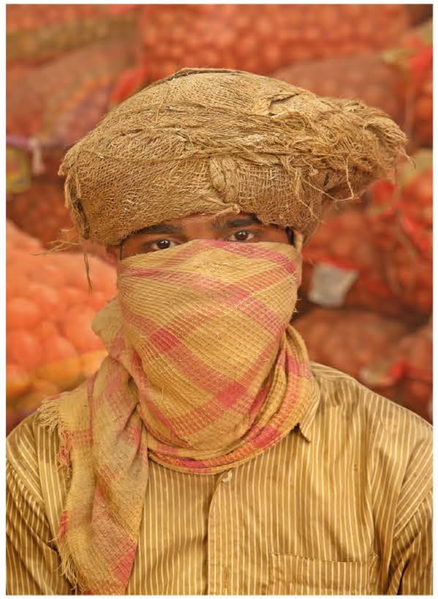
GLOBAL HEAT HEALTH INFORMATION NETWORK

Linking Global and Local approaches to extreme heat protection



Joy Shumake-Guillemot

South Asia Heat Health Summit

14 February, 2020 Pune ,India

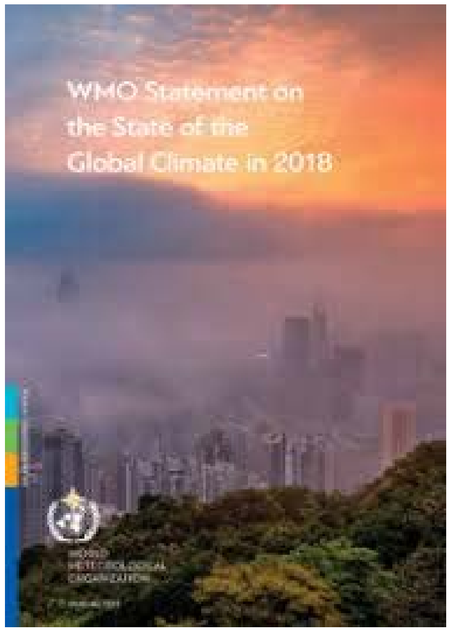
A WARMING WORLD

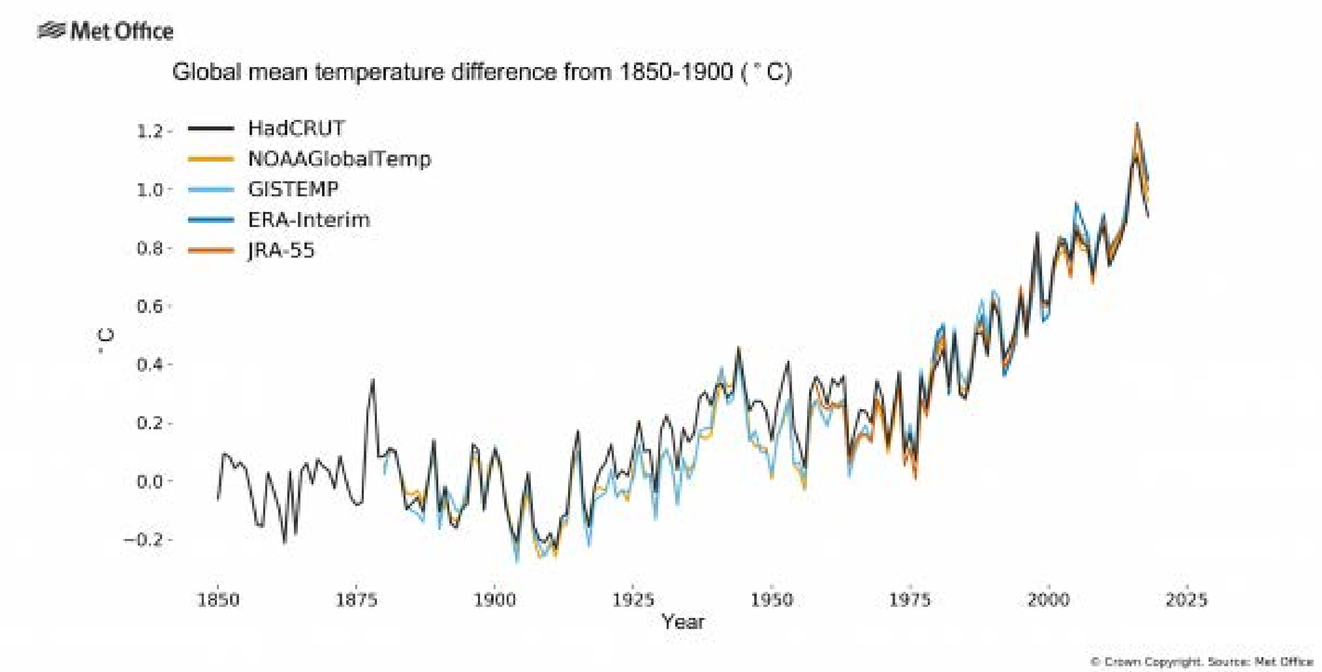
Already experienced 1C global average warming

Currently experiencing +.2C warming per decade

The hottest 20 years on record have occurred in the past 22 years, with the hottest 4 years between 2015-2018.

2019 set to join, potentially being hottest





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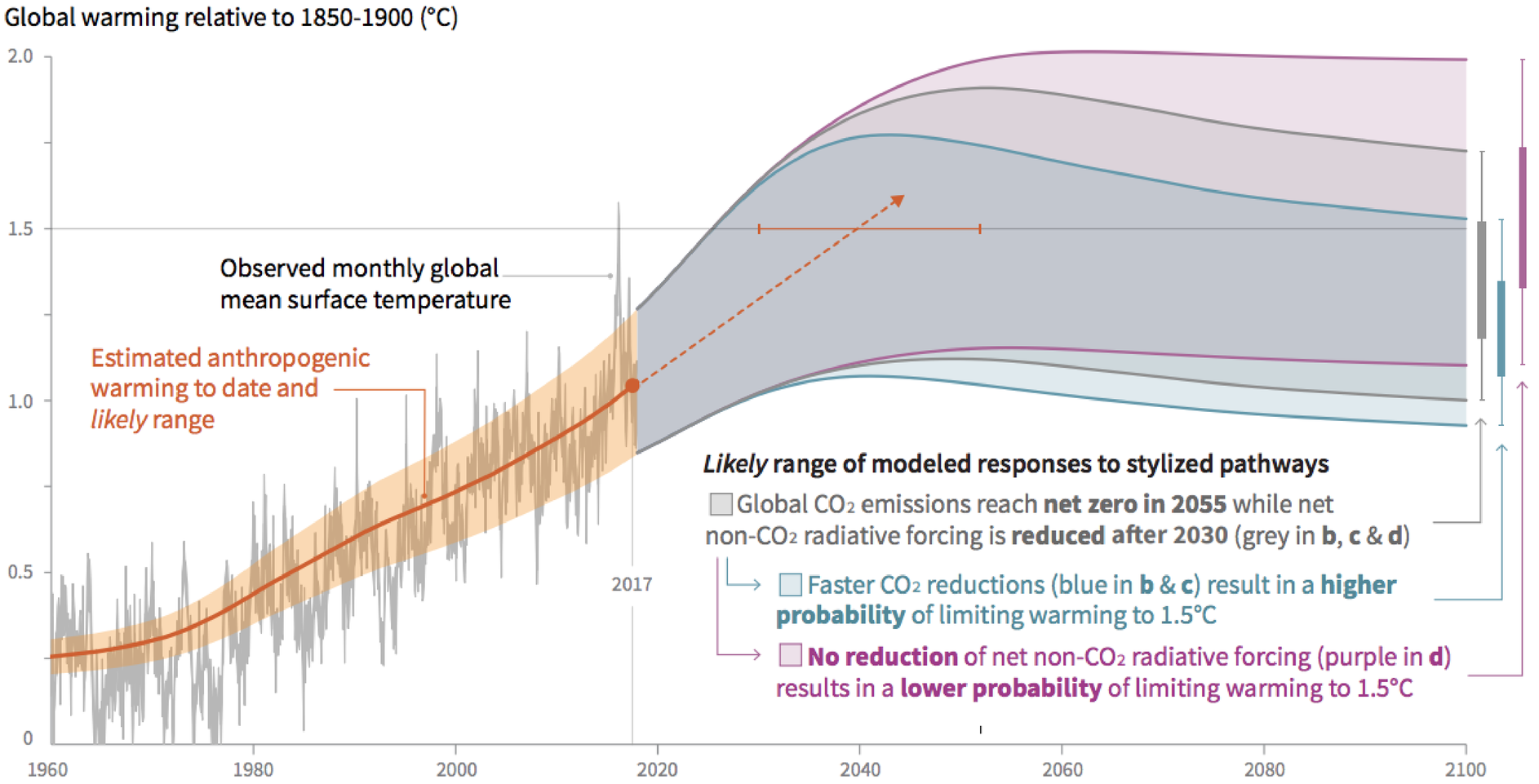
Climate Negotiations are about not letting warming exceed 1.5C

