GROUP 20

Modernization and GDP

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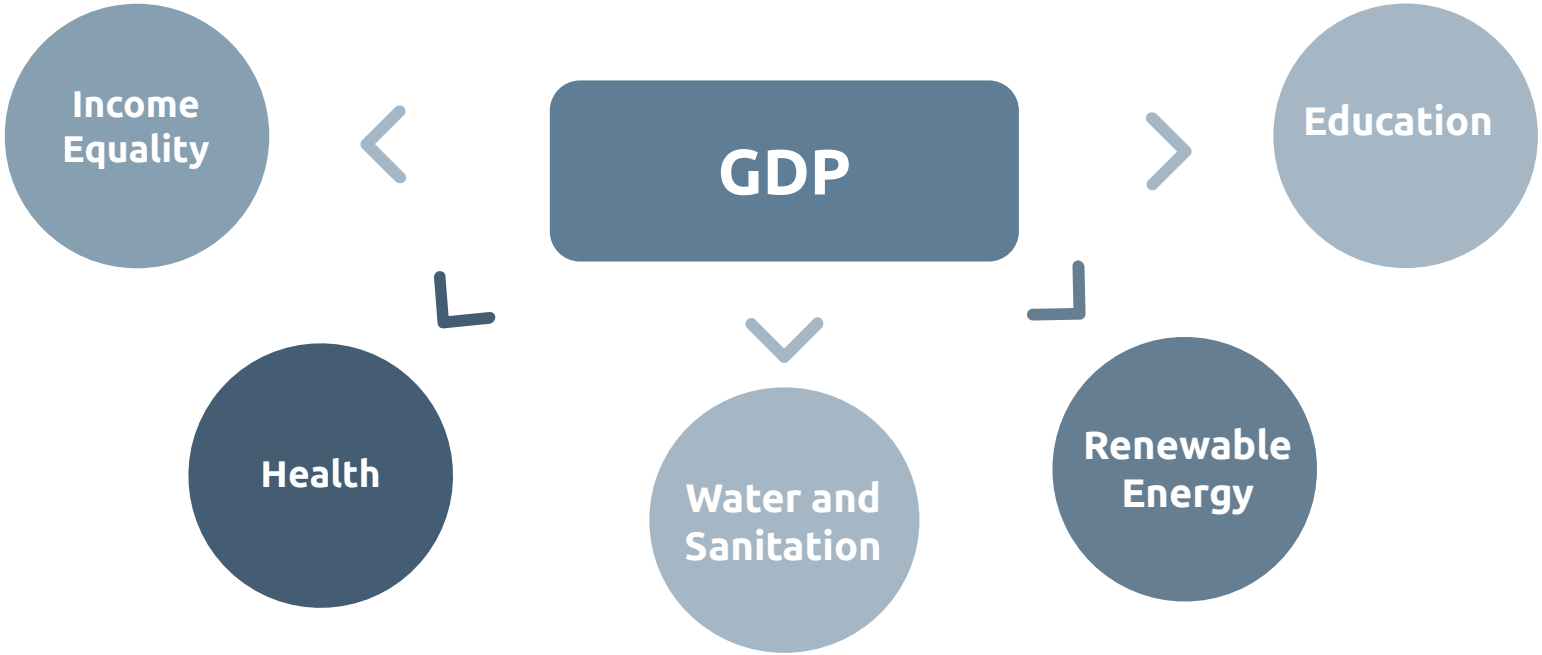
Introduction



