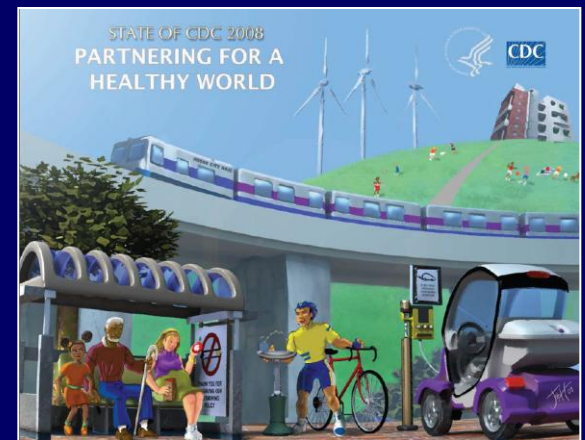


The Centers for Disease Control and Prevention (CDC) *Partnering for a Healthy World*

Judith R. Qualters, PhD
Chief, Environmental Health Tracking Branch
Division of Environmental Hazards & Health Effects
National Center for Environmental Health
Centers for Disease Control and Prevention
September, 2009



Contributors

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The success or failure of any government in the final analysis must be measured by the well being of its citizens. Nothing can be more important to a state than its public health; the state's paramount concern should be the health of its people.

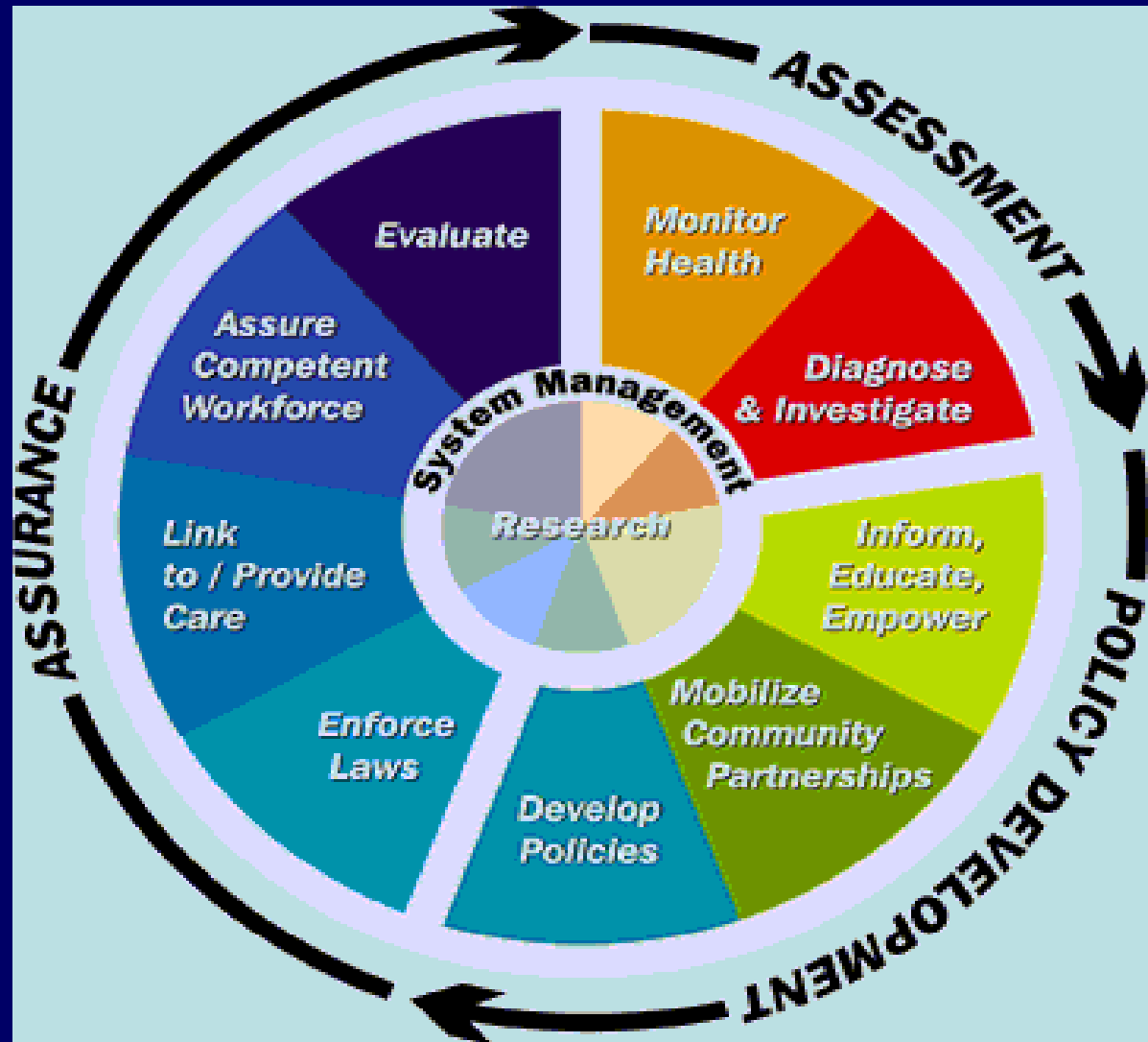
Franklin Delano Roosevelt



Three Core Functions of Public Health

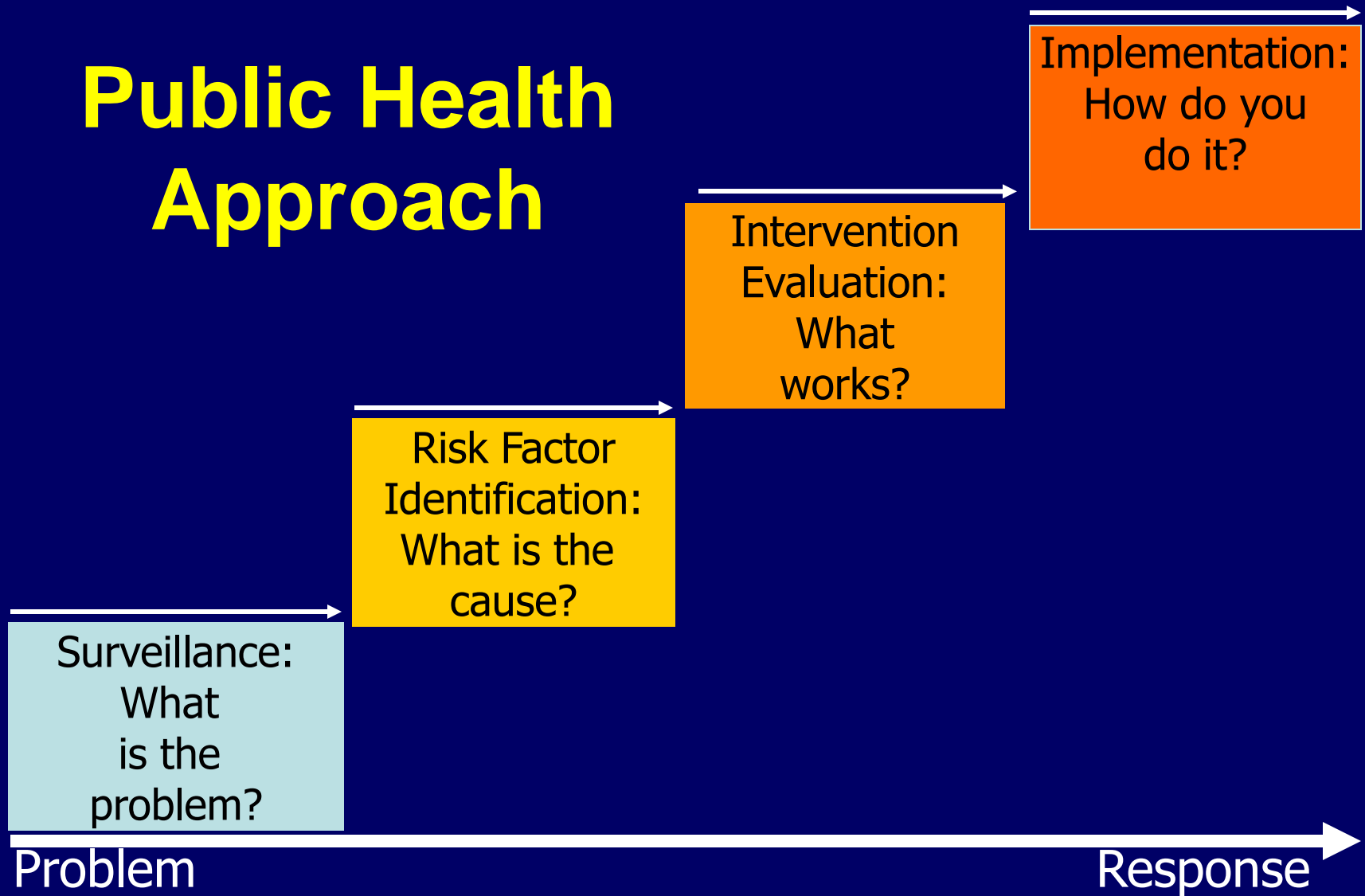
- ❖ **Assessment**
- ❖ **Policy development**
- ❖ **Assurance**

