

# Actions to reduce health risks from extreme heat – Interventions and effectiveness

**Shubhayu Saha**

National Center for Environmental Health  
US Centers for Disease Control and Prevention

1<sup>st</sup> Global Heat Health Forum, Hong Kong  
December 2018

# 1<sup>st</sup> Global Heat Health Forum

Building Heat Health Management Networks: Partnerships and capacity

Understanding Risk and Predicting Health Outcomes

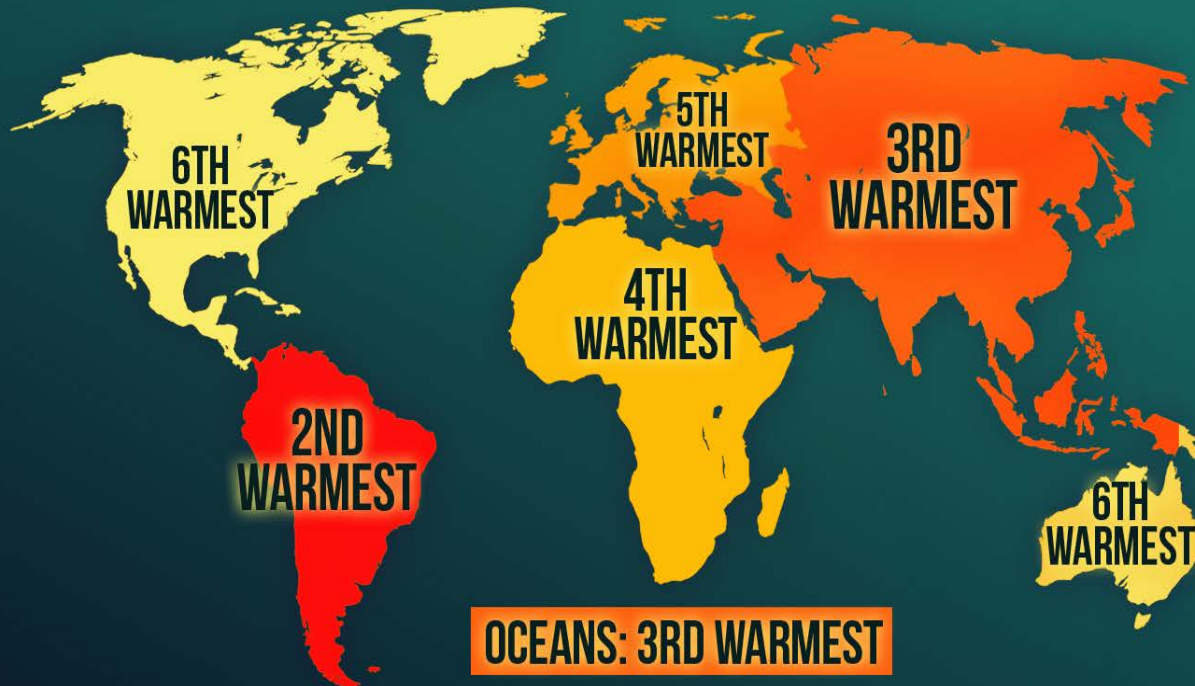
Observations, forecasts, early warnings and information to inform action

