Statewide and Regional Capacity of Local Health Departments to Prepare for Health Impacts of Climate Change

Margaret Round, Chief of Air Toxics
Environmental Toxicology Program
Bureau of Environmental Health
Massachusetts Department of Public Health
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Thursday, December 10, 2015
Managing Coastal Risk: Enhancing Community Resilience In A Changing Climate

Margaret Round, Chief of Air Toxics
Environmental Toxicology Program
Bureau of Environmental Health
Massachusetts Department of Public Health
I. Climate Change and Health in Massachusetts

II. Background on CDCs Climate Ready States and Cities Initiative (CRSCI)

III. Results of Local Public Health Climate Change Survey for Region 5

IV. DPHs Current Activities to Support Local Adaptation Planning Efforts

V. Summary

VI. Questions
Mitigation

- Reduce greenhouse gas emissions below 1990 levels by 10-25% by 2020 and 80% reduction by 2050
- “Clean Energy and Climate Plan for 2020” (the 2020 Plan)

Adaptation

- Convene a committee and prepare a report to Legislature to: “analyze strategies for adapting to the predicted impacts of climate change in the Commonwealth”
- MA Climate Change Adaptation Report issued in 2011
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
- Air pollution
- More extreme weather
- Increasing allergens
- Water and food supply impacts
- Water quality impacts
- Malnutrition, diarrheal disease
- Cholera, cryptosporidiosis, campylobacter, leptospirosis, harmful algal blooms
- Changes in vector ecology
- Rising sea levels
- Rising temperatures
- Increasing sea levels
Climate and Health in Massachusetts


<table>
<thead>
<tr>
<th>Category</th>
<th>Areas of Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Health</td>
<td>Public health infrastructure, vector-borne diseases, heat stress, allergens, respiratory and cardiovascular diseases, extreme weather events</td>
</tr>
<tr>
<td>Air Quality</td>
<td>Ambient and indoor air quality</td>
</tr>
<tr>
<td>Water Quality/Sanitation</td>
<td>Drinking water, algae blooms, wastewater, water-borne diseases</td>
</tr>
<tr>
<td>Agriculture and Food Systems</td>
<td>Crops and livestock, water demand, pesticide use, new or invasive pests, food transmitted illnesses, security and safety</td>
</tr>
<tr>
<td>Vulnerable Populations</td>
<td>Social determinants of health, food security, allergens, air and water quality, vector-borne diseases, recovering from extreme weather events</td>
</tr>
</tbody>
</table>
**Recommended Public Health Adaptation Strategies from 2001 MA Adaptation Report:**

- Add climate impact lens to current planning
- Add structured assessments of vulnerabilities to minimize harm
- Continue to improve emergency local and regional response
- Promote healthy and resilient communities
- Increase research and improve forecasting
- Support public health monitoring, tracking and surveillance efforts
- Develop communication, education, and outreach programs
- Support regionalized Board of Health authority
"...comprehensive survey aimed at assessing the capacity of local health departments in Massachusetts to respond to the public health impacts of climate change..."
Background on Climate Ready States and Cities Initiative

• In 2010 MDPH was one of ten states/cities awarded funds from US Centers for Disease Control and Prevention

• Goal: assess capacity of local health departments to respond to climate change impacts

• DPH developed a survey to collect information from Massachusetts local health officials:
  » Perceptions of climate change related health risks and capacity to address those risks
  » Community characteristics
  » Baseline operations, emergency planning, and communication systems

• Surveys were returned from 227 of communities (65%)
Statewide Response Rate: 65%
In the next 20 years, it is likely that your jurisdiction will experience one or more serious public health problems as a result of climate change.
Preparation to deal with the public health effects of climate change has been identified as an important priority for your health department.
You believe your community has adequate resources to address public health as a result of climate change
You believe your community’s health department staff currently has expertise to assess the potential public health impacts associated with climate change in my community.

<table>
<thead>
<tr>
<th></th>
<th>Region 5</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>disagree</td>
<td>70%</td>
<td>60%</td>
</tr>
<tr>
<td>agree</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>don't know</td>
<td>20%</td>
<td>20%</td>
</tr>
</tbody>
</table>
Sources of Drinking Water in Massachusetts

Percent of Communities

- MWRA
- Municipal groundwater
- Municipal surface water
- Private
- Other

Region 5

State
Sewage Treatment Methods in Massachusetts

<table>
<thead>
<tr>
<th>Region 5</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>MWRA sewage</td>
<td>%</td>
</tr>
<tr>
<td>Septic</td>
<td>%</td>
</tr>
<tr>
<td>Municipal groundwater discharge</td>
<td>%</td>
</tr>
<tr>
<td>Municipal surface water discharge</td>
<td>%</td>
</tr>
<tr>
<td>Other</td>
<td>%</td>
</tr>
</tbody>
</table>
Estimate of Air Conditioning Availability in Homes and Schools

