

IAC 5.0

# State of the World's Children

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## Key Takeaways

- **Malnutrition is the most challenging issue faced by the world with 1 in 3 children under age of 5 not growing well.**
- **Our 5 dimensional analysis indicates that even though a country is exceedingly good in one criterion, it does not guarantee overall wellbeing.**
- **As expected, under-developed Sub Saharan and Central African countries are lagging behind in all criteria and it requires a global effort to improve their conditions.**
- **Better data collection is required to focus on the underlying problems.**

## Dashboard

[https://public.tableau.com/views/IACSubmission/IAC?:display\\_count=y&publish=yes&:origin=viz\\_share\\_link](https://public.tableau.com/views/IACSubmission/IAC?:display_count=y&publish=yes&:origin=viz_share_link)

**Note:** This dashboard can be accessed in Tableau Public and contains a detailed analysis of our report with Five Indicators affecting the quality of life of children.

## Introduction

A large number of children and young people in the world face problems such as malnutrition, obesity, consumption of highly processed foods, lack of education and lack of social protection. It hurts us all to realize that these problems undermine their capacity to grow, develop and learn to their full potential. One of the main risk factors for the global burden of diseases now is poor diets. Globalization, urbanization, inequities, humanitarian crises and climate shocks are causing striking negative changes in the nutrition and safety situations of children around the world. Sound food systems and services are required to deliver nutritious, safe, affordable and sustainable diets for all children and thereby improve children's overall condition. Accurate and timely data helps to understand the gravity of problems faced by children and also take coordinated and evidence-based

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actions to find remedies. We, '404 Not Found', analyze the given data on the state of the world's children based on different criteria and present our results.

In this report, we analyze the various insights about the state of the world's children across different dimensions. We detail the methodology used to extract useful information from the various indicators under each dimension and rank countries based on the extracted score. We discuss the inhibitors for improving the Children's growth and programs undertaken by successful countries which can be cross-pollinated.

## About the Data

The dataset examines the state of the world's children using statistics from various dimensions like Health, Nutrition, Women development, Education, Child protection etc. Each dimension contains a snapshot of various indicators of ~200 countries for the year 2011-2016. The high degree of missing data adds another dimension to extract meaningful insight from the data.

## Methodology

### Missing Value Imputation

The dataset has a high degree of missing value which requires an innovative approach to impute with reasonable value. Although we want to utilize maximum data available, imputation of columns with more than 40% missing values biases the data and therefore was dropped. We have utilized the Iterative Imputer algorithm using decision tree estimators, which models each feature with missing values as a function of other features, and uses that estimate for imputation. To this modeling process, we have added 3 additional information about the countries.

- Economic Indicators : Per Capita Nominal GDP <sup>[1]</sup>
- Demographic Indicators : Population, Average urban growth rate.
- Regional Information : UNICEF Region mapping and Least Developed Countries<sup>[2]</sup>

This additional information improves the imputation logic learned by the model.

## Feature Engineering

Columns with a high degree of redundant information such as “Wasting moderate & severe (%)” and “Wasting severe (%)” were modified to “Wasting severe to moderate & severe ratio” so as to capture nuanced dynamics of the data. Intuitively, it adds user domain knowledge to the algorithm.

