Assessing Emergency Shelters with Consideration for Vulnerable Populations

UNC Institute for the Environment

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This paper represents work done by a UNC-Chapel Hill undergraduate student team. It is not a formal report of the Institute for the Environment, nor is it the work of UNC-Chapel Hill faculty.

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*Appendix D stored separately from this report, with capstone staff

Introduction and Overview

Communities face a range of serious threats, both natural (such as hurricanes, earthquakes, floods, and fires) and technological (such as explosions or spills). Some aspects of modern life, including settlement patterns and economic activity, increase the threat of disasters and amplify negative impacts on physical and social systems. Injury and loss of life, along with property damage and social disruption, can devastate a community and require years or decades of recovery.

Recently, our state of North Carolina has suffered hurricanes, tornados, droughts, fires, ice storms and more. Urban and rural, coastal and inland communities—all face a variety of challenges relating to understanding, preparing for and responding to disasters. When disasters strike and residents are forced to flee their homes and seek shelter, vulnerable populations may find designated shelters inadequate for their needs.

This project took on the task of assessing whether emergency shelters can accommodate vulnerable citizens, such as those with limited mobility, special medical needs, dependent animals, no access to transportation, or limited English. The team interviewed key informants who work in the field of emergency planning, in an effort to identify challenges in designating and operating shelters, particularly in cases of prolonged emergency events, and to develop recommendations to address gaps. The team explored the literature on emergency sheltering for vulnerable populations and existing tools, and developed and piloted a shelter audit instrument.

Emergency Sheltering and Vulnerable Populations

Sheltering vulnerable populations during and after emergencies is one of the most difficult challenges emergency managers face. Certain people (e.g., very young and very old, disabled, car-less, and those with cognitive or sensory impairments or other medical conditions) may have needs that exceed what is available in emergency shelters, which often are schools, churches, or government buildings, without specialized equipment, and intended to provide safe havens for brief periods.

Emergency shelters meet an important requirement of many response operations in disasters both natural and manmade. When a disaster displaces people from their homes, they often look to emergency shelters to meet their needs. While some individuals may be able to evacuate and find adequate shelter on their own, many individuals depend on publicly operated emergency sheltering for survival.

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In the event of a natural disaster or other local or regional emergency, the designation and operation of emergency shelters become vital. However, emergency shelters do not always fully accommodate populations with special needs. Emergency shelters themselves could potentially prove more harmful for some citizens than the emergency itself. Emergency shelter operators all face unique challenges based on the facilities themselves. Shelters may be designated in advance, or on short notice in response to a developing emergency. Shelters vary widely in their capacity to meet the needs of a broad range of citizens. At the same time, those seeking emergency shelter may have fewer resources and present more needs than the general population. For this reason, identifying gaps in the emergency management process with respect to vulnerable populations may help emergency shelter operators identify needs and better serve all citizens.

Our team, enrolled in an environmental capstone (senior team project) at UNC—Chapel Hill, took on the challenge of constructing an emergency shelter audit tool suitable for assessing the capacity of any emergency shelter to meet the needs of socially vulnerable populations. The goal for this audit tool was that it should be easily usable by an individual carrying out an inspection of an emergency shelter. Literature research and interviews with community leaders in emergency management informed the creation of the tool, which took the form of a checklist with multiple sections and annotations referring to other tools and useful resources. Individuals with functional needs, such as those with physical or cognitive disabilities, medical requirements, or mobility limitations, may seek shelter in a facility that does not possess the resources necessary to serve the physical and mental health of all those seeking emergency sheltering. Such people may find themselves poorly served, adding more stress in an already difficult situation.

This provides an opening for development of a useful new tool to fill a gap in the supporting documents typically used by emergency planners and shelter operators. Many tools already in existence focus largely on the general population, and do not take into account the needs of vulnerable individuals who may enter a shelter. For this reason, this team developed a more comprehensive audit tool that addresses the unique needs of these populations, called The Shelter Accessibility and Livability Tool (SALT).

