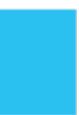


# Cool Chi 2023 End of Year Recap

**December 13, 2023**



and in our communities to combat those longstanding inequities.



**CONGRATULATIONS,  
CHICAGO!**

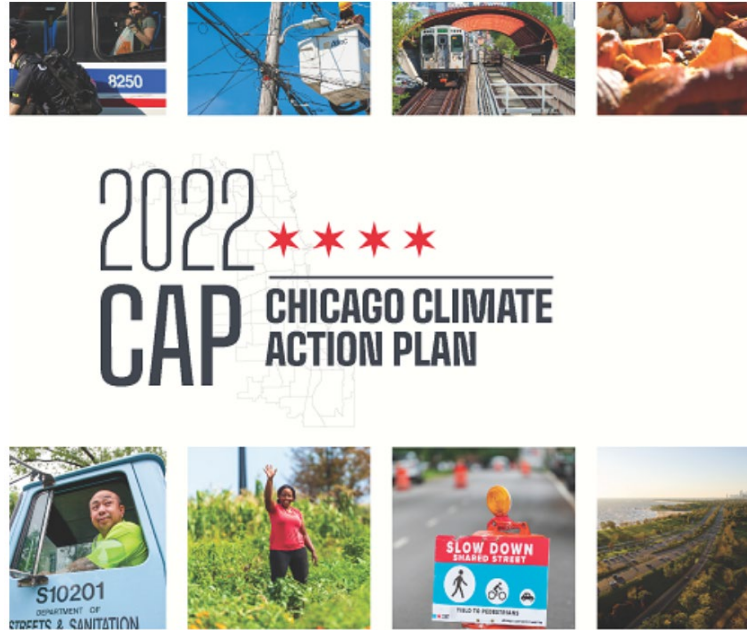




# WE DID IT, CHICAGO

- Communities Organized to Win
- Homan Grown  
L3C/TREEmendous
- North Park Village Nature Center
- People's Response Network (PRN)
- People for Community Recovery (PCR)
- Mi Villita Neighbors
- Southeast Environmental Task Force (SETF)
- Windsor Park Lutheran Church
- 2023 Mayoral Fellows

# ★ Big Picture Conversation



**Defusing Disasters**

**Northwestern**  
BUFFETT INSTITUTE  
FOR GLOBAL AFFAIRS

## ★ Stay In Touch

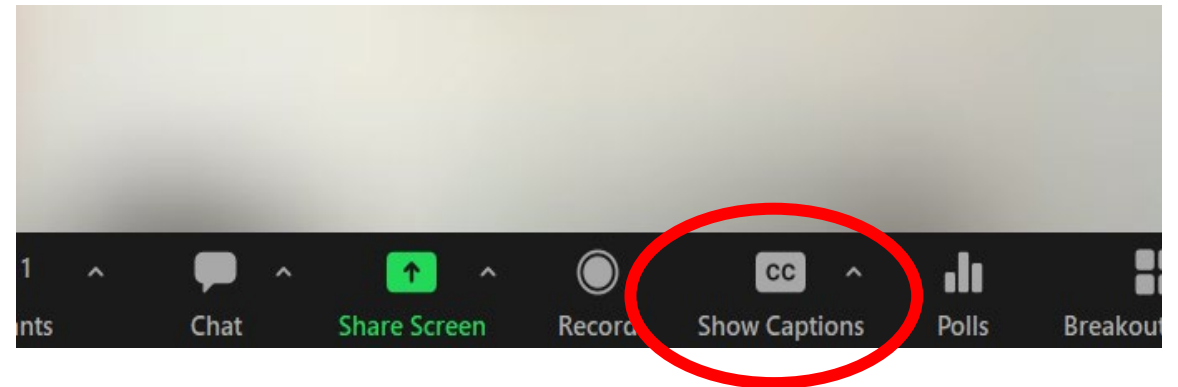
- Here are 3 ways to receive information about Heat Watch and Cool Chi
  - Scan the QR code
  - Go to this URL <https://bitly.ws/35CpW>
  - Email us at [coolchi@cityofchicago.org](mailto:coolchi@cityofchicago.org)



*Scan me*

# ★ Disclaimer

- This event is being live-streamed
- Closed-captioning has been enabled
  - To see captions, click the 'Show Captions' icon



# INTRODUCTION TO HEAT WATCH

**Joey Williams**

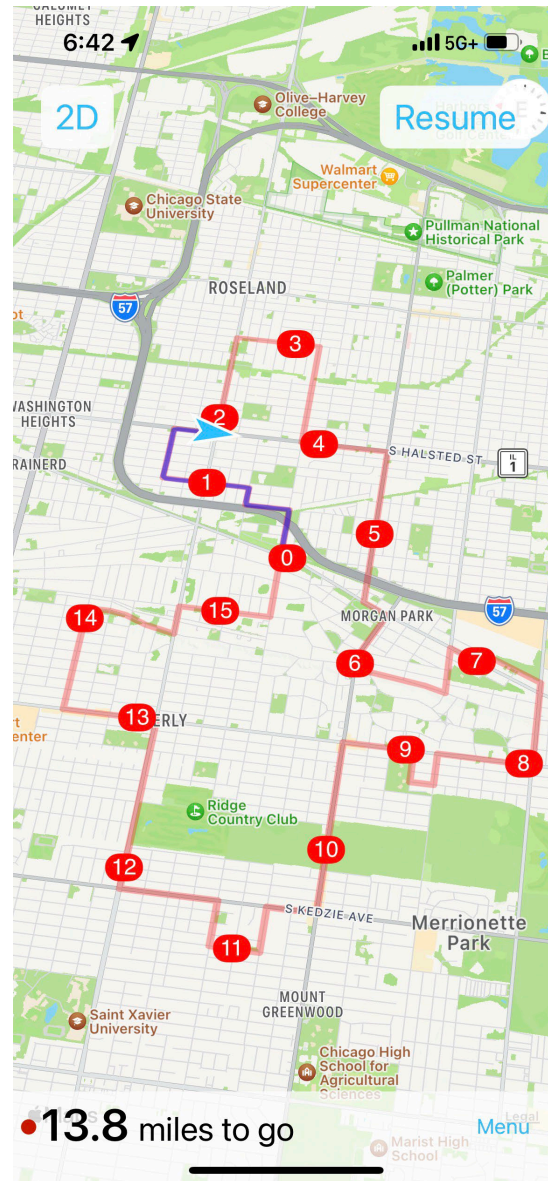
**Manager, CAPA Strategies**



# ACTIVATION DAY

**Adella Bass Lawson**

**Health Equity Director, People for Community Recovery**



# HEAT WATCH CHICAGO DATA AND REPORT

**Raed Mansour**

**Director of Environmental Innovation, City of Chicago**

## Reflections and Q&A

- What words or descriptions stand out about the national NOAA program or Heat Watch Chicago process?
- What caught your attention about the maps?
- Did anything surprise you?



