GLOBAL HEAT HEALTH INFORMATION NETWORK

HEAT HEALTH DIALOGUES | OUTCOME BRIEF

HEAT IN THE CITY

28 July 2020 / Conveners: **Ladd Keith**, University of Arizona; **Julie Arrighi**, American Red Cross and the Red Cross Red Crescent Climate Centre; **Chao Ren**, University of Hong Kong

On 28 July 2020 experts on heat in urban settings explored the state of the practice of increasing resilience to extreme heat in cities across the world, from their diverse perspectives of governance, planning, design, and vulnerable populations. Presentations were followed by a facilitated panel discussion and audience engagement.

Key Messages

+ Over **half of the world population** now lives in cities that are disproportionately heating due to climate change and the urban heat island effect.

+ **Significant temperature variations across a city can exist** as microclimates result in broad ranges of heat exposure. Urban hotpots may be experiencing "heatwave conditions" far before meteorological heatwaves are declared.

+ **Heat exposure in cities is deadly, yet preventable** with long-term urban planning, civic engagement, and effective cross-government emergency management.

• **Cities represent innovative hubs** that have
+ the potential to catalyze new opportunities, such as good governance, protective social measures and urban design for cooling.

The following issues emerged from the dialogue:

• **Vulnerable populations within cities are disproportionally affected** by extreme heat, including the elderly, disabled, low-income communities, and communities of color.

• **Heat risk advisories** should consider the urban microclimate vulnerabilities and exposures to target the areas worst affected.

• **Maintaining safe indoor temperatures** during warm seasons is challenged by a triad of factors related to energy and cooling access, housing materials and design, and socio-economic conditions.

• **Metrics to monitor, evaluate, and track progress on addressing urban heat risks are vital** to target interventions appropriately and save lives.

• **Governance, particularly leaders at urban scales,** have the ability to enact a wide range of locally tailored and responsive policies, thus playing a major role in the success of urban interventions.

• **Diverse and ever-evolving solutions addressing urban heat are underway** all over the globe that both mitigate greenhouse gas emissions and have often immediate and significant benefits for human health, and we need to scale them further.

• **Effective collaboration and learning across cities and sectors,** including **active and inclusive engagement with community members,** can unlock the potential of cities to combat extreme heat and protect the most vulnerable.

Emerging Priorities and Innovations

The dialogue highlighted issues opportunities and innovations in building design and urban planning, governance and financing, and community engagement.

AMPLIFYING THE CLIMATE CO-BENEFITS OF URBAN HEAT ACTIONS

Cities have the opportunity to lead mitigation actions that help limit global greenhouse gas emissions and meet Nationally Determined Contribution commitments, while also implementing adaptation actions to reduce the impacts of extreme weather events and increase climate resilience to urban heat. Integrating heat risk management policies and practices across diverse sectors is critical and can help identify the suite of available opportunities to combine interventions that reduce and manage urban heat while also reducing carbon emissions.

Holistic perspectives of urban growth and resilience is essential and can identify actions that may be complementary or synergistic, as well as actions that may result in trades offs or that might become ineffective overtime without sufficient resilience due to climate change (e.g. "mal-investment"). Some examples include, the promotion of electric vehicles that reduce waste heat which contributes to urban heat islands, as well as green roofs on public transportation stations in Quito and cool pavement on bike lanes in Los Angeles that demonstrate how working together with the transportation sector can reduce the risks of heat.

While the use of air conditioners presents a trade-off in many parts of the world (i.e. an action with contrary effects for mitigation and adaptation), building design and materials can reduce the need for air conditioning, such as the vertical garden tower in Singapore. Finally, considerations of Business as Usual and Best Practice future scenarios in urban planning for Brooklyn, New York considered carbon footprint and urban heat island data to identify win-win opportunities between climate mitigation and adaptation options.

IDENTIFYING AND VISUALIZING HEAT EXPOSURE AND IMPACTS ACROSS CITIES AND SCALES TO PROTECT THOSE MOST AT RISK

Heat risk mapping in cities is often the first step to better understanding the distribution of heat's health burden in a city and identifying and addressing issues of social inequity. Heat risk is derived from estimates of the hazard, exposure to the hazard, and vulnerability of those exposed. The hazard of heat in urban areas is represented as the intensity of the urban heat island (UHI) effect across neighborhoods and between urban and exurban spaces. The spatial distribution of the hazard is mapped to understand exposure, though the distribution and duration of the effect may change under different climate conditions. Once the urban heat island effect is mapped, social vulnerability variables are often incorporated into the analysis to approximate the overall risk presented by extreme heat.

