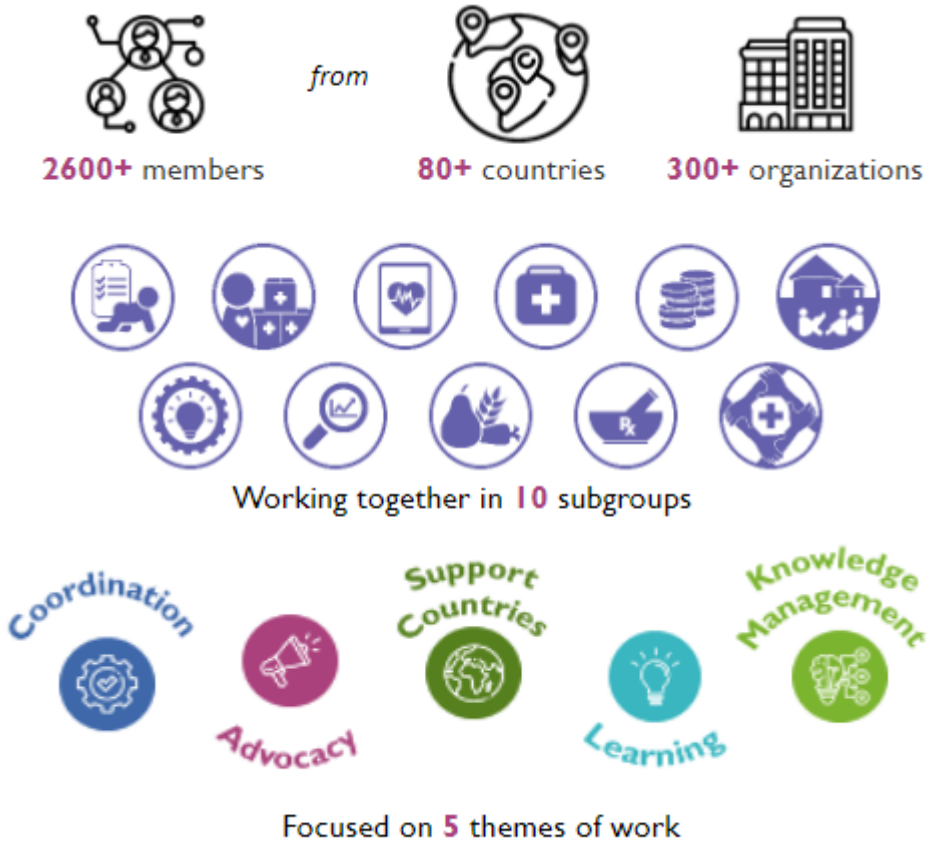
The Burden of Climate Change on Children

Addressing climate-related inequities in child health

4 May, 2022

Photo credit: Karen Kasmauski/MCSP, Anjiro, Madagascar

Child Health Task Force Today



Goal: Strengthen equitable and comprehensive child health programs - focused on children aged 0-19 years in line with Global Strategy for Women's, Children's and Adolescents' Health (2016-2030) - through primary health care, inclusive of community health systems.

Strategic Plan Priorities

STRATEGIC PRIORITY 1: *Engage global and country stakeholders about the need for increased resources, accountability and a multi-sectoral approach to child health.*

STRATEGIC PRIORITY 2: *Align around common goals and measures of success for child health along the life-course (including the newborn period, post-neonatal, and adolescence), with a focus on post-neonatal mortality reduction.*

STRATEGIC PRIORITY 3: *Partner to implement interventions, monitor for equitable coverage and quality care, and track progress towards SDG targets.*

STRATEGIC PRIORITY 4: *Foster the generation and sharing of evidence, lessons learned, tools and promising program approaches.*

STRATEGIC PRIORITY 5: *Synthesize and package information in sharable and accessible products and enhance communications.*

Read the Child Health Task Force Strategic Plan on the website:
https://bit.ly/chtfstrategyen

Presenters

Dr. Regina Bures
Senior Program Director
Population Dynamics Branch
Eunice Kennedy Shriver National Institute of Child Health and Human Development
National Institutes of Health

Dr. Norohasina Rakotoarison
Head of Health and Environment Department
Ministry of Health Madagascar

Alsa Bakhtawar
Consultant
USAID Building Health Cities Project
JSI

Dr. Maria Neira
Director
Environment, Climate Change and Health
World Health Organization

Climate Change and Child Health

Regina Bures, Ph.D.

