

# Countries : Direst aid need

**Study by**  
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## **Problem Statement**

### **Introduction**

HELP International is an international humanitarian NGO that is committed to fighting poverty and providing the people of backward countries with basic amenities and relief during the time of disasters and natural calamities. It runs a lot of operational projects from time to time along with advocacy drives to raise awareness as well as for funding purposes.

### **Business Understanding**

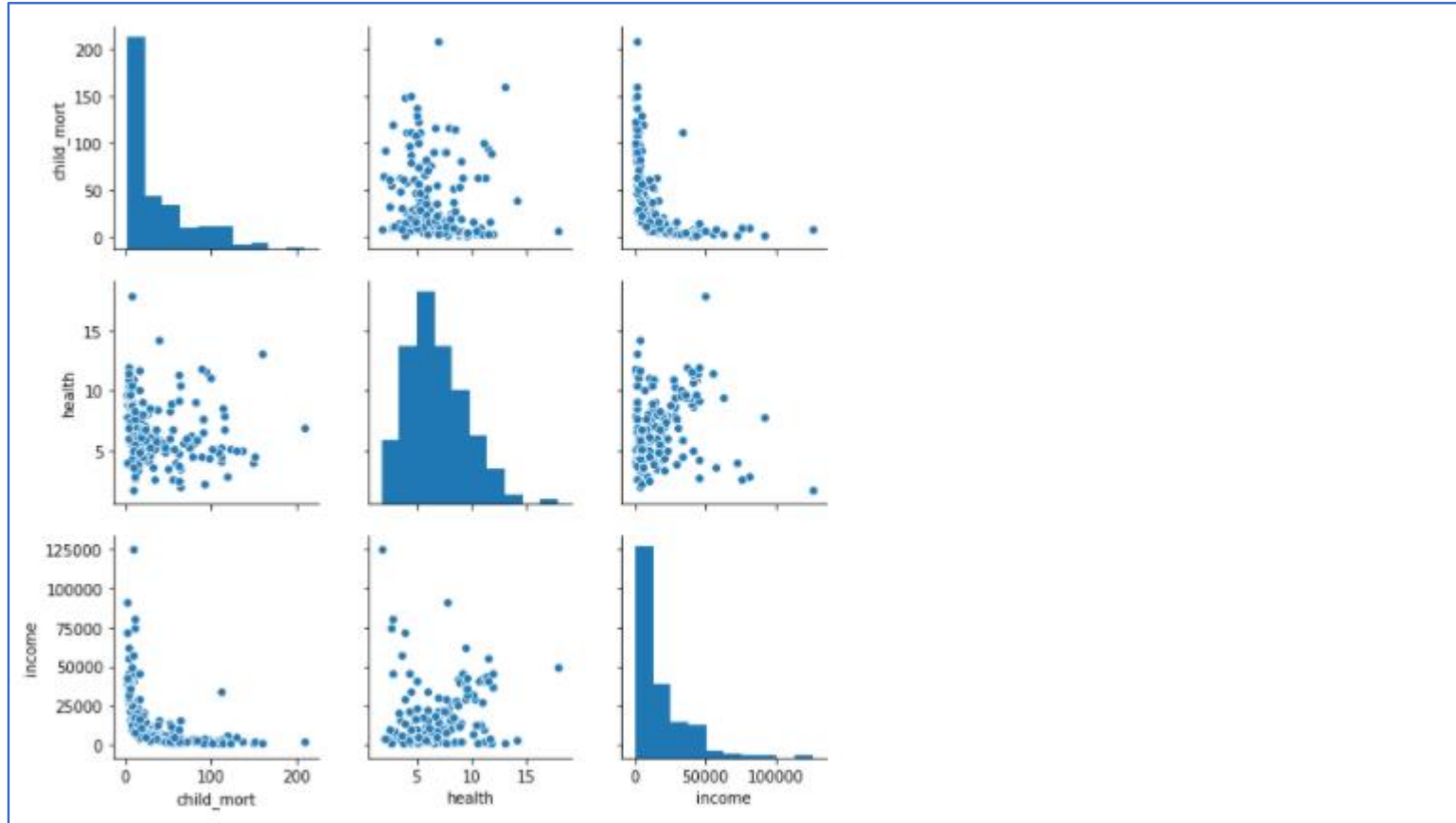
After the recent funding programs, they have been able to raise around \$ 10 million. Now the CEO of the NGO needs to decide how to use this money strategically and effectively. The significant issues that come while making this decision are mostly related to choosing the countries that are in the direst need of aid.

