CLIMATE HEALTH ADAPTATION PLANNING IN MICHIGAN

Training for Local Planners and Decision Makers

June 2
Lansing, MI
Today’s Presenters

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In Traverse City, MI

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Michigan Dept. of Health and Human Services
A new way of viewing the master plan process, focusing on adaptation in the face of changing conditions and circumstances.
Michigan Climate & Health Adaptation Program
Preparing for the Public Health Impacts of Climate Change

Through support from the Centers for Disease Control and Prevention (CDC), MI-CHAP is building a climate-resilient public health system for Michigan at the state, local health department, and community levels.
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Climate and Health Implications for Michigan Communities

Extreme heat events
Flooding
Infectious disease
Air quality issues
Reductions in crop yield
Negative impacts on trees
Increased wildfire risk
Waterborne diseases
Overview of Today’s Training

Goals for Today:
1. Gain familiarity of climate projections and health impacts.
2. Identify ways to advocate for positive public health outcomes.
3. Leave with implementable ideas for addressing public health issues in your community.

- Intersection of Planning and Public Health
- Climate Trends (National and Regional)
- Projected Health Impacts
- Tools for Planners and Health Officials to address Climate Challenges
- Ideas for Implementing Positive Public Health Outcomes (political realities, funding, etc.)
- Feedback on Michigan Health Adaptation Plan
Each Packet Includes:

- Agenda
- Handout describing the Climate Health Adaptation Training
- 1 copy of the presentation slides
- Activity #1: Climate Impacts at the Local Level
- Activity #2: Using Scenarios to Develop Solutions
- Activity #3: Guidance on the MI-CHAP Adaptation Plan
- HIAs to Enhance Health Outcomes – Examples from Three Michigan Communities
- Regional Climate Trends for Southwest Lower Michigan
- Site Plan Review Reference Guide (Monroe County)
- Resources Handout
- Training Feedback Form
- Master Citizen Planner Credit Request Form
Historical origins of planning are rooted in Public Health

Late 1800’s response to deplorable urban living conditions.

Concerned with water sanitation, minimum housing standards, light and air quality, industrial plant safety, welfare of employees.

Resulted in municipal regulation of land uses.
Contemporary Land Use Decisions

Have resulted in many public health issues we face today.
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EMERGING ISSUES
21st Century

- Aging Population
- Placemaking (places, to live, work and play)
- Move to Urban Centers
- Sustainable/Reuse
- Aging Infrastructure
- Health and Access to Food
- Global Economy
- Energy
- Climate Change
- Resilience and Adaptation

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Role of the Planner in Public Health

Planner as a convener
Planner as an information sharer and policy practitioner
“We are the frontline in population-based public health, the community is our patient.”

Public Health Departments in Michigan focus on:
1. Prevention - reduce or eliminate a health concern before an issue arises.
2. Response - Protect the whole community including the people, land, and natural resources within that community. (population-based approach)
3. Partnerships - form collaborative partnerships in the community to address health issues.

More information at Michigan Association for Local Public Health
http://www.malph.org/
### Health and Planning Areas of Overlap

#### TABLE 1. SUMMARY OF HEALTH TOPICS

1. **ACTIVE LIVING**
   - Active Transport
   - Recreation
   - Injury

2. **EMERGENCY PREPAREDNESS**
   - Climate Change
   - Natural and Human-caused Disasters
   - Infectious Disease

3. **ENVIRONMENTAL HEALTH**
   - Air Quality
   - Water Quality
   - Brownfields

4. **FOOD & NUTRITION**
   - Access to Food and Healthy Food Options
   - Water
   - Land Use

5. **HEALTH & HUMAN SERVICES**
   - Accessibility to Health & Human Services
   - Aging

6. **SOCIAL COHESION & MENTAL HEALTH**
   - Housing Quality
   - Green & Open Space
   - Noise
   - Public Safety / Security

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Indicates a direct and indirect connection to impacts and issues that may be amplified by climate change.

