Priority Actions for Climate Change Adaptation: Perspectives from the Health Sector

Christopher Portier, PhD
Director
National Center for Environmental Health
Centers for Disease Control and Prevention

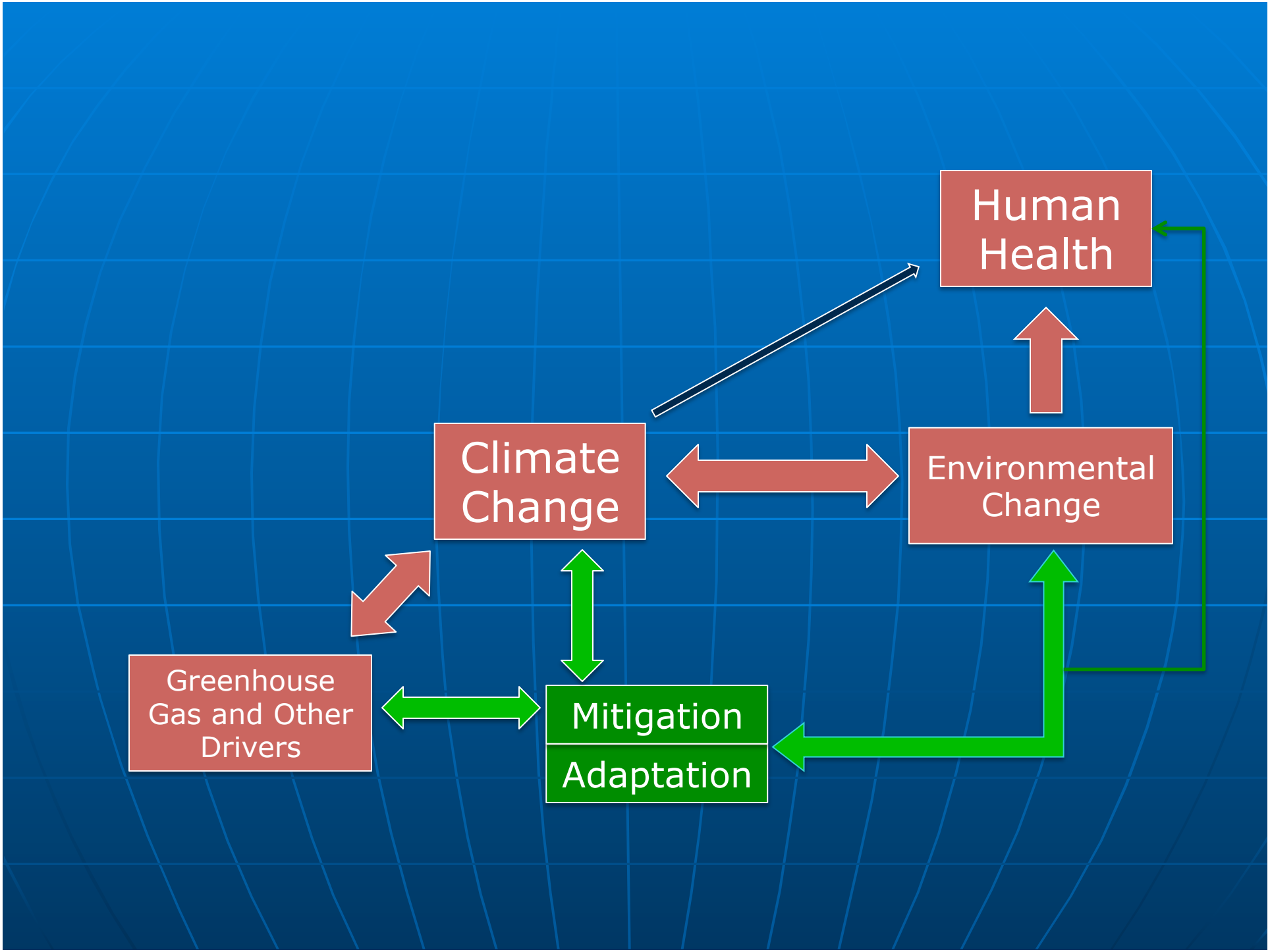
National Climate Assessment:
SE Regional Health Sector Meeting, Charleston, SC