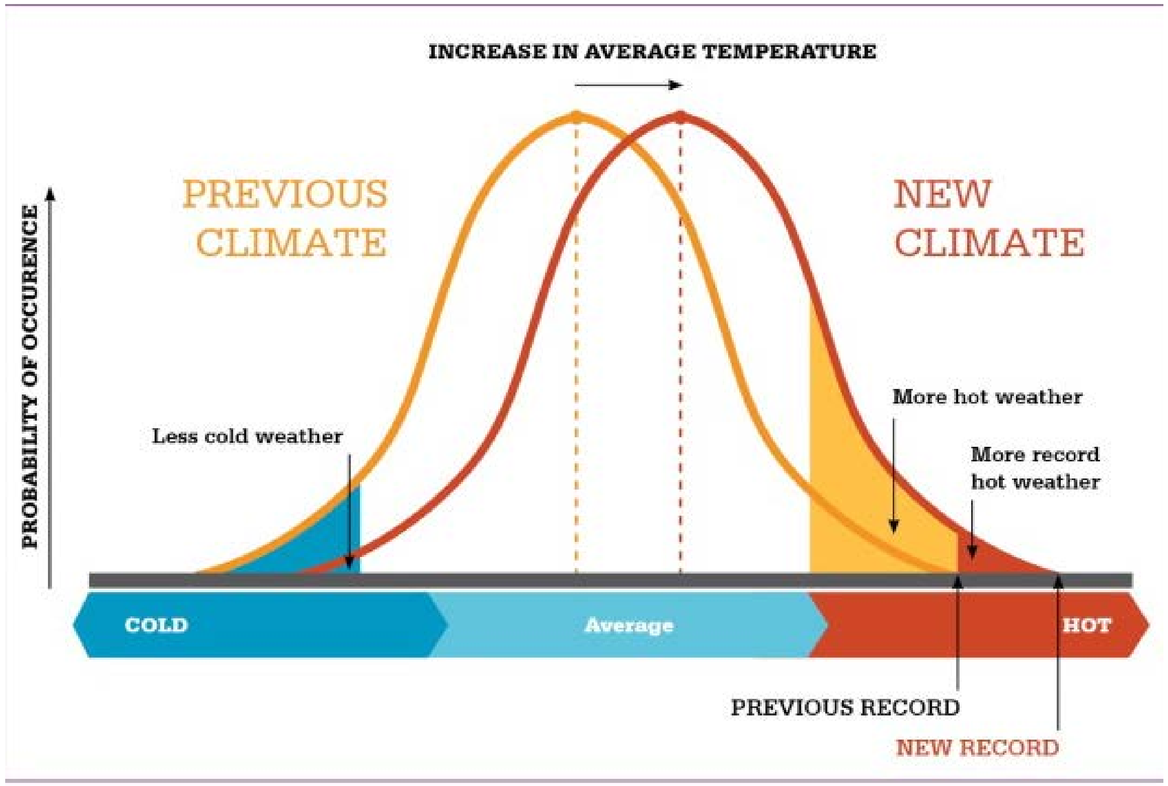
“Locked-in” Warming

Global avg. mean warming will reach 1.5C between 2030 and 2052



INCREASED RISK

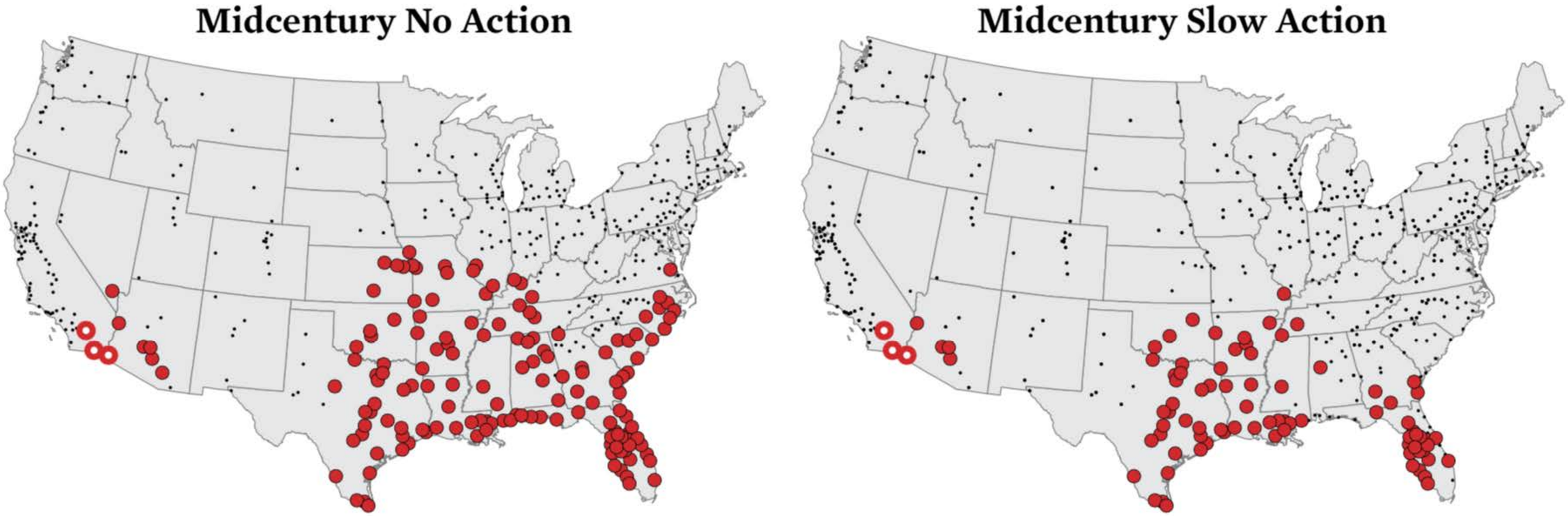
Climate Change makes extreme weather more likely, and an urgent health threat for humans.



Source: Modified from IPCC, 2007

www.climatecommission.gov.au

FIGURE 7. Urban Areas Face Frequent, Extreme Heat by Midcentury



2050 **150 urban areas** **vs** **80 urban areas**

www.ucsusa.org/sites/default/files/attach/2019/07/killer-heat-analysis-full-report.pdf

LATEST RESEARCH

New research from 27 global institutions published in the Lancet finds that **our vulnerability to heat is unacceptably high and rising in all regions of the world.**

Outdoor workers, people with underlying health conditions and the urban elderly are especially at risk.

LANCET COUNTDOWN: TRACKING PROGRESS ON HEALTH AND CLIMATE CHANGE

- 157 million more vulnerable people were subjected to a heatwave last year than in 2000, and 18 million more than in 2016.
- 153 billion hours of work were lost in 2017 due to extreme heat as a result of climate change. China alone lost 21 billion hours, the equivalent of a year's work for 1.4% of their working population. India lost 75 billion hours, equivalent to 7% of their total working population. New methodologies have captured this data for the first time.
- Rising ambient temperatures are placing vulnerable populations at increased risks across all regions of the world. Europe and the East Mediterranean are particularly at risk, most likely due to ageing populations living in cities, with 42% and 43% of over 65s vulnerable to heat exposure - markedly higher than Africa (38%) and southeast Asia (34%).
- Heat greatly exacerbates urban air pollution, with 97% of cities in low- and middle- income countries not meeting WHO air quality guidelines.
- Heat stress, an early and severe effect of climate change, is commonplace and we, and the health systems we rely on, are ill-equipped to cope.
- The mean global temperature change to which humans are exposed is more than double the global average change, with temperatures rising 0·8°C versus 0·3°C. assuming each person experienced a heatwave once.

Source: *The Lancet Countdown on Health and Climate Change 2018*

HEAT RISK AMPLIFIES OTHER DISASTER RISKS

Co-occurrence with

Droughts
Fire
Hazardous Air Quality
Cyclones
Infrastructure Outage

Heat itself is often not considered a disaster, it is not factored into emergency management planning as it should be.

USA, 2017: Hurricane Irma knocks out power, amplifying impacts of a concurrent heatwave.