This project began with an overview of existing literature on the challenges facing socially vulnerable populations seeking emergency shelter. We drew on sources identified by the team's graduate assistants, who researched a variety of secondary resources that generally fell into three different categories. The first category centered around tools created by leading authorities and agencies in emergency management, such as the American Red Cross Shelter Survey and the FEMA Functional Needs Support Services Guidance material. The second category included scholarly publications that focused on emergency management, such as the journal *Disaster Management and Response*. The final general category included materials produced by advocacy groups and aid organizations representing vulnerable populations, such as disability policy

consultants and organizations. These resources helped us develop a list of vulnerable populations that may not necessarily be adequately served in emergency shelters. This literature search will contribute to a comprehensive literature review on emergency planning and vulnerable populations, for submission to a peer-reviewed journal.

Once we developed that list of vulnerable populations and associated functional needs, we organized the data into a checklist appropriate for use by an individual overseeing an emergency shelter location, then compared it with other tools to assess the degree of overlap. Our goal is for this audit tool to complement existing shelter audit tools, while addressing in a single document the most common categories of needs for both general and special populations

Methods

Literature Review

This project required several interlocking components to eventually produce several deliverables: this brief report on motivation, methods, findings, and recommendations; a new user-friendly audit tool that has already been piloted, revised, and field-tested; a guide to using and expanding the audit tool; comments and guidance for future capstone teams; and our interview transcripts.

The literature search conducted by the team's graduate assistants involved identifying and evaluating for relevance a variety of sources including--but not limited to--journals, reports, reviews, websites, and pamphlets. The purpose of the literature search was to identify all relevant material in order to develop a comprehensive audit checklist that would serve as our ultimate project goal. The overall focus of the literature search was on vulnerable populations in emergency shelters, which also touched on the topics of emergency management, disaster assessments, and vulnerability assessments. The capstone team compiled demographic information on the counties with which we partnered—Forsyth and Duplin—so that the final product reflects the counties' specific sheltering needs and interests.

As described above, the identified literature fell into three general categories: tools by leading authorities in emergency management (FEMA), scholarly publications (*e.g., Disaster Management and Response*), and materials produced by advocacy groups. The materials also could be seen as falling into two sub-categories. The first category was a compilation of any literature that contributed to our general knowledge of our focal topic – vulnerable populations and emergency management. The second category was a compilation of any literature that could contribute, by way of checklists or assessments that would directly assist in the generation of our own checklist product. Each item listed was annotated with abstract and key words, so that our team could appropriately utilize the information in our product.

Demographic Data

We researched the demographics of an urban and a rural county, and kept the relevant descriptive statistics in mind when developing our audit tool. Using selected social characteristics, selected economic characteristics, and disability characteristics, we looked at a range of variables that would make a population more vulnerable in a disaster, including: age, household size, race, language spoken, poverty, and disability status. All data were obtained from the United States Census Bureau's website. All data are located in Appendix A and are discussed further in the results section of this report.

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Interview Process

Before beginning the interview process, the entire group completed CITI training and submitted an application to the Institutional Review Board (IRB). The IRB is a committee designated to approve, monitor, and review any research—including behavioral—Involving human subjects. As such, our team submitted our interview script as part of our IRB application. Our project was deemed "exempt from further review" status, primarily because the team interviewed key informants in the course of their normal work as public officials. Although we did not have any required measures to follow with regards to sensitive data, we nonetheless followed our stated plan to carefully handle any data because of the remote possibility that it could be sensitive.

The interview period lasted from February 1st to April 4th. This period included constructing the interview script, practicing interviews with the interview script, identifying and contacting interview targets, scheduling and conducting interviews, transcribing interviews and coding the interview transcripts. The research team prepared several documents prior to carrying out interviews. The team prepared a stakeholder contact tracking document, which facilitated accurate tracking of all communication between the interviewees and the research group. The group then developed an interview schedule that listed the dates and times of all scheduled interviews as well as the individual assigned to carry out the interview. We determined the availability of all team members during regular work hours so that all interviews could be scheduled during a time when at least one person was able to conduct the interview. We logged these availabilities on a spreadsheet for quick reference. The team then drafted, constructed, and tested an instrument to use while interviewing in order to prepare for the interview period. Practice interviews were conducted on February 18th and 19th to test the interview instrument's fluidity as well as increase the interviewers' familiarity with the tool and the interview procedure. After conducting the practice interviews, the group concluded that two undergraduate members of the team would undertake most of the interviews and have note-takers present for each interview. The group prepared a brief introduction script for use in the initial contact with each interviewee. The script provided a set format for introducing the caller to the interviewee and a brief explanation of the purpose of the project.

