

Heat and Vulnerable Populations

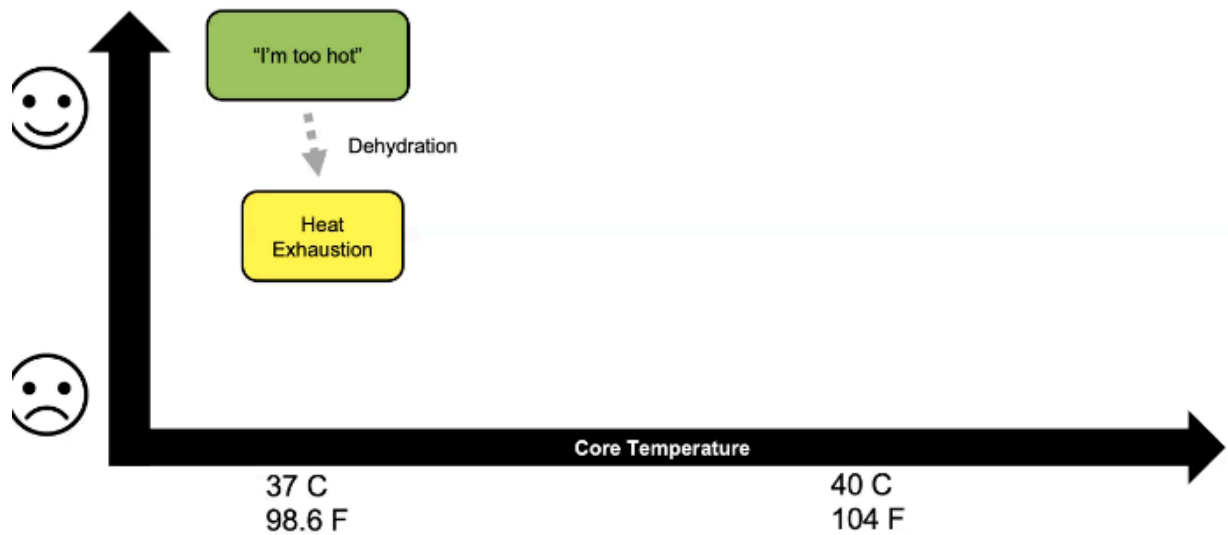
St Luke's Environmental Sustainability
sustainability@slhs.org

[St. Luke's YouTube Climate and Health lectures playlist](#)

Notes

- Case:
 - Mid 80s, top floor of building, no cooling because unable to install A/C in heat
 - Heat exhaustion, delirium in addition to heat stroke

