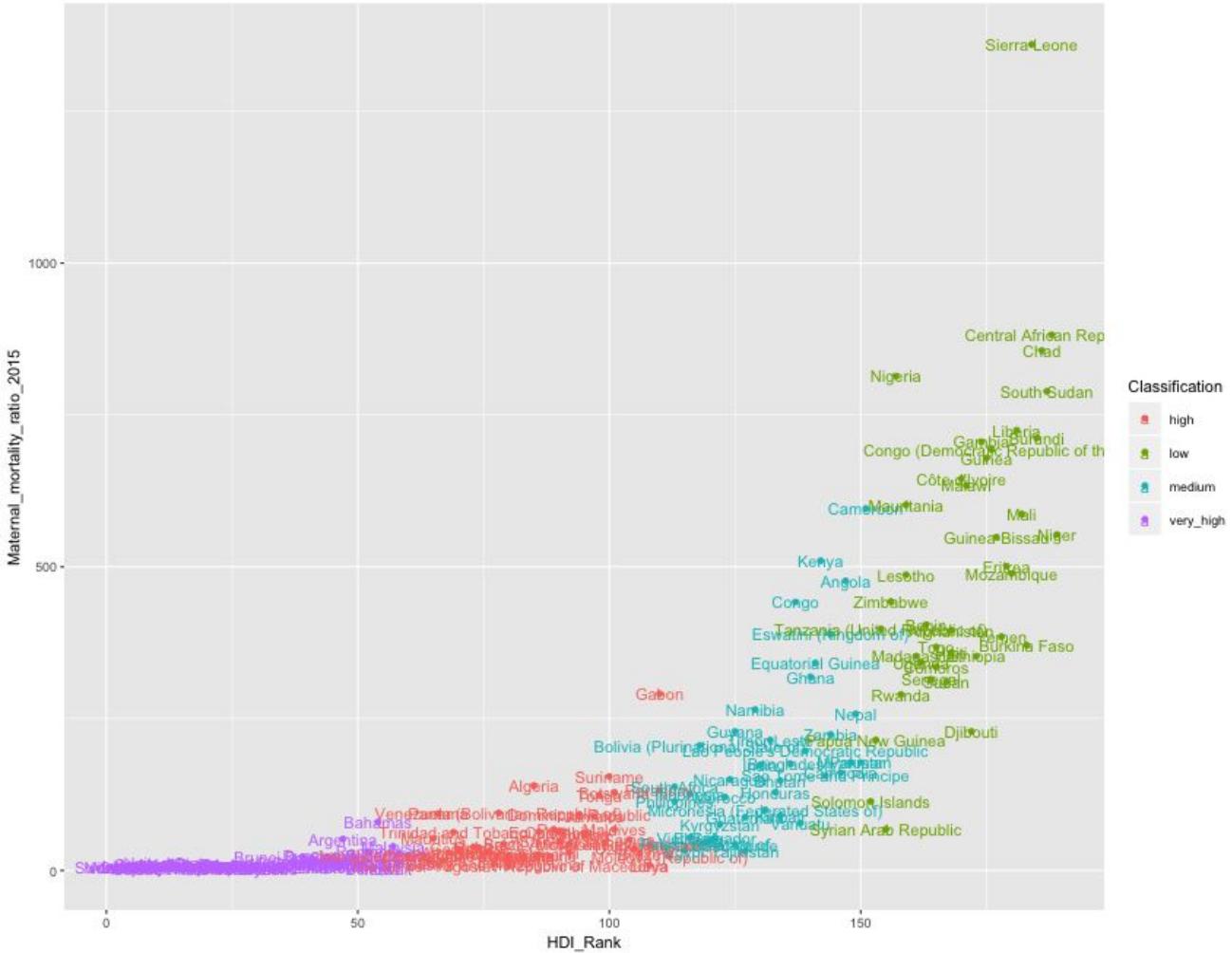
- % Labour force participation rate in 2017 - Male and Female, age 15 years and older

# HDI and GII (gender inequality index)

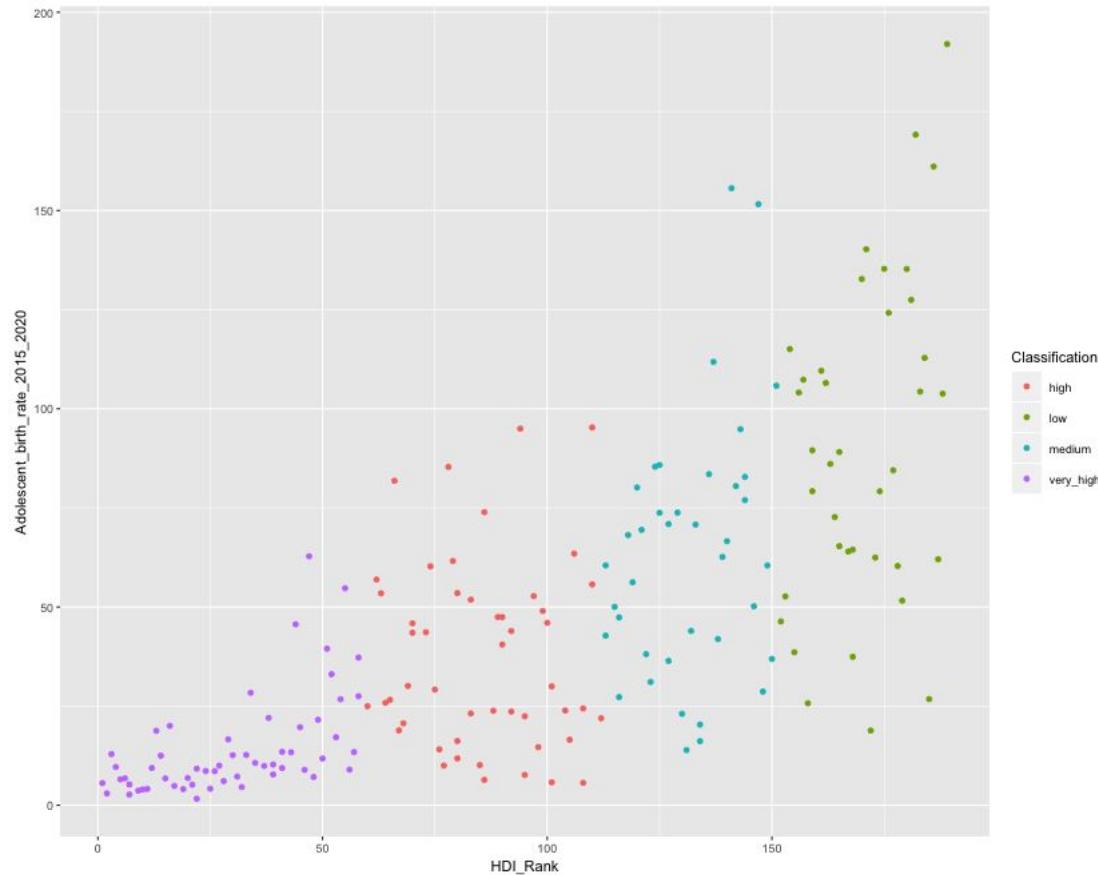


# HDI and Maternal Mortality ratio (2015)

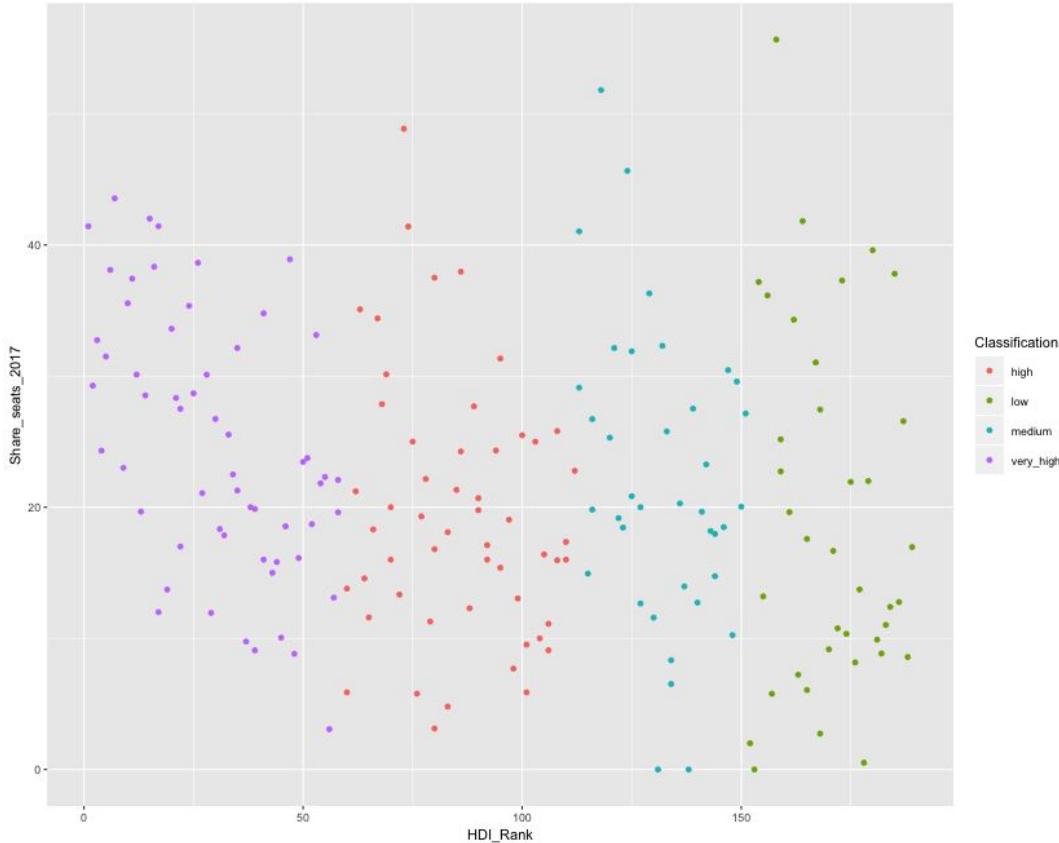




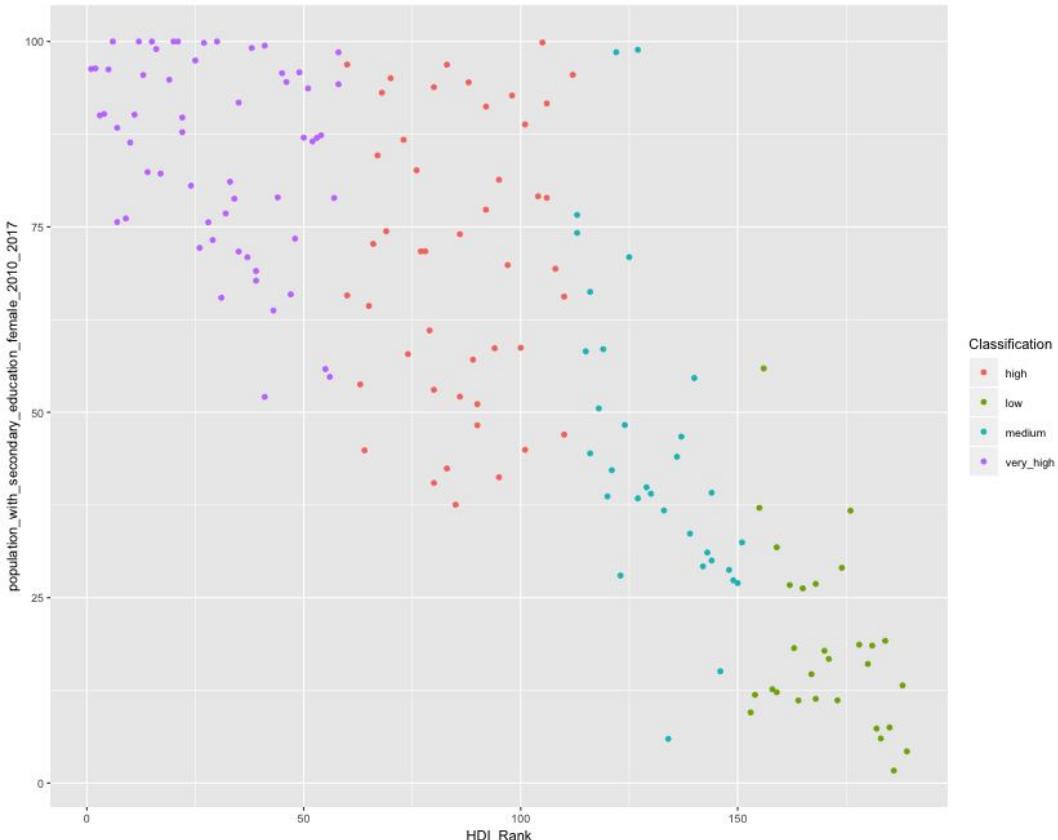
# HDI and Adolescent birth rate (2015 - 2020)



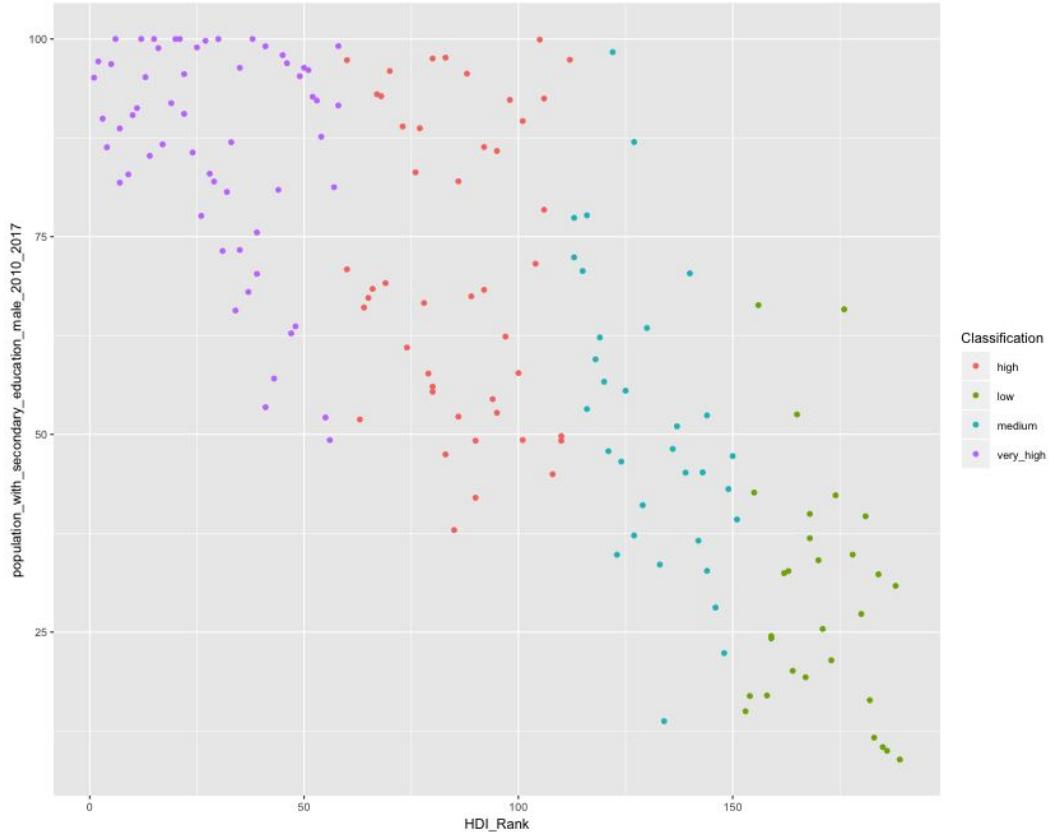
# HDI and Share of seats in parliament (2017)



