



**American  
Red Cross**



AMERICAN ACADEMY OF NURSING

# Closing the Gaps: Advancing Disaster Preparedness, Response and Recovery for Older Adults

25 Evidence-Informed Expert Recommendations to  
Improve Disaster Preparedness, Response and Recovery  
for Older Adults Across the United States

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JANUARY 2020



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In June 2018, the American Red Cross Scientific Advisory Council, in partnership with the American Academy of Nursing, initiated a review of the latest evidence on disaster preparedness for older adults. Following the review a group of experts were invited to participate in a Policy Expert Round Table on Emergency/Disaster Preparedness for Older Adults to inform the development of recommendations to improve disaster preparedness, response and recovery for older adults. Enlisted experts that contributed to the development of this report are listed below.

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## Acknowledgments

The authors would like to thank Elliot Nguyen, Catherine Stratton, Peg Christensen, Daphne Horn, Shruthi Janardhanan and Allan McKee for their important contributions towards the development of this report.

## Organizational Endorsements

The American Red Cross Scientific Advisory Council in partnership with the American Academy of Nursing Policy Expert Round Table on Emergency/Disaster Preparedness for Older Adults that led the development of this report and its recommendations wishes to thank the American Red Cross and the American Academy of Nursing for their official endorsements of it.



We would also like to thank the following organizations who have also given their support and official endorsement of this work.



# Abbreviations

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AAN	American Academy of Nursing
ADA	Americans with Disabilities Act
ADLs	Activities of Daily Living
ADRD	Alzheimer’s Disease and Related Dementias
ARC	American Red Cross
AARP	American Association of Retired Persons
CDC	Centers for Disease Control and Prevention
CILs	Centers for Independent Living
CMS	Centers for Medicare and Medicaid Services
DHS	Department of Homeland Security
DOE	Department of Energy
ED	Emergency Department
EMS	Emergency Medical Services
FEMA	Federal Emergency Management Agency
HHS	The Department of Health and Human Services
HRSA	Health Resources and Services Administration
ICS	Incident Command System
JCAHO	Joint Commission on Accreditation of Health care Organizations
LTC	Long-Term Care
PTSD	Post-Traumatic Stress Disorder
NABP	National Association of Boards of Pharmacy
PDA	Personal Digital Assistant
PPE	Personal Protective Equipment
SAC	Scientific Advisory Council
SDM	Substitute Decision Maker
SMART	SiMple triage And Rapid Treatment
SWiFT	Seniors Without Families Team

# Executive Summary

## Background and Context

Older adults consistently experience the greatest proportion of casualties during and after natural disasters compared to younger age groups (Fernandez, Byard, Lin, Benson, & Barbera, 2002; Mokdad, 2005). In 2005, approximately half of all deaths resulting from Hurricane Katrina were among persons age 75 years or older (Brunkard, 2008). Similarly, following Hurricane Sandy in 2012, *The New York Times* reported that approximately half of those who died in the storm were age 65 or older, many of whom drowned at home or died from storm-related injuries (Keller, 2012).

Several research studies have demonstrated that these poor outcomes are linked to physiological age-related changes such as impairments to sensory, cognitive and mobility disabilities or access and functional needs; social isolation and a lack of access to familial and other social supports; having limited financial resources; and insufficient policies and procedures (Al-Rousan, Rubenstein, & Wallace, 2014; Fernandez et al., 2002; Killian, Moon, McNeill, Garrison, & Moxley, 2017). Furthermore, interruption to the timely provision of routine medical care is recognized as a likely contributor to mortality and morbidity associated with exacerbation of medical conditions during natural disasters, especially in the immediate months following major natural disasters.

Recent events have prompted a variety of legislative actions to better prepare the nation for disasters, such as the adoption of the Centers for Medicare and Medicaid Services' (CMS) final

rule, *Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers*. Implemented on November 15, 2016, this rule outlines emergency preparedness requirements for 17 types of participating Medicare and Medicaid providers and suppliers, including hospitals, long-term care facilities, psychiatric residential treatment facilities, and home health agencies around four aspects of emergency preparedness: risk assessment and planning, policies and procedures, communication plan, and training and testing. To standardize the adoption of collaborative emergency response plans nation-wide, relevant providers and suppliers are required to establish emergency plans that incorporate services from federal, state, tribal, regional, and local emergency preparedness systems (Smith & McDonald, 2006). Despite these efforts, deficiencies in emergency preparedness for older populations continue to threaten the safety of older adults in these settings along with those living in assisted living facilities and those living in their own homes.

During the 2017 hurricane season, tragedy occurred in a Florida nursing home after Hurricane Irma disabled the facility's air-conditioning system, leaving 14 residents dead and many sustaining heat-related injuries (Nedelman, 2017). The existing gaps in disaster management around the United States were further reinforced by images of older adults sitting waist-high in floodwater when an assisted living facility in Texas was reportedly initially denied evacuation assistance from first responders during Hurricane Irma (Bell, 2017). This provoked a resident's



daughter to publicize the devastating state of the assisted living facility to initiate an emergency response (Said, 2017). In order to improve the response to disasters, the nation needs greater adoption of evidence-informed, uniform and collaborative emergency management interventions. These efforts will further require the necessary resources and capacity to meet the emergency/disaster needs of all older adults regardless of the variety of circumstances and settings in which they may be living.

To address these gaps in emergency and disaster preparedness and management, members of the American Red Cross Scientific Advisory Council and the American Academy of Nursing Policy Expert Round Table on Emergency/ Disaster Preparedness for Older Adults agreed to collaborate in conducting a scientific review of the latest evidence and current available legislation policies, in order to develop a set of recommendations that could be further reviewed and strengthened by a broader panel of experts with specific expertise in the fields of social work, education, public health, research, health policy, emergency management, geriatrics, and nursing. Through a rigorous consensus decision-making process, a comprehensive final set of 25 evidence-informed recommendations were ultimately developed and endorsed by this group.

This report presents these 25 evidence-informed recommendations, and the rationale behind them, for improving disaster preparedness, response and recovery interventions for older adults across the United States. In order to achieve a collaborative approach to improving disaster

management nation-wide, the recommendations are categorized across six relevant emergency management domains: 1) individuals and unpaid caregivers; 2) community services and programs; 3) healthcare professionals and emergency response personnel; 4) care institutions and organizations; 5) legislation/policy; and 6) research. The intention of these recommendations is to encourage interventions that can bridge the existing gaps in disaster preparedness, response and recovery, and facilitate better outcomes for older adults across the United States.

An index of the recommendations with their associated domains can be found in Appendix A: Index of Recommendations and Responsible Emergency Management Domains.

## Summary of Recommendations

After a systematic review of the literature and an evaluation by an expert panel on disaster preparedness, response and recovery for older adults, 25 final evidence-informed expert recommendations for intervention are proposed to reduce adverse outcomes for older adults during and after disasters. The final recommendations have been organized based on the six identified emergency management domains:

### 1. Individuals and Unpaid Caregivers Domain

**Recommendation 1.1:** Older adults and their unpaid caregiver(s) should be provided with tailored, easy-to-access information related to emergency/disaster preparedness and guidance

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on how to develop customized emergency plans. Volunteers representative of older persons should be recruited and involved in training material development and implementation, to ensure their voices and perspectives are reflected.

**Recommendation 1.2:** Older adults who are reliant on mobility aids should remove or minimize barriers affecting their ability to evacuate, and should take steps to ensure their safety within their surroundings.

**Recommendation 1.3:** If registries for people with functional and other needs, including persons with disabilities, have been established by local emergency response agencies, older adults and/or their unpaid caregiver(s) should register so they can be assisted/supported efficiently during emergencies/disasters.

**Recommendation 1.4:** Older adults who have a sensory impairment, such as a visual or hearing disability, should take additional precautions to prepare themselves for emergencies/disasters.

**Recommendation 1.5:** Older adults who live with chronic health conditions should maintain a readily accessible list of their current medical conditions, treatments (medications, durable medical equipment, supplies and other healthcare needs), healthcare professionals, and emergency contacts including substitute decision makers (SDMs).

**Recommendation 1.6:** Older adults who take medications should work with their healthcare professionals to ensure they have access to at least a 30-day supply of medications during an emergency.

**Recommendation 1.7:** Older adults, and their unpaid caregivers, who are reliant on medical devices that require electricity, should ensure they have back-up power supplies in place, especially if required while sheltering-in-place.

- Older adults and their unpaid caregivers should contact their electricity company in advance to discuss their needs and ensure options for alternative power sources are available, especially addressing the need for access to power to charge cell phones and other mobile devices.
- Older adults and their unpaid caregivers should seek assistance with obtaining and maintaining an alternative power source at home, if required, such as when being required to move heavy equipment and fuel or in accessing these resources in rural locations, and operating equipment.

**Recommendation 1.8:** Older adults should be encouraged to continually maintain an adequate local support network that can be called upon during impending disasters and unexpected emergencies, especially if they live alone or lack easy access to relatives.

**Recommendation 1.9:** Unpaid caregivers of persons with Alzheimer's disease and related dementias should know how to identify signs of distress, anxiety, or confusion, and how to redirect their attention, or calm them down during these times. In addition, unpaid caregivers should be prepared to prevent wandering, and have plans in place and resources to locate their care recipients if they do wander away during a disaster.

## 2. Community Services and Programs Domain

**Recommendation 2.1:** Access to tailored community-based programs that educate older adults and their unpaid caregivers about disasters/emergencies that affect their region and how best to prepare for and respond to them should be increased.

**Recommendation 2.2:** Programs that provide essential community services, such as Meals on Wheels, and assistance with daily living activities for older people (financial, medical, personal care, food and transportation) should develop plans and protocols related to responding adequately to the needs of their clients during emergencies/disasters.

**Recommendation 2.3:** Local governments should leverage data sources such as registries that identify at-risk individuals to enable emergency responders to more easily prioritize their search and rescue efforts following a disaster or emergency.

## 3. Healthcare Professionals and Emergency Response Personnel Domain

**Recommendation 3.1:** Healthcare professionals and emergency response personnel should receive training on providing geriatric care relevant to their discipline and how best to assist older adults and their unpaid caregivers during disasters.

**Recommendation 3.2:** Health care professionals and emergency response personnel should strive to mitigate psychological distress among older persons during and after disasters

by making an effort to assess the psychological well-being of older adults and provide appropriate treatments as needed.

## 4. Care Institutions and Organizations Domain

**Recommendation 4.1:** Care institutions and organizations should include emergency/disaster preparedness and response education in their routine training courses.

- Multi-modality educational tools and practices should be used to better facilitate knowledge acquisition and behavioral change.
- Volunteers representative of older persons should be recruited and involved in training material development and implementation, to ensure their voices and perspectives are reflected.

**Recommendation 4.2:** Additional strategies to improve the collection and transfer of identifying information and medical histories should be adopted into current standardized patient handoff procedures to better facilitate effective tracking, relocation and care of patients during a disaster.

## 5. Legislation/Policy Domain

**Recommendation 5.1:** The US Congress 2017 Bill S. 1834 “Protecting Seniors During Disasters Act” that recommends the establishment of a national advisory committee on activities related to disaster preparedness for older adults should include at least two older adults, those with geriatric care expertise and improved representation from the private sector.

**Recommendation 5.2:** Agencies with the Department of Health and Human Services (HHS) should provide change-funding guidance to allow Centers for Independent Living to use their contingency funds to provide food and water to their clients during disasters.

**Recommendation 5.3:** All states and/or local governments should support the implementation of tax-free emergency preparedness weekends during specific times of the year or in anticipation of a disaster. Items covered should include disaster/emergency supplies, such as batteries, portable generators, additional mobility aids (canes, walkers), hurricane shutters, rescue ladders, radios, and ice packs.

**Recommendation 5.4:** The Licensure Compact that provides multi-state licenses for nurses, physicians, and emergency medical service personnel should be adopted by all states.

**Recommendation 5.5:** All persons should be able to obtain at least a 30-day supply of emergency prescription medications prior to and during a disaster.

**Recommendation 5.6:** In alignment with the State of Florida’s “Environmental Control for Nursing Homes Rule”, all US nursing homes and assisted living facilities should be mandated to include additional contingencies in their emergency/disaster plans to ensure that, in the event of a power outage, temperatures are kept at reasonable levels to avoid the exacerbation of existing health issues among nursing home and assisted living facility residents.

