Chapter 25
Responses of the Long-Term Care System to Recent Natural Disasters

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The number of people affected by disasters has grown steadily since the mid-1970s. The number of deaths due to natural disasters world-wide between 1970 and 2006 is estimated at nearly 2.8 million (EM DAT 2009). Recent natural disasters include the tsunami in South Asia, and major earthquakes in Haiti, Japan, Pakistan, China, and Turkey. In the United States, four powerful hurricanes struck Florida in 2004, and Hurricanes Katrina and Rita caused major destruction in the Gulf Coast states in 2005. These events highlight serious and fatal health consequences following major disasters. In the United States, more than 45 million people live in the coastal region of the Atlantic and Gulf Coast, which are exposed to considerable risk of hurricanes (U.S. Census Bureau 1997); the risk of hurricanes has increased by nearly 40% in the past 15 years, due in large part to rising sea temperatures (Pew Center on Global Climate Change 2009). More than 12% of the population of U.S. coastal states will be aged 65 and above by 2025. Large heavily populated areas of the United States are also at risk of major earthquakes, including much of the West Coast, the Central Mississippi River Valley, and the coastal Southeast (U.S. Geological Survey 2009). The growing numbers of natural disasters, as well as the threat of man-made emergencies, underscore the importance of improved planning at the individual and community levels to address the disaster preparedness and recovery needs of older people and their families.

In the United States, the population aged 65 and above will increase to 82 million by 2050, from 35 million in 2000. About four million older people in the United States live in nursing homes or residential care facilities (Association for Homes and Services for the Aged 2009; Centers for Disease Control 2008). The vast majority of older people live in the community. Many of the negative consequences of natural disasters for older people are due to exacerbations of chronic diseases, which disproportionately affect older people (Fernandez et al. 2002; Miller and Arquilla 2008). Over 70% of people aged 80 and older have a disability; over 40% need help to perform basic activities of daily living (U.S. Census Bureau 2002). Effects of Hurricane Katrina underscored the need to improve preparedness for older people, both those living in the community and those in long-term care residential facilities. Hurricane Katrina devastated many communities in the Gulf Coast in August of 2005. Over 1,300 people died, the majority being older people (Simerman et al. 2005). The response to a disaster by emergency management organizations, public health agencies, and medical providers depends in large part on advance planning. This planning must consider the needs of special populations, such as frail older people and disabled individuals (Johnson et al. 2006; Saliba et al. 2004; U.S. Office of Inspector General 2006). There is considerable consensus among public health experts and researchers that medical systems and emergency management in the U.S. and in many other countries are not prepared for public health disasters (Johnson et al. 2006; Miller and

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Arquilla 2008). Their lack of preparation is particularly acute regarding needs of older populations (Fernandez et al. 2002; Johnson et al. 2006; Miller and Arquilla 2008; Saliba et al. 2004; U.S. Office of Inspector General 2006).

In this chapter, we first describe preparedness challenges and opportunities affecting nursing homes. Next, we consider the preparedness needs of organizations that provide health and other supportive services to older people living in the community. Our focus in the first two sections is on long-term care organizations in the United States. Next, we focus on preparedness responses and needs of older individuals. In that section, we broaden our lens to include experiences and studies conducted in a number of counties following recent disasters, including Turkey, China, and Japan. We consider responses and perspectives from a life course perspective. Some researchers view disasters as a combination of populations and potentially destructive natural or man-made events, where the combination involves a socially produced condition of vulnerability (Hoffman and Oliver-Smith 1999). Such conditions arise, for example, when large cities grow in areas that are subject to intense hurricanes or massive earthquakes. A disaster creates an immediate need to respond to new and unique conditions. Individuals' responses to such rapid change are influenced by their conceptual frameworks, which are a function of their life experience (Hoffman and Oliver-Smith 1999). Thus, disasters may be symptomatic of strategies societies use to adapt in the context of their social, economic, and built environments (Hoffman and Oliver-Smith 1999).

We turn next to implications for research and practice. To help guide future research, we present an integrated model of long-term care preparedness, The Socio-Ecological Model of Individual and System Preparedness in Long-Term Care. This model applies elements of the socio-ecological model of health to disaster preparedness, including individuals, families, neighborhoods and communities, and political perspectives. Next, we consider how the life course perspective applies to preparedness for older people. Then, implications for practice are considered, including needs for communication and training.

Definition of Disasters and Emergencies

Most studies examining preparedness use the terms "emergency" and "disaster" interchangeably, to refer to life-threatening unexpected events (e.g., Laditka et al. 2008a). These events can encompass a relatively localized "emergency," such as a tornado, or a more massive "disaster," such as Hurricane Katrina. We recognize that the government, communities, social service, and health care organizations play a role in preparing older people for local events affecting a small number of individuals, such as a house fire. However, in this chapter, we use the terms emergency and disaster to refer to widespread events that disrupt community infrastructure over a broad geographic area. This definition of an emergency or disaster is consistent with well-recognized published guidelines (Task Force of Quality Control of Disaster Management 2002). The terms "emergency" and "disaster" relate to the sociology of aging in that these are categories of events for which individuals and society can help older people and the organizations that serve them to prepare, where that preparation includes advanced planning for major unexpected widespread disruptive events and their aftermath.