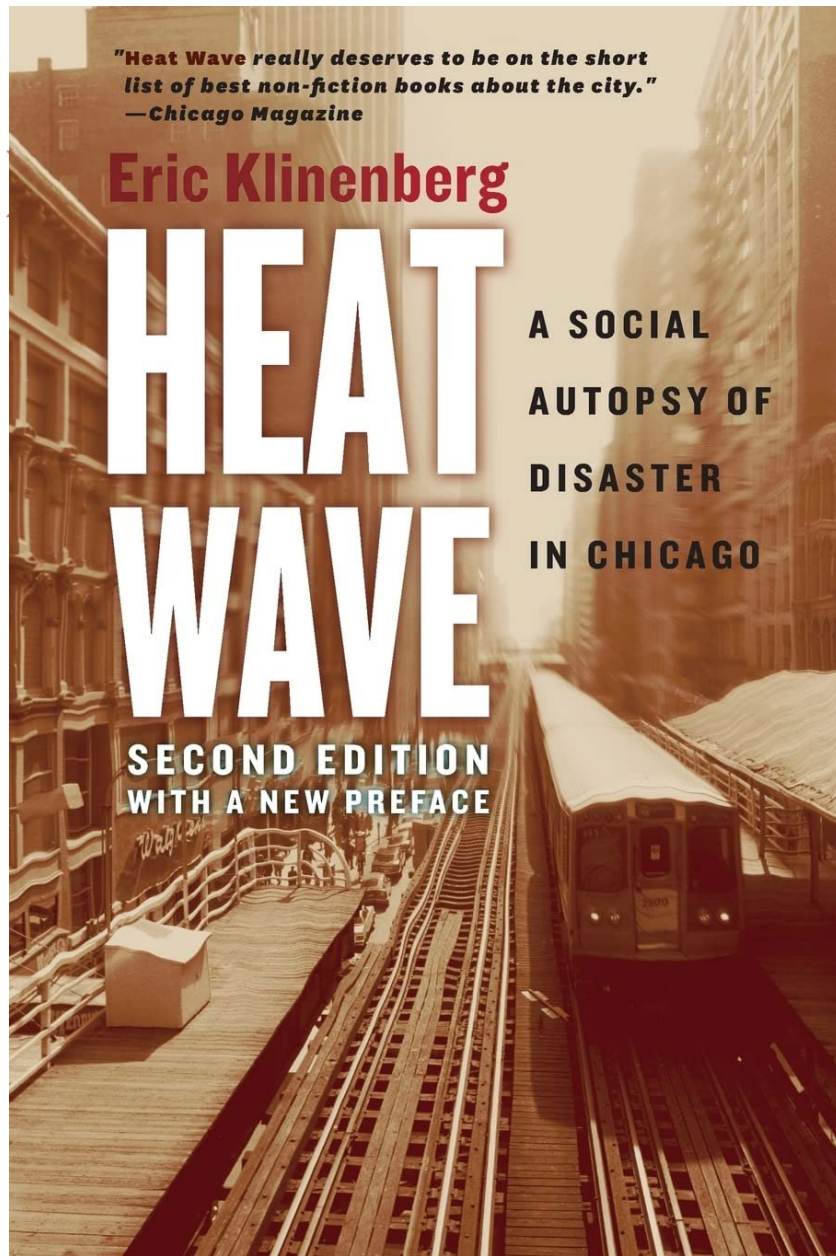
# Determining Chicago's Heat Vulnerability to Build Resilience

**Sheetal Khedkar Rao, MD**

**Assistant Professor of Clinical Medicine, Dept of Internal Medicine, UIC**

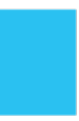
**Adjunct Clinical Assistant Professor, Environmental & Occupational Health, UIC SPH**

**Chief Health and Engagement Officer, Nordson Green Earth Foundation**



## CHICAGO HEAT WAVE – JULY 1995

- Temps > 100°F for five days (heat index > 120°F)
- >700 Chicagoans killed and hundreds more in the Midwest
  - Seniors
  - Socially isolated
  - Minorities
  - No A/C and/or sealed windows
- Failure of infrastructure:
  - Power grid failure
  - 23 hospitals on bypass
  - Transportation breakdown



# Examples of what the City has done since 1995

- Impact-based excessive heat criteria specific to the city of Chicago to **enhance the warning communication** for future events

1. Any day the maximum expected heat index is forecast to reach at least 110°.
2. Two consecutive days with maximum heat indices forecast to reach at least 105°.
3. Three or more consecutive days with maximum heat indices forecast to reach at least 100°.



# Examples of what the City has done since 1995

- Heat Safety information (<https://www.weather.gov/lot/heatprepare>)
- City of Chicago (Family & Support Services):  
[https://www.chicago.gov/city/en/depts/fss/provdrs/serv/svcs/dfss\\_cooling\\_centers.htm](https://www.chicago.gov/city/en/depts/fss/provdrs/serv/svcs/dfss_cooling_centers.htm)



## BEAT THE HEAT!

**KEEP YOUR COOL DURING EXTREME HOT WEATHER.**

The City of Chicago has services available to help residents cope safely with extreme weather conditions. Those resources will be even more impactful with your support. Make a special effort to check on your friends and neighbors during a heat wave, especially if they are older adults, young children, live alone or are people with special needs.

**CALL 3-1-1 TO:**

- Locate a Cooling Center near you.
- Request a well-being check for someone.

**HOT WEATHER TIPS:**

- Drink lots of water, avoid alcoholic beverages, coffee, and sodas.
- Avoid going outside in extreme heat.
- If you don't have air conditioning, keep shades drawn and blinds closed, with windows slightly open.
- If you must be outside, seek shade.
- Keep electric lights off or turned off.
- Minimize your use of your stove or oven.
- Wear loose, light, cotton clothing.
- Take cool baths and showers.
- Don't leave anyone (including pets) in a parked car, even for a few minutes.
- Never leave children, older adults, or those who require special care during periods of intense summer heat.
- Older adults and others who may be sensitive to extreme heat should contact friends, neighbors, or relatives periodically throughout the day.
- Seek help if you feel symptoms of heat related illnesses.

**REMEMBER**

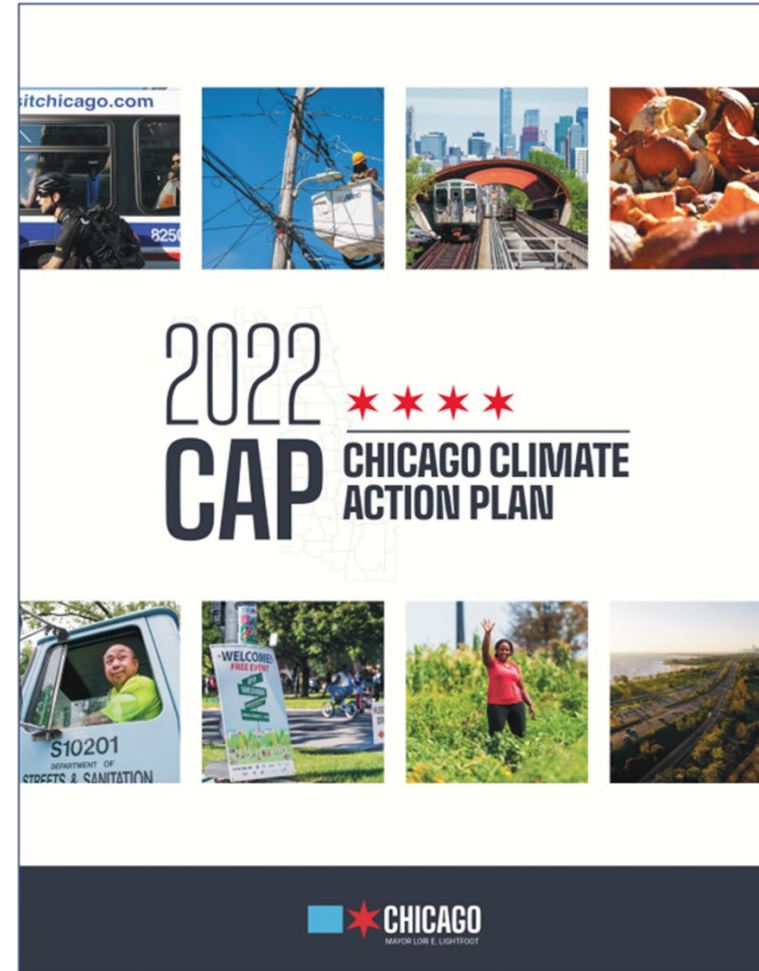
Check on relatives, neighbors and friends. If you are unable to make contact, call 3-1-1 and request a well-being check.