In order to gain insight into potential interviewees, the group established a primary contact on February 20th. The primary contact, the director of the Duplin County Emergency Service, took time to learn about the project and later interviewed with a team member on February 24th. During the interview he provided the names and contact information for the Duplin County Manager, two members of the Duplin County Health Department, the Head of Duplin County Sheriff department, the director of social services and the Emergency Management director of the county. The primary contact also allowed the research team to use his name as a reference.

The group then contacted potential interviewees through phone calls to their workplace. The callers introduced themselves as members of a research team from the University of North

Carolina at Chapel Hill and inquired as to the potential interviewee's willingness to speak for a few minutes. If the interviewee consented, he/she listened to the rest of the introduction script that informed the interviewee of the general topic and estimated length of the interview. If the interviewee then agreed to participate in the interview, the team arranged a date and time for the interview using the team member availability spreadsheet. The interviewee provided his/her email address so that he/she could obtain a document of the list of questions that the actual interview would include, as well as information regarding the recording and handling of potentially sensitive information. Once the interviewee confirmed a date and time for an interview, the research group logged the call on the interview tracking sheet and noted the scheduled interview.

On the day of the interview, the two team members called the interviewee using a mobile telephone. Before each interview began, the interviewer asked the interviewee for his/her consent to be recorded during the interview. If the interviewee complied, the interviewer carried out the recording by setting the interview phone to speakerphone mode and utilizing either a laptop or handheld recorder to record audio.

As previously mentioned, the research team developed an interview instrument to utilize during the interviews. While the interviewee had perused the questions beforehand, each question carried several follow-up questions the interviewee had not seen beforehand. The follow-up questions were related to specific populations or resources identified through searches of relevant literature. If the interviewee did not speak on those populations or resources while answering a specific question, the interviewer would ask the interviewee specifically regarding those populations or resources. The interview instrument is found in Appendix C.

Interview Analysis

Upon interview completion, the interviewer uploaded the recording to Blackboard and moved it to a secure folder so that it could be downloaded by each person conducting transcription. Transcribers utilized the unlicensed version of ExpressDictate (v5.53, NCH Software) to transcribe the recording. The transcribers worked with the goal of accurately reproducing the contents of the conversation, but for the sake of readability, they omitted filler words or phrases (such as "okay" or "you know") in places where they did not carry meaning in the overall sentence.

The transcribers then uploaded the completed document to Blackboard and moved it to a secure folder. The research group then worked to develop a code and chose people to actually code the documents. Participants carried out the coding using ATLAS.ti (v6.2 buid 27, ATLAS.ti Scientific Software Development GmbH, Berlin). Using two rounds of coding and the same

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codes (Table 1), two different group members coded the transcripts, and compared and reconciled the codes to create a thorough code list.

Table 1: Codes

Code	Description
Vulnerable Populations	This was an overall category code used in conjunction with every code attached to a more specific reference to a vulnerable population.
Children	*Subset of Vulnerable Populations*
Mobile Home Owners	*Subset of Vulnerable Populations*
People with functional needs	*Subset of Vulnerable Populations*
Pet Owners	*Subset of Vulnerable Populations*
Socially Isolated	*Subset of Vulnerable Populations*
Spanish-speaking populations	*Subset of Vulnerable Populations*
People with medical needs	*Subset of Vulnerable Populations.* Only used if the interviewee did not provide a more specific description of the population (e.g., people with a specific type of medical need, such as diabetes).
Older adults	*Subset of Vulnerable Populations*
People without personal transportation	*Subset of Vulnerable Populations.* This category may include individuals of low socioeconomic status, but may also include many older adults.
Low-income populations	*Subset of Vulnerable Populations.* Only used if the interviewee did not provide a more specific description.
Criminal populations	*Subset of Vulnerable Populations*
Identified gaps	Used to indicate a gap in shelter operations identified specifically by the interviewee.
Organizational structure	Used any time another agency was mentioned as part of communication or decision-making processes.
Shelter features	Used to indicate features of the shelter environment, such as accessibility ramps.
Shelter type	Used to indicate when a specific type of shelter was referenced by the interviewee.
Supplies	Could include food, medical supplies, and other resources.

