# Caregiver Perceptions of Household Disaster Preparedness Among Immigrant Older Adults

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## ABSTRACT

The increasing frequency of disasters in recent years has made clear the importance of preparing for their devastating impacts. The intersection of immigrant status and older age in immigrant older adults subjects them to a high risk for harm in disasters. Thus, ensuring that this population can effectively prepare for disasters is crucial. However, research that focuses on disaster preparedness among immigrant older adults in a Canadian context is limited. We interviewed informal caregivers of immigrant older adults to explore their experiences regarding the disaster preparedness of their care recipients. We aimed to describe caregivers' knowledge of disaster risk among immigrant older adults, as well as their experiences and perceptions of barriers and facilitators of preparedness among older immigrants. We conducted semi-structured individual interviews with a sample of 10 informal caregivers of older immigrants who reside in Ottawa and Toronto. All interviews were audio-recorded, and interview content was analyzed using inductive thematic analysis. Participants were able to identify the additional risks their older immigrant family members experience, and they took on the responsibility for disaster preparedness and response for the care recipients. However, the following barriers to preparedness efforts were identified: The financial costs of preparing, lack of confidence to prepare due to inadequate information about preparedness measures, communication difficulties among family members, and time constraints. Participants' contingency plans for caregiving for the older immigrants were largely unspoken, and influenced by cultural norms. Lastly, faith-based organizations were seen by participants as potentially having a significant role in their family members' disaster preparedness and response; participants were largely unaware of any other relevant community-based supports. We anticipate that our results will provide insight into the barriers and protective factors that older immigrants and their caregivers experience in safeguarding against harm in disasters, and we anticipate the recommendations will inform policies and interventions to support them.

**Keywords**: Disaster risk reduction, disaster preparedness, immigrant health, older adults, informal caregiving.

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# Chapter 1: Introduction

## 1.1 Problem Definition

Canada owes its rich ethnic and cultural diversity to the many foreign-born immigrants it has received throughout its history. According to a 2014 Statistics Canada report, Canada is the G8 country with the highest proportion of immigrants, with 20.6% of the population consisting of newcomers from countries such as the Philippines, China, the United States, and Pakistan. As the census metropolitan area with the 5th highest number of immigrants, the Ottawa-Gatineau region is home to 3.5% of Canada's foreign-born population (Statistics Canada, 2014). Newcomers come to Canada hoping to experience the high quality of life that it is known for. However, various social and economic factors that arise as part of the settling process in the host country render immigrants at high risk of health declines, as indicated by increases in chronic disease status after immigration (De Maio, 2010; Hyman & Jackson, 2010; Vang et al., 2016).

One of the main social determinants that affects the health of immigrants who have not migrated from English-speaking countries is the language barrier. Past studies indicate that language barrier is among the main reasons for non-English speaking immigrants' under-utilization of health or social services in their host countries (Fuller-Thomson et al., 2011; Thomson et al., 2015). Inability to communicate in English is also a barrier to forming social connections in the host country; and can prevent new immigrants from amassing the social capital that is useful for knowledge sharing and social support (McKeary & Newbold, 2010; Ng et al., 2011). Research has also found that older immigrants who experience language barriers in their host country have even fewer opportunities to form new social ties, being largely excluded from the main societal institutions of school or the workplace (Gubernskaya, 2014). This phenomenon, largely seen in groups who have immigrated in older age, may cause individuals to self-segregate within their own ethnic groups and fail to join the larger community in their host

country (Gubernskaya, 2014). This demonstrates the impact of the settlement process on health, as well as the significance of the event of immigration within the life trajectory. Inability to access crucial sources of social capital may cause older immigrants to experience serious health declines, as well as economic and social disadvantages throughout their lives.

Furthermore, language barriers, as well as lack of recognition of foreign credentials, are major challenges to new immigrants that can result in underemployment or unemployment (Creese & Wiebe, 2009; Man, 2004). Inadequate employment can in turn affect income, which acts as a determinant of health through its influence on the accessibility of high quality resources such as housing, neighbourhood, diet, and leisure activities (Beiser, 2005; McKeary & Newbold, 2010). These factors, as well as the lack of culturally-sensitive provision of social or health services (Guilfoyle et al., 2008), all interact to augment the mental, physical, and financial strain of settling and living in the host country. It is also important to recognize that this baseline level of everyday strain can render immigrants more susceptible to harm resulting from crises or disasters.

The United Nations Office for Disaster Risk Reduction (UNISDR) defines disasters as hazardous events that impede upon the normal functioning of a community by causing human, economic, or environmental losses (UNISDR, 2009). They can arise from natural, anthropogenic, environmental, technological, or biological hazards, and include such events as hurricanes, earthquakes, tornadoes, ice storms, episodes of mass violence, cyberattacks, epidemic or pandemic disease, or industrial or nuclear accidents (UNISDR, 2015). Like ‘disaster’, the term ‘emergency’ is also used to describe hazardous events, but those that are acute and cause disruptions to functioning on a smaller scale than the community- or society-level disruptions of disasters (UNDRR, 2020). As disasters and emergencies are notably increasing in frequency and severity, the benefits of preparedness measures that support communities in preventing, adapting to, and recovering from them have been internationally

recognized by the Intergovernmental Panel on Climate Change and the International Federation of Red Cross and Red Crescent Societies (IFRC) (Noble et al., 2014; IFRC, 2016). As an example, meteorological disasters are increasing in both number and severity, and a changing climate will lead to more unanticipated and unprecedented weather events in the future (Noble et al., 2014). Thus, it is important that communities are able to adapt to the consequences of climate change in the long term, and prepare for these disastrous events.

Disasters affect different populations in different ways, and are typically inequitable. Winsemius et al. found in a 2015 study of global data the existence of a “poverty exposure bias”, in which those who are poor disproportionately experience the negative effects of natural disasters such as droughts and urban floods. The consequences of disasters include serious demands on resources and social support services in impacted communities (Rawls & Turnquist, 2012). These demands are increased when certain populations experience disproportionate harm because of individual functional limitations, or because they have been accorded with inadequate capacities and resources by larger social and structural forces (Enarson & Walsh, 2007; Noble et al., 2014). Populations such as these are said to be ‘high-risk’ for harm in disasters, due to their limited capacities to take self-protective action before disasters, or to quickly recover from their damaging effects (O’Sullivan et al., 2014; Enarson & Walsh, 2007). When high-risk populations lack proper disaster risk reduction measures, the resulting pressure on social systems and resources pose challenges for governments in managing and responding to disasters (Noble et al., 2014).

One approach to considering the inequitable impacts of disasters involves the analysis of root causes behind individual or group susceptibilities to the impacts of disaster events, such as climate extremes (Preston, Yuen, & Westaway, 2011). Factors such as gender, age, disability status and socioeconomic status can influence an individual’s risk for harm resulting from disasters (Noble et al., 2014). These factors, in the context of the individual’s sociocultural and

political environment, ultimately determine the individual's allocation of resources, such as income and housing, social capital, education, and mobility, and determine how severely they can be impacted by disasters (Enarson & Walsh, 2007). Those who are less advantaged tend to experience disproportionately high levels of risk, due to the clustering of social determinants of ill health (WHO, 2008). Equity can only be achieved with the implementation of adequate disaster risk reduction methods to improve the resilience of high-risk populations. The significance of this is evident in the Sendai Framework for Disaster Risk Reduction, which is an initiative that has been undertaken by UN member states and other stakeholders to reduce economic, social, and physical disaster-related losses (UNISDR, 2015). It lists as a guiding principle the empowerment and inclusion of society's most at-risk populations, and emphasizes the use of a perspective that is sensitive to all ages, genders, cultures, and abilities (UNISDR, 2015).

One population that is particularly susceptible to adverse outcomes in disasters is older adults; an analysis of the WHO mortality database found that older adults experience disproportionate mortality rates from hydro-meteorological disasters (Zagheni et al., 2015). As the challenges that older adults experience in disasters are distinct from those experienced by the general population, conventional disaster management resources and responses are inadequate to serve their needs (Henderson et al., 2010). For example, characteristics such as chronic diseases, functional limitations, and lack of mobility or transportation options can render older adults more at-risk in disasters (Henderson et al., 2010). If the risk factor of advanced age is combined with that of immigrant status, as it is in older immigrants, individuals may experience difficulties due to lack of social capital, lower socioeconomic status, cultural differences, and/or any language barriers in place, in addition to the aforementioned challenges (Carter-Pokras et al., 2007).

Older adults living in residential care facilities benefit from the preparedness plans that these institutions implement, but those who remain in their homes do not, and remain at the

greatest risk for harm resulting from disaster events (Brown & Frahm, 2016). In Canada, 92% of older adults live in their own homes in the community (Statistics Canada, 2011). For this reason, preparedness is particularly important for Canadian households with aging immigrants who are dependent on the support of family caregivers. Unpaid care arrangements provided by friends or family members are generally referred to as informal caregiving (Roth et al., 2015). This type of care involves assistance with activities of daily living, usually for dependent family members with disabilities or other limiting conditions (Roth et al., 2015). Such caregiving situations are common in Canada, with 25% of Canadians over the age of 14 having provided this type of care in 2018 (Hango, 2020). Given the recent growth of Canada's older population, it is not surprising that needs related to functional decline from aging were reported to be the most common condition requiring informal care, accounting for 28% of all conditions (Sinha, 2013).

While informal caregiving is unpaid, it can be demanding on the caregiver, and informal caregivers are known to experience disproportionately negative effects on their social, economic, mental, and physical well-being (Fast, 2015). In homes in which an older adult receives informal care, the responsibility of preparing and implementing contingency plans for dependent persons falls to their caregivers (Elkins et al., 2014). This can be especially challenging for informal caregivers of older immigrants, given the multiple intersecting social factors that can impact older immigrants during a crisis or disaster; these can compound with higher risk of negative outcomes due to caregiver strain.

In Canada, a country which has the highest proportion of immigrants among the G8 countries (Statistics Canada, 2014), this issue is particularly relevant. A 2016 Statistics Canada report predicted, using current trends in immigration, that in 2022, over a quarter (26.2%) of adults in their mid-60s will be foreign-born (Carrière, Martel, Légaré, & Picard, 2016). However, the state of emergency or disaster preparedness among informal caregivers of immigrant older

adults in a Canadian context is a topic that to our knowledge has not yet been studied empirically.

### 1.2 Research Question and Objectives

This study was conducted with the following research question and objectives in mind:

Research Question: What is the state of disaster preparedness of family units in which aging immigrants rely on informal caregiving in their homes in Ottawa and Toronto, Ontario?

Objective 1: To describe family caregivers' knowledge of disaster preparedness.

Objective 2: To explore any contingency plans for caregiving that are in place among families with an older immigrant who relies on daily assistance from an informal caregiver.

Objective 3: To identify any barriers that caregivers may experience during household preparedness for disaster events.

## Chapter 2: Literature Review

### 2.1 Disaster Risk Reduction

Disaster risk is defined as the sum of potential losses and disturbances to normal function that can result in a given community or society as a result of disasters (UNISDR, 2009). The disaster risk of a group can be quantified by assessing for potential impacts of various hazards on a community (UNISDR, 2009). UNISDR describes disasters and their harmful effects as being products of underlying vulnerabilities in communities, and thus, as resulting from factors that are endogenous to societies, rather than solely from exogenous insults (UNISDR, 2013). It follows that disaster risk is anthropogenic in nature, arising as a result of the exposure of groups who are at heightened physical, social, and economic risk for various natural or anthropogenic hazards (UNISDR, 2013). This highlights the importance of identifying and addressing the physical, social, and economic disparities experienced by high-risk groups, in order to anticipate and reduce their disaster risk.

Disaster risk management encompasses all efforts aimed towards minimizing the potential harms that disasters can inflict on a community (UNISDR, 2009). The Sendai Framework for Disaster Risk Reduction is one example of a concerted global approach towards disaster risk reduction. It is a commitment to action undertaken by UN member states and other stakeholders to understand and address disaster risks as part of a strategy for prevention and mitigation of harm from disasters (UNISDR, 2015). The Sendai Framework outlines the following as its main priorities: 1) Attaining a better understanding of various disaster risks through pre-disaster assessments and research; 2) enhancing the governance of disaster risk management to encourage the participation of multiple sectors in disaster risk reduction; 3) increasing public and private investments in disaster risk reduction, with a focus on enhancing community and individual resilience; and 4) improving preparedness measures so they ensure effective disaster response and Building Back Better in post-disaster recovery (UNISDR, 2015).

Also identified in the Sendai Framework is the efficacy and cost-effectiveness of focussing disaster management efforts on upstream prevention and harm mitigation through risk reduction, rather than post-disaster response and recovery (UNISDR, 2015). Conventional disaster risk reduction methods involve strategies such as applying risk information to develop new policies and technologies aimed at reducing risk (UNISDR, 2015). In addition to these conventional methods, the Sendai Framework also identifies the fostering and strengthening of resilience as a key upstream strategy to address disaster risks in communities and individuals (UNISDR, 2015).

Resilience is defined as the ability of individuals or communities to retain their functions by responding to and accommodating for external hazards (UNISDR, 2009). Resilient individuals and groups have adaptive capacity, or, attributes and resources that allow them to prepare for and protect themselves from harm in disasters, and ultimately to cope with and recover from a wide range of disturbances or shocks (Field et al., 2012). Resilience-building approaches usually involve programs of a wide range of preparedness interventions that complement one another to reduce vulnerability and enhance capacity in high-risk groups (Field et al., 2012; Twigg, 2015). These approaches, which aim to equip individuals against a wide range of complex hazards, are broader and more holistic than conventional disaster risk reduction methods, which tend to be more targeted interventions aiming to protect groups against single specific hazards, such as hurricanes, or nuclear accidents (Twigg, 2015). Thus, a focus on resilience is warranted in works that aim to assess disaster risks, and in interventions and resources supporting risk reduction.

### 2.2 Disaster Risk Reduction for High-Risk Populations

High-risk populations are those that experience a greater risk for harm resulting from disasters, usually due to physical, social, or economic factors such as gender, age, disability status and socioeconomic status (O'Sullivan & Phillips, 2019). These factors interact with the

individual's sociocultural and political environment to act as determinants of the individual's adaptive capacity (Enarson & Walsh, 2007; Norris et al., 2008). This ultimately leads to an inequitable distribution of the structural, financial, and health-related consequences of disasters; high-risk populations are disproportionately impacted (Preston et al., 2011; Zagheni et al., 2015). The importance of equity regarding disaster risks and impacts is also noted in the Sendai Framework, which includes as a key objective the aim to support and empower high-risk populations that are disproportionately affected by disasters (UNISDR, 2015). For high-risk populations, the disaster risk reduction measures that are recommended in current literature seek to augment household and communities' resilience and their capacities to adapt to disaster impacts (UNISDR, 2015).

Many examples of such measures are outlined in the empirically-based EnRiCH Community Resilience Framework for High-Risk Populations (O'Sullivan et al., 2014). This framework supports a community-based participatory approach to disaster risk management, which empowers community members and allows them to contribute information about their own assets and vulnerabilities (O'Sullivan et al., 2014). Its goal is to develop interventions and policies that respond to the unique needs of a community to reduce risk and mobilize assets, and ultimately, enhance resilience (O'Sullivan et al., 2014). For example, providing opportunities for greater community participation is one type of intervention that supports resilience, as participation facilitates identification of community assets, and of community needs or limitations (O'Sullivan et al., 2014). This increased awareness of assets, of their potential contribution, of how exactly to mobilize them, and the self-efficacy and motivation to act on this awareness, is termed asset literacy, and it is defined as a process as well as a capacity in itself (O'Sullivan et al., 2014; 2018). Enhancing asset literacy helps to build greater adaptive capacity in individuals and communities (O'Sullivan et al., 2014). Thus, engaging members of high-risk communities and allowing them to participate in decision-making for the community is a valuable resource for

effective disaster risk reduction. Asset-based approaches such as this one add value to the conventional deficit-based perspectives of health and social inequities, which focus on needs and risks, as they allow for the identification of determinants of well-being and good health, and the consideration of interventions that support the augmentation of these factors (Morgan & Ziglio, 2010).

In the literature, household disaster preparedness is a term generally used to describe whether certain behaviours relating to preparation have been carried out at the household or individual level (Onuma et al., 2017). These pre-emptive self-protective actions include collecting sufficient disaster supplies and preparing a household emergency plan for communication or evacuation (Pickering et al., 2018). Participants' knowledge of disasters is also used in various studies to gauge their level of preparedness. Undertaking these preparedness actions requires individuals to recognize their disaster risk, but also to exercise asset literacy. They need to: Identify assets such as supplies and emergency plans; recognize how exactly these assets might aid in reducing their disaster risk; recognize how to mobilize the assets; and achieve the degree of self efficacy necessary to prepare and use them (O'Sullivan et al., 2018). These measures of household preparedness will also be used in this study to describe participants' states of preparedness for disasters.

### 2.3 Immigrant Populations and Disasters

Various aspects of the immigrant experience can exacerbate disaster risk for immigrant populations, rendering them high-risk in cases where multiple inequitable forces intersect, and worsening their post-disaster outcomes (Drogendijk et al., 2011; Grude et al., 2017). Some examples of factors detrimentally affecting immigrants' disaster risk include social isolation and lack of social capital (Drogendijk et al., 2011; Uekusa & Matthewman, 2017), and financial instability (Donner & Rodriguez, 2008; Eisenman et al., 2009). Past research on the state of

disaster preparedness in Latino immigrants in the United States found that most participants did not have any emergency plans in case of disaster events, reportedly due to lack of information or time (Carter-Pokras et al., 2007). The lack of disaster preparedness knowledge in this population was also evident in a study in which few immigrant participants mentioned medications or blankets, when prompted about important supplies that would be necessary in a disaster (Eisenman et al., 2009). Participants also had not considered the disruption of essential services (such as medical care) as a possible consequence of disasters (Eisenman et al., 2009). Given that disaster preparedness is so heavily influenced by one's knowledge of risks and available resources (Brown & Frahm, 2016), this is an important aspect for consideration.

One of the chief reasons behind lack of awareness of disaster preparation measures among immigrants is language (Uekusa, 2019). Recent telephone survey data obtained in 14 US states indicated that minority status and limited English literacy skills are risk factors for insufficient disaster preparation (DeBastiani et al., 2015). A language barrier is a functional limitation that is particularly hindering in disaster situations, as individuals' perception of risk and knowledge of emergency protocols depend upon their ability to comprehend disaster information broadcasts or public service announcements (Carter-Pokras et al., 2007; Maldonado et al., 2016; Nepal et al., 2012). The advanced reading skills required to understand many government disaster preparedness resources, as well as their availability being limited to online sources, render them inaccessible for many immigrant groups who possess low English literacy levels, or lack internet access (DeBastiani et al., 2015).

Moreover, even the translated versions of public safety and preparedness messages may often be inadequate; research on the accessibility of these materials for minorities found that translations that do not use culturally appropriate terms or are overly literal are difficult to comprehend (Nunez-Alvarez et al., 2007). One study found that such translations may have the undesirable effect of discouraging disaster risk-mitigating behaviours in immigrants (Gierlach et

al., 2010). This indicates that resource allocation to accurate and culturally sensitive translation of disaster information would greatly benefit immigrant groups in the context of disaster risk reduction.

The method in which populations prefer to exchange and receive information, such as disaster preparedness messages, is also a factor that influences preparedness (Levac et al., 2011). In the case of immigrants, a major barrier to preparedness is the discrepancy between their preferred knowledge exchange methods, and currently established disaster risk reduction interventions and policies. While the channel of disaster preparedness information found to be most commonly used by public health and safety agencies in the United States is the internet (DeBastiani et al., 2015), many immigrant groups tend to exchange and receive information in their social networks in such places as religious or cultural groups (DeBastiani et al., 2015; Carter-Pokras et al., 2007). Examples such as this illustrate the importance of examining existing disaster risk reduction interventions to determine whether they are inclusive to all groups in society. The lack of such considerations contributes to the further marginalization of social groups that may already be marginalized by ethnicity, class, or age.

