Hazard Vulnerability Assessment

Spring 2023

Western Massachusetts Health and Medical Hazard Vulnerability Assessment

May 2023

www.region1hmcc.org

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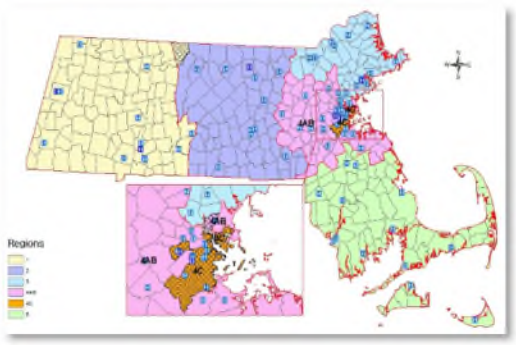
Contents

Introduction

Background

The Western Massachusetts Health and Medical Coordinating Coalition (W MA HMCC) strives to further emergency preparedness and response capacity across the healthcare and public health systems throughout the four westernmost counties of Massachusetts: Berkshire, Hampden, Hampshire, and Franklin. The W MA HMCC collaborates with healthcare partners on various strategies and initiatives to advance regional healthcare system preparedness and response capacity. The activities of the W MA HMCC are funded under the United States Department of Health and Human Services through the Office of the Assistant Secretary for Preparedness & Response (ASPR) Healthcare Preparedness Program grant and administered through the Franklin Regional Council of Governments, which serves as the fiduciary for the W MA HMCC. One such activity requested of all ASPR-funded healthcare coalitions nationally is to regularly engage in collaborative, regionally based, and jurisdictional risk assessments. Such assessments are designed to augment the regular facility-based assessments that many of our partners are required to undertake annually.



This multi-disciplinary Hazard Vulnerability Assessment Report describes our systematic approach to identifying hazards and risks that are most likely to impact the demand for western Massachusetts' public health services or the healthcare system's ability to provide health and medical services. It culminates in updated findings and recommendations to guide future preparedness planning and further response capacity for the HMCC overall and within our partner disciplines in the region.

Purpose

Many healthcare organizations must annually assess facility and community hazards from an emergency management perspective and follow significant real-world events and exercises. These assessments form the basis of healthcare emergency management programs and assist in prioritizing program activities and resources. The Office of the Assistant Secretary for Preparedness & Response (ASPR) defines a hazard vulnerability assessment (HVA) as a systematic approach to identifying hazards or risks that are most likely to have an impact on the demand for healthcare services or the healthcare delivery system's ability to provide these services.

Through support from the MA Department of Public Health (DPH) Office of Preparedness and Emergency Management (OPEM), the Region 1 HMCC has completed several regional HVAs over the years through collaboration with regional public health, hospitals and other community

agencies. Partner organizations provided vital information related to hazards, vulnerabilities, and guidance on risk interventions that helped to create a regional, multi-discipline HVA. With a more focused approach to reducing the impact of common high-stakes vulnerabilities across multiple hazards, they could use findings to inform their respective organization's HVA.

Each succeeding HVA consists of reviewing the previous year's data (updating where appropriate) and integrating relevant new information as it becomes available through exercises and real-world events. The W MA HMCC HVA will also incorporate lessons learned and corrective actions identified. While the HVA process guides further development in the upcoming year, it is also dynamic. The HMCC will revisit the HVA annually and when new and significant hazards or vulnerabilities are identified.

Goals

The goal of this year's HVA is to produce an updated assessment, including Berkshire, Hampden, Hampshire, and Franklin counties, to review current hazards and identify new risks, vulnerabilities, and gaps in preparedness efforts to inform the planning, training, and equipping needs in the region. Region 1 reviewed existing healthcare facilities and regional HVAs to generate a refreshed and current collective picture for public health and healthcare systems. We sought participation from regional healthcare, public health, and emergency management experts to validate identified hazards and assess regional healthcare impacts. Region 1 HMCC will share these findings with local, regional, and state partners.

Limitations

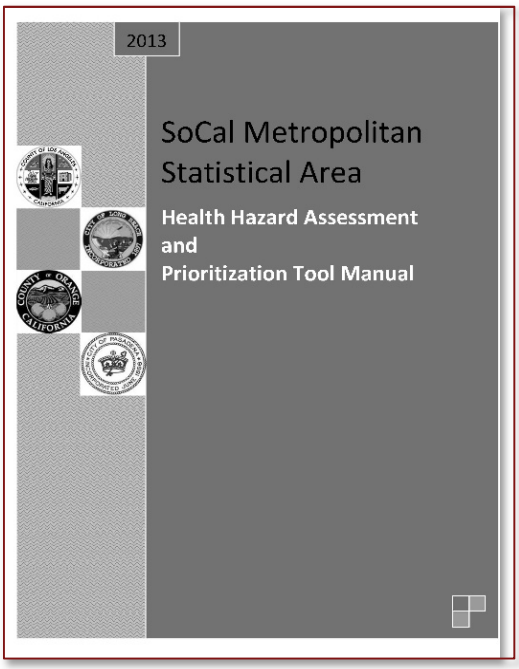
- Although this HVA process incorporates state and local emergency management organization assessments, the focus of this assessment is the potential impacts on healthcare and public health systems.
- While there is likely some overlap between the multi-jurisdictional HVA for the W MA HMCC and the HVA for a given healthcare organization or facility, these are separate and distinct processes.
- The individuals participating in the regional HVA have varied emergency management training and experience.
- The regional HVA is not a replacement for an organization or facility's HVA.
- A specific vulnerability may not exist across all Coalition member organizations; however,
  Coalition members will generally face many of the same hazards.
- Individual facility HVA data is subject to the accuracy and content of information available within each agency.
- The analysis is based upon participant feedback and is not a comprehensive assessment of all partners.

- Data provided by participants are influenced by their own organizational experience and planning efforts.
- The assessment of hazards across the region is based on quantitative data and qualitative estimations.
- Threats and vulnerabilities in this assessment may appear to be more homogenous throughout the region than at the local level; to the extent that it is reasonable, the report does indicate some county-level differences.

