

Climate And Extreme Heat: The Health Case for Improving Maternal and Neonatal Health

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1/31/2024

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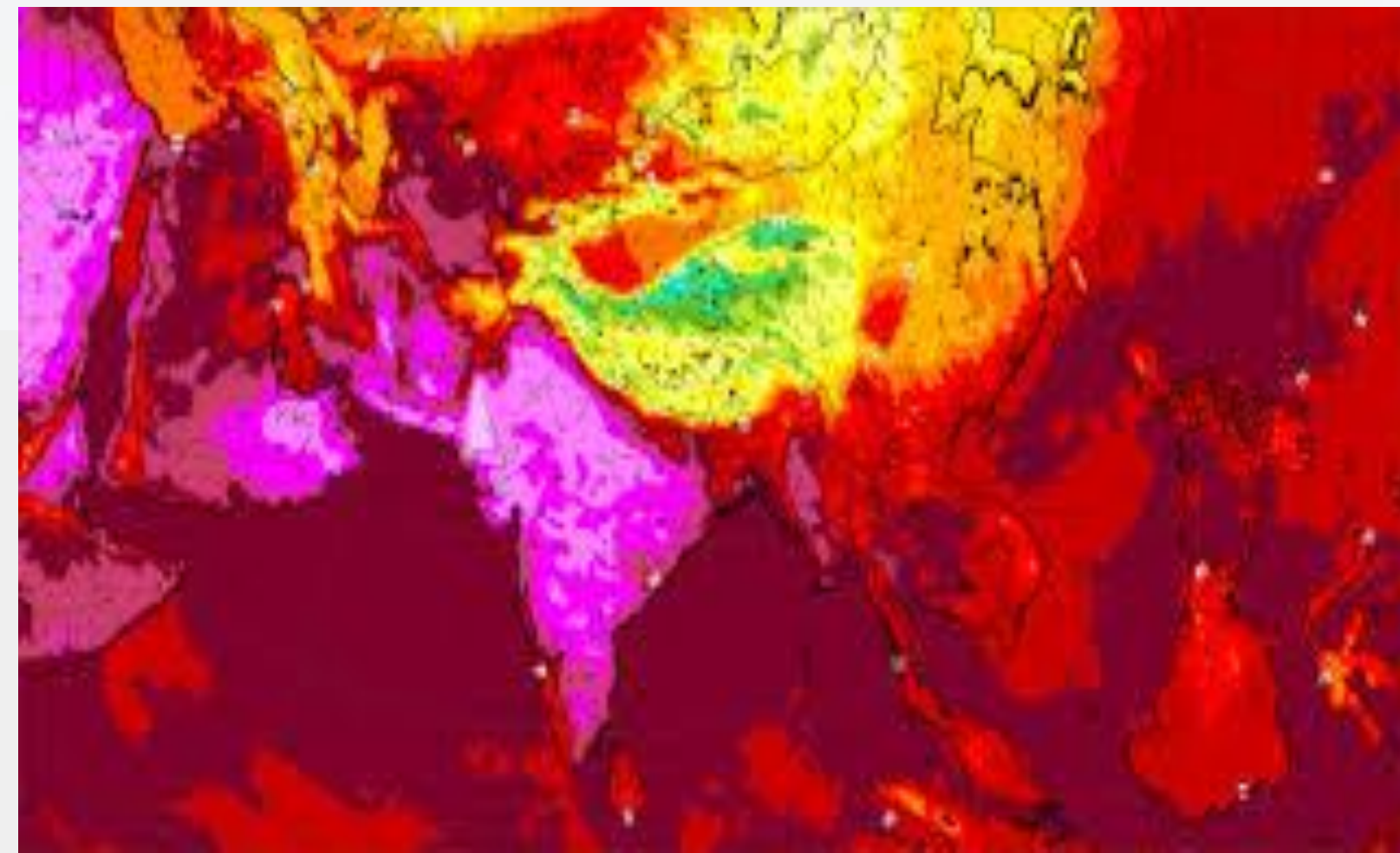
CLIMATE CHANGE HEAT EXPOSURE AND AIR POLLUTION

The Problem

Disconnected Air Pollution (AP) and Climate Change (CC) approaches.

