

Child Stunting VS Economic Condition

Aim :

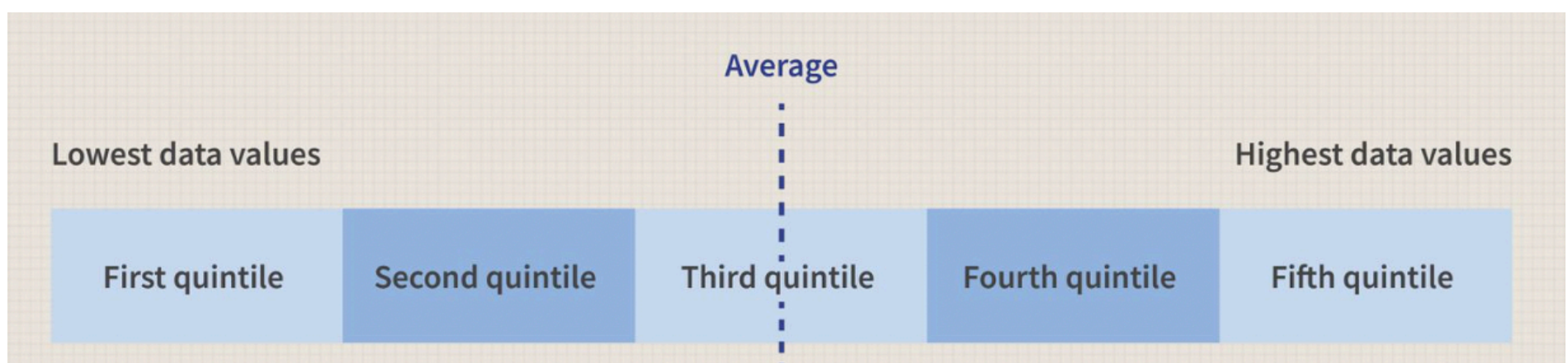
We wish to find the relationship between the Economic Condition of people in a country and stunting.

For this we would divide the people of the countries into different economic Quintile.

What are Economic Quintiles :

Quintile , as the name suggests, is dividing into 5 groups, when applied to economic conditions of citizens of a country, It means dividing into 5 classes based on economic conditions. Example 5th Quintile would mean the richest 20% of the people in the country. Similarly 1st Quintile would mean the poorest 20% of a country.

For our analysis, we would focus on 3 different Quintiles, namely 1st Quintile, 3rd Quintile and 5th Quintile. This would cover people belonging to 3 different classes namely lower middle and higher class.

