

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

# Session 7: Financing Health and Climate Adaptation

Re-imagining the Package of Care for Children Subgroup July 13, 2023



#### Moderators of the series:

Cara Endyke Doran, <a href="mailto:cendykedoran@globalcommunities.org">cendykedoran@globalcommunities.org</a> Swathi Manchikanti, <a href="mailto:smanchikanti@unicef.org">smanchikanti@unicef.org</a>

## Series Overview

#### **TODAY:**

#### Session 7: Financing Health and Climate Adaptation (July 13, 2023)

Summary of mainstreaming climate adaptation planning and funding opportunities for climate and health activities

#### **Upcoming Sessions:**

Session 8: Communicating Health Effects of Climate Change—August 22, 2023

Session 9: Measuring Health and Climate Adaptation—September 14, 2023

#### **Previous sessions:**

Session I: Framed the series (November 10, 2022)

- Shared the Healthy Environments for Healthy Children (HEHC) Framework and highlights from UNICEF's heatwaves 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)

• Review extreme heat and its contributions to congenital heart disease (CHD)

Session 4: Protecting Children and Pregnant People from Heat Stress (March 29, 2023)

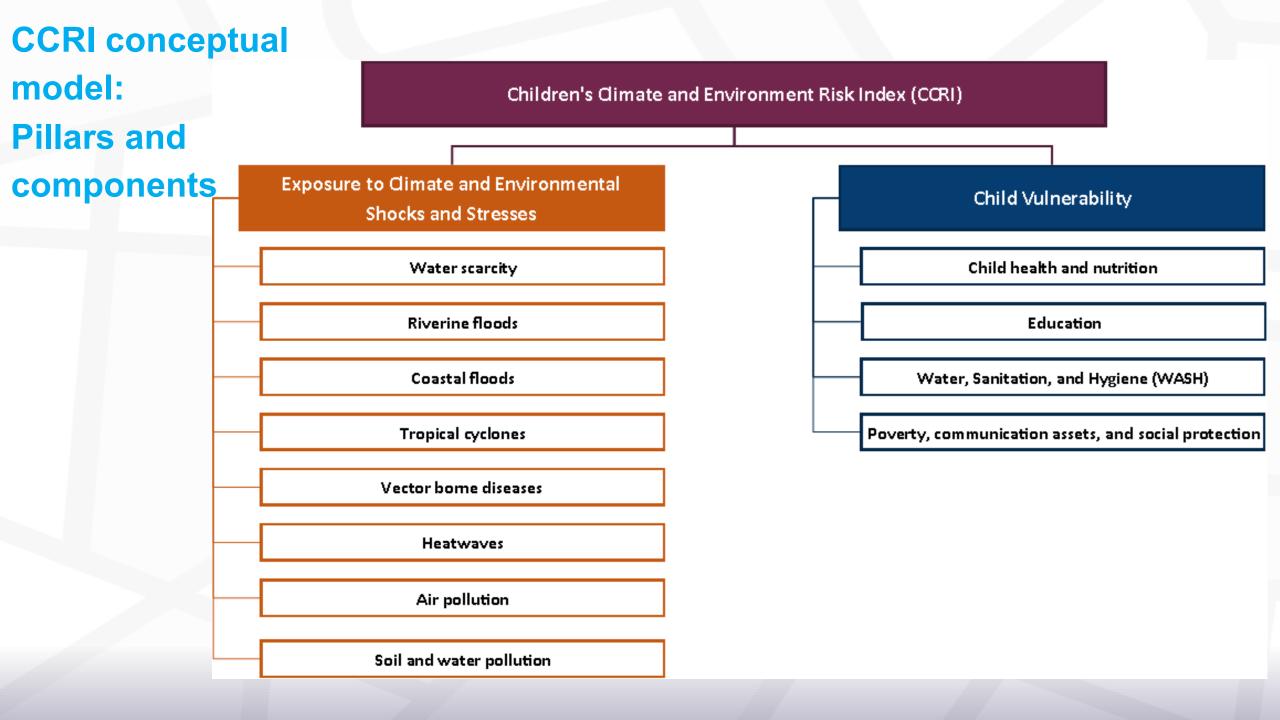
Possible interventions and recommendations

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 and possible interventions and recommendations

Session 6: Climate Effects on Arboviruses and Child Health (June 15, 2023)

• Overview of arboviruses (e.g. dengue, chikungunya and Zika) and their effects on child and maternal health, how they are being affected by climate change, and recommendations for a primary healthcare response.