10 Essential Services of Public Health



Adopted: Fall 1994, Source: Public Health Functions Steering Committee, Members (July 1995):

Public Health Approach



CDC's Vision for the 21st Century: *“Health Protection...Health Equity”*



1946: malaria control



2009: Prevention & control of infectious and chronic diseases, injuries, workplace hazards, disabilities, and environmental health threats

Goals

Healthy People in Every Stage of Life

All people, and especially those at greater risk of health disparities, will achieve their optimal lifespan with the best possible quality of health in every stage of life.



Healthy People in Healthy Places

The places where people live, work, learn, and play will protect and promote their health and safety, especially those people at greater risk of health disparities.



People Prepared for Emerging Health Threats

People in all communities will be protected from infectious, occupational, environmental, and terrorist threats.



Healthy People in a Healthy World

People around the world will live safer, healthier, and longer lives through health promotion, health protection, and health diplomacy.



Healthy People in Health Places

❖ Environmental Public Health

- The science and service that promote human health by creating healthy human environments and protecting people from disease and other health effects related to the environment



EPH Concerns

Safe Water



Healthy Communities



Safe Food



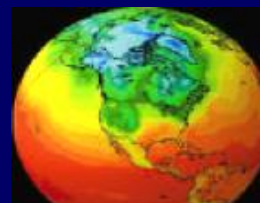
Healthy Homes



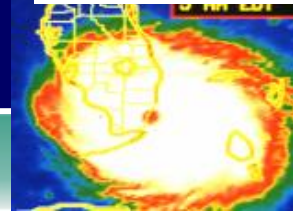
Safe Air



Global Climate Change

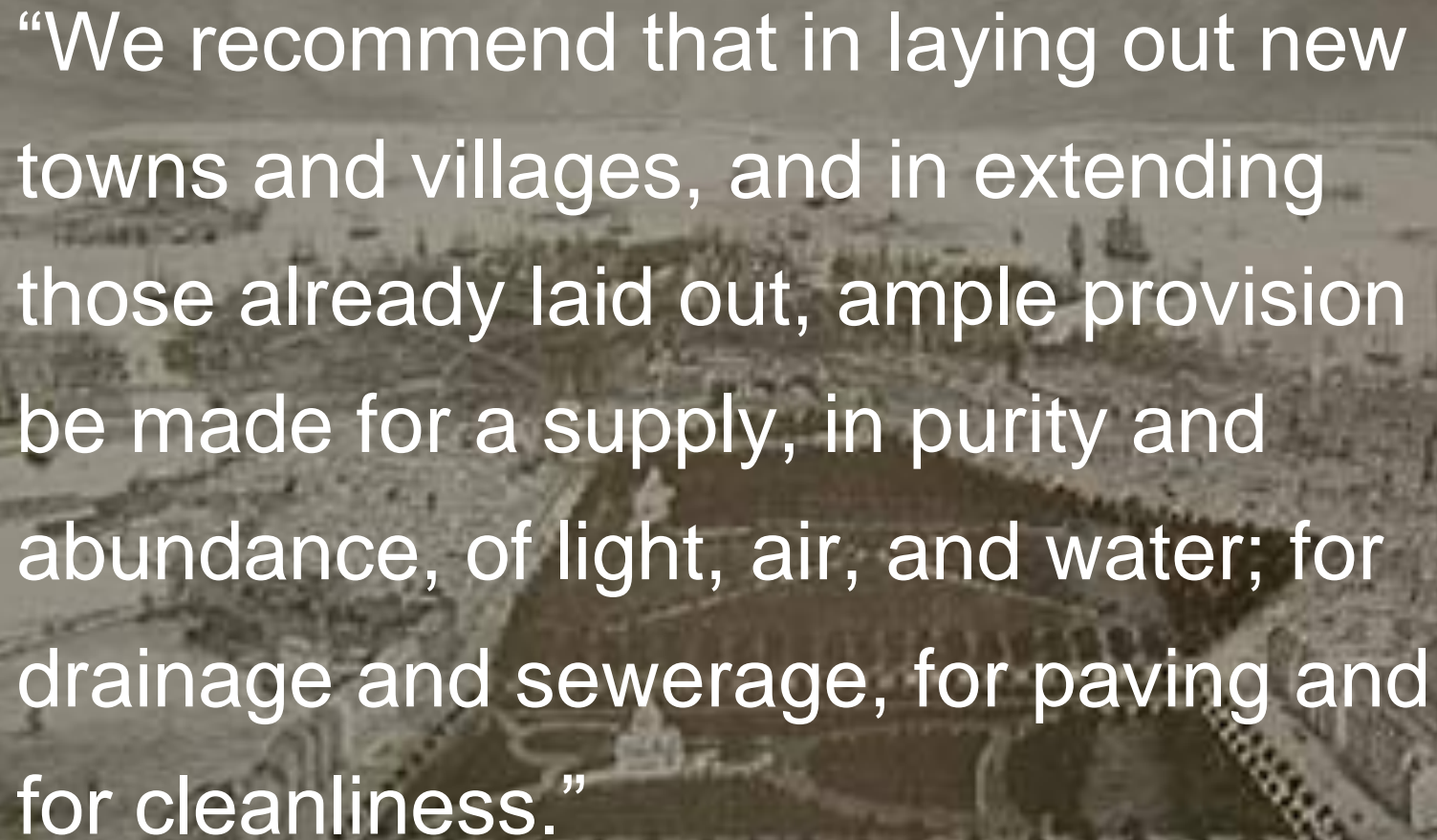


Proper Waste Management



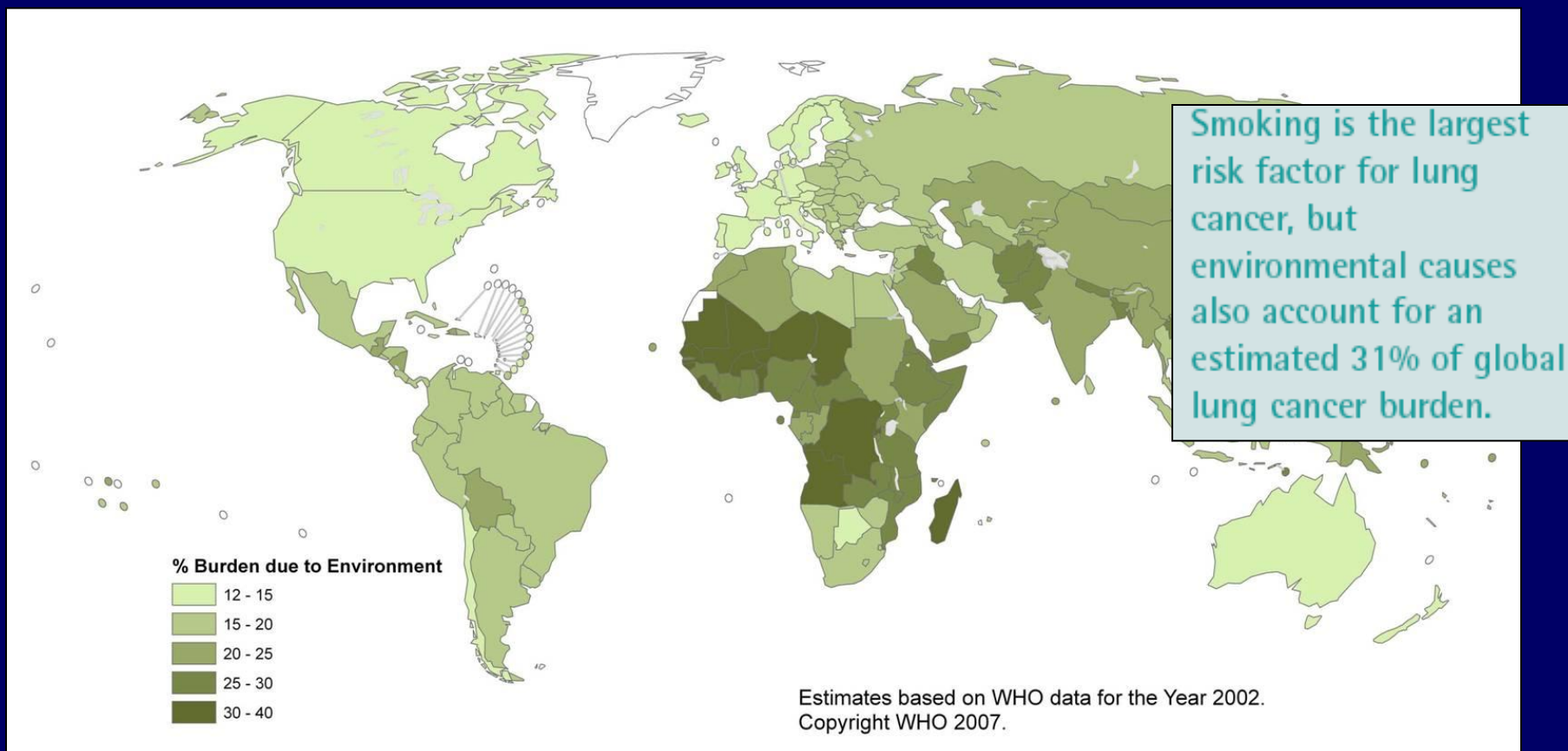
Report of the Sanitary Commission of Massachusetts, 1850

“We recommend that in laying out new towns and villages, and in extending those already laid out, ample provision be made for a supply, in purity and abundance, of light, air, and water; for drainage and sewerage, for paving and for cleanliness.”

An aerial photograph of a city, likely Boston, showing a large, dark, rectangular park area in the center. The city is built on a peninsula, with water visible on the left and right sides. The image is in sepia tones and serves as a background for the text.

Percentage of the Total Disease Burden Attributable to the Environment

WHO, 2007

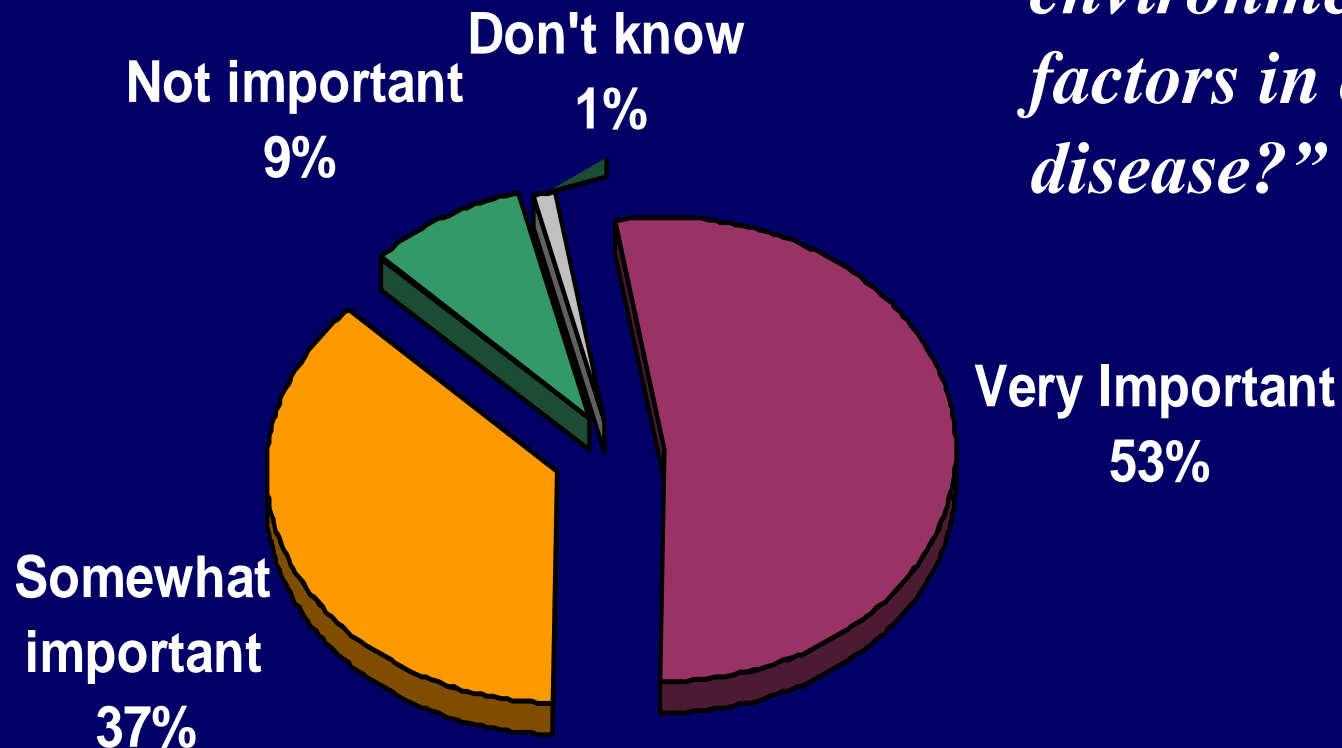


In developed countries, it was estimated that 16% (10–34%) of cancers in men (other than lung cancers), and 13% (10–23%) in women, were attributable to the environment. In developing countries, the



Public Perceptions of Environmental Health Risks

“How important are environmental factors in causing disease?”