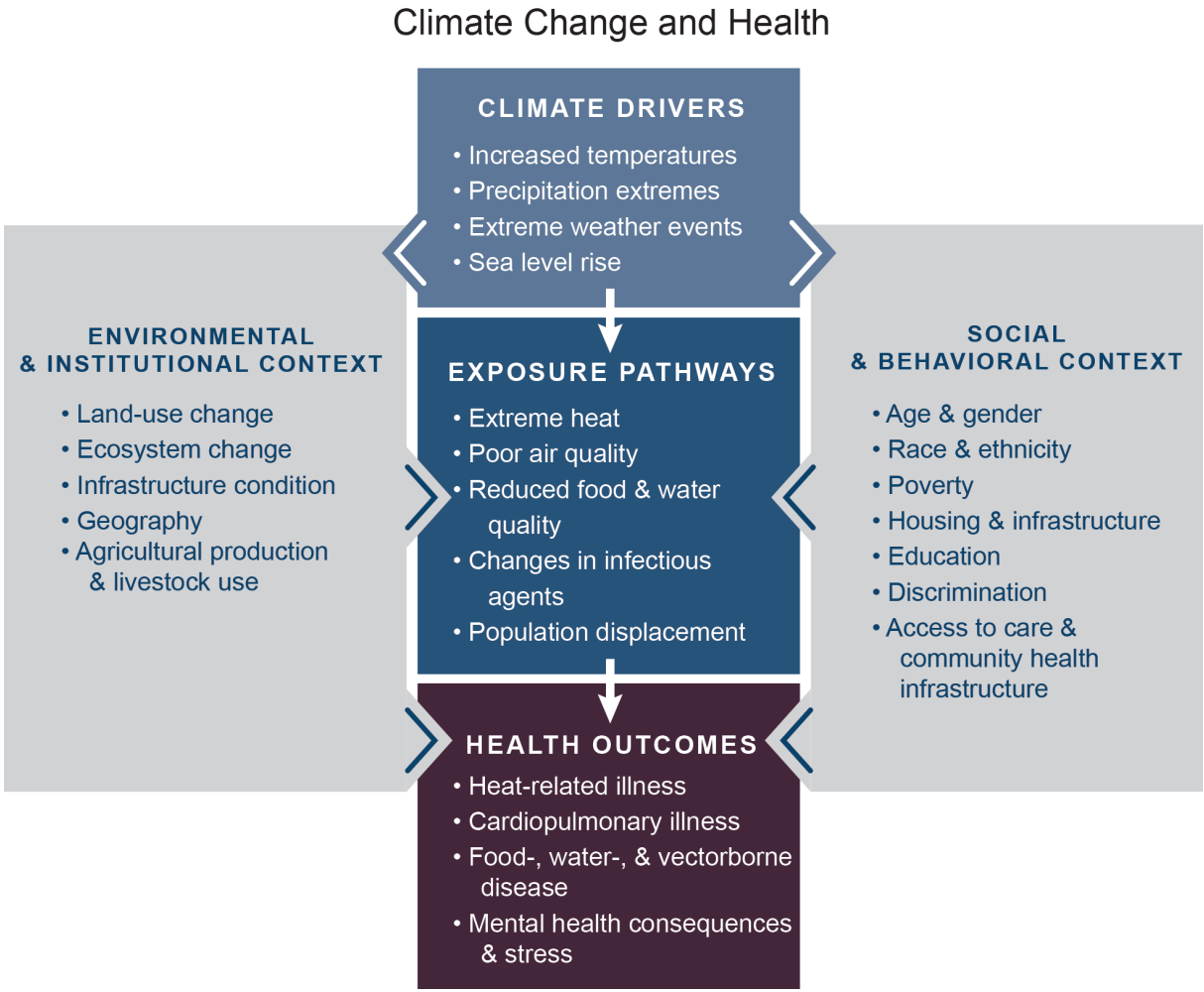
National Institutes of Health

Eunice Kennedy Shriver **National Institute of Child Health and Human Development**

May 4, 2022

Climate Impacts on Health

- A changing climate impacts many health outcomes both directly and indirectly
- Health impacts are **mediated** by interrelated environmental, exposure, social, and behavioral factors
- Solutions require innovative **trans-disciplinary** research using **systems approaches**

