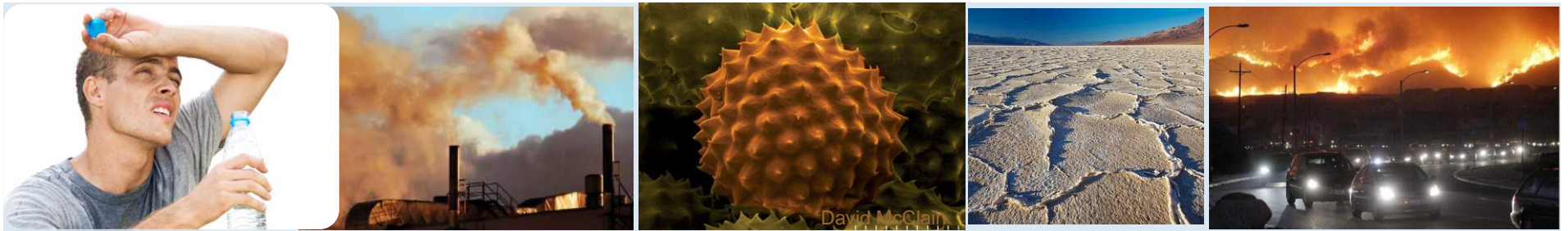


Urban Heat and Health: Assessing the Risks – Dr. Hess

- Respondent – Kim Knowlton, NRDC



- Heat is a significant driver of morbidity and mortality
- Cities themselves (UHI) can contribute as much warming as does climate change
- Increasing exposures plus simultaneous growth of vulnerable populations; adaptive capacity varies
- Strategies to reduce greenhouse gases & limit future climate change (mitigation) can also have current-day benefits for health & save \$ (co-benefits)

Doctors: Climate change harming our patients right now

by Dan on Jun 26, 2014 • 10:10 am

7 Comments

How is climate change affecting the U.S. today? According to hundreds of doctors from the National Medical Association, it already causes great harm to their patients.

At a press event yesterday in Washington, D.C., medical and public health experts, as well as patients, discussed the immediate impact of climate change — and an opportunity to bring the conversation into health care.

“Most people don’t know a climate scientist, so when 97 percent of climate scientists say that climate change is happening — if you’re not really that tuned into science — that may not influence you,” said APHA member Mona Sarfaty, director of George Mason University Center for Climate Change Communication program for climate and health.



Mark Mitchell (left), co-chair of the National Medical Association's environmental health task force, speaks at a news conference in Washington, D.C., about research findings on effects of climate change on health. Photo by Daniel Greenberg/APHA

\$14 billion in health-related costs *from just six* US climate change-related events, 2002-2009 (Knowlton et al., *Health Affairs* 2011)

Six U.S. Case Studies, 2002-2009, Resulted in More Than \$14 Billion in Climate-Related Health Costs.

Over a two-week heat wave, 655 deaths, 1,620 hospitalizations, and more than 16,000 excess emergency room visits, resulted in nearly \$5.4 billion dollars in costs. Major heat waves such as this are expected to occur more frequently in the future.

HEAT WAVE, CALIFORNIA, 2006



WILDFIRES, SOUTHERN CALIFORNIA, 2003

These fires burned more than 736,000 acres and resulted in 69 deaths, 778 hospitalizations, and more than 47,600 outpatient visits. Together, this resulted in health-related costs exceeding \$578 million. Conditions conducive to wildfires, including drought and extreme heat, are expected to worsen in many parts of the country due to climate change.



© Dave Powell, USDA Forest Service

FLOODING, NORTH DAKOTA, 2009



FEMA News Photo



WEST NILE VIRUS, LOUISIANA, 2002

An outbreak of West Nile Virus in Louisiana in 2002 resulted in an estimated 24 premature deaths, 204 hospitalizations, and nearly 5,800 outpatient visits. Health-related costs totaled \$207 million. Mosquito-borne diseases are expected to emerge and spread into more northern climates as temperatures increase and create more habitable environments for mosquitoes.