Princeton Survey Research Associates, 2000; Margin of error: $\pm 3\%$

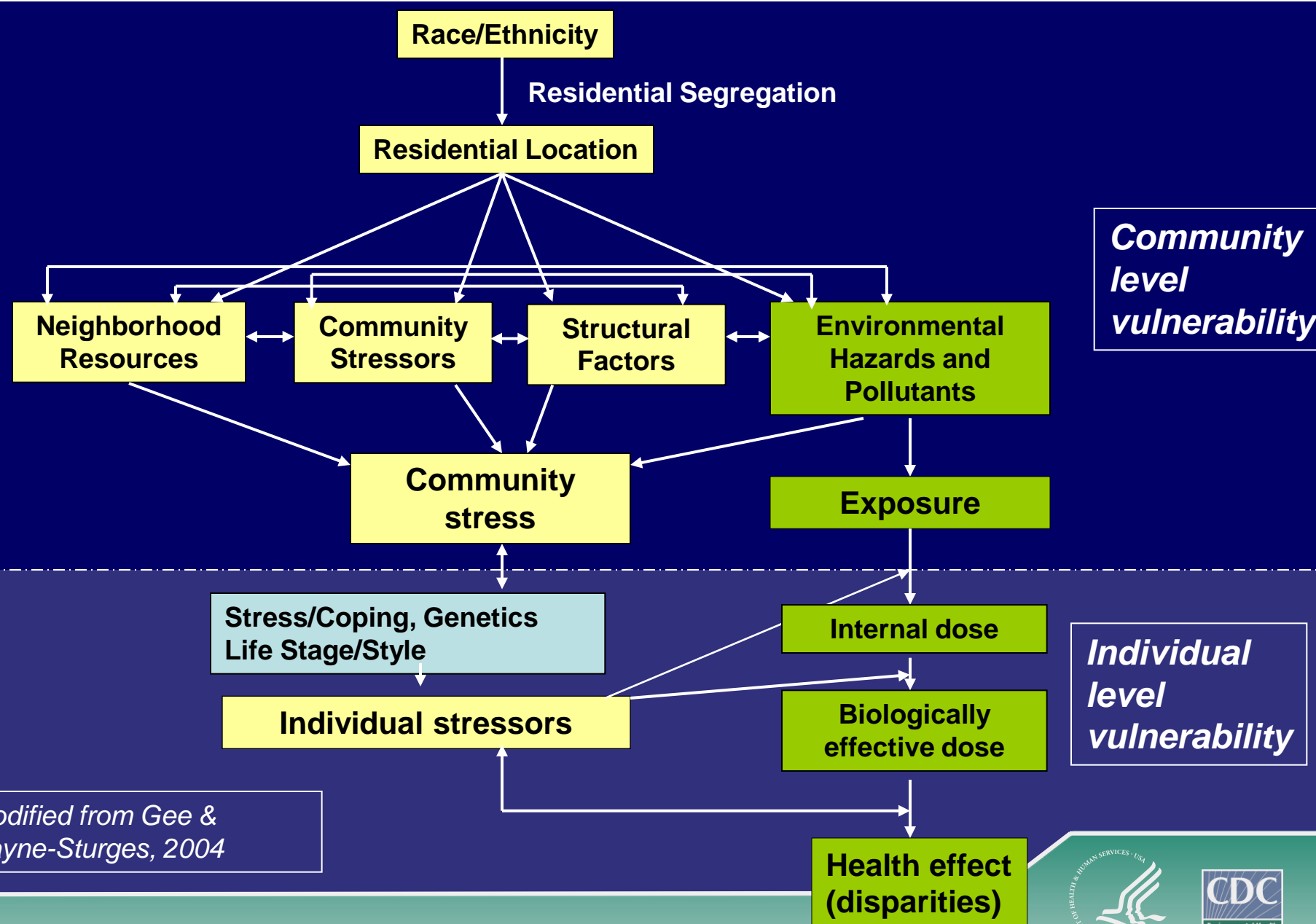


Understanding the Role of the Environment on Health

Genetics/Life stage



Exposure-Disease-Stress Framework for Environmental Health Disparities



Memorandum of Understanding: CDC, ATSDR, and NASA

Exploring Applications of Earth Science Research and Development for Environmental Public Health

- ❖ Evaluate the use of NASA Earth system science, technology and data as potential solutions to characterizing high priority environmental hazards and other risk factors to be measured and tracked by CDC/ATSDR
- ❖ Verify, validate, and benchmark the potential solutions
- ❖ Identify education, training and communications needs
- ❖ Establish an interagency working group



CDC/NASA Partnership in Environmental Health

❖ *Damn it Jim, I'm a doctor not an engineer – Dr. Leonard McCoy*



❖ *Coming together is a beginning, staying together is progress, and working together is success - Henry Ford*



Outcomes



- ❖ Improved data
- ❖ Better tools and methods
- ❖ Available technical expertise/resources
- ❖ Increased workforce capacity

In this meeting....

- ❖ Fine particulate matter exposure modeling and epidemiology
- ❖ Pollen and dust
- ❖ Land use
- ❖ Predicting heat mortality
- ❖ Monitoring and forecasting cyanobacterial blooms



Environmental Health Programs



Climate Change and Public Health

CLIMATE CHANGE SPOTLIGHT

AMERICAN JOURNAL OF PREVENTIVE MEDICINE
Official Journal of APTR & ACPM

[AJPM special issue on climate change](#)
American Journal of Preventive Medicine examines global climate change and public health in November 2008 special issue, including five free full-text articles[more](#) [Exit]

[Intramural Funding for Climate Change and Public Health Awards](#)[more](#)

[CDC's Climate Change Policy](#)
CDC leads efforts to anticipate the health effects of climate change...[more](#)



Air Quality, Fires, and Volcanic Eruptions

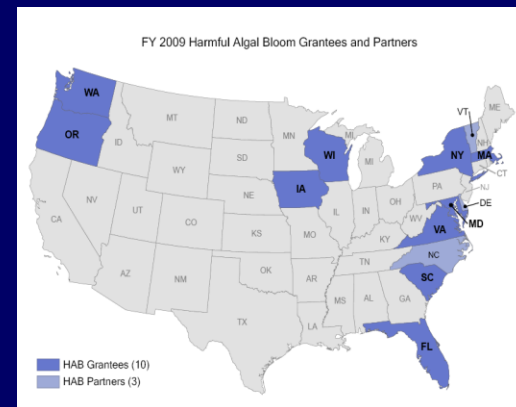
Air Quality and Fires
General Information

In the Spotlight

Prevention Guidelines:
Protect Yourself and Your Family from Debris Smoke
What you need to do if you smell smoke.

Presentations at the August 2007 International Biomass Smoke Health Effects Conference co-sponsored by CDC and the University of Montana

Indoor Air Quality Information
List of offices or programs identified by each state as dealing with indoor air-related health inquiries.