Dataset + Cleaning

1. Remove countries with NaN values
2. Remove countries with “..” values
3. Weigh down GDP per capita values
4. Merge datasets based on countries

index	life_expectancy	Physicians_per_1000	GDP_per_capita	mortality	health_gdp	CO2	coal_electricity	hydro_electricity	gas_electricity
Albania	78.194000	1.2164	20	17.0	202.013321	0.001603	0.000000	100.000000	0.000000
Algeria	76.298000	1.8325	19	17.2	260.772552	0.003855	0.000000	0.210762	98.357510
Argentina	76.221000	4.0013	63	15.8	1153.534058	0.004664	2.029567	26.241575	49.482260
Australia	82.448780	3.5672	249	9.1	4971.614746	0.015340	62.871617	5.296184	20.795478
Austria	81.641463	5.1234	226	11.4	4709.875977	0.007089	8.226608	59.997086	12.601396
...	...	...	...	...	...	...	...	...	...
United States	78.539024	2.5881	289	14.6	9877.871094	0.015990	34.232734	5.841638	31.942161
Uruguay	77.498000	3.9558	76	16.7	1450.144897	0.001964	0.000000	60.160116	0.000000
Vietnam	75.172000	0.8281	10	17.1	124.059410	0.002032	29.571446	36.613975	33.210467
Zambia	62.464000	0.1628	6	17.9	57.362690	0.000285	0.000000	96.993824	0.000000
Zimbabwe	60.294000	0.1788	7	19.3	113.408859	0.000892	46.781337	51.395612	0.000000

