Addressing Effects of Climate Change on Local and Global Health

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IHSI: Catalyzing, Supporting, and Uniting Illinois Health Sciences Research

SYNERGIZING HEALTH SCIENCES:
WHAT WE DO

CATALYZE: We CATALYZE health research by identifying common interests and strengths at Illinois.

CONNECT: We CONNECT investigators and labs with clinical partners and resources, for greater collaboration.

SUPPORT: We SUPPORT research projects and studies from novel ideas to successful collaborations.

ENGAGE: We ENGAGE local and global communities in participatory health sciences research and through outreach.
In 1966, Dr. Martin Luther King Jr stated “Of all forms of discrimination and inequalities, injustice in health is the most shocking and inhuman”.

Health disparities are large, persistent, and intergenerational.
The Impacts of CLIMATE CHANGE on LOCAL PUBLIC HEALTH

Julie A. Pryde, MSW, MPH
Administrator
Champaign-Urbana Public Health District
Climate change threatens the fundamentals that sustain life and health:

* Fresh water *
* Food *
* Clean air *
* Shelter *
* Security *
Impact of Climate Change on Human Health

- Injuries, fatalities, mental health impacts
- Asthma, cardiovascular disease
- Heat-related illness and death, cardiovascular failure
- Malaria, dengue, encephalitis, hantavirus, Rift Valley fever, Lyme disease, chikungunya, West Nile virus
- Forced migration, civil conflict, mental health impacts
- Respiratory allergies, asthma
- Extreme heat
- More extreme weather
- Changes in vector ecology
- Increased allergens
- Rising temperatures
- Increasing sea levels
- Water and food supply impacts
- Water quality impacts
- Malnutrition, diarrheal disease
- Cholera, cryptosporidiosis, campylobacter, leptospirosis, harmful algal blooms
- Extreme weather
- Air pollution
- Severe weather
Local Concern: Extreme Heat and Extreme Weather

Heat causes more deaths than any other natural disaster.
- Heat-related illness such as heat stroke or heat exhaustion
- Heat exposure triggers multiple physiological mechanisms that damage heart, brain, intestines, kidneys, liver, lungs, and pancreas
- Increased ozone levels
- Heat stress-related dehydration
- Negatively impacts mental health (more violence & suicide)
- Some medications are heat sensitive
Heat-related Illness for 2017

Champaign County HRI's for Summer 2017

Date

Data: Normal  Data: Warning  Data: Alert
Heat Related Illness for 2018

Champaign County 2018 Summer HRIs

- Data: Normal
- Data: Warning
- Data: Alert
- NWS Heat Advisories
- NWS Excessive Heat Warning
Climate Change does not impact all the same:

Climate change disproportionately impacts the health of low-income communities and communities of color:

- Exacerbates existing health inequities (lack of access to health care, medicine)
- Pre-existing conditions such as asthma, COPD, heart disease
- Living conditions (urban area heat islands, lack of adequate air conditioning, lack of screens, etc.)
- Rising food prices, especially for healthy fresh food

As of 2013, AA 52%, Asian Am 32%, Hispanics 21% more likely to live in heat vulnerable areas of the US.
Changes in Vector Ecology: Mosquitoes (*Culex*)

- Transmit the West Nile virus
- Bite at dusk and after dark
- Lay “rafts” of eggs on still water in a variety of natural and man-made containers.
- Adult *Culex* mosquitoes do not fly far from where they develop as larvae.
- And unlike other mosquitoes that die with the coming of the first hard frost in autumn, the house mosquito can “over-winter” in protected places like sewers, crawlspaces and basements.
Changes in Vector Ecology: Mosquitoes (*Aedes*)

- Includes many nuisance mosquitoes, as well as species that transmit disease to humans.
- Asian tiger mosquitoes are container-breeding mosquitoes, laying their eggs in small, water-filled cavities, including tree holes, stumps, logs, and artificial containers, such as discarded tires.
- They are often the first mosquito noticed in spring, and later after heavy rainfall.
- Adults emerging together from flooded areas are often so numerous that natural controls, such as predators and parasites, are overwhelmed.
- In Illinois, they may bite more people than any other species.
- They typically begin flying in late afternoon and are most active after dark, but will bite any time of day if disturbed while resting in shaded, heavily vegetated areas.
- Fortunately, in the United States they rarely, if ever, transmit disease, and typically die in autumn with the first hard frost.
What diseases can Aedes albopictus transmit?

