Adapting Health Systems to Protect Children from the Impact of Climate Change

Re-imagining the Package of Care for Children Subgroup
May 3, 2023

Co-Chairs:
Cara Endyke Doran, cendykedoran@globalcommunities.org
Raoul Bermejo, rbermejo@unicef.org
Series Overview

Session 5: Climate Effects on Malaria Programming for Children

• Summary of the evidence of changing temperature and climate conditions and effects on malaria-specific vectors and strategies for malaria surveillance that can be used to inform program decision-making.

• Examples of adjustments taken in malaria programs in response to changing temperatures and climate conditions in Senegal

Previous sessions:
Session 1: Framed the series (November 10, 2022)
• Shared an overview of the Healthy Environments for Healthy Children (HEHC) Framework and highlights from UNICEF’s heat waves report

Session 2: Children’s Climate Risk Index (CCRI) (December 13, 2022)
• Reviewed the CCRI methodology and its potential application

Session 3: The Impact of Climate Change on Newborn Health Outcomes: A Focus on Congenital Heart Defects (February 13, 2023)
• Reviewed extreme heat and its contributions to congenital heart disease (CHD)

Session 4: Protecting Children and Pregnant People from Heat Stress (March 29, 2023)
• Possible interventions and recommendations
Healthy Environments for Healthy Children

Swathi Manchikanti | Climate Adaptation for Health Lead, Healthy Environments for Healthy Children UNICEF HQ, New York
smanchikanti@unicef.org
Child survival, health and well-being is under threat

Over 1 in 4 children under the age of 5 are dying from environmental risks
Healthy Environments for Healthy Children Framework

1. Pollution and health

2. Climate adaptation for health
   - Climate-resilient and environmentally sustainable healthcare facilities

3. Strengthen climate-resilience and environmental sustainability in healthcare facilities

   - Develop responsive primary health care

   - Embed environmental health in school programmes

   - Promote climate and environmental action with children, adolescents and young people

   - Mobilize collective action

smanchikanti@unicef.org
Focusing on adapting primary healthcare response to five categories of environmental hazards

- **Climate Change**
- **Toxic Metals**
  - Pb: Lead
  - Hg: Mercury
  - Cd: Cadmium
  - As: Arsenic
- **Toxic Chemicals**
  - Highly hazardous pesticides
  - Benzene
  - Dioxins and dioxin-like substances (incl. PCBs)
- **Hazardous Waste**
  - Landfills and household waste
  - E-waste
- **Environmental Risks**
  - Air Pollution
  - Mould and mycotoxins
  - Noise
  - Radiation

- Excess Fluoride
- Additional chemicals in consumer products
- Medical waste
- Conflict related contamination
Climate and Malaria: Strategies for surveillance and data that can be used to inform program decision-making

Radina Soebiyanto, PhD
US President’s Malaria Initiative (PMI)
Malaria Burden

In 2021, there were **247 million** malaria cases and **619,000** deaths across 84 endemic countries.

**80%** of deaths were children under 5 years old.

Nigeria accounted for **38.4%** of global malaria deaths in children under 5 years old.

Data and images source: World Malaria Report 2022, WHO
Climate and Malaria

Climatic and environmental variables (temperature, rainfall, humidity, vegetation index, soil moisture, etc.) influence
- Mosquito population dynamics & habitat
- Pathogen growths
- Logistics of commodity and intervention campaign

Climate and Malaria

- Temperature influence malaria mosquito (*Anopheles*) life cycles
- Malaria pathogen (*Plasmodium falciparum*) cannot complete its growth cycle in the *Anopheles* mosquito at temperatures below 20°C (68°F) [CDC]

Climate and Malaria

Mosquito habitat depends on various climatic and environmental factors

- Rainfall
- Vegetation
- Soil moisture
- Land use

Hinne et al. (2021) *Parasite Vectors* 14:193
Climate and Malaria

Extreme weather events can disrupt
- Access to care
- Supply chains of key commodities
Climate and Malaria

Shifts in weather pattern influence the timing of malaria campaigns that are often scheduled prior to or around rainy season

- Insecticide residual spraying (IRS)
- Seasonal malaria chemoprevention (SMC) – monthly administration of antimalarials to children under 6 years old during malaria season
- Surveys
Many climatic and environmental data are now publicly available that can be integrated into surveillance systems. Continuously monitoring climatic and epidemiological data can help inform program decision making.

