



## Mini Review

### Elderly People with Disabilities and Natural Disasters: Vulnerability of Seniors and Post Trauma

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#### Abstract

Throughout the world catastrophic events such floods, rail derailment and fires in senior homes have unfortunately affected many people over the age of 65. Some of these people suffered serious injuries, other feared for their lives, and unfortunately, many of them were unable to deal with the dangers. The purpose of this article is to highlight the prominent facts of a scientific literature review on the factors that make seniors vulnerable to disaster and those who project them at greater risk than younger adults to die, to suffer injuries, not to receive enough assistance and support from public authorities or Non-Governmental Organizations (NGO) and to develop post-disaster health problems.

**Keywords:** Disaster; Elderly; Environmental barriers; Vulnerability

#### Introduction

In its latest published report on natural disasters worldwide, the Centre for Research on the Epidemiology of Disaster (CRED) identified in 2019, 315 disasters of this type causing the death of 11,804 people and affecting more than 68.5 million people [1]. The majority of these natural disasters were floods and storms. According to the World Health Organisation (WHO), “a natural disaster is an act of nature of such magnitude as to create a catastrophic situation in which the day-to-day patterns of life are suddenly disrupted and people are plunged into helplessness and suffering, and as a result, need food, clothing, shelter, medical and nursing care and other necessities of life, and protection against unfavourable environmental factors and conditions [2].

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In the event of a disaster, certain subgroups of seniors are more vulnerable than others for a variety of reasons: some depend on others to get away from the hazards or to receive the required help, others do not have easy access to community resources. Again, some have disabilities preventing them from hearing or complying with evacuation notices, or cannot to fully understand and apply safety instructions stated by the local authorities. Elderly people with physical or cognitive disabilities are among the population subgroups that are vulnerable or disadvantaged during periods of crisis and social disorganization caused by disasters, and in the weeks, months and years following such events.

#### Vulnerability of Elderly

The occurrence of a disaster would affect elderly people with various disabilities disproportionately [3]. Moreover, it was shown that in elderly people with one or more chronic health problems (arthritis, hypertension, heart disease, diabetes, respiratory disorders, etc.), their level of vulnerability to disaster increases by undermining their ability to prepare, respond and recover from it [3]. When thousands of people must be supported by different care and support systems, which are themselves severely affected by a chaotic environment, the difficulties can only get worse. It then becomes important, according to Ngo [4], to target those who require special attention, including certain vulnerable subgroups of seniors, to provide them with social and health services adapted to their specific reality. Elderly people with physical or cognitive disabilities, as well as those with low incomes or no social support network, are among the groups most at risk of injury, dying or developing post-disaster health problems.

Consequently, all over the world, year after year, among those who have died and those who have suffered injuries in the aftermath of a disaster, there is generally a very high percentage of seniors who far exceeds the proportion they represent within their community. For example, in New Orleans in 2005, during Hurricane Katrina, 71% of those who died were seniors; yet they represented only 15% of the population at that time [5].

#### Over representation of the elderly among the deceased

With respect to the 2011 earthquake and tsunami in Japan, government authorities reported that, as of August 2012, 90% of those who died during this event and in the following months were seniors over 70 years old. Yet, seniors make up only 25% of the population of that country [6]. At the time of the tsunami, the main cause of death for seniors would have been drowning either because of the lack of time to escape the waves, or because of their physical inability to move without the help of another person. In addition, in the weeks following this tsunami, the main causes of death among seniors were related, among other things, to the moral and physical exhaustion of seniors evacuated from hospitals and retirement homes and who had been relocated in school gymnasiums.

## Needs and disabilities of the elderly

The American Association of Retired Persons also pointed out, in one of its reports on the needs of seniors in the event of a disaster, that about 15% of Americans aged 50 and over believe they would not be able to evacuate their homes without assistance in the event of a natural disaster and that half of them would need the help of someone from outside their household. These percentages increase significantly with advancing age [5]. Several countries believe that the number of elderly people with disabilities will increase in the coming years. Consequently, in 2050, the prevalence of disability in some developing countries is expected to increase by 400% due to an aging population. By 2050 in India, the incidence of disability is expected to increase by 120 percent, in China by 70 percent and by 257 percent in sub-Saharan Africa [7].

