CLIMATE HEALTH ADAPTATION PLANNING IN MICHIGAN

Training for Local Planners and Decision Makers

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Michigan Green Communities Conference
Lansing, MI
Today’s Presenters

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Michigan Dept. of Health and Human Services
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.
Planning for Resilient Communities
Learning, Adapting & Thriving

A new way of viewing the master plan process, focusing on adaptation in the face of changing conditions and circumstances.
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 Presentation

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.)
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.
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
Role of the Planner in Public Health

Planner as a convener

Planner as an information sharer and policy practitioner
# Health and Planning Areas of Overlap

## TABLE 1. SUMMARY OF HEALTH TOPICS

<table>
<thead>
<tr>
<th>1. ACTIVE LIVING</th>
<th>4. FOOD &amp; NUTRITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Transport</td>
<td>Access to Food and Healthy Food Options</td>
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<tr>
<td>Recreation</td>
<td>Water</td>
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<tr>
<td>Injury</td>
<td>Land Use</td>
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<table>
<thead>
<tr>
<th>2. EMERGENCY PREPAREDNESS</th>
<th>5. HEALTH &amp; HUMAN SERVICES</th>
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<tbody>
<tr>
<td>Climate Change</td>
<td>Accessibility to Health &amp; Human Services</td>
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<tr>
<td>Natural and Human-caused Disasters</td>
<td>Aging</td>
</tr>
<tr>
<td>Infectious Disease</td>
<td>6. SOCIAL COHESION &amp; MENTAL HEALTH</td>
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<th>3. ENVIRONMENTAL HEALTH</th>
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<tr>
<td>Air Quality</td>
<td>Housing Quality</td>
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<tr>
<td>Water Quality</td>
<td>Green &amp; Open Space</td>
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<tr>
<td>• Brownfields</td>
<td>• Noise</td>
</tr>
<tr>
<td></td>
<td>Public Safety / Security</td>
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</tbody>
</table>

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

Source: Healthy Plan making, Final Report, APA
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
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

http://www.cdc.gov/climateandhealth/effects
Respiratory Diseases

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.
Vector Diseases

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.
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).
<table>
<thead>
<tr>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
</tr>
</thead>
<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>
</tr>
<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>
</tr>
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Source: MDHHS, MAP 2015 Conference

**Public Health Interventions**

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>
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<tr>
<th>Intervention</th>
<th>Public Health Benefit</th>
<th>Community Planning Benefit</th>
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</thead>
</table>
| Increase access to and diversify transit opportunities | - Increased physical activity  
- Reduced localized air pollution including ozone  
- Greater access to social services and health care | - Reduced traffic congestion  
- Increase customer access to businesses  
- Support market based, high density, multi-use development |
| Utilize “complete streets” design strategy         | - Increase tree canopy coverage for shade  
- Increase walkability and bike-ability  
- Reduction in CSO and sewer backup events | - Storm-water management from green infrastructure  
- Reduce wear and tear on infrastructure  
- Place based economic development |
| Energy diversification and reduction strategies   | - Reduced regional and localized mercury, SOx & NOx, particulates  
- Reduced opportunity for power outage related impacts | - Reduce stress on vulnerable energy systems  
- Stabilize and even reduce energy costs |

Source: MDHHS, MAP 2015 Conference
Actions of No Regret

Public health climate adaption actions make communities better, more vibrant places to live.
2. Valuable Tools for Planners, Policy Makers, and Public Health Officials

1. Vulnerability Assessment
2. Health Impact Assessment

Both types of assessments promote good planning policies, regardless of climate change predicted impacts.
A vulnerability assessment is a first step in climate adaptation, just as a risk assessment is an early step in risk management.

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
Flooding Vulnerability Assessment

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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.”
Monroe County HIA

**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
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

“The 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

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)
   - Water Quality (http://water.usgs.gov/owq/data.html)
   - Food Desert Mapping
   - Vulnerability Assessment Updates
### Example Indicator Tracking

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>3,500 ACRES OF WETLANDS</strong></td>
<td>In the Grand Haven Community. Each acre of wetlands can retain up to one million gallons of water!</td>
</tr>
<tr>
<td><strong>58% TREE CANOPY</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>2,300 RESIDENTS</strong></td>
<td>of the Grand Haven Community rode bikes for fun in 2014, 18% more than the national average!</td>
</tr>
<tr>
<td><strong>6,200 RESIDENTS</strong></td>
<td>walked for leisure last year in the Grand Haven Community, 11% more than the national average.</td>
</tr>
<tr>
<td><strong>$123 MILLIONS OF DOLLARS</strong></td>
<td>may be at risk in property values during times of heavy flooding and average water levels on Lake Michigan.</td>
</tr>
<tr>
<td><strong>334 STRUCTURES</strong></td>
<td>may be at risk during times of heavy storms and average water levels.</td>
</tr>
<tr>
<td><strong>500 COMMUTERS</strong></td>
<td>get to work in ways other than driving alone. This is a 95% increase since 2005-2009!</td>
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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 surfaces in excess of 10% can degrade water quality, as stormwater runs off into lakes and rivers.

334 STRUCTURES may be at risk during times of heavy storms and average water levels.

500 COMMUTERS get to work in ways other than driving alone. This is a 95% increase since 2005-2009!

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.
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
Resources

A copy of this presentation, supporting handouts, and break-out group activities used for this training can be downloaded at [www.liaa.org/health](http://www.liaa.org/health)

LIAA’s Resilient Communities Program: [www.resilientmichigan.org](http://www.resilientmichigan.org)

Michigan Climate Health Adaptation Program: [www.michigan.gov/mdhhs/0,5885,7-339-71548_54783_54784_55975---,00.html](http://www.michigan.gov/mdhhs/0,5885,7-339-71548_54783_54784_55975---,00.html)