Disaster Preparedness and the Special Needs of Older Populations

The special needs of older populations in disaster preparedness need to be considered by practitioners, policymakers, and planners, to enhance geriatrics disaster training and education. The Bioterrorism and Emergency Preparedness in Aging Committee, formed in 2002, addressed these

areas by developing and disseminating education and training materials to improve preparedness for older people residing in the community and in residential facilities (Johnson et al. 2006). The Bioterrorism and Emergency Preparedness in Aging Committee consisted of members of the National Association of Geriatric Education Centers. Six of the 46 Geriatric Education Centers in the U.S. took the lead in this initiative. The Bioterrorism and Emergency Preparedness in Aging framework conceptualizes the special needs of older populations as stemming from: (1) compromised immune systems, which make older people more susceptible to stress induced by extremes of temperature or biological agents; (2) failure of major body systems such as renal failure, and comorbidities such as diabetes, which put older individuals at higher risk of adverse outcomes following a disaster; (3) declines in functional and cognitive status, limitations in mobility, and loss of vision and hearing, which result in special communication needs and additional preparation time required by older populations; and (4) other factors related to lower socioeconomic status, racial and ethnic disparities, social isolation, disability, and ageism (Johnson et al. 2006).

Preparedness in Nursing Homes

More than 1.5 million older Americans reside in nursing homes (Centers for Disease Control 2008). Despite a declining prevalence of disability, their number will grow due to population aging (Laditka 1998). In this section, we extend the discussion introduced by Laditka et al. (2008b, 2009). Nursing homes are vulnerable to many wide-spread disasters, including hurricanes, earthquakes, floods, outbreaks of infectious disease, terrorism, prolonged loss of power, as well as other challenges involving ice, snow, fire, or wind. Disasters raise particularly difficult challenges for preparedness, because these events substantially disrupt infrastructures of emergency response and regional economies, often affecting the availability of electrical power, communications, gasoline and other fuels, transportation, food, medicines and other supplies, and staff (Laditka et al. 2008b, 2009). Relatively little research examined disaster preparedness in nursing homes before Hurricane Katrina.

The four hurricanes that struck Florida in a 44-day period in 2004 – Charley, Frances, Ivan, and Jeanne – prompted a recently published study of 291 nursing homes. Researchers found that major concerns were transportation and long lasting power outages (Hyer et al. 2009). There was evidence that transportation agreements were not upheld; generators were not adequate to support air conditioning and laundry services. A number of studies were conducted in the aftermath of Hurricane Katrina. One identified perceptions about disaster preparedness among nursing home administrators in South Carolina in the period immediately before and after Hurricane Katrina (Laditka et al. 2007a). Although South Carolina was not directly affected by Katrina, nursing home administrators in the state followed the events surrounding Katrina closely because South Carolina is at risk for severe Hurricane damage. Administrators expressed concerns about their ability to care for evacuees from other nursing homes in the event of a disaster, and about their lack of appropriate transportation (Laditka et al. 2007a, b). In a response to a brief survey of administrators immediately following Hurricane Katrina, the majority of respondents said that they were rethinking their preparedness plans for transportation, supplies, staffing, and communication (Laditka et al. 2007a). In a study of nursing homes primarily in Mississippi that sheltered nursing home residents evacuated from areas with the most damage from Hurricane Katrina, nursing home administrators also raised concerns about communication, transportation, supplies, and staffing (Laditka et al. 2008a). Laditka and colleagues (2008b) found reports of long-term mental health needs among both residents and staff following Katrina. Administrators said that nursing homes were not included in community preparedness planning (Laditka et al. 2008b).

Administrators of nursing homes in New Orleans who evacuated or sheltered affected individuals following Hurricanes Katrina and Rita said major challenges were lack of appropriate transportation,

staffing shortages, and a perception of abandonment by state and federal response agencies (Dosa et al. 2007). A study of hospitals in New Orleans serving older patients in skilled nursing facilities and hospice units found that loss of power, shortages of staff and supplies, and extreme heat were major challenges following Katrina (Gray and Hebert 2007).

Another study following Hurricane Katrina focused on responses of 38 staff in four nursing homes in Mississippi that sheltered frail evacuees (Laditka et al. 2009). Staff emphasized the need to provide emotional support to evacuees as well as physical care. Many staff said caring for evacuees was difficult because they were anxious and in poor physical condition after the evacuation. A major challenge in caring for evacuees was communicating with evacuees' families: landline and cell phones did not operate for weeks following the hurricane; further, families were spread by the evacuation (Laditka et al. 2009). Staff also stressed challenges associated with preventing dehydration, lack of food and personal hygiene supplies, and staff exhaustion. At the same time, many described caring for evacuees as "a blessing," saying the experience helped them to bond with residents, evacuees, and other staff. Staff emphasized the importance of teamwork, community help, and the need to have a well-organized disaster plan, extra supplies, and dependable staff (Laditka et al. 2009).

