CLIMATE AND HEALTH ADAPTATION PLANNING GUIDE FOR MICHIGAN COMMUNITIES

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CENTERS FOR DISEASE CONTROL AND PREVENTION

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MICHIGAN DEPARTMENT OF HEALTH & HUMAN SERVICES

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MICHIGAN STATE UNIVERSITY SCHOOL OF PLANNING, DESIGN AND CONSTRUCTION AND MICHIGAN STATE UNIVERSITY EXTENSION

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Marquette County, Michigan, including the Marquette County Health Department, the Marquette County Climate Adaptation Task Force (CATF), Superior Watershed Partnership (SWP), and numerous community stakeholder groups all held vital roles in the MICHAP and MSU pilot project to address Marquette area climate and health impacts. This community project formed the basis for this more widely applicable guidebook.

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EXECUTIVE SUMMARY

The climate is changing in the Great Lakes Region. The average temperature, the frost-free season, total precipitation, and the number of heavy precipitation events all increased from 1951–2017, according to the most recent data available. Around the world, public health agencies have identified climate change as one of the greatest threats to human health. Many communities in Michigan are already experiencing negative consequences on health with the more vulnerable people and places being impacted first and more severely. The impacts occur unequally because climate change multiplies risk factors such as racial inequity, environmental injustice, economic disparities, access to health care, and aging infrastructure. Future climate-related health impacts can be prevented by mitigating climate change itself through greenhouse gas reduction. However, state and local governments and health departments must also develop climate adaptation strategies to reduce, eliminate or prepare for those health impacts already occurring.

This guide is intended to help communities in Michigan and across the Great Lakes Region develop a climate and health adaptation plan or to integrate climate and health concepts into existing initiatives. A climate and health adaptation plan is defined here as a strategy document that fosters collaboration across disciplines and interest groups to instigate a series of activities toward the common objectives of understanding and then preventing or reducing the anticipated health impacts of climate change in the area.

Communities are unique in their makeup, systems, and needs, which makes planning for climate and health adaptation complex. This guide was developed to be accessible and flexible for the unique situations of urban, suburban, and rural communities. With that in mind, a set of core principles establishes a foundation from which each community can build. Those include: 1. Centering on health and equity; 2. Engaging diverse partners reflective of the community, especially vulnerable and marginalized populations, along with technical stakeholders and decision makers; 3. Incorporating locally relevant climate and health data in decision making; and 4. Establishing a shared vision for what successful climate adaptation means to the community. A clear understanding of the impacts on all sectors and subgroups is required in order to prepare for and respond to climate-related health impacts in an equitable manner. Working across sectors to build adaptive capacity is crucial for taking meaningful actions.

This guide utilizes four planning phases: 1. Engage stakeholders and identify concerns; 2. Engage community and develop the plan; 3. Prioritize and implement; and 4. Monitor, update, and keep active. There is also an extensive section on developing visual aids to create buy-in and establish the community's vision for adaptation in a local context. Within each phase there are detailed sub-steps with checklists and resources that can be used to facilitate and document progress.

Throughout the guide there are case studies and examples from the pilot of this process in Marquette, Michigan. These are included to stimulate ideas relevant to your locale and to illustrate the effectiveness of this approach. The Appendices have templates for conducting community visioning meetings and a curated list of guidance documents, and there is an extensive list of other references with hyperlinks.

We hope this Guide provides readers with the knowledge and tools they can use to build healthier, more resilient communities.

DEFINITIONS

Adaptive Capacity: The expertise, plans, programs, or resources a community has in place to prevent or reduce negative impacts (Manangan et al., 2014)

Built Environment: All of the physical parts of the spaces where we live and work (e.g., homes, buildings, streets, open spaces, and infrastructure) (CDC, 2011)

Climate and Health Adaptation Plan: A strategy document that fosters collaboration across disciplines and interest groups to instigate a series of activities toward the common objectives of understanding and then preventing or reducing the anticipated impacts of climate change in the area (Marinucci et al., 2014)

Climate Adaptation: Actions taken at the individual, local, regional, and national levels to reduce risks from climate conditions and prepare for projected future climate changes (Lempert et al., 2018)

Climate and Health Adaptation: Steps taken to protect people and communities from the health risks associated with a changing climate (American Public Health Association, 2015)

Climate Change: Changes in average weather conditions—such as temperature, precipitation, and risk of extreme events—that persist over multiple decades or longer (Jay et al., 2018)

Climate Change Mitigation: Efforts to reduce or prevent the emission of greenhouse gases (UN Environment, n.d.)

Climate-Health Pathway: A description of how climate change directly and indirectly impacts human health (Cameron et al., 2015)

Community Sectors (aka Sectors): Various groups that people in the larger community might be divided into for reasons of common social, political, economic, cultural, or religious interests (Center for Community Health and Development, 2018a)

Exposure: The severity, frequency, and types of changes to an area's climate (Manangan et al., 2014)

Green Infrastructure: The use of vegetation, soils, and other elements and practices to restore some of the natural processes required to manage water and create healthier urban environments (United States Environmental Protection Agency, n.d.)

Resilience: The capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption (USGCRP, 2016)

Rural: As a "non-metro" county, a rural county includes some combination of: open countryside, rural towns (places with fewer than 2,500 people), and urban areas with populations ranging from 2,500 to 49,999 that are not part of larger labor market areas (metropolitan areas) (USDA ERS, 2019)

Stakeholder: Anyone with an interest in a particular decision. This interest can stem from the potential to influence the decision, and/or from the potential to be influenced by the decision. Stakeholders can act as individuals or as representatives of a larger group (Garder et al., 2009)

Vector: Mosquitoes, ticks, and fleas that spread pathogens. A person who gets bitten by a vector and gets sick has a vector-borne disease (CDC, Division of Vector-Borne Diseases, n.d.)

Visualization: Before-and-after images and other visual aids used to help stakeholders and the general public understand the connection between climate, health, and what adaptation might look like in their community

Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt (Intergovernmental Panel on Climate Change, n.d.). Climate Vulnerability is a function of the character, magnitude, and rate of climate variations to which a system is exposed, its sensitivity, and its adaptive capacity (Manangan et al., 2014)