Despite these sources of additional risk that immigrant populations are exposed to, they remain a resilient population (Uekusa & Matthewman, 2017). In their study of immigrant groups that experienced the Canterbury or Tohoku earthquakes in 2010 and 2011, Uekusa and Matthewman (2017) noted a “paradox of resilience”, in which immigrant groups are simultaneously resilient as a result of their past experiences of adversity and/or disasters, and vulnerable due to lack of social, economic, or cultural capital in their host country. The example highlights the importance of considering high-risk populations’ assets in evaluating their disaster risk; often, their needs and limitations do not comprise the entire story. As a part of its “all-of-society” disaster risk management approach, the Sendai Framework makes note of the resilience that immigrant groups can contribute to their communities, and offers the

recommendation to encourage immigrant populations to participate and lend their skills and experiences to community initiatives for disaster risk reduction (UNISDR, 2015).

### 2.4 Older Adults and Disasters

Like immigrants, older adults are a population that is likely to experience unique combinations of factors that heighten their disaster risk. One such factor is the presence of pre-existing chronic conditions, which can be life-threatening if exacerbated due to disasters and the disaster recovery process (Gamble et al., 2013). The current COVID-19 pandemic is a grim example of the additional risk conferred by chronic disease status; older adults with chronic underlying chronic disease have been identified in the literature as the group with the highest likelihood of morbidity and mortality from this disease (Wu & McGoogan, 2020). In two different surveys of households affected by natural disasters in El Salvador or the United States, the majority of respondents reported to have at least one family member who experienced a subsequent worsening of their chronic conditions (Woersching & Snyder, 2003; Greenough et al., 2008). Factors that were found to influence these exacerbations include the disruption of medical care and medications, exposure to harsh environmental conditions, dehydration and exhaustion, and disruption of the patterns of daily life (Woersching & Snyder, 2003). Moreover, the additional medical needs and equipment that many older adults require can also limit their access to necessary disaster response and recovery services, for example, due to a lack of space for their equipment (McGuire et al., 2007). This underscores the importance of considering in advance the unique needs of this population, to ensure that community preparedness measures are implemented in an inclusive manner.

Other factors that can subject older adults to greater disaster risk include low socioeconomic status (Gamble et al., 2013), social isolation or lack of social support (Gamble et al., 2013; Tuohy et al., 2014), cognitive impairment (Adelman & Legg, 2010; O'Sullivan, 2009),

or other functional limitations (Henderson et al., 2010). Despite their increased disaster risk, research has shown that older adults are less likely than the general population to take individual preparedness measures, even despite having previous personal experiences of disasters, in some cases (Bethel et al., 2011; Heller et al., 2005). One reason for a lack of preparation in this population may be declines in health and functional status that prevent the execution of self-protective actions (Al-Rousan et al., 2014). Older adults' severe disaster risk can compound with a lack of preparedness to place them at even greater risk of harm; indeed, this population has been shown to experience greater physical, financial, and social consequences from disasters (Bolin & Klenow, 1983; Brunkard et al., 2008; Hendry & East, 2013).

Moreover, research has consistently found that older adults who are unable to function independently and depend on others for assistance with activities of daily living are at higher risk for adverse outcomes in the event of a disaster (O'Sullivan, 2009; Enarson & Walsh, 2007; Bloodworth et al., 2007). This characterizes a large proportion of individuals who receive informal caregiving from family members in their homes (Roth et al., 2015). These findings highlight the need to address the increased disaster risks these older adults experience, by enhancing their adaptive capacities, as well as those of their caregivers, with additional supports for all phases of a disaster.

The Sendai Framework notes the potential for older adults' skills and knowledge of disaster risk management, derived from their years of experience, to benefit policy and intervention design (UNISDR, 2015). Older adults' participation in community disaster risk reduction initiatives can also ensure that policies and interventions are inclusive and sensitive of the additional and often complex needs of this population.

### 2.5 Informal Caregiving and Disasters

The physical, financial, and emotional demands of caregiving often place caregivers at higher risk of harm in disasters; studies have shown that informal caregivers experience greater emotional distress and lower health-related quality of life than non-caregivers (Roth et al., 2009; Litzelman et al., 2014). Some recent examples of additional emotional stresses placed upon informal caregivers during disasters come from the COVID-19 pandemic. Baxter's (2020) article details a personal account of the additional stressors placed upon informal caregivers of an older adult who is moved between multiple care settings due to the COVID-19 pandemic. Moreover, in a study of a sample of 32 informal caregivers of patients with Parkinson's Disease, more than half of participants have been reported to experience higher levels of mood/cognition-related distress as a result of the lockdown measures put in place in response to COVID-19 (Oppo et al., 2020). It is known that those who consistently experience stress on a routine basis are more susceptible to the harmful effects of additional stressors produced by disasters (Elkins et al., 2014). Considering this, as well as the fact that the burdens of preparing and implementing disaster plans for the caregiver and care recipient dyad often fall upon the caregiver (Elkins et al., 2014), it is clear that supporting an improvement in caregiver resilience should be a key priority in disaster risk reduction for this population.

Past studies on the state of disaster preparedness among informal caregivers has shown a lack of preparedness, despite an awareness of its importance (Kubicek et al., 2008; O'Sullivan et al., 2012; Wakui et al., 2017). Caregivers in these studies demonstrated a lack of preparedness with regards to collecting disaster supplies to compile a disaster kit, implementing a household emergency plan, and, importantly, caregiving contingency planning (Kubicek et al., 2008; O'Sullivan et al., 2012; Wakui et al., 2017). Caregiving contingency planning is an additional dimension of disaster or emergency preparedness that is recommended for informal caregivers and care recipients (O'Sullivan et al., 2012). This involves discussing and arranging

for formal or informal back-up caregiver(s) in preparation for the possibility that the current caregivers are unable to provide care (O'Sullivan et al., 2012). Caregiving contingencies are a crucial aspect of preparedness planning for older adults requiring informal care, as disasters may bring about situations in which they are left with no accessible options for support. The above findings demonstrate the need for further investigation on the determinants of preparedness behaviours in this population.

Enhancing informal caregivers' resilience may not be as dire a task as it may seem, as the evidence also shows that caregivers are an extremely capable population who are able to effectively problem-solve and routinely navigate barriers, such as their care recipients' functional limitations or illnesses (Brown & Brown, 2014). Also evident is the potential benefit (to both caregivers, and care recipients) in providing informal caregivers with disaster preparedness supports and resources with the aim of enhancing the skills they already possess.

The research reviewed above demonstrates that the various factors that influence older immigrants' disaster risk interact in ways that are complex and unique to this group. Disaster risk reduction methods aimed to serve the general public are often not inclusive to this high-risk population. Consequently, a thorough evaluation of the disaster risk experienced by this group is necessary, to ensure that policies and interventions can be tailored to meet their needs. The literature also indicates a need in the informal caregiver population for resources and support to ease their burden with regards to household emergency preparedness. Research on the state of disaster preparedness among informal caregivers of older adults is limited (Pickering et al., in press). Moreover, to our knowledge, Canadian studies with a focus on household preparedness of older immigrant populations have not yet been done; this study seeks to fill this gap in the literature.

## Chapter 3: Methods

The purpose of this study was to describe the knowledge, behaviours and perceptions of caregivers of older immigrants regarding disaster preparedness, and to identify challenges they may face in improving household preparedness for the care recipients. This chapter includes a description of the research design and methods used for data collection and analysis in this study. This is followed by a discussion of my positionality and reflexivity in this work.

### 3.1 Research Design

Given the limited published research on the disaster preparedness of Canadian older immigrants, a qualitative descriptive approach was most appropriate for this study. In comparison to quantitative forms of inquiry, which often collect data pertaining to predetermined variables, qualitative research is typically inductive, making it ideal for generating novel findings that have not been anticipated by the researcher (Guest et al., 2017). Qualitative description was chosen for its utility in capturing the context of our phenomenon of interest, as well as any related phenomena, in order to develop a richer understanding of the subject matter (Creswell & Creswell, 2017). This form of inquiry also allows for an exploration of the subjective realities experienced by the participants, often in the participants' own words (Guest et al., 2017). This understanding of participants' experiences can lead to clear conclusions and recommendations for how services can be enhanced to improve health outcomes in the population of study (Sandelowski, 2000).

The philosophical worldview used in this study is that of the transformative approach, in which the aim is to give voice to the experiences and barriers experienced by a marginalized or disadvantaged participant group (Creswell & Creswell, 2017). The goal of this work is to increase awareness of the challenges and inequities experienced by the participants, ultimately to promote systemic and community-level changes that address these inequities (Creswell &

Creswell, 2017). Using the philosophical assumptions of the transformative worldview, our discussion of the study results yields a series of recommendations for policymakers and community partners to consider, as a part of an agenda to improve household disaster preparedness in immigrant older adults and their caregivers. The following sections detail the specific techniques carried out as a part of this research design.

### 3.2 Data Collection

Data collection in this study involved semi-structured individual interviews with a sample of informal caregivers of immigrant older adults who reside in Ottawa or Toronto, Ontario. The informal caregiver was the unit of analysis that we used to explore disaster preparedness in the households of immigrant older adults. To reach as many informal caregivers as possible, a snowball sampling approach was used in conjunction with multiple recruitment methods online, in-person, and using print media.

#### *3.2.1 Participant Recruitment*

The participants in this study were adult informal caregivers of aging immigrants who reside in their homes in Ottawa or Toronto, Ontario. For sampling purposes, we defined an informal caregiver as an individual who self-identified as providing unpaid care for an immigrant who is 65 years of age or older within the previous 2 years. Care was defined as the provision of assistance in at least one of the activities of daily living (ADL; eating, transferring, toileting, dressing, bathing, walking across a room) or instrumental activities of daily living (IADL; preparing meals, grocery shopping, managing money or medications, doing housework, using the telephone, and driving or using public transit). This definition of care is one that has been used in several other studies on informal caregiving (Brown et al., 2009; Fredman et al., 2010),

and the ADL/IADL measures used have been found to be valid and reliable measures of functional status (Katz et al. 1963; Finlayson et al., 2005). Eligibility criteria for the study also included being able to participate in an interview in English. In Canada, about 30% of care recipients do not live in the household of their primary informal caregiver (Sinha & Bleakney, 2014). To ensure maximum variation in the sample, we did not include living arrangements as an exclusion criteria; this enabled exploration of the experiences of caregivers of older immigrants with a variety of caregiving arrangements. All informal caregivers of older immigrants were included, regardless of whether they resided in the same households as their care recipients.

The size of the sample for this study was determined inductively, and sampling continued until we determined that theoretical saturation had been reached, and no new themes were being identified. This decision was based on a study by Guest, Bunce, and Johnson (2006) on sizing of non-probability samples in studies involving in-depth interviewing of participants. The authors found that most of the literature regarding non-probability sample sizes for such studies in social, behavioural, and health research recommend this method of inductive sample size determination. This approach required participant recruitment, data collection, and data analysis to be conducted concurrently. Throughout the course of data collection, I periodically assessed whether theoretical saturation had been reached, to determine when to conclude recruitment. Recruitment for this study began in February 2018, following the approval of this study by the uOttawa Research Ethics Board, and continued until January 2019. The ethics certificate for this research can be found in Appendix A.

The recruitment strategy used in this study involved multiple modes of communication, online, in-person, and through print media. Several different methods of recruitment were used. The recruitment plan involved sharing notices about the study on social media sites (Facebook, Twitter, Kijiji, and Reddit), as well as posting printed recruitment notices in community centres,

public libraries, and university campuses in Ottawa and Toronto. We also used in-person recruitment strategies, such as handing out flyers to festival-goers at cultural and ethnic festivals, and offering to briefly chat with them about the study if they showed interest. Lastly, we emailed notices to various community gatekeepers, such as religious leaders and heads of community and cultural organizations. These community gatekeepers were asked to forward the recruitment notice to members of their organizations or social circles that might be interested and eligible to participate. The recruitment strategies and notices used in this study are further detailed in Appendix B (Recruitment Methods), Appendix C (Recruitment Notice), and Appendix D (Social Media Posts).

The study notice used for recruitment included a brief description of the study and the inclusion criteria for participation, as well as the contact information of the lead researcher. Interested participants were asked to contact us for more information. Extra care was taken to reach a broader audience and maximize recruitment. Study notices did not include any technical terms, and instead used language that is more accessible for the target population. We did this to take into account the possibility that informal caregivers of older immigrants may have limited English literacy skills. For example, the recruitment notices used called for “Adult Children and Grandchildren of Immigrant Older Adults”, rather than “Informal Caregivers of Immigrant Older Adults”.

In addition to the strategies detailed above, we used the socially-based recruitment technique of “snowball sampling”, or, chain referral, in which recruits are asked to refer peers who may be interested and eligible to participate in the study (Vogt, 2005). To avoid the distribution of individuals’ contact information without their informed knowledge or consent, participants were asked to pass along my contact information to peers whom they thought might be interested in participating in the study. Chain referral sampling techniques such as this one have been widely used in social and health research to access various social groups that may

otherwise be difficult to reach (Vogt, 2005). Lastly, upon initial contact, potential participants were asked a short series of questions to assess their eligibility for the study according to the above criteria. Participants were also emailed a consent form to sign before participating in the study. The consent form can be found in Appendix E.

### *3.2.2 Semi-Structured Interviews*

The method of data collection used in this study was individual in-depth semi-structured interviews. This interview format was chosen due to its usefulness in elucidating rich data on individuals' personal experiences, perceptions, and motivations, and in allowing for extensive probing that is personalized to the interviewee's specific responses (Guest et al., 2017). We were also mindful of the possibility that the interviewees, who are informal caregivers of immigrant older adults, might have limited English or disaster-related literacy skills. Conducting individual interviews gave us the flexibility to rephrase and clarify questions for interviewees who did not understand them; it also allowed for the collection of nuanced data on the level of individuals' understanding of disaster-related terminology. I conducted one individual interview with each participant, in which I used a combination of a pre-determined open-ended questions and added probe questions when needed to elicit in-depth responses.

These interviews were semi-structured, to provide some flexibility while maintaining the focus of the interview. In this method of data collection, interviews are structured enough to allow for systematic item-by-item comparison of participant responses during analysis, while giving participants enough freedom to choose the depth with which they wish to discuss their responses (McIntosh & Morse, 2015). The development of the interview guide was informed by a literature review, as well as consultation with my thesis supervisor. Interviews generally began with simpler questions about the participants' demographic information, as well as those about the caregiving arrangements in place for the older immigrant. These were followed by open-

ended questions on the following topics: Informal caregivers' knowledge and perceptions of disasters and preparedness, their personal experiences of household preparedness among older immigrants, their experiences with supports that may enhance resilience in older immigrants, and their experiences with contingency planning for the care of their older immigrant care recipient. The interview guide used for the semi-structured interviews can be found in Appendix F. I conducted interviews by phone or in person in the EnRiCH Research Laboratory at the University of Ottawa Lees Campus.

### 3.3 Data Analysis

All interviews were audio-recorded, with prior permission from each participant, and subsequently transcribed for analysis. Following each interview, I transcribed the audio recording, and all transcriptions were independently verified by a research assistant. We then analyzed the interview content using inductive thematic analysis, which involved inductive coding of the interview transcripts to identify themes that arose from the texts (Guest et al., 2012). Keeping with the principles of inductive analysis, we had no predetermined themes in mind before the coding process (Guest et al., 2012). This method involves multiple stages of analysis, many of which have the purpose of ensuring study rigor. First, two researchers (myself and a research assistant) independently read through two interview transcripts to code them using open and inductive coding. After discussing and coming to an agreement about the definitions and contents of the resulting code categories, we established an initial codebook, which I then used to code the remaining transcripts. Throughout the coding process, I modified the codebook as needed, based on the content encountered in the latter transcripts, as recommended by Lincoln and Guba (1985). For example, I would add new codes to the codebook, and re-configure categories as new codes or relationships emerged from the text. Afterwards, I re-coded all of the interview transcripts with the finalized version of the codebook.

This was followed by a verification of my coding, a process in which a research assistant used the finalized codebook to code 10% of the transcripts. We then discussed our respective coding decisions for this segment of the transcripts, to resolve any disagreements that arose in coding. This marked the end of the coding process. The finalized version of the coding grid can be found in Appendix G.

In the final analytic phase, we closely analyzed segments of text coded at each category to identify emergent themes in the data. This was conducted independently by two investigators (myself and a research assistant), and the themes that we identified were discussed and verified between us and then with my supervisor. I used a number of approaches to facilitate the identification of themes, including the Framework Method for thematic analysis that was established by Ritchie and Lewis (2003), as well as writing of case summaries for each individual participant to facilitate within-case as well as cross-case analysis. The computer software used for the coding, thematic analysis, and general management of the interview transcripts was NVivo10 (QSR International). The final set of themes are presented in the next chapter.

### 3.4 Reflexivity Statement

As qualitative research involves a degree of interpretation of the subjective meanings that participants share (Creswell & Creswell, 2017), a consideration of the researcher's positionality was crucial in this work. As a Korean-Canadian woman who immigrated to Canada from South Korea at 1 year old, and with an older immigrant grandparent living in Canada, I have a detailed and personal insight into the older immigrant experience. I have also recently taken on some family caregiving roles, and thus have personal experience as an informal caregiver. Thus, it was necessary for me to bracket my own experiences when considering the narrative of the participants in this study.

Various efforts were made to ensure that the findings of the study are reflective of the participants' experiences, and are minimally affected by any biases that I hold. These include the writing of reflective post-interview memos, independent initial coding of interview transcripts by two different researchers to create the initial codebook, and post-analysis verification of coding by yet another researcher. These efforts are discussed in detail in the sections above.

## Chapter 4: Results

This chapter describes the results of the qualitative thematic analysis detailed above; it is divided into four sections. In the first section (4.1), a description of the participants of the study is provided; they were adult caregivers of immigrant older adults. In the second section (4.2), an overview of the older immigrant care recipients is included, as well as other contextualizing information about the nature of care provided for them. In the third section (4.3), we present a summary of the themes. The fourth section (4.4-4.9) details the six main themes that we have identified in the interview transcripts. The fifth section (4.10) concludes this chapter with a schematic diagram depicting the relationships between the concepts described in each theme.

### 4.1 Description of Sample

In total, n=10 informal caregivers of immigrant older adults participated in this study. The ages of the participants ranged from 21 to 72 years, with a mean participant age of 43 years. Of the 10 interviews, nine were conducted over the phone, and one interview was conducted in person. The lengths of the interviews ranged from 24 to 41 minutes, with an average length of 29 minutes. Half of the participants live in Ottawa (*n=5*), and the other half live in Toronto (*n=5*).

Of the informal caregivers who were interviewed, four are also immigrants, and one is an immigrant older adult themselves. While all participants are related to their care recipients, and thus qualify as family caregivers, most participants do not live in the same household as the care recipient (*n=7*). The majority of interviewees self-reported as having full-time paid employment in addition to their caregiving duties (*n=6*). The remaining four caregivers were either undergraduate students in university (*n=2*) or retired (*n=2*). Most participants were providing care for just one immigrant older adult (*n=7*); three participants reported to provide care for two older immigrant care recipients. Of these three, at the time of the interview, two were the sole

caregivers of their care recipients. Table 1 further details the characteristics of the interviewed informal caregivers.

