

# Michigan Climate and Health Adaptation Program (MICHAP)

## **Strategic Plan Update: 2016-2021**

August 31, 2016

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### **Acknowledgements:**

We thank Susan Manente for her review and input.  
This document was prepared with the support of Cooperative Agreement Number EH00124 from the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the Michigan Department of Health and Human Services.



## I. Mission

In cooperation with the Centers for Disease Control and Prevention (CDC), MICHAP is building a climate-resilient public health system for Michigan at the State, local health department, and community levels.

## II. Background

The *MICHAP 2010-2015 Strategic Plan* (Cameron et. al, 2011) was first developed in 2010 in consultation with partners both internal to the Michigan Department of Health and Human Services (then Michigan Department of Community Health), and externally across the state of Michigan. The intent of this strategic plan was to prepare the public health system in Michigan to address the public health consequences of climate change in a coordinated manner. The public health system includes the Michigan Department of Health and Human Services (MDHHS) and local health departments (LHDs), as well as key partners in other areas of state government, academia, health care, professional organizations, non-profits, and other organizations whose work relates to public health and/or the environment. This effort sought to build a statewide vision with a diverse, large group representing multiple perspectives and expertise.

The original *Plan's* 2010-2015 objectives were integrated into CDC cooperative agreements that supported activities aimed at scoping climate and health issues for Michigan and building adaptive capacity. However, its high-level goals remain relevant, providing the foundation for moving climate and health adaptation planning forward in Michigan. For the period 2016-2021, MICHAP will be cooperating in CDC's Climate and Health Adaptation and Monitoring Program (CHAMP). It will implement and monitor interventions that address the State's priority climate related health outcomes, with a focus on Michigan's most vulnerable people and places. **As such, this 2016-2021 Strategic Plan Update (referred to as the 'Plan Update' moving forward) will retain the original Plan's goals but will update MICHAP's strategies and activities according to the CHAMP requirements and stakeholder feedback.**

## III. Strategic Planning Goals and Priorities

### A. Plan Goals

The three overarching goals from the 2010-2015 Strategic Plan will continue to serve as guiding principles for MICHAP in completing the CHAMP strategies and activities from 2016-2021:

1. Climate change is recognized as a public health issue and is integrated into public health practice.
2. Public health agencies and stakeholder organizations have the tools, resources, and activities to respond to climate change impacts within existing programs.
3. Vulnerable populations are explicitly considered in programs and policies addressing climate change impacts.

### B. Priority climate change - public health issues in Michigan

During the 2010 strategic planning sessions, participants **prioritized public health issues related to climate change** in Michigan according to many factors, including perceived likelihood of

occurrence and impact. The collective priorities of all who participated, in either or both of the strategic planning sessions, were grouped as follows:

Priority short-term climate change events:

1. Increasing number of heat events with related illness and deaths.
2. Declining air quality, a result of increased production of ozone and particulate matter from heat and drought events.
3. Adverse changes to water quality and quantity following severe weather events.

Priority long-term public health challenges:

1. Rising incidence of infectious diseases and outbreaks of new diseases not currently endemic to Michigan.
2. Increasing numbers of disease vectors and appearance of new vectors not currently established in Michigan.
3. Degradation of food safety, security and supply.

Response priorities to climate change events:

1. Develop responses for emergencies related to extreme weather and/or climate change that are protective of vulnerable populations.
2. Ensure accessibility to health care services for people with chronic conditions during service disruptions caused by extreme weather events.
3. Address anxiety, depression or other mental health conditions as consequences of a climate change event.

In the intervening years, MICHAP refined these issues to focus on **five priority climate-related health impacts** for our state:

1. Heat-related illness and mortality.
2. Respiratory disease exacerbation, especially asthma.
3. Carbon monoxide poisoning and other injuries related to extreme weather events.
4. Waterborne diseases related to extreme rain events.
5. Vector-borne diseases, especially Lyme disease and West Nile virus.