SMOG POLLUTION, NATIONWIDE, 2002

Across the U.S. in 2002, nearly 288 million Americans were exposed to ozone smog levels above the health-based standard, which was then 80 ppb. This exposure hastened death for 795 people, and caused 4,150 hospitalizations and more than 365,000 outpatient visits, at a cost of \$6.5 billion. Smog levels are anticipated to rise in the coming years, in the absence of strategies to reduce precursor emissions, because as climate change increases temperatures, ozone-forming chemical reactions also increase.



FEMA News Photo

HURRICANES, FLORIDA, 2004

Four major hurricanes caused 144 premature deaths, nearly 2,200 hospitalizations, 2,600 emergency visits, and \$1.4 billion in health-related costs. Climate change is projected to increase the intensity of hurricanes, as sea surface temperature rise in the North Atlantic and provide more energy to drive storm systems. Some climate models project a doubling in the most intense hurricanes (Category 4 and 5) by late in this century.⁵

Over 760,000 encounters with the US health care system from 6 events

Table 1. Health costs in climate change-related case study areas, with costs per health effect, 2002 through 2009.

Climate Change-Related Case Study	Premature Death	Illness	Total Health Cost by Case Study
Ozone smog pollution	\$6.3 Billion	\$254 Million	\$6.5 Billion
Heat wave	\$5.2 Billion	\$179 Million	\$5.3 Billion
Hurricane	\$1.1 Billion	\$255 Million	\$1.4 Billion
Wildfire	\$545 Million	\$34 Million	\$578 Million
Mosquito-borne infectious disease	\$190 Million	\$18 Million	\$207 Million
River flooding	\$16 Million	\$5 Million	\$20 Million
Total costs (in U.S. dollars, 2008)	\$13.3 Billion	\$744 Million	\$14.1 Billion