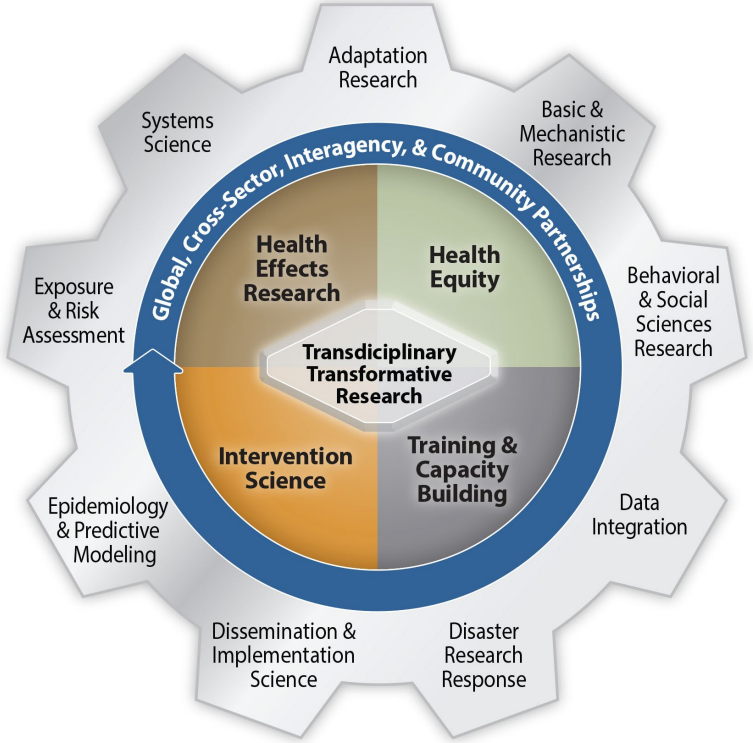


GCRP Climate Health Assessment, 2016

NIH Climate Change and Health Strategic Framework

Input from:

- RFI responses
- Portfolio analysis
- Strategic whiteboard session with NIH WG Staff
- Landscape analysis



See: www.nih.gov/ClimateAndHealth

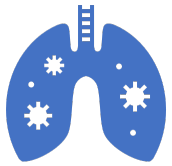
Climate Impacts on Children's Health

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 <15 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[a]	1.038 (1.032, 1.044)
1-week temperature lag[b]	1.014 (1.011, 1.017)
2-week temperature lag[b]	1.016 (1.013, 1.019)
3-week temperature lag[b]	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)[c]	0.913 (0.886, 0.941)
Year (secular trend)[d]	0.968 (0.961, 0.974)

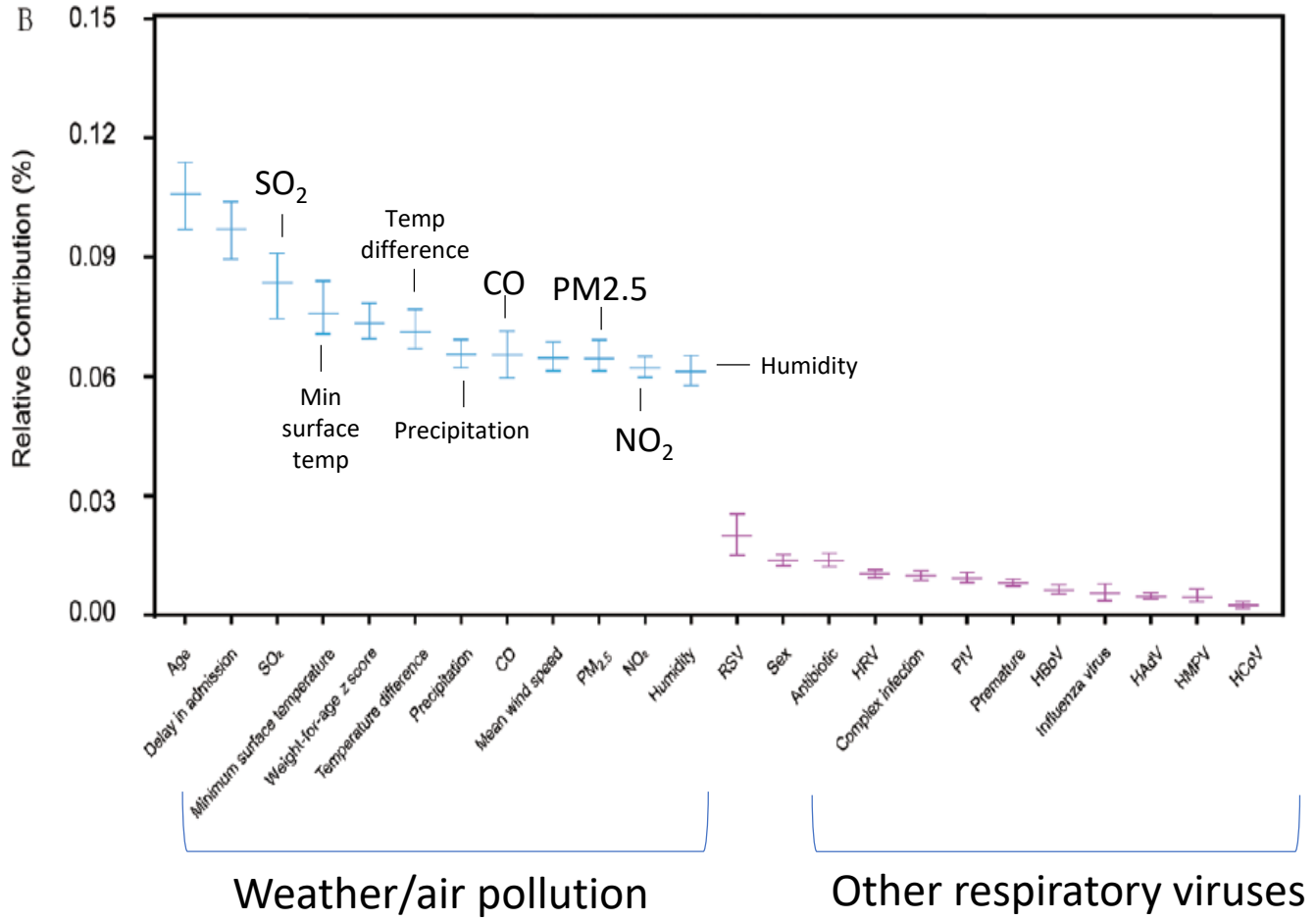
IRR incidence rate ratio, *CI* confidence interval
Multivariable model: IRRs are controlled for other variables in the model/table, and for province. This model also included terms for the interaction between the rotavirus vaccine era and temperature variables; the overall interaction was not significant ($p = 0.37$), thus the temperature estimates stratified by vaccine era are not presented.
[a] Combined effect of temperature across 3 weeks prior to weekly diarrhea report.
[b] 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.
[c] Compared to the pre-rotavirus vaccine era (2005–2009).
[d] Continuous term for year.