A recent study examined emergency evacuation plans for about 2,100 nursing homes in the U.S. (Castle 2008). Although most facilities were relatively well prepared to shelter in place, most did not include plans to evacuate. Summit meetings of key stakeholders, including leaders in long-term care, transportation, emergency management, federal and state agencies, and nursing homes, were convened in 2007 to discuss challenges and opportunities in disaster preparedness for nursing homes (Hyer et al. 2006). Participants recommended enhancing transportation and communication resources, improving coordination between nursing homes and local emergency preparedness systems, refining disaster preparedness guidelines, and conducting emergency drills (Hyer et al. 2006).

Taken as a whole, research and recent meetings of key stakeholders identified a number of common problems faced by nursing homes following disasters: loss of power; lack of sufficient or appropriate transportation for evacuation; wide-spread disruption of communication systems, with breakdowns in landline and cell phone service; lack of food, water, gasoline, medications, and other medical and general supplies; and lack of adequate staff (Dosa et al. 2007; Hyer et al. 2006; Laditka et al. 2007a, 2008b, 2009; Saliba et al. 2004). Findings suggest that nursing homes receive substantially less support than hospitals from local, state, and federal response agencies, and that this shortcoming affects them before, during, and following disasters (Brown et al. 2007; Dosa et al. 2007; Hyer et al. 2006; Laditka et al. 2008b). For example, state and federal laws do not require that nursing homes receive priority for power restoration following a disaster (Brown et al. 2007).

Summary of Disaster Preparedness Lessons Learned from Nursing Home Studies

There were a number of important "lessons learned" from nursing home-related research conducted following Hurricane Katrina. Laditka et al. (2008b) adapted six of the training and practice domains described by The Bioterrorism and Emergency Preparedness in Aging Committee (Johnson et al. 2006) to describe care, practice, and policy implications for nursing homes and other residential facilities serving older people. The six domains described by Laditka et al. (2008b) are: (1) maintain core functions, i.e., the ability to maintain normal day-to-day operations following a disaster, with a focus on ensuring that there are sufficient supplies for residents and families of staff and their pets; (2) respond to needs of a diverse group of stakeholders, e.g., provide culturally sensitive care to residents; (3) apply geriatric-specific protocols in patient and resident care, including triage and

medication management; (4) address mental health needs of residents and staff, recognizing that older people and staff are vulnerable to depression after a disaster and may have long term mental health needs; (5) ensure transportation is available if evacuation is needed, and that transportation services meet the special needs of older people (e.g., heating, cooling, accommodate wheelchairs); and (6) ensure communication systems are in place with backup systems for landline and cell phones and the internet. Laditka et al. (2008b) also introduced two new preparedness domains for long term care populations: (1) ensure that needs of nursing homes are addressed in community preparedness planning, e.g., lifelines such as power are restored promptly; and (2) recognize nursing homes provide valuable health care resources to the community, including oxygen, trained health care personnel, and supplies. The preparedness concepts in the domains described by Laditka et al. (2008b) can be extended to or adapted for many types of residential communities for older people, including independent living communities, assisted living communities, and continuing care retirement communities. These preparedness domains can also be applied to health and social services agencies providing care to older people living in the community, which are described in the section that follows.

Preparedness Among Agencies Providing In-Home Care to Older People in the Community

In this section, we turn to preparedness among agencies providing care to older people in their homes, drawing on the discussion introduced by Laditka et al. (2008a). More than eight million vulnerable older Americans receive long term care services in their homes (Hughes and Renehan 2005). Support for home care will grow, as a continuing response to the Supreme Court's 1999 Olmstead Decision (United States Supreme Court 1999). Most recipients of home care are over age 75 and live alone. These older adults are at high risk of rapid physical decline, mental disorientation, emotional trauma, and death; few would be able to care for themselves during and after a disaster. Thus, agencies providing care in the home serve as a critical component in the long-term care continuum.

Home health agencies and personal care agencies provide a broad array of medical and support services for older people in their homes. Home health agencies provide more highly skilled nursing care, whereas personal care agencies provide basic assistance with bathing, dressing, meal preparation, and similar activities (Hughes and Renehan 2005). The federal Centers for Medicare and Medicaid Services requires home health agencies to have disaster plans. No specific rules govern the types or regularity of training or the content of those plans. Most states require home health agencies to be certified to obtain Medicare reimbursement (Hughes and Renehan 2005). Improving federal and state regulations could substantially enhance preparedness among home health agencies. Home health agencies can also seek accreditation from the Joint Commission or the Community Health Accreditation Program. Since 2006, the Joint Commission standards require home health agencies to conduct one disaster drill per year (Joint Commission 2007).