**DFSS**  
Department of Family and Support Services



# Examples of what the City has done since 1995

- Chicago Climate Action Plan
  - <https://www.chicago.gov/city/en/sites/climate-action-plan/home/get-involved.html>



The New York Times

## *Medical Journals Call Climate Change the 'Greatest Threat to Global Public Health'*

An editorial published by more than 200 journals worldwide warned of 'catastrophic harm to health that will be impossible to reverse.'



**TACKLING CLIMATE  
CHANGE COULD  
BE THE GREATEST  
GLOBAL HEALTH  
OPPORTUNITY OF  
THE 21ST CENTURY**

The Lancet, June 2015



# How to better prepare and adapt?

- Engage community partners and residents in data collection and policy development for Chicago's future in urban heat management.
- Understanding the distribution of heat and vulnerability to heat in the City of Chicago
  - “Heat Vulnerability Index”

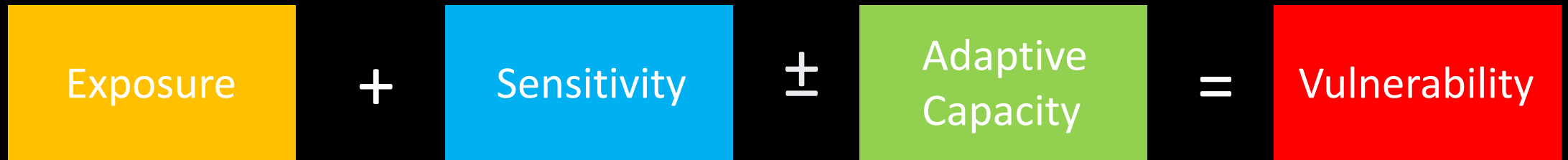


# ★ What is a heat vulnerability index (HVI)

- Model that predicts who is vulnerable to heat
- More than just temperature!
- What influences vulnerability?

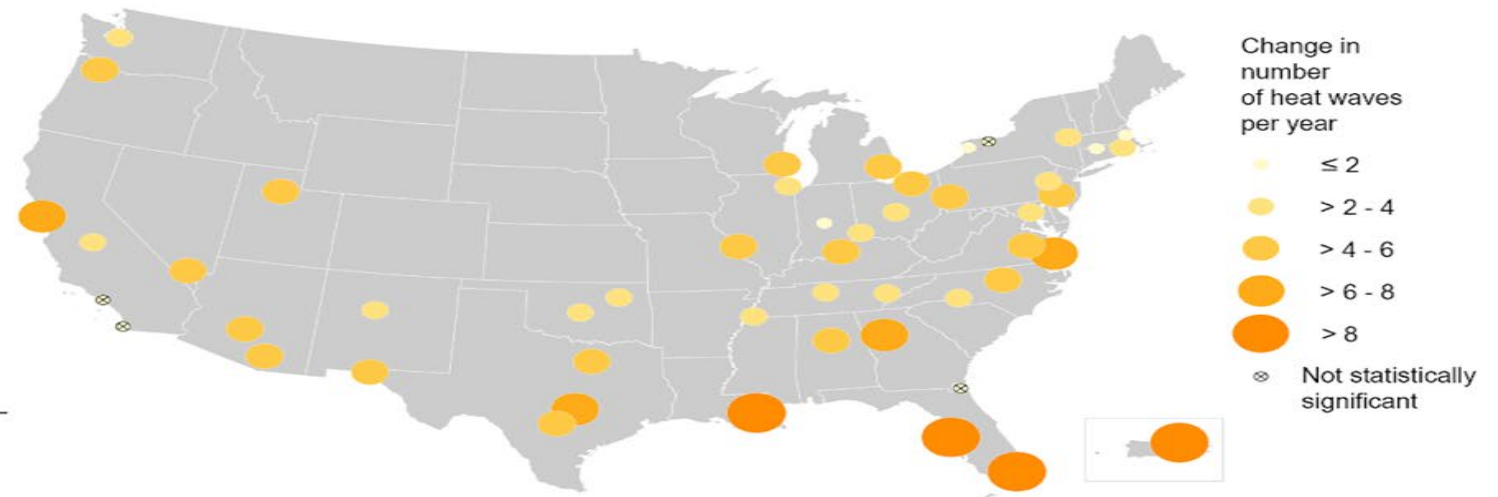
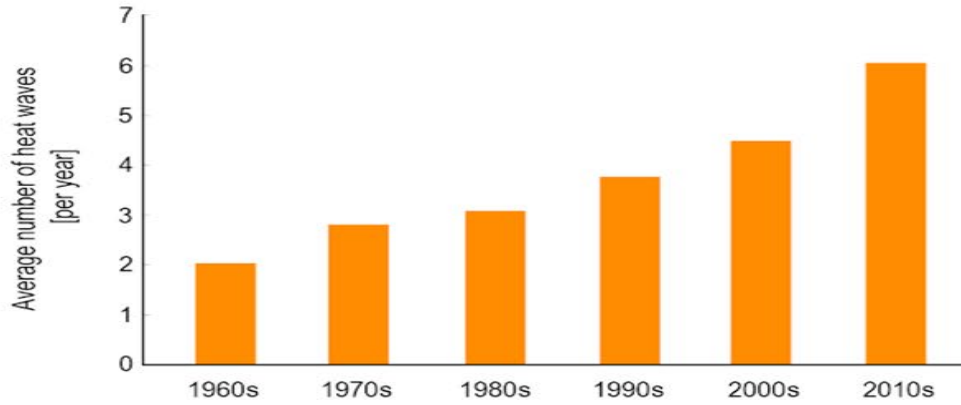


