PATHWAYS TO BUILDING AWARENESS AND PREPAREDNESS AMONG AT-RISK POPULATIONS IN CANADA

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ABOUT PARTNERS FOR ACTION

P4A is a research initiative at the University of Waterloo that seeks to empower Canadians to become flood resilient by promoting awareness and preparedness actions that are inclusive and evidence based. Partnership is central to our approach: strategic collaborations allow us to focus on changing the flood response landscape at the ground level and with policy makers. As a thought leader and steward of Flood Smart Canada, P4A moves conversation and multi-level action forward by localizing community-engaged flood risk awareness and preparedness, partnering for adaptation, and developing flood resilience planning and foresight. These priorities will enable communities to access effective resources and innovative research, and ultimately, embrace inclusive resilience. Learn more about us at www.uwaterloo.ca/partners-for-action.

ABOUT THE CANADIAN RED CROSS

Here in Canada and overseas, the Red Cross stands ready to help people before, during and after a disaster. As a member of the International Red Cross and Red Crescent Movement – which is made up of the International Federation of Red Cross and Red Crescent Societies, the International Committee of the Red Cross and 192 national Red Cross and Red Crescent societies – the Canadian Red Cross is dedicated to helping people and communities in Canada and around the world in times of need, and supporting them in strengthening their resilience.

1.0 EXECUTIVE SUMMARY

Before, during and after disasters, the Canadian Red Cross works with people and communities across Canada to strengthen their resilience to disasters. Funded by the Government of Canada through Public Safety Canada, the **Driving Risk Awareness to Action and Building Resiliency for Vulnerable Canadians in High-Risk Areas** project, commonly referred to as the Inclusive Resilience project seeks to increase awareness of disaster risks and promote inclusive approaches, tools and actions that foster inclusive disaster risk reduction (DRR) and emergency preparedness across Canada.

The project seeks to identify the most effective means to increase awareness of floods, wildfires, and earthquakes and practical actions to prepare for these hazards among women, older adults, people with low income, Indigenous Peoples, and newcomers to Canada. The project is implemented by the Canadian Red Cross in partnership with FireSmart Canada, Partners for Action (University of Waterloo), the BC Earthquake Alliance, Native Women's Association of Canada and community partners.

To achieve these outcomes, the project uses a learning-by-doing approach. The process starts with research to inform the development of messaging, tools, and delivery modalities. Next, these are tested by public awareness campaigns and community-based activities to measure uptake and effectiveness. The three elements are then adapted and retested. The project features four components: research activities, national public awareness campaigns, community-based activities, and a granting project.

For more information about the research informing this report, visit the Inclusive Resilience research study website: uwaterloo.ca/inclusive-resilience

The Inclusive Resilience Report At-a-Glance

All people should have equal access to information about the kinds of natural hazard risks that may affect them, how to prepare for them, and how to respond to the circumstances of an emergency event in their region. However, previous work by the Canadian Red Cross, and literature in the field of Disaster Studies, have identified that certain groups of people are underserved and under-resourced when it comes to accessing this information. Subsequently, people in these groups experience challenges protecting their families and communities from natural hazards.

National surveys conducted by Partners for Action between 2016 and 2020 confirm and reaffirm that Canadians have low levels of preparedness for natural hazard-related emergencies. These surveys also show that Canadians have variable levels of concern for probable hazards in their region.

THE FOCUS: HAZARDS AND DEMOGRAPHICS

The available literature points out that it is essential to tailor an emergency preparedness message to both reach *and* resonate with those most at-risk of experiencing a given natural hazard.

With this in mind, the research team set out to learn more about how to best engage with and encourage five demographic groups in Canada to better prepare for wildfires, flooding and/or earthquakes: women, older adults, people with low income, Indigenous Peoples, and newcomers to Canada.

WHAT INFORMED THE STUDY

The research process included:

- a literature review,
- a survey conducted in five geographic regions (Bay St. George region in Newfoundland; Ottawa, Ontario; Renfrew County, Ontario; Thompson, Manitoba; and Richmond, British Columbia),
- seven focus groups in those five regions, and
- supplementary interviews in three regions.

Survey outreach included the five demographics identified above, in the five geographic regions. Each region was identified as at-risk of one or more of the following natural hazards: flood, wildfire and/or earthquake. Focus group outreach centered on three demographics: older adults, people with low income, and newcomers to Canada (≤5 years) in the same five geographic regions.