Methods Overview

The W MA HMCC Steering Committee[1], a team of emergency management, healthcare, public health, and planning subject matter experts, approved the regional HVA strategy to combine and evaluate a variety of prior and current facility-based data and build off a comprehensive HVA performed in 2019, which was refreshed with new data in 2022. HMCC staff involved interested coalition members, inviting feedback via virtual meetings, email, and sharing of partnering agency HVAs and reported findings to generate an aggregate picture collaboratively.

The W MA utilized the Health Hazard Assessment and Prioritization (HHAP) tool for this HVA. This tool was developed by the Los Angeles Department of Public Health in collaboration with the Orange County Health Care Agency, the Long Beach Department of Health and Human Services, and the Pasadena Department of Public Health. This tool provides a six-step hazard vulnerability assessment process, and offers a health-focused mechanism to engage the community, identify organizational priorities, and improve the community or organization's ability to prepare, respond to, and recover from potential emergency threats. This tool since has been included as part of the US Department of Health and Human Service (HHS) Office of the Assistant Secretary for Preparedness and Response (ASPR) TRACIE (Technical Resources, Assistance Center, and Information Exchange) as a best practice resource for Hazard Vulnerability/Risk Assessment.



[1] For a greater sense of how the W MA HMCC structures its governance and communicates with its various disciplines, please refer to "Health and Medical Coalitions: An Introduction to the Western Massachusetts HMCC," available online at: https://region1hmcc.org/wp-content/uploads/HMCC-Introduction-reworked-Summer-2018.pdf.

HMCC Roadmap to Completing HVA

The updated, comprehensive HVA reviews current hazards and identifies new hazards, vulnerabilities, and preparedness and response effort gaps. Identifying these gaps provides a renewed and prioritized focus for future hazard-specific planning, response, and mitigation projects. The 2022 HMCC HVA endeavored to include all HMCC coalition member disciplines in submitting representative data to analyze regional risks faced in western Massachusetts collaboratively. The inclusion of qualitative and quantitative data, stakeholder feedback, and various shared report findings serve as resources in producing this HVA.

The tools utilized for data collection were the Health Hazard Assessment and Prioritization (HHAP) tool for raw demographic data and the Massachusetts Department of Public Health Emergency Populations Planning Tool for social vulnerability data. Feedback from partners and the steering committee was obtained during virtual meetings and via email.

Milestone	Timeline
Release of Guidance and Template	March 31st/
Release of Updated Scenarios	April 13th, 2023
Strategic plan set	April 1st , 2023
Data compiled, reviewed, and aggregated	May 12th, 2023
Identification of Hazards and vulnerabilities completed	May 15th 2023
Findings and recommendations completed	May 17th 2023
Draft reviewed by HMCC Steering Committee	May 19th 2023
Finalized HVA completed, approved, and submitted to OPEM	May 26th, 2022

See Appendix E for a detailed list of participants and a timeline for completion.

Data Collection

HMCC leadership and staff utilized the US Census Bureau for demographics and the MDPH Emergency Populations Planning Tool for social vulnerability data, as required by MDPH OPEM. In addition to these tools, Region 1 agreed that the extensive surveying conducted for previous iterations of this HVA laid sufficient groundwork for the 2023 HVA data collection strategy. In hopes of avoiding recreating the wheel and generating survey fatigue, leadership elected to:

- Review and update the hazard and risk data previously captured in the 2019 HMCC HVA.
- Incorporate aggregate facility-based data from participating members/disciplines
- Generate a refreshed and current aggregate picture for public health and healthcare systems.

Datasets beyond individual health system or health facility HVAs included capability analysis by regional Public Health Emergency Preparedness Coalitions, census, and demographic data, historical incidents and disaster declarations, after-Actions Reports (AARs), and Improvement Plans (IPs) from real-world incidents and events as well as exercises.

Data Prioritization Process

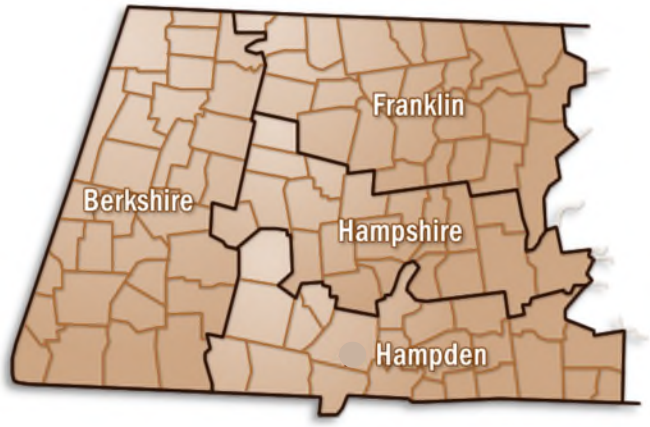
Qualitative and quantitative data were used to determine risks and vulnerabilities, including implementation of the hHap tool, demographic data, and previous feedback. The steering committee reviewed and analyzed data using practical experience and knowledge based on previous events and in the context of current socio-cultural, economic, and environmental influences. The committee then excluded items that did not reasonably meet this practical review to establish priorities.

Distribution

This W MA HMCC Hazard Vulnerability Assessment will be available via the HMCC website: www.region1hmcc.org. Members are encouraged to use this data to develop strategies and projects to improve the region's healthcare and public health response capabilities.

Hazard Data Review

Geography



Western Massachusetts shares borders with four other states: New Hampshire, Vermont, New York, and Connecticut, and has two distinct sub-regions: the **Pioneer Valley** and the **Berkshires**. The **Pioneer Valley** consists of 69 cities and towns composing western Massachusetts Hampden, Hampshire, and Franklin County areas. The Pioneer Valley is bisected by the Connecticut River, which runs north/south through the entire state. The flat plains of the Connecticut River Valley contain most of the existing large-scale development. This area also encompasses much of the farmland in the region. The cities of Springfield, Chicopee, and Holyoke anchor the region's urban core and are major employment centers. At the same time, Northampton and Amherst are the heart of the Five College area and a second concentration of employment and population.