Emerging Need for Action on Adaptation and Mitigation

Despite the evidence of harm…

The Public health effects of climate change remain largely unaddressed

CDC
Environmental Health


Human Health
Climate Change
Environmental Change
Greenhouse Gas and Other Drivers
Mitigation
Adaptation

Potential Health Effects of Climate Change

Climate Change:

- **Temperature rise**
- **Sea level rise**
- **Hydrologic extremes**

HEAT	Heat stress, cardiovascular failure
SEVERE WEATHER	Injuries, fatalities
AIR POLLUTION	Asthma, cardiovascular disease
ALLERGIES	Respiratory allergies, poison ivy
VECTOR-BORNE DISEASES	Malaria, dengue, encephalitis, hantavirus, Rift Valley fever
WATER-BORNE DISEASES	Cholera, cryptosporidiosis, campylobacter, leptospirosis
WATER AND FOOD SUPPLY	Malnutrition, diarrhea, harmful algal blooms, asthma
MENTAL HEALTH	Anxiety, despair, depression, post-traumatic stress
ENVIRONMENTAL REFUGEES	Forced migration, civil conflict

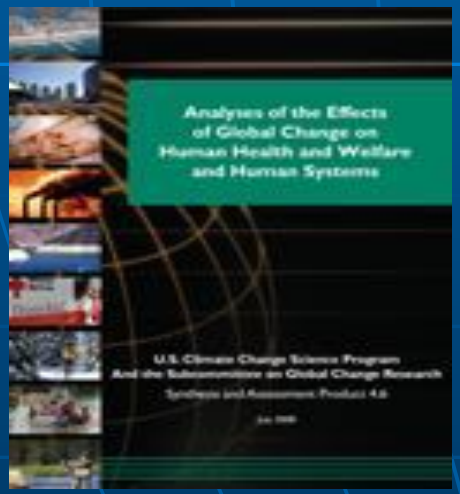
Adapted from J. Patz

Climate Assessments that Focus on Health

- US GCRP
- United Kingdom
- Canada
- Australia

UK 2012 | Climate Change Risk Assessment

Synthesis and Assessment Product 4.6 (2008)



Types* of Climate Change Adaptation

- Reactive / autonomous
- Anticipatory / planned

- Much adaptation is reactive
  - e.g. extreme weather events

- Few anticipatory adaptation activities
  - considerable evidence of intention to act
  - e.g. vulnerability assessments (Berrang-Ford, Ford et al. 2010).

- Climate assessments (NCA, IPCC) provide critical evidence to support anticipatory adaptation

* Carter, T., M. Parry, et al., Eds. (1994). Technical Guidelines for Assessing Climate Change Impacts and Adaptations, Report of Working Group II of the Intergovernmental Panel on Climate Change.

Towards an Anticipatory Approach:
CDC's Priority actions for Climate Change

- A set of "priority actions"
  - •guide a comprehensive approach to capacity building for climate change adaptation

- 2007 CDC Climate Change Workgroup recommendations

- Forms the cornerstone for CDC's policy on Climate Change:
  http://www.cdc.gov/nceh/climatechange/

CDC
Environmental Health

CDC's Priority health actions for climate change

Key Audiences:	Actions
▪ General Public	Develop communications strategies and materials
▪ Policy Makers	"Health in all Policies"
▪ Scientific community	Identify and fund priority research

CDC
Environmental Health

Research Priorities and Gaps for Climate Change and Health

Categories of human health consequences of climate change:

1. Asthma, Respiratory Allergies, and Airway Diseases
2. Cancer
3. Cardiovascular Disease and Stroke
4. Foodborne Diseases and Nutrition
5. Heat-Related Morbidity and Mortality
6. Human Developmental Effects
7. Mental Health and Stress-Related Disorders
8. Neurological Diseases and Disorders
9. Vectorborne and Zoonotic Diseases
10. Waterborne Diseases
11. Weather-Related Morbidity and Mortality

http://www.cdc.gov/climatechange/pubs/HHCC_Final_508.pdf

- primarily asthma, hay fever, rhinitis, and atopic dermatitis for allergies
- chronic obstructive pulmonary disease (COPD) in adults
- impact approximately 50 million individuals within the United States
- management of asthma and other allergic diseases relies on several factors including strict control of exacerbation triggers of the diseases

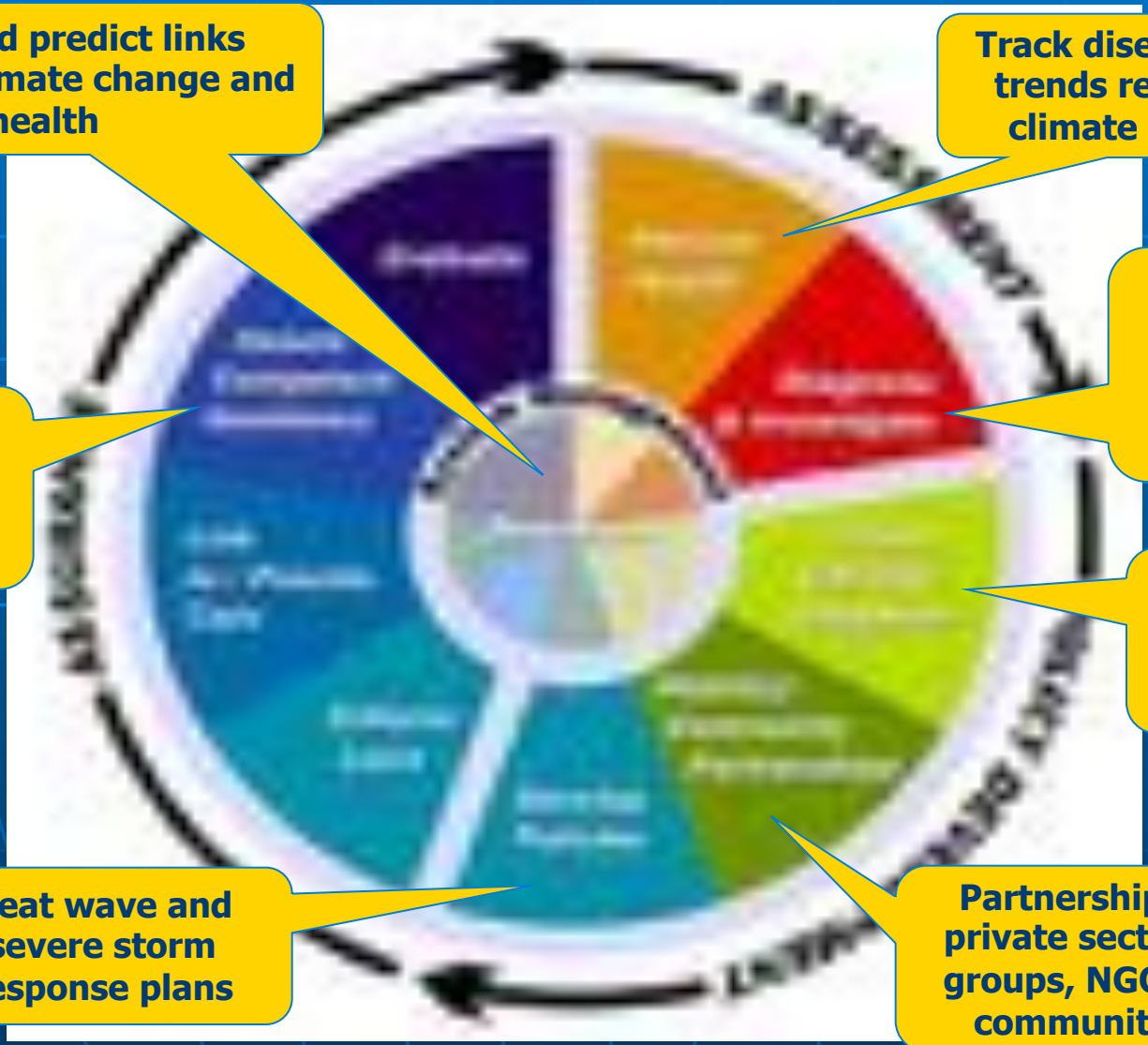
Asthma, Allergies and Airway Disease

- Air quality changes
  - climate variables (temperature, humidity, etc.), CO_2, and other air pollutants may alter the production, distribution, and allergenicity of pollen particles
  - climate change is likely to alter airborne dust, including indoor dust, and changes in dust composition resulting in asthma exacerbation
  - wildfires from reduced rainfall will impact asthma and other respiratory diseases, both acutely and over time
  - COPD is sensitive air pollution levels which will change in complex ways with the changing climate
- Floods and extreme weather
  - molds and mildew exacerbate existing lung disease and cause others
- Oceans
  - harmful algae blooms which can increase in frequency and intensity with changing weather could exacerbate asthma attacks

Asthma, Allergies and Airway Disease

- Mitigation and adaptation
  - Energy and transportation
    - Could increase or decrease certain air pollutants increasing or decreasing lung disease
    - Walking and bicycling can reduce pollution but increase traffic deaths