Philadelphia Heat-Health Warning System



HEAT WATCH/WARNING SYSTEMS SAVE LIVES

Estimated Costs and Benefits for Philadelphia 1995–98

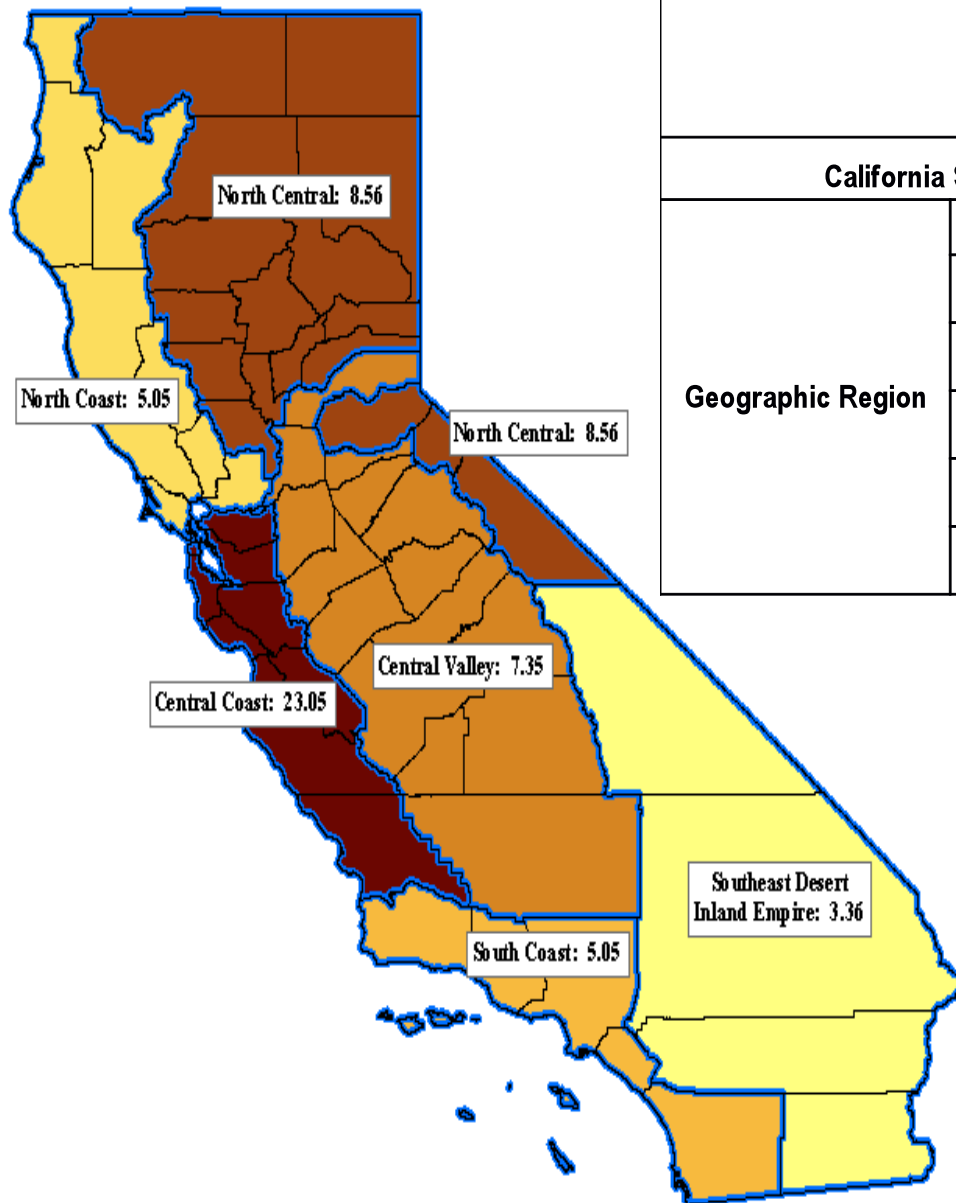
BY KRISTIE L. EBI, THOMAS J. TEISBERG, LAURENCE S. KALKSTEIN,
LAWRENCE ROBINSON, AND RODNEY F. WEIHER

The cost of running a heat wave warning system for Philadelphia were practically at the "noise" level compared to the economic benefits of saving 117 lives in three years.

Ebi et al. (BAMS 2004)



- **Identifying Vulnerabilities** - City worked w/agencies to identify where elders live; Neighbors check on elderly via "buddy system" in heatwaves
- **Tracking** - National Weather Service, Dept of Public Health, Corporation for Aging, News Media are in contact when heat wave is predicted, and public is alerted frequently; free "Hotline" info
- **Climate-Smart Design** Cool Homes Program encourages energy-efficient design; free energy audits
- **Public Education**
Cooling centers opened; no utility service suspensions; more Fire, EMS, Homeless svc staff; Public education about what to do/what not to do



		Heat-related Illnesses	
		Emergency Dept. (ED) Visits	Hospital admissions
		Rate Ratio (95% CL)	Rate Ratio (95% CL)
California Statewide		6.30 (5.67, 7.01)	10.15 (7.79, 13.43)
Geographic Region	Central Coast	23.05 (15.05, 37.10)	Insufficient data
	Central Valley	7.35 (6.01, 9.07)	17.10 (9.08, 36.30)
	North Central	8.56 (5.24, 14.82)	Insufficient data
	North Coast	5.05 (3.14, 8.49)	Insufficient data
	South Coast	5.05 (4.12, 6.25)	6.29 (3.95, 10.49)
	Southeast Desert	3.36 (2.74, 4.15)	4.36 (2.72, 7.29)