No federal regulations govern disaster preparedness for personal care agencies. Preparedness among these agencies varies substantially by state. We provide one case example using South Carolina. Most personal care agencies in South Carolina have a contractual agreement to provide services to clients enrolled in the Community Long-term Care Program. This is a Medicaid home- and community-based waiver program serving approximately 12,500 clients who qualify for both nursing home placement and Medicaid (Pande et al. 2007). Case managers are employed by the Community Long-term Care Program. Case managers are required to ensure that clients of personal care agencies have disaster plans (South Carolina Department of Environmental Control, SC DHEC 2005). Case managers develop an "emergency preparedness checklist" and an "emergency telephone

list" with clients and/or designated caregivers (SC DHEC 2005). Clients' needs are assessed when they are enrolled in the Program, and updated every 30 days (SC DHEC 2005). Nurse consultants evaluate clients and identify those who should have priority status during disasters. With clients' permission, names are shared with emergency agencies.

Research examining disaster preparedness in agencies providing services to older and/or disabled clients in their homes is sparse. Until recently, almost all studies have been limited to narrative reports about the impact of a disaster on clients of home care services (Riddix and Dellar 2001) or ways home health care nurses can help clients to prepare (Sienkiewicz et al. 2007). There are few empirical studies in this area. Using qualitative methods, researchers evaluated how five home health agencies in Orleans Parish, Louisiana, responded to Hurricane Katrina (Kirkpatrick and Bryan 2007). All of the agencies had preparedness plans. However, the breakdown of communications was widespread due to the loss of landline and cell phone operability. Results showed a lack of coordination among government and home health agencies (Kirkpatrick and Bryan 2007). The researchers recommended additional drills to train agency staff, better ways to identify clients who are reluctant to evacuate, enhanced communications and transportation, and early evacuation.

Another recent study examined preparedness among health care and personal care agencies in South Carolina (Laditka et al. 2008a). Telephone interviews were conducted with administrators of 16 agencies providing in-home personal care to 2,147 clients, and five agencies providing in-home health care to 2,180 clients. For agencies in both categories, findings suggest a lack of preparedness: in identifying clients at high risk and assisting them in planning, providing written materials and/or recommendations for clients, training staff, and coordinating disaster planning and response across agencies (Laditka et al. 2008a). Although home health agencies were better prepared than personal care agencies, a number of home health administrators commented that they were unsure how well their plans would work. Most administrators said that better coordination and/or more preparedness training is needed. The findings support incorporating disaster planning in certification requirements for home health agencies, and developing additional educational materials for administrators and staff and for clients (Laditka et al. 2008a).

Older Adults' Experiences and Responses to Disasters

In this section, we focus on responses to disasters and needs of older people. Responses are considered using a life course perspective, building on the recent review by Shenk et al. (2009). We include studies conducted in the United States and in other countries.

Coping Approaches

From a life course perspective, memories and previous experiences help shape how older people experience and cope with disasters (Krause 1987). Disasters often evoke one or more coping strategies. Two broad coping styles used by older adults have been identified: emotion-focused coping and problem-focused coping.

In emotion-focused coping, older people often turn to activities or emotional states that keep them from directly confronting stressful events (Yeung and Fung 2007). In this strategy emotional support, humor, and disengagement are often used by older people to mediate responses to stressful events. Some responses may be positive. For example, older adults may help others affected by the disaster. This response can distract older individuals from their own problems, and provide a greater sense of

emotional control (Heller et al. 2005). Emotion-focused coping can also lead to negative responses. For example, one study suggested that talking about an earthquake caused older people to relive the disaster experience and resulted in increased stress (Alea et al. 2004).

Problem-focused coping involves efforts to reduce and alleviate stressful situations (Yeung and Fung 2007). An example of problem-focused coping is improved preparation for another disaster among people who have experienced a previous disaster (Ecevit and Kasapoglu 2002). Findings in this area are mixed. A lifetime of experiences with life changes – including but not limited to disaster-related changes – may enable older adults to better cope with change (Heller et al. 2005; McMillen et al. 1997; Norris and Murell 1988). Some research suggests that experiencing a disaster prompts older people to recognize the need to prepare (Heller et al. 2005). In one actual experience, however, older people who experienced an earthquake and recognized a need to prepare for a future earthquake did relatively little to prepare (Heller et al., 2005). A recent study examined preparedness among 547 older people in Florida who responded to a survey while visiting an ambulatory Veterans Administration clinic (Cherniack et al. 2008). Nearly 84% reported that they had lived in a hurricane prone area of Florida for more than 10 years; about 31% reported experiencing 5–10 hurricanes, nearly 38% reported experiencing more than 10 hurricanes. Yet, most respondents did not understand common warning terminologies, e.g., "hurricane watch" or "hurricane warning," or what steps to take if they heard these warnings and only 56% had an evacuation plan. About 30% said they had an electric generator, but of these, only 46% said they knew how to operate it (Cherniack et al. 2008). These findings suggest that preparation for hurricanes was lacking even among an older population with substantial disaster experience.