We used these codes to analyze relationships in the data. Each code was analyzed using the tools built into ATLAS.ti to analyze the way codes were connected through quotes. The tool essentially builds a web of relationships, where a single code acts as the originating node of the web. All quotes that include that founder code are graphed in the display. Then, all the codes that those quotes are coded with are displayed. If multiple quotes are labeled with the same code,

each quote is shown as connected to a shared box. This allows the user to see the second-degree relationships between codes.

All data was stored in secure folders on the Blackboard course management system, restricted only to the members of the capstone team. While identifying names were present in the initial transcripts and internal scheduling documents, no identifying information was used in final documents for release to other parties.

Generation of Checklist

The overall goal of this project was to develop a comprehensive checklist that would be used to evaluate how well emergency shelters can accommodate various vulnerable populations. The capstone team compiled all the primary and secondary resources that we accumulated. By drawing from our literature sources, our own analyses and discussions, and our key informant interviews, we developed a preliminary checklist of needs that our tool would evaluate in shelters. We then piloted the checklist in five emergency shelters in Forsyth and subsequently evaluated for usability, clarity, and general functionality. The group did not necessarily worry about the results the audit tool displayed as much as how well the tool addressed the problems we identified at the start of the project. During the pilots, eight professionals from emergency planning agencies in Forsyth County accompanied the group and provided useful feedback for the tool. After piloting, the group edited the checklist to include all the changes we saw necessary, then field-tested the tool in five more shelters; pilots and initial field tests included schools, churches, and large facilities such as a county coliseum complex. Additional field tests are planned in several counties for summer 2013, including Duplin, for which our team conducted key informant interviews and gathered demographic data but where schedules prevented spring 2012 field testing.

We divided the checklist into two main sections. The first section included general habitability needs. The second section included a breakdown of needs divided into categories of vulnerable populations, which included: mobility-limited, vision-impaired, hearing-impaired, limited English proficiency, chronic medical illnesses, mental health, populations with service animals, populations with companion animals, and children. The checklist items were set up to be ranked with scores from 0-2, where 0 indicates that the shelter had no capacity to provide the need listed and where 2 means the shelter had ideal capacity to provide the need listed.

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Results

Demographics

We noted from our demographic research that there was a substantial population that speaks English less than "very well," and a significant population with a variety of disabilities, as well as a substantial population below the poverty level. All of these populations represent citizens who may be vulnerable in a disaster if they seek shelter in a facility that cannot meet their particular needs.

Coding and Transcript Analysis

After we coded all of the transcripts and the coded quotes were finalized and collected in one document, they were analyzed for relationships in the codes. Family relationship plots were created for each code (Table 2). We analyzed these plots to determine the codes that were immediately connected to the code of interest through its primary quotes.

Table 2: Relevant Quotes From Interviews

Interviewee	Organization	County	Interviewer	Date	Time	Relevant Quotations	
Contact 2	County Manager	Rural	David	2/28/12	8:00AM	"The problem with that has been, historically, that the [public facility administration] wasn't real keen on designating a specific room or area...for children."	"One obvious shortcoming is, that not all of our shelters are pet-friendly... it could be a 30 minute drive for someone at one extreme quadrant to the other to get to a designated pet-friendly shelter."
Contact 3	Health Department Director	Rural	Charles	2/28/12	2:15PM	"…there is no place for them [children] to play other than just around in the gym within the space of the people."	"You know you always have people that may come to the shelter that forgot their medicine."
Contact 4	Director of Social Services	Rural	Cristina	3/1/12	3:00PM	"Each of the shelters has a nurse on site. If they're any medical issues that arise, the nurse is there to address them."	"Our country is a poor country, about 24% of our population is below federal poverty guidelines and…live in trailers….So…it creates a much more vulnerable situation for them if they choose to stay at home"
Contact 6	Disaster Preparedness Committee	Urban	Charles	3/1/12	4:00PM	"Those with dietary needs can present some challenges. People that are prescribed medication and do not bring their prescribed medicines. That can present some challenges."	"More planning, training, more exercising, and more collaboration [is needed]."
Contact 7	Emergency Management	Urban	Charles	3/1/12	2:00PM	"…the people who are very skilled in setting up shelters…already have it in their plans because they know kind of what their demographic breakdown is in those regions to have the appropriate translators in their shelters."	"The very old are our biggest customers. Typically what happens…[is] your biggest audience is nursing homes. You have to evacuate an entire nursing home and shelter that entire nursing home."
Contact 8	County Red Cross	Urban	Charles	3/7/12	1:00PM	"One of the things we lacked was oversize cots, because we had a lot of severely obese people that came in."	"We have a number of predetermined shelter locations, however, we're limited to securing an agreement the day of."
Contact 9	City-County Planning Board	Urban	Charles	3/6/12	1:00PM	"I'm sure there are other language issues, but here it's almost exclusively Spanish."	"I do think that we probably do need some additional preplanning. Some of these issues…need to be resolved prior to an emergency."

