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CHILDREN'S CLIMATE RISK INDEX FOR CAMBODIA



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**CHILDREN'S
CLIMATE RISK
INDEX**
FOR CAMBODIA



Contents

Foreword by the Ministry of Environment

Foreword by UNICEF Cambodia

List of maps, figures and tables

i

Acronyms

ii

Executive Summary

1

About the Children's Climate Risk Index for Cambodia

2

Key findings from the CCRI-Cambodia

3

Key recommendations

7

Introduction: Overview of the Children's Climate Risk Index for Cambodia

10

Filling the evidence gap on children's exposure and vulnerability to climate hazards, shocks and stresses

10

Interpretation of the CCRI scores in Cambodia

10

What makes the CCRI unique?

11

Section 1: Pillar 1 findings – Children's exposure to climate and environmental hazards, shocks and stresses

13

Drought

14

Riverine floods

15

Heat

16

High wind speed

18

Vector-borne diseases

19

Air pollution

20

Section 2: Pillar 2 findings – Children's vulnerability to climate and environmental hazards, shocks and stresses

23

Child health and nutrition

24

Water, sanitation and hygiene

26

Education

28

Child protection

31

Livelihoods and social protection

33

Conclusions and recommendations

36

Annex I: Methodology

41

Annex II: Hazard maps: Pillar 1

54

Foreword by the Ministry of Environment

The publication of the Children’s Climate Risk Index (CCRI) is an important milestone for Cambodia and its children and youth. Our country has been at the forefront of sustained efforts to tackle climate change and natural disasters and, more recently, to address the growing threat of environmental degradation that is harming public health, biodiversity and our precious land, forests, and water.

Cambodia is vulnerable to natural shocks. Because of the increasing environmental challenges brought by economic growth, modernization and urbanization, as well as the many pressures of agriculture on natural resources, Cambodia is facing a combination of human and natural threats that must be tackled together. It is critical that such efforts be coordinated across sectors and across government and non-government stakeholders at all levels.

We have set out our ambitions on climate change, disasters, and environmental degradation in several policies and strategies including the Climate Change Strategic Plan 2014–2023, Clean Air Plan, the updated Nationally Determined Contribution (NDC), the Long-Term Strategy for Carbon Neutrality, and the Circular Strategy on Environment.

We do, however, acknowledge the need to better address children’s specific and heightened vulnerabilities to human and nature-caused risks in our efforts. We need to do more to ensure that our actions are guided by a child-rights approach and enriched by the meaningful participation of children and young people in decision-making at all levels.

The August 2023 launch of the UN Committee on the Rights of the Child’s General Comment No. 26 (2023) on children’s rights and the environment, with a special focus on climate change, marked a pivotal moment for children across the world. As a State party to the UN Convention on the Rights of the Child, the Royal Government of Cambodia fully intends to follow this important guidance in the development and implementation of her priorities, plans, strategies, policies, and programmes.

By focusing on the subnational level, the CCRI gives us – for the first time – a detailed assessment of the risks that children and communities face from climate and environmental stresses and disasters across the communes of Cambodia. It also reminds us, however, that the progress that we have made on children’s survival, well-being and development is not benefiting the harder to reach and vulnerable children who are disproportionately affected by the catastrophic impacts of these overlapping shocks.

I would like to take this opportunity to thank UNICEF and all of our partners across sectors who have contributed to the development of the index. I would like to particularly thank UNICEF Cambodia for its unwavering support to our country and for leading a truly ongoing collaborative process in which Cambodia is honoured to be engaged.

We have no future if our children have no future. Cambodia must act now and together with our dedicated partners, and most importantly, with our children and our young people. We must drive an agenda for action that transcends sectors to ensure that all children in our country are resilient, have access to essential services, as well as the knowledge and information to be agents of change in their communities and beyond. 9

Phnom Penh, 24 December 2024



Dr. Eang Sopheleth
Minister

Foreword by UNICEF Cambodia

Cambodia's six million children are facing the wrath of a deadly combination of climate and environmental related shocks and disasters, intertwined with health and socio-economic crises, such as the ongoing fallout of COVID-19 and the Ukraine conflict, creating the most complex crisis that children in the country have ever experienced. According to UNICEF's global Children's Climate Risk Index data, Cambodia ranks 46th out of 163 countries, which is in the top third of countries facing high risks associated with climate change.

It is hard to comprehend why children – the least responsible for the calamities of our planet – are also those who are the most impacted and who suffer the most from increasingly frequent and harmful natural and human-made crises. Despite being disproportionately affected, children also remain largely absent in climate and disaster policies and decision-making processes at the local, national, regional and global levels. Children's invisibility is compounded by a lack of data highlighting how multiple climate and environmental shocks and disasters specifically affect them, which in turn means their perspectives, concerns, needs and priorities are not represented or considered.

UNICEF's global Children's Climate Risk Index (CCRI) was an important first step towards addressing children's omission in national climate and disaster risk management policy processes. We applaud the Government of Cambodia for using the index's findings to inform how they spearhead increased dialogues and support initiatives to fill this evidence and action gap.

However, we know that all crises do not impact children equally and that national data can hide huge disparities within a country. Intersecting vulnerabilities, compounded by systemic discrimination and marginalisation, not only magnify children's risks to shocks and disasters, but they also significantly hinder their access to services that are critical to their survival and their resilience.

The CCRI for Cambodia provides the first ever assessment of the climate, environmental, and disaster risks that children are exposed to and their degrees of vulnerability at the subnational level. It exposes the important disparities within Cambodia's regions and unmask important inequalities in the coverage and quality of essential and life-saving services. It also highlights the critical importance of locally-led planning and programming on climate change adaptation, disaster risk reduction and environmental action to deliver more effective and equitable policies and outcomes for children and communities.

The development of the CCRI-Cambodia has been driven by a highly consultative process, co-led by UNICEF and Cambodia's Ministry of Environment. I would like to thank the Government of Cambodia for engaging with, supporting, and coordinating the process across sectors and for collaborating with a wide range of stakeholders including local, national and international actors and partners, as well as civil society organisations whose expertise, knowledge, ideas and insights have been paramount in developing the model. In particular, I would like to commend youth's engagement in, and dedication to the process.

The CCRI-Cambodia should now be used to ensure that climate, environment and disaster policies and programmes work for children in the country. UNICEF Cambodia looks forward to continued collaboration with the government to guide and support sub-national authorities in planning and delivering child-sensitive interventions and services and to continued engagement with and championing of children's and young people's role in climate, environment and disaster policy making at all levels.

Phnom Penh, 26 July 2024



Dr. Will Parks

Representative, UNICEF Cambodia

List of maps, figures and tables

Maps

Map 1.	Children's Climate Risk Index for Cambodia	3
Map 2.	Child exposure to climate and environmental hazards, shocks and stresses (pillar 1)	4
Map 3.	Child exposure to drought	14
Map 4.	Child exposure to riverine floods	15
Map 5.	Child exposure to heat	16
Map 6.	Child exposure to high wind speed	18
Map 7.	Child exposure to vector-borne diseases	19
Map 8.	Child exposure to air pollution	20
Map 9.	Child vulnerability (pillar 2)	6
Map 10.	Child vulnerability – Child health and nutrition	24
Map 11.	Child vulnerability – Water, sanitation and hygiene	27
Map 12.	Child vulnerability – Education	28
Map 13.	Child vulnerability – Child protection	31
Map 14.	Child vulnerability – Livelihoods and social protection	34
Map 15.	Annual Standardized Precipitation Index moderate drought frequency (2013-2022)	54
Map 16.	Heatwave frequency (2000-2020)	54
Map 17.	Average heatwave duration (2000-2020)	55
Map 18.	Number of days with temperature >35°C (2000-2020)	55
Map 19.	Riverine flooding hazard (50-year return period)	56
Map 20.	Wind speed hazard (200-year return period)	56
Map 21.	Malaria (<i>Plasmodium vivax</i>) mean annual incidence rate (2016-2020)	57
Map 22.	Aedes transmission potential	57
Map 23.	Dengue transmission potential	58
Map 24.	Mean annual particulate matter (PM2.5) air pollution level (2020–2022)	58

Figures

Figure 1.	CCRI-Cambodia framework: Pillars and components	11
Figure 2.	Example of construction of component for child exposure to riverine floods under pillar 1	44
Figure 3.	Pillar 1 – Child exposure: Components and indicators	45
Figure 4.	Pillar 2 – Child vulnerability: Components and indicators	49

Tables

Table 1.	Pillar 1 data set	46
Table 2.	Pillar 2 data set	50
Table 3.	Class limits at the level of the CCRI and pillars	51
Table 4.	Class limits at the component level – pillar 1	52
Table 5.	Class limits at the component level – pillar 2	53

Acronyms

CCRI	Children's Climate Risk Index
CEH	Children's environmental health
DRR	Disaster risk reduction
GC	General comment
INFORM	Index for Risk Management
NAPA	National adaptation programme of action
NDC	Nationally determined contribution
UNICEF	United Nations Children's Fund
VBD	Vector-borne disease
WASH	Water, sanitation and hygiene



Executive Summary

Cambodia's 6 million children are experiencing an increased burden due to a combination of extreme weather events and environmental shocks. They also face amplified vulnerabilities due to intersecting socioeconomic factors, including poverty, ethnicity, gender, and disability.

The long-standing efforts of Cambodia on climate change and disasters are laudable and the country can pride herself on having comprehensive policy frameworks to strengthen her capacity to sustain and improve action on the climate crisis and other shocks. They include the National Adaptation Programme of Action on Climate Change (NAPA),¹ the Climate Change Strategic Plan 2014–2023,² the National Action Plan for Disaster Risk Reduction (2019–2023)³ and the Clean Air Plan of Cambodia (2021).⁴ Cambodia has also demonstrated leadership on climate change and disaster risk reduction (DRR) at the global level. At the twenty-seventh Conference of the Parties to the United Nations Framework Convention on Climate Change, the Government urged high CO₂ emission countries to deliver on their promises of increased funding to address climate change.⁵

Until recently, the Royal Government of Cambodia had limited focus on children's unique and heightened vulnerabilities to the country's multiple and overlapping threats and their harmful immediate and longer-term effects on their well-being and development. The Government of Cambodia is showing strong leadership in addressing this gap, however. The updated 2020 nationally determined contribution (NDC)⁶ of Cambodia under the Paris Agreement represented an important milestone in the Government's consideration of children and young people in the context of climate change. UNICEF's 2021 study of NDCs found that Cambodia was one of only 35 out of the 103 countries included in the study whose climate plans were "child-sensitive."⁷ The updated 2020 NDC acknowledges the disproportionate impact of climate change on children and young people and sets out how the country can increase child-sensitive and climate-smart cross-sectoral planning.⁸ The NDC is also aimed at supporting and increasing young people's engagement in specific areas, such as improving livelihood opportunities in rural areas, conducting awareness-raising campaigns on early warning systems and providing separate spaces in rural shelters to protect women, girls, and children from violence.

The Government's collaboration with UNICEF on the production of the subnational CCRI for Cambodia marks a significant milestone in the country's adoption of a child-sensitive and child-centred agenda on climate action.

¹ Ministry of Environment, [National Adaptation Programme of Action on Climate Change \(NAPA\)](#), Government of Cambodia, Phnom Penh, October 2006.

² National Climate Change Committee, [Climate Change Strategic Plan 2014–2023](#), Government of Cambodia, Phnom Penh, 2013.

³ Government of Cambodia, [National Action Plan for Disaster Risk Reduction \(2019–2023\)](#), unpublished.

⁴ Ministry of Environment, [Clean Air Plan of Cambodia](#), Government of Cambodia, November 2021.

⁵ 'National statement by head of the Cambodian delegation, his Excellency SAY Samal, Minister of Environment, at the 27th United Nations Climate Change Conference', 15 November 2022.

⁶ National Council for Sustainable Development/Ministry of Environment, [Cambodia's Updated Nationally Determined Contribution](#), Government of Cambodia, Phnom Penh, 2020.

⁷ Plush, Dr. Tamara et al., ['Making Climate and Environment Policies for & with Children and Young People'](#), Discussion paper, UNICEF, New York, November 2021.

⁸ Cambodia's Updated [Nationally Determined Contribution 2020](#).

About the Children's Climate Risk Index for Cambodia

The CCRI-Cambodia provides the first comprehensive analysis of climate and environmental risks from a child's perspective at the commune level. By focusing on the subnational level, it reveals a highly heterogeneous and disparate picture of children's exposure and vulnerabilities to climate and environmental shocks, beyond national-level data that often mask inequalities.

The CCRI adopts a multi-shock and multi-sectoral approach and, importantly, goes beyond a sole focus on climate risks to encompass broader and overlapping natural and environmental shocks that affect children at the lowest of Cambodia's four-tier administrative system (national, provincial, district and commune). It also considers critical factors of vulnerability across social sectors: child health and nutrition, water, sanitation and hygiene (WASH), child protection, education and livelihoods and social protection. It is therefore a significant milestone towards identifying where children (under 18 years) in the country are most at risk of climate and environmental shocks because of a lack of access to critical social services.

The CCRI-Cambodia⁹ builds on and is adapted from the framework of UNICEF's global Children's Climate Risk Index. It incorporates Cambodia-specific components and indicators from the two pillars used in the global CCRI. Pillar 1 estimates children's **exposure** to multiple climate and environmental hazards, shocks and disasters, while pillar 2 assesses children's **vulnerability** to such threats.

Complemented by an interactive dashboard,¹⁰ the CCRI-Cambodia can further stimulate and facilitate stakeholder engagement at the local level and improve collaboration, coordination and collective efforts.

Specifically, the index can be used for:

- Generating child-centred, multi-hazard risk analysis at the subnational level.
- Fostering cross-sectoral coordination and inclusive decision-making and planning across all levels of the administrative system of Cambodia.
- Prioritizing the most vulnerable children and communities in emergency preparedness and response processes.
- Strengthening coherent and aligned policies across the climate, environment and disaster sectors and the country's broader development agenda.

How are the index scores calculated?

The CCRI presents exposure and vulnerability risk scores in the form of indices with scores between 0 and 10, which show how each of the 1,646 communes¹¹ of Cambodia scores on the overall risk index and on the pillars, components and individual indices compared with all other communes. The final CCRI score is a geometric average of the pillar 1: shock exposure score (0-10) and the pillar 2: child vulnerability score (0-10). A higher score on an index corresponds to a higher risk level or worse situation. The explanation of the index's findings is facilitated by the identification of five categories of risk (very high, high, medium, low and very low) of a commune compared with all communes. **For the purposes of this report, we have explored subnational data only for the top two category limits (very high and high).**

⁹ The CCRI is part of the Children's Climate Risk Index-Disaster Risk Model (CCRI-DRM), a subnational assessment initiative that has been piloted in several countries.

¹⁰ Dashboard available from UNICEF (<https://geosight.unicef.org/project/cambodia-ccri-drm-index>) and the Ministry of Environment (<https://ncsd.moe.gov.kh/dcc/data-portal/cambodias-childrens-climate-risk-index-ccri>)

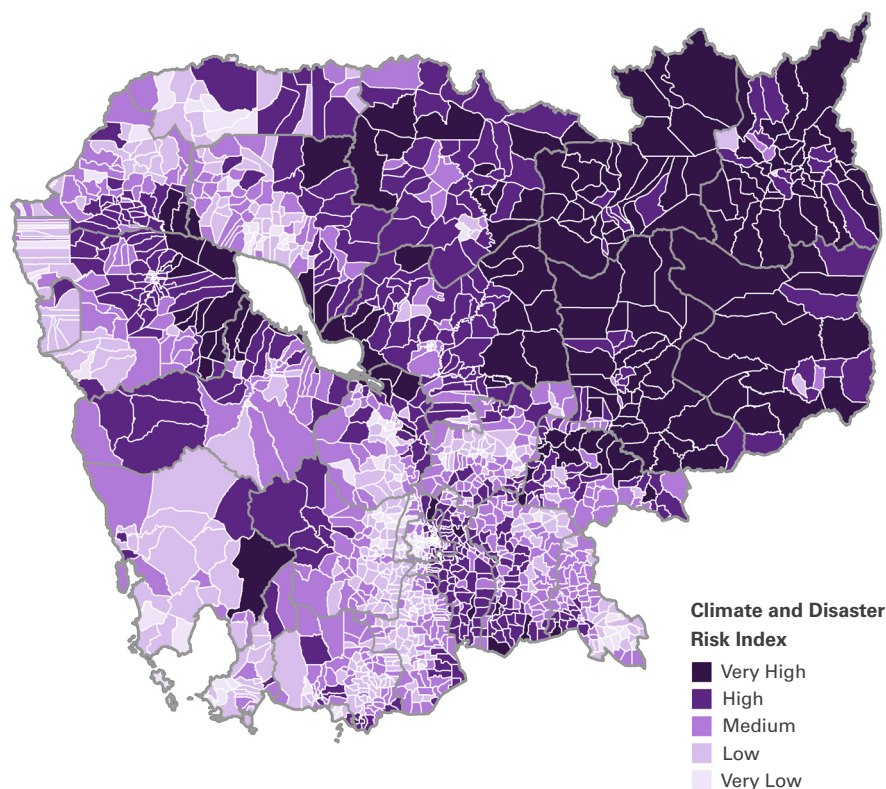
¹¹ Based on Cambodia's Census 2019.

Key findings from the CCRI-Cambodia

1. Approximately 1.9 million children (36 per cent of children in the country) live in 554 communes (34 per cent of total communes) with high and very high children's climate risk indices, with 84 per cent of these communes located in rural areas.

The rural communes are primarily located in the country's remote and mountainous provinces. Hosting some of the poorest communities, primarily Indigenous and ethnic minority groups, these include the provinces of Stung Treng, Mondul Kiri, Ratanak Kiri, Kratie and Preah Vihear in the north-eastern part of the country, Kampong Thom and Battambang in the Tonle Sap Lake region, and Tboung Khmum and Kandal in the Mekong Delta region. Worryingly, many of children in these groups live in communes exposed to more than one shock.

Map 1: Children's Climate Risk Index for Cambodia

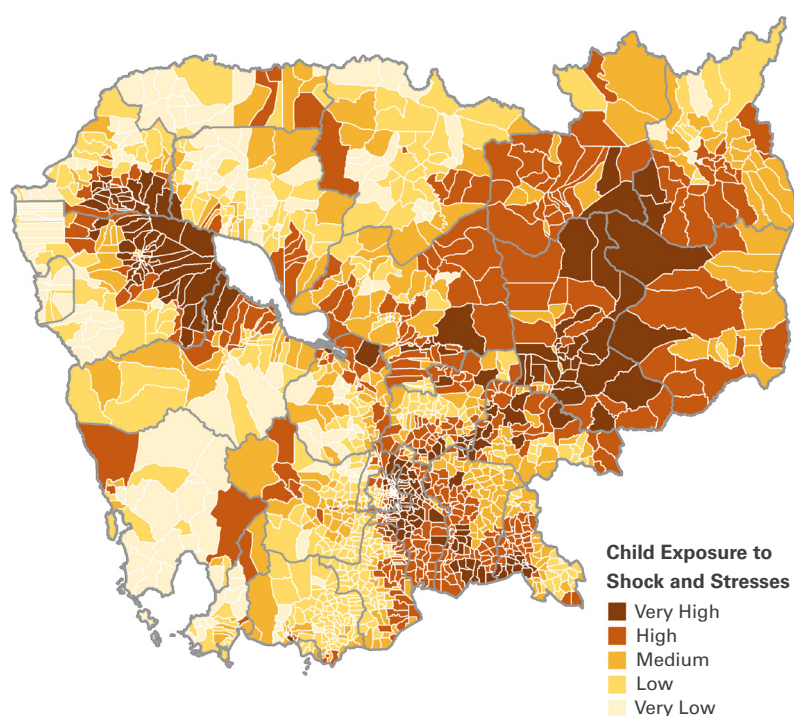


Source: CCRI-Cambodia 2024

2. Approximately 2.3 million children (43 per cent of children in the country) live in 627 communes (38 per cent of total communes) with high and very high child exposure to one or more climate and environmental hazards, shocks and stresses, with 70 per cent of those communes located in rural areas.

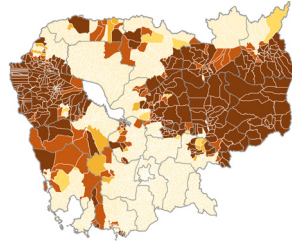
Communes with a severe risk of climate and environmental shocks are largely predominant in provinces in the north-eastern part of the country (Kratie, Stung Treng, Ratanak Kiri and Mondul Kiri) and the plains and Tonle Sap Lake regions (Kandal, Prey Veng, Phnom Penh, Svay Rieng, Tboung Khmum, Battambang and Banteay Meanchey). There are significant differences, however, within provinces, with some communes exposed to multiple and overlapping shocks.

Map 2: Child exposure to climate and environmental hazards, shocks and stresses (pillar 1)



Source: CCRI-Cambodia 2024

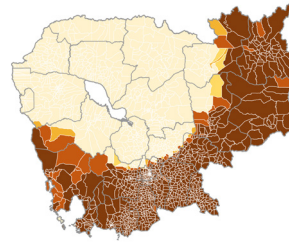





Map 3

Child exposure to drought 

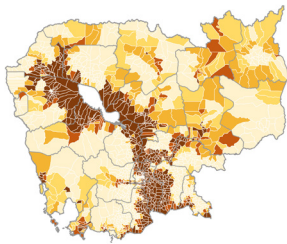
Nearly 1.4 million children (26 per cent of children in the country) live in 426 communes (26 per cent of total communes) with high and very high child population exposure to drought compared with all communes.



Map 6

Child exposure to high wind speed 

Nearly 3 million children (55 per cent of children in the country) live in 934 communes (57 per cent of total communes) with high and very high child population exposure to high wind speed compared with all communes.

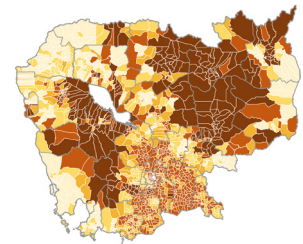


Map 4


Child exposure to riverine floods 

Around 2.2 million children (41 per cent of children in the country) live in 636 communes (39 per cent of total communes) with high and very high child population exposure to riverine floods compared with all communes.

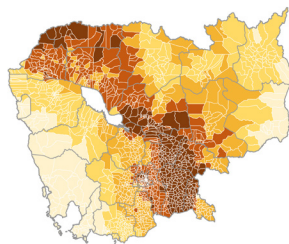
Overview of child exposure to climate and environmental hazards, shocks and stresses



Map 7

Child exposure to vector-borne diseases 

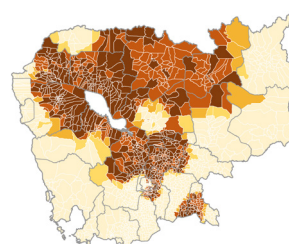
Around 3 million children (56 per cent of children in the country) live in 798 communes (48 per cent of total communes) with high and very high child population exposure to vector-borne diseases compared with all communes.



