

**Emergency Preparedness Education Inclusive of Chronic Disease and Access and  
Functional Needs**

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## **Emergency Preparedness Education Inclusive of Chronic Disease and Access and Functional Needs**

Natural disasters have the potential to impact communities leaving many people vulnerable to a variety of damages. Natural disasters are defined by the United States (US) Department of Homeland Security (2018) as “all types of severe weather, which have the potential to pose a significant threat to human health and safety, property, critical infrastructure, and homeland security” (para. 1). These disasters are becoming an increasing threat worldwide; from 2000 to 2019, there were 8067 natural disasters worldwide with a total of four billion people affected (EM-DAT: The International Disaster Database [EMDAT], 2020a). Over the span of those twenty years, natural disasters have caused at least \$2.48 trillion US dollars in damage (EM-DAT, 2020a). In the US alone, 472 natural disasters occurred from 2000 to June 2020. During that time, over 109 million people were affected by the disasters and damage totaled to \$915 trillion USD (EM-DAT, 2020b). The sheer number of lives being altered, and financial resources allocated to post-disaster recovery and assistance is undeniable. North Carolina alone experienced 21 severe storms, 13 tropical cyclones, four winter storms, two freezes, six droughts, and one flood between 2000 and 2020; these disasters cost approximately \$468 billion USD and accounted for 1249 deaths (National Oceanic and Atmospheric Administration, 2020).

The most recent disaster, the novel coronavirus (COVID-19) pandemic rapidly spread throughout the world causing many states in the US to declare shelter-in-place/stay-at-home orders. The first state-wide order was in California on March 19, 2020; many other states followed suit by early April (Kates et al., 2020). All but eight states mandated statewide stay-at-home orders though these states had varying guidelines on what residents were allowed to do and

what stores could remain open (Secon, 2020). In North Carolina, Governor Roy Cooper closed public beaches, non-essential stores such as clothing stores and retailers, and discouraged non-essential travel (Porter, 2020). While hospitals, primary care offices, pharmacies, and grocery stores were still open, vulnerable populations were encouraged not to go in public places (Centers for Disease Control and Prevention, 2020). This way of life was new for many people who may not have considered themselves vulnerable before. One unique problem that vulnerable people had was acquiring medical supplies. Stores were running out of not only toilet paper, paper towels, and meats, but also items like Clorox wipes, rubbing alcohol, and alcohol wipes. These shortages presented a unique situation for all vulnerable patients, especially diabetic patients who need the latter items to maintain sterility during medication administration (Weber, 2020). This culmination of events underscores the importance of being prepared for disasters and emergency situations at any time, not only for the general population but for people with special considerations and vulnerabilities.

Disasters and the damage left in their wake will continue to be a problem; however, current measures and recommendations in place are not sufficient nor are they evidence-based (Clay et al., 2020). The Federal Emergency Management Agency's (FEMA; 2018) current goal is to have a protected and resilient nation with the ability to adapt to hazards. This goal is, in part, to be achieved by the FEMA recommendations for emergency kits. These recommendations are based on expert opinion alone, not evidence-based research (Heagele et al., in press). The emergency kits include the following: 3-day supply of water and nonperishable food, first-aid kit, 7-day supply of medications, important documents, contact numbers, cash, maps, flashlight, radio, matches, cell phone, and a generator (Ready.gov, 2020a). In addition to these

recommendations, FEMA provides additional recommendations for children, persons with disabilities, seniors, and pet owners.

Disasters can be a looming topic that some people consider an inevitable risk (Olympia et al., 2010). The perception that disaster damage is unavoidable is one reason that many people in high-risk areas do not prioritize disaster preparation. Another reason that some residents may avoid disaster preparation in the form of kits is because of the lack of science supporting the utility of the kit in a post-disaster situation. There have been very few studies that correlate having a simple checklist of items to significantly changed outcomes of people experiencing the disasters (Clay et al., 2020).