These health impacts were the focus of MICHAP's CDC-funded cycles *Developing Public Health Capacity and Adaptations to Reduce the Human Health Impacts of Climate Change* (2010-2013) and *Building Resilience Against Climate Effects* (2013-2016). MICHAP has monitored the magnitude and distribution of these health impacts in Michigan, identified key vulnerabilities, and characterized the current and projected changes in climate across Michigan. See ***Michigan Climate and Health Profile Report*** for details (Cameron et al., 2015). Following CDC's guidance (Manangan et al., 2014), MICHAP used geographic information systems to conduct a statewide vulnerability assessment by mapping the distribution of the socioeconomic and biophysical indicators of health risk identified during those previous steps. This information, along with the ***Intervention Effectiveness Assessments*** jointly conducted by the Midwest x Southeast BRACE Collaborative (Climate and Health Program, 2016), established a preliminary list of adaptation activities, some of which are included in the *Plan Update*.

Drafts of the *Plan Update* were shared with community level stakeholders during a series of five spring 2016 training sessions conducted across the state in partnership with the Land Information Access Association (LIAA), a nonprofit regional planning organization (LIAA, 2016). Participants

from a variety of backgrounds including community and regional planning, local public health, community groups, and academia provided feedback.

### C. Strategies and Activities (2016-2021)

The 2010-2015 *Strategic Plan* emphasized **five major strategic themes: 1. Connect and educate; 2. Identify and secure resources; 3. Organize, plan and implement a response; 4. Collect, analyze, and disseminate data; and 5. Focus on vulnerable populations.** Moving forward, MICHAP will still incorporate those themes but activities will shift from identification of climate related health issues and solutions, to piloting interventions in vulnerable communities around the state and monitoring results. The 2016-2021 *Plan Update* will incorporate the following activities:

#### **1. Identify & cultivate relationships with stakeholders**

- a) By early 2017, MICHAP will recruit at least two Michigan communities and relevant stakeholders to collaborate on developing, piloting, and evaluating an intervention addressing at least one of the priority health impacts. The communities and stakeholders will be representative of the vulnerability and equity issues faced by urban and rural jurisdictions.
- b) Representatives from each community will be asked to participate throughout the planning, implementation, and evaluation processes. Additionally, an advisory group of key stakeholders will meet with MICHAP staff on a regular basis to address their community's intervention work.
- c) MICHAP will leverage existing resources and partnerships to provide value for communities and LHDs to participate.

#### **2. Plan, communicate, implement, and evaluate community-level interventions**

- a) By early 2017, MICHAP will create communication and evaluation plans in consultation with internal and community advisors, and distribute them to community stakeholders.
- b) By mid-2018, the first intervention will be designed and implementation will begin by the end of that year.
- c) By mid-2019, the second intervention will be designed and implementation will begin by the end of that year.
- d) By 2020, at least one of the interventions will be completed, with the other completed by 2021.
- e) By the end of 2021, completed projects will be evaluated and results reported with conclusions and recommendations.

#### **3. Continuous program improvement**

- a) At the end of each year, MICHAP will conduct a program evaluation of the completed work to date. The results will be used to update processes and outcomes, and improve implementation and collaboration activities.
- b) The MICHAP will review the evaluation results with stakeholders annually. The intervention and adaptation plans will then be updated to reflect the intended improvements.

### D. Potential Community Level Interventions for Priority Health Impacts

The following list describes potential interventions and adaptations for each priority climate-related health impact. These were synthesized from several initiatives, as described in Section B above, including: garnering community level stakeholder input; identifying key sensitivities and exposures for Michigan residents; and determining the plausibility and effectiveness of potential interventions. MICHAP will further refine this list and implement specific interventions using the strategies and activities described in Section C, above.

## 1. Health Impact: Heat illness

*Background:* Extreme heat causes more deaths in the U. S. than any other extreme weather event. Warmer temperatures and heat waves can lead to heat stress illness, especially in those whose health is already impaired for other reasons. Warmer summer temperatures and more extreme heat days (over 95°F) are projected for Michigan, with urban areas in the southeastern Lower Peninsula most likely to experience higher temperatures.

*Vulnerable People:* young children; the elderly; those with low incomes; persons with chronic diseases; minority and/or socially isolated individuals; outdoor workers.