**Actions to manage heat risks - interventions and effectiveness**

Taking Action: Engagement, Outreach, and communications

# Extreme heat – a global health concern

## WORLDWIDE HEAT 2017 RANKINGS

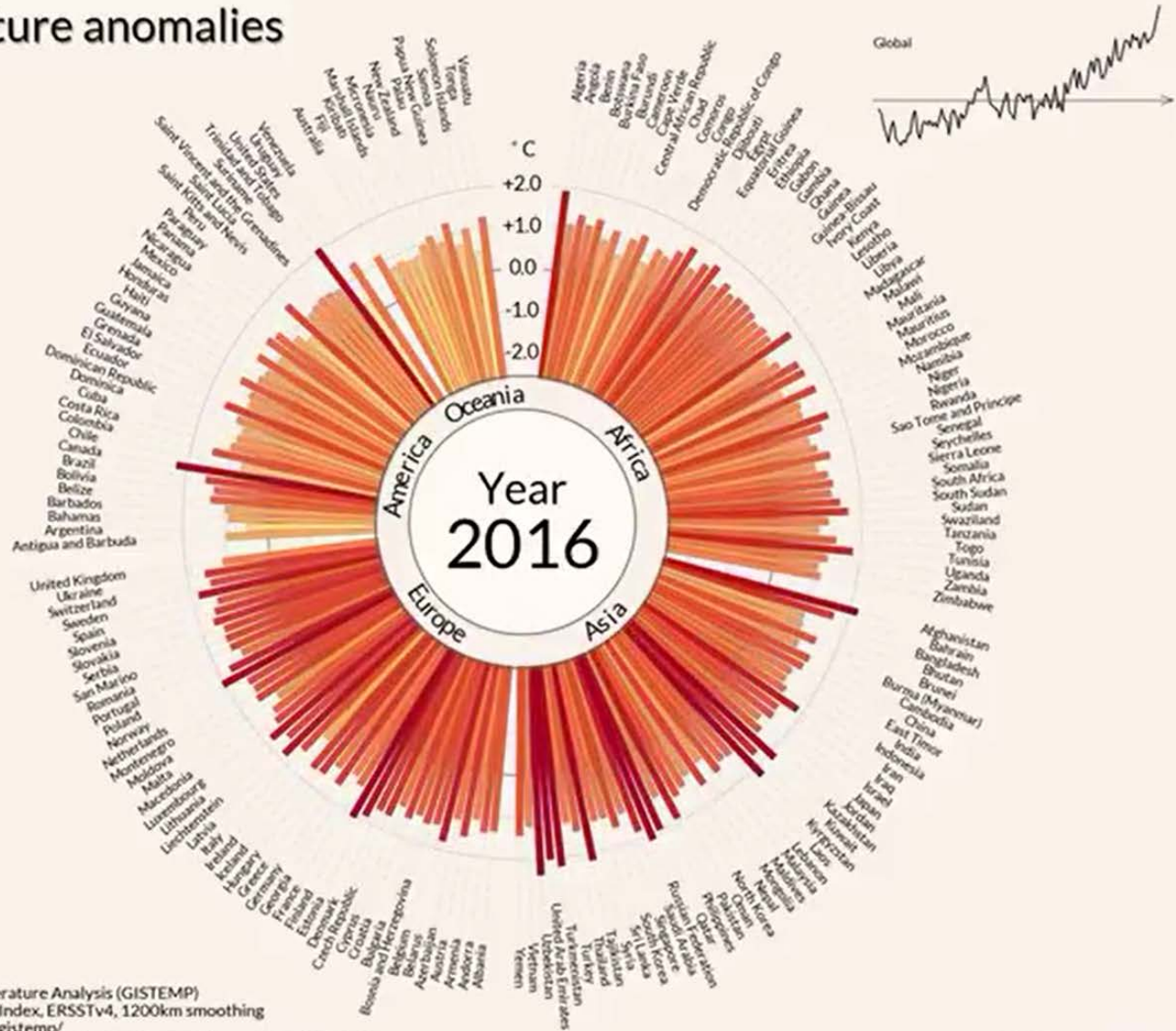


Source: NOAA/NCEI Climate at a Glance

CLIMATE  CENTRAL

# Extreme heat – a global health concern

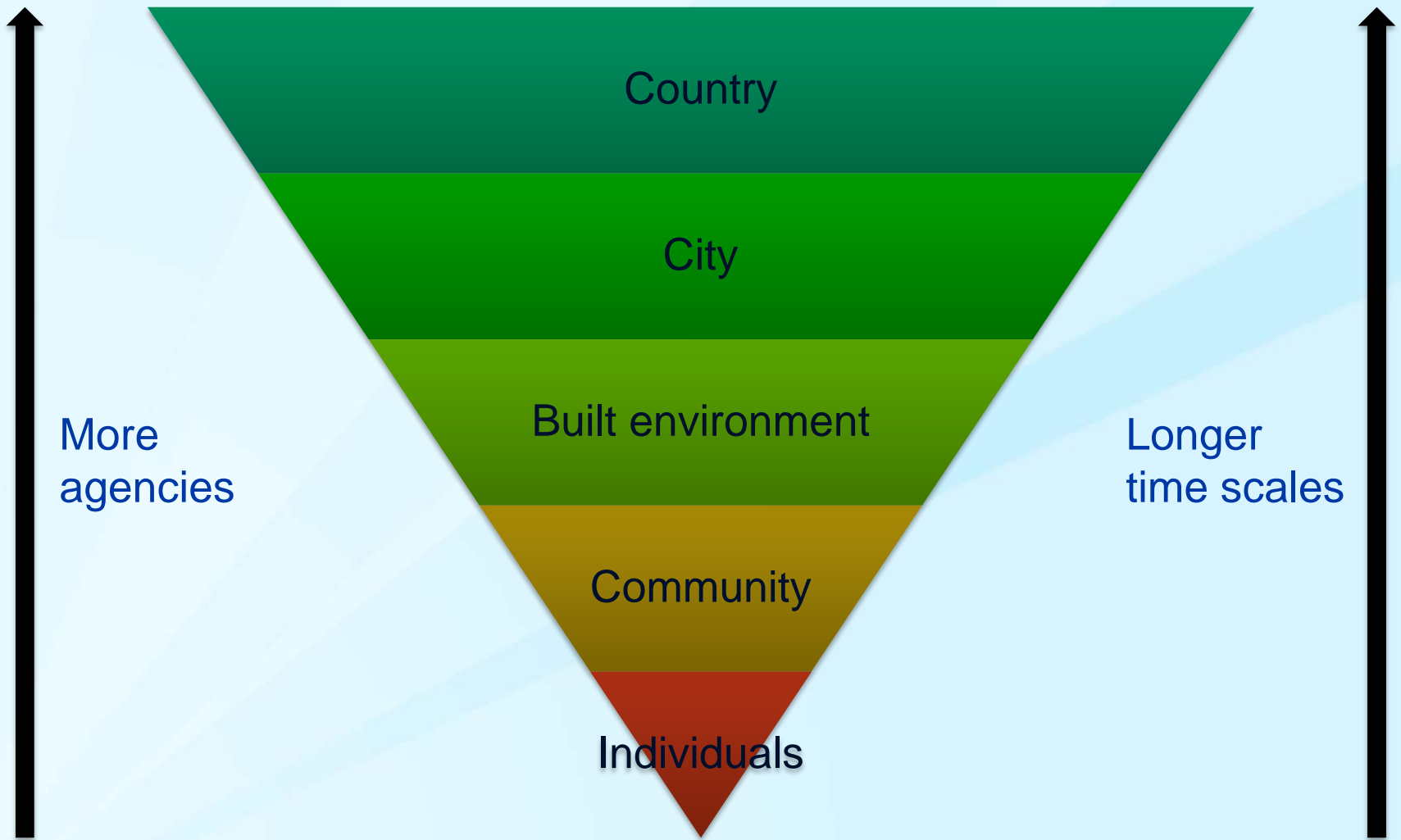
## Temperature anomalies



Data source:  
 NASA GISS Surface Temperature Analysis (GISTEMP)  
 Land-Ocean Temperature Index, ERSSTv4, 1200km smoothing  
<https://data.giss.nasa.gov/gistemp/>  
 Average of monthly temperature anomalies. GISTEMP base period 1951-1980.

Antti Lipponen (@anttilip)

# Actions to reduce the health risk from extreme heat



# Examples of prior work on evaluating heat interventions

Measure	Examples	Advantages	Disadvantages
Short-term measures	<ul style="list-style-type: none"> <li>Advice on behaviour</li> <li>Access to cool spaces</li> <li>Mobile evaporative coolers</li> <li>Room air conditioners</li> </ul>	<ul style="list-style-type: none"> <li><u>Cheap</u>, immediate benefit</li> <li>Can be implemented by individuals</li> </ul>	<ul style="list-style-type: none"> <li>Inherently inequitable</li> <li>increase in energy use and greenhouse gas emissions</li> <li>May be of <u>limited public health benefit</u></li> <li>Potential adverse health impacts of room air conditioners, e.g. airborne infections</li> </ul>