Knowledge of percentage of homes with air conditioning:

<table>
<thead>
<tr>
<th>Region 5</th>
<th>Statewide</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>60</td>
</tr>
</tbody>
</table>

Knowledge of air conditioning availability in schools:

<table>
<thead>
<tr>
<th>Region 5</th>
<th>Statewide</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>40</td>
</tr>
</tbody>
</table>
Knowledge of Local Health Departments About Percentage of Vulnerable Residents

<table>
<thead>
<tr>
<th>Region 5</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elderly</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td></td>
</tr>
<tr>
<td>Children with asthma or diabetes</td>
<td></td>
</tr>
<tr>
<td>Adults with asthma or diabetes</td>
<td></td>
</tr>
</tbody>
</table>
Adequate Capacity of Local Health Departments to Address Climate Change Impacts

Public Health Effects of Climate Change

- Heat waves
- Droughts
- Storms (including flooding)
- Water and food borne diseases
- Vector-borne diseases
- Health care services
- Food safety and security

Percent of Communities
Adequate Capacity of Local Health Departments to Address Public Health Effects of Climate Change

![Bar Chart]

- Heat waves
- Respiratory issues
- Indoor environment
- Outdoor air quality
- Drinking water quality
- Recreational water
- Flooding
- Hazardous weather
- Vector-borne disease
- Food-related issues

Percent of Communities

Public Health Issue

Region5
State
Communities with Plans to Reduce Public Health Impacts of Heat Waves

When to open cooling centers

Location and operational hours of cooling centers

Region 5

State
Methods Used by Local Health Departments to Communicate About Health Information to the General Public

<table>
<thead>
<tr>
<th>Method of Communication</th>
<th>Percent of Communities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community website</td>
<td>100</td>
</tr>
<tr>
<td>Other website</td>
<td>0</td>
</tr>
<tr>
<td>Email</td>
<td>0</td>
</tr>
<tr>
<td>Information sessions</td>
<td>30</td>
</tr>
<tr>
<td>Distribution through mail</td>
<td>50</td>
</tr>
<tr>
<td>Local newspaper</td>
<td>90</td>
</tr>
<tr>
<td>Other</td>
<td>100</td>
</tr>
</tbody>
</table>

Region 5 (blue) vs. State (yellow)
Capacity of Community to Contact Vulnerable Populations During Emergencies

![Bar chart showing methods of emergency communications.

- TV news
- Radio news
- Reverse 911
- Police
- Other

The chart compares the percentage of communities using these methods in Region 5 and the state. For each method, Region 5 generally shows higher percentages, with Reverse 911 being the highest.

Methods of Emergency Communications

- Region 5
- State

Percent of Communities
Capacity of Communities to Contact Vulnerable Populations During an Emergency

Populations Communities Have Plans to Contract During an Emergency
Local Health Department’s Familiarity with Sources of Public Health Surveillance Data

Will access to public health surveillance data be useful to local health departments?

<table>
<thead>
<tr>
<th></th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region 5</td>
<td>79.5</td>
</tr>
<tr>
<td>State</td>
<td>82.0</td>
</tr>
</tbody>
</table>

http://matracking.ehs.state.ma.us/
Building Resilience against Climate Effects—A Novel Framework to Facilitate Climate Readiness in Public Health Agencies

Gino D. Martinec 1, George Luber 1, Christopher K. Uejio 2,3, Shubharni Saha 1 and Jeremy J. Hess 1,4

1 Climate and Health Program, Division of Environmental Hazards and Health Effects, National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, GA 30341, USA; E-Mails: gxp1@cdc.gov (G.D.M.); gel4@cdc.gov (G.L.); cuejio@fsu.edu (C.K.U.); hsfs@cdc.gov (S.S.)
2 Department of Geography, Florida State University, 113 College Loop, Tallahassee, FL 32306, USA
3 Department of Environmental Health, Rollins School of Public Health at Emory University, Atlanta, GA 30322, USA
4 Department of Emergency Medicine, School of Medicine, Emory University, Atlanta, GA 30322, USA

Author to whom correspondence should be addressed; E-Mail: jhess@emory.edu; Tel.: +1-404-251-8851; Fax: +1-404-688-6351.

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Climate Change Hazards


DRAFT DO NOT DISTRIBUTE
Climate Change Effects

What are the Public Health Effects?