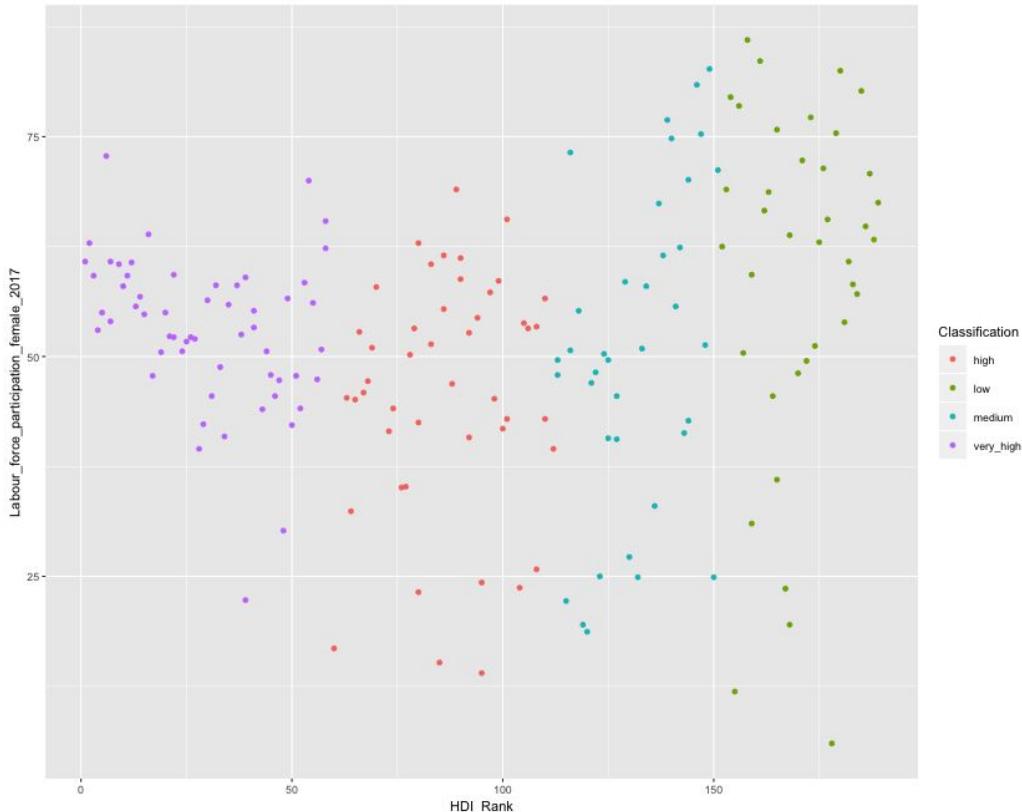
# HDI and Secondary education Female (2010 - 2017)



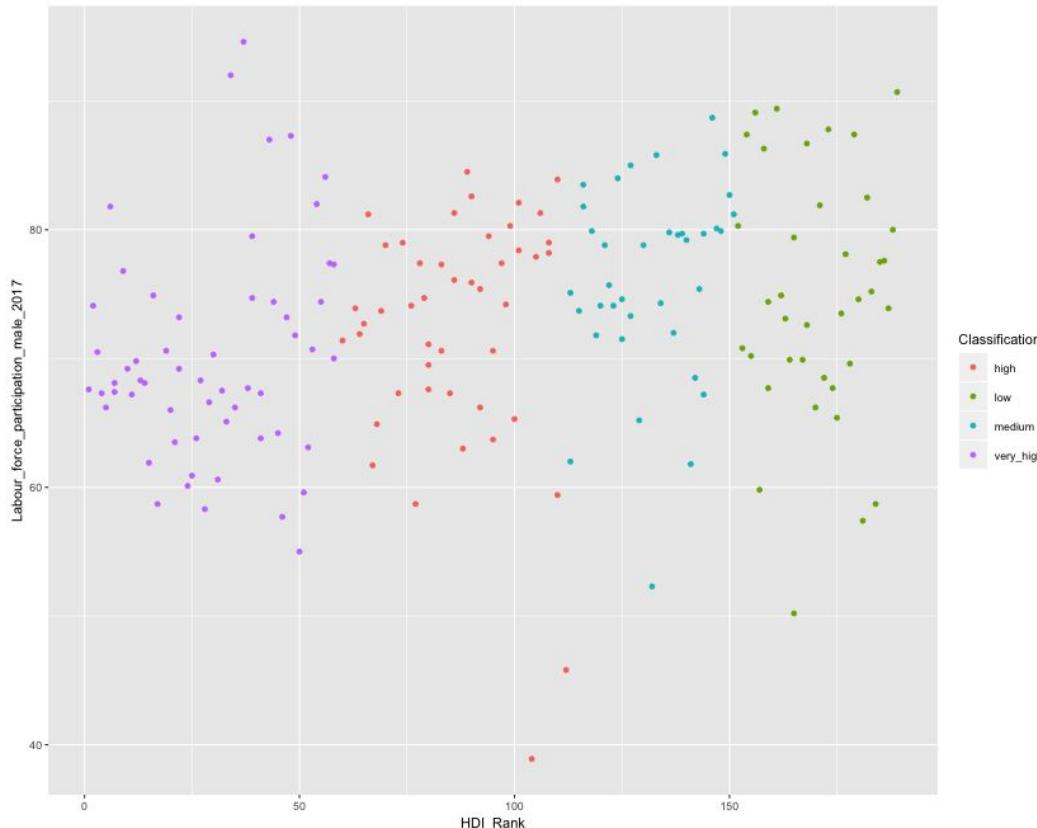
# HDI and Secondary education Male (2010 - 2017)



# HDI and Labour force participation Female (2017)



# HDI and Labour force participation Male (2017)



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# HDI and Education

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In 189 Countries

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*Yurui Li*



# HDI and Education

What are the key elements that uncover a country's education level?

# Education Variables

- Expected years of schooling

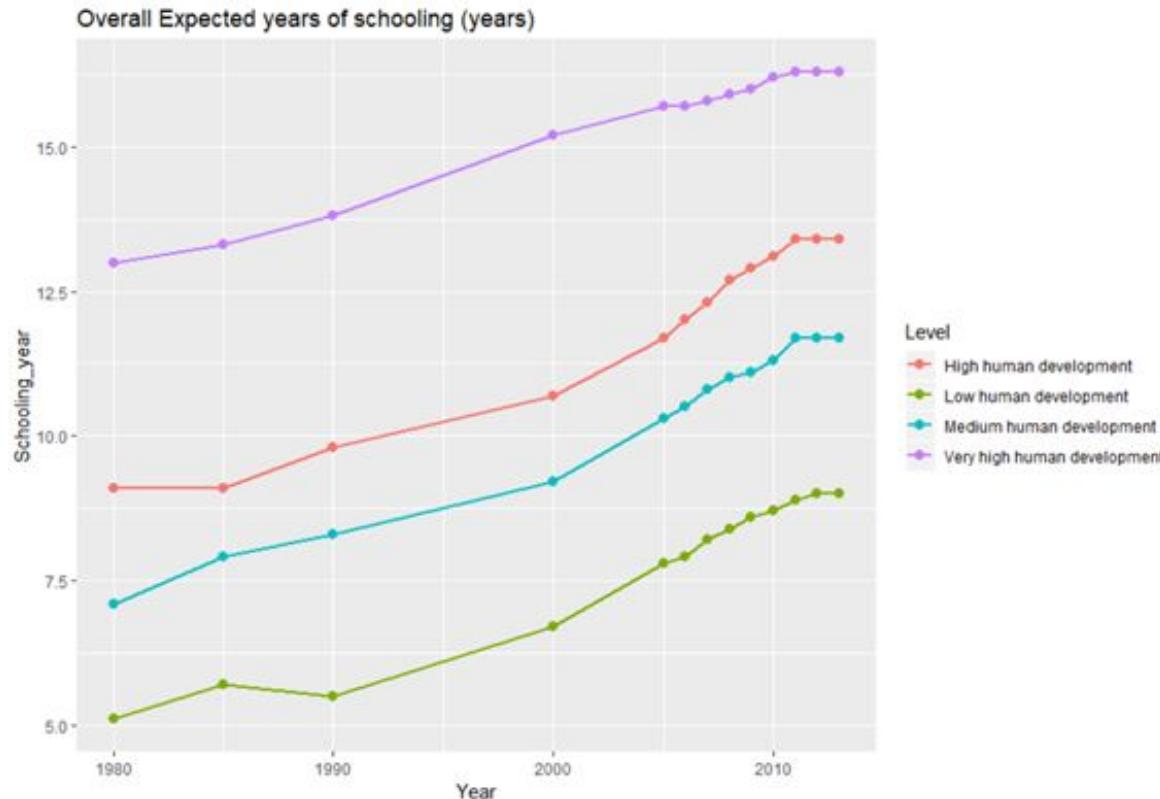
Number of years of schooling that a child of school entrance age can expect to receive.

- Mean years of schooling (Male/Female)

Average number of years of education received by people ages 25 and older.

- Population with at least some secondary education

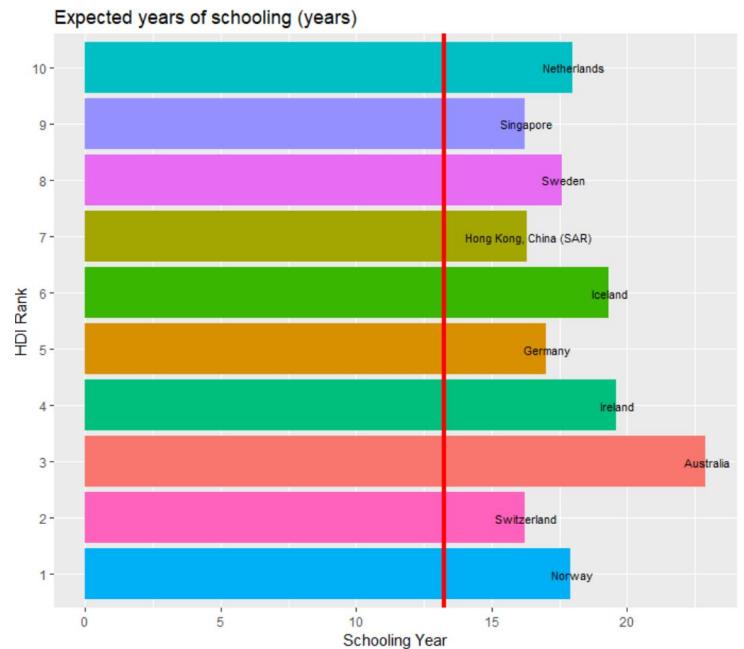
# Overall expected years of schooling



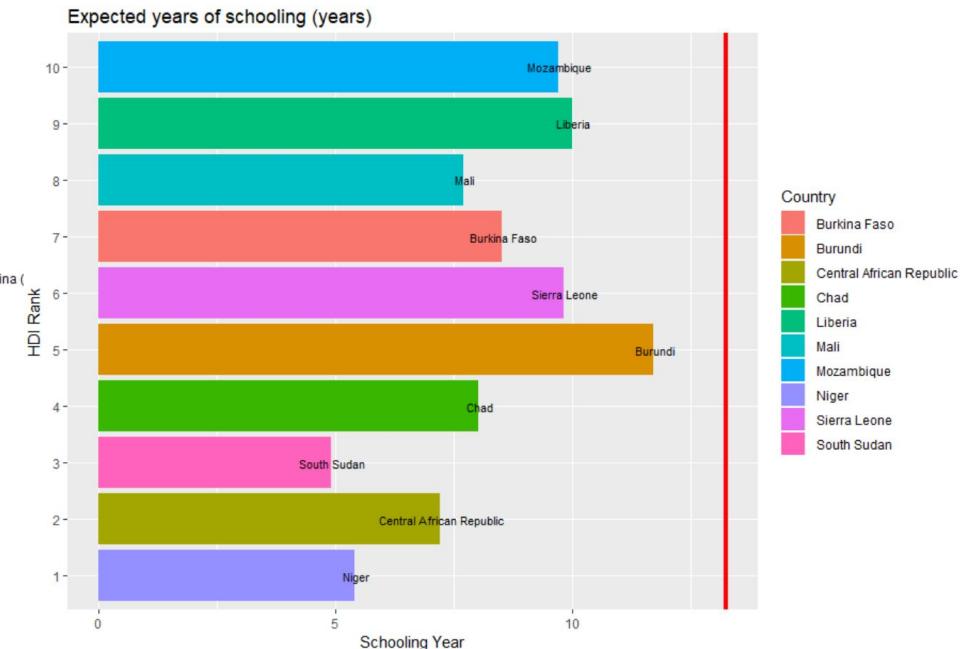
# Expected years of schooling

(2017 mean = 13 years)