The **Berkshires** region consists of 32 towns located in westernmost Massachusetts. Elevations range from 3,491 feet at Mount Greylock, the highest point in the state, to 594 feet in Williamstown. Two major rivers drain the region; the Hoosic in the north and the Housatonic in the south. Their adjacent valley lands contain most of the region's development and population. Hills and mountains on the east and west characterize the topography of the Berkshires, with flatter lands in the valleys of the Hoosic and Housatonic Rivers. The Taconic Mountains lie along the region's western edge, and the Berkshire Hills lie along the eastern edge.

Climate

Western Massachusetts' climate pattern is typified by significant seasonal temperature differences, with warm to hot (and often humid) summers and cold (sometimes severely cold) winters. Precipitation is usually well distributed throughout the year and averages from 3 inches to 4 inches per month. Typical summer weather averages a high of 80°F. Winter brings temperatures that hover right around the freezing mark of 32°F, give or take five degrees.

Although there is some general regularity with temperature levels, the Massachusetts climate does have its extreme temperature variances. These can range from hot summer days above 90°F and below 0°F temps in the winter. The Berkshire County climate is generally cooler than in the neighboring Pioneer Valley and tends to receive more snowfall.

Key takeaways from a 2022 analysis by the National Oceanic and Atmospheric Administration for the state of Massachusetts include the following considerations:

- Average annual temperatures are projected to exceed historical record levels by 2050. The annual number of days above 90°F is projected to increase by up to 40 days for parts of Massachusetts by midcentury under a higher emissions pathway.
- Massachusetts experienced extreme drought from 2016 to 2017 and again in 2020, straining water supplies.
- Precipitation has increased during the last century, with a record-setting number of extreme events occurring over the last decade.
- The number of extreme precipitation events is projected to more than double by the end of this century. Projections of above-average precipitation totals and more frequent extreme precipitation events may also result in increased coastal and inland flooding.

Source: Runkle, J., K.E. Kunkel, R. Frankson, D.R. Easterling, A.T. DeGaetano, B.C. Stewart, W. Sweet, and J. Spaccio, 2022: Massachusetts State Climate Summary 2022. NOAA Technical Report NESDIS 150-MA. NOAA/NESDIS, Silver Spring, MD, 5 pp.

Demographics

The last official census in the United States was carried out in 2020, with 807,525 people living in Western Massachusetts HMCC Region. Berkshire, Franklin, Hampshire, and Hampden counties make up this region, with a population concentrated in cities and suburbs along the Connecticut River and in Springfield's urban axis.

A secondary population concentration exists in the Housatonic-Hoosic valley due to the industrial heritage of Pittsfield and North Adams and the development of tourism throughout that valley. The rest of Western Massachusetts is lightly populated, particularly the "Hilltowns," where densities below 50 persons per square mile (20 per km^2) are the rule.

In descending order of size, the largest communities are Springfield, Chicopee, Pittsfield, Westfield, Holyoke, Northampton, Agawam, West Springfield, Amherst Center, Easthampton, Longmeadow, East Longmeadow, North Adams, and Greenfield. The region is mainly White (82.6%), with 6% of the population identifying as Black, 3% Asian, and 8% other. 41% of the population is employed in management, business, arts, and sciences, while 20% work in the service sector and 20% in sales and office jobs. The remaining 19% are employed in production,

See Appendix C for detailed demographics

transportation, logistics, natural resources, construction, and maintenance. The region's mean household income is $95,650, with slightly over 5% of households living in poverty.

Social Vulnerability

During disasters, populations with higher levels of social vulnerability are more likely to be adversely affected. Vulnerability to hazards is influenced by many characteristics, including age or income, the strength of social networks, and neighborhood characteristics. Social vulnerability is used to identify those communities that are more susceptible to the damaging effects of a hazard. Variables such as poverty, health, education, and disability status impact an individual's ability to adapt, resist hazard consequences and recover from emergencies.

Information on the location and relative concentration of different types of social vulnerabilities can help preparedness planners locate and plan for the specific needs of their communities. Effective emergency preparations require integrating individual and population-level approaches to overcome barriers to locating and reaching at-risk people before and during an emergency. The information provided here can help preparedness planners, and emergency managers think critically about identifying and engaging at-risk groups and how best to serve them in a disaster.

This HVA uses these characteristics to identify areas of Region 1 with higher social vulnerability indices via the Emergency Preparedness Portal developed by the Massachusetts Department of Public Health, a collaboration between MA DPH's Bureau of Environmental Health (BEH) and the Office of Preparedness and Emergency Management (OPEM). Based on the Bureau of Environmental Health Community Profiles, the portal provides a range of data on each Massachusetts community at the individual community, county, and HMCC region levels.

See Appendix B for detailed vulnerable population data links.

Previous Disasters

The FEMA website distinguishes between **Emergency Declarations** and **Major Disaster Declarations** as follows (https://www.fema.gov/disaster-declaration-process):

Emergency Declarations: "The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed. Emergency declarations supplement State and local or Indian tribal government efforts in providing emergency services, such as protecting lives, property, public health, and safety, or lessening or averting the threat of a catastrophe in any part of the United States. The total monetary assistance provided in a single emergency may not exceed $5 million. The President shall report to Congress if this amount is exceeded."

LT. Governor Polito tours the wreckage from the Conway MA Tornado in 2017 with Senator Hinds and then-MEMA Director Schwartz. Photo Credit: Andy Castillo, Greenfield Recorder.

Major Disaster Declarations:
"The President can declare a major disaster for any natural event. This includes any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, or, regardless of cause, fire, flood, or explosion, that the President determines caused damage of such severity that it is beyond the combined capabilities of state and local governments to respond. A major disaster declaration provides a wide range of federal assistance programs for individuals and public infrastructure, including funds for both emergency and permanent work."