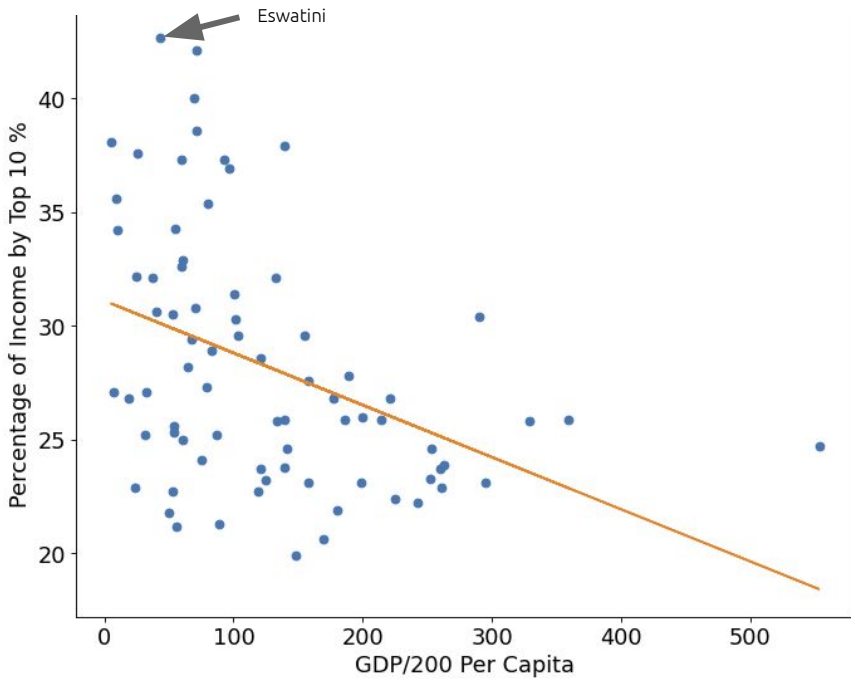
Datasources

World Bank dataset

Renewable Energy per Country

Analysis

Percentage of Income of the Top 10%

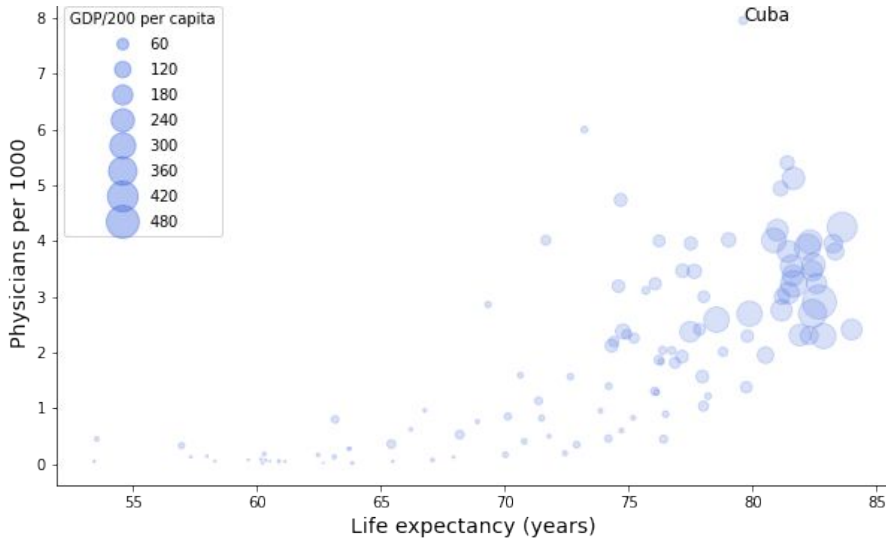


- Wealthier countries tend to have a better distribution of wealth
- Pearson's correlation: -0.403
- **Case Study Eswatini**

Eswatini Case Study

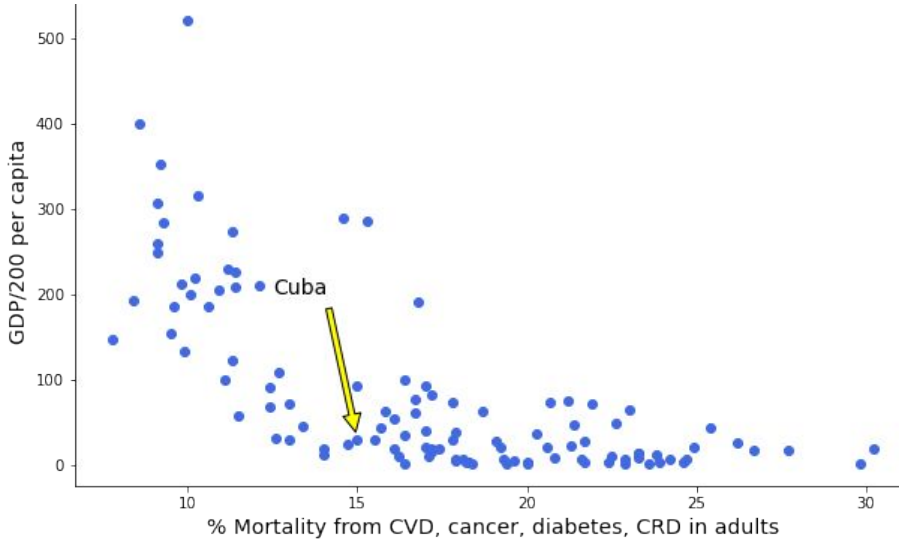
- Highest income disparity in the World
- Main export is Sugar
- 70% of rural community is considered under the national poverty line
- Majority of employment in subsistence agriculture
- High productivity in industrial lands but low in subsistence farming

Health vs Wealth



- Physicians per 1000 - indicator of health care infrastructure
- Life expectancy - indicator of people's health
- Strong correlation, pearsonr = 0.72
- General trend - healthy country tends to be wealthy
- Outlier - Cuba

