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FLORIDA POLICY EXCHANGE CENTER ON AGING

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APPLYING THE AGE-FRIENDLY-HEALTH SYSTEM 4M PARADIGM TO REFRAME DISASTER PREPAREDNESS FOR NURSING HOME POPULATIONS

Executive Summary: Nursing home (NH) residents are at increased risk of adverse outcomes from climate-related disasters. As disasters become more frequent, it has also become clear that current disaster guidance does not adequately address the specific needs of NHs. Researchers propose a modified age-friendly 4M model to guide NH disaster planning. This modified model takes both a person-centered approach to disaster planning, and also addresses key organizational needs of NHs, such as availability of staff and resources to manage sheltering-in-place and evacuations.

Keywords: climate-related disasters, hurricanes, nursing homes, person-centered care, age-friendly, disaster planning, preparedness

IMPORTANCE

From 1980 to 2020 the US had 285 separate billion-dollar climate-related disasters (e.g., hurricanes and wildfires), twenty-two of which were in 2020 alone. Climate-related disasters are expected to continue to increase with more frequent temperature extremes than in the past. The 1.4 million nursing home (NH) residents in the US are particularly vulnerable to negative effects of disasters. Almost half live in hurricane-prone states.

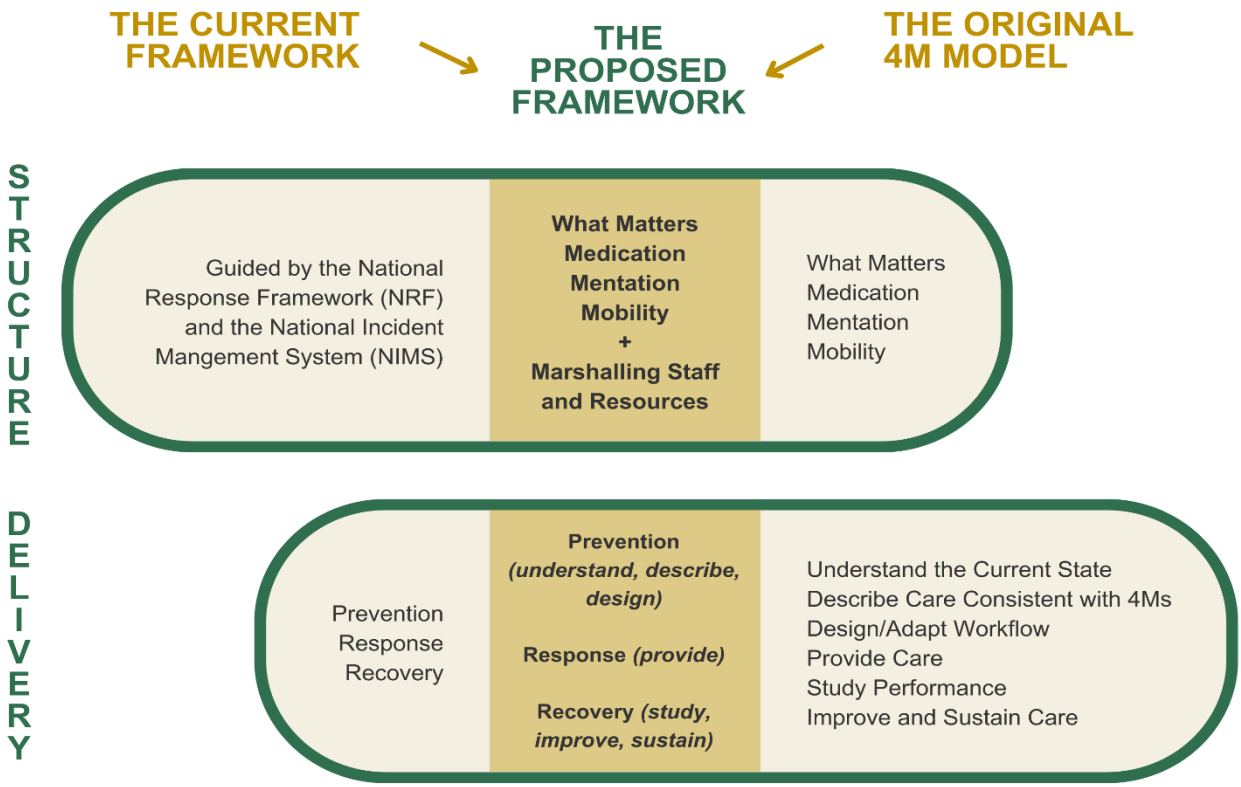
In fact, one study found that NH residents are the highest risk group of individuals for adverse health effects following disasters. Generally, NH residents have more severe functional limitations than community dwelling adults, including vision and hearing impairments, limitations with activities of daily living (e.g., mobility), and 48% live with Alzheimer's disease and related dementias (ADRD). Even more, hospitals are discharging patients to NHs for recovery "sicker and quicker" than ever before, leading to overall higher acuity among NH residents (Goldstein & Peterson, 2023). These increased vulnerabilities make them more susceptible to adverse mental, emotional, and physical effects during climate-related disasters.