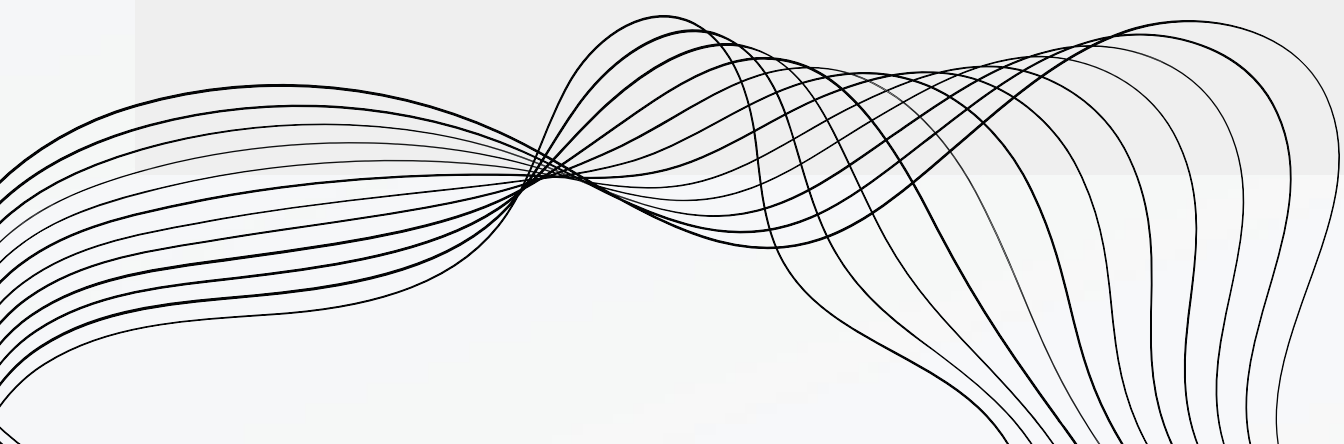
Where is the gap?

The full extent of the interaction between CC and AP remains incompletely understood.



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What We Know

Sources and Contribution

Burning fossil fuels, a major source of air pollution, also releases greenhouse gases contributing to climate change.

Climate Influence on Air Pollution

Changes in climate patterns influence atmospheric circulation, precipitation, and pollutant distribution, exacerbating air pollution issues.

Heatwaves

intensified by climate change, worsen air pollution effects by increasing ground-level ozone formation.

Health Impacts

Both air pollution and climate change have significant overlapping health impacts. Air pollution leads to respiratory and cardiovascular diseases; climate change exacerbates conditions like asthma and allergies.

Scope of my presentation

- ❑ Present findings from the Climate Heat Maternal and Neonatal Health Africa (CHAMNHA) consortium on how heat impacts maternal and neonatal health.
- ❑ Highlight the interplay between extreme heat and indoor Air pollution and its impacts on maternal and newborn health
- ❑ Advance the case for interdisciplinary research using a system perspective to understand the interplay between CC and AP on human health