The following table outlines Massachusetts disaster declarations over the past 65 years. Data was accessed from the FEMA website:
https://www.fema.gov/locations/massachusetts#block-views-block-disasters-block-2-2

Disaster Type	Declaration Type	Year(s)
Tornado	Major Disaster	2011
Hurricane	Emergency	2005; 2010; 2011; 2012
	Major Disaster	1985; 1991; 2012
Severe Storms, Flooding	Emergency	1996; 2005; 2011
	Major Disaster	1972; 1987; 1991; 1992; 1996; 1998; 2001; 2004; 2005; 2006; 2007; 2009; 2010; 2011; 2013; 2015; 2018; 2021
Toxic Algae in Coastal Waters	Major Disaster	1972
Fire	Emergency	1999
	Major Disaster	1973; 1981
Blizzards/Snowstorms	Emergency	1978; 1993; 2001; 2003; 2004; 2005; 2008; 2022
	Major Disaster	1996; 2011; 2012; 2018
Coastal Storm, Flood, Ice, Snow	Major Disaster	1981
Water Main Break	Emergency	2010
Marathon Bombing	Emergency	2013
Pandemic	Emergency	2020
	Major Disaster	2020

Previous HVA Findings

Region 1 has HVA data to consider from the recent past; the MA Department of Public Health's Office of Preparedness and Emergency Management facilitated the conduct of regional assessments in 2014, 2017, and again in 2019. We will further review the progress made and recommend steps regarding prior and current assessments in this report's "Findings and Future Work" section.

2014

A 2014 Regional Hazard Vulnerability Assessment conducted by participants with experience and expertise in healthcare, behavioral health, public health, emergency management, and social sectors identified the following as hazards of concern:

- Winter Storms
- Hurricanes
- Floods
- Radiological Emergency
- Influenza Pandemic
- Earthquake
- Heat Wave

The participants in the **2014 process** identified the following areas of focus:

2014 Preparedness Area	2014 Strategies
Medical Surge	Engage hospitals, health centers, public health, and other partners to strengthen medical surge capacity. **Target Areas**: situational awareness, crisis standards of care, patient tracking, and demobilization.
Non-Pharmaceutical Interventions (NPI)	Engage partners in planning for NPI. **Target Area**: coordination of NPI interventions.
Mass Care	Work with partners to identify and fill gaps and exercise plans. **Target Areas**: staffing in general and for specific roles such as security, screening, and triaging; training on public health roles; exercising existing plan.
PH Surveillance & Epidemiological Investigation	Work with partners to improve processes for case investigations.
Volunteer Management	Increase efforts to recruit and retain volunteers; improve capacity to coordinate volunteer placement.

	Target Areas: exercising existing plans and placement of non-MRC volunteers; planning volunteer demobilization.
Community Preparedness & Recovery	Fill in gaps in planning and response partnerships. Improve continuity of operations planning for healthcare coalition partners. Improve community engagement in preparedness efforts.
Emergency Public Information and Warning	Strengthen plans and systems to coordinate messaging across the region.
Emergency Operations Coordination	Develop Region 1 Multi-Agency Coordination Center (MACC). Provide more ICS training opportunities for public health.

2017

In **2017**, the MA DPH OPEM contracted with a third-party vendor to conduct an updated Hazard Vulnerability Analysis in each MA Preparedness Region to support the Health and Medical Coordinating Coalitions. Process participants were asked to look more deeply at the potential impacts of the scenarios identified in the 2014 HVA (with the addition of a tornado hazard) and their likely impacts on the healthcare and public health systems. The participants in the **2017 process** identified the following areas to work on to improve preparedness and reduce risk:

2017 Preparedness Area	2017 Strategies
Staffing & Volunteers	Developing and implementing regional strategies to recruit, train, and retain volunteers Developing a regional plan to accept and manage spontaneous volunteers
Demand for Healthcare & Public Health Services	Expand capacity to provide mass prophylaxis to the regional population. Activities could include: • Increasing the number of closed dispensing sites • Exercising EDSs (open and closed) • Training additional volunteer EDS staff

Functional Needs Support Services	Develop a regional plan to meet the needs of people with functional needs. Activities could include: • Ensuring regional capability to provide information to the public in formats that are accessible to all • Identifying and ensuring access to specialized resources
Regional Coordination	Strengthen and broaden engagement of regional partners in the HMCC. Activities could include: • Focusing on those previously engaged, health care providers, local government, and smaller organizations • Increasing awareness of HMCC capabilities & partner organization roles Provide education and training to partners. Activities could include: • Holding a Training and Exercise Planning Workshop (TEPW) to capitalize on existing regional training and exercise opportunities • Providing training and education on isolation and quarantine (I&Q) laws

2019

Hazards included in the 2019 HVA addressed both ongoing concerns and emerging hazards. The HMCC Steering Committee worked with health and medical disciplinary leaders to augment prior regional assessment hazard and impact data with current facility and discipline-level hazard vulnerability assessments. Region 1 HMCC approached the 2019 HVA with greater attention to impacts-based planning methodology. We identified hazards that appeared with the most frequency amongst the various HMCC member disciplines and identified the likely impacts of those hazards, the majority of which are cross-cutting amongst disciplines.

2022

The HVA in 2022, which was completed under an accelerated timeline, built upon 2019's comprehensive assessment. Many of the areas of concern, such as extreme weather and infrastructure vulnerabilities, identified in the assessment continue to be concerns across multiple healthcare disciplines.