*Source: Healthy Plan making, Final Report, APA*
Scientists often discuss changes in terms of averages, but our environments are managed in terms of extremes.
Rising Average Temperatures

Projected Change in Average Temperature
Period: 2041-2070 | Higher Emissions: A2

- **Observed**: 1900-2012
- **Projected**: 2041-2070

- **2.0°F**
  - Observed
  - 1900-2012

- **3.5 - 6°F**
  - Projected
  - 2041-2070

Data Source: NOAA NCCDCDICS-NC

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Increases in Extreme Precipitation

From the 3rd National Climate Assessment, 2014
Slide Source: GLISA

37% Observed Precipitation Increase in the Highest 1% of Storms 1958-2012
37-46% Projected Increase in Number of Days with 2 Inches or More of Precipitation by 2050
Tips for Talking about Climate Change

- Focus on data, not politics (not why its happening, but what is happening)
- Talk about impacts of climate change without saying the word climate change (e.g., increased stormwater runoff)
- Focus on local solutions to global issues
- Visual cues of recent events (i.e. flooding damage, etc.)
- Stakeholders can describe how the climate is impacting their job (e.g. farmers, public works officials)
- Focus on identifying actions of no regret and non-climate benefits of actions
- Acknowledge the uncertainty of climate science
Sources for Climate Data

**International Resources:**

**National Resources**
NOAA: [http://www.education.noaa.gov/Climate/](http://www.education.noaa.gov/Climate/)
Climate Adaptation Knowledge Exchange (CAKE) features a wide variety of case studies: [http://www.cakex.org/](http://www.cakex.org/)

**Midwest Resources**
GLISA – Headquarters for all climate data in the Midwest region: [http://glisa.umich.edu/](http://glisa.umich.edu/)

**Michigan Resources**
Hazard Mitigation: [Michigan Hazard Mitigation Plan](http://shop.msu.edu/product_p/bulletin-e3149pdf.htm)
Community Health: [Michigan Health Adaptation Plan](http://glc.org/energyglew/pdf/GLEW-Phase-I-Report-FINAL.pdf)
Activity #1

Please refer to the handout in your packet to answer the following questions:

1. What climate impacts have you seen in your community? Has there been an impact to public health?
2. Has your community had meaningful conversations about climate change? Are these issues difficult to bring up in your community? If so, why?
Climate change is one of the most serious public health threats facing our nation. Yet few Americans are aware of the very real consequences of climate change on the health of our communities, our families and our children.

Georges Benjamin, MD, Executive Director
American Public Health Association

Source: MICHAP
The Michigan Climate Health Profile identifies 5 priority Health Outcomes due to Climate Change:

1. Respiratory Diseases
2. Waterborne Diseases
3. Vector-borne Diseases
4. Carbon Monoxide (CO) Poisoning
5. Heat Related Illnesses
Overall, projected conditions favor increased air pollution and worsening respiratory disease. Climate projections also favor an earlier and longer growth period for plants indicating increased pollen levels, which could increase allergies and exacerbate symptoms including asthma.
In general, climate conditions leading to flooding will be the same or more intense in the future. This leaves areas vulnerable to sewage/septic failures and runoff at increased risk for waterborne diseases and in certain areas, development of harmful algal blooms.
Projections point to warmer winters, earlier springs, and warmer summers. Each of these are conditions suitable for West Nile Virus and its mosquito vector. Similarly, current and future conditions are suitable for Lyme disease and its tick vector although there is greater difficulty in projecting the burden based on the complex sequence of climate conditions and the tick’s life cycle needs.
Carbon Monoxide (CO) Poisoning

Extreme weather events conducive to power outages are projected to increase, especially in winter, leading to increased use of generators and thus increased risk of CO poisoning. Clean up after an event by using power washers may also increase risk of CO poisoning. Freezing rain and flooding increases will raise traumatic injury risk.
Heat-Related Illnesses

Air mass stagnation events may increase in frequency if high humidity occurs with high temperature and low winds, leading to increased heat stress-related morbidity and mortality. Projected increasing numbers of high heat days by mid-century suggest there will likely be large direct impacts on human health, especially if occurring simultaneously with other variables such as urban heat island effect.
Pathways – Example for Extreme Heat Events

Extreme heat related direct and indirect conceptual human health impact pathway based on climate changes resulting from increased Greenhouse Gas Emissions (GHG).
There are a variety of public health *Adaptation Preventions* that range from reducing the environmental exposure to lessening the impact of an existing disease.