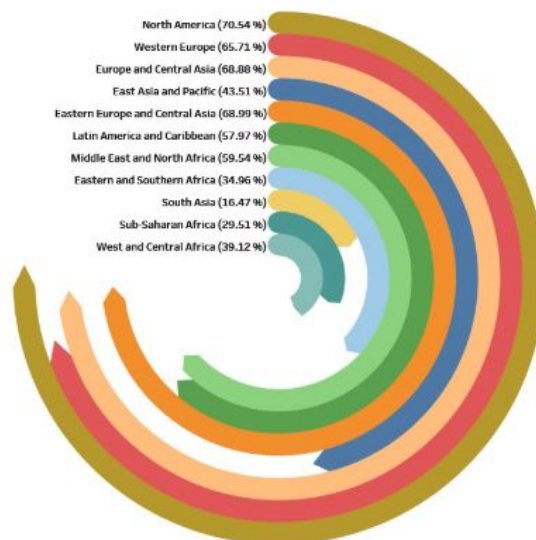
## Factor Analysis and Scoring

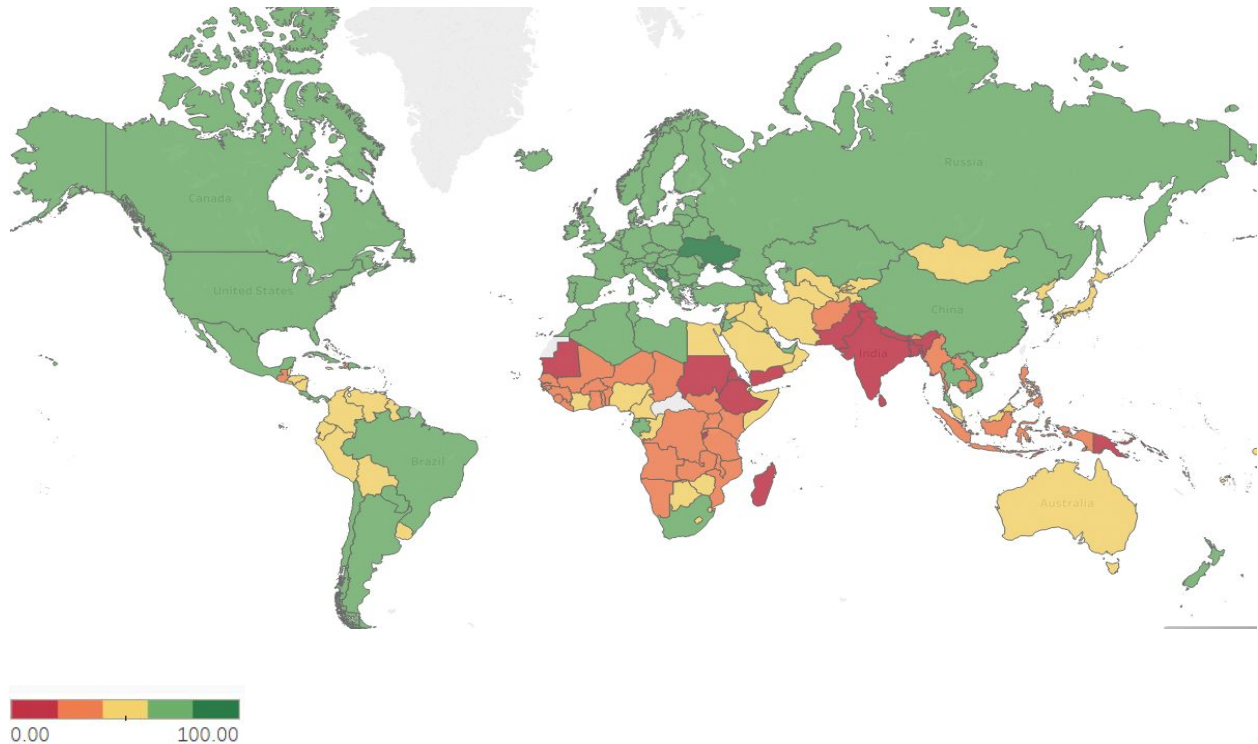
Ranking the countries based on each dimension provides great possibilities for further analysis and selecting best practices of countries. Factor Analysis techniques is a great tool to condense the various indicators under each dimension to a single index. The scores are thereafter normalized to a 0-100 scale with the best performing country given a score of 100 and 0 score for the worst country.

## Analysis

### Nutrition

In a scenario where 1 out of 3 children in the world under age of 5 is not growing well, malnutrition is the biggest challenge that the world faces. Increased urbanization, working women, climate change have added increased strain on proper diet to children. Adding to that embracing a high sugar and fat diet are causing obesity issues among developed countries. Indicators like low birthweight, breast feeding, stunting, wasting, overweight are used to rank countries.



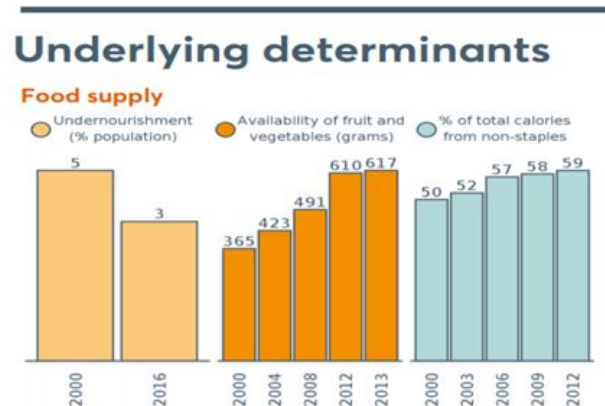


From the world map, we can clearly see that most of the sub Saharan and south Asian countries are facing problems like Stunting and wasting. It was really interesting to notice that the North American countries are also facing “Overweight” as a key issue.