New York City

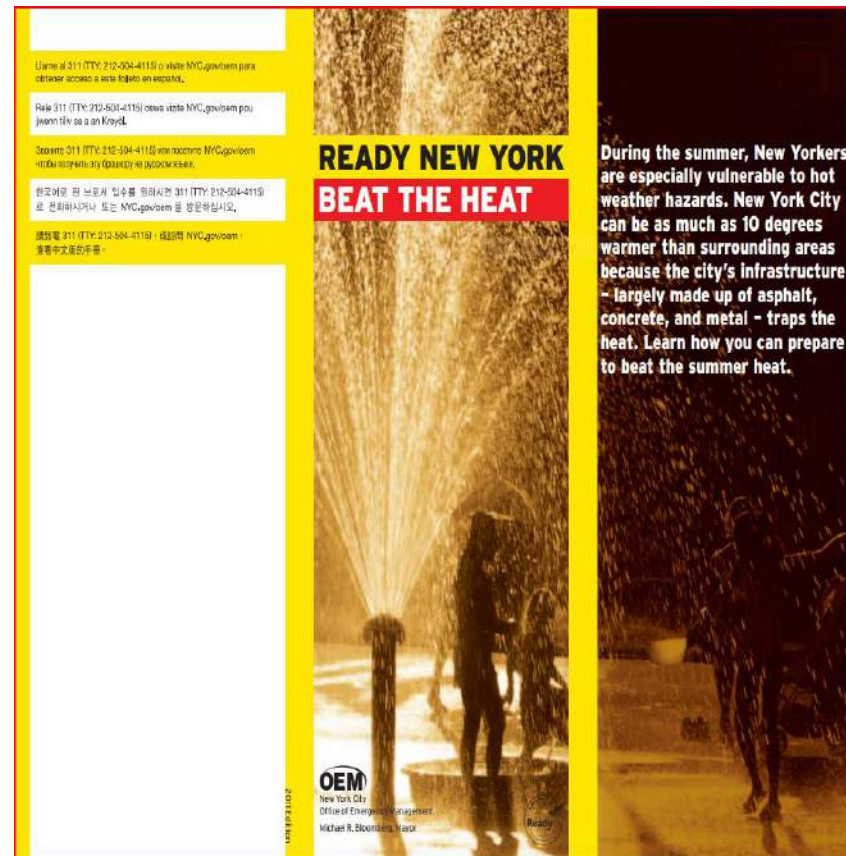
Best Practices

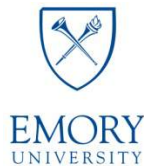
- Heat health hotline

- Health tips
- Cooling Center locations

- Online Cooling Center Map during heat season

- Includes ozone health tips in publications





INDIAN
INSTITUTE OF
PUBLIC HEALTH
GANDHINAGAR



Heat-Health Collaboration: Reducing Heat Vulnerability in India



March 2011: Indo-US Scientific Workshop: 40 experts discuss heat-adaptation strategies; 2010 Heat Wave Focus

March 2012: Discussions and surveys with most heat-exposed people; fact sheets & report shared among communities; trainings with medical professionals