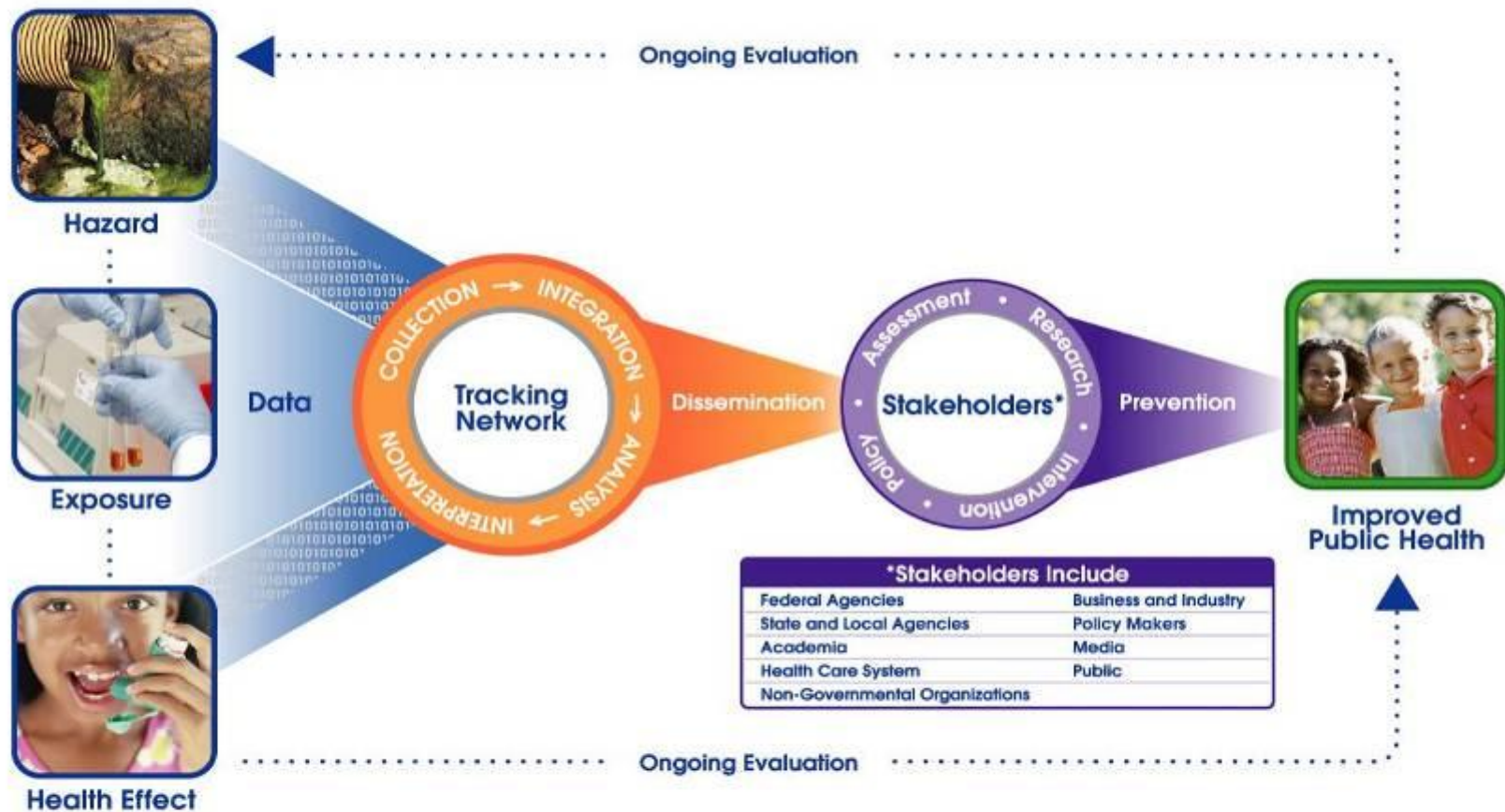


*In public health, we can't do
anything without surveillance.
That's where public health
begins.*

Dr David Satcher



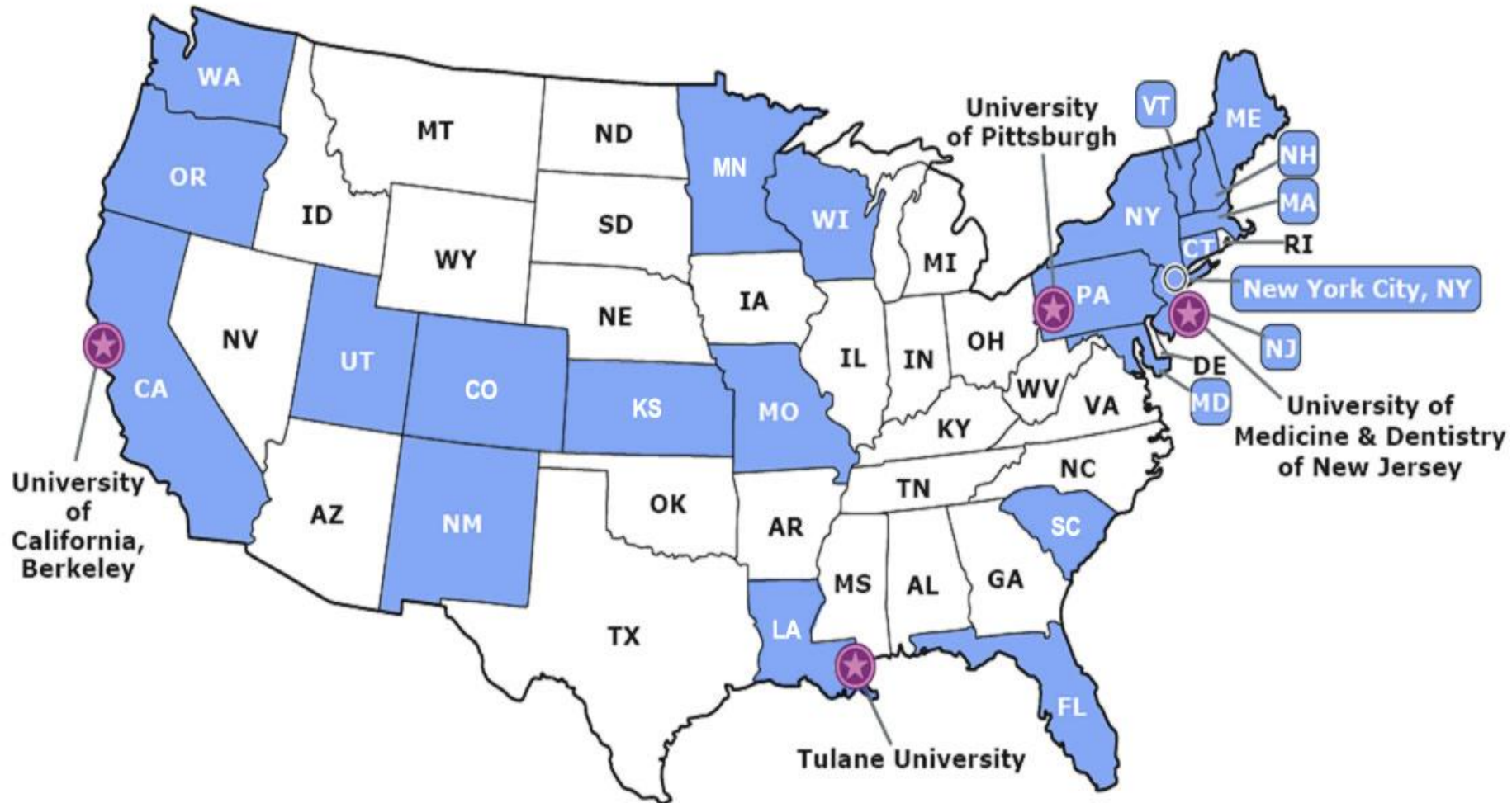
ENVIRONMENTAL PUBLIC HEALTH TRACKING



Tracking = Surveillance



National Environmental Public Health Tracking Program - 2009



Tracking Network: At-A-Glance

The screenshot shows the CDC National Environmental Public Health Tracking Network homepage. At the top is the CDC logo and the text "Centers for Disease Control and Prevention" and "Your Online Source for Credible Health Information". Below this is a green header with the title "National Environmental Public Health Tracking Network". A navigation bar includes links for Home, About Tracking Program, State & Local Tracking Portals, Indicators & Data, and Secure Portal. A "Tracking A-Z Index" is displayed with letters A through Z. The date "Thursday, February 19, 2009 4:00:48 PM" is shown. The main content area features three images: a child in a blue jacket, a person in a white lab coat, and a forest scene. Text explains that environmental causes of chronic diseases are hard to identify and that the network is a system of integrated health, exposure, and hazard information. A sidebar on the right includes "Page Options" (Text Size, Email this page, Printer-friendly version, Get Email Updates, Bookmark and Share), "Tracking Hot Topics" (Tracks 2009: Washington D.C. February 24-26, 2009; Environmental Health at CDC), "Resources" (Document Library), and "Contact Us" (Phone: 800-CDC-INFO, 800-232-4636; 888-232-6348 (TTY); Email: epht@cdc.gov). The bottom section has three columns: "Environments" (Outdoor Air, Water, Homes), "Health Effects" (Asthma, Cancer, Childhood Lead Poisoning, More Health Conditions), and "Info by Location" (a map of the United States with a "Select State" dropdown and a "SEARCH" button). The footer includes links for Home, Policies and Regulations, Disclaimer, e-Government, FOIA, Accessibility, Other Languages, Link To Us, Site Map, and Contact Us, along with the slogan "SAFER • HEALTHIER • PEOPLE™".