For example, most catastrophic events in recent years have unfortunately shown that elderly people, particularly those with physical or cognitive disabilities, are at greater risk than younger adults of dying, suffering injuries, not receiving sufficient support and assistance from public authorities or Non-Governmental Organizations (NGOs), and developing post-disaster health problems [5,8,9]. The relationship between increasing age and a high rate of morbidity and mortality during and following a disaster is therefore conclusive within the literature identified, allowing us to recognize that the elderly, with or without a disability, are at high risk of not receiving enough disaster assistance and developing post-disaster health problems or worsening existing ones. In addition, it should be noted that at age 85, the normal effects of aging diminish anyone's abilities, even in the absence of a major health problem. The damage that natural or technological disasters can inflict on collective infrastructure of a community, such as water breaks, power outages, traffic lane sectioning, or loss of landmarks and material assets suffered by the elderly during these same events, may potentially prevent seniors with disabilities from continuing their daily activities and moving to seek assistance from public authorities.

The purpose of this article is to review the factors that weaken elderly people with disabilities and the consequences they have with respect to their ability to cope with the challenges posed by a disaster. In the first instance, information is provided on the reactions of seniors in general who are victims of disasters, and then specificities are given regarding the weakening of elderly people with disabilities during a disaster. Before addressing the reactions of seniors in a disaster, it is important to note that most of them, in their lifetime, have had to deal with different stresses and have developed social skills, can demonstrate flexibility and empathy and are, for the most part, able to communicate their needs to the different members of their entourage [10]. Moreover, the majority of seniors, with or without disabilities, are generally able to solve their problems, make plans and be critical and thoughtful. Generally, with advancing age and the onset of disability, they also continue to benefit from contacts with members of their entourage. However, the occurrence of a disaster can significantly disrupt the life of elderly people or seniors with one or more disabilities and the support they may receive from members of their social networks. The presence of disabilities can also prevent elderly people from reacting well to the various stresses and challenges that arise during a natural or technological disaster at various phases of these events, namely during alert, rescue and recovery phases. In a disaster, vulnerable seniors are at higher risk, as minor barriers in normal circumstances can be significant handicaps in times of crisis.

## Elderly's reactions during a disaster

Eldar [11], Fields [12], Myers [13], as well as Thompson et al., [14] consider that seniors are less inclined to take into account evacuation warnings and have greater resistance to leaving their homes. They would also be more likely to be alone in their homes at the time of a disaster, which increases the risk of adverse consequences of disasters in this population. Seniors would also tend to complain less than younger individuals [15,16], would under-utilize formal support resources and would generally require less support from family members and community organizations [15,17,18]. Bolin and Klenow [17] also believed that seniors would suffer more than other adults from losses due to the sentimental value of what was destroyed or lost and that they would have more difficulty recovering economically.

In various studies of the impacts of a severe flood and ice storm on the health of seniors and their recovery process, we were able to identify the main difficulties that these people experience during and after exposure to this type of disaster [19-27]. According to the elderly, in addition to the constraints related to frequent changes of residence, they frequently experienced other difficulties. The complexity of the procedures involved in financial compensation claims, the many trips, the fatigue, the hardships that accumulate, the sleep difficulties, the prohibition of access to one's home, the fear of vandalism or theft and the fear of being exposed again to other traumatic events made life difficult for them. They also reported being particularly disturbed by having lost all their clothing or being unable to recover it quickly and seeing family members scattered in various places.

## Disasters and elderly people with one or more disabilities

In its 2007 report on global disasters [28], the International Federation of Red Cross and Red Crescent Societies stresses that seniors are very vulnerable in crisis situations due to a variety of conditions including the presence of mobility problems or chronic health problems, special nutritional needs and isolation. Moreover, studies have shown that, following a disaster, elderly people receive less help than younger people proportionally [29], either because they are not seen as priorities by the local authorities or because they themselves are reluctant to inform their relatives and public or community bodies of their support needs. The energy that is lacking in old age would also contribute to their vulnerability [30], while the simultaneous presence of several physical or psychological health problems in certain seniors before or after their exposure to a disaster would mean that responders may underestimate their real suffering [16].