With the number of disasters that North Carolinians are exposed to, the subsequent costs for recovery, and the countless lives affected and lost, it is clear that efforts to educate citizens of North Carolina and motivate them to become prepared are needed, particularly among vulnerable populations. Further, it is unclear what methods of education regarding emergency preparedness are most effective. There is evidence that being made aware of recommendations by a subject matter expert can be effective (McNeill et al., 2016); however, evidence exists that emergency preparedness education from a healthcare provider is also effective (Al-Roussan et al., 2014; Killian et al., 2017). Healthcare provider education may address the increased preparedness measures necessary among vulnerable populations. The purpose of this project is to: 1) determine what evidence exists in the literature regarding emergency preparedness levels of vulnerable populations, 2) determine what evidence exists in the literature regarding the effect of healthcare provider education on emergency preparedness levels of vulnerable populations, 3) examine what education methods and other tools can be utilized to easily deliver emergency

preparedness education by health care providers to vulnerable populations, and 4) develop evidence-based emergency preparedness education deliverable to various populations.

## **Background**

### **General Preparedness Levels**

The effect of current recommendations on preparedness measures is discussed in many studies. Even though FEMA includes a disaster kit in the recommendations for emergency preparedness (Ready.gov, 2020a), “it has not been empirically established that being prepared for disaster with a disaster supply kit results in actually surviving a disaster without need for outside assistance” (Heagele, 2016, p.980). While owning a disaster kit is still universally recommended, many people are shifting the interpretation of preparedness to a basis of knowledge and actions (Clay et al., 2020; Heagele, 2016; Heagele et al., in press; Killian et al., 2018). People often report the reason they were prepared was because they knew they were vulnerable (Killian et al., 2018); this is a great testament to knowledge being critical to preparedness.

Even with current measures in place, the percentages of communities who meet preparedness standards remains very low. In a survey of adults aged 50+, about two-thirds of the participants had no written emergency plan, had never participated in disaster preparation programs, and had no knowledge of resources available and over one-third of the participants did not have additional food, water, or medical supplies on hand (Al-Rousan et al., 2014). Another survey of New York City residents found that over half of the respondents had either food, water, a flashlight, or a radio on hand prior to Super Storm Sandy; however, less than half of them had all four of the supplies with even less having an evacuation plan or medication supplies (Clay et al., 2020). Beyond kit recommendations, most families also do not have evacuation plans or

emergency response plans (Olympia et al., 2010). Even more worrying is that while almost two-thirds of participants from Arkansas reported that they believed they were prepared for a disaster, yet less than half of them had a 3-day supply of water available (McNeill et al., 2018). Clearly many people, not just increasingly vulnerable ones, are not only not in compliance with recommendations, but are also under the incorrect impression that they are prepared for disasters.

### **Preparedness of Vulnerable Populations**

The identification of vulnerable populations is one of the very first steps that agencies must complete before designing and implementing disaster education (Torani et al., 2019). When educational materials and standards are made without reflecting the needs of those that have special considerations such as using life-saving devices that need electricity, medications, and communication or transportation issues, the materials have the potential to widen the gap between people and effective preparation.

Many studies of US populations reveal different demographics are at risk for a variety of negative consequences of a disaster (Al-Rousan et al., 2014; Benevolenza & DeRigne, 2019; Cherry et al., 2017; Hernández et al., 2018; Malik et al., 2018; Prohaska & Peters, 2019). In the disaster planning phase, families that earn a low-income are groups that are commonly identified as needing special attention (Al-Rousan et al., 2014; Hernández et al., 2018). Low-income families are at a significant threat for a term coined ‘resilience depletion’ (Hernández et al., 2018). Resilience depletion occurs when people who are consistently under pressure in their typical life are met with a disaster. The depletion of resilience from pre-disaster life leaves them with few resources to adequately handle the disaster. This phenomenon causes long term damage that would be less likely to occur if their resilience had not already been depleted. Families classified as low income do not usually have the means to put together the recommended

emergency kits. They also often have trouble finding access to transportation and communication equipment (Al-Rousan et al., 2014; Benevolenza & DeRigne, 2019). This lack of transportation and communication is one of the many factors that causes low preparedness levels in the community. Resilience depletion, lack of kit procurement, and lack of access to transportation and communication equipment leaves many low-income families in need of additional support in the post-disaster recovery phase. It is vital that they understand their risk so that they can begin to build protective factors to address them.