CHAMHA Partners, Countries & Funders

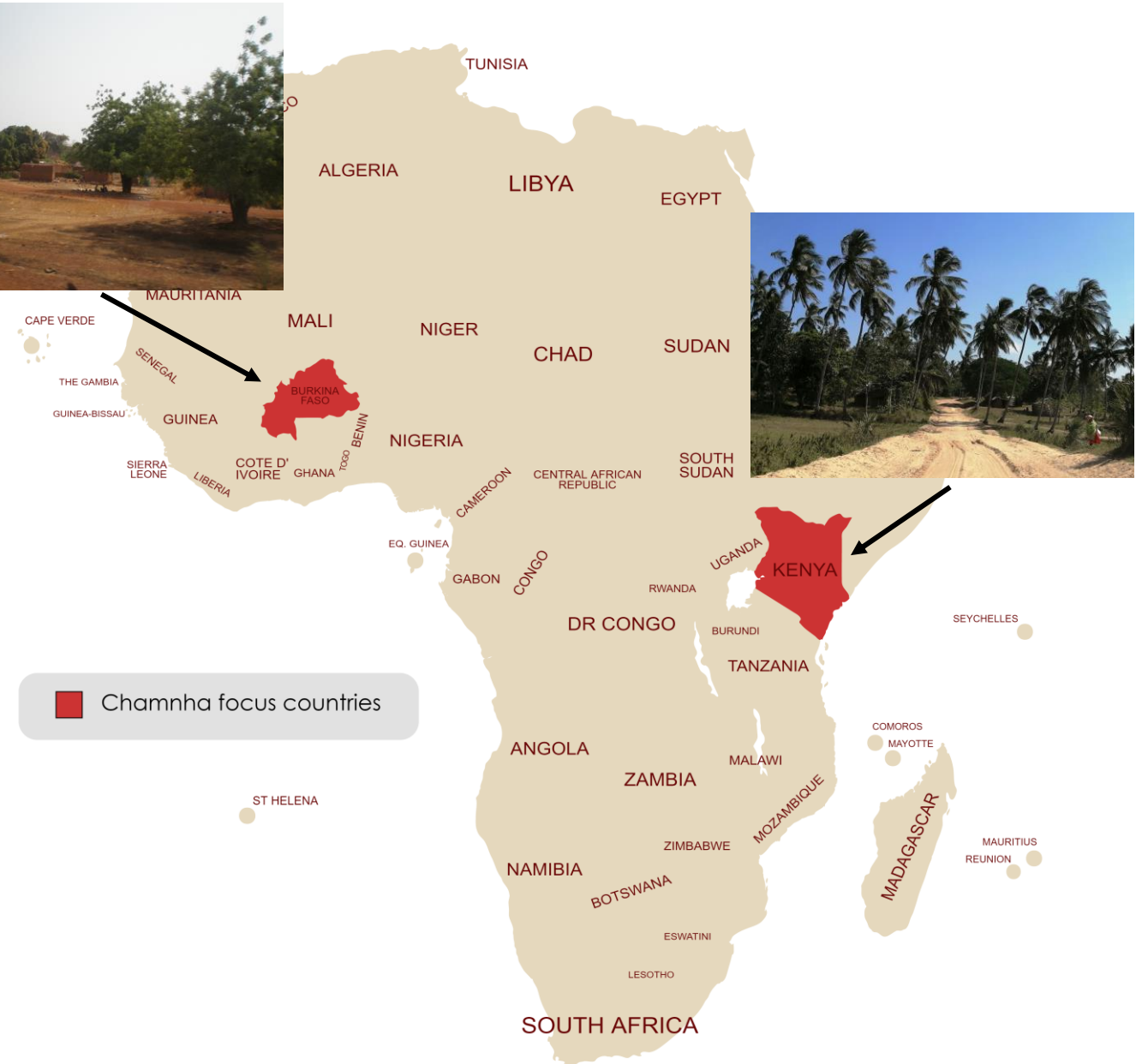
Partners:



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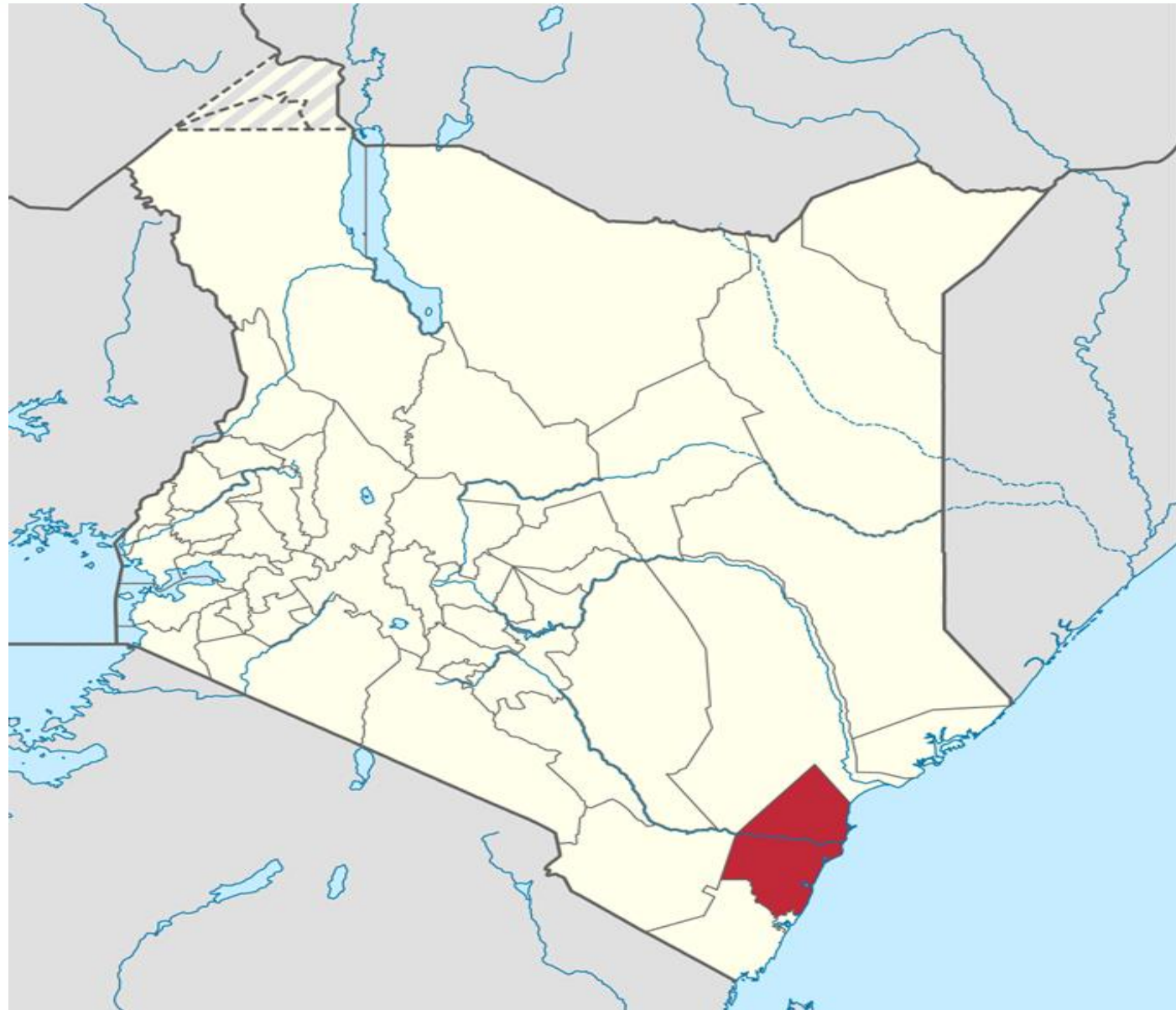