2023 Regional Hazards and Impacts of Concern

Western MA Jurisdictional Risk Assessment Hazards 2023	
Biological	• Pandemic Flu • Emergent Infectious Disease
Natural	• Severe Winter Storms/Icing • Severe Summer Storms • Temperature Extremes
Technological	• Utility Failure *(gas, electric, sewer, HVAC)* • Cyber Attack • Information Systems Failure/Cyber Attack
ChemRad	• Factory/Transportation Chemical Spill

Potential Western MA Impacts Based on Hazards	
Healthcare System	**Public Health System**
Increase in Emergency Department Demand	Increased/Active Surveillance – for disease morbidity, mortality, complications, hospitalization rates, and outcomes.
Increase in Hospital Bed Demand	Need for Health Communications
Increased Demand for Outpatient Healthcare Services	Need for coordinated planning, policy determinations, and public messaging with government officials and representatives of key agencies.
Increased Demand for Emergency Medical Services	Implementation of plans to distribute and dispense vaccines and medication to points of care and points of dispensing.
Increased Staff Shortages	Increased Staff Shortages.
Increased Healthcare Supply Shortages	Increased Public Health Supply Shortages.
Need for coordinated planning, policy determinations, and public messaging regarding resource limitations & depletion and possible impact on standards of care	Demand for shelter staffing and supplies.
Potential disruption of services, including interruption of outpatient, inpatient, and home health services	Increased Demand for Environmental Health Services.
Potential disruption of access to healthcare facilities for both patients and staff	Disruption of public health information systems and electronic reporting.
Loss of emergency response capabilities	
Loss of computer-dependent operations	

Findings

HMCC Priorities

- Hazard 1: Extreme Weather

    - Extreme weather events can lead to public health emergencies which can overwhelm public health and health care system capacities, disrupt services, and damage facility infrastructure. They also have the potential to create long-term disruptions to electrical and transportation infrastructure. These disruptions can create several obstacles to health care delivery including limiting access to critical healthcare facilities, limiting services these systems are able to provide, impeding staff from accessing worksites, and creating shortages of essential supplies such as fuel and medicine. Climate change, now the primary driver of extreme weather, is also expected to pose greater health risks from other factors, such as poor air quality, reduced drinking water quality, food-borne diseases and vector-borne and zoonotic diseases.

- Hazard 2: Pandemic Flu/Emergent Disease

    - Despite scientific and medical advances, the potential for diseases to spread is actually increasing, as is the risk of outbreaks escalating into epidemics or pandemics. A variety of global factors contribute to this increased risk and include increased travel, urbanization, climate change, increased human-animal contact, and health care worker shortages in low- and middle-income countries. Responding to the COVID-19 Pandemic has had significant impacts across every healthcare discipline in our region. Hospital systems remain at or near capacities due, in part, to the impacts that delayed care had on the overall health of the region's population. Many healthcare sectors are suffering from continuing, often significant, staffing shortages at all levels of operations. While the causes of these staffing constraints are complex, and many pre-date the pandemic, all were exacerbated by it. Trust in public health authorities, public health interventions, vaccination, and government generally remain lower than they were pre-pandemic. Pandemic "fatigue", experienced by both healthcare workers, and the public, may contribute to reduced compliance with the mitigation strategies required to respond to an emergent disease or pandemic influenza. All of these factors leave public health and healthcare systems vulnerable to another pandemic or emergent disease.

- Hazard 3: Water Supply Disruption

    - Water used in hospitals and other health care facilities comprises 7 percent of the total water use in commercial and institutional facilities in the United States.

Without access to clean water supplies many of the services delivered by our healthcare systems would not be possible. Climate change, along with aging infrastructure, both continue to increase vulnerabilities in water sourcing and delivery systems. While there are plans and equipment in place to temporarily replace other utilities, such as electricity, the region does not have robust plans or equipment available to mitigate the impacts of long-term or widespread water service disruptions.

- Hazard 4: Cyber Attack

  - Healthcare facilities and municipalities continue to be targeted by cybercriminals in ransomware and other types of cyber-attacks. These attacks can have serious impacts on the ability of healthcare systems to provide services to patients. Attacks on hospitals, for example, may necessitate diverting patients to other hospitals and/or lead to an inability to access patient records to continue care delivery. Cyber-attacks can also expose sensitive patient information and lead to substantial financial costs to regain control of systems and patient data. Cyber-attacks on healthcare records, IT systems, and medical devices have infected even the most protected systems. Every component of healthcare, from public health offices and small, single practitioners, to large, integrated health systems, are venerable to cyber-attack.

- Hazard 5: Chemical Release

  - Several high-profile incidents involving the accidental release of hazardous chemicals have occurred within the last year in the United States. Primarily these events were related to the transportation of hazardous materials or fires at facilities that use hazardous materials in manufacturing or are otherwise engaged in the production of these materials. Our region contains major highway and rail transportation corridors and has a long tradition of industrial manufacturing. The recent focus on pandemic response has resulted in reduced planning and training surrounding hazardous chemicals. It may also have impacted relationships between the various healthcare disciplines and public safety agencies leading to less frequent collaborative planning and exercising opportunities.

Recommendations for Regional Partners

Recommendations for regional healthcare and public health partners are general, and may not apply to each organization or facility. The HMCC recognizes that some disciplines and facilities may already have implemented many of these recommendations, while others may not be as far along in their preparedness planning and implementation. Recommendations are intended to provide a roadmap and justification for inclusion in future work plans in the region.

1. Plan and Prepare for Extreme Weather

Standard emergency management approaches, such as all-hazards programs should be modified, as necessary, to incorporate observed and projected changes in the frequency, intensity and duration of extreme weather events to increase preparedness. Partners should reasonably equip facilities to prepare for the impacts of extreme weather. This should include, at minimum, alternate power sources, such as generators and/or batteries, and communications equipment. Plans for managing power outages should be developed, reviewed, and tested regularly to ensure that effective measures are in place to continue to provide care when electricity is limited. Public health programs and the training of health care providers should be modified, as necessary, to reflect changes in the geographic range and incidence of climate-sensitive infectious diseases. Logisticians should be cognizant that more extreme weather events are likely to disrupt supply chains and should diversify suppliers and develop contingency plans accordingly.