INTEL SEPTEMBER 26, 2017 / 2:45 AM / 2 YEARS AGO

With Irma - and a power failure - Miami gets a taste of deadly heat

Adriana Brasileiro 9 MIN READ

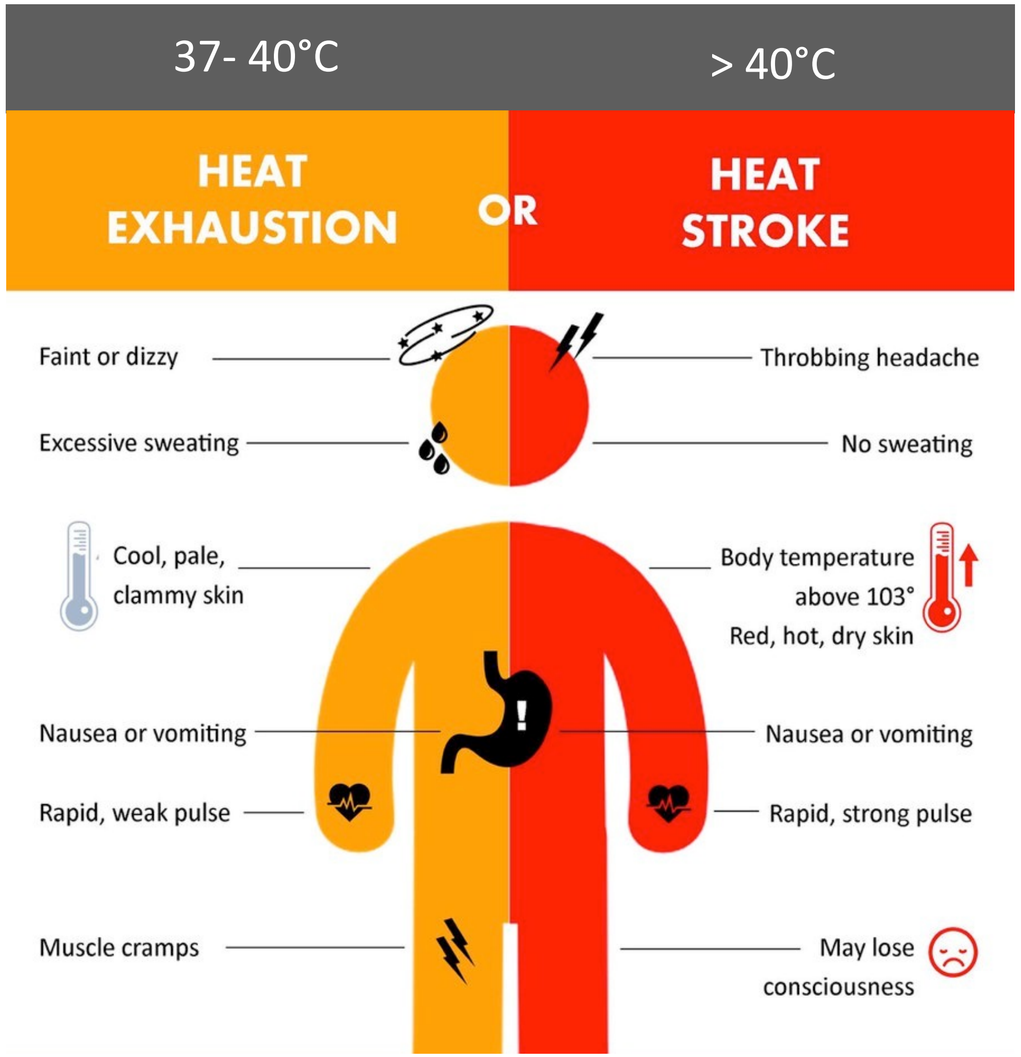
MIAMI (Thomson Reuters Foundation) - Miami is a city that lives on air conditioning. When it fails, people can die.

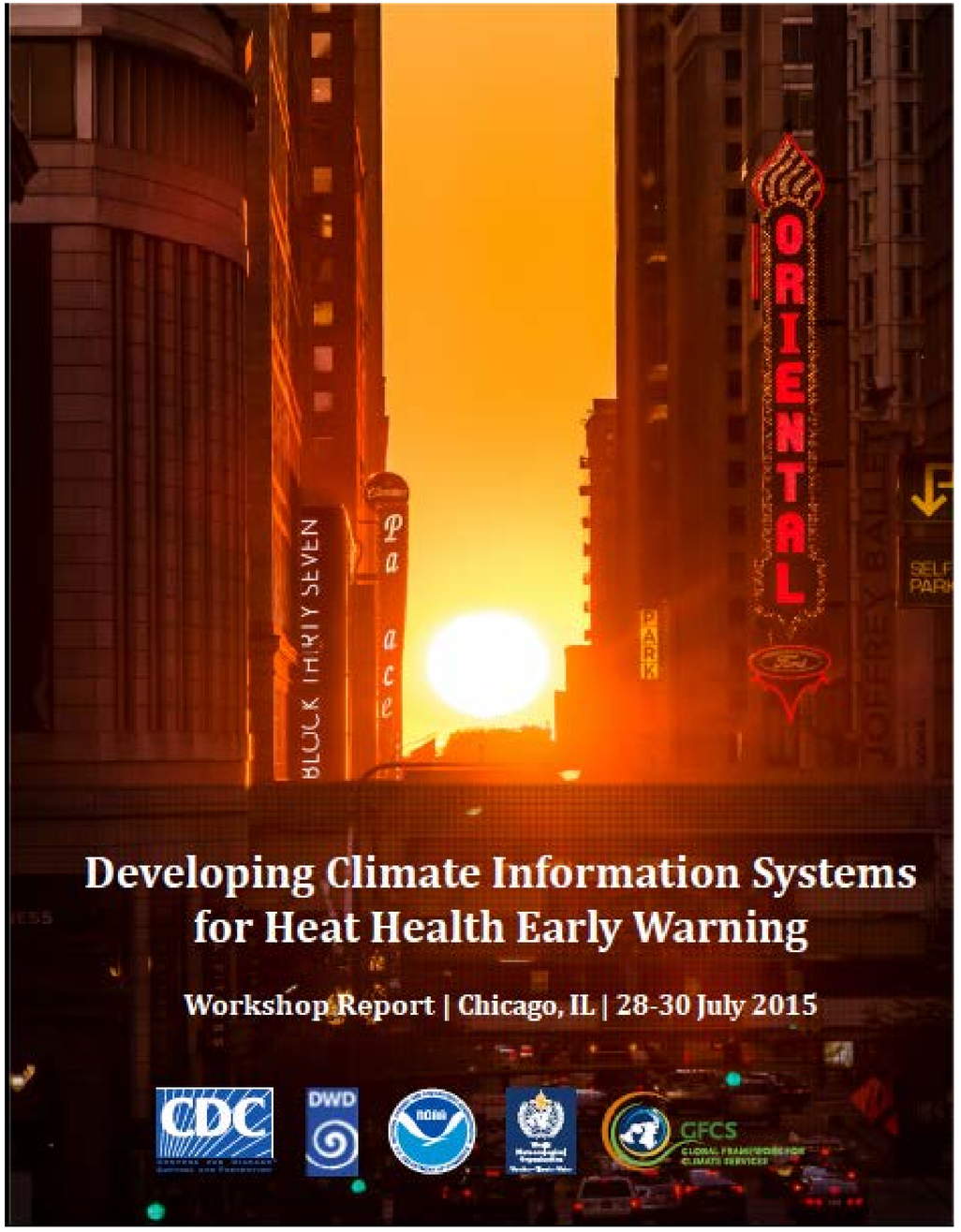
HEAT STRESS IS A SERIOUS AND URGENT HEALTH THREAT FOR HUMANS

Case-fatality rate of untreated heat stroke is 65-80%.