Several approaches for mapping urban heat islands have been employed across the globe, including: air temperature maps based on the weather station observations, estimates of land surface temperature from satellites, and community science field campaigns where air temperature and humidity sensors are attached to mobile platforms and transects are driven throughout neighborhoods in a city. Additionally, many cities are overlaying socio-demographic data to create and visualize **vulnerability indices** to inform cooling interventions. This approach can start to document some of the underlining systemic and structural inequity, enable environmentally just actions and policies, and explore the effect of the extreme dichotomy of wealth facing many cities. Moreover, data and information gathered from mapping exercises has the ability to guide the development of targeted communication strategies (e.g. elderly and/or non-English speaking communities) and coupled with culturally appropriate and significant methods, such as the use of storytelling, can reach the most at-risk groups.

RAISING AWARENESS FOR AND REDUCING THE THREAT OF INDOOR TEMPERATURES

Dangerous heat conditions also occur indoors during hot weather, regardless of whether a heatwave is declared. Health impacts of rising indoor temperatures are a growing concern in cities. Good practices include regulations, policies and practices to address thermal loading within buildings, such as in Hong Kong, that require low-cost, relatively simple temperature gauges to help residents and managers identify dangerous conditions. In New York City, temperature specific building codes are used to protect vulnerable populations, such as senior citizen centers. Minimum temperature thresholds exist for landlords where sufficient heat needs to be provided during cold weather, however there is no such maximum temperature requirement for extreme heat, and the provision of cooling facilities.

Air conditioning is a lifesaving intervention in dangerously hot conditions. Unfortunately, it is not accessible to many experiencing energy poverty, homelessness, or other factors limiting access and use of air conditioning.

Communicating indoor heat risk is a challenge. Media coverage worldwide tends to use images of outdoor scenes often because they are easier to photograph, yet do not represent the location of greatest heat exposure risk. This may falsely bias public risk perceptions to consider outdoor exposures as the greatest threat, and often only during heat waves, when media give attention to this issue.

The use of trusted messengers, such as doctors and social workers; and a community-focused approach that emphasizes checking on neighbors, highlighting risk factors for vulnerable populations, and describing resources and opportunities to access cooling facilities can be effective.
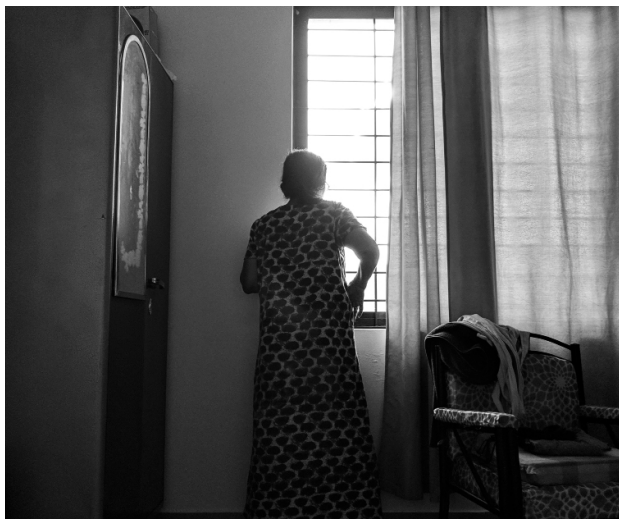
SIMULTANEOUSLY ADDRESSING CURRENT AND FUTURE HEAT RISKS USING DIVERSE MULTI-SECTORAL INTERVENTIONS

Examples from the dialogue include the C40 Cool Cities Network, which represents a mayor-led global network of ~35 cities working to reduce the impacts of extreme heat, as well as the urban / climate design workshops held across the world that bring together stakeholders and practitioners from climate and urban design disciplines to solve problems around urban heat islands.

Multi-agency heatwave response protocols and communication strategies - like the targeted outreach campaigns for vulnerable groups implemented in Athens and Buenos Aires - are excellent examples of how to improve heat emergency management to improve heat health early warning and heat emergency management.

Emergency preparedness and response should be coupled with long-term cooling actions, such as shading, cool roofs and pavements, green spaces, and the use of water features. The 'Green Corridors' of Medellín, Colombia involves a network of greenery across the city aiming to reduce UHI effect, and also improve biodiversity and air quality. Trees, shrubs and ground cover have been planted along the main transport axes, riverside as well as marginalized neighborhoods.

The Cool Neighborhoods NYC initiative has also taken a multi-agency approach to implement improved signage and coordination with cooling centers, as well as a subsidized air conditioning programme during heat emergencies. The initiative is implementing a combination of interventions which address both current and future risks, including tree planting, legislation requiring white and green roofs, targeted cool roof measures, indoor / outdoor air temperature monitoring, climate risk training for trusted messengers, and advocacy on energy assistance programs.

