

Compendium of Best and Promising Practices for Hurricane Health Impact Mitigation

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About the Compendium

This compendium includes best and promising practices for mitigating the health impacts of hurricanes. The strategies identified are categorized by the following principles for convenient and efficient planning:

- Community Preparedness,
- Messaging,
- Outreach/Welfare Checks,
- Sheltering,
- Evacuation,
- Policy Implementation,
- Back-up Power,
- Recovery Planning, and
- Continuity of Operations (COOP).

These strategies aim to serve populations that are at higher risk or likely to be disproportionately impacted by acute and/or chronic or lingering health impacts as a result of hurricanes. The "Relevant Populations" column indicates which of these populations will benefit from the associated action or strategy; however, some strategies may also benefit other populations.

Planners should keep in mind a few key planning principles when developing mitigation strategies intended to address the health impacts of hurricanes within their community. These key planning principles include:

- Engage individuals who are at higher risk or likely to be disproportionately impacted by disasters within your community, as well as community organizations serving these populations, to inform preparedness efforts (70)
- Incorporate equity measures into community interventions when planning for a disaster (1)
- Invest in preparedness efforts that focus on individuals who are at higher risk or likely to be disproportionately impacted (3, 15)
- Understand how inequities occur within disaster response to avoid further exacerbating these inequities (19)

Community Preparedness

Overarching Principle: Assess community readiness and identify populations that are susceptible to health impacts from hurricanes. Promote and support the development of customized individual preparedness plans to support community members to become more prepared for disasters. (22)

Relevant Populations	Best and Promising Practices
All community members	Assess the current state of preparedness in your community to determine necessary mitigation strategies. (2)
	Encourage individuals and households to develop preparedness plans. (45)
	Facilitate the development of community preparedness groups to lead outreach, mutual aid, and advocacy activities. Members can support preparedness by promoting the development of individual and family preparedness plans and response activities, such as checking on higher risk neighbors. (22)
People with pre-existing health conditions; People living alone or who are socially isolated; Households with no motor vehicles; People living in poverty; Children; People with power-dependent medical devices; Non-English speakers or people with limited English; People experiencing homelessness; People who require medication	Encourage customized individual, household, or family emergency plans based on needs, such as: <ul style="list-style-type: none"> → For someone with pre-existing health conditions, include a supply of medication and documentation of prescribing doctor and pharmacy; → For someone who uses Durable Medical Equipment (DME), document size, make, model and supplier; → For someone with asthma, include an asthma action plan and a portable, battery-powered nebulizer; and → For someone who is deaf or hard of hearing, include a weather radio with text display and flashing alerts and extra hearing-aid batteries. (6, 7, 8, 9, 45, 66)
People living near the coast or in flood zones	Promote the MA Homeowner's Handbook to Prepare for Coastal Hazards, which has guidance for strengthening a home's physical structure to withstand severe storms, ensuring homeowners have proper insurance, and developing family emergency plans. (10)
	Refer to flood maps and flood risk resources to plan for hurricane impacts. Share preparedness materials with community members living in high risk areas to promote awareness. (11)

Messaging

Overarching Principle: Use established principles and Crisis and Emergency Risk Communication (CERC) techniques to develop initial and ongoing messaging, including truth-telling, saying what is not known, committing to following up with new information, avoiding false reassurances, and using plain language. (13)

Messaging – Recommended Messaging

Relevant Populations	Best and Promising Practices
All community members	Ensure public messaging prior to a storm includes steps to prepare one's home to prevent injuries, as well as health hazards that may exist post-hurricane. (26, 27, 28)
	Collaborate with the media to ensure accurate information is conveyed and reduce trauma by providing warnings before sharing graphic material. (13)
	<p>Predevelop messaging regarding hurricane-specific health topics, including health risks related to post-hurricane debris, for example:</p> <ul style="list-style-type: none"> → Pre-storm preparedness tips; → Accessing potable water; → Using bottled or treated water for medical devices; → Food safety; → Available back up power resources; → Normal emotional reactions to disasters; → Accessing health and behavioral health care; → Accessing needed medications (e.g., securing and storing medication, promoting Rx Open); → Mold remediation; → Asbestos exposure; → Live downed power lines; → Infrastructural damage (e.g., sagging roof or cracked foundations); and → Limiting risks of injury and exposures during recovery and clean up (e.g., contaminated floodwaters, air quality risks including thunderstorm asthma and mold, carbon monoxide, electrical hazards, other dangerous materials, insects, stray animals). (29, 30, 28, 31, 32, 33, 34, 35, 36, 37, 38, 39, 13, 72)

