

Child Stunting VS Economic Condition

Aim :

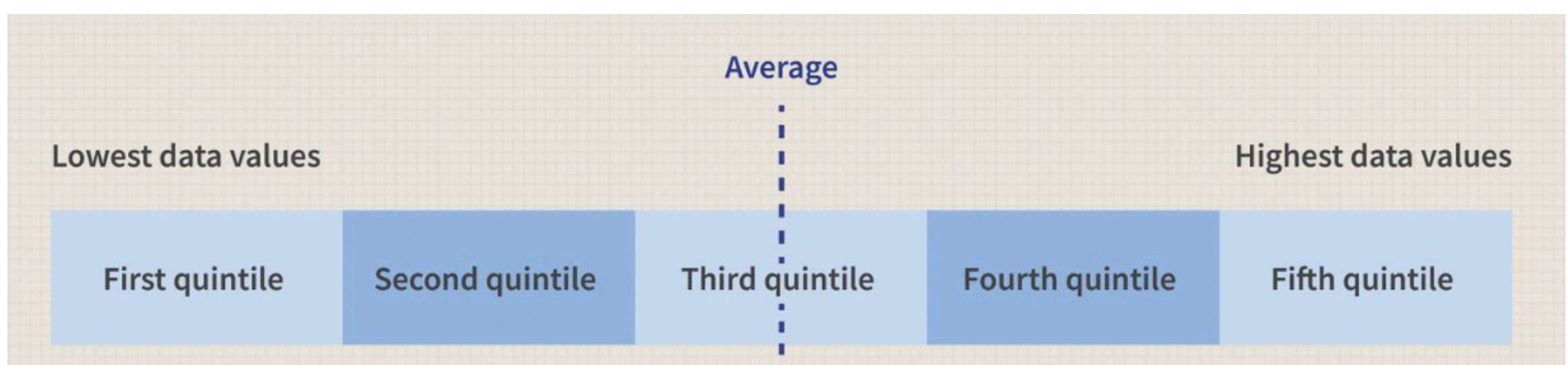
We wish to find the **relationship between the Economic Condition of people in a country and stunting**.

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.