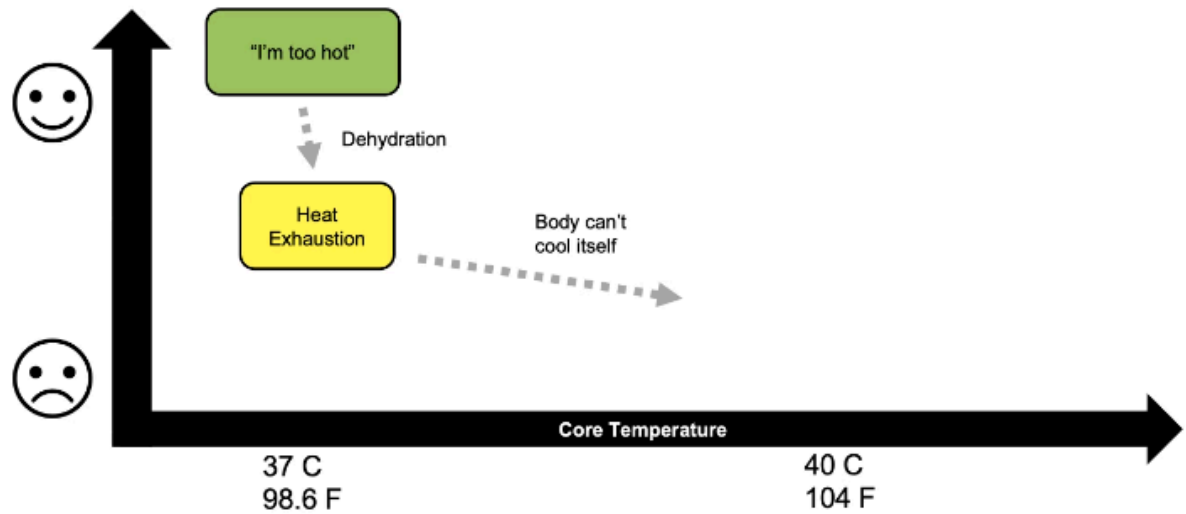
Heat: A Spectrum of Impacts



Climate Change, Environment and
Health Curricular Theme

-
- Cannot hydrate

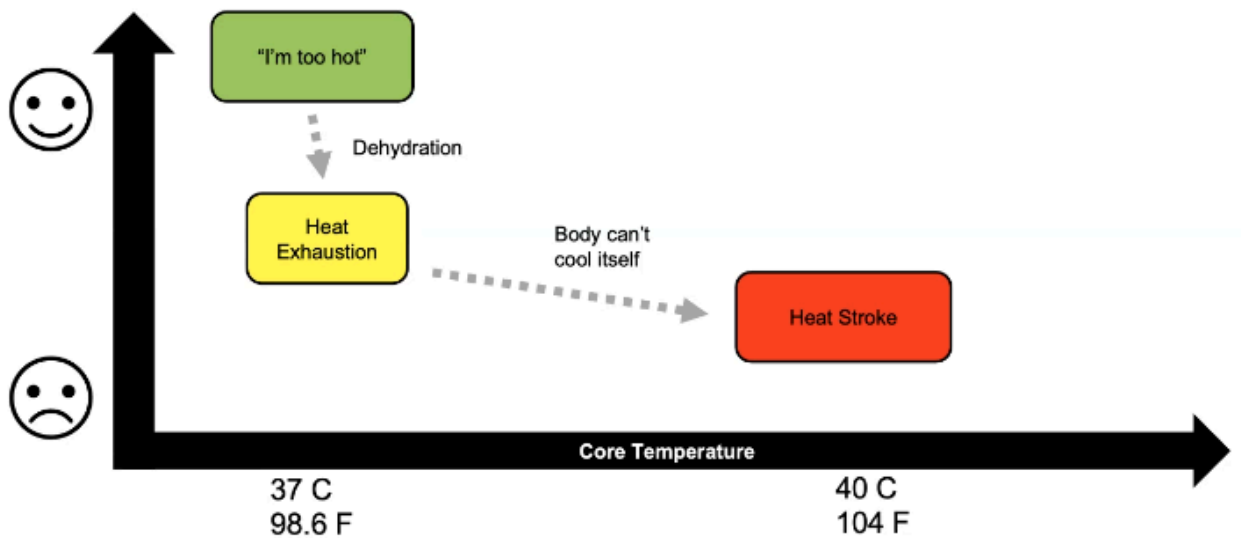
Heat: A Spectrum of Impacts



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- Working in heat can happen rapidly
- Elderly happens slower

Heat: A Spectrum of Impacts

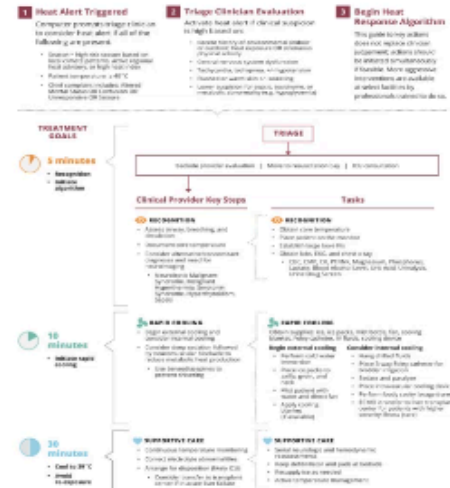


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What do we do? Management of Heatstroke