Map 5

Child exposure to heat 

Around 3 million children (56 per cent of children in the country) live in 778 communes (47 per cent of total communes) with high and very high child population exposure to heat compared with all communes.



Map 8

Child exposure to air pollution 

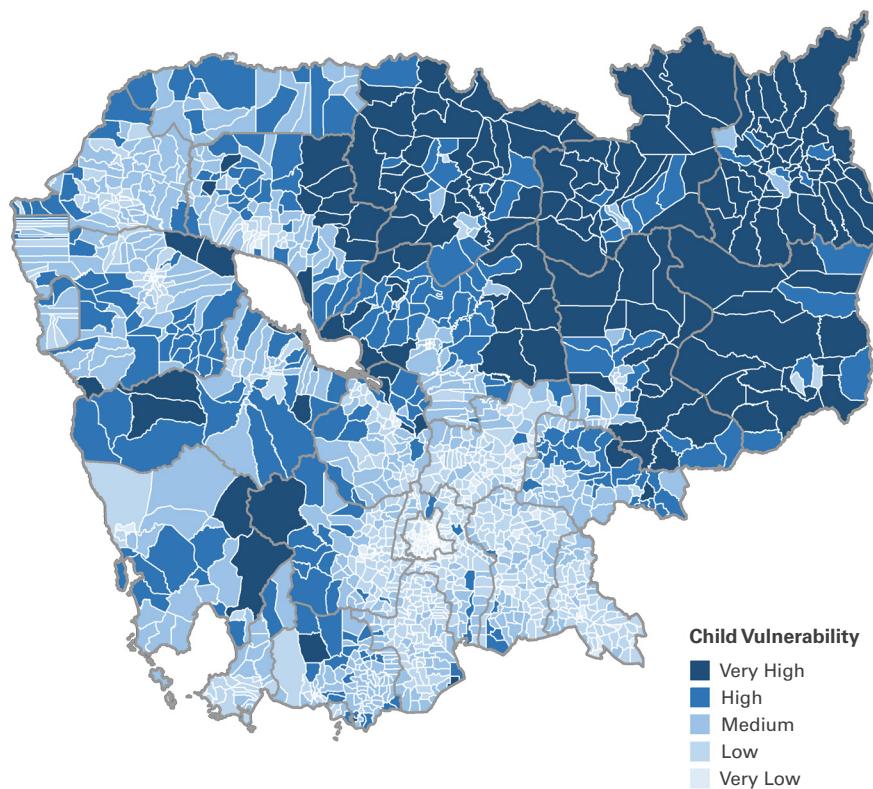
Around 2.7 million children (50 per cent of children in the country) live in 803 communes (49 per cent of total communes) with high and very high child population exposure to air pollution (PM_{2.5}>15µg/m³) compared with all communes.

3. Approximately 1.2 million children (21 per cent of children in the country) live in 407 communes (25 per cent of total communes) with high and very high child vulnerability to the impact of climate and environmental hazards, shocks and stresses, with 97 per cent of those communes in rural areas.

The most vulnerable children live in the north-eastern and Tonle Sap Lake regions, with a majority of those communes concentrated in the most remote and poorest provinces, including Stung Treng, Ratanak Kiri, Mondul Kiri, Preah Vihear, Kratie and Kampong Thom.

All children face challenges from climate change and a degrading natural environment. However, some children are more vulnerable to their impacts depending on the availability, quality, equity and sustainability of such essential services as water and sanitation, health care and nutrition, education and social and child protection. According to the CCRI-Cambodia, the high and very high child vulnerability in 25 per cent of the communes stems primarily from varying degrees of insufficient essential social services, with health and nutrition being the most critical, followed by inadequate livelihoods and social protection, WASH, child protection and education.

Map 9: Child vulnerability (pillar 2)



Source: CCRI-Cambodia 2024

Key recommendations

The CCRI is a unique tool that should act as a catalyst for stepping up government action to implement a child-centred and child-sensitive and community-led climate change, disaster and environmental agenda. Working across line ministries and with national and international partners, affected communities and children and young people at all levels, the Royal Government of Cambodia should use the CCRI data to:

1. Scale up cost-effective, targeted interventions

There are cost-effective, efficient and immediately available solutions to reduce the vulnerability of children and communities to climate, environmental and disaster risks and other shocks. As a matter of priority, the Government and development partners must prioritize the scale-up of children's equitable access to essential and life-saving social services, including child health and nutrition, WASH, child protection, education and social protection, in the communes and provinces where children are most vulnerable to climate and environmental shocks, stresses and hazards.

2. Increase cross-sectoral coordination

The CCRI must guide cross-sectoral planning, targeting, programming and budgeting efforts on climate, environmental and other natural and human shocks and disasters. The index should also foster greater linkages, synergies and coordination between climate and DRR stakeholders and the social sectors that cater to children's and families' well-being and development needs at the national and subnational levels and between subnational authorities.

3. Adopt a community-led and child-focused approach

Local governments must be given the support and authority required to lead in child-sensitive climate change adaptation and environmental degradation and disaster risk reduction at the subnational level, prioritizing strengthening the shock resilience of the services that children depend upon most. They must ensure the inclusion, participation and representation of children in all their diversity, including age, gender, ethnicity and disability, in subnational planning and budgeting processes.

4. Ensure the meaningful inclusion and participation of children and young people

Children and young people must be engaged and their voices heard in decision-making across all levels of government. They should also be provided with climate-focused capacity-building and opportunities to develop and lead climate actions. This is essential to ensure that solutions are informed by their experiences and developed with them and for them. Their meaningful participation is not a "nice to have" – it is a necessity if Cambodia wants to truly make climate, environmental and disaster efforts work for children and young people. Young people are eager to contribute to and take action in their communities; they also have clear recommendations for the Government.



Voices from young people

Young people in Cambodia want to take action on climate issues through:

- **Awareness and education:** Initiating campaigns to educate children on personal hygiene, clean water and climate change adaptation using technology.
- **Environmental actions:** Participating in tree planting, reducing plastic bag consumption, advocating for recycling and promoting sustainable transportation.
- **Community engagement:** Establishing youth networks for environmental protection, educating children on climate risks and engaging in forest conservation.
- **Health and safety initiatives:** Educating communities on disease prevention, providing first aid training and promoting child nutrition and hygiene practices.

They also want action from the Government on climate risks, in particular:

- **Community support and livelihoods:** Supporting rural communities with livelihood opportunities, vocational training and climate-resilient shelter.
- **Policy and legal frameworks:** Strengthening environmental laws, particularly on forest conservation and waste management, and ensuring rigorous enforcement.
- **Public awareness and education:** Enhancing public understanding through early warning systems, multimedia platforms and training programmes on climate and environmental risks.
- **Children's health, education and protection:** Prioritizing children's health, safety and education amid climate shocks, with such initiatives as child protection committees and curriculum integration for climate adaptation.
- **Climate-resilient infrastructure:** Developing robust water management systems and ensuring that rural households have access to clean water.
- **Youth engagement and empowerment:** Engaging young people through forums and tools for active participation in climate resilience initiatives, fostering communication between authorities and young people.



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Introduction: Overview of the Children's Climate Risk Index for Cambodia

Filling the evidence gap on children's exposure and vulnerability to climate hazards, shocks and stresses

Cambodia is vulnerable to the impacts of climate change¹² and one of the most disaster-prone countries in Southeast Asia.¹³ While her exposure to shocks is relatively lower than that of some of its neighbours, the country is forecast to experience the greatest increase in the percentage of its population (nearly 50 per cent) exposed to intensifying multi-hazard risks.¹⁴

Increasing and recurrent climate and environmental shocks, stresses and disasters are threatening to undo decades of hard-won development progress for the country's children, especially the most vulnerable, who are disproportionately affected. Yet the policy frameworks of Cambodia have not fully addressed children's unique vulnerabilities and the inequalities that compound the harmful immediate and longer-term effects of multiple and recurrent shocks on their well-being and development.

The lack of child-centred data on climate and disaster risks has been a key factor in the insufficient attention and prioritization given to children in government policy and planning and the advancement of a child-sensitive and cross-sectoral climate and disaster agenda. What is more, the absence of subnational child-sensitive climate and disaster risk data and analysis has resulted in a failure to reflect the wide inequalities experienced by children and their communities, which are often missing from national-level data averages.

The Royal Government of Cambodia is taking action to address this critical gap, however, through its close collaboration with UNICEF on the production of the subnational CCRI.

The CCRI-Cambodia builds on UNICEF's global Children's Climate Risk Index, which is a multi-hazard and multi-sectoral model and allows the development of a subnational and context-specific model that captures local data and provides an evidence base for guiding and informing child-sensitive and child-centred policies and programming at the local level.

Interpretation of the CCRI-Cambodia scores

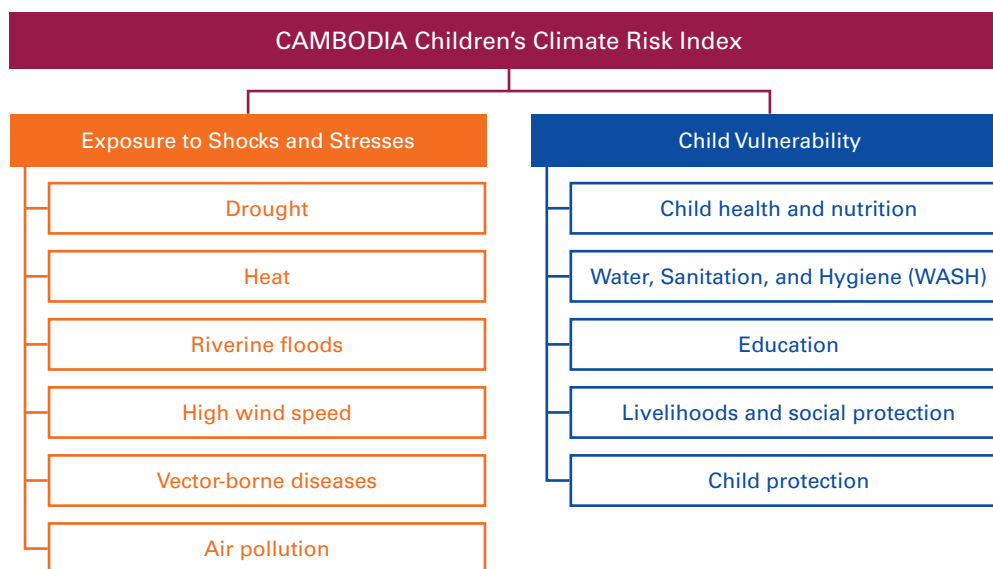
The CCRI methodology is adapted from the global Index for Risk Management (INFORM) model. It is a composite risk index that includes two pillars. Pillar 1 measures the exposure of children to climate and environmental hazards, shocks and stresses and pillar 2 captures child vulnerabilities to such threats. The pillars comprise components, subcomponents and specific and quantitative indicators to best assess children's risks.

¹² World Bank Group and Asian Development Bank, *Climate Risk Country Profile: Cambodia*, Washington, D.C. and Manila, 2021.

¹³ World Meteorological Organization, *State of the Climate in Asia 2022*, Geneva, 2023.

¹⁴ *Seizing the Moment: Targeting Transformative Disaster Risk Resilience, Asia-Pacific Disaster Report 2023* (United Nations publication, 2023).

Figure 1: CCRI-Cambodia framework: Pillars and components



The CCRI presents the exposure and vulnerability risk scores in the form of indices, with scores between 0 and 10, which show how each of the 1,646 communes of Cambodia score on the overall risk index and on the pillars, components and individual indices compared with all other communes. A higher score on an index corresponds to a higher risk level or worse situation of a commune compared with all other communes. The explanation of the model's findings is facilitated by the grouping of the communes into five risk categories (very high, high, medium, low and very low) on the overall CCRI and on the pillars and components. **For the purposes of this report, we have analysed only the results for the communes in the high and very high categories of each index.**

What makes the CCRI unique?¹⁵

The index adopts a **multi-shock and multisectoral** approach that reflects the complex web of human-made and natural shocks and stresses on the resilience of communities. The risk of deprivations and disasters – or the likelihood of impacts on critical areas of child well-being and development - is a function (or product of the interaction between) children's exposure to multiple hazards, shocks and stresses and child vulnerabilities in multiple sectors.

The index also provides **complete coverage** at the commune level by considering all of the country's 1,646 communes (based on Cambodia's Census 2019) and generating previously unavailable evidence on how children in every commune in Cambodia are at risk of deepening deprivations or disasters due to their exposure to multiple hazards, shocks and stresses and their vulnerabilities. It does so by using **reliable and verified** secondary data, including the 2019 government census.

Most importantly, **the CCRI is flexible and can be updated and improved** when new indicators or insights are developed or better data become available. It can also be adapted to meet the specific needs of policymakers and implementers, for example, through the development of geographical or thematic adaptations.

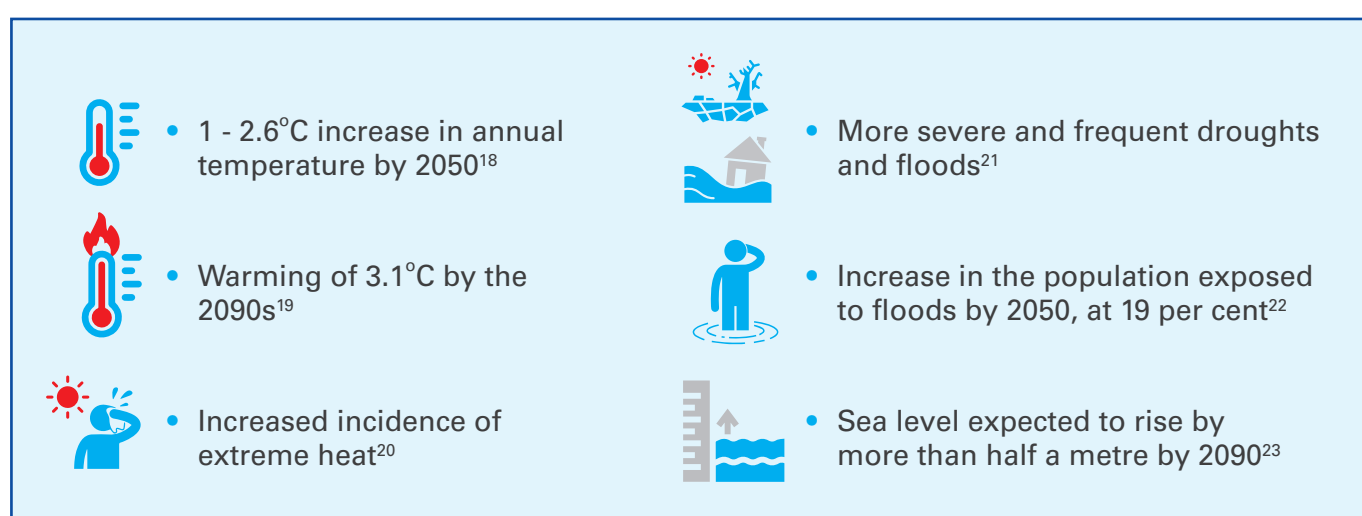
Finally, the CCRI is the product of **extensive consultation and collaboration** with government and non-State national and subnational actors, including development partners and young people, which has been paramount in ensuring that the model is context-specific and reflective of the realities of the country and its communities.

¹⁵ The principles of the CCRI are based on the core principles of the INFORM model.



Section 1: Pillar 1 findings – Children’s exposure to climate and environmental hazards, shocks and stresses

Cambodia is vulnerable to frequent, recurrent, and overlapping hydrometeorological weather shocks, in particular floods and droughts. These are both considered to be the most fatal disaster events. Cambodia is also prone to epidemics and diseases, including water- and vector-borne diseases, which are themselves heavily influenced by climate shocks and, increasingly, by environmental degradation. At the same time, several human-related drivers of environmental¹⁶ and climate threats,¹⁷ such as the fast increase in urbanization, are depleting the natural resources that the country heavily relies on for its economy and are worsening the risks and effects of climate shocks and disasters on children and communities, most of whom live in rural areas.



Pillar 1 is focused on child population exposure to the various hazards, shocks and stresses, with each exposure index providing a comparison between all communes (communes having high or very high levels compared with all other communes).

According to the CCRI–Cambodia, approximately 2.3 million children (43 per cent of children in the country) live in 627 communes (38 per cent of total communes) with high and very high child exposure to one or more climate and environmental hazards, shocks and stresses, with 70 per cent of those communes located in rural areas.

Communes with high and very high child population exposure to climate and environmental hazards, shocks and stresses are largely predominant in provinces in the north-eastern part of the country (Kratie, Stung Treng, Ratanak Kiri and Mondul Kiri) and the plains and Tonle Sap Lake regions (Kandal, Prey Veng, Phnom Penh, Svay Rieng, Tboung Khmum, Battambang and Banteay Meanchey). There are significant differences within provinces, however, reflecting differences in communes’ exposure to multiple and overlapping shocks.

Six climate and environmental hazards, shocks and stresses are considered under the shock exposure pillar. The key findings for each risk are highlighted below.

¹⁶ World Population Review, ‘Phnom Penh Population 2023’

¹⁷ Argyriou, Dimitris, et al., *1st Forest Monitoring Report*, Citizens Engaged in Environmental Justice for All, 2022; Food and Agriculture Organization of the United Nations, *Fishery and Aquaculture Country Profiles: Cambodia*, May 2019.

¹⁸ United States Agency for International Development (USAID), *Climate Risk Profile: Cambodia, Fact sheet*, 2019.

¹⁹ World Bank Group and Asian Development Bank, *Climate Risk Country Profile: Cambodia*, 2021.

²⁰ Ibid.

²¹ Ibid.

²² Ibid.

²³ *Climate Change Strategic Plan 2014–2023*.



SPOTLIGHT

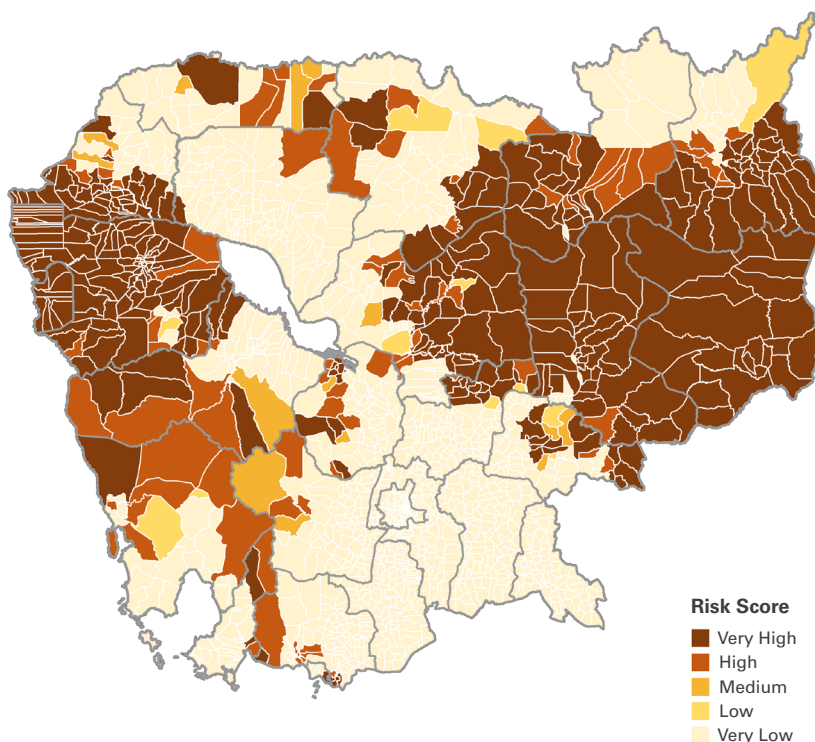
Children's vulnerability to climate and environmental shocks

Children are inherently more vulnerable to climate and environmental shocks than adults, especially those under 5 years of age, due to physical, physiological and behavioural characteristics as well as developmental needs. These make them less able to withstand and survive such shocks.²⁴ They are more **likely to suffer immediate and long-term health** impacts from climate shocks and disasters. Common effects include wasting, injuries and diseases, including lung diseases, as well as physical and cognitive development impairments and mental health issues. They are also at risk of increased **mortality and morbidity**. For example, children are at heightened risk of death from disease outbreaks relating to climate shocks, such as diarrhoea and dengue, and heat-related conditions, including chronic respiratory conditions, such as asthma, and cardiovascular diseases. Existing health and nutrition disorders can also increase children's mortality and morbidity risk.²⁵ Finally, **children's ability and capacity to cope with climate shocks and environmental degradation and disasters can be significantly impaired in the longer term** by the irreversible damage to their health, development and well-being, resulting in a lifetime of lost opportunity to contribute economically.

Drought

Almost 1.4 million children (nearly one third of all children) live in 426 communes (26 per cent of total communes) with high and very high levels of child population exposure to drought compared with all communes, with 85 per cent of those communes located in rural areas. Communes with high and very high child population exposure to drought are primarily found in provinces with a mountainous terrain in the north-eastern part of the country, including Mondul Kiri (all communes highly exposed to drought), Ratanak Kiri and Kratie, and in the provinces of Pailin, Battambang and Banteay Meanchey, in the western part of the country.

Map 3: Child exposure to drought



Source: CCRI-Cambodia 2024

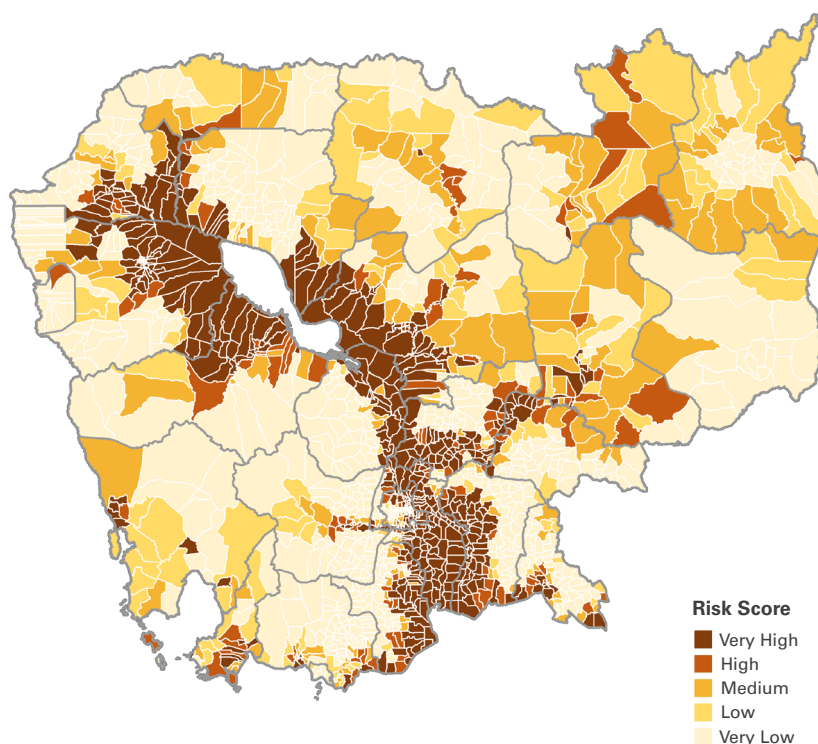
²⁴ UNICEF, *The Climate Crisis is a Child Rights Crisis: Introducing the Children's Climate Risk Index*, New York, 2021.