Health vs Wealth



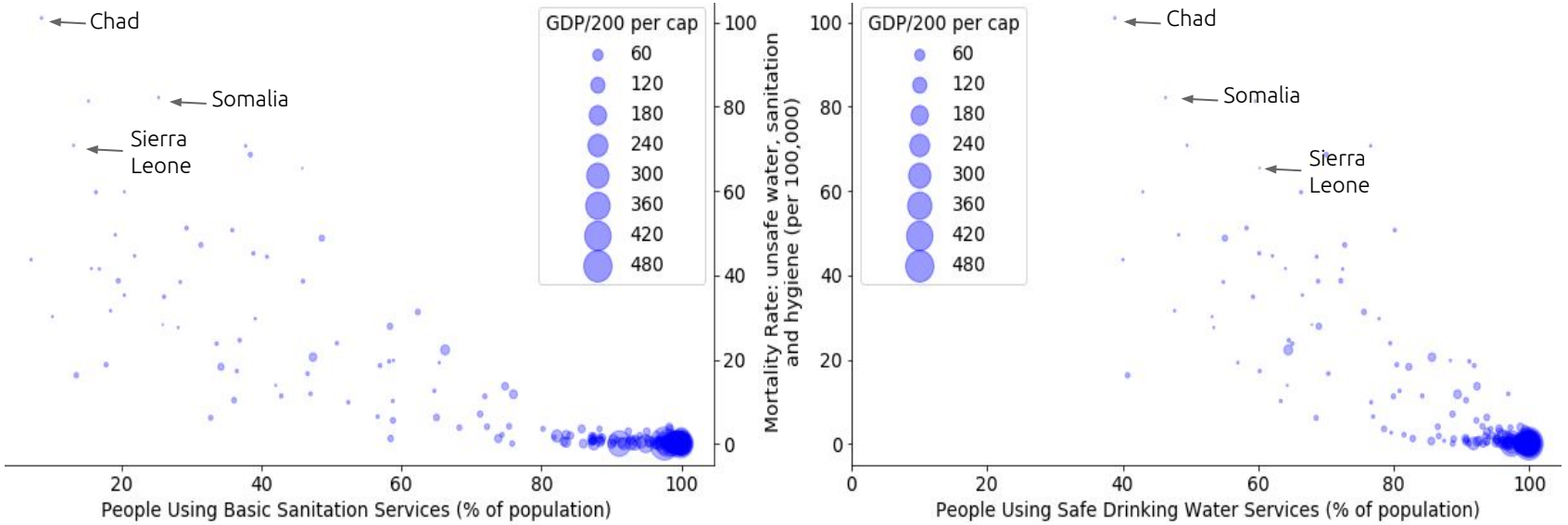
- Strong Negative correlation between mortality and gdp per capita
- Wealthy countries better equipped to treat cancer, diabetes, CVD
- pearsonr = -0.694

Cuban Health Paradox

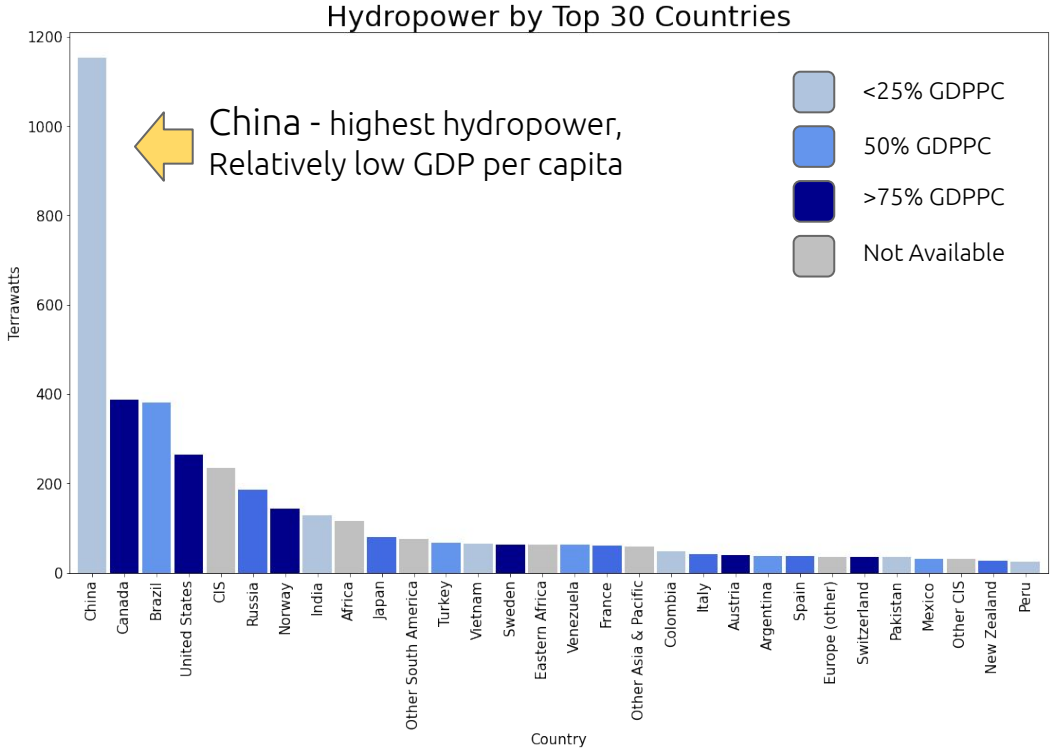
- Low GDP per capita
- High life expectancy - Universal and free healthcare
- Low mortality - High number of physicians.
- Less deaths from communicable diseases
- Moderate mortality (cancer, diabetes , CVD) - restrictions on import of drugs

