Key messages from the report
A Threat to Progress
Confronting the effects of climate change on child health and well-being
Key messages

While there is a growing evidence base on the impacts of the climate crisis on children, much of it focuses on individual hazards, rarely focuses on the unique vulnerabilities of children, and lacks strong and actionable policy recommendations. UNICEF’s new report ‘A Threat to Progress: Confronting the Effects of Climate Change on Child Health and Well-being’ compiles existing evidence on the impacts of climate change on child health and wellbeing and presents a set of core policy recommendations for action by policymakers. Specifically, this report highlights the relationship between key climate hazards, such as extreme heat, droughts, wildfires, floods and storms, air pollution and ecosystem changes, multipliers such as water scarcity, food insecurity, displacement and underlying vulnerabilities including socio-economic status and location resulting in adverse health impacts that contribute to child mortality and morbidity.

1. Recent decades have seen remarkable progress for children’s health. The number of deaths in children under 5 has declined from 93 per 1,000 live births in 1990 to 37 per 1,000 live births in 2022. Climate change is a threat to this progress.

2. Climate change is changing children. It is impacting almost every aspect of child health and well-being from pregnancy to adolescence.

3. Climate change poses unique threats to the health and well-being of children and pregnant mothers. Exposure to climate-related hazards is linked to:

   
   b. Child malnutrition including stunting, wasting and micronutrient deficiencies.
   
   c. Killer infectious diseases such as malaria and dengue which are intensifying with climate change.
   
   d. Non-communicable diseases such as heat-related illnesses, asthma, chronic metabolic and cardiovascular diseases.
   
   e. Impacts on neurodevelopment and mental health including developmental delays, cognitive dysfunction and depression.
   
   f. Effects on well-being including learning loss, violence, abuse and exploitation.
   
   g. Injuries resulting from exposure to extreme hazards, including drowning and burns.
4. Children are uniquely vulnerable to climate change and face different health challenges than adults. The interplay of physiological, psychosocial, and behavioural factors and their dependence on caregivers makes children more susceptible:

a. **Physiological changes during pregnancy** make mothers particularly vulnerable to the health impacts of climate change. During pregnancy, in-utero exposure to climate-related hazards can significantly impact perinatal and childhood development. During childhood, children's developing organs and immune systems make them less equipped to handle the stressors induced by climate-related events.

b. **Children's behavioural patterns** - higher levels of outdoor activity and exploration - expose them to environmental risks differently.

c. **Children rely heavily on caregivers** for their health and well-being and disruptions in their care can have profound impacts on their health.

5. The climate-related hazards that place the greatest burdens on children are floods and storms, droughts, extreme heat, wildfires, air pollution and ecosystem change. Existing research outlines impacts on children including:

a. Severe and recurrent **floods** impact undernutrition, mainly in the forms of stunting, wasting and underweight in children under five years in low-and-middle income countries and the spread of infectious diseases like malaria and cholera.

b. Multiple studies point to the impact of **drought** and food insecurity to low-birth-weight among children, undernutrition and lifelong health effects. A sub-Saharan Africa study found that women who experienced drought conditions in their childhood were more likely to have children born at low birth weights.

c. **Extreme heat**: Odds of stillbirth and pre-term birth rise by 5 per cent per 1°C increase in temperature.

d. Each 1 microgram per cubic metre of air (mg/m³) increase in PM$_{2.5}$ emanating from **fires** was associated with a 2.3 per cent increase in the risk of child mortality; exposure was found to be ‘super-linear’, meaning that more exposure to larger fires led to increased toxicity.

e. **Air pollution** is associated with increased risk of infant death and adverse birth outcomes, with approximately 2 million preterm births annually attributed to ambient particulate matter exposure.

f. **Ecosystem change**: The WHO documented a 10-fold surge in reported cases of dengue worldwide, with cases increasing from 500,000 to 5.2 million between 2000-2019. Studies have found that the highest incidence of cases occur in children and adolescents, who are also prone to experience more severe symptoms.
6. The impact of climate-related hazards on child health is multiplied by how climate-related hazards affect food and water security and contamination, damage infrastructure, disrupt services and drive displacement. In addition, the severity of these impacts is determined by underlying vulnerabilities and inequities children face based on their socioeconomic status, gender, location, existing health status and country context.