## Presenters



**Dr. Rebecca Carter** Adaptation Lead World Resources Institute



Dr. Regina Bures, Ph.D. Senior Scientific Advisor Division of Cardiovascular Sciences National Heart, Lung, and Blood Institute (NHLBI)

National Institutes of Health (NIH)



Mainstreaming and Financing Climate Adaptation for Health Systems

Rebecca Carter, PhD

Adaptation Lead

World Resources Institute

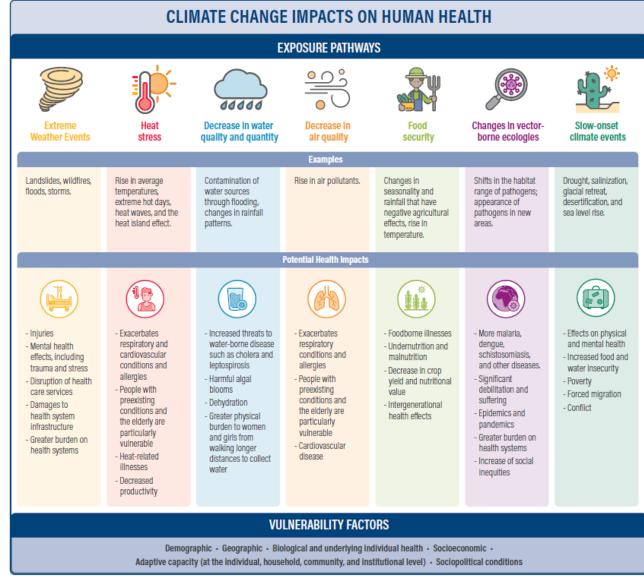




Climate change is already significantly impacting

human health

Figure 2 | The Many and Varied Health Risks Associated with Climate Change Impacts



Notes: This infographic is meant to illustrate the main linkages between climate and health and is not exhaustive. Please note that social equities and Disability Adjusted Life Years (DALYs), representing years of life spent in states of less than full health or with disability, can be lost across all exposure pathways.

Source: the authors, with some data points from Savage et al. forthcoming.

Source: Tye, S. and Waslander, J. 2021. Mainstreaming Climate Adaptation Planning and Action into Health Systems in Fiji, Ghana, and Benin. Wri.org

# Climate Change Impacts on Health Systems

Quotes from IPCC AR6 WGII Summary for Policymakers (2022)

- Climate change has adversely affected physical health of people globally and mental health of people in the assessed regions.
- Mental health challenges, including anxiety and stress, are expected to increase under further global warming in all assessed regions, particularly for children, adolescents, elderly, and those with underlying health conditions.
- 'Mental health' includes impacts from extreme weather events, cumulative events, and vicarious or anticipatory events.
- Mental health challenges are associated with increasing temperatures, trauma from weather and climate extreme events, and loss of livelihoods and culture.

# Adaptation can help...

- Strengthening the climate resilience of health systems will protect and promote human health and well-being.
- Health and well-being would benefit from integrated adaptation approaches that mainstream health into food, livelihoods, social protection, infrastructure, water and sanitation policies, requiring collaboration and coordination at all scales of governance.
- Climate change impacts on health are mediated through natural and human systems, including economic and social conditions and disruptions.
- Integrated, multi-sectoral solutions that address social inequities and differentiate responses based on climate risk and local situation will enhance food security and nutrition (and thereby health).

# Targeted finance is needed to reduce specific risks and build resilient health systems

**Extreme Heat:** Heat Health Action Plans with early warning and response systems

**Water- and food-borne diseases:** Improved access to potable water and early warning systems; reduced exposure of water and sanitation systems to flooding and extreme weather events

**Vector-borne diseases:** Surveillance, early warning systems, vaccine development

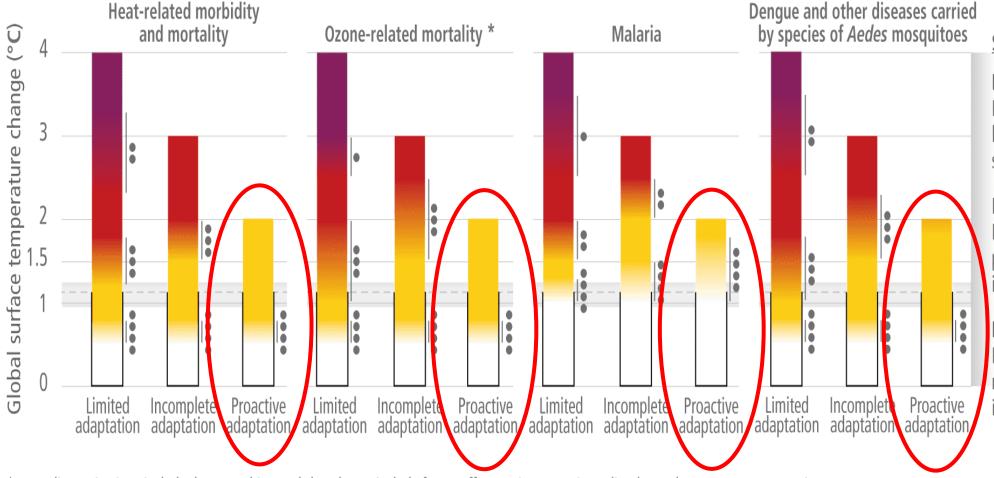
**Mental health risks:** Improved surveillance, access to mental health care, and monitoring of psychosocial impacts from extreme weather events