- Dengue Fever
- Zika
  - Also sexually transmitted
- Yellow Fever
- Chikungunya
Range in 2017

Estimated Potential Range of *Aedes aegypti* in the United States, 2017

Estimated Potential Range of *Aedes albopictus* in the United States, 2017

Mosquitoes’ ability to live and reproduce

- very unlikely
- unlikely
- likely
- very likely
Changes in Vector Ecology: Ticks

Black Legged Tick (Deer Tick)
* Lyme Disease
* Babesiosis
* Ehrlichiosis
* Anaplasmosis
* Powassan Disease

Lone Star Tick
* Lyme Disease
* Rocky Mountain Spotted Fever
* Meat aversion/allergy
* Heartland virus

American Dog Tick (Wood Tick)
* Rocky Mountain Spotted Fever
* Ehrlichiosis
* Tuleremia
New exotic species found in NJ

Longhorned Tick

* SFTS Virus Severe Fever with Thrombocytopenia Syndrome

* Japanese Spotted Fever
What is CUPHD doing about Climate Change?

• New insulated white roof
• Solar panels
• LED lighting
• Energy-efficient AC and heating
• 30 raised-bed garden on our property * promote urban gardening
• Mosquito workers ride bikes
• Food pantry in lobby to help with food insecurity
• Kid-friendly cooling center with free wifi, books, breakfast/lunch/snacks for kids
• Conduct health vulnerability
• Intersectoral collaboration assessments
Climate Health Disparities

Warren G. Lavey
September 25, 2018
How do you picture climate change?
Global Land and Ocean Temperature Anomalies

Annual

Anomaly (°F)

Year

Climate change is the greatest threat to global health in the 21st century.
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Physicians are encouraged to advocate for climate change adaptation and mitigation policies and communicate about the health co-benefits of addressing climate change to their community and policymakers.

Climate change is the greatest threat to global health in the 21st century.
 WHETHER YOU LIVE IN A...

Rural village

Small island or coastal town

Big city

CLIMATE CHANGE THREATENS YOUR HEALTH

Drought, floods and heat waves will increase.

Vector-borne diseases, like malaria and dengue virus will increase with more humidity and heat.

Basic necessities will be disrupted...

FOOD
Hunger and famine will increase as food production is destabilised by drought.

AIR
Pollution and pollen seasons will increase leading to more allergies and asthma.

WATER
Warmer waters and flooding will increase exposures to diseases in drinking and recreational waters.

Between **2030** and **2050** climate change is expected to cause **250 000 ADDITIONAL DEATHS PER YEAR** due to malaria, malnutrition, diarrhoea and heat stress.

World Health Organization
Groups with higher health risks from climate change

- Elderly
- Very young
- Disabled
- Poor
- Living alone
- Existing medical conditions, such as heart disease or asthma
- Living in urban areas with high air pollution
- Living in buildings with no air conditioning
Total population 208,419

- Children under 18 39,332
- Adults 65 & over 24,576
- Poverty estimate 36,364
- Pediatric asthma 2,880
- Adult asthma 15,074
- COPD 9,192
- Cardiovascular disease 14,310

American Lung Association, State of the Air (2018)
In March, a 63-year-old man succumbed to heat and cardiovascular disease, collapsing on the searing sidewalk near his house.
Breathing Seattle’s air right now is like smoking 7 cigarettes. Blame wildfires.

Major wildfires are delivering choking haze to much of the western United States.
"The government is just starting to realize that it needs to take steps to mitigate the impact of global warming," Takashi Okuma, an emeritus professor at Niigata University.
Japan's Floods, Heatwave Kill More Than 300 in July

3 weeks of heatstroke hospitalizations
- 10,000
- 22,000
- 13,700
We’ll put a smile on your face! India creates a Ministry for Happiness to keep the nation happy

A Guide to Top 5 Eco-yoga retreats in India
In India’s parched Bundelkhand, drought brings a tide of migration

As lengthening drought becomes the new normal, a parched region between India’s Madhya Pradesh and Uttar Pradesh states is clearing out

By Shuriah Niazi (Thomson Reuters Foundation) | 5 July 2018

Around half of the four million farmers living in the region have migrated temporarily or permanently since last year.
Bodies found as floods recede in Kerala, death toll above 400

Kerala Focuses on Epidemic Control as People Return to Defunct Toilets, No Water and Hundreds of Carcasses
Hurricane Maria killed 2,975 people in Puerto Rico
FIRST IT WAS A HURRICANE. THEN PIG POOP. NOW IT’S COAL ASH.
Coroner: Heat killed county nursing home resident found in courtyard

Thu, 08/31/2017 - 10:35pm | Tom Kacich

URBANA — The death of a 78-year-old Champaign County Nursing Home resident, whose body was found in an exterior courtyard on a hot day in June, was caused by hyperthermia brought on by exposure to hot weather, according to a report by Champaign County Coroner Duane Northrup.