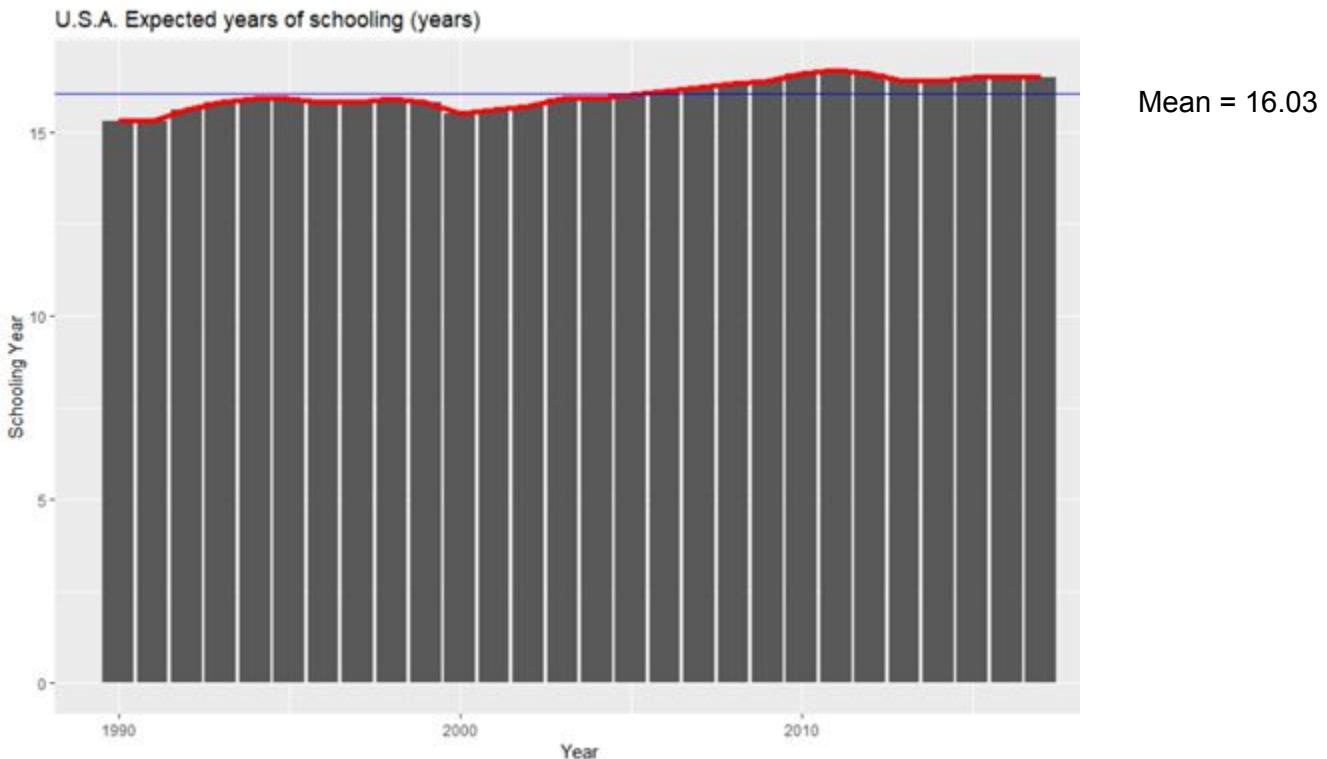
## Top 10 Countries



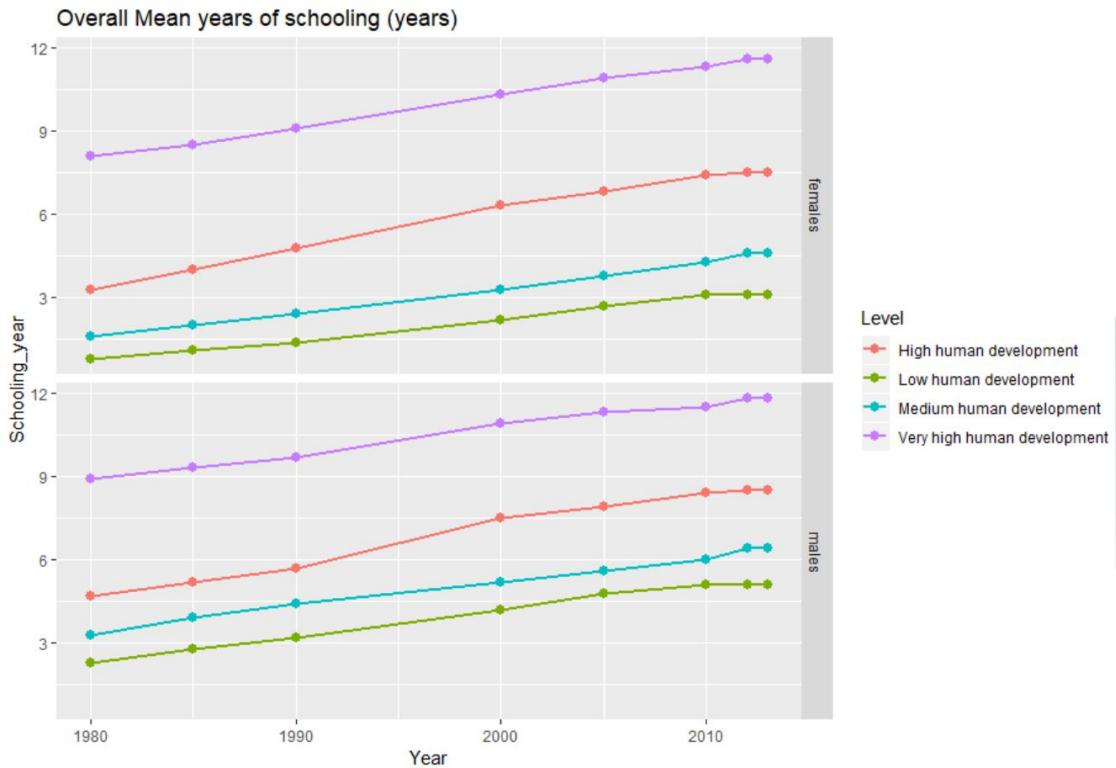
## Bottom 10 Countries



# How about USA? (13th)



# Overall Mean Years of Schooling



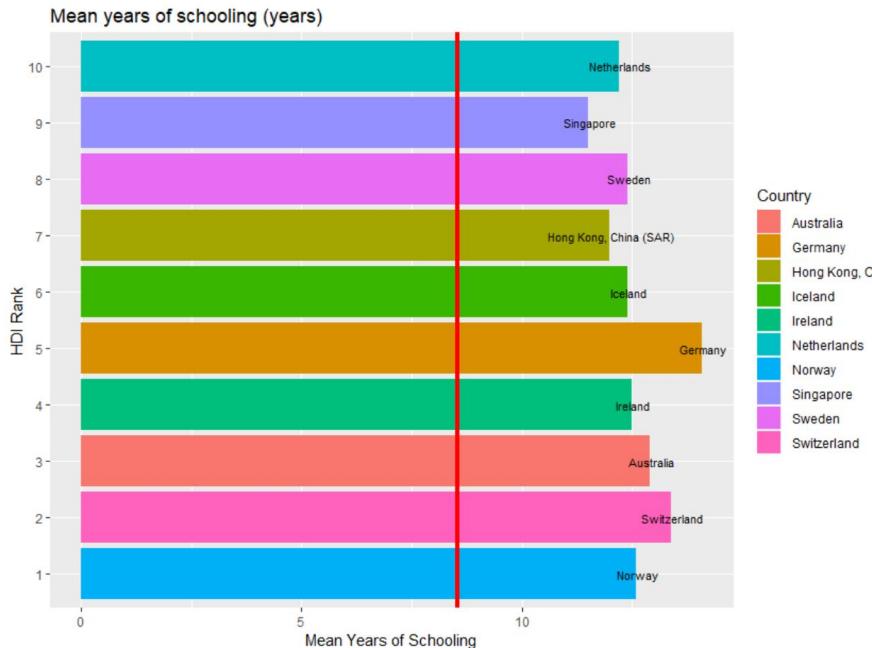
## Level

- High human development
- Low human development
- Medium human development
- Very high human development