<table>
<thead>
<tr>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
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<tbody>
<tr>
<td>Reduce or <strong>eliminate exposures</strong> projected to occur with climate change.</td>
<td>Aims to <strong>prevent the onset</strong> of adverse health outcomes related to a climate exposure.</td>
<td>Measures to <strong>reduce long-term impairment</strong> and minimize suffering caused by existing disease.</td>
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<tr>
<td>Ex) Redesigning water and waste water systems to reduce flooding and contamination thereby increasing resilience to increasing precipitation and more frequent and extreme events.</td>
<td>Ex) Strengthening disease surveillance programs to provide early intelligence of the emergence or re-emergence of vector-borne disease.</td>
<td>Ex) Proper identification and treatment of health impacts related to or exacerbated by heat illness and stress.</td>
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Source: MDHHS, MAP 2015 Conference
<table>
<thead>
<tr>
<th>Intervention</th>
<th>Public Health Benefit</th>
<th>Community Planning Benefit</th>
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<tbody>
<tr>
<td>Increase access to and diversify transit opportunities</td>
<td>- Increased physical activity</td>
<td>- Reduced traffic congestion</td>
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<tr>
<td></td>
<td>- Reduced localized air pollution including ozone</td>
<td>- Increase customer access to businesses</td>
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<td></td>
<td>- Greater access to social services and health care</td>
<td>- Support market based, high density, multi-use development</td>
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<td>Utilize “complete streets” design strategy</td>
<td>- Increase tree canopy coverage for shade</td>
<td>- Storm-water management from green infrastructure</td>
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<td></td>
<td>- Increase walkability and bike-ability</td>
<td>- Reduce wear and tear on infrastructure</td>
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<td></td>
<td>- Reduction in CSO and sewer backup events</td>
<td>- Place based economic development</td>
</tr>
<tr>
<td>Energy diversification and reduction strategies</td>
<td>- Reduced regional and localized mercury, SOx &amp; NOx, particulates</td>
<td>- Reduce stress on vulnerable energy systems</td>
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<tr>
<td></td>
<td>- Reduced opportunity for power outage related impacts</td>
<td>- Stabilize and even reduce energy costs</td>
</tr>
</tbody>
</table>

Source: MDHHS, MAP 2015 Conference
Actions of No Regret

Public health climate adaption actions make communities better, more vibrant places to live.
Public Health Data Sources

- Robert Wood Johnson County Health Rankings
- National Environmental Public Health Tracking Network
- Refer to the Community Health Needs Assessment conducted by your local hospital
- Local Health Assessments

National Environmental Public Health Tracking Network
http://ephtracking.cdc.gov/showHome.action

Non-profit Hospitals conduct a Community Health Needs Assessment:
http://www.astho.org/Programs/Access/Community-Health-Needs-Assessments/
Two Valuable Tools for Planners, Policy Makers, and Health Officials:
1. Vulnerability Assessment
2. Health Impact Assessment

Both types of assessments promote good planning policies, regardless of climate change predicted impacts
Vulnerability = Sensitivity + Exposure

1. Identify community vulnerabilities that can be addressed to increase resilience. Key concerns are in respect to public health/welfare, property values and infrastructure, and natural resources.
2. Serve as a tool to assist community officials in choosing policy options that foster resilience in the face of unforeseen challenges.

“A vulnerability assessment is a first step in climate adaptation, just as a risk assessment is an early step in risk management.”