    - New fuels for cars could create new air pollutants with unknown impacts on lung function
    - Depending on the source for electricity, electric cars could increase air pollution and/or greenhouse gases
  - Increased air conditioning use could reduce heat-related morbidity and mortality but increase demand for energy and increase pollution levels

The Public Health Response to Climate Change



Study and predict links between climate change and health

Track diseases and trends related to climate change

Investigate infectious water-, food-, and vector-borne disease outbreaks

Public health workforce prepared to respond

Credible resource on health consequences of climate change

Heat wave and severe storm response plans

Partnerships with private sector, civic groups, NGOs, faith community, etc.

CDC's Priority health actions for climate change

Track data on environmental conditions, disease risks, and disease occurrence

Will require *enhancement and expansion* of national disease surveillance systems and the *integration* of infectious and environmental disease information systems

National Climatic Data Center
U.S. Department of Commerce

NATIONAL Environmental Public Health Tracking Program

CDC's Priority health actions for climate change

Communicate the health-related aspects of climate change.

APHA American Public Health Association

Climate Change: Mastering the Public Health Role" webinar series

follow us on twitter CDC_DrCPortier

Extreme Heat Media

Preventing and Treating Heat Related Illness: an e-learning course

CDC's Priority health actions for climate change

Identify locations and population groups at greatest risk

Examples:

Epidemiologic investigations

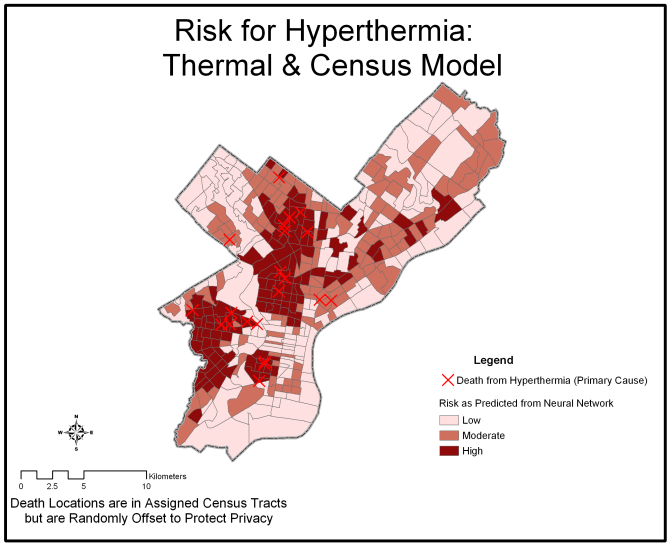
Vulnerability mapping

CDC
Environmental Health

Vulnerability Assessments and Mapping

Austin, TX: Local Environmental Public Health Indicators for Climate Change

Philadelphia: Using NASA Data and Models to Improve Heat Watch Warning Systems for Decision Support