Created with mapchart.net

Funders:



Field sites : Kenya and Burkina Faso



1 urban site: Ouagadougou, Centre region

1 rural site: Kaya District, Centre-Nord region





Heat is perceived to have a harmful effect on maternal and neonatal health.



HEAT EFFECTS ON MATERNAL AND NEWBORN HEALTH

High temperatures increase risk of:

- Congenital abnormalities (heat is teratogenic)
- Pre-term birth
- Stillbirth
- Hypertension/ pre-eclampsia
- Gestational diabetes
- Malaria and infectious illnesses

Heat Illness

Heat effects on health-related behaviours:

- Reduced time breastfeeding
- More likely to supplement breastfeeding
- Less likely to access antenatal care
- Less likely to use bed nets
- More anxiety (especially with reduced access to water for hygiene)

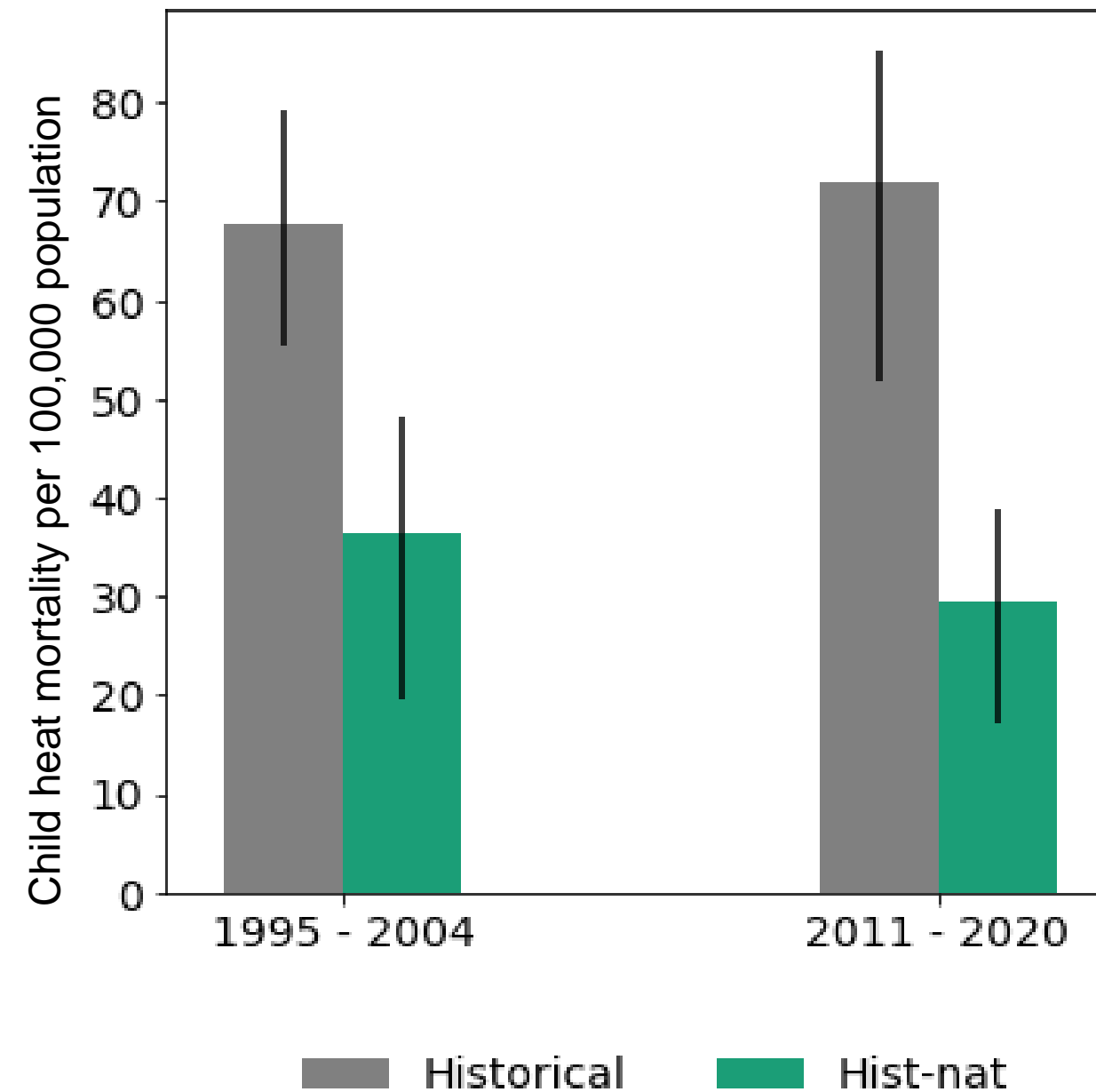
Occupational health risks



Climate change impacts on heat-related child mortality



- Climate change has already had impact on heat-related child mortality in sub-Saharan Africa
- Climate penalty
 - Annual average number of heat-related child deaths for period 2005 – 2014 are higher than would have been observed without observed climate change



CMIP6 ensemble mean of child heat related mortality in Africa [WHO AFRO region] with climate change (historical) and without (hist-nat) Chapman et al., *in prep*

Climate change has already undermined improvements in child mortality and the ability of countries to achieve SDG3 [Target 3.2]

Neonate



Due to extreme heat, some babies are born underweight, many have blisters on the head or in the mouth, which causes discomfort and difficulties in sleeping, breastfeeding and kangaroo care

“During periods of high temperatures, use of Kangaroo care affects the baby ... it will cause discomfort to the baby because of the heat and will develop those rashes [malenge lenge]

(Focus group discussions, female community health)



“Babies develop blisters after birth on the tongue, in the face ...can't feed and cries most of the time”

(Female focus group discussions –mothers in-laws, Kilifi)



CHAMNHA
CLIMATE, HEAT AND
MATERNAL AND NEONATAL
HEALTH IN AFRICA

“these pregnant mothers, they feel abnormal heat”

“when there is extreme heat, my temperature or blood pressure will shoot up as well”

“At night she may be throwing her hands as if she is dying. Mothers get really exhausted”

The body is “burning”, “really hot”, “on fire”

“You will feel the speed of your heartbeat increases

“She will be harsh to the children and the husband”

“Often she is a little sad, angry and even mean. The slightest noise makes her angry, especially during the hot season.”

“No matter how many times the pregnant woman takes a shower, she will always be hot”

“This body feels like it is not mine”

“When I wasn’t pregnant, I didn’t feel [heat] so much”

“The hot weather can bring about pressure”

“They complain of tachycardia, fast heart rate and the baby gets up to the lungs”,

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“when I go with her to the hospital, I am told it is because of carrying heavy loads, that is why she is bleeding”

“Their faces look flushed, lips are dry. To me I feel it is like they get dehydrated”

Pregnant women complain that “their chests are heating up”

“The heat troubles me so much until I cannot sleep”

“She feels like going to sleep instead of working...she does not do the work she should be doing in the house”

“Small pimples that itch so much”

“scratching my body more often”



Indoor pollutants



- Smoke has detrimental direct effects in pregnancy, postpartum and on newborns.

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CC & AP interaction

Built Environment



Unventilated homes, no windows, no chimneys or vents to disperse pollutants and reduce harmful exposure.