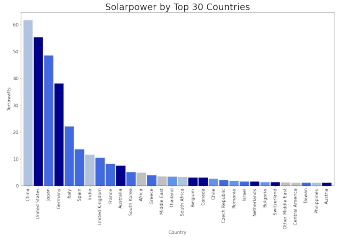
High GDP per capita - high life expectancy , better health care and low mortality

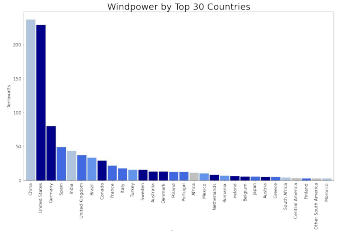
Access to Water and Sanitation

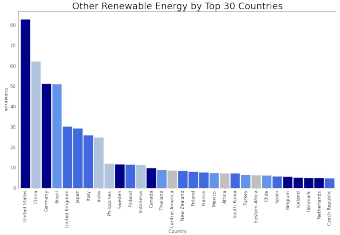


Renewable Energy v GDP

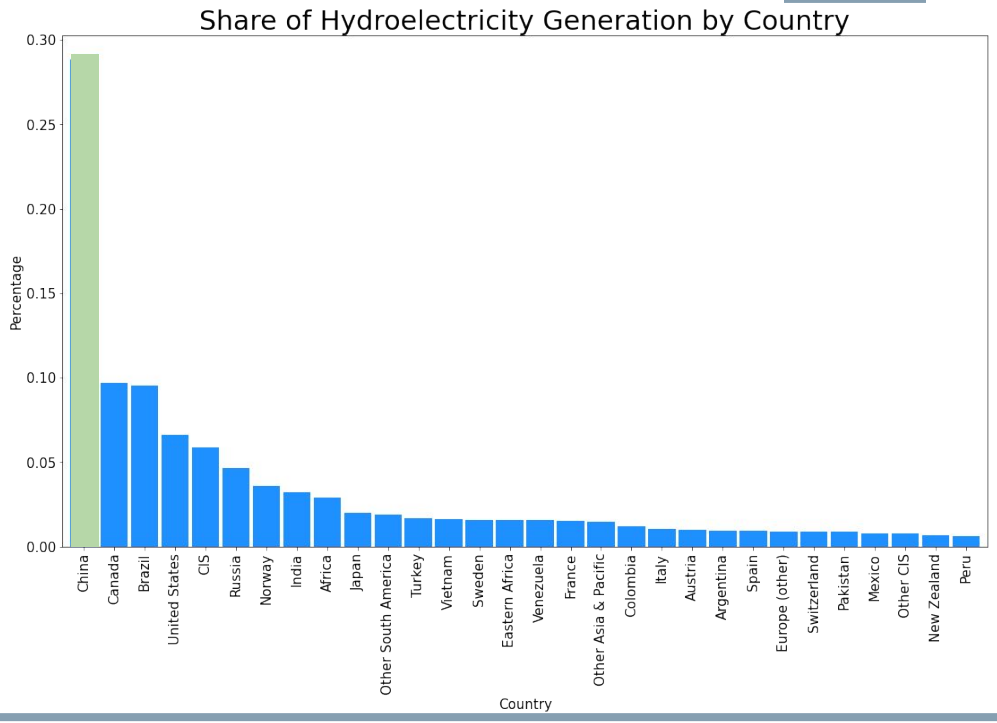








Hydroelectricity

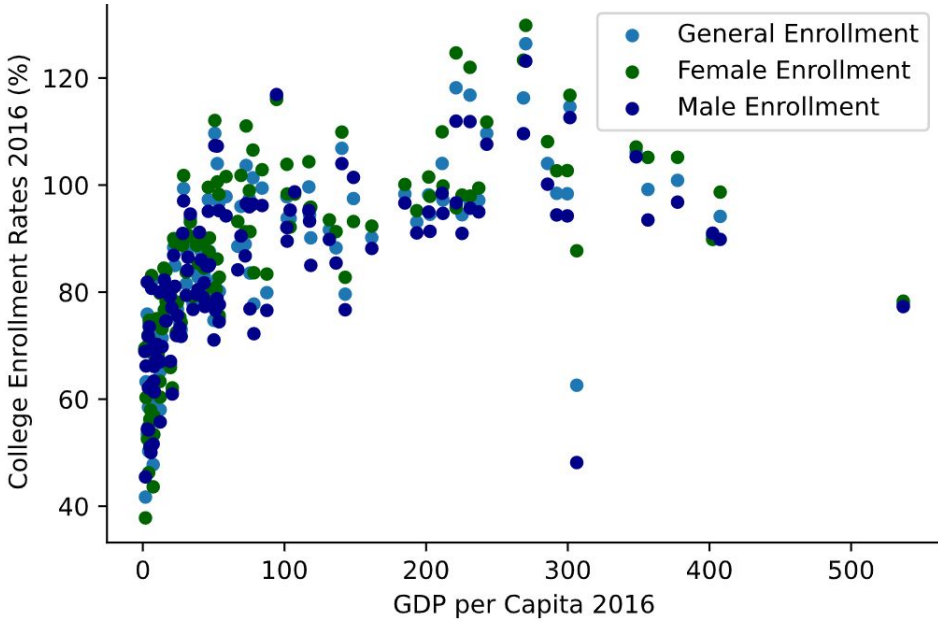


30% of worldwide hydroelectricity

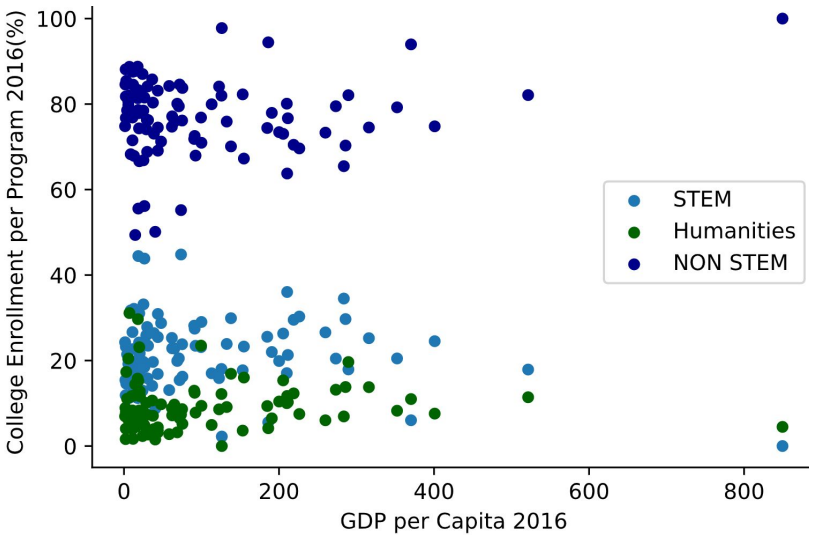
1,126 TWh in 2015

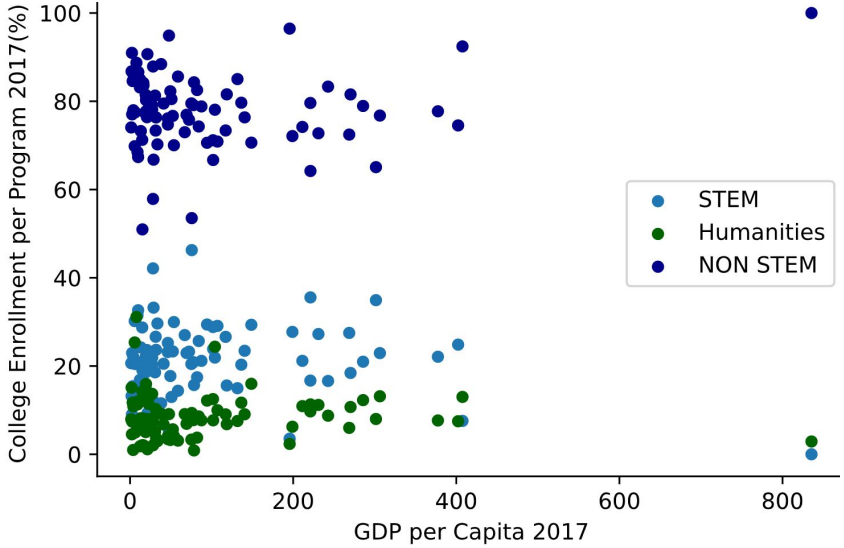
Equivalent to **27%** of USA energy consumption