Level of Coping Self Efficacy

According to Bandura (1997), coping self-efficacy is defined as self-reported ability to cope with the effects of a disaster or trauma. Individuals can often recognize their relationship to the environment, and thus anticipate future adaptive responses. Through this process, older people consider possibilities for their future, and attempt to control their future life course. This approach can help define the older person's feelings, thoughts, motivations, and behaviors. Levels of coping self-efficacy are related to the individual's personality and life experience. Those with high coping self-efficacy have better abilities and are more likely to cope effectively with stresses during and after a disaster (Bandura 1997).

Psychological effects: Negative psychological effects of disasters can include anger, fear and shock (Yeung and Fung 2007), sadness (Alea et al. 2004), and emotional numbness and social isolation (Ecevit and Kasapoglu 2002). Depression following disasters varies depending on individual characteristics. For example, among older people who survived the Loma Prieta earthquake in San Francisco, greater exposure to the damage and destructive effects of the earthquake increased depression overall, and exacerbated depressive symptoms of older people with depression (Nolen-Hoeksema and Morrow 1991). Although often negative, psychological effects after a disaster can be positive. Positive effects include personal growth and reassessment of life priorities (McMillen et al. 1997). Surviving such an experience sometimes causes survivors to articulate community needs, and can help to inform improvements in infrastructure, services, and policy (McMillen et al. 1997).

Social support: During and after disasters, social support is provided through formal groups and structures and informal systems of family, friends, and neighbors. Organizations and the community provide resources and services. Support is also needed to address emotional needs. Social workers often fulfill essential roles following disasters, thanks to their skills in providing information and services to older individuals in the community (Javadian 2007) as well as in long-term care facilities

(Laditka et al. 2008b, 2009). In many instances, older people have been living in the disaster area for a longer time (Goto et al. 2006), and have established better social networks than younger residents, factors that can help older people to cope following disasters (Kato et al. 1996). As suggested in our review of recent research on nursing homes and organizations providing services to frail older people in the community, establishing strong community linkages and networks well in advance of a disaster is an important characteristic of organizations that respond more successfully to disasters (Laditka et al. 2008b, 2009). An analogous benefit may accrue to older individuals who have strong social networks.

Life experiences and responses to disasters: As a whole, evidence suggests that older people have greater coping abilities than younger adults. Some research attributes stronger coping abilities to more life experiences (Melick 1985), and experiences with coping with stressful events (Heller et al. 2005; Thompson et al. 1993). A lifetime of experiences with many life changes may help some older people cope with disasters reasonably well (Norris and Murrell 1988; Thompson et al. 1993). Many older adults have experienced a previous disaster (Kato et al. 1996), and may therefore be more confident in their ability to manage a new one (Phifer and Norris 1989). There is evidence that older persons who experienced a disaster previously may experience less stress after another disaster (Goto et al. 2006; Melick 1985; Phifer and Norris 1989). There may be analogous beneficial effects of having experienced a lifetime of lesser emergencies, challenges, and traumatic events, as they can help to prepare the individual for new challenges even if they might be unexpected. Studies of older persons' emotional health have identified individual characteristics that promote successful adaptation, variously described as resilience, mastery, self-efficacy, or emotional vitality (Hendrie et al. 2006). Analyzing data from the Berlin Aging Study, Baltes and Baltes (1990) proposed that accumulated life experiences for some older persons result in "wisdom," the ability to exercise good judgment about important but uncertain matters, which enables successful adaptation. It seems likely that those older persons who have developed this ability to make good judgments in the face of uncertainty would be better adapted to deal with disaster experiences successfully.

Implications for Research and Practice

The Socio-Ecological Model of Individual and System Preparedness in Long Term Care

Drawing on previous research at both the organizational and individual levels, we offer an initial theory of preparedness for older people in long term care. A useful starting point for conceptualizing a framework of preparedness for long term care is the Vulnerability Perspective (Blaikie et al. 1994). Thomas and Soliman (2002) adapted the Vulnerability Perspective to examine factors that contributed to death among older people in heat waves the United States during a 20-year period. As adapted by Thomas and Soliman (2002), the Vulnerability Model suggests that the progression of vulnerability is influenced by "root causes" such as limited resources, "dynamic pressures" such as lack of local institutions, and "unsafe conditions" such as lack of preparedness to cope with disasters and hazards (Thomas and Soliman 2002, p. 27). The Vulnerability Perspective offers a framework for how various external factors, such as social, economic, and political institutions increase or decrease vulnerability to disasters among certain groups of people. The model suggests that personal characteristics such as age, gender, and level of disability interact with the external environment and organizational systems to affect the ability of individuals and organizations serving older people to plan for disasters, and to

recover from them. According to this model, risk arises as a combination of vulnerability and hazard; that is, the interaction of these factors increases individuals' susceptibility to risk.