- Rapid cooling
 - Ice water immersion
 - Evaporative cooling
 - Internal cooling
- Reduce heat generation
 - Prevent shivering
 - Paralyze skeletal muscle
- Supportive care
 - Fluids
 - Organ-specific advanced supports if needed

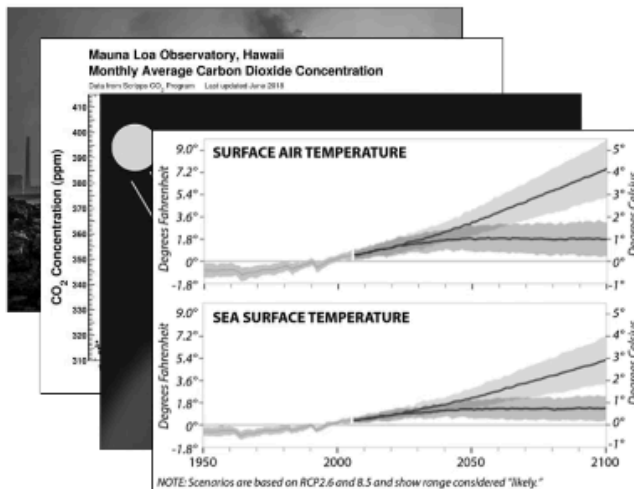
Emergency Management of Heatstroke: AN EVIDENCE-BASED APPROACH



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- Minutes matter – tissue damage is happening
- Climate Change

Connecting Climate Change, Heat, and Health

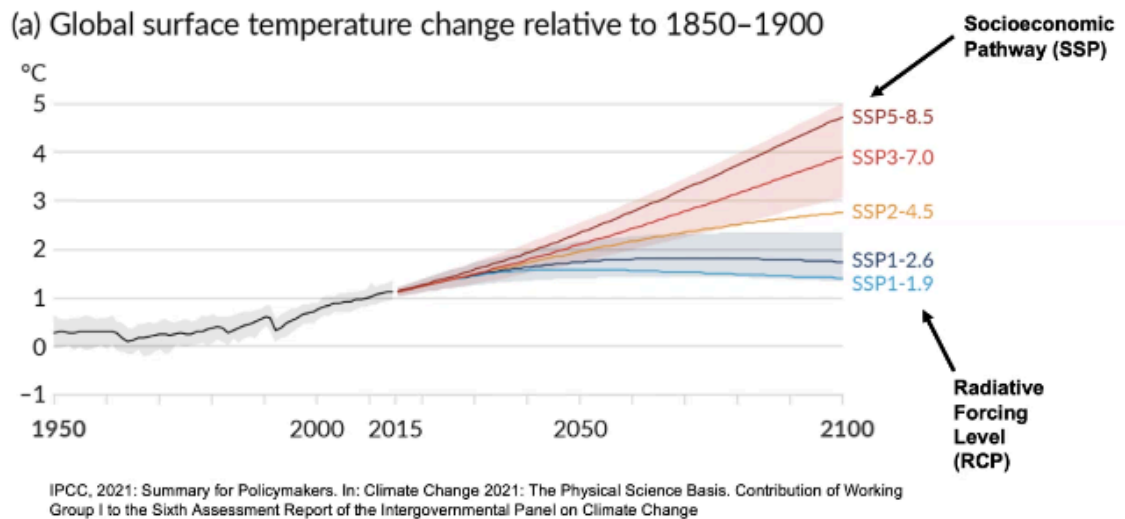


- Heat
 - Droughts
 - Wildfires
 - Storms
 - Floods
 - Hurricanes
 - Shifting biomes
 - Sea level rise
 - Etc.
- Health Impacts
- Healthcare System Impacts
- Societal Impacts