Your job is to categorize the countries using some socio-economic and health factors that determine the overall development of the country. Then you need to suggest the countries which the CEO needs to focus on the most

## Analysis approach

1. Reading and understanding the data
2. Data transformation
3. Outliers treatment
4. Data standardization
5. Modelling with Kmeans and Hierarchical Clustering
6. Analysis of the clusters and identify the ones which are in dire need of aid
7. Resulted clusters analysed against **gdpp**, **child\_mort** and **income**
8. Differentiation of the clusters of developed countries from the clusters of under-developed countries.
9. visualizations on the clusters that have been formed
10. Final listing of 5 countries which are in direst need of aid

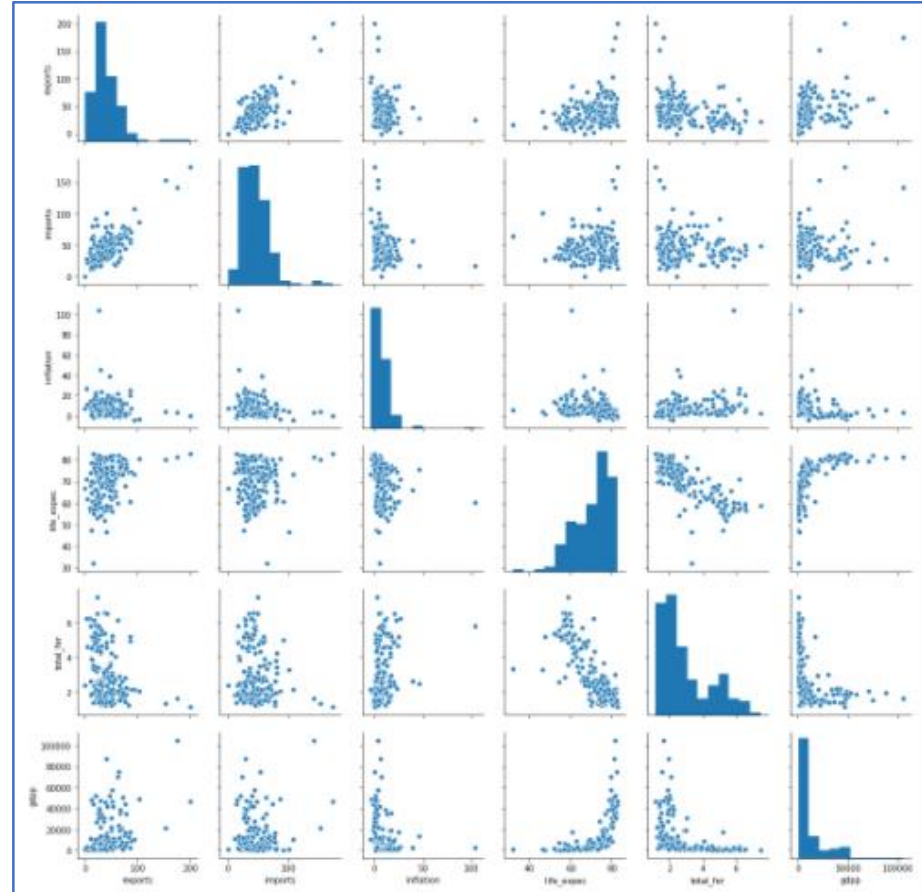
# Comparative study of parameters : 'child\_mort','health', 'income'



## ➤ Observation :

Child mortality (i.e. Death of children under 5 years of age per 1000 live births) is high for low , income people. These people also spending high on health even though they have less income, and such things will further attract poverty.