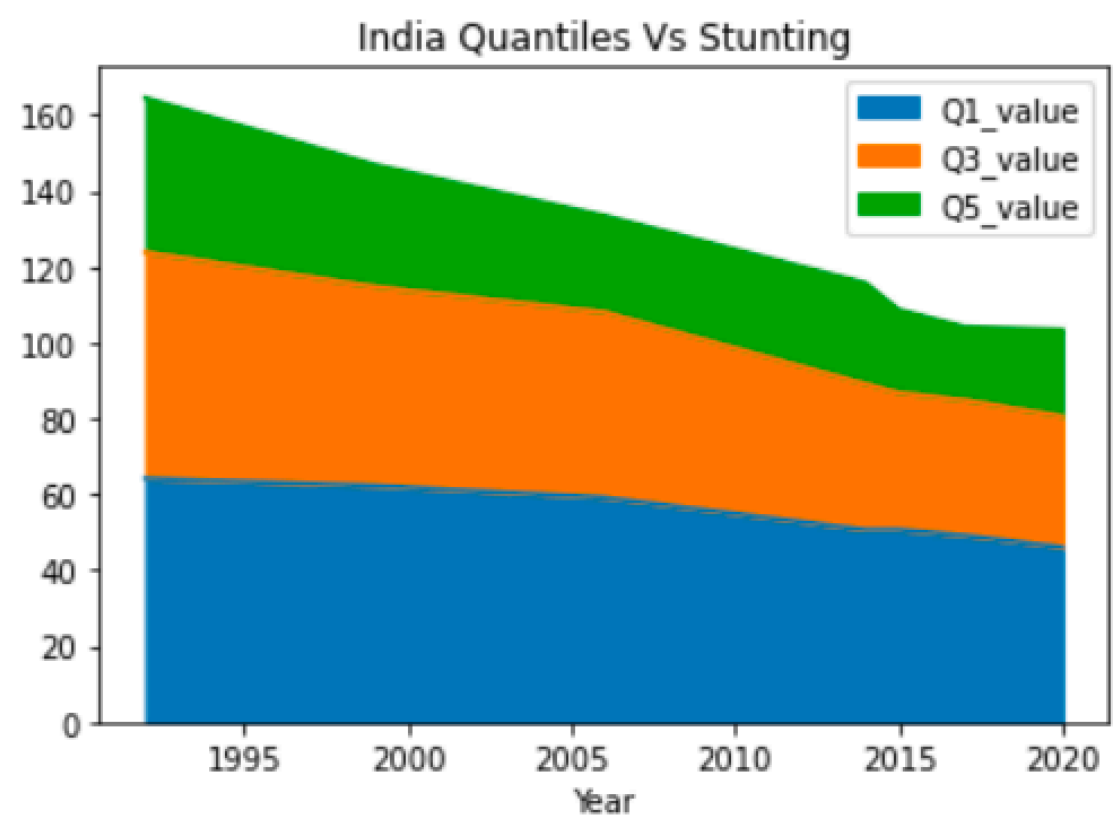
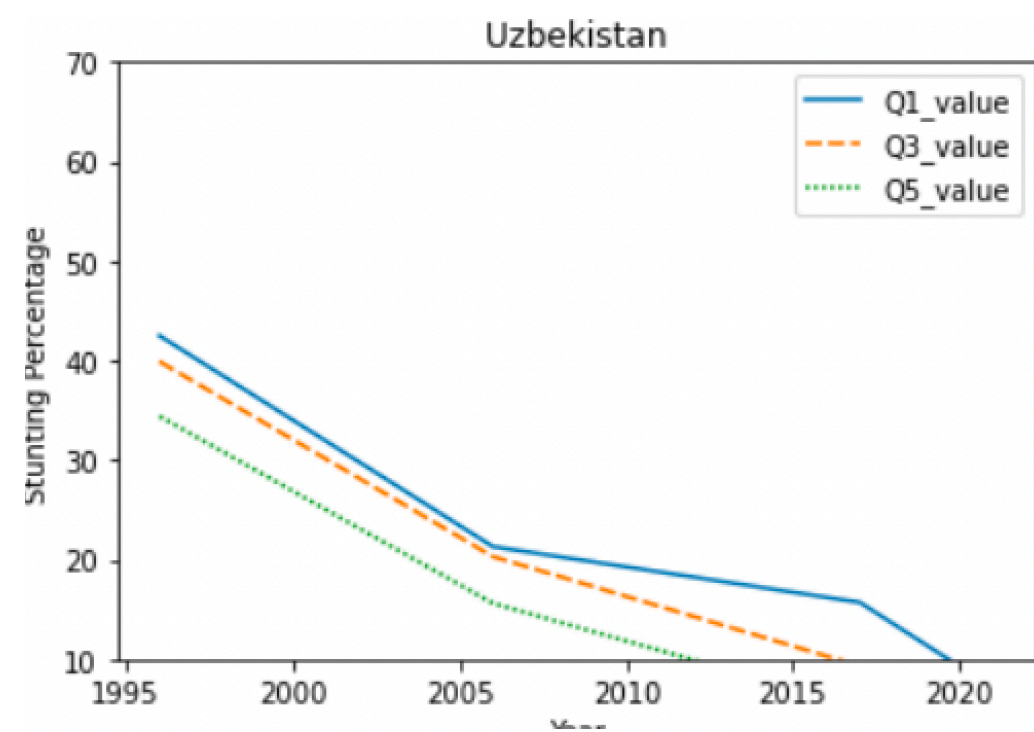
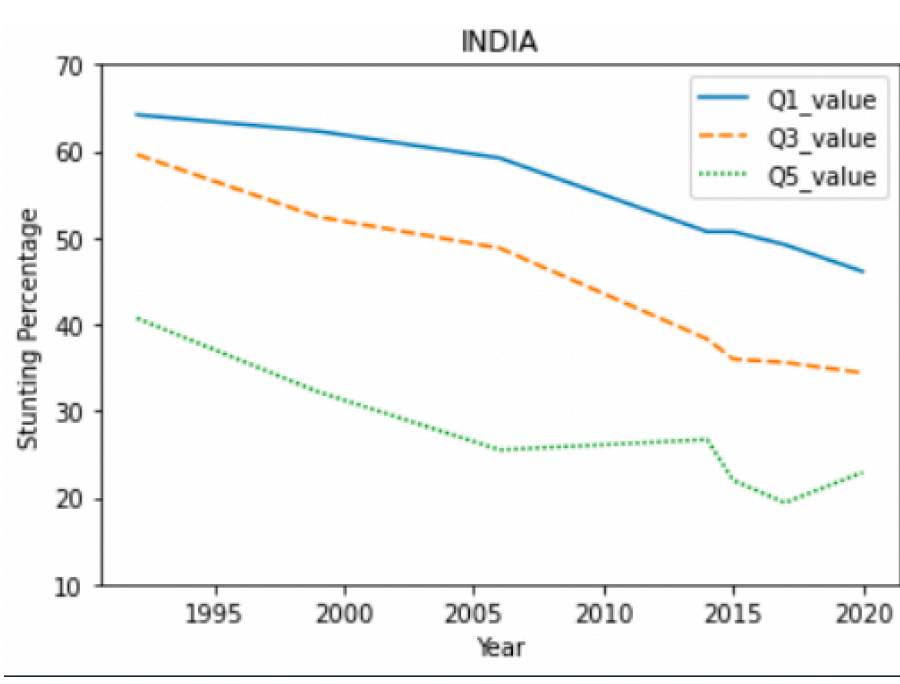