2. Leverage Lessons Learned from COVID-19

While emergent disease remains a significant hazard to public health, the COVID-19 pandemic provided invaluable real-world testing of the capabilities and limitations of our public health and health care systems. Partners should leverage those experiences and incorporate lessons learned into planning. Solutions, processes, and procedures developed in response to the pandemic should be well documented for future use and planning. Risk communication strategies should be developed to counter public opposition to routine public health and social measures. These strategies may include active opposition to misinformation and disinformation. A healthy workforce is essential for the provision of quality care and services. The health and well-being of the workforce should be prioritized with strategies that ensure adequate protection of worker health and foster workforce resiliency. Insufficient/ineffective supply stockpiling and pandemic related supply chain disruptions impacted all sectors of healthcare. High volume medical commodity consumers, such as hospitals and long term care, should work with their suppliers/vendors to create redundancies within established supply chains and to establish alternate sources of essential supplies. Stockpiles and caches of essential supplies should be continually evaluated to ensure they are of sufficient quantity and in usable condition. The next pandemic is unlikely to unfold exactly like COVID-19. Steps should be taken to ensure decisions about how to best respond to an emergent disease are not

clouded by, but rather informed by, recent experiences. Planning and exercises should address diseases with varied transmission, screening, and treatment modalities.

3. Water and Health

Water supplies can and do fail. Several types of events such as a natural disaster, a failure of the community water system, construction damage, or even an act of terrorism can cause water supply interruption. Partners should understand how public health and patient safety, quality of care, and their organization's operations will be impacted. Health care facilities should evaluate water usage, identify which functions are essential to protect patient health and safety and which functions can be temporarily altered, and develop a water supply plan in advance of an emergency. These plans should include alternative emergency water supplies and identify emergency conservation measures that could be implemented. Public health should create and/or update plans that include provisions for increased waterborne disease outbreak surveillance and tracking. Staffing contingencies that account for these labor intensive activities should be developed. They should also create messaging strategies regarding potential water contamination, waterborne disease, and water conservation.

4. Engage in Cybersecurity Planning, Training, and Exercising

Cyber-attack remains a continuing threat to healthcare systems and facilities; many healthcare partners have experienced hacks and ransomware attempts. The use of personal electronic devices, such as personal cell phones, for work purposes and more remote/in-home offices have significantly increased cybersecurity risks. Partners should engage in ongoing cybersecurity planning, training and exercising. The Health and Human Services, Administration for Strategic Preparedness and Response (ASPR) TRACIE website and The Department of Homeland Security's, Cybersecurity and Infrastructure Security Agency (CISA) website, both host cybersecurity planning guidance for the public health and medical sector.

5. Chemical Emergency Considerations for Healthcare

With the world primarily focused on responding to the COVID-19 pandemic, preparedness activities surrounding other hazards may not have received sufficient attention. Partners should renew their focus on response planning for the accidental, or intentional, release of chemicals in our region. Plans should include the chemical risks and vulnerabilities specific to your community or facility. Industry stakeholders, agencies responsible for managing hazardous materials, and external subject matter experts should be incorporated into both planning and response activities. Exercises should be developed for a variety of scenarios and include considerations for populations with access and functional needs. Relevant training should be provided to leadership and staff that reflect their roles during a chemical emergency. Hospitals should determine the types and amounts of space, supplies, and staff needed to provide ambulatory and non-ambulatory patient decontamination at their facilities and maintain an operations-level training

plan for staff. Public health should be prepared to issue guidance about population protective measures, communicate health risks, and to investigate, track, and follow up on health effects in exposed persons. Pre-scripted messages should be developed for specific hazards found within each community to help reduce confusion during a response. Training and practicing with other response partners will allow agencies to be familiar with the capabilities of those partners.

Conclusion

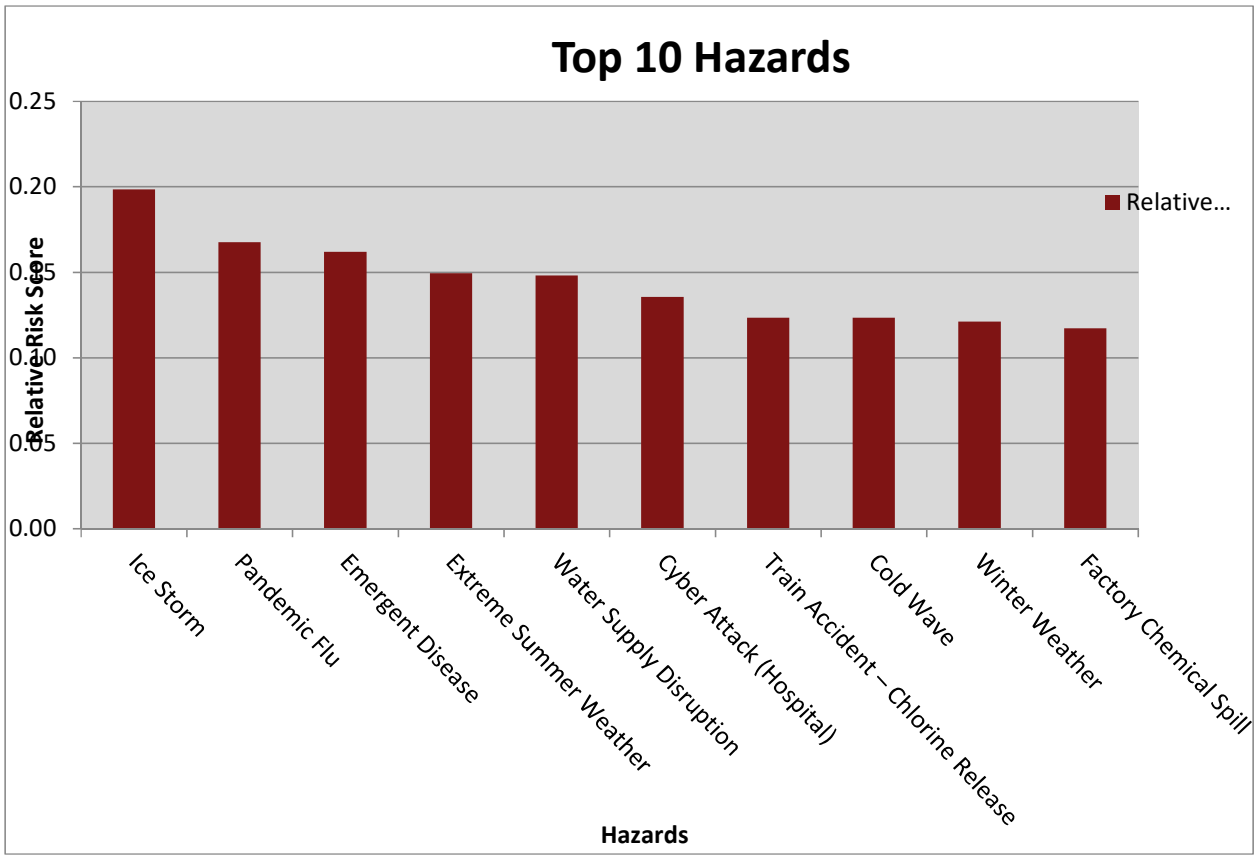
The W MA HMCC 2023 HVA is a broad strategic planning tool that links hazards, risks, and vulnerabilities so healthcare partners can better plan for emergencies and disasters. The threat picture for the region is dynamic and will change over time.