Heat

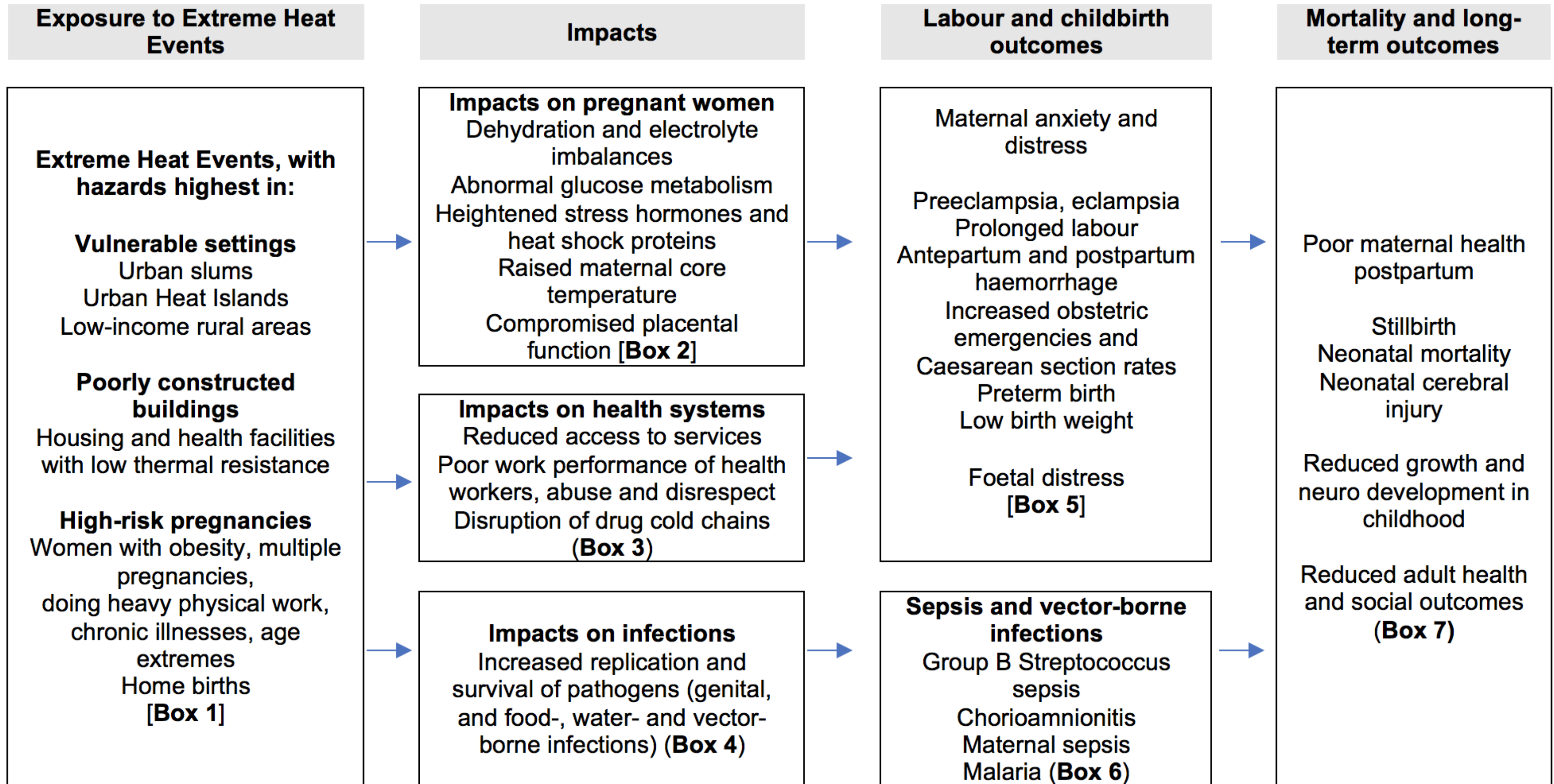
Heat from Cooking



The interactions of intense heat and smoke from cooking fires, indoor dust, and extremely high temperatures pose significant health risks to mothers.