**Overall health and well-being:** Integrated adaptation approaches that **mainstream** health across sectors

IPCC 2022



## (e) Climate sensitive health outcomes under three adaptation scenarios



#### Scenario narratives

### Limited adaptation:

Failure to proactively adapt; low investment in health systems

### Incomplete adaptation:

Incomplete adaptation planning; moderate investment in health systems

#### Proactive adaptation:

Proactive adaptive management; higher investment in health systems

<sup>\*</sup> Mortality projections include demographic trends but do not include future efforts to improve air quality that reduce ozone concentrations.

# But existing approaches are not enough

- Despite progress, adaptation gaps exist between adaptation currently and what is needed to respond to impacts and reduce climate risks.
- Most observed adaptation is fragmented, small in scale, incremental, sector-specific, designed to respond to current impacts or near-term risks, and focused more on planning rather than implementation.
- The largest adaptation gaps exist among lower income population groups where vulnerability is highest.

will

 At current rates of adaptation planning and implementation, the adaptation gap continue to grow.

IPCC 2022



# **Adaptation Finance Gaps**

- Current funding flows for adaptation from both public and private finance sources are **insufficient** for and constrain implementation of adaptation options, esp. in developing countries (IPCC 2022).
- Adaptation needs alone are estimated at \$140-300 billion annually by 2030 and \$565 billion annually by 2050 (UNEP 2022).
- In 2020, **\$83.3 billion** in climate finance was provided and mobilized from developed to developing countries, with only about **one-third** (i.e. **\$27.7B**) **going toward adaptation actions** (OECD 2022)
- Adaptation finance has come predominantly from public sources, with minimal private investment.
- Adverse climate impacts can reduce the availability of financial resources through economic
  damages and impeding national economic growth, thereby further increasing financial constraints
  for adaptation, particularly for developing and least developed countries that may have heavy debt
  burdens.

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# Mainstreaming adaptation

Integrating, or *mainstreaming*, adaptation across sustainable development initiatives can help drive economic growth, reduce poverty and improve human well-being.

Building resilience...underpins successful policies to reduce climate risks across a wide range of sectors, from agriculture and water to transportation and **health**.



WORLD REPORTED RESIDENT

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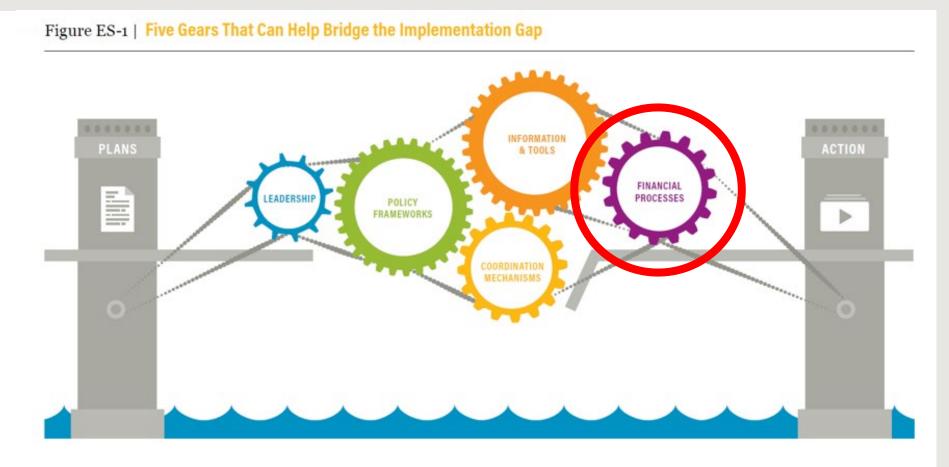
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# From Planning to Action: Mainstreaming Climate Change Adaptation Into Development

Mainstreaming costeffective and proven adaptation approaches across development strategies can bridge the gap between national plans and local-level implementation, helping the world avoid some two-thirds of expected losses from climate change by 2030.



Source: Mogelgaard et al 2018. From Planning to Action. wri.org.