**Table 1**

*Characteristics of Participants (Informal Caregivers of Immigrant Older Adults, N=10)*

| Characteristics | | Number of Participants, n |
|---|---|---|
| **Sex** | | |
| | Male | 4 |
| | Female | 6 |
| **Age** | | |
| | 18-29 | 3 |
| | 30-49 | 2 |
| | 50-64 | 4 |
| | 65+ | 1 |
| **City of residence** | | |
| | Ottawa | 5 |
| | Toronto | 5 |
| **Immigrant status** | | |
| | Yes | 4 |
| | No | 6 |
| **If immigrant, country of origin (n=4)** | | |
| | South Korea | 2 |
| | Jamaica | 1 |
| | Pakistan | 1 |
| **Has full-time paid employment** | | |
| | Yes | 6 |
| | No | 4 |
| **Lives in same household as older immigrant care recipient(s)** | | |
| | Yes | 3 |
| | No | 7 |
| **Has more than one older immigrant care recipient** | | |
| | Yes | 3 |
| | No | 7 |
| **Sole caregiver of older immigrant care recipient(s)?** | | |
| | Yes | 3 |
| | No | 7 |

### 4.2 Description of Care Recipients and Nature of Care

Interview questions were asked to elicit information relating to the demographic information of the care recipients and the nature of the care situation in place for them. At the time of data collection, the participants were providing care for a total of 13 older immigrants, all of whom were family members. The majority of the older immigrants were reported to be female (*n=9*), and they came from a diverse group of countries, including South Korea, Jamaica, Pakistan, Bangladesh, the United Kingdom, Italy, Greece, Poland, and Serbia. At the time of the interviews, the length of time the older immigrants had lived in Canada varied considerably, ranging from 19 to 70 years. Caregivers reported that most of the older immigrants (*n=8*) had lived in Canada for over 30 years. However, most were assumed by their caregivers to be experiencing a language barrier in Canada (*n=10*). Lastly, more than half (*n=7*) of the older immigrants were reported to live alone.

The participants reported similar responses when asked about the types of care tasks they provided. Two older immigrants were receiving assistance with both activities of daily living and instrumental activities of daily living, while 11 of them received assistance only with instrumental activities of daily living. The most commonly reported care tasks were physical tasks related to the upkeep of the older immigrants' households, and communication-related care tasks, such as interpretation. Driving the care recipient to various appointments or for grocery shopping was also a care task noted by participants.

### 4.3 Summary of Themes

The following is a list of the themes derived from open and inductive coding of the interview transcripts. Subsequent sections will describe each theme in depth.

Theme 1: “I'm her emergency preparedness”

Theme 2: Caregivers recognize that independent living increases the older immigrants' disaster risk

Theme 3: Caregivers have general knowledge of disaster preparedness measures, but don't believe it is actionable

Theme 3 has the following three sub-themes:

*Caregivers demonstrate basic knowledge of disaster preparedness measures*

*Preparedness knowledge does not necessary translate into action*

*Lack of confidence in preparedness knowledge is a barrier to preparedness*

Theme 4: Financial barriers compound with lack of confidence in preparedness-related knowledge

Theme 5: Caregiving contingency plans are based on assumptions and cultural norms

Theme 6: Limited literacy about community assets supporting disaster risk management

### 4.4 Theme 1: “I'm Her Emergency Preparedness”

Caregivers in this study generally assumed responsibility for preparing the older immigrants for disaster and, more commonly, managing the older immigrants’ disaster response. All but one of the caregivers reported that their older immigrant family members did not take any independent actions toward disaster preparedness. Consequently, preparedness actions carried out in the older immigrants’ households were either prompted by the caregivers, or carried out by the caregivers themselves. For example, one caregiver described how she would talk to her mother over the phone to let her know what she should do in case of emergency:

> *I call her, and I tell her when we talk, about what could happen and what she needs. I gave her candles, you know, to prepare her. Make sure she has extra blankets, and I tell her what to do*. (Participant 9)

The caregivers had contemplated how they might assist their family members in disasters, and they anticipated playing essential roles in the older immigrants’ disaster response. One caregiver said of her mother, “Oh, *I’m* her emergency preparedness” (Participant 1). She expressed that she was the key resource for preparedness for her mother; her mother would be entirely dependent upon her in a disaster. Caregivers showed clear motivations to prepare their care recipients, and to help them manage disasters. One possible motivating factor was the perception amongst several caregivers that the older immigrant care recipient had not given any thought to the concepts of disasters or preparedness for disasters:

> “*For my mom...you know, she don’t really think about this*.” (Participant 9)

> “*I don't think she thinks about things like that*.” (Participant 8)

> “*Yeah she's quite like, she’s not very on top of that*.” (Participant 6)

Reasons for this apparent lack of concern among older immigrants were unclear. One caregiver thought his family's expectations about the caregiving roles of the adult children affected how much his father concerned himself with disasters or preparedness:

> "*Like, if an emergency were to happen, he would really turn to us to provide that leadership role. So in a sense he's kind of deferring that responsibility to us. So he doesn't even think about it, because he knows that we'll be there and we'll support…and I think that's kind of built up in his mind*." (Participant 7)

Thus, perhaps owing to their perceptions of the older immigrants' lack of awareness of, and lack of concern about disasters and preparedness, most caregivers took on the responsibility of managing the older immigrants' disaster preparedness and response. Consequently, caregivers were able to share in-depth perspectives of the older immigrants' households and their states of preparedness for disasters.

### 4.5 Theme 2: Recognition of Older Immigrants' Increased Risk Due to Independent Living

Many of the older immigrants who were receiving care from the participants lived independently (i.e., separately from any informal caregivers), either alone (*n*=*7*), or with a spouse who is also an older immigrant (*n*=*2*). Most of the concerns the caregivers expressed about the older immigrants' disaster risk stemmed from this independent living. They mentioned various sources of disaster risk that either result from, or are exacerbated by, the independent living of the older immigrants. These included the inability to access support if incapacitated due to injury or illness, and the inability to drive, either to evacuate from their homes, or to procure necessary supplies. Language barriers were also a source of concern for participants whose care recipients live independently. A particular concern was that, alone, the care recipients would not be able to understand disaster-related messaging or communicate with support

service workers in an emergency. One participant explained her concerns about her mother's ability to communicate, and thus to "advocate for herself enough" in a disaster:

> *"[I]f she's to call supports outside, do they understand? Okay. So let's say the doctor, her health, did he fully understand? The guy who cleans the snow off her driveway, does he fully understand that she's stuck in the snow? And maybe she doesn't have food, she can't get out*." (Participant 1)

Another concern that participants expressed was the potential for negative psychological and emotional effects on the older immigrants, if they have to address a disaster situation alone. This demonstrated that caregivers recognize this additional risk for mental health-related harm that older immigrants might experience when living in the community. For example, one participant expected that the potential inability to communicate with or transport his mother in a disaster would cause her to become "*very anxious*" (Participant 2). Yet another participant worried that her mother's emotional response might prevent her from remembering and thus following an emergency plan if she were to face a disaster situation by herself: *"[A]s I said, she gets anxious, and my fear is, maybe she don't remember what I told her*" (Participant 10). In this way, caregivers expressed concerns about, and demonstrated awareness of the enhanced physical and psychosocial risks that their older immigrant family members experience as a part of independent living. Table 2 details the strategies that participants used to address these increased disaster risks, including physical assistance, regular monitoring, using technology, mobilizing social support, and broaching the topic of moving.

**Table 2**

*Strategies Used to Reduce Risk From Living Independently*

| Name of Strategy | Description | Examples and Supporting Quotations |
|---|---|---|
| 1. Physical Assistance | Some participants made it their main priority in a disaster situation to either physically reach, or at least make contact with the care recipients, to give them physical or communication-related assistance. | • One participant stated that his primary concern in a disaster would be "*communication [and] transportation*" for his older immigrant mother (Participant 2).<br>• Another participant, who stated that the "worst-case scenario" would be one in which he would not be able to reach the care recipients, said the following about his own plans to assist them in a disaster: "*If I'm able to get to them, then—you know, if the roads are clear, and my car is working, and all that sort of stuff, I can probably, you know, find a pharmacy that's open and get stuff to them or whatever they need, or bring them to my place. So…uh... but if I couldn't reach them, then that would be a problem*." (Participant 5) |
| 2. Regular Monitoring and Assistance | Caregivers exhibited routine, day to day responses to the recognition of increased disaster risk due to the care recipients' independent living.<br><br>Most measures were taken by caregivers on an everyday basis, outside of disasters, but nonetheless acted to reduce the older immigrants' disaster risk.<br><br>One such measure was routinely checking in on the older immigrant(s), either on a daily or weekly basis. Many caregivers considered this to comprise a very basic part of their care for their family member. | • According to one participant, who stated repeatedly that she would "assume nothing" about her older immigrant mother and thus would check on her daily: "*The thing is, if I don't do this, it's easier for me to put a plan of action and take care of her in increments instead of dealing with a dead—or someone who's had a stroke […] So, I don't assume anything of my mom because of her poor literacy rate, her reading and writing, and her often conflictual way that she expresses herself but is misunderstood*." (Participant 1)<br><br>This participant preferred to provide continuous care and assistance with physical and communication-related tasks in order to prevent her mother from coming into any harm. Other participants had similar thoughts regarding the prevention of harm through regular monitoring and assistance. |
| 3. Use of Technology | The use of technology and personal emergency response systems was a method of monitoring care recipients' wellbeing that was mentioned by participants — but not used by any of them.<br><br>Participants recognized the utility of personal emergency response systems such as fall detectors, and expressed the desire to use these technologies with the care recipients. | • One caregiver mentioned that it was popular for adult children of older adults in her social circle to buy these for their parents.<br>• However, a few participants reported that the care recipients were not receptive to the idea of using these technologies, citing reasons such as a "phobia" (Participant 5) of technology, as well as pride. This suggests that the lack of familiarity and the discomfort that older immigrants may associate with technological devices are barriers that hinder the potential utility of these devices in disaster risk reduction. |

**Table 2** (continued)

*Strategies Used to Reduce Risk From Living Independently*

| Name of Strategy | Description | Examples and Supporting Quotations |
|---|---|---|
| 4. Mobilizing Social Support | Mobilization of social support was a strategy identified by the caregivers that they use to address the increased disaster risk that older immigrants experience as a result of independent living. For example, social support can be a solution for the emotional distress of responding to a disaster as a single-person household.<br><br>Caregivers mobilized social supports for the day-to-day monitoring and care of the older immigrants. They described being part of a group of caregivers for an older immigrant, which consisted mostly of the older immigrant's children and grandchildren, as well as neighbours, in some cases. Systems were described in which caregivers would share or alternate their caregiving responsibilities to ensure that the older immigrant was being regularly attended to, and they had assistance with day to day activities. | • One participant felt her mother would be "quite frightened on her own" in a disaster, without the social support of additional household members; she predicted that her mother would benefit from "find[ing] a group, like, to be with".<br><br>She described with gratitude the support that her mother currently received from friends and family members to upkeep her household, which the participant described as being "*a bit too much for her*". "[*M]y brother is there and our neighbour helps a lot with like, yard staff. It's really like a network of people […] like, different friends, um... she will have paid help as well sometimes, but they're more like, family friends that she'll pay to like run laundry, or help organize her closet if it gets, like out of control*." (Participant 6) |
| 5. Broaching the Topic of Moving | Some caregivers addressed the additional disaster risk associated with independent living by suggesting that the care recipient(s) move in with them. The rationale they described was that moving in with the older immigrant would be an effective way to reduce the workload involved with providing care from a distance, and to reduce the disaster risk.<br><br>The caregivers who expressed their preference to take this course of action were all providing care for someone who required relatively more care. These participants were concerned about risk of harm particularly because of severe functional limitations that require a greater amount of care for their family member. However, the older immigrants in these situations were described as resistant to this suggestion. | • One participant stated he was "in the process of trying to convince [his] father in law to move in with [him and his wife]" (Participant 5).<br><br>• Another participant simply said of her older immigrant mother, "She won't leave", hinting at her resignation after multiple failed attempts to convince her mother to move out of her large house (Participant 1). |

### 4.6 Theme 3: Caregivers Have General Knowledge of Disaster Preparedness Measures, but Don't Believe it is Actionable

We found in this study that the caregivers were able to demonstrate general knowledge of disaster preparedness measures; however, this knowledge did not necessarily translate into preparedness actions. One major contributor to this inaction was the participants' lack of confidence in their own knowledge. Due to the complex nature of this theme, it is divided into the following three subthemes:

*Caregivers demonstrate basic knowledge of disaster preparedness measures*

*Preparedness knowledge does not necessary translate into action*

*Lack of confidence in preparedness knowledge is a barrier to preparedness*

#### *4.6.1 Caregivers Demonstrate Basic Knowledge of Disaster Preparedness Measures*

The participants were able to describe, in broad terms, various strategies that might be used to prepare for disaster, including gathering disaster supplies, and creating an emergency plan. When asked to list any disaster supplies that came to mind, they were all able to identify items that would be useful in a variety of disaster or emergency situations, such as flashlights, matches or lighters, stores of drinking water and non-perishable food, medications, and first aid kits. They were also able to list examples of disasters that are most likely to occur in their geographical area. Some participants elaborated upon specific preparedness measures to take for these particular types of disaster events. Additionally, the majority of caregivers interviewed recognized the utility of having a detailed emergency plan for their household, and for the care recipient:

"*When it comes to being prepared for emergency situations, if you've thought things out*

*and if you have a plan, then I think, then, naturally you will be in a better place than someone who has not thought of those things and doesn't have a plan. So from that perspective, yeah. I think it would have a quite a big impact [on disaster management]."* (Participant 7)

### *4.6.2 Preparedness Knowledge Does Not Necessarily Translate Into Action*

Despite their general knowledge of various disaster preparedness measures, most of the caregivers we interviewed had not deliberately equipped themselves or their family members with disaster supplies or emergency plans. For example, participants reported having basic supplies such as matches, candles, flashlights, toolkits, and spare batteries in their own households. However, many expressed that most of these items had been naturally accumulated over time, and had not been purposefully collected with the intention of preparing for disaster: "[*W]e just kind of—it wasn't really with the mind that we are going to use this in the case of emergency. We just accumulated them when we needed them*" (Participant 4). Furthermore, only 1 of the 10 participants reported having a kit, or a designated portable receptacle in which they stored these supplies. Despite this lack of deliberate preparedness, caregivers showed asset literacy regarding these supplies; they were able to recognize, without prompting, how they would benefit from the use of the supplies in a disaster. For these specific assets, caregivers had moved beyond the first, second, and third stages of asset literacy, in which individuals become aware of assets, recognize their utility, and know how to access or use the assets, respectively (O'Sullivan et al., 2017).

The disaster supplies of the older immigrants who live independently were reportedly similar to those of the caregivers' households. Participants expressed that the older immigrants had not deliberately prepared supplies for their households, but nonetheless had accrued some of them: "[*T]hey're just things we have […] she just has that stuff in her house*" (Participant 8).

Some caregivers made efforts to provide their family members with additional supplies, such as candles or batteries. Despite having some supplies in their households, such as first aid kits, medications, flashlights, and batteries, none of the older immigrants were reported by their caregivers to have these supplies set aside in a portable disaster kit. Overall, the older immigrants' households seemed to lack certain essential disaster supplies, including stores of non-perishable food or water, back-up copies of important documents, sleeping bags, and portable chargers or external batteries for cellphones.

Some caregivers expressed guilt for not being prepared with disaster supplies. They demonstrated a degree of self-awareness about their own state of preparedness, as well as feelings of responsibility for the preparedness of the care recipients. One participant said, "*There are some basic [supplies] that we probably need to get more on top of*" (Participant 6).

Moreover, despite recognizing the benefits of having a household emergency plan, most participants reported having no detailed plans for disasters, either for their own households or for those of the care recipients. Caregivers had given some thought to what they would do to help the care recipient(s) in an emergency situation, but only one of them reported having a plan that was agreed upon by all household members and the older immigrant. From this participant's description of their own household plan, however, it is evident that it was not detailed or comprehensive:

> *"Say, for instance there's a fire coming. My kids know what to do. We're not to go out and look for the fire. And hopefully, we'll find out early enough that we'll know how to get out. Stuff like that*." (Participant 9)

In place of an emergency plan that is agreed upon by all household members, caregivers had unspoken and ill-defined intentions to assist the care recipients in a disaster. Many caregivers anticipate that they will play a central role in the disaster management of their care recipients. One participant said of her mother, "*The only thing my mom needs to worry about in a*

*natural disaster, is does she have enough of her diabetes medication on her […] everything else, my sister and I can get to her*" (Participant 1). These older immigrants' successful management of a disaster situation would be contingent upon their caregivers' involvement.

Other caregivers had expectations of assistance from external sources. Two of the participants' care recipients reside alone in community housing apartments. As they themselves did not implement or discuss any emergency plans with their care recipients, they expressed hopes that the housing board would have a plan for these buildings: "*Yeah, as I told you, my mother lives alone. And hopefully the housing corporation has some kind of contingency, or, crisis plan for seniors*" (Participant 2). These types of expectations for disaster response are heavily dependent upon the presence and abilities of caregivers or other support workers. Such expectations render older immigrants vulnerable to harm, especially in disaster situations in which they are alone and not easily accessible by these people.

### *4.6.3 Lack of Confidence in Preparedness Knowledge is a Barrier to Preparedness*

When asked about the reason for the discrepancy between their knowledge of preparedness measures and their actual degree of preparedness, only two participants stated that they did not see the need for preparedness, and demonstrated perceptions of low disaster risk in their respective geographical areas. Many more participants expressed that a major factor that contributes to their lack of preparedness is their impression that they do not have enough specific information about how to prepare. This is despite their having demonstrated general knowledge of disaster supplies and the importance of emergency plans throughout their interviews. For example, the following participant was unsure that her knowledge of preparedness measures was sufficient: "*I know the basic things but still I don't know what is the most, the proper preparation, you know? […] What is the adequate amount of preparation? I don't know*" (Participant 3). Another participant explained her hesitance to take further action

toward developing an emergency plan without becoming more thoroughly informed on how to do so:

> *You know, you don't want to just go without knowing more. You need to know more. The more information you have, the better it is. The plan will be better and more reliable for you, if disaster occurs, for you to treat it properly. For me, it is an ongoing learning process to see what is happening, and see*. (Participant 9)

Yet another cited his lack of detailed knowledge about preparing supplies as being the reason for his household's lack of disaster provisions:

> *Um, so part of the reason is, we don't really know what supplies to have. Like what an ideal kind of emergency storage bin should have. Like I have no idea… I assume like some of the [supplies I mentioned] would be included in stuff, but then like clothes, or you know, like how much water you should have. I don't really know…* (Participant 7)

Participants conveyed their anxiety about taking concrete actions toward preparedness, as they felt ill-equipped, information-wise, to do so. This is suggestive of a lack of self-efficacy in this matter. A few participants suggested that more exposure to expert recommendations or standardized guidelines could increase their confidence in their knowledge of preparedness actions. Most of the participants did not recall seeing or receiving informational resources for any type of disaster preparedness in the recent past. The few participants who did recall instances of seeing or receiving information related to disaster risk or preparedness, such as on a billboard by the highway, or in a television advertisement, did not remember the content of these messages.

### 4.7 Theme 4: Financial Barriers Compound With Lack of Confidence in Preparedness-Related Knowledge

Participants reported the financial costs of preparing to be another factor that influenced their likelihood to take deliberate preparedness actions. Many participants demonstrated an awareness of the substantial financial cost of both compiling a disaster kit, by purchasing supplies, and maintaining the kit, by replenishing certain supplies as needed. One participant expressed uncertainty about purchasing disaster supplies for her older immigrant mother; given the great financial cost involved, she worried about the possible implications or the tone of this action:

> *We haven't really had the conversation and I'd probably want to pay for everything, but then like if I went out and got it, like, knowing that she wouldn't have purchased this stuff on her own, so like…maybe a slight financial piece to it…or like, financial ambiguity. Like…I would feel like I'm sort of forcing it on her.* (Participant 6)

This participant had concerns about undermining her mother's autonomy by imposing such a large purchase upon her. Often, the financial cost of preparedness alone was enough to discourage participants from preparing. However, financial barriers also acted in conjunction with other barriers, to exacerbate their effects. Many participants were already hesitant to buy supplies and compile a disaster kit, as they felt that they lacked the requisite knowledge to do so. The financial costs of preparation acted to further dissuade these individuals. For example, one participant said:

> *So I think I want some more expert insight into like how…like what the recommendations are, before I do anything. Again, going back to the investment thing, because if we do buy a bin and we buy a bunch of supplies, like, that's an added cost for us […] And let's say it's like 300 bucks…that's 300 bucks. And if you're not doing it—like I would feel, I wouldn't be comfortable spending that much money and knowing that*

*I didn't even do it properly.* (Participant 7)

In this way, the financial barrier to this preparedness measure compounded with the negative effects of the participants' uncertainty about their own preparedness-related knowledge, to ultimately hinder further efforts to prepare. This occurred despite participants' perceptions of the need for preparedness and of their own disaster risk, as well as their perceptions of the disaster risk of the older immigrant care recipient.