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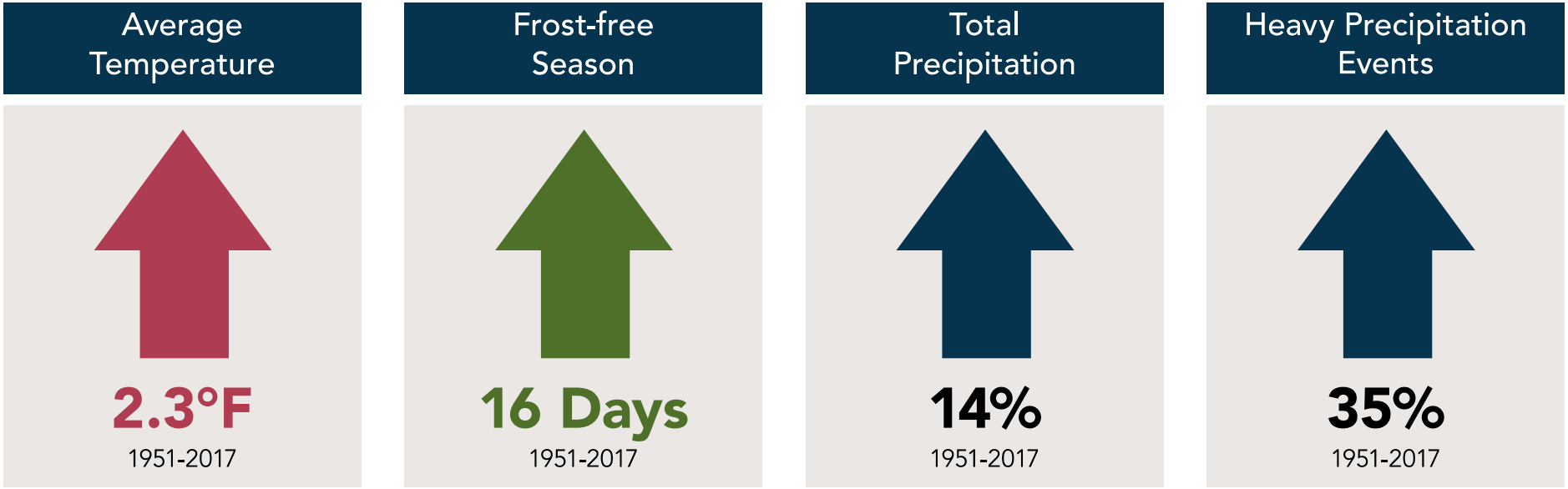
INTRODUCTION

The climate is changing in the Great Lakes Region (Great Lakes Integrated Sciences and Assessments [GLISA], n.d.). The average temperature, the frost-free season, total precipitation, and the number of heavy precipitation events all increased from 1951–2017, according to the most recent data available (Figure 1). Weather and climate have a variety of significant impacts on human health. For example, heavy rain events can lead to flooding, heat waves can lead to illness and death, and frost-free seasons influence pollen-producing plants and disease-carrying insect habitats (Centers for Disease Control and Prevention [CDC], 2014). Furthermore, climate change is a risk multiplier, meaning that changing seasonal patterns and more frequent and intense heat and precipitation events related to climate change can exacerbate the environmental, social, and economic stressors communities already face, while also presenting new threats in new areas (U.S. Global Change Research Program [USGCRP], 2016).
The importance of planning now for the health impacts of climate change in our communities is clear.

Figure 1: *Climate change in the Great Lakes Region. (Adapted from figure in GLISA, 2019).*



Although many communities recognize the impacts and the need to respond, many are restricted by actual or perceived limitations in funds, staff time, technical expertise, and coordination between necessary partners or stakeholders (Maibach et al., 2008). An additional limitation, particularly for rural communities, is a lack of relevant evidence-based guidance related to climate planning and implementing practical solutions.

Recognizing the importance of adapting to the changing climate and the challenges Michigan communities face in doing so, the MDHHS Climate and Health Adaptation Program (MICHAP) has partnered with Michigan State University (MSU) School of Planning, Design and Construction (SPDC) and Michigan State University Extension (MSUE) to develop this guide as a resource for Michigan communities that wish to undertake climate and health adaptation planning. Though any community can utilize this guide, it is developed with the recognition that climate guidance is often focused on more urban communities and that smaller and more rural communities need resources that are adaptable to their unique challenges and opportunities as well.

WHY USE THIS GUIDEBOOK?

While climate change is recognized as one of the greatest threats to public health, few models of climate and health planning currently exist, particularly for small and more rural communities. For those communities that are proactively building climate adaptation capacity, there is limited guidance available on how to incorporate health perspectives; coordinate local governments, planners, health departments, and other partners; and engage vulnerable populations. This guide builds upon the experience gained and lessons learned by MICHAP, MSU SPDC, and MSUE from a pilot project in Marquette County, Michigan, which resulted in the creation of the three-volume Marquette Area Climate and Health Adaptation Guidebook (https://www.canr.msu.edu/climatehealthguide). This guidebook demonstrates how even small communities can approach the unique challenges of climate and health adaptation planning.

CLIMATE AND HEALTH ADAPTATION PLANNING BACKGROUND

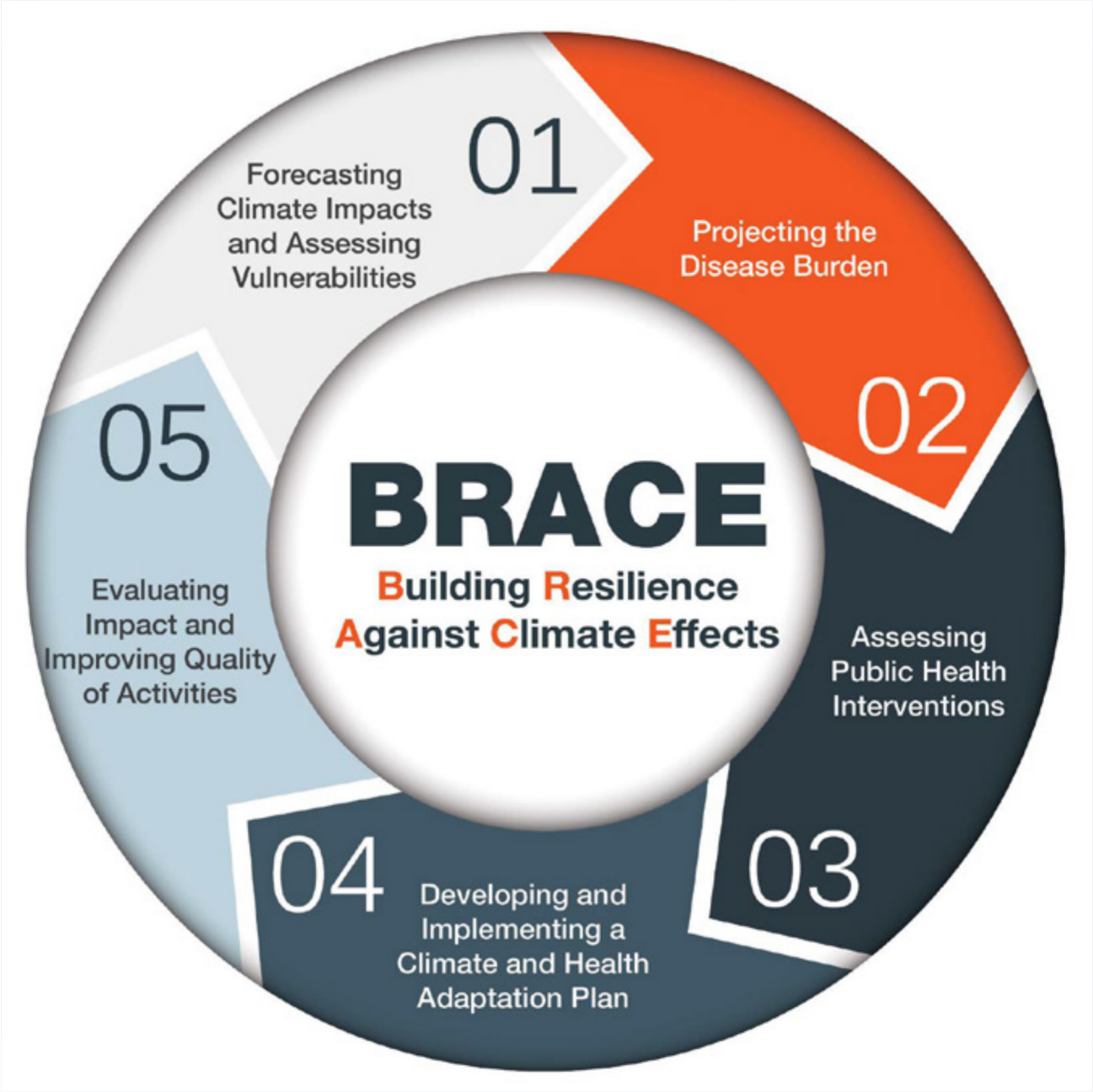
The CDC's Climate and Health Program developed the Building Resilience Against Climate Effects (BRACE) framework to guide health departments and communities in preparing for the health effects of climate change. The Program has provided funding for MICHAP and other state and city health departments to implement BRACE since 2010. BRACE follows five steps for building resilience (Figure 2). The steps of the BRACE framework inform the four phases of this guide.