Given the particular vulnerabilities of NH residents during disasters, what structures are in place to support them?

CURRENT DISASTER FRAMEWORK

National Response Framework

Currently, NHs prepare for and manage disasters with guidance from the National Response Framework (NRF). The National Incident Management System (NIMS) is another primary guiding document that works in conjunction with the NRF to establish shared vocabulary and processes for multiple



stakeholders (e.g., governmental, non-governmental, and private business) to work together to plan for and manage disasters on all levels (*NIMS and NRF*, n.d.). While considerable effort and expertise has been put into these frameworks, they are still overarching guidelines that do not adequately address the specific needs and resources of NHs during disasters. ***Gaps in these frameworks are evidenced by…***

- ✓ **Hurricane Katrina.** One of several studies on Katrina found that NH residents experienced significantly worse mortality, hospitalization, and functional decline after the storm (Dosa et al., 2010).
- ✓ **National requirements.** In 2006, the US Office of the Inspector General evaluated NH disaster preparedness and response. They found that in 2004 to 2005, 94% of NHs nationwide adhered to federal requirements for emergency plans, yet many nursing homes still experienced disproportionate adverse effects from disasters (Levinson, 2006).
- ✓ **Increased efforts.** After Katrina, there were considerable efforts to include NHs as health care facilities in NIMS, and to strengthen preparedness requirements. Yet, disasters have grown even more frequent and NH residents still experience disproportionately adverse impacts.
- ✓ **Recent disasters.** Several more recent disasters, including Winter Storm Uri and Hurricanes Harvey and Irma, have had adverse impacts on NHs. For example, mortality and hospitalization increased among NH residents after Hurricane Irma (Goldstein & Peterson, 2020).

In summary, most NHs adhere to federal preparedness requirements and STILL experience disproportionate adverse impacts from climate-related disasters. Therefore, stakeholders may consider reframing NH disaster preparedness guidelines rather than continuing to specify additional requirements within the existing framework that may not be the most appropriate for NHs.

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PROPOSED DISASTER FRAMEWORK
Age-Friendly 4M Model (Modified)

The Age-Friendly 4M Model stands for What Matters, Medication, Mentation, and Mobility. These categories were designed to consider the specific needs of aging individuals, as well as capacities and processes of aging organizations. The 4M Model also includes six steps to make these categories actionable:

1. Understand the current state
2. Describe care consistent with the 4Ms
3. Design or adapt workflow
4. Provide care
5. Study performance
6. Improve and sustain care

Researchers have proposed that the 4M Model could be adapted to be an ideal framework to guide NH disaster preparedness with a couple of modifications:

1. **An Additional M.** Researchers propose a fifth "M," Marshalling Staff and Resources. The 4M Model is person-centered, which works well when providing daily care. However, disasters require an extraordinary amount of organizational preparation to be able to make quick, informed decisions and utilize resources that ensure the safety and comfort of residents, thus the 5th M.