Building on the Vulnerability Perspective, we suggest a framework for conceptualizing preparedness for older people, The Socio-Ecological Model of Individual and System Preparedness in Long Term Care. The model extends the Vulnerability Perspective framework by incorporating domains of preparedness identified in previous studies of disaster preparedness among organizations providing health, medical, residential, and other supportive services to older people (Cherniack et al. 2008; Dosa et al. 2007; Hyer et al. 2006, 2009; Johnson et al. 2006; Kirkpatrick and Bryan 2007; Laditka et al. 2007b, 2008b, 2009; Saliba et al. 2004), and older adults' experiences and responses to disasters (Shenk et al. 2009). Figure 25.1 shows a simplified version of the model. Using this model, the older person's risk can be viewed as a function of vulnerability plus individual characteristics, and organizational and system level preparedness factors. As shown in Fig. 25.1, risk for older people is at the center of the model. Risk is affected by three sets of factors, represented by three ovals, extending out from the center in the following order: (1) individual characteristics, such as health status, mobility, education, location of residence (e.g., rural or urban, coastal or noncoastal, earthquake prone or nonearthquake-prone), disability status, income, access to transportation and information/resources, ability to communicate, social support (e.g., presence of a spouse and/or adult children), and life course experiences; (2) organizational characteristics, including staff number and type, type and number of older people served by the organization, location factors analogous to individual location characteristics, training, communication resources, and transportation resources; and (3) system factors, including health care resources, emergency systems resources, technology resources, transportation network, and communications network. Thus, the model incorporates domains previously identified as important in long-term care preparedness studies at the individual, organizational, and system levels. These factors interact to affect risk among older people from natural or man-made disasters.

Many older people live alone, some with limited resources and few social contacts. Many will not be able to engage in active information gathering during a disaster (Slaughter et al. 2005). An integrated theory of disaster preparedness in long term care will anticipate this need for information, strengthen multilevel communication efforts, and provide specific recommendations for the preparedness needs of older adults at the individual, organizational, and system levels, integrating an understanding of the life course perspective.

Although the Vulnerability Perspective framework and the Socio-Ecological model provide useful conceptual frameworks for disaster preparedness, these models have limitations. They are not causal models. Further, they do not allow researchers to identify certain factors and characteristics that play more (or less) prominent roles in preparedness for older people. It would be useful for future research to identify linkages among sets of factors and causal pathways and to determine factors and characteristics that play a key role in preparedness for older individuals. These steps will help to develop an integrated theory of preparedness in long-term care. We suggest that an integrated theory should present the current state of knowledge regarding such preparedness, depict areas in which revisions of current knowledge, practice, or policy may be desirable, inform future research into emergency preparedness among organizations serving older populations, and lay out directions for future research in the field.

Implications for Life Course Research

The strength of the life course perspective lies in its ability to integrate the context of individuals' lives, including the current phase of life with its previous experiences and consequences, the time and events both before and after the point being studied, and the ways in which the individual's life