It can lead to:
Severe dehydration
Blood clotting
Stroke
Organ damage

It can aggravate:
Kidney disorders
Mental health
Cardiac conditions
Pulmonary conditions



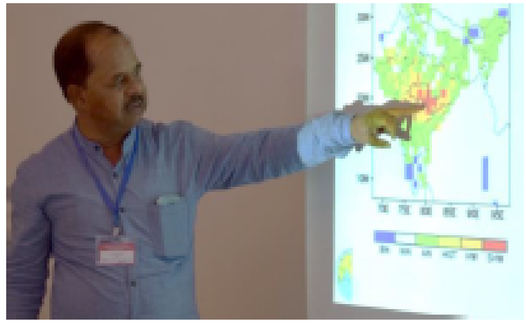


1st South Asia Climate Services Forum for Health (CSF-Health)

IMPROVING

HEALTH PREPAREDNESS FOR EXTREME HEAT EVENTS

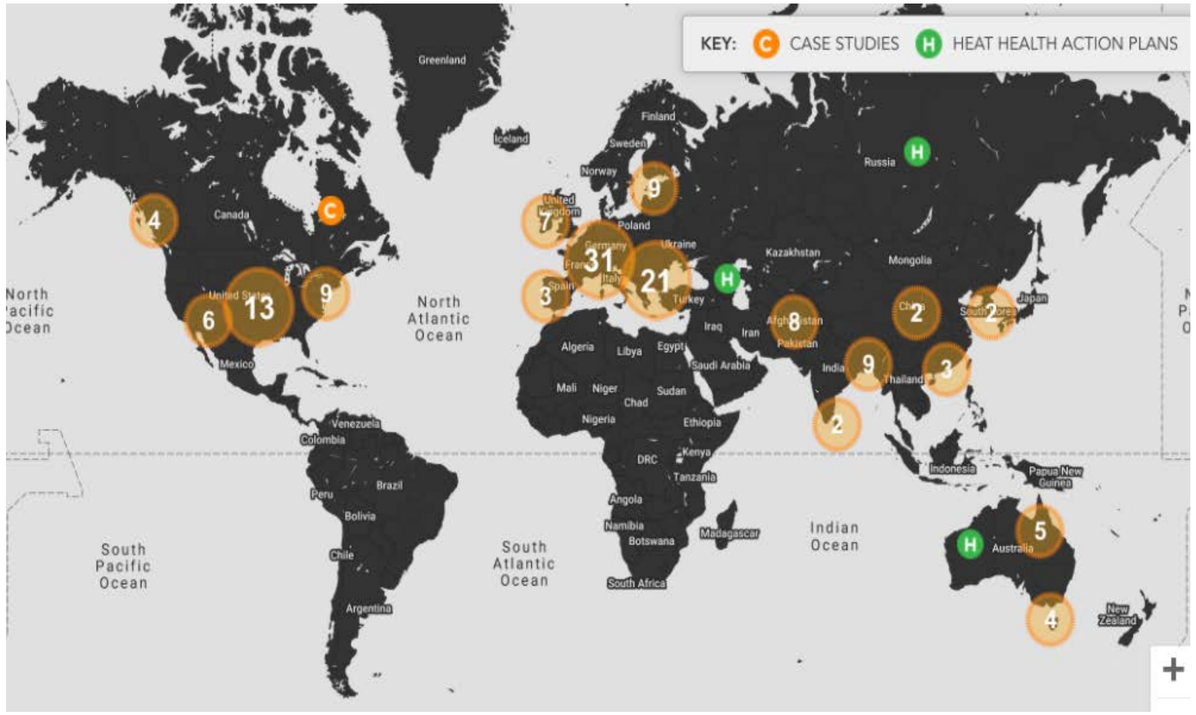
IN SOUTH ASIA



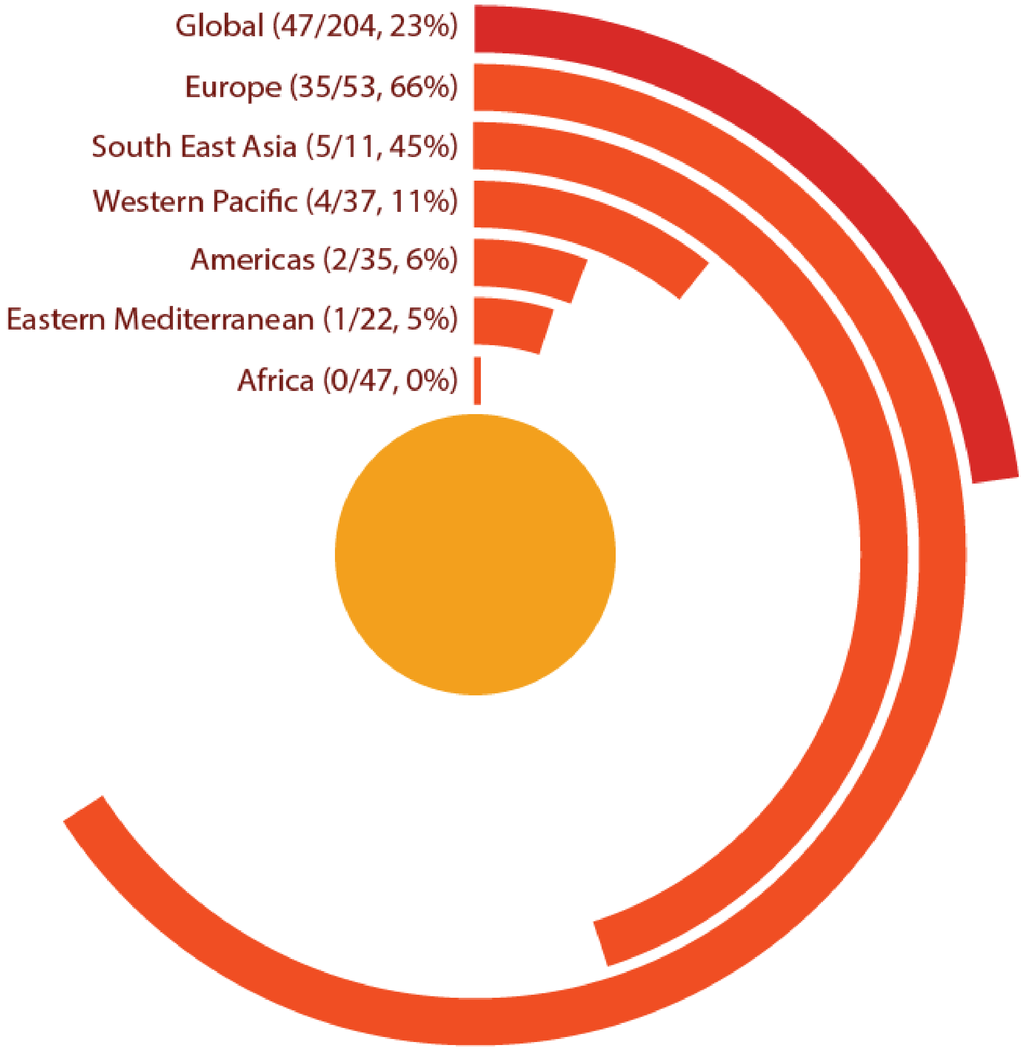
MEETING REPORT

Colombo, Sri Lanka | 26-28 April, 2016

We are unprepared for a warming future, but can do more together, faster.



Countries with Heat Health Action Plans



GLOBAL HEAT HEALTH INFORMATION NETWORK

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Our Network is enhancing efforts to address heat health risk.

GHHIN is a forum for scientists and practitioners, enhancing global-to-local learning for heat health risk reduction.

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INFORMATION NETWORK

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OUR VALUE

Why now?

- **Urgency:** Extreme heat is an urgent issue. We need a more active conversation, evidence and information to drive action and advocacy.
- **Connectivity:** Many nations, organizations, and individuals are working on pieces of the problem and finding creative solutions, but knowledge transfer and harmonization is lacking.
- **Capacity:** Capacity is still limited and exists in disparate pockets, especially in high risk parts of the world.
- **Information:** A better understanding of heat risks and a push to drive evidence and risk information into policy and action is needed.
- **Monitoring:** We need to better document events and impacts, how we are reacting, what the emerging issues are, and whether we are getting ahead of the risks?

Bottom line:

We can prevent a grand majority of heat impacts, but we are missing opportunities to work together more, better, and faster.

WHO WE ARE

The Network is an independent, voluntary, member-driven forum of scientists, professionals, and policymakers focused on enhancing existing efforts to address heat health risk.

It seeks to be a **catalyst, knowledge broker and forum** for facilitating exchange, learning and identifying needs.

Member-driven forum

Go-to resource hub

Knowledge Broker

Not a funding or grant-making mechanism

OUR MEMBERS

Diverse expertise and perspectives

Our members self-select, enhancing inclusion of a broad range of organizations and professionals from around the world.

Compatible motivation

The mission and values of our members are expected to be compatible with the GHHIN vision.

Scientific integrity and shared principles

Members will be encouraged to uphold scientific integrity and principles of good public health practice.

Includes: Government agencies / academic institutions / international organizations / NGOs / private sector boundary institution / individuals in relevant fields

Founding members

Boston University

Collaborating Centre for Oxford University and CUHK for Diaster and Medical Humanitarian Response

Durham University

Deutscher Wetterdienst

Imperial College London

World Health Organization

World Meteorological Organization

UK Met Office

U.S. National Oceanic and Atmospheric Administration

NRDC Natural Resources Defence Council

Public Health England

University of Washington, School of Public Health

International Research Institute for Climate and Society, Earth Institute, Columbia University

Climate Services for Resilient Development

Global Framework for Climate Services

WHAT WE DO

We improve the capacity of governments, organizations, and professionals to protect populations from the avoidable health risks of extreme ambient heat.

Country profiles

Online platform

Global synthesis report

FOCUS

The Network brings together the work and progress of its members to create a more holistic picture of the needs, science, and strengths across the network.