A web-based information system that exists at the local, state, and national level that serves the public, environmental public health agencies, health care providers and researchers

Tracking Network: www.cdc.gov/ephtracking



National Tracking Network

Launched
July 2009

Public Portal

- ❖ One-stop access to health and environmental information
- ❖ Risk and prevention messages + query system
- ❖ Design based on extensive user testing

Secure Portal

- ❖ Supporting secure collaboration among multiple partners
- ❖ Integrating health, exposure, hazard, and other data
- ❖ Sharing of methods, tools, and ideas
- ❖ Drawing board for turning data into information



Current Data

Directly from States:

- Asthma, MI, CO hospitalizations
- CO ED
- Drinking water
- Birth defects

Requested from Federal partners:

- Childhood lead poisoning
- Vital statistics
- Cancer
- Air
- USGS water

- Obtaining state health data from Feds – data steward involvement



New Directions

- ❖ Pesticides
- ❖ Climate Change
- ❖ Health Impact Assessment
- ❖ Health and Environment Linkages
- ❖ Population parameters (e.g. SES)
- ❖ Other risk factors



Air Pollution Epidemiology



Goals

- ❖ **Characterize the impact of indoor and outdoor air quality on human health, particularly respiratory health.**
- ❖ **Translate air pollution and respiratory health research into sound public health programs and practice.**
- ❖ **Reduce morbidity and mortality due to carbon monoxide exposure.**



Impact of Air Quality on Human Health: Examples of Activities

Epidemiologic studies

Understand the relationship between ambient air pollution, lung function, and respiratory symptoms

- Children with sickle cell anemia
- Commuters with asthma



Impact of Air Quality on Human Health: Examples of Activities (cont'd)

Response-related activities:



Provide assistance and technical response to emergency events



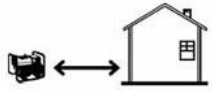
⚠ DANGER

Using a generator indoors **WILL KILL YOU IN MINUTES.**

Exhaust contains carbon monoxide, a poison gas you cannot see or smell.



NEVER use in the home or in partly enclosed areas such as garages.



ONLY use outdoors and far from open windows, doors, and vents.



Impact of Air Quality on Human Health

Other activities:

- ❖ Provide support in the development / design of appropriate environmental interventions
- ❖ Collaborate with the environmental health laboratory and other groups working on air quality and health



Harmful Algal Blooms



- ❖ Appear to be increasing along the coastlines and in US surface waters
- ❖ CDC
 - Investigates how blooms of cyanobacteria, marine microalgae, and *P. piscicida* may affect public health
 - Conducts surveillance (HABISS)

Harmful Algal Bloom-related Illness Surveillance System (HABISS)

❖ **Purpose:** To reduce the public health impacts from HAB-related human and animal illnesses

❖ **Goals**

- **Detection:** identify early cases
- **Mitigation:** limit exposures
- **Prevention:** prevent further cases
- **Link cases of illness with environmental data**



Human Illnesses related to Harmful Algae (reported between Jan 1, 2007 and Sept 10, 2009)

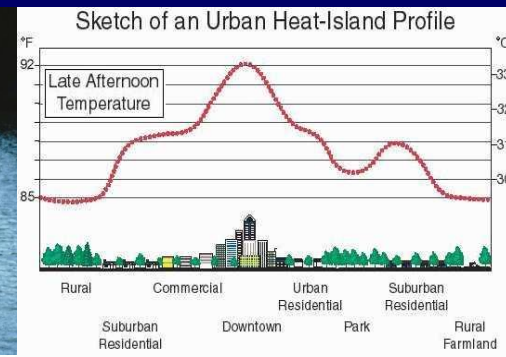
Illness Name	2007	2008	2009 (to date)	Total
Ciguatera Fish Poisoning	33	46	30	109
HAB-related Rash (toxin unknown)	16	<5	14	31
HAB-related Illness (toxin unknown)	2	18	9	29
Saxitoxin Poisoning from Ingestion (PSP)	4	11	6	21
Microcystin Poisoning	0	<5	<5	5
Anatoxin-a Poisoning	0	0	<5	<5
Brevetoxin Poisoning				
NSP	<5	0	0	<5
Domoic Acid Poisoning from Ingestion (ASP)	0	0	<5	<5

CDC's Public Health Built Environment Initiative

HEALTHY
COMMUNITY
DESIGN



LOUIE FAVORITE / STAFF
Traffic heads north on I-75, just north of I-285, on Thursday. A proposal for the interstate is enough to make a road builder weep with joy, and make others wonder whether it's overkill.



Community Design and Health

Related to land use

- Obesity, physical activity, CVD
- Water quantity and quality

Related to automobile dependency

- Air pollution and asthma
- Climate change contribution
- Car crashes
- Pedestrian injuries

Related to social processes

- Mental health impact
- Social capital
- Environmental justice



Public Health Built Environment Initiative Goals



- ❖ Conduct and Support Scientific Research
- ❖ Support Public Health Efforts
- ❖ Create Tools



Community design and land use choices can either promote or harm human health



Healthy Community Design

- ❖ Promote physical activity
- ❖ Improve air quality
- ❖ Lower risk of injuries
- ❖ Increase social connection and sense of community
- ❖ Reduce contributions to climate change
- ❖ Create social equity for all residents regardless of income, age and ability
- ❖ Allow people to age in place



Climate Change and Human Health



Asthma outbreak hits kids RISKS OF THE 'RED ZONE'



Asthma sufferer Tyrone Johnson, 2, breathes fresh air Friday as his aunt Susan Thomas tends him at Atlanta's Hughes Spaulding Children's Hospital. Sky-high smog readings in metro Atlanta have produced a flare-up of asthma cases, especially among children.

Atlanta Journal-Constitution SATURDAY, AUG. 19, 2000



Heat stalks city elderly



Deaths climb; officials warn risk not over

Thousands hit by power outages

By Jeremy Martin and John Chase
Times Staff Writers

In a frightening tale of heat and power, the hottest days in the Chicago area in four years played as many as 15 lives Friday and early Saturday, and power outages that left some left up to 100,000 households virtually defenseless against soaring temperatures.

The Cook County medical examiner's office said Saturday that 21 deaths had been linked to temperatures that topped 100 degrees and had

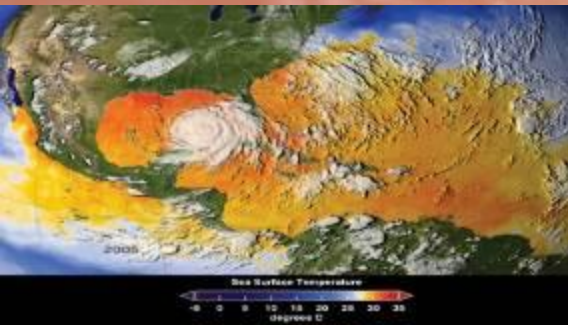
indicated that heat-related deaths continued the first day after the hottest weather, on the way to a total of more than 70 dead.

The danger is not just, Chicago officials said, a news conference.

That because it will be cooler today, some emergency will be able to get through," said Mayor Richard Daley, who called on residents to help the workers

heat-related deaths continued the first day after the hottest weather, on the way to a total of more than 70 dead.

The danger is not just, Chicago officials said, a news conference.



Fatalities a stark reminder of summer of '95

By Lisa Black and Megan O'Watz
Times Staff Writers

At St. Luke's Hospital, one of the city's largest hospitals, the heat was so bad that it was hard to breathe. The heat was so bad that it was hard to breathe. The heat was so bad that it was hard to breathe.

Heat-related deaths continued the first day after the hottest weather, on the way to a total of more than 70 dead.