Future planning efforts that utilize this document to prioritize activities must weigh relative risks and vulnerabilities. Not all hazards are equal in terms of risk, and therefore all real and perceived vulnerabilities may not apply. The top regional hazards list is not absolute and reflects the participants' experience and expertise. Ultimately, local, state, and national priorities, budgets, funding, and the dynamic nature of threat and risk assessments will drive long-range preparedness efforts for western MA.

We encourage all our health and medical partners to be aware of the demographic makeup of the regions they serve and to consider the impact of disasters on vulnerable populations. The W MA HMCC website hosts several planning guides and tool kits incorporating vulnerability data in emergency response plans.

The W MA HMCC staff and leadership will review this HVA annually to ensure it is consistent with current planning priorities and to reflect any changes in emerging hazards. Over the next year, we will also use this report to drive deeper inquiry into the impact of existing mitigation efforts on overall hazard vulnerability.

Appendix A: Hazard Vulnerability Assessment HHAP Instrument



Appendix B: MA DPH Vulnerable Populations Portal Data

Portal demographic data is from the USD Census Bureau, American Community Survey (ACS) 5-year estimates (https://www.census.gov/programs-surveys/acs).

INDICATOR DESCRIPTIONS

Age: Certain age groups are more at risk of adverse health outcomes than others: the youngest and oldest populations. Older and younger populations often rely on caregivers to help prepare for and respond to an emergency. These populations are particularly challenged in an emergency for many reasons, including reliance on routine, susceptibility to illness, and reduced mobility.

Language Spoken/No English Spoken: Non-English-speaking people and those with limited ability to read, write, or understand English may be vulnerable in an emergency. Individuals with limited English proficiency (LEP) experience inequalities that can prevent access to health insurance and care, resulting in health disparities. Language barriers can even arise between people who speak the same language, so translation services must be sensitive to colloquialisms, dialects, and regional differences. These barriers can increase the risk of nonadherence to medication or create stress for those receiving care. LEP is a source of social isolation, which may limit situational awareness. People with LEP may engage in daily activities differently from those fluent in English (e.g., using visual symbols and memory to navigate public transit routes). They may not understand the role or presence of police and other law enforcement officers, and they might not understand instructions. Many non-English speakers rely on word-of-mouth or community/faith-based organizations for communication updates. Identifying primary languages within a service area is essential for communicating emergencies and available resources and identifying organizational needs (e.g., translation and interpretive services) to ensure that those with LEP remain safe and prepared for emergencies and receive quality care and access to resources.

Less Than 9th Grade Education: People who do not have a high school education may be more vulnerable in emergencies. Part of this increased vulnerability is likely because individuals with less education often have limited material resources, lower social and political capital, and exhibit more adverse health-related behaviors (e.g., smoking) compared to individuals with more education. In general, less education is associated with poorer health outcomes (e.g., higher infectious disease rates and lower life expectancy). People without a high school education typically have a lower reading level. Health and emergency officials should use clear communications during emergencies.

Populations 65 Years or Older, Living Alone: Living alone can exacerbate age-related vulnerabilities experienced by the elderly, particularly in emergencies. Older adults are more likely to have chronic diseases, conditions, and physical or cognitive disabilities (e.g., dementia). Living alone can result in social isolation and decreased access to emergency-related communications. This population may be less willing or able to leave home or seek shelter.

Planners should identify where elderly community members live to ensure this population receives needed resources during and following emergencies.

Populations with Disabilities: "Disability" is an umbrella term that refers to a diverse group of people living with significant function, movement, or activity limitations. People with disabilities have experienced a long history of discrimination and institutionalization contributing to today's health disparities. People with disabilities are more likely to have chronic diseases and conditions like diabetes, cardiovascular disease, and hypertension. They may also rely on caregivers, who can be socially isolated and increase vulnerability. It is essential to identify the type of disabilities common in a service area to ensure that the needs of people with disabilities are met during an emergency.

Populations With no Vehicle Available: Lack of car ownership can challenge accessing amenities and healthcare and evacuating during emergencies. Vehicle ownership tends to be lowest in urban areas, especially among lower-income individuals. If an evacuation is required, individuals with no vehicle may be stranded, mainly if public transportation options are unavailable or are temporarily down. Rural individuals with no vehicle may be even more vulnerable due to increased isolation and less transportation infrastructure. Shelters or other emergency response sites may be farther from residents in rural locations, making the lack of a vehicle more problematic. Planners should consider alternate transportation options (e.g., the use of school buses) to ensure those without vehicles can safely access shelters and other resources.