Homebound, socially isolated, and mobility-impaired seniors may also have difficulty recovering from a disaster, as may individuals who are dependent on regular medication, medical treatment, nursing care and those who need a meal delivery service to their home [29]. Finally, according to Health Canada [31,32], a set of personal and contextual characteristics makes certain elderly more vulnerable when exposed to a disaster. For example, being 75 years old or older, having mobility problems, having witnessed the death of a loved one in the past two years, having been hospitalized shortly before the disaster, and suffering from confusion or incontinence are important risk factors for the development or aggravation of post-disaster health problems. In a study conducted in China among earthquake victims, which aimed to identify the long-term psychological consequences of this event in two groups of people aged 20 to 70 (a group of physically limited individuals and a group without physical limitations),

Zhang, et al. [33] demonstrated that the earthquake left permanent traces in the interviewees in the two groups of victims met.

Then, despite the fact that in this article the authors do not refer to the use of a measuring instrument to determine the presence or absence of Post-Traumatic Stress Disorder (PTSD), it was possible to identify some manifestations such as fear of reliving such an event, anxiety, sleep problems or repetitive dreams, etc.,. According to these authors, the primary effects become visible shortly after the earthquake and psychological sequelae are still present after a long period. In addition, this study shows that the impact of a disaster on victims significantly affects, on the one hand, their perception of the event and, on the other hand, several spheres of their lives, for example, their personal lives, family, professional, etc.,. These authors have also shown that the personality or attitude of some people has been greatly changed as a result of this traumatic event, making them less stable in their lifestyle and more irritable [33]. It also shows that people with physical limitations have had to deal with more difficulties in their interpersonal relationships and social integration than people without this type of limit. In other words, in the aftermath of a natural disaster, people with physical disabilities have a harder time adjusting to their new situation than people without physical disabilities [33].

Several experts also mentioned that after a disaster, many elderly people with one or more chronic diseases do not receive the treatments necessary for their survival and do not receive regular check-ups monitoring their health or have no access to medication to treat common problems frequently encountered in seniors such as diabetes, hypertension or asthma, etc., [3,34]. Furthermore, IASC [35] points out that during a natural disaster, health services are often disrupted and elderly people may have difficulty managing their own chronic diseases or conditions effectively. Moreover, according to various experts, in the month following a disaster, elderly people with or without disabilities, regularly tend to neglect or forget to take adequate medications that are essential to their well-being as they face at different acute stress [36-38].

What is more, chronic diseases such as hypertension, diabetes, heart disease, arthritis and respiratory disorders are some of the major causes of elderly disabilities in the event of a natural disaster [35,39]. During a disaster, minor health problems can also become bothersome and disabling, making elderly people feel completely overwhelmed by events [40]. The physical health of some seniors would make them unwilling to move [35]. Some older adults have more difficulty accessing services and fleeing places that pose a risk to their physical integrity [3,35]. The presence of sensory perception disorders can lead to problems of avoidance of danger during the event and, therefore, create difficulties in understanding the state of emergency and the instructions issued by the authorities present on the scene [3,41,42]. This reality has the elderly feel helpless and left out.

The majority of seniors (80%) would have at least one chronic condition making them more vulnerable than healthy people during a disaster [3,43]. According to Aldrich and Benson [3], these chronic diseases combined with physiological, sensory and cognitive changes make elderly people more vulnerable and require specific treatments in the event of an emergency. Specifically for people with one or more types of disabilities (physical, hearing, visual, intellectual and mental), the World Health Organization estimates that 600 million individuals are included in this particularly vulnerable group when di-

saster strikes [28]. This vulnerability is generated by the complex juxtaposition of pre-disaster and post-disaster risk factors associated with both the person's inability, socially conveyed representations and the characteristics of the disasters encountered [44]. First, the momentary or prolonged experience of a disability generates the emergence of specific needs both individually and socially [45]. Indeed, many people with disabilities are forced to accept a sometimes routine and vital dependence on specialized medical equipment (wheelchairs, artificial respirators, hemodialysis equipment, etc.), medication (antidepressants, anxiolytics, etc.) or assistance that is often indispensable and supported by others [45-47].