Delahov et al., Environ Health, 2021

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



Wang et al., Clin Infect Dis, 2021

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 malaria over dengue
- Public health burden of arboviruses could overtake that of malaria as climate suitability increases (warming) for arboviruses

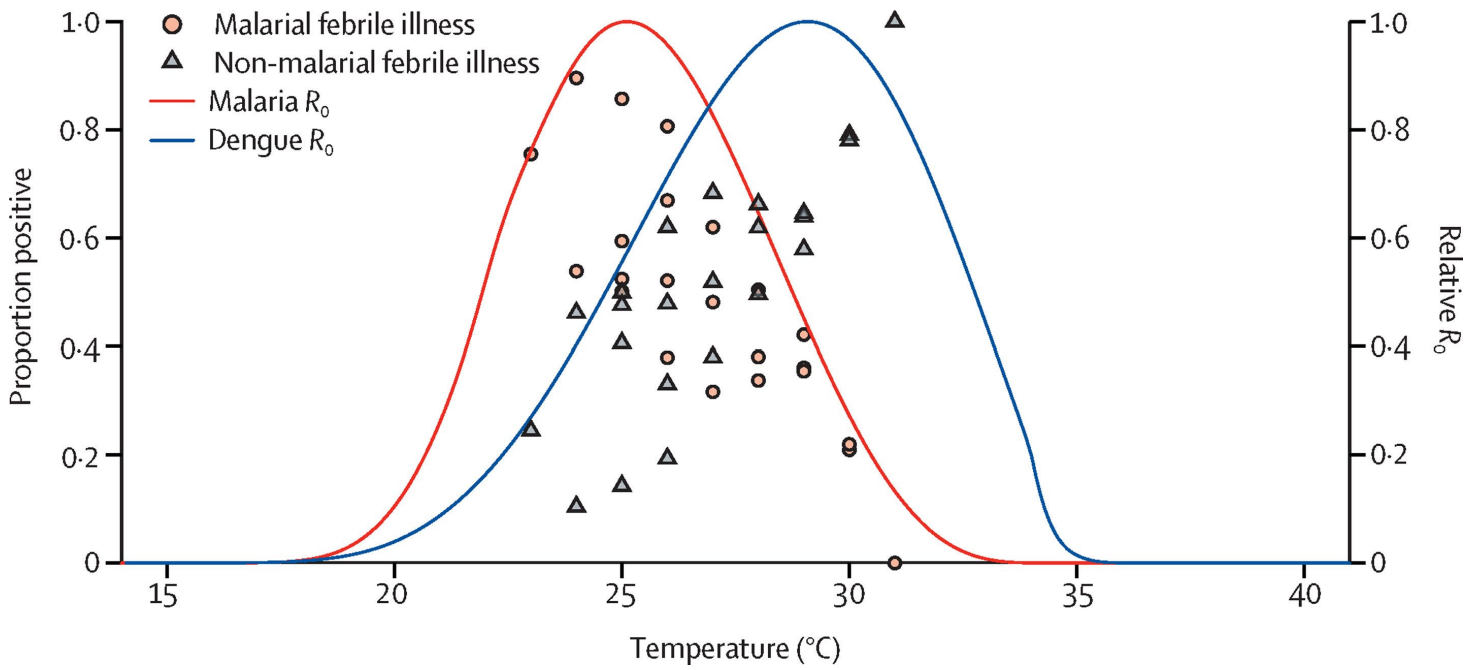


Figure 1. Malarial and non-malarial fever among Kenyan children from 2014 to 2018 versus temperature, overlaid on R_0 curves for malaria and dengue