### Case Study : Ukraine

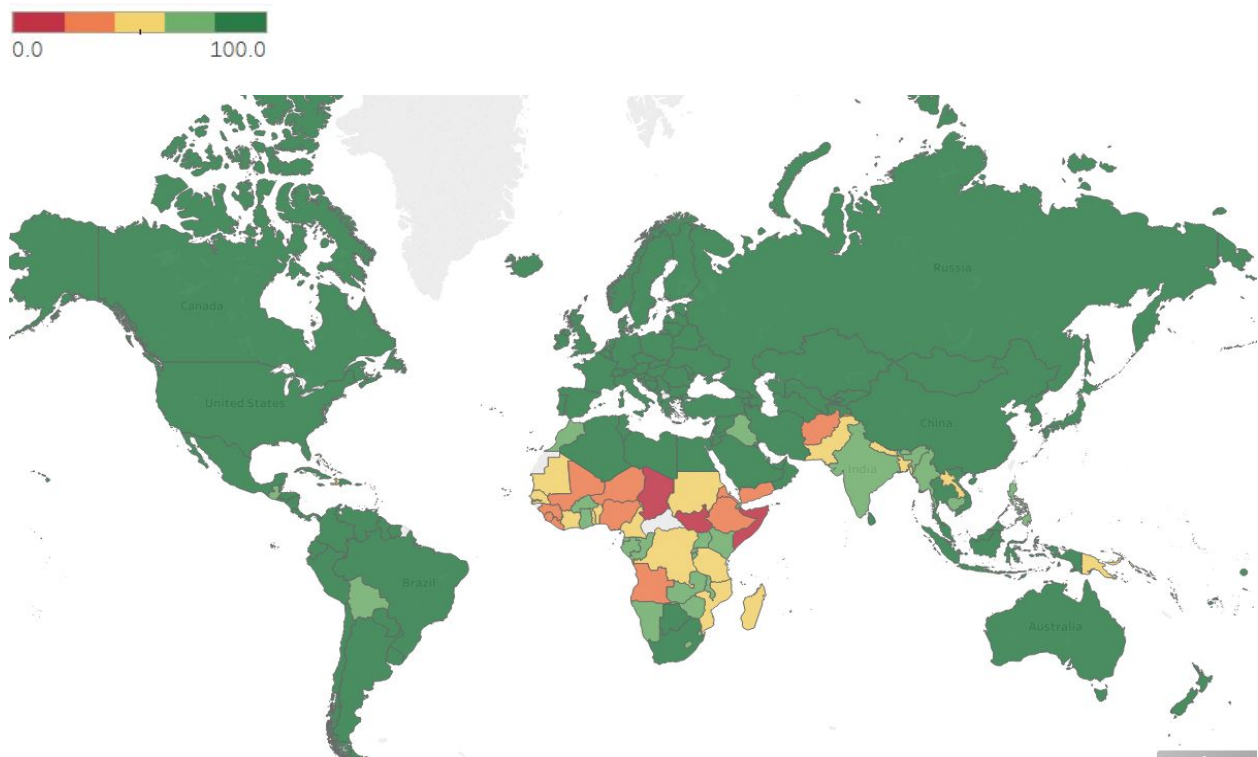
Considering top countries in “Nutrition” model, we can learn that following factor’s heavily impacts quality of life of the kids:

- Underlying determinants like Vitamin A supplement: Global nutrition report-2018, shows that “Food supply” has improved over the years. [12]
- Low Stunting and wasting ratio: have severe impact on scoring for quality of child’s life. Ukraine has a relatively lower percentage than other developing countries.

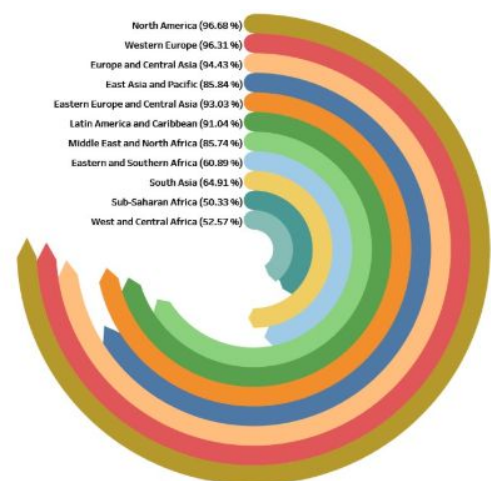


## Women Empowerment

Empowering women has a cascading improvement in the state of a child. Indicators like Women life expectancy, school enrollment ratio, family planning, delivery care and maternal mortality ratio are utilized in this session to score the countries. From the world map, we can clearly see that Central (52.57 %), Sub Saharan African(50.33 %) and South Asian(64.91 %) countries are lagging in these categories.