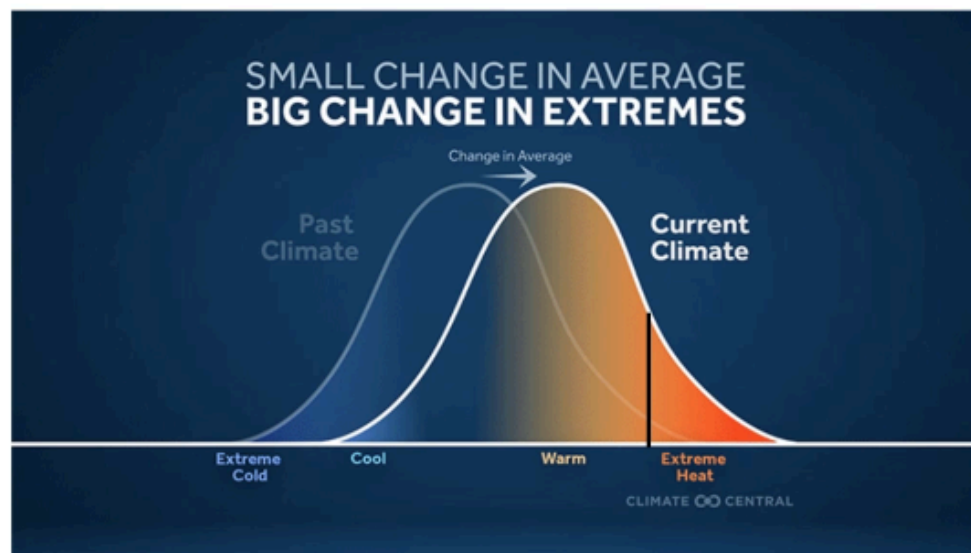


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Future Projections



Extremes increase faster than averages



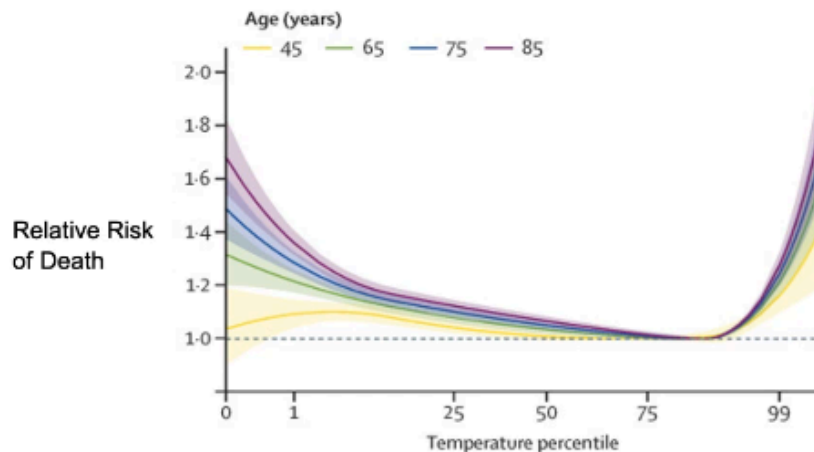
Reproductive Health Impacts of Heat Exposure

- “heat exposure may increase the risk of some **birth defects**, with evidence strongest for cardiac lesions such as ASDs and VSDs” (Haghighi et al, 2021)
- “...exposure to heatwaves in the week before delivery was consistently associated with increased odds of **early-term birth**. Exposure to more high heat days and more degrees above the threshold yielded higher magnitude ORs.” (Huang et al, 2021)
- “Nine of the 10 articles (90%) found a significant association between exposure to heat during pregnancy and **adverse birth outcomes**.” (Bekkar et al, 2020)
- “We notably found that experiencing higher maximum temperatures and smaller diurnal temperature range during the last week before birth increased the risk of **preterm birth** and **stillbirth**.” (McElroy et al, 2022)



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Heat-Mortality Effect More Pronounced in Elders