MICHAP'S BRACE PILOT PROJECT IN MARQUETTE COUNTY

As a part of the CDC's Climate-Ready State and Cities Initiative, MICHAP uses the BRACE framework to build public health resilience to climate impacts in Michigan. MICHAP noted that rural communities, in particular, needed to build their capacity to address climate-related health impacts. In response to this finding, they partnered with MSU SPDC and MSUE to develop a pilot program for climate and health adaptation planning in rural Michigan communities. In 2017, the team initiated a three-year pilot of a climate and health adaptation project in the largest rural county in Michigan, Marquette County. The project brought together stakeholders from across 1,873 square miles of land representing close to thirty local units of government, agencies, and organizations to address climate and health adaptation. This project is novel because it uses visualizations as a central part of communication. The visualizations include posters, maps, and other displays that improve engagement by illustrating how climate change can harm public health and how adapting spaces and the built environment can improve health, increase usability, and promote resilience for everyone.

The process used for the pilot project is the basis for this guide. Through inclusive and frequent stakeholder and community engagement, detailed and informative before-and-after visualizations, and evidence-based recommendations, the steps laid out here provide a framework for community-wide action. The guide uses Marquette County as a case study to provide examples, with the understanding that each community is unique and will modify the approach as appropriate for them.

Figure 2: *CDC's Building Resilience Against Climate Effects (BRACE) Framework. (CDC, 2018).*



PLANNING FOR CLIMATE AND HEALTH OVERVIEW

WHAT IS A CLIMATE AND HEALTH ADAPTATION PLAN?

A climate and health adaptation plan is a strategy document that fosters collaboration across disciplines and interest groups to instigate a series of activities toward the common objectives of understanding and then preventing or reducing the anticipated impacts of climate change in the area. Moreover, it builds a community's adaptive capacity to address the impacts of climate change on public health by engaging stakeholders in the process of outlining climate-related health risks, connecting with vulnerable people and places, and building consensus around opportunities for responding. By focusing on actions that address community-identified concerns and describing locally relevant metrics that can be used to measure impacts, a climate and health adaptation plan will guide a community's efforts to adapt to climate change.

WHY IS A CLIMATE AND HEALTH ADAPTATION PLAN IMPORTANT?

Climate change can impact the health of everyone. Often it impacts certain vulnerable populations first and hardest. A climate and health adaptation plan explicitly incorporates those health and vulnerability factors. It guides stakeholders and community leaders to consider those concerns when developing new policies, directing funding, starting projects, and building overall adaptive capacity.

THE CLIMATE AND HEALTH CONNECTION

Climate change is occurring in Michigan and has serious consequences for human health. The changes in overall climate conditions are leading to shifting seasonal patterns and more extreme weather events. These changes include more frequent and extended periods of high heat and humidity, flooding, and droughts caused by changing precipitation patterns, extreme weather such as heavy snow and freezing rain, and ecosystem changes that expand ranges for disease-carrying pests and pollen-

CLIMATE ADAPTATION VS. CLIMATE MITIGATION

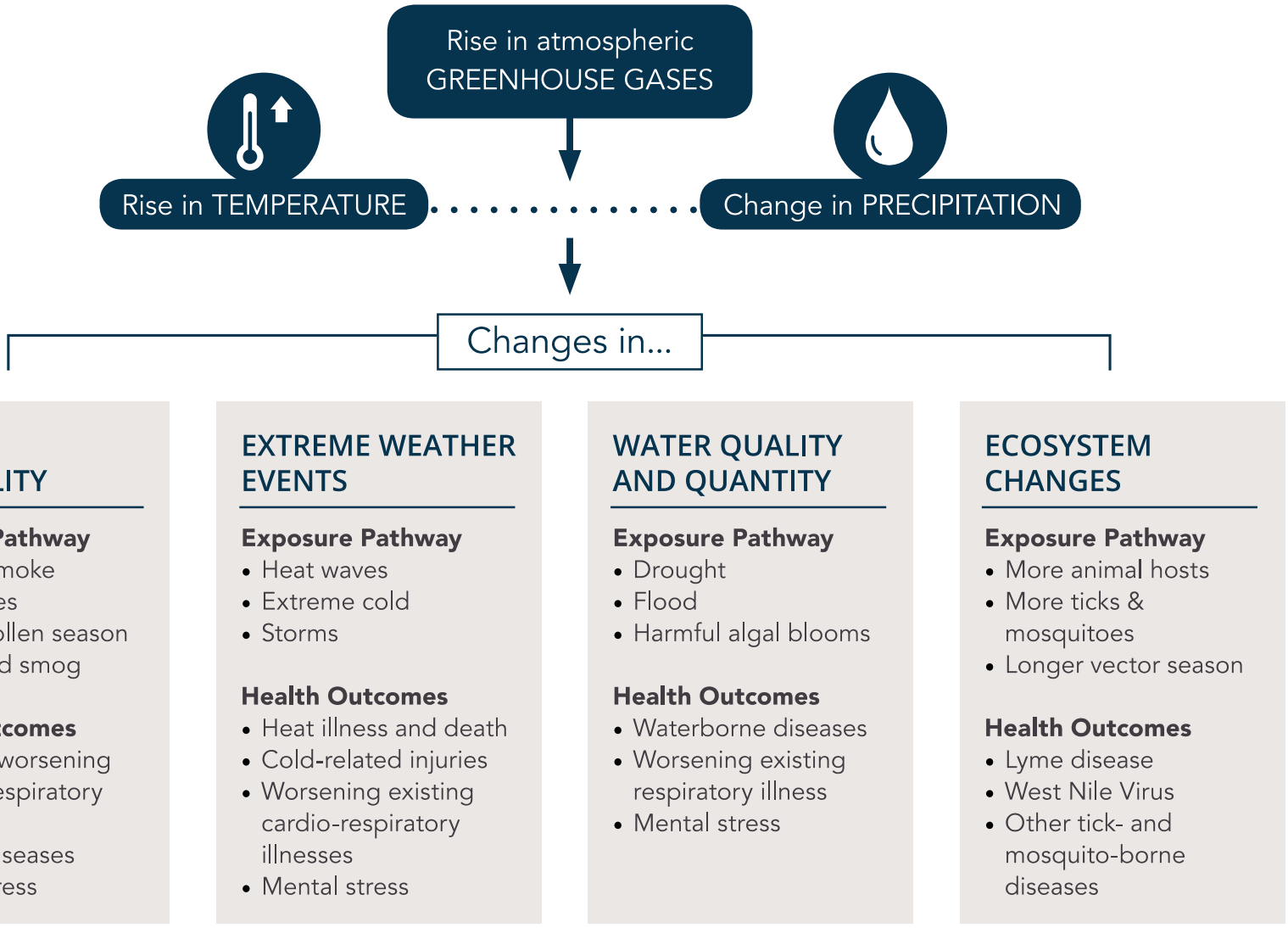
Climate adaptation addresses the impacts of climate change by recognizing that the climate is already changing which is leading to health-related and other impacts. Public officials can coordinate effective responses to these impacts through Climate Adaptation Plans. Conversely, *climate mitigation* is the process of reducing or eliminating the cause of climate change, greenhouse gas emissions. Climate Mitigation (or Action) Plans often lay out renewable energy and energy efficiency strategies to reduce emissions in sectors such as buildings, transportation, and utilities. Though the focus of this guide is on climate adaptation protective of health, both adaptation and mitigation strategies should be developed together to promote greater overall resilience.