Correlation Between College Enrollment and GDP

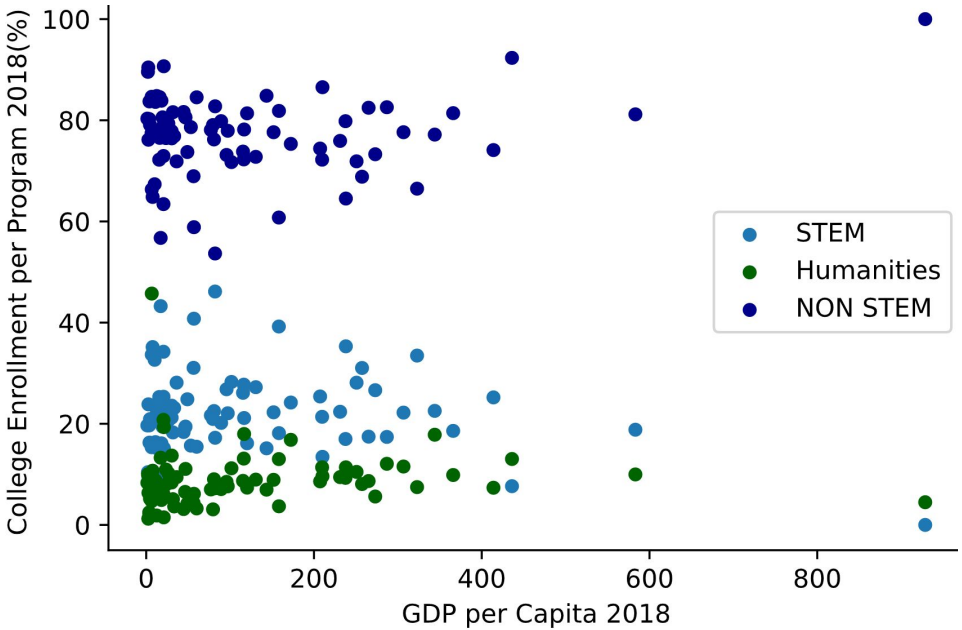


Correlation Between Major and GDP





Effects of a STEM Education on Economic Growth



- Strong correlation found between GDP, and the number of college graduates
- No correlation between the type of major and GDP
- Follows studies showing “diminishing returns per STEM degree per worker”

Final Thoughts

Our Takeaway

1. **Low Income inequality = Higher GDP**
2. **Health = Higher GDP**
3. **Low mortality due to unsafe water and sanitation = Higher GDP**
4. **Renewable energy varies widely between countries**
5. **Higher enrollment in college = Higher GDP**

While we would expect a level of consistency between countries with similar GDP, we found a number of anomalies that show this isn't true.

GDP per Capita is not a Perfect Indicator

- **Eswatini**
- **Cuba**
- **China**
- **Lack of correlation between STEM major and GDP**

There will always be some outliers, and the numerous socioeconomic factors make it difficult to have definitive statements.

References

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Questions?