Global forum

Learning exchange

Moving towards: Affiliated research projects, technical working groups

COMMON SCIENCE PILLARS OF HEAT-HEALTH

1. **Capacity and partnerships** to manage heat risk
2. **Understanding heat risk**: research, vulnerability and impacts
3. Observation, data and forecasting, and early warning products for **action**
4. **Actions to manage heat risks**: interventions and effectiveness
5. **Engagement, outreach and communication**

Community building and knowledge brokering → **Scientific synthesis and technical harmonization**

KNOWLEDGE BROKERING

Online Learning Centre

Relevant Projects

Climate Services for Resilient Development

Tackling extreme heat – changing behaviours, changing policy

PROJECT: Deepening and Expanding Heat Health Action in India

Protecting Urban Livelihoods from Climate Change - Building Heat Stress Resilience amongst Da Nang City's most Vulnerable Worker

Addressing the negative impact of increased workplace heat stress on the health and productivity of five strategic European industries: manufacturing, construction, transportation, tourism and agriculture.

ACASIS : Alerte aux Canicules Au Sahel et à leurs Impacts sur la Santé

Red Cross Red Crescent CLIMATE CENTRE: reducing the impacts of climate change and extreme weather events on vulnerable people

NIHHIS helps decision makers prepare for extreme heat events days, months, and years in the future.

UCAR: Heat Wave Awareness Project

Heat Wave Risk Perceptions

EuroHEAT online heatwave forecast

Developing mitigation and risk prevention and management strategies concerning the urban heat island (UHI)phenomenon

HIWeather

World Weather Research Programme

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KNOWLEDGE BROKERING

Online Learning Centre

Explore

Publications & Guidance | Academic Literature | Heat Health Projects | Tools for Heat Health | Glossary

Recommended Resources

Call to Action from the First Global Forum on Heat and Health

Heatwave Guide for Cities (IFRC)

Heatwaves and Health: Guidance on Warning-System Development (WHO/WMO)

Heat Health Action Plans (WHO)

Heatwaves and Human Health (USAID)

KNOWLEDGE BROKERING

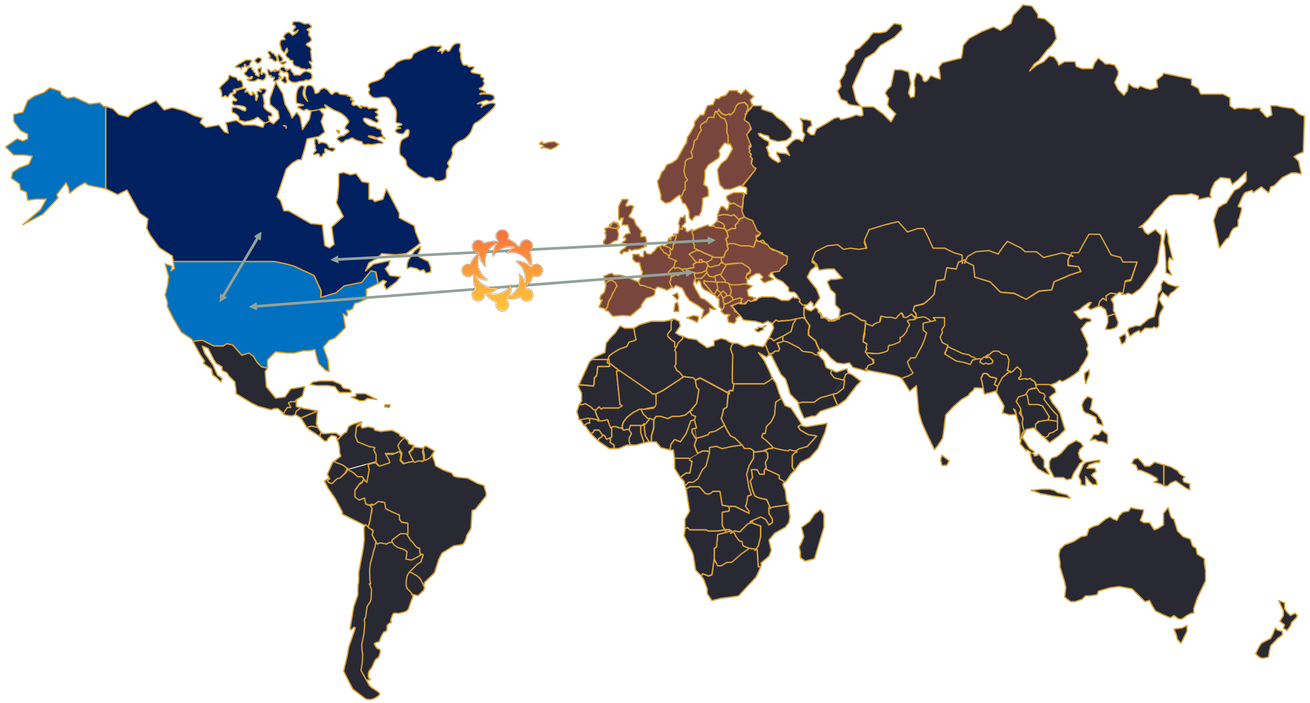
Learning Exchange

Twinning learning and teaching opportunities through:

- Workshops
- Webinars and Teleconferences
- Hands-on training placements
- Development of training materials and courses on relevant subjects
- Professional mentoring

Assessment of Heat Action Plan Intervention Effectiveness

Conversation – observation – relationship building



Currently taking place in US, Canada, Europe –
but not informed by one another.

Monthly Newsletter

GLOBAL HEAT HEALTH INFORMATION NETWORK

Global Heat Health Digest August 2019

Knowledge and information to address the global challenges of extreme heat and human health

Upcoming Expert Debrief on 2019 Heatwaves

The record breaking 2019 Northern Hemisphere heat season has challenged communities and resulted in thousands of preventable deaths and hospitalizations across North

Monitoring Health Impacts of Extreme Heat in North America

A summary report and presentations from a December 2018 CEC workshop on 'Monitoring Health Impacts from Extreme Heat Events,' held in Phoenix, Arizona, are now available.
Access Presentations / Download Summary Report: EN / ES / FR

Pre-season trial runs of Heatwave Early Actions in Hanoi, Viet Nam

In advance of a heatwave affecting Hanoi from 18-21 July 2019, Red Cross cooling centres and other early actions were tested in an attempt reduce the occurrence of heat-related symptoms in vulnerable populations. Read more >

As world warms, it's time to get serious about heat stress: lessons from India

Heat-related deaths and illness are on the rise in India. With summertime highs hitting 45° Celsius in rural areas, urgent action is needed to protect vulnerable populations. Read more >

Upcoming Heat Health Events

31st annual conference of the International Society for Environmental Epidemiology (ISEE 2019)
25-28 August 2019 / Ultrecht, Netherlands

14th International Congress of Physiological Anthropology
24-27 September 2019 / Singapore

C40 World Mayors Summit
9-12 October 2019 / Copenhagen

5th International Conference on Countermeasures to Urban Heat Islands
2-4 December 2019 / Hyderabad, India

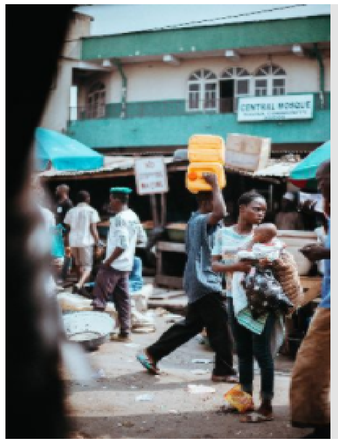
International Climate Services Conference 6
10-14 February 2020 / Pune, India

Symposium on Challenges for Applied Human Biometeorology
2-3 March 2020 / Freiburg, Germany

Are you presenting at any of these events on heat and health? Let us know, and share your presentations and outcomes with the Network!

http://www.ghhin.org/subscribe

@heathealth_info



Do you have insights to improve heat health prevention and preparedness?

Share your ideas, events, new findings, lessons and approaches that can help others around the world. Connect with us to **submit content** for our Digest, website and social media channels.

Don't forget to join the **#HeatHealth** conversation on Twitter by following us **@heathealth_info**.

Submit your news and events

Share Tweet Forward

Get in touch:
info@ghhin.org

Visit our website:
www.ghhin.org

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GHHIN Regional Heat Health Profiles

GLOBAL HEAT HEALTH INFORMATION NETWORK

REGIONAL HEAT HEALTH PROFILE

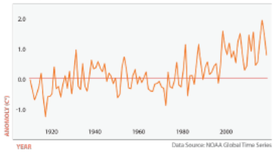
NORTH AMERICA

Regional Climate Trends

In 2017, North America had warmer than average annual temperatures across much of the continent. The mean temperature in 2017 for Canada, the United States, and Mexico ranked among the 10 hottest years on record for each country.