²⁵ UNICEF, *Child Malnutrition*, May 2023.

Riverine floods

Around 2.2 million children (41 per cent of children in the country) live in 636 communes (39 per cent of total communes) with high and very high child population exposure to riverine floods compared with all communes, with 67 per cent of those communes in rural areas. Riverine floods are a recurrent phenomenon due to the country's extensive river network²⁶ and changing weather patterns that further exacerbate flood frequency, duration and severity. Communes with the highest levels of population exposure to riverine floods are in rural areas (67 per cent) and highly concentrated in the plains and Tonle Sap Lake regions, including in the provinces of Kampong Cham, Kampong Thom, Kandal, Prey Veng and Pursat. Similarly to drought, in some provinces, the severity level of exposure to riverine floods differs significantly between communes, with proximity to the Tonle Sap Lake and its tributaries strongly influencing exposure level, especially as more than 1 million people in that region live in floating villages.²⁷ For example, around half of communes with high or very high exposure to floods in Prey Veng are in the western and southern parts of the province, while in the eastern part of the province, all communes have low levels of child population exposure.

Map 4: Child exposure to riverine floods



Source: CCRI-Cambodia 2024

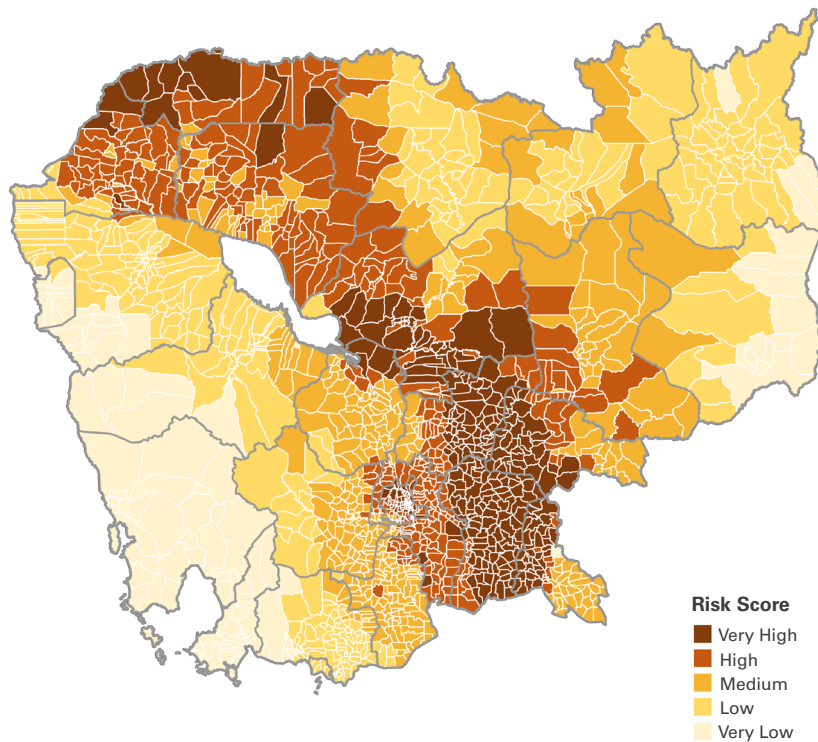
²⁶ Phy, S.R., et al., 'Flood Hazard and Management in Cambodia: A review of activities, knowledge gaps, and research direction', *Climate*, vol. 10, 2022.

²⁷ Save the Children, 'Cambodia: Children Build Innovative Tool To Trap Rubbish In Floating Villages', 2 November 2023.

Heat

Around 3 million children (56 per cent of children in the country) live in 778 communes (47 per cent of total communes) with high and very high child population exposure to heat compared with all communes, with 69 per cent of those communes in rural areas. Over the past decades, Cambodia has experienced rising temperatures and recurrent heatwaves. In April 2024, the country suffered one of the most extreme heatwaves of recent years, with the highest temperatures on record in 170 years.²⁸ The index shows that 69 per cent of communes at high risk of exposure to heat are in rural areas across 16 provinces in the Mekong Lowlands and Central Plains compared with all communes. In Prey Veng, Kandal and Phnom Penh, specifically, an overwhelming majority of communes or even 100 per cent are highly or very highly exposed to heat. A large number of communes with high or very high levels of exposure are also found in provinces in the north-western part of the country. In Otdar Meanchey, 23 out of 24 communes are in the high or very high categories. Although a majority (69 per cent) of communes highly affected by heat are in rural areas, children in communes in the main cities and most densely populated parts of the country are also highly exposed.

Map 5: Child exposure to heat



Source: CCRI-Cambodia 2024

²⁸ 'Cambodia Facing Hottest Temperatures Recorded in 170 years', Khmer Times, 30 April 2024.



SPOTLIGHT

Committee on the Rights of the Child, *General comment No. 26 (2023) on children's rights and the environment, with a special focus on climate change*²⁹

The newly adopted general comment No. 26 (2023) (GC 26) is the first guidance on children's rights and the environment. As such, it provides a unique opportunity to address the current lack of prioritization of children's risks and vulnerabilities in global and national policy and financing agendas on climate change and environmental degradation. GC 26 specifies that States are responsible for protecting children's rights from immediate harm and for foreseeable violations of their rights as a direct result of Governments' actions or failure to act. It also emphasizes that Governments' responsibilities and obligations to prevent and address environmental harm and climate change go beyond their borders. This means that States have a duty to act for the damage and harm they cause to children and communities that are the least responsible for environmental degradation and the climate crisis. GC 26 also requires Governments to adopt a child rights-based approach to climate action, including through child rights impact assessments for all environment-related law and policies and programmatic and budget decisions.

Through steady and decisive leadership, engaging children and young people and working with partners, Cambodia must use this landmark document to guide its climate and environmental agenda, putting children's rights at the centre of policies and programming and ensuring that children have a say now and in the future in issues that affect them.



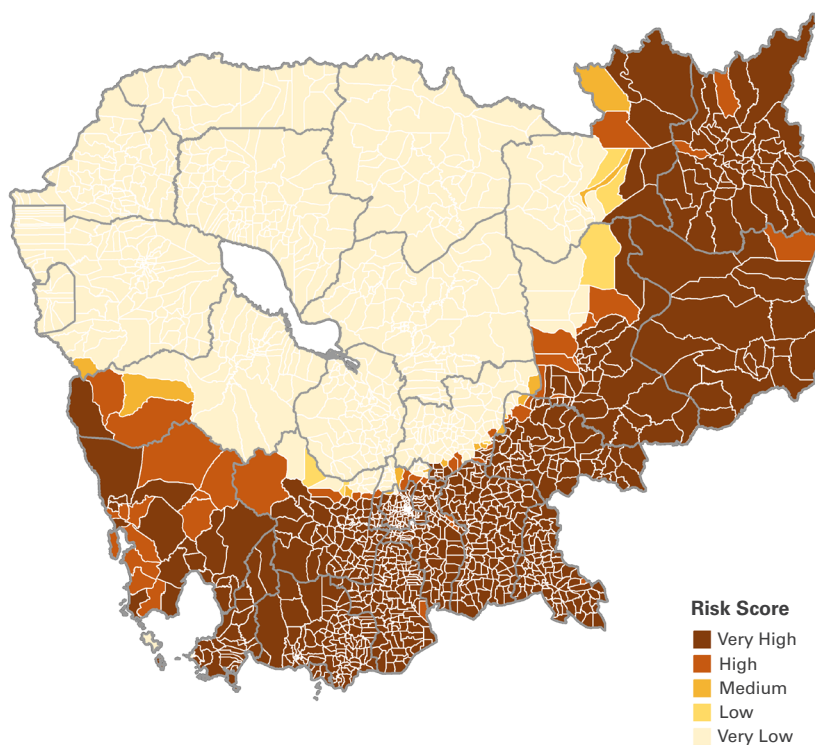
© UNICEF/UN077824/Llaurado

²⁹ Committee on the Rights of the Child, *General comment No. 26 (2023) on children's rights and the environment, with a special focus on climate change*, 22 August 2023.

High wind speed

Nearly 3 million children (55 per cent of children in the country) live in 934 communes (57 per cent of total communes) with high and very high child population exposure to high wind speed compared with all communes, with 66 per cent of those communes in rural areas. Communes located in the provinces in the coastal zones are characteristically the most exposed. However, the geographical proximity of Cambodia to the Lao People's Democrat Republic, Thailand and Viet Nam amplifies exposure to high wind speed along the border in the eastern and south-eastern parts of the country. In recent years, Cambodia has been hit by severe tropical storms, such as Vamco, in 2020, which struck the Philippines and Viet Nam before reaching Cambodia.³⁰ Vamco severely affected the coastal provinces of Kampot, Koh Kong and Preah Sihanouk, which host communes identified by the CCRI as having high or very high levels of child population exposure for high wind speed. **All communes in eight provinces (Kep, Takeo, Svay Rieng, Ratanak Kiri, Prey Veng, Mondul Kiri, Koh Kong and Kampot) score high or very high for exposure to high wind speed**, followed by Phnom Penh, Preah Sihanouk and Tboung Khmum, where more than 90 per cent of communes (almost all communes in Phnom Penh) have high or very high levels of exposure for high wind speed.

Map 6: Child exposure to high wind speed



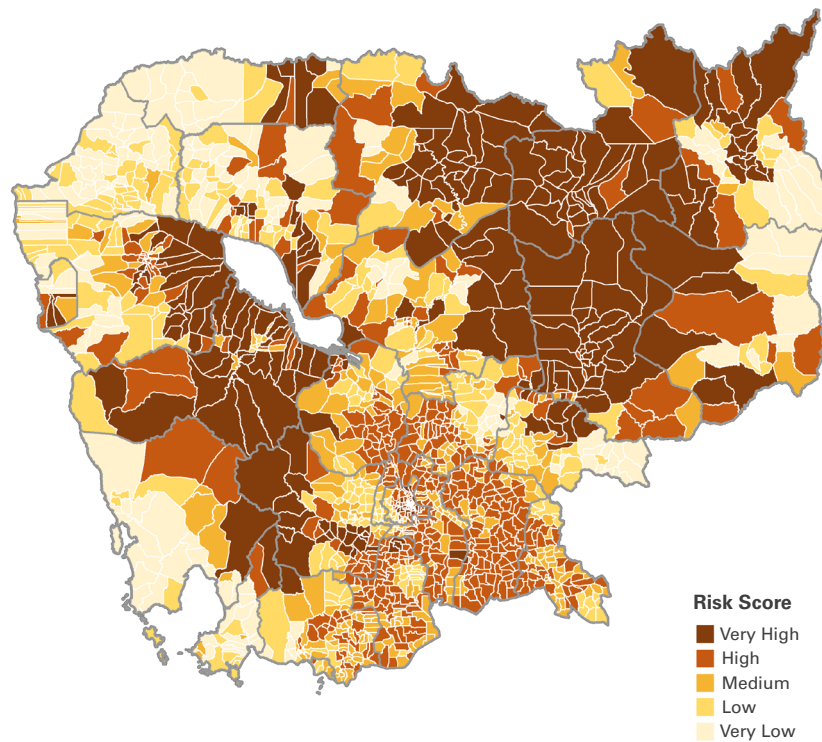
Source: CCRI-Cambodia 2024

³⁰ 'One Storm After Another: Southeast Asia's typhoon barrage', The New Humanitarian, 16 November 2020.

Vector-borne disease

Around 3 million children (56 per cent of children in the country) live in 798 communes (48 per cent of total communes) with high and very high child population exposure to vector-borne disease (VBD) compared with all communes, with 70 per cent of these communes in rural areas. The country has made significant progress towards ending malaria. Only 3.7 per cent of malaria cases are among those under 5 years of age.³¹ However, the entire population of children of Cambodia is exposed to dengue fever,³² which is a large contributor to hospitalizations and deaths of children under 5 years of age.³³ The index reflects the endemic nature of children's high exposure to VBD in Cambodia. Out of 25 provinces, 24 have some communes where the exposure risk of VBD is high or very high. The highest number of communes with high and very high levels of exposure to VBD are found in the north-eastern parts of the country and some areas in the south-western and central regions. There are huge variations in terms of numbers of communes with high levels of exposure between and within provinces. Almost all communes in Stung Treng and Kratie have high or very high levels of exposure, at 94 per cent and 91 per cent, respectively.

Map 7: Child exposure to vector-borne disease



Source: CCRI-Cambodia 2024

³¹ USAID, *U.S. President's Malaria Initiative Cambodia: Malaria Operational Plan FY 2020*.

³² UNICEF, *Analysis of the CCRI for Least Developed Countries*, New York, 2023.

³³ Yek, C., et al., *National Dengue Surveillance, Cambodia 2002–2020*, *Bulletin of the World Health Organization*, July 2023.

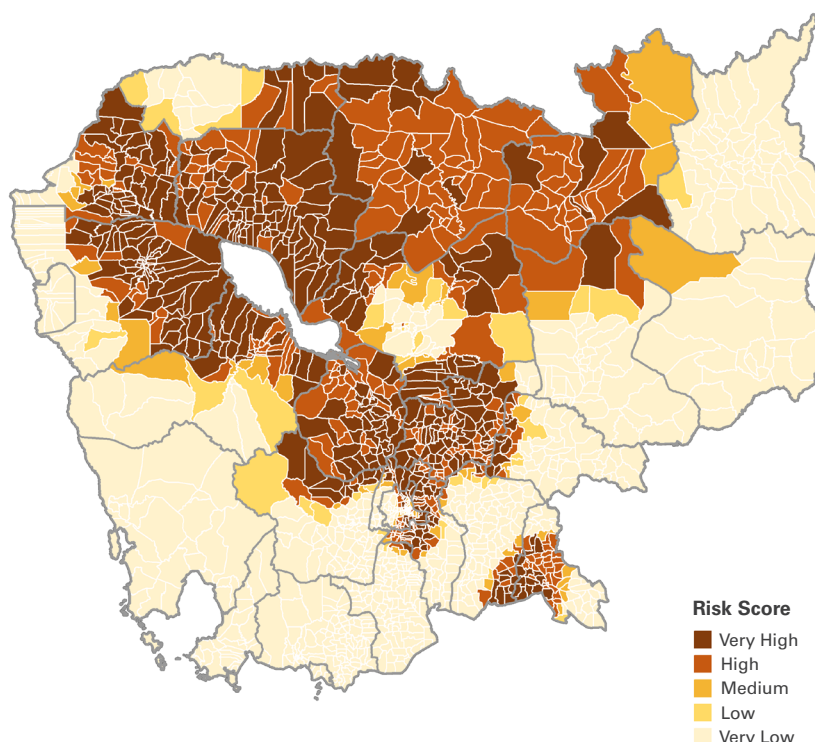
Air pollution

Around 2.7 million children (50 per cent of children in the country) live in communes with high and very high child population exposure to air pollution (PM2.5) exceeding 15 micrograms per cubic metre ($\mu\text{g}/\text{m}^3$) – corresponding to the World Health Organization (WHO) Interim Target 3 (IT-3) value. Those children live in 803 communes (49 per cent of total communes), with 74 per cent of those communes in rural areas.

One in five deaths among children under 5 years of age in Cambodia is attributable to air pollution³⁴ and the country's 6 million children³⁵ are exposed to air pollution in excess of the WHO guidelines for the protection of human health.³⁶ However, Cambodia has made significant strides in driving a clean air agenda; the national target of 25 $\mu\text{g}/\text{m}^3$ has been achieved in almost all communes and children in only a few communes (0.5 per cent of communes) are exposed to air pollution exceeding the national target level.

The index shows that communes with high or very high levels of child exposure to air pollution are in rural areas (74 per cent) and some of the urban and densely populated areas of the country, primarily in the north-west and lower central regions. Although the country's largest sources of pollution stem increasingly from urban areas (e.g. transport, electricity generation and industry),³⁷ rural communes remain the most affected by air pollution, especially as the 80 per cent of people living in rural areas still use wood as fuel for cooking stoves. Some rural households also rely on wood burning for bee honey harvesting and burn old pastureland to improve growth and maintain the delicate tall grass ecosystem in the rainy season. These techniques increase air pollution in the dry season, raising the average value of yearly air pollution. In urban areas, air pollution is mostly constant, however, because there are not enough forested areas to offset the high air pollution in the rainy season, unlike in the mountainous regions, where air quality is mostly good during the rainy season. All communes in Siem Reap, Preah Vihear and Kampong Chhnang and more than 90 per cent of communes in Kampong Cham and Stung Treng have high and very high levels of exposure to air pollution.

Map 8: Child exposure to air pollution (PM2.5>15 $\mu\text{g}/\text{m}^3$)



Source: CCRI-Cambodia 2024

³⁴ UNICEF Cambodia, 'Cambodia's First Children's Environmental Health Assessment Identifies Important Risks and Urgent Collective Action', Press release, 27 August 2023.

³⁵ UNICEF, *Over the Tipping Point: How multiple, overlapping climate and environmental shocks and hazards on children in the East Asia and Pacific region are eroding their coping strategies, exacerbating inequality, and forever changing their futures*, UNICEF East Asia and Pacific Regional Office, May 2023.

³⁶ Sokharavuth, P., et al., 'Air Pollution Mitigation Assessment to Inform Cambodia's First Clean Air Plan', Environmental Research, Vol. 220, 1 March 2023.

³⁷ Ibid.



SPOTLIGHT

Children's environmental health assessment

Cambodia recently completed her first children's environmental health (CEH) assessment, which provides a detailed overview of the current state of children's health in the context of environmental degradation and considers other types of air pollution that affect child survival and development, including household air pollution, water and food contamination, toxic metals, pesticides and hazardous waste. The assessment was led by the Ministry of Health in collaboration with several other ministries and with the support of UNICEF. Together, the CCRI and the CEH assessment findings contribute to a better understanding of the multiple climate and environmental hazards, shocks and stresses that children face across Cambodia.³⁸



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³⁸ UNICEF Cambodia, 'Cambodia's First Children's Environmental Health Assessment', Press release, 27 August 2023.



Section 2: Pillar 2 findings – Children’s vulnerability to climate and environmental hazards, shocks and stresses

Cambodia has made considerable strides in improving children’s rights and child health and well-being outcomes. Despite such progress, however, a large majority of children still face deprivation³⁹ and nearly half of all children (0-17 years) live in multidimensional poverty.⁴⁰ Deprivation, poverty and the intersecting factors of discrimination and inequality significantly affect children’s access to essential and life-saving services and their ability to have their most basic rights fulfilled. The country’s low capacity to adapt to climate shocks and disasters,⁴¹ insufficient investments in shock-resilient systems and infrastructure and inadequate child rights policy and legislation further impair children’s ability to cope with and to recover from the negative effects of single and multiple shocks.

Approximately 1.2 million children (21 per cent of children in the country) live in 407 communes (25 per cent of total communes) with high and very high child vulnerability to the impact of climate and environmental hazards, shocks and stresses, with 97 per cent of those communes in rural areas.

According to the CCRI-Cambodia, the high and very high child vulnerability in 25 per cent of communes stems primarily from varying degrees of insufficient essential social services, with health and nutrition being the most critical, followed by inadequate livelihoods and social protection, WASH, child protection and education. Some children are more vulnerable to the impacts of shocks than others, depending primarily on the availability, quality, equity and sustainability of essential services and existing inequalities. **The most vulnerable children live in communes in the north-eastern part of the country, in the mountainous and plateau region, where some of the poorest communities**, primarily Indigenous and ethnic minority groups, can be found and where access to the essential services that are paramount for resilience and the ability to cope with shocks is severely limited. There are also small areas in other communes that have high levels of child vulnerability, particularly in the Tonle Sap Lake region. **Just six provinces host more than half (212) of the communes where child vulnerability to climate and environmental shocks is high.** In the Ratanak Kiri, Mondul Kiri, Stung Treng and Preah Vihear provinces, between 88 per cent and 92 per cent of communes have high or very high levels of child vulnerability.

Five key underlying factors of children’s vulnerability were considered in the index, using specific indicators. The main findings are highlighted below.



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³⁹ UNICEF, ‘An Analysis of the Situation of Children and Adolescents in Cambodia 2023’, 2023.

⁴⁰ Ibid.

⁴¹ Notre Dame Adaptation Initiative, ‘Readiness Country Rankings’, updated May 2023.