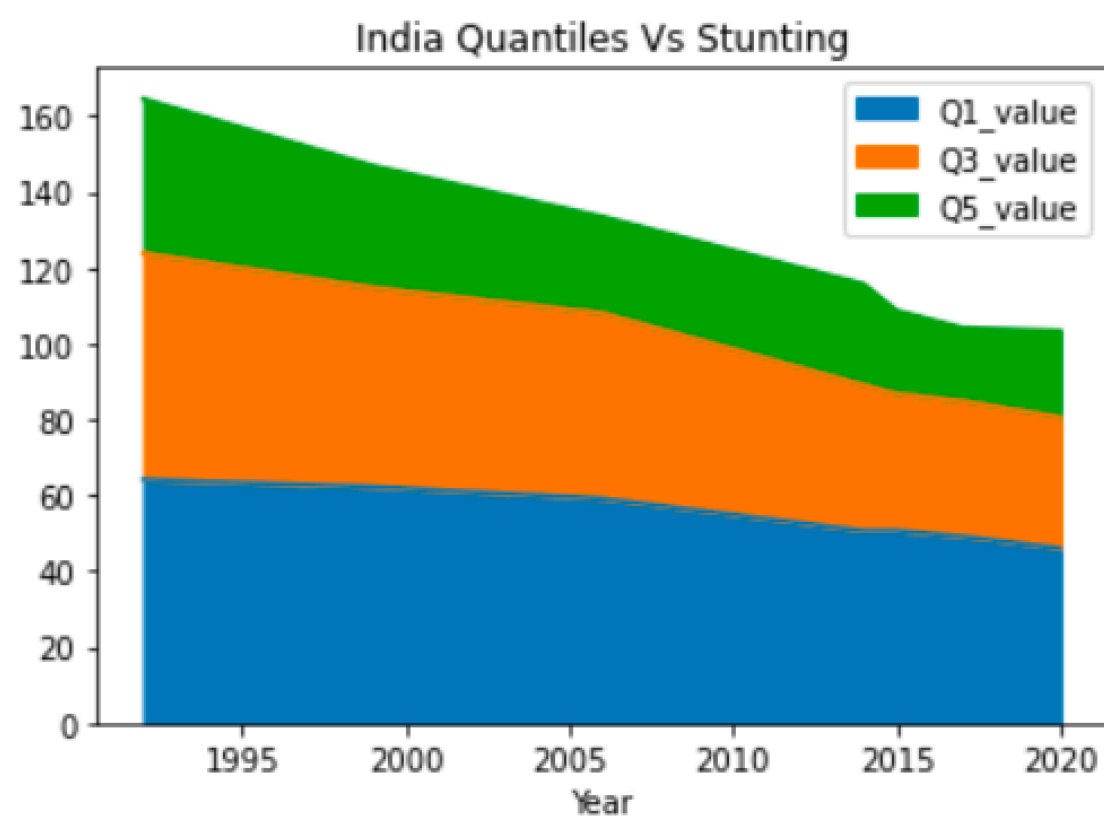
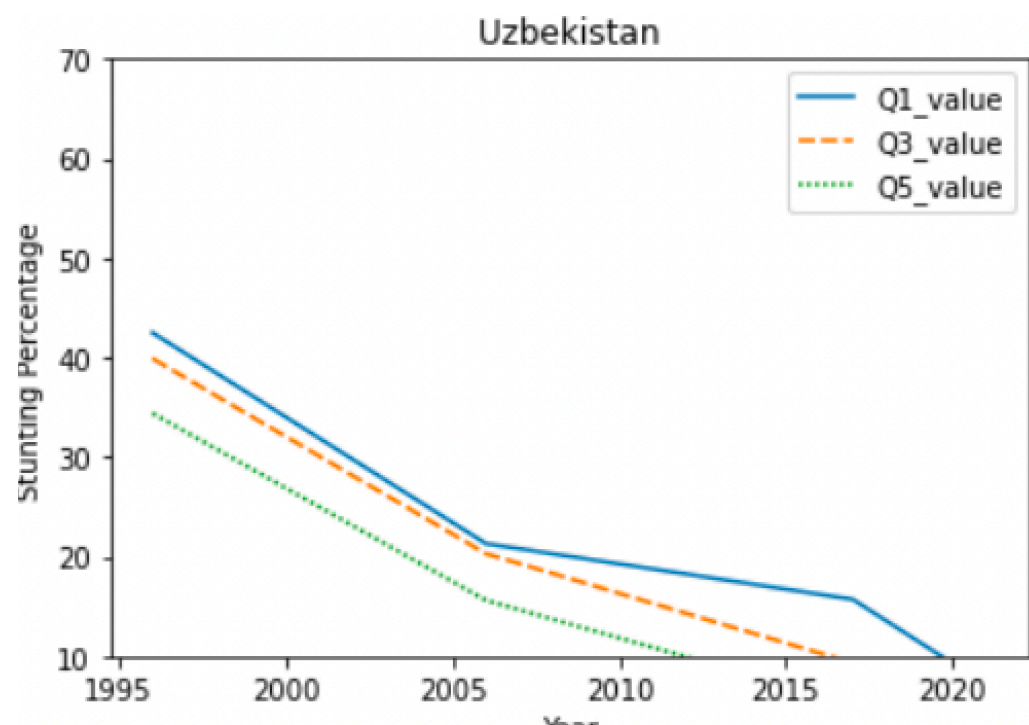
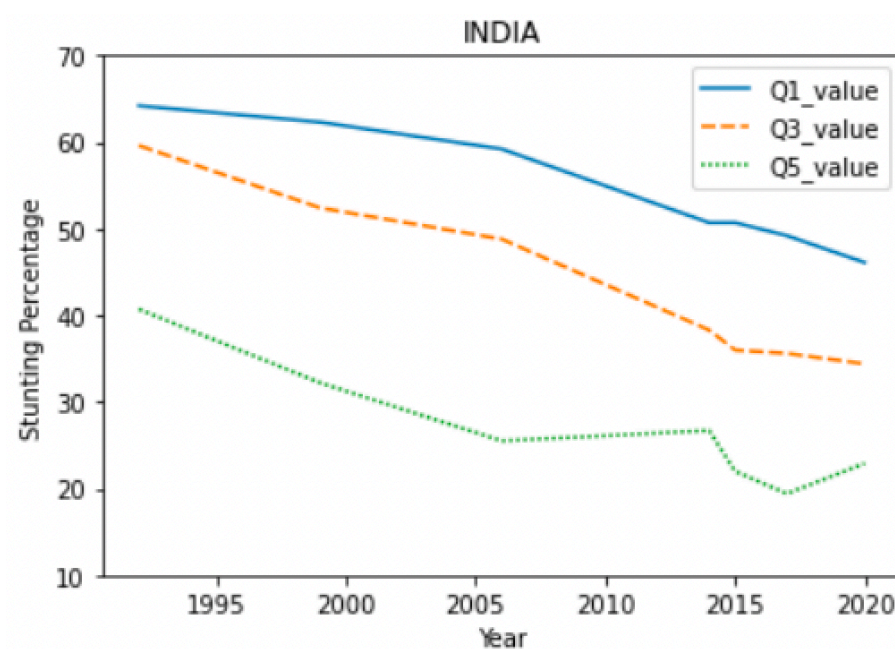
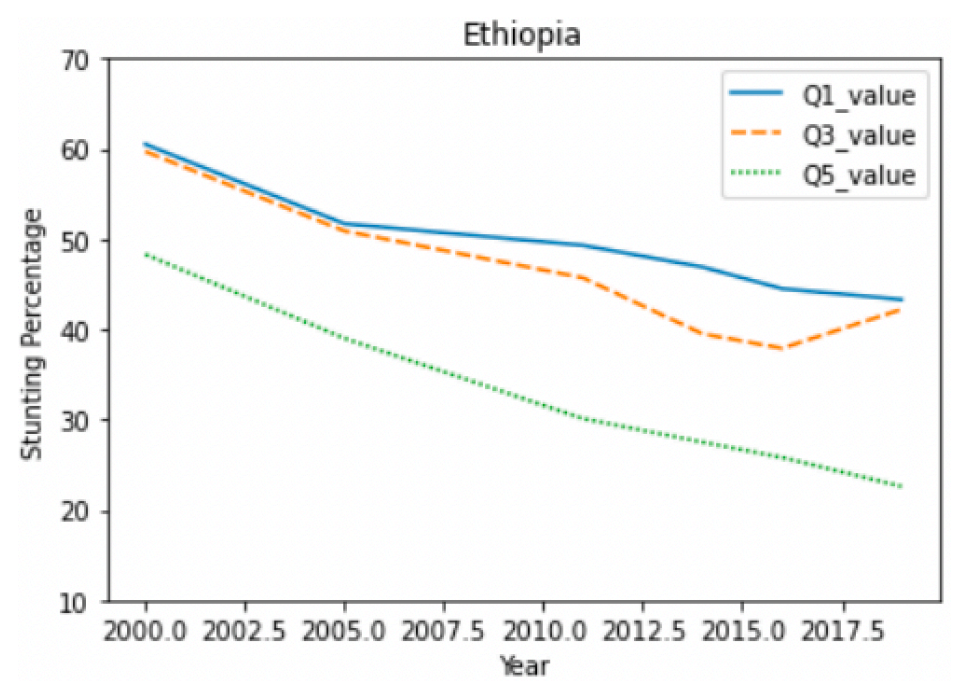
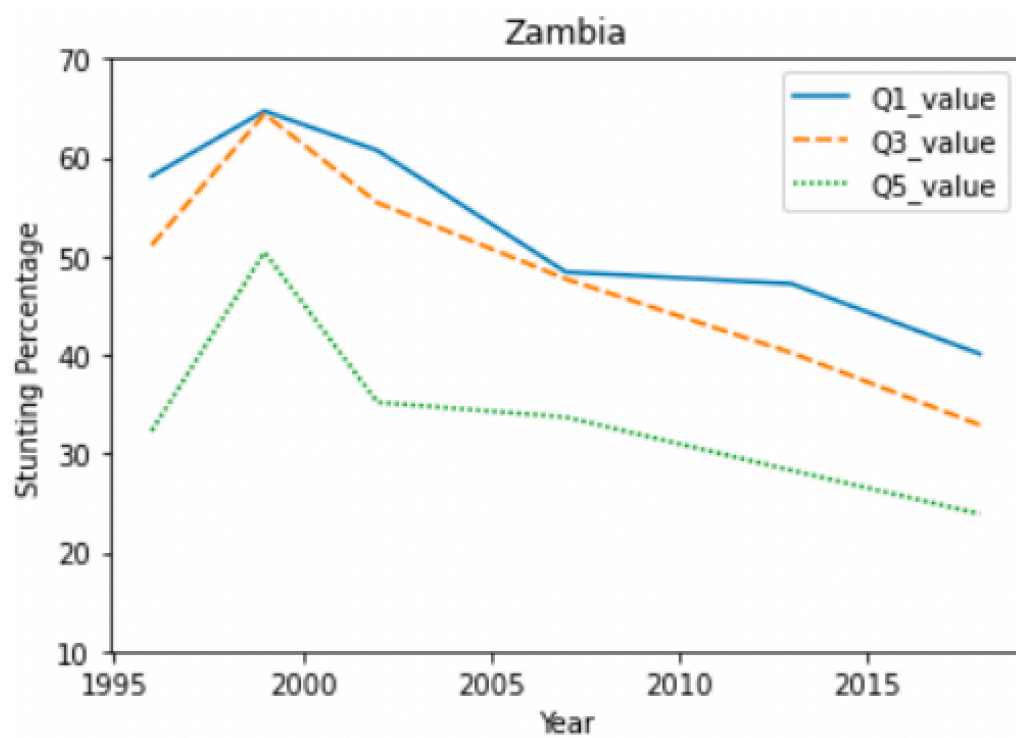
For our analysis, we would focus on 3 different Quintiles, namely **1st Quintile, 3rd Quintile and 5th Quintile**. This would cover people belonging to 3 different classes namely lower middle and higher class.