Michigan DNR
Heat Vulnerability Assessment

Figure 8: Detroit Sensitivity to Excessive Heat by Block Group 2010
Source: American Community Survey; US Census 2010
Map Prepared By: University of Michigan Detroit Climate Capstone

Figure 3: Detroit Exposure to Excessive Heat Based on Land Cover by Block Group 2010
Source: USGS GloVis LandSat 7 ETM+; US Census 2010
Map Prepared By: University of Michigan Detroit Climate Capstone

Figure 9: Detroit Heat Vulnerability by Census Block Group 2010
Source: USGS GloVis LandSat 7 ETM+;
American Community Survey; US Census 2010
Map Prepared By: University of Michigan Detroit Climate Capstone

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Flooding Vulnerability Assessment

Map 23
Percent of Households Living below the Poverty Threshold and Homes Built before 1940

Map 24
Homes Vulnerable to Flooding

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An HIA is a “means of assessing the health impacts of policies, plans, and projects in diverse economic sectors using quantitative, qualitative, and participatory techniques”

“A spatial assessment to determine where increase in tree canopy would be most beneficial to residents’ health.”
Project Goal: How can planners make decisions that foster better positive health outcomes?

- Convened a series of Focus Groups with Planners, Local Health Officials, Social Service Agencies, and Others
- Site Plan Review Reference Guide
- Video for Planning Commissioners
Activity #2: Using Scenarios to Develop Solutions

The GOAL of this exercise is to develop solutions to a series of potential climate future scenarios, which include:

1. Extreme Heat Scenario
2. Heavy Rain and Flooding Scenario
3. Severe Drought and Wildfire Scenario
4. Winter Storm Scenario

As a group, please develop short-term and long-term resilience solutions as they relate to your scenario.

Refer to the scenario handout in your packet for scenario descriptions and for corresponding questions regarding emergency response and long-term adaptation.
Institutionalize without Extra Funding

Identify Opportunities to Integrate Health Actions into Existing Community Plans and Documents

• Examples:
  • Green Infrastructure Plan
  • Hazard Mitigation Plan
  • Climate Action Plans/Sustainability Plans
  • Resource Management Plans
  • Placemaking Initiatives
Include a Community Health Profile in the Master Plan
  • Example: Monroe, City of Lansing

Engage Diverse stakeholders with broad perspectives
  • Social Service organizations (e.g. Red Cross, United Way, GoodWill)
  • Emergency Managers (severe weather risks)
  • Local Businesses (livable communities)
  • Environmental Organizations (interested in air quality and storm water run off)
  • Community organizers (often bring environmental justice perspective)

Weave health-concepts throughout the Master Plan

“As planners have a stronger understanding of their role in shaping public health outcomes... they can contribute to creating built environments that support healthy living throughout the lifetime.”

American Planning Association, Healthy Plan Making
Grand Rapids Sustainability Plan

This serves as a 5-year strategic plan for the City. Each department has specific goals and metrics, based on the triple bottom line.

Specific Metrics that Relate to Public Health:

4. HEALTHY LIFESTYLES AND HEALTHY ENVIRONMENTS
   4.1 Improve access to local food sources.
   4.2 Increase and maintain human health and wellness.
   4.3 Increase availability of recreational programs/facilities.

5. PUBLIC SAFETY
   5.1 Reduce the occurrence of crime.
   5.2 Reduce the loss of life and property from fire and emergency medical calls.
   5.3 Ensure capacity for responding to emergencies and disasters.
   5.4 Increase crime prevention, neighborhood public safety, and neighborhood-based leadership or involvement.
Hazard Mitigation Planning

Used data developed by Great Lakes Integrated Sciences and Assessments to convene focus groups. Attendees included:

- hazard mitigation
- emergency response
- municipal planning professionals

[Table]

www.hrwc.org/climate-resilient-communities
Ongoing Monitoring and Evaluation

1. **Build monitoring capacity into the project plan and budget**
2. **Look for indicators with readily available data**
   - Health Outcomes and Health Factors – County Health Rankings
   - Miles of Bike Lanes or Transit Routes in your Community
   - Air Quality - The Environmental Protection Agency provides different types of air quality data ([https://www3.epa.gov/air/airpolldata.html](https://www3.epa.gov/air/airpolldata.html))
   - Water Quality ([http://water.usgs.gov/owq/data.html](http://water.usgs.gov/owq/data.html))
   - Food Desert Mapping
   - Vulnerability Assessment Updates
**Example Indicator Tracking**