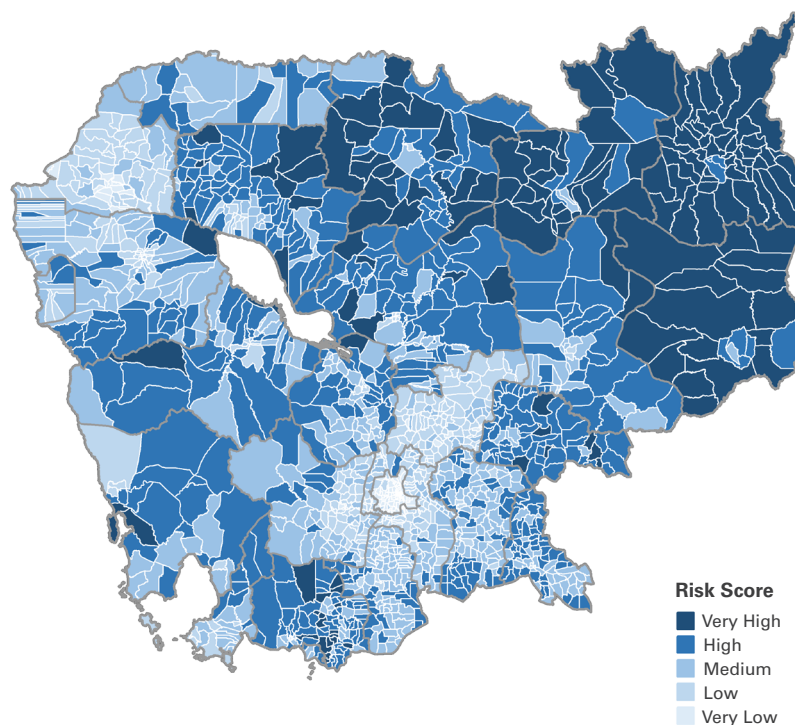
Child health and nutrition

While Cambodia has made significant progress in improving child health, preventable diseases still account for a large proportion of under-5 mortality in the country, especially in rural areas. Huge geographical disparities also persist across regions and provinces. Ratanak Kiri and Mondul Kiri have the highest infant and under-5 mortality rates, Phnom Penh the lowest.⁴² Malnutrition is one of the underlying causes of child deaths, and 6 per cent of children in the country are still considered to be zero-dose children.⁴³

Despite laudable efforts by the Government to strengthen the country's health system and its commitment to universal health coverage (UHC), significant systemic challenges affect children's access to health care and nutrition interventions. They include poor quality of care, coverage gaps, fragmented community health-care delivery and a lack of funding and human resources for health across the country.⁴⁴ Out-of-pocket spending also drives people away from services or increases financial stress. Across the country, 71 per cent of Cambodian households pay for health care using their income and 23.7 per cent use their savings.⁴⁵

Around 1.9 million children (35 per cent of children in the country) live in 690 communes (42 per cent of total communes) with high and very high levels of child vulnerability due to inadequate health and nutrition, with 98 per cent of those communes in rural areas. The highest number of communes in the high and very high categories of inadequate health and nutrition are primarily in the north-eastern and mountainous regions of the country (Ratanak Kiri, Mondul Kiri, Stung Treng, Preah Vihear, and Tboung Khmum), in the Tonle Sap Lake region, including Siem Reap and Kampong Thom, and in Kampot. These provinces are remote, and poor and isolated communities are more likely to struggle to have access to timely and quality critical health and nutrition services. Socioeconomic factors, such as wealth, education level and ethnicity, as well poor quality of care, coverage gaps and fragmented community health-care delivery,⁴⁶ further affect their ability to benefit from essential and life-saving interventions.⁴⁷

Map 10. Child vulnerability – Child health and nutrition



Source: CCRI-Cambodia 2024

⁴² Government of Cambodia, NIS, *Report of Cambodia Socio-Economic Survey 2021*, Phnom Penh, December 2022.

⁴³ UNICEF *The State of the World's Children 2023: For every child, vaccination – Regional Brief: East Asia and the Pacific*, UNICEF Innocenti–Global Office of Research and Foresight, Florence, Italy, April 2023. “Zero-dose” children are defined as children who lack access to or have never been reached by routine immunization services.

⁴⁴ Hirschhorn, Dr. Lisa R., et al., *Exemplars in Under-5 Mortality: Cambodia Case Study*, University of Global Health Equity, 28 February 2020.

⁴⁵ Government of Cambodia, NIS, *Report of Cambodia Socio-Economic Survey 2021*, Phnom Penh, December 2022.

⁴⁶ Hirschhorn, Dr. Lisa R., et al., *Exemplars in Under-5 Mortality*, February 2020.

⁴⁷ Chan Soeung, Sann, et al., ‘From Reaching Every District to Reaching Every Community: Analysis and response to the challenge of equity in immunization in Cambodia’, *Health Policy and Planning*, vol. 28(5), August 2013.

Case study: Health system strengthening and climate change adaptation in Cambodia

The coronavirus disease (COVID-19) exposed limitations in health systems and preparedness for large-scale disease outbreaks across the globe, including in Cambodia. At the same time, it has been a catalyst for renewed momentum on health system strengthening for primary health care, a critical component of climate change adaptation. Since 2019, Cambodia has been piloting a project on building climate-resilient health systems to the adaptive capacity of her health systems and institutions to better respond to and manage health risks associated with climate shocks and disasters.⁴⁸ The project has so far led to improved data-sharing and cross-sectoral collaboration for climate-informed health surveillance, including through the development of a health national adaptation plan; the expansion of health surveillance and early warning systems (e.g. a new rapid response plan and improved surveillance for dengue outbreaks); and WASH-related interventions in health-care centres and in communities. The initiative, which is locally led and gender-sensitive, is centred around the meaningful participation of actors at the national and subnational levels. They include local communities and vulnerable groups, such as Indigenous populations, and the targeting of girls and women in the delivery of climate-resilient water safety plans. Currently, UNICEF is working with the Ministry of Health and the Ministry of Rural Development to support solarization and environmentally sustainable health-care waste management capacities in targeted health facilities serving the most vulnerable communities. These measures will not only protect against climate shocks and prevent and control the spread of disease, but also improve the quality of services and reduce exposure to environmental hazards.



SPOTLIGHT

Climate change and child undernutrition

Climate change and environmental degradation and disasters are significant drivers of child malnutrition globally.⁴⁹ In Cambodia, they affect crop and fishery production and water supplies, disrupting food systems and livelihoods and reducing the nutritional value of crops. These severely affect rural households' food security, diet diversity and children's nutrition. The World Food Programme (WFP) reports that 63 per cent of farming households affected by droughts and floods in the period 2019–2020 still had not recovered by 2021, and 75 per cent had no coping mechanisms in place in case of recurrent shocks.⁵⁰

Despite improvements, all forms of child malnutrition are still significant issues. A total of 22 per cent of children under 5 years of age are stunted and child wasting remains persistently high, at 10 per cent.⁵¹ Wealth and geographical disparities drive the inequitable burden of child malnutrition within the country.⁵² Currently, less than 10 per cent of the estimated 60,000 children suffering from wasting in Cambodia have access to treatment.⁵³

In May 2021, Cambodia became one of the 21 front-running countries to develop a costed road map for a global action plan on child wasting,⁵⁴ setting a target of reducing the number of children with symptoms of wasting from 10 per cent to 5 per cent by 2025. Critical challenges remain, however, in the generation of adequate resources and investments to scale up prevention and treatment interventions. Multisectoral coordination for implementation at the subnational level and between the national and subnational levels could be strengthened.

⁴⁸ WHO, 'Building Resilience of Health Systems in Asian LDCs to Climate Change', News note, 2 December 2019.

⁴⁹ WHO, 'Climate Change and Health', Fact sheet, 26 February 2021.

⁵⁰ WFP, *Draft Cambodia Country Strategic Plan (2024–2028)*, 10 July 2023.

⁵¹ UNICEF, 'Analysis of the Situation of Children and Adolescents in Cambodia 2023'.

⁵² NIS and Ministry of Health, Cambodia, and ICF, *Cambodia Demographic and Health Survey (CDHS) 2021–22 Final Report*, Phnom Penh and Rockville, MD, USA, March 2023.

⁵³ UNICEF Cambodia, 'UNICEF Secures \$3.4 million to Reduce Life-threatening Child Wasting in Six Provinces', Press release, 9 September 2022.

⁵⁴ United Nations, *Global Action Plan on Child Wasting: Country operational roadmap – Cambodia, May 2021*.

Water, sanitation and hygiene

Children's high level of exposure to multiple climate hazards, shocks and stresses, including floods and drought, increase the risk of water-borne diseases. Some of these diseases, in particular diarrhoea,⁵⁵ are among the leading causes of death for children under 5 years of age in Cambodia.⁵⁶ While significant progress has been achieved in increasing access to WASH services,⁵⁷ social and geographical inequalities severely affect children's access to such services, both at home and in the community (school, health facilities). Rural households, in particular, lag behind in access to basic facilities, and disparities persist across provinces.⁵⁸

Among the country's pre-primary schools, 7 in 10 do not have access to WASH facilities, such as basic toilets that are sex-disaggregated and usable, while 50 per cent of rural health-care facilities do not have sufficient water year round.⁵⁹ There are similar disparities in access to WASH services in urban areas.⁶⁰ Climate shocks and extreme weather events⁶¹ further hinder access to safe water sources and sanitation.



SPOTLIGHT

Strengthening climate-resilient WASH services in Cambodia

Improving WASH services in Cambodia is crucial for mitigating the climate risks faced by children. Enhanced WASH infrastructure can reduce children's vulnerability to climate-related hazards, promote health and support resilience against environmental shocks. Prioritizing WASH services will ensure a healthier and more secure future for the children of Cambodia in the face of climate change. To ensure climate-resilient WASH services, climate risks must be understood and addressed through a coordinated cross-sectoral approach. Recently, UNICEF worked with relevant line ministries to assess the risks affecting WASH services and to develop solutions through the Global Water Partnership-UNICEF Strategic Framework for WASH Climate Resilience. Together, the two organizations have developed the *Climate Rationale for Water, Sanitation and Hygiene Services in Cambodia*,⁶² which provides evidence for embedding climate-related risks to and vulnerabilities of WASH services in policymaking and programming in Cambodia. It provides tailored WASH climate solutions for both urban and rural settings and recommends the enhanced integration of climate into WASH policies and vice versa, along with increased investment in sustainable, climate-resilient systems and universal access to WASH services.

According to the CCRI-Cambodia, around 1.6 million children (30 per cent of children in the country) live in 568 communes (35 per cent of total communes) with high and very high child vulnerability due to inadequate WASH services, with 93 per cent of those communes in rural areas. Similarly to other vulnerability factors, however, the most vulnerable children are found in a small number of provinces and communes that are primarily located in remote and mountainous areas of the country, including in the provinces Ratanak Kiri, Stung Treng, Preah Vihear, and Otdar Meanchey, where households are less likely to have access to basic WASH services, including drinking water.⁶³ Some provinces in the south-western parts of the country also have clusters of communes with high levels of child vulnerability for WASH, including Pursat, Koh Kong and Kampot.

⁵⁵ Merali, Hasan, et al., 'Diarrheal Knowledge and Preventative Behaviors Among the Caregivers of Children Under 5 Years of Age on the Tonle Sap Lake, Cambodia, *Research and Reports in Tropical Medicine*, vol. 9, 27 March 2018.

⁵⁶ Kelly GC, Rachmat A, Hontz RD, Sklar MJ, Tran LK, Supaprom C, et al. (2023) Etiology and risk factors for diarrheal disease amongst rural and peri-urban populations in Cambodia, 2012–2018. *PLoS ONE* 18(3): e0283871. <https://doi.org/10.1371/journal.pone.0283871>

⁵⁷ CDHS 2021-22.

⁵⁸ CDHS 2021-22.

⁵⁹ UNICEF Cambodia, 'Water, Sanitation and Hygiene'.

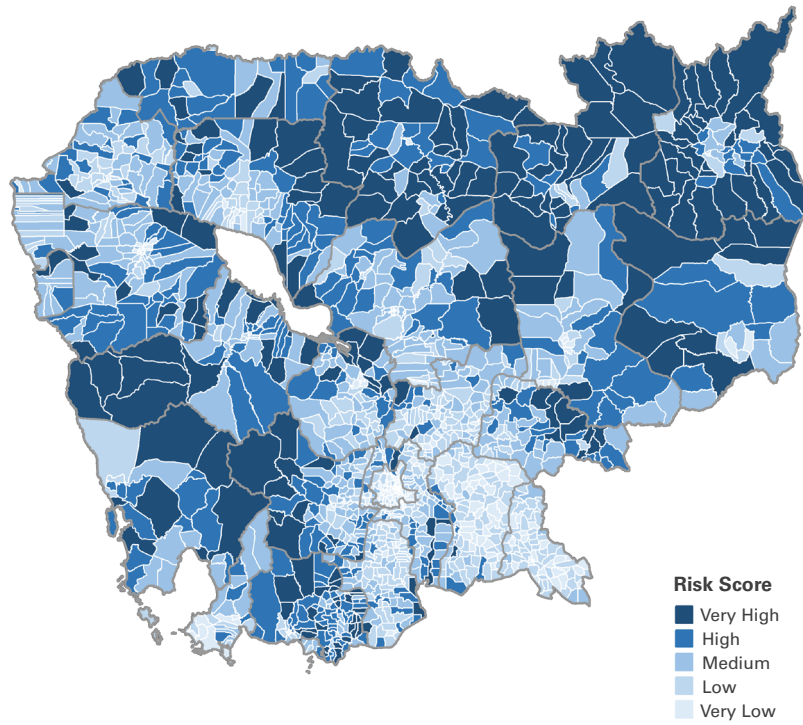
⁶⁰ UNICEF Cambodia, *Climate Rationale for Water, Sanitation and Hygiene Services in Cambodia*, 2023.

⁶¹ UNICEF, 'Analysis of the Situation of Children and Adolescents in Cambodia 2023'.

⁶² 'UNICEF Cambodia, *Climate Rationale for Water, Sanitation and Hygiene Services in Cambodia*, 2023.

⁶³ CDHS 2021-22.

Map 11. Child vulnerability – Water, sanitation and hygiene



Source: CCRI-Cambodia 2024

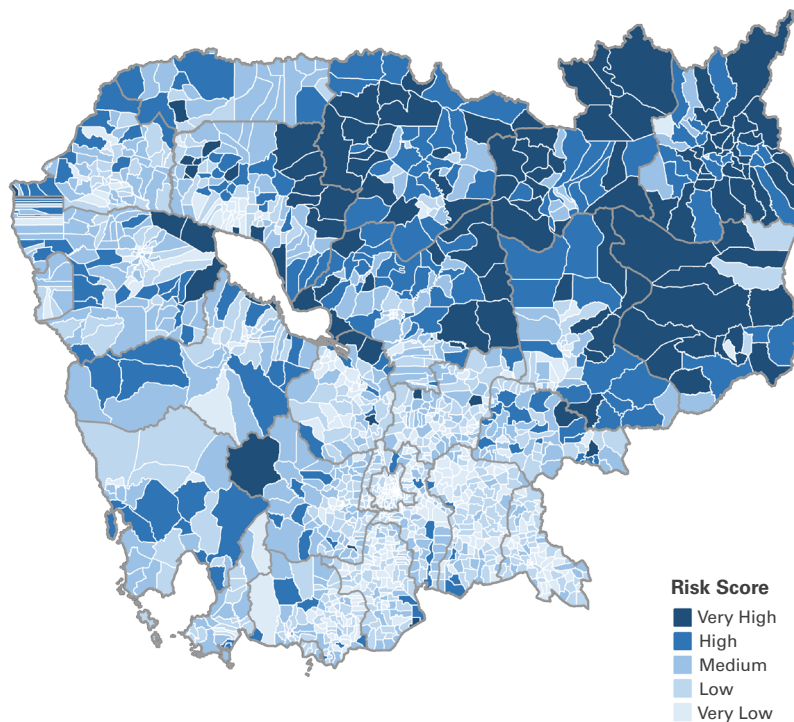


Education

Aside from health-related vulnerabilities, children’s vulnerability to climate and environmental shocks is also amplified by a lack of adequate education and learning. Socioeconomic factors drive inequalities in children’s ability to learn. More than 10 per cent of children in Cambodia do not have access to education and around 45 per cent of children aged 5 to 14 years are economically active.⁶⁴ The poorest children and children from Indigenous and ethnic minority groups are the most likely to not complete primary education or to be out of school.⁶⁵ For example, while primary school enrolment in Mondul Kiri - one of the poorest provinces - reached 96.2 per cent in the school year 2021/22,⁶⁶ the drop-out rate is significant, especially among children from minority groups. In Ratanak Kiri, 87 per cent of children from ethnic minority groups drop out after completing primary education.⁶⁷ Ethnic minority girls are also less likely to enrol than boys.⁶⁸

According to the CCRI-Cambodia, 971,000 children (18 per cent of children in the country) live in 335 communes (20 per cent of total communes) with high and very high vulnerability to the impacts of climate and environmental hazards, shocks and stresses due to inadequate education. These communes are spread across 22 provinces and 94 per cent of those communes are in rural areas and mostly found in the north-eastern parts of the country, including in Ratanak Kiri, Stung Treng, Mondul Kiri and Preah Vihear.

Map 12. Child vulnerability – Education



Source: CCRI-Cambodia 2024

⁶⁴ The Borgen Project, ‘Improving Education for Children in Cambodia’, March 2021.

⁶⁵ World Vision, Unlocking Cambodia’s Future by Improving Access to Quality Basic Education, November 2019.

⁶⁶ Government of Cambodia, Ministry of Education, Youth and Sport, *Public Education Statistics & Indicators 2021–2022*, Phnom Penh, March 2022.

⁶⁷ See CARE International, <https://www.care.org.au/country/cambodia>.

⁶⁸ World Vision, Unlocking Cambodia’s Future by Improving Access to Quality Basic Education, November 2019.



SPOTLIGHT

Climate change action in the education sector

Schools are critically important for educating children and young people about climate change and disaster awareness and to inform, empower and motivate them to participate in and influence discussions and decisions that directly concern them.

Cambodia has been at the forefront of climate change education in schools and non-formal education settings. The Climate Change Strategic Plan reiterates the importance of mainstreaming climate change knowledge and information in education, while the Climate Change Strategic Plan for Education 2014–2023⁶⁹ and the Climate Change Action Plan for Education 2014–2018⁷⁰ outline the Government’s agenda on climate change and the education sector. The Royal Government of Cambodia has also integrated climate change into her Education Strategic Plan and Cambodia’s Education 2030 Roadmap: Sustainable Development-Goal 4.⁷¹ In 2020, climate change education was integrated into a new and expanded earth science curriculum for higher secondary schools⁷² and multiple initiatives are also encouraging youth engagement.⁷³

The Royal Government of Cambodia has initiated some changes in her approach to climate- and disaster-resilient education systems,⁷⁴ but current investments and progress are inadequate in the face of the growing threat of increased flooding and other shocks to schooling. The highly siloed approach adopted by the education sector, which focuses primarily on curriculum development and emergency response, means that the potential of the sector to actively engage in climate change adaptation and DRR continues to be limited. The stark disparities in vulnerability in terms of access to education, which are highlighted by the CCRI-Cambodia, also make clear the need for renewed efforts by Government at all levels to increase enrolment and completion rates.



⁶⁹ Ministry of Education, Youth and Sport, [Climate Change Strategic Plan For Education](#), 2013.

⁷⁰ Ministry of Education, Youth and Sport, [Climate Change Action Plan for the Education 2014–2018](#), Government of Cambodia, Phnom Penh, 2014.

⁷¹ Ministry of Education, Youth and Sport, [Cambodia’s Education 2030 Roadmap: Sustainable Development Goal 4](#), Government of Cambodia, Phnom Penh, February 2019

⁷² International Bureau of Education, [Cambodia: Leading the Way in Climate Change Education](#), United Nations Educational, Scientific and Cultural Organization, 26 August 2020.

⁷³ UNICEF, [‘Schools as Platforms for Action – Cambodia’](#), Education Case Study, 17 April 2023; United Nations Environment Programme (UNEP), [‘Seeding the Future: School-Children in Cambodia Pave Way for Climate Adaptation’](#), Story, 15 January 2019.

⁷⁴ UNICEF East Asia and Pacific Regional Office UNICEF, [It Is Getting Hot: Call for education systems to respond to the climate crisis](#), Perspectives from East Asia and the Pacific, 2019.



SPOTLIGHT

Children with disabilities: The forgotten children of climate action

Children with disabilities, who often live in poverty,⁷⁵ are more vulnerable to climate change and disasters.⁷⁶ Yet their voices are often not heard and their needs and wants not considered in either government or civil society-led efforts on climate change and disasters in Cambodia.⁷⁷ They also have very limited access to adapted and child-friendly information and resources to equip them to cope with the immediate effects and aftershocks of disasters. Their invisibility is compounded by a lack of data focusing on the realities of children living with disabilities in the country and the systemic discrimination that leads to their exclusion from decision-making across all areas of their lives, including education. While Cambodia has pledged to improve the rights of children with disabilities through its ratification of the Convention on the Rights of Persons with Disabilities and, specifically, to uphold their right to education, the Government has drafted a disability law that proposes segregated classes for children with disabilities.⁷⁸ As such, the proposed law goes against the principles of full inclusion and equal participation in society that underpin the Convention,⁷⁹ which was ratified by Cambodia in 2012.

Inclusive education that places the integration of all children, regardless of needs, at the heart of climate change adaptation and disaster reduction must underline the laudable efforts of Cambodia on education. The voices and contributions of all children in all their diversity are paramount in the planning and successful delivery of the Government's agenda.



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⁷⁵ 'Analysis of the Situation of Children and Adolescents in Cambodia 2023'.

⁷⁶ UNICEF, 'Children with Disabilities', UNICEF Fact Sheet, August 2022.

⁷⁷ Carlsson, Louise, "They Are Ignored": Exploring the rights and challenges of children with disabilities in Cambodia in the context of climate change, Thesis, Lund University, Lund, Sweden, May 2023.

⁷⁸ Committee on the Rights of the Child, Concluding observations on the combined fourth to sixth periodic reports of Cambodia (CRC/C/KHM/CO/4-6).

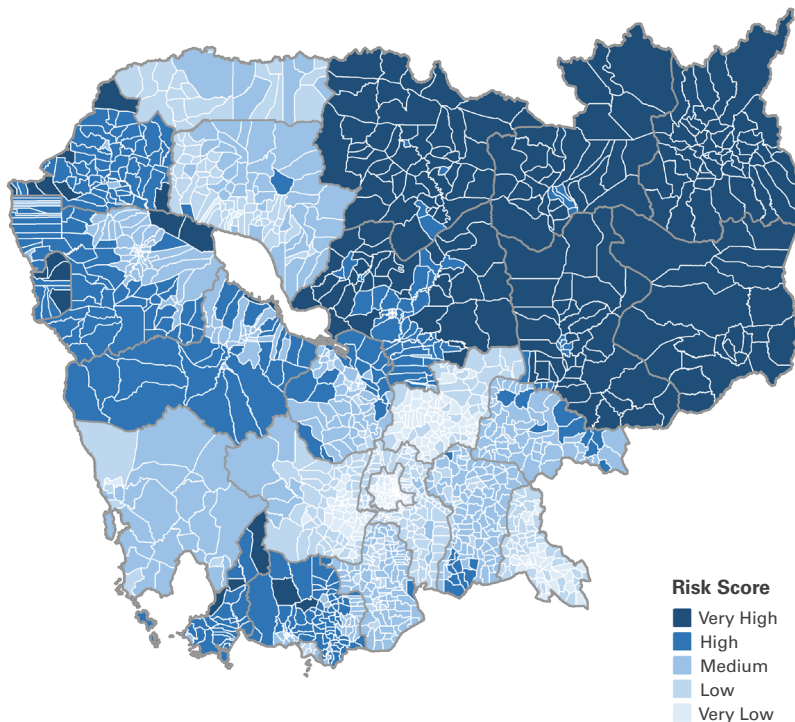
⁷⁹ United Nations, Convention on the Rights of Persons with Disabilities, United Nations, New York, 12 December 2006.