DRAFT DO NOT DISTRIBUTE
Climate Change Health Effects

(Source: NIEHS “A Human Health Perspective on Climate Change”, EHP, 2010)
PURPOSE: Couple climate projections with health data to more effectively anticipate, prepare, and respond to climate sensitive health impacts.

STEP 1: Forecast Climate Impact and Assess Vulnerabilities
STEP 2: Project Disease Burdens from Climate Change
STEP 3: Assess Public Health Interventions
STEP 4: Develop & Implement Climate Adaptation Plan
STEP 5: Evaluate Impact and Improve Framework
Evaluation of a Heat Vulnerability Index on Abnormally Hot Days: An Environmental Public Health Tracking Study

Colleen E. Reid, Jennifer K. Mann, Ruth Allsopp, Paul B. English, Galatea C. King, Rebecca A. Lincoln, Helena G. Margolis, Dan J. Rubado, Joseph E. Sabato, Nancy L. West, Brian Woods, Kathleen M. Navarro, and John R. Behrens

*Environmental Health Sciences, School of Public Health, University of California-Berkeley, Berkeley, California, USA; †Massachusetts Department of Public Health, Bureau of Environmental Health, Boston, Massachusetts, USA; ‡Environmental Health Investigations Branch, California Department of Public Health, Richmond, California, USA; §Department of Health and Human Services, Maine Center for Disease Control and Prevention, Augusta, Maine, USA; ¶Department of Internal Medicine, School of Medicine, University of California-Davis, Davis, California, USA; ‡Office of Environmental Public Health, Oregon Health Authority, Portland, Oregon, USA; †Division of Environmental Health, Washington State Department of Health, Olympia, Washington, USA; ¶Environmental Health Epidemiology Bureau, New Mexico Department of Health, Santa Fe, New Mexico, USA; ‡Division of Occupational and Environmental Medicine, Department of Medicine, University of California, San Francisco, California, USA

BACKGROUND: Extreme hot weather conditions have been associated with increased morbidity and mortality, but risks are not evenly distributed throughout the population. Previously, a heat vulnerability index (HVI) was created to geographically locate populations with increased vulnerability to heat in metropolitan areas throughout the United States.

OBJECTIVE: We sought to determine whether areas with higher heat vulnerability, as characterized by the HVI, are susceptible to heat-related health impacts at a state level.

METHODS: We used geospatial mapping software to overlay the HVI on the map of Massachusetts to identify populations potentially vulnerable to heat-related health impacts.

RESULTS: The map shows the areas of Massachusetts with the highest heat vulnerability index, indicating the regions most at risk for heat-related health impacts.

CONCLUSIONS: The HVI can be used to identify populations at risk for heat-related health impacts, enabling targeted interventions to reduce vulnerability.
Implementing the BRACE Framework in MA

- Local And Regional Assessment Of Climate Change Impacts On Health and Vulnerability Assessment
  - Identify climate effects more likely to impact Southeast Massachusetts
    - Sea Level Rise along the coast and flooding
    - Extreme weather events
      - Informed by MassDOT Extreme Weather Variability Assessment
    - More frequent heat waves
      - Vulnerable populations: elderly living alone, children, high school athletes, outdoor workers
    - Increase in risk of vector-borne diseases
      - Eastern Equine Encephalitis
      - Lyme Disease
      - West Nile Virus
  - Identify vulnerable populations
    - Challenges of delivering services to high impact areas with large elderly population
Implementing the BRACE Framework in MA:

• Collaborate Across Jurisdictions, Programs, Organizations Focused on Climate Change

• Develop climate adaptation toolkits for local health planning efforts containing:
  » Climate profiles for region that municipality is located
  » Population Vulnerability Maps at municipal and Census Tract levels
  » Evidence-based interventions
  » Tools and approaches for adaptation planning at the local level

• Sponsor trainings for local health departments
  » April 22, 2016 in Westborough, MA
  » 2016 MHOA Trainings

• Continue to work with MDPH Office of Preparedness and Emergency Management

• Promote Health Impact Assessments of Climate Change Plans
  » Integrate BRACE framework into HIA framework
  » Completed final draft “Assessing the Health Impacts and Benefits of Regional Climate Action Plan Strategies in Western Massachusetts”
• Local health departments in Regions 5 have made significant progress in preparing for and responding to public health emergencies; however, plans in Region 5 and in all other areas of the state will need enhancements to address impacts of climate change

• Data and information from MDPH will help to enhance these plans to better address climate impacts on health

• Trainings, technical assistance, and enhanced website on climate change are important for furthering these efforts
V. Questions?
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