Older people are also considered an at-risk demographic for low preparedness levels (Al-Rousan et al., 2014) and adverse health events (Prohaska & Peters, 2019). In New York City, people aged 65+ who resided in areas most impacted by Hurricane Sandy experienced a surge in emergency department (ED) visits for up to three weeks after the hurricane (Lee et al., 2016; Malik et al., 2018). However, certain subcategories in this age group experienced a larger surge in ED visits than others. People aged 85+ faced the largest jump in visits and many differing primary and secondary diagnoses (Malik et al., 2018). These diagnoses are useful in recognizing the problems that older adults are faced with during disasters. Primary diagnoses that increased at least 2.0% included prescription refills, dialysis, and homelessness. Secondary diagnoses that increased at least 3.0% were as follows: homelessness and medical facility unavailable (65-74 years), homelessness, ventilator dependence, and other health conditions (75-84 years), and homelessness (85+) (Malik et al., 2018). In addition to age being identified as a key component in ED use, “patients with dementia, cardiac comorbidities, amputations, or ostomies were more likely to develop acute medical needs” following disaster exposure (Lee et al., 2016, p. 359). The previously mentioned diagnoses and the acute medical needs that accompany them are important

parts of distinguishing which patients are at high risk for acute exacerbations of chronic diseases. These criteria are also important to consider in allocation of resources following a disaster.

Mental health is another aspect of care that is at-risk during and after disasters. At risk individuals such as children (Torani et al., 2019), the old, the disabled, those with poor pre-disaster mental health, and those that are low-income tend to have worsened or heightened mental health reports in the months following a disaster compared to their average self-reported mental health prior to exposure (Benevolenza & DeRigne, 2019). Another surprising population at risk for mental health deterioration are those who rely on public housing. People who rent their housing (Ma & Smith, 2020) and people who use public housing have been shown to be at a greater risk for not only property damage but also symptoms of post-traumatic stress (Hernández et al., 2018). While few longitudinal studies have been done to determine the extent of self-reported mental health deterioration that occurs as a result of disasters, current studies provide evidence of a distinct change in mental health lasting up to 16 months post-disaster (An et al., 2019). In general, older people are more susceptible than others to the effects of stress from a disaster (Al-Rousan et al., 2014; Benevolenza & DeRigne, 2019; Prohaska & Peters, 2019). Some studies yielded conflicting results, determining young people reported similar or more disruption than their older counterparts in perceived mental health. This null result could have been attributed to the older participants' past experience with disasters (An et al., 2019; Cherry et al., 2017). Despite many older adults exhibiting high resilience levels, many of them cannot overcome disaster stress due to confounding risk factors in addition to their age such as poor physical and mental health (Allen et al., 2018). Since mental health is a constantly evolving spectrum for each person, it is important for providers to routinely assess patients mentally and physically when evaluating risk and treating patient's post-disaster.



Community and social support have been commonly linked to decreased distress and increased preparedness in disasters (Cherry et al., 2017; McNeill et al., 2018). Previous disaster exposure has been attributed to better mental health outcomes during repeat disasters (Cherry et al., 2017). Personal interviews of people who had successfully weathered disasters specifically identified prior exposure as having played a part in their preparedness (Killian et al., 2018). A community approach to preparedness allows a unique structure in which stories from disaster involvement may be able to substitute the benefits of first-hand experience (Killian et al., 2018). This means that residents in diverse community settings may not have to go through a disaster to reap the benefits and understand how to properly prepare for one. From a social standpoint, experienced residents are sometimes able to identify certain gaps in recovery services, such as facilities not accommodating to those with special considerations economically, socially, and medically (Hernández et al., 2018). They can offer more specialized insight to other members in the group in relation to what specific emergency items they may need. Some people reporting negative views of the recovery response testified that other community organizations such as the Catholic Church and residents in the same housing facility came together to support each other (Hernández et al., 2018), further emphasizing the importance of community support. Community impact is a protective factor in that people with low health that lived in high-advantaged communities had better preparedness levels than those in low-advantaged communities (Adams et al., 2019). Encouraging social support between people with different disaster experience is a small yet important aspect in emergency preparedness; the members of a community may be able to offer time and advice that other agencies and services may not be able to offer.

With so many different risk factors associated with decreased preparedness and increased disaster impact, disaster education needs to include special considerations for all types of

vulnerable populations (Torani et al., 2019). However, the problem lies in not only trying to create an educational tool that can be inclusive to the many different combinations of vulnerabilities but also in finding a suitable way of promoting this tool to reach the intended populations and evaluating its effectiveness.