*Vulnerable Places:* urban areas with impervious surfaces, lack of trees or green space; and areas with older rental housing stock, (a surrogate for high indoor temperatures, low air conditioner prevalence). Urban communities that are highly vulnerable include the City of Detroit and surrounding areas in Wayne, Oakland and Macomb counties.

*Key Partners:* providers of services to the elderly; emergency planners; weather media; community planners; neighborhood organizations; LHDs; and academics conducting community-based research in Detroit.

*Potential Interventions and Adaptations:*

- a) **Education and inclusion:** Develop communication plans and messaging on heat stress recognition and protective personal behaviors. Improve inter-agency discussion, coordination, and communication utilizing partners and working groups. When creating materials, developing trainings, or organizing any planning processes, ensure inclusion of diverse stakeholders such as representatives of the vulnerable populations and social service providers.
- b) **Landscape actions:** Reduce urban heat island effects by increasing tree canopy and/or green spaces.
- c) **Policy:** Coordinate adaptations with ongoing community development and public health activities by tying them into a community's master planning and health improvement planning processes. By doing so, formally implant a vision of resilience for business and residential districts to guide long-term investment in infrastructure and health and social service programming in a sustainable manner. **Potential actions:** Enact regulations or ordinances to guide infrastructure changes that reduce ambient and indoor heat, such as reducing parking lot size, setting maximum parking standards, or adopting a tree canopy policy. Open and promote the use of cooling centers in vulnerable neighborhoods, and provide free or reduced-cost transportation to the centers.
- d) **Surveillance and Tracking:** Increase capacity for collection and analysis of environmental and heat related illness data. Develop local indicators to track impacts and incorporate into cost/benefit risk analyses or health impact assessments. Set targets based on those indicators to measure success and incorporate into plans. **Potential indicators:** area of tree canopy coverage, impervious surface coverage, number and location of cooling centers in relation to vulnerable populations, and number of public transit rides given to cooling centers on high heat days. Tie tracking to collaborative educational and policy approaches to reveal co-benefits of the interventions that otherwise may not be accounted for or properly communicated to the community and decision makers.

## 2. Health Impact: Exacerbation of respiratory problems

*Background:* Particulate and ozone emissions can contribute to poor air quality that makes breathing more difficult, especially for people with asthma or other respiratory conditions. Pollen from ragweed and other plants can also trigger breathing problems in allergic individuals. Increasing temperatures are predicted to make both emissions, particularly low level ozone, and pollen concentrations worse.

*Vulnerable People:* young children; the elderly; those with low incomes; minority and/or socially isolated individuals; persons with cardiorespiratory diseases, especially asthma.

*Vulnerable Places:* urban areas; areas with frequent high ozone and particulate levels; areas with high ragweed density or heavy pollen production; high traffic density areas. Highly vulnerable areas include Detroit and surrounding urban communities, as well as urban areas of Flint, Saginaw, Grand Rapids and Lansing, and communities along Lake Michigan, in particular Benton Harbor/St. Joseph, Holland and Muskegon.

*Key partners:* asthma programs and coalitions; weather media; community planners; neighborhood organizations; academics conducting community-based research in Detroit; LHDs; regional extension agents.

### *Potential Interventions:*

- a) **Education and inclusion:** Develop communication plans and messaging on protective personal behaviors during poor air quality days. Promote use of the AirNow app by those with asthma and other respiratory conditions. When creating materials, developing trainings, or organizing any planning processes, ensure inclusion of diverse stakeholders such as representatives of the vulnerable populations and social service providers.
- b) **Landscape actions:** Reduce pollen/ragweed levels by regular mowing of public areas; promote use of low-allergenic tree and ornamental plantings in public spaces.
- c) **Policy:** Coordinate adaptations with ongoing community development and public health activities by tying them into a community's master planning and health improvement planning processes. By doing so, formally implant a vision of resilience for business and residential districts to guide long-term investment in infrastructure and health and social service programming in a sustainable manner. **Potential actions:** Promote clean energy initiatives, including Complete Streets programs, to reduce traffic volume and vehicle emissions. Promote ozone action days. Implement land use policies to limit sprawl and reduce the exposure of school and residential areas to traffic and industrial related air pollutants. Use local ordinances to regulate rural burn practices (trash, wood boilers, etc.). Provide subsidies to low-income individuals for asthma treatment.
- d) **Surveillance and Tracking:** Increase capacity for collection and analysis of local data on air quality and respiratory diseases. Increase air quality monitoring; especially in low-income neighborhoods. Develop local indicators for a community to track impacts over time and incorporate into cost/benefit risk analyses or health impact assessments. Set targets based on those indicators to measure success and incorporate into plans. **Potential indicators:** number and size of ragweed control areas, number of air quality monitors deployed, miles of bike lanes created, and number of children being treated for asthma. Tie tracking to collaborative educational and policy approaches, to reveal co-benefits of the interventions that otherwise may not be accounted for or properly communicated to the community and decision makers.