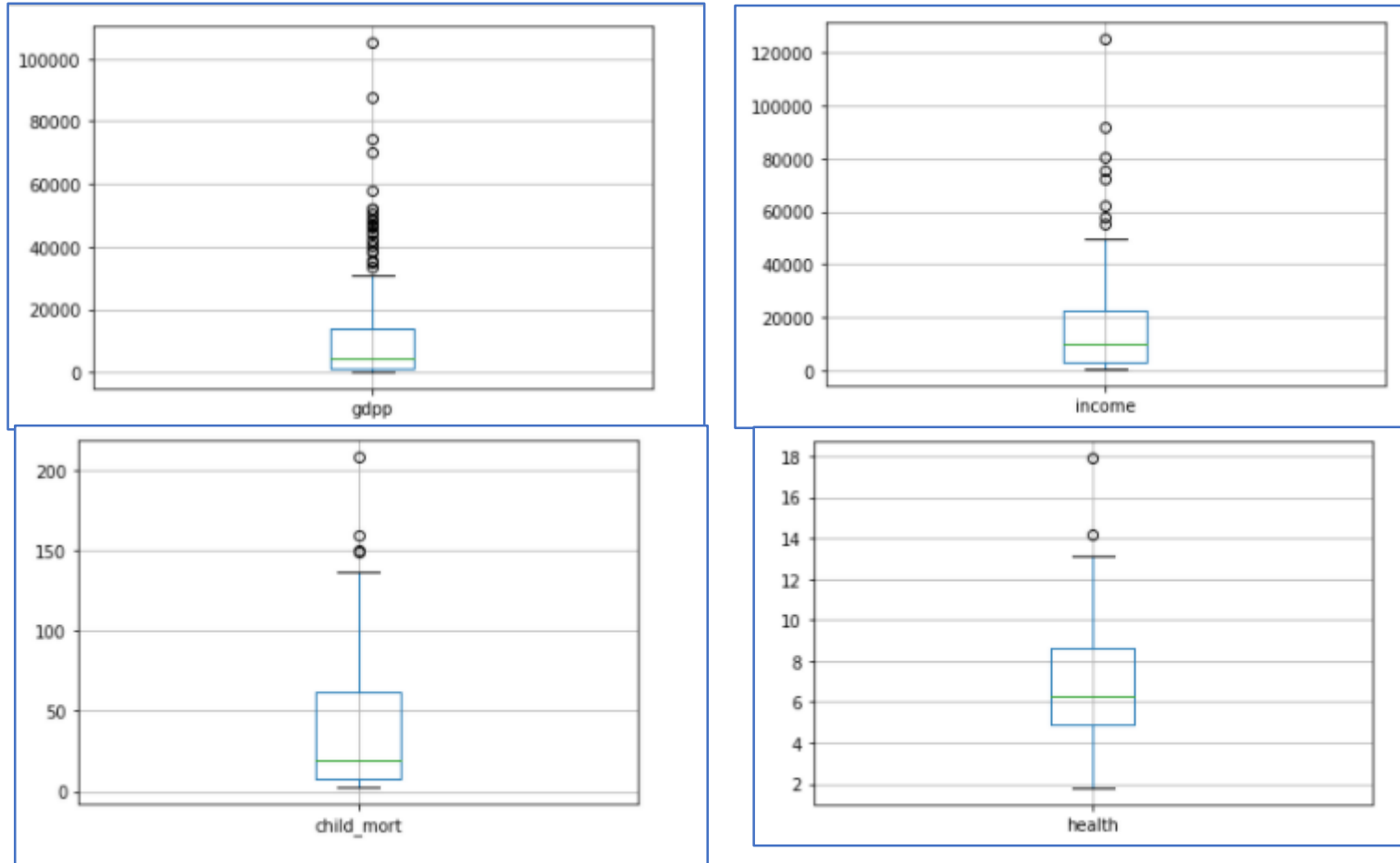
# Comarative study of parameters : 'exports', 'imports','inflation', 'life\_expec', 'total\_fer', 'gdpp'



## ➤ Observation :

- 1.Import and export of counties are directly proportional
- 2.Countries with higher GDP is also exporting more.
- 3.Life expectancy is higher for high income country.