Wimberly et al. (2021) *Trends in Parasitology* 37(6): 525
Example: Rainfall

Use cases of monitoring current year rainfall pattern against previous year and historical average

- Retrospective analysis of malaria trends – was increasing/decreasing malaria cases preceded by anomalously high/low rainfall?
- Changing the timing and/or duration of seasonal malaria chemoprevention (SMC) following a shift in rainfall pattern
- Check whether survey was timed appropriately during peak season
Provide climatic variable data and visualization at subnational level
Rainfall data can be used to help determine SMC eligibility
Criteria: children in age groups at high risk of severe malaria in areas where malaria is highly seasonal, and transmission is intense – which often corresponds with the period of highest rainfall [WHO]
THANK YOU
Adapting climate change for malaria

SENEGAL EXPERIENCE AND ADAPTATION

DR ABOUBACAR SADOU
PMI RESIDENT ADVISOR
Evolution Morbidité, Mortalité proportionnelles de 2001 à 2021
implémentation des interventions majeures

MORBIDITE PROPORTIONNELLE
MORTALITE PROPORTIONNELLE

Paludisme = Tout Cas de Fièvre

Paludisme = Cas Confirmé par TDR / GE

ACT: Combinaisons thérapeutiques à base de dérivés sinine

TPI chez la femme

TDR Test Diagnostoc Rapide

FTAT FSAT FDA
dans la zone de pré élimination

CPS

TTT Pré-transfert
PECADOM intégrée
PECADOM Plus

CPS

CU / MILDA

MILDA 0 - 5 Ans

PECADOM

Source RBMME - PNLP
Evolution de la pluviométrie de 2017 à 2022 au Sénégal
Adaptation Programming- PMI activities

• **Malaria Control and Elimination:**
  PMI and the Senegal National Malaria Control Program are adapting to climate change by innovating and adapting actual malaria control strategies through:

1. Expanding the home-based malaria case management (PECADOM) and its proactive component (PECADOM Plus)
   - **In time** to ensure a year-round implementation instead of just focusing on the malaria high transmission period, and
   - **In space** to include more and more geographic areas that are seeing recrudescence of malaria cases

2. Adapting the implementation of seasonal malaria chemoprevention (SMC) by:
   - Increasing the number of monthly rounds to cover the whole rainy season
   - Reviewing recent climate data to adapt the implementation start date and best target the beginning of the rainy season.

These adaptations conducted to an increase of the budget for these interventions by about 20% as compared to the standard implementation.
Thank you!
We have compiled a collection of resources for you

Resource Pack for Protecting Children from Heat Stress

The panelists of the heat stress webinars and the facilitators together developed a short but helpful list of key selected resources as part of a Heat Stress Resource Pack that can help you quickly read up on the impact of heat stress on maternal, infant, and child populations and also see examples of plans and guidelines currently being implemented in healthcare settings across countries.

CHTF Events page:
Climate Change and Child Health Discussion Series

Engage with the co-chairs:

- Cara Endyke Doran: cendykedoran@globalcommunities.org
- Raoul Bermejo: rbermejo@unicef.org

Reach out to the Child Health Task Force Secretariat: childhealthtaskforce@jsi.com

Healthy Environment Healthy Children Framework:

CCRI:

Subgroup information, recordings and presentations from previous webinars are available on the subgroup page of the Child Health Task Force website:
www.childhealthtaskforce.org/subgroups/expansion
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