Mordecai EA et al., Lancet Planet. Health, 2020

National Institutes of Health

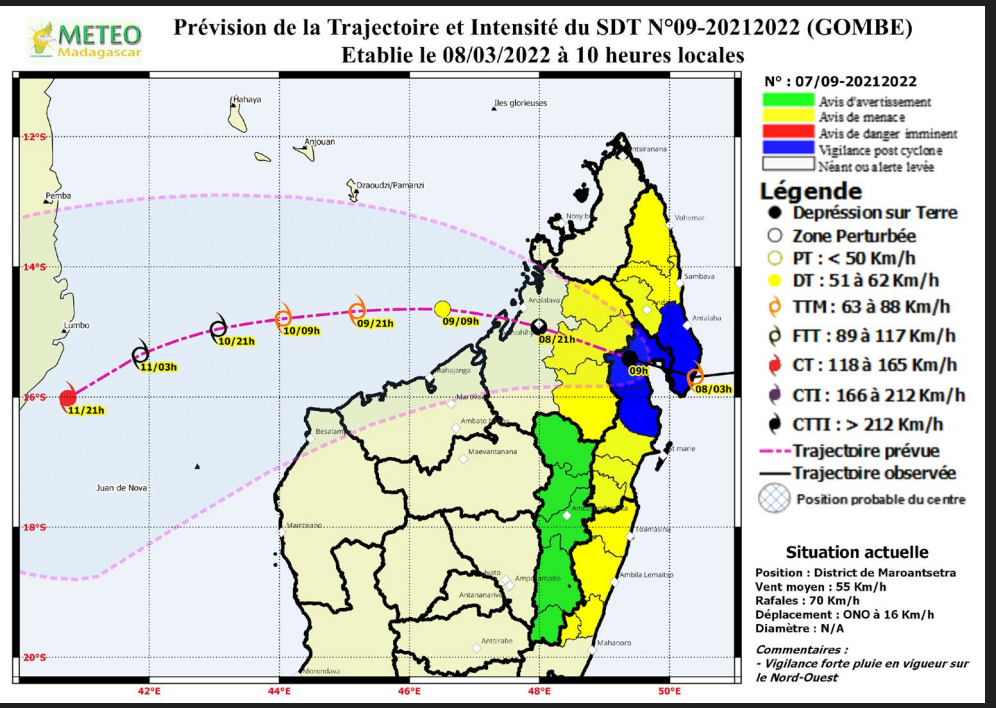
Thank you.

Impact du changement climatique sur les enfants à Madagascar : défis et perspectives