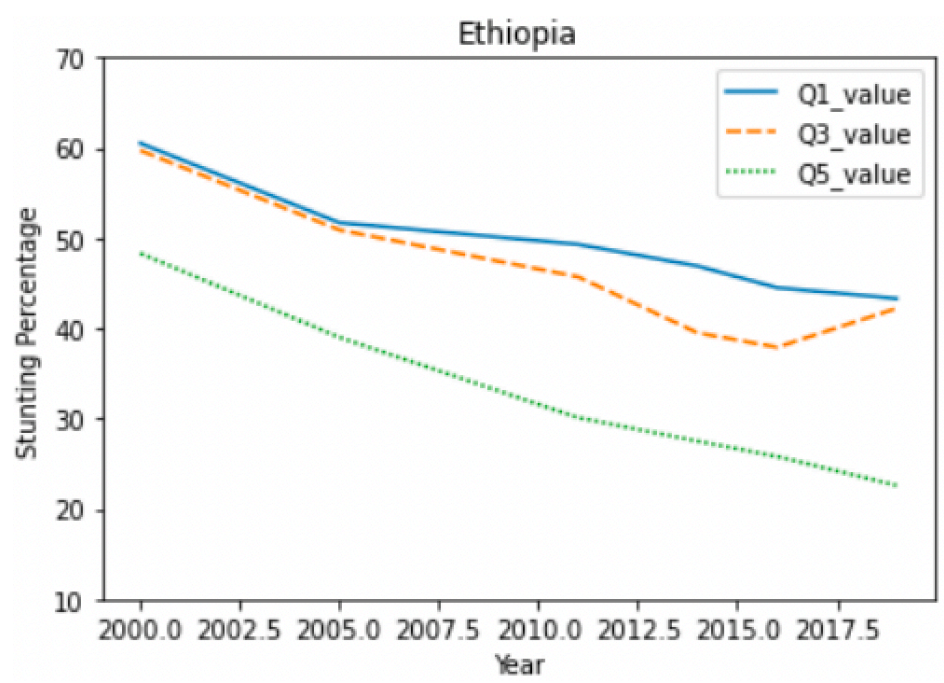
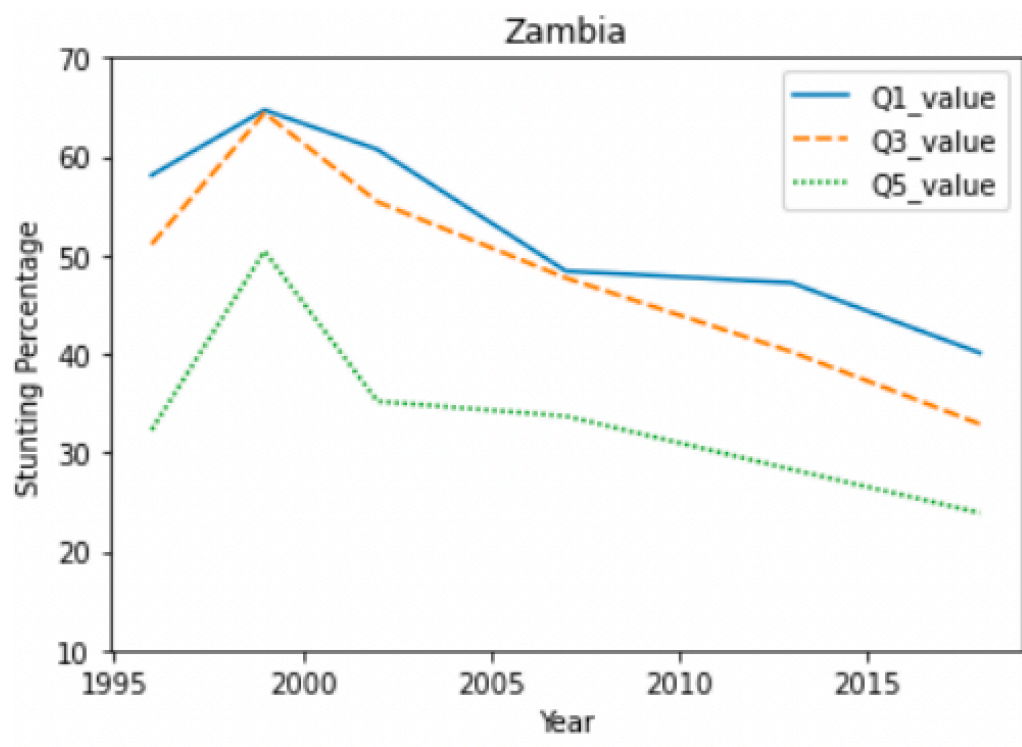