Medium-term measures	<ul style="list-style-type: none"> <li>Increased albedo of building envelope</li> <li>External shading</li> <li>Insulation</li> <li>Decreasing internal heat load</li> <li>Passive cooling technologies</li> <li>Efficient active cooling</li> </ul>	<ul style="list-style-type: none"> <li>Can be designed without increase in energy consumption and implemented at building or city scales</li> <li>Synergetic effects throughout the year</li> </ul>	<ul style="list-style-type: none"> <li>Advance planning needed</li> <li>Selection of measures at the building scale needs to consider local circumstances</li> <li>Moderately expensive</li> <li>Potential risk to "design buildings for the heat-wave" forgetting the rest of the year</li> </ul>
Long-term measures	<ul style="list-style-type: none"> <li>Building regulations</li> <li>Urban planning</li> <li>Land-use changes</li> <li>Mitigation of climate change</li> </ul>	<ul style="list-style-type: none"> <li>Reduced energy consumption and greenhouse gas emissions</li> <li>Can be combined with active mobility and air pollution reductions</li> <li>Inherently equitable, with <u>major potential health benefits</u></li> </ul>	<ul style="list-style-type: none"> <li><u>Costly</u></li> <li>Long lead times</li> <li>Requires political will (in the case of climate change mitigation, even at international level)</li> </ul>