# Country Example: Fiji

Figure 4 | Policy Landscape for Integrating Climate Adaptation into Fiji's Health System



## Integration into policies and plans

- Climate Change and Health Strategic Action Plan (CCHSAP)
- Roadmap for Democracy and Sustainable Socio-Economic Development (2010-2014)
- Green Growth Framework (2014)
- National Climate Change Policy (2019-2030)
- National Adaptation Plan (NAP)
- National Development Plans (NDP 2017-2021; 2017-2036)



#### Political leadership

- Permanent Secretaries of the Ministry of Health, who also encouraged cross-sectoral collaboration
- Climate Change and Health Unit (Ministry of Health)
- Climate Change Health Steering Committee for the CCHSAP
- Participation in the Pacific Islands Action Plan on Climate Change and Health Working Group



## Funding mechanisms in place

- Fiji has received external funding to carry out pilot projects
- Domestic funding for the Ministry of Health



#### Challenges

#### - Insufficient finance

- Technical capacity, including to understand climate and health linkages

Source: Authors.

Source: Tye, S. and Waslander, J. 2021.

# Country Example: Ghana

Figure 6 | Policy Landscape for Integrating Climate Adaptation into Ghana's Health System



## Integration into policies and plans

- National Climate Change Adaptation Strategy
- National Climate Change Policy (NCCP)
- Ghana National Climate Change Master Action Programmes for Implementation (2015-2020)
- Ghana Shared Growth and Development Agenda (2014-2017)
- Integrated Disease Surveillance and Response system



# Political leadership

 Inter-ministerial National Climate Change Committee, which included the Ministry of Health and the Ghana Health Service



# Funding mechanisms in place

- Ghana has received external funding to carry out projects
- It is unclear to what extent domestic funding exists for climate and health, although plans to earmark such budgets have been outlined (e.g., see Asante et al. 2015)



#### Challenges

- Insufficient finance
- Coordination between ministries
- Limited understanding of adaptation and health links
- Sustaining gains after closure of projects

Source: Authors.

Source: Tye, S. and Waslander, J. 2021.

## Country Example: Benin

Figure 8 | Policy Landscape for Integrating Climate Adaptation into Benin's Health System



# Integration into policies and plans

- Third National Communication to the UNFCCC (2018)
- National Health Development Plan (2009-2018)
- National Adaptation Programme of Action (2008)
- NAP (forthcoming)



# Political leadership

- Establishment of "environmental cells" in key ministries
- Ministry of Health
- Environmental Agency



# Funding mechanisms in place

- The Finance Ministry is expected to start integrating adaptation in its budget cycle
- External support from the UN to local communities via the Local Climate Adaptive Living Facility



#### Challenges

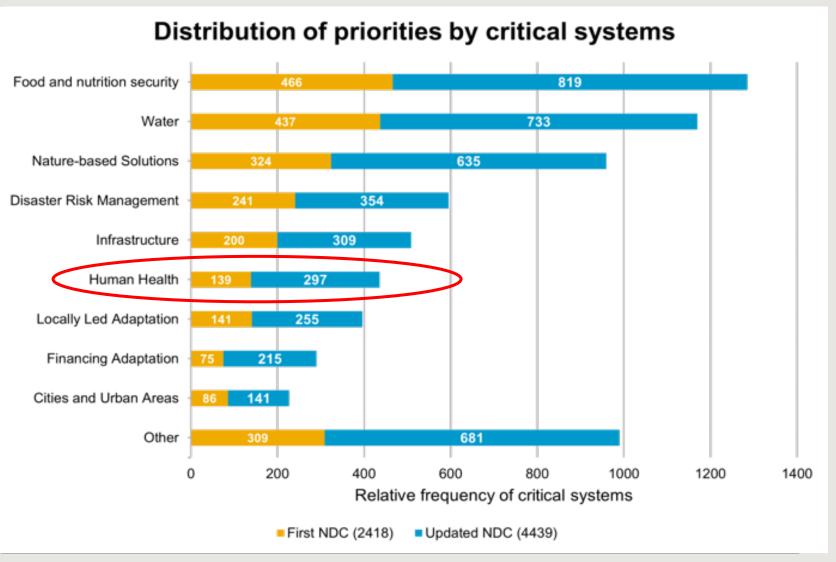
- Insufficient public and external finance
- Climate risk management and data capacities
- Sustaining gains after closure of projects

*Note:* Abbreviations: NAP: National Adaptation Plan; UNFCC: United Nations Framework Convention on Climate Change; UN: United Nations. *Source:* Authors.

Source: Tye, S. and Waslander, J. 2021.