Messaging – Trusted Messengers

Relevant Populations	Best and Promising Practices
All community members	Implement peer-to-peer outreach programs in which community members can share information and resources with their neighbors. (17, 24)
	Facilitate virtual town hall meetings to address community concerns. (24)
People experiencing homelessness	Work with organizations serving people experiencing homelessness to encourage those with cell phones to register for automated community

	alert programs and conduct physical outreach to those without access to technology in the days leading up to a hurricane and when the danger has passed. (21)
<p>People living in poverty;</p> <p>Non-English speakers or people with limited English;</p> <p>Communities of color</p>	Partner with organizations trusted by communities, (e.g., non-profit legal services, community and faith-based groups for non-English-speaking communities; agencies serving low income residents) to prepare and deliver messages before and during an emergency. Consider developing Memoranda of Understanding (MOUs) with partners. (12, 46, 47)

Messaging – Accessibility

Relevant Populations	Best and Promising Practices
All community members	Design online preparedness resources and printed educational materials with icons, graphics, and simple layout. (12)
	When using online messaging alert systems, keep the content concise and specific so that it is easy to remember and convey by word of mouth. (21)
<p>All community members;</p> <p>People with disabilities;</p> <p>Non-English speakers or people with limited English</p>	Use clear, simple language that is understood by people with intellectual or developmental disabilities and people with limited English proficiency or literacy. (12, 15)
Non-English speakers or people with limited English	Know the languages spoken in your community and develop materials, signage and messages accordingly; utilize ready.gov language resources. (23, 48, 49, 25)
	Consider training emergency responders in basic phrases of community-relevant languages to improve time sensitive and on-the-ground communication during response times. (25)

Messaging – Channels

Relevant Populations	Best and Promising Practices
All community members	Create interactive online platforms where community members can ask questions, share experiences, and access resources. (24)
	Use diverse communication channels, including local media outlets (television and radio), texting, robocalls, and social media. Distribute printed materials at gathering places such as community centers, grocery stores, and public spaces. Disseminate messages through ethnic media outlets, community centers, and faith centers to reach specific cultures. (63, 64, 12)
	Ensure registries are frequently validated and updated. (3)

People with pre-existing health conditions	Develop strategies and plans with primary care providers and home health programs to disseminate emergency information. (12)
People with power-dependent medical devices	Develop communication strategies with partners who serve individuals who rely on electricity-dependent medical devices in a power outage (e.g., utility companies, DME vendors). (12, 5)
People with disabilities	Ensure messages are accessible to all. Provide accessible emergency notification systems. Use American Sign Language interpreters for televised emergency announcements. Ensure that websites are 508 compliant (e.g., accessible to screen readers). (12)

Outreach/Welfare Checks

Overarching Principle: Identify and engage directly with community organizations that have a trusted presence with populations that are susceptible to the health impacts of a hurricane. Collaborate to ensure that preemptive protective outreach measures are taken to accommodate these populations. (15, 56)

Relevant Populations	Best and Promising Practices
Pre-existing health conditions; People experiencing homelessness; Non-English speakers or people with limited English; People who are undocumented; People with power-dependent medical devices	Connect and collaborate with community organizations, public officials, and community health workers (CHWs) to provide hurricane-related outreach to those they serve. Generate a list of community organizations that work with populations at higher risk to include in emergency response plans, such as: <ul style="list-style-type: none"> → Non-profit legal services, community and faith-based groups, and advocacy organizations → Meals on Wheels, accessible transportation service providers, paratransit providers → Independent Living Services, Councils on Aging, public and personal assistance services, home health organizations → Equipment vendors, mail-in pharmacy services, utility discount services, assistive technology services (15, 14, 58, 59, 21, 46)
People experiencing homelessness	Recommend that local officials limit encampment sweeps during the days leading up to a hurricane to avoid separating people from their possessions, medications, devices, personal resources, and shelter throughout the duration and aftermath of this extreme weather event. (56)
Tourists	Collaborate with local tourism entities and businesses to develop emergency response actions that will support tourist safety. (55)