### 4.8 Theme 5: Caregiving Contingency Plans are Based on Assumptions and Cultural Norms

An important aspect of the disaster preparedness of immigrant older adults is having a caregiving contingency plan for disaster situations in which the main caregivers may not be able to provide assistance or care. When asked about contingency plans for the caregiving of the older immigrants, most participants responded that they did have a basic plan in mind for a disaster. However, none of the participants in this study reported having discussed any detailed plans for back-up caregiving, with other caregivers, family members, or with the older immigrants themselves.

Some participants ascribed their lack of communication regarding back-up caregiving plans to the emotional distress that such a conversation might cause for the older immigrant. A subset of participants identified their care recipient as being prone to experiencing anxiety; these participants, in an effort to avoid upsetting the older immigrant, avoided discussing the possibility of needing such a plan. Caregivers anticipated that it would be distressing for their family members to be reminded of the possibility that the primary caregiver may not be around. Another anticipated source of distress was the thought of possibly being uprooted from their current environment as a result of changes in caregiving arrangements. For example, one participant said about her grandmother:

> *Like if there's a disaster and things went up in flames, I guess I could send her to my mom, to stay with her for a little while, something like that, until we figure things out. Um... it's kind of difficult. The thing that makes it difficult is that she has a strong emotional attachment to things in her life. […] Like, my grandmother, she doesn't like to be away from my cousins, my younger cousins. So like, if she had to move somewhere far away from them, that would bother her. You know what I mean? That would be devastating for her.* (Participant 8)

When asked whether he had discussed any potential caregiving contingency plans with his mother, another participant replied, after a lengthy pause, "*No, no…not really. I mean we probably should, but…that would probably be such a disturbing topic for my mother, in particular…I don't even want to go there*" (Participant 5). It is evident that considering and discussing a situation in which caregivers are not present or able to provide care for the older immigrant may not only be upsetting for the older immigrants, but for their caregivers as well. In this way, some participants' desire not to evoke mental suffering in their family members caused them to avoid discussions that would allow for collaborative planning of caregiving contingencies. As a result, we did not hear of any contingency plans that were explicitly discussed and jointly agreed upon by the care recipient and any other caregivers involved.

Another factor that participants cited as contributing to the lack of discussion about caregiving contingency plans was the state of the relationships between their family members. As an example, one participant reported pre-existing difficulties with communication between family members; and predicted they might struggle not only to communicate the details of a potential caregiving contingency plan, but also to agree upon the terms of the plan. Disagreements between family members regarding the care-related decisions for an older immigrant parent or grandparent were mentioned by a number of participants; this seemed to be a common source of conflict within 'care networks' comprised of family members. These

conflicts have the potential to act as barriers to timely and thorough preparedness actions for the older immigrant, such as the devising of a caregiving contingency plan. Yet another participant was not on speaking terms with some key family members who might step in and care for her grandmother in the participant's absence: "*I don't speak to my uncles. I'm not going be talking to them about what to do or what not to do*" (Participant 8). Evidently, pre-existing family conflict prevented any disaster preparedness or contingency planning-related communication between these caregivers. Thus, conflicts preventing effective communication between caregivers acted as barriers to some older immigrants' preparedness for disasters.

Many of the participants had privately considered, without any discussion with the individuals involved, potential back-up caregivers for their care recipients; these were individuals that participants either expected or hoped would take on a primary caregiving role in their absence. Generally, projected back-up caregivers were informal in nature; usually family members, friends or neighbours. However, some of the participants' anticipated that the back-up caregiving arrangements would be unsustainable for the long term. For example, two participants stated that they would ask a neighbour and a community member, who did not currently provide care for the older immigrants, for back-up caregiving or assistance for the older immigrants:

> "*One neighbour who is next door to my parents' house*." (Participant 3)
>
> "*I would contact somebody in her community, in the church. Some younger person*." (Participant 1)

These two participants demonstrated optimism that their neighbours would be willing and able to take on the new task of providing care for the older immigrant. As in these cases, many of the participants had high expectations that their chosen alternate caregivers would assent to taking on a primary caregiving role.

Participants' unspoken "*plans*" for the back-up caregiving of the immigrant older adults were based upon their assumptions about the willingness or ability of the potential caregivers. One major factor that contributes to such assumptions is the cultural norms that prescribes caregiving roles within families. Based on the cultural background of the participant's family, norms and expectations related to caregiving roles for different family members varied. For example, one participant, who is also a first-generation immigrant, of Jamaican background, identified herself as the only female child amongst her older immigrant mother's children. She spoke of the very low potential for any of her five brothers to act as back-up caregivers: "*[T]here's others that can take care of my mom, but they would be the last resort. As the only girl, I can see that it would be me*" (Participant 9). This was in spite of the fact that she is not able to drive and provide driving-related assistance to her mother, and also has to provide care for her own four children, three of whom are underage adolescents. About this arrangement, she said, "*Yeah, I have to. I'm the only girl she has, so she depends on me*" (Participant 9). It is evident that this arrangement is influenced by Jamaican cultural norms, which commonly allocate unpaid caregiving for elderly parents to women, rather than men (OECD, 2017). Another participant, who is the oldest son in his family, with two older sisters, spoke in depth about the strong influence of Bangladeshi family role-related norms in determining that he would provide the most care for his older immigrant father:

> *So in our culture, there's a very high expectation. It's kind of complicated. The oldest son in the household, kind of, as time goes on, as your parents get older, the oldest son has to take, basically takes over the household. So he becomes a leader in the house and he's responsible for the well-being of his parents. Even, like, even if they're retired, even as they kind of go through senior-hood, the oldest son in the household is kind of responsible, and it's an unspoken rule but it's like very culturally valid. Like everyone knows that that's the way things are.* (Participant 7)

This participant explained that he had never discussed any caregiving contingency plans for his father with his family members, but was still confident that they would all be in agreement about who would step into this role in the participant's absence:

> *So we've never explicitly discussed it, no. But then again, like based on, I guess, the more cultural values, kind of, it's like we know who the second in command would be. And we kind of know that if an emergency were to hit us, like you know, after my mom would take care of the immediate needs, my sister would kind of—like they'd go to my sister's house, and my sisters would offer whatever support they could. […] I don't know if it's a plan. It's tough. So it's not an explicit plan, but in our minds we know exactly how it's going to pan out.* (Participant 7)

As evidenced by these individuals' accounts, many participants' assumptions of the inclination of potential back-up caregivers to provide care were based on cultural norms that prescribed caregiving roles within their families. These cultural norms were widely varied, and had powerful influences on both the caregiving and back-up caregiving arrangements in place for the older immigrants.

### 4.9 Theme 6: Limited Literacy About Community Assets Supporting Disaster Risk Management

Generally, caregivers demonstrated limited asset literacy regarding community resources that might contribute to enhancing their care recipients' preparedness or resilience for disasters. Caregivers were asked to give examples of resources for preparedness in their communities that they were aware of; as a part of the question stem, I listed examples such as informational, material, or financial resources to improve the older immigrants' disaster preparedness, or community programs or groups that might enhance their resilience. With the exception of faith-based organizations that the older immigrants were members of, caregivers reported of being

unaware of any similar resources. It is difficult to draw strict conclusions about these reports, as they may be indicative of a number of circumstances; it is possible that these types of resources do not exist in participants' communities, or that they do exist, and caregivers are lacking the asset literacy to identify these resources as those that can enhance disaster preparedness in older immigrants.

The community resources that most of the older immigrants were reported to utilize were faith-based organizations (FBO), including churches, a mosque, and a Jewish Community Centre. These were the types of supports for the older immigrant care recipients that participants were aware of, and consistently mentioned. Participants identified these organizations as community resources that might enhance the preparedness and resilience of their care recipients; we were able to deduce from this that they had reached the first of four stages of asset literacy, which is to identify available assets (O'Sullivan et al., 2017). However, whether participants realized the second stage of asset literacy concerning FBO, which is to recognize how exactly the asset could contribute to disaster preparedness (O'Sullivan et al., 2017), was unclear. Caregivers showed they recognized the value of the programs and social support provided by the members of their FBO. For example, one participant said, "*They have resources to help her. So when Thanksgiving comes, there's a Thanksgiving dinner. There's a Christmas dinner. They take them on trips, they provide them with um…you know, stimulation, and you know, give them things to do*" (Participant 8). Another participant expressed the importance of having the support of members of her older immigrant mother's Greek Orthodox church community, as her mother was more inclined to feel comfortable with individuals of a similar ethnic and cultural background:

> *When it comes to her telling them her problems, she won't trust someone who doesn't speak her language. Or is—I mean, even her religion*. (Participant 1)

> *You see, immigrants often want to be around people who speak their language or*

*understand their culture, right? I'm not saying there's anything wrong for other—my mom, she gets along very well with a lot of people, but if it came to her care, she would do better with a Greek [person].* (Participant 1)

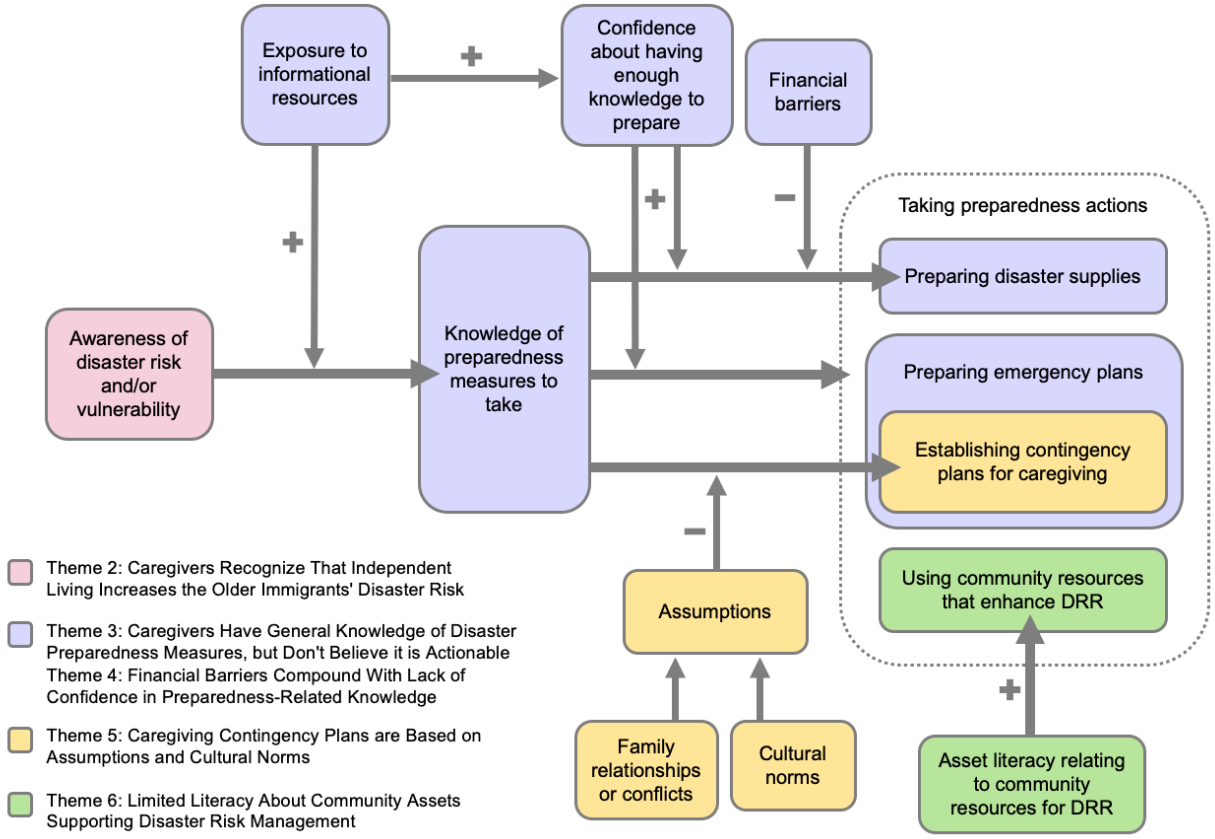
However, when asked about the specific impacts of these FBO-related resources on the older adults' disaster preparedness and disaster management, participants were uncertain and found it difficult to articulate these. This suggests that they have not reached the second component of asset literacy (O'Sullivan et al., 2017). Some participants suggested that members of their FBO would mobilize to aid the older immigrant in a disaster. However, when asked for more details about what this support might entail, they were uncertain: "*I'm not sure how. I would have to ask […] Maybe they have—maybe they have a committee, or something like that*" (Participant 8). Another participant expressed vague but high expectations for their church's leaders to prepare her older immigrant mother for disasters: "*Yeah, um, the pastor and his wife…I think they would prepare her, for anything that happens. Or is going to happen, yeah*" (Participant 9). Similarly, many caregivers expressed hope for the support that members of FBO could provide for the care recipients in disaster preparedness and response, despite their lack of specific knowledge about this. There was a general sense of hope among the caregivers that external and community resources might contribute to filling the gaps in disaster preparedness experienced by their care recipients.

### 4.10 Relationships Between Study Themes

Figure 1 depicts the relationships between the themes found in this study.

**Figure 1**

*Schematic Diagram of the Relationships Between Study Themes*




*Note.* The legend indicates the theme that each coloured box corresponds to.

We found that participants were aware of their older immigrant family members' increased disaster risk. They were particularly aware of the increased risks that arose due to the older immigrants' independent living. Participants expressed a need for detailed informational resources about preparedness measures; these would contribute positively to participants' knowledge of specific preparedness measures, and to their confidence about having enough knowledge to start preparing. This confidence in their preparedness knowledge was identified by participants as an important factor that would prompt them to move their knowledge into preparedness actions such as preparing disaster supplies and emergency plans. Financial

barriers were identified by patients to hinder efforts to carry out preparedness actions. Another important aspect of preparedness that was discussed with participants was contingency planning for the caregiving of their immigrant older adult family members. We found that this planning had not been executed or verbalized, and instead was mostly based upon assumptions about back-up caregivers that drew from family relationships and conflicts, as well as cultural norms. Lastly, participants reported having limited knowledge of resources within their communities that could enhance their older immigrant family members' resilience or preparedness for disasters. As a result, participants' mobilization of formal community resources and support services for disaster preparedness was minimal.

# Chapter 5: Discussion

In this study we explored how informal caregivers perceive household preparedness among the older immigrants they provide care for. Specifically, we were interested in perceptions of barriers and facilitators to preparedness, potential solutions to enhance preparedness, and the nature of contingency plans families have developed.

The previous chapter presented the results of this study in the form of six main themes that were identified in the interview transcripts. The following chapter focuses on a discussion of these results, including the broader implications of the findings. The chapter concludes with a discussion of the limitations of this study.

## 5.1 Awareness of Factors Influencing Disaster Risk

Study participants demonstrated a detailed awareness of the increased disaster risk experienced by the older immigrant care recipients. The majority of the risks described by participants were associated with the older immigrants' living alone, demonstrating their recognition of independent living as a risk for increased harm in disaster events. Independent living is well-documented in the literature as introducing additional risk for older adults in disaster events; older adults participating in a 2018 community-based action study also identified this as a key factor affecting their vulnerability to disasters resulting from climate change (Rhoades et al., 2018); participants in that study commented on the risk of missing important messaging or warnings, as well as social isolation and lack of support within the home (Rhoades et al., 2018).

Similarly, in our current study, participants' concerns stemmed from the older immigrants' dependence upon their support for essential functions, such as transporting long distances, or communicating in or understanding English. Despite the fact that the majority of the older immigrants receiving care from our participants had lived in Canada for over 30 years, almost all

of them were reported to experience language barriers. Caregivers recognized that, in a disaster situation in which they were unable to reach the care recipients, the older immigrants would be unable to communicate in English with support service workers or neighbours, or transport themselves to access support, to retrieve necessary supplies, or to evacuate from their homes. The inability to access transportation is a limitation commonly experienced by older adults in emergency situations, given that several factors, including financial constraints, physical difficulties, and sensory deficits, may prevent them from being able to drive (Rhoades et al., 2018). Further, public transportation systems, which many older adults are dependent upon, may not be operational in a disaster, and alternative options for transportation may be costly or otherwise inaccessible (Gamble et al., 2013; Rosenkoetter et al., 2007).

Limited proficiency in the dominant language of the host country has also been established in the literature as a substantial barrier to immigrants' well-being in disasters. For example, a 2013 survey of 911 responders in the state of Washington revealed the responders' difficulties in understanding, and obtaining timely and appropriate supports for, callers with limited English proficiency (Carroll et al., 2013). An additional constraint is presented by the finding that there is a scarcity of appropriately-translated and culturally sensitive emergency communications disseminated to immigrant populations (Yip et al., 2013; Rowel et al., 2012). As the caregivers in our study were able to appreciate, both language barriers and the inability to transport oneself represent significant risk factors that increase individuals' risk for harm in disasters (Nepal et al., 2012; Gamble et al., 2013).

Participants also expressed concerns about the psychological distress that the care recipients might experience due to living and being alone during a disaster event. Living alone has been associated with negative psychological health outcomes post-disaster in various populations (Fernandez et al., 2002; Lima et al., 1987; Matsubara et al., 2014; Zhou et al., 2013). Older adults are particularly susceptible to mental or emotional disturbances resulting

from disasters such as severe weather events (Gamble et al., 2013). This illustrates the importance of having social support within one's household, not only in managing disaster events, but in recovering from their stressful effects. In this way, participants demonstrated an in-depth awareness of legitimate disaster risks experienced by the older immigrants due to their living alone.

Another notable finding regarding disaster risk awareness was the participants' perception that the older immigrant care recipients had not given much thought to the possibility of disasters, or to disaster preparedness. In the results of this study, the reasons for this possible lack of concern about disasters among the older immigrants are unclear. The literature shows that past experiences of disaster events strongly influence individuals' perceptions of their disaster risk (Wachinger et al., 2013). For example, a 2012 study found that the understanding and awareness of disasters in immigrant groups in the United States were highly contingent on the amount of time they had spent in the US (and thus, whether they had experienced any disasters there), as well as the similarity of the hazard profile of their native country to that of the US (Nepal et al., 2012). As the majority of the older immigrants receiving care from our study participants had lived in Canada for over 30 years, it would be unlikely that they are very inexperienced with disasters common to Canada. However, if an older immigrant had migrated from a country with a vastly different climate, or hazard profile than those of Canada, this may have contributed to their lack of familiarity of Canadian disasters. The perceived low level of disaster risk awareness in the immigrant older adults in this study seems to be consistent with that of immigrant older adults in the literature, who have been found to be dependent on their children and grandchildren for any disaster-related information (Nepal et al., 2012).

In the interviews, participants were asked to give suggestions for community resources that could enhance disaster preparedness or resilience among older immigrants. The nature of the participants' suggestions also demonstrated their awareness of the specific risks

experienced by older immigrants. For example, many participants listed as potential resources language supports for older immigrants to be able to communicate their needs and locations to support service workers, and to access information about resources or emergency management procedures during a disaster. While some participants were not able to think of any suggestions for community resources, several caregivers readily provided ideas. These participants have moved beyond simple awareness of the disaster risk posed by language barriers and the lack of a social support network, to consideration of possible solutions and resources that might decrease this risk. Overall, despite the older immigrants' apparent lack of awareness of disaster risks in Canada, the study participants demonstrated an advanced level of risk awareness that reflected many key risk factors for harm in disasters identified in the literature.