MEETING COMMUNITY GOALS THROUGH ADAPTATION PLANNING

Developing a climate and health adaptation plan can help meet other community goals, including Michigan State Drinking Water Act compliance and Federal Emergency Management Agency disaster relief funding requirements. For more information about how local tools fall within the state and federal policy framework, see Appendix A.

producing vegetation. These direct and indirect climate impacts can exacerbate current health problems, as well as create new health threats for all Michiganders. Figure 3 shows how changes in climate lead to health effects.

Figure 3: *Changes in our atmosphere lead to health effects (Figure adapted from Minnesota Department of Health, 2016).*



MICHAP has identified five climate-related health outcomes of most concern: respiratory diseases, heat-related illnesses, waterborne diseases, vector-borne diseases, and injuries, specifically carbon monoxide (CO) poisoning (Cameron et al., 2015).

1. **Respiratory Diseases:** Under a business-as-usual scenario, projected conditions indicate increased air pollution and worsening respiratory disease. Climate projections also forecast earlier and longer growth periods for plants. This translates to increased pollen levels, which could worsen allergies and exacerbate symptoms and respiratory conditions, including asthma.

2. **Heat Illness:** 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. The numbers of high heat days are projected to increase by mid-century. As a result, there will likely be large, direct impacts on human health, especially if occurring simultaneously with other variables, such as the urban heat island effect.

3. **Waterborne Diseases:** Climate conditions leading to flooding are projected to worsen in the future. This increases the risk of waterborne diseases in areas vulnerable to sewage/septic failures and runoff. In certain areas, it will also increase the risk of the development of harmful algal blooms.

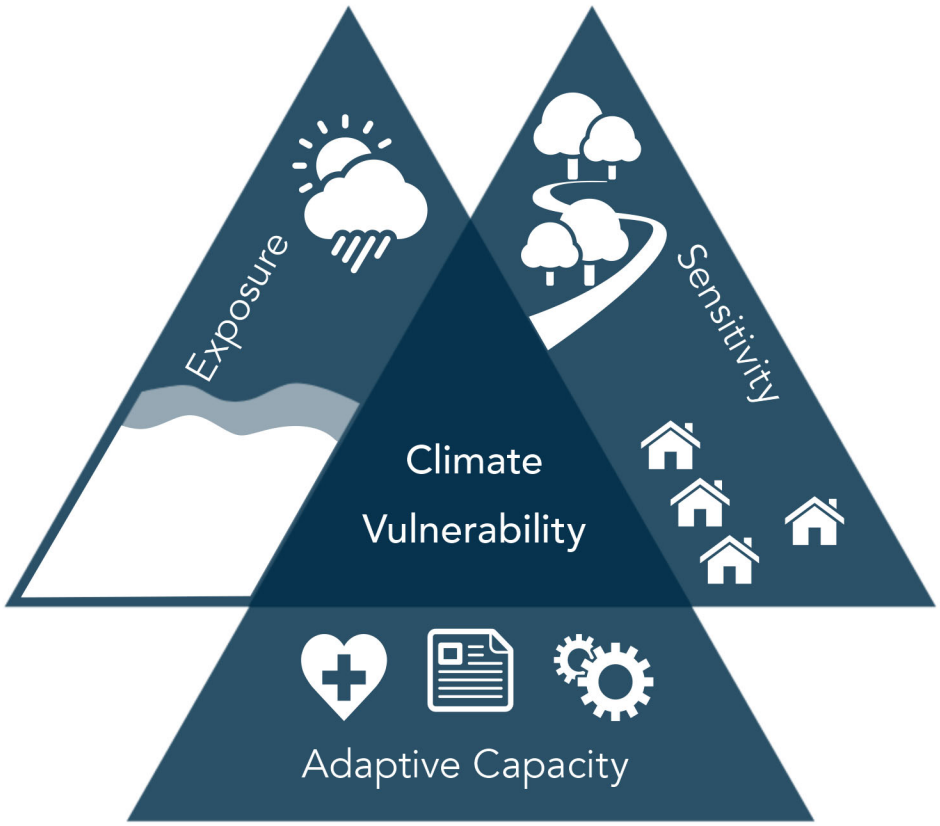
4. **Vector-borne Diseases:** Projections point to warmer winters, earlier springs, and warmer summers, conditions suitable for mosquitos carrying West Nile Virus and other serious diseases. Similarly, current and future conditions are suitable for Lyme disease and its tick vector, although there is greater difficulty in projecting the burden given the complex sequence of climate conditions and the tick's life cycle needs.

5. **Injury and CO Poisoning:** Extreme weather events conducive to power outages are projected to increase, especially in winter. This will lead to increased use of generators and thus an increased risk of CO poisoning. Power washers used during cleanup following an extreme weather event may also increase the risk of CO poisoning. Freezing rain and flooding increases will raise traumatic injury risk.