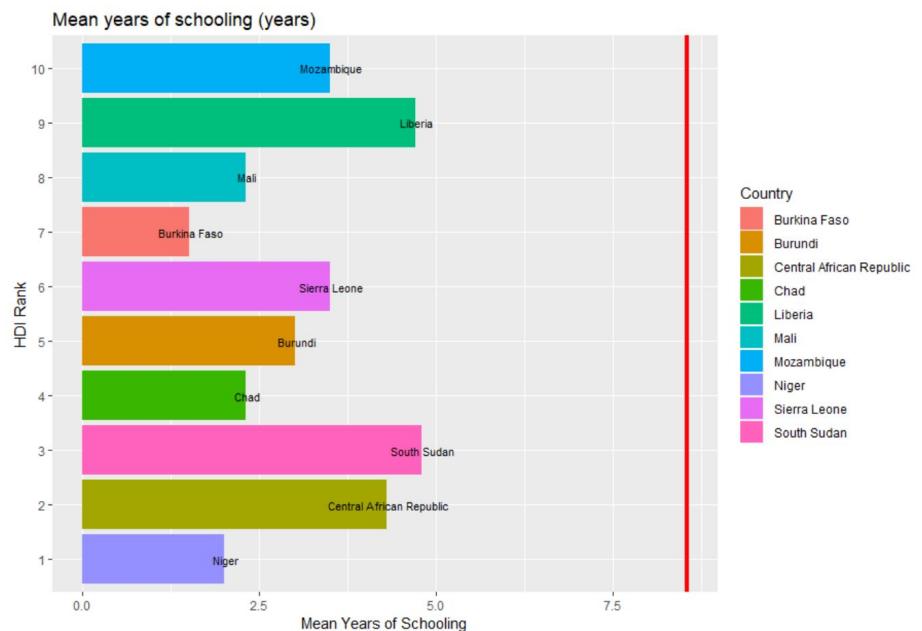


# Mean years of schooling (2017 mean= 8.55 years)

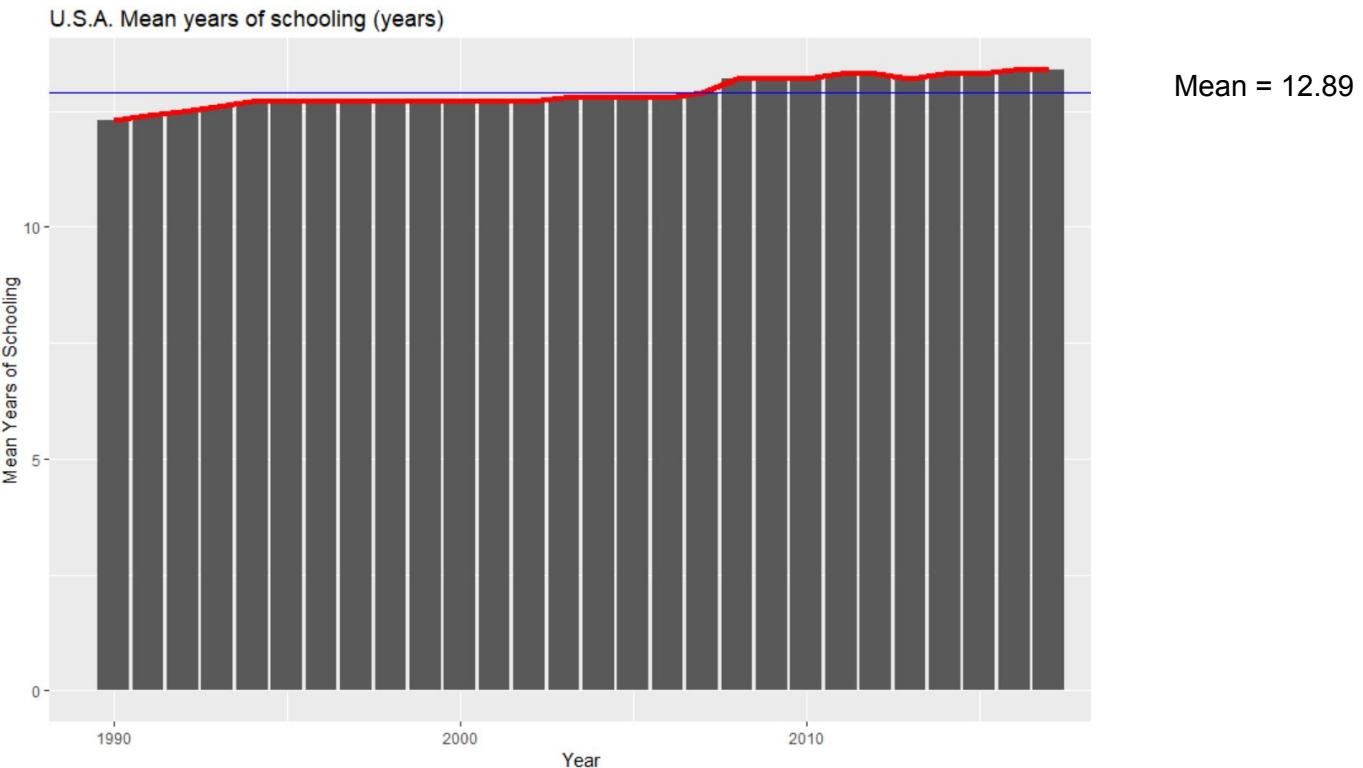
## Top 10 Countries



## Bottom 10 Countries

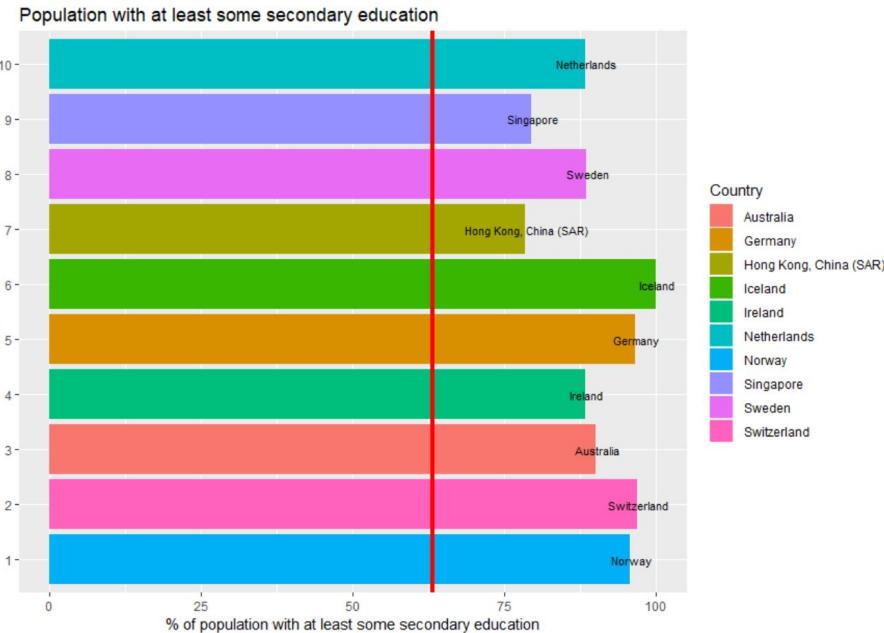


# How about USA?

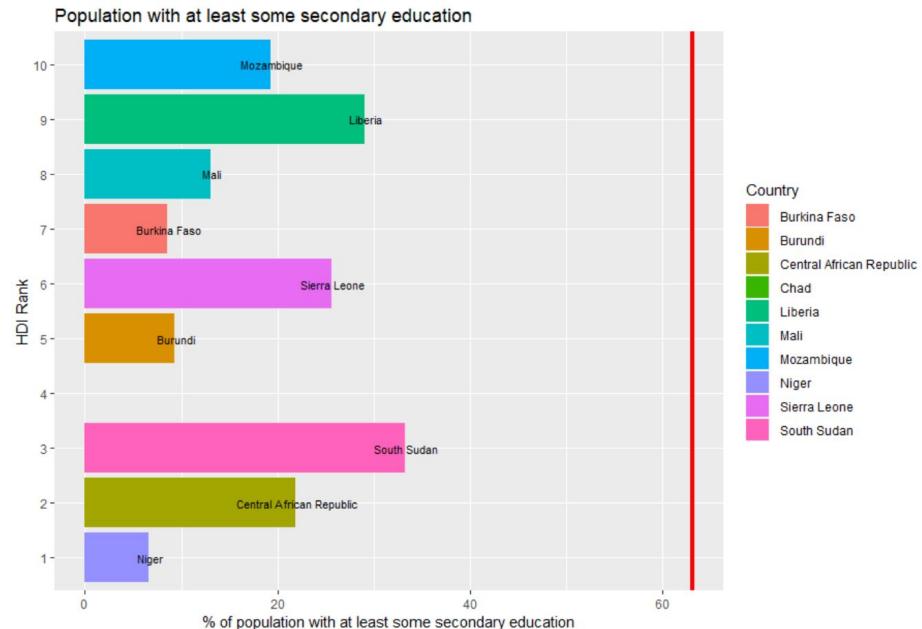


# Population with at least some secondary education (2017 mean = 63.1 %)

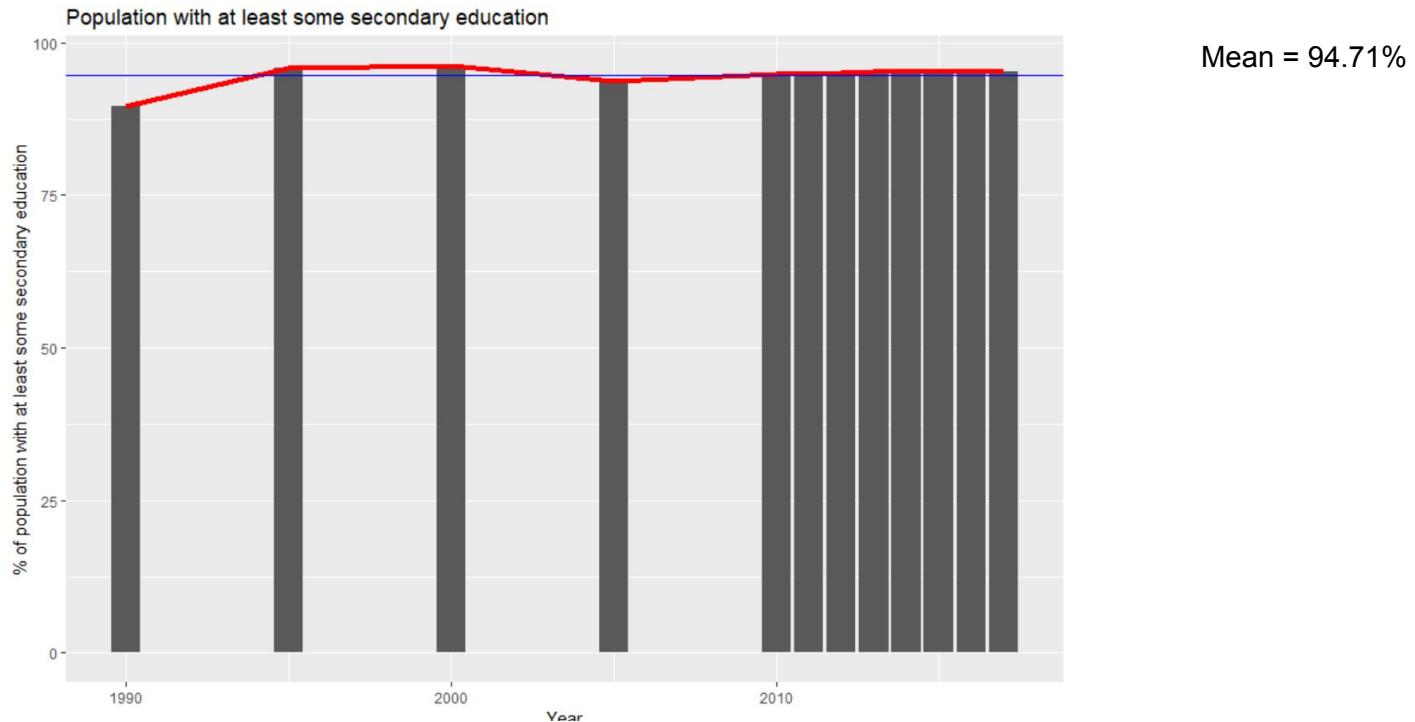
## Top 10 Countries



## Bottom 10 Countries



# How about USA?



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# HDI and Health

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In 189 Countries

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*Xiaoshi Guo*

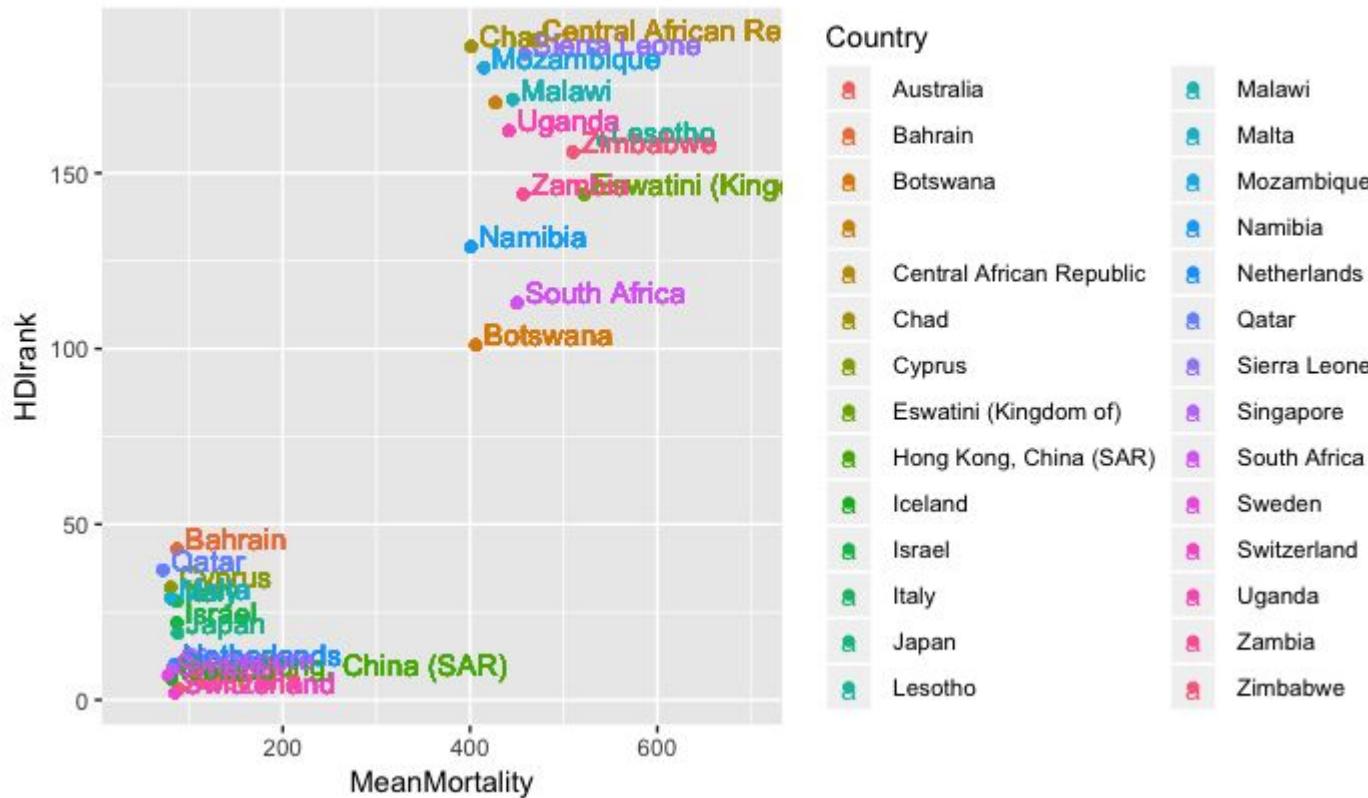
# The relationship between Health and HDI rank in 2017

Health variables:

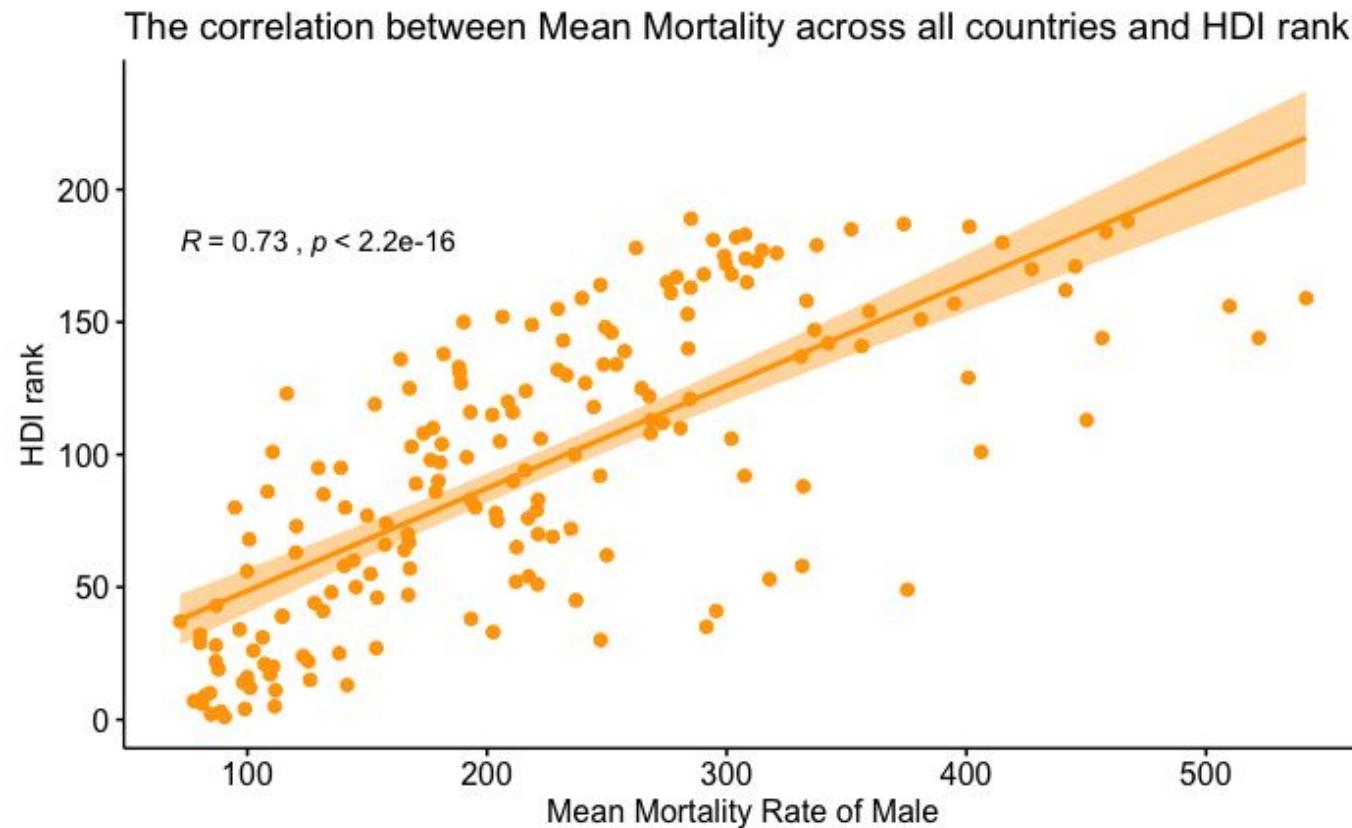
- ❖ Mortality rate, male adult (per 1000 people)
- ❖ Mortality rate, female adult (per 1000 people)
- ❖ Health expenditure (% of GDP)
- ❖ Life expectancy at birth, male (years)
- ❖ Life expectancy at birth, female (years)

# Mortality rate for male and HDI rank

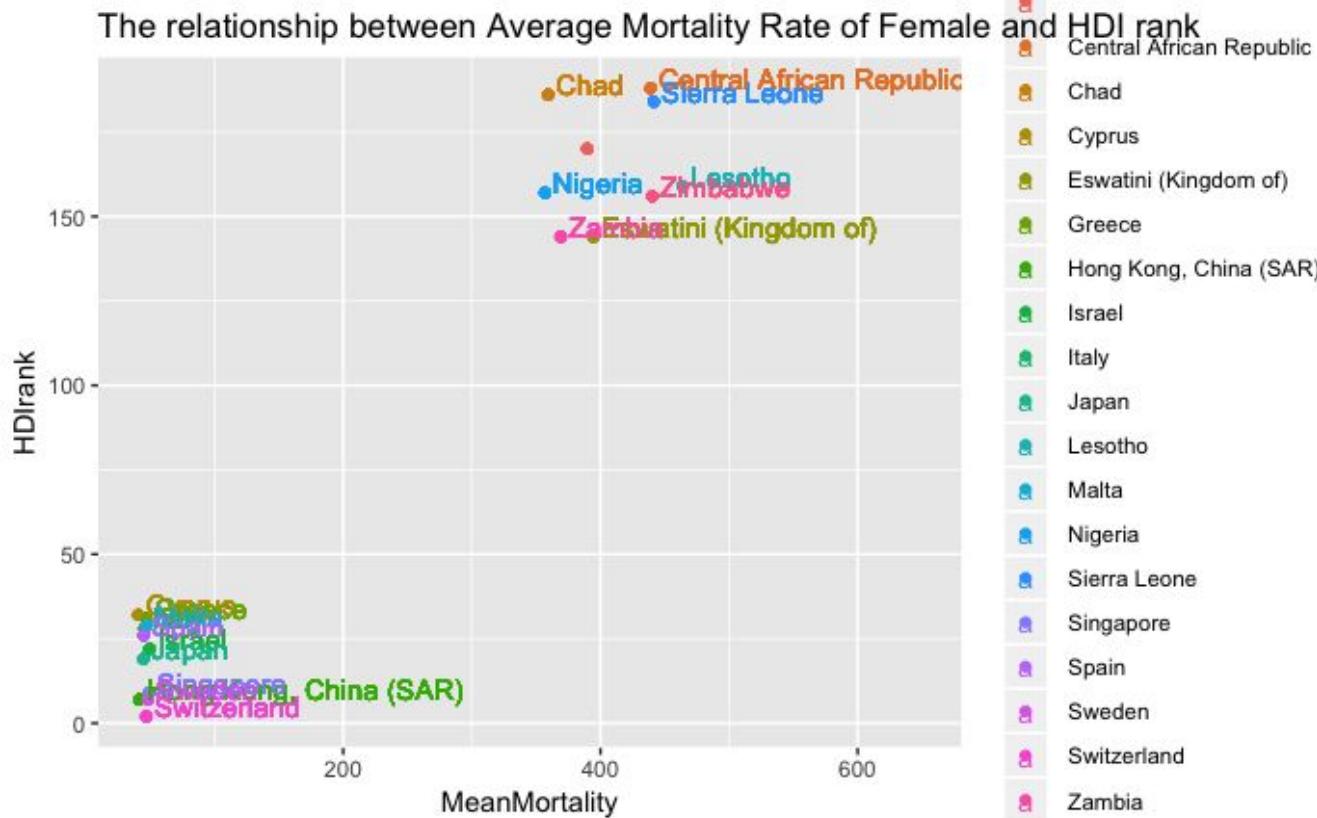
The relationship between Average Mortality Rate of Male and HDI rank



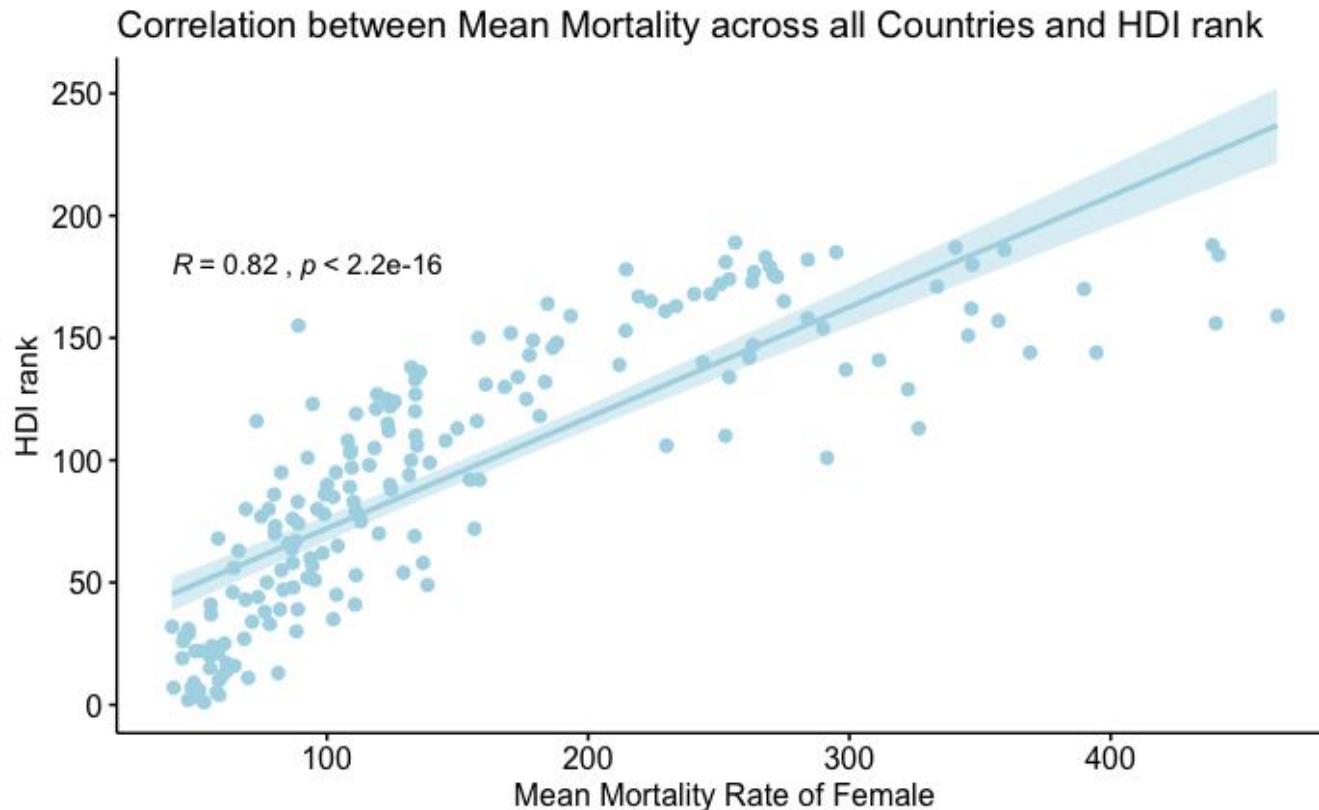
# Correlation?