## 6. Research Domain

**Recommendation 6.1:** There is a need to prioritize the creation and funding of research efforts to better support the development of a common framework for measuring the quality and levels of disaster preparedness among care institutions, organizations, paid professionals, community organizations, and other groups that work primarily with older adults and their unpaid caregivers during and after disasters.

**Recommendation 6.2:** There needs to be a more concerted effort in utilizing outcomes from existing evidence to support the planning, design, and refinement of more evidence-informed emergency/disaster preparedness interventions, policies, and regulations in support of older adults and unpaid caregivers, as well as organizations and care professionals that will be responsible for meeting their needs during and after a disaster.

- Published studies related to disaster preparedness and recovery should be made open access to strengthen knowledge translation and exchange that support improvements in disaster/emergency responses and recovery efforts across communities.

**Recommendation 6.3:** A network of disaster preparedness researchers to encourage partnerships in the ongoing evaluation of emergency/disaster preparedness interventions targeting older adults needs to be created. Network members should advocate for an increased focus on emergency/disaster preparedness research among the various societies or journals that they are members of.

## Background and Context

### The Current State of Disaster Outcomes for Older Adults in the United States

Natural and man-made disasters pose a great risk to public health and safety because of their ability to disrupt the functions of a population. Traditionally, disaster/emergency preparedness and response efforts have predominantly focused on the large-scale evacuation of persons to prevent harm; ways to provide basic shelter and nutrition; and how to control the spread of infectious diseases in densely populated settings (Mokdad, 2005). However, in 2005, the response to Hurricane Katrina highlighted the important existing gaps in disaster management for older adults (The White House Administration, 2006). Approximately half of all deaths resulting from Hurricane Katrina were among persons age 75 or older (Brunkard, 2008). Similarly, following Hurricane Sandy in 2012, CDC reported that close to half of those who died in the storm were ages 65 or older. Many of these older victims drowned at home or died from storm-related injuries (Center for Disease Control and Prevention, 2013).

The effects that disasters have on older adults rarely end once a disaster has ended. Interruptions to one's medical care, especially for those living with chronic conditions can cause increased morbidity and mortality in the months following a severe disaster. Despite the insufficiencies in disaster preparedness and response efforts that were highlighted by the events of Hurricanes Katrina and Sandy, older adults continue to experience a greater proportion of disaster-related mortality rates, disaster-related declines

in health, while continuing to report lower rates of disaster preparedness (Al-Rousan et al., 2014; Brunkard, 2008; Cherniack, Sandals, Brooks, & Mintzer, 2008; Gibson & Hayunga, 2006; Kosa, Cates, Karns, Godwin, & Coppings, 2012; Mokdad, 2005).

As the baby boomers continue to age, it is expected that the population of older adults will double from 46 million in 2016 to over 98 million by 2060, making older adults the fastest-growing age group in the United States (Mather, 2016; United States Census Bureau, 2011). This exponential growth in the population of older Americans will increase the demand for disaster/emergency services to meet the disaster preparedness, response and recovery needs of these individuals at greater risk for negative outcomes. The need for more age-friendly disaster/emergency services is further supported by the expected increase in the frequency and severity of weather events (Field, Barros, Dokken, Mach, & Mastrandrea, 2014). In 2017, weather and climate-related disasters reached historic levels in the United States. Communities nation-wide were affected by a variety of weather and climate disasters, including wildfires, three category-4 hurricanes, eight severe storms, two inland floods, crop freeze, and drought (Smith, 2018). As the frequency and severity of disasters continue to increase, ensuring the safety of older adults will require greater efforts in the overall area of disaster management for this growing population.

Disaster-related literature further highlights the socioeconomic factors that make older adults more vulnerable to experiencing adverse

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outcomes during and after a natural disaster, and the insufficiencies present among various levels of emergency management. Particularly, older adults have been found to experience more adverse outcomes during a disaster compared to their younger counterparts due to their complex and individualized capabilities and challenges. As one gets older, age-related changes begin to take place, such as an increased chance of having a chronic health condition or multi-morbidity, living in social isolation, and experiencing declines in sensory, cognitive and physical functioning (Aldrich & Benson, 2008). While these changes are often sufficiently managed in an older adult's day-to-day life, disasters can impose additional barriers to accessing resources and supports, putting older adults with complex needs at an increased risk of harm.

Disaster management for older adults can be further weakened by healthcare professionals' low levels of disaster and geriatric education and training (Pesiridis, Sourtzi, Galanis, Kalokairinou, 2014; Scott, 2010; Wyte-Lake, 2014); limited provision of community-based disaster training programs for older adults and their unpaid caregivers; and statutes and regulations that impose barriers to individual preparedness and lack a standardized approach to disaster preparedness nation-wide.

To address this gap in disaster preparedness, members of the American Red Cross Scientific Advisory Council and the American Academy of Nursing Policy Expert Round Table on Emergency/Disaster Preparedness for Older Adults agreed to collaborate in conducting a

scientific review of the latest evidence, current available legislation and policies, in order to develop a set of recommendations to improve disaster-related outcomes for older adults. This review aimed to determine the factors that make older adults and their unpaid caregivers more vulnerable to adverse outcomes during disasters, identify existing gaps in disaster management within the public and private sectors, and present successful interventions that could be used to develop evidence-informed recommendations.

During the development of this white paper and its evidence-informed recommendations, members of the American Red Cross (ARC) Scientific Advisory Council (SAC) and the American Academy of Nursing (AAN) hosted a Policy Expert Round Table on Emergency/Disaster Preparedness for Older Adults (Policy Expert Round Table) in June, 2018, in Washington, DC. The Round Table brought together 15 experts from a variety of fields, including social work, education, research, health policy, emergency management, geriatrics, and nursing. The Policy Expert Round Table used a consensus decision-making process to critique the existing scientific evidence that was retrieved during the scientific review, and, with the application of its members' collective expertise, provided an evaluation of and unanimous support for the development of evidence-informed expert recommendations.

This report's reference panel and its related organizations have endorsed 25 final recommendations that aim to implement disaster preparedness-related changes among the following relevant emergency management

domains: 1) individuals and unpaid caregivers; 2) community services and programs; 3) healthcare professionals and emergency response personnel; 4) care institutions and organizations; 5) legislation/policy; and 6) research.

## **Report Recommendations Development Approach**

### **Initial Scoping Review and Development of an Ecological Analytical Framework**

The American Red Cross Scientific Advisory Council and the American Academy of Nursing Policy Expert Round Table on Emergency/Disaster Preparedness for Older Adults began an initial scoping review of the age-related factors that make older adults more vulnerable to adverse outcomes during and after a disaster. For the purpose of this research, a disaster was defined as a natural or man-made phenomenon that causes interruptions to loss of life. Disasters based on this definition included the following: floods, hurricanes, tornadoes, nuclear explosions, and complex disasters. Disasters arising from biological and chemical agents, and terrorism were excluded.

Older adults were found to be more vulnerable to adverse outcomes during and after disasters due to an increased prevalence of chronic health conditions, physical, cognitive and sensory disabilities, weak social networks, accessibility and equity issues, and limited financial resources. This literature review also identified older adults and unpaid caregivers, community services and programs, healthcare professionals and emergency response personnel, care institutions

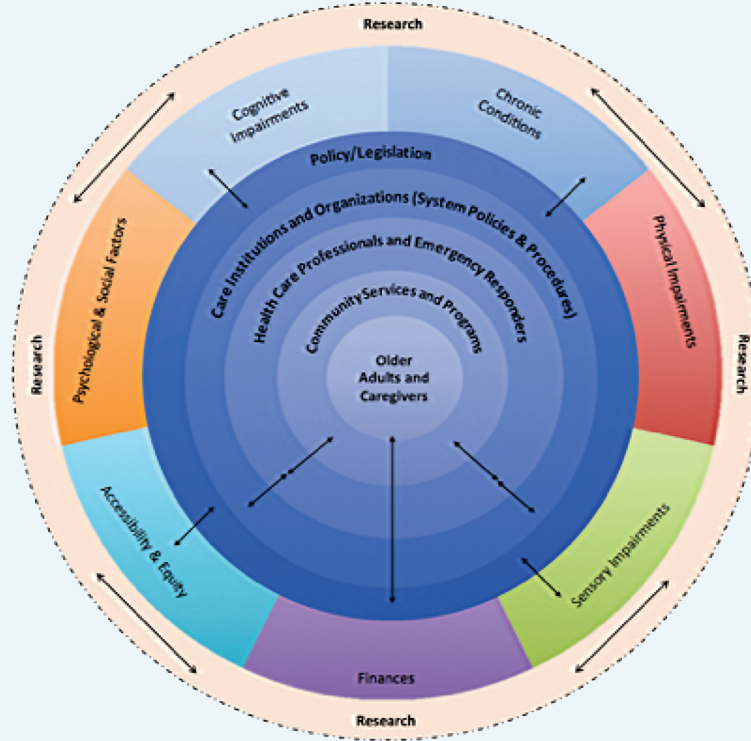
and organizations, policy/legislation and research as the relevant domains that contribute to disaster/emergency management for older adults.

Adequate disaster preparedness was found to depend on synergy among relevant disaster management domains in order to mitigate the factors creating increased vulnerability among older adults to disasters. Surrounding five of the six emergency management domains, and the seven factors of vulnerability, is the domain of research because it can identify and help to fill the existing gaps in knowledge and behavior. Bronfenbrenner's Ecological Framework was adapted to illustrate the interacting relationship of the seven factors of vulnerability and the six disaster management domains identified (Figure 1).

### **Systematic Review Process**

A subsequent systematic review was conducted to examine existing gaps in disaster preparedness among the six previously identified disaster management domains for older adults (see Figure 1) and to determine successful interventions. The findings were used to develop evidence-informed recommendations to better address outstanding issues identified within each domain. The search was guided by the six research questions listed below.

**Figure 1.** Adapted from: Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, 32, 513–531



## 1. Individuals and Unpaid Caregivers Domain

**What are the factors that make older adults more vulnerable to adverse outcomes during a disaster compared to younger adults?**

- 1.1 Are there age and/or function-related factors that make older adults more vulnerable to adverse outcomes compared to younger adults?
- 1.2 What is the incidence of psychological distress among older adults following a disaster compared to younger adults?

- Is there a difference in the incidence of psychological distress among older adults across different socio-demographic factors (education, income, race, and geography) following a disaster?
  - Is there a difference in the incidence of psychological distress among older adults with dementia, dementia-related disorders or other cognitive impairments?
- 1.3 Are there specific actions unpaid caregivers of older adults should undertake to minimize adverse outcomes of the older adults they care for during or after a disaster?



## 2. Community Services and Programs Domain

**What are the strategies and resources that can be leveraged at the individual (older adults and family caregivers) and community levels to improve disaster preparedness for older adults?**

- 2.1 Is there a need for more geriatric-focused supportive care strategies to better prepare older adults and/or family caregivers for disasters?
- 2.2 Are conventional disaster preparedness resources effective at facilitating knowledge acquisition and behavioral change among older adults and/or family caregivers with low literacy skills, or among those who are not fluent in English or Spanish?
- 2.3 What are the most effective formats that can be used to communicate guidance on preparedness, warning messages, and messages on how to access recovery resources in times of pending disaster among older adults and/or family caregivers?
  - What types of community/not-for-profit-led interventions can be implemented to facilitate positive recovery outcomes for older adults and/or family caregivers following a disaster?
- 2.4 What are the recovery resources required to mitigate adverse outcomes for older adults and/or family caregivers following a disaster?

## 3. Healthcare Professionals and Emergency Response Personnel Domain

**What are the strategies and resources that can be leveraged to improve disaster response among healthcare professionals and emergency response personnel?**

- 3.1 Is there a need for increased use of geriatric-focused triage care strategies when assessing the needs of older adults before or during disasters?
- 3.2 What are the age- and function-specific training methods that healthcare professionals and emergency response personnel should follow when caring for and assisting older adults with varying capabilities and limitations during a disaster?
  - What are the most effective methods to teach age- and function-specific education to facilitate knowledge acquisition and behavioral change?
- 3.3 What are the recovery resources required to mitigate adverse outcomes for older adults following a disaster?

## 4. Care Institutions and Organizations Domain

**What are the strategies and resources that can be leveraged at the organizational or institutional levels to improve disaster preparedness and recovery efforts for older adults?**

- 4.1 Is there a need for more geriatric-focused supportive care strategies or design elements to better prepare organizations or institutions

(disaster relief agencies and shelters) that may be required to provide care for older adults during or after disasters?