Child protection

Overlapping climate and environmental shocks act as a powerful threat multiplier for violence against children⁸⁰ due to inadequate child protection services. There is little data on the impacts of climate change and disasters on child protection in Cambodia, although there is ample evidence of the linkages between natural and human-induced shocks and disasters and violence against children,⁸¹ including due to displacement and family separation. While the Government has stepped up its efforts to strengthen child protection laws and systems,⁸² violence against children continues to be a significant issue in the country. Due to insufficient systems, climate shocks often result in child labour and child marriage in rural areas, with a lack of access to basic education further exacerbating households' reliance on such harmful coping strategies.⁸³ The country's low birth registration rates in rural areas, especially among minority and Indigenous communities, also amplify child protection risks,⁸⁴ as a lack of legal identity prevents children from having access to basic services and the lack of proof of age also increases the risk of child marriage and child labour.

Around 1.6 million children (30 per cent of children in the country) live in 559 communes (34 per cent of total communes) with high and very high child vulnerability to the impacts of climate and environmental hazards, shocks and stresses due to the lack of adequate child protection services. A large majority (88 per cent) of those communes are in rural areas. According to the index, all communes in Pailin, Stung Treng, Mondul Kiri, Kratie, Preah Vihear and Ratanak Kiri, which has the highest prevalence of child marriage, and most communes in Preah Sihanouk, Banteay Meanchey and Kampong Thom have high child vulnerability levels due to the lack of adequate child protection services. While the Government has stepped up its efforts to strengthen child protection policies, laws and systems, critical gaps remain, including due to the siloed nature of government efforts across ministries and the lack of a strong child protection lens applied to climate change adaptation and disaster management policies and programming. and systems,⁸⁵ critical gaps remain, including due to the siloed nature of government efforts across ministries and the lack of a strong child protection lens applied to climate change adaptation and disaster management policies and programming.⁸⁶

Map 13. Child vulnerability – Child protection



Source: CCRI-Cambodia 2024

⁸⁰ Barnfonden, *Exploring the link between climate change and violence against children, Literature Review*, 2021. See also: End Violence Against Children, *Is there evidence that the climate crisis is driving increased violence against children?*

⁸¹ Barnfonden, *Exploring the Link Between Climate Change and Violence*. See also End Violence Against Children, *'Is There Evidence that the Climate Crisis is Driving Increased Violence Against Children?'*

⁸² *'Analysis of the Situation of Children and Adolescents in Cambodia 2023'*.

⁸³ Ibid.

⁸⁴ UNICEF, UNICEF Cambodia and Division of Data, Research and Policy, *A Statistical Profile of Child Protection in Cambodia*, UNICEF, New York, 2018.

⁸⁵ *'Analysis of the Situation of Children and Adolescents in Cambodia 2023'*.

⁸⁶ Ministry of Social Affairs, Veterans and Youth Rehabilitation and Ministry of Interior and, *Child Protection Sector Strategic Implementation Plan 2022–2026*, Government of Cambodia, Phnom Penh, 2022.



SPOTLIGHT

Gendered impacts of climate and environmental shocks and disasters

Women and girls are uniquely and disproportionately vulnerable to violence during climate shocks and disasters.⁸⁷ Socioeconomic status and geographical disparities, combined with harmful cultural and gender norms, significantly increase the protection risks for women and girls in times of shocks and disasters, including multiple forms of gender-based violence. Shock-induced income and asset losses often lead households to adopt negative coping strategies. Cambodia has one of the highest rates of child marriage in the region,⁸⁸ and research by the United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women) has found that child marriage in Cambodia is increasing with the heightened frequency of drought episodes and rising temperatures due to the impact of such events on households' economic security. Climate-related factors are also statistically associated with gender-related outcomes across wealth, education and age categories.⁸⁹

The Royal Government of Cambodia has made great strides in her gender and climate crisis and disasters agenda. She has integrated gender across multiple climate change and disaster management strategies and developed the Gender and Climate Change Action Plan 2014–2018.⁹⁰ However, the integration of gender and climate change considerations into the policies and programmes of other key sectors has been insufficient. Significant challenges remain in the delivery of strategies.⁹¹ At the commune level, the lack of budget and of women's participation in decision-making leads to a lack of gender-specific interventions on violence against women and girls in times of disaster.⁹² In addition, at the policy level, the specific issues pertaining to young and adolescent girls and intersecting factors of vulnerabilities, such as disability and ethnicity, have not been considered or addressed in existing climate and disaster plans and strategies.



SPOTLIGHT

Mental health toll of climate shocks and disasters on children and young people

There is growing evidence that climate change and disasters⁹³ have significant emotional and psychological effects on children because of their direct exposure to shocks and their immediate consequences, such as family separation, displacement, destruction, the closure of schools and physical and emotional harm and abuse. Pre-existing vulnerabilities, such as health and mental health issues, as well as violence, social exclusion and socioeconomic determinants,⁹⁴ also render some children more vulnerable to emotional distress.⁹⁵ The mental health impacts of disasters can lead to long-term effects, such as post-traumatic stress disorder, depression and anxiety. Yet the prioritization of mental health by Cambodia remains insufficient.⁹⁶

A child-sensitive climate change and disaster agenda must adopt a holistic approach to health that not only strengthens and improves vital health services and infrastructure but also incorporates mental health as a key vulnerability factor.

⁸⁷ Thurston, Alyssa M., et al., 'Natural Hazards, Disasters and Violence Against Women and Girls: A global mixed-methods systematic review', *BMJ Global Health*, 2021.

⁸⁸ UNFPA East Asia and the Pacific, *Beyond Marriage and Motherhood Patterns and Trends of adolescent pregnancy and child marriage in Southeast Asia and the Pacific*, 2022.

⁸⁹ UN-Women, *Gendered Impacts of Climate Change: Empirical Evidence from Asia*, April 2023.

⁹⁰ Gender and Climate Change Committee, Ministry of Women's Affairs, *Gender and Climate Change Action Plan 2014–2018*, Government of Cambodia, Phnom Penh, June 2014.

⁹¹ UN-Women and Cambodia Development Resource Institute, *State of Gender Equality and Climate Change in Cambodia*, 2021.

⁹² Tanyage, Maria, and True, Jacqui, *Gender Responsive Alternatives to Climate Change: A country report on Cambodia*, Monash Gender, Peace and Security Centre, 2019.

⁹³ Olness, Karen, 'Children's Mental Health at Times of Disasters: A Narrative Review', *Pediatric Medicine*, vol. 5, 28 May 2022.

⁹⁴ Newnham, Elizabeth A., et al., 'Long term mental health trajectories after disasters and pandemics: A multilingual systematic review of prevalence, risk and protective factors', *Clinical Psychology Review*, vol. 97, November 2022.

⁹⁵ Olness, Karen, 'Children's Mental Health at Times of Disasters: A narrative review', *Pediatric Medicine*, vol. 5, 28 May 2022.

⁹⁶ Parry, Sarah J., and Wilkinson, Ewan, 'Mental Health Services in Cambodia: An overview', *British Journal of Psychiatry International*, vol. 17 (2), 2020.

Livelihoods and social protection

Cambodia saw her poverty rate fall by almost 50 per cent between 2009 and 2019 but the COVID-19 pandemic reversed some of the progress.⁹⁷ Improvements have also been unequal and poverty remains highest in rural areas. Households relying on agricultural wages as their main source of income are the poorest and represent 12 per cent of the poor nationwide.⁹⁸ Ratanak Kiri, Mondul Kiri, Stung Treng and Preah Vihear, where a majority of communes have high or very high levels of exposure to multiple shocks reflected in pillar 1 of the index and where critical services for children are inadequate, have the highest poverty rates, which also vary widely within provinces' districts and communes.⁹⁹ Poverty is a key factor in vulnerability to climate and environmental shocks, including due their financial consequences and their impacts on housing and often limited assets. In addition, the lack of access to information about risks and forecasts, including before, during and in the aftermath of a disaster, exacerbate communities' ability to prepare for and mitigate the effects of shocks. In particular, the overall Internet quality is still limited in the country and the most remote areas lack access, with rural and Indigenous communities the most at risk of being left behind.¹⁰⁰

According to the CCRI-Cambodia, around 1.8 million children (34 per cent of children in the country) live in 607 communes (37 per cent of total communes) with high and very high child vulnerability due to the lack of adequate livelihoods and social protection, with 97 per cent of those communes in rural areas. A majority of the most vulnerable children live in hard-to-reach and poor areas of the country that also score high for other vulnerabilities. In particular, in Stung Treng (82 per cent), Mondul Kiri (81 per cent), Kratie (81 per cent), Ratanak Kiri (80 per cent), Preah Vihear (75 per cent) and Kampong Thom (68 per cent), a large majority of communes have high child vulnerability levels due to the lack of adequate livelihoods and social protection.

Numerous cash transfer programmes were initiated in response to Covid-19, as well as to floods and global inflation. These included targeted cash transfers during the pandemic lockdowns in specific provinces, national cash transfers for households identified through the Government's Identification of Poor Households Programme (IDPoor) and cash transfer programmes for at-risk households affected by inflationary pressure and severe floods. All of these programmes were introduced under the principle of adaptive and shock-responsive social protection. The Government's current endorsement of the National Social Assistance Family Package guidelines is a promising step towards strengthening the link between climate shocks and social protection. The guidelines also pave the way for the further integration of existing social protection programmes, ultimately providing the most vulnerable groups with increased resilience to face and adapt to the consequences of climate change. The digital delivery system of the Family Package will inform a future single registry.

Despite progress and the positive steps taken by the Government, however, child-sensitive social protection coverage in the country remains very limited.¹⁰¹ In addition, to date, there has been insufficient integration between the sectors of climate change, disasters and social protection, which has affected the delivery of a comprehensive and adequate shock-responsive social protection framework.¹⁰² The lack of detailed and localized data on climate and disaster exposure and vulnerability, including intersecting vulnerabilities, as well as challenges in access to and the capacity to use existing data, have also compounded the slow progress in developing climate adaptive social protection programmes.¹⁰³

⁹⁷ The World Bank, [Cambodia Poverty Assessment: Toward a more inclusive and resilient Cambodia](#), International Bank for Reconstruction and Development/The World Bank, Washington, D.C., 2022.

⁹⁸ Ibid.

⁹⁹ Ibid.

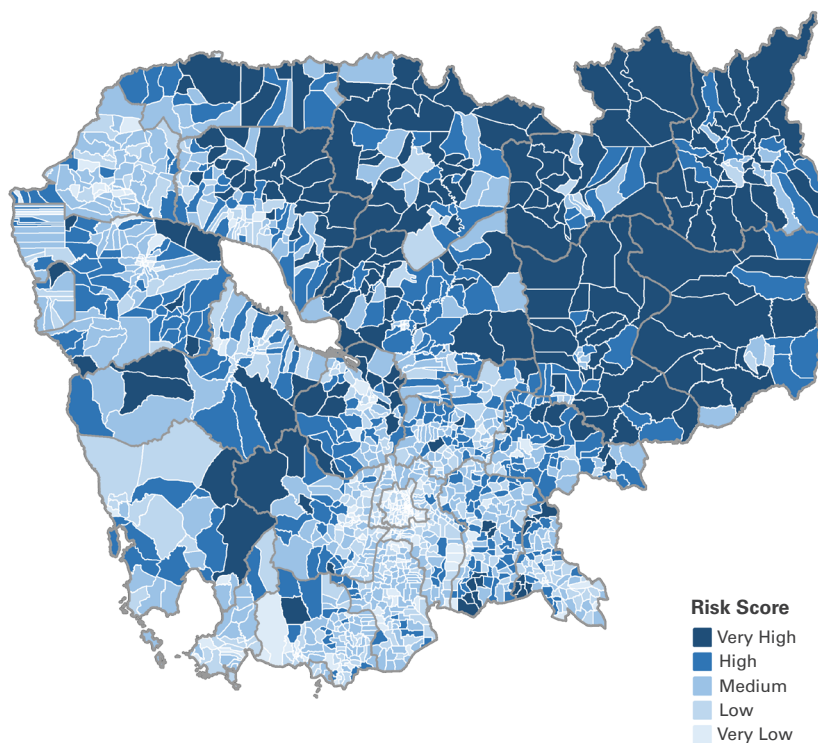
¹⁰⁰ Cambodian Journalists Alliance Association, '[Rural and Indigenous Communities Still Struggle With Internet Access](#)', 6 June 2023.

¹⁰¹ Save the Children and Development Pathways, [Child-Sensitivity of Social Protection in Cambodia](#), Policy brief, June 2022.

¹⁰² Béné, Chris, and Ballard, Brett M., [Adaptive Social Protection in Cambodia](#), Strategy paper, United Nations Development Programme, Phnom Penh, 2015.

¹⁰³ WFP, '[Leveraging Climate Risk Data Tools to Inform Social Protection: The case of WFP's Platform for Real-time Impact and Situation Monitoring \(PRISM\)](#)', Brief, 10 July 2023.

Map 14. Child vulnerability – Livelihoods and social protection



Source: CCRI-Cambodia 2024



SPOTLIGHT

Child-responsive climate financing

Financing for climate change and disasters remains woefully inadequate and child-responsive climate funding is virtually non-existent. Just 2.4 per cent of main multilateral climate funds can be categorized as supporting child-responsive activities.¹⁰⁴ A review of external climate financing across sectors shows that almost no child-related social sectors in Cambodia, including child protection and social protection, receive any international funding.¹⁰⁵ External financing is also insufficient and poorly targeted.¹⁰⁶ While the total share of public funding exclusively to address climate change in the country has slowly been rising, it is still low compared to the increasing level of need and is not reaching subnational levels.¹⁰⁷ It is also primarily spent on road improvement and irrigation to the detriment of the social and productive sectors.¹⁰⁸

¹⁰⁴ Children’s Environmental Rights Initiative, *Falling Short: Addressing the climate finance gap for children*, June 2023.

¹⁰⁵ National Council of Sustainable Development, ‘*Overview of External Climate Finance*’, Government of Cambodia.

¹⁰⁶ *Ibid.*

¹⁰⁷ National Committee for Sub-National Democratic Development, *National and SubNational Schemes for Mainstreaming Climate Resilience at Province, District and Commune Level*, Government of Cambodia, August 2018.

¹⁰⁸ Ministry of Economy and Finance, *Cambodia Climate Public Expenditure Review 2021*, Government of Cambodia, Phnom Penh, September 2022.



Conclusions and recommendations

Across Cambodia, from the largest cities to the smallest and in most rural communities, children are trying to survive multiple and mutually reinforcing shocks that feed on and exacerbate inequalities. The CCRI-Cambodia provides a worrying picture of both the levels of climate, environmental and disaster risks to which the poorest and most deprived children are exposed and the challenges that they face in gaining access to essential and life-saving services.

The long-standing efforts of the Royal Government of Cambodia to reduce poverty and improve children's rights ought to be commended. Dramatic progress has been made in lifting people out of poverty and the country has achieved substantial improvements for children, including a dramatic reduction in child mortality and child stunting and a nearly 100 per cent primary school enrolment rate. Cambodia has also strengthened the policy and legal framework that provide a stronger enabling environment for children. Yet substantial gaps remain and the rights of certain groups of children continue to be overlooked or threatened. Intersecting vulnerabilities, such as geography, poverty, gender, ethnicity, disability and limited participation in decisions that affect them, have complex, powerful and harmful consequences for children's survival, well-being and development.

Over the past few years, the Royal Government of Cambodia has been at the forefront of national efforts to increase the country's capacity to adapt to climate change, environmental degradation and disasters. Most notably, in the context of this report, Cambodia has demonstrated strong leadership in strengthening her climate and environmental agenda for children. She has increasingly engaged and invested in increasing the evidence on children's climate, environmental and disaster risks and vulnerabilities, most notably by working with UNICEF on the index.

The findings reflected in the CCRI must now inform a strong and locally driven agenda for action for all children and communities. The index provides a unique multi-hazard and multisectoral model that can drive evidence-based and localized action that reflects the lived realities of children and communities in the country's most remote and vulnerable locations, transcends siloed and sectoral mandates and enhances coherence between policies and strategies at different levels. Such coherence is essential for addressing the interconnected nature of crises that converge to slowly erode hard-won development gains and amplify inequalities. Complemented by an interactive dashboard, the CCRI can further stimulate and facilitate stakeholder and sectoral engagement at the local level and improve collaboration, coordination and collective programmatic and advocacy efforts.

Overall recommendations

1. Scale up cost-effective targeted interventions

There are cost-effective, efficient and immediately available solutions to reduce the vulnerability of children and communities to climate, environmental and disaster risks and other shocks. As a matter of priority, the Government and development partners must prioritize the scale-up of children's equitable access to essential and life-saving services, including health and nutrition, WASH, protection, education and social protection, in the communes and provinces where children are most vulnerable to climate and environmental shocks, stresses and hazards.

2. Increase cross-sectoral coordination

The CCRI must guide cross-sectoral planning, targeting, programming and budgeting efforts on climate, environmental and other natural and human shocks and disasters. The index should also foster greater linkages, synergies and coordination between climate and DRR stakeholders and the social sectors that cater to the well-being and development needs of children and families at the national and subnational levels and between subnational authorities.

3. Adopt a community-led and child-focused approach

Local governments must be given the support and authority required to lead in child-sensitive climate change adaptation and environmental degradation and disaster risk reduction at the subnational level, prioritizing the strengthening of the shock resilience of services that children depend upon the most. They must ensure the inclusion, participation and representation of children in all their diversity, including age, gender, ethnicity and disability, in subnational planning and budgeting processes.

4. Ensure the meaningful inclusion and participation of children and young people

Children and young people must be engaged and their voices heard in decision-making across all levels of government. They should also be provided with capacity-building and opportunities to develop and lead climate actions. This is essential to ensure that solutions are informed by their experiences and developed with them and for them. The meaningful participation of children and young people is a necessity if Cambodia truly wants to make climate, environmental and disaster efforts work for children.

Voices of young people

“I feel my voice is being heard. I feel empowered to work together across provinces.

It’s also a good opportunity for me to network with other young people from other provinces.”

Hong Pidor, Phnom Penh

Because they are disproportionately exposed to and affected by climate and environmental shocks, children and young people must be part of the solutions. In a youth workshop organized by UNICEF to discuss the CCRI findings, young people aged 15-24 years across the country’s 25 provinces identified clear solutions that they want to be part of and set out action-oriented recommendations aimed at the Government.

Young people want to act, including through:

1. Awareness raising and education:

- Create campaigns to promote child awareness on personal hygiene, clean water and quality education, using technology.
- Develop easy-to-understand knowledge materials about climate change adaptation and personal hygiene.

2. Environmental actions:

- Participate in tree planting campaigns.
- Reduce plastic bag consumption and promote proper waste management.
- Advocate for recycling and the reduction of chemical use in agriculture.
- Promote the use of public transport and low-emission vehicles.

3. Community engagement:

- Establish youth networks to promote environmental protection and community services.
- Educate small children about climate risks and environmental cleanliness.
- Engage in forest conservation activities and advocate against deforestation and open burning.
- Support community livelihoods and education through local initiatives.



4. Health and safety initiatives:

- Educate communities about vector-borne diseases and prevention measures.
- Provide first aid training and develop evacuation plans for children and young people.
- Raise awareness about child nutrition and hygiene practices.

“I will disseminate the information I learned today [during the workshop] on the climate and environmental risks children are facing to my community. I will mainstream some of the solutions found today in my province into the plastic campaign we are doing right now in my province. I will share what I learned today on the risks children are facing in my classroom.”

Lim Sokcheng, Tbong Khmum province

Young people also want the Government and relevant line ministries to act through:

1. Community support and livelihoods:

- Support communities' livelihoods, increase job opportunities and provide vocational training.
- Provide shelter and other types of support for climate-affected communities, especially those in rural and remote areas.

2. Policy and legal frameworks:

- Strengthen policy and legal frameworks, including environmental laws on forest conservation and plastic and waste management.
- Ensure the enforcement of regulations to mitigate climate and environmental risks.

3. Public awareness and education:

- Raise public understanding and awareness on climate and environmental risks and impacts.
- Share information through early warning systems, multimedia platforms, public forums and training programmes.

4. Children's health, education and protection:

- Ensure that children's health, safety, well-being and development considerations in the context of climate and environmental shocks are understood and acted upon.
- Promote child health, including mental health, education and child protection.
- Set up child protection committees, build more schools in rural areas, strengthen quality education and include specific training on climate change adaptation in the school curriculum.

5. Climate-resilient infrastructure:

- Build and strengthen climate-resilient water management systems, including reservoirs and drainage systems to divert floods.
- Ensure that all households in rural areas and along the river have access to a clean water supply.

6. Youth engagement and empowerment:

- Involve and provide tools to young people for greater engagement and action.
- Set up forums to foster exchanges between local authorities and young people, increasing communication channels and opportunities for youth participation.

Detailed recommendations

For the Royal Government of Cambodia at the national level:

- **Share the CCRI findings with development partners**, including donors, United Nations agencies and national and international non-governmental organizations, to stimulate a dialogue on a cross-sectoral and child-sensitive response to multi-shocks, hazards and stresses.
- **Ensure the wide dissemination of and access to the data** by making it open source and accessible through an online dashboard.
- **Use the CCRI as a basis for future, regular monitoring and assessment** of the risks to and vulnerabilities of children and how such risks and vulnerabilities are changing and are addressed over time and inform the evidence-based geographic targeting of climate action and DRR efforts.
- **Provide resources for the delivery and effective implementation of child-centred strategies**, policies and legislation and address gaps in existing laws that compound protection risks for children, including child labour and child marriage.
- **Raise awareness and understanding among social sector actors** of their role in supporting and integrating child-specific climate change, environmental and disaster risks into their policies, programmes and budgets.
- **Produce materials and provide training to improve key subnational actors' understanding of the child-specific risks relating to climate and environmental shocks and disasters** and of the value of child-centred climate, environmental and disaster policies and programmes. The government should also support local stakeholders in targeting, identifying priorities and developing plans based on risks in their context/localities.
- **Increase the communication of multi-hazard early warning and forecast information** at the commune level.
- **Develop and implement a public awareness raising and education strategy** on the impacts of climate shocks and disasters and adaptation activities targeted at specific stakeholder groups, such as the private sector, media institutions and communities.
- **Invest in strengthening and providing resources for shock-resilient essential systems**, including such key and essential services for children as health care, child protection, WASH and social protection.
- **Implement and monitor the delivery of the child-sensitive sectoral commitments of the NDC** across the health, nutrition, education, child protection, social protection and WASH sectors.
- **Ensure that the country's next climate change strategic plan is child-sensitive and incorporates an intersectional approach**, including by involving children and young people in all their diversity and all sectors in the development of the plan, using the findings and tools of the CCRI to inform the plan's content, integrating a child-specific objective with measurable indicators of progress, adopting a cross-sectoral approach and increasing synergies at the subnational level.
- **Review existing gaps in legislation, national standards and regulations** relating to climate and the environment to improve and strengthen them.
- **Increase annual funding to disaster management committees in the provinces, districts and communes**, including child-sensitive climate financing, with clear budget indicators at the national and subnational levels and resourcing mechanisms for the increased participation of children and young people in decision-making at all levels.