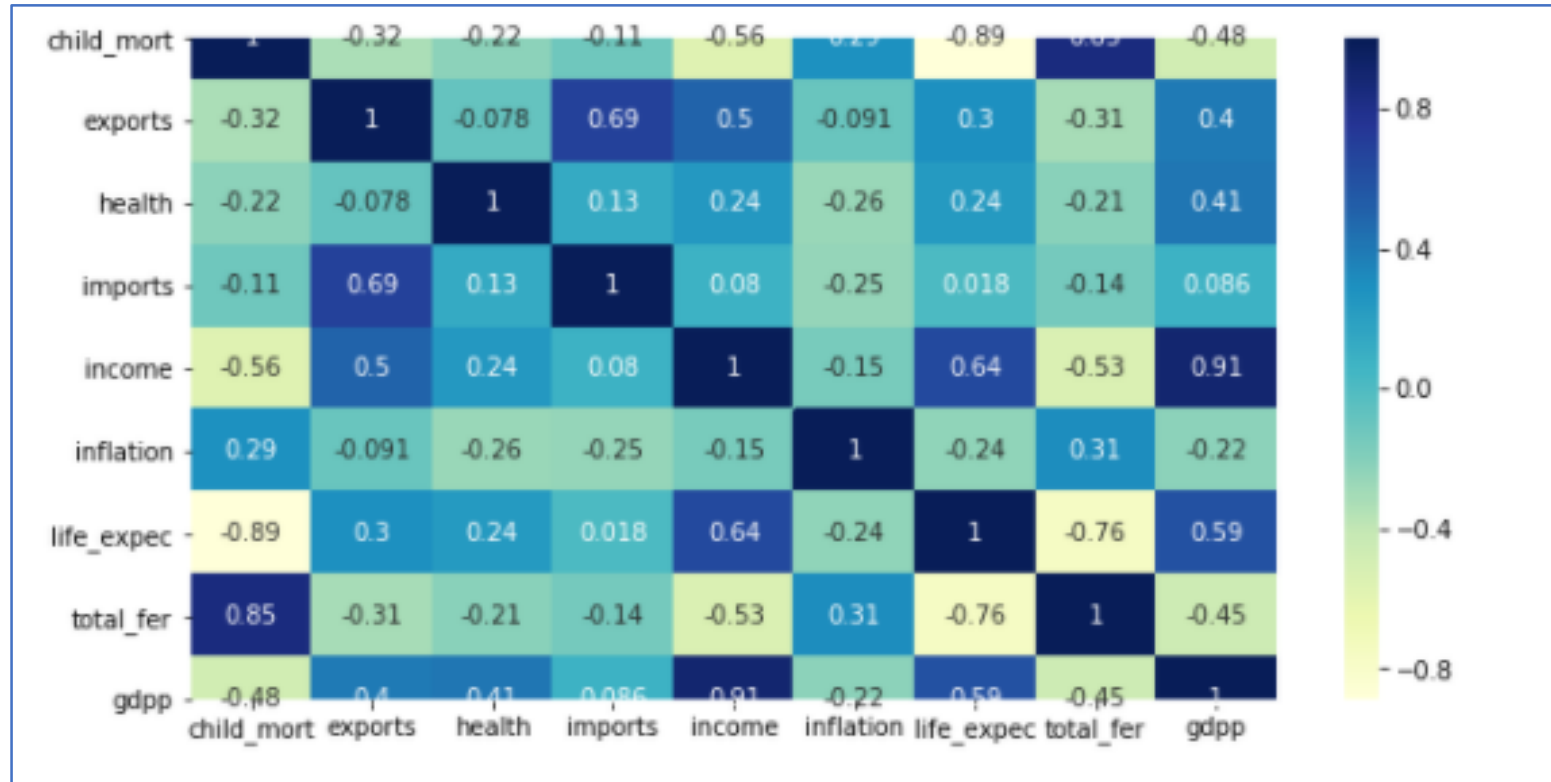
# Distribution of important variable :



## ➤ Observation :

Most people ie 75 % of population on average have income around 20000. However, few people have exceptionally high income around 120000. Income with > 60K, can be categorised as high income group. However, we will treat these as outliers for optimum clustering.