Docteur Norohasina RAKOTOARISON

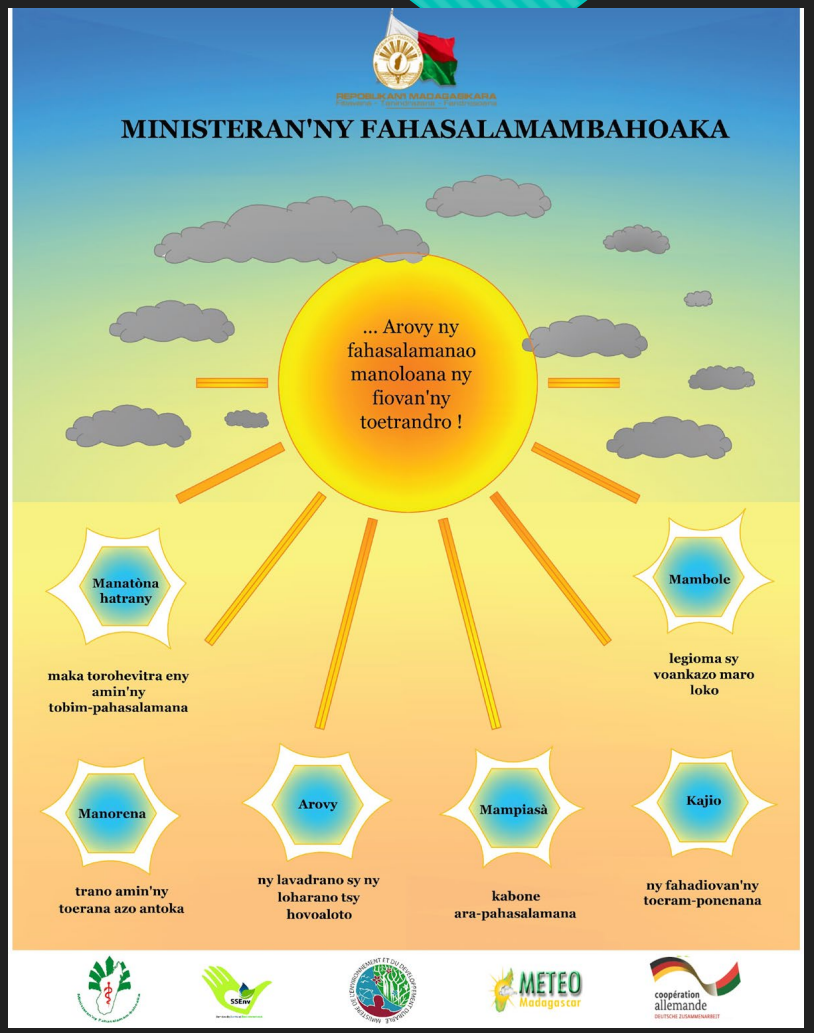
4 mai 2022

Changement climatique et santé



- Manifestation du changement climatique :
  - augmentation de la température, vague de chaleur, extrême précipitation, augmentation de l'intensité du cyclone, Augmentation du niveau de la mer
- Principaux impacts sanitaires du changement climatique chez les enfants :
  - Infections respiratoires aigues : 40% des motifs de consultation dans les centres de santé de base
  - Maladies diarrhéiques: 55.2% des nouveaux cas vus en consultation externe des CSB sont des enfants moins de 5 ans
  - Paludisme chez les enfants: 33.7% des nouveaux cas de paludisme vus en consultation externe au niveau des CSB sont des enfants de moins de 5 ans
- Contexte socioéconomique et sanitaire précaire
  - Taux de mortalité infanto juvénile : 44,2 /1000
  - Taux de malnutrition infantile : 48,9%
  - 70% de la population vivant au dessous du seuil de pauvreté
  - 54% du taux d'accès à l'eau potable

Mesures prises



- Cadrage stratégique et technique : Plan stratégique d'adaptation du secteur santé au changement climatique, Curriculum de formation des acteurs locaux, Manuel technique en santé et changement climatique
- Intégration du thème changement climatique dans le programme scolaire
- Renforcement des capacités des acteurs locaux
- Diffusion des messages d'alerte (Bulletin climat santé)
- Renforcement de la PCIMEC : prise en charge intégré des maladies de l'enfant au niveau communautaire

Principaux défis

- Connaissance et considération de l'adaptation au changement climatique dans la vie quotidienne des ménages
- Adresser les causes profondes de vulnérabilité des ménages
- Conscientiser les enfants des problématiques sanitaires posés par les changements climatiques

Perspectives

- Mise à jour de l'étude d'évaluation de la vulnérabilité et des capacités d'adaptation du secteur santé et des ménages au changement climatique
- Renforcement de la lutte contre la pollution pour réduire la vulnérabilité des enfants vis-à-vis des effets du changement climatique
- Renforcement des actions de sensibilisation de la population, et des enfants pour l'adoption de comportements positifs face au changement climatique

Je vous remercie de votre aimable attention!

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BUILDING HEALTHY CITIES

How BHC is supporting air pollution mitigation in Indore and Kathmandu

Alsa Bakhtawar

THRIVE NETWORKS

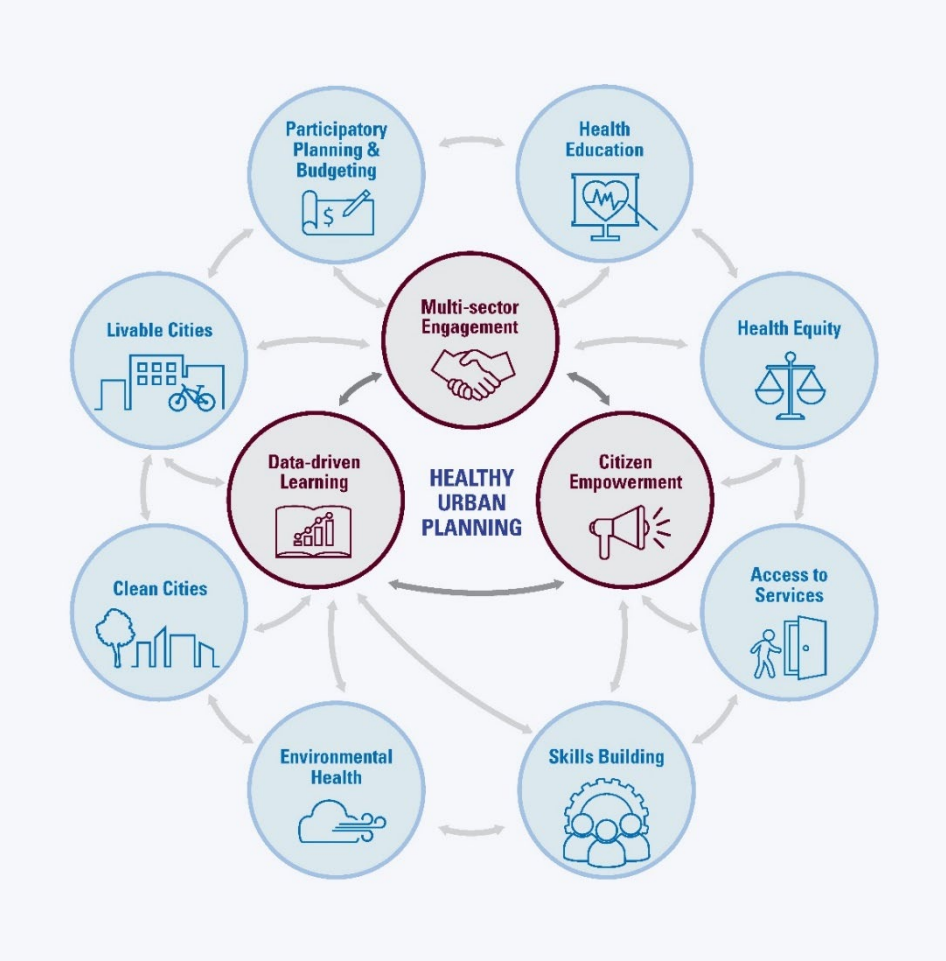
International Organization for Migration (IOM)
The UN Migration Agency