Ms. Kington had been a resident of the nursing home for more than four years. When admitted, the coroner's report said, her medical history included dementia, pneumonia, muscle weakness, osteoarthritis, hypertension, chronic obstructive pulmonary disease and depression.
13 Chicago Postal Workers Hospitalized For Heat Illnesses
by Fox Illinois News Team, Aug. 1, 2016

Workers were reportedly suffering heat-related symptoms like exhaustion, heat stroke and dehydration after an air conditioner system malfunction.

Excessive heat warning issued for weekend
Thu, 06/28/2018 - 11:24pm | Tim Ditman

East Central Illinois is now under an excessive heat warning from Friday morning until Saturday night.

With the heat index, it could feel as hot as 110 degrees. You should limit your time outside, drink plenty of water, wear lightweight clothing, and check on pets and the elderly.
40 people taken to hospital for heat in Philadelphia in July 1-7, 2018

- up to 8°F above area average
  Poorer, minority areas with older, crowded housing, often without A/C

- up to 14°F below area average
  Wealthier suburbs with more trees and open spaces, with A/C
Underwater
Rising Seas, Chronic Floods, and the Implications for US Coastal Real Estate

Union of Concerned Scientists
Heavy Rains in Illinois Trigger Flash Flooding, Daring Water Rescue  By Pam Wright  June 19 2018 weather.com

In Rockford, a 70-year-old man was rescued from a submerged car after thunderstorms dumped 3 to 5 inches of rain on the city in less than four hours.

Rescuers Mark Picket and Ryan Craig came upon the stranded motorist, Bruce Salley.

When they saw Salley's black Cadillac drifting by on a strong current, the two bravely jumped on the top of the car to help Salley escape by breaking through a window.

He was scared,” said Pickett. “He didn’t want to get cut from the glass around the windows. He was worried about his car and his insurance papers.... I finally told him ‘Buddy, you have two choices. Either you get cut and get out or you’re going to die.’"
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Updated Air Quality Alert continues in effect Friday for a good portion of the Chicago area

The Illinois Environmental Protection Agency has extended the Air Quality Alert for the Greater Chicago Metropolitan Area, including the northeast Illinois counties (grey-shaded on the highlighted map) from Midnight Thursday night until Midnight Friday night.

An air pollution action day is declared when weather conditions are such that widespread ozone and or particulate levels are expected to be at or above the unhealthy for sensitive groups category of the air quality index.

Active children and adults especially people with pulmonary or respiratory disease such as asthma should limit prolonged outdoor activity.
Vulnerability to Flooding

Vulnerability to Ozone Effects on Asthma
First 1,000 Days Symposium

September 4-5, 2018

I-Hotel and Conference Center, Champaign, IL

Healthy Beginnings

Our Community. Our Commitment.
Low birth weight
Champaign County: 8%
Illinois: 8%

Infant mortality (w/in 1 year, per 1,000 live births)
Champaign County: 7
Illinois: 7
“term infants exposed to heat in the third trimester were \textbf{31 percent} more likely to be of low birth weight”

“infants born after the entire pregnancy occurred during atypically hot temperatures were \textbf{249 percent} more likely to be of low birth weight”
“The effects of climate change put women at elevated risk of disease, malnutrition, sexual violence, poor mental health, lack of reproductive control, **negative obstetric outcomes**, and death.”

“This also has an impact on future generations, with the rate of **low-birth weight infants** increasing in regions impacted by climate change.”
Global Climate Change and Children’s Health

• Mental and physical illness, injury and death
• Infectious diseases, asthma and allergies
• Food and water scarcity, migration, conflict
Outcomes
• Low birth weight
• Pre-term birth

Environmental determinants
• Worse air quality – respiratory problems
• Heat – dehydration and renal problems
• Contaminated water and food – diarrhea and poor nutrition
• Extreme weather – mental stress
Possible Healthy Beginnings actions on climate health risks

• Incident reports on households visited
  • No A/C
  • Mold
• Educate mothers on
  • Cooling and water
  • Flooding and mold
  • Stress from weather
• Cooling centers in communities
• Check-in during extreme weather
Climate change -- greatest health opportunity
Sign your support!
california
Clean Cars Campaign
SCHMID ELEMENTARY SCHOOL

9755 S. Greenwood, Pullman neighborhood
How do you picture climate change?
How do you picture climate change?