# Elements of Heat Vulnerability

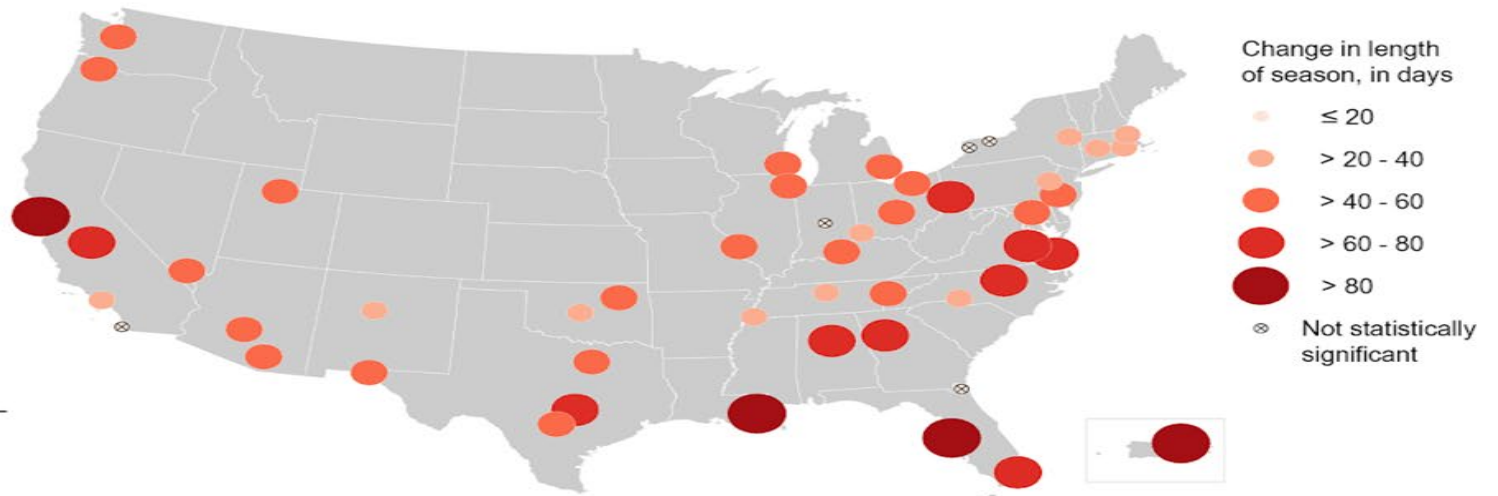
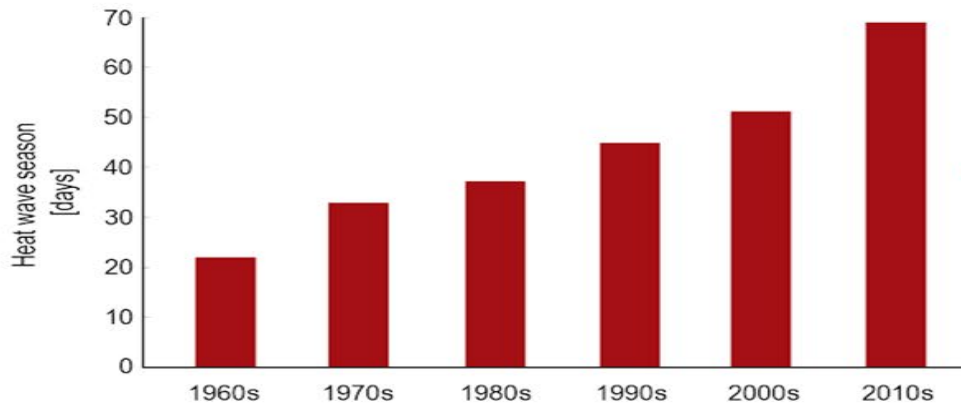


# Heat Wave Characteristics in 50 Large U.S. Cities, 1961-2018

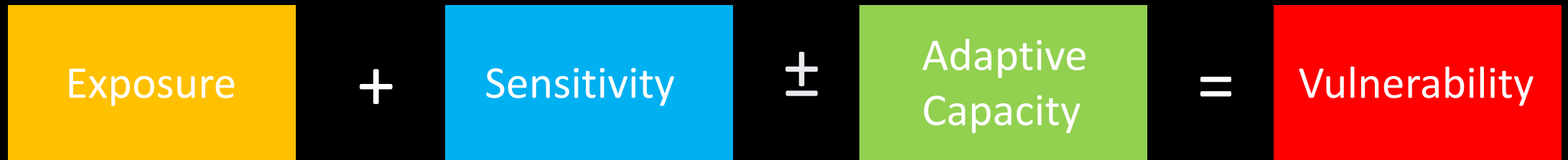
## Heat Wave Frequency



## Heat Wave Season Length




# Elements of Heat Vulnerability



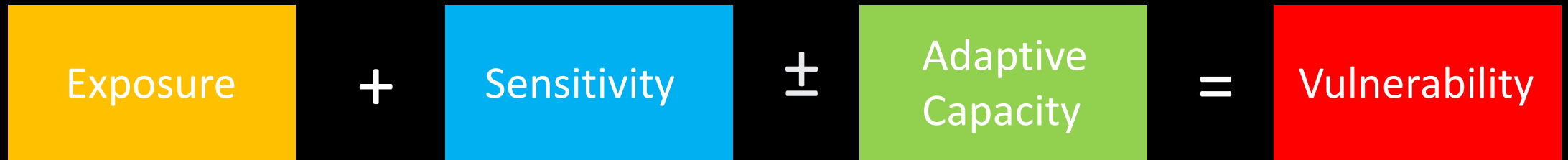


# People With Higher Sensitivity to Heat:

- seniors >65
  - young children (<age 4)
  - pregnant women
  - people with disability or impaired mobility
  - people with chronic health conditions (i.e. heart dz, lung dz, diabetes, obesity)
  - people taking certain medications
  - people with mental illness (i.e. schizophrenia)
- 



# Elements of Heat Vulnerability





# Factors Affecting Adaptive Capacity:

- economic status
  - availability of A/C
  - language barrier
  - living alone
  - support from a community
  - education level
  - recent immigrant
  - access to medical care
- 



# Why create a heat vulnerability index (HVI)?

- Identify who is at risk
- Identify regions at need for interventions
- Explore what interventions are most likely to work
  - Community leadership is essential