Due to the limitations of reaching newcomers to Canada (≤5 years) via telephone survey, the research team conducted supplementary interviews in three regions (Ottawa, ON; Richmond, BC; and Thompson, MB).

It is important to note that while Indigenous Peoples were included as part of community outreach within the five geographic areas of this research, tailored recruitment of Indigenous participants was not conducted. This approach was taken because a parallel study, comprised of a completed research project (based on a desk review and focus interviews with Knowledge Holders)and community focus groups are currently under design. This is being done directly by the Canadian Red Cross to inform its approach to the project and its work with Indigenous Peoples. The data pertaining to Indigenous Peoples in this study represents only those study participants who self-identified as First Nations, Métis or Inuit who also live in one of the geographic regions included in the study recruitment.

STUDY INSIGHTS

Review of the survey data, supplementary interviews, and qualitative feedback from the supplementary interview and focus groups revealed some consistent preferences by demographic:

Women

- Women are more likely than men, to report that they have many people they can turn to during an emergency.
- They also reported a high level of preference for emergency preparedness communications via social media.

Older Adults

- Older adults who belonged to an older adults group and/or community organization expressed confidence in their ability to learn about natural hazard risk preparedness.
- All older adults expressed concern about their ability to respond to an emergency event, regardless of whether they had a social/support network.
- Older adults are less likely to have prepared first aid kit supplies, but they are significantly more likely to have copies of their important documents.

People with Low Income

- Survey respondents with low income spent less time on emergency preparations than all other demographics studied with 65% reporting no time spent compared to the average 57% reported by all other demographics (Survey Report Findings, pg. 33).
- They are also less likely to have three days' worth of supplies.
- Cost is the most significant barrier to preparedness for people with low income.

Newcomers to Canada

- 911 was reported as the anticipated primary source of emergency response assistance for most newcomers to Canada.
- No newcomers to Canada reported having contacts such as friends, family, neighbours, or community groups to turn to for help in the event of a natural hazard-related emergency. Instead, they could only point to institutions (i.e. government agencies) or emergency services (i.e. 911-dialing) for expected assistance.
- Social media is a preferred communication channel to reach newcomers

Insights from the focus groups with all five demographics:

1/ The greatest barrier to natural hazard preparedness was denial and/or indifference: For example, the belief that one will not be personally affected by a natural hazard(s) in one's region due to a lack of risk perception and/or misperception about the hazard(s). Common responses: "It won't happen to me," and "I know I should, but I haven't."

2/ Cost was the second greatest barrier to preparedness identified, and all of those who listed this barrier also identified as having low income.

3/ The third greatest barrier to preparedness was a lack of awareness about the natural hazard risks in their region and a lack of knowledge on how best to prepare for an emergency event.

Insights from the supplementary interviews with newcomers to Canada and focus group participants:

- Newcomers to Canada share the same top three barriers to preparedness though the order of their relevance differs among interviewees such that awareness is the greatest barrier to preparedness, followed by denial and/or indifference and then cost.
- An additional barrier of "Other priorities and/or no time" was tied for the position as the third greatest barrier to preparedness.
- In interviews, most newcomers reported that they have not taken any specific actions to prepare for a flood, wildfire, or earthquake.

Of note, most focus groups and interview participants did not know of any public service campaigns promoting preparedness and response to floods, wildfires, and earthquakes, which suggests that they have not encountered such information. They did express that government – local/municipal government specifically, in the case of the focus groups – is their preferred source of emergency preparedness information. The research team asked participants what would help them overcome these barriers and have summarized their recommendations below.

Learning how to prepare / Recommended actions

AT THE COMMUNITY AND HOUSEHOLD LEVELS

Participants see the benefit of preparing for natural hazards with their communities in addition to their own, individual households. Community disaster resilience was defined by participants as knowing their neighbours, forming dedicated community groups for emergency preparedness (e.g. Condominium committees, buddy systems with older adults) and growing their collective knowledge of emergency preparedness through annual community events. The prominence of this perceived role of community in disaster resilience calls for a greater exploration of community partnerships in emergency preparedness campaigns.