7. The world is at a crossroads with hard-won advances over the past decades for maternal, newborn and child survival and well-being at risk. Unless mitigation efforts are accelerated and adaptation efforts urgently scaled up, current and future generations of children will continue to bear the brunt as climate change affects their survival, and lifelong health and well-being.
Calls to action

Every child has the right to a clean, healthy and sustainable environment. UNICEF is calling on all actors, including governments and the private sector to;

1. Reduce emissions to meet 1.5°C degree threshold, ensuring the best interest of the child and prioritize mitigation efforts that address multiple challenges and deliver clear child health co-benefits.
   a. Urgent ambitious mitigation actions are needed from high-income countries to reduce emissions and provide support to low-and-middle income countries in their energy transition. Ensure universal access to modern fuels and technologies for cooking to reduce emissions and child deaths attributable to household air pollution and support transition to sustainable energy in sectors that provide essential services to children.
   b. Expand climate education, green infrastructure and integrate decarbonization technologies with detoxification strategies.

2. Protect children from the impact of climate change by ensuring climate policies and commitments such as Nationally Determined Contributions, National Adaptation Plans and the plans of health and health-determining sectors meet the needs of children exposed to climate hazards.
   a. Caregivers should be given the information and skills to protect children and governments should invest in multi-hazard early warning and alert systems, risk communication campaigns and increased capacity building of health workers.
   b. Strengthen climate-resilient primary health care to ensure continuity of essential maternal, newborn, child and adolescent health and nutrition services.
   c. Safeguard access to food and water while establishing climate-resilient water and sanitation infrastructure, implement disaster risk reduction strategies, improve the coverage and quality of humanitarian action and outbreak responses while promoting ‘One Health’ to protect child health holistically from threats pertaining to climate change, pervasive pollution and loss of biodiversity.
   d. Prioritize child-sensitive and shock-responsive social protection measures to identify the most vulnerable and enhance their resilience.

3. Prioritize child health and wellbeing in climate policy, investment and action.
   a. Climate action must centre on its impact on child health and well-being, ensuring targeted strategies are implemented to protect children's health, safety and future.
   b. Specific actions and investments are needed to generate local data, prioritizing child-focused vulnerability assessments, addressing gaps in research, and fostering multistakeholder collaboration to bridge knowledge-to-action gaps on children's environmental health, including with the participation of children and youth.
Read the report at the Children's Environmental Health Collaborative

UNICEF, United Nations Environment Programme, and the World Bank founded the Children's Environmental Health Collaborative, a multi-stakeholder initiative uniting partner efforts around a common vision – that all children deserve to grow up in a clean, healthy, and sustainable environment. Governments and international civil society partners and the private sector are invited to join this effort to inspire, motivate, equip and mobilize efforts through advocacy, brokering knowledge and catalysing action.

The Collaborative hosts technical and guidance notes specific to protecting children from a range of climate and environmental hazards, such as extreme heat, wildfire smoke and air pollution. It features easy-to-use communication materials such as expert videos, communication assets and key messages to spread the message and mobilize action. It is also the home to the Children's Environmental Health Country Profiles, which provide the first comprehensive view of environmental exposures and health impacts including from climate change.

Additionally, the Collaborative hosts the first-of-its-kind e-course on children's environmental health, aimed at equipping health workers globally with the skills they need to recognize, prevent, diagnose and manage children's conditions related to an array of environmental threats.

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Extreme Heat

• A 1°C increase in temperature in low-income countries leads to an additional 16.6 children per 1,000 live births dying before their first birthday.

• Heat stress can trigger fetal tachycardia, development of congenital defects and fetal distress.

• **Odds of stillbirth and pre-term birth rise by 5 per cent per 1°C increase in temperature.**

• Without air conditioning, for each 0.56°C increase in school-year temperature, student achievement declined by 1 per cent of a year’s learning.

• Temperature rises can be associated with increases in suicides and suicidal behaviour; rises in hospital admission for mental health conditions; and poor overall community health and well-being.

Droughts

• The risk of an event similar to the unprecedented 2022 drought in the Horn of Africa, which affected more than 20 million children and led to at least 20,000 additional under-five deaths, has been estimated to become 100 times more probable due to human-made climate change.

• **Malnutrition: Multiple studies point to the impact of drought and food insecurity to low-birth-weight in children, child undernutrition and lifelong health effects.** A sub-Saharan Africa study found that women who experienced drought conditions in their childhood were more likely to have children born at low birth weights.