Priority health actions for climate change

Promote workforce development

ASPH
ASSOCIATION OF SCHOOLS OF PUBLIC HEALTH

EIS

The National Center for Atmospheric Research
sponsored by NSF
NCAR
managed by UCAR to serve the community

Adaptation Strategies for Climate Change

- Develop evidence based approaches that identify spatially-specific vulnerable populations and places
- Enhance surveillance by integrating environmental, meteorological and health data
- Identify co-benefits for health of mitigation and adaptation strategies

CDC's Climate Change Program

Formally constituted as a Program in March 2009 with a congressional appropriation

Leads efforts to:

- identify the health impacts of climate change and the populations most vulnerable to these impacts;
- anticipate future trends;
- assures that systems are in place to detect and respond to emerging health threats;
- takes steps to assure that these health risks can be managed now and in the future.

The Climate Change Program at CDC fills three critical roles:

(1) to **analyze and translate** the latest evidence in climate science to our public health partners;

(2) to apply these findings to evidence-based **decision support tools**

- aid in the state and local public health response

(3) to **provide leadership**

- inside and outside CDC
- ensure that public health concerns are represented in climate change adaptation and mitigation strategies
- create linkages between public health and other sectors

Translate Climate Science to our Public Health Partners

Identify the health impacts of climate change and the populations most vulnerable to these impacts

Identify regional climate trends that impact health

Model future health impacts

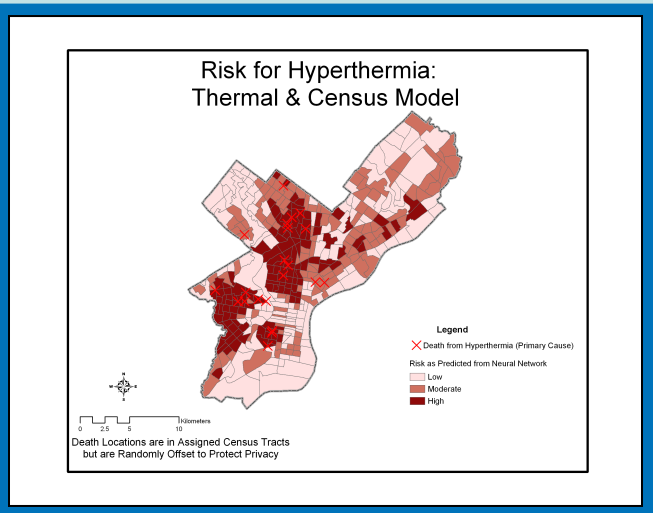
CDC

Develop Support Tools for State and Local Public Health

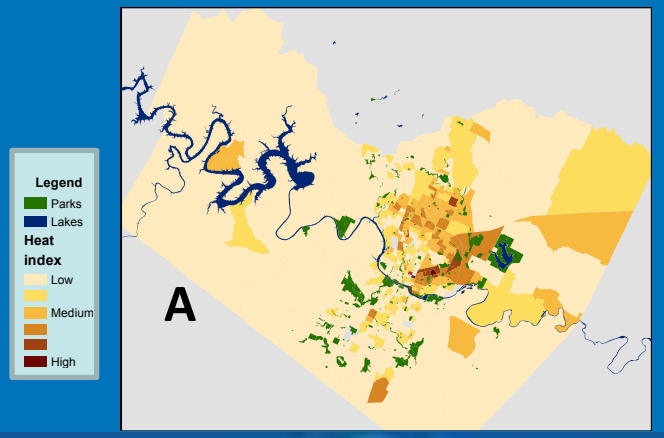
Technical guidance and support for adaptation planning

Create vulnerability maps

Enhance surveillance tools



NATIONAL Environmental Public Health Tracking Program



CDC

Leadership and Collaboration

Establish and communicate the key importance of public health in the climate change response

Create linkages between public health and efforts in other sectors

United States Global Change Research Program

Austin Climate Protection Program — Cool Austin. Cool Planet.