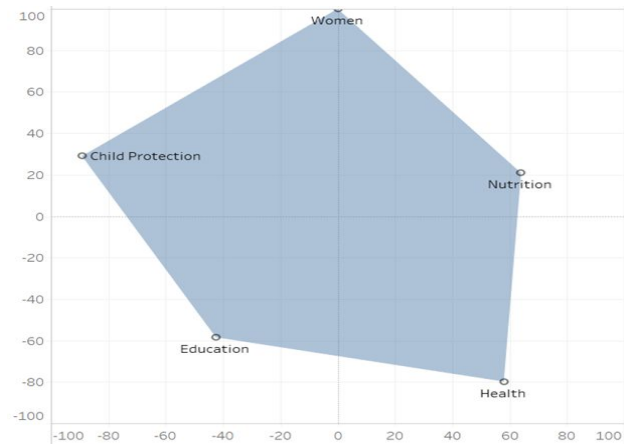
North American (96.69%) and Western European (96.31%) countries are leading in these categories due to better healthcare systems and higher awareness.



### Case Study : Sweden

According to the U.S. News, Sweden is ranked 2nd in Best countries for women[5] and for raising kids[4]. Some recommendations to improve the quality of life of the kids keeping “Sweden” as a role model would be:

- Better female adult literacy: Sweden has enacted a “School Reform Law” which allows and gives rights for girl’s education in 1842 [6].
- Better institutional delivery care: One of the major factors contributing would be excellent healthcare facilities and Skilled medical professionals.



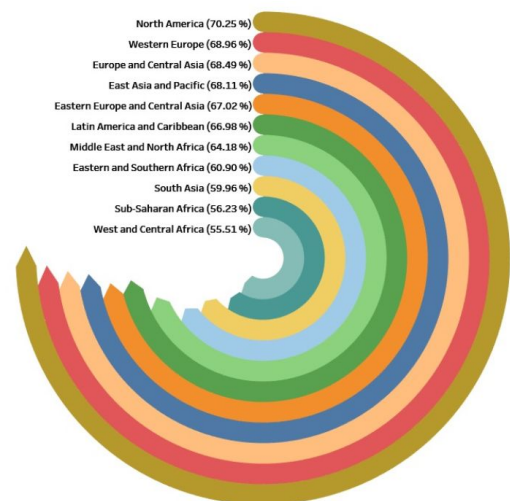
o Government sponsored healthcare: Sweden spends around 14% of its public spending on Healthcare which ensures affordable healthcare for all.

(Fig: Spider chart for Sweden)

### **Female Education**

Child Education is important to drive any nation’s progress. Education plays a crucial role in improving the state of the children. Here we are ranking the countries based on important indicators derived from the female to male ratio in primary education , secondary education, youth literacy rate, mobile users.

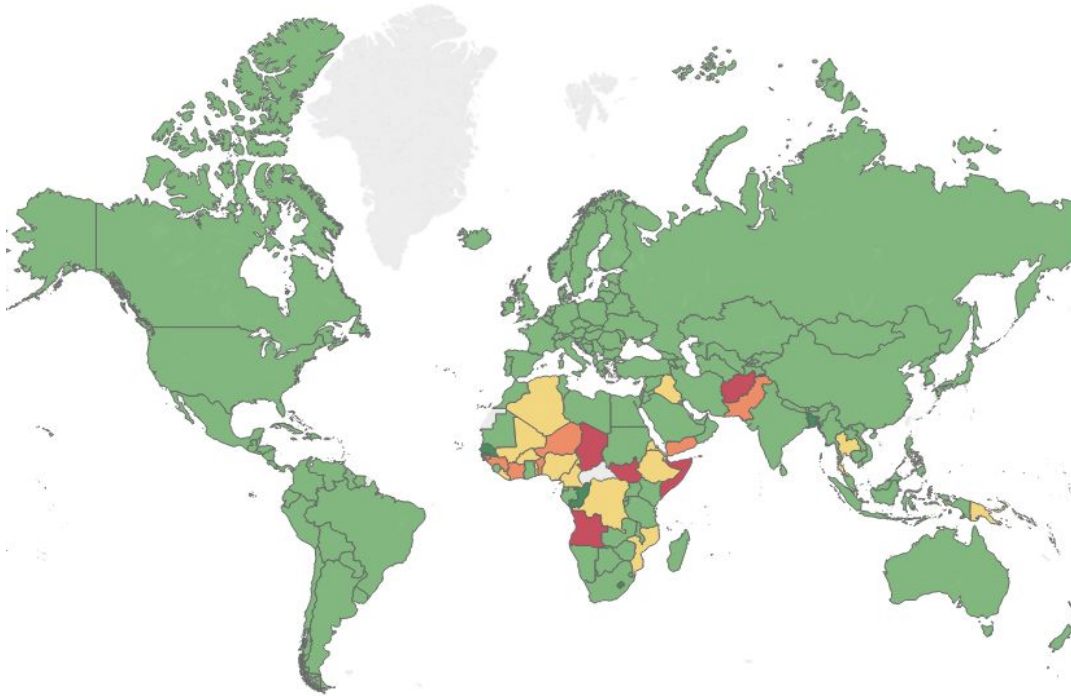
North American and Western European countries are found to take a lead in this criterion which can be due to the low gender decrimination within these developed societies. West and Central African countries fare worse in female education compared male education.