Poverty: Poor households are more susceptible to emergencies due to many social and physical factors. People or families meeting the criteria for poverty may not have reliable access to healthcare, making them less resilient to changes in health status. They are also generally less likely to own vehicles, affecting their ability to evacuate. Low-income people or families cannot absorb the financial impacts of being out of work for a period due to a disaster.

Race/Ethnicity: Stemming from a long history of inequality, minority populations are more vulnerable to adverse health outcomes than non-minority populations. Social and physical factors such as lack of economic resources, cultural barriers, and housing conditions can contribute to health status, emergency preparedness, and disaster recovery. For example, minority groups concentrated in urban areas may be more susceptible to heat illnesses because they live in older housing that is poorly insulated or may lack the financial means to own or operate air-conditioning equipment. Targeted communications through social networks or community and faith-based organizations may be more effective than conventional communication methods.

Types of Disability: The term disability encompasses a broad range of limitations and health statuses that include:

- **Hearing difficulty**: deaf or having severe difficulty hearing.
- **Vision difficulty:** blind or having serious difficulty seeing, even when wearing glasses.

- **Cognitive difficulty:** physical, mental, or emotional problems that lead to difficulty remembering, concentrating, or making decisions.
- **Ambulatory difficulty:** having severe difficulty walking or climbing stairs.
- **Self-care difficulty:** having difficulty bathing or dressing.
- **Independent living difficulty:** physical, mental, or emotional problems that lead to difficulties doing errands alone, such as visiting a doctor's office or shopping.

Region 1 HMCC Vulnerable Population Data Reports
HMCC Regional Summary
Berkshire County
Franklin County
Hamden County
Hampshire County

Appendix C: Demographics: US Census Bureau

W MA HMCC Region 1 Demographics		
Basic Information	**Category**	**Value**
Total Population in HMCC Region 1		807,525
Age	Age 0-19	186,583
	Age 20-34	167,264
	Age 35-64	305,366
	Age 65+	148,312
Sex	Male	387,673
	Female	419,852
Race	White	667,019
	Black	49,138
	Asian	23,151
	Native Hawaiian and Other Pacific Islander	415
	Other	67,802
Education Level	Population aged 25+	552,270
	Population Aged 25+ High School Graduate	492,753
	Population Aged 25+ with a bachelor's degree	186,074
	Population Aged 25+ with a graduate degree	81,748
Occupation	Civilian employed population 16+ years old (CEP16)	390,332
	CEP16 - Management, business, science, and arts occupations	158,514
	CEP16 - Service occupations	78,157
	CEP16 - Sales and office occupations	76,780
	CEP16 - Natural resources, construction, and maintenance occupations	28,411
	CEP16 - Production, transportation, and material moving occupations	48,470
Household Income	Mean household income (dollars)	95,649
	Median household income (dollars)	74,940

	Families/People whose income in the past 12 months is below the poverty line (%)	5.02%
Transportation	Occupied Housing Units	318,857
	Occupied housing units - No vehicles available	35,241
Marital Status	Male Population 15+ years old	323,669
	Males 15+ Never Married	135,051
	Males 15+ Now Married	144,654
	Males 15+ Separated	4,536
	Males 15+ Widowed	8,767
	Males 15+ Divorced	30,661
	Female Population 15+ years old	358,844
	Females 15+ Never Married	132,204
	Female 15+ Now Married	143,512
	Female 15+ Separated	6,910
	Females 15+ Widowed	30,958
	Females 15+ Divorced	45,260
Children	Number of Women who gave birth past 12 months	8,265
Homeownership	Occupied Housing Units	318,857
	Owner Occupied Housing Units	205,929
	Renter Occupied	112,928
Disability Status	Total Civilian Noninstitutionalized Population	798,154
	Total Civilian Noninstitutionalized Population - With a disability	119,865

Appendix D: Groups and Stakeholders

Region 1 HMCC Steering Committee Members		
Name	**Discipline**	**County**
Heather Barbieri	Hospitals	Berkshire
Ron Riethle	Hospitals	Hampden
Jeanne Galloway	Public Health	Hampden
Allison Egan	Public Health	Berkshire
John Meaney	EMS	Berkshire
Brian Andrews	EMS	Berkshire
Jacqueline Johnson	CHC	Hampden
Jennifer Wilkinson	CHC	Berkshire
Melinda Monasterski	LTC	Hampden
Patricia Haner	LTC	Berkshire

Other Groups and Stakeholders	
Group	**Discipline**
Western Region Hospital Emergency Preparedness Committee (WRHEPC)	Hospital
Western MA Public Health Advisory Group (WAG)	Public Health
Region 1 Community Health Center Emergency Preparedness Committee	Community Health Center
Western MA EMS	EMS
Mass Senior Care	LTC

Appendix E: Meetings and Participation

W MA HMCC HVA Timeline to Completion		
Date	**Group**	**Activity**
March 2023	HMCC Staff	Reviewed HVA guidance
April 2023	HMCC Staff	Began demographic and social vulnerability data sourcing using US Census Bureau and MDPH Emergency Populations Planning Tool
April 2023	Western Region Hospital Emergency Preparedness Committee	Provided overview of HVA strategy and requested any data from WRHEPC committee members
April 2023	Western MA Public Health Advisory Group (WAG)	Requested data from the four PHEP Coalitions in the HMCC region
April 2023	Region 1 Community Health Center Committee	Requested data from all Community Health Centers in the HMCC region
April 2023	Western MA EMS	Requested data from the four county EMS groups in the HMCC region
April 2023	Mass Senior Care	Requested data from Mass Senior Care
April 2023	HMCC Staff	Commenced review of existing data; distilled data from HMCC disciplines
May 2023	HMCC Staff	Identified hazards with the highest potential consequences using the hHap instrument
May 2023	HMCC Staff Steering Committee	Reviewed draft HVA with aggregated facility and regional datasets and associated impacts for prioritization.
May 2023	HMCC Staff	Compiled findings into HVA
May 2023	HMCC Staff	Submitted Steering Committee approved HVA to DPH