For the Royal Government of Cambodia at the sub-national level:

- **Increase the integration of prevention and the reduction of environmental and climate risks into existing essential services and systems** (e.g. health and nutrition, education, child protection, WASH and social protection), including through community settings and structures, such as health-care workers and health facilities as well as informal and formal decision-making forums, which provide entry points for promoting awareness, disseminating messages and stimulating actions.
- **Strengthen coordination between the DRR, climate and environmental and social sectors** through subnational committees for disaster management and the formulation of local development plans.
- **Strengthen data and mechanisms** to monitor the resilience of essential services and their contribution to strengthening community resilience.
- **Organize local consultations with children and young people** to discuss how to disseminate and promote the CCRI findings among their peers and communities.

For development partners and donors:

- **Substantially increase child- and gender-sensitive climate funding** that focuses specifically on strengthening and supporting the scale-up of critical services for children, including health care and social protection, and the participation of children and young people, including girls and children with disabilities, at all levels in Cambodia, with a focus on reaching the most vulnerable children, who have the highest risk of exposure to overlapping shocks but are the least able to cope with them.
- **Support the leadership and participation of women and children at the local level** in decision-making and planning through flexible and accessible funding, connecting their lived realities to planning and policy.
- **Provide subnational authorities with capacity-strengthening** for systemic and gender- and child-sensitive multi-shock risk assessments, the use of geospatial information technologies and the collection and use of data, disaggregated by sex, age, ethnicity, income and disability, on the differential impacts of shocks and disasters on communities.
- **Support the authorities in the provision of irrigation systems**, water resource management tools and information on climate-resilient crops.



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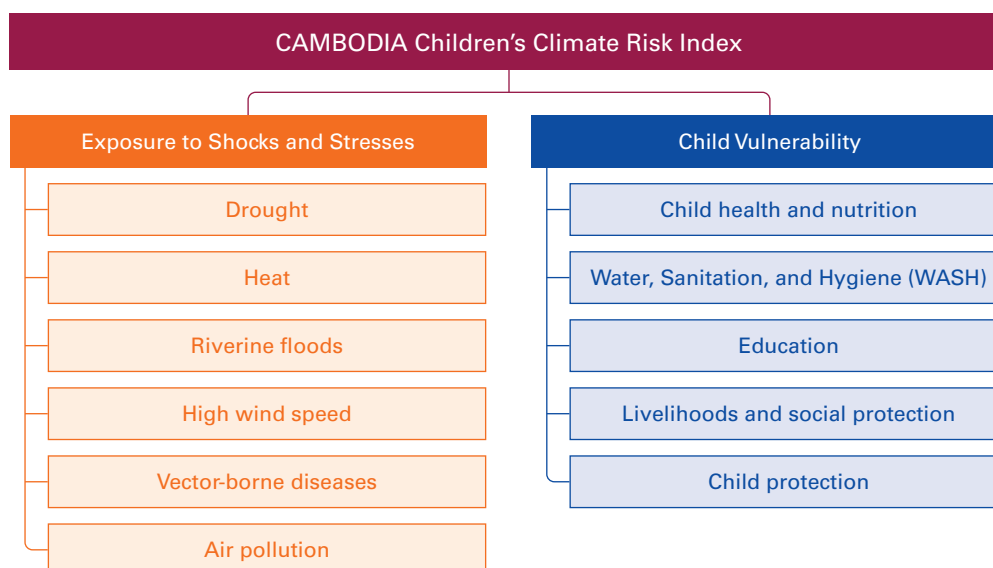
Annex I. Methodology

The Children’s Climate Risk Index for Cambodia (CCRI-Cambodia) subnational risk-assessment model builds on the risk concept adopted by the UNICEF Guidance for Risk-Informed Programming and on the methodology of the Index for Risk Management (INFORM),¹⁰⁹ developed by the global INFORM initiative. The CCRI uses the framework of the UNICEF global Children’s Climate Risk Index as a starting point and incorporates risk factors identified by national stakeholders during a workshop held in April 2023. The model consists of two pillars:

- **Pillar 1:** Exposure to climate and environmental hazards, shocks and stresses
- **Pillar 2:** Child vulnerability

The final CCRI is a geometric average¹¹⁰ of pillar 1 (shock exposure) and pillar 2 (child vulnerability).

Figure 1. CCRI-Cambodia framework: Pillars and components



Methodology and calculations used to construct the CCRI-Cambodia

All of the indicators are converted into indices on a scale of 0 (better) to 10 (worse), using predefined minimum and maximum values for the normalization of each index to allow comparison over time, with rounding of the normalized indicators to the first decimal. All subcomponents and indicators within components are weighted equally, applying an arithmetic or geometric average.¹¹¹ An arithmetic average is applied at the lower levels of pillar 2. A geometric average is applied for the aggregation of absolute (estimate) and relative (percentage) numbers of exposed children towards the exposure indicators of pillar 1, where the geometric average will reward the indicator with a higher score (worse situation).¹¹² All components within pillars 1 and 2 are weighted equally, applying a geometric average¹¹³ in pillar 1 and an arithmetic average in pillar 2. The final CCRI score is the geometric average of the scores in pillar 1 and pillar 2.

¹⁰⁹ Marin-Ferrer, M., et al., *Index for Risk Management – INFORM: Concept and Methodology, Version 2017*, Science for Policy Report, European Commission, Luxembourg, 2017.

¹¹⁰ In the case of a geometric average of two indices, an area has to present a high score in only one of the two indices to present a higher score in the composite index. The geometric average is always smaller than or equal to the arithmetic average. In order to reward those areas with high scores, an inversion is applied in the calculation procedure of the geometric average. For more details on the procedure, refer to chapter 6 of *INFORM, Version 2017*.

¹¹¹ As explained in chapter 6 of *INFORM, Version 2017*, "...aggregation is a tool to compensate a deficit in one dimension by surplus in another. With arithmetic average compensation is constant while with geometric average compensation is lower and rewards more the indicators with higher scores".

¹¹² In the case of an arithmetic average of two indices, a country has to present a high score in both indices to present a higher score in the composite index. In the case of a geometric average of two indices, a country has to present a high score in only one of the two indices to present a higher score in the composite index.

¹¹³ To reward the communes with high scores, an inversion is applied in the calculation procedure of the geometric average.

Calculations¹¹⁴

Step 1: Data collection and imputation of missing values

In the case of Cambodia, there are only three indicators with missing data: 180 communes are missing data on the indicators for the WASH in school subcomponent, including on drinking water in schools, sanitation in schools and hygiene in schools. No complementing indicators are used for the WASH in school subcomponent. The WASH in school subcomponent is not counted towards the aggregation to the WASH component for these 180 communes. As all communes have data values on the other WASH indicators, all communes have a score on the WASH component. In particular, logarithmic transformations are applied to indicators on the number of children exposed to reduce the skewness of the data.

Step 2: Transformation of data values to a non-dimensional scale

Data values are transformed to a non-dimensional scale (e.g. percentages, rates, values per capita, density or logarithmic transformation) when it can be justified to change absolute differences between communes in order to improve the interpretation of differences between them. Indicators used in pillar 2 are already expressed as percentages or rates, so no transformations are needed. In pillar 1, a logarithmic transformation is applied to the number of children exposed to each shock to reduce the skewness of the data.

Step 3: Raw indicator data scaled to scores that range from 0 to 10

The raw indicator data are scaled on a range of 0 (better) to 10 (worse). Minimum and maximum values are predefined for each indicator. In this way, it is ensured that the normalization of each indicator is consistent over time. It also avoids the distortion by outliers of the scaling of the raw indicator data. Furthermore, it allows the definition of acceptable minimum and maximum values for specific topics (e.g. a critical level of stunting could be defined for the normalization of the indicator). Different approaches can be used to establish the minimum and maximum values and exclude outliers, including expert opinions, visual inspection of the data values, analysis of the interquartile range and analysis of the skewness and kurtosis.¹¹⁵

All index scores are presented with the understanding that a higher value corresponds to a worse situation. Therefore, an inversion is applied if a higher indicator data value would contribute to a lower CCRI score (e.g. in the case of preschool enrolment and the three immunization indicators used in the Cambodia model, a higher data value presents a clearer situation and an inversion is applied).

Step 4: Subcomponent, component, pillar and final index scores (aggregation) computed

- Subcomponent and component scores are calculated by taking the arithmetic or geometric mean¹¹⁶ of constituent indicators for each (sub)component.
- In the same way, pillar scores are computed by taking the arithmetic or geometric mean¹¹⁷ of constituent components.
- The final CCRI score is the geometric average¹¹⁸ of the pillar 1 (shock exposure) score (0-10) and the pillar 2 (child vulnerability) score (0-10).

Step 5: Classification of the CCRI score and pillars

Fixed thresholds are established for the grouping of the communes into five categories (very high, high, medium, low, very low) within each of the two pillars and in the final CCRI-Cambodia score to facilitate the interpretation of the results of the overall CCRI index and of the two pillars. Each of the components under each pillar was also grouped into those five categories to facilitate component-specific analysis.

¹¹⁴ The calculation steps and their descriptions in this section have been based on the methodology of the global INFORM model. See chapter 6 of *INFORM, Version 2017*, for more detailed explanations.

¹¹⁵ A data set with both skewness above 2 and kurtosis above 3.5 is considered anomalous.

¹¹⁶ The geometric average is always smaller than or equal to the arithmetic average. In order to reward the communes with high scores, an inversion is applied in the calculation procedure of the geometric average. See chapter 6 of the *INFORM, Version 2017*, for more detailed explanations.

¹¹⁷ The geometric average is always smaller than or equal to the arithmetic average. In order to reward the communes with high scores, an inversion is applied in the calculation procedure of the geometric average. See chapter 6 of *INFORM, Version 2017*, for more detailed explanations.

¹¹⁸ To reward the communes with high scores, an inversion is applied in the calculation procedure of the geometric average.

Interpretation of the results

The composite CCRI index and all indices are scored between 0 and 10, where a low score represents a better situation and a high score a worse situation. All indices are a relative comparison between communes included in the CCRI, meaning that the performance of a commune on the different indices is better or worse in comparison with all other communes included in the index.

The CCRI model is a simplification of a complex reality and contributes to an understanding of a multidimensional problem. It provides the big picture. The final index should be used in combination with the underlying components and indicators and complemented by other relevant information. The visualization of the model in the interactive geospatial platform (GeoSight) supports this complementary analysis.

Pillar 1: Components and indicators

Pillar 1 of the CCRI-Cambodia reflects the likelihood that the child population across Cambodia's communes is exposed to climate and environmental shocks and disasters. It includes six components aggregated with a geometric average (table 1 and figure III).

The construction of each shock exposure component involved several steps:

- The number of children under the age of 18 years exposed to the shock was estimated with the use of geospatial analysis techniques, where a hazard map was combined with a commune-level child population (under 18 years) data set derived from the 2019 census to estimate the number of children living in the hazard areas.
- The proportion of children under 18 years of age exposed to the shock was calculated.
- Indices of the estimates and the proportion of children under the age of 18 years exposed to the shock were created.
- To establish the shock exposure component, a geometric average of these absolute and relative indices of children exposed to the shock was calculated (box 1).

Box 1. Absolute versus relative population exposure

Pillar 1 considers both the estimates and the proportion of the child population exposed to the individual hazards, shocks or stresses, in line with the approach of the INFORM global risk model. The INFORM methodology report explains that "there are two ways to consider population exposed to natural shocks. The absolute value of people exposed will favour more populated countries while the value of population exposed relative to the total population will reverse the problem and favour less populated shock-prone communes. To enable a proper comparison between communes, in INFORM the subcomponent indicator is calculated both ways and then aggregated using a geometric average. At the level of the core indicators (i.e. the absolute and relative values of people exposed to specific shocks), the datasets are rescaled into a range of 0 to 10 in combination with a min-max normalization. Since distribution of the absolute value of exposed people is extremely skewed, the log transformation is applied."

Marin-Ferrer, M., et al., *INFORM – Index for Risk Management: Concept and methodology, Version 2017*, Science for Policy Report, European Commission, Luxembourg, 2017.

Figure 2. Example of the construction of component for child exposure to riverine floods under pillar 1

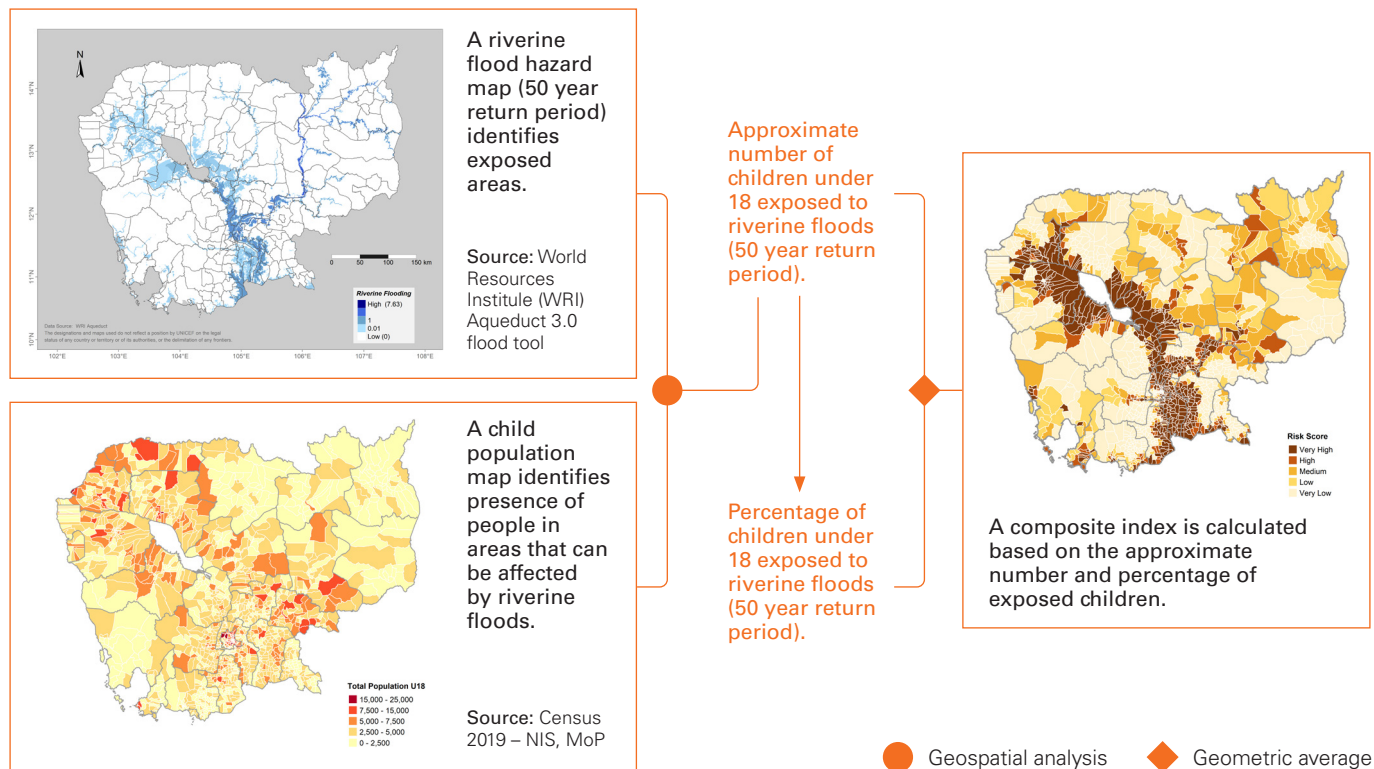
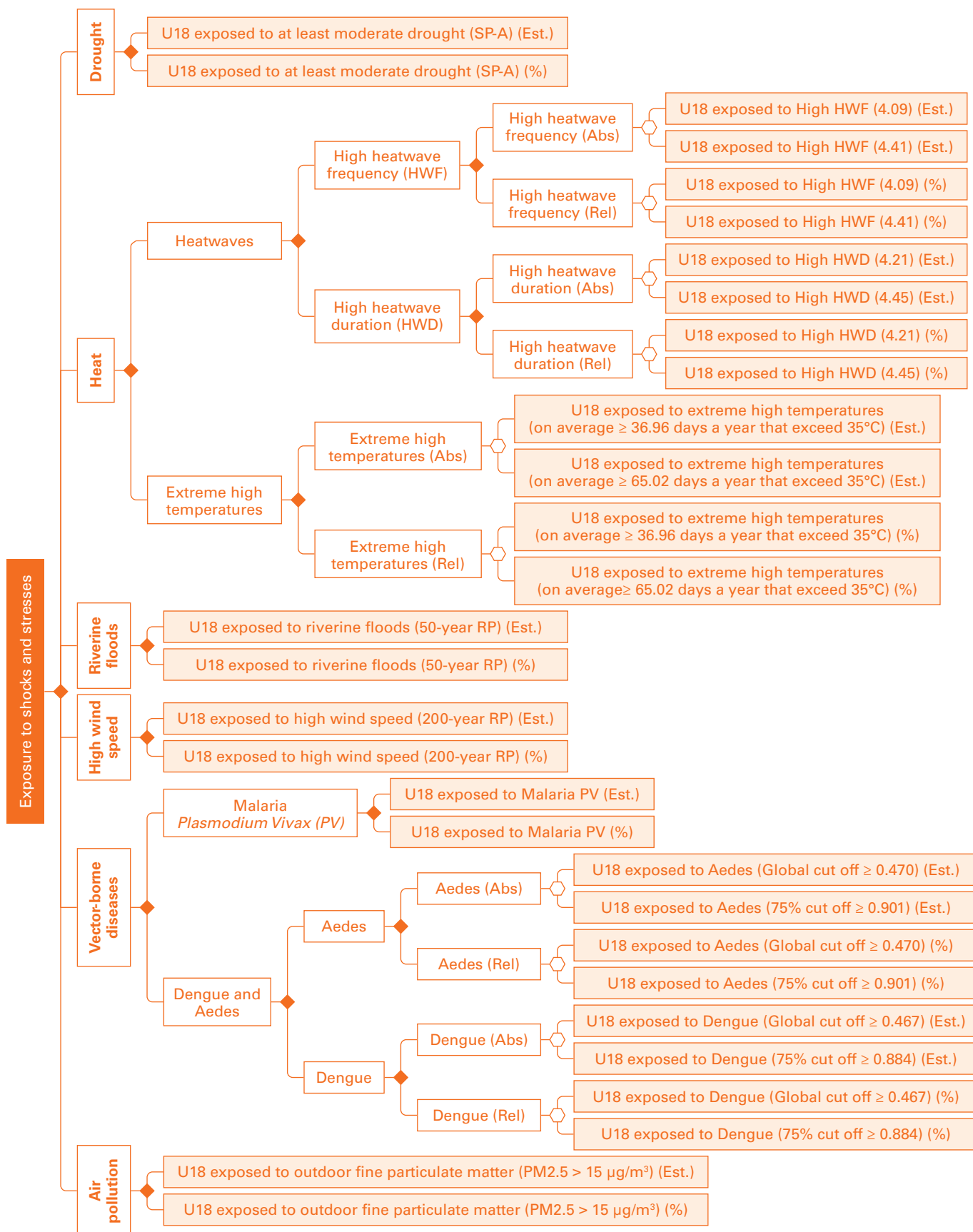


Figure 3. Pillar 1 – Child exposure: Components and indicators



○ Arithmetic average ◆ Geometric average U18 = Children under 18 years Est. = Estimates

Table 1. Pillar 1 data set

Component	Hazard data set	Description of component calculation (estimation)	Data source
Drought (Map 3)	At least moderate drought (Standardized Precipitation Index (SPI) -annual) (Map 15)	To estimate the approximate number of children under 18 years of age exposed to at least moderate drought, a global map of the annual frequency of at least moderate drought conditions for 10 years (2013–2022) was combined with a commune-level child population (under 18 years) data set derived from the 2019 census. At least moderate drought conditions are measured by the annual values of the 10 year-time series of SPI (2013–2022), where $SPI \leq -1.0$ is classified as at least moderate drought conditions. Areas with at least moderate drought conditions in at least 3 out of 10 years between 2013 and 2022 were included in the analysis of child exposure to drought conditions. This frequency includes all values greater than or equal to the 75 th percentile point of the values in the at least moderate drought map of Cambodia.	UNICEF calculations based on the 12-month SPI derived from Climate Hazard Group InfraRed Precipitation with Station data (CHIRPS)
Heat (Map 5)	Heatwave frequency (Map 16)	<p>To estimate the approximate number of children under 18 years of age exposed to high heatwave frequency, a map of mean annual heatwave frequency between 2000 and 2020 was combined with a commune-level child population (under 18 years) data set derived from the 2019 census.</p> <p>A heatwave event is defined as any period of three days or more when the maximum temperature each day is in the top 10% of the local 15-day average.</p> <ul style="list-style-type: none"> • Areas with, on average, 4.09 or more heatwaves per year between 2000 and 2020 were included in the analysis. The heatwave frequency of 4.09 includes all values greater than or equal to the 25th percentile point of the values in the heatwave frequency map of Cambodia. • Areas with, on average, 4.41 or more heatwaves per year between 2000 and 2020 were included in the analysis. The heatwave frequency of 4.41 includes all values greater than or equal to the 75th percentile point of the values in the heatwave frequency map of Cambodia. 	Heatwave frequency metric: Data for Children Collaborative, using the Berkeley Earth Surface Temperatures (BEST) data set
	Heatwave duration (Map 17)	<p>To estimate the approximate number of children under 18 years of age exposed to high heatwave duration, a map of the average length of heatwave events between 2000 and 2020 was combined with a commune-level child population (under 18 years) data set derived from the 2019 census.</p> <ul style="list-style-type: none"> • Areas where the average heatwave event lasted 4.21 days or longer between 2000 and 2020 were included in the analysis. The duration of 4.21 days includes all values greater than or equal to the 25th percentile point of the values in the heatwave duration map of Cambodia. A heatwave event is defined as any period of three days or more when the maximum temperature each day is in the top 10% of the local 15-day average. • Areas where the average heatwave event lasted 4.45 days or longer between 2000 and 2020 were included in the analysis. The duration of 4.45 days includes all values greater than or equal to the 25th percentile point of the values in the heatwave duration map of Cambodia. A heatwave event is defined as any period of three days or more when the maximum temperature each day is in the top 10% of the local 15-day average. 	Heatwave frequency metric: Data for Children Collaborative using the Berkeley Earth Surface Temperature (BEST) dataset
	Extreme high temperatures (Map 18)	<p>To estimate the approximate number of children under 18 years of age exposed to extreme high temperatures, a map of the average number of days per year in which the temperature exceeded 35°C between 2000 and 2020 was combined with a commune-level child population (under 18 years) data set derived from the 2019 census.</p> <ul style="list-style-type: none"> • Areas where, on average, 36.96 or more days a year exceeded 35°C between 2000 and 2020 were included in the analysis. The yearly average of 36.96 or more days includes all values greater than or equal to the 25th percentile point of the values in the heatwave severity map of Cambodia. • Areas where, on average, 65.02 or more days a year exceeded 35°C between 2000 and 2020 were included in the analysis. The yearly average of 65.02 or more days includes all values greater than or equal to the 75th percentile point of the values in the heatwave severity map of Cambodia. 	Extreme high temperatures metric: Data for Children Collaborative using the Berkeley Earth Surface Temperature (BEST) dataset