### **The Role of Healthcare Providers**

One large barrier when discussing preparedness education is access. Offering preparedness classes and events often reaches people who are already aware of their vulnerabilities and are actively seeking out ways to better prepare themselves. However, education efforts must also be delivered to people who do not yet know or understand they are vulnerable. Additionally, people who are lower risk still need to ensure they are prepared for emergencies but may not know how to do so. Health care providers in a myriad of roles can be effective in educating such populations.

Since current recommendations such as disaster kits and emergency plans are not linked to significant changes in disaster outcomes (Clay et al., 2020; Heagele, 2016), some researchers have shifted their focus to the healthcare team. Primary care providers have been recently tasked with adding this more in depth disaster education in their visits with patients; this has raised some concerns over the amount of information providers have to cover during visits (Olympia et al., 2010; Peters et al., 2019) and the effectiveness of the education delivered. Despite the lack of time and the unclear guidelines (Olympia et al., 2010; Wyte-Lake et al., 2014), many providers have continued to educate their patients on different aspects of emergency preparation. Many simple topics such as activating 911, evacuating the home, and having an emergency plan were covered with patients more often than more difficult or time-consuming topics such as preparing kits or registering for shelters and assistive transport (Wyte-Lake et al., 2019). Despite some

providers not discussing these time-consuming topics, provider education is still linked to increased preparedness scores and compliance with recommendations (McNeill et al., 2018; Olympia et al., 2010).

While some people with lower risk may see their physicians less often, many that use home-based care are aging and have chronic conditions and physical and sensory changes (Wyte-Lake et al., 2018). The providers at these facilities are uniquely positioned to provide disaster education to patients at highest risk for negative disaster outcomes (Wyte-Lake et al., 2019). Increased disaster exposure coincides with increased ED use and less utilization of home-based care; this may be indicative of not only a gap in access to home-based care providers during disaster but also of an increasingly vulnerable population subgroup (Rosenheim et al., 2018). This possible gap underscores the importance of educating the patients who use home-based care. Promisingly, having a physical limitation was directly linked to receiving disaster education from home-based providers (Wyte-Lake et al., 2019). This implies that providers can recognize at-risk patients and provide education for their limitations.

One issue in the implementation of provider-based education is the lack of structured education, not only for the providers but from them. Providers do not typically receive ample education on preparedness themselves and many providers reported this as a possible area for improvement in the future (Wyte-Lake et al., 2014). There is also no consistent educational material to hand out to patients, which forces many agencies and providers to create standards and supplies on their own; this can lead to inconsistent recommendations and creates a clear gap between practice and policy (Wyte-Lake et al., 2014).

## **Educational Tools and Methods to Improve Preparedness**

Newer instruments show promise in identifying disasters that areas are at risk for, identifying high-risk people, and evaluating preparedness progress (Peters et al., 2019). Detecting what populations may be at risk for different disasters may prove useful in larger scale public health matters and certainly being able to track the progress of new preparedness measures would be useful as well. Some agencies have shown optimal results in improving community resilience in patients by having checklists present with providers during visits (Wyte-Lake et al., 2018).

Since current education is neither clear nor consistent, many researchers have fixated on identifying what tools providers and patients may benefit from. Use of a holistic approach is one of the first steps providers must take when approaching a patient on the topic of emergency preparedness; they must recognize that this is key in providing care to vulnerable populations but especially older adults with multiple conditions (Prohaska & Peters, 2019). A wide variety of health care providers identified that training, consistency of education length, initial assessments, and reassessing preparedness should be prioritized to help increase overall preparedness scores of patients (Wyte-Lake et al., 2014). These recommendations grew from three frequently identified challenges that patients faced with preparedness including limited resources, cognitive impairments, and difficulty with preparedness ‘buy in’ (Wyte-Lake et al., 2014). Several approaches to reduce these challenges include making sure that people understand that a hazard exists, that they can decrease the hazard, and that recommendations are consistent for decreasing the hazard are consistent (Heagele, 2016).