URBAN INSTITUTE

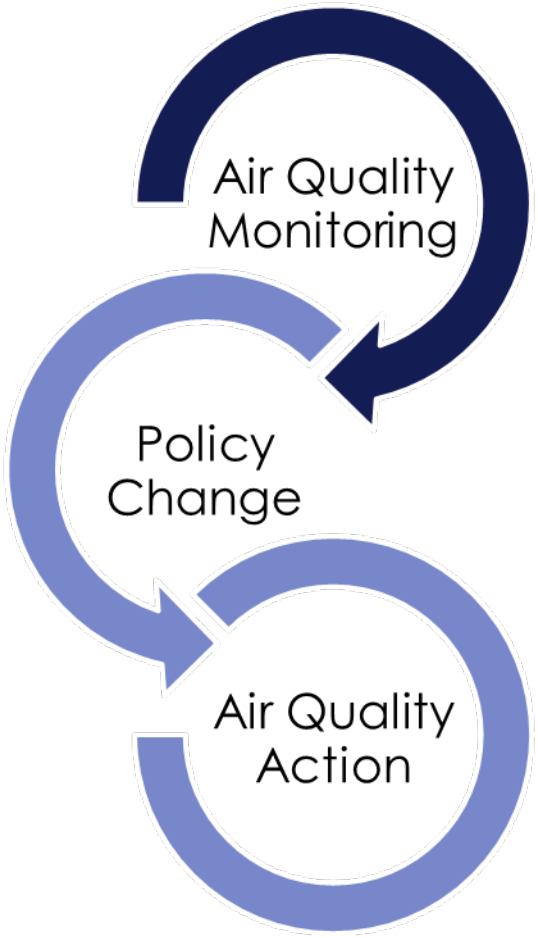
BHC's Systems Approach

Systems mapping from four cities have identified drivers of pollution-related health risks as being most closely related to:

- Short term goals trumping longer term health (citizens, private sector, government).
- Mismatches between community needs and government funding/regulations, even when political will exists to improve air quality.
- Lack of knowledge or access to information on pollution, including missing indicators on air quality in city data dashboards.



BHC's air quality work spans 3 areas



Air Quality Monitoring

- **Putting existing air quality data into the public eye:**

  BHC & MPPCB collaborated on a journal article in 2018 using existing air monitoring data that had not yet been evaluated over time.

- **Journey Mapping:**

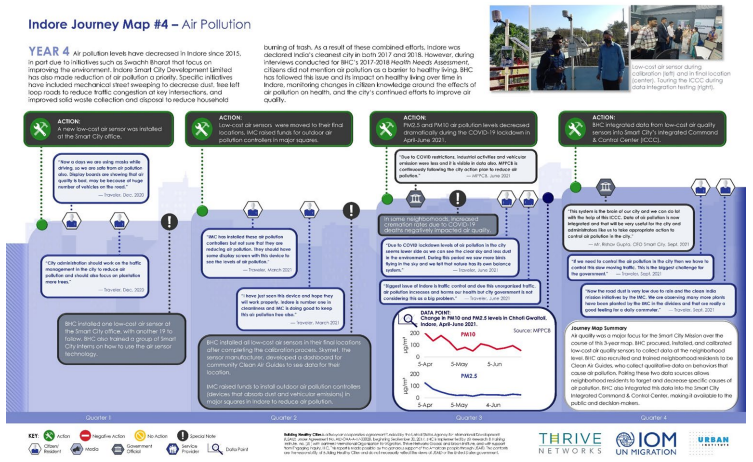
  Noting citizen's perceptions about air pollution and its impacts in the city

- **Using new technology:**

  Use of low-cost air sensors to monitor air quality in Indore.