Sheltering

Overarching Principle: Provide and ensure a safe, dignified, and accessible space to meet the key needs of individuals; consider the needs of a community in crisis, including protection from hazards, clean water, food, basic hygiene, psychological aid and/or privacy, necessary health services, transportation, and power sources. (69)

Relevant Populations	Best and Promising Practices
All community members	Ensure sheltering plans include provisions for keeping the shelter environment safe for shelter residents, including access to basic hygiene and healthcare services, clean water and safe food, and monitoring for potential health hazards. (28, 43)
People with disabilities; People with pre-existing health conditions; People with pets; People with power-dependent medical devices	Ensure emergency shelter plans incorporate guidance and best practices for accessibility and integration of functional needs support services. Specific considerations include: <ul style="list-style-type: none"> → Providing reasonable accommodations to ensure service animals are welcomed in all shelters per the Americans with Disabilities Act (ADA) → Allowing pets and emotional support animals in a co-located or nearby standalone animal shelter → Including supports for residents who use power-dependent medical devices (57, 16, 3)
Household with no motor vehicles; People with disabilities	Establish shelters at locations accessible by public transportation, and clearly designate the transportation routes to the centers. Work with partners to provide accessible transportation to shelters for people they serve. (65)
Tourists	Establish shelters in tourist-heavy areas. (18)

Evacuation

Overarching Principle: Identify and utilize evacuation protocols and transportation options that are safe, efficient, and accessible, collaborating with community organizations and utilizing multiple communication channels to ensure community awareness of evacuation plans. (42)

Relevant Populations	Best and Promising Practices
People living in poverty; Households with no motor vehicles; People with disabilities	Partner with community organizations to establish evacuation options for residents who lack financial means and/or personal transportation, or face transportation barriers due to disabilities, such as: <ul style="list-style-type: none"> → Providing cost-free public transport in the hours prior to and during a mandated evacuation → Facilitating the availability and affordability of safe, short-term housing accommodations → Encouraging residents without a car to make preemptive evacuation plans with friends, family, or neighbors with a vehicle (40, 41, 42)

Policy Implementation

Overarching Principle: Consider what policy actions may be taken to protect populations that will be impacted by storm exposure, power outage, and response and recovery operations, including taking steps to implement recommendations and regulations from agencies like OSHA, NIOSH, and FEMA. (67, 68)

Relevant Populations	Best and Promising Practices
All community members	Encourage local officials and healthcare providers to recognize storm exposure as a social determinant of health (similar to a chronic condition or impactful life circumstance). (61)
People living near the coast or in flood zones	Evaluate the FEMA voluntary incentive program that reduces flood insurance premium rates to determine if it would be beneficial for your community. Participate in and educate your community on its benefits. (60)
Emergency responders and cleanup crews	Encourage implementation of Occupational Safety and Health Administration (OSHA) and National Institute for Occupational Safety and Health's (NIOSH) regulations during response and recovery (e.g., for first responders, construction workers). Advocate for legislation and for codification of strategies to protect workers. (67)
People living in poverty	Work with large employers and policy makers to ensure workers who evacuate early are not penalized. (40)
People with power-dependent medical devices	Explore mechanisms to fund additional batteries to extend the run time of DME, either for individuals or in a community-level cache. (68)

Back-up Power

Overarching Principle: Make provisions to identify and support populations that require power to maintain health. (3, 44)