A household emergency preparedness instrument (HEPI) has been developed by Heagele et al. (in press) using a Delphi study that began with a 106-question survey that was created from

literature reviews and prior materials. They asked an extensive panel of experts and community stakeholders from 36 countries to rank these questions on importance to preparedness. The goal of this method was to include questions on the final questionnaire that had reached a certain consensus from the experts and to create new questions to be voted on from open ended responses at the end of the survey. When all experts voted on recommended quantities of supply kit items, there was no consensus; this result was likely due to different countries' response rates after disasters. Using the quantities that had received a majority vote resulted in having one week's worth of food and water and two weeks of medication and medical supplies. In the end, a 51-question survey was created. This evidence-based instrument is the first of its kind (See Appendix A). It used many different methods and various stakeholders to create a widely accepted survey that includes topics on "preparedness actions (11 questions), communication planning (3 questions), evacuation planning (12 questions), disaster supplies (16 questions), and specific to those with access or functional needs (9 questions)" (Heagele et al., in press, p. 13).

### **Methods**

The HEPI (Heagele et al., in press), as the only empirically developed instrument of its kind, will be used as the foundation to develop educational interventions intended to improve preparedness. Each item in the HEPI represents possession of necessary disaster supplies, preparedness actions, or plans needed to properly prepare for an emergency. Each component of the HEPI will be utilized to guide the education provided. One preparedness action in the HEPI is: Do you know the types of disasters that are most likely to occur in your community? To facilitate participant knowledge, the education will contain information on the most likely disasters within a given community. Ultimately, the intended outcome of this educational intervention is a more well-prepared community to facilitate good outcomes and increased

resilience after a disaster. Another preparedness action in the HEPI is: Have you signed up for a community emergency alert system? Education provided will include information for how to sign up for the region's emergency alert system. The goal of this intervention is to connect people with a consistent way to receive information pertaining to emergency alerts. One question in the HEPI's communication plans portion is: If there were no power or telephones, would you have a way to receive information about disasters in your area, such as with a solar, hand-crank, or battery-operated radio? Simple education about pros/cons of various communication options, prices, and locations to buy these products can easily facilitate community preparedness for service or power outages. In the evacuation plans portion of the HEPI, one question is: Do you know where your local emergency shelter is? This question will be reflected in the education as information on the location of the local shelters in that specific area. This education will aid people in having a set location that can help increase good outcomes during disasters.

Additional information pertaining to the specific recommendations for disaster supplies are listed in Appendix A in questions 27-42. Education provided will reflect these recommendations and will include examples of nonperishable food items. Having clear recommendations that are now based on empirical evidence is important to facilitating proper education and community preparedness. When creating the education, each question in the HEPI will be reflected on and utilized to guide educational materials to facilitate better participant preparedness.

Pre- and post- questions will be created and administered to determine the knowledge that participants have of each component of preparedness (supplies, actions, and plans) at each point in time. They will evaluate the effectiveness of the education and assess knowledge of the participants before and after the education. Questions will include: "How confident are you that

you know what needs to be a part of your emergency preparedness plan for your home?”, “How would you rate your knowledge of disasters that may impact your community?”, “Please rate your knowledge of safe and unsafe places in the community”, “How confident do you feel in knowing what supplies are needed to be prepared for an emergency?”, “ How would you rate your knowledge of preparedness resources in the area?”, and “How would you rate your knowledge of necessary preparedness actions?”.

### **Discussion**

Clear, consistent, and evidence-based recommendations need to be provided to all populations during disaster education (Clay et al., 2020). However, vulnerable populations such as those with chronic diseases, disabilities, and the elderly need to be considered when creating and administering the education. The end goal of this education is to bring about behavioral change and facilitate understanding in participants.

Upon review of current studies and evidence, recommendations for effective education included actively engaging the audience (Wells et al., 2013) and offering free materials (Saramago et al., 2014). The first recommendation is facilitated in Appendix C by asking open-ended questions that require critical thinking and active participation throughout the administration of the education. The second recommendation for effective education is attained by raffling items such as first aid kits and crank radios. The purpose of educating in this manner is to increase participation and information retention. Ideally, disaster education should bring about a tangible behavioral change in the population that receives the education (McNeill et al., 2016). FEMA’s four step outline for personal preparedness along with recommendations from the HEPI (Heagele et al., in press) and McNeill et al. (in press) were used as a framework for the education.