## Health in the Adaptation Components of NDCs

- Countries are becoming more detailed and ambitious with their NDC adaptation components
- More coverage of systems and sectors for adaptation actions
- Better alignment with plans and policies, including NAPs
- More inclusion of gender and Indigenous Peoples



# Adaptation at COP28 and beyond

- COP28 will feature the first ever thematic <u>Health day</u> and climate-health ministerial,
   which is expected to raise the profile of health on the global climate agenda.
- **Global Goal on Adaptation**, i.e. agreement on how to measure progress on adaptation (and identify areas that are lagging), *including for sectors like health*.
- Countries need to speed up and scale up their investments in adaptation and minimize unintended impacts (maladaptation).
  - Calls to scale up adaptation finance to be on par with mitigation finance, i.e. 50% of \$100B commitment countries made as part of Paris Agreement
  - o Through mainstreaming, should (eventually) result in more funding for building more resilient health care systems
- Focus on **climate justice**, i.e. ensuring that those who did the least to cause the problem and have the fewest resources with which to adapt have the financial resources and other types of support they need including children.



# NIH Climate Change and Health Initiative

Regina Bures, PhD
Senior Scientific Advisor, Division of Cardiovascular Sciences, NHLBI

Adapting Health Systems to Protect Children from the Impact of Climate Change Series, Session Seven: Financing Climate Adaptation for Health Systems, July 13, 2023



"There is perhaps no greater opportunity for NIH to fulfill its mission than by providing global leadership in the response to the burgeoning climate change & and health crisis."

~NIH Climate Change and Health Initiative Framework Document

Learn more: <a href="https://www.nih.gov/climateandhealth">https://www.nih.gov/climateandhealth</a>

### **An NIH Opportunity: Initiative Goals and Objectives**

**Goals:** Reduce health threats across the lifespan and build health resilience in individuals, communities, and nations around the world, especially among those at highest risk.

### **Objectives:**



**Identify risks and optimize benefits** to the health of individuals, communities, and populations from actions to mitigate or adapt to climate change.



Develop the necessary **research infrastructure and workforce** to enable the generation of timely and relevant knowledge, drawing from the full spectrum of biomedical disciplines.



**Leverage partnerships** with other scientific and social disciplines and organizations to achieve the most impactful results.



**Innovate** across the research translation continuum to ensure findings are credible, accessible, and actionable for achieving these goals.



## **Strategic Framework Core Elements**

- Four Core Elements
  - Health Effects Research
  - Health Equity
  - Intervention Science
  - Training & Capacity Building
- 9 Supporting Areas of Science

https://www.nih.gov/climateandhealth





## Climate Change Impacts on Children's Health



Heat associated with higher rates of preterm birth, low birthweight, stillbirth, and neonatal stress



Heat and precipitation increase transmission of infectious disease



Drought leads to child malnutrition, which is associated with reduced educational achievement and mental health



Children are more vulnerable to PTSD after extreme events; flooding increases diarrheal diseases in children



Air pollution and early onset spring exacerbates allergies and asthma in children



Exposure to particulate matter is associated with behavioral problems in children

Climate change under high emission scenarios could cause an additional 48,000 deaths in children under 15 years in 2030

## Temperature, El Niño Events Associated with Higher Incidence Rate of Diarrhea

**Among Children** 

- Study included weekly meteorological data from 194 Peruvian provinces and rate of clinic visits for diarrhea in children under 5 years old from 2005-2015
- An increase of 1° C in temperature across three prior weeks was associated with a 3.8% higher rate of clinic visits for diarrhea
- Higher incidence rate of diarrhea clinic visits during moderate/strong El Niño events and dry season

**Table 2** Association between meteorological factors and incidence rate of childhood clinic visits for diarrhea, Peru, 2005–2015

	IRR (95% CI)
Temperature across 3 weeks prior to diarrhea cases <sup>a</sup>	1.038 (1.032, 1.044)
1-week temperature lag <sup>b</sup>	1.014 (1.011, 1.017)
2-week temperature lag <sup>b</sup>	1.016 (1.013, 1.019)
3-week temperature lag <sup>b</sup>	1.008 (1.005, 1.010)
Moderate/strong El Niño period	1.026 (1.009, 1.044)
Dry season	1.014 (1.002, 1.027)
Rotavirus vaccine era (2010–2015) <sup>c</sup>	0.913 (0.886, 0.941)
Year (secular trend) <sup>d</sup>	0.968 (0.961, 0.974)

IRR incidence rate ratio, CI confidence interval

Multivariable model: IRRs are controlled for other variables in the model/table, and for province. This model also included terms for the interaction between the rotavirus vaccine era and temperature variables; the overall interaction was not significant (p = 0.37), thus the temperature estimates stratified by vaccine era are not presented.