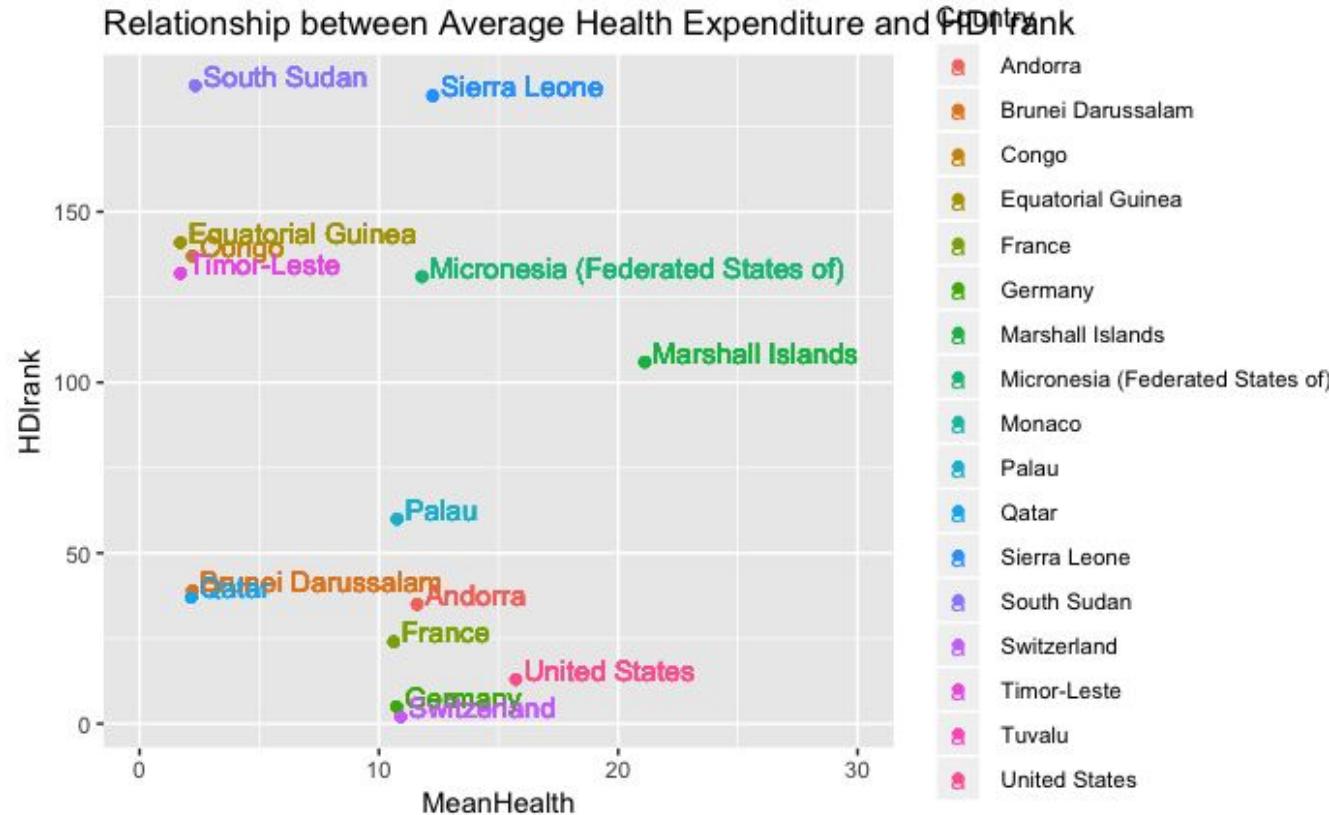
# Mortality rate for female and HDI rank



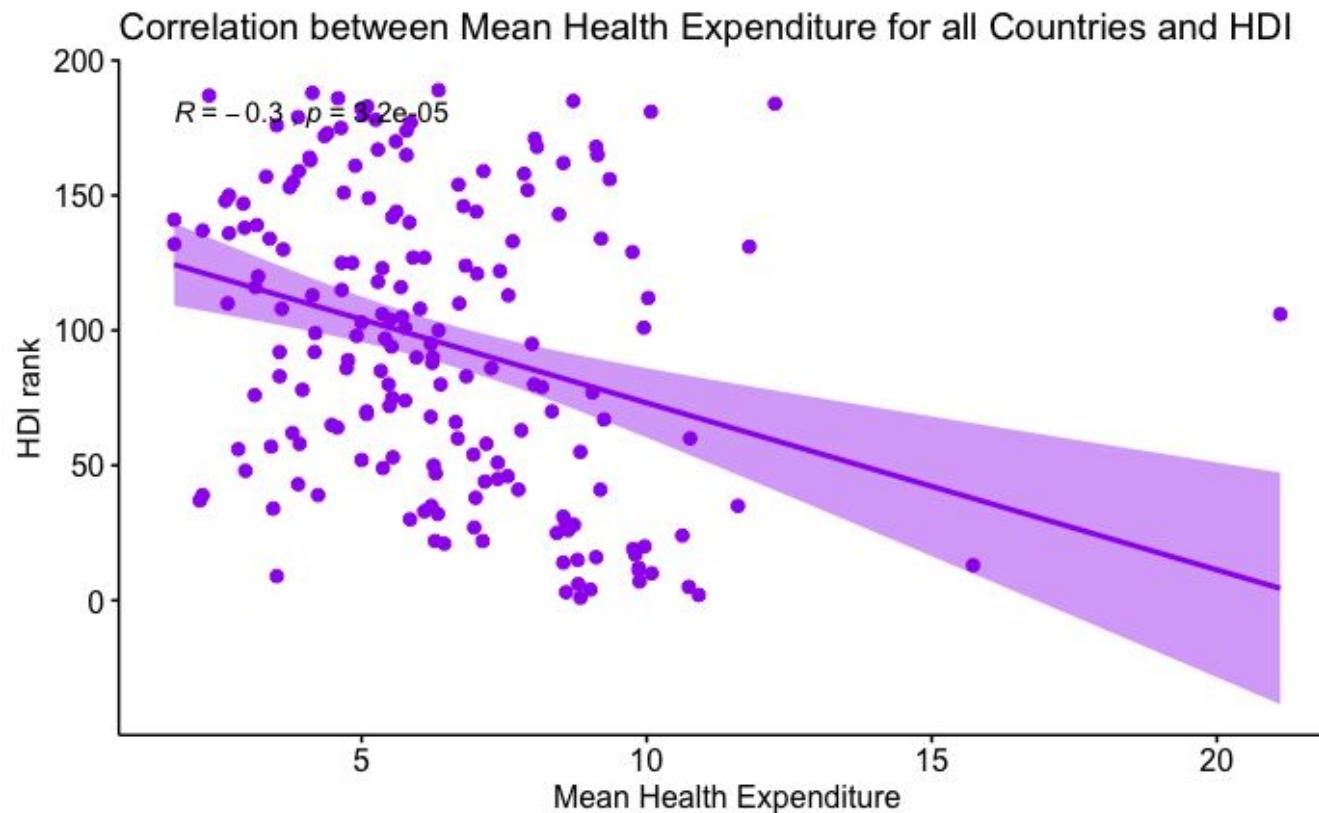
# Correlation ?