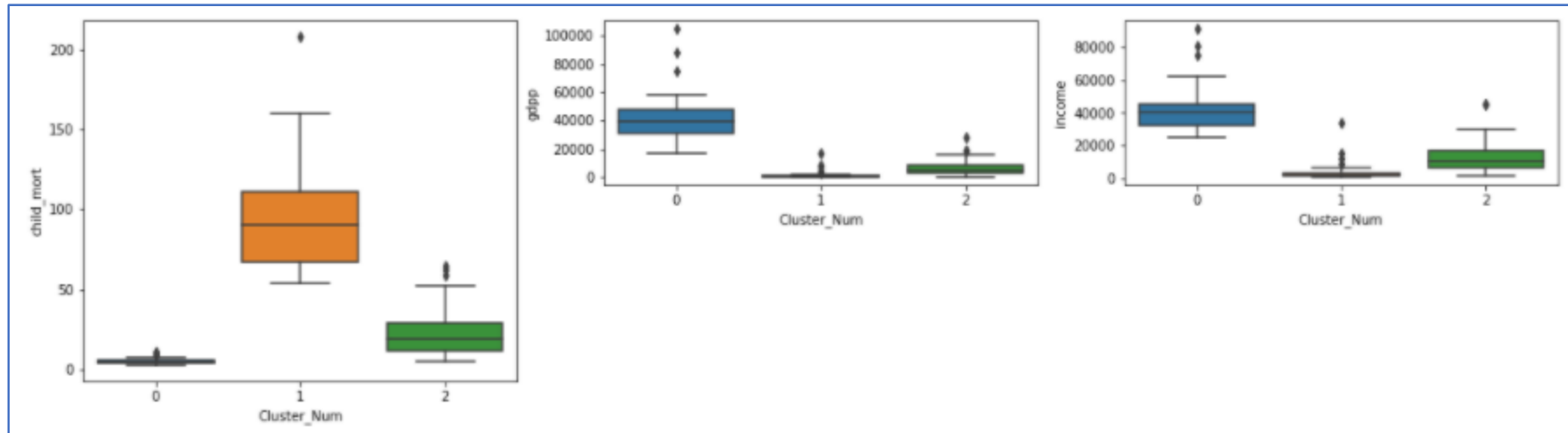
# Checking overall correlation between different variables to understand the data further



## ➤ Observation :

1. child\_mort is highly correlated with total\_fer meaning that countries with higher children born also have high death rate.
2. High income country have higher GDP as expected.

# visualizing clusters obtained from KMeans



## ➤ Observation :

As per visualizations obtained for KMeans :

cluster 1 is belonging to countries which are in dire need of aid. Here, Child\_mort is highest, gdp & income both are at lowest

Thus,

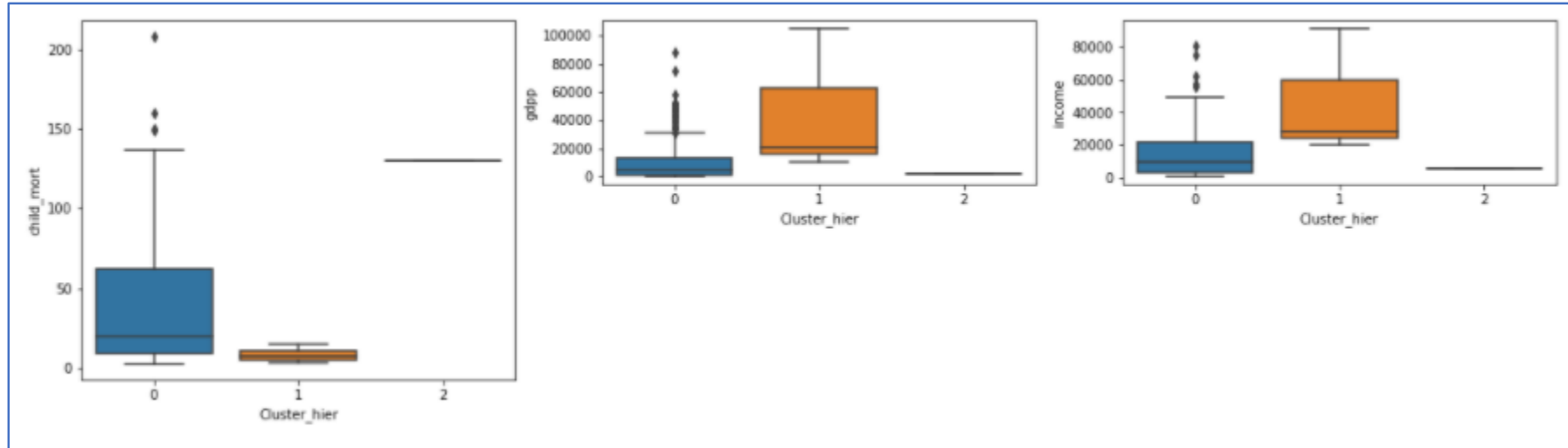
Cluster 1 => Undeveloped countries

Cluster 0 => Most developed countries. Here, child\_mort is lowest and gdp & income both are at top which is a sign of developed countries.