March 2013: 'table-top exercise'; heat wave early warning system tested

April 2013: Heat Action Plan piloted



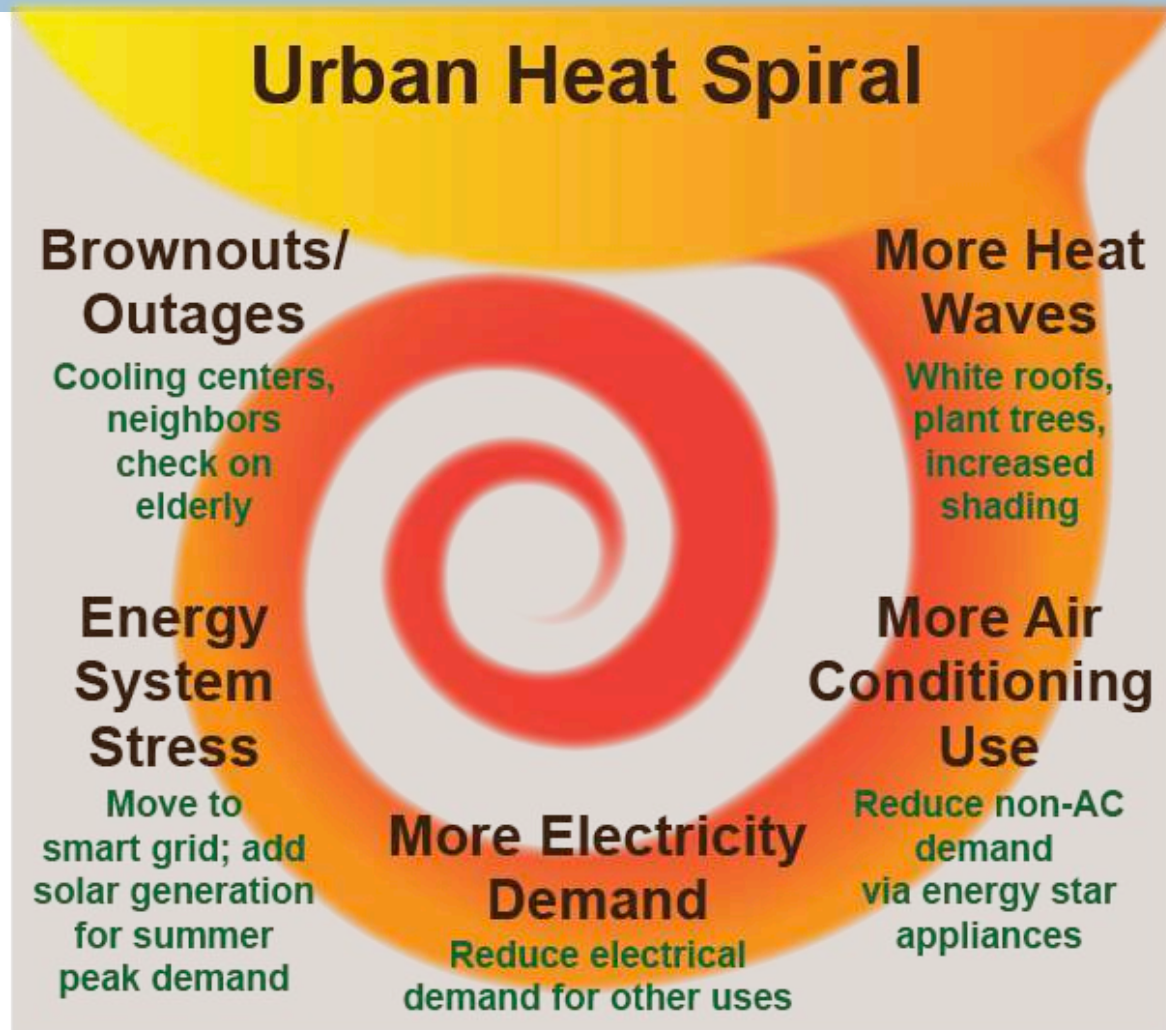
March 2011 Kick-Off Workshop - Ahmedabad, India

Adaptation to Increasing Heat

Spiraling effects of Heat Waves

**Green: response
options**

Source: Figure 20.6: **Urban Heat and Public Health**
from Southwest Chapter,
NCA3 (May 2014)



Protecting Community Health:

Opportunities to Prevent & Prepare for Climate Change

“Responding to climate change provides opportunities to improve human health and well-being across many sectors, including energy, agriculture, and transportation. Many of these strategies offer a variety of benefits, protecting people while combating climate change and providing other societal benefits.”

-Third National Climate Assessment (NCA3),
Human Health (Chapter 9)



Key points



- Heat is a significant driver of morbidity and mortality
- Cities themselves (UHI) can contribute as much warming as does climate change
- Increasing exposures plus growth of vulnerable populations
- Strategies to reduce greenhouse gases & limit future climate change (mitigation) can also have current-day benefits for health & save \$ (co-benefits)
- **We can create healthier, more secure cities**