**Community Driven, Data Informed!!!**



# Past Attempts

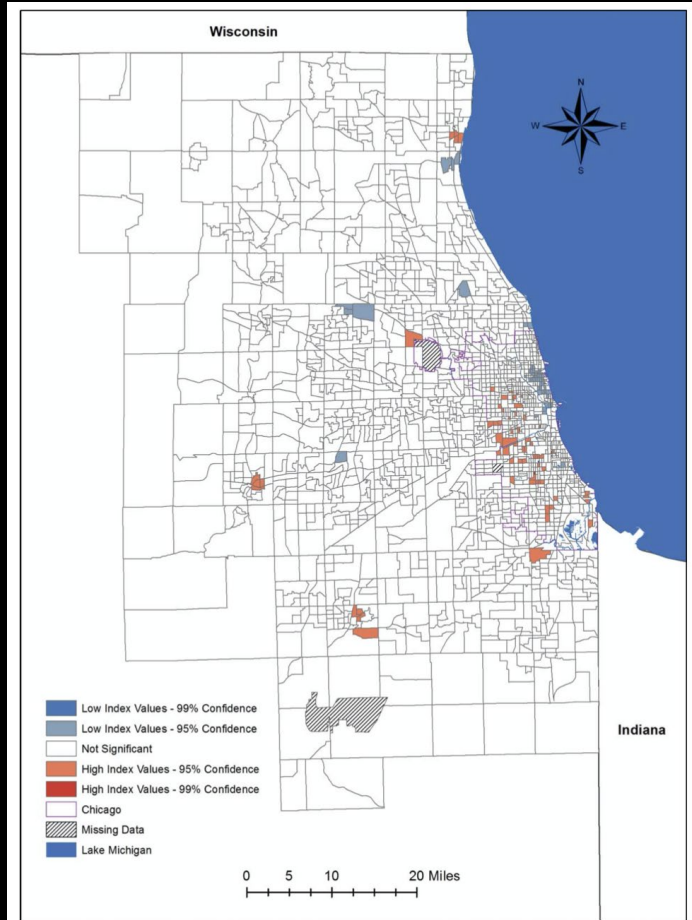
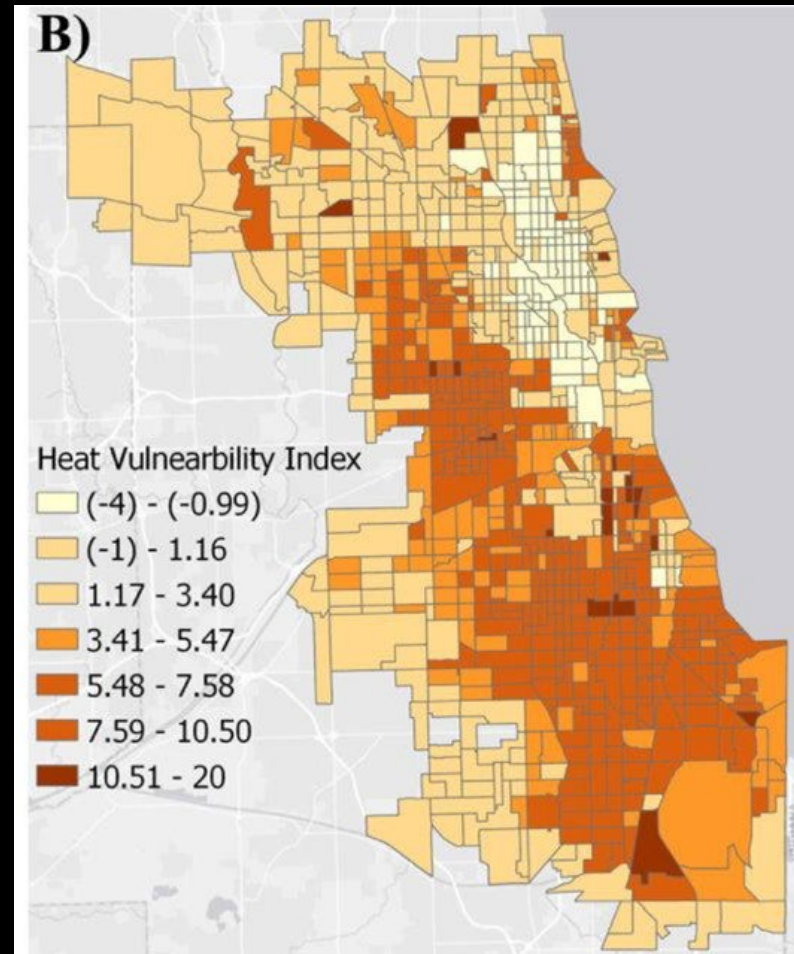


Figure 3. Clusters of high and low index values in the Chicago region, 2000.



- Lacked co-creation of knowledge with community
- Lacked access to public health data

## Community Driven

- Community knows what they have
- Community knows what they need
- Community knows what will work for them



# Principles of CBPR

Recognizes community as a unit of identity

Builds on strengths and resources within the community

Facilitates collaborative partnerships in all phases of the research

Integrates knowledge and action for mutual benefit of all partners

Promotes a co-learning and empowering process that attends to social inequalities

Involves a cyclical and incremental process

Addresses health from both positive and ecological perspectives

Disseminates findings and knowledge gained to all partners



# FACTORS IN SUCCESSFUL HVIs

- **Representative participation** from affected communities
- **Multi-Sector collaboration**
- **Stakeholder engagement**
- **Indicators for monitoring and evaluation** to support project implementation

# Defusing Disasters Working Group



## Interdisciplinary Team

- 12 NU Researchers
  - Feinberg School of Medicine
  - McCormick School of Engineering
  - Weinberg College of Arts and Science

## External partners

- Chicago Metropolitan Agency for Planning (CMAP)
- Chicago Department of Public Health (CDPH)
- Chicago Fire Department (CFD)
- Office of Climate and Environmental Equity
- University of Illinois, Chicago
- Elevate
- IIT
- NOAA / CAPA

## Leaders

- Daniel Horton, Earth and Planetary Sciences, Weinberg College of Arts & Sciences
- George Chiampas, Emergency Medicine, Feinberg School of Medicine

## Funding

- The Buffett Institute for Global Affairs at Northwestern University
  - Stipends for drivers and navigators
  - Refreshments
  - Community Events







# Objective: Diffusing Disasters

- Identify heat-vulnerable residents and populations
- Allocate resources to build resilience
- Design solutions/interventions to reduce vulnerability
- Better assessments → better information → better responses  
→ **Lives saved**



# INVESTIGATING INDOOR AIR TEMPERATURES

**Rachel Scheu**

**Principal Director, Research and Innovation,  
Elevate**

# ★ Context

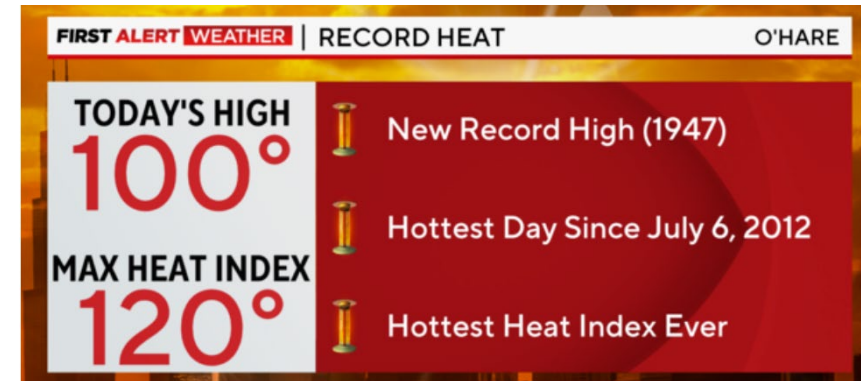
- Extreme heat events becoming more frequent, prolonged, and severe in Chicago
- Risk factors: Low central AC prevalence, buildings designed based on historical climate, limited heat acclimatization among population

## Chicago roasting in record-setting heat that feels like 120 degrees

The 120-degree heat index smashed the previous record set in 1995 during the historic Chicago heat wave that killed more than 500 people.