<sup>&</sup>lt;sup>a</sup> Combined effect of temperature across 3 weeks prior to weekly diarrhea report.

<sup>&</sup>lt;sup>b</sup> The 1-week temperature lag is the effect of temperature in the week before the diarrhea cases, the 2-week lag refers to the week before that, etc.

<sup>&</sup>lt;sup>c</sup> Compared to the pre-rotavirus vaccine era (2005-2009).

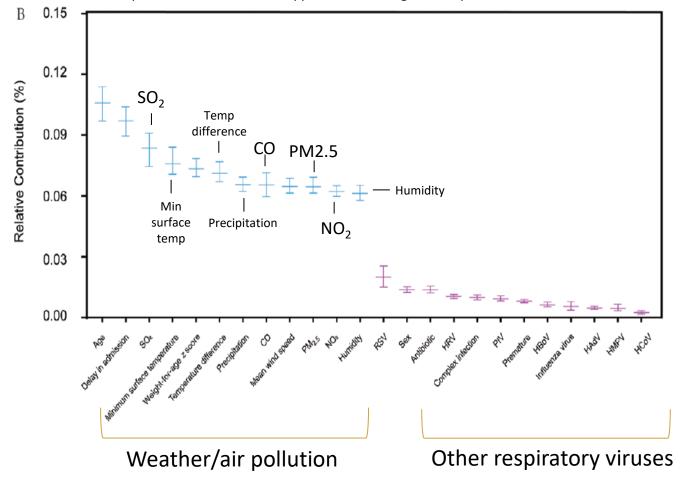
d Continuous term for year.



## Air pollution, Climate Variables Contribute to Severe Childhood Pneumonia

- Study used machine learning to identify determinants of severe pneumonia for 6,611 pediatric pneumonia patients between 2009 and 2018.
- Models showed 9 weather and air pollution indicators were important determinants of severe pneumonia, contributing 62.53%, while other respiratory viruses contributed 7.36%
- Results could help predict when children would be at increased risk for severe pneumonia and when interventions (reducing outdoor activities) may be warranted

**Figure 3.** The efficiency estimate of variables in the model with all 24 factors included for analysis. Each midline represents the mean value; upper and lower segments represent the 95% confidence interval





### Climate Change Could Shift Disease Burden from Malaria to Arboviruses in Africa

- Malaria transmission peaks at 25° C and dengue transmission peaks at 29° C based on mechanistic transmission models
- Warming temperatures are expected to favor transmission of dengue over malaria
- Public health burden of arboviruses could overtake that of malaria as climate suitability increases (warming) for arboviruses

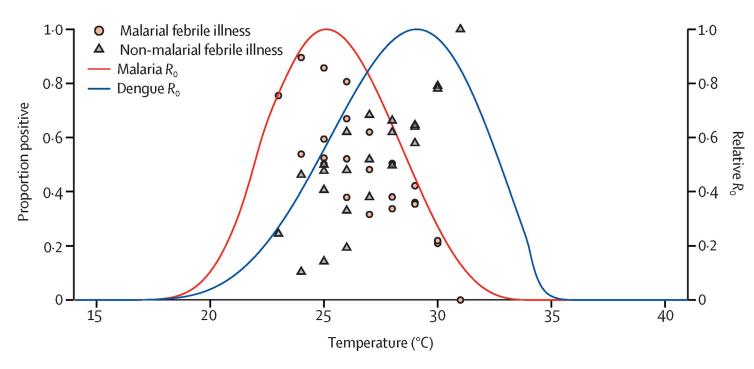


Figure 1. Malarial and non-malarial fever among Kenyan children from 2014 to 2018 versus temperature, overlaid on  $R_0$  curves for malaria and dengue



## **Addressing Climate Change in Pediatric Clinical Practice**

- Ways that pediatricians <u>can</u> discuss climate change in clinical settings include:
  - Educate about disaster preparedness
  - Provide resources to those impacted by climate change effects
  - Educate on actions that families can take to decrease carbon emissions/reduce health impacts
  - Provide developmentally appropriate materials to support parent-child discussions on climate change
  - Connect the impact climate change has on other SDOHs to address a range of unmet social needs

- Challenges to addressing climate change in a clinical setting include:
  - There are not always communitybased resources or clinics to offer patient referrals to, like with other social determinants of health (SDOHs)
  - Some components of addressing climate change may be best accomplished on a policy level, such as reducing carbon emissions