### 3. Health Impact: Water-borne diseases

*Background:* Extreme rain events can trigger runoff of biological and chemical contaminants into surface water; this runoff can also contaminate drinking water wells. Contact with floodwater also increases risk of exposure to pathogens. There are already concerns over the large number of private well, septic systems, and failing urban infrastructure in the state. Climate projections indicate more frequent severe rain events in Michigan's future and potential for overflows. This outcome is a priority concern for most of the state.

*Vulnerable People:* young children; elderly persons; low income individuals; persons with chronic diseases or who are immune compromised.

*Vulnerable Places:* areas with high private well and septic density; residential areas in a flood plain; old urban areas with combined or inadequate sewer systems; residences near areas of high livestock density; areas with high numbers of septic failures or untreated sewage discharges; areas with frequent heavy rain events. Most areas of the state are at risk, however highly vulnerable areas include Wayne County and several rural counties in the southern (Lenawee, Cass) and western (Allegan, Barry, Kent, Muskegon, Montcalm, Newaygo) Lower Peninsula.

*Key partners:* LHD environmental and communicable diseases staff; regional staff of the Michigan Department of Environmental Quality; community planners; neighborhood organizations; local environmental organizations; academics conducting community-based research in Detroit; regional Extension agents; local real estate agents and police; drain commissioners.

#### *Potential Interventions:*

- a) **Education and inclusion:** Develop communication plans and messaging to promote well testing, wellhead protection, septic system maintenance, and to warn of waterborne disease risk after flood events. When creating materials, developing trainings, or organizing any planning processes, ensure inclusion of diverse stakeholders such as representatives of the vulnerable populations and social service providers.
- b) **Landscape actions:** Construct raingardens, green roofs, bio-swales, and other green infrastructure to reduce runoff.
- c) **Policy:** Coordinate adaptations with ongoing community development and public health activities by tying them into a community's master planning and health improvement planning processes. By doing so, formally implant a vision of resilience for business and residential districts to guide long-term investment in infrastructure and health, and social service programming in a sustainable manner. **Potential actions:** Regularly inspect/test private wells and septic systems; connect residential areas to community drinking water systems and storm sewer systems; continue the separation of combined sewer systems and increase storm sewer capacity. Develop emergency response plans for flood events. Incorporate water quality issues into economic development and regional promotion (e.g., *Pure Michigan, Great Lakes* promotional campaigns).
- d) **Surveillance and Tracking:** Increase capacity for collection and analysis of environmental and waterborne disease related data. Develop local indicators to track impacts and incorporate into cost/benefit risk analyses or health impact assessments. Set targets based on those indicators to measure success and incorporate into plans. **Potential indicators:** number of green infrastructure projects completed, number and volume of combined sewer overflows in a year, number of septic or well systems inspected, area of impervious surface coverage. Tie tracking to

collaborative educational and policy approaches, to reveal co-benefits of the actions that otherwise may not be accounted for or properly communicated to the community and decision makers.

#### **IV. Summary**

The *Plan Update* for 2016-2021 will implement community-level interventions against extreme heat effects, respiratory conditions, and waterborne diseases. Implementation will begin with the CDC's *Climate and Health Adaptation and Monitoring Program* grant cycle on September 1, 2016. MICHAP will collaborate with at least two vulnerable Michigan communities over the five years on designing and implementing interventions to address at least one priority health outcome. These strategies will utilize evidence-based public health interventions founded upon existing evidence where possible, and will incorporate monitoring and evaluation.

#### **V. References**

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