VULNERABILITY TO CLIMATE CHANGE

Climate vulnerability is a measure of a community's risk of being negatively impacted by climate change, its ability to prepare for those impacts, and its ability to respond when events occur. The Third National Climate Assessment describes **vulnerability** as "a function of the character, magnitude, and rate of climate variations to which a system is exposed, its sensitivity, and its adaptive capacity" (IPCC, 2012). Figure 5 illustrates the three variables included in a vulnerability assessment and how they relate. In the context of climate and health adaptation, **exposure** is the severity, frequency, and types of changes to an area's climate. Exposure includes changes to average temperature and precipitation, shifting seasonal patterns, and extreme events such as high heat, heavy rain, and drought. **Sensitivity** characterizes the population and their health and living conditions. Variables to consider when determining the sensitivity of a community include but are not limited to personal characteristics such as age, gender, pre-existing conditions, or taking certain medications; infrastructure such as transportation, housing, or energy; and overall population attributes such as social or geographic isolation, low income, or discrimination. **Adaptive capacity** is the expertise, plans, programs, or resources a community has in place to prevent or reduce negative impacts (Manangan et al., 2014).

Figure 4: *Components of vulnerability (Figure adapted from Fig. 14 in Trundle & McEvoy, 2015).*



EXPOSURE

- Area impacted by climate hazard(s)
- Severity of climate hazard(s)
- Frequency of climate hazards

ADAPTIVE CAPACITY

- Mobilizable response resources
- Information, skills & communication
- Institutional and social capital

SENSITIVITY

- Household & community characteristics
- Quality of housing & other physical systems
- Functionality of, access to services & utilities

GUIDING PRINCIPLES OF A CLIMATE AND HEALTH ADAPTATION PLAN

There are four guiding principles to keep in mind when developing a climate and health adaptation plan (Adapted from Alameda County, California Office of Sustainability, 2018; Frumkin et al., 2008; Rudolph et al., 2018). These principles can help to ensure the plan successfully engages residents and community leaders in comprehensively addressing the climate and health concerns of the community.

Keep health and equity at the forefront of all action

As climate change and health inequities are "inextricably interconnected," there is opportunity for addressing both with one set of actions (Rudolf et al., 2018). Centering the process on health and equity starts with involving community members from all racial, economic, and technical groups in organizing, planning, and resource allocation. There should be safe, open, and honest discussions around current and historic systems and processes that contribute to injustices and climate vulnerabilities. As the plan is developed and the process moves forward, continue monitoring who is missing from the discussion, who is benefiting from the project and what the benefits are, and how each decision is meeting the community's needs in an equitable manner.

Engage decision makers and representative community members throughout the process

Early and continuing community buy-in is essential for implementing the plan. Buy-in requires building relationships with and gathering perspectives from decision makers as well as representatives from diverse populations and community groups throughout the process. In keeping with the first principle, extra effort should be made to include vulnerable and marginalized populations throughout the process. Consider finding times and locations that are accessible to different groups, compensating community members for their knowledge and expertise, providing childcare during the meetings, and planning for transportation. Be sure to show in the plan how community feedback has been recorded and incorporated. Clearly showing how public input shaped the plan is essential to long-term support and implementation.

Use locally relevant climate data and vulnerability assessments

Before developing a climate and health adaptation plan, it is important to understand how the climate has already changed in the area, how it is projected to change in the future, and where the community's vulnerabilities exist. Conducting a climate vulnerability assessment can provide these valuable insights, but complex data sets and technical capacity can be barriers. Fortunately, datasets and interactive tools exist (see Appendix A) that can provide guidance and reduce those barriers. In addition, talking with community members about their observations, experiences, and climate-related concerns provides valuable 'ground truthing' of local impacts and priorities and enhances the plan's relevance and acceptability.

Leverage visualizations tools to establish shared vision

Sometimes words like "adaptation" and "climate change" bring up resistance within a community. Even for supportive community members, envisioning an "adapted" environment can be difficult and deter some from participating in the planning process. Visualizations are effective in conveying how adaptation looks in the community and help to explain the pathways which connect climate and health. Imaging of the community, of areas before and after adaptation installations, examples of interventions from other communities, and geographic information system (GIS) mapping are examples of visualizations that aid in the education component of the planning process. Leverage all available tools and resources to help illustrate the idea of climate and health adaptation within the community. It may be helpful to work with university partners or local nonprofits with graphics skills. See p. 43 for information about visualizations.

STEPS FOR CREATING A CLIMATE AND HEALTH ADAPTATION PLAN

Each community will complete a climate and health adaptation plan at a different pace. The timeline depends on the level of community engagement, staff capacity, availability of information and resources, and other factors. Regardless of the pace, effective climate and health adaptation planning includes four phases, with each phase consisting of multiple steps. The purpose of this phased approach is to ensure the plan is relevant to the entire community. The four phases and steps described in this guide and shown in Figure 6 are derived from the Marquette Area Climate and Health Adaptation pilot project. Although appropriate for Marquette County and applicable to other communities, these methods may be customized based on a particular community's needs

Phase 1 involves engaging key community stakeholders and identifying the community's climate and health priorities. In Phase 2, the project team will work with community members in developing actionable recommendations and overall strategies for addressing these priorities. Phase 3 will entail prioritizing specific objectives and taking action to achieve them. During Phase 4, the implementation and outcome of these recommendations will be monitored, and the actions and strategies laid out in the plan will be updated as necessary.

Figure 5: *Steps for Creating a Climate and Health Adaptation Plan*

PHASE ONE

Engage Stakeholders and Identify Concerns

1.1 Establish Project Leadership

1.2 Establish Steering Committee

1.3 Identify Climate Trends, Vulnerable Populations, and Stakeholders

1.4 Engage Stakeholders and Identify Concerns

1.5 Identify Stakeholder Priorities

PHASE TWO

Engage the Community and Develop the Plan

2.1 Meeting One: Community Visioning

2.2 Identify Potential Adaptations and Metrics and Develop Visualizations

2.3 Obtain Feedback

2.4 Finalize the Plan Using Recommendations and Visualizations

PHASE THREE

Prioritize and Implement

3.1 Host an Implementation Prioritization Workshop

3.2 Develop a Strategy for Implementing the Climate and Health Adaptation Plan

3.3 Implement the Community's Climate and Health Adaptation Plan

PHASE FOUR

Monitor, Update, and Keep Active

CLIMATE AND HEALTH ADAPTATION PLANNING PHASES

This section provides a detailed description of readiness assessment and the four phases of climate and health adaptation planning. Each step includes a checklist of critical activities completed during that step.

BEFORE YOU BEGIN: ASSESS CAPACITY AND READINESS FOR ADAPTATION PLANNING

Climate and health adaptation planning is a complex process, one that takes time and dedication (Marinucci et al., 2014). A certain level of community readiness is necessary for successful planning and for the implementation of the resulting recommendations. How ready is the community to act? Understanding where the community is on the continuum of readiness can help shape the planning process and the approaches the community chooses in adaptation planning.