### 5.2 Knowledge of Preparedness Measures

In contrast to the participants' high degree of awareness of disaster risks and their general knowledge of preparedness measures, they lacked detailed practical knowledge on how to carry out these measures. This was detrimental to their confidence to move their knowledge to action. For example, all of the participants were able to list several supplies to prepare in case of emergency, such as flashlights, water, non-perishable foods, and medications. However, they were uncertain about the quantities of materials to prepare, or when to replenish them. Our findings parallel those of several other studies (Chesser et al., 2006; Eisenman et al., 2009; Wang, 2018). For example, in the study by Eisenman et al. (2009), participants, who were Latino immigrants living in Los Angeles County, mentioned similar basic disaster supplies when prompted, but also lacked knowledge of the specific varieties or quantities to stock. Moreover, a 2008 study with another type of caregiver, parents of schoolchildren, the participants identified a similar lack of confidence in their practical knowledge of specific disaster preparedness measures, despite their perceptions of responsibility for the care recipients' wellbeing, as well as

their own, in disasters (Kubicek et al., 2008). These findings show that various populations are hindered by limited preparedness-related knowledge, regardless of whether or not they hold additional responsibilities for the well-being of others, as caregivers. This is noteworthy, as the caregivers in our study found that their limited knowledge of the particulars of preparedness measures greatly hindered their efforts to prepare.

Participants conveyed that being given detailed expert guidelines or recommendations for preparedness would be crucial to increase their confidence in carrying out preparedness actions. This need for greater confidence that was identified in the results represents the psychological variable of self-efficacy, which influences individuals' motivation to carry out positive preparedness-related behaviours, such as gathering disaster supplies or establishing a family disaster response plan (Adams et al., 2019; O'Sullivan et al., 2012; Poussin et al., 2014). Research has shown that poor self-efficacy is a key predictor for low levels of disaster preparedness and limited efforts to prepare (Adams et al., 2019; FEMA, 2009). We suggest that efforts to increase informal caregivers' self-efficacy for preparedness should be a priority area for action by emergency risk management services. Possible avenues to positively influence self-efficacy beliefs, according to Bandura's Self Efficacy Theory (Bandura,1997), might include facilitating personal experiences of mastery of the preparedness actions, potentially through the use of training programs or detailed informational resources (Bandura, 1994; 1997; O'Sullivan et al., 2012). Another approach could be to promote the sharing of positive influences from individuals' social networks, such as anecdotes or second-hand experiences of successful implementation of preparedness measures (Bandura, 1994; 1997).

A major factor influencing participants' knowledge of disaster preparedness measures, and thus, their inaction in disaster preparedness, is insufficient or ineffective information dissemination to the public. Many of our participants stated that they would take measures to prepare if they had more detailed information on how exactly to do so, and most participants

reported having no recollection of receiving any informational resources for disaster preparedness in the past. A few participants recalled instances of seeing information related to disaster preparedness on a highway billboards and television advertisements; however, they did not remember the content of these messages. The informational resources that these few participants did list are examples of broad messaging aimed towards all members of the general public, rather than messaging targeted for certain populations, such as those with high-risk factors for harm in disasters.

Risk management messaging that is not relevant to high-risk populations leave these groups susceptible to harm in disasters. For example, in an interview study of older adults who experienced the Canterbury earthquakes in New Zealand, one participant noted that his decreased mobility rendered New Zealand's "Drop, Cover, Hold" earthquake awareness campaign unhelpful to him, as well as to many other older adults or individuals with physical limitations (Tuohy et al., 2014). The shortage of tailored and appropriately accessible messaging for high-risk populations, such as older adults, individuals with accessibility needs, or individuals with multiple informal caregiving roles, represents a critical gap in disaster risk communication and preparedness supports for these populations. These gaps seem to be fairly prevalent; a recent interview study of 11 American public health departments found that the majority of these departments did not have any objectives or programming related to disaster preparedness information dissemination or education targeted to older adults (Shih et al., 2018). Moreover, a 2018 study of the countries of the Caribbean Disaster Emergency Management Agency, as well as Cuba, identified a gap in the availability of disaster preparedness and management-related information for persons with disabilities in 8 out of the 16 participating countries (Carby & Ferguson, 2018). The unfilled need for targeted disaster preparedness messaging and education of high-risk populations represents a significant missed opportunity for upstream protection of these groups from harm due to disasters.

The reports from the participants in this study about their limited retention of the information they received also brings into question the effectiveness of risk messaging. Research has found that disaster risk information conveyed through forms of mass communication, such as television broadcasts, is often lacking in relevant details for people to evaluate and appraise their personal risks (McComas, 2006). The lack of personal relevance that these forms of mass messaging present to individuals, as well as the lower engagement necessary to receive information via TV broadcast or billboard (as opposed to a workshop or online training session) may be factors that limit retention. It is important for various forms of risk communication to include actionable instructions for preparedness measures, as well as directions to further information about personal risk evaluation (McComas, 2006; Wood et al., 2011). Ensuring that information is retained seems to be a significant challenge in disaster preparedness education. Kubicek et al.'s (2008) study of parents of schoolchildren found that they had more exposure to informational resources about disaster preparedness than the caregivers in our study. Parents reported seeing news reports about supplies to collect in case of disaster, as well as flyers sent home from school with examples of household emergency plans (Kubicek et al., 2008). However, similar to our study, retention of preparedness information was also low in this sample, as parents reported very low perceived levels of preparedness and expressed a need for more formal or structured training methods (Kubicek et al., 2008). Indeed, there is a growing body of research on the efficacy of disaster preparedness education methods such as community-based training programs or alternative forms of learning through games or web-based tools in promoting retention of information and preparedness behaviours (Baker et al., 2012; Joffe et al., 2016; Kimura et al., 2017; McCabe et al., 2012).

Half of the participants in this study are immigrants themselves; this may have influenced their knowledge of preparedness measures, as research has found that broad public health messaging is often ineffective at reaching and informing immigrant populations (Carter-Pokras et

al., 2007; Nepal et al., 2012; Wang et al., 2011). We also found in our study that the older immigrants were dependent upon their caregivers for preparedness-related information; a failure to disseminate information to older immigrant populations may have contributed to this phenomenon, which has also been reported by Nepal et al. (2012). Thus, targeted disaster preparedness messaging that is sensitive to language barriers and cultural differences is especially important in preparing groups, such as immigrant older adults, for disasters (Nepal et al., 2012; Shiu-Thornton et al., 2007). Moreover, different immigrant groups have been found to prefer different information sources. For example, in contrast to the desire for official or expert guidelines expressed by our participants, Woodall et al. (2009) found that Chinese immigrants living in the Pacific Northwest preferred to receive health information through in-person interpersonal communication with their friends or health care providers, compared to other mediums such as English-language newspapers, radio, or the Internet. Some reasons for this preference for unofficial, more personal sources of information over sources like the news or government notices, may be that personal networks tend to provide information that is more locally applicable and personally relevant (Ryan, 2013), and that official sources of information are perceived to be delivered more slowly, and thus to be out of date (Palen et al., 2009). This highlights the importance of using communication mediums that various immigrant groups find to be trustworthy and accurate.

Another important consideration for immigrant populations is to ensure that preparedness messaging and messaging for emergency situations is translated to various languages with care, to be clear and culturally appropriate (Andrulis et al., 2007). Currently, in Ottawa, one of the cities in which this study was conducted, the municipal emergency preparedness webpage only lists guidelines for preparation in French and English (City of Ottawa, 2020). The city of Toronto's webpage has this information available in English only (City of Toronto, 2019). An interview study on this topic with medical interpreters produced the recommendation to work with

organizations and leaders in limited English-proficiency communities to tailor the content and distribution of preparedness messages to their preferences and needs (Shiu-Thornton et al., 2007). Also, it is crucial to ensure accessibility of the messaging to older adults is being mindful of varying sensory capabilities in this population (Rhoades et al., 2018), and avoiding an overdependence on online sources for information sharing (Andrulis et al., 2007). These changes to public health messaging may allow older immigrants to receive preparedness information themselves, decreasing their dependence on their English-speaking caregivers for information, and thus decreasing their disaster risk.

## 5.3 State of Preparedness for Disasters

The participants in this study and their care recipients generally were unprepared for disasters, in terms of their stocks of disaster supplies as well as the states of their emergency plans.

### *5.3.1 Disaster Supplies*

Despite participants' understanding of the collection of disaster supplies as a crucial component of preparedness, as well as their ability to list various examples of supplies that one might need in different types of disasters, their actual stores consisted of few basic supplies, and many of them had not considered the need for a disaster kit. Moreover, participants did not deliberately prepare these supplies for the purpose of preparing their households for disaster; rather, they were supplies that they had accrued naturally over time. This is a common finding in many studies of immigrant as well as caregiver groups. Kubicek et al.'s (2008) study with a sample of parents of schoolchildren found that many reported only food and water as their prepared disaster supplies, and that many of these supplies were not set aside for use only in

emergencies. Time constraints were a major barrier that was reported by these caregivers to prevent them from preparing supplies, despite their knowledge that this is an important aspect of preparedness (Kubicek et al., 2008). The sample of Latino immigrants in the United States in Eisenman et al.'s (2009) study also did not have adequate disaster supplies set aside, and they tended to quickly use up the few extra items they did purchase. Barriers to preparedness that were cited in this sample included the financial costs of stockpiling many items, as well as a lack of storage space for the items (Eisenman et al., 2009).

Notably, the members of the studies mentioned above did not recognize the need for, or prepare, a disaster kit or bin, with the exception of a small subset of Kubicek et al.'s (2008) sample (Eisenman et al., 2009). This is comparable to the findings in our study, and suggests that there is a need for greater education and awareness on the importance of creating a portable and accessible disaster kit, rather than simply collecting supplies. Additionally, it seems to be a common experience that the time- and cost-intensive nature of planning for and purchasing appropriate disaster supplies for a complete kit acts as a barrier to preparedness; this is consistent with our participants' accounts. This particular barrier may compound with the financial and time-related costs of caregiving, rendering this preparedness measure further out of reach for caregivers. By comparison, households of individuals with special needs in Southeastern Pennsylvania, many of whom demonstrated a greater-than-average degree of preparedness by having a household evacuation plan in place, were not more likely than the general population to purchase and prepare supplies for a disaster kit (Uscher-Pines et al., 2009). We suggest that emergency risk management services implement interventions to address this particular preparedness task, perhaps by selling subsidized and pre-made household disaster kits at a low, accessible cost, with programs in place to replenish supplies in a timely manner.

A similar lack of purposeful collection of supplies for disaster was reported in the older immigrants that our participants provide care for. Preparing supplies, including any medications, is especially crucial for older adults, due to factors such as frailty or chronic disease that decrease their adaptive capacity in disaster situations (Gamble et al., 2013). Al-Rousan et al. (2014) found in a survey of a cohort of Americans over 50 years old that almost two-thirds of the respondents reported having a 3-day supply of food, water, and medications in case of an emergency situation. Although not a complete disaster kit, this stockpile of supplies represents a much higher degree of preparedness than the older immigrants in our study, who were reported to depend almost entirely on their caregivers for the collection of supplies for disaster. This may be a result of the older immigrants' lack of past experience of disasters in Canada, as well as their lack of exposure to accessible informational resources that promote the need for such supplies. Older adults often experience health-related challenges that make crucial the inclusion of any medications, medical records, and necessary medical equipment in their disaster kits. Therefore, there may be a potential role for older adults' primary care physicians to assess their disaster risk and give recommendations and guidance on various preparedness measures, including the preparation of supplies.

### *5.3.2 Household Emergency Plans*

Our participants, and the older immigrant care recipients they support, showed a similar lack of preparedness with regards to having a detailed and explicit household emergency plan, or one for the household of the older immigrant care recipient. Most participants reported not having a definitive emergency plan that was discussed and agreed upon by the members of their households. In place of a clear household plan, caregivers often had unspoken and somewhat vague plans of how they envisioned a disaster situation would play out in their household and that of the older immigrant.

In a similar sample of family caregivers of older adults in Japan, Wakui et al. (2017) found that over 75% of the 952 surveyed caregivers did not have an emergency evacuation plan in place for the older adults, despite about 65% of respondents indicating being somewhat or very worried about their disaster preparedness. This was also a trend seen in other caregiving populations, including parents of schoolchildren (Kubicek et al., 2008), and parents of children with special healthcare needs (Baker & Baker, 2010), and families living with the impacts of stroke (O'Sullivan et al., 2012). Kubicek et al. (2008) found that parents were uninformed about the principles of establishing a family preparedness plan, despite their children being dependent on them to initiate the implementation of such a plan; parents identified this lack of knowledge as an area of concern. Families of children with special healthcare needs reported that the number one reason for their lack of an emergency plan was uncertainty about how to establish one, and the second was the difficulty of completing this task (Baker & Baker, 2010). These families, despite their greater interaction with health and social support services, may have not been exposed to enough information about this aspect of preparedness (Baker & Baker, 2010). This data suggests that households are in need of more guidance on the important components of an emergency preparedness plan, and how to initiate a household discussion of the plan.

Similar difficulties in establishing household preparedness plans were found in studies of immigrant populations as well, with other common reasons being lack of time or energy, as well as anticipated difficulties in family communication and agreement on a plan (Carter-Pokras et al., 2007; Eisenman et al., 2009). Participants in our study noted that potential conflicts and communication difficulties are barriers to any family conversations about emergency or contingency planning. One method to address this is to offer detailed informational resources on strategies to implement a household emergency plan, including useful tips on how to start the conversation with family members, culturally-sensitive conversation guides to refer to in case of family disagreement or conflict, and examples of detailed emergency plans. An interactive online

tool could also be developed, for which families can fill out a questionnaire designed to identify any additional areas of increased disaster risk within their household to address in their plan.

Although our study participants had vague ideas of what their emergency plans might entail, one common factor in almost all of their reported plans was the caregiver's central role in the older immigrant's disaster response. This is because many of the older immigrants in this study live alone, and experience functional limitations that prevent them from being self-sufficient in an emergency. However, caregivers' assumption of their primary role in the older immigrants' emergency plans aligns with heavy dependency on the caregivers. It is generally recommended that emergency or contingency plans for older adults not depend solely upon informal caregivers, in case they are indisposed during an emergency and are unable to attend to the older adult (Al-Rousan et al., 2014; Levac et al., 2011). This risk of leaving an older immigrant without any support is greater in caregiving arrangements in which the caregiver's geographical distance from the older immigrant prevents easy access to their household, or in which the caregiver has multiple caregiving roles and is responsible for the safety of multiple people in an emergency. Caregivers should take care to include the option of accessing formal supports and resources in their discussion of the personalized emergency plan with care recipients (O'Sullivan, 2009). Some examples of such supports include: transportation options the older immigrant can access in an emergency; places of shelter to evacuate to in the event that it is necessary; and formal support services to contact for assistance with mobility, communication, or obtaining any necessary supplies.

### *5.3.3 Caregiving Contingency Plans*

Another important aspect of disaster preparedness for immigrant older adults is having a caregiving contingency plan for disaster situations in which the main caregivers are not able to provide assistance or care. To implement such a plan, all involved parties should be given an

opportunity to provide input, discuss possible options, and collaborate to devise a final plan. However, none of the participants in this study had discussed detailed plans for the back-up caregiving of the older immigrants, with other caregivers, family members, or with the immigrants themselves. Not discussing caregiving contingency plans has negative implications for the older immigrant, as having no back-up caregivers puts them at risk of being left without any assistance in a disaster (O'Sullivan et al., 2012). Not discussing or establishing beforehand any back-up caregiving plans may also subject the older immigrants to abrupt, unexpected, and possibly unwanted life changes; for example, a change in caregivers or in living situations. These disruptions to the older immigrants' everyday routine have the potential to trigger significant emotional distress and negative health impacts (Bei et al., 2013).

One reason the participants in our study mentioned for not broaching the topic of caregiving contingencies was their desire not to evoke any emotional distress. This seems to be a common barrier preventing families from pursuing this conversation; caregivers of stroke survivors in the study by O'Sullivan et al. (2012) expressed similar reservations. This may be addressed by advising informal caregivers of the importance of discussing caregiving contingency options in advance. Discussions around contingency plans can help caregivers ensure that plans reflect the care recipients' values and desires, and that care recipients are not surprised by any unexpected changes in their caregiving arrangements. Informing caregivers of these potential benefits can motivate them to initiate these emotionally-fraught and difficult conversations earlier.

Participants described cultural norms about caregiving as a salient factor determining their current caregiving arrangements. Some participants also ascribed their lack of discussion of caregiving contingency plans to these cultural expectations. One participant explained that the cultural expectations of the caregiving-related roles of his older immigrant parents' adult children were fairly detailed and shared amongst all of his family members, essentially removing the

need for an explicit discussion of caregiving contingencies. There is a lack of research on culturally-diverse caregivers and the influence of cultural expectations on establishing and executing caregiving contingencies. Further work is needed to determine these impacts, especially in second and third-generation immigrant families, in which cultural norms may not be as ubiquitously shared.

Participants held assumptions about their families' shared understanding of caregiving roles based on their cultural norms; these assumptions discouraged them from initiating direct discussions to prepare caregiving contingency plans. We also saw that participants' assumptions about the availability and ability of friends or family members to provide back-up care were a significant part of their unspoken contingency plans. Caregivers in the study by O'Sullivan et al. (2012) demonstrated a similar dependence upon privately-held hopes and assumptions about friends or family members in their contingency planning; they also showed a lack of direct discussion of these hopes with the projected caregivers in question. Generally, such assumptions are found to be detrimental to effective caregiving contingency planning. Thus, as discussed above, there is a need for education about the importance of open discussion and collaborative contingency planning for caregivers.

### 5.4 Asset Literacy Regarding Social Supports that Enhance Preparedness

Social support was a crucial asset that most of the participants in this study were able to identify and use as a caregiving aid. Participants described systems in which multiple caregivers shared or alternated caregiving responsibilities. Also described were the contributions of various relatives and neighbours in performing strenuous household tasks, or in providing care in the absence of the primary caregivers. Social support has the potential to decrease disaster risk in both caregivers and care recipients: first, by reducing caregiver burden and resultant negative health outcomes in caregivers and care recipients (Dias et al., 2015; Ong et al., 2018); second,

by providing sources for risk-related information (Levac et al., 2011); and third, by creating social norms related to preparation (Wakui et al., 2017). Wakui et al. (2017) found in their study of family caregivers of older adults in Japan that having social support from family members and from community members both increased the likelihood of being prepared for disasters and having an evacuation plan for the older adults.

Participants were able to recognize the value of social support as an asset for caregiving, as well as for disaster preparedness. This was evident in the nature of the ideas for caregiving contingencies that participants shared; these were highly dependent on people in their social networks and, as these plans were unspoken, often involved assumptions about their availability and ability to take on the back-up caregiving role. The participants expressed high hopes for the contributions of these social supports, and many of their proposed arrangements seemed unsustainable for longer-term scenarios of back-up caregiving. This brings into question the degree of participants' understanding of how exactly the social assets they identified, such as the older immigrants' neighbours, could be mobilized in an emergency. As many participants spontaneously offered ideas for back-up caregiving, in response to being questioned, it can be concluded that they had yet to fully realize the second component of asset literacy (O'Sullivan et al., 2017). This emphasizes the need to impress upon caregivers the importance of early planning and evaluation of assets available to themselves and to the older adults. Informational resources on identifying and mobilizing various assets, as well as open discussions with identified social supports can contribute to enhancing this awareness.