# Climate Change as a Social Determinant of Health for the Pediatric Community

- Social determinants of health (SDOHs): the social circumstances in which people are born, grow, live, work, and play
- As other SDOHs do, climate change:
  - Worsens health
  - Increases health care costs
  - Disproportionately impacts vulnerable communities
  - Intensifies the effects of other SDOHs
- Viewing climate change as an SDOH is pivotal for the pediatric community as the effects of climate change:
  - Increase costs of pediatric care
  - Disproportionately impact child health locally and globally





## **Current Initiative-Funded Activities**

## Research Coordinating Center - Boston University SPH - Harvard TH Chan SPH

- Researchers from Boston University School of Public Health and Harvard T.H. Chan School of Public Health will coordinate and develop the Research Coordinating Center (RCC) that will support the NIH Climate and Health Initiative.
- Drs. Greg Wellenius, Amruta Nori-Sarma (BUSPH),
   Francesca Dominici (HSPH) lead the effort
- Develop and nurture a Community of Practice of Climate Reseachers and translational partners in the US and abroad
- Survey the landscape of issues related to integration of data on climate, environment and health and develop a model to share CH data from NIH funded studies
- Distribute pilot funds for the CCH initiative on topics of priority to the program

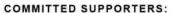








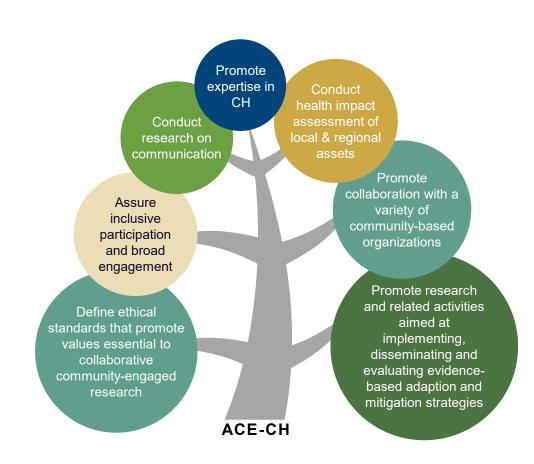






## Alliance for Community Engagement – Climate and Health (ACE-CH)

- Goal: The ACE-CH seeks to coordinate and build community engagement research opportunities to:
- Support community-engaged research and outreach focused on climate change
- Promote inclusion of underserved, racial/ethnic minority, and rural populations with the greatest disadvantage to the impacts of climate change
- Funding: FY22 with IC contributions
  - Continued funded in FY23-26 from the appropriation
  - Administered by NHLBI using OTA mechanism



ACE-CH will work in close collaboration with community partners, including health service providers, public health agencies, policymakers, community-based organizations, health advocacy groups, environmental justice and climate justice groups, and other stakeholders as appropriate.

## Alliance for Community Engagement -Climate and Health



# Alaska Alliance for Community Engagement – Climate and Health (AK ACE-CH)

- Communities: Indigenous Alaska Natives in rural/remote AK
- Climate impacts: Food systems, infectious disease, mental health
- Approaches: Pilot test strategies to assess multi-level risk and resilience factors; Disseminate and implement Indigenous-led strategies to build adaptive capacity



# Mountain West ACE-CH Hub: Climate Change Engagement Platform to Support Resilient Rural and Urban Communities

- **Communities**: Economically disadvantaged, communities of color, immigrant groups, and vulnerable occupational groups near Denver
- Climate impacts: Air quality, drought, wildfires, extreme heat
- Approaches: Develop community-engaged survey about air quality concerns; Produce health impact assessment of local CC assets; Develop recommendations for each community



# Community-driven approaches to EJ and Health in the Face of the Climate Crisis in Southern CA

- **Communities**: Economically disadvantaged, immigrant groups, people of color, unhoused and elderly communities in LA and Carson
- Climate impacts: EJ, extreme heat, air pollution, wildfires
- Approaches: Assess neighborhood-scale vulnerability; Expand community air monitoring; Advance community education and research capacity



# Climate Health Adaptation and Resilience Mobilizing (CHARM) Lake County Project

- **Communities**: American Indian tribal, immigrant populations, rural and agricultural workers in Lake County, CA
- Climate impacts: Extreme heat, harmful algal blooms (HABs)
- Approaches: Continuous community engagement; Identify health impacts of HABs and heat events; Improve communication and collaboration in HABs and heat preparedness and response

## Training and Capacity Building: NIH Climate and Health Scholars Program

- Goal: to bring scientists actively working in CCH to share knowledge and help build CCH science capacity across the NIH
- 2023 Scholars Program Launched with 8 Scholars working across NIH

#### Overview:

- Call for applications for round 2 of the program is open at <a href="https://www.nih.gov/climateandhealth">https://www.nih.gov/climateandhealth</a>
- Applications are requested by <u>July 15</u>