Caption

Quintiles VS Stunting Trends In Countries:

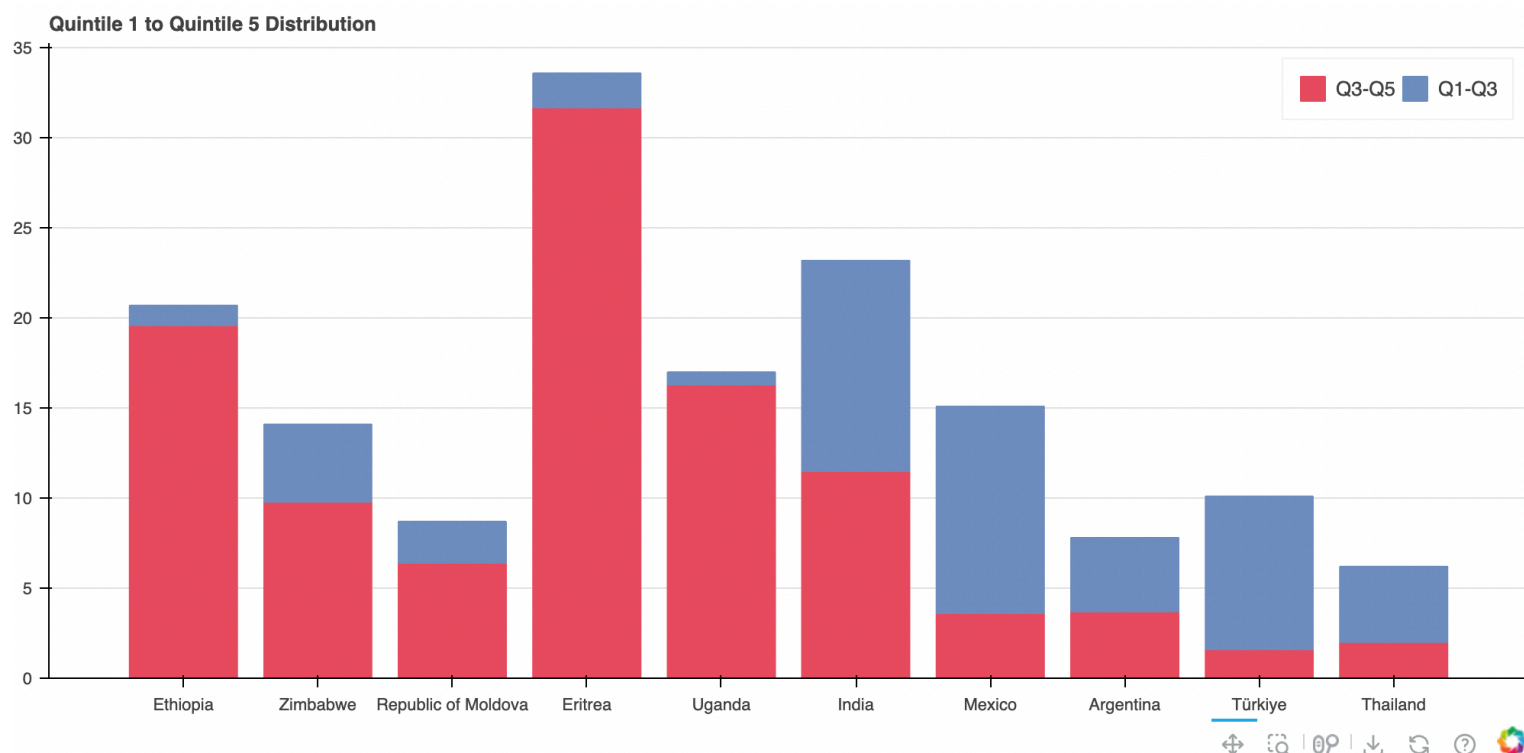
First we would try to see if there is any correlation between the 3 Quintiles mentioned above and stunting. For this we randomly choose a few countries and try to plot their corresponding Quintiles vs stunting in a graph, to find some interesting trends.