## 5. Legislation/Policy Domain

**Are there pieces of legislation or policies that have been developed or adopted at the municipal, state or federal levels to improve disaster preparedness and recovery efforts for older adults?**

- 5.1 Is there evidence that shows the effectiveness/ positive impact of any particular piece of legislation or policy?
- 5.2 Is there any evidence to suggest any existing legislation or policy may contravene what existing evidence would support?

## 6. Research Domain

**What research or evidence gaps have been noted in the literature that could better inform efforts to improve disaster preparedness and recovery efforts for older adults?**

### Search Strategy and Study Selection

The search for academic literature was restricted to databases with literature relevant to the fields of medicine, public health, nursing, and healthcare, which included PubMed, MEDLINE, Google Scholar, AgeLine, Global Health, HealthStar, UpToDate, Clinical Key, EBSCOhost, and Scopus. The databases were accessed from June, 2017, to June, 2018. The reference lists of relevant articles were also manually searched. The search was restricted to articles that were published between 2008 and 2018 in English.

The titles and abstracts of the populated articles were screened to identify peer-reviewed articles that were eligible for a full text review. Articles were selected based on the following inclusion criteria: titles and abstracts that contained search terms or content relevant to disaster management outcomes for one of the six identified domains. Relevant populations of older adults included those that live in assisting life facilities, nursing homes, independently at home, and those that are homebound or homeless. There were no geographic restrictions for the study population. All articles that met the inclusion criteria were saved in the reference manager Mendeley for future review and referencing. Legislative and policy documents were retrieved using Google.

This research strategy yielded a total of 826 peer-reviewed journal articles, 56 of which met the inclusion criteria for data extraction, in addition to five legislative documents (see Appendix A). Review of the findings led to the generation of an initial set of draft recommendations that were then reviewed and discussed as a part of a consensus decision-making process.

### Consensus Decision-Making Process

In June 2018 the American Red Cross (ARC) Scientific Advisory Council (SAC) and the American Academy of Nursing (AAN) Policy Expert Round Table on Emergency/Disaster Preparedness for Older Adults hosted a Policy Expert Round Table on Emergency/Disaster Preparedness for Older Adults (Policy Expert Round Table) to evaluate the findings of our scientific review and the feasibility of the proposed recommendations.

To facilitate an evaluation of the recommendations and potential remaining gaps in disaster preparedness, a consensus decision-making process was adapted for the Policy Expert Round Table because it is an effective method of facilitating a collective contribution to a solution or intervention by encouraging dialogue, with the aim of considering and addressing the opinions and concerns of each of the participating experts (Seeds for Change, 2010). **Consensus decision-making** is a problem-solving process that aims to develop solutions that are supported by all the contributors. This is in contrast to voting processes, which generate solutions that reflect and satisfy the opinions of the majority of the contributors, but not the entire group (Seeds for Change, 2010).

Nineteen experts were invited to participate in the Policy Expert Round Table; however, only 15 participants were able to attend. The final group consisted of experts from a variety of backgrounds related to disaster preparedness for older adults, including social work, education, public health, or public health research, health policy, emergency management, geriatrics, and nursing. To better facilitate engagement in the topic during group discussions, all the participants were emailed a copy of the summary of evidence tables from the systematic literature review. This gave the participants an opportunity to become familiar with the findings that were used to formulate the initial recommendations, and guide any external research of their own which could later be used in discussion and amendments to the recommendations.

To begin the decision-making process, the existing issues related to disaster preparedness, and the proposed recommendations for intervention, were introduced and explained to all the participants in one large group. This gave the participants an opportunity to briefly review the methodology, a summary of evidence tables (see Appendix C) and the recommendations for intervention. The recommendations were divided into six sections based on the emergency management domains that were determined to be responsible for adopting or enforcing a given recommendation.

After reviewing the supporting documents, two rounds of breakout sessions divided the participants into three groups consisting of five experts per group. Breakout session one was used to review the list of recommendations for individuals and unpaid caregivers, community services and programs, and healthcare professionals and emergency response personnel. Breakout session two was used to review the list of recommendations for care institutions and organizations, legislation/policy and research. Participants were able to select which breakout session groups they wanted to be placed in by indicating their preferences during the week prior to the Policy Expert Round Table. Since there were 15 participants and six sets of recommendations, each panellist participated in one recommendation discussion per breakout session. In their discussion groups, each participant was asked to consider the following discussion questions when reviewing the recommendations:

- What issues/topics related to this area are missing from the evidence available?

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- Are the current recommendations adequate to address the issues related to this area?
  - What further additions/edits do you suggest to the current recommendations and why?

The goal of the research questions was to facilitate discussion regarding the feasibility of the recommendations and whether or not the proposed recommendations were thought to be able to sufficiently address the current gaps in disaster preparedness, response and recovery for older adults. Breakout sessions one and two were conducted for a duration of one hour which gave the experts an opportunity to provide their comments and critiques on the initial recommendations, make amendments to the initial recommendations, or propose additional recommendations that were not included in the initial draft. The time allocated to the breakout sessions were also used to discuss and reach consensus on issues related to comprehension and syntax of each of the recommendations that were delegated to a specific group. A consensus was required before new recommendations were added to the list, or omissions or amendments were made to the initial recommendations. If participants reached a point of disagreement within their group, facilitators probed participants for additional comments, clarification, justification or new approaches to problem-solving in order to reach a consensus within the group.

After the participants reviewed all the recommendations in their breakout groups, the Policy Expert Round Table concluded with a final face-to-face meeting with all 15 participants. This meeting gave each breakout group an opportunity to present the final copy of their proposed recommendations drafted from the outcomes of their discussions, and also provided the participants who were not present in the remaining two groups an opportunity to discuss the feasibility of these recommendations as well. Review of the recommendations by the panel led to the generation of 25 evidence-informed recommendations that aim to reduce the occurrence of adverse disaster-related outcomes for older adults by increasing disaster preparedness among individuals and unpaid caregivers, and leverage appropriate disaster-related resources and strategies among the remaining disaster management domains.

In August 2018, a draft of this report was sent to all attendees of the Policy Expert Round Table, and additional experts and organizations who were not able to attend the Policy Expert Round Table. This gave all attendees another opportunity to provide final critiques of the recommendations, and all non-attendees an opportunity to contribute feedback to the recommendations. The combined contribution of the two rounds of review ultimately generated the 25 final recommendations presented in this white paper.

## Domain 1: Individuals and Caregivers

Older adults, particular those who are living with chronic health conditions, are low-income and/or have low literacy skills, tend to disproportionately experience greater adverse outcomes during disasters and emergencies. There is a clear opportunity to develop, implement and evaluate disaster/emergency preparedness and response activities at the individual level that can better improve knowledge and recovery outcomes for older adults and their caregiver(s).

An investigation of the vulnerabilities of older adults during disasters was guided by Research **Question 1: What are the factors that make older adults more vulnerable to adverse outcomes during a disaster compared to younger adults?** (see Development Approach). The search strategy that was used yielded 56 articles that met the inclusion criteria, 14 of which were used for data extraction related to this specific question. The review of these 14 articles revealed that older adults who are reliant on medications, and life-sustaining or assistive devices to support their health and well-being, have an increased risk for experiencing an adverse outcome during a disaster. Consequently, in response to this gap, nine evidence-informed expert recommendations were developed with the aim of increasing the levels of disaster preparedness among older adults with health- and/or function-related declines, and their caregiver(s).

### Recommendation 1.1

Older adults and their unpaid caregiver(s) should be provided with tailored, easy-to-access information related to emergency/disaster preparedness and guidance on how to develop customized emergency plans. Volunteers representative of older persons should be recruited

and involved in training material development and implementation, to ensure their voices and perspectives are reflected.

### Recommendation 1.2

Older adults who are reliant on mobility aids should remove or minimize barriers affecting their ability to evacuate, and should take steps to ensure their safety within their surroundings.

### Recommendation 1.3

If registries for people with functional and other needs, including persons with disabilities, have been established by local emergency response agencies, older adults and/or their unpaid caregiver(s) should register so they can be assisted/supported efficiently during emergencies/disasters.

### Recommendation 1.4:

Older adults who have a sensory impairment, such as a visual or hearing impairment, should take additional precautions to prepare themselves for emergencies/disasters.

### Understanding the Unique Personal and Functional Needs of Older Adults During Disasters

During a disaster, or while sheltering-in-place, an older adult's access to the support services that they require to maintain their overall quality of life and independence, such as home care and community services, can be disrupted. These circumstances can be further challenged by a lack of age-friendly services, a lack of accommodations for older adults at relief shelters, and concerns around pet safety and evacuation. Indeed, households who own pets are less likely to evacuate than those without pets. This is likely because people are concerned that they will not be

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evacuated with their pets, which is often cited as one of the main contributors to why people do not evacuate during disasters or emergencies (Benson, 2017; Whitehead, et al., 2000).

A survey conducted in a Medical Special Needs Shelter that housed 199 evacuees during Hurricane Gustav in 2008 reported that some of the services and aids provided at the relief shelter did not meet the functional and/or health-related needs of the evacuees, such as a lack of provision of “diabetic” friendly foods, having to wait for 15 to 30 minutes to check in, and having to sleep on cots that were reported to cause back pain or were difficult for older evacuees to use because they were too low to the ground (Missildine et al., 2009). Many evacuees also required and received assistance with walking, medications, and respiratory machines (Missildine et al., 2009). The conditions in the Medical Special Needs Shelter in Tyler, TX, illustrate the importance of providing older adults with the tools and services they need to be better prepared for the health and quality of life challenges associated with disasters.

One of the many strategies that can be leveraged to improve disaster preparedness among older adults is to encourage self-preparedness through the provision of easy access to disaster preparedness educational materials and planning guides. Many health and safety organizations currently provide access to online emergency preparedness resources, such as the Ready Campaign, developed by the Department of Homeland Security (DHS) (Department of Homeland Security, 2018), which provides printer-friendly preparedness booklets specific to a variety of disaster types and links to additional community resources. While many of these resources aim to encourage older adults to prepare for a variety of disasters, they fail

to address solutions to overcome the unique challenges that many older adults face when preparing for, responding to, and recovering from a disaster.

To address this current gap in disaster preparedness guides for older adults, **Recommendation 1.1** aims to encourage older adults and their unpaid caregivers to be particularly mindful of their functional and health-related needs when developing a disaster/emergency plan. By encouraging older adults and their unpaid caregivers to take an initiative in evaluating their needs and developing appropriate plans to accommodate their expected challenges, this can help older adults to be more self-reliant when responding to an emergency/disaster or provide the additional resources needed to help emergency response personnel better assist older adults with functional limitations. For example, older age is often associated with a decline in motor functioning which can put older adults at risk of harm if they are unable to access their daily assistive devices, such as walkers and wheelchairs, or their unpaid caregivers during an evacuation (Bhalla, Burgess, Frey, & Hardy, 2015). However, as outlined in **Recommendation 1.2**, by preparing to overcome this barrier to evacuation by installing wheelchair ramps, evacuation chairs and/or arranging for home evacuation and transportation assistance from a family member, friend, or caregiver, older adults can independently ensure that they have developed a more effective emergency evacuation plan.

### **The Potential Role of Registries for People with Functional and Other Needs, Including Persons with Disabilities**

Registries for people with **functional and other needs, including persons with**

**disabilities**, are resources and an example of data sources that have been established in many municipalities to provide emergency response agencies with a reference of the functional needs of residents in a community to allow emergency responders to better serve them. While registries can act as a resource for quickly locating persons with functional or other needs, it is not being recommended as a primary source of assistance for older adults or emergency response agencies to prepare for and respond to disasters. This is because governments and aid agencies cannot guarantee that their assistance will be provided due to the high demands for response assistance during disasters, which limit the availability of these services. In addition, panel discussion of the limitations of registries identified that these registries have proven to be sometimes ineffective at identifying individuals in their target audience because many persons avoid registering out of fear of the stigmas associated with being labeled as ‘vulnerable persons.’ There was also concern that **registries** often instill the incorrect assumption that persons who have registered will be provided with priority assistance during a disaster.

In reality, severe disasters can be so resource restricting and demanding that assistive services cannot be guaranteed regardless of the severity of an individual’s condition or needs. With these limitations in mind, the panel arrived at a consensus that older adults who live in municipalities that have established registries should consider registering for this service, however, establishment of these registries should not be a requirement, as stated in **Recommendation 1.3**. Instead, it is intended that **Recommendation 1.1** through **Recommendation 1.9** will facilitate sufficient

self-preparedness at the individual level by providing the guidance needed to develop an emergency plan that is customized to meet the health and functional needs of an individual older adult.