While it is not within the scope of this project to administer and evaluate the effectiveness of the teaching, Appendix B contains a survey created to administer as a pre- and post-test for the educational delivery. This survey focuses primarily on the participants' confidence and knowledge in relation to disasters. Since mere possession of materials is not sufficiently linked to increased preparedness levels (Heagele, 2016, p.980), comprehension of materials needs to be assessed through the survey.

### **Conclusion**

In a world where natural disasters are becoming an increasing and costly threat, proper preparation is vital (EM-DAT: The International Disaster Database, 2020b). With recent pandemics and wildfires affecting hundreds of thousands of people (Newburger, 2020), namely those with chronic health conditions, more emphasis needs to be placed on creating effective, evidence-based education that is inclusive of people with chronic diseases and other particular vulnerabilities.

Creation, administration, and subsequent evaluation of the education is imperative to disaster educators; without any meaningful change such as an increase in confidence of one's own abilities or new insight of how to take further preparational steps, there is a small chance that the education will prove useful following a disaster, either short term or long term. Future research should be geared toward the administration of the educational materials in Appendix C with the use of the evaluation in Appendix B.



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## Appendix A

## Household Emergency Preparedness Instrument

A. Preparedness Actions			
A. Preparedness Actions	Yes.	No.	This does not apply to me.
1. Have you prepared and discussed a family emergency plan?			
2. Have you practiced or drilled on what to do in an emergency at home?			
3. Have you taken first aid training?			
4. Do you have working smoke detectors?			
5. Do you have a fire escape plan for your home?			
6. Do you know the types of disasters that are most likely to occur in your community?			
7. Do you have important family documents such as copies of insurance policies, identification, and bank account records in a waterproof, portable container or stored on a flash drive or cloud storage server?			
8. Have you signed up for a community emergency alert system?			
9. Do you have supplies set aside in your home in a kit to use in case of a disaster?			
10. Do you check your disaster supplies regularly for expired items?			



11. If you have the shut off valves in your home, do you know how to turn off the utilities (water, gas, propane, etc.)?			
<b>B. Communication Plans</b>	Yes.	No.	This does not apply to me.
12. Have you planned for how you and your family would contact each other in an emergency if you were separated?			
13. Do you have written contact information of family and friends?			
14. If there were no power or telephones, would you have a way to receive information about disasters in your area, such as with a solar, hand-crank, or battery-operated radio?			
<b>C. Evacuation Plans</b>	Yes.	No.	This does not apply to me.
15. In the event of an evacuation, have you considered safe and unsafe places in your community?			
16. Do you know if your home is in an evacuation zone?			
17. Have you planned where to go if you had to evacuate from your home?			
18. Have you planned what route to take if you evacuate from home?			

19. Do you have a source of transportation to leave your neighborhood quickly in the event of a necessary evacuation of your home?			
20. Do you have a family meeting place in case of separation?			
21. Is everyone in your home aware of your evacuation plan?			
22. Do you have family or friends that you could stay with during an emergency?			
23. Do you know where your local emergency shelter is?			
24. Do you have a plan for what you will take if you had to leave your home quickly?			
25. Have you prepared a small kit with emergency supplies to take with you if you had to leave quickly?			
26. If you have a pet, do you have an evacuation plan for your pet?			

Instructions for part D:

Please answer the questions below about whether you have certain disaster supplies by placing a check in the matching column.

*“I do not have this item”* means you do not have the item in your home.

*“I have this item in my home”* means you have the item in your home, but it is not in a disaster supply kit.

*“I have this item in my disaster supply kit”* means you have the item in your home and it is in a disaster supply kit that you can take with you if you had to leave quickly.

If the question does not apply to you, place a check in the “this does not apply to me” column.

<b>D. Disaster Supplies</b>	I do not have this item.	I have this item in my home.	I have this item in my disaster supply kit.	This does not apply to me.
27. Do you have a supply of water that would provide at least 3.8 liters (one gallon) of water per day for each person in your home for 1 week?				
28. Do you have a 1-week supply of ready-to-eat food that will not spoil for all those living with you?				
29. Do you have moist wipes, hand sanitizer, and other personal hygiene supplies (soap, tampons, pads, etc.)?				
30. Do you have a flashlight/torch, a headlamp, lanterns, glow sticks, candles, or other non-electric portable lighting?				
31. Do you have a first aid kit?				
32. Do you have a sleeping bag or warm blanket for each person?				
33. Do you have cash?				
34. Do you have extra batteries?				
35. Do you have matches?				
36. Do you have a fire extinguisher?				