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Shown here is an example relationship view for the code for "People with medical needs." The orange numbered boxes are icons for the quotes; a white box depicts a code; and an arrow depicts a link between the codes and the quotes. Many of these quotes connected to the "People with medical needs" code are also connected to either the "Identified gaps," "Supplies," or "Organizational structure/Coordination of Services" codes. The unconnected "People without personal transportation" code box is an artifact of the program's display and is not meaningful in this context.

Figure 1 – Code Analysis

Several themes were identified through this analysis. These themes are described below. Some of these themes represent information sourced from several interviewees. Others represented information discussed by only individual, due to differences in the personal experience and training of each individual or the context of the interview.

People with medical needs
Medical supplies, such as medication and dietary needs, were identified as primary needs related to a lack of supplies and identified gaps of shelter operations. Several quotes identified the problem of individuals not bringing required medications to the shelter. In cases where medications were salvageable, such as localized emergencies, attempts were made to retrieve

medications if possible. In other situations, volunteers would contact the issuing pharmacy if the missing medication was critical to survival.

Dealing with demand for supplies and treatment for medical issues had some overlap with coordination with outside agencies, usually through efforts to acquire needed medicine, arrange for outside medical care, or provide for individuals with medical dietary needs.

Identified gaps

The issue of sheltering pets was the most urgent need identified by the audits. Although pet sheltering is becoming more commonplace, several interviewees identified it as a barrier to sheltering for many people. Barriers to pets include deficiencies in shelter features to house animals or deal with problems of air quality and sanitation, lack of veterinary care, and lack of supplies.

In addition to the medical needs issues previously described, other important identified gaps dealt with non-English-speaking populations. While some translated printed materials might be available, there is no guarantee that shelter staff will be capable of interpretive functions, and access to outside interpreters may be hampered if communication or power is interrupted.

Older adults

Older adult populations were not mentioned frequently as having barriers to the use of shelters that did not also fall under another category. The most important aspects of meeting the needs of older adults were supplies and shelter features. Adult diapers, shelter features such as higher toilets, and home health care were identified by interviewees as some needs of older adults.

Low-income populations

Transportation was an important problem relevant to low-income populations. Many individuals will seek alternative accommodations if possible rather than stay in an emergency shelter; low-income individuals may not have the means to arrange for accommodation or the ability to travel to another region, and so may end up in a shelter.

People without personal transportation

People without personal transportation had some overlap with low income populations, but other populations with higher incomes may also rely on public transportation that would be interrupted by an emergency situation. Individuals without transportation are limited to whatever transportation is available during the disaster, usually to a shelter.

Criminal populations

Although an interviewee identified criminal populations only once, they represent an important area for shelters to address. An incident was identified where attempts to evacuate individuals

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with outstanding warrants were being airlifted to another shelter location while carrying drugs, stolen property, or guns.

Related problems identified by the research team include those of identifying and accommodating sex offenders, and whether staff should change their procedures to deal with the potential risks of having a registered sex offender present in the shelter.

Children
Children often have medical needs and supply needs in the form of medications, diapers, and wipes. Medical issues were also mentioned, such as the need to move children (or premature babies) to hospitals to deal with medical issues. Another commonly raised theme is the need for separate and safe designated play areas for children.