Graphs Of Different Quintiles in Various Countries VS Stunting:



Primary Observation From Graphs :

From the above Graphs, we Notice that some countries have Quintile 1 and Quintile 3 lines very close compare to others. We use area graph to show the same.



Interesting Observation through Graphs:

The Graphs above show that in Under developed countries, the difference between the stunting value of Quintile 1 and 3 is small compared to that in between Quintile 1 and 5.

When this observation is applied to Developed Countries, it has been observed that the difference between Quintile 1 and 3 is similar to that between Quintile 1 to 5.

It can also be observed in the graphs depicted below.

Clearly, The spacing between Quintile 1 and Quintile 3 is comparable to that of Quintile 1 and Quintile 5.

Physical meaning of the above observation :

In Developed and fast Developing Countries, each Quintile level offers facilities better than previous which helps in reducing stunting rate. Where as facilities in Under Developed Countries are not that much in reach of lower economic Quintiles which is the reason for insignificant stunting reduction.

As citizens of India, which has the 5th largest GDP, we have a very good chance of reducing stunting if we are able to improve the condition of economic Quintiles.

Metric and Method Used to Verify Our Observation :

Step 1 :

We need to divide the countries into Developed and Underdeveloped. To do this we, we will use GDP as the main parameter. Many sources consider GDP as a complimentary parameter to measure Development but not completely adequate. Here, we have used GDP to divide Countries into two categories.

Developed Countries include countries with around top 30 GDP across the world (Source).

Namely India , Germany , Argentina , Brazil, Mexico, Republic of Korea, Turkey, Thailand, Maldives, Egypt.

Under Developed Countries are also taken from the same list sourced, They include Ethiopia, Republic of Congo, Zambia, Viet Nam, Uzbekistan, Zimbabwe, Uganda, Barbados, Eritrea, republic of Moldova.