To learn about their local natural hazard risks and begin preparing for a possible emergency event, participants:

- Highly desired resource materials that offer checklists of key items and clear, simple actions for preparedness;
- Requested straightforward instructions, accompanied by realistic, representative depictions of people in different housing types;
- Wanted more varied depictions of preparedness strategies for tenants (as opposed to the more common depiction of single family home ownership) and tailored resources for the context of apartment dwellings and/or high rises.

Some additional, qualitative insights are presented by demographic below:

- Women made note of the design components of preparedness resources more than men.
- Older adults more often raised concerns about reliable access to information resources during emergency situations, such as power outages.
- Older adults expressed a preference for physical formats of preparedness and response information over digital formats.
- Older adults requested modifications to the preparedness guides for those with mobility difficulties.
- Low-cost lists of emergency preparedness items are preferred.
- Newcomers sought brief instructions for emergency preparedness in plain language.

Call to action

This study builds on existing literature and recent Canadian surveys and provides qualitative feedback on how people in the five demographic groups want to engage and learn about emergency preparedness associated with floods, wildfires, and earthquakes. The emergence of generalizable findings for each demographic was limited by the complexity of studying five demographics across five geographies and three hazards. However, the report offers meaningful insights into how communication campaigns and community partnerships might be coordinated to better raise awareness and preparedness levels among women, older adults, people with low income, Indigenous Peoples, and newcomers to Canada (≤5 years) .

More specific work with individual demographics would build on our findings and contribute deeper insights. For example, another study might specifically consider cost as a barrier to preparedness among specific populations and examine its impact on emergency awareness and preparedness. The project partners look forward to learning from others in this space and collaborating on future projects.

2.0 INTRODUCTION

Floods, Wildfire and Earthquakes: Canada's Natural Hazards

2.1 What we know

Across Canada, the risks associated with extreme weather and natural hazards are growing.[1] To better prepare for and respond to these risks, all levels of government and industry leaders are developing diverse solutions, in the form of infrastructure, technology and policy, to better protect people and property.

Advances in emergency management and disaster risk reduction—through investments in early warning earthquake detection systems, floodplain mapping, and construction industry guidelines for residential wildfire resilience, to name a few—can significantly enhance public safety.[2, 3, 4]

Natural Hazard

For the purposes of this report (and the survey, focus groups and interviews on which it is based), a natural hazard specifically refers to flooding, wildfire, or earthquakes.

However, individuals have an important role to play in reducing their own risk to emergencies resulting from natural hazards such as floods, wildfires and earthquakes. For instance, a disaster preparedness kit can allow a family to meet their needs for at least three days in the event of an emergency. Similarly, moving all valuables to an upper floor can help a household protect their belongings from basement flooding.

The Red Cross is working alongside Public Safety Canada, research organizations, subject-matter experts, insurance companies, and various other Canadian stakeholders, to increase individual, household and community resilience to disaster risks resulting from natural hazards in Canada, with particular focus on those exacerbated by climate change. In collaboration with these partners, the Red Cross is developing programs, approaches and risk communication materials to help people understand their risk of floods, wildfires, earthquakes, and other natural hazards, and to develop the skills, capacities, behaviours, and actions needed to reduce their vulnerability to such events.

The Red Cross has two main goals within the Inclusive Resilience project for informing the public about natural hazard risks:

1/ To increase **critical awareness* of hazards and risks;** and

2/ To promote practical, gender-responsive and inclusive **risk reduction and preparedness actions** that can be taken at the individual, household and community levels.

*defined in Glossary

Canadians' awareness of—and preparedness for—risks such as floods, wildfires and earthquakes is highly variable.

In 2020, most Canadians (76%) were either unaware of (47%) or unconcerned (29%) about specific risks related to extreme weather and natural hazards.[5] These sentiments are reflected in the findings that most Canadians (74%) believe they live in a low- (53%) or moderate-risk (22%) area. Additionally, only about one in ten Canadians (11%) had taken steps to reduce the risk of their home being affected by weather-related emergencies or natural hazard risks such as floods, wildfires, tornados, and ice storms, to name a few (see Figure 1).[5]