- **Getting new air quality data to the public and decision makers:**

  Through multi-sectoral data sharing mechanisms.



Air Quality Policy Change

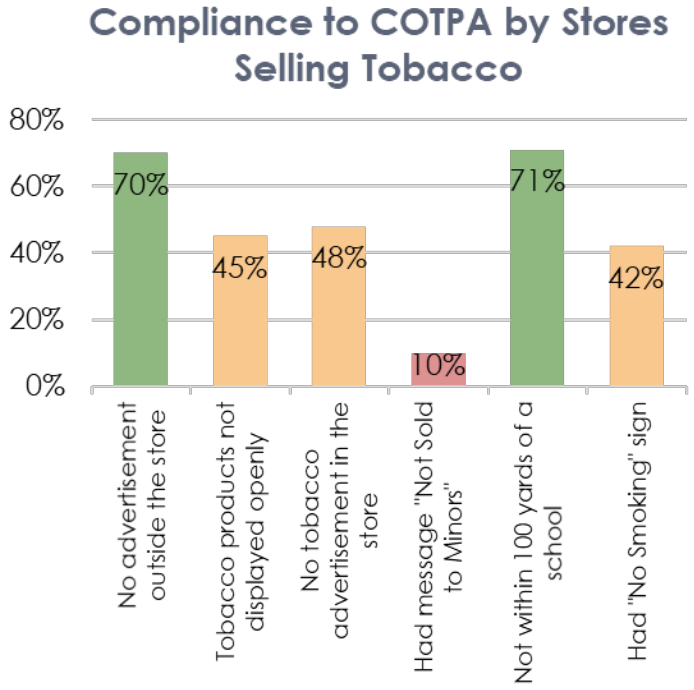
Indore Healthy City Action Plan:

Driven by the systems thinking process, it contains 7 city-wide "coherent actions" that are interlinked with one action that focuses specifically on creating better air quality and livability in Indore via citizen participation.

Orientation of City Officers of Indore on Cigarette & Other Tobacco Product Act (COTPA)

Kathmandu Valley Air Quality Action Plan (KVAP) Implementation Plan:

An implementation plan for Kirtipur and Chandragiri as pilot municipalities.



Air Quality Action

IEC campaign in Kathmandu:

Focused on open burning of waste and discouraging people from burning waste by showing the harmful effects to themselves and their family.

Engaging communities of Indore in air pollution mitigation through 20 Clean Air Guides:

Identifying and addressing sources of air pollution through community engagement.

Kaya Kalp:

Piloting a comprehensive air quality approach in one urban poor community of Indore.

Consensus building on air quality action

Thank You

World Health Organization Presentation

The WHO shared the following publications:

Inheriting a sustainable world: Atlas on children's health and the environment

Don't pollute my future! The impact of the environment on children's health

Panel Discussion Questions

1) The threat of climate change on the health and wellbeing of children is compelling. Why has it been so hard to move the needle on this issue?
2) What are the evidence, policy and practice gaps to accelerate actions on mitigating the impacts of climate change?
3) Listening to the experiences from Madagascar and India, how do you see the intersection between the available guidance and research to support actions? How important was government and municipal commitment to address climate change? What changes were made that reflected this commitment (e.g., funding)? Did you hear a gap that needs to be addressed?
4) Reflecting on your experience to date, if you were to do your project/program again, what would you do differently? What would you keep?

Breakout Rooms

1) Climate-related risk factors for major killers (pneumonia, diarrhea, malaria)
2) Effects of climate change on child health in humanitarian settings
3) Climate effects on malnutrition and food insecurity for children
4) Equity, child rights & climate

How to engage more with the network

Visit the website
www.childhealthtaskforce.org

Browse the website resources, events, information hubs on COVID-19 & child health and school health & nutrition, visit the subgroup pages!

Email the Secretariat
childhealthtaskforce@jsi.com

Contact us with feedback or resources to share. If you participate in a national child health technical working group – reach out for coordination & technical support!

Follow our new LinkedIn
www.linkedin.com/company/child-health-task-force

Stay up-to-date on events, employment opportunities, new publications, tools & resources!

Spread the word
https://bit.ly/joinchtf

Encourage your colleagues to join us using the link above. If you work in a country, make sure the MOH and other key partners are in the loop!

The materials from this webinar (recording & slides) will be available later in the week here on the website: https://www.childhealthtaskforce.org/events