Moreover, people with disabilities are usually required to spend a great deal of effort every day to address different social stigma barriers in most societies around the world [44]. According to Wisner [44], the vulnerability of people with disabilities stems mainly from the persistent marginalization of many societies, which to a certain extent, implicitly refuse to adapt their social structures to meet the specific needs of this segment of the population. The omnipresence of this exclusion can be observed through the multitude of barriers with which this population must deal on a daily basis such as the major difficulty in accessing: 1) quality education; 2) a job providing a decent income; 3) a comfortable and safe type of dwelling; and (4) public and private infrastructure to support rewarding and fulfilling personal, social and professional activities [28,48,49].

In a disaster context, elderly people with disabilities are at risk of being plunged into an extremely vulnerable state when the requirements usually experienced daily meet the requirements generated by the occurrence of a disaster [44,45,49,50]. In fact, the risk factors associated with disasters (power outages, destruction of infrastructure, etc.) that, when combined with those related to the limitations imposed by the existence of a disability and the prevailing social representations, potentiate the level of vulnerability to the occurrence of a disaster [44,48,49,51]. In other words, when combined with the risks of disasters and surrounding social stigma, the presence of disabilities can compromise access to the various resources that can help them [44,45]. For example, many victims with disabilities had to be separated from their families due to the lack of space available in temporary shelters during hurricanes Katrina and Rita [52]. In this way, people with disabilities could not rely on emotional, instrumental, or medical support from family members [52]. For its part, the National Organization on Disability [46] reported that less than 30% of makeshift shelters had an interpreter for sign language. These interpreters are, however, likely to make emergency measures clear to hearing-impaired individuals. Their absence could then reduce the elderly of their chances of survival or deprive them of their support needs. Secondly, some authors [53-55] believe that physically or mentally weakened individuals may be less able to rapidly deploy actions that can increase their life expectancy. In this sense, Takhashi, et al., [56] point out that certain characteristics related to people with intellectual disabilities affect their potential to adapt to sometimes challenging post-disaster conditions, as they generally demand to meet very strict circumstantial requirements. For example, people with intellectual disabilities may, once confined within a makeshift living space shared with other affected individuals, be victims of discriminatory acts on the part of others; these acts are often motivated by their misunderstanding of the sometimes strange behaviours adopted by people with intellectual disabilities [47,57-60]. This phenomenon, according to

the Nagata Support Network [58], constitutes an additional stress factor likely to raise the level of vulnerability of this population to the consequences underlying the various forms of disasters. Table 1 provides non-exhaustive examples of the barriers or difficulties that elderly adults may experience in five areas of disability: sight, hearing, mobility, communication and cognitive skills.

### Conclusion

The number of disasters has tripled in the last 40 years [61]. Recalling some recent historical facts has shown that elderly people, particularly those with physical or cognitive disabilities, are particularly vulnerable in a disaster. Many specialists highlight Quebec’s growing vulnerability to climate disruption [62-66]. In fact, certain scenarios predict that Quebec will experience an increase in the frequency, intensity or duration of extreme weather events (floods, droughts, forest fires, snow storms and freezing rain), thereby increasing risks to vulnerable people and communities living in areas prone to natural hazards [67-69]. It is now evident that some individual and social factors influence the level of vulnerability of different groups of individuals with loss or damage from natural disasters, including elderly people with disabilities [61].

In such a context, it is relevant to identify the elements likely to maintain or exacerbate the vulnerability of certain segments of the population to disasters in order to be able to develop and implement