• Infectious disease: Reduced access to clean water due to drought limits the possibility for proper hygiene and sanitation practices, which in combination with undernutrition can lead to increased risk of infectious diseases including cholera.

• Well-being: The pressure of food insecurity and water scarcity on families can force displacement and even long-term migration, leading to lasting impacts on the health of children.

• Mental health: Droughts in particular, which are ‘slow-creeping’ events, are more strongly associated with mood disorders and a direct association has been found between exposure to a prolonged drought and worsening mental health in young people, including an elevated risk of suicide.

Wildfires

• Each 1 microgram per cubic metre of air (mg/m³) increment of PM$_{2.5}$ emanating from fires was associated with a 2.3 per cent increase in the risk of child mortality; exposure was found to be ‘super-
linear’, meaning that the per-unit exposure to larger fires led to increased toxicity.

- Compared to PM$_{2.5}$ from other sources, PM$_{2.5}$ released from wildfires is about 10 times more harmful to children's respiratory health, particularly for children under 5 years of age.

- Landscape fire smoke in Central and West Africa, as well as South and Southeast Asia regions are of particular concern as children under the age of five account for 39 per cent of attributable mortality.

- PM$_{2.5}$ from fires was more strongly associated with acute respiratory infection than PM$_{2.5}$ from non-fire sources.

**Floods and Storms**

- Overall mortality and injuries: Direct mortality in children from drowning is particularly prevalent, while children also suffer morbidity from flood-associated injuries.

- Overall mortality: Over more long-term trajectories, a study found that infants living in flood-prone areas in Bangladesh had an 8 per cent higher chance of dying compared with their counterparts who were not exposed to floods, leading to more than 150,000 additional infant deaths over a 30-year period.

- Adverse pregnancy outcomes: Gestational flood exposure is associated with an 8 per cent increased risk of pregnancy loss, including stillbirths, with greater effects on women younger than 21 or older than 35 years of age, as well as those dependent on surface water and with lower income or education levels.

- Adverse pregnancy outcomes: A 2022 review found that risk of gestational hypertension, preeclampsia and eclampsia increased slightly after a flood.

- Malnutrition: Long-term nutritional effects on children such as wasting or malnutrition are observed in the aftermath of floods, principally in low-resource rural settings.

- Infectious disease: A 43-country study found a slight increase in diarrheal prevalence in children under 5 years when exposed to flooding; children exposed to droughts prior to floods were at even higher risk of diarrheal incidence.

- Mental health: For example, in the 2022 Pakistan flooding, half of the affected children showed signs of distress. More long-term mental health challenges from flooding include post-traumatic stress syndrome and depression, both in low- and high-income settings.

**Air Pollution**

- In 2019, 476,000 infants died in their first month of life from health effects associated with air pollution exposure.

- Air pollution is associated with increased risk of infant death and adverse birth outcomes, with approximately 2 million preterm births annually being attributed to ambient particulate matter exposure.

- Air pollution exposure during the later stages of pregnancy and the neonatal period has been associated with cognitive disabilities and dysfunctional neurodevelopment in children.
Ecosystem Changes

- The 2023 World Malaria Report indicates that there were over 249 million malaria cases and 608,000 deaths in 2022, with approximately three quarters (76 per cent) among children under five years.

- The WHO documented a 10-fold surge in reported cases of dengue worldwide, with cases increasing from 500,000 to 5.2 million. Studies have found that the highest incidence of cases occur in children and adolescents, who are also prone to experience more severe symptoms.

- Infection with dengue during pregnancy is associated with more severe disease, post-partum haemorrhage and higher mortality, as well as adverse pregnancy outcomes, including stillbirth.

- Zika virus, another arbovirus, has high rate of vertical transmission during pregnancy and can lead to fetal loss or congenital Zika syndrome, with microcephaly and neurodevelopmental abnormalities. Lyme disease, expanding its geographic area due to climate change, has multisystemic effects and can cause cardiac, neurological, musculoskeletal, psychosocial and rheumatological symptoms, with implications for the mental and physical health of children and adolescents exposed to the disease, as well as their caregivers' mental well-being.
For every child

Whoever she is.
Wherever he lives.
Every child deserves a childhood.
A future.
A fair chance.
That’s why UNICEF is there.
For each and every child.
Working day in and day out.
In more than 190 countries and territories.
Reaching the hardest to reach.
The furthest from help.
The most excluded.
It’s why we stay to the end.
And never give up.