

Project Preparation

Comparing methodologies to calculate UNICEF's Children's Climate Risk Index (CCRI)

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Overview



- 1** Project context
- 2** Project goal
- 3** Challenges
- 4** Methodology
- 5** Preliminary results
- 6** Success criteria
- 7** References

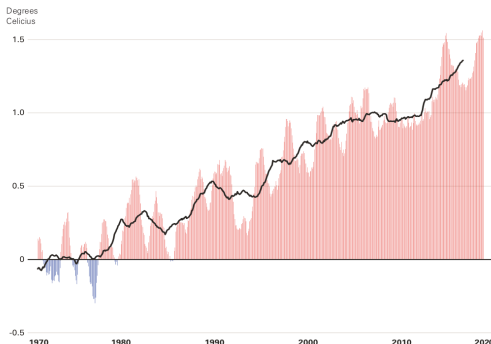
Climate change



The 6th report of the UN's Intergovernmental Panel on Climate Change states 'with high confidence' that widespread global changes have already occurred due to human activity.

- UNICEF:
established by the
UN to meet the
needs of children
worldwide, 1946
- Published the
Children's Climate
Risk Index, 2021

Figure 2: Global land surface temperature anomalies over time (baseline: 1951–1980)



References at end

UNICEF's Children's Climate Risk Index (1)



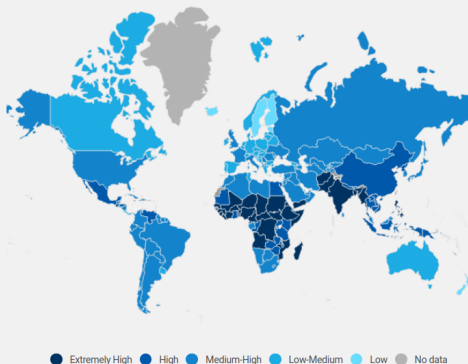
CCRI RANK	COUNTRY	CLIMATE AND ENVIRONMENTAL FACTORS	CHILD VULNERABILITY	CHILDREN'S CLIMATE RISK INDEX
1	Central African Republic	6.7	9.8	8.7
2	Chad	7.0	9.4	8.5
2	Nigeria	8.8	8.1	8.5
4	Guinea	7.7	8.9	8.4
4	Guinea-Bissau	6.4	9.5	8.4
4	Somalia	7.0	9.3	8.4
7	Niger	7.3	8.9	8.2
7	South Sudan	6.8	9.2	8.2
9	Democratic Republic of the Congo	7.2	8.6	8.0

CCRI RANK	COUNTRY	CLIMATE AND ENVIRONMENTAL FACTORS	CHILD VULNERABILITY	CHILDREN'S CLIMATE RISK INDEX
154	Ireland	2.3	1.8	2.1
154	Malta	2.9	1.2	2.1
154	Norway	3.3	0.8	2.1
158	Sweden	2.8	0.7	1.8
159	Estonia	2.1	1.2	1.7
159	Finland	2.6	0.7	1.7
161	New Zealand	2.4	0.8	1.6
162	Luxembourg	1.1	1.8	1.5
163	Iceland	1.0	0.9	1.0

UNICEF's Children's Climate Risk Index (2)



Globally, approximately **1 billion children** (nearly half of the world's children) live in extremely high-risk countries.



Approximately 1bn children live in extremely high risk countries (darkest shade)

Project goal



To compare Climate Change Risk indices built with different methodologies:

Index:	INFORM (Index For Risk Management)	SoVI (Social Vulnerability Index)
Author	Joint Research Centre, European Union	Hazards, Vulnerability & Resilience Institute, Uni. of South Carolina
Type	Variable addition	Variable reduction
Methodology	Separate 'Pillars' (Hazard & Child Vulnerability domains) calculated from absolute and relative indicators using geometric, arithmetic means	Principal Components Analysis reduces many indicators to fewer underlying factors, sign adjusted and summed
First/Latest	2014 / 2022	2003 / 2019

If time permits,

- To look for more data; only 163 of 202 countries are represented
- ND-GAIN Country Index, World Risk Index, Disaster Risk Index...
- UG's R implementation of INFORM (cf. Excel spreadsheet)

Challenges



What are the challenges; how can they be mitigated?

Insufficient domain knowledge to explain results

Not a geoscientist; checkpoints built into the workplan
(Nov/Feb/Apr) to assess knowledge gaps, extend literature review

Obtaining data

Core project does not depend on it; set time limit on searching for data

INFORM in R not available

Core project does not depend on it; will know in September and can adjust plan

Methodology



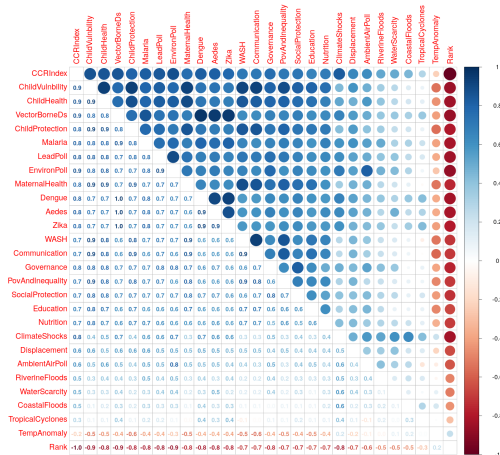
Main steps in the workplan:

- 1 implement SoVI simplistically (drop countries with gaps)
- 2 consider what makes a good index; how to compare
- 3 an in-depth look at the gaps in the data
- 4 investigate methods of data imputation
- 5 investigate implementations of PCA that are robust to gaps
- 6 choose and justify method for dealing with gaps
- 7 implement the SoVI methodology using this method
- 8 compare the resulting index with the INFORM index
- 9 bring in domain knowledge to discuss conclusions

Preliminary results



- The dataset has missing values, may need different techniques
- Data distribution of indicators varies
- Correlation plot from Feasibility Study report



Success criteria



There are two possible outcomes to this comparison of INFORM and SoVI methodologies:

Indices are similar

- indicates that both methods can be appropriate to the task
- reassuring that the choice of methodology has not distorted the results

Indices are different

- further research questions to answer!
- where are the differences; can we explain them?

Aim to have extended our understanding of social vulnerability index methodology, in the context of the risks of the climate crisis.

Reference(s)



Any Questions?



UNICEF, *The climate crisis is a child rights crisis: Introducing the Children's Climate Risk Index*, <https://data.unicef.org/resources/childrens-climate-risk-index-report/>, August 2021