Caregivers demonstrated a similar degree of awareness of one form of social support available in the wider community: the faith-based organizations that the older immigrants attended. This was the one community-based asset that was consistently mentioned by participants as an important source of aid for the older immigrants. Similar to their hopes regarding other social assets for the older immigrants, participants expressed high expectations

for leaders and members of the faith-based organizations to contribute to the older immigrants' disaster preparedness and response. The utility of faith-based organizations as a resource for disaster management is one that has been recognized in the literature and in practice (De Vita et al., 2008; McCabe et al., 2012; Zhi et al., 2017). Research has shown that these organizations often indirectly contribute to preparedness by facilitating robust social networks that can act as a protective factor in disasters (Muller et al., 2014). Some also provide direct disaster-related services such as preparedness education programs, and emergency notification and check-in systems for high-risk congregation members (Lin et al., 2014; Rivera et al., 2019). It is unclear whether similar services are offered by the faith-based organizations that the participants referred to in our study. However, it is notable that participants had high expectations for the roles of these groups in the older immigrants' disaster response, despite lacking knowledge on the particular supports that they can offer. These beliefs and this degree of dependence on external supports may compromise further individual efforts to prepare for disasters. Moreover, participants were also unaware of any other community supports that they or the older immigrants could benefit from in disaster preparation or management. A similar lack of awareness of community resources was noted in various populations including Chinese limited English proficiency populations and older adults living in their homes in the community (Al-Rousan et al., 2014; Rhoades et al., 2017; Yip et al., 2013). Thus, risk management programs should focus on outreach efforts to improve awareness of any available community supports among high-risk populations.

### 5.5 Study Limitations

The limitations of this study will be addressed in this section. The first limitation is that of the sample size; 10 informal caregivers of older immigrants participated in our study. The challenge of recruiting participants in this study may have been due to the many demands of

their time that informal caregivers often experience. Another limitation that may have influenced recruitment is the fact that interviews were only conducted in English; as many informal caregivers of older immigrants are immigrants themselves, they may experience language barriers that prevented their participation in the study. While we were able to reach thematic saturation in our analysis of the results, the above limitations may have influenced recruitment in a way to prevent a diverse sample. However, as with all qualitative research, our study does not have the aim of generalizability; the findings and themes in this work are meaningful within the context from which they have been identified.

Lastly, a limitation of the study design may have been the decision to interview only the informal caregivers of older immigrants, and not the older immigrants themselves. This was a decision based on our appraisal of the feasibility of recruiting and interviewing many older immigrant adults in English. However, interviewing older immigrants may have provided greater insights on the perceptions and motivations of the older immigrants with regards to disaster preparedness.

# CHAPTER 6: CONCLUSION

## 6.1 Contribution of Research

The results of this study provide insight into informal caregivers' experiences with disaster risk management for their own households, as well as for the households of the older immigrants that they care for. Informal caregivers are resilient, and, as a part of their caregiving role, often have the privilege and responsibility of undertaking preparedness efforts for multiple households. Our findings regarding the challenges that this group faces in preparing themselves and their family members for disasters can inform future practice among emergency risk management organizations. Priorities for action should include improving immigrant groups' access to detailed informational resources on preparedness measures, and providing options for a low-cost and straightforward means to access disaster kits. Lastly, supporting policies that enhance the provision and accessibility of community-based interventions for disaster risk management in this population should be prioritized.

## 6.2 Opportunities for Future Research

This exploratory study provides a starting point for further research into the knowledge, perceptions, and practices of informal caregivers of older immigrants regarding their disaster preparedness, as well as that of their care recipients. Future work should aim to confirm these results with a larger, more diverse sample. It would also be valuable to investigate the disaster preparedness-related knowledge and perceptions of the immigrant older adults themselves, through interview studies with this group. Moreover, cultural norms and past experiences of disaster in their native countries could potentially play roles in the risk awareness and preparedness behaviours of both informal caregivers and older immigrants. Thus, further research on the perceptions and practices of informal caregivers and older immigrants from specific immigrant groups should be considered. Another area that warrants further analysis is

the impact of the stage of the settlement process on older immigrants' disaster preparedness. Factors such as the older immigrants' age at time of immigration, or time since immigration could impact many of the determinants of their preparedness, and thus, their effects should be explored in future studies. Lastly, as this is a high-risk population that experiences significant negative health and social disparities within the context of disaster risk management, it would be beneficial for future work to involve a participatory research design, so as not to further disenfranchise this group.

## REFERENCES


Adams, R. M., Eisenman, D. P., & Glik, D. (2019). Community Advantage and Individual Self-Efficacy Promote Disaster Preparedness: A Multilevel Model among Persons with Disabilities. *International Journal of Environmental Research and Public Health*, *16*(15), 2779. https://doi.org/10.3390/ijerph16152779

Adelman, D. S., & Legg, T. J. (2010). Caring for older adults with dementia when disaster strikes. *Journal of Gerontological Nursing*, *36*(8), 13–17. https://doi.org/10.3928/00989134-20100701-01

Al-Rousan, T. M., Rubenstein, L. M., & Wallace, R. B. (2014). Preparedness for natural disasters among older US adults: A nationwide survey. *American Journal of Public Health*, *104*(3), 506–511. https://doi.org/10.2105/AJPH.2013.301559

Andrulis, D. P., Siddiqui, N. J., & Gantner, J. L. (2007). Preparing Racially And Ethnically Diverse Communities For Public Health Emergencies. *Health Affairs*, *26*(5), 1269–1279. https://doi.org/10.1377/hlthaff.26.5.1269

Baker, L. R., & Baker, M. D. (2010). Disaster preparedness among families of children with special health care needs. *Disaster Medicine and Public Health Preparedness*, *4*(3), 240–245. https://doi.org/10.1001/dmp.2010.28

Baker, M. D., Baker, L. R., & Flagg, L. A. (2012). Preparing families of children with special health care needs for disasters: an education intervention. *Social work in health care, 51*(5), 417-429.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press. (Reprinted in H. Friedman [Ed.], *Encyclopedia of mental health*. San Diego: Academic Press, 1998).

Bandura, A. (1997). *Self-efficacy: the exercise of control.* New York, NY: W.H. Freeman.

Baxter, L. F. (2020). A *Hitchhiker's Guide* to caring for an older person before and during coronavirus-19. *Gender, Work & Organization*, *27*(5), 763–773. https://doi.org/10.1111/gwao.12470

Bei, B., Bryant, C., Gilson, K. M., Koh, J., Gibson, P., Komiti, A., Jackson, H., & Judd, F. (2013). A prospective study of the impact of floods on the mental and physical health of older adults. *Aging and Mental Health*, *17*(8), 992–1002. https://doi.org/10.1080/13607863.2013.799119

Beiser, M. (2005). The health of immigrants and refugees in Canada. In *Canadian Journal of Public Health* (Vol. 96, Issue SUPPL. 2). Canadian Public Health Association. https://doi.org/10.1007/bf03403701

Bethel, J. W., Foreman, A. N., & Burke, S. C. (2011). Disaster preparedness among medically vulnerable populations. *American Journal of Preventive Medicine*, *40*(2), 139–143. https://doi.org/10.1016/j.amepre.2010.10.020

Bloodworth, D. M., Kevorkian, C. G., Rumbaut, E., & Chiou-Tan, F. Y. (2007). Impairment and Disability in the Astrodome after Hurricane Katrina. *American Journal of Physical Medicine & Rehabilitation*, *86*(9), 770–775. https://doi.org/10.1097/PHM.0b013e31813e0439

Bolin, R., & Klenow, D. J. (1983). Response of the Elderly to Disaster: An Age-Stratified Analysis. *The International Journal of Aging and Human Development*, *16*(4), 283–296. https://doi.org/10.2190/MQEG-YN39-8D5V-WKMP

Brown, L. M., & Frahm, K. A. (2016). The Impact of Disasters: Implications for the Well-Being of Older Adults. In *Handbook of Aging and the Social Sciences: Eighth Edition* (pp. 357–374). Elsevier Inc. https://doi.org/10.1016/B978-0-12-417235-7.00017-2

Brown, R. M., & Brown, S. L. (2014). Informal Caregiving: A Reappraisal of Effects on Caregivers. *Social Issues and Policy Review*, *8*(1), 74–102. https://doi.org/10.1111/sipr.12002

Brown, S. L., Smith, D. M., Schulz, R., Kabeto, M. U., Ubel, P. A., Poulin, M., Yi, J., Kim, C., & Langa, K. M. (2009). Caregiving behavior is associated with decreased mortality risk. *Psychological Science*, *20*(4), 488–494. https://doi.org/10.1111/j.1467-9280.2009.02323.x

Brunkard, J., Namulanda, G., & Ratard, R. (2008). Hurricane katrina deaths, Louisiana, 2005. *Disaster Medicine and Public Health Preparedness*, *2*(4), 215–223. https://doi.org/10.1097/DMP.0b013e31818aaf55

Carby, B., & Ferguson, T. (2018). An Exploratory Study of Disaster Risk Management Information for Persons with Disabilities in the Caribbean: Provisions and Gaps. *Caribbean Quarterly*, *64*(1), 57–78. https://doi.org/10.1080/00086495.2018.1435336

Carrière, Y., Martel, L., Légaré, J., & Picard, J. F. (2016). *The contribution of immigration to the size and ethnocultural diversity of future cohorts of seniors.* Ottawa, ON: Statistics Canada.

Carroll, L. N., Calhoun, R. E., Subido, C. C., Painter, I. S., & Meischke, H. W. (2013). Serving limited english proficient callers: A survey of 9-1-1 police telecommunicators. In *Prehospital and Disaster Medicine* (Vol. 28, Issue 3, pp. 286–291). Cambridge University Press. https://doi.org/10.1017/S1049023X13000265

Carter-Pokras, O., Zambrana, R. E., Mora, S. E., Aaby, K. A., O., C.-P., R.E., Z., S.E., M., Carter-Pokras, O., Zambrana, R. E., Mora, S. E., & Aaby, K. A. (2007). Emergency preparedness: Knowledge and perceptions of Latin American immigrants. *Journal of Health Care for the Poor and Underserved*, *18*(2), 465–481. https://doi.org/http://dx.doi.org/10.1353/hpu.2007.0026

Chesser, A., Ablah, E., Hawley, S. R., Wolfe, D., Romain, T. St., Grube, C. D., & Molgaard, C. (2006). Preparedness Needs Assessment in a Rural State: Themes Derived from Public Focus Groups. *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*, *4*(4), 376–383. https://doi.org/10.1089/bsp.2006.4.376

City of Toronto. (2019, October 10). Before an Emergency. Retrieved December 31, 2020, from https://www.toronto.ca/community-people/public-safety-alerts/emergency-preparedness/before-an-emergency/

City of Ottawa. (2020, April 27). Emergency preparedness. Retrieved December 31, 2020, from https://ottawa.ca/en/health-and-public-safety/emergency-preparedness

Creese, G., & Wiebe, B. (2012). 'Survival Employment': Gender and Deskilling among African Immigrants in Canada. *International Migration*, *50*(5), 56–76. https://doi.org/10.1111/j.1468-2435.2009.00531.x

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches.* Sage Publications.

Eisenman, D. P., Glik, D., Maranon, R., Gonzales, L., & Asch, S. (2009). Developing a Disaster Preparedness Campaign Targeting Low-Income Latino Immigrants: Focus Group Results for Project PREP. *Journal of Health Care for the Poor and Underserved*, *20*(2), 330–345. https://doi.org/10.1353/hpu.0.0129

De Maio, F. G. (2010). Immigration as pathogenic: A systematic review of the health of immigrants to Canada. *International Journal for Equity in Health*, *9*(1), 27. https://doi.org/10.1186/1475-9276-9-27

De Vita, C. J., Kramer, F. D., Eyster, L., Hall, S., Kehayova, P., & Triplett, T. (2008). *The role of faith-based and community organizations in post-hurricane human service relief efforts.* Washington DC: Urban Institute.

DeBastiani, S. D., Strine, T. W., Vagi, S. J., Barnett, D. J., & Kahn, E. B. (2015). Preparedness Perceptions, Sociodemographic Characteristics, and Level of Household Preparedness for Public Health Emergencies: Behavioral Risk Factor Surveillance System, 2006-2010. *Health Security*, *13*(5), 317–326. https://doi.org/10.1089/hs.2014.0093

Dias, R., Santos, R. L., Sousa, M. F. B. D., Nogueira, M. M. L., Torres, B., Belfort, T., & Dourado, M. C. N. (2015). Resilience of caregivers of people with dementia: a systematic review of biological and psychosocial determinants*. Trends in Psychiatry and Psychotherapy, 37*(1), 12-19. https://doi.org/10.1590/2237-6089-2014-0032

Donner, W., & Rodriguez, H. (2008). Population Composition, Migration and Inequality: The Influence of Demographic Changes on Disaster Risk and Vulnerability. *Social Forces*, *87*(2), 1089–1114. https://doi.org/10.1353/sof.0.0141

Drogendijk, A. N., Van Der Velden, P. G., Gersons, B. P. R., & Kleber, R. J. (2011). Lack of perceived social support among immigrants after a disaster: Comparative study. *British Journal of Psychiatry*, *198*(4), 317–322. https://doi.org/10.1192/bjp.bp.110.077644

Elkins, J., Holt, J., & Miles, T. P. (2014). The Role of Informal Caregivers for Frail Elders in Disasters. In C. A. Cefalu (Ed.), *Disaster Preparedness for Seniors: A Comprehensive Guide for Healthcare Professionals* (pp. 89–99). Springer New York. https://doi.org/10.1007/978-1-4939-0665-9_8

Enarson, E., & Walsh, S. (2007). *Integrating Emergency Management and High-risk Populations: Survey Report and Action Recommendations.* Retrieved from: http://www.redcross.ca/cmslib/general/dm_high_risk_populations.pdf

Fast, J. (2015). *Caregiving for Older Adults with Disabilities: Present Costs, Future Challenges.* IRPP Study 58. Montreal: Institute for Research on Public Policy.

Federal Emergency Management Agency [FEMA]. (2009). Personal Preparedness in America: Findings from the 2009 Citizen Corps National Survey. Retrieved from: www.fema.gov/media-library/assets/documents/29972

Fernandez, L. S., Byard, D., Lin, C. C., Benson, S., & Barbera, J. A. (2002). Frail elderly as disaster victims: Emergency management strategies. *Prehospital and Disaster Medicine*, *17*(2), 67–74. https://doi.org/10.1017/S1049023X00000200

Field, C. B., Barros, V., Stocker, T. F., & Dahe, Q. (Eds.). (2012). *Managing the risks of extreme events and disasters to advance climate change adaptation: Special report of the Intergovernmental Panel on Climate Change.* Cambridge University Press.

Finlayson, M., Mallinson, T., & Barbosa, V. M. (2005). Activities of daily living (ADL) and instrumental activities of daily living (IADL) items were stable over time in a longitudinal study on aging. *Journal of Clinical Epidemiology*, *58*(4), 338–349. https://doi.org/10.1016/j.jclinepi.2004.10.008

Fredman, L., Cauley, J. A., Hochberg, M., Ensrud, K. E., & Doros, G. (2010). Mortality Associated with Caregiving, General Stress, and Caregiving-Related Stress in Elderly Women: Results of Caregiver-Study of Osteoporotic Fractures. *Journal of the American Geriatrics Society*, *58*(5), 937–943. https://doi.org/10.1111/j.1532-5415.2010.02808.x

Fuller-Thomson, E., Noack, A., & George, U. (2011). Health Decline Among Recent Immigrants to Canada: Findings From a Nationally-Representative Longitudinal Survey. *Canadian Journal of Public Health/Revue Canadienne De Sante Publique, 102*(4), 273-280.

Gamble, J. L., Hurley, B. J., Schultz, P. A., Jaglom, W. S., Krishnan, N., & Harris, M. (2013). Climate Change and Older Americans: State of the Science. *Environmental Health Perspectives*, *121*(1), 15–22. https://doi.org/10.1289/ehp.1205223

Gierlach, E., Belsher, B. E., & Beutler, L. E. (2010). Cross-Cultural Differences in Risk Perceptions of Disasters. *Risk Analysis*, *30*(10), 1539–1549. https://doi.org/10.1111/j.1539-6924.2010.01451.x

Greenough, P. G., Lappi, M. D., Hsu, E. B., Fink, S., Hsieh, Y.-H., Vu, A., Heaton, C., & Kirsch, T. D. (2008). Burden of Disease and Health Status Among Hurricane Katrina-Displaced Persons in Shelters: A Population-Based Cluster Sample. *Annals of Emergency Medicine*, *51*(4), 426–432. https://doi.org/http://dx.doi.org/10.1016/j.annemergmed.2007.04.004

Grube, L. E., Fike, R., & Storr, V. H. (2018). Navigating Disaster: An Empirical Study of Federal Assistance Following Hurricane Sandy. *Eastern Economic Journal*, *44*(4), 576–593. https://doi.org/10.1057/s41302-017-0098-x

Gubernskaya, Z. (2015). Age at Migration and Self-Rated Health Trajectories After Age 50: Understanding the Older Immigrant Health Paradox. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *70*(2), 279–290. https://doi.org/10.1093/geronb/gbu049

Guest, G., Bunce, A., & Johnson, L. (2006). How Many Interviews Are Enough? *Field Methods*, *18*(1), 59–82. https://doi.org/10.1177/1525822X05279903

Guest, G., MacQueen, K., & Namey, E. (2012). Introduction to Applied Thematic Analysis. In *Applied Thematic Analysis* (pp. 3–20). SAGE Publications, Inc. https://doi.org/10.4135/9781483384436.n1

Guest, G., Namey, E. E., & Mitchell, M. L. (2017). Collecting Qualitative Data: A Field Manual for Applied Research. In *Collecting Qualitative Data: A Field Manual for Applied Research*. SAGE Publications, Ltd. https://doi.org/10.4135/9781506374680

Guilfoyle, J., Kelly, L., & St Pierre-Hansen, N. (2008). Prejudice in medicine: Our role in creating health care disparities. *Canadian Family Physician/Medecin de Famille Canadien*, *54*(11), 1511–1513, 1518–1520. http://www.ncbi.nlm.nih.gov/pubmed/19005106

Hango, D. (2020). Support received by caregivers in Canada. In: *Insights on Canadian Society. January*. (Catalogue 75-006-X). Retrieved from Statistics Canada: https://www150.statcan.gc.ca/n1/pub/75-006-x/2020001/article/00001-eng.htm

Heller, K., Alexander, D. B., Gatz, M., Knight, B. G., & Rose, T. (2005). Social and Personal Factors as Predictors of Earthquake Preparation: The Role of Support Provision, Network Discussion, Negative Affect, Age, and Education1. *Journal of Applied Social Psychology*, *35*(2), 399–422. https://doi.org/10.1111/j.1559-1816.2005.tb02127.x

Henderson, T. L., Roberto, K. A., & Kamo, Y. (2010). Older Adults' Responses to Hurricane Katrina. *Journal of Applied Gerontology*, *29*(1), 48–69. https://doi.org/10.1177/0733464809334287

Hendry, C., & East, S. (2013). Impact of the Christchurch earthquakes on clients receiving health care in their homes. *Kai Tiaki Nursing Research, 4*(1), 4.

Hyman, I., & Jackson, B. (2010). The healthy immigrant effect: A temporary phenomenon. *Health Policy Research Bulletin, 17*, 17-21.

International Federation of Red Cross and Red Crescent Societies [IFRC]. (2016). *World Disasters Report.* Retrieved from: http://www.ifrc.org/Global/Documents/Secretariat/201610/WDR%202016-FINAL_web.pdf

Joffe, H., Perez-Fuentes, G., Potts, H. W., & Rossetto, T. (2016). How to increase earthquake and home fire preparedness: the fix-it intervention. *Natural Hazards, 84*(3), 1943-1965.

Katz, S., Ford, A. B., Moskowitz, R. W., Jackson, B. A., & Jaffe, M. W. (1963). Studies of Illness in the Aged. *JAMA*, *185*(12), 914. https://doi.org/10.1001/jama.1963.03060120024016

Kimura, R., Hayashi, H., Kobayashi, K., Nishino, T., Urabe, K., & Inoue, S. (2017). Development of a "Disaster Management Literacy Hub" for Collecting, Creating, and Transmitting Disaster Management Content to Increase Disaster Management Literacy*. Journal of Disaster Research, 12*(1), 42-56.