pre-disaster and post-disaster biopsychosocial interventions to enhance their adaptive capacities in times of disaster and prevent the emergence of public health problems. Murphy argues that disasters correspond to a type of experience with particularly traumatic potential since they are likely to generate a cascade of catastrophic events and this even though they are frequently perceived as unique episodes. This phenomenon is particularly noticeable when one realizes the juxtaposition of stressors that can be felt by vulnerable elderly people during a disaster. The numerous studies, conducted among different groups of individuals on the consequences of disasters and on the risk factors related to the development of health problems during the crisis period and during the post-disaster period, make it possible to identify particularly vulnerable groups in disaster case. In the context of a disaster, vulnerability is the ability of an individual or group to anticipate, cope, resist and recover from the impact of a natural hazard [70]. According to Watts and Bolhe [71], the concept of vulnerability includes three elements: 1) the risk of being more often and more severely exposed to crisis situations (exposure); 2) the risk of not having the resources to cope with the situation (ability to cope) and; 3) the risk of incurring negative consequences as a result of exposure to crises and not being able to recover the losses incurred (potentialities). In this regard, this article found that elderly people with disabilities are at greater risk of not receiving the services they require during the period of emergency measures and are more likely to develop post-disaster health problems than other subgroups of the population.

Area of disability	Examples of obstacles or difficulties
<b>Sight</b>	<ul style="list-style-type: none"> <li>• Reading of information documents (posters, leaflets, letters, etc..)</li> <li>• Difficulty moving around unfamiliar places</li> <li>• Difficulty completing insurers’ or government authorities’ forms</li> <li>• Reduced mobility</li> <li>• Difficulty accessing services offered in the community</li> </ul>
<b>Hearing</b>	<ul style="list-style-type: none"> <li>• Trouble hearing instructions, instructions and rescue instructions from local authorities and responders</li> <li>• Reduced ability to understand and respond to information</li> <li>• Difficulty compared to traditional forms of communication such as radio and television</li> <li>• Difficulty understanding large amounts of information</li> <li>• Exclusion in the decision-making process</li> <li>• Difficulty understanding information at large gatherings</li> </ul>
<b>Mobility</b>	<ul style="list-style-type: none"> <li>• Inability to evacuate home or other dangerous places without the help of another person</li> <li>• Inability to flee danger quickly</li> <li>• Difficulty to go to disaster support centres</li> <li>• Dependency on mobility aids</li> <li>• Difficulty waiting in line to receive food, water and care</li> <li>• Difficulty accessing services offered</li> <li>• Difficulty competing with other disaster victims when distributing resources</li> <li>• Difficulty accessing health facilities in disaster relief centres</li> <li>• Restricted ability to perform the necessary restoration work at home</li> <li>• Difficulty in accessing the distribution sites of goods essential to life</li> <li>• Exclusion in the decision-making process</li> </ul>
<b>Communication</b>	<ul style="list-style-type: none"> <li>• Difficulty defending and claiming rights</li> <li>• Difficulty expressing their needs</li> <li>• Creation of language barriers with others (victims, responders and public authorities)</li> <li>• Risk of not receiving the drugs necessary for their survival</li> <li>• Confusion and misunderstanding between elderly people and people trying to communicate with them</li> <li>• More likely to experience abuse and neglect than people without disabilities</li> <li>• Exclusion in the decision-making process</li> </ul>
<b>Cognitive faculties</b>	<ul style="list-style-type: none"> <li>• Difficulty in expressing their support needs and sharing them with others</li> <li>• Inability to defend their rights</li> <li>• Difficulty in understanding guidelines from responders and local authorities</li> <li>• Need of supervision</li> <li>• Increased risk of experiencing insecurity or trauma related to spatial disorientation during a change of life environment</li> <li>• More likely to experience abuse and neglect</li> <li>• Inability to protect oneself from danger</li> <li>• Complications during evacuation</li> <li>• Difficulty in providing for one’s own needs</li> <li>• Need to resort to increased protection</li> </ul>

**Table 1:** Summary of difficulties or obstacles that may arise according to five areas of disability.



Recent events, such as Hurricane Katrina and the heat wave in Europe, have unfortunately shown that in the event of a disaster, the level of vulnerability of the elderly can be greatly underestimated and therefore cause the death of several individuals. According to Ngo [4], although the term vulnerable elderly person has been broadly defined in geriatric and gerontological literature, it is now necessary to develop an operational definition of this concept in case of disaster and ensure that each community can respond to the needs of seniors of all ages, while paying close attention to the dire needs of people aged 75 or older and those with physical or cognitive disabilities.

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