Caption

Quintiles VS Stunting Trends In Countries:

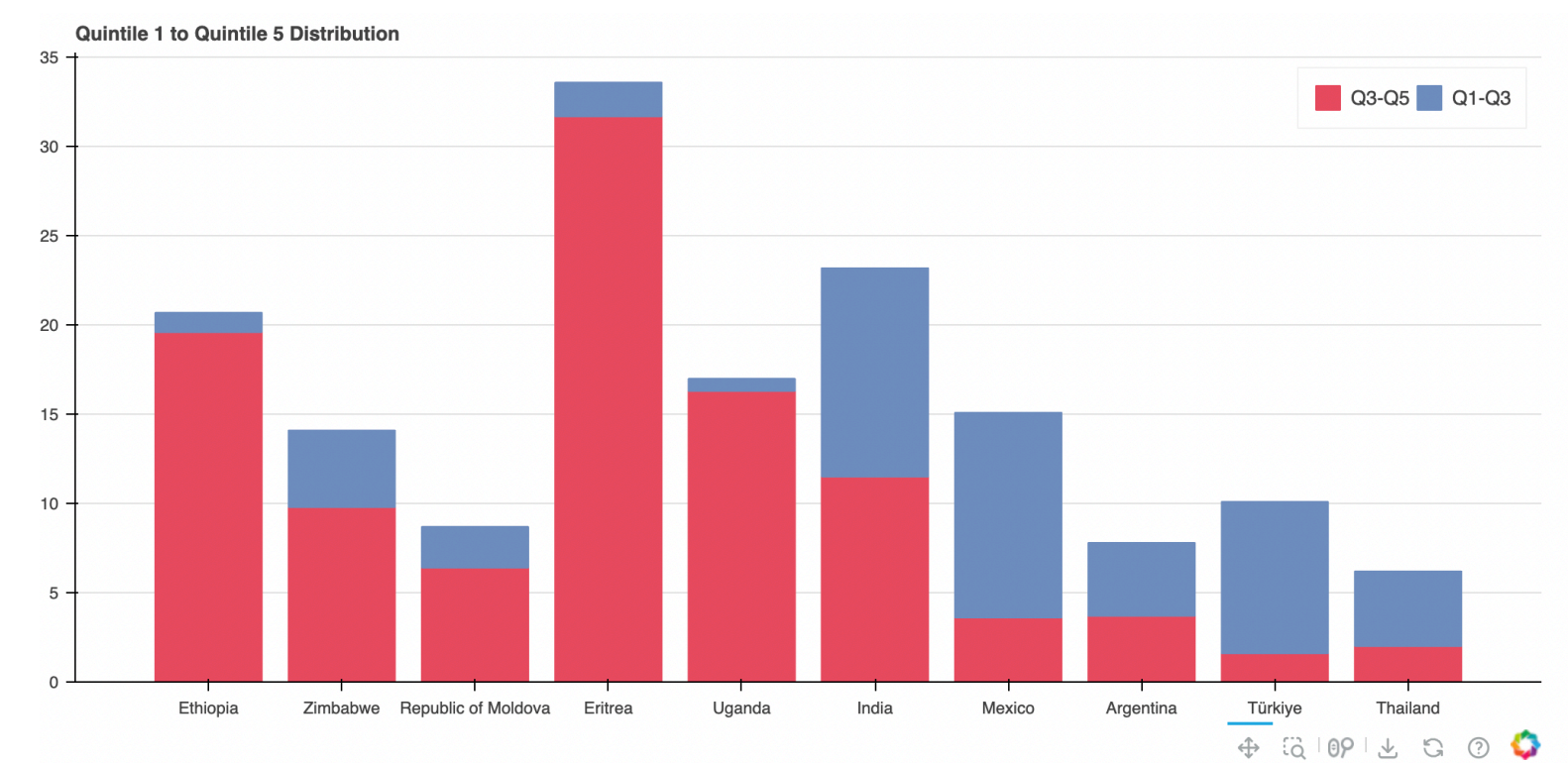
First we would try to see if there is any correlation between the 3 Quintiles mentioned above and stunting. For this we randomly choose a few countries and try to **plot** their corresponding Quintiles vs stunting in a graph, to find some interesting trends.