Among Asian countries, Pakistan and Afghanistan show degraded statistics on Female education.

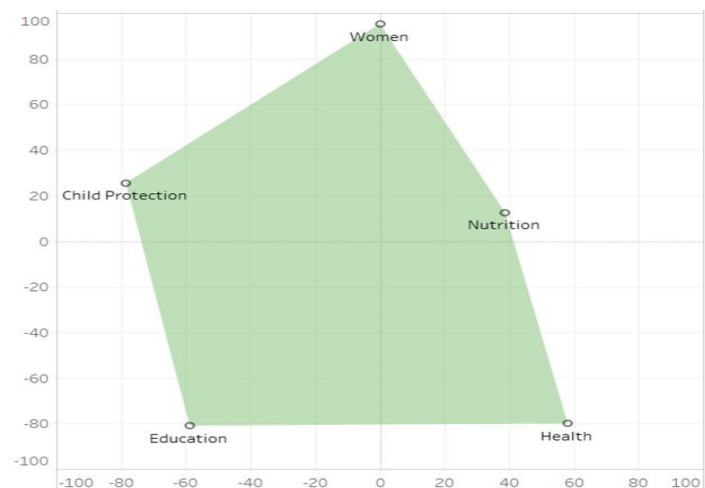
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### Case Study : Palau

Using our ranking methodology,  
**“Palau” is the best country in terms  
for promoting female education.**

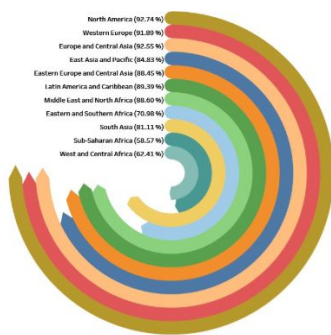
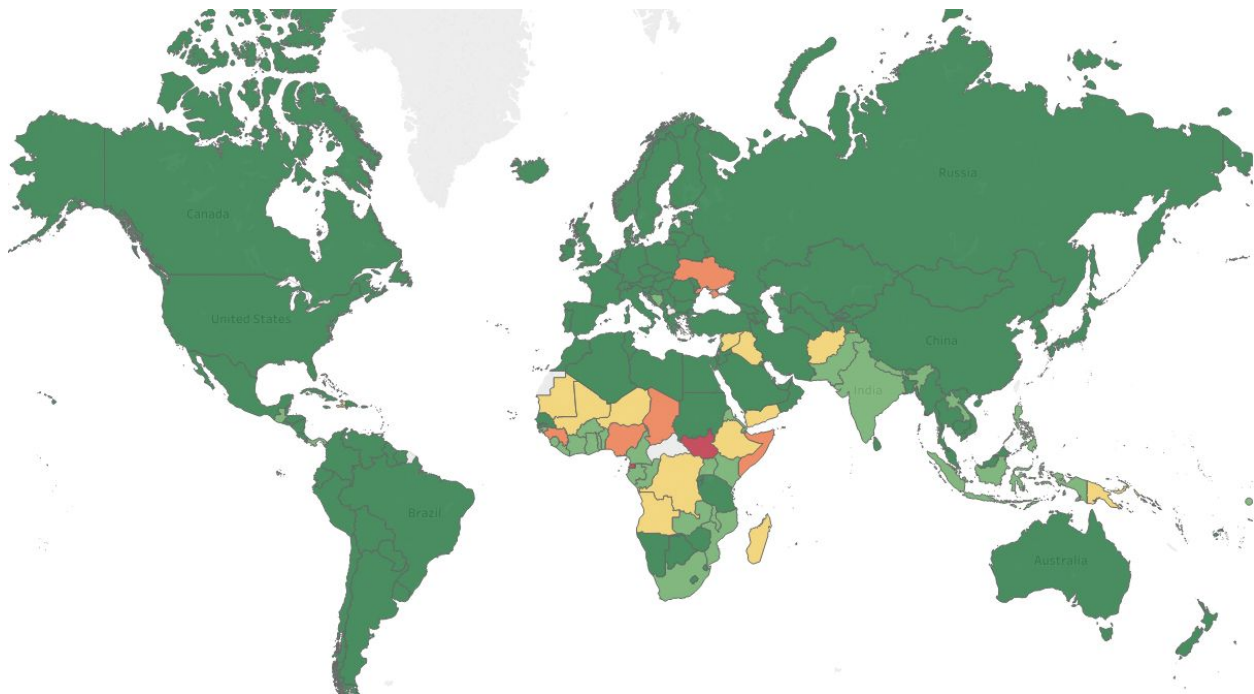
According to a 2008 analysis by UNICEF[10], girls and young women in Palau have at times had higher enrollment rates than boys and men. Some recommendations to improve the quality of life of the kids:



- Increasing female to male ratio Pre-primary school participationGross enrolment ratio: According to the Ministry in 2005, the adjusted ratio of women to men with post-secondary education was 1.11, and the ratio of girls to boys in secondary school and primary school was 1.23 and 0.92, respectively.