# Health expenditure and HDI rank

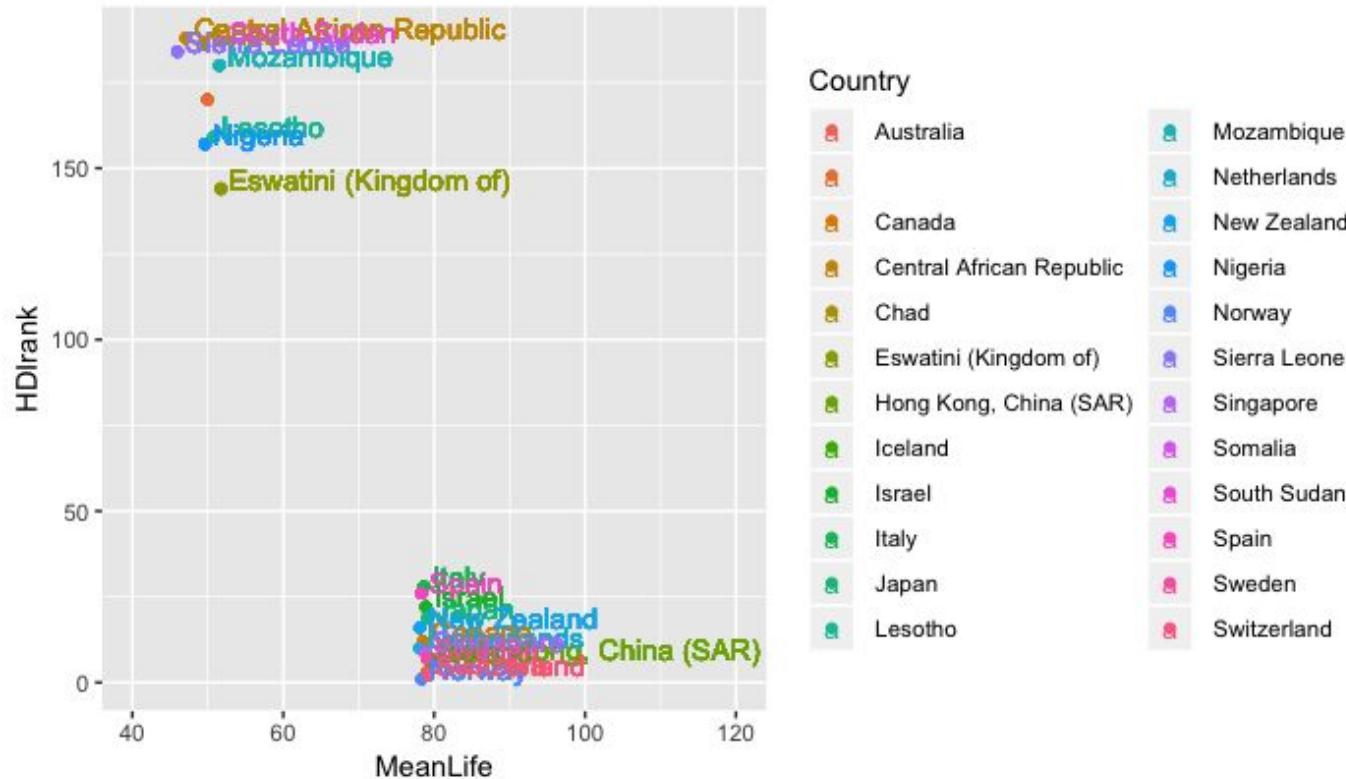


# Correlation ?

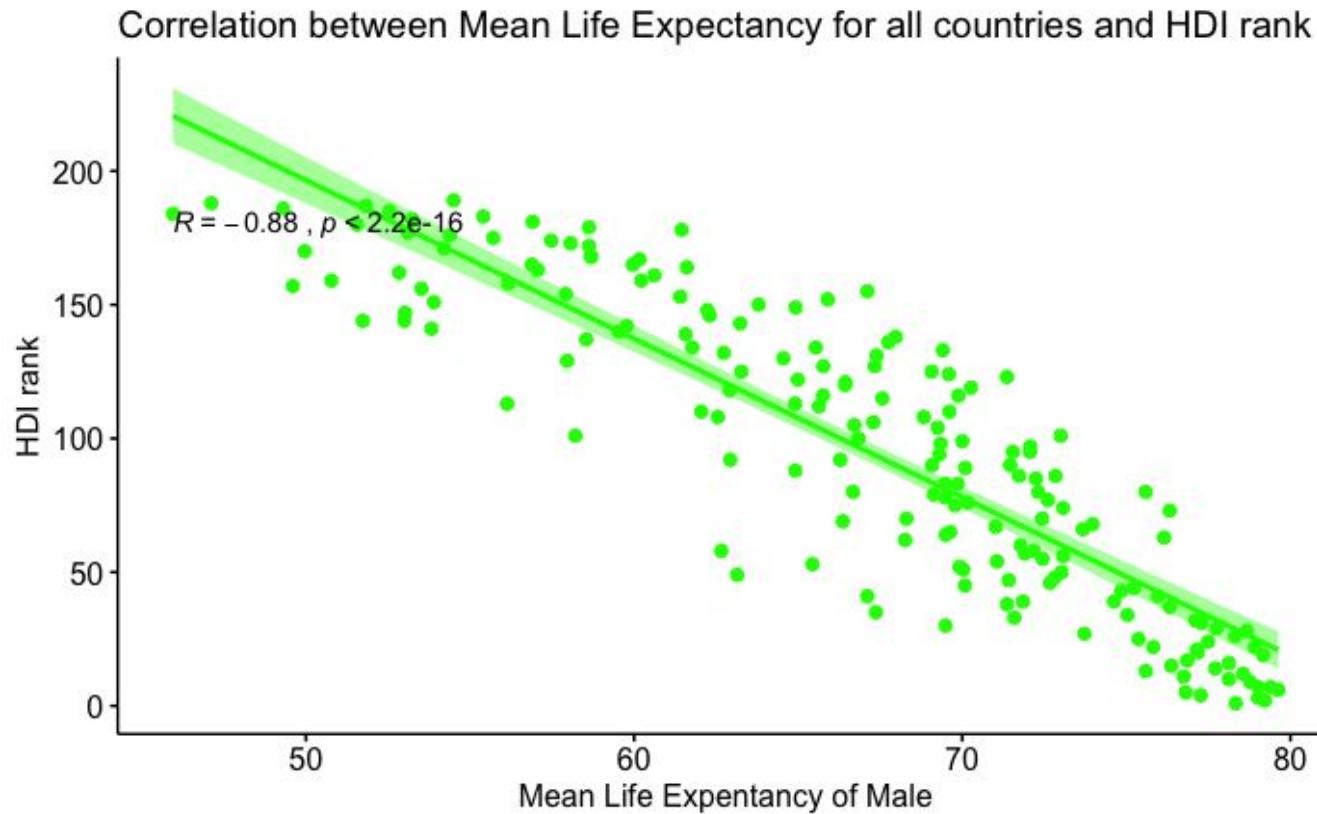


# Life expectancy for male and HDI rank in 2017

The relationship between the Average Life of Male and HDI rank

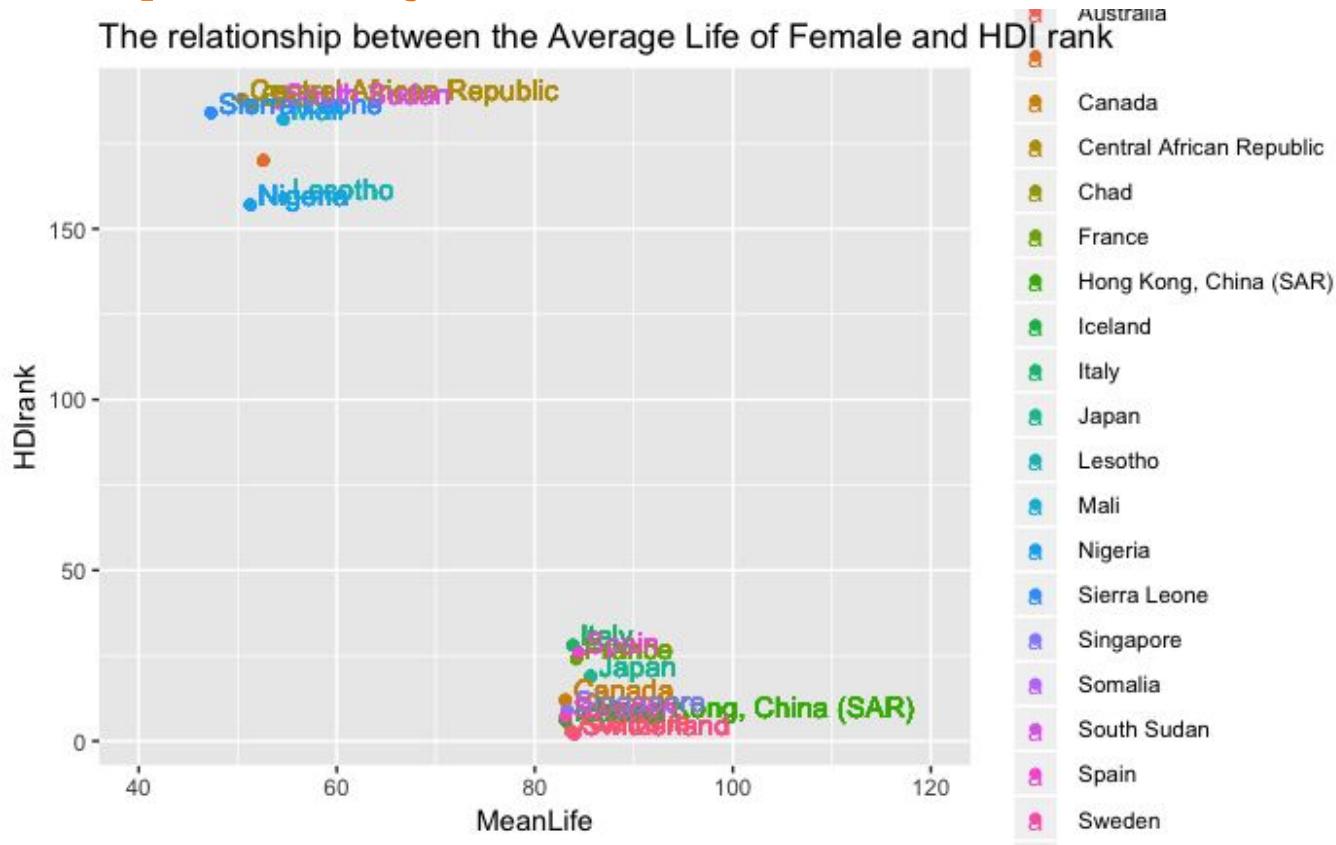


# Correlation ?

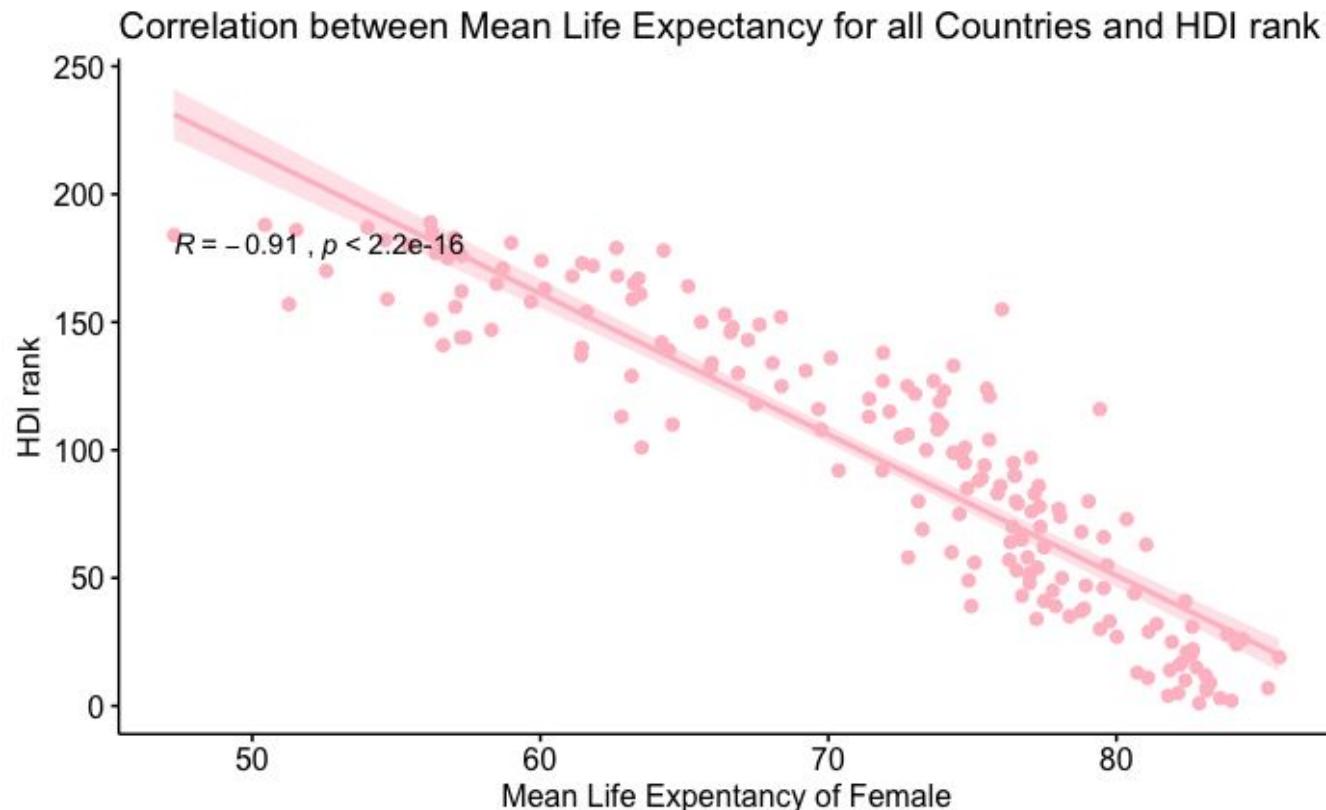


# Life expectancy for female and HDI rank

The relationship between the Average Life of Female and HDI rank



# Correlation ?



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# HDI and Gender

In 189 Countries

1995:2017

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*Farzaneh Faramarzi*

# Understanding the problems

- I was curious about Female's situation in other countries. I wanted to know is there a relationship between HDI and Gender in different aspects of life or no.



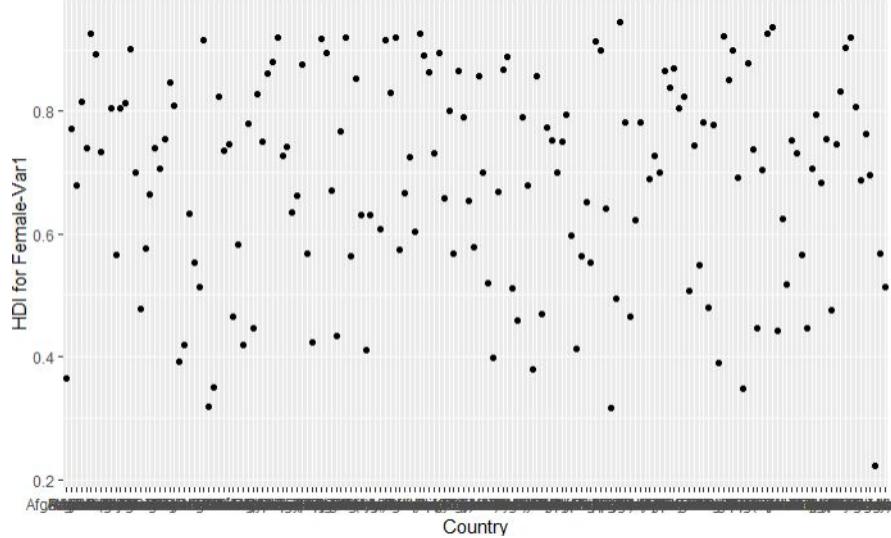
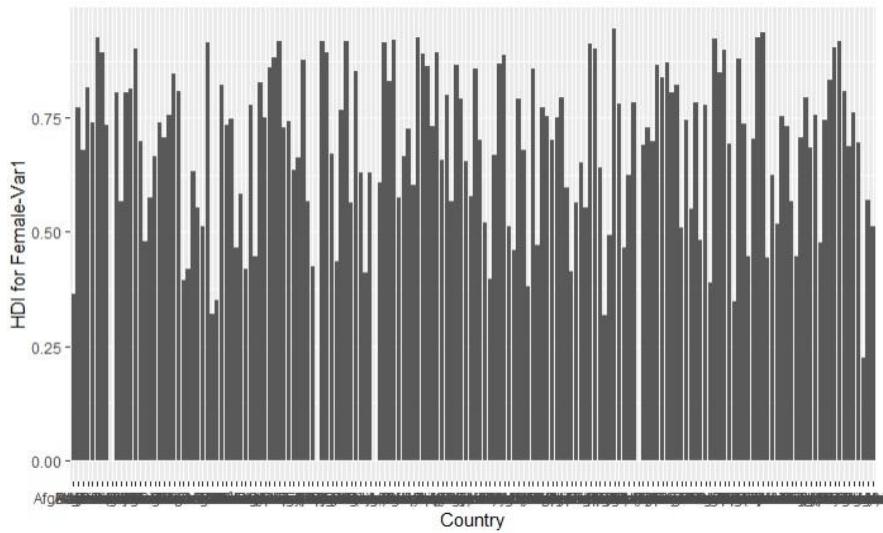
# Preparing Dataset

- In my project, for every single variable I have a separate dataset.
- Also I had some questions for each variable, I decided to answer for those question with all my selected variables. In this way, I think my result will be comparable.
- I cleaned my data before working.

# Variables in Gender

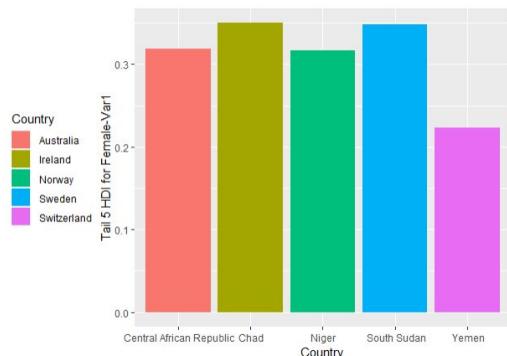
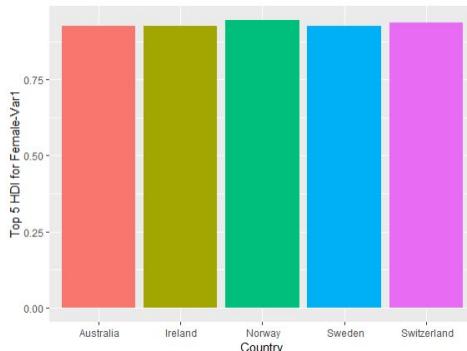
- 1) Comparing Female and Human Development Index(HDI)
- 2) Comparing Male and Human Development Index(HDI)
- 3) Comparing Child Marriage and HDI Ranking in 2017 between Countries
- 4) Estimated gross national income(GNI) per capita (Female)
- 5) Estimated gross national income(GNI) per capita (Male)
- 6) Female share of employment in senior and middle management (%)
- 7) Female share of graduates in science, mathematics, engineering, manufacturing and construction at tertiary level (%)

## 1)Comparing Female and Human Development Index(HDI)

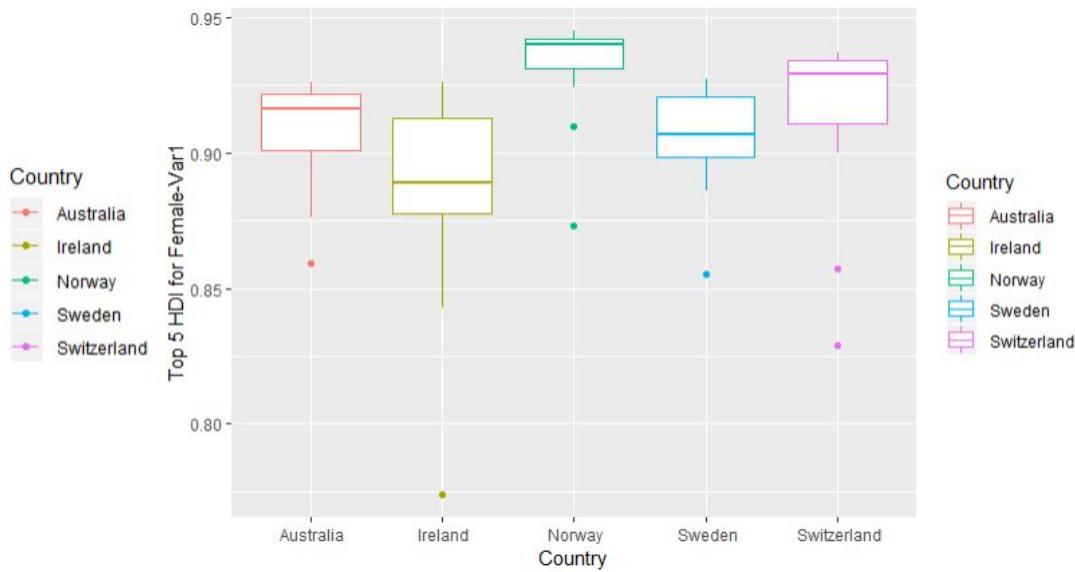
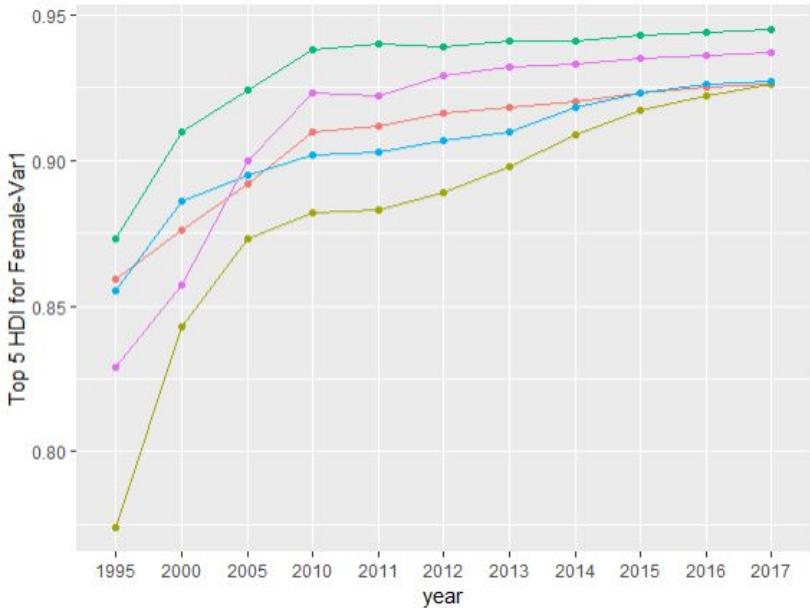


# 1)Comparing Female and Human Development Index(HDI)

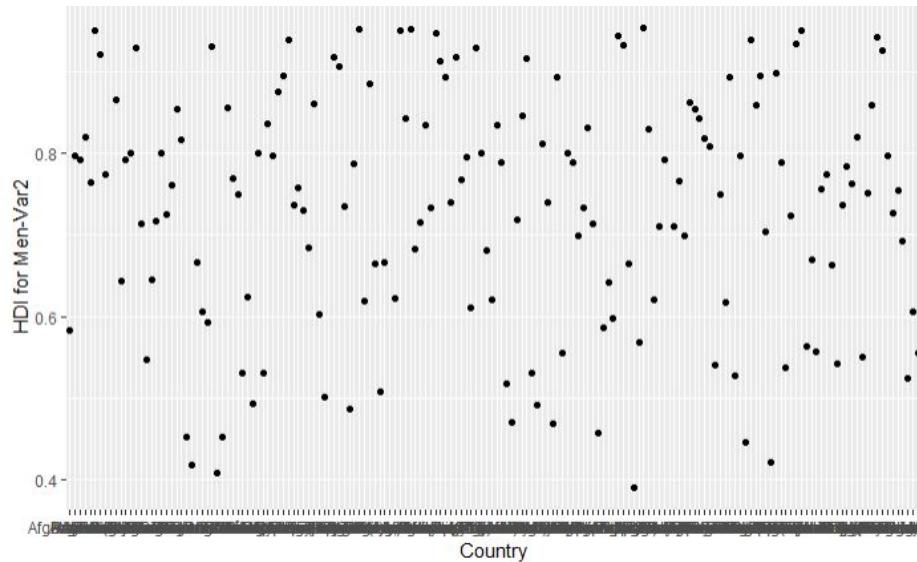
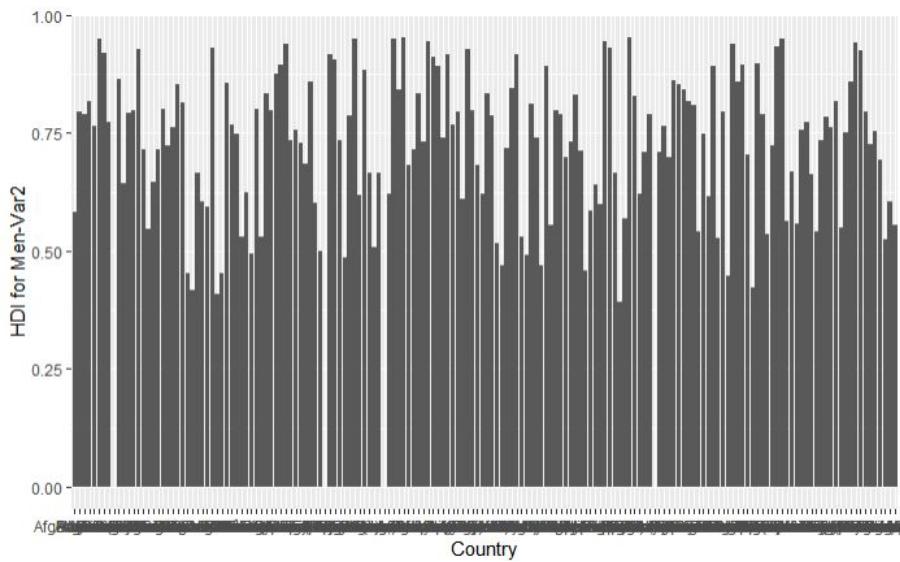
Top 5 countries	Tail 5 countries
Norway	Yemen
Switzerland	Niger
Sweden	Central African Republic
Australia	South Sudan
Ireland	Chad