Source: NBC News August 24, 2023

<https://www.nbcnews.com/news/weather/chicago-roasting-record-setting-heat-feels-120-degrees-rcna101701>



Source: CBS News August 24, 2023

<https://www.cbsnews.com/chicago/news/chicago-weather-alert-heat-warning-heat-index-record/>

# ★ 2023 Summer Indoor Air Temperature Monitoring



**ILLINOIS TECH**

Armour College of Engineering



**ELEVATE**

July 25, 2023-September 8, 2023



**Northwestern**

BUFFETT INSTITUTE  
FOR GLOBAL AFFAIRS

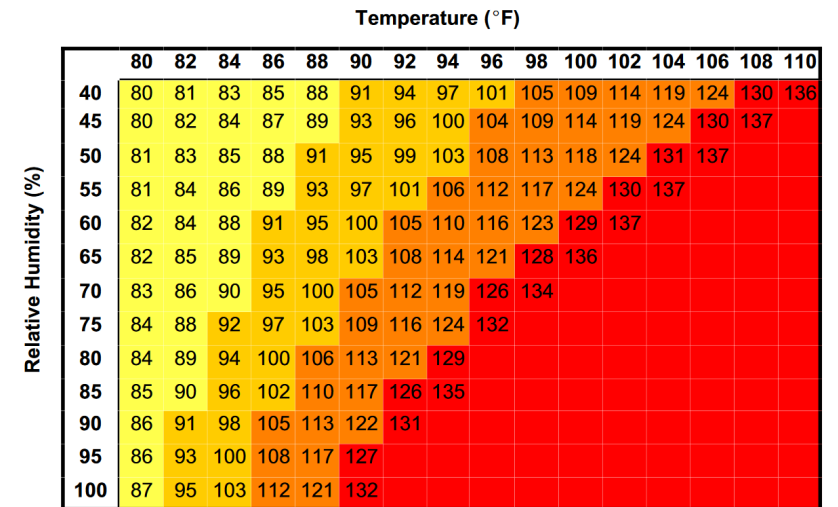


# Study Objectives

1. Advocate for increased investment, policies, and community-driven solutions to mitigate and reduce the deadly impacts of extreme heat.
2. Prepare for funding opportunities for home energy upgrades and support for homes that lack central AC
3. To support the goals of *Defusing Disasters* and the development of a *Heat Vulnerability Index* (HVI) with the Chicago Department of Public Health and Northwestern University; and *Heat Watch*, led by the Chicago Department of Public Health, CAPA Strategies, and the National Oceanic and Atmospheric Administration (NOAA).

# ★ Methods

- Recruit 10 homeowners in representative home types in Chicago.
  - Criteria: Own and reside in a 1-4 unit home without central air conditioning (window units ok); no members of household vulnerable to heat stress; have Wi-Fi.
- Four sensors per home for 26-64 days
- Metrics: Temperature & Heat index
- Survey questions about extreme heat concerns, risk perception, strategies and behaviors to mitigate heat exposure, and reasons for not having central cooling.



**Likelihood of Heat Disorders with Prolonged Exposure and/or Strenuous Activity**  
 ■ Caution ■ Extreme Caution ■ Danger ■ Extreme Danger

Ranges of heat index and likelihood of heat disorders. Source: National Weather Service



# Homes Included in Study (2-4 Unit Brick Homes)



Community Area: Edgewater  
Year Built: 1924  
Floors occupied: 2 floors  
Units: 2 full units and a basement studio  
Sensors: 7/25-8/29



Community Area: Logan Square  
Year Built: 1928  
Floors occupied: 2 floors  
Units: 3 units  
Sensors: 7/25-8/28



Community Area: Albany Park  
Year Built: 1917  
Floors occupied: 1 floor  
Units: 2 units  
Sensors: 8/3-8/29



Community Area: West Town  
Year Built: 1879  
Floors occupied: 2 floors  
Units: 4 units  
Sensors: 8/2-9/8

# ★ Homes Included in Study (Single Family Brick Homes)



Community Area: Logan Square  
Year Built: 1899  
Floors occupied: 2 floors  
Units: 1 unit (Single Family)  
Sensors: 7/25-8/28



Community Area: Hermosa  
Year Built: 1931  
Floors occupied: 3 floors  
Units: 1 unit (Single Family)  
Sensors: 7/25-8/28



Community Area: Calumet Heights  
Year Built: 1964  
Floors occupied: 1 floor  
Units: 1 unit (Single Family)  
Sensors: 7/27-9/8







# Homes Included in Study (Frame Single Family & 2-4 unit Homes)

## Single Family Frame Homes



Community Area: Logan Square  
Year Built: 1899  
Floors occupied: 2 floors  
Units: 1 unit (Single Family)  
Sensors: 7/25-8/28



Community Area: Logan Square  
Year Built: 1894  
Floors occupied: 2 floors  
Units: 1 unit (Single Family)  
Sensors: 8/2-8/28

## 2-4 Unit Frame Home



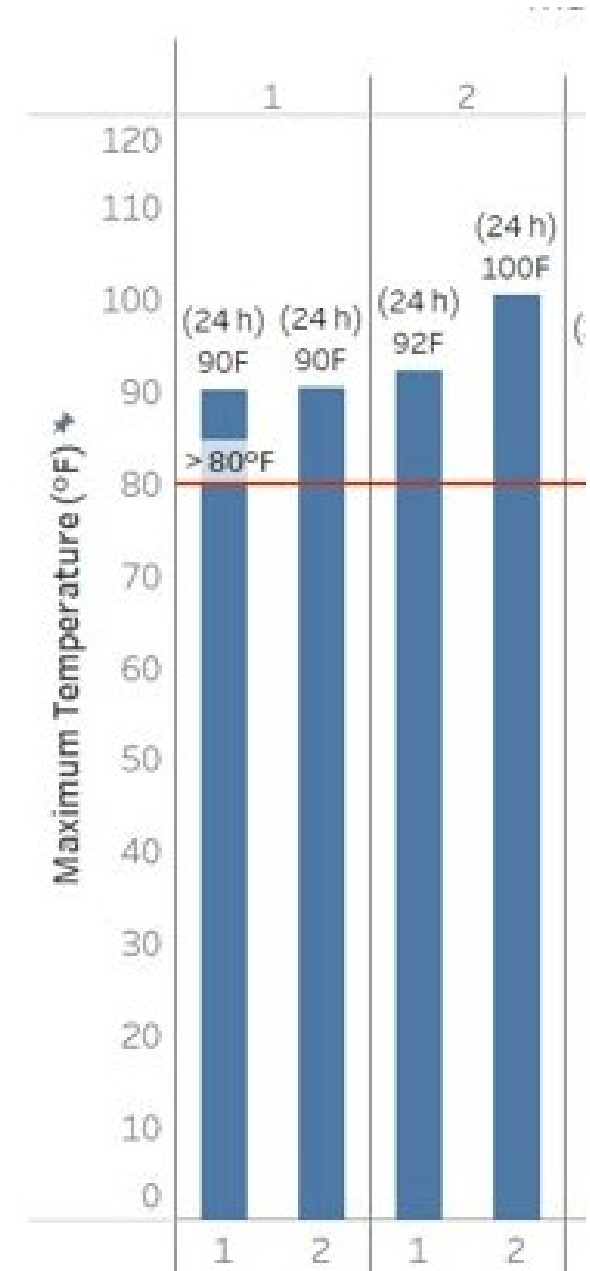
Community Area: Logan Square  
Year Built: 1899  
Floors occupied: 2 floors  
Units: 2 units  
Sensors: 7/31-10/3





# Results – Temperature on August 24

- All homes\* were over 80°F during the extreme heat day (August 24)
- Most spaces were over 80°F for 24 hours