### **Supporting Older Adults with Sensory Impairments**

Vision or hearing impairments can make it challenging for older adults to safely respond during a disaster, such as when navigating their surroundings at night or in an unfamiliar environment, or being able to effectively perceive emergency warnings (Cloyd & Dyer, 2010). While many preparedness resources already recommend that persons with sensory impairments make preparations to their environment that will make it easier for them to navigate in the event of a disaster, **Recommendation 1.4** proposes additional considerations to better prepare older adults with sensory impairments to respond to a disaster.

Older adults with hearing impairments may find it difficult to hear disaster updates, emergency instructions or communicate in a noisy environment (Banks, 2012; Cloyd & Dyer, 2010). To better assist older adults with a hearing impairment to communicate with emergency personnel, strategies should be adopted to help notify assisting personnel of their hearing impairment. Strategies include moving their lips without making a sound or pointing to their ear/hearing aid. An effective strategy for notifying others of their hearing impairment will help signal to assisting personnel that they should adjust their communication approach to better accommodate persons with a hearing impairment.

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Many emergency preparedness guides urge for the installation of alert devices and emergency plans that incorporate oral communication with support network members, however, these guides often neglect to provide recommendations specific to persons who are hearing impaired, and therefore may be unable to use traditional emergency devices. To tailor emergency communication plans to better meet the capabilities of persons with hearing impairments, non-verbal communication devices, such as text messages and teletypewriters should be adopted for communication. Since these communication devices do not depend on verbal communication, they can allow persons with hearing impairments to quickly and effectively contact support network members to ask for assistance, provide updates on their status and location, and better mimic everyday communication devices used by persons who are hearing impaired. Additionally, emergency plans that encourage the installation of alert devices that use lights or vibrations in addition to sound, such as bed shaker alarm devices, may be more effective at alerting persons with hearing impairments of an emergency than conventional alert devices that solely produce loud sounds when activated.

Persons who are visually impaired are likely to experience challenges in navigating their surroundings during an emergency, particularly in a poorly lit shelter or in unfamiliar places, which can cause them to respond more slowly to a disaster (Lamb & O'Brien, 2010). To help prevent a delayed response, assistive devices and strategies, such as mobility aids (canes, walkers) guide animals, or a buddy system should be incorporated into one's emergency/disaster plan to facilitate a faster response. To plan for

unexpected interruptions to evacuation, it is also recommended that older adults with visual impairments include alternative evacuation routes and transportation methods into their emergency plan. By tailoring their surroundings and their emergency plans to better meet their needs, older adults with sensory impairments can create a plan that will allow them to respond more quickly and effectively during disasters.

### **Recommendation 1.5**

Older adults who live with chronic health conditions should maintain a readily accessible list of their current medical conditions, treatments (medications, durable medical equipment, supplies and other healthcare needs), healthcare professionals, and emergency contacts including substitute decision makers (SDMs).

### **Recommendation 1.6**

Older adults who take medications should work with their healthcare professionals to ensure they have access to at least a 30-day supply of medications during an emergency.

### **Recommendation 1.7**

Older adults, and their unpaid caregivers, who are reliant on medical devices that require electricity, should ensure they have back-up power supplies in place, especially if required while sheltering-in-place.

- Older adults and their unpaid caregivers should contact their electricity company in advance to discuss their needs and ensure options for alternative power sources are available, especially addressing the need for access to power to charge cell phones and other mobile devices.



- Older adults and their unpaid caregivers should seek assistance with obtaining and maintaining an alternative power source at home, if required, such as when being required to move heavy equipment and fuel or in accessing these resources in rural locations and operating equipment.

### **Supporting Older Adults with Chronic Health Issues**

The resource-straining effects of severe disasters continue to threaten access to resources needed to support the complex needs of older adults with chronic health conditions during a disaster. Disasters can detrimentally affect one's health by creating power outages that can interrupt medical interventions that depend on electricity, such as life-supporting devices or medications that must be refrigerated during storage. During the Northeast blackout of 2003, New York City Emergency Departments (EDs) were flooded with persons who were forced to evacuate to EDs in order to access electricity to power their at-home medical devices, such as home ventilators, oxygen concentrators and medication nebulizers (Beatty, Phelps, Rohner, & Weisfuse, 2006).

During disasters, older adults can be restricted from accessing medications due to laws that prohibit the obtainment of at least a 30-day supply of disaster/emergency medications or shortages in medication supplies in emergency shelters. This issue was particularly highlighted in 2012 during Hurricane Sandy when the ED at Staten Island University Hospital experienced a surge in hospital visits for medication refills (Greentstein, Chacko, Ardolic, & Berwald, 2016).

Barriers to accessing electricity and medications can be detrimental to the health of older adults due to the high prevalence of chronic health

conditions, such as hypertension, high cholesterol, and diabetes within this subpopulation (National Council on Aging, 2018) **Recommendation 1.5** aims to encourage the creation and/or incorporation of a resource for identifying an individual's medical history into their preparedness plan by encouraging older adults to prepare an outline of their medical condition(s), medical treatment(s) and their healthcare professional(s) and emergency contacts for their disaster kit. Having a summary of their medical history will help older adults minimize disruptions to their care. In doing so, unpaid caregivers and healthcare professionals who may be unfamiliar with their conditions will have the medical information necessary to effectively support their health needs, or continue their care in the case of a medical emergency or after relocation to a care facility or relief shelter.

### **Improving Access to Necessary Medications During Disasters**

Shortages of essential medications can often lead to an exacerbation of a pre-existing chronic medical condition. To prevent running out of medications and subsequent surges in medication refill requests during disasters, as was experienced at the Staten Island University Hospital ED during Hurricane Sandy, and at relief shelters during Hurricane Katrina, **Recommendation 1.6** encourages older adults to work with their healthcare professionals to obtain access to a supply of disaster/emergency medications for their disaster kit. While it is acknowledged that only six states allow the obtainment of a 30-day supply of emergency/disaster medications, it is essential that older adults explore their possible options for obtaining additional supplies of medications when preparing for disasters (Ford, Trent, & Wickizer,

2016). Retrospective reviews of medical services provided during disasters repeatedly cite surges in medication refill requests as a leading cause of medical services (Currier, King, Wofford, Daniel, & deShazo, 2006; Greenstein et al. 2016; Jhung et al., 2007; Kraushar & Rosenberg, 2015; Ochi, Hodgson, Landeg, Mayner, & Murray, 2014 ). This high demand for prescription medications suggests that evacuees may benefit from reduced barriers to accessing medications during disasters across all states or more information on how to access disaster/emergency medication supplies prior to a disaster. It is important that older adults are provided with the resources to adequately self-prepare to support their pharmaceutical needs during a disaster.

### **Supporting Older Adults with Electronic Life-Supporting Devices**

To prevent interruptions to the supply of power to electronic life-supporting devices, as outlined in **Recommendation 1.7**, preliminary efforts should be made to contact the user's electricity company to inquire about priority service restoration during disasters to persons who have life-supporting devices at home, as well as alternative power sources that can be safely used at home. It should be noted that older adults may require assistance with obtaining and maintaining an alternative power source at home, such as when moving a generator and fuel, as well as accessing these resources in rural locations and operating them. During these instances, support network members may be a reliable source of assistance. By establishing plans to safely, effectively, and independently support the health of an older adult who is dependent on a life-supporting device during a disaster, scenarios that can lead to deteriorating health and hospitalizations can be prevented/avoided.

### **Recommendation 1.8**

Older adults should be encouraged to continually maintain an adequate local support network that can be called upon during impending disasters and unexpected emergencies, especially if they live alone or far away from relatives.

### **Developing and Maintaining a Personal Support Network**

Having a support network can greatly aid older adults in providing the emotional and tangible resources they need to reduce the stress of preparing for and surviving a disaster. Many older adults live without a spouse or a family member, and are more susceptible to social isolation and/or dependent on unpaid caregivers for assistance (Gibson & Hayunga, 2006). Dependence on the assistance of unpaid caregivers is so prevalent among older adults that 90 percent of adults who are 65 years or older and living with a disability report receiving assistance from unpaid caregivers, (Gibson & Hayunga, 2006) while approximately 50 percent of adults who are 85 years or older report living alone (Fernandez et al., 2002). An emergency or disaster can leave those that rely on daily assistance stranded and unable to care for themselves if rescuers and their caregiver(s) cannot reach them.

To reduce the negative impacts of social isolation, **Recommendation 1.8** advises all older adults to establish a support network they can depend on for assistance in preparing for and responding to all disasters relevant to their region. For older adults with chronic health conditions, each member of their support network should be able to provide basic support for their health, such as access to their medication list, and should have the knowledge needed to identify and operate all required medical equipment. It is intended that

by being able to provide basic support, support network members will be able to work together with the person they are caring for to provide the assistance needed to prevent interruptions to their medical care and avoid hospitalizations. It is also important that their support network consist of at least two people who live in close proximity to them because this will enable members to provide assistance within minutes, which will prevent prolonged periods of being incapacitated or stranded.

### **Recommendation 1.9**

Unpaid caregivers of persons with Alzheimer's Disease and Related Dementias should know how to identify signs of distress, anxiety, or confusion, and how to redirect their attention, or calm them down during these times. In addition, unpaid caregivers should be prepared to prevent wandering, and have resources to locate their care recipients if they do wander away during a disaster.

#### **Supporting the Unique Needs of Older Adults Living with Dementia**

A decline in working memory and an impaired ability to filter out irrelevant information are two changes in cognitive function associated with Alzheimer's disease and Related Dementias (ARD). These changes can impede the nearly 5.5 million older adults living in the United States who have Alzheimer's Disease (Alzheimer's Association, 2018) from identifying a disaster situation, following disaster preparedness recommendations, adapting to changes in their routine and environment or following emergency warnings and instructions. In addition, new behavioral problems can arise, existing behaviors can become exacerbated, or function can deteriorate rapidly, if there are interruptions to the

administration of dementia-related medications (Cloyd & Dyer, 2010).

Dementia can also be compounded by the occurrence of delirium. Delirium is a state of confusion that comes on suddenly and is characterized by an inability to think clearly and pay attention, as well as an unawareness of one's environment (American Delirium Society, 2015). The most common causes of delirium include infection, medications, electrolyte or blood sugar disturbances, hypoxemia, and low blood pressure (Cloyd & Dyer, 2010).

Since individuals with more advanced dementias require daily assistance from a caregiver to help them perform their activities of daily living (ADLs) and protect them from dangers, it is a necessity for their caregiver(s) to be educated about the unique precautions that should be taken to reduce the occurrence of adverse behaviors and outcomes for the person they are caring for during a disaster. In particular, unpaid caregivers should be knowledgeable about effective outlets for mitigating upset feelings, anxiety, wandering, confusion and agitation; how to return an agitated person to a calmer state; behaviors that should be avoided when communicating with older adults with ARD when they are displaying extreme reactions; and methods of communication that aid memory retention.

As an additional precaution, unpaid caregivers should register their care recipient for an emergency response service for persons with ARD (Dyer, Regev, Burnett, Fest, & Cloyd, 2008), such as the *Medic Alert+ Alzheimer's Association Safe Return* program (Dyer, Regev, Burnett, Fest, & Cloyd, 2008), to provide emergency response assistance if their care recipient wanders away.

## Domain 2: Community-Based Services and Programs

Community-based organizations and their staff are likely to be engaged in response and recovery efforts for older adults and their unpaid caregivers depending on the level to which their services and programs support older adults and their unpaid caregivers. Therefore, a clear opportunity exists to develop, implement and evaluate preparedness and response activities for Community-Based Services and Programs that can better facilitate knowledge translation and exchange within the community and increase levels of preparedness, response and recovery efforts and outcomes among designated populations and those personnel that have the responsibility to support them.

An investigation of existing community-based resources that can contribute to improving disaster preparedness, response and recovery outcomes for older adults was guided by Research **Question 2: *What are the strategies and resources that can be leveraged at the individual (older adult and family caregiver) and community levels to improve disaster preparedness for older adults? (see Development Approach).*** The search strategy that was used yielded 56 articles that met the inclusion criteria, eight of which were used for data extraction related to this specific question. The findings from these eight articles identified that there is a greater need for community-integrated preparedness and response services to encourage and facilitate increased levels of preparedness and support recovery. Consequently, in response to this gap, three evidence-informed expert recommendations were developed with the aim of addressing identified opportunities noted for community-based services and programs to better support disaster preparedness and response.