Kubicek, K., Ramirez, M., Limbos, M. A., & Iverson, E. (2008). Knowledge and behaviors of

parents in planning for and dealing with emergencies. *Journal of community health, 33*(3), 158-168.

Levac, J., Toal-Sullivan, D., & O`Sullivan, T. L. (2011). Household Emergency Preparedness: A Literature Review. *Journal of Community Health*, *37*(3), 725–733. https://doi.org/10.1007/s10900-011-9488-x

Lima, B. R., Pai, S., Santacruz, H., Lozano, J., & Luna, J. (1987). Screening for the psychological consequences of a major disaster in a developing country: Armero, Colombia. *Acta Psychiatrica Scandinavica*, *76*(5), 561–567. https://doi.org/10.1111/j.1600-0447.1987.tb02919.x

Lin, A. C., Burke, R. V., Berg, B. M., Muller, V. M., & Upperman, J. S. (2014). Disaster preparedness education in South Los Angeles faith-based organizations: A pilot study in promoting personal and community preparedness and resiliency. *American Journal of Disaster Medicine*, *9*(4), 287–296. https://doi.org/10.5055/ajdm.2014.0180

Lincoln, Y., & Guba, E. G. (1985). Establishing trustworthiness. In *Naturalistic Inquiry* (pp. 289-409). Newbury Park, CA: Sage Publications.

Litzelman, K., Skinner, H. G., Gangnon, R. E., Nieto, F. J., Malecki, K., & Witt, W. P. (2014). Role of global stress in the health-related quality of life of caregivers: Evidence from the Survey of the Health of Wisconsin. *Quality of Life Research*, *23*(5), 1569–1578. https://doi.org/10.1007/s11136-013-0598-z

Maldonado, A., Collins, T. W., & Grineski, S. E. (2016). Hispanic Immigrants' Vulnerabilities to Flood and Hurricane Hazards in Two United States Metropolitan Areas. *Geographical Review*, *106*(1), 109–135. https://doi.org/10.1111/j.1931-0846.2015.12103.x

Man, G. (2004). Gender, work and migration: Deskilling Chinese immigrant women in Canada. *Women's Studies International Forum*, *27*(2), 135–148. https://doi.org/10.1016/J.WSIF.2004.06.004

Matsubara, C., Murakami, H., Imai, K., Mizoue, T., Akashi, H., Miyoshi, C., & Nakasa, T. (2014). Prevalence and Risk Factors for Depressive Reaction among Resident Survivors after the Tsunami following the Great East Japan Earthquake, March 11, 2011. *PLoS ONE*, *9*(10), e109240. https://doi.org/10.1371/journal.pone.0109240

McCabe, O. L., Mosley, A., Marum, F., Gwon, H. S., Kaminsky, M. J., Everly Jr, G. S., & Langlieb, A. (2012). Community capacity-building in disaster mental health resilience: A pilot study of an academic/faith partnership model. *International Journal of Emergency Mental Health, 14*(2), 112-122.

McComas, K. A. (2006). Defining moments in risk communication research: 1996-2005. In *Journal of Health Communication* (Vol. 11, Issue 1, pp. 75–91). Taylor & Francis Group . https://doi.org/10.1080/10810730500461091

McGuire, L. C., Ford, E. S., & Okoro, C. A. (2007). Natural disasters and older US adults with disabilities: implications for evacuation. *Disasters*, *31*(1), 49–56. https://doi.org/10.1111/j.1467-7717.2007.00339.x

McIntosh, M. J., & Morse, J. M. (2015). Situating and Constructing Diversity in Semi-Structured Interviews. *Global Qualitative Nursing Research*, *2*, 233339361559767. https://doi.org/10.1177/2333393615597674

McKeary, M., & Newbold, B. (2010). Barriers to Care: The Challenges for Canadian Refugees and their Health Care Providers. *Journal of Refugee Studies*, *23*(4), 523–545. https://doi.org/10.1093/jrs/feq038

Morgan, A., & Ziglio, E. (2010). Revitalising the Public Health Evidence Base: An Asset Model. In *Health Assets in a Global Context* (pp. 3–16). Springer New York. https://doi.org/10.1007/978-1-4419-5921-8_1

Muller, V. M., Burke, R. V., Berg, B. M., Lin, A. C., & Upperman, J. S. (2014). A mixed-methods pilot study of disaster preparedness and resiliency among faith-based organizations. *Prehospital and Disaster Medicine*, *29*(2), 127–133. https://doi.org/10.1017/S1049023X14000120

Nepal, V., Banerjee, D., Perry, M., & Scott, D. (2012). Disaster preparedness of linguistically isolated populations: Practical issues for planners. *Health Promotion Practice*, *13*(2), 265–271. https://doi.org/10.1177/1524839910384932

Ng, E., Pottie, K., & Spitzer, D. (2011). Official language proficiency and self-reported health among immigrants to Canada. *Health Reports*, *22*(4), 15–23. http://www.ncbi.nlm.nih.gov/pubmed/22352148

Noble, I. R., S. Huq, Y. A. Anokhin, J. Carmin, D. Goudou, F. P. Lansigan, B. Osman-Elasha, & A. Villamizar. (2014). *Adaptation needs and options. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 833-868). Cambridge, UK: Cambridge University Press.

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology, 41*(1-2), 127-150.

Nunez-Alvarez, A., Martínez, K. M., Ramos, A., & Gastelum, F. (2007). San Diego firestorm 2007 report: Fire impact on farm workers and migrant communities in North County. *San Marcos, CA: National Latino Research Center, California State University.*

O'Sullivan, T. L. (2009). Support for families coping with stroke or dementia: Special considerations for emergency management. *Radiation Protection Dosimetry*, *134*(3–4), 197–201. https://doi.org/10.1093/rpd/ncp076

O'Sullivan, T., Ghazzawi, A., Stanek, A., & Lemyre, L. (2012). "We Don't Have a Back-Up Plan": An Exploration of Family Contingency Planning for Emergencies Following Stroke. *Social Work in Health Care*, *51*(6), 531–551. https://doi.org/10.1080/00981389.2012.681539

O'Sullivan, T. L., Kuziemsky, C. E., Corneil, W., Lemyre, L., & Franco, Z. (2014). The EnRiCH Community Resilience Framework for High-Risk Populations. *PLoS Currents*, *6*. https://doi.org/10.1371/currents.dis.11381147bd5e89e38e78434a732f17db

O'Sullivan, T. L., Fahim, C., & Gagnon, E. (2018). Asset literacy following stroke: Implications for disaster resilience. *Disaster Medicine and Public Health Preparedness*, *12*(3), 312–320. https://doi.org/10.1017/dmp.2017.66

O'Sullivan, T. & Phillips, K. P. (2019). From SARS to pandemic influenza: the framing of high-risk populations. Nat Hazards 98, 103–117. https://doi.org/10.1007/s11069-019-03584-6

Ong, H. L., Vaingankar, J. A., Abdin, E., Sambasivam, R., Fauziana, R., Tan, M. E., Chong, S. A., Goveas, R. R., Chiam, P. C., & Subramaniam, M. (2018). Resilience and burden in caregivers of older adults: Moderating and mediating effects of perceived social support. *BMC Psychiatry*, *18*(1), 27. https://doi.org/10.1186/s12888-018-1616-z

Onuma, H., Shin, K. J., & Managi, S. (2017). Household preparedness for natural disasters: Impact of disaster experience and implications for future disaster risks in Japan. *International Journal of Disaster Risk Reduction, 21,* 148–158. https://doi.org/10.1016/j.ijdrr.2016.11.004

Oppo, V., Serra, G., Fenu, G., Murgia, D., Ricciardi, L., Melis, M., Morgante, F., & Cossu, G. (2020). PD Symptoms Have A Distinct Impact on Caregivers' and Patients' Stress: A Study Assessing the Consequences of COVID -19 Lockdown. *Movement Disorders Clinical Practice*. https://doi.org/10.1002/mdc3.13030

Organisation for Economic Co-operation and Development [OECD]. (2017). *Latin America and the Caribbean SIGI Regional Report.* Paris, France: OECD Publishing.

Palen, L., Vieweg, S., Liu, S. B., & Hughes, A. L. (2009). Crisis in a Networked World. *Social Science Computer Review*, *27*(4), 467–480. https://doi.org/10.1177/0894439309332302

Pickering, C. J., O'Sullivan, T. L., Morris, A., Mark, C., McQuirk, D., Chan, E. Y., Guy, E., Chan, G. K., Reddin, K., Throp, R., Tsuzuki, S., Yeung, T., & Murray, V. (2018). The Promotion of "Grab Bags" as a Disaster Risk Reduction Strategy. *PLOS Currents Disasters, 1*(1–23). https://doi.org/10.1371/currents.dis.223ac4322834aa0bb0d6824ee424e7f8

Pickering, C., Dancey, M., Paik, K., & O'Sullivan, T. (in press). Informal Caregiving and Disaster Risk Reduction: A Scoping Review, *International Journal of Disaster Risk Science.*

Poussin, J. K., Botzen, W. J. W., & Aerts, J. C. J. H. (2014). Factors of influence on flood damage mitigation behaviour by households. *Environmental Science and Policy*, *40*, 69–77. https://doi.org/10.1016/j.envsci.2014.01.013

Preston, B. L., Yuen, E. J., & Westaway, R. M. (2011). Putting vulnerability to climate change on the map: a review of approaches, benefits, and risks. *Sustainability Science*, *6*(2), 177–202. https://doi.org/10.1007/s11625-011-0129-1

Rawls, C. G., & Turnquist, M. A. (2012). Pre-positioning and dynamic delivery planning for short-term response following a natural disaster. *Socio-Economic Planning Sciences*, *46*(1), 46–54. https://doi.org/10.1016/J.SEPS.2011.10.002

Rhoades, J. L., Gruber, J. S., & Horton, B. (2018). Developing an In-depth Understanding of Elderly Adult's Vulnerability to Climate Change. *The Gerontologist*, *58*(3), 567–577. https://doi.org/10.1093/geront/gnw167

Ritchie, J. and Lewis. J. (Eds.) (2003). *Qualitative Research Practice: A Guide for Social Science Students and Researchers.* London: Sage Publications.

Rivera, L., Pagaoa, M., Morgenthau, B. M., Paquet, C., Molinari, N. A. M., & LeBlanc, T. T. (2019). Participation in Community Preparedness Programs in Human Services Organizations and Faith-Based Organizations — New York City, 2018. *MMWR. Morbidity and Mortality Weekly Report*, *68*(35), 757–761. https://doi.org/10.15585/mmwr.mm6835a2

Rosenkoetter, M. M., Covan, E. K., Cobb, B. K., Bunting, S., & Weinrich, M. (2007). Perceptions of Older Adults Regarding Evacuation in the Event of a Natural Disaster. *Public Health Nursing*, *24*(2), 160–168. https://doi.org/10.1111/j.1525-1446.2007.00620.x

Roth, D. L., Fredman, L., & Haley, W. E. (2015). Informal caregiving and its impact on health: A reappraisal from population-based studies. *Gerontologist*, *55*(2), 309–319. https://doi.org/10.1093/geront/gnu177

Roth, D. L., Fredman, L., & Haley, W. E. (2015). Informal Caregiving and Its Impact on Health: A Reappraisal From Population-Based Studies. *The Gerontologist*, *55*(2), 309–319. https://doi.org/10.1093/geront/gnu177

Roth, D. L., Perkins, M., Wadley, V. G., Temple, E. M., & Haley, W. E. (2009). Family caregiving and emotional strain: associations with quality of life in a large national sample of middle-aged and older adults. *Quality of Life Research*, *18*(6), 679–688. https://doi.org/10.1007/s11136-009-9482-2

Rowel, R., Sheikhattari, P., Barber, T. M., & Evans-Holland, M. (2012). Introduction of a guide to enhance risk communication among low-income and minority populations: A grassroots community engagement approach. *Health Promotion Practice*, *13*(1), 124–132. https://doi.org/10.1177/1524839910390312

Ryan, B. (2013). Information seeking in a flood. *Disaster Prevention and Management: An International Journal*, *22*(3), 229–242. https://doi.org/10.1108/DPM-05-2012-0059

Sandelowski, M. (2000). Focus on research methods: Whatever happened to qualitative description? *Research in Nursing and Health*, *23*(4), 334–340. https://doi.org/10.1002/1098-240x(200008)23:4<334::aid-nur9>3.0.co;2-g

Shih, R., Acosta, J., Chen, E., Carbone, E., Xenakis, L., Adamson, D., & Chandra, A. (2018). Improving Disaster Resilience Among Older Adults: Insights from Public Health Departments and Aging-in-Place Efforts. In *Improving Disaster Resilience Among Older Adults: Insights from Public Health Departments and Aging-in-Place Efforts* (Vol. 8, Issue 1). RAND Corporation. https://doi.org/10.7249/rr2313

Shiu-Thornton, S., Balabis, J., Senturia, K., Tamayo, A., & Oberle, M. (2007). Disaster preparedness for limited english proficient communities: Medical interpreters as cultural

brokers and gatekeepers. *Public Health Reports*, *122*(4), 466–471. https://doi.org/10.1177/003335490712200407

Sinha, M. (2013). Portrait of caregivers, 2012. In: *Spotlight on Canadians: Results from the General Social Survey.* (Catalogue 89-652-X). Retrieved from Statistics Canada: https://www.statcan.gc.ca/pub/89-652-x/89-652-x2013001-eng.htm

Sinha, M., & Bleakney, A. (2014). Receiving care at home. In: *Spotlight on Canadians: Results from the General Social Survey*. (Catalogue 89-652-X). Retrieved from Statistics Canada: https://www150.statcan.gc.ca/n1/pub/89-652-x/89-652-x2014002-eng.htm

Statistics Canada. (2014). *Immigration and Ethnocultural Diversity in Canada.* (Catalogue number 98 312-X2011003). Retrieved from Statistics Canada: http://www12.statcan.gc.ca/census-recensement/2011/as-sa/98-312-x/98-312x2011003_4-eng.cfm

Statistics Canada. (2011). *Living Arrangements of Seniors.* (Catalogue number 99-010-X2011001). Retrieved from Statistics Canada: http://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-010-x/99-010-x2011001-eng.pdf

Thomson, M. S., Chaze, F., George, U., & Guruge, S. (2015). Improving Immigrant Populations' Access to Mental Health Services in Canada: A Review of Barriers and Recommendations. *Journal of Immigrant and Minority Health*, *17*(6), 1895–1905. https://doi.org/10.1007/s10903-015-0175-3

Tuohy, R., Stephens, C., & Johnston, D. (2014). Older adults' disaster preparedness in the context of the September 2010-December 2012 Canterbury earthquake sequence. *International Journal of Disaster Risk Reduction*, *9*, 194–203. https://doi.org/10.1016/j.ijdrr.2014.05.010

Twigg, J. (2015). *Disaster risk reduction – Good Practice Review.* London, UK: Humanitarian Policy Group Overseas Development Institute.

Uekusa, S. (2019). Disaster linguicism: Linguistic minorities in disasters. *Language in Society*, *48*(3), 353–375. https://doi.org/10.1017/S0047404519000150

Uekusa, S., & Matthewman, S. (2017). Vulnerable and resilient? Immigrants and refugees in the 2010–2011 Canterbury and Tohoku disasters. *International Journal of Disaster Risk Reduction*, *22*, 355–361. https://doi.org/10.1016/j.ijdrr.2017.02.006

United Nations Office for Disaster Risk Reduction [UNISDR]. (2009). *UNISDR Terminology on Disaster Risk Reduction.* Retrieved from: http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf

United Nations Office for Disaster Risk Reduction [UNISDR]. (2013). *The Special Representative of the Secretary-General for Disaster Risk Reduction (SRSG)'s proposed elements for consideration in the development of the post-2015 framework for disaster risk reduction.* Retrieved from: https://www.preventionweb.net/go/35888

United Nations Office for Disaster Risk Reduction [UNISDR]. (2015). *Sendai Framework for*

*Disaster Risk Reduction.* Retrieved from: http://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf

United Nations Office for Disaster Risk Reduction [UNDRR]. (2020). Disaster. Retrieved December 31, 2020, from https://www.undrr.org/terminology/disaster

Uscher-Pines, L., Hausman, A. J., Powell, S., DeMara, P., Heake, G., & Hagen, M. G. (2009). Disaster Preparedness of Households with Special Needs in Southeastern Pennsylvania. *American Journal of Preventive Medicine*, *37*(3), 227–230. https://doi.org/10.1016/j.amepre.2009.04.028

Vang, Z. M., Sigouin, J., Flenon, A., & Gagnon, A. (2017). Are immigrants healthier than native-born Canadians? A systematic review of the healthy immigrant effect in Canada. *Ethnicity & Health*, *22*(3), 209–241. https://doi.org/10.1080/13557858.2016.1246518

Vogt, W. P. (2005). *Dictionary of statistics & methodology : a nontechnical guide for the social sciences*. Sage Publications. https://books.google.ca/books/about/Dictionary_of_Statistics_Methodology.html?id=bAUZuM2YkZwC

Wachinger, G., Renn, O., Begg, C., & Kuhlicke, C. (2013). The risk perception paradox-implications for governance and communication of natural hazards. *Risk Analysis*, *33*(6), 1049–1065. https://doi.org/10.1111/j.1539-6924.2012.01942.x

Wakui, T., Agree, E. M., Saito, T., Kai, I., T., W., E.M., A., T., S., Wakui, T., Agree, E. M., Saito, T., & Kai, I. (2017). Disaster Preparedness Among Older Japanese Adults With Long-Term Care Needs and Their Family Caregivers. *Disaster Medicine and Public Health Preparedness*, *11*(1), 31–38. https://doi.org/http://dx.doi.org/10.1017/dmp.2016.53

Wang, C. J., Little, A. A., Holliman, J. B., Ng, C. Y., Barrero-Castillero, A., Fu, C. M., Zuckerman, B., & Bauchner, H. (2011). Communication of urgent public health messages to urban populations: Lessons from the massachusetts water main break. *Disaster Medicine and Public Health Preparedness*, *5*(3), 235–241. https://doi.org/10.1001/dmp.2011.69

Wang, C. (2018). Bracing For Hurricanes: A Qualitative Analysis of the Extent and Level of Preparedness Among Older Adults. *The Gerontologist*, *58*(1), 57–67. https://doi.org/10.1093/geront/gnx187

Winsemius, H. C., Jongman, B., Veldkamp, T. I. E., Hallegatte, S., Bangalore, M., & Ward, P. J. (2015). *Disaster Risk, Climate Change, and Poverty: Assessing the Global Exposure of Poor People to Floods and Droughts*. The World Bank. https://doi.org/10.1596/1813-9450-7480

Woersching, J. C., & Snyder, A. E. (2003). Earthquakes in El Salvador: A descriptive study of health concerns in a rural community and the clinical implications, part I. *Disaster Management and Response*, *1*(4), 105–109. https://doi.org/10.1016/S1540-2487(03)00049-X

Wood, M. M., Mileti, D. S., Kano, M., Kelley, M. M., Regan, R., & Bourque, L. B. (2012). Communicating Actionable Risk for Terrorism and Other Hazards⋆. *Risk Analysis*, *32*(4), 601–615. https://doi.org/10.1111/j.1539-6924.2011.01645.x

Woodall, E. D., Taylor, V. M., Teh, C., Li, L., Acorda, E., Tu, S. P., Yasui, Y., & Hislop, T. G. (2009). Sources of health information among Chinese immigrants to the Pacific Northwest. *Journal of Cancer Education*, *24*(4), 334–340. https://doi.org/10.1080/08858190902854533