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.

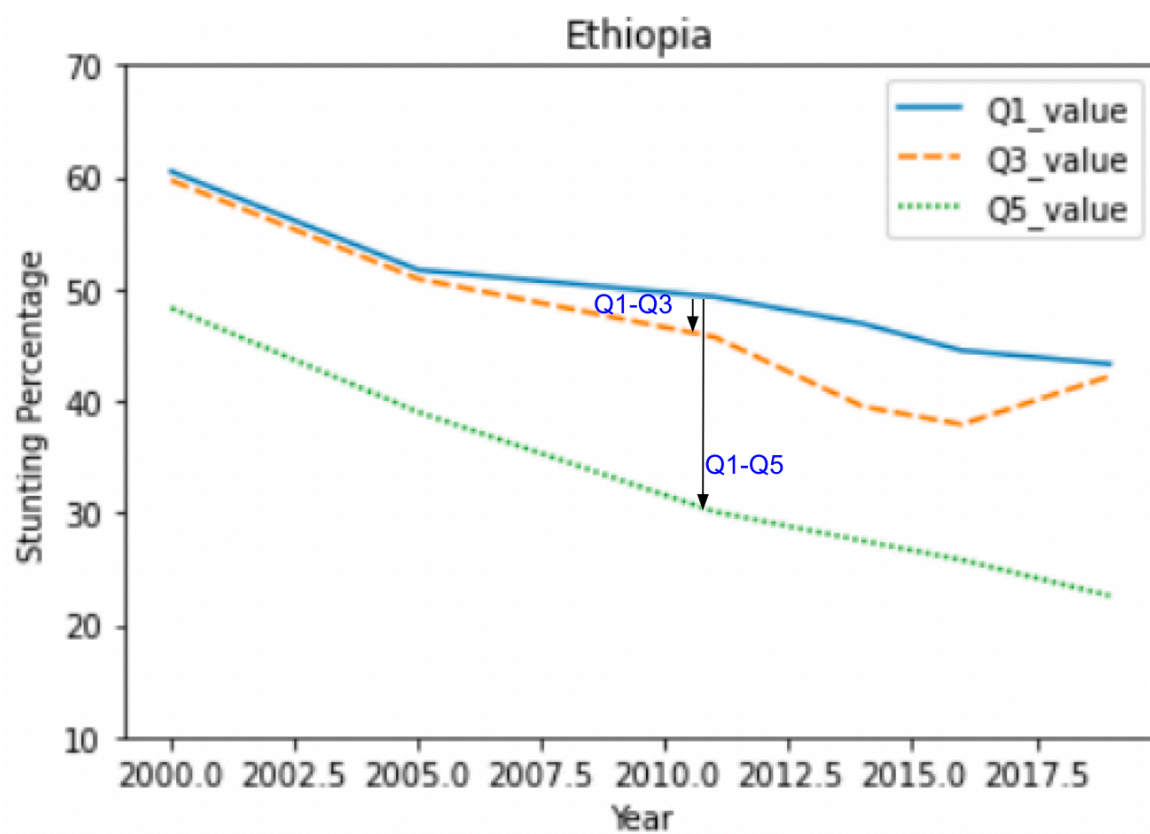
Developed Countries include countries with around **top 30 GDP** across the world (Source).

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