Table 1: (Continued)

Component	Hazard data set	Description of component calculation (estimation)	Data source
Riverine floods (Map 4)	Riverine flooding potential (50-year return period) (Map 19)	<p>To estimate the approximate number of children under 18 years of age exposed to riverine floods, a flood hazard map (50-year return period) was combined with a commune-level child population (under 18 years) data set derived from the 2019 census.</p> <p>The global riverine flood hazard map represents flooding from river overflow and occurs in river basins with an area of at least 10,000 km². It shows the inundated area and inundation height that is expected to be exceeded at least once in the 50-year return period. The spatial extent of the inundated area, including any inundation level (≥ 0.01 metre), was used to identify the population exposed.</p>	World Resources Institute, Aqueduct baseline floods hazard map (version 2, 2020)
High wind speed (Map 6)	Wind speed hazard (200-year return period) (Map 20)	<p>To estimate the approximate number of children under 18 years of age exposed to high wind speed, a wind speed hazard map (200-year return period) was combined with a commune-level child population (under 18 years) data set derived from the 2019 census.</p> <p>Areas with a wind speed of 91.8 km/hr or above were included in the analysis. A wind speed of 91.8 km/hr or above includes all values greater than or equal to the 75th percentile point of the values in the 200-year return period wind speed hazard map of Cambodia.</p>	STORM Tropical Wind Speed dataset of 4TU. Centre for Research Data
Vector-borne diseases (Map 7)	Malaria (Plasmodium vivax) (PV) mean annual incidence rate (Map 21)	<p>To estimate the approximate number of children under the age of 18 years at risk of Plasmodium vivax malaria, an incidence map of the average annual estimates of newly diagnosed P. vivax cases for five years (2016–2020) was combined with a commune-level child population (under 18 years) data set derived from the 2019 census.</p> <p>Areas with, on average, one newly diagnosed PV case or more per 100,000 people per year between 2016 and 2020 were included in the analysis. The average annual estimate of one case or more per 100,000 people includes all values greater than or equal to the 50th percentile point of the values in the PV incidence map of Cambodia.</p>	Malaria Atlas Project, version 202206
	Aedes aegypti mosquito transmission potential (Map 22)	<p>To estimate the approximate number of children under 18 years of age potentially exposed to the Aedes aegypti mosquito, a map of the predicted distribution of the Aedes aegypti mosquito was combined with a commune-level child population (under 18 years) data set derived from the 2019 census.</p> <ul style="list-style-type: none"> Any area with a predicted Aedes aegypti mosquito suitability value of 0.47 or above was considered at risk for Aedes aegypti mosquito exposure. This is the same suitability value as the value used in the global CCRI and INFORM models. Any area with a predicted Aedes aegypti mosquito suitability value of 0.901 or above was considered at risk for Aedes aegypti mosquito exposure. This suitability value includes all values greater than or equal to the 75th percentile point of the values in the mosquito suitability map of Cambodia. 	Kraemer <i>et al.</i> (2015) The global distribution of the arbovirus vectors Aedes aegypti and Ae. Albopictus. Citation: eLife 2015;4: e08347 DOI: 10.7554/eLife.08347 (Data shared by authors through the INFORM Global Initiative) (https://pubmed.ncbi.nlm.nih.gov/26126267/)
	Dengue transmission potential (Map 23)	<p>To estimate the approximate number of children under 18 years of age potentially exposed to dengue, a map of environmental suitability for dengue was combined with a commune-level child population (under 18 years) data set derived from the 2019 census.</p> <ul style="list-style-type: none"> Any area with a predicted dengue suitability value of 0.467 or above was considered suitable for dengue. This is the same suitability value as the value used in the global CCRI and INFORM models. Any area with a predicted dengue suitability value of 0.884 or above was considered suitable for dengue. This suitability value includes all values greater than or equal to the 75th percentile point of the values in the environmental suitability map of Cambodia. 	Messina, J.P., Brady, O.J., Golding, N. <i>et al.</i> The current and future global distribution and population at risk of dengue. Nat Microbiol 4, 1508–1515 (2019). https://doi.org/10.1038/s41564-019-0476-8 (Data shared by authors through the INFORM Global Initiative) (https://www.nature.com/articles/s41564-019-0476-8)

Table 1: (Continued)

Component	Hazard data set	Description of component calculation (estimation)	Data source
Air pollution (Map 8)	Exposure to ambient fine particulate matter (PM2.5) (Map 24)	To estimate the approximate number of children living in areas where ambient air pollution exceeds the WHO IT-3 for outdoor fine particulate matter exposure (PM2.5) of 15 µg/m ³ , a map of average annual mean ground-level fine particulate matter concentrations (PM2.5) was combined with a commune-level child population (under 18 years) data set. The map of the ground-level fine particulate matter concentrations (PM2.5) average annual mean for the PM2.5 indicator was developed by applying an inverse distance weighted technique to the average annual mean PM2.5 concentrations recorded by air quality monitoring stations between 2020 and 2022.	Air quality monitoring station data of the Ministry of Environment (Department of Air Quality and Noise Management)
Child population	Child population	Child population under 18 years of age	2019 census, NIS/ Ministry of Planning
Urban/rural	Urban/rural	Urban/rural designation by NIS/Ministry of Planning	2019 census, NIS/ Ministry of Planning

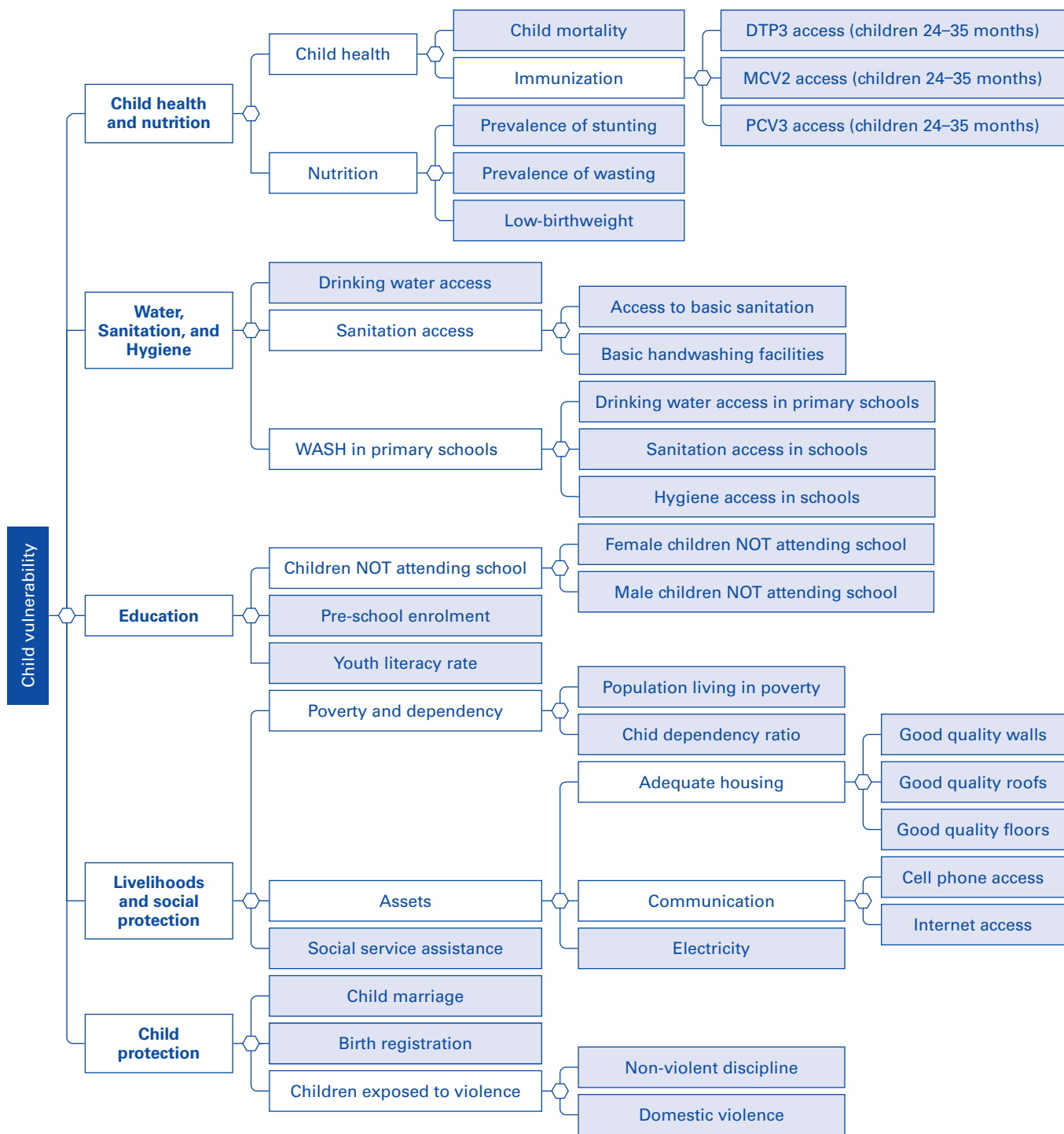
Pillar 2: Components and indicators

Pillar 2 of the CCRI captures the underlying factors that render exposed children and young people and their families and communities susceptible to the adverse effects of multiple hazards, shocks and stresses (e.g. health, nutrition, education, social protection, child protection and WASH). This pillar considers both susceptibility to these shocks and stresses and the ability to respond to their effects, including the capacities of services, systems and resources to help to alleviate their impact. The pillar is constructed of five components that measure different aspects of child vulnerability and the capacity and readiness of communities and systems to deliver services that are essential for the well-being of children.



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Figure 4. Pillar 2 – Child vulnerability: Components and indicators



⬡ Arithmetic average

Table 2: Pillar 2 data set

Component	Subcomponent	Indicator	Data source
Child health and nutrition	Child health	Under-5 mortality rate (per 1,000 live births)	2019 census, NIS/ Ministry of Planning
		DTP3 access (children 24–35 months)	CDHS 2021–2022, NIS/ Ministry of Planning
		MCV2 access (children 24–35 months)	
		PCV3 access (children 24–35 months)	
	Nutrition	Prevalence of stunting, height for age (% of children under 5 years)	
		Prevalence of wasting (% of children under 5 years)	
Low birthweight babies (% of births)			
WASH	At least basic drinking water access	Proportion of population using drinking water from an improved source, provided collection time is not more than 30 minutes for a round trip, including queuing	2019 census, NIS/ Ministry of Planning
	At least basic sanitation access	Proportion of population with basic sanitation: improved facilities that are not shared with other households	
	Basic hand-washing facilities	Proportion of population with handwashing facilities with soap and water available at home (% of population)	CDHS 2021–2022, NIS/ Ministry of Planning
	WASH in primary schools	Proportion of primary schools with improved water available on premises	EMIS 2022–2023
		Proportion of primary schools with single-sex usable, improved toilets	
		Proportion of primary schools with handwashing facilities after using toilet	
Education	Children not attending school	Proportion of male/female children over school age (≥ 6 years and <18 years old) NOT attending school	2019 census, NIS/ Ministry of Planning
	Youth literacy rate	Youth literacy rate, population 15–24 years, both sexes (%)	2019 census, NIS/ Ministry of Planning
	Preschool enrolment	Preschool net enrolment ratio: children = 5 years in preschool/ all children = 5 years	Commune database, National Committee for Subnational Democratic Development (NCDD)
Livelihoods and social protection	Poverty and dependency	Proportion of de jure population by wealth quintile, direct from census	2019 census, NIS/ Ministry of Planning
		Child dependency ratio	
	Assets	Buildings with good quality wall materials	2019 census, NIS/Ministry of Planning
		Buildings with good quality roof materials	
		Buildings with good quality floor materials	
		Proportion of households with cell phone	
		Proportion of households that can access the Internet	
	Distribution of households using electricity as the main source of light		
Social service assistance	% of families receiving social service assistance from commune	Commune database, NCDD	

Table 2: (Continued)

Component	Subcomponent	Indicator	Data source
Child protection	Child marriage	Proportion of women aged 20–24 years who were married or in a union before the age of 18 years (%)	CDHS 2021–2022, NIS/ Ministry of Planning
	Birth registration	Proportion of children under 5 years of age whose births have been registered with a civil authority	
	Children exposed to violence	Proportion of children who experience only non-violent discipline (%)	
		Proportion of women aged 15–49 years who have ever experienced physical violence since the age of 15 years (%)	

Classification of the CCRI score, pillars and components

Table 3: Class limits at the level of the CCRI and pillars

Children’s Climate Risk Index		
	Min	Max
Very high	7.3	10.0
High	6.4	7.2
Medium	5.6	6.3
Low	4.9	5.5
Very low	0.0	4.8

Pillar 1: Exposure to hazards, shocks and stresses		
	Min	Max
Very high	7.8	10.0
High	6.9	7.7
Medium	5.9	6.8
Low	4.8	5.8
Very low	0.0	4.7

Pillar 2: Child vulnerability		
	Min	Max
Very high	7.6	10.0
High	6.3	7.5
Medium	5.1	6.2
Low	3.8	5.0
Very low	0.0	3.7

Table 4: Class limits at the component level – pillar 1

Drought			High wind speed		
	Min	Max		Min	Max
Very high	9.2	10.0	Very high	9.4	10.0
High	7.1	9.1	High	7.0	9.3
Medium	4.1	7.0	Medium	4.3	6.9
Low	1.2	4.0	Low	1.5	4.2
Very low	0.0	1.1	Very low	0.0	1.4

Heat			Vector-borne disease		
	Min	Max		Min	Max
Very high	8.0	10.0	Very high	7.5	10.0
High	6.7	7.9	High	6.2	7.4
Medium	4.8	6.6	Medium	5.2	6.1
Low	2.2	4.7	Low	3.8	5.1
Very low	0.0	2.1	Very low	0.0	3.7

Riverine floods			Air pollution		
	Min	Max		Min	Max
Very high	8.6	10.0	Very high	9.0	10.0
High	6.3	8.5	High	7.2	8.9
Medium	4.1	6.2	Medium	4.2	7.1
Low	1.5	4.0	Low	1.5	4.1
Very low	0.0	1.4	Very low	0.0	1.4



Table 5: Class limits at the component level – pillar 2

Child health and nutrition		
	Min	Max
Very high	8.4	10.0
High	7.3	8.3
Medium	6.3	7.2
Low	4.9	6.2
Very low	0.0	4.8

WASH		
	Min	Max
Very high	7.1	10.0
High	5.4	7.0
Medium	3.9	5.3
Low	2.3	3.8
Very low	0.0	2.2

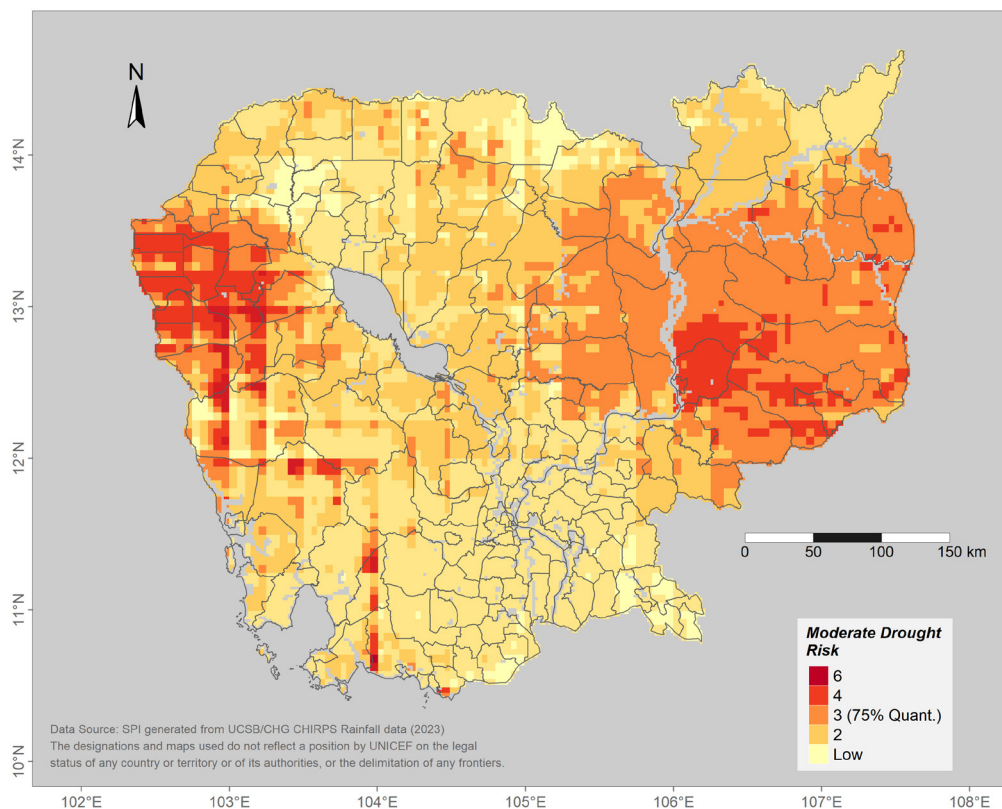
Education		
	Min	Max
Very high	8.2	10.0
High	6.0	8.1
Medium	4.1	5.9
Low	2.5	4.0
Very low	0.0	2.4

Livelihoods and social protection		
	Min	Max
Very high	7.8	10.0
High	6.2	7.7
Medium	4.7	6.1
Low	3.0	4.6
Very low	0.0	2.9

Child protection		
	Min	Max
Very high	7.8	10.0
High	6.4	7.7
Medium	5.3	6.3
Low	4.3	5.2
Very low	0.0	4.2

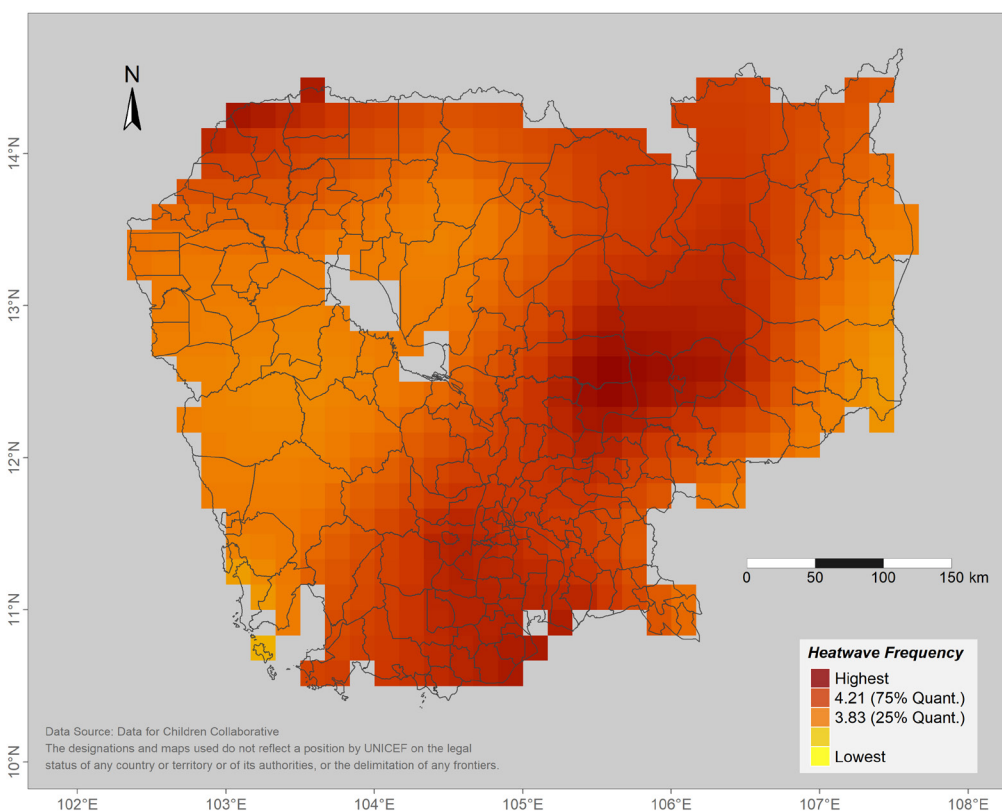
Annex II. Hazard maps: Pillar 1

Map 15. Annual Standardized Precipitation Index moderate drought frequency (2013-2022)



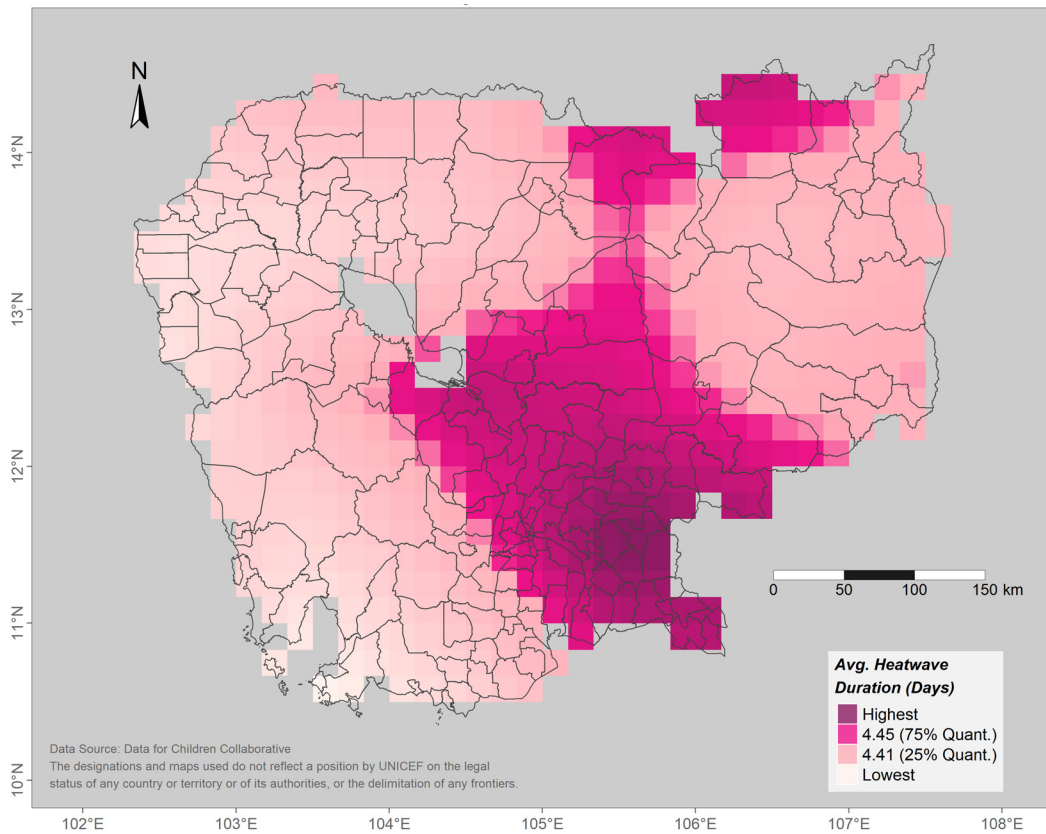
Source: UNICEF calculations based on the 12-month SPI derived from Climate Hazard Group InfraRed Precipitation with Station data (CHIRPS). See Table 1 for full details.