### Recommendation 2.1

Access to tailored community-based programs that educate older adults and their unpaid caregivers about disasters/emergencies that affect their region and how best to prepare for and respond to them should be increased.

#### **Improving Community-Based Disaster Self-Preparedness Educational Programs**

Many of the adverse outcomes that older adults face during and after a disaster can be avoided by simply being informed about the dangers associated with the disasters that could affect their region, the appropriate precautions they should take to keep themselves safe, and adopting behavioral changes that facilitate adequate self-preparedness. When interviewed about their self-perceived preparedness for disasters, older adults have been found to report low levels of preparedness. In a study that investigated nationwide preparedness of older adults, 23.6% of the 1,304 participants interviewed reported that they had a disaster/emergency evacuation plan, 24.8% did not have access to a car or other forms of transportation in case of an emergency, and 4.9% reported that at least one of their healthcare providers had discussed what to do during a disaster with them (Al-Rousan, Rubenstein, & Wallace, 2014).

To increase the low levels of disaster preparedness found in the general public, community-based disaster preparedness training courses have been piloted and found to be effective tools for encouraging behavioral change. PrepWise is a disaster preparedness program designed to assist older adults in developing a tailored home-based disaster preparedness plan (Catizone, 2017). During the training sessions, the participants were guided through seven learning modules: (1)

knowing types of emergencies and what to do, (2) vulnerability assessment (alerts/warnings, evacuations, transportation, communication, sheltering, personal care, and medical care and equipment), (3) developing a personal emergency support network (formal list of family/friends and local community members), (4) making an emergency plan, (5) keeping a supply of medications, (6) making an emergency supply kit, and (7) making home, school, work, and car travel safer (Ashida, Robinson, Gay, Slagel, & Ramirez, 2017). Upon follow up, it was reported that enrollment in the PrepWise program led to a greater understanding of disaster preparedness requirements, such as preparing an emergency kit and designating alternative shelters to be used in the event of an emergency (Ashida et al., 2017; Ashida, Robinson, Gay, & Ramirez, 2016). The PrepWise program was also found to encourage participants to seek out additional emergency support network members to whom they could “turn to for help and guidance in an emergency” and/or “[who] they would come to for assistance” (Ashida et al., 2017).

Similar successes in using community-based disaster preparedness training sessions were also found with the Ready CDC disaster preparedness education program, which was designed to increase knowledge, influence attitudes and strengthen community resiliency. Ready CDC uses the following tactics: (1) gain attention, (2) present stimulus material, (3) provide learning guidance, (4) elicit performance and provide feedback, and (5) enhance retention and transfer to facilitate behavioral change (Thomas et al., 2018). When levels of behavioral change through the Trans-Theoretical Model (TTM) were evaluated within a sample of 212 CDC staff and public health employees who had completed the Ready CDC

disaster preparedness education program, 44 percent of enrollees progressed to at least one stage higher or remained at the “maintenance” stage for assembling an emergency kit, and 45 percent of participants progressed to at least one stage higher or remained at the “maintenance” stage for developing a written disaster plan (Thomas et al., 2018). In addition, during follow up, the 25 percent, 27 percent, and 43 percent of participants in the “pre-contemplation”, “contemplation”, and “preparation” stages at baseline for assembling an emergency kit, respectively, were identified as having progressed to the “preparation” stage (Thomas et al., 2018).

These results suggest that community-based disaster preparedness sessions are effective methods for conveying disaster preparedness information to the public and facilitating behavioral change. Recommendation 2.1 outlines a strategy for the development of nation-wide community-based disaster preparedness education programs for older adults. The program’s content should include, but not be limited to, modules about the different types of natural and man-made disasters that affect a given region, the effects and associated dangers of these disasters, as well as guidance on how to perform a personal vulnerability assessment, how to make an emergency plan and kit, the importance of developing and maintaining a social support network, and strategies and resources to aid recovery. The program should also aim to achieve accessibility for persons with lower literacy skills, non-English and non-Spanish speakers, and the incorporation of age-friendly considerations into its structure, such as the distribution of emergency kits that are easy to transport, if applicable. Community-based emergency preparedness training classes that have

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been adapted to address the unique needs of older adults should maximize the positive impact they have among older adults.

### **Recommendation 2.2**

Programs that provide essential community services, such as Meals on Wheels, and assistance with daily living activities for older people (financial, medical, personal care, food and transportation) should develop plans and protocols related to responding adequately to the needs of their clients during emergencies/disasters.

#### **Better Leveraging Community Support Services to Aid in Disaster Response Efforts**

Community-accessible resources have been found to be associated with facilitating higher levels of preparedness among older adults. In a 2017 study that examined the socio-demographic factors that influence levels of emergency preparedness among persons 50 years and older, participants who discussed emergency plans with their physician were more likely to be prepared than older adults who did not (Killian, Moon, McNeill, Garrison, & Moxley, 2017). Similar to physician visits, community agencies and programs that have a significant proportion of older users could act as an accessible portal for encouraging older adults to access disaster preparedness and recovery aids and services.

An additional benefit to incorporating disaster preparedness and recovery efforts into the scope of services provided by community agencies and programs is the additional social support that these resources can provide. In interviews conducted with older adults in New Jersey who experienced extensive levels of emotional, social, and financial challenges after Hurricane Sandy,

the social support they received from neighbors was identified as being critical for facilitating their physical and emotional recovery. Reported examples of support provided during and after Hurricane Sandy included distributions of evacuation notices, assistance with cleaning up after the hurricane, provision of food and help accessing shelters and hotels (Heid, Schug, Cartwright, & Pruchno, 2017). Similarly, to facilitate a holistic recovery, community services could provide further social support, in addition to tangible resources, particularly for older adults who have been identified as having limited or no social support.

### **Recommendation 2.3**

Local governments should leverage data sources such as registries that identify vulnerable groups to enable emergency responders to more easily prioritize their search and rescue efforts following a disaster or emergency.

#### **Enabling the Development of Repositories of Data Sources to Support Local Government Disaster Response Efforts**

During the panel discussion, experts recognized that while many registries of people with functional needs including persons with disabilities exist for and are easily accessible to municipal authorities, they can be difficult for state authorities to access. To increase the efficiency and identification of at-risk persons by emergency response personnel, it is recommended that local governments create a repository of their data sources. The establishment of a repository of data sources will act as a singular, easy-to-access reference to facilitate a fast-integrated response from neighboring, state or federal emergency assistance services. For example, it is intended that providing all national and local aid agencies

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with a repository of data sources such as available registries will help to facilitate the cooperation of different aid agencies to provide the work force needed to assist with evacuations, distribute disaster supplies and provide medical care.

## Domain 3: Healthcare Professionals and Emergency Response Personnel

Response and recovery efforts for older adults can vary depending on the level of training of emergency healthcare providers, emergency response personnel and other potential first responders. Healthcare professionals indeed play a critical role in disaster preparedness and response because they are often the first point of contact for health-related guidance and care.

An investigation of the levels of disaster-related competency for healthcare professionals and emergency response personnel was guided by **Research Question 3: *What are the strategies and resources that can be leveraged to improve disaster response among healthcare professionals and emergency response personnel?*** (see Development Approach). The search strategy that was used yielded 56 articles that met the inclusion criteria, nine of which were used for data extraction related to this specific question. The review of these nine articles revealed that some healthcare professionals feel insufficiently prepared to provide appropriate care for older adults during disasters. To address this gap, two evidence-informed expert recommendations were developed with the aim of augmenting training courses for healthcare professionals to include additional geriatric-related considerations for assisting and caring for older patients and residents during and after a disaster.

### **Recommendation 3.1**

Healthcare professionals and emergency response personnel should receive training on providing geriatric care relevant to their discipline and how best to assist older adults and their unpaid caregivers during disasters.

### **Improving the Knowledge and Skills of Healthcare Professionals in Geriatric and Disaster Healthcare Principles**

Obtaining training in geriatric care is essential to ensuring that healthcare professionals are aware of the unique needs of older adults and how best to assist them, particularly during situations when they may be required to provide care during a disaster. In a report by Karen V. Lamb, *An Overview: Disaster Preparedness for Gerontological Nurses*, the author identifies that cognitive impairment associated with dementias can be exacerbated during an emergency and produce feelings of confusion and delirium. It is recommended that healthcare professionals and emergency response personnel be knowledgeable about how best to assist older adults in these situations. Lamb also emphasizes the need for nurses to be aware of the risks of providing care during a disaster. Treatment can become a challenge because there is a possibility that medical records or resources, such as medications, oxygen, and dialysis, may not be available (Lamb & O'Brien, 2010). When combined with stress, limits to basic supplies, medications, and extreme changes in temperature, emergency/disaster situations can greatly exacerbate medical conditions and limit access to care interventions (Ardalan et al., 2010).

Considering that 80 percent of older adults have at least one chronic health condition requiring medication and sometimes medical equipment, medical professionals should be knowledgeable about alternative and effective methods for managing chronic conditions, and how to play an active role in disaster preparedness planning strategies at their local shelter or other temporary emergency care facilities. Therefore, emergency



response personnel should be knowledgeable about conditions that are more likely to affect older adults, and how to effectively interact with or assist persons also living with dementia if they become agitated, confused, anxious or wander away.

One resource available online for healthcare entities, healthcare providers and emergency managers and personnel is the United States HHS Office of the Assistant Secretary for Preparedness and Response (ASPR) Technical Resources, Assistance Center and Information Exchange (TRACIE). This exchange allows providers to access tools and resources that enable them to be better prepared for disaster management, and also facilitates providers to connect with their peers to seek help and exchange advice over disaster preparedness and management issues (Brown et al., 2013). For a list of more resources available to healthcare providers and emergency personnel, please refer to Appendix D.

### **Recommendation 3.2**

Healthcare professionals and emergency response personnel should strive to mitigate psychological distress among older adults during and after disasters by making an effort to assess the psychological well-being of older adults and provide appropriate treatments as needed.

#### **Better Addressing the Mental Health Needs of Older Adults During Disasters**

While there is a preconceived notion that older adults are more emotionally fragile than younger adults, there are mixed reports about an existing difference in the incidence of psychological distress among older adults compared to younger

adults following a disaster, which has indicated that older age may be a protective factor.

When investigating potential differences in the onset of psychological disorders following natural and man-made disasters among older adults compared to younger adults, anxiety and depressive symptoms have been found to not have a significant difference in incidence rates among older adults compared to younger adults (Parker et al., 2016; Siskind et al., 2016). However, differences were found in the incidence of post-traumatic stress disorder (PTSD). In a 2016 study conducted by Parker and colleagues, PTSD was found to have a significantly greater incidence among older adults compared to younger adults, similar results were also found by Jia et al. (2010) who reported a greater prevalence of PTSD symptoms among a sample of survivors of the 2008 Sichuan earthquake. Conversely, Siskind and colleagues (2016) found that older adults were 2.85 times less likely to experience PTSD symptoms compared to younger adults in a meta-analysis of the mental health outcomes of older adults following human-induced disasters. However, differences in the onset of psychological distress among persons of different socio-demographic statuses have also been reported. Obtaining less than a high school education and/or a bachelor's degree, being unemployed or becoming unemployed due to the event of a disaster, living in social isolation, or witnessing three or more events associated with a disaster depression and PTSD. (Blackmon, Lee, Cochran, Kar, Rehner & Baker, 2017; Ruskin, Rasul, Schneider, Bevilacqua, Taioli, & Schwartz, 2018; Welch, Caramanica, Maslow, Brackbill, Stellman & Farfel, 2016).

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Overall, while findings suggest that extensive additional resources do not need to be directed towards protecting the psychological well-being of older adults from disasters, it is still recommended that healthcare professionals make greater efforts to assess the psychological well-being of older patients during and after a disaster and provide appropriate treatments in order to provide early interventions for the existing proportion of older adults that do develop a psychological disorder. Greater emphasis should also be given to assessing the psychological well-being of older adults who satisfy at least one of the many socio-demographic factors that have been linked to a greater likelihood of developing a psychological disorder during or after a disaster.

## Domain 4: Care Institutions and Organizations

Care institutions and organizations that are responsible for the livelihood of their residents or patients during a disaster must make decisions that will support the health and well-being of their residents/patients. During disasters such institutions and organizations should, for example, know when it is appropriate to evacuate or shelter-in-place and what to do in each case.