Masselot et al, *Lancet Planetary Health*, 2023



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Prevention

Populations at Risk



- Anyone with problems thermoregulating
- Anyone unable to control their environment or engage in adaptive behaviors
- Those exposed to extreme heat stress

Support care givers in risk reduction

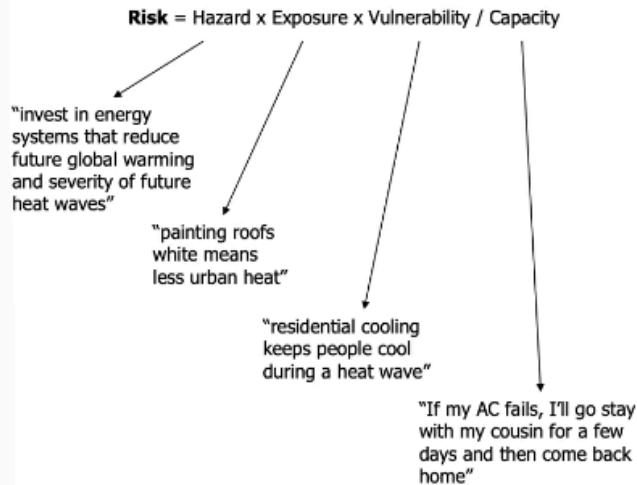
Patients at Risk

Examples include:

- Heart Failure
- Chronic Respiratory Disease
- Multiple Sclerosis
- Pregnancy
- Dementia
- Diabetes

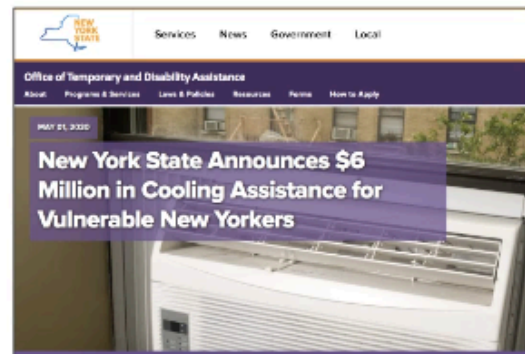


Heat Risk Modification



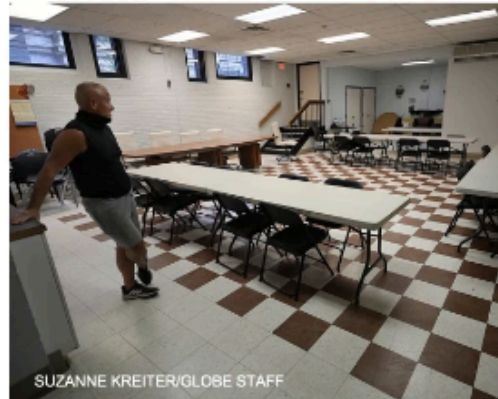
Protective Effects of Residential Cooling

- Lower relative risk of heat stroke admissions in counties with higher air conditioning prevalence (*Wang et al, 2016*)
- In single-city studies of deaths, most who die do not have functioning air conditioning (*Burtolos, Dresser, and Shandas, 2023; Maricopa County, 2024*)



Cooling Centers: A solution for some, but not all

- Libraries, senior centers, school buildings, etc.
- Can meet the needs of some individuals.
- Accessibility, acceptability, awareness, and thus utilization are often challenging.
- Highest risk individuals in a community may also have the hardest time using them.



Bedi NS, Adams QH, Hess JJ, Wellenius GA. The Role of Cooling Centers in Protecting Vulnerable Individuals from Extreme Heat. *Epidemiology*. 2022 Sep 1;33(5):611-615



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This is challenging to implement - not a universal solution, people are refuse to use them for their own reasons

Social connectivity is important

Wellness Checks



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Toolkit: Resources for Caregivers

General Weather Hazard Guidance

For Caregivers

When you are caring for someone, a family member with a chronic condition, or someone with a disability, you need to be aware of the weather hazards that could affect them. This toolkit provides information on how to prepare for and respond to weather hazards. It includes information on how to prepare for and respond to weather hazards, and how to help someone who is vulnerable to weather hazards.