Mobile home owners
Our analysis identified large populations of mobile home owners in rural areas. Mobile homes are more vulnerable than a typical house. Thus, they create a larger risk if the mobile home owner decides to stay home. This population also is at more risk for loss of property.

Organizational structure
The plans for the shelters are made and carried out by the county emergency management agencies. They often coordinate with the county schools for facilities and various organizations such as the American Red Cross for added assistance. More than one interviewee said that a general population shelter, depending on circumstances, can be prepared and ready for use within twenty-four hours of the plan being enacted.

People with functional needs
The shelters rarely run into problems when sheltering people with functional needs. All shelters are either handicap accessible or have sufficient staff and or volunteers to ensure that accessibility is assured. In any instance where there was not a dedicated staff member to accommodate their needs, volunteers provided assistance with regards to blind and deaf populations. Any person with needs that a shelter is unable to meet was sent the local hospital.

Pet owners
Pet owners were one of the largest populations to not use the shelters. Most commonly, this was due to the pet owner not being able to bring their pets with them to the shelter. While most counties have a pet-friendly shelter, there may be only one, which may not be conveniently located for all individuals. Our team speculated that pet owners who live nearer to non-pet-friendly shelters may choose to stay at home rather than travel the further distance to the pet-friendly shelter.

Shelter features

Most shelters discussed were school facilities. Often gymnasiums were designated as living areas and ample kitchen areas were available on site. Individual classrooms could be used as needed for any persons needing to be isolated.

Shelter personnel

There is evidence of an overall limit to the ability to recruit and secure volunteers for shelter operations. Some plans exist to receive help from Red Cross staff if the shelters run for more than a few days. Shelter staff receives shelter operations training as well as disaster service training. Implementing peer support groups would ultimately increase the number of people to manage. Depending on the disaster, support from outside organizations may come into play as local resources are exhausted. Organizations like "Hands On" exist to provide outside volunteers.

Shelter type

Shelters are allocated based on anticipated severity and type of disaster. Importance of shelter openings at schools must be weighed against the degree to which it will disrupt school and community functions. Sometimes shelters are not pre-identified before they are needed. Typically when schools are used as shelters school will have been cancelled due to the disaster anyway.

Socially isolated

There may be individuals or clusters of citizens whose social isolation discourages them from seeking shelter in case of an emergency. These may include individuals living in buildings physically isolated from other population concentrations, citizens without telephone services, or others who do not have regular interaction with neighbors or with public officials. Undocumented workers may be hesitant to use shelters out of fear of their citizenship status becoming known; although shelters do not require proof of citizenship, the presence of public health and public safety officers or the use of shelter registries may be a deterrent.

Supplies

Shelter setup takes only a few hours and supplies are stored in central locations ready to be picked up when they are needed. Shelters usually have enough supplies on hand to last for a few days and during that time arrangements are made to have supplies delivered if the need arises later. Evacuation shelters provide less than general population shelters (people bring their own cots and bedding). Historically it has been difficult to cater specifically to people with dietary needs. People who forget their medication pose significant problems.

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Vulnerable populations

Shortcomings remain as far as how shelters accommodate pet owners and their companion (as opposed to service) animals. People living in mobile homes are particularly vulnerable to events like floods and hurricanes. Historically schools have been opposed to taking pets in during disasters. People with serious health problems beyond the scope of shelters are sent directly to hospitals. Shelters are somewhat prepared to procure foods for specific dietary needs. Communication and transportation is one of the biggest hurdles for low-income people.

Non-English speaking

Spanish radio and TV stations are notified of the status of shelters. Historically there have been enough people to translate for Spanish speaking populations at shelters. Interpreters include professionals as well as multi-lingual children and adults.

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Conclusion

Overall, the capstone team identified a variety of populations that require certain services or items. Emergency shelters may not always be able to meet those needs without prior planning. The potential exists for certain populations to be harmed in an emergency shelter more than by remaining at home because the shelter cannot provide for such certain needs. Therefore, it is critical that gaps in emergency management and vulnerable populations be identified. Once those populations and their specific needs are identified, emergency planners can better work towards filling those gaps and accommodating all people equally.