These intersectionalities are not well studied

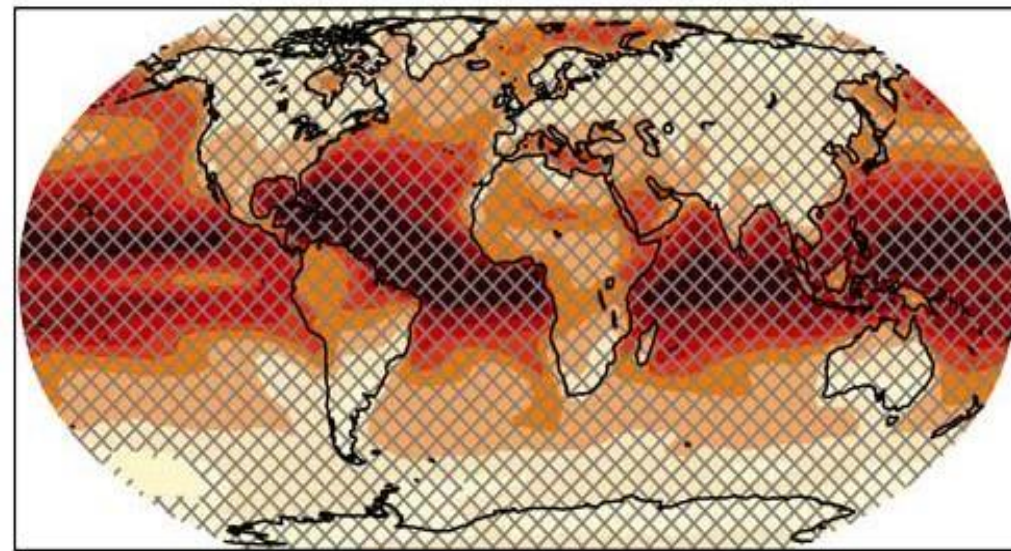
Figure 2: Conceptual framework for exposure, impacts and outcomes



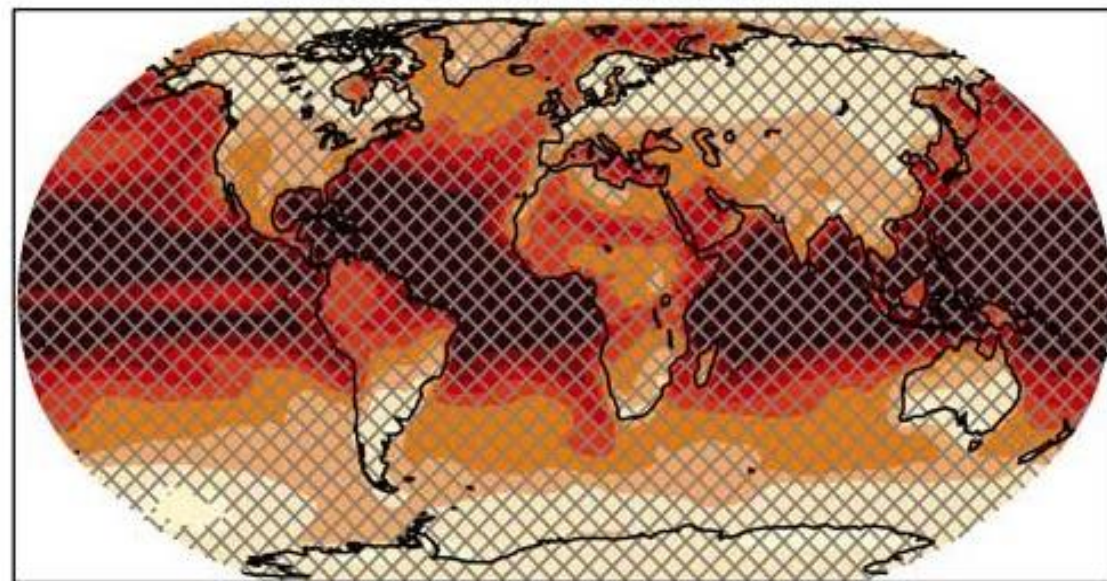
Evidence for each component of the framework shown in Forest Plots in Figure 3

Published evidence from Kilifi, Kenya

Change in number of hot days (NHD) at 1.5°C GMST warming



Change in number of hot days (NHD) at 2.0°C GMST warming



days

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“Mothers get really exhausted!” The lived experience of pregnancy in extreme heat: Qualitative findings from Kilifi, Kenya

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BMC Pediatrics

RESEARCH Open Access

Too hot to thrive: a qualitative inquiry of community perspectives on the effect of high ambient temperature on postpartum women and neonates in Kilifi, Kenya

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Abstract
Objective To understand community perspectives on the effects of high ambient temperature on the health and wellbeing of neonates, and impacts on post-partum women and infant care in Kilifi.
Design Qualitative study using key informant interviews, in-depth interviews and focus group discussions with pregnant and postpartum women (n = 22), mothers-in-law (n = 19), male spouses (n = 20), community health volunteers (CHVs) (n = 22) and stakeholders from health and government ministries (n = 16).
Settings We conducted our research in Kilifi County in Kenya's Coast Province. The area is largely rural and during summer air temperatures can reach 37°C and rarely go below 23°C.