## Health Care

Having a good and accessible healthcare system is crucial for child development. Indicators like Usage of drinking water, sanitation services and Immunization coverages are used to rank the countries. Sub Saharan(58.57 %) and Central African(62.41%) countries are found to lag in this category.



Among European countries, **Ukraine (23.43 %)** is found to be worse. Low immunization drive among diseases like DTP1, DTP3, polio, MCV1, MCV2, Hepatitis B in Ukraine is contributing to this sharp drop in Health Indicators.

“In 2008, 95% of eligible children in Ukraine received their second (and final) recommended dose of measles-mumps-rubella vaccine (MMR) on time according to the national routine schedule. By 2016, this rate had fallen to 31%, the

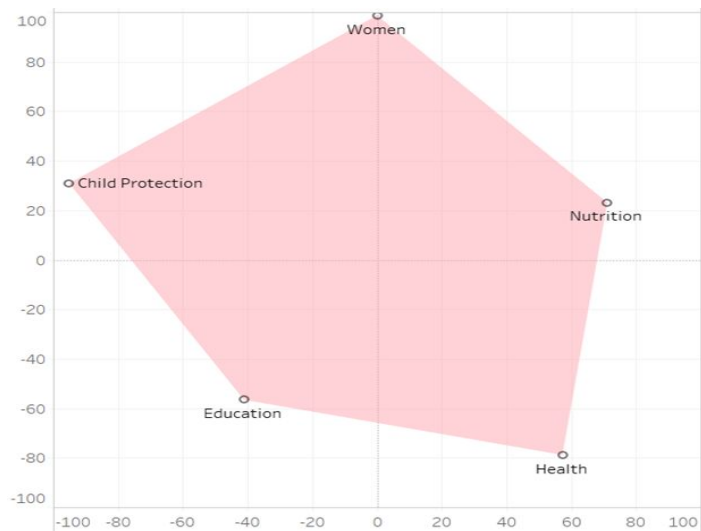


lowest coverage in the WHO European Region and among the lowest in the world. In addition, in 2016 only 19% of children received the third recommended vaccine dose of diphtheria-tetanus-pertussis (DTP) and 56% of children received the third recommended dose of oral polio vaccine (OPV).”[3]

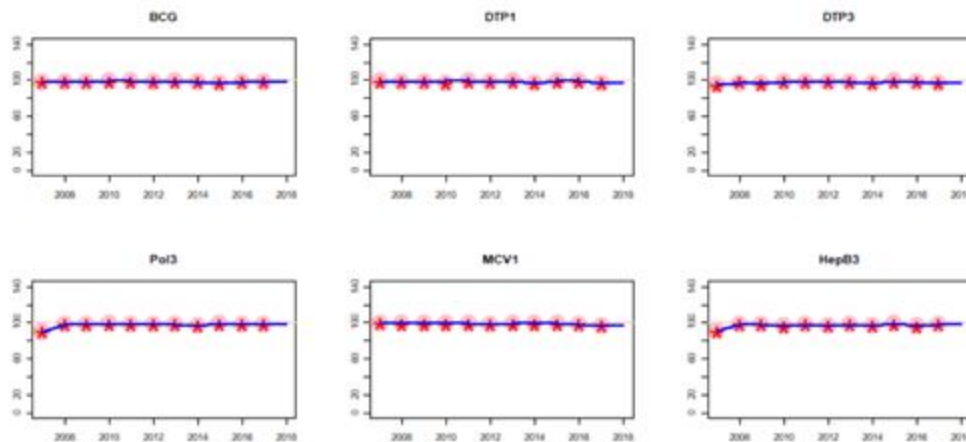
### Case Study : Belarus

According to the “Save my children” organisation, Belarus was ranked one among the top 26 countries among 176 countries for most favourable/feasible countries for motherhood[8]. Considering Belarus’s model in the area of Health, some recommendations to improve the quality of life of the kids would be:

- Better Immunization coverage:  
It has 100% coverage for basic immunization over the years (BCG, DTP-1, DTP-3, Pol3, MCV1, HepB3)[7]



Belarus: WHO and UNICEF estimates of immunization coverage: 2018 revision

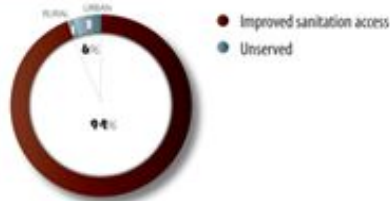


Use of basic sanitation and drinking facilities: Belarus's council of minister has approved 3rd state program on water supply and sanitation clear water in 2015, which was expected to produce following result[9]:

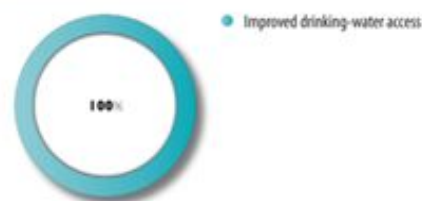
- Improved urban sanitation – 98.5%, Improved rural sanitation – 32.5%, Improved urban drinking-water supply – 98.5%, Improved rural drinking-water supply – 83.5%.