In Hong Kong, the real estate sector is considering that resilience to heat is factored into sustainable development and building design. To minimize thermal loading both within and outside the building, shading fins help to block direct sunlight, reduce glare and maximize natural light, as well as selecting energy-saving materials early in the building development process.

Accelerating action to address key needs for urban heat

LEVERAGE AND MAXIMIZE RESOURCES

Further support is needed to help urban actors access diverse financial and human resources to address urban heat impacts. Given limited funding and competing interests in cities, it is important to advocate for the prioritization and investment in heat-reducing actions, such as:

· Developing guidance on good practices, reflecting lessons learned on how to access funding and support for building resilience to urban heat risks and cooling interventions;

· Continuing to research and promote the health co-benefits of urban heat mitigation policies and technologies;

· Developing a catalog of evidence-based options or approaches for reducing heat health risks in low-resource settings; and

· Supporting innovative partnerships and human resources solutions that identify synergies and efficient win-win options.

ENSURE ACTIONS TO ADDRESS URBAN HEAT VULNERABILITIES ARE EQUITABLE

Urban heat health adaptation and mitigation options need to be viewed through the lens of the most vulnerable and marginalized to safeguard against inequality and inequity issues. Actions include, but are not limited to:

· Developing tailored and community-focused risk communication materials that engage vulnerable and marginalized populations and promote equitable interventions;

· Advocating for policy reforms and legislation that support low-income and high-risk communities, as well as aim to address systemic inequities;

· Promoting an inclusive and health-centered approach to climate policy; and

· Vulnerability mapping and identification of heat hot spots can help target interventions in the communities most at risk.

REDUCE HEALTH IMPACTS OF UNSAFE INDOOR TEMPERATURES

There is an emerging gap in monitoring and raising awareness about increasing indoor air temperatures facing cities that have consequences for health and must be addressed. Actions include, but are not limited to:

· Increasing research on the physiological and health impacts of indoor heat conditions;

· Reviewing and developing indoor minimum and maximum temperature standards for residential, commercial, and public facilities, based on sound research;

· Enhancing awareness and policy advocacy of indoor heat safety; and

· Improving the application of indoor and personal heat sensing technology for enhanced risk awareness and response.

STRENGTHEN METRICS FOR HEAT ADAPTATION

A continued emphasis on metrics for urban heat actions are needed to measure, evaluate, and learn from successes (and failures) to reduce the urban heat health risks. Actions include, but are not limited to:

· Identifying effective and inclusive process and impact indicators to track progress on heat mitigation which can be monitored over time and detect changes in risks and resilience;

· Increasing support to cities to develop heat-health action planning processes, which can facilitate the development and monitoring of comprehensive performance indicators and include triggers for anticipatory interventions and hotspot detection; and

· Improving methods to monitor the effectiveness of heat risk management interventions on health outcomes, such as heat-related mortality and hospitalization rates, as well as heat exposure conditions.

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INTEGRATE MULTI-SECTOR AND AGENCY PLANNING

Continued effective coordination across sectors and disciplines is paramount to bridge science and action. Actions include, but are not limited to:

- Supporting the use of Heat Action Plans to provide a focused opportunity for a range of stakeholders to come around the same table and be part of the solution.

UTILIZE AND PROMOTE CIVIC ENGAGEMENT

People-centered urban design is an important concept that can build urban heat resilience, as well as promote social cohesion and equity. Actions include, but are not limited to:

- Ensuring that the needs of communities are prioritized using co-production and participatory approaches when designing, implementing, and evaluating heat-health adaptation interventions; and
- Leveraging civil society actions for community based interventions, awareness raising, and advocacy.

Network support for urban heat

The Global Heat Health Information Network helps bring together a wide range of partners including practitioners, governments, NGO, academia across a multitude of expertise all with the common goal of improving and protecting public health and reducing heat health risk.

The Network supports efforts to reduce the impacts of heat in urban settings by focusing on raising awareness, building, synthesis and application of science, and engaging expertise and leadership.

Upcoming activities in 2020-2021 include:

+ **www.ghhin.org:** Resource section on managing and adapting to heat in the city features urban-focused case studies and guidance on key issues.

+ **"Open Forum" Discussions:** A new monthly global call-in series will take a deeper dive on specific issues that will inform the GHHIN action agenda, as well as encourage coordination and learning.