In Canada the annual average temperature in 2017 was 0.7 °C above the 1981-2010 average. In the United States, with the exception of Washington every state in the country experienced warmer than average annual temperatures, with record high temperatures in Arizona, New Mexico, North Carolina, South Carolina, and Georgia. Mexico experienced its hottest year on record, at 1.6 °C above the 1981-2010 average.[1]

North American Temperature Anomalies
January - December 1910-2018



Impacts of Heat on Health

Elevated ambient temperatures over the last few decades and an increasing frequency and severity of heatwaves have resulted in thousands of cases of heat-related illness (HRI), hospitalizations, and mortality across North America. A significant proportion of hospitalizations for chronic diseases such as coronary heart disease (CHD) have been attributed to heat. The incidence of HRI and HRI--related mortality is projected to increase.

Health Statistics

TThe CDC National Environmental Public Health Tracking Network maps state-level public health and environmental data in the US. It includes data for HRI emergency department visits, hospitalizations, and mortality in 20 US states.[3] Between 2001-2010, there were approximately 28,000 HRI hospitalizations in 20 states.[3,4] Between 1979 and 2014, more than 9000 Americans died from heat-related causes. Individuals over age 65 and non-Hispanic blacks were disproportionately affected.[7,8] As identified by the syndromic surveillance system in the state of Sonora, Mexico, there were 968 non-fatal cases of HRI and 58 HRI-related deaths between 2016-2018. The majority of cases were male migrant and/or outdoor workers between the ages of 24-44.[9]

Attributable Risk and Heat-Health Relationships

In Canada, occupational-HRI[10] and pregnancies complicated by placental abruption[11] have been significantly associated with elevated maximum weekly and daily temperatures, respectively. Of the 1.4 million CHD hospitalizations that occurred in Ontario between 1996 - 2013, 1.20% were attributed to extreme heat.[12] In the US, 0.43% of the approximately 1056 daily cardiorespiratory deaths were attributed to elevated ambient temperature between 1987 - 2000.[13]

Heat Health Projections and Scenarios

In North America, a climate change scenario resulting in a 3.6 °C temperature increase by the end of the century (RCP 6.0) would increase mortality attributable to heat from 0.5% between 2010-2019 to 1.8% between 2090-2099. A scenario resulting in a 4.9 °C temperature increase (RCP 8.5) would increase the heat-attributable mortality to 3.6%.[14,15] In 15 US cities, pursuing a 1.5 °C climate change mitigation scenario would avoid between 110 - 2720 annual heat-related deaths.[14]

July 2019 temperatures smash Alaska's all-time records

As reported by NOAA meteorologist and blogger Tom Di Liberto, parts of Alaska experienced record high temperatures in July 2019, particularly in Kenai, Palmer, King Salmon, and Anchorage. Anchorage experienced it's warmest week on record, reaching up to 32.2 °C--over 15 °C above its July average.[2] This has provided ideal wildfire conditions for the state; as of July 31, 2019, there were 258 active wildfires covering 2,361,732 acres of land.[4] As a result, Anchorage and Fairbanks have endured high levels of particulate matter, prompting the National Weather Service to issue its first ever Dense Smoke Advisory for Anchorage.[2]

Heat Interventions

Numerous heat-health interventions have already been established in North America at both national (see: Environment & Climate Change Canada; Health Canada; the US National Integrated Heat Health Information System) and subnational levels.[5,17,18] A number of emerging heat-health interventions are currently being tested and evaluated in Canada, the United States, and Mexico, including:

Heat Health surveillance

A pilot project to enhance syndromic surveillance of HRI in Canada, the United States, and Mexico has been established by the Commission for Environmental Cooperation to develop an operational, real-time syndromic surveillance system for extreme heat events (EHEs) in three selected at-risk communities in Canada, Mexico and the United States and to highlight best practices and lessons learned on developing such a system.[19]

Forecasting products

NOAA is currently testing the National Weather Service HeatRisk forecast system, which assigns heat risk scores at high spatial resolution across the United States, incorporating temperature, climate, and temporal data.[20]

Risk assessment

The CDC's National Institute for Occupational Safety and Health (NIOSH) is evaluating the use of Wet Bulb Global Temperature (WBGT) sensors, which are instruments designed to adjust temperature measurement by detecting and combining on-scene humidity, air movement, and radiant heat data.[21]

Decision support tools

Decision calendars provide a framework to support planning by organizing information about user context in decision making, i.e., what needs to be known when, by whom, and to what degree of certainty in order to effectively reduce heat health risk. NIHHIS facilitates calendar interviews, focus groups, and workshops in affiliated pilot cities across the country to support local decision makers.

Developing an Integrated Heat Health Information System for Long-Term Resilience to Climate and Weather Extremes in the El Paso-Juarez-Las Cruces Region

Convened by NIHHIS on July 13, 2016, practitioners, academics, and experts from local and federal agencies met in El Paso, Texas to identify public health needs with regard to extreme heat monitoring and preparedness. The region is home to approximately 2.4 million people, most of whom live in Ciudad Juarez, Chihuahua; El Paso, Texas; and Las Cruces, New Mexico.

In recent years the region has been subject to extremely high ambient temperatures and increasingly frequent and severe heat waves. Workshop attendees identified key steps and information requirements for developing a regional heat action plan, including the need for vulnerability assessment, more robust medical data, and enhanced interagency coordination for heat early warning systems and forecasting.[22]

Syndromic Surveillance and Heat Action in Sonora, Mexico

In 2016 the Commission for Environmental Cooperation launched an HRI syndromic surveillance system in Hermosillo, Mexico, which has since been expanded to include all health authority units in six health jurisdictions in the State of Sonora.

The surveillance system provided health authorities with near real-time data and insight into the epidemiology of HRI in the state, allowing for the deployment of timely interventions and a 51% reduction in HRI-incidence between 2017-2018. During this time a total of 169,330 preventive actions were taken, including the distribution of 27,000 informational items and 40,380 packets of oral rehydration therapy. In particular, interventions targeted vulnerable populations such as outdoor workers.[23]

A new HRI surveillance system was also recently implemented in hospitals, pharmacies, and private healthcare institutions in the State of Chihuahua. Public health officials in the area are alerted to heat-health impacts through a comprehensive electronic medical record database.[23]

Future Frontiers of Heat Management and Key Challenges

Heat health surveillance

The United States and Mexico lack national heat action plans. Further, only 25 US states participate in the national heat health surveillance system. Heat-related morbidity and mortality estimates in North America are further limited by numerous and redundant data sources (workplace incidents; death certificates; the news; syndromic surveillance).

Forecasting products

There is still much uncertainty in seasonal and sub seasonal meteorological predictions. City-level meteorological data are currently limited; while multiple research groups are downscaling predictions to the city-level, approaches vary significantly.

Risk assessment

There is a lack of guidance and consensus on heat indices (e.g., wet bulb temperature versus NWS heat index). There is also a limited understanding of how interactions between extreme heat with other environmental hazards (i.e., the urban heat island phenomenon[24]; wildfires) adversely impact human health.

Capacity and funding

Mexico in particular does not have adequate capacity to manage heat-health, given limited resources for both prediction and remediation activities.

Monitoring, Evaluation, and Implementation Science

The evidence base for the efficacy of heat health interventions is limited; impact assessments and evaluations of heat health interventions are warranted.

NIHHIS tool to prepare and protect vulnerable populations from extreme heat

NIHHIS has partnered with the GIS company Esri to map populations most vulnerable to heat and heat related illness. This online mapping and visualization tool allows decision makers to prepare for extreme heat events and to better understand their options for reducing risk. The tool maps risk according to socioeconomic status, household composition and disability, minority status, language barriers, and issues surrounding housing and transportation. It also displays locations of cooling centers, health care facilities, and areas requiring improved tree canopy.[18]

Heat-health interventions get local and community-engaged in Maricopa County

Arizona's Maricopa County has made preventing HRI a public health priority. The county implements a number of cooling stations and water distribution centers during extreme heat.[25]

A 2014 study evaluated 53 cooling centers in Maricopa. The majority of cooling stations were housed in community, senior, and religious centers, and offered services to 1500 individuals daily. The cooling stations served vulnerable populations in particular, including homeless individuals.[26] While the majority of users in the study learned about the cooling centers by word of mouth,[26] Maricopa County's website provides a detailed, interactive map of hydration and cooling stations.[25]

About the Global Heat Health Information Network

The Global Heat Health Information Network is an independent, voluntary, and member-driven forum of scientists, practitioners, and policy makers focused on enhancing global and local learning for heat health.