Emergency preparedness in Canada

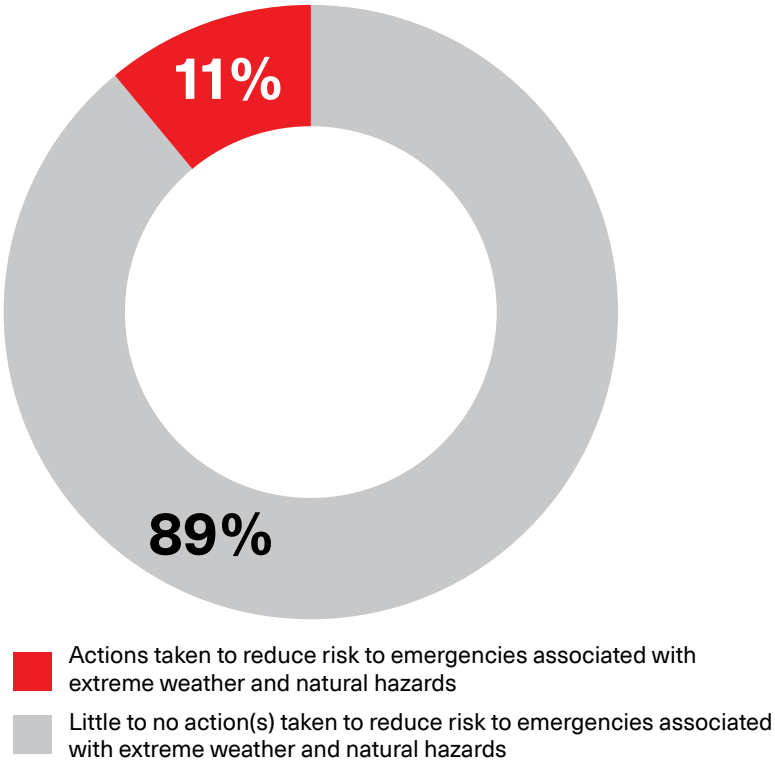

Figure 1. Of the 2,022 Canadians surveyed in 2020, only 11% reported that they had taken multiple steps to prepare their home for weather-related emergencies and natural hazards. (e.g. Installing a sump pump in the basement, altering the grading around the foundation of the house to promote water runoff, removing dead wood from the property, etc.)[5]

FLOODWATER, WILDFIRES AND EARTHQUAKES

National surveys conducted in 2016 and 2020 found that Canadians living in high-risk flood areas are largely unaware of their risk and have not acted to protect their homes from flood events, such as by purchasing flood insurance or by implementing property-level flood protection measures (see Figure 2).[6,7] The picture looks slightly different when focussed on earthquake and wildfire hazard zones. A 2017 survey of British Columbians found that earthquakes and wildfires were concerns for most respondents; however, few households had yet prepared for those risks, as defined by purchasing appropriate insurance coverage, having easily accessible access to sufficient emergency supplies and establishing 'complete' emergency response plans (see Figure 3).[8]

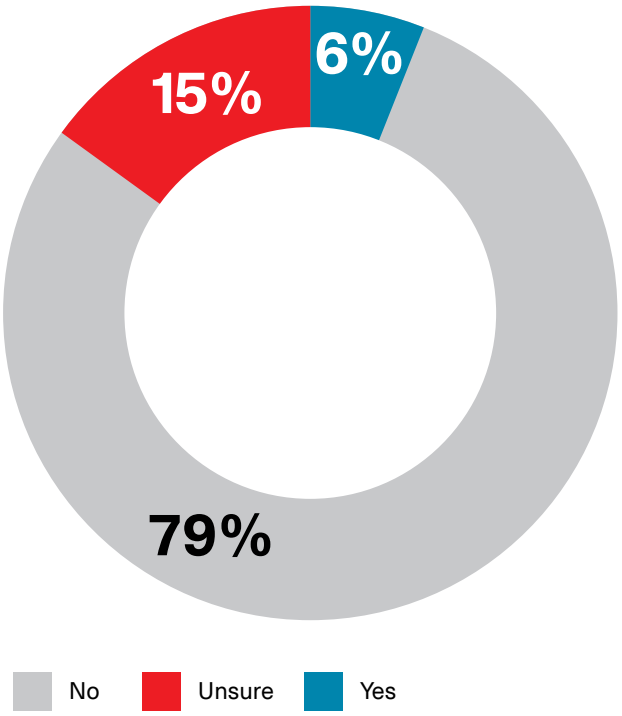

Figure 2. Findings from a 2020 survey by Partners for Action revealed that only 6% of the 2,500 Canadians surveyed were aware of their flood risk, despite living in designated flood risk areas.[7]