+ **Training and capacity building:** Network masterclass series will continue to provide resources and training on methods and good practices to understand and address urban heat. Graduate, post-doctoral, and mid-career training / rotations and other learning opportunities will be developed and advertised through the Network.

+ **Urban Heat technical activities and resource development:** The Network is highlighting several new and emerging actions for addressing urban heat, such as the Urban Integrated Climate Services which can support EWS for cities; learning and sharing methods Urban Heat Island Mapping; profiling a toolkit for Urban Heat Vulnerability mapping-assessment tools; and seeking pilots and partners for City Heat Plans.

+ **Partnerships and Expertise**
The Network will continue to expand partnerships with city governments, civil society, academia, and others working to reduce heat impacts in urban settings. Learning from and leveraging local successes and expertise to increase capacity worldwide.

+ **Research**
The Network will outline critical information and knowledge needs at the interface of urban climate, sustainability, and human health and vulnerability.

Speakers

LAURIE L. GOERING (MODERATOR)

Climate Change Editor and Head of Climate Programme, Thomson Reuters Foundation

Laurie Goering has written on climate change issues for nearly two decades, from dozens of countries. She has for a decade run climate change news coverage for the Thomson Reuters Foundation, the charitable arm of the Reuters news agency. Her team's award-winning stories focus on the human impacts of climate change, told from the frontlines in some of the world's most climate vulnerable – and innovative – countries. She has a particular interest in reporting on heat risks. Previously she was a Chicago Tribune newspaper correspondent based in New Delhi, Johannesburg, Havana, Mexico City, Rio de Janeiro and London.

KIZZY CHARLES-GUZMAN

Deputy Director NYC Mayor's Office of Resiliency

Kizzy Charles-Guzman leads efforts to strengthen neighborhoods, community organizations, and social infrastructure so that they are ready to withstand and emerge stronger from the impacts of climate change. Kizzy engages in citywide sustainability and resiliency planning efforts to ensure that social, public health and environmental justice priorities are integrated into adaptation plans and environmental policies. She led the development of Cool Neighborhoods NYC, the City's first comprehensive strategy to address the impacts of rising temperatures and heat waves.

REGINA VETTER

Cool Cities Network Manager C40 Cities Climate Leadership Group

Regina Vetter is responsible for supporting cities globally to manage the urban heat island effect and to implement greening and cooling solutions. Regina also provides technical guidance on climate adaptation aspects of cities' Climate Action Plans and facilitates the integration of urban adaptation and mitigation climate solutions.

JEFFREY RAVEN

Associate Professor & Director, Graduate Program in Urban + Regional Design, New York Institute of Technology

Jeffrey Raven is a specialist in sustainable and resilient urban design whose research is applied in professional practice and disseminated throughout the profession, government and allied disciplines. As Director of the New York Institute of Technology Graduate Program in Urban and Regional Design, he has shaped the program to engage the fluid, interdisciplinary and global urban design profession that is practiced in the 21st century. Since 2016, he serves as Co-Chair of the American Institute of Architects New York Chapter Planning & Urban Design Committee and on the Board of Directors for AIA New York State. He serves on the sustainable cities NGO Pilot4Dev Steering Board (Brussels) and is principal, at RAVEN Architecture + Urban Design, LLC. He was educated at Cambridge University (England), the Rhode Island School of Design and Trinity College.

CALVIN LEE KWAN

General Manager, Corporate Development & Strategy, Link REIT

Calvin Lee Kwan is General Manager of Corporate Development & Strategy at Link REIT, the largest real estate investment trust in Asia. He believes in using creativity and innovation to advance corporate sustainability in today's world of high urban density and smart city living. With a Doctor of Environmental Science and Engineering from UCLA and an MBA from the Kellogg School of Management at Northwestern, he understands the integrated nature of society, the environment, and the challenges of operating a business within their context. He is a committee member of United Nations Environment Programme Finance Initiative's Investment Committee, co-chair and Asia Pacific representative of the Property Working Group and is a member of the Benchmark Committee of the Global Real Estate Sustainability Benchmark.

Learn more

Access the dialogue video recordings, presentations, recommended reading, reporting and more:
www.ghhin.org/events/dialogue-heat-in-the-city

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Contributors

Christopher Boyer
University of Washington

Joy Shumake-Guillemot
WHO / WMO Joint Office for Climate and Health

Hunter Jones
US National Oceanic and Atmospheric Administration (NOAA)

Ladd Keith
University of Arizona

Julie Arrighi
American Red Cross and the Red Cross Red Crescent Climate Centre

Chao Ren
University of Hong Kong

Maddie West
WHO / WMO Joint Office for Climate and Health