2. **Delivery.** Researchers also propose that the six steps of the 4M model fit well into the existing disaster protocol of prevention, response, and recovery.

THE COMPONENTS

What Matters: Providers should align care with individuals' preferences and goals. Disaster-related preferences and goals should be documented in advance, and updated at quarterly care planning meetings. Even more, preferences during disasters should be both digitally and physically documented so they can be accessed during power outages. Components should include:

- ✓ Documentation of **what matters** to residents during disasters
- ✓ Updated and accessible **advance directives**
- ✓ Consideration of residents' **culture** and personal life
- ✓ Awareness of preferred **comforting items/techniques** during disasters
- ✓ Communication and collaboration with **family and preferred staff members**

While individual preferences are central to what matters, NH administrators should also aggregate individual preferences into their disaster plans so that they can 1) best utilize resources to meet as many preferences as possible, and 2) prioritize preferences based on resource availability and potential impact (e.g., helping the most vulnerable residents first).

Medication: Providers should be acutely aware of residents' medication **needs, access, and potential impacts of medication disruptions** during disasters.

- ✓ **Need.** On average, NH residents take nine daily prescription medications. This contributes to commonplace medication issues, including polypharmacy and adverse drug reactions. Even more, many residents have health conditions, such as congestive heart failure and diabetes, that could cause significant bodily disruptions if maintenance medications are not administered on time.

- ✓ **Access.** Disasters may disrupt regular transportation or infrastructure necessary for NH residents to access time-sensitive treatments, such as dialysis. Disaster-related infections or injuries are also best managed if staff confirm they have as-needed medications, such as antibiotics and first-aid supplies, available before disasters.

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- ✓ **Impacts.** One-third of all emergency department (ED) visits after Hurricanes Katrina and Rita were due to chronic health conditions, and ED visits among assisted living residents with congestive heart failure increased 12% after Hurricane Irma. While disasters disrupt access to medications, they can also impact how individuals ***tolerate*** regular medications. For example, heat-exposure (common after hurricanes in warm states) can cause dehydration which changes medication tolerance.

Mentation: Mentation involves all aspects of caring for dementia, depression, and delirium, including prevention, identification, treatment, and management. Mentation is an important consideration during everyday NH care considering about 48% of NH residents have ADRD. It is especially important during disasters, since simple changes in environment or schedule can trigger agitation, delirium, and anxiety for individuals living with ADRD. This is an aspect of disaster management that other entities may not consider, and a couple of simple strategies could help improve outcomes:

- ✓ **Strengths-based Peer Support.** Some residents may be able to support other residents with coping strategies and emotional support during disasters when staff are focused on essential preparedness and safety issues. NHs are often resource constrained environments that should consider residents as active, underutilized members of disaster planning.

- ✓ **Preventive Mental Health Programs.** Nursing home residents and staff have access to relatively limited mental health programs. Most disaster-related mental health programs that do exist, such as resilience building and crisis counseling, are under-funded and activated after disasters have caused significant damage. Governing entities suggests that programs initiated before disasters could help improve resilience and minimize adverse outcomes (*Disaster Assistance*, 2023).

Mobility: Mobility issues among NH residents can surface in all phases of disasters.

- ✓ Even in ideal circumstances, NH residents are **three times more likely to fall** than community-dwelling older adults.

- ✓ Both **sheltering-in-place and evacuation carry risks to mobility**, including having to make rapid movements, moving up stairs, long bus-trips, and poor shelter conditions (e.g., mats on floors in common spaces).

- ✓ Research demonstrates **poor mobility contributes to increased morbidity and mortality** following hurricanes.

Disasters can be a time of extreme transfers, especially during evacuations. Thus, NH disaster plans must consider residents' mobility risks individually and collectively, the supply of mobility aids at all facilities (including evacuation shelters), and both the numbers and skillsets of available staff to support mobility needs during disasters.