The tool that the capstone team developed aims to identify such gaps and areas where shelter operations and preparedness can be changed to improve the experience of all individuals using the emergency shelter. The capstone team took a variety of measures to ensure that the tool we generated would be a suitable supplement to other shelter survey tools. The capstone team designed the tool to be user-friendly, and easily navigated by emergency planning professionals and shelter operators. It is important to note that no one county in North Carolina will have the same populations of concern as another. Therefore, the capstone team also included instructions on how to expand the tool to include more vulnerable populations than the ones we identified. By ensuring that the tool is functional, useful, accessible, and easy to expand, the capstone team hopes that it will eventually become a useful, widespread supplement to existing shelter evaluations, such as the American Red Cross Shelter Survey, and that local emergencies claim the lives of fewer and fewer people.

Appendices

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APPENDIX A: Demographic Characteristics of Forsyth and Duplin Counties

Demographic characteristcs	Forsyth #	Forsyth %	Duplin #	Duplin %	National %
Total Population	350,670		58505		
Under 5 years	23861	6.8	4284	7.3	6.5
65 years and over	45511	13.0	8295	14.2	13
Total households	141163		22495		
Population in households	340819	97.2	57826	98.8	97.4
Race (alone or in combination with one or more other races)					
White	224561	64.0	34175	58.4	74.8
Black or African American	95429	27.2	15134	25.9	13.6
American Indian and Alaska Native	3385	1.0	580	1.0	1.7
Asian	7978	2.3	207	0.4	5.6
Native Hawaiian and Other Pacific Islanders	471	0.1	115	0.2	0.4
Some Other Race	27159	7.7	9297	15.9	7
Hispanic or Latino Population	41775	11.9	12059	15.9	16.3
Language spoken at home					
Population 5 years and over	327602		52462		
English only	285178	87.1	42948	81.9	79.4
Language other than English	42424	12.9	9514	18.1	20.6
^of these, speak English less than "very well"	23691	7.2	6492	12.4	8.7
Spanish	31767	9.7	9191	17.5	12.8
^of these, speak English less than "very well"	20306	6.2	6373	12.1	5.7
Other Indo-European Languages	5557	1.7	164	0.3	3.7
^of these, speak English less than "very well"	1924	0.6	18	0.0	1.2
Asian and Pacific Island Languages	3634	1.1	149	0.3	3.2
^of these, speak English less than "very well"	1235	0.4	91	0.2	1.5
Other languages	1466	0.4	10	0.0	0.9
^of these, speak English less than "very well"	226	0.1	10	0.0	0.3
Disbaled populations					
Total civilian noninstitutionalized population	347292		57056		
^with a disability	33001	9.5	9927	17.4	11.9
^with a hearing difficulty	8075	2.3	2578	4.5	3.4
^with a vision difficulty	5048	1.5	2563	4.5	2.1
^with a cognitive difficulty	12502	3.6	4118	7.2	4.5
^with an ambulatory difficulty	18194	5.2	5922	10.4	6.4
^with a self-care difficulty	5896	1.7	2087	3.7	2.4
^with an independent living difficulty	12128	3.5	3191	5.6	4.3
Percentage of Faimilies and People whose income in the past 12 months is below poverty level					
All families		12.5		17	11.3
All People		16.4		24.6	15.3

Sources:

DP01 2010 Demographic profile data, US Census Bureau, 2010 Census

DP02 Selected social characteristics ACS 1-year estimates, US Census Bureau, 2010 American Community Survey

S1810 Disability characteristics ACS 1-year estimates, US Census Bureau, 2010 American Community Survey

DP03 Selected economic characteristics, ACS 1-Year Estimates, 2010 American Community Survey

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APPENDIX B – Key Informants

Interviewee	County	Interviewer	Date	Time	Completed (Y/N)
Contact 1	Rural	Cristina Flanagan	2/24/12	2:00PM	Y
Contact 2	Rural	David Goldberg	2/28/12	8:00AM	Y
Contact 3	Rural	Charles Hodgens	2/28/12	2:15PM	Y
Contact 4	Rural	Cristina Flanagan	3/1/12	3:00PM	Y
Contact 5	Rural	Charles Hodgens	3/1/12	2:00PM	Cancelled
Contact 6	Urban	Charles Hodgens	3/1/12	4:00PM	Y
Contact 7	Urban	Charles Hodgens	3/1/12	2:00PM	Y
Contact 8	Urban	Charles Hodgens	3/7/12	1:00PM	Y
Contact 9	Urban	Charles Hodgens	3/6/12	1:00PM	Y