37. Do you have a wrench, pliers or multi-tool to turn off utilities (water, gas, propane, etc.)?				
38. If you wear prescription glasses or contact lenses, do you have extra glasses or contact lenses?				
39. If you have a baby, do you have a 1-week supply of formula, bottles, and baby food?				
40. If you have a baby, do you have a 1-week supply of diapers/nappies?				
41. If you have a pet, do you have a 1-week supply of pet food and water for each pet?				
42. If your pet takes medications, do you have a 2-week supply of extra medications?				

Instructions for part E:

Do you have a disability? Are you 65 years of age or older? Do you take at least one prescription medication? Are you pregnant?

If you said no to those four questions, you are finished with this survey.

If you said yes to any of those four questions, please complete part E of this survey. Please answer the following questions about your own preparedness actions by placing a check in either the “yes” or “no” column. If the question does not apply to you, place a check in the “this does not apply to me” column.

<b>E. Access and Functional Needs Subscale</b>	Yes.	No.	This does not apply to me.
43. Do you have your medical history written on paper or stored on a flash drive or cloud storage server?			
44. Do you have a list of your doctors on paper or stored on a flash drive or cloud storage server?			
45. Have you asked family or friends if they will be able to help you in a disaster?			
46. If you take prescription medications, do you have a written list of your medications including how much you must take?			
47. If you take medications prescribed to you by your doctor, do you have a 2-week supply of extra medications?			
48. Do you have a 2-week supply of special diet food, syringes, blood sugar monitoring strips, oxygen cylinders, or other needed medical supplies?			
49. Do you have a plan for an alternate power source for medical equipment or refrigerated medicine in the event of a power outage?			
50. Do you have a small cooler, portable ice chest, ice box, cool box, chilly bin, or an esky and cold packs/freezer bricks for refrigerated medications?			
51. Do you have a paper copy of your advanced directives or provider's order for life-sustaining treatment form, or is it stored on a flash drive or cloud storage server?			

## Appendix B

## Pre- and Post- Survey

	Not Very Informed	Somewhat Not Informed	Neutral	Somewhat Informed	Very Informed
How would you rate your knowledge of available preparedness resources in the area?	1	2	3	4	5
How would you rate your knowledge of the disasters that may impact your community?	1	2	3	4	5
Please rate your knowledge of safe and unsafe places in the community.	1	2	3	4	5
How would you rate your knowledge of necessary preparedness actions?	1	2	3	4	5
Please rate your knowledge of your own limitations and how they pertain to disaster preparation.	1	2	3	4	5

	Not Very Confident	Somewhat Not Confident	Neutral	Somewhat Confident	Very Confident
How confident are you that you know what needs to be a part of your emergency preparedness plan for your home?	1	2	3	4	5
How confident do you feel in your ability to successfully evacuate your current residence?	1	2	3	4	5
How confident do you feel in your ability to identify important copies of	1	2	3	4	5

documents that may be needed in disasters?					
Please rate your confidence in your ability to maintain communication with family members in the event of separation	1	2	3	4	5
How confident are you that you know what needs to be considered when creating evacuation plans?	1	2	3	4	5
How confident do you feel in knowing what supplies are needed to be prepared for an emergency?	1	2	3	4	5
How confident do you feel in your ability to acquire and maintain the supplies needed for an emergency?	1	2	3	4	5

## Appendix C

### Emergency Preparedness Education PowerPoint Presentation

# EMERGENCY PREPAREDNESS:

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# WHY DO WE PREPARE?