#### EQUITY IN ACCESS<sup>1</sup>

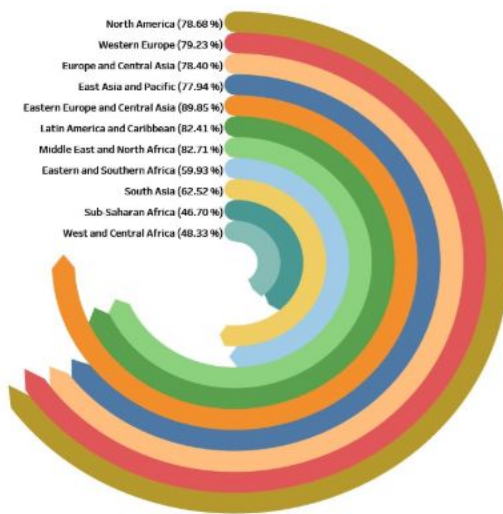
**Figure 3.** Population with access to improved sanitation facilities



**Figure 4.** Population with access to improved drinking-water sources

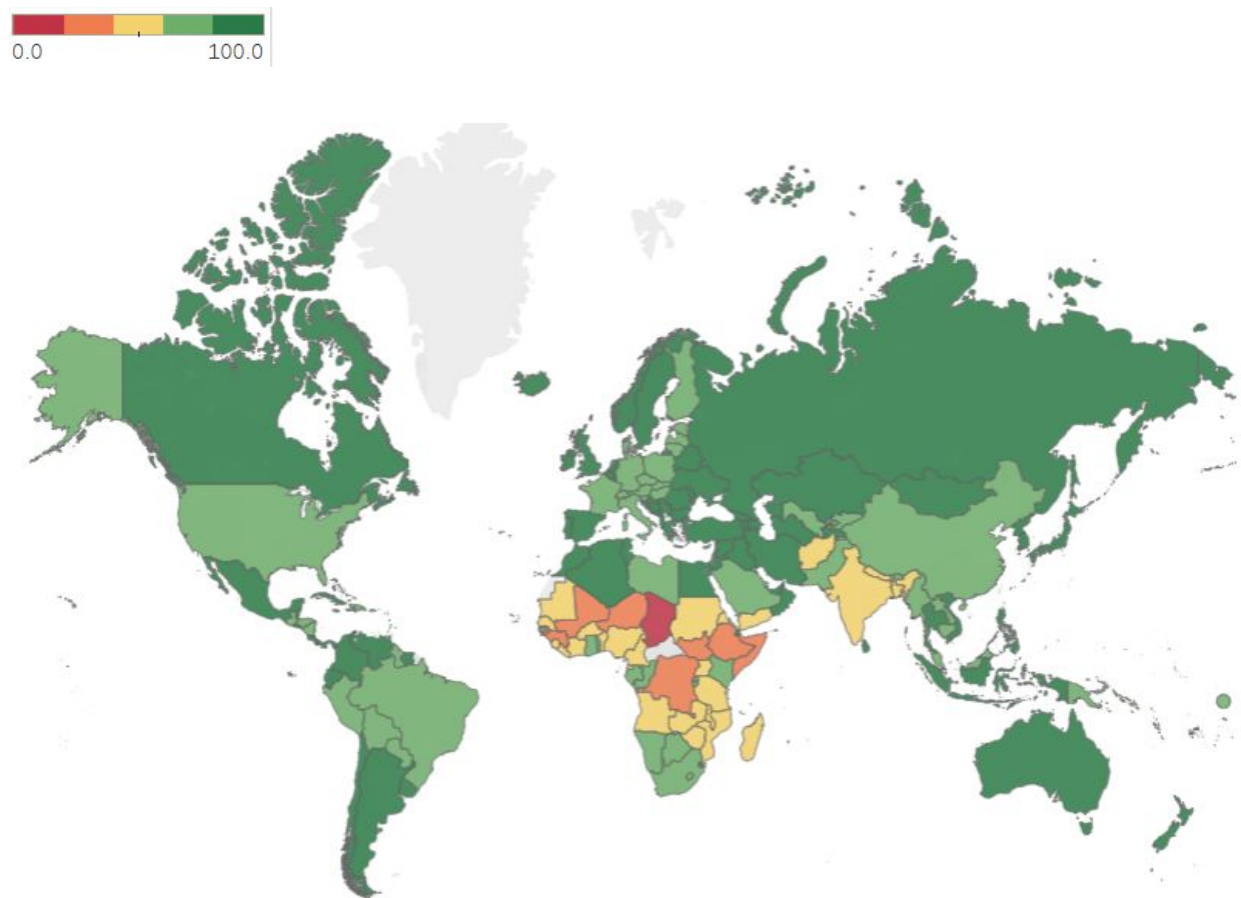


## Child Protection



Child protection is imperative for a protected childhood which gives freedom for exploration and overall development. In this category, Child marriage, child labour, use of violent discipline is used to create a score to rank the countries.

Eastern Europe and Central Asian Countries (89.85 %) is found to be best in this category. African countries are trailing in these categories.

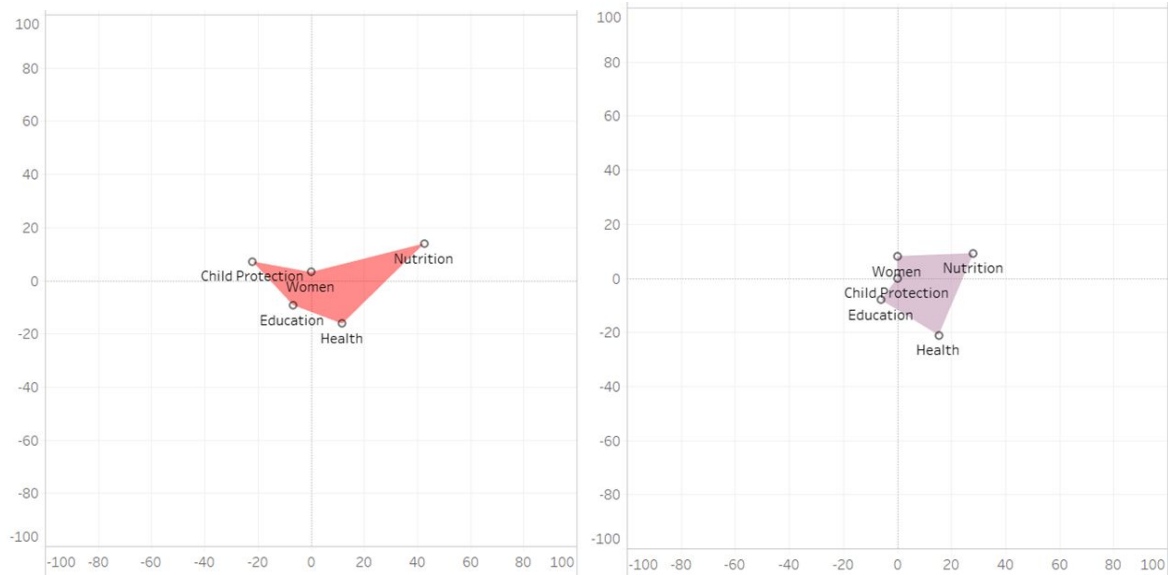


### Case Study : Belarus/ Somalia

We would like to see the facts on both sides of coin. So countries on the trough side are like Somalia, Chad and on the crest side are Belarus.

Some key takeaways for improving to improve the quality of life of the kids:

- Enforcing strict child labor and marriage laws: According to UNICEF, Somalia has the tenth highest prevalence rate of child marriage and almost 60% [11 ] of the childrens are engaged in worst forms of child labor. While in Belarus they have separate laws for child rights which are strictly enforced.



## Conclusion

With our Analysis around 5 different indicator variables, we could see that “Nutrition” is a much bigger problem around under developed and developing countries. Despite the encouraging decline in stunting/wasting, most countries are still lagging behind. So in order to meet UNICEF’s 2030 targets for stunting (12.2%), overweight(3%) and wasting (3%), progressive countries need to come together to help each other in the form of financial aid or food supplements and improve the world in this humanitarian crisis.

Also, countries need to cross-pollinate laws and programs which are proven effective in other countries. This includes tightening the Child protection laws to Western European standards and sensitization to gender discrimination.

Lastly, good statistics is always required to understand the underlying problems. In the current state of affairs, it is difficult for anyone to create well rounded programs and therefore the focus should be on better data collection.

## References

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3. <http://www.euro.who.int/en/countries/ukraine/news/news/2018/05/ukraine-restores-immunization-coverage-in-momentous-effort-to-stop-measles-outbreak-that-has-affected-more-than-12-000-this-year>
  4. <https://www.usnews.com/news/best-countries/best-raising-children?slide=5>
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