## 5 Top countries in all years since 1995 to 2017(Var.1)

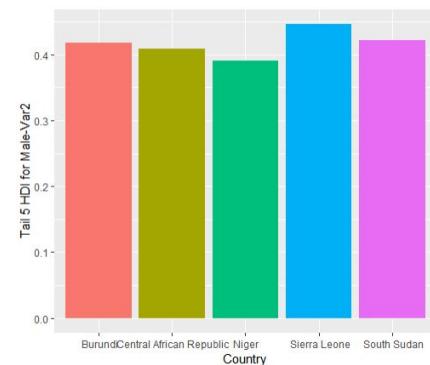
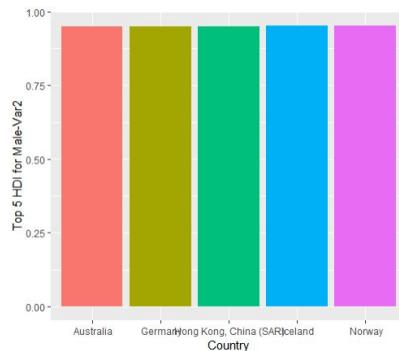


## 2)Comparing Male and Human Development Index(HDI)

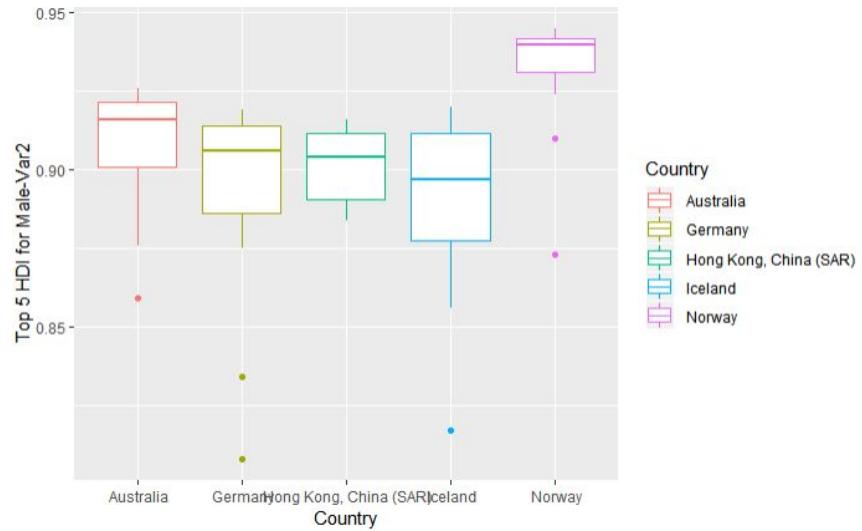
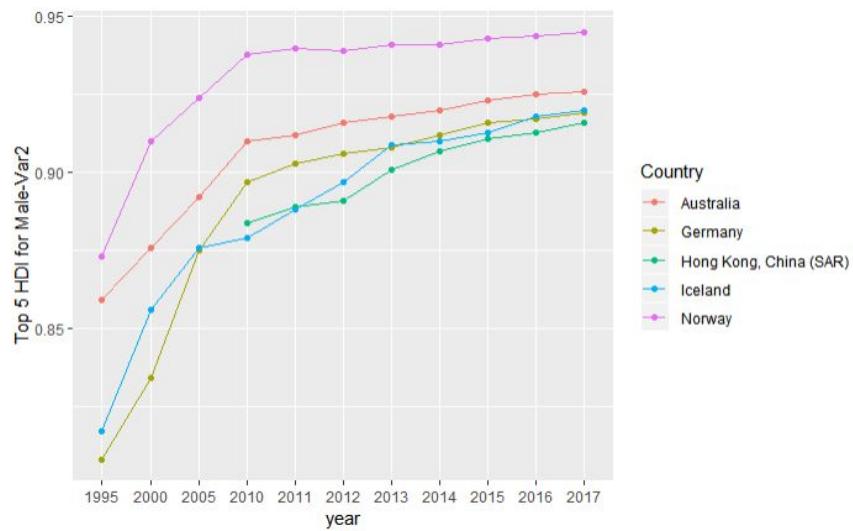


## 2)Comparing Male and Human Development Index(HDI)

Top 5 countries	Tail 5 countries
Norway	Niger
Iceland	Central African Republic
Germany	Burundi
Australia	South Sudan
Hong Kong, China (SAR)	Sierra Leone



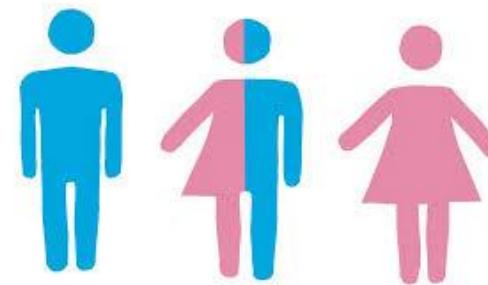
## 5 Top countries in all years since 1995 to 2017(Var.2)



## Some compare and more info about two variables HDI (Male, Female)

### United States

HDI for Male	17
HDI for Female	10



### Top Countries

### Same Rank

Norway

1

Australia

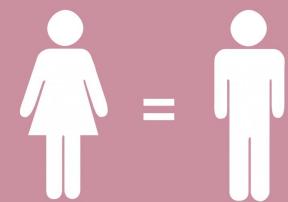
4

### Tail Countries

### Same Rank

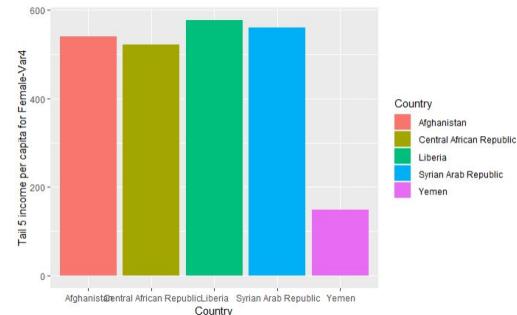
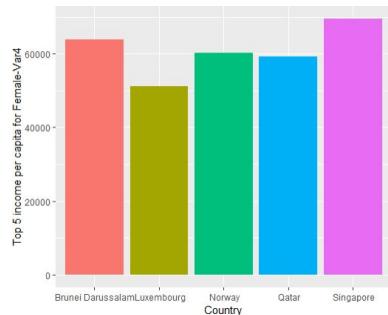
South Sudan

4

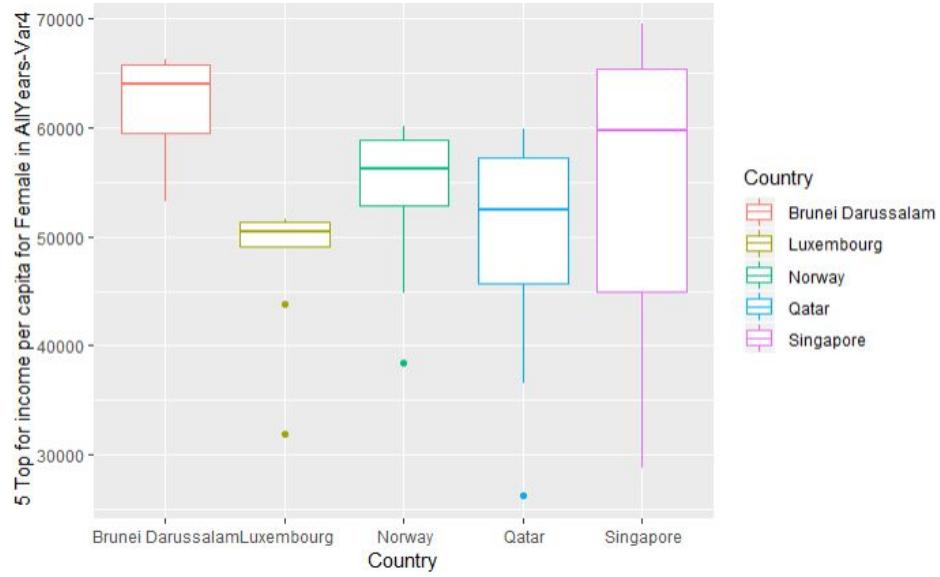
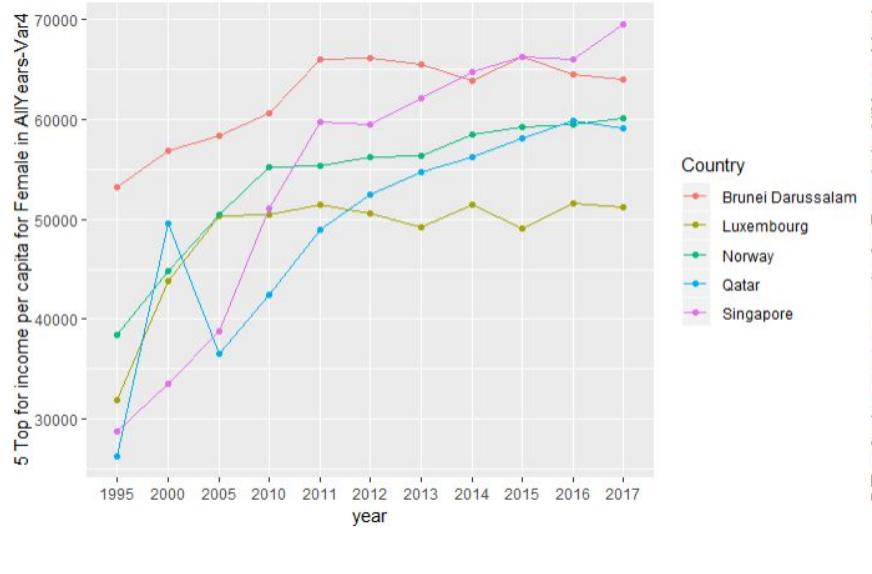


## 4) Estimated gross national income(GNI) per capita (Female)

Top 5 countries	Tail 5 countries
Singapore	Yemen
Brunei	Central African Republic
Norway	Afghanistan
Qatar	Syrian Arab Republic
Luxembourg	Liberia

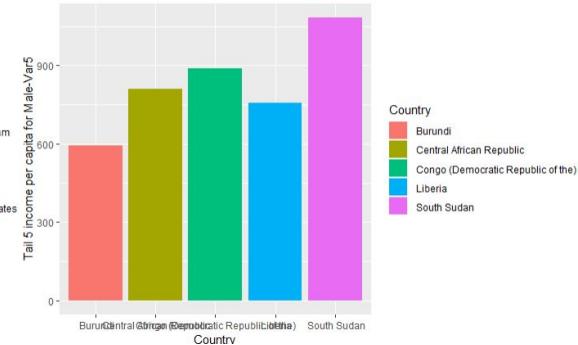
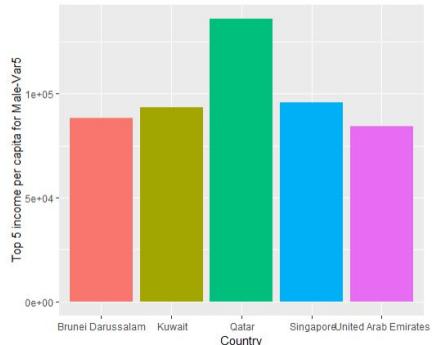


## 5 Top countries in all years since 1995 to 2017 (Var.4)

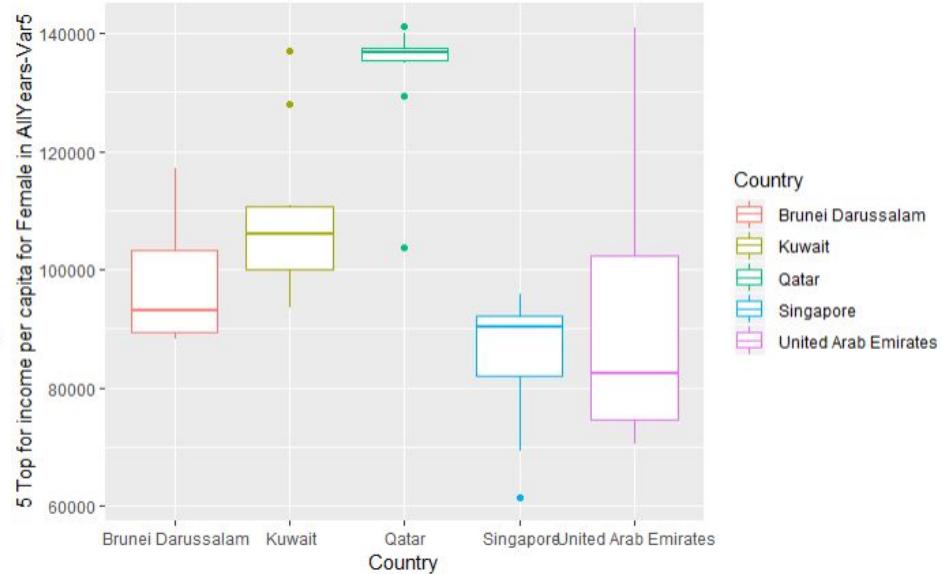
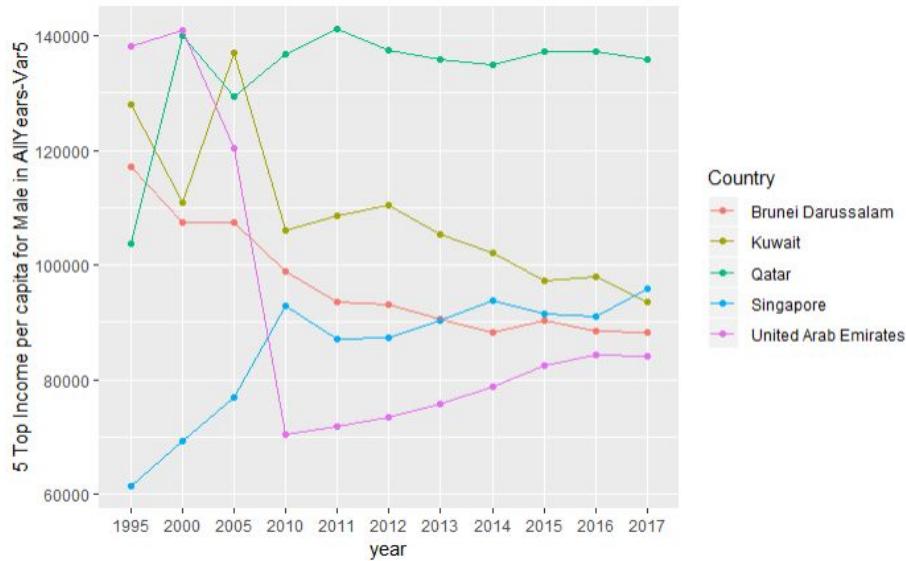


# 5) Estimated gross national income(GNI) per capita (Male)

Top 5 countries	Tail 5 countries
Qatar	Burundi
Singapore	Liberia
Kuwait	Central African Republic
Brunei Darussalam	Congo (Democratic Republic of the)
United Arab Emirates	South Sudan

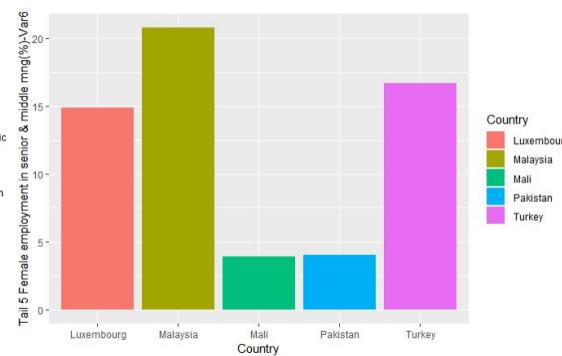
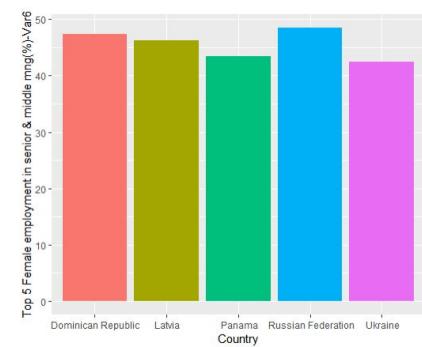