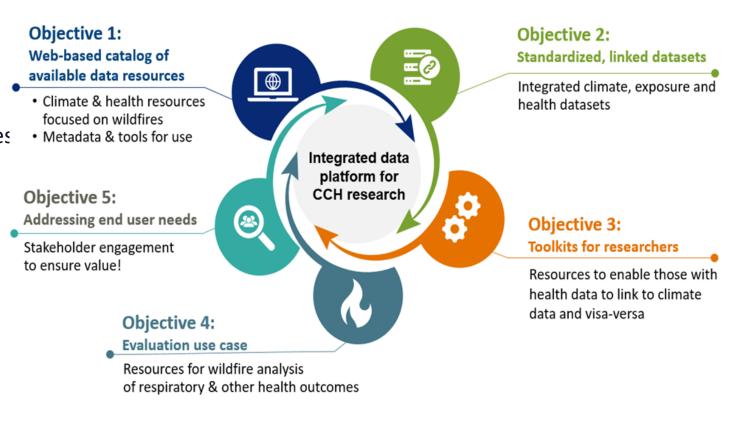


## NIH Climate and Health Outcomes Research Data Systems (CHORDS)

Goal: This new project will create a resource that links climate and environmental data with health outcomes data so that researchers can identify, analyze, and reduce the health effects associated with climate-related events and improve patient and population health outcomes

**Project:** Effort to harmonize, standardize, and link diverse types of data, in order to produce publicly accessible data products and resources to improve patient and population health.

- Examples of data types:
  - GIS mapping data
  - Climate satellite data
  - Personal Exposure data
  - Electronic Health records



Collaboration partners: NIEHS, NHLBI, NIA, CDC, NASA, AHRQ, HHS-OS



# **Current Funding Opportunities**

As of 6/28/2023

**Types of Grant Programs at NIH** 



## **Current Funding Opportunities**

- Notice of Special Interest (NOSI) [NOT-ES-23-006]:
  - Goal: Supports CCH research in the U.S. and globally.
     Encourages use of common data element and collection tools. Open for 3 years.
- Notice of Special Interest: Innovation Technologies for Research on Climate Change and Human Health (SBIR/STTR) [NOT-ES-22-009] & [NOT-ES-22-010]:
  - Goal: Supports technologies for capturing the effects of climate change/extreme weather on human health and to reduce the health threats posed by climate change.



**NOT-ES-23-006** 



NOT-ES-22-009



NOT-ES-22-010



## **NIH P-20 Exploratory Grants [RFA-ES-23-007]**

# **Exploratory Grants for Climate Change and Health Research Center Development**

 This funding opportunity is to solicit applications for Climate Change and Health Research Centers which will support the development of a transdisciplinary research environment to sustain a program of fundamental and applied research to examine the impacts of climate change on human health.

### Application Timeline

- Informational Webinar will occur sometime in the fall
- Letter of Intent Due Date(s): October 7, 2023
- Application Due Date(s): November 6, 2023





"Climate change exacerbates chronic and contagious disease, worsens food and water shortages, increases the risk of pandemics, and aggravates mass displacement.

What's clear now is that the health effects are worse than anticipated — and that they're already being felt. "



Tedros Adhanom Ghebreyesus, Ph.D.
 Director-General, World Health Organization



# **Thank You**

#### NIH Climate Change and Health Initiative

Information on the Initiative and Framework

www.nih.gov/climateandhealth



#### **Public Seminar Series**

Promoting transdisciplinary discussion and collaboration against this threat to health.

 https://www.nih.gov/climateandhealth#seminarseries



#### **Climate Change and Human Health Literature Portal**

Searchable database to provide access to the most relevant scientific literature

https://tools.niehs.nih.gov/cchhl/index.cfm



# Collection of resources can be found on our events page

#### **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.



Resource Pack for Protecting Children from Heat Stress

## Series webpage:

https://www.childhealthtaskforce.org/events/2022/11/adapting-health-systems-protect-children-impact-climate-change-series



# Climate Change and Child Health Discussion Series



### Engage with the moderators:

- Cara Endyke Doran:
   cendykedoran@globalcommunities.org
- Swathi Manchikanti: smanchikanti@unicef.org

Reach out to the Child Health Task Force Secretariat: <a href="mailto:childhealthtaskforce@jsi.com">childhealthtaskforce@jsi.com</a>

# Healthy Environment Healthy Children Framework:

https://www.unicef.org/media/91631/file/Healthy-Environments-for-Healthy-Children-Global-Programme-Framework-Summary.pdf

#### **CCRI**:

https://www.unicef.org/reports/climate-crisis-child-rights-crisis

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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