Map 16. Heatwave frequency (2000-2020)



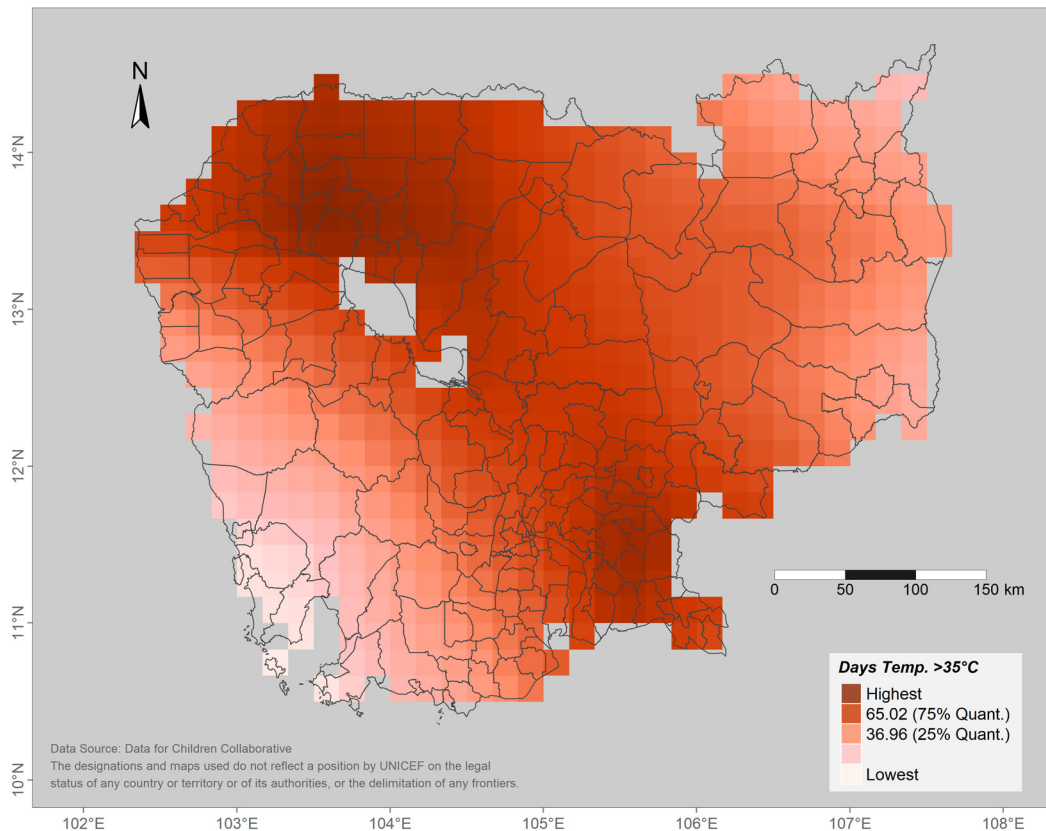
Source: Heatwave frequency metric: Data for Children Collaborative using the Berkley Earth Surface Temperature (BEST) dataset. See Table 1 for full details.

Map 17. Average heatwave duration (2000–2020)



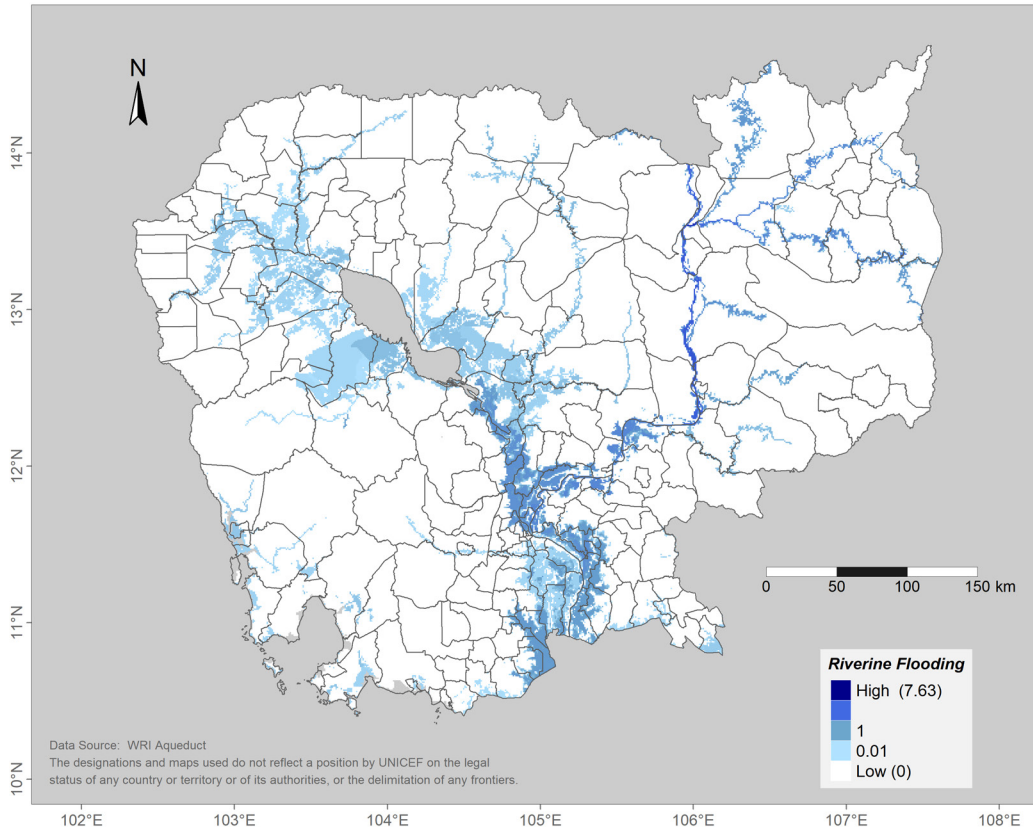
Source: Heatwave frequency metric: Data for Children Collaborative using the Berkley Earth Surface Temperature (BEST) dataset. See Table 1 for full details.

Map 18. Number of days with temperature >35°C (2000–2020)



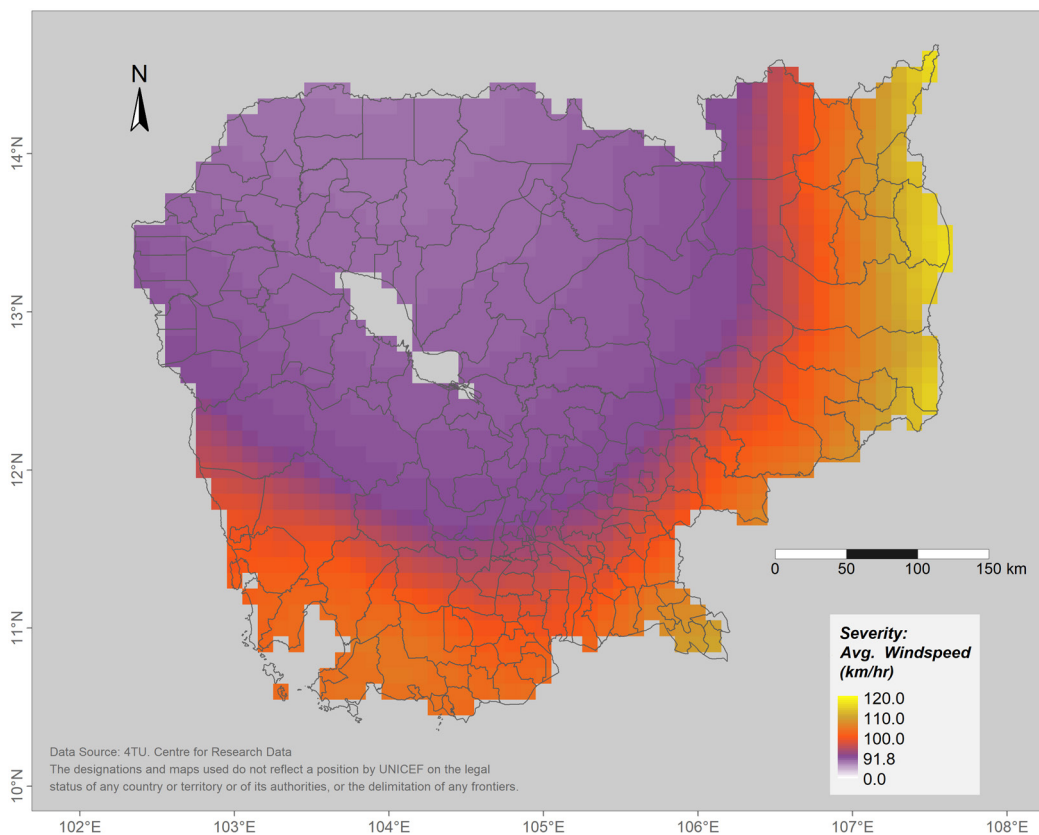
Source: Heatwave frequency metric: Data for Children Collaborative using the Berkley Earth Surface Temperature (BEST) dataset. See Table 1 for full details.

Map 19. Riverine flooding hazard (50-year return period)



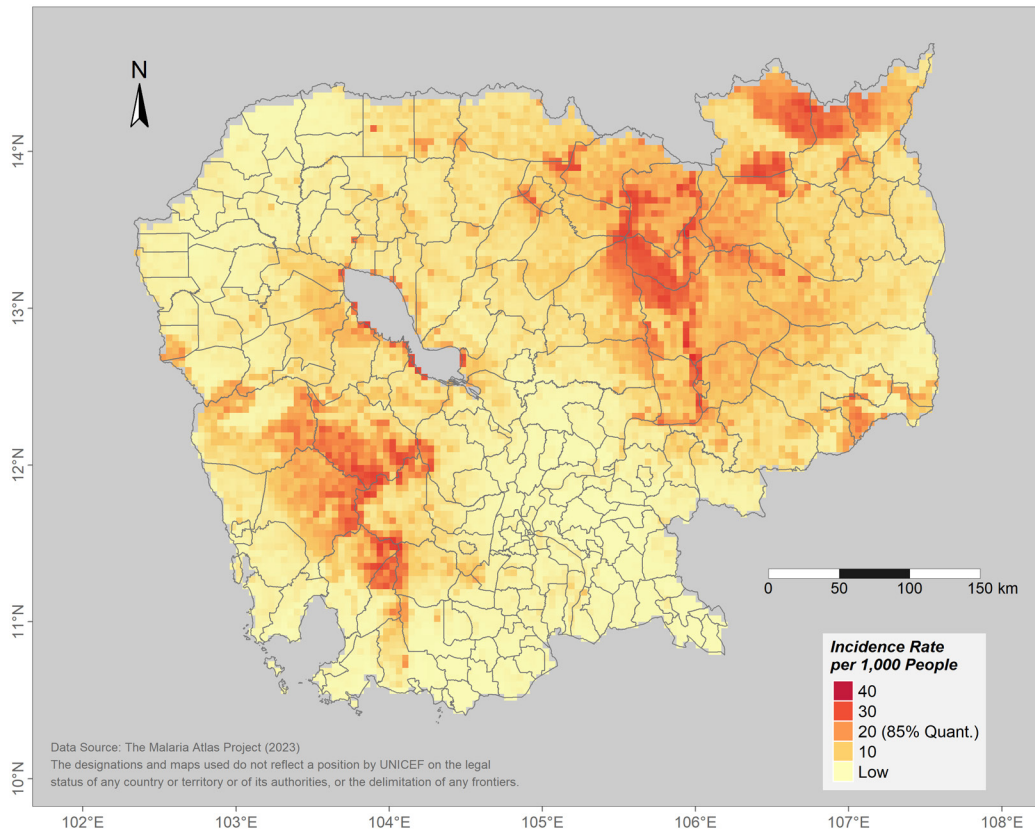
Source: World Resources Institute Aqueduct baseline floods hazard map (Version 2, 2020). See Table 1 for full details.

Map 20. Wind speed hazard (200-year return period)



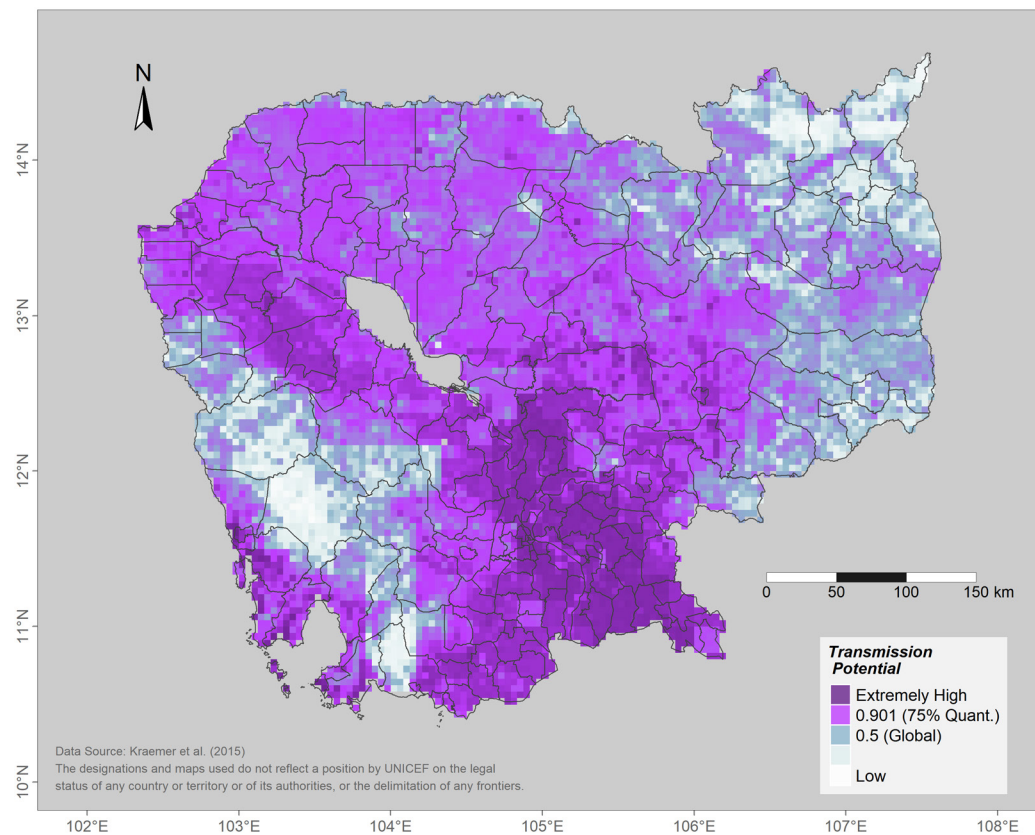
Source: STORM Tropical Wind Speed dataset of 4TU. Centre for Research Data. See Table 1 for full details.

Map 21. Malaria (*Plasmodium vivax*) mean annual incidence rate (2016–2020)



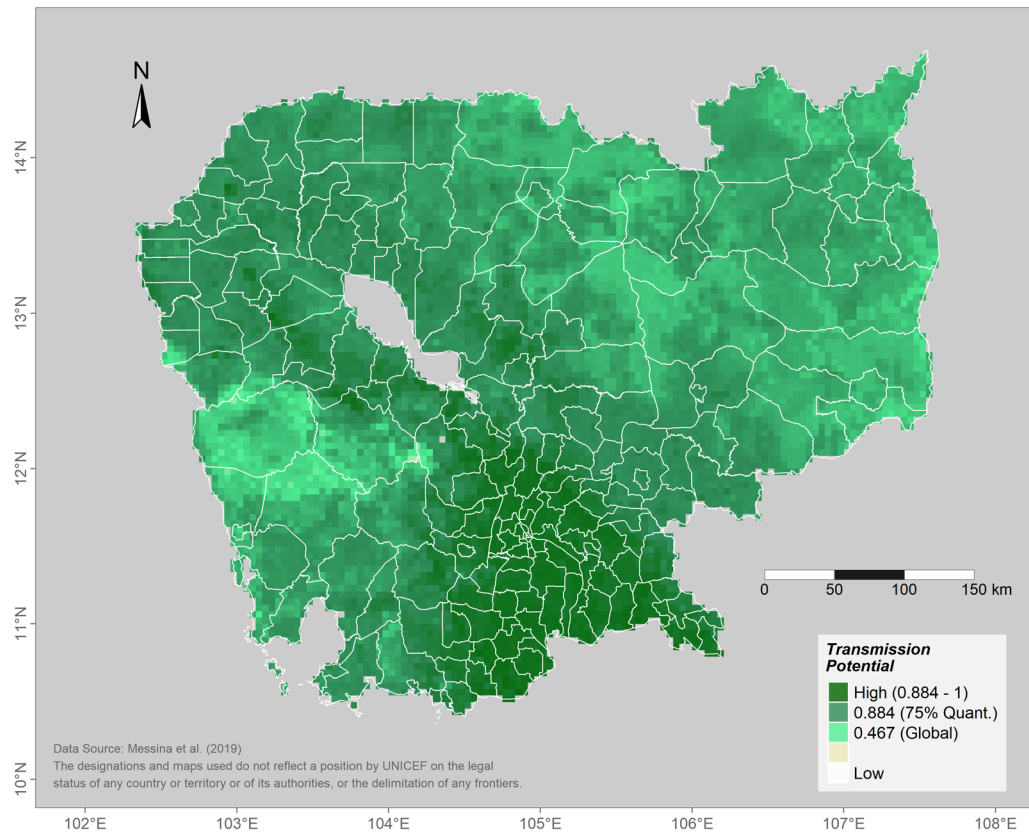
Source: Malaria Atlas Project, version 202206. See Table 1 for full details.

Map 22. Aedes transmission potential



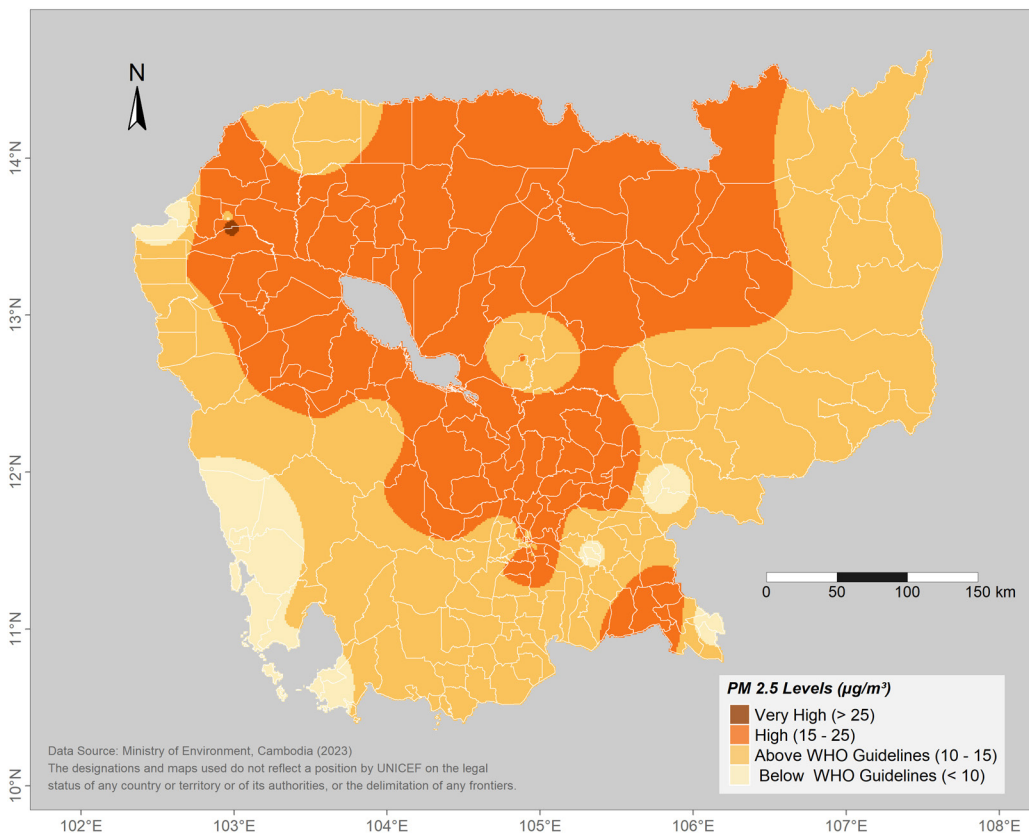
Source: Kraemer et al. (2015) The global distribution of the arbovirus vectors *Aedes aegypti* and *Ae. Albopictus*. Citation: eLife 2015;4:e08347 DOI: 10.7554/eLife.08347. See Table 1 for full details.

Map 23. Riverine flooding hazard (50-year return period)



Source: Messina, J.P., Brady, O.J., Golding, N. et al. The current and future global distribution and population at risk of dengue. *Nat Microbiol* 4, 1508–1515 (2019). <https://doi.org/10.1038/s41564-019-0476-8>. See Table 1 for full details.

Map 24. Mean annual particulate matter (PM2.5) air pollution level (2020–2022)



Source: Air quality monitoring station data of the Ministry of Environment (Department of Air Quality and Noise Management). See Table 1 for full details.



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