The network is spearheaded by the World Health Organization (WHO) and World Meteorological Organization (WMO) Joint Office for Climate and Health and the United States National Oceanic and Atmospheric Administration (NOAA). It includes health and meteorological practitioners and scientists from all populated continents.

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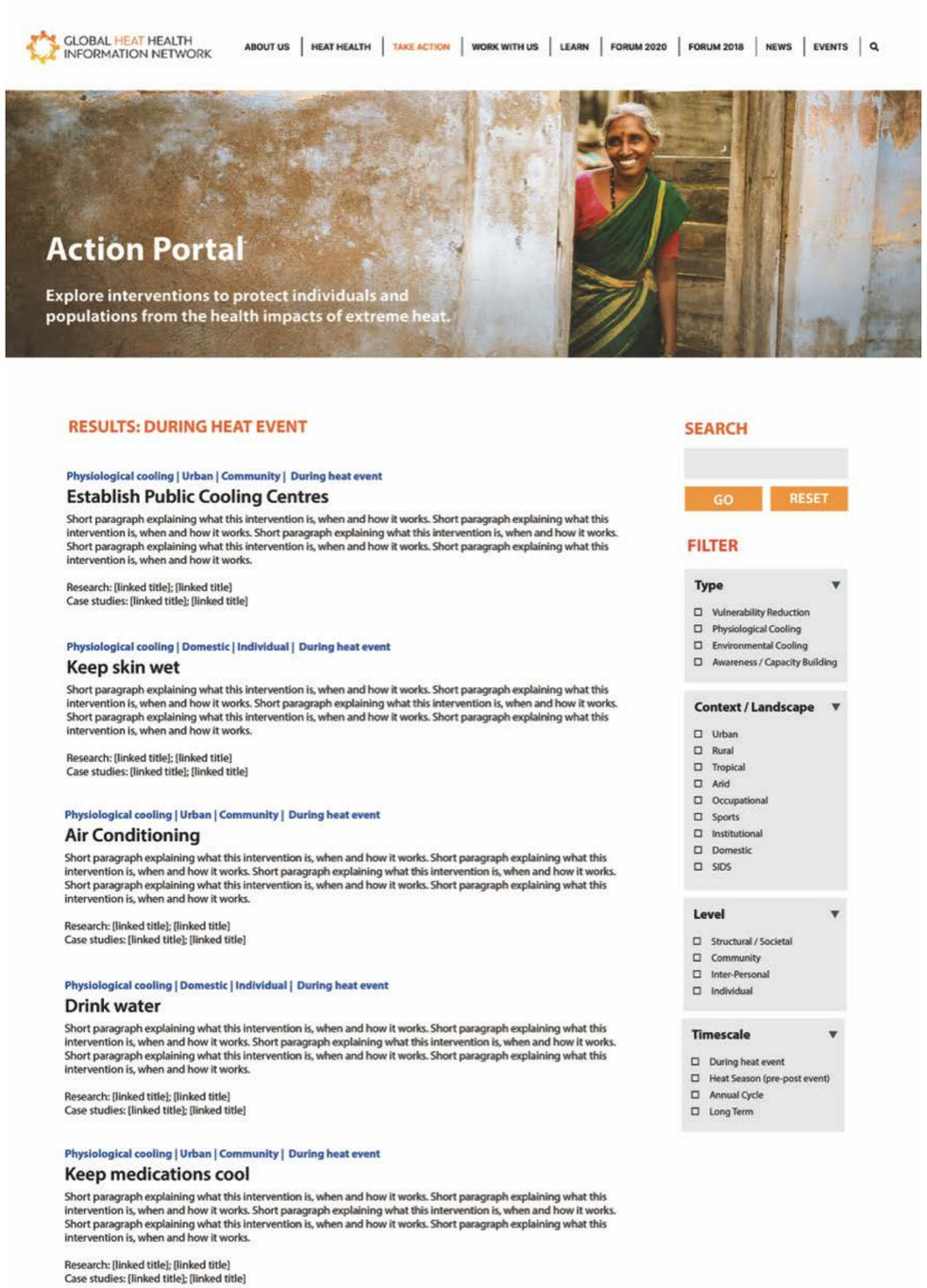
Global Heat Action Platform

Sharing of Good Practice

Evidence based Interventions

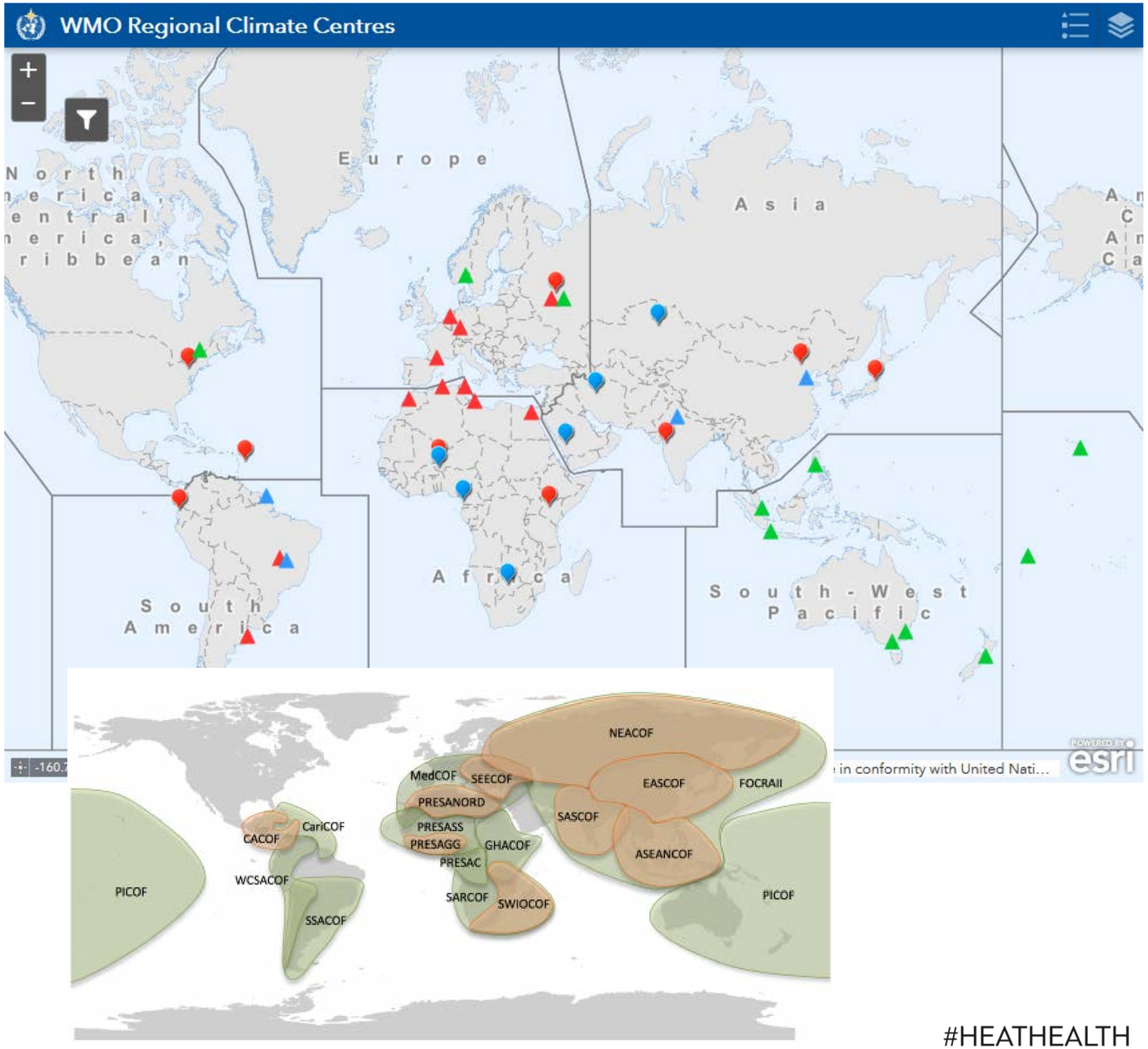
Case Studies



Regional Climate Information for Heat Health Preparedness

WMO has designated several Regional Climate Centers (RCCs) which provide climate predictions for their regions (temp and precip at a minimum) and provide training and capacity building.

Regional Climate Outlook Forums (RCOFs) take this information a step further by convening stakeholders to interpret and apply this information in many sectors.