Community readiness for climate and health adaptation planning can range from zero awareness of or outright hostility toward climate change-related topics to a high level of community ownership surrounding adaptation and mitigation (Center for Community Health and Development, 2018b). Awareness, time, collective values, and resources—among other characteristics—factor into a community's readiness. Communities that have undertaken some climate action or adaptation planning or that have conducted community health assessments and developed responses may have already laid a foundation for approaching climate and health adaptation planning. For example, a community with a history of climate action or resilience planning may have established a core group of leaders or a taskforce dedicated to moving climate adaptation forward in the community. That capacity is an asset that can be shifted toward climate and health adaptation planning.

Assessing community readiness requires connecting across disciplines, cultures, and perspectives to take stock of attitudes toward climate change, knowledge of its connection to health, and learning about existing climate adaptation or sustainability initiatives (Center for Community Health and Development, 2018b). As such, being able to communicate effectively across diverse stakeholder groups and understand their roles is essential. The CDC Climate and Health Program has developed A Guide for Cross-Sector Collaboration to provide "insights and pointers for collaboration opportunities in 10 sectors" (CDC, 2019b). This guide can serve as a practical starting point for those looking to start the climate and health adaptation planning process.

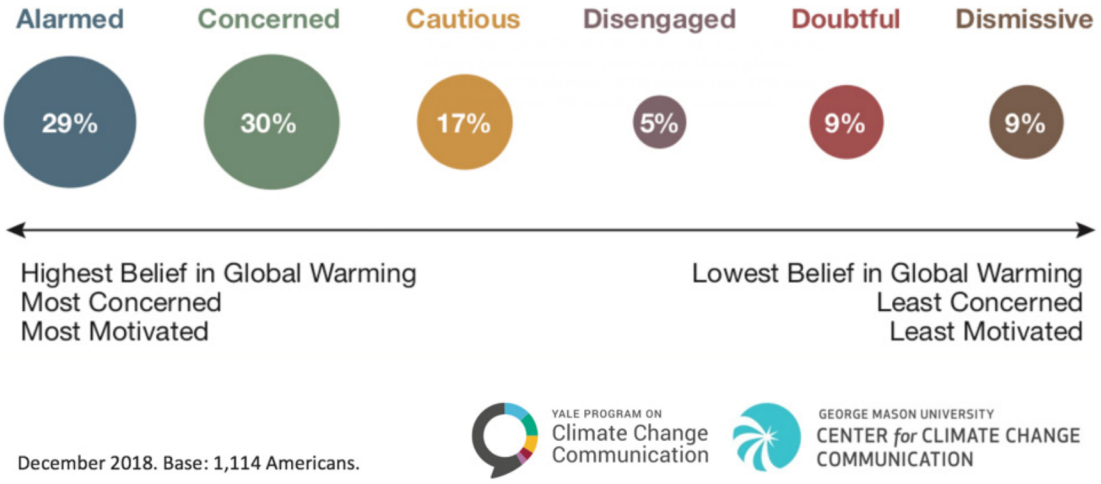
Existing climate adaptive capacity can act as an indicator of community readiness.

Existing adaptive capacity can act as an indicator of community readiness. What actions have previously been taken to prepare for the negative health impacts of climate change? What resources does the community have for undertaking adaptation actions? Are there opportunities to build adaptation into existing plans for

CASE STUDY

In Marquette County, existing adaptive capacity was a strong indicator of community readiness to take on the Marquette Area Climate and Health Adaptation pilot project. Marquette is unique compared to other communities of its size, and even those much larger, in terms of the number and sophistication of climate adaptation activities already underway and the variety of stakeholders participating. Climate plans have been created and are being implemented for the Lake Superior Watershed (Superior Watershed Partnership, 2012), Marquette County (Superior Watershed Partnership, 2013), and the City of Marquette (MSUE & MSU SPDC, 2013). Groups such as the Marquette County Climate Adaptation Task Force (CATF) and the Superior Watershed Partnership & Land Trust (SWP) have been instrumental in laying the foundation of climate change awareness and understanding while also building a broad network. Assessments of the environment and infrastructure had been completed, and local experts identified. This allowed the climate and adaptation plan to focus on building relationships with vulnerable populations, explore connections between the climate, health, and the built environment, and find ways to incorporate climate and health recommendations into existing initiatives.

Figure 6: *2018 "Six Americas" Survey Results. (Yale Program on Climate and Communication, 2016).*



projects such as existing community health assessment and response processes? Who should be involved, and at what levels? Is there an organization that will coordinate or own the implementation of recommendations? Appendix A provides tools such as the CDC's Climate and Health: *Planning Worksheet – Preparing a Coordinated Community Response* and the Minnesota Sea Grant's *A Self-Assessment to Address Climate Change Readiness in your Community* that can be helpful in answering these questions and bringing stakeholders together to assess readiness across sectors such as public health, infrastructure, facilities, natural resource management, tourism, community planning, and others.

A simple framework of understanding community attitudes known as "Global Warming's Six Americas" was presented by the Yale Program on Climate Change Communication. "Six Americas" segments the population into six audiences based on their climate change beliefs, attitudes, and behaviors. The audiences range from "alarmed," those who are convinced of the seriousness of global warming and believe in immediate policy action as a solution, to "dismissive," those who do not believe global warming is a real problem and oppose related policies. The survey has been conducted annually since 2009 and has since seen a dramatic rise in the number of Americans who are either "alarmed" or "concerned" about global warming. Figure 6 shows the breakdown of the audience segments, with 29% of Americans alarmed, 30% concerned, 17% cautious, 5% disengaged, 9% doubtful, and 9% dismissive.

KNOW YOUR AUDIENCE

Every community is comprised of residents with different beliefs, values, and priorities. Understanding the distribution of community attitudes toward climate and health adaptation planning and climate change in general can be important in getting the community on board. For example, a 2019 study found that 61% of registered voters are worried about global warming, and 58% support local government action to address global warming (Leiserowitz et al., 2019).

Figure 7: *Estimated percentage of adults who are worried about global warming in Michigan. (Yale Program on Climate and Communication, 2018).*

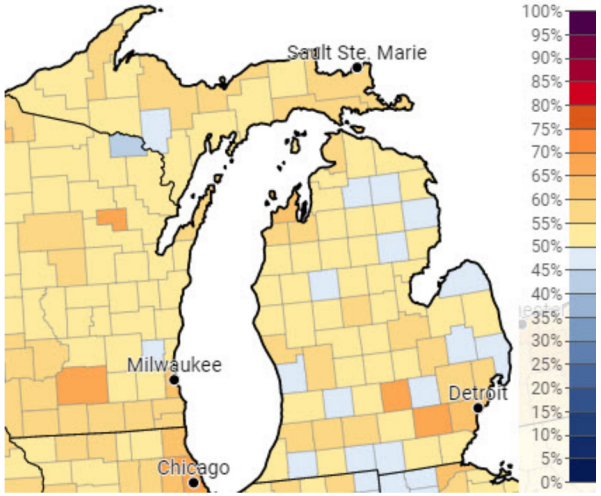


Figure 7 depicts the 2018 survey results for Michigan indicating the percentage of adults concerned about global warming by county and gives a sense of overall attitudes. In Michigan, based on the 2018

data, the percentage of adults concerned about global warming ranges from 45 to 70 by county. While the "Six Americas" is a general overview and starting place, gathering local data on attitudes of residents and community leaders may be informative and useful to individual communities.