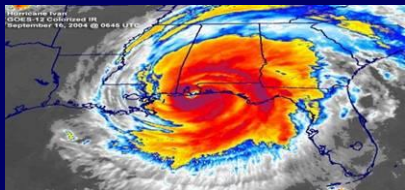
Some Projections of Future Changes in Climate (IPCC 2007)



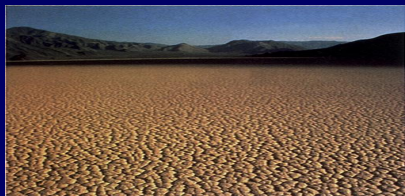
- Very likely that heat waves, will become more intense and frequent. [> 90% probability]



- Very likely that heavy precipitation events will become more frequent. [> 90% probability]



- Likely that tropical cyclones will become more intense, with larger peak wind speeds and more heavy rainfall [> 66% probability]



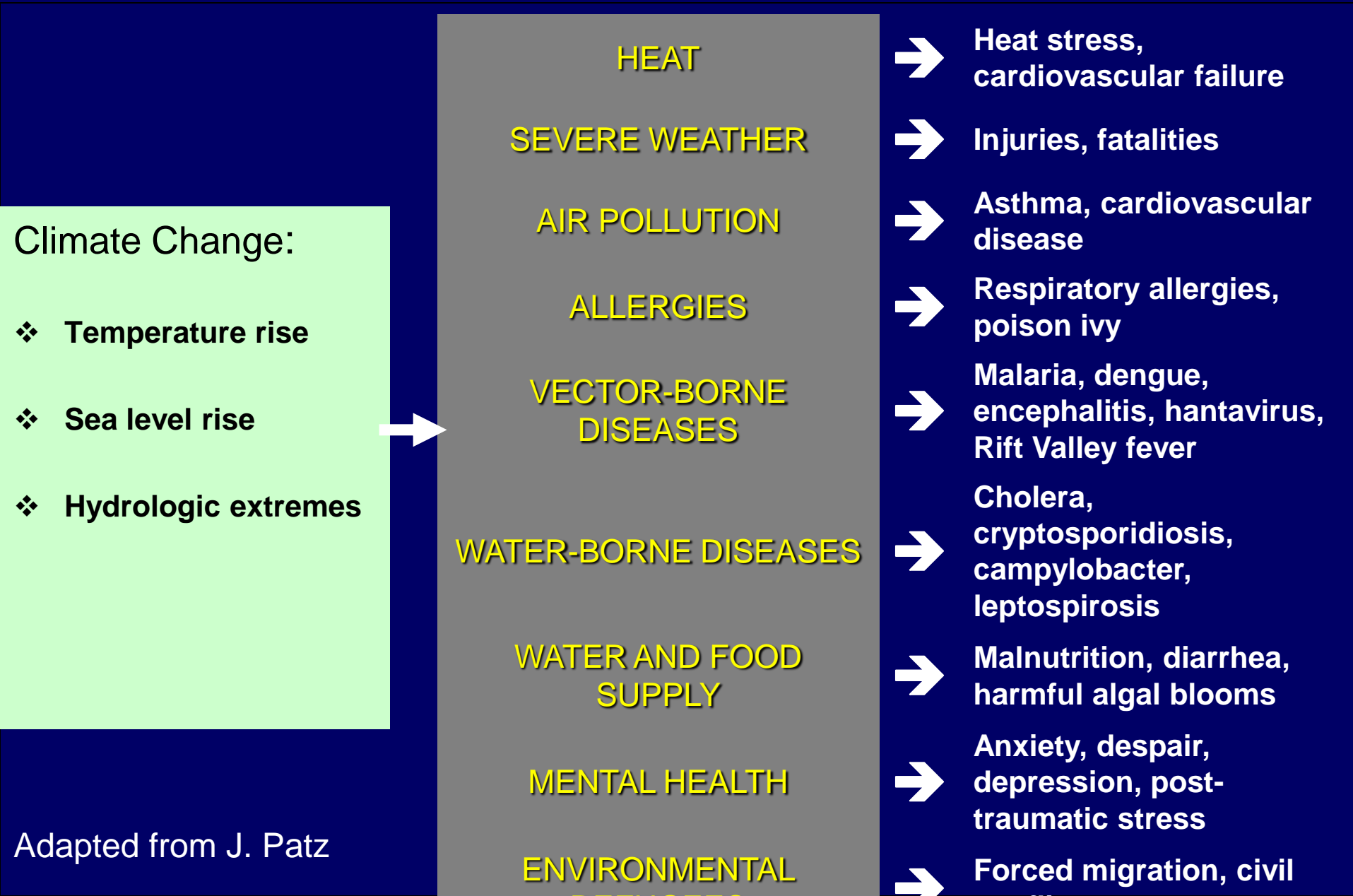
- Likely increase in areas affected by drought. [> 66% probability]



- Likely increase in incidence of extremely high sea level [> 66% probability]