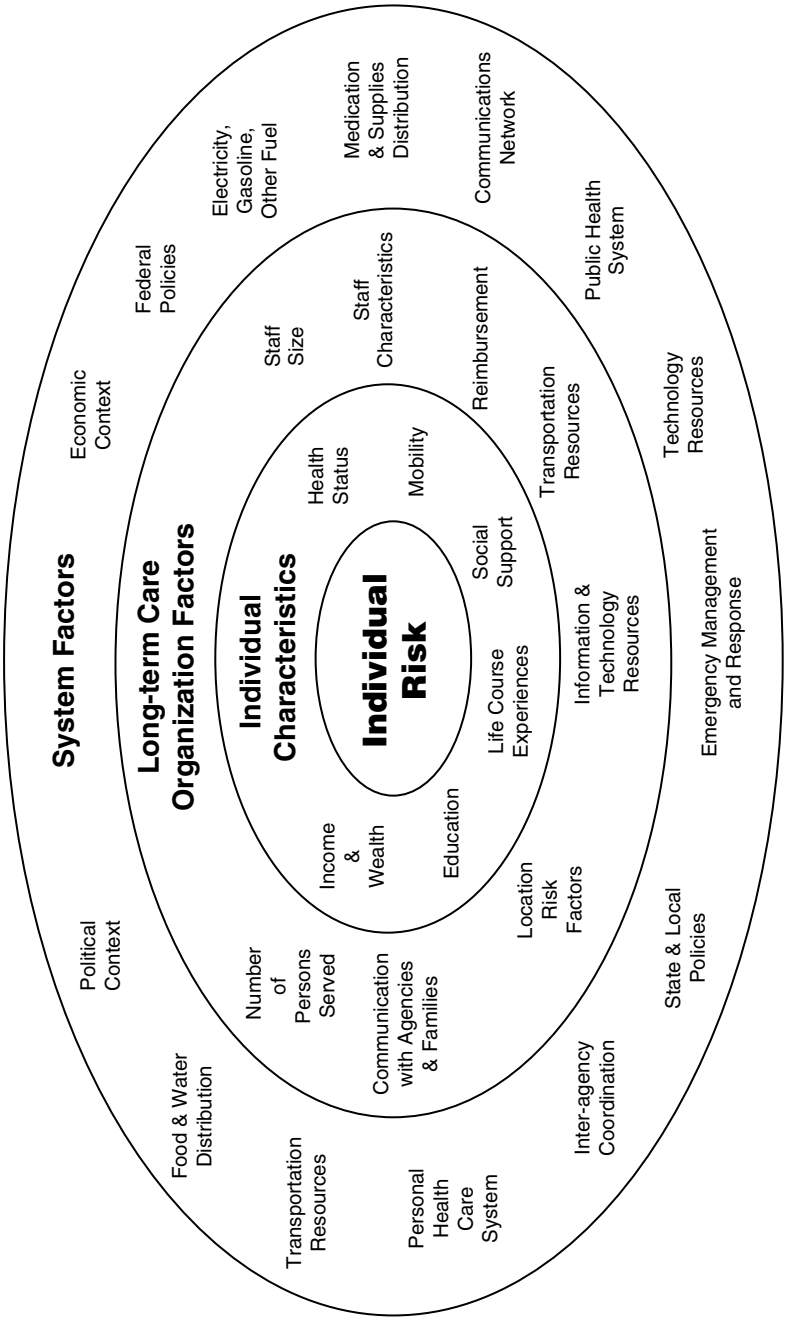

Fig. 25.1 The socio-ecological model of individual and system preparedness in long-term care

is intertwined with others (Shenk et al. 2009). The past helps to shape the individual's orientation to the present and the future so that life before the experience of the disaster and life after the disaster exist in the context of the individual's personal experiences and environment. Thus, there is interplay between biography and history, or self and society. The biography of the older adult interacts with the historical encounter of the disaster experience. It is from this interaction that the life course perspective extends itself to conceptualization and understanding of individual action.

Central to the concept of disaster studies are the obvious effects a disaster brings, including vulnerability, loss of lives, and destruction or loss of material possessions. Following a disaster, everyone is likely to experience losses and be affected. However, more severe and longer lasting adverse effects occur among those who belong to the most vulnerable groups. This includes those with lower socioeconomic status, those most affected by health disparities associated with race or ethnicity, individuals with limited social support, and those with limited ability to access resources to rebuild and recover. Among older adults, their frailty and vulnerability may often be compounded by misconceptions about their abilities and needs. Older people can be further victimized by oversimplified generalizations about their abilities to respond in the event of a disaster.

The experiences of disasters by older adults influence the rest of their lives and the consequences are likely to bring behavioral changes. Their life orientations and intrinsic features can also set them apart from other disaster victims. As noted earlier, previous experiences with a disaster can improve confidence in their ability to manage the situation; longer length of residence in the disaster area may have led to development of stronger social networks (e.g., Kato et al. 1996). The number of years lived with the range of experiences they are likely to have encountered can make older adults emotionally stronger and more mature in handling the stresses of a disaster encounter (e.g., Heller et al. 2005). The emotional competency that derives from these intrinsic features is often affected by the physiological changes that aging often brings. Though older adults are often viewed as vulnerable and frail, these characteristics are countered by the heightened emotional stability they possess (e.g., Hendrie et al. 2006). Given these skills, older people can often serve as sources of information for disaster preparation and recovery.

The best way to mitigate the unfavorable outcomes of a disaster experience is to be prepared. Although researchers have identified many negative effects of disasters, the interpretation of the encounter varies across individuals. Capitalizing on strengths of older adults as expressed in the richness of their lifetime of experiences can make a significant contribution to disaster research. Disaster studies can help to inform life course research. Disaster research provides a vivid example of how the life course perspective can help us to understand the complexities of interactions of history and memory and of individuals' experiences within a historical context. The challenge is to balance strengths and vulnerabilities of older adults as survivors of disasters who can aid in preparing for future disasters.

Disaster and Emergency Communication Needs

Preparedness communication is a key factor in disaster preparedness (Kreps et al. 2005). Unfortunately, preparedness information may not reach older adults or their families, due to limited access to information, confusing communication of messages that are not well designed for their intended audience, and poor understanding of these messages by older adults (Cherniack et al. 2008). At all ages, people increasingly are turning to the internet for information about health risk and disease. Facing a pending disaster or emergency, many older people rely on the internet to provide accurate, current, and easily understood information. A recent study evaluated the readability and suitability (e.g., content, layout, cultural appropriateness) of 50 top websites with information about disasters and preparedness aimed at the general public in the U.S. (Friedman et al. 2008).

The researchers found that most websites required a high reading level, nearly grade 11, and were rated difficult or very difficult. Most were rated as either below average or adequate in suitability. These results suggest that there is a need for web-based preparedness resources that can be more easily understood.