Marshalling Staff and Resources: Even some of the most well-equipped NHs have staffing and resource issues in daily operations (Goldstein & Peterson, 2023). During disasters, NHs must consider both marshalling resources to manage disaster-specific needs, as well as maintaining the necessary staff, resources, and supplies for undisrupted everyday care. Some core resource needs include:

- ✓ **Strong communication channels with outside entities**, such as local public health officials and first responders. Research demonstrates that more collaboration is needed among these entities and NHs to

properly support NH residents during disasters.

- ✓ **Adequate staffing numbers and skill mix.** A rich body of research demonstrates that staffing is strongly associated with quality care outcomes (Goldstein & Peterson, 2023). Disasters require even more staff to carry out disaster plans while maintaining everyday care. This becomes critical if staff are responsible for evacuating medically-frail residents.

- ✓ **Strong resource management.** The typical disaster resources, such as gasoline for generators and non-perishable food, are important considerations in disaster plans. NHs must also consider more specific resources, including extra injectables, mobility devices, and medications to manage chronic conditions. Even more, they must consider the facility environments for sheltering-in-place (e.g., building integrity), and evacuation (e.g., transporting flammable gases like oxygen).

MAKING THE MODEL ACTIONABLE

The NRF describes disaster planning in three steps: 1) prevention, 2) response, and 3) recovery. The six action steps of the 4M Model fit well into these three disaster planning steps.

Prevention

1. **Understand the current state.** In the traditional 4M model, NHs obtain a clear picture of residents' characteristics (e.g., preferred languages) and facility characteristics (e.g., staff ability to meet residents' preferences; *Age-Friendly Health Systems*, 2020). In the proposed model, NHs are guided to focus on the specific resident and facility characteristics relevant to disasters (e.g., residents' mobility).

2. **Describe care consistent with the 4Ms.** NHs describe current care that aligns with the 4Ms, and identifies gaps in 4M care (*Age-Friendly Health Systems*, 2020). The chart on the following page provides guidance to apply this to disasters.

3. **Design/adapt workflow.** NHs identify opportunities to combine, adapt, and/or redesign activities and processes (*Age-Friendly Health Systems*, 2020) to best use their limited resources to address the 5Ms in disaster planning.

Response

4. **Provide care.** In everyday care, NHs test new 4M procedures by starting with a small number of residents, modifying as needed, and expanding (*Age-Friendly Health Systems*, 2020). This is more difficult in disasters, but NHs could consider applying some disaster responses to the most vulnerable residents, first.

Recovery

5. **Study performance.** At minimum, NHs should ask staff what went well and what needs improvement for next time (*Age-Friendly Health Systems*, 2020).

6. **Improve and Sustain Care.** This includes taking an intentional and systematic approach to not only make improvement suggestions actionable, but also ensure they are sustained over time (e.g., maintaining generators for future disasters; *Sustaining Improvement*, n.d.).

Actionable Steps of the Proposed Model

PHASE	WHAT MATTERS	MEDICATION	MENTATION	MOBILITY	MARSHALLING RESOURCE
PREVENTION	Regularly review advance directives	Keep 5-14 days of residents' medications	Provide training in ADRD behavioral interventions	Conduct evacuation drills with staff	ID minimum required staffing levels
	Ensure proxy/DPOA documents are up-to-date	Keep emergency drug kits in strategic spots	ID residents at greatest risk during disasters	Obtain mobility equipment needed for evacuation	Consider resident acuity to determine sufficient staff
	✓	Keep a medication profile for each resident	Help staff maintain both physical and mental safety	Develop transportation strategies for evacuation	ID residents who need extra support during evacuation
	✓	Develop a process to get 3-days of medications as needed	✓	Assess residents' fall risks	ID staff members to lead during emergencies
	✓	✓	✓	✓	Communicate with local emergency management groups
	✓	✓	✓	✓	✓