Pre-Planning Checklist:

- ☐ Create an initial list of key disciplines and functional areas of the community to engage.
- ☐ Assess community capacity and readiness for climate and health adaptation planning.

Suggested Tools:

- Climate and Health: Planning Worksheet – Preparing a Coordinated Community Response (https://www.cdc.gov/climateandhealth/pubs/CDC_PlanningWorksheet-508.pdf)
- A Self-Assessment to Address Climate Change Readiness in Your Community (https://glslcities.org/library/a-self-assessment-to-address-climate-change-readiness-in-your-community/)

PHASE 1: ENGAGE STAKEHOLDERS AND IDENTIFY CONCERNS

The first phase of climate and health adaptation planning is about building relationships, beginning to educate stakeholders about climate and health issues, and gathering concerns or solutions from their perspective. Ensure participants are representative of the community to increase the likelihood of a relevant plan that will have social, political, and financial support. This phase includes five steps.

PHASE 1 GOALS:

- Establish plan leadership and a steering committee.
- Identify climate trends, key stakeholders, vulnerable populations, and community partners.
- Engage key stakeholders and identify priority climate and health concerns.

PHASE 1 EXPECTED OUTCOME: Plan leadership is established, key stakeholders are engaged, and priority climate and health concerns are identified.

PHASE 1 RESOURCES NEEDED:

- Significant time input from plan leadership
- Commitment by steering committee members
- Local climate data

STEP 1.1: ESTABLISH PROJECT LEADERSHIP

Who will be organizing this initiative? Are they from inside or outside of the community? What skill sets do they bring? What resources do they have access to that could benefit the planning project? Do vulnerable and marginalized groups have an equal leadership role? Establishing a designated lead person or team of people can help ensure that the planning project continues to move forward. Leaders might include a local or county planning department, a local health department, a climate- or health-related local organization, an institution such as a university, or other community-invested firms or agencies. At this time, the project team structure should also be addressed, identifying who will be coordinating project activities and who will be responsible for completing deliverables leading up to and culminating in the climate and health adaptation plan. The project team may include those involved with the project leadership, but there may be additional skills or capacity needed. Once selected, the project leadership can draft a project scope, timeframe, and major project benchmarks to guide plan development.

Step 1.1 Checklist:

- ☐ Identify an individual or team to lead the project.
- ☐ Select the project team.
- ☐ Draft a project scope, timeframe, and major project benchmarks.

STEP 1.2: ESTABLISH STEERING COMMITTEE

A steering committee can help determine the structure of the planning process, ensure a dedicated group exists to provide feedback, and facilitate buy-in from key individuals and organizations. Membership of a steering committee should reflect the community's sectors (Center for Community Health and Development, 2018a), including vulnerable and marginalized groups. Consider including people familiar with climate change, public health, sustainability, community planning, critical needs and social services, and other related topics. Public officials, residents, businesses, academics, non-profits, and other local organizations should be represented on the committee. The broader the representation, the higher the likelihood that the process and input will be a true reflection of community needs. This group is also likely to be influential in ensuring local ownership of the results and recommendations of the planning project. Refer to the CDC Climate and Health Program's A Guide for Cross-Sector Collaboration for additional "insights and pointers for collaboration opportunities in 10 sectors" related to climate and health adaptation (CDC, 2019b).

In some cases, the steering committee may consist of an existing task force dedicated to climate adaptation for the region. In other cases, the plan development process might spur the creation of one.

WHO IS YOUR PLAN CHAMPION?

Climate and health adaptation planning is a people-driven process. Plan champions are community members or public officials passionate about and dedicated to moving a plan forward in a community. They are vital to a successful planning process and implementation of a plan. A plan champion's role includes making sure plan leadership meets regularly and holding team members accountable for getting their tasks done. Capitalizing on their energy early on can help the plan gain momentum from the outset.

CASE STUDY

In the Marquette County pilot project, plan leaders at MICHAP and MSU helped organize and structure the planning process. Local plan champions, including a Marquette County Health Department Officer, the Climate Adaptation Task Force Chair, and the local MSU Extension Educator, kept local momentum alive throughout the planning process.

The project leadership should work with a newly formed steering committee to review and modify, if necessary, the project scope, timeline, and goals based on their unique insights. At this stage, the group should also

jointly develop a communication plan and an evaluation plan. The communication plan will be beneficial in guiding outreach and engagement to additional stakeholders in step 1.3 and beyond. The evaluation plan will help define the types of data needed, the process for data collection throughout the plan development and implementation process, how the data will be used, the metrics that are needed, and how the results will inform the process and stakeholders involved. Appendix A provides links to resources on both communication and evaluation planning if additional guidance is needed in those areas.

Step 1.2 Checklist:

- ☐ Establish a steering committee representative of the community.
- ☐ Review the scope, timeline, and goals.
- ☐ Develop a communication plan.
- ☐ Develop an evaluation plan.

Suggested Tools:

- University of Kansas Center for Community Health and Development Community Tool Box: Developing a Plan for Communication (https://ctb.ku.edu/en/table-of-contents/participation/promoting-interest/communication-plan/main)
- CDC Program Performance and Evaluation Office (https://www.cdc.gov/eval/index.htm)

CASE STUDY

In Marquette County, the previously established CATF functioned as the plan's steering committee. CATF is comprised of members from a variety of backgrounds throughout the county, providing diverse expertise and representing a wide variety of organizations and jurisdictions.

STEP 1.3: IDENTIFY CLIMATE TRENDS, VULNERABLE POPULATIONS, AND STAKEHOLDERS

Prior to beginning this planning process, the community may have undergone a vulnerability assessment to identify the climate trends and projections for the area and the populations most vulnerable to these changes. If a vulnerability assessment has not been conducted, consider stepping back to do so in order to better inform the community of the current and future risks from climate change. Sources of this information include regional climate experts, such as GLISA, the CDC Climate and Health Program, a state health department program, such as MICHAP and other BRACE-funded health department programs, local health departments, or other organizations involved in climate- and health-related activities. A more comprehensive list of tools and resources can be found in Appendix A.

A vulnerability assessment uses the attributes of a community that can include but are not limited to social, economic, environmental, and physical characteristics to identify certain people and locations that are more at risk of being harmed by climate change. This type of assessment can be used in conjunction with local knowledge to identify the community's vulnerable populations. There are many potentially vulnerable populations.