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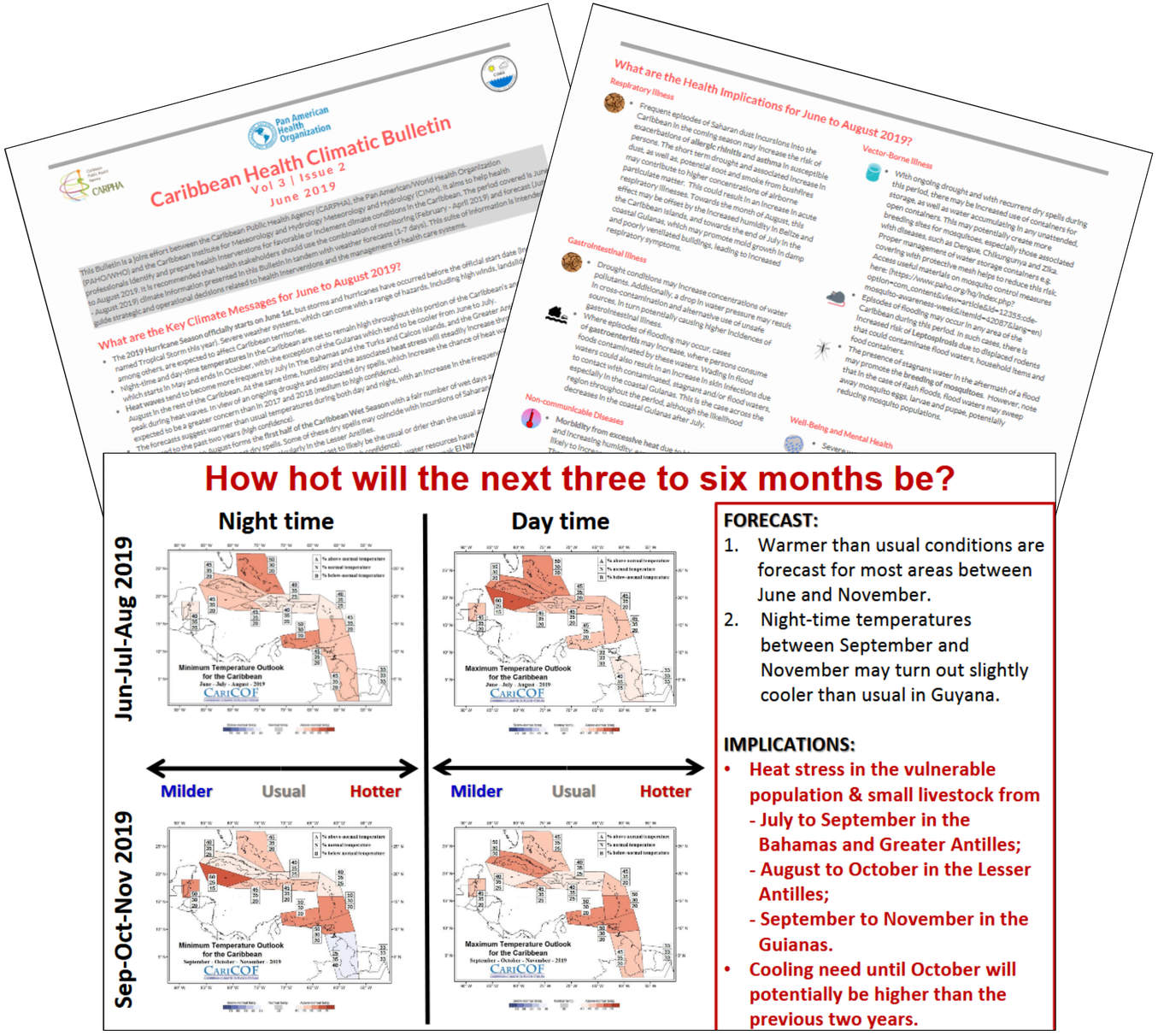
An example of RCOF information from the Caribbean (CariCOF)

CariCOF produces quarterly health bulletins that interpret climate information for impacts from disease vector population changes to mental health impacts.

CariCOF also produces a separate monthly long-range heat outlook during heat season which puts predictions in a climate context.



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Caribbean Regional Climate Centre

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1st Global Forum on Heat and Health

December 2018 / Hong Kong, China

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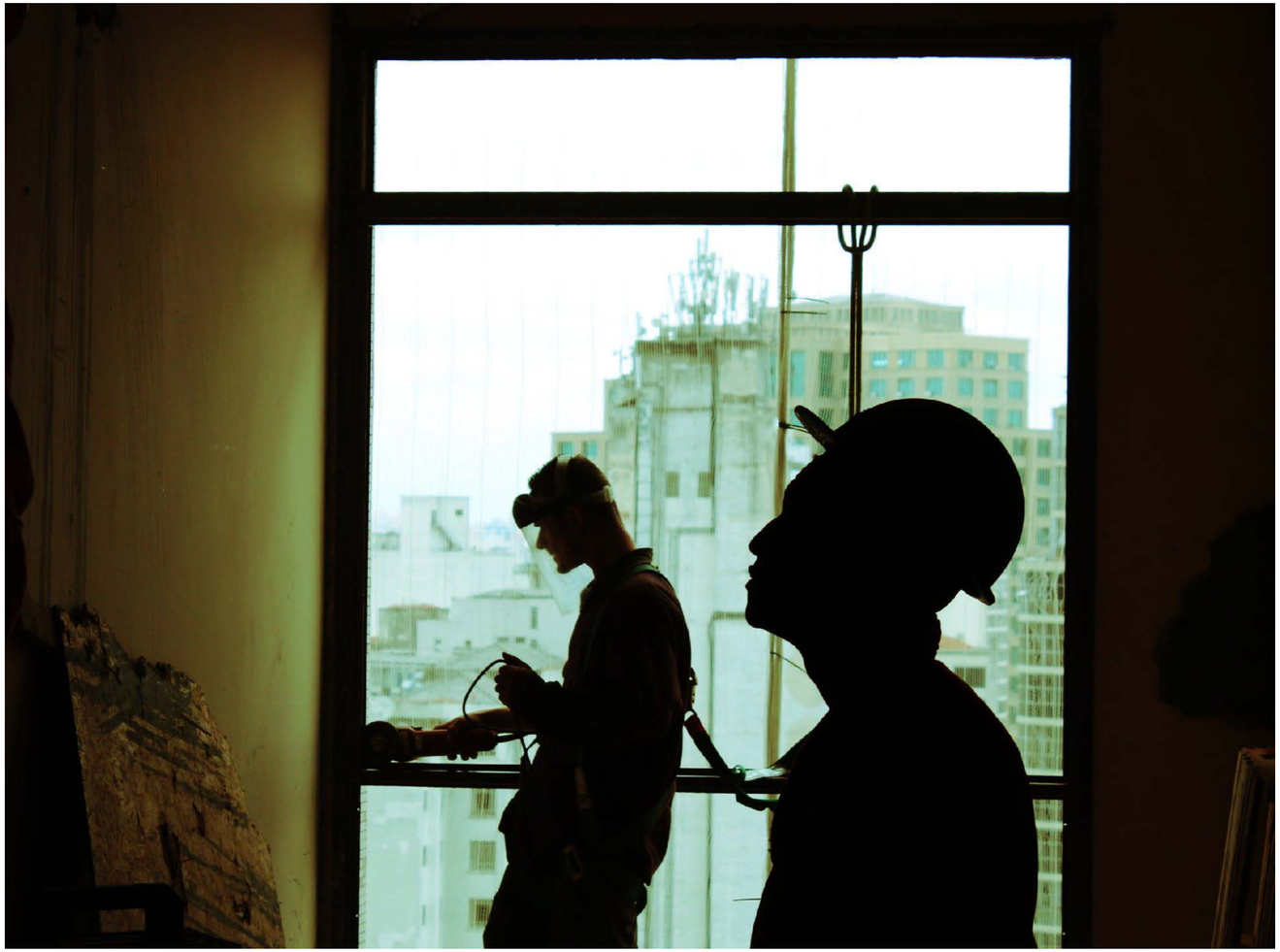
Occupational heat strain directly affects workers' health

Impacts include elevated risk of dehydration, kidney disease, work accidents, and lost work productivity.

Loss of productivity and income hinders the ability of individuals to live healthy and productive lives.



Urban environments magnify heat exposure

Dense and vertical constructions, extensive use of heat retaining materials, limited vegetation cover, and heat generation from energy use in cooling and transport all contribute to urban heat island effects.

Urban Heat Islands, and micro-heat islands within cities, increase exposure risk to local inhabitants.

2nd Global Forum on Heat and Health

July 28-31 2020 / Copenhagen, Denmark

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#HEATHEALTH
www.ghhin.org

Ways to Participate

1. Subscribe!
2. Share
3. Pilot Projects
4. Identify heat plans & resources
5. Contribute to National & Regional Heat Profiles

Connect with us!

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