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- Survival
- Decreasing risk
- Increasing resilience

# WHAT DOES IT TAKE?

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- Resilience
- Community
- Preparation

# FEMA GUIDE (READY.GOV, 2020A)

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- Be informed
- Make a plan
- Build a kit
- Get involved



# BE INFORMED (FEMA, 2020)

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- Common disasters
- Shelters
- Communication

## FEMA Mobile App



[Get it on Google Play](#). You can also download the app via text messaging on an Android device: Text **ANDROID** to **43362** (4FEMA)



[Download on the Apple App Store](#). You can also download the app via text messaging on an Apple Device: Text **APPLE** to **43362** (4FEMA)

## DISASTERS IN GREENVILLE NC (USA.COM, N.D.)

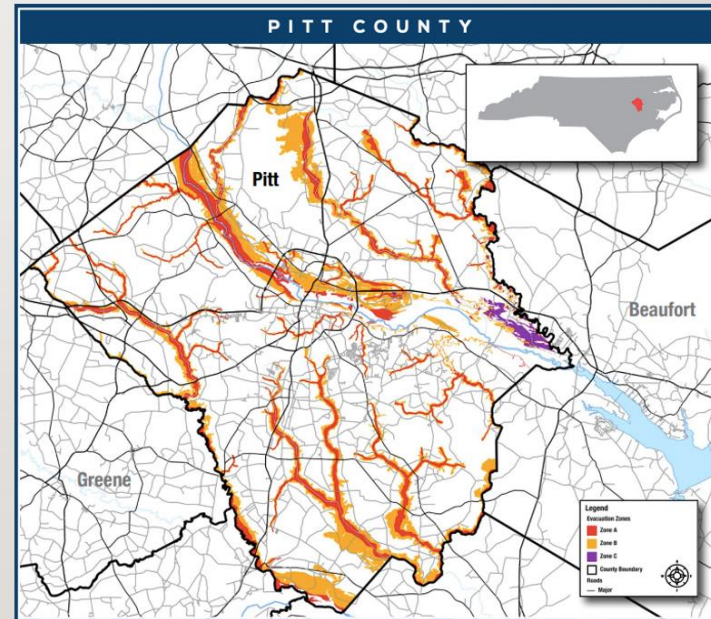
---

- Tornadoes, thunderstorm winds, hail, flood, winter-storm
- Find emergency shut-off valves

## EVACUATION PLANS:

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- **Location risk** (North Carolina Department of Public Safety, 2020)
- **Pitt County Sign Ups** (Pitt County North Carolina, n.d.)
- **FEMA App**



## MAKE A PLAN:

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- Family plan
- Fire plan

# FAMILY EMERGENCY PREPAREDNESS PLAN

(READY.GOV, 2020B)

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- Emergency meeting locations
- Important phone numbers and points of contact
- Alternate forms of communication
  - Solar or hand crank radios



# FAMILY EMERGENCY PREPAREDNESS PLAN

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- Informing extended family members
- Discussing and printing off information
- Keeping it on your person
- Drills

## SPECIAL CONSIDERATIONS

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- Transportation
- Small children

# FIRE PLANS:

(Arlington Virginia Fire Department, n.d.)

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- Creating a fire escape plan
- 2 escape routes and meeting place
- Ladder use

# SMOKE DETECTORS

(Allstate.com, 2015)

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- Test system
- Change batteries
- Replacing the system

## BUILD A KIT:

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- Having a designated bag
- Rotating items and checking for expiration dates

## DISASTER SUPPLIES:

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- Water
- Food supply
- Hygiene supplies + face coverings

## MORE SUPPLIES:

(Heagele et al., in press)

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- Lighting
- First aid kits
- Sleeping bags/blankets
- Multi-tool
- Cash

## SPECIAL CONSIDERATIONS:

(Heagele et al., in press)

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- Pet food
- Medication reserve of 2 weeks
- Baby food and diapers



## CHRONIC DISEASES:

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- Medication reserve of 2 weeks
- Special equipment reserve of 2 weeks
  - Diabetes
  - Dialysis
  - Heart Failure
- Alternate power sources for medical equipment
- Copies of medical history, medications, and advanced directives

## GET INVOLVED:

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- Community
- Neighbors
- Organizations

# FIRST AID TRAINING

(American Red Cross, n.d.)

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- Online 3 hours course \$35
- CPR/First Aid/AED

# SUMMARY

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## 4 STEPS

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- **Be informed**
  - Disasters
  - FEMA app
- **Build a kit**
  - Food and water
  - Additional items
  - Special considerations
- **Make a plan**
  - Family Plan
  - Fire plan
- **Get involved**
  - Community engagement

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