VULNERABLE POPULATIONS MAY INCLUDE:

- Children (<5 years)
- Elderly (>65 years)
- Socially isolated and living alone
- Those experiencing homelessness
- Ethnic and racial minorities
- Residents without a postsecondary education
- Low-income households
- Non-English speakers
- Outdoor workers
- Commuters
- The chronically ill
- People with limited access to climate control or utility assistance

Figure 8a: *Ishpeming Senior Center in Marquette County. Residents over the age of 65 are considered at greater risk to the negative health impacts of climate change.*

Figure 8b: *Planning team conducts a field visit with stakeholders during the first phase of the Marquette Area Climate and Health Adaptation Project. The team observes where the Silver Lake Dam failed in 2003.*

Representatives of the vulnerable parts of the community should be included in the project's decision making early and regularly to ensure equity in decision making and resource allocation. Invite representatives from or advocates for these vulnerable populations to take part in the planning process. These representatives may come from the local homeless shelter, Veterans Affairs, aging services, or other community service organizations. Looking around the table of those involved and asking, "Who's not here?" is a crucial step to ensuring all are included. In addition, consider ways of reducing barriers for participation in the process. This can include but is not limited to compensating stakeholders for providing their knowledge and expertise to the process, holding meetings at times and locations that are accessible and promote participation, facilitating transportation to and from meetings, and providing childcare during meeting times.

Also important in this step is identifying cross-sector stakeholders (who may or may not be members of the steering committee) to inform and provide feedback throughout the phases of the climate and health adaptation plan development and implementation. Since buy-in is crucial for both the development and implementation of the plan, these stakeholders must be representative of the larger community, including the vulnerable populations and areas identified previously. Consider the scope of the plan and how best to represent community needs and geographic distribution. Invite representatives of local groups engaged in climate action, health departments, physicians, local institutions including universities, emergency management, fire departments, schools, local governments, public works, and other representatives crucial to understanding impacts and developing solutions as identified in the previous readiness and vulnerability assessment steps. The number of stakeholders to include will depend on the community, but typically, no more than 15-25 are necessary (UCLA Center for Health Policy Research, n.d.).

If not already completed in Step 1.2, also identify partner organizations or individuals that may be trusted voices in communicating next steps and results to the broader community throughout the process. This may include local or regional media outlets, faith-based organizations, or community-based organizations that have relationships with disenfranchised or hard-to-reach populations. Established local environmental or public health advocacy groups can be vital in bringing local credibility to the project and provide valuable insight into existing local actions. Area universities and schools can also help garner student and parent attention and participation.

Step 1.3 Checklist:

- ☐ Identify major climate trends and potential related health concerns for the community.
- ☐ Determine vulnerable populations and areas.
- ☐ Develop a list of community stakeholders to invite into the planning and implementation processes.
- ☐ Create a spreadsheet for tracking stakeholders and their level of involvement.

Suggested Tools:

- Climate and Health: A Guide for Cross-Sector Collaboration (https://www.cdc.gov/climateandhealth/docs/CrossSectorClimateandHealth.pdf)
- United States EPA Environmental Justice Screening and Mapping Tool (https://www.epa.gov/ejscreen)
- U.S. Climate Resilience Toolkit: Assess Vulnerability & Risks (https://toolkit.climate.gov/steps-to-resilience/assess-vulnerability-risks)

STEP 1.4: ENGAGE STAKEHOLDERS AND IDENTIFY CONCERNS

Utilize the methods included in the communication plan developed in Step 1.2 to reach out to the stakeholders identified in Step 1.3. In this step, the project leadership and their team will be setting up a meeting, interview, facilitated discussion, or site visit to discuss the climate and health concerns faced by the population or sector each stakeholder represents. These meetings need to involve a level of flexibility to ensure the participants are comfortable in providing quality input based on their experiences. Accurately capturing input from these representatives is essential and ensures the plan reflects community needs. If possible, preserve the responses as stated and avoid rewording. It may be advisable to have a team member act as a scribe while another conducts the interviews or leads the discussions. The UCLA Center for Health Policy Research provides a useful guide to conducting successful interviews (UCLA Center for Health Policy Research, n.d.).

What should be discussed at the meeting?

Though it is an opportunity to provide some background information on climate and health adaptation planning, the primary focus of these meetings is to listen. Use the time to learn about issues the community is facing, including those that may be indirectly related to climate and health. Understand that what is heard in these meetings may shape the direction the plan takes and help determine whom to interview next. Ask a few simple questions to steer the conversation toward their climate and health concerns. In Marquette County, for example, the interviewers used broad questions that allowed the stakeholders to lead the conversation.

Some generalized open-ended questions that can be used by the interviewer include:

- What does your organization do, and whom do they represent?
- What are the climate and health issues for the organization and for the population it represents and why?
- What are the solutions to these issues?
- Are any of these being implemented already?
- What other organizations or individuals in the community would you recommend speaking to about these issues?

CASE STUDY

In Marquette County, the project team used stakeholder meetings not only to gather information about how organizations were experiencing the impacts of climate change but also to ask what other organizations should be included in the conversation. With these suggestions, additional stakeholder interviews were held, ensuring that representative voices of the community provided input to the plan.

Step 1.4 Checklist:

- ☐ Develop interview questions and technique.
- ☐ Select designated interviewers.
- ☐ Conduct key informant interviews.
- ☐ Record key informant input.
- ☐ Track stakeholder participation.

Suggested Tool:

- UCLA Center for Health Policy Research, Section 4: Key Informant Interviews (https://healthpolicy.ucla.edu/programs/health-data/trainings/Documents/tw_cba23.pdf)

STEP 1.5: IDENTIFY STAKEHOLDER PRIORITIES

From the conversations with local stakeholders, some issues will have been recorded. The project leadership team, along with the steering committee, should carefully consider how that information is organized. The major themes identified in this step should reflect the responses of the participants and will shape the narrative of the plan going forward. A tabulated matrix with stakeholder groupings and climate health issue themes may help organize and identify the major climate health issues discussed at the meetings. Suggested groupings of stakeholders by sectors, roles, and perspectives could be climate change, public health, emergency preparedness, underserved populations, and local government. Climate health issues will vary based on what the stakeholders voice. Using a matrix, such as the example shown in Figure 9, can help identify which group discussed what concerns.

Once the information is organized and the stakeholder climate and health concerns have been identified, bring this information back to the steering committee for review. As the local experts and representatives of the community, they can provide feedback as to whether what was captured accurately represents the full spectrum of climate and health concerns faced by the community and can suggest priorities.

It is important to note that while priorities will emerge in this step of the process, they are likely to evolve through the development, implementation, and follow-up phases as more insights are gained. Tracking these changes as part of the evaluation process can reveal the effectiveness of the engagement process and show changes in community knowledge and attitudes.

Concerns not identified as priorities should still be noted and recorded as issues the community is aware of and wants to address. This record can serve as a guide for future climate and health planning actions to be addressed as community capacity grows.

CASE STUDY

In Marquette County, an important community partner and steering committee member was the Superior Watershed Partnership. As this group was already established as a trusted authority on climate action in the area, their partnership provided the project with an initial level of credibility within the community. As a well-connected group with a network of go-to partner organizations, their support on the project helped ensure overall success and continued activity beyond the initial grant period of the pilot project.

In Marquette, the local MSUE educator played multiple roles in the Climate and Health Adaptation project. Part of the Leadership Team, the educator was also a Plan Champion. Well-connected and knowledgeable on the work going on in the community, the MSUE educator helped connect the project team with the community and ensured a strong turnout from major decision makers from across the county throughout each phase of the planning process.