Woodall, E., Taylor, V., Teh, C., Li, L., Acorda, E., Tu, S.-P., Yasui, Y., & Hislop, T. G. (2009). Sources of Health Information Among Chinese Immigrants to the Pacific Northwest. *Journal of Cancer Education*, *24*(4), 334–340. https://doi.org/10.1080/08858190902854533

World Health Organization. (2008). *Older Persons in Emergencies: An Active Ageing Perspective.* Geneva, Switzerland: World Health Organization. Retrieved from: http://www.who.int/ageing/publications/EmergenciesEnglish13August.pdf

Wu, Z., & McGoogan, J. M. (2020). Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72314 Cases from the Chinese Center for Disease Control and Prevention. In *JAMA - Journal of the American Medical Association* (Vol. 323, Issue 13, pp. 1239–1242). American Medical Association. https://doi.org/10.1001/jama.2020.2648

Yip, M. P., Ong, B. N., Meischke, H. W., Feng, S. X., Calhoun, R., Painter, I., & Tu, S. P. (2013). The Role of Self-Efficacy in Communication and Emergency Response in Chinese Limited English Proficiency (LEP) Populations. *Health Promotion Practice*, *14*(3), 400–407. https://doi.org/10.1177/1524839911399427

Zagheni, E., Muttarak, R., & Striessnig, E. (2015). Differential mortality patterns from hydro-meteorological disasters: Evidence from cause-of-death data by age and sex. In *Vienna Yearbook of Population Research* (Vol. 13, pp. 47–70). Austrian Academy of Sciences Press. https://doi.org/10.2307/24770025

Zhi, Q., Merrill, J. A., & Gershon, R. R. (2017). Mass-Fatality Incident Preparedness among Faith-Based Organizations. *Prehospital and Disaster Medicine*, *32*(6), 596–603. https://doi.org/10.1017/S1049023X17006665

Zhou, X., Kang, L., Sun, X., Song, H., Mao, W., Huang, X., Zhang, Y., & Li, J. (2013). Prevalence and risk factors of post-traumatic stress disorder among adult survivors six months after the Wenchuan earthquake. *Comprehensive Psychiatry*, *54*(5), 493–499. https://doi.org/10.1016/j.comppsych.2012.12.010

# APPENDICES

## Appendix A: Ethics Certificate

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

### CERTIFICAT D'APPROBATION ÉTHIQUE | CERTIFICATE OF ETHICS APPROVAL

| | |
|---|---|
| **Numéro du dossier / Ethics File Number** | H-01-18-301 |
| **Titre du projet / Project Title** | Caregiver Perceptions of Household Preparedness Among Older Immigrants |
| **Type de projet / Project Type** | Thèse de maîtrise / Master's thesis |
| **Statut du projet / Project Status** | Approuvé / Approved |
| **Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)** | 02/02/2018 |
| **Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)** | 01/02/2019 |

### Équipe de recherche / Research Team

| Chercheur / Researcher | Affiliation | Role |
|---|---|---|
| Karen PAIK | École interdisciplinaire des sciences de la santé / Interdisciplinary School of Health Sciences | Chercheur Principal / Principal Investigator |
| Tracey O'SULLIVAN | École interdisciplinaire des sciences de la santé / Interdisciplinary School of Health Sciences | Superviseur / Supervisor |

**Conditions spéciales ou commentaires / Special conditions or comments**

## Appendix B: Recruitment Methods

| City: | Mode of communication: | | |
|---|---|---|---|
| | **In-person** | **Print media (flyers, posters)** | **Online** |
| **Locations in Ottawa** | • Ethnic and cultural festivals — approached festival goers with flyers and offered to chat about the study and answer any questions<br>• Shopping centres — approached mall-walking groups | • Community centres<br>• Ethnic and cultural grocery stores<br>• Faith-based organizations<br>• Public libraries<br>• Public recreation centres<br>• University and college campuses — uOttawa, Carleton University, Algonquin College<br>• Other organizations — community immigrant services organizations and seniors' services organizations | • Email — community gatekeepers such as leaders of faith-based organizations, executive members of cultural clubs on university/college campuses<br>• Facebook — shared on EnRiCH lab members' Facebook accounts<br>• Kijiji — Ottawa/Gatineau Area<br>• Reddit — r/Ottawa<br>• Twitter — shared on EnRiCH lab Twitter account |
| **Locations in Toronto** | • N/A | • Community centres<br>• Ethnic and cultural grocery stores<br>• Faith-based organizations<br>• Public libraries<br>• Public recreation centres | • Kijiji — Toronto (GTA)<br>• Reddit — r/Toronto<br>• Twitter — shared on EnRiCH lab Twitter account |

**Appendix C: Recruitment Notice**

uOttawa

University of Ottawa
Faculty of Health Sciences

Interdisciplinary School of Health Sciences

Université d'Ottawa
Faculté des sciences de la santé

École interdisciplinaire des sciences de la santé

# Adult Children of Immigrant Older Adults

## are Invited to Participate in a Research Study on Disaster Preparedness

The purpose of this study is to describe the behaviours and perceptions of adult children/grandchildren of older immigrants regarding disaster preparedness in their parents'/grandparents' households.

We are interviewing **any adult children or grandchildren (18 years or older) of an immigrant who is 65 years of age or older**.

Participants will be asked to take part in **one 30 minute interview**, **either in person or over the phone**, to discuss their experiences regarding preparedness for disasters in households with older immigrants.

Participants will be selected on a first come, first served basis.

If you are interested, please take a tab and contact **Karen Paik** at
(toll free) or at Thank you!

**Appendix D: Social Media Posts**

**On Facebook.com:**
Hello everyone! The EnRiCH lab at the University of Ottawa is currently recruiting family or other informal caregivers of older immigrants (aged 65+) to participate in a 30-minute interview, either in person or over the phone, to discuss their experiences about preparedness for disasters among households with older immigrants. If you are interested or have any questions, please take a look at the attached recruitment notice! Thank you!

**On Twitter.com:**
Recruiting family or other informal caregivers of immigrant older adults for research study on household disaster preparedness in older immigrants. Interested participants are invited to take part in a 30-minute interview, in person or over the phone. Please see attached notice!

**On Reddit.com:**
Hi [subreddit name]! I'm a grad student at uOttawa, and I'm conducting a research project on the household disaster preparedness of older immigrants (aged 65+) living in the Ottawa-Gatineau/GTA regions. I'm looking to interview any adult children or grandchildren of immigrant older adults, over the phone or in person, to learn about their experiences/opinions regarding disaster preparedness in their parents'/grandparents' households. The interview should take about 30 minutes.
Attached is a copy of the recruitment notice for this study – if you're interested in participating, please don't hesitate to comment below or contact me for more details. Thank you!

## Appendix E: Consent Form



uOttawa

Université d'Ottawa
Faculté des sciences de la santé

École interdisciplinaire des sciences de la santé

University of Ottawa
Faculty of Health Sciences

Interdisciplinary School of Health Sciences

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Ottawa ON K1N 6N5
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www.uOttawa.ca

**Participant Consent Form**

**Title of the Research Project:** Caregiver Perceptions of Household Preparedness Among Older Immigrants

**Principal Investigator**:
Karen Paik (MSc student)
EnRiCH Research Lab

**Supervisor**:
Dr. Tracey O'Sullivan (uOttawa; )

**Purpose:** The purpose of this project is: *to describe the behaviours and perceptions of informal caregivers of older immigrants regarding the disaster preparedness of their care recipients, and to identify challenges they may face in improving household preparedness.*

In this project, we will be interviewing informal caregivers of older immigrants who reside in their homes in Ottawa to understand the state of disaster preparedness of older immigrants who are dependent upon the support of informal caregivers.
In this project, what is meant by 'informal caregiver of an older immigrant' is any individual aged 18 years or older who has provided unpaid care for an immigrant who is 65 years of age or older within the past two years.

What is meant by 'care' is assistance in at least one of the activities of daily living (eating, toileting, dressing, bathing, or walking across a room) **or** instrumental activities of daily living (cleaning and maintaining the house, preparing meals, grocery shopping, managing money, taking prescribed medications, or using the telephone or any other mode of communication).

This research is being conducted as part of a University of Ottawa student's Master's thesis.

**Participation:** As a participant in this study, I am being asked to participate in an individual interview in person, or on the phone. The interview will be approximately 30 minutes in duration. During the interview, I will be asked questions related to my knowledge of disaster preparedness information and the current preparedness practices and plans in place for the older immigrant I provide care for. Other questions will relate to various factors that may help me to or hinder me from ensuring that my care recipient has the appropriate resources to safeguard against harm in disasters.

**Benefits:** My participation in this study will benefit the greater population of older immigrants who are dependent upon assistance from informal caregivers by contributing to knowledge in the field of disaster and emergency management about the barriers and facilitators of disaster preparedness in older immigrants receiving care from informal caregivers at home.

**Confidentiality and anonymity:** I have received assurance from the researcher that the information I share will remain strictly confidential. I understand that my responses will be used for the purposes of this project, and possibly for the basis of secondary studies related to this topic, including student research projects. In all cases, my confidentiality will be protected. I have been assured that in written reports, presentations, and publications, my name will be disguised. Any students or research assistants working with the data will sign a privacy and confidentiality form.

**Conservation of data:** To ensure accuracy, the interviews for this study will be audio-recorded. I understand that it is my choice whether or not to be quoted: (please initial beside your choice). The data collected (digital recording of my interview and interview transcript) will be kept in a secure manner. It will be stored on a computer with a secure password. Only the lead researcher (Ms. Karen Paik), her supervisor (Dr. Tracey O'Sullivan), and 2 research assistants will have access to the interview data. The data will be conserved for 10 years after March 2018.

- *I agree to have my interview audio-recorded* _____ .
- *I do not wish to have my interview audio-recorded* _____ .

**Risks:** Some people may find it stressful to discuss issues related to potential or actual disasters in their community. I understand I may refuse to answer any questions I do not wish to answer, and I have the right to withdraw from the study at any time.

**Quotations:** I understand that participants in this project may be quoted in the research study reports, presentations and publications, but no names or identifying information will be used. I understand that it is my choice whether or not to be quoted: (please initial beside your choice)

- *I agree to be quoted but all personally identifying information shall be removed or altered and contents of the quote shall not be revelatory of my identity.* _____.
- *I do not wish to be quoted from my interview.* _____.

**Voluntary Participation:** My participation is voluntary and there is no financial compensation provided for my participation in this study. I understand I am free to withdraw from the study at any time. My signature on this form indicates I understand the information regarding my participation in the research project and agree to participate. If I choose to withdraw from the study, my interview recordings and transcripts will be destroyed and will not be included in the results from this study.

Participants are invited to contact the principal investigator (Karen Paik) at
for more information.

**Note:** If you have any questions concerning your rights as a participant in this research, please contact The Protocol Officer for Ethics in Research at the University of Ottawa at the following address, phone number or email:

Mailing address: Protocol Officer for Ethics in Research
Research Grants and Ethics Services
University of Ottawa
Tabaret Hall (154)
Ottawa, ON K1N 6N5

Phone: 613-562-5387 Email: ethics@uottawa.ca

There are two copies of this consent form, one of which I am to keep.

Participant name (please print): _____

Participant signature: _____

Date: _____

Investigator name (please print): _____

Investigator signature: _____ Date: _____

Thank you for your interest in this study.

**Appendix F: Interview Guide**

1. **Introduction**
    - On average, this interview is about 30 to 40 minutes long. The goal today is to listen to your experiences and perceptions about the disaster preparedness of the older immigrant that you provide care for. For data collection purposes, our conversation is going to be audio-recorded. Is that alright with you?
2. **Demographic Information (Caregiver)**
    - How old are you?
    - Do you work full-time?
    - Are you an immigrant?
        - (**Prompt**: country of origin; time since immigration to Canada)
3. **Can you please tell me a little bit about your caregiving situation?**
4. **Demographic Information (Care Recipient)**
    - What is your relationship with [care recipient]?
    - How old is [care recipient]?
    - What is [care recipient]'s country of origin?
    - How long it has been since [care recipient] immigrated to Canada?
    - Does [care recipient] experience any language barriers in Ottawa?
5. **Nature of care**
    - Does [care recipient] live with you?
        - (**Prompt**: members of care recipient's household)
    - Are you the only caregiver for [care recipient]?
        - (**Prompt**: number of caregivers, informal and formal; caregivers' relationships to care recipient)
    - Can you give me some examples of the tasks you perform as a part of your care for [care recipient]?
6. **Perceptions of Disasters and Preparedness**
    - When I say the word "emergency", what examples come to mind?
    - When I say the word "disaster", what examples come to mind?
    - (**Explain**: In this interview, some examples of what I mean by disasters are: natural disasters, industrial accidents, mass shootings, disease outbreaks, etc.)
    - Living in Ottawa, do you feel that you are at risk of disasters?
        - (**Prompt**: examples of disasters that they feel they are at risk of)
    - How do you think disasters and their aftermaths might impact your day to day living?
        - What about [care recipient]'s daily life? How might disasters and their aftermaths impact her/him?
    - What are some measures that you could take to prepare for disasters in your household?
        - (**Prompt**: how effective they think these measures would be)
7. **Personal Experiences of Household Preparedness in Older Immigrants**
    - Have you ever received any information that might help you prepare yourself or [care recipient] for disaster situations?
        - (**Prompts**: ask for examples; sources of information/mediums through which this information was received)

- Does [care recipient]'s household have a prepared plan of action to follow when a disaster occurs?
    - **If yes:**
        - [**Prompts**: person responsible for preparing this plan; detailed description of plan; (if participant prepared the plan) factors that motivated them to prepare the plan; (if participant prepared the plan) factors that helped them with preparing the plan]
    - **If no:**
        - (**Prompts**: reasons for not preparing a plan; factors that make it difficult for care recipient to prepare a plan for themself; factors that make it difficult for participant to prepare a plan of action for care recipient)
- Do you know of anyone (family member, friend, co-worker, etc.) who has a plan of action for any kind of disaster?
    - (**Prompt**: ask for a description of their plan)
- When you hear the phrases, 'disaster supplies', or 'emergency supplies', what examples come to mind?
- Does [care recipient]'s household have any supplies to use in emergencies or disasters?
    - **If yes:**
        - [**Prompts**: descriptions and quantities of the supplies; person/people responsible for preparing these supplies; (if participant prepared the supplies) factors that motivated them to prepare the supplies; (if participant prepared the supplies) factors that helped them with preparing the supplies]
    - **If no:**
        - (**Prompts**: reasons for not preparing supplies; factors that make it difficult for care recipient to prepare supplies for themself; factors that make it difficult for participant to prepare supplies for care recipient)
- In your opinion, would preparedness methods like [examples that were just discussed] make a big difference in the way you manage or cope with a disaster?
    - (**Prompt**: ask for their reasoning, examples)

**8. Supports to Enhance Resilience of Older Immigrants**

- Do you know of any supports in the community that can help [care recipient] prepare for or handle disasters or emergency situations? These can include sources of information, programs, material resources, or other resources available to them.
    - **If yes:**
        - (**Prompts**: ask for examples; whether participant or care recipient have ever used any of these resources)
            - **If participant/care recipient have used the resources:**
                - (**Prompts:** motivations for using these supports; evaluation of the accessibility of the supports; evaluation of the helpfulness of these supports)
            - **If participant/care recipient have not used the resources:**

        - (**Prompts**: reasons for not using supports; would they suggest any changes to the supports to make them more inclined or better able to use them?)
- Do you have any suggestions for forms of support that the community could offer to [care recipient], to help them cope with disasters and their effects?
    - (**Prompt**: what about for older immigrants in general?)

**9. Contingency Plans for Care of Older Immigrants**

- In disasters or other emergencies, there may be situations in which you might not be available to provide care for [care recipient]. Have you ever considered or discussed how caregiving arrangements for [care recipient] might change if you're not there? For example, with the household members that care recipient lives with, or their family.
    - Is there a back-up plan in place for the care of [care recipient]?
        - **If yes**:
            - (**Prompt**: description of the plan)
        - **If no**:
            - (**Prompt**: reason for not having a back-up plan for the care of [care recipient])
- What do you think are some challenges associated with making back-up plans like this?

**10. Conclusion**

- Now that we've had this conversation about disaster preparedness, do you intend on taking more action to prepare yourself and [care recipient] for disasters?
    - (**Prompt**: ask for details/examples)
- Is there anything else that you would like to share?

**Appendix G: Coding Grid**

1. **Care for the older immigrant:** Anything pertaining to various aspects of the care being provided for the older immigrant
    - **Nature of caregiving**: Pertaining to the caregiving role and the various positive and negative aspects/consequences of caregiving
        - **Coping strategies/supports used in caregiving:** Methods that caregivers use to more effectively handle their caregiving responsibilities
        - **Caregiving tasks/functions:** Duties or responsibilities the caregiver performs as a part of their caregiving
    - **Nature of the care situation, support network:** Anything pertaining to the older immigrant's support network or their network of caregivers
        - **Living arrangements/geographical proximity of caregivers:** Descriptions of living arrangements of older immigrant and their caregiver(s)
        - **Sources and types of support**: Sources of social support (i.e. descriptions of members of the support network), as well as community, material, or financial supports

2. **Older Immigrant Experience:** Relating to the experience of being in an older immigrant-caregiver dyad (experiences relating to caregiving, and/or disaster preparedness)
    - **Financial freedoms/limitations:** Financial impacts on caregiving or on disaster preparedness
    - **Physical capabilities/limitations:** Impacts of physical capabilities or limitations on caregiving or on disaster preparedness
        - **Health status/specific health conditions:** Impacts of specific health conditions on caregiving or on disaster preparedness
    - **Having a voice:** Experiences and perceptions of the older immigrants'/caregivers' voices (i.e., not being heard, or being heard by certain people)
    - **Impact of culture:** Cultural impacts on caregiving or on disaster preparedness
    - **Impact of education level/literacy:** Impacts of education level/literacy on caregiving or on disaster preparedness
    - **Impact of gender:** Impacts of gender on caregiving or on disaster preparedness
    - **Impact of language/communication**: Impacts of language barriers or communication-related issues on caregiving or on disaster preparedness
    - **Experience of independent living:** (For older immigrants that live alone) Specific experiences or perceptions of aspects of independent living

3. **Preparedness:** Pertaining to the household disaster preparedness of immigrant older adult and/or of their caregiver
    - **Barriers/facilitators of preparedness:** Anything that might be seen as positively or negatively influencing the household disaster preparedness of the immigrant older adult or the caregiver
        - **Disaster-related knowledge and personal risk awareness:** Knowledge of disasters and related concepts: how they define disasters/emergencies; knowledge of preparedness measures

        - **Personal risk/hazard awareness:** Knowledge/awareness of the hazards or risks they are exposed to (and their potential impacts)
        - **Perceptions of preparedness:** Perceptions of preparedness (e.g. perceptions of motivations for preparedness, perceptions of the effectiveness of various preparedness measures)
        - **Degree of preparedness of caregiver:** Caregiver's risk awareness, knowledge of preparedness measures, or status of preparedness (whether they have taken action to prepare for any disaster)
        - **Degree of reliance on caregiver/care recipient's willingness to be helped by caregiver:** Whether immigrant older adult is willing to be helped by caregiver (in the context of preparing their household for disasters)
        - **Preparedness of people in social network:** Caregiver's experience/perceptions of household disaster preparedness of people in their social networks
        - **Community resources that enhance disaster preparedness:** Supports available in the community that are offered with the purpose of enhancing disaster preparedness/resilience in immigrant older adults/their caregivers
    - **Preparedness measures:** Any methods that the caregiver or immigrant older adult could take, or have taken, that may help prepare them for the effects of disasters
        - **Emergency planning:** Any mention of creating an plan (e.g. an evacuation plan) for the household to carry out in the case of disaster
            - **Contingency planning for care of older immigrant:** Creating a back-up plan for the caregiving of the older immigrant, in case primary caregiver(s) are not available
        - **Supplies, disaster kit:** Any mention of having prepared supplies, or having supplies (in a kit, or otherwise) to use in case of disaster