Relevant Populations	Best and Promising Practices
People with power-dependent medical devices	Utilize HHS emPOWER and REST Service data to quantify the number of people who utilize power-dependent medical devices in the community to inform planning and decision-making regarding staging and deployment of resources. (3, 50)
	Identify existing utility programs to support customers using DME and explore opportunities for collaboration between utilities and public health, emergency management, and disability affairs agencies. (44)
	Establish community recharging facilities with dedicated emergency power resources. (44)
	Establish a voluntary program for homeowners who own backup generators to assist with charging backup batteries to power medical devices in coordination with first responders. (44)

Recovery Planning

Overarching Principle: Support community recovery by taking steps to preserve health by: implementing surveillance of injury, disease, and exacerbation of chronic conditions; supporting family reunification efforts; undertaking psychological and social welfare checks; and assisting with establishing disaster assistance plans to direct local financial resources to those impacted. (40, 13, 4)

Relevant Populations	Best and Promising Practices
All community members	Develop plans to provide a local/regional "disaster assistance safety net" utilizing a case management approach that streamlines access to locally available resources for people impacted by hurricanes. Such plans may work in tandem with FEMA Disaster Recovery Centers. (40)
	Plan to operationalize post-hurricane surveillance for injury and infectious disease, for example, by leveraging ICD-10 syndrome groupings or providing data-collection guidelines and forms to health care providers before the storm, to ensure rapid initiation of post-storm data collection. (4, 2)
	At the primary care level, increase screening and educational interventions following a disaster for early identification of distress reactions, psychological disorders, and maladaptive coping strategies. Provide information to health care practitioners on the phases of community psychosocial recovery. (13)
	Be prepared to offer psychological first aid early following a hurricane, including promoting safety, enhancing calming, increasing self- and community-efficacy, encouraging social connectedness, and engendering a sense of hope of optimism. (13)
	Establish reunification plans to reunite family members separated during the storm; include data systems for expediting reunification (e.g., National Emergency Child Locator Center, FEMA's National Emergency Family Registry and Locator System). (40, 62)
	Adopt the Community Assessment for Public Health Emergency Response (CASPER) methodology and survey to gather optimal information about the status of community health post-hurricane and determine a path forward based on community needs. (73, 74)
	Support community cleanup efforts by convening individuals for neighborhood cleanups. Identify neighborhoods that would benefit the most from an organized cleanup event, and engage community organizations that can operate as a trusted community lead. (70)
	Collaborate with your municipal waste disposal facility to coordinate additional trash pick up days, assistance with transporting debris to landfills, and providing equipment and education around disposing of potentially hazardous debris. (70, 71)

All community members; People who require medication	Partner with pharmacies in affected areas to support reopening or provision of mobile resources, including delivery of prescriptions to homebound residents. (40, 13)
People with power-dependent medical devices; People with disabilities; People with pre-existing health conditions	Connect patients covered by CMS with resources on coverage exceptions for DME replacement following a declared disaster. (3)

Continuity of Operations

Overarching Principle: Outreach to organizations that provide health care to support their ability to maintain operations in emergencies. (51, 52)

Relevant Populations	Best and Promising Practices
All community members; People in institutions; People with pre-existing health conditions; People who require medication	Initiate outreach to mental health facilities, health clinics, dialysis centers, opioid treatment centers, and DME suppliers to strengthen community partnerships and support these institutions in developing emergency response protocols and communication plans. Work with these community institutions to identify key components of their emergency plans. Ensure that: <ul style="list-style-type: none"> → Dialysis centers can provide early dialysis in advance of a storm and promote the three-day emergency diet; → DME suppliers have business continuity plans which address supply chain continuity; and → Healthcare facilities are prepared to provide post-disaster healthcare that encompasses mental health services, such as care coordination interventions, counseling, and stepped-care models. (51, 52, 40, 53, 3)
People in institutions	Engage with and support carceral, psychiatric, and long-term care facilities in order to develop and share best practices for hurricane preparedness, such as: <ul style="list-style-type: none"> → Record and maintain health records for patients with chronic conditions, mental health challenges, and other information that would be important to share during an evacuation → Determine an activation timeline for initiating evacuation plans that aligns with city officials → Create a plan for sending/receiving incarcerated evacuees to/from neighboring institutions → Create and disseminate accessible messaging (e.g., necessary languages, digital displays, and audio messaging) (54)

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