IPCC — Intergovernmental Panel on Climate Change

ecdc — European Centre for Disease Prevention and Control

WMO

UNEP

CDC

Climate-Ready States and Cities Initiative: Building the Anticipatory Approach

Objective: To enhance the capability of state and local health agencies to deal with the challenges associated with climate change

Cooperative Agreements with State and Local HDs:

"Developing Public Health Capacity and Adaptations to Reduce Human Health Effects of Climate Change"

Developing Decision Support Tools:

Communications and Educational Tools

Vulnerability Mapping Tools

Climate-Ready States and Cities Initiative

Category 1: Assessment and Planning to Develop Climate Change Programs

4 States and 1 City HD

<u>Activities</u>

- Agency needs assessment
- Early strategic plan implementation
- Partnership building & engagement with other initiatives
- Strategic plan development

Climate-Ready States and Cities Initiative

Category 2: Building Capacity to Implement Climate Change Programs and Adaptations

4 States and 1 City HD

<u>Activities</u>

- Strategic Plan Implementation
- Identification and prediction of health impacts & population & system vulnerabilities
- Develop & tailor health programs
- Identify co-benefits and intended consequences of policies, programs and projects in other sectors (HIA)

Towards and Anticipatory Framework for Climate Change Adaptation Planning

- The BRACE (Building Resiliance Against Climate Effects) Framework.
- A series of actions for Health Departments to take that will lead to a formal Climate Change Adaptation Plan.

BRACE's 5 Steps

- Forecasted Impact & Vulnerability Assessment
- Health Risk Assessment
- Intervention Assessment
- Health Adaptation Planning & Implementation
- Evaluation

follow us on twitter

@CDC_DrCPortier

National Center for Environmental Health
Agency for Toxic Substances and Disease Registry

CDC ATSDR

Key Points to Consider

- Stakeholder Engagement
  - Critical throughout
  - Appropriate stakeholders may change by stage.
- Prioritization of health impacts
  - Can occur at Stage 1, 2 or 3
  - Dependant on level of prior analysis
  - Available evidence
  - Political considerations

Step 1. Forecasted Impact & Vulnerability Assessment

Goal: Identify the range of climate impacts, associated potential health outcomes, & vulnerable populations and locations within a jurisdiction

- Determine the geographic and temporal scope of the assessment
- Assess localized forecasted climate impacts
- Assess health outcomes sensitive to these climate impacts

Step 2: Health Risk Assessment

Goal: Estimate/quantify the additional burden of health outcomes due to Climate Change

- Identify data sources for climate related mortality/ morbidity assessment
- Employ qualitative and quantitative approaches to assessing the data
- Quantify potential magnitude of individual health risks (absolute or relative)

Step 3: Intervention Assessment

Goal: Identify the most suitable health interventions

- List the range of health interventions available for each health outcome
- Assess capacity to deliver each intervention
- Prioritization of health interventions deemed most suitable for the jurisdiction

Step 4: Health Adaptation Planning & Implementation

Goal: Develop and implement a plan that introduces health system program changes that address the health impacts of climate change

- Applying agency procedures to developing a unified plan of action
- Disseminating the plan to stakeholders that play a part in executing the interventions
- Incorporating adaptations into executing the interventions

Step 5. Evaluation

- Process evaluation goal: Periodic review to ensure that the projections continue to be sound and the adaptations are still suitable.
- Outcome evaluation goal: Ensure that climate change is considered in broader PH planning and implementation activities. To ensure that PH is considered in broader climate change planning and implementation activities.