An evaluation of the quality and levels of disaster preparedness within care institutions and organizations was guided by Research Question 4: ***What are the strategies and resources that can be leveraged at the organizational or institutional level to improve disaster preparedness and recovery efforts for older adults?*** (see Development Approach). The search strategy that was used yielded 56 articles that met the inclusion criteria, 18 of which were used for data extraction related to this specific question. A review of these 18 articles revealed that greater action can be taken to prevent threats to an older patient's/resident's health that can arise when severe disasters disrupt the operations at care institutions and organizations, as well as patient handoff procedures. Consequently, in response to this knowledge gap, two evidence-informed expert recommendations were developed with the aims of increasing the levels of disaster preparedness knowledge among healthcare professionals and care facility staff, as well as better facilitating effective patient hand-off during a disaster.

### **Recommendation 4.1**

Care institutions and organizations should include emergency/disaster preparedness and response education in their routine personnel training courses.

- Multi-modality educational tools and practices should be used to better facilitate knowledge acquisition and behavioral change.
- Volunteers representative of older persons should be recruited and involved in training material development and implementation, to ensure their voices and perspectives are reflected.

In a 2012 study by Roush and Tyson that assessed the knowledge of disaster preparedness among nurses enrolled in a community-accessible disaster preparedness workshop, many of whom were employed at a nursing home, found that the majority of participants had no formal disaster planning and response training and many reported low or no proficiency ratings in disaster preparedness knowledge (28%). After completion of the workshop, the proficiency ratings increased to 76% and the majority of participants reported that they planned on including portions of the content from the workshop into courses for students, colleagues and/or patients (Roush & Tyson, 2012). The findings from this study suggest that some healthcare professions working within and outside of a geriatric healthcare setting would benefit from additional training in their knowledge of how to respond to disasters and care for older adults during these times (Lamb & O'Brien, 2010).

To address this gap in education and improve disaster management in hospitals, the New York City Department of Health and Mental Hygiene (NYC DOHMH) developed the Elderly Populations in Disasters: Hospital Guidelines for Geriatric Preparedness toolkit. The toolkit outlines training in geriatric care for healthcare professionals that includes guidelines for managing geriatric patients, common age-

related misdiagnoses, when to obtain a geriatric medicine consultation and appropriate dosages for common psychiatric medication for frail elderly, as well as the development of reference charts to help make appropriate medical assessments for older adults during disasters (Ahronheim, Arquilla, & Greene, 2009). Given that this toolkit provides a focus on geriatric-specific care needs to hospitals aiming to address a variety of circumstances common among older adults during disasters, it may be beneficial for all care institutions and organizations to develop similar emergency toolkits based on the services that their organization provides.

When teaching healthcare professionals and hospital-based staff about disaster/emergency preparedness, multi-modality teaching methods have been found to be an effective tool. A 2016 study by Collander and colleagues examined the efficiency of a multi-modality disaster preparedness training course for hospital-based healthcare professionals, called Hospital Disaster Life Support (HDLS) (Collander et al., 2016). The program was taught using lectures, disaster exercises (that is, pneumonia and bomb simulations), skills sessions and tabletop sessions. Upon assessment of the participants' changes in knowledge acquisition and behaviors related to disaster preparedness, the results of a 1 to 5-point Likert scale, with 5 being the most favorable, showed that the mean response was 4.24. Comparisons of pre- and post-test scores revealed that all participants significantly improved their mean pre-test and post-test scores for disaster preparedness knowledge, the mean test score was 85% for the group.

Successes in increasing disaster preparedness knowledge using a multi-modality training course were also replicated by Scott and colleagues in 2010 in a disaster medicine course for medical students, and in a randomized control trial conducted by Pesiridis and colleagues (2015) that assessed the efficiency of a disaster medicine education course in improving knowledge and self-confidence related to disaster preparedness among a sample of nurses. These positive outcomes suggest that training sessions that utilize a multi-modality teaching approach can be an effective method for increasing disaster preparedness knowledge and self-confidence in demonstrating disaster procedures among a variety of healthcare professionals. Based on the competency domains of the reviewed disaster preparedness training courses, Recommendation 4.1 proposes that the content of future disaster preparedness sessions for healthcare professionals should include, but not be limited to, learning about the disaster incident command system (ICS), personal safety, disaster communications, personal protective equipment (PPE), triage (that is, simple triage and rapid treatment (SMART)), worker safety post-disaster, and extraction and patient transportation, mass decontamination, recognition and treatment of toxic syndromes.

### **Recommendation 4.2**

Additional strategies to improve the collection and transfer of identifying information and medical histories should be adopted into current standardized patient handoff procedures to better facilitate effective tracking, relocation and care of patients during a disaster.

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## **Improving Transitions of Care for Patients During Disasters**

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) requires all facilities to have a standardized approach to patient hand-off procedures, which adequately supports communication when patients are transported for diagnostic testing or procedures (Nursing, 2006). However, additional tracking strategies should be incorporated into traditional patient hand-off procedures to better facilitate patient/resident transfers during disasters. To prevent interruptions to treatment after relocation, both electronic-based and non-electronic-based methods should be used to facilitate successful delivery of patient identification and their associated medical history to the receiving organization after relocation.

Specifically, it is recommended that documents should include demographic characteristics, appearance specifications, and medical information. The inclusion of content specific to patient identification is intended to assist in matching patients to their medical histories in the event that their medical files are misplaced or to assist in identifying patients, particularly those who are unable to successfully do so themselves. Electronic-based tracking methods identified through a systematic review of patient tracking methods used internationally included electronic triage tags such as smart tags and other sensors to determine triage level, radio-frequency identification tags, and personal digital assistants (PDAs) for triage in these situations (Smith & McDonald, 2006).

A strong correlation was further noted between the impact of evacuations and increased hospitalization and mortality rates. This reiterates the critical need for care institutions to have disaster management plans, as well as robust transition of care plans for when patients need to be evacuated. It also emphasizes the importance of reviewing and updating these plans on a regular basis (Blanchard & Dosa, 2009; Dosa et al., 2010; Laditka, Laditka, Cornman, Davis, & Richter, 2009; Nomura et al., 2013; Thomas et al., 2012; Willoughby et al., 2017).

## Domain 5: Legislation and Policy

Federal, state and local governing bodies already all play a regulatory role in disaster preparedness and response by outlining and enforcing how, and to what extent, relevant bodies and organizations should contribute to more effective disaster preparedness and response efforts through their policy and legislative powers.

A review of existing gaps in disaster preparedness, response and recovery policies and pieces of legislation relevant to the outcomes of older adults was conducted. The investigation was guided by Research Question 5: Are there pieces of legislation or policies that have been developed or adopted at the municipal, state or federal levels to improve disaster preparedness and recovery efforts for older adults? (see Development Approach). The search strategy that was used yielded 56 articles that met the inclusion criteria. Seven articles and five legislative documents were used for data extraction related to this specific question. A review of the documents revealed that while some states have amended and implemented new policies/legislation in response to past experiences related to previous disasters/emergencies, recent policy and legislative actions continue to be highly inconsistent among various states and insufficient to support the essential needs of older adults consistently during disasters across the United States. Through the development of six policy/legislative evidence-informed expert recommendations, an opportunity to implement pieces of legislation that can better improve disaster outcomes for older adults is proposed.

### Recommendation 5.1

The US Congress 2017 Bill S. 1834 “Protecting Seniors During Disasters Act” that recommends

the establishment of a national advisory committee on activities related to disaster preparedness for older adults should include at least two older adults, those with geriatric care expertise and improved representation from the private sector.

### Improving the Representation at the National Advisory Committee Level

In 2017, Bill S. 1834 was introduced to amend title XXVIII of the Public Health Service Act to include the establishment of the National Advisory Committee on Seniors and Disasters (Protecting Seniors During Disasters Act, 2017). The Advisory Committee was intended to be established by the Secretary, with the consultation of the Secretary of Homeland Security and the Secretary of Veterans Affairs. The duties tasked to the Advisory Committee included evaluating and providing input on activities related to the medical and public health needs of older adults during all-hazard emergencies, and providing advice and recommendations to the Secretary with respect to older adults, medical and public health grants and cooperative agreements related to preparedness and response activities authorized under the Secretary. To ensure that the committee has the expertise required to better serve its designated tasks, Bill S. 1834 outlines a list of appropriate representatives that the committee should comprise; representatives identified on the Bill include: the Director of the Centers for Disease Control and Prevention (CDC), the Administrator of the Center for Medicare & Medicaid Services (CMS), the Administrator of the Federal Emergency Management Agency (FEMA), at least two non-federal healthcare professionals with expertise in medical disaster planning, preparedness, response or recovery

and representatives from other relevant Federal agencies, such as the Department of Energy and the Department of Homeland Security (DHS).

While it is recognized that establishing an Advisory Committee can act as an age-friendly consultation service for decision-makers working within the private and public sectors, the panel recommended that the list of required committee members be expanded to include at least two older adults, a greater representation from relevant private sector providers and geriatric care professionals (geriatricians, geriatric psychiatrists, gerontological nurses, social workers and pharmacists, and other geriatric care experts). Older adults have been found to play essential roles in policy development because they can provide insight on “salient barriers to active aging and options for post-natural disaster recovery and redevelopment that may not have been previously considered” (Annear, Keeling, & Wilkinson, 2014). In addition, Bill S. 1834 only recommends the inclusion of two private sector members and at least 12 public sector representatives. In order to reduce biases associated with public sector representatives and provide first-hand insight into the challenges faced by private agencies and organizations, the specifications of the committee members should be amended to promote an equal number of private and public sector representatives. Lastly, gerontologists can provide insight and guidance on common geriatric syndromes, such as dementia, delirium, and psychosis, as well as common areas that older adults may require assistance with, such as taking medications, mobility, understanding emergency instructions and accessing social support, which are commonly managed by geriatric healthcare professionals.

## **Recommendation 5.2**

Agencies with the Department of Health and Human Services (HHS) should provide change-funding guidance to allow Centers for Independent Living to use their contingency funds to provide food and water to their clients during disasters.

### **Supporting CILs to Better Support their Clients During Disasters**

As a preliminary action, participants in the Legislation/Policy discussion group proposed that agencies within the Department of Health and Human Services (HHS) should allow for the reallocation of contingency funding for CILs towards the purchasing of essential supplies in preparation for and during a disaster. This would provide residents of these facilities with easy and close access to the supplies they may need for sheltering-in-place or during an evacuation, especially if their supplies begin to dwindle during a disaster. Consequently, this may prevent unnecessary evacuations during emergencies when older adults can safely remain at home.

## **Recommendation 5.3**

All states and/or local governments should support the implementation of tax-free emergency preparedness weekends during specific times of the year or in anticipation of a disaster. Items covered should include disaster/emergency supplies, such as batteries, portable generators, additional mobility aids (canes, walkers), hurricane shutters, rescue ladders, radios, and ice packs.

### **Supporting Improved Self-Preparedness Activities**

When faced with the financial burdens associated with disasters, older persons repeatedly

experience less robust economic recovery than younger age groups (Fernandez et al., 2002). Younger age groups tend to financially recover better due to a greater likelihood of having insurance, higher credit values, greater financial savings, and their reduced likelihood of living at or near the poverty line (Fernandez et al., 2002). Older adults may use financial aid sources less than other age groups because they may not meet the qualifications for financial assistance, often due to having a fixed income or lack of employment. Furthermore, in cases where aid is received, it is often difficult to obtain money to replace uncovered losses, making older adults more dependent on support from charities and their Social Security benefits (Fernandez et al., 2002).

Tax-free weekends can act as an incentive for older adults to purchase resources for their disaster kit or provide the price reductions needed to help older adults with limited resources access these essential supplies. Currently, 16 states have implemented tax-free weekends, however, only three have included ‘weather related’ preparedness or ‘severe weather’ preparedness supplies as part of the selected items that are eligible for a tax break or tax exemption. To provide all older adults with access to reduced costs for disaster supplies, all states should adopt at least one tax-free weekend annually that includes temporary tax reductions on all essential disaster preparedness supplies. Supplies should include, but not be limited to, batteries, portable generators, mobility aids (canes and walkers), hurricane shutters, rescue ladders, radios, and ice packs.

## **Recommendation 5.4**

The Licensure Compact that provides multi-state licenses for nurses, physicians, and emergency medical service personnel should be adopted by all states.