Cluster 2 => This can be categorized as developing countries or less developed countries. Here both these parameters are at moderate levels.¶



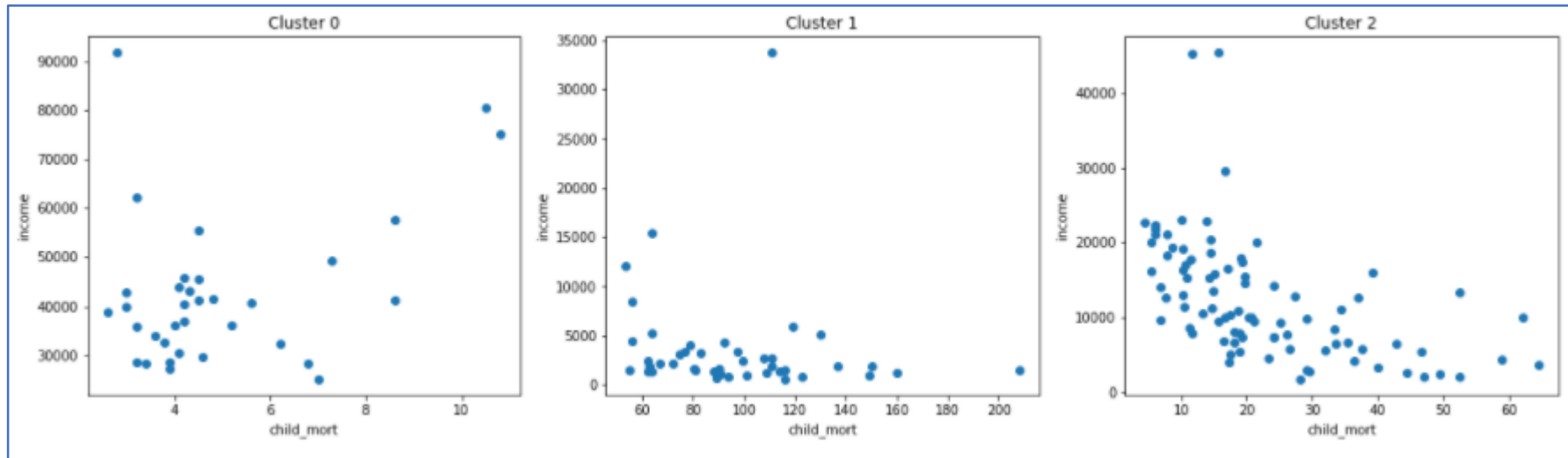
# visualizing clusters obtained from Hierarchical clustering algorithm



## ➤ Observation :

Clustering with hierarchical algorithm showing that cluster 2 belonging to most undeveloped countries and are most dire need of aid.

# Visualization of clusters formed with KMeans with parameters 'child\_mort' & 'income'



## ➤ Observation :

We can see here that cluster1 is having countries with lowest income. Cluster 2 have many countries with high income.

# Five most undeveloped countries which are in dire need of aid along with parameters

country	child_mort	exports	health	imports	income	inflation	life_expec	total_fer	gdpp	Cluster_Num	Cluster_hier
Central African Republic	149.0	11.8	3.98	26.5	888	2.01	47.5	5.21	446	1	0
Congo, Dem. Rep.	116.0	41.1	7.91	49.6	609	20.80	57.5	6.54	334	1	0
Haiti	208.0	15.3	6.91	64.7	1500	5.45	32.1	3.33	662	1	0
Niger	123.0	22.2	5.16	49.1	814	2.55	58.8	7.49	348	1	0
Sierra Leone	160.0	16.8	13.10	34.5	1220	17.20	55.0	5.20	399	1	0

# Conclusion

- **GDP growth rate is extremely low of these countries**
- **5 most undeveloped countries which are in dire need of aid countries selected based on high child\_mort & lowest income.**
- **Export and import comparatively very low**
- **Final list of countries which are direst need of aid are as follows :**
  1. Central African Republic
  - 2.Congo, Dem. Rep.
  - 3.Haiti
  - 4.Niger
  - 5.Sierra Leone

**THANK YOU**