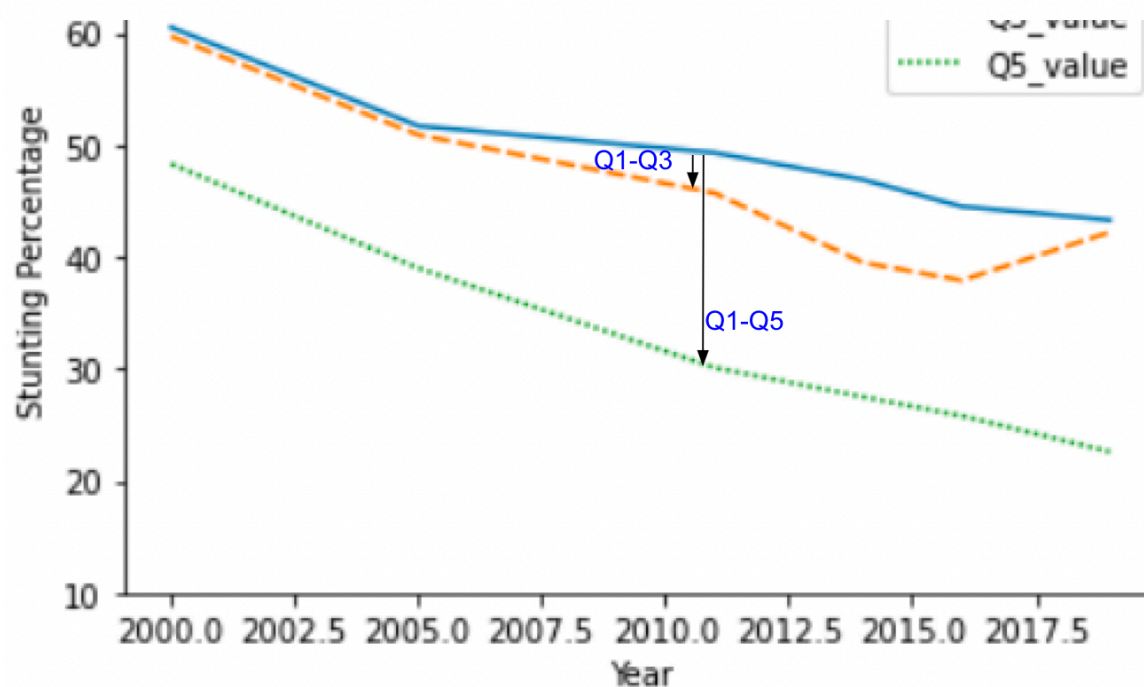
Step 2 :

After some data processing, we find the difference between first and third Quintile and first and fifth Quintile for both Under developed and Developed Countries along all years using method shown below in figure.

Step 3 :

Now we see what fraction of distance between Quintile 1 and Quintile 5 is covered by Quintile 1 and Quintile 3. This is done by :

$$\frac{(Quantile\ 1\ Value - Quantile\ 3\ value)}{(Quantile\ 1\ value - Quantile\ 5\ value)}$$



Step 4 :

After finding the above value we convert it into percentage and average it across all different counties and years in a group as defined above. There is a warning in averaging percentages

NOTE :

We need to just see the existence of trend as hypothesised by us, so we can average these percentage. We will just see if the average percentage is significantly lower in Underdeveloped Countries or not. We won't be able to draw any numeric conclusions by comparing the two average percentages.

OBSERVATION AND SURPRISING OUTCOME:

We Observe that the average percentage of the above stunting difference in Quintile levels discussed above is 21% for Under Developed countries. For Developed Countries, The percentage number increases to an astounding 58.5%, around thrice as high.

Fraction Between 1st and 3rd vs total in Under Developed.
20.99589575732953

Fraction Between 1st and 3rd vs total in Developed.
58.59575600606708

Caption

Physical Interpretation of The Outcome :

This indicates that in Under Developed Countries, stunting is significantly reduced only in 5th Quintile where as in Developed countries in India, stunting is significantly and almost equally reduced between Quintile 3 and 1 and Quintile 3 and 5.

Suggestions :

As we saw through analysis, If a person is able to jump Quintile up in countries like India, there would be a rapid reduction in possibility in stunting. Any policies doing so will have huge impact on stunting reduction.

Scope Of Improvement :

This study can be more accurate by working on following points:

- If we have datas of more big countries like USA, China, we can improve the study.
- If our data has lesser number of voids, we can include more countries in both our lists of developed and under developed countries.
- If we have a more refined metric instead of GDP which tells how developed the country is, Then we can get more accurate study.
- If we could divide the world into developed, developing and under developed, we would get more specific results.

Sources :

Some links embedded above in blog post :

○ *Is GDP A Good Measure To Development :*

<https://www.theigc.org/blogs/gdp-adequate-measure-development#:~:text=Economic%20growth%2C%20measured%20popularly%20via,wealth%20and%2C%20thus%2C%20power>

○ *Classifying Countries According to GDP :*

[https://en.wikipedia.org/wiki/List_of_countries_by_GDP_\(nominal\)](https://en.wikipedia.org/wiki/List_of_countries_by_GDP_(nominal))

○ *Warning to Use Percentage Averaging :*

<https://www.robertoreif.com/blog/2018/1/7/why-you-should-be-careful-when-averaging-percentages>

Some Libraries Used:

- Numpy
- Pandas
- Seaborn
- Matplotlib
- Date
- Bokeh