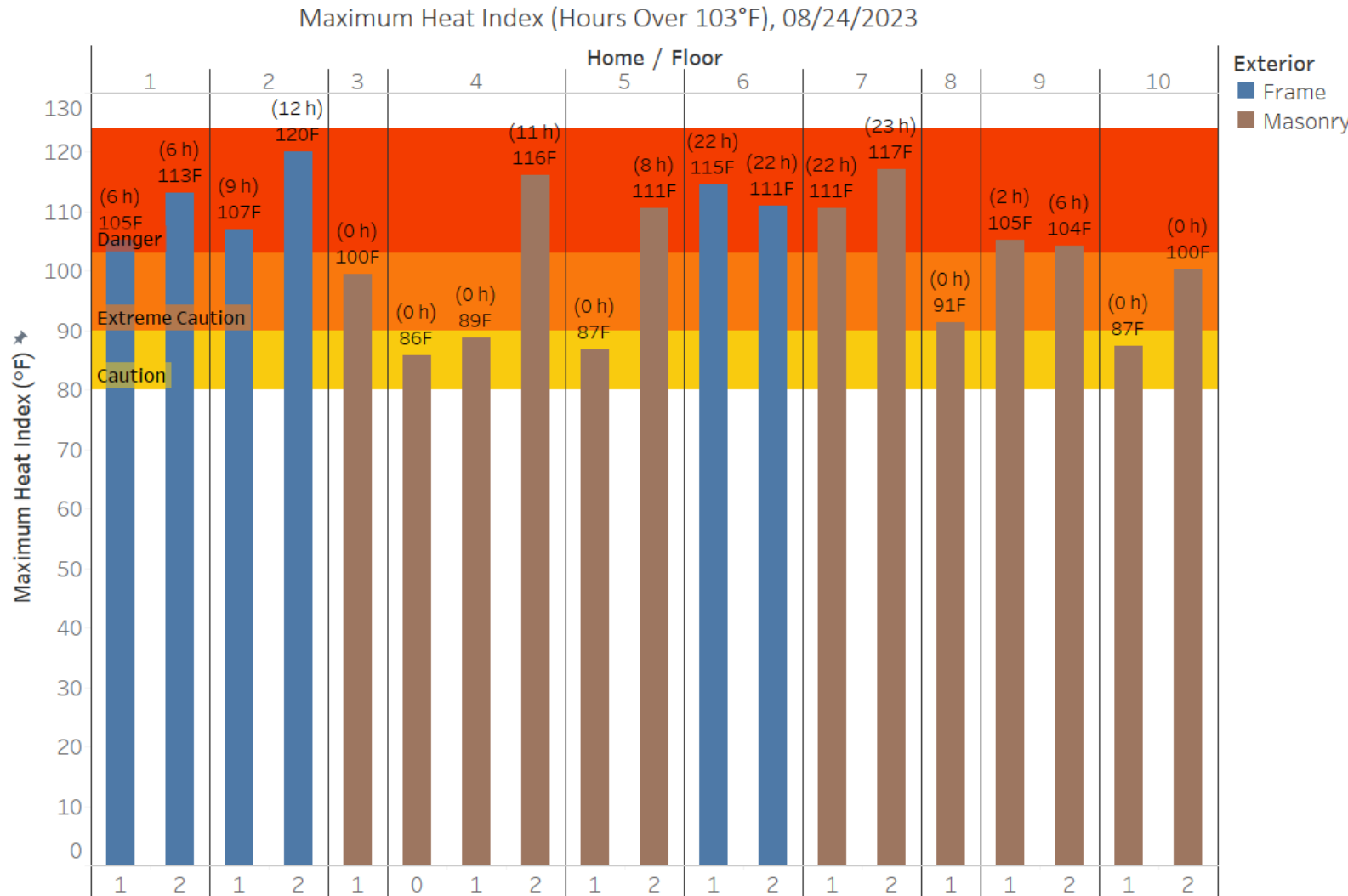


\*unconditioned spaces

# ★ Results – Heat Index (Max) on August 24

All 10 homes\* reached the extreme caution or danger threshold for heat index on August 24

\*unconditioned spaces



# ★ Homeowner Survey and Results- Risk Perception

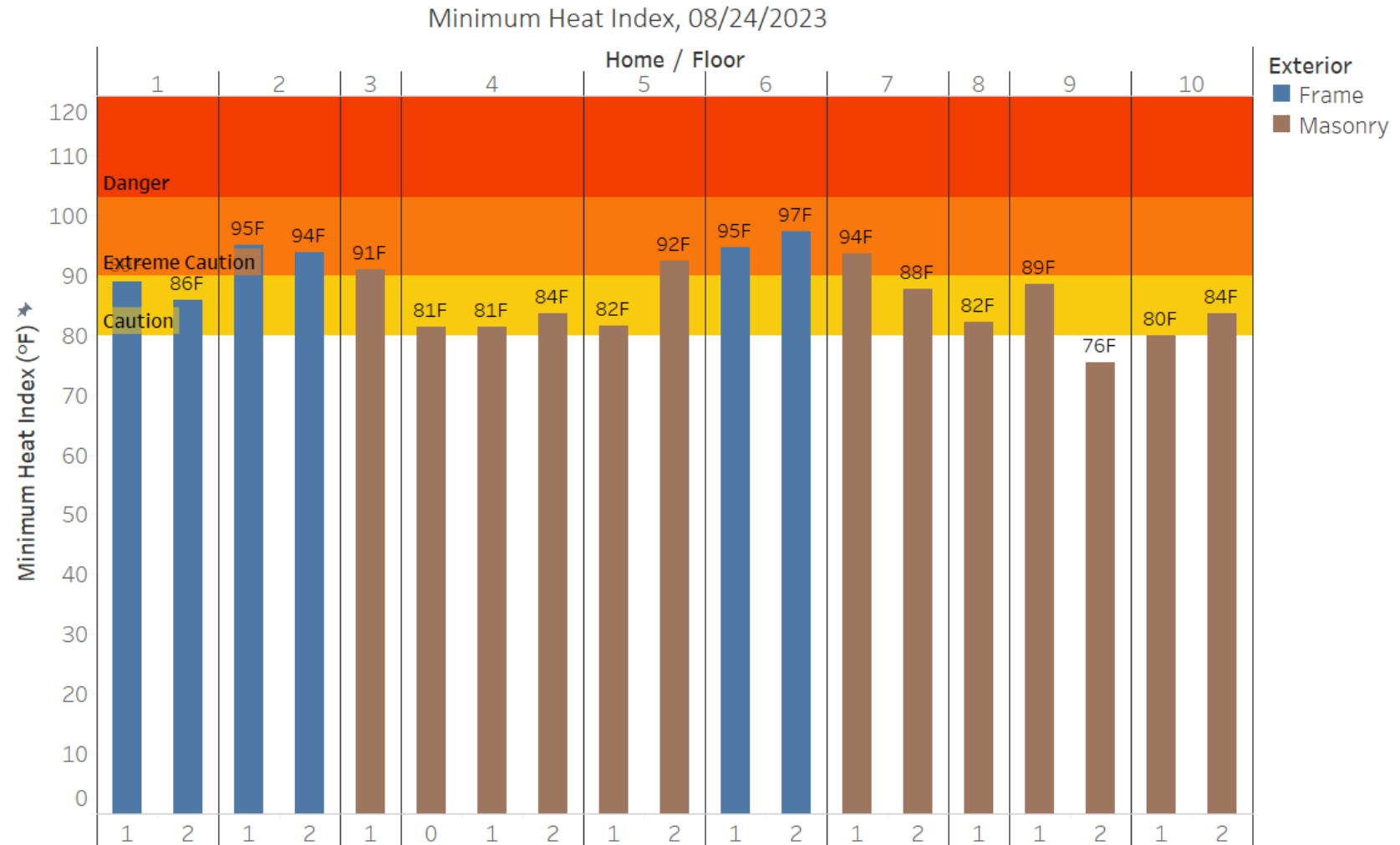
50% believe their home reaches unsafe temperatures in the summer