Learn about local hazards and health risks

Climate change is leading to more frequent and severe weather events, including hurricanes, floods, wildfires, and extreme heat events. These events can pose serious risks to people who are vulnerable to weather hazards, including people with chronic conditions, disabilities, and older adults. It is important to learn about the local weather hazards in your area and to take steps to prepare for them.

Plan ahead to prevent medical problems

When you are caring for someone, it is important to plan ahead to prevent medical problems. This includes making sure that you have a plan for what to do in case of an emergency, and that you have the resources you need to care for someone who is vulnerable to weather hazards.

General Weather Hazard Guidance

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Check on and support people who live alone

People who live alone are at a higher risk of being affected by weather hazards. It is important to check on them regularly and to provide them with the support they need to stay safe.

Before a disaster

It is important to prepare for a disaster before it happens. This includes making sure that you have a plan for what to do in case of an emergency, and that you have the resources you need to care for someone who is vulnerable to weather hazards.

During a disaster

When a disaster happens, it is important to follow the instructions of the local authorities and to take steps to protect yourself and the people you are caring for.

After a disaster

After a disaster, it is important to check on the people you are caring for and to provide them with the support they need to recover.

General Weather Hazard Guidance

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Information about specific hazards

This section provides information on specific weather hazards, including hurricanes, floods, wildfires, and extreme heat. It includes information on how to prepare for and respond to these hazards, and how to help someone who is vulnerable to them.

Self-care

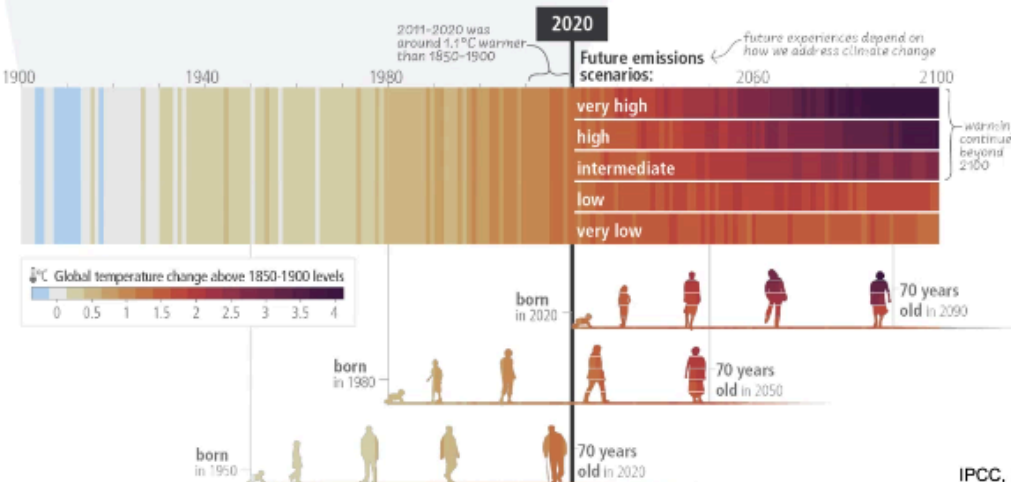
Caring for someone who is vulnerable to weather hazards can be stressful. It is important to take care of yourself and to seek support when you need it.



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... and where are we headed?

c) The extent to which current and future generations will experience a hotter and different world depends on choices now and in the near-term



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Free A/C programs

- Electrical costs can be a barrier
- Cost of A/C much less than medical intervention

Churches are good for building social interconnections needed by elderly during heat events

Idaho Clinicians for Climate and Health, [Click here for lecture series](#)

- Climate Change and Farming: Worker Protections and Community Resiliency
- Impacts of Heat on Vulnerable Populations
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