- **3,500 Acres of Wetlands** in the Grand Haven Community. Each acre of wetlands can retain up to one million gallons of water.
- **58% Tree Canopy** Over 13,400 acres of the Grand Haven Community is covered in trees. Beyond looking beautiful, trees help absorb flood water and provide habitat and shade. To maximize these benefits, research suggests that at least 40% of a community should be covered by trees.
- **2,300 Residents** of the Grand Haven Community rode bicycles for fun in 2014, 18% more than the national average.
- **6,200 Residents** walked for leisure last year in the Grand Haven Community; 11% more than the national average.
- **$123 Million** Dollars may be at risk in property values during times of heavy flooding and average water levels on Lake Michigan.
- **500 Commuters** get to work in ways other than driving alone. This is a 95% increase since 2005-2009.
- **334 Structures** may be at risk during times of heavy storms and average water levels.

Research on economic recovery has shown that communities with a high share of manufacturing jobs and with poorly educated populations are more susceptible to economic downturns. Additionally, when income gaps between rich and poor are high, economies are more likely to experience shocks and take longer to recover.

- **Manufacturing**: 21% of all jobs in the Grand Haven Community are in manufacturing compared to 17% of all jobs in the State.
- **Education**: 65.9% of adults in the Grand Haven Community have at least some college education compared to 53.9% of adults in the State overall.
- **Income Gap Coefficient**: .41 in Ottawa. .40 in the State.

A "0" means everyone makes the same income and a "1" means one person makes all the income and everyone else makes no income.

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**How Resilient is the Grand Haven Community in 2016?**

- **15% of Residents** in the Grand Haven Community live within a 1/2 mile walk of a grocery store. Access to fresh food is a strong health benefit that addresses food deserts and increases local resiliency.
- **11% Paved Surfaces** Over 2,500 acres of the Grand Haven Community is covered in impervious surfaces like driveways, buildings, and roads. Impervious surface in excess of 10% can degrade water quality, as stormwater runs off into lakes and rivers.
Ideas for Funding

Local Funding
• Tax Increment Financing
• Local Community Foundations

U.S. Dept. of Housing and Urban Development
• Sustainable Communities Planning Grant Program
• Community Development Block Grants

Transportation-related Funding
• Surface Transportation Block Grant (STBG) program
• Congestion Mitigation Air Quality Funding

Infrastructure
• Stormwater, Asset Management, and Wastewater

PACE (property-assessed clean energy) Program

Center for Disease Control and Prevention
• Example: Community Transformation Grants (2011-2014)

Healthy Communities grants
• Historically come from Kellogg Foundation, Kresge Foundation, and Robert Wood Johnson Foundation.
**Activity 3**

MICHP needs your input to help determine their activities for the next five years. They must choose and implement interventions to reduce the harm to public health that can occur from the following climate-related environmental conditions: heat waves, poor air quality, and poor water quality.

Please refer to the handout in your packet to answer each question.

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**Guidance on the Michigan Climate and Health Adaptation Plan (2010-2015)**

**Goal #1:** Climate change will be recognized as a public health issue and integrated into public health practice.

**Goal #2:** Public health agencies will have the resources, tools and activities for responding to climate change impacts integrated / included in their existing programs.

**Goal #3:** Vulnerable populations and their needs will be explicitly considered in programs and policies addressing health impacts associated with climate change.
Wrapping Up

- Public Health and planning professionals have the same overall goals for creating healthy communities.
- Severe weather events are increasing in frequency and intensity and have a broad range of impacts on human health. Planning policies can be used to mitigate these impacts.
- Politics and ideology associated with the climate change debate are not necessary to bring into the community conversation regarding positive public health outcomes.
- Positive public health outcomes can be fostered through a variety of planning processes.
- There are many opportunities for engaging public health professionals in planning processes.

Next Steps:
1. Update the Michigan Department of Health and Human Services MICHAP
2. Interested in LIAA’s Resilient Communities program? Please email resilientmichigan@liaa.org