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SOLUTIONS

- 1/51/2024 • Tailored interventions including raising community awareness about the health risks of indoor pollution and heat exposure.
- Promote behaviour change by engaging with communities to understand their cooking practices, cultural preferences, and socio-economic constraints
- , socioeconomic

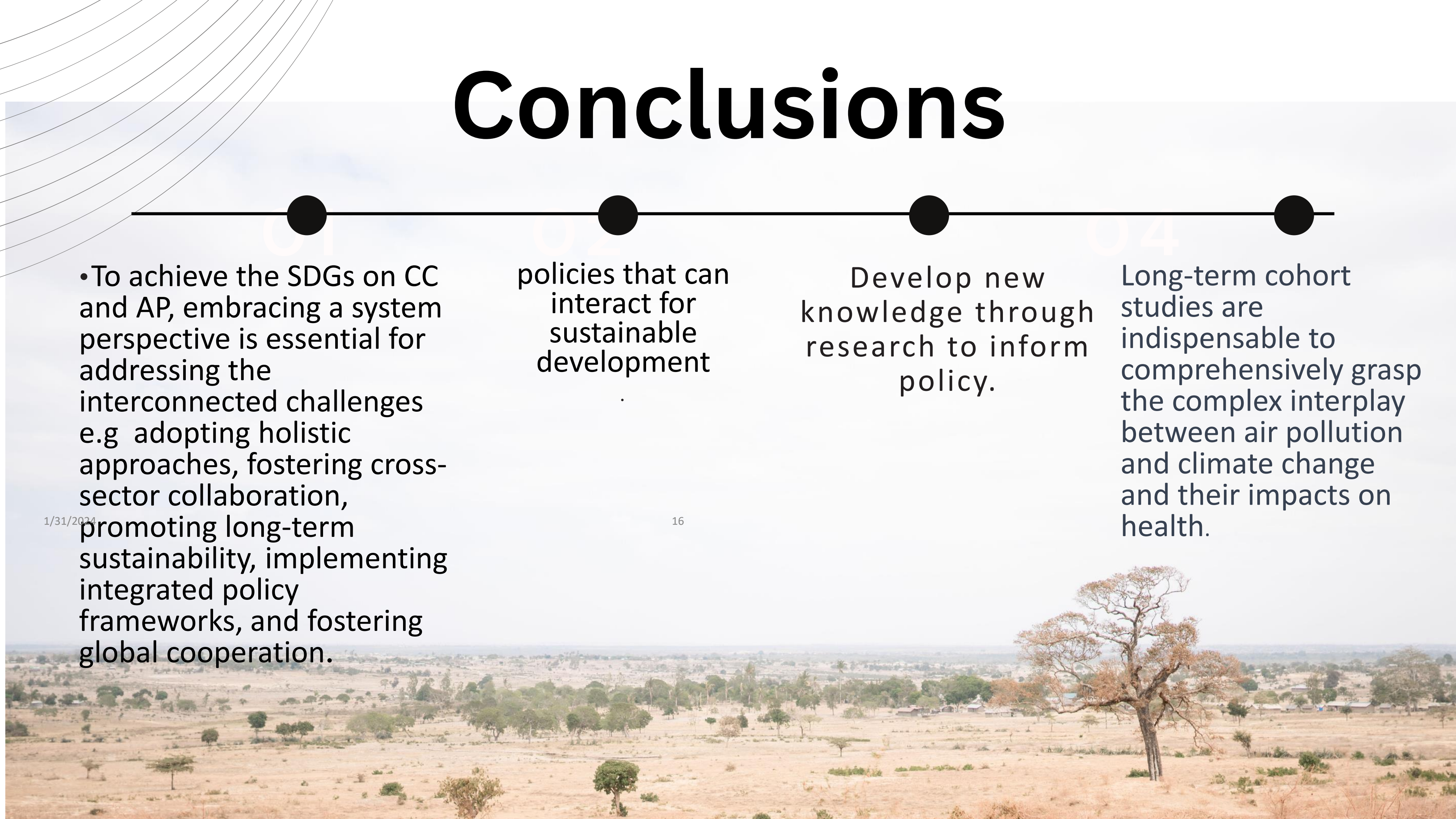
Conclusions

•To achieve the SDGs on CC and AP, embracing a system perspective is essential for addressing the interconnected challenges e.g adopting holistic approaches, fostering cross-sector collaboration, promoting long-term sustainability, implementing integrated policy frameworks, and fostering global cooperation.

policies that can interact for sustainable development

Develop new knowledge through research to inform policy.

Long-term cohort studies are indispensable to comprehensively grasp the complex interplay between air pollution and climate change and their impacts on health.



THANK YOU FOR LISTENING