*“Our second floor is unbearable when the outside temps hit 100 degrees. We have a window unit that cools the sleeping areas, but it's not enough.”*

# ★ Results – Heat Index (Min) on August 24

Even the **minimum heat index** was in the extreme caution or caution during the extreme heat day (August 24)

\*unconditioned spaces



# ★ Homeowner Survey Results- Heat Concerns

## Extreme Heat Concerns

Concern over the wellbeing of friends, family, and community during heat wave



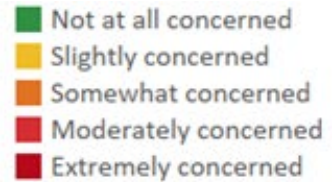
Changes in sleep quality and sleep duration due to increased temperatures



Higher electric bills due to increased energy use for cooling needs



Increased health risks due to heat strain



0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Percent of Responses

*“I am mostly concerned about others who are sensitive to heat. I never had AC growing up so am used to using fans, opening windows at night, etc. And we do have one room with an AC we can **retreat** to.”*

# ★ Homeowner Survey and Results- Heat Adaptation

- 16 of 17 strategies were used by at least 50% of respondents
- Top 3 strategies: fans to cool down(100%), using window curtains/blinds/shades(100%), and wearing lighter clothing(100%)
- Least utilized strategy: leaving the home(30%)
- Those that leave the home mostly go to an air-conditioned business (e.g. grocery store) rather than an air-conditioned public place like a community center or library

# ★ Homeowner Survey and Results- Cooling At Home

- On the hottest days, respondents reported an average of
  - 16.7 hours of window AC use
  - 19.2 hours of fan use
- Both AC and fans mainly used at night

*“My daughter sleeps on the top floor in the finished attic. It can get really hot up there. We do have AC but it has to run all the time just to keep it bearable. Sometimes she sleeps in the basement [to keep cool].”*





# Results Summary

- All 10 homes\* reached the extreme caution or danger threshold for heat index on 8/24
  - 7 homes exceeded 103°F (danger) for 2h - 23h on 8/24
  - 2 homes (both floors) were in the danger category for 21+ hours on a heat wave day
  - Max Temperature: 108°F; Max HI: 120°F;
  - Upper floors generally warmer and more danger hours compared to lower floors; Max HI differential: 36.8F; Masonry homes had the greatest differentials
- Excluding the heat wave days, most spaces experienced temperatures over 80°F during the study
  - Ranging from 1% of the time (5 hours) to 34% of the time (354 hours)
- Majority staying home during heat waves despite very warm indoor temperatures
- All employed multiple adaptive capacity strategies to keep cool
- Only 50% thought their homes were too hot, while the rest were unsure or did not have concern, though they have concern for others



## Study Insights

- Greater access to safe conditions and affordable cooling in homes
- Better understanding and increased education about risks
- Additional public communications before and during heat events
- Better understand community needs with respect to extreme heat



## Reflections and Q&A

- What words or descriptions stand out about the indoor air temperature study?
- What caught your attention?
- Did anything surprise you?

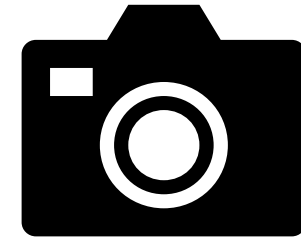


# CENTERING DIRECT AND DIVERSE COMMUNITY VOICES

**Ben Barrett, PhD Student, Northwestern University**

# ★ Upcoming Project: Photovoice

What is it?



Research method where:

1. Community members submit pictures and stories in response to specific questions
2. The pictures and stories are discussed among community members and researchers to *co-discover* and *co-create* common themes



# Photovoice ... Demonstration from Heat Watch

Picture:



Story:

I was impressed by how families, friends, and fur-babies turned out to support Heat Watch Activation Day. Extreme heat is harmful to all living beings, including our pets. To me, these furry friends contributed to the community spirit and emphasized the importance of the day for all living things.

## ★ Photovoice ... Why are we using this approach?

1. Idea raised initially by Heat Watch community planning partners
2. Brings people and data together to answer key questions (e.g., How does heat affect you?)
3. Allows for community discussions:  
*Essential* component to identify important themes for the Heat Vulnerability Index
4. Allows for data sharing back to the community

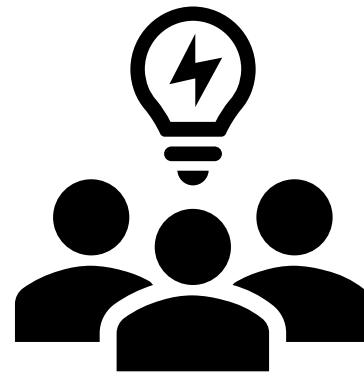
# ★ Photovoice ... Stay Tuned

This is just an introduction  
– project launching soon!

Look out for an invitation  
(email) to share your  
pictures/stories and sign  
up for community  
discussions

## Questions?

- Ben Barrett: [benjamin.barrett@northwestern.edu](mailto:benjamin.barrett@northwestern.edu)
- Terry Horton: [thorton@northwestern.edu](mailto:thorton@northwestern.edu)





# **NEXT STEPS: Engaging Community in Defusing Disasters**

**Dr. Terry Horton**

**Associate Professor, Northwestern University**



# ★ Defusing Disasters – What is it?

- **Chicago Region Goals:**
  - A clinical model to aid healthcare professionals
  - A public health model to inform management and policy
- **Global Learning Community Goals:**
  - Inform best-practices for HVIs globally
  - Shift global approaches to disaster preparedness and responses

# ★ Defusing Disasters – Who's Needed

- **Community**

- Community knows what they have
- Community knows what they need
- Community knows what will work for them



# Defusing Disasters – Locally and Globally

- Building HVIs requires skills in
  - Data analytics
  - Geographical information systems
  - Statistics and Mathematics
- Novel component of this project: engagement with multiple stakeholders
  - Academic researchers
  - Civic and governmental organizations
  - Community-based organizations and individuals

# ★ Invitation to engage

- Principles of Community-Engaged Research
  - Collaboration, Respect, Equity, Transparency, Impact
- Join in co-development of the HVI
  - Your comfort level
- Examples of opportunities
  - Photovoice
  - Collaboration meetings
- Have data skills?
  - Be part of the data team.



*Scan me*

# ★ Importance of Community Voices

- Communities have the lived experience
  - Does it make sense in your community?
  - What features impact your community?
  - What features contribute to heat burdens?
  - What changes would improve your community?
  - What research has already been done in your community that should be considered?

# ★ How can you get involved?



- Or, go to this URL  
<https://bitly.ws/35Cpw>
- Or, email us at  
[coolchi@cityofchicago.org](mailto:coolchi@cityofchicago.org)



**CONGRATULATIONS,  
CHICAGO!**