### **Enhancing the Portability of Healthcare Professional Expertise During Disasters**

It is apparent that access to medical services must be provided as part of all disaster responses to support emergent medical needs. It is recommended that steps should be taken to support the preliminary recruitment of healthcare professionals to facilitate a faster and standardized assembly of emergent medical teams during disasters. It is recognized that the Medical Reserves Corps (MRC) currently acts as a database of medical and non-medical volunteers who can provide disaster medical support in their community during disasters; it is recommended that this resource and similar resources be further improved upon to support healthcare assistance from volunteers outside of their primary state of residence. To increase the availability of volunteers during a disaster, actions should be taken to adopt the licensure compact program within all states. All relevant healthcare professionals should work with their respective professional state boards and legislators to pass the required legislation in their respective states.

Currently, 31 states are licensure compact states for nursing, (Nurse Licensure Compact, n.d.) 14 states and 1 territory are licensure compact states for emergency medical services (EMS) personnel, (National Registry of Emergency Medical Technicians, n.d.) and 24 states are licensure compact states for physicians (Interstate Medical Licensure Compact, n.d.). While this is a step in



the right direction, the remaining non-compact states should take immediate legislative actions to join the licensure compact programs currently available to all healthcare professionals in order to better facilitate an interstate mobilization of healthcare volunteers during disasters.

Considering that during a disaster there is often a great demand for a variety of healthcare services, it is recommended that recruitment efforts focus on encouraging healthcare professionals to join the licensure compact program of their respective professions prior to a disaster in order to increase the reserve of various healthcare professionals capable of providing assistance.

In accordance with expanding the licensure compact programs nation-wide, the expert panel further recommends that malpractice insurance for volunteering healthcare professionals should be established to provide coverage for volunteers when they are practicing outside of their primary state of residence. This recommendation is intended to grant healthcare professionals the pre-authorization they require to immediately provide interstate assistance during a disaster.

### **Recommendation 5.5**

All persons should be able to obtain at least a 30-day supply of emergency prescription medications prior to and during a disaster.

- All state governments should pass legislation that allows for the provision of at least a 30-day supply of emergency prescription refill during disasters.
- Inter-organizational collaboration should be established between pharmaceutical providers and relief agencies to ensure an adequate supply of prescription medications are available at relief shelters and medical centers.

### **Ensuring Access to Medically Necessary Medications During Disasters**

In the aftermath of Hurricane Katrina, many older adults were relocated to public shelters miles away from their homes. Reflective discussions of the medical care provided in the Astrodome in Houston, TX, and the Mississippi Coliseum and the Mississippi Trade Mart in Jackson, MS, have exposed the impact that existing barriers to accessing at least a 30-day supply of emergency prescription medications can have on one's health. In Jackson, MS, the Department of Medicine, in partnership with local medical facilities deployed a pop-up Katrina clinic in the Mississippi Coliseum and Mississippi Trade Mart shelters (Currier et al., 2006). Though many of the 2,394 evacuees left their homes with the conventionally recommended three-day supply of medications, most people required access to additional supplies of their medications to manage chronic conditions (Aldrich & Benson, 2008; Currier et al., 2006). It was reported that the most common medical needs at the clinic were for prescription refills, particularly for cardiovascular, antihistamine/decongestant, psychotropic, analgesic and diabetic medications (Welch et al., 2016).

A review of state pharmacy laws has highlighted that emergency refill laws are not uniform across states. One state allows for a one-day supply, 15 states restrict emergency pharmacy refills to a three-day supply, three states allow for a seven-day supply, seven states have unspecific pharmacy refill restrictions, 21 states had no provisions for emergency refills and only six states allow for the obtainments of a 30-day supply of medications, one of which being Florida (Ford, Trent, & Wickizer, 2016). During severe disasters such as Hurricane Katrina, where

persons can be displaced for extended periods of time, ranging from a few days to a few months, it is critical that persons who are dependent on medications are able to evacuate their homes with a pharmaceutical supply that can support their health and well-being, particularly if they must evacuate to an isolated area or stay at a relief shelter, where pharmaceutical supplies can be limited at warehouses and coordinating centers for disaster response (Currier et al., 2006). It is recommended that all state pharmacy boards adjust their policies to allow persons to obtain at least a 30-day supply of medications. A 30-day supply of medications was identified as being the desired emergency medication supply amount because it can satisfy the pharmaceutical needs of evacuees for a variety of disaster severities, durations and circumstances. The provision of up to a 30-day emergency supply of medications is also endorsed by the National Association of Boards of Pharmacy in their Model Rules for Public Health Emergencies document (Catizone, 2017).

To further facilitate access to prescription medications during disasters, particularly in relief shelters, relief agencies should develop partnerships with local pharmaceutical companies and local retail pharmacies to ensure that relief shelters have adequate supplies of medications to manage a variety of medical conditions among evacuees. Additional considerations should be made for establishing how patients will be triaged and how medications will be securely stored. The SWiFT assessment toolkit provides an example of an approach that can be used by healthcare professionals in relief shelters to help identify and triage persons who require medical assistance, minimize negative outcomes, and

promote advocacy for older adults in a manner that considers their needs (Dyer, Regev, Burnett, Fest, & Cloyd, 2008).

### **Recommendation 5.6**

In alignment with the State of Florida’s “Environmental Control for Nursing Homes Rule”, all US nursing homes and assisted living facilities should be mandated to include additional contingencies in their emergency/disaster plans to ensure that, in the event of a power outage, temperatures are kept at reasonable levels to avoid the exacerbation of existing health issues among nursing home and assisted living facility residents.

#### **Improving Environmental Control Efforts in Nursing Homes and Assisted Living Facilities**

During the 2017 hurricane season, the emergency preparedness of a Florida nursing home was tested when Hurricane Irma disabled the air conditioning system at a nursing home in Hollywood, Florida. The facility did not have an alternative power source to power their air conditioning system during a power outage, which forced many residents to be subjected to sweltering heat conditions while plans to evacuate the facility were delayed. As a result, 14 residents died and 141 of the residents that were evacuated were treated for heat-related issues (Nedelman, 2017). These incidences have highlighted an existing gap in emergency preparedness plans that are effective, practical and uniform among care facilities. In response to the adverse outcomes that occurred at the nursing home, Florida Governor Rick Scott enacted the Emergency Environmental Control for Nursing Homes (2018) rule. This new rule requires all nursing homes in Florida to have alternative power sources on-site that can

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maintain temperatures at 81 degrees Fahrenheit or cooler for at least 96 hours, in a “sufficient portion of the facility to accommodate all of the facility’s residents” in the event of a power outage. To protect the well-being of residents, the rule also requires facilities to implement policies and procedures to ensure that residents are not harmed by heat-related issues. To ensure the same standards for environmental control in nursing homes across the country, all states should implement mandates that include, but are not limited to, the requirements outlined in the Emergency Environmental Control for Nursing Homes rule implemented in the state of Florida. When adopted nationally, this rule should be enhanced to require all facilities to have back-up generators to support air heating, ventilation, and air conditioning (HVAC) systems in a variety of hot and cold weather-related disasters and environmental threats.

To further enable this proposed requirement, the Centers of Medicare and Medicaid Services’ (CMS) Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers final rule should be enhanced to require facilities to have backup generators for heating, ventilation and air conditioning (HVAC

systems. The CMS final rule became effective on November 15, 2016, and issues emergency preparedness requirements for 17 participating Medicare and Medicaid providers and suppliers. As part of their requirements for policies and procedures, final rule requires all facilities to have “alternative sources of energy to maintain temperatures to protect resident health and safety.” It is proposed that backup generators be explicitly designated as the required alternative sources of energy to power HVAC systems during power failures. Funding should also be made available at the state and/or federal levels to nursing homes and assisted living facilities to support them to meet these requirements.

## Domain 6: Research

A holistic review of the identified literature revealed that research in the field of disaster/emergency preparedness, response, and recovery for older adults is highly underdeveloped. The unpredictability of both the timing and types of disasters/emergencies make traditional research designs and methodologies difficult. Nevertheless, there is a clear opportunity to develop and evaluate preparedness initiatives and their potential impact during response and recovery efforts, as well as the outcomes for designated populations and those personnel and organizations with a responsibility for supporting them.

### Recommendation 6.1

There is a need to prioritize the creation and funding of research efforts to better support the development of a common framework for measuring the quality and levels of disaster preparedness among care institutions, organizations, paid professionals, community organizations, and other groups that work primarily with older adults and their unpaid caregivers during and after disasters.

### Recommendation 6.2

There needs to be a more concerted effort in utilizing outcomes from existing evidence to support the planning, design, and refinement of more evidence-informed emergency/disaster preparedness interventions, policies, and regulations in support of older adults and unpaid caregivers, as well as organizations and care professionals that will be responsible for meeting their needs during and after a disaster.

- Published studies related to disaster preparedness and recovery should be made open access to strengthen

knowledge translation and exchange that support improvements in disaster/emergency responses and recovery efforts across communities.

### Prioritizing Disaster Preparedness and Response Research

A review of the existing literature relevant to disaster preparedness, response, and recovery for older adults has highlighted a gap in this research field. Current research efforts have highlighted that older adults experience a disproportionately greater vulnerability to adverse outcomes during and after disasters compared to younger adults; however, there is limited available research that evaluates interventions that can be implemented to induce more positive outcomes for older adults. Specifically, there are insufficient studies that evaluate best practices for assisting and caring for older adults with health and functional declines, and the most effective methods for delivering services and resources to them. Regarding system operations, there is research that documents the effects of surge capacity operations in the ED and patient tracking methods that are used internationally, but a lack of available research on the most effective policies and procedures to ensure a favorable outcome during surge capacity operations or patient hand-offs during disasters. The development of a research agenda related to disaster preparedness, response and recovery for older adults is essential to facilitating greater experimental exploration of disaster-related interventions for older adults.

Researchers should also develop a common framework for measuring the quality and levels of disaster preparedness among various institutions and organizations. Developing a common evaluation framework for measuring the quality

and levels of disaster preparedness among various institutions and organizations can reduce the variability and biases that can be associated with comparing systems that have been evaluated using different frameworks, which can differ based on their chosen metrics and domains of measure.

### **Applying Relevant Research Findings to Real-Life Disaster Health Practices**

Recommendation 6.2 further supports the utilization of research in policy making by proposing that published studies related to disaster preparedness and recovery be made open access. Providing open access to disaster preparedness and recovery research can help facilitate greater experimental investigation in the field of disaster preparedness and response.

### **Recommendation 6.3**

A network of disaster preparedness researchers to encourage partnerships in the ongoing evaluation of emergency/disaster preparedness interventions needs to be created. Network members should advocate for an increased focus on emergency/disaster preparedness research among the various societies or journals that they are members of.

### **Establishing a Network of Disaster Health Researchers**

The panel further recommends that a network of disaster preparedness researchers be established to support the progression of research efforts related to disaster preparedness for older adults. The tasks of the research group would include evaluating the efficiency of existing policies and procedures within care institutions/organizations and government, identifying gaps in knowledge and knowledge delivery, and delegating priorities for research. It is intended that this group of researchers will fill the current gap in disaster preparedness, response and recovery research to support the development of evidence-based policies.

## Glossary

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**Alzheimer’s Disease:** a form of dementia that causes problems with memory, thinking, behavior and independent functioning; it is the most common cause of dementia

(<https://www.alz.org/alzheimers-dementia/what-is-alzheimers>).

**Dementia:** a general term used to categorize a group of diseases associated with progressive declines in cognitive abilities, including memory, communication, language, attention, reasoning, judgement and visual perception that negatively impact independent functioning (<https://www.alz.org/alzheimers-dementia/what-is-dementia>).

**Emergency Response Personnel:** personnel responsible for providing assistive services during an emergency, including firefighters, police, civil defense/emergency management officials, sheriffs, military and manufacturing and transportation personnel.

**Geriatric Care Professionals:** practitioners that specialize in treating the physical, mental, emotional and/or social problems among older adults, including nurses, dentists, social workers, occupational and physical therapists, and pharmacists.

**Healthcare Professionals:** an individual that has been certified and authorized to provide preventable, curable, rehabilitative, and promotional health services ([http://www.who.int/hrh/statistics/Health\\_workers\\_classification.pdf](http://www.who.int/hrh/statistics/Health_workers_classification.pdf)).

**Shelter-in-place:** a precaution taken when hazardous materials (chemical, biological or radiological) are released in the air. This requires seeking a small, interior room with no or minimal windows within the building one already occupies.

**Incident Command System:** a standardized tool for enabling an effective command, control, and coordination of an emergency response, allowing agencies to work together to facilitate a consistent response

([https://ops.fhwa.dot.gov/publications/ics\\_guide/glossary.htm](https://ops.fhwa.dot.gov/publications/ics_guide/glossary.htm)).