## 5 Top countries in all years since 1995 to 2017(Var.5)

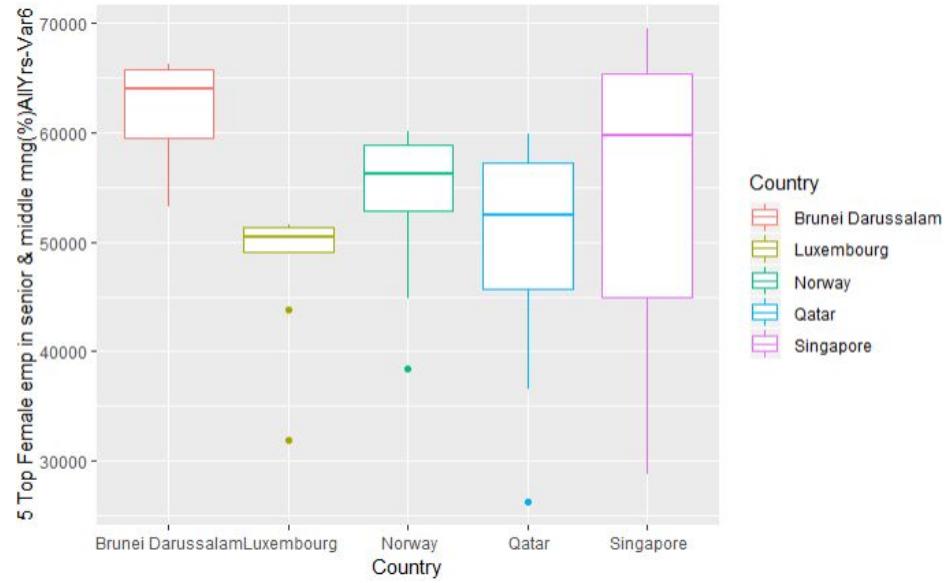
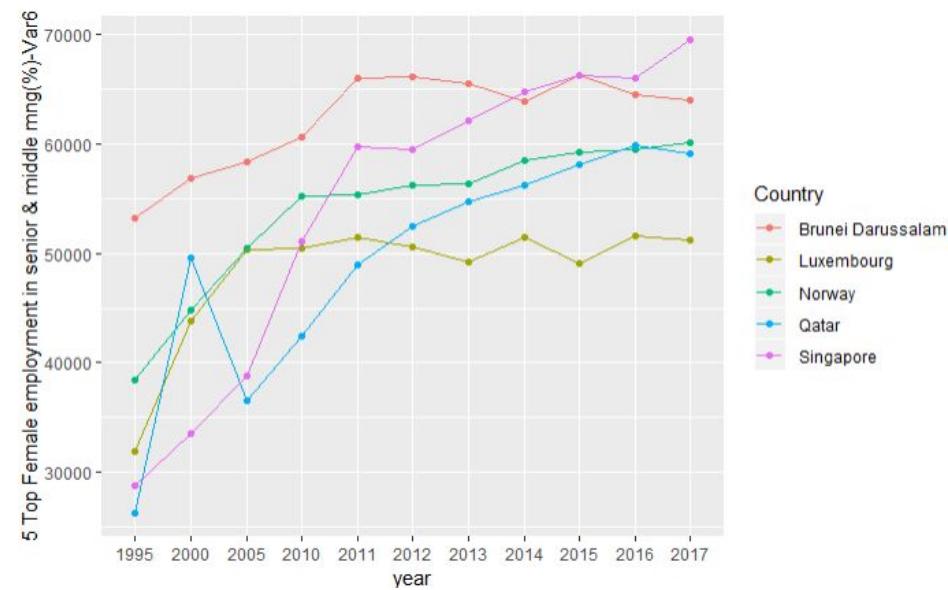


## 6) Female share of employment in senior and middle management (%)

Top 5 countries	Tail 5 countries
Russian Federation	Mali
Dominican Republic	Pakistan
Latvia	Luxembourg
Panama	Turkey
Ukraine	Malaysia

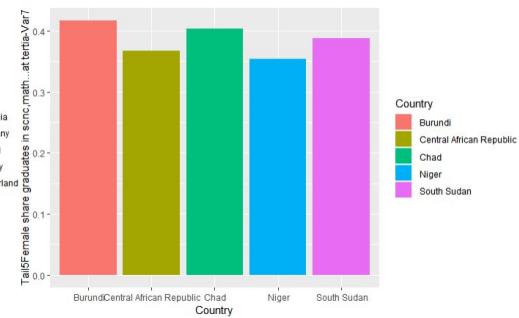
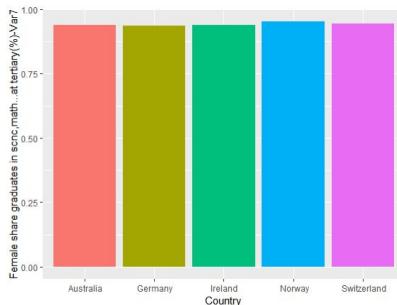


## 5 Top countries in all years since 1995 to 2017(Var.6)

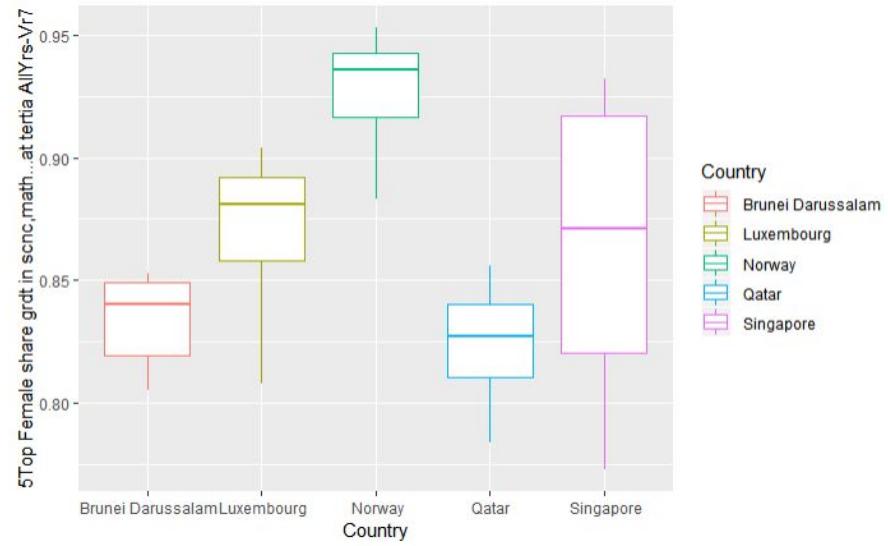
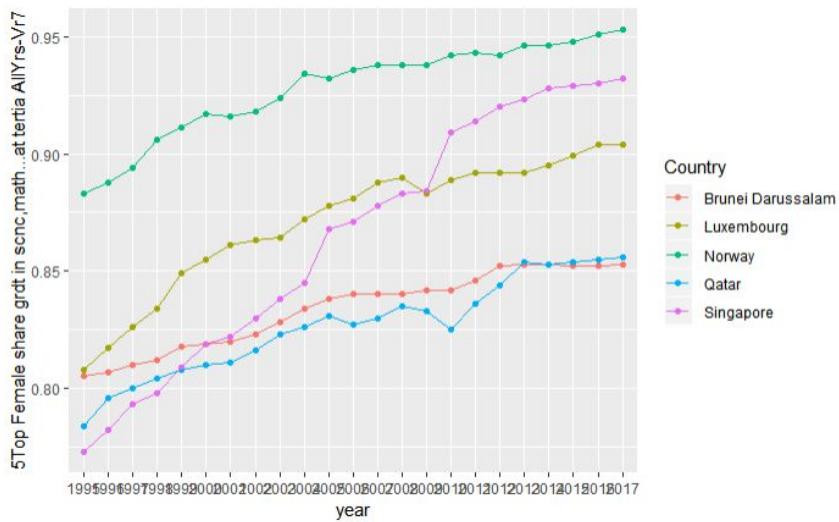


## 7) Female share of graduates in science, mathematics, engineering, manufacturing and construction at tertiary level (%)

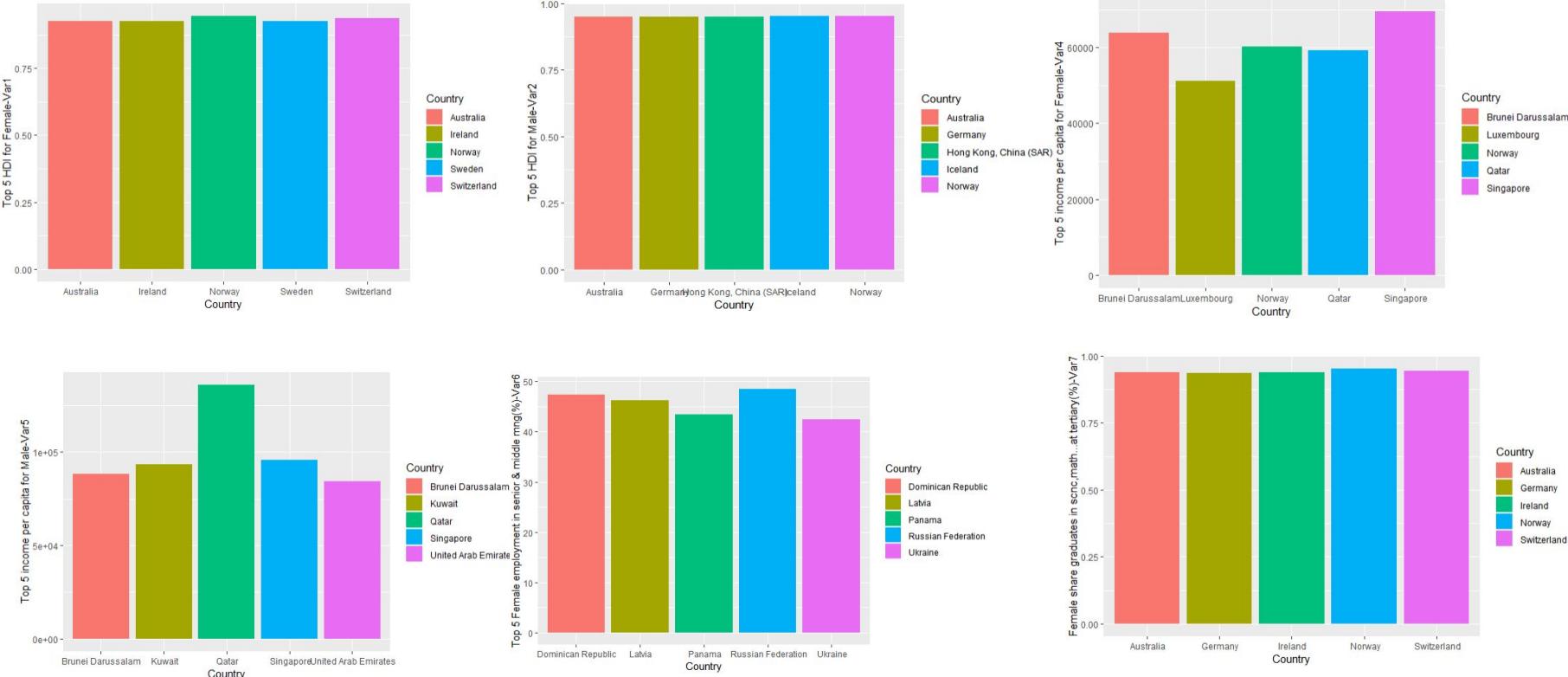
Top 5 countries	Tail 5 countries
Norway	Yemen
Switzerland	Central African Republic
Australia	Afghanistan
Ireland	Syrian Arab Republic
Germany	Liberia

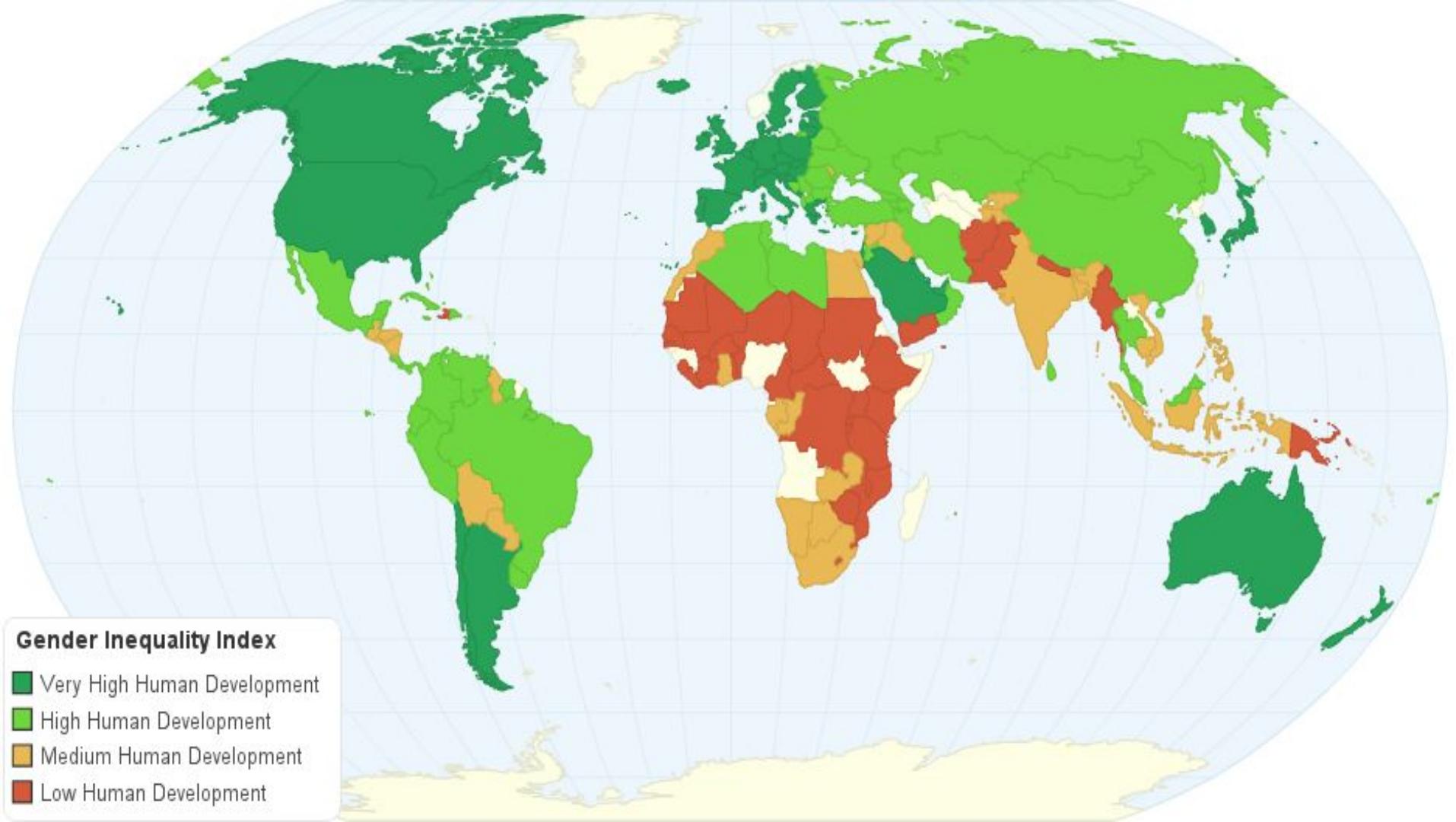


## 5 Top countries in all years since 1995 to 2017(Var.7)



# Compare 5 Top Countries in one view





### Gender Inequality Index

- Very High Human Development
- High Human Development
- Medium Human Development
- Low Human Development

# Summary

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