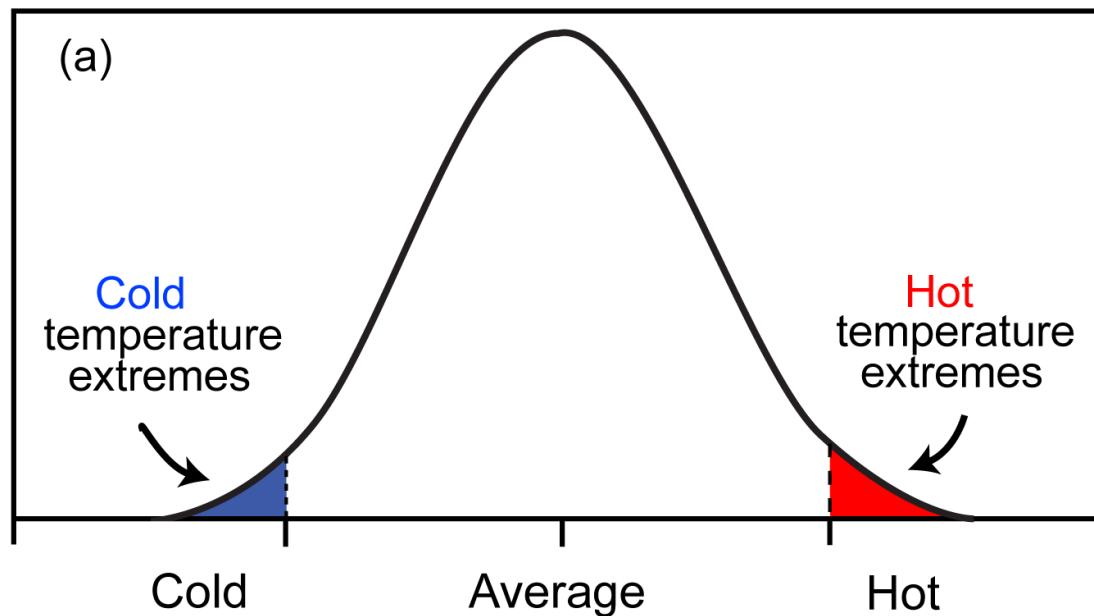


Potential Health Effects of Climate Change



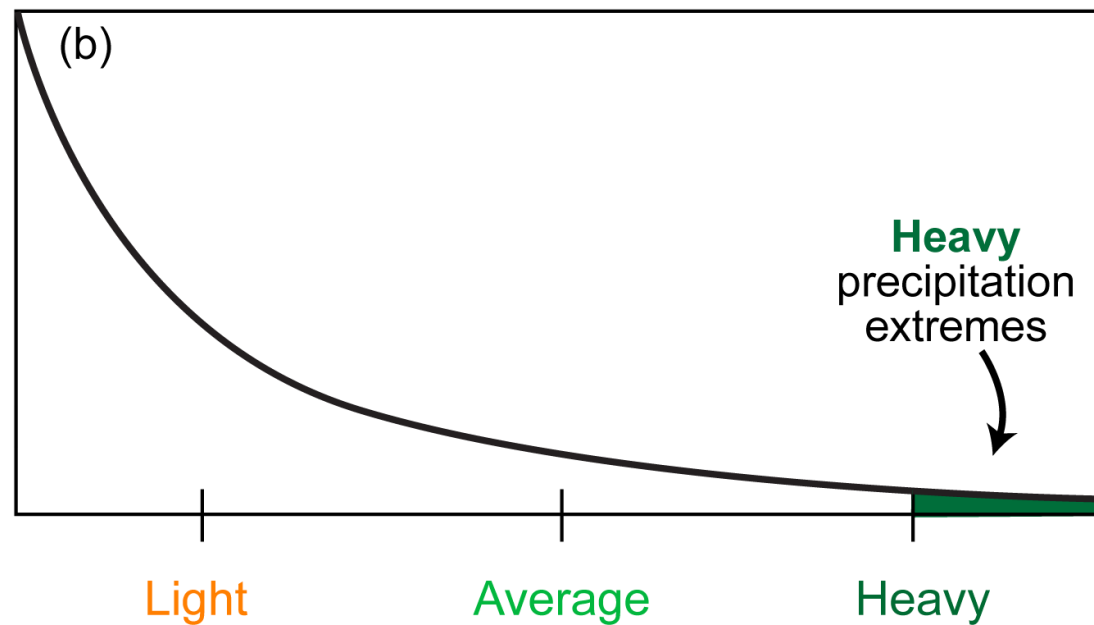
Probability of occurrence
↑

Temperature



Probability of occurrence
↑

Precipitation



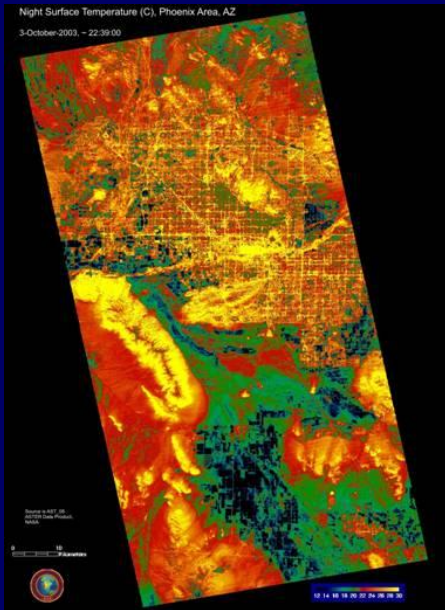
**Extremes
impact
people more
than mean**

Peterson *et al.*, 2007b



Climate Change and Urban “Built” Environments

❖ Cities and climate are co-evolving in a manner that will place more populations at risk.



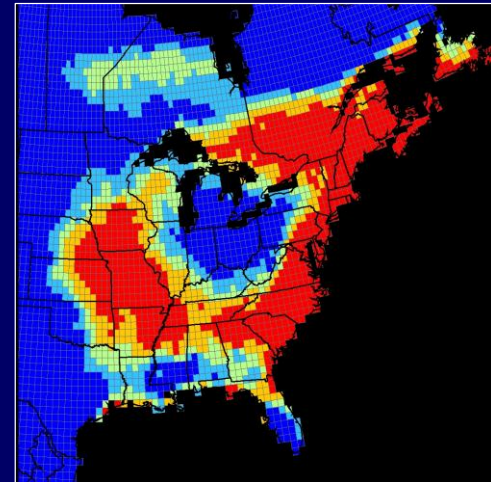
❖ Increase in vulnerable populations:

- Today, more than half of the world's population lives in cities, up from 30% in 1950.
- By 2100 there will be 100 million more people > 65 years old (relative to 2000) (Ebi et al. 2006).

❖ Intensification of exposures: Urban heat islands

CDC's Priority Health Actions for Climate Change

- ❖ Serve as a credible source of information
- ❖ Track data on environmental conditions, disease risks, and disease occurrence related to climate change
- ❖ Expand capacity for modeling and forecasting health effects
- ❖ Enhance the science to better understand the relationship between climate change and health

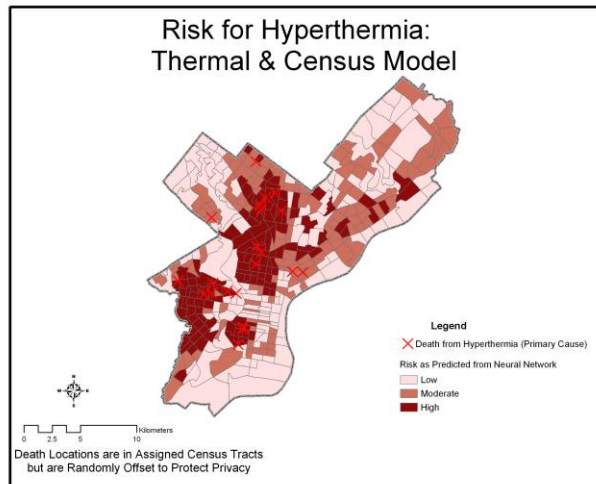


Lyme Disease – 2080
Brownstein et al., 2005



CDC's Priority Health Actions for Climate Change

- ❖ Identify locations and population groups at greatest risk
- ❖ Communicate the health-related aspects of climate change
- ❖ Develop partnerships to address U.S. and global health aspects of climate change
- ❖ Provide leadership regarding health protection from climate change effects





page

HEAT-RELATED ILLNESS

What is Heat-Related Illness?

There are three main types of heat-related illnesses (HRI): heat cramps, heat exhaustion, and heatstroke. These can occur when individuals are exposed to extreme heat.

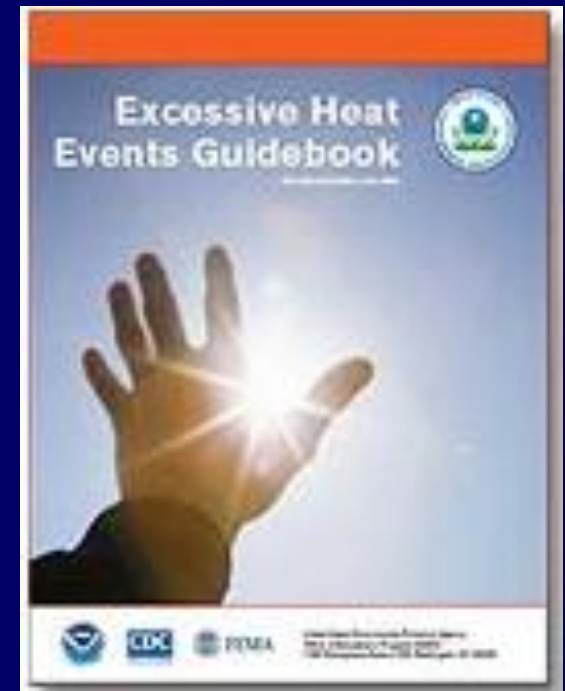
HRI may lead to death if not properly diagnosed and treated. Athletes playing in extreme conditions are especially vulnerable. HRI has accounted for complications and even death in athletes on the playing field. Heat-related illness is currently the 3rd leading cause of death in high school athletes.



CDC
Centers for Disease Control and Prevention

CDC's Priority Health Actions for Climate Change

- ❖ Develop and implement preparedness and response plans for health threats
- ❖ Provide technical advice and support implementing national and global preparedness measures
- ❖ Promote workforce development



Multiple Opportunities for Future Collaboration

- ❖ *Do what you can, with what you have, where you are – Theodore Roosevelt*
- ❖ *The great thing in this world is not so much where we are, but in what direction we are moving – Oliver Wendell Holmes Jr.*
- ❖ *Men make history, and not the other way around. In periods where there is no leadership, society stands still. Progress occurs when courageous, skillful leaders seize the opportunity to change things for the better – Harry S. Truman*
- ❖ *The only limit to our realization of tomorrow will be our doubts of today. Let us move forward with strong and active faith – Franklin D. Roosevelt*



For more information:

Tracking Program: www.cdc.gov/nceh/tracking

Tracking Network: www.cdc.gov/ephtracking

Air Pollution and Respiratory Health Branch:
www.cdc.gov/nceh/airpollution

HABISS: www.cdc.gov/hab

Built Environment: www.cdc.gov/healthyplaces

Climate Change: www.cdc.gov/climatechange



Thank You!

*Be sincere; be brief; be
seated* - Franklin D. Roosevelt