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APPENDIX C – Interview Instrument

1. **Does your jurisdiction have an emergency sheltering plan? If so, please describe. If there is no formal plan, what steps or actions does the county usually take to prepare its emergency shelters for possible disasters?**
   Follow-up about:
   - *checklists - are they willing to show us their checklists?*
   - *supply stocks - do they maintain a standard inventory?*
   - *back-up power generators,*
   - *HVAC systems*

   [Summarize the answer back to them]

2. **In general, how much time is needed to prepare a shelter during an emergency?**

3. **Think back to the most recent emergency during which people used shelters: was there any portion of the preparation plan which was not carried out?**
   [If interviewee says no, list each step they had mentioned in answer to question 1 and clarify that those were all completed in time]

4. **Again, recalling the most recent emergency: once people arrived at the shelter, were there any unexpected problems, such as certain populations whose needs were not adequately served? Please describe.**
   [Summarize the answer back to them]

5a. **Among the populations that use your shelters, what populations have unique needs?**
   If the interviewee does not mention the following categories, follow-up about:
   - *Persons at extremes of age,*
   - *Persons with disabilities (people in wheelchairs, deaf/blind, developmental disabilities, etc)*
   - *Persons with limited English language proficiency,*
   - *Persons with cultural or geographic isolation (such as religious minorities or undocumented workers)*
   - *Persons who are economically disadvantaged*

   [For each population identified as utilizing shelters and having unique needs]:
5b. **What has been done in the past to meet those needs, and how well did it work? What might work better?**
   [Summarize the answer back to them]

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6. **Are there vulnerable populations in your jurisdiction that have not fully utilized your emergency shelters?**
   Do you know of any specific barriers that might have prevented these populations from using the shelters?
   For example, you've mentioned that there is a large X community in Duplin: do they
   - *receive adequate emergency notification?*
   - *have difficulties communicating with shelter staff?*
   - *have difficulties accessing or using shelter facilities?*
   [Summarize the answer back to them]

7. **What kind of paid or volunteer support structures exist to run and maintain emergency shelters during a disaster?**
   How does your jurisdiction coordinate these services?
   [What is the leadership structure? How are volunteers recruited?]

8. **Do the staff or volunteers receive training specific to their role within the emergency sheltering plan? Please describe.**

9. **Can you think of any feasible changes that would improve your emergency shelters' disaster preparedness or operations?**
   [If they don't have many ideas, read list of recommendations and gauge interest in each].
   a. *Create a peer support system for disabled people: a team of volunteers who have experience with disabilities and can provide to support to others with disabilities at the shelter during a disaster*
   b. *Recruitment of occupational therapists to staff shelters in disaster situations*
   c. *Shelters that cannot easily be altered to serve residents with physical disabilities should be identified, and resources for the disabled should be concentrated on the shelters that are already accessible (these shelters serve as "hubs")*
   d. *Designated privacy areas should be part of the shelter set-up, as they will benefit persons with disabilities must change catheter bags, elderly people, nursing mothers, and people with psychiatric disabilities*
   e. *Separate sleeping areas for families, single men, single women, elderly, and those with special circumstances*
   f. *Play area for children*

10. **Do you have any other comments or concerns that have not been covered yet?**
    [What type of audit tool do they think would be useful?]

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[FOR HEAD OF EMERGENCY MANAGEMENT ONLY]
11. **Which areas of the county are the most vulnerable to disasters? Are there shelters in those areas?**

12. **How does the county provide supplies to emergency shelters before and during a disaster?**

13. **What kinds of facilities are used as emergency shelters? By what criteria are shelter locations chosen?**
    [Schools? Churches? etc.]

APPENDIX D—for Future Capstone Teams

Stored with Capstone staff, for use with future capstone projects. Questions may be directed to: disastermanagement@unc.edu.

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