Public and governmental health organizations, and organizations providing long term health care and support services, can help prevent excess morbidity and mortality among older people by communicating about the need for preparedness and its desired characteristics, and about disasters that are predictable in the short term. Community, public health, and organizational responsibilities may include helping older people to prepare for unexpected events, helping them to shelter-in-place or assisting with evacuation and/or transportation to shelters if necessary, and helping them to recover from disasters (Johnson et al. 2006). In all of these areas, clear, targeted messages will result in better attention to the information, and a greater probability of understanding the need to take action when required (Kreuter et al. 1999).

Preparedness Training Needs Among Students of Health Administration and Health Professions

There is an urgent need to enhance disaster preparedness training for students of public health, gerontology, health administration, nursing, social work, and other health-related fields. One recent study used a train-the-trainer process and experiential learning to teach doctoral students to serve as preparedness educators for students of public health and health administration (Laditka et al. 2007a). After reviewing preparedness instructional materials, students worked in small groups of 3 or 4 students to develop teaching materials for master's level students. The results of eight paired Likert scale questions on pre and postassignment surveys showed significant and meaningful improvement in students' perceptions. The results showed markedly improved knowledge about disaster preparedness for vulnerable groups, and in the students' confidence in their ability to develop and teach disaster preparedness (both $p<0.05$) (Laditka et al. 2007a). This type of experiential approach can be adapted by faculty to incorporate a "stand alone" assignment in a course for students, including students of public health, health administration, gerontology, social work, and nursing. It can also be adapted to train leaders in the private and public sectors, as well as health care professionals, to train health care and public health workers and volunteers to plan for disasters and respond to them.

Additional Areas for Future Research in Long-Term Care Preparedness

A growing number of studies have examined preparedness in nursing homes, in response to the aftermath of Hurricane Katrina. In the past 20 years there has been a huge growth in other residential options for older people in the United States, including assisted living facilities, continuing care retirement communities, and retirement communities. To our knowledge, no research has examined preparedness plans in these long-term care organizations and communities in which most residents are older. Thus, little is known about procedures and processes to help these older people during and after disasters. The eight training and practice domains described by Laditka et al. (2008b) could be adapted for research in these residential facilities and communities. In another area, research has not typically distinguished between reactions to natural disasters and reactions to man-made disasters. Reactions to the latter, particularly terrorist events, may differ qualitatively from reactions to natural

disasters. They may also result in different life course effects, including, for example, enhanced feelings of patriotism or vulnerability, either of which could influence behaviors throughout the ensuing life course.

Research that explicitly examines cohort effects in preparedness would also be useful. Results of a recent study using nationally representative data for Vietnam era veterans ($n = 7{,}914$) from the 2001 National Survey of Veterans illustrates the usefulness of considering cohort effects in disaster preparedness among older populations. Brooks et al. (2008) compared the treatment of posttraumatic stress disorder and that for other mental health conditions of veterans of the Vietnam War era who served in Vietnam and those who served elsewhere, stratifying the analysis by age (<60, ≥60). Most mental health measures were significantly poorer among veterans who served in Vietnam than those who served elsewhere; veterans who served in Vietnam were also significantly more likely to receive treatment for posttraumatic stress disorder (Brooks et al. 2008). A cohort effect was observed: the negative effect of service in the war zone on mental health measures was substantially worse among those who experienced the war at younger ages; they were dramatically more likely to be treated for posttraumatic stress disorder than were those who experienced the war at older ages (Brooks et al. 2008). These findings highlight the complex interplay of cohort, age, and shared life-altering experiences. There may be similar differential disaster-related effects.

In addition, research has examined the role of race and ethnicity in vulnerability to disasters in the U.S. (for a review of earlier studies, see Fothergill et al. 1999). Most of these studies have been conducted after Hurricane Katrina (e.g., Chen et al. 2007; Elliott and Pais 2006; Lee et al. 2009; White et al. 2007). Taken as a whole, there is substantial evidence that African Americans are disproportionately adversely affected after a disaster, compared with non-Hispanic whites (Chen et al. 2007; Elliott and Pais 2006; Lee et al. 2009; Mills et al. 2007; White et al. 2007). Further, there is evidence that African American women may have the greatest vulnerability for long-term mental health problems after a disaster (Chen et al. 2007; Mills et al. 2007). The experiences of African American women following Hurricane Katrina are the focus of a recently conducted study (Laditka et al. 2010).

Conclusions

In this chapter, we described challenges and opportunities of disaster preparedness in organizations providing long term care for older people. A life course approach was used to consider older adults' experiences and responses to disasters. We also proposed a framework for long-term care preparedness. We encourage researchers, policy makers, practitioners, and administrators to continue to improve knowledge of how to help older people prepare for disasters, and to recover from them. Older adults bring a lifetime of experience to disasters. Their special needs and coping styles need to be addressed in disaster planning and recovery. It is important to recognize the vulnerabilities and special challenges that older adults experience following a disaster. At the same time, the history and memories of older people can prepare them to draw valuable lessons from past disasters and challenging experiences, and often also to cope with present disasters. Public health and community professionals who specialize in preparedness, together with administrators of organizations that provide health and social services to older people, would benefit from incorporating the valuable perspectives of older individuals in disaster planning.

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