PHASE	WHAT MATTERS	MEDICATION	MENTATION	MOBILITY	MARSHALLING RESOURCE
RESPONSE	Prioritize residents with high needs	Ensure accessibility and security of emergency drug kits	Help residents with stress coping strategies	Organize staff strategically to support transitions	Have staff assess temperature-related illness hourly
	✓	✓	Provide emotional support/behavioral intervention	Monitor residents for falls	ID residents who need advanced medical support from an RN
	✓	✓	✓	✓	Document staff/resident interactions on paper
	✓	✓	✓	✓	Communicate with emergency services
	✓	✓	✓	✓	Assess evacuation need 2x/day
	✓	✓	✓	✓	✓

PHASE	WHAT MATTERS	MEDICATION	MENTATION	MOBILITY	MARSHALLING RESOURCE
RECOVERY	Document any changes to advance directives	Ensure maintenance of regular medications	Assess disaster-related traumas	Address post-disaster mobility changes	ID gaps in planning & response
	Document any changes to proxies/DPOAs	Assess new medication/treatment needs	Make referrals for evaluation as needed	ID training/equipment needed for future disasters	Review strengths & weaknesses with staff
	✓	✓	Conduct a review and implement new procedures as needed	✓	Treat bodily injuries & stress-related illness
	✓	✓	✓	✓	Ensure adequate staff for future disasters
	✓	✓	✓	✓	✓

USE THIS CHART TO INPUT ADDITIONAL FACILITY-SPECIFIC ACTION ITEMS
ADAPTED FROM TABLE 1 OF THE PRIMARY ARTICLE

REFERENCES

Primary Article:

Dosa, D., Jester, D., Peterson, L., Dobbs, D., Black, K., & Brown, L. (2023). Applying the age-friendly-health system 4M paradigm to reframe climate-related disaster preparedness for nursing home populations. *Health Services Research*, *58*(Suppl 1), 36–43. https://doi.org/10.1111/1475-6773.14043

Supporting References:

Age-Friendly Health Systems: Guide to Using the 4Ms in the Care of Older Adults. (2020). Institute for Healthcare Improvement. https://www.americangeriatrics.org/sites/default/files/inline-files/IHIAgeFriendlyHealthSystems_GuidetoUsing4MsCare.pdf

Disaster Assistance: Action Needed to Improve Resilience, Response, and Recovery | U.S. GAO. (2023, March 15). Office of U. S. Government Accountability. https://www.gao.gov/products/gao-23-106544

Dosa, D., Feng, Z., Hyer, K., Brown, L. M., Thomas, K., & Mor, V. (2010). Effects of Hurricane Katrina on Nursing Facility Resident Mortality, Hospitalization, and Functional Decline. *Disaster Medicine and Public Health Preparedness*, *4*(0 1), S28–S32. https://doi.org/10.1001/dmp.2010.11

Goldstein, C., & Peterson, L. (2023). *An AARP Overview of Direct Care Staffing and Related Policies in Florida*. University of South Florida. https://www.usf.edu/cbcs/aging-studies/fpeca/documents/aarpoverviewofflstaffingnhmar2023.pdf

Goldstein, C., & Peterson, L. J. (2020). *Association Between Exposure to Hurricane Irma and Mortality and Hospitalization in Florida Nursing Home Residents* (p. e2019460). University of South Florida. https://www.usf.edu/cbcs/aging-studies/fpeca/documents/mortality-and-hospitalization-among-nh-residents.pdf

Levinson, D. R. (2006). *Nursing Home Emergency Preparedness and Response During Recent Hurricanes*. Department of Health and Human Services, Office of Inspector General.

NIMS and NRF. (n.d.). Federal Emergency Management Agency. Retrieved May 2, 2025, from https://emilms.fema.gov/is_0703b/groups/10.html

Sustaining Improvement. (n.d.). Institute for Healthcare Improvement. Retrieved May 2, 2025, from https://www.ihi.org/resources/white-papers/sustaining-improvement