# Evaluations of actions to reduce heat risk

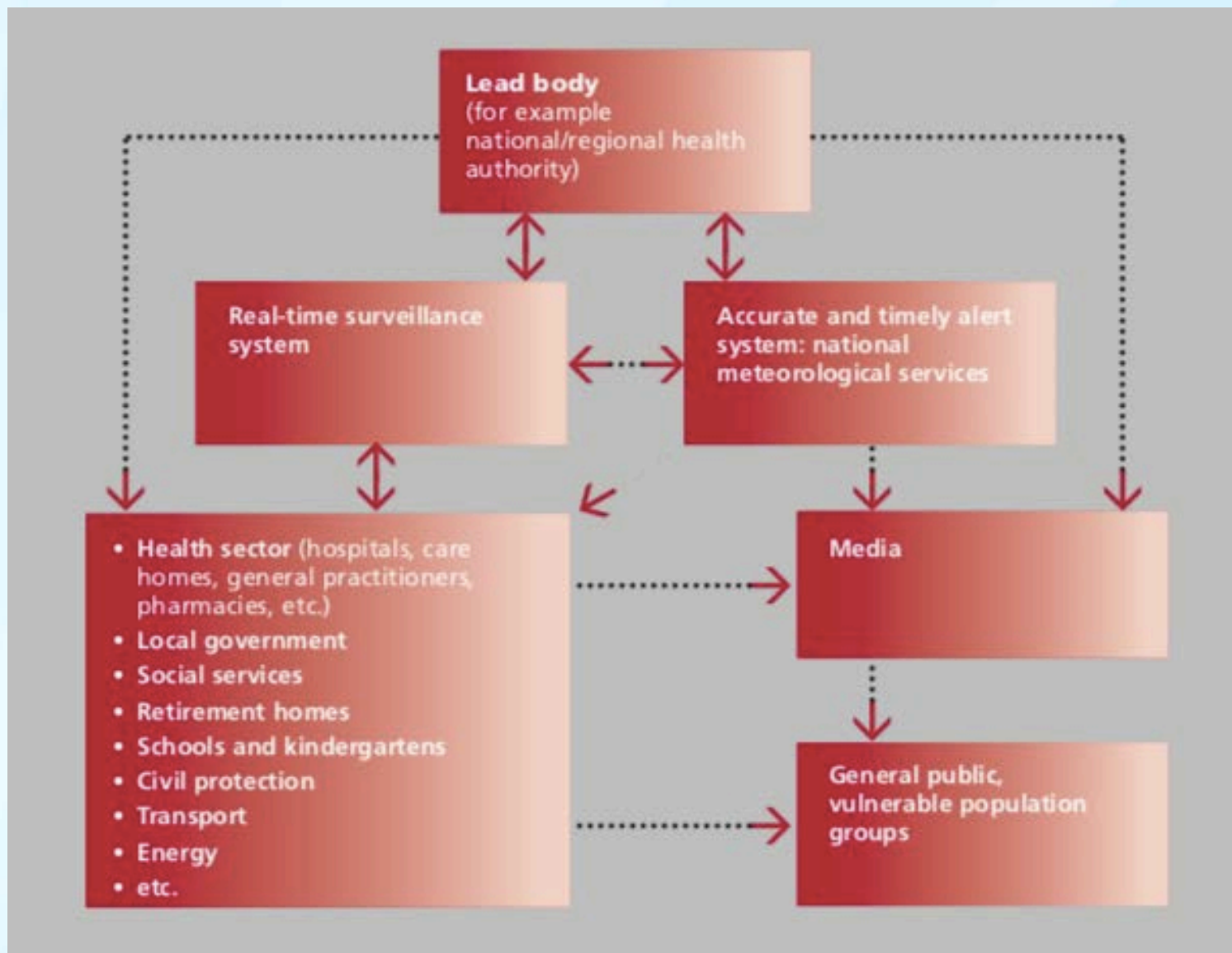
## *Effectiveness*

- Monitoring health outcomes
- Attributing change in health to the action
- Determining the right time interval to observe change
- Incorporating local context

## *Cost*

- Identifying the agency responsible for implementation
- Estimating costs for the specific elements
- Life cycle of the program

# Developing and implementing heat action plans





Shubhayu Saha  
Division of Environmental Health Science and Practice  
National Center for Environmental Health  
US Centers for Disease Control and Prevention

ssaha@cdc.gov

**For more information please contact Centers for Disease Control and Prevention**

1600 Clifton Road NE, Atlanta, GA 30333

Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

Visit: [www.cdc.gov](http://www.cdc.gov) | Contact CDC at: 1-800-CDC-INFO or [www.cdc.gov/info](http://www.cdc.gov/info)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.