**State of Emergency:** a circumstance declared by a government when a disaster has occurred and is severe or is imminent and expected to require state aid to supplement local resources to prevent or alleviate damage, loss and hardship within a region (<http://ready.nj.gov/about-us/state-of-emergency.shtml>).

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# Appendices

## Appendix A: Index of Recommendations and Enabling Bodies

The index below provides an outline of the 25 recommendations presented in this whitepaper and an identification of the disaster management domains that have been determined to be responsible for adopting or enforcing a given recommendation.

Recommendations	Relevant Federal Agencies	State & Local Governments	Care Institutions & Organizations	Healthcare Professionals & Emergency Response Personnel	Community Services & Programs	Individuals & Caregivers
<b>Domain 1: Individuals and Unpaid Caregivers</b>						
Recommendation 1.1: Older adults and their unpaid caregiver(s) should be provided with tailored, easy-to-access information related to emergency/disaster preparedness and guidance on how to develop customized emergency plans. Volunteers representative of older persons should be recruited and involved in training material development and implementation, to ensure their voices and perspectives are reflected.	X	X	X	X	X	X
Recommendation 1.2: Older adults who are reliant on mobility aids should remove or minimize barriers affecting their ability to evacuate, and should take steps to ensure their safety within their surroundings.				X		X
Recommendation 1.3: If registries for people with functional and other needs, including persons with disabilities, have been established by local emergency response agencies, older adults and/or their unpaid caregiver(s) should register so they can be assisted/supported efficiently during emergencies/disasters.			X	X	X	X
Recommendation 1.4: Older adults who have a sensory impairment, such as a visual or hearing impairment, should take additional precautions to prepare themselves for emergencies/disasters.				X	X	X
Recommendation 1.5: Older adults who live with chronic health conditions should maintain a readily accessible list of their current medical conditions, treatments (medications, durable medical equipment, supplies and other healthcare needs), healthcare professionals, and emergency contacts including substitute decision makers (SDMs).				X		X
Recommendation 1.6: Older adults who take medications should work with their healthcare professionals to ensure they have access to at least a 30-day supply of medications during an emergency.				X		X
Recommendation 1.7: Older adults, and their unpaid caregivers, who are reliant on medical devices that require electricity, should ensure they have back-up power supplies in place, especially if required while sheltering-in-place. <ul style="list-style-type: none"> <li>Older adults and their unpaid caregivers should contact their electricity company in advance to discuss their needs and ensure options for alternative power sources are available, especially addressing the need for access to power to charge cell phones and other mobile devices.</li> <li>Older adults and their unpaid caregivers should seek assistance with obtaining and maintaining an alternative power source at home, if required, such as when being required to move heavy equipment and fuel or in accessing these resources in rural locations, and operating equipment.</li> </ul>				X	X	X

Recommendations	Relevant Federal Agencies	State & Local Governments	Care Institutions & Organizations	Healthcare Professionals & Emergency Response Personnel	Community Services & Programs	Individuals & Caregivers
Recommendation 1.8: Older adults should be encouraged to continually maintain an adequate local support network that can be called upon during impending disasters and unexpected emergencies, especially if they live alone or far away from relatives.				X	X	X
Recommendation 1.9: Unpaid caregivers of persons with Alzheimer's Disease and Related Dementias should know how to identify signs of distress, anxiety, or confusion, and how to redirect their attention, or calm them down during these times. In addition, unpaid caregivers should be prepared to prevent wandering, and have resources to locate their care recipients if they do wander away during a disaster.				X	X	X
<b>Domain 2: Individuals and Unpaid Caregivers</b>						
Recommendation 2.1: Community-based programs that educate older adults and their unpaid caregivers about disasters/emergencies that affect their region and how best to prepare for and respond to them should be increased.		X	X		X	
Recommendation 2.2: Programs that provide essential community services, such as Meals on Wheels, and assistance with daily living activities for older people (financial, medical, personal care, food and transportation) should develop plans and protocols related to responding adequately to the needs of their clients during emergencies/disasters.					X	
Recommendations 2.3: Local governments should leverage data sources such as registries that identify vulnerable groups to enable emergency responders to more easily prioritize their search and rescue efforts following a disaster or emergency.		X				
<b>Domain 3: Healthcare Professionals and Emergency Response Personnel</b>						
Recommendation 3.1: Healthcare professionals and emergency response personnel should receive training on providing geriatric care relevant to their discipline and how best to assist older adults and their unpaid caregivers during disasters.			X	X	X	
Recommendation 3.2: Healthcare professionals and emergency response personnel should strive to mitigate psychological distress among older persons during and after disasters by making an effort to assess the psychological well-being of older adults and provide appropriate treatments as needed.			X	X		
<b>Domain 4: Care Institutions and Organizations</b>						
Recommendation 4.1: Care institutions and organizations should include emergency/disaster preparedness and response education in their routine personnel training courses. <ul style="list-style-type: none"> <li>Multi-modality educational tools and practices should be used to better facilitate knowledge acquisition and behavioral change.</li> <li>Volunteers representative of older persons should be recruited and involved in training material development and implementation, to ensure their voices and perspectives are reflected.</li> </ul>	X	X	X			

Recommendations	Relevant Federal Agencies	State & Local Governments	Care Institutions & Organizations	Healthcare Professionals & Emergency Response Personnel	Community Services & Programs	Individuals & Caregivers
Recommendation 4.2: Additional strategies to improve the collection and transfer of identifying information and medical histories should be adopted into current standardized patient handoff procedures to better facilitate effective tracking, relocation, and care of patients during a disaster.			X			
<b>Domain 5: Legislation/Policy</b>						
Recommendation 5.1: The US Congress 2017 Bill S. 1834 "Protecting Seniors During Disasters Act" that recommends the establishment of a national advisory committee on activities related to disaster preparedness for older adults should include at least two older adults, those with geriatric care expertise and improved representation from the private sector.	X		X	X	X	X
Recommendation 5.2: Agencies with the Department of Health and Human Services (HHS) should provide change-funding guidance to allow Centers for Independent Living to use their contingency funds to provide food and water to their clients during disasters.	X					
Recommendation 5.3: All states and/or local governments should support the implementation of tax-free emergency preparedness weekends during specific times of the year or in anticipation of a disaster. Items covered should include disaster/emergency supplies, such as batteries, portable generators, additional mobility aids (canes, walkers), hurricane shutters, rescue ladders, radios, and ice packs.		X				
Recommendation 5.4: The Licensure Compact that provides multi-state licenses for nurses, physicians, and emergency medical service personnel should be adopted by all states.		X				
Recommendation 5.5: All persons should be able to obtain at least a 30-day supply of emergency prescription medications prior to and during a disaster.  • All state governments should pass legislation that allows for the provision of at least a 30-day supply of emergency prescription refill during disasters.  • Inter-organizational collaboration should be established between pharmaceutical providers and relief agencies to ensure an adequate supply of prescription medications are available at relief shelters and medical centers.	X	X		X	X	
Recommendation 5.6: In alignment with the State of Florida's "Environmental Control for Nursing Homes Rule", all US nursing homes and assisted living facilities should be mandated to include additional contingencies in their emergency/disaster plans to ensure that, in the event of a power outage, temperatures are kept at reasonable levels to avoid the exacerbation of existing health issues among nursing home and assisted living facility residents.	X	X				

Recommendations	Relevant Federal Agencies	State & Local Governments	Care Institutions & Organizations	Healthcare Professionals & Emergency Response Personnel	Community Services & Programs	Individuals & Caregivers
<b>Domain 6: Research</b>						
Recommendation 6.1: There is a need to prioritize the creation and funding of research efforts to better support the development of a common framework for measuring the quality and levels of disaster preparedness among care institutions, organizations, paid professionals, community organizations, and other groups that work primarily with older adults and their caregivers during and after disasters.	X					
Recommendation 6.2: There needs to be a more concerted effort in utilizing outcomes from existing evidence to support the planning, design, and refinement of more evidence-informed emergency/disaster preparedness interventions, policies, and regulations in support of older adults and unpaid caregivers, as well as organizations and care professionals that will be responsible for meeting their needs during and after a disaster.  • Published studies related to disaster preparedness and recovery should be made open access to the public to strengthen knowledge translation and exchange that support improvements in disaster/emergency responses and recovery efforts in communities.	X					
Recommendation 6.3: A network of disaster preparedness researchers to encourage partnerships in the ongoing evaluation of emergency/disaster preparedness interventions needs to be created. Network members should advocate for an increased focus on emergency/disaster preparedness research among the various societies or journals that they are members of.	X					

## Appendix B: Training Materials and Resources for Healthcare Providers and Emergency Medicine Personnel

Resources	Description	Resource and Training Material Site/Type	Link/Source
<b>ASPR TRACIE</b>	ASPR TRACIE is a healthcare emergency preparedness information gateway initiative developed by the U.S. Department of Health and Human Services along with the Office of the Assistant Secretary for Preparedness and Response. ASPR TRACIE provides healthcare providers, healthcare entities, emergency managers, public health practitioners and emergency personnel, access to resources, as well as a platform to interact, discuss and share information and practices regarding disaster preparedness and management.	<ul style="list-style-type: none"> <li>• Online access to articles and databases. Membership required for access to the Information Exchange Discussion Board.</li> </ul>	<a href="https://asprtracie.hhs.gov/">https://asprtracie.hhs.gov/</a>
<b>Center for Domestic Preparedness</b>	The CDP is an organization dedicated to identifying, developing and delivering training to state, local, tribal and territory emergency response providers. It is committed to providing all-hazards training to the emergency response community. Training of state, local, tribal and territorial responders is funded by the Department of Homeland Security, while the training of federal, foreign, and private sector responders is on a fee-for-service basis. Training is provided to responders in at least 17 different disciplines including, Emergency Management, Emergency Medical Services, Fire Service, Governmental Administrative, Hazardous Materials, Healthcare, Law Enforcement, Public Health, Public Safety Communications, Public Works, Agriculture, Education, Citizen/Community Volunteer, Information Technology, Security and Safety, Search and Rescue, and Transportation.	<ul style="list-style-type: none"> <li>• Online</li> <li>• On-Site training options</li> </ul>	<a href="https://cdp.dhs.gov/find-training">https://cdp.dhs.gov/find-training</a>
<b>FEMA – Emergency Management Institute</b>	EMI is the emergency management community's primary training institution. Training is provided to officials across all levels ranging from federal, state, local, tribal, volunteer, private and public officials. EMI provides an overview of the National Incident Management Systems, National Response Framework, National Disaster Recovery Framework and supports the implementation of these frameworks across the nation.	<ul style="list-style-type: none"> <li>• Online</li> <li>• On-Campus Course Options</li> </ul>	<a href="https://training.fema.gov/emi.aspx">https://training.fema.gov/emi.aspx</a>

Resources	Description	Resource and Training Material Site/Type	Link/Source
<b>Johns Hopkins Center for Public Health Preparedness</b>	Free National Incident Management Systems (NIMS) training resource for Public Health Departments	<ul style="list-style-type: none"> <li>• On-campus training at the Johns Hopkins Bloomberg School of Public Health.</li> <li>• On-site training</li> <li>• Online training</li> </ul>	<a href="https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-public-health-preparedness/training/">https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-public-health-preparedness/training/</a>
<b>National Training and Education Division</b>	NTED serves the first responder community, and offers more than 150 courses to help build critical skills that allow responders to function quickly and effectively in mass consequence events. NTED serves state, local, territorial and tribal entities across 18 professional disciplines.	<ul style="list-style-type: none"> <li>• On-site training facility</li> <li>• Mobile training units</li> <li>• Online training.</li> </ul>	<a href="https://www.firstrespondertraining.gov/frt/content.do?page=howToTakeTraining">https://www.firstrespondertraining.gov/frt/content.do?page=howToTakeTraining</a>
<b>Psychological First Aid (PFA)</b>	PFA was developed to be used in the immediate aftermath of disasters to decrease associated initial distress, provide adaptive functioning, and coping skills and capabilities. This intervention was designed by the National Child Traumatic Stress Network (NCTSN) and the National Center for PTSD (NCPTSD) and is funded by the Substance Abuse and Mental Health Services Administration and the US Department of Health and Human Services.	<ul style="list-style-type: none"> <li>• Online training options provided by Johns Hopkins University via Coursera.</li> <li>• On-site training workshops by Johns Hopkins Preparedness and Emergency Response Learning Center</li> </ul>	<a href="https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-public-health-preparedness/training/online/mental-health-trainings.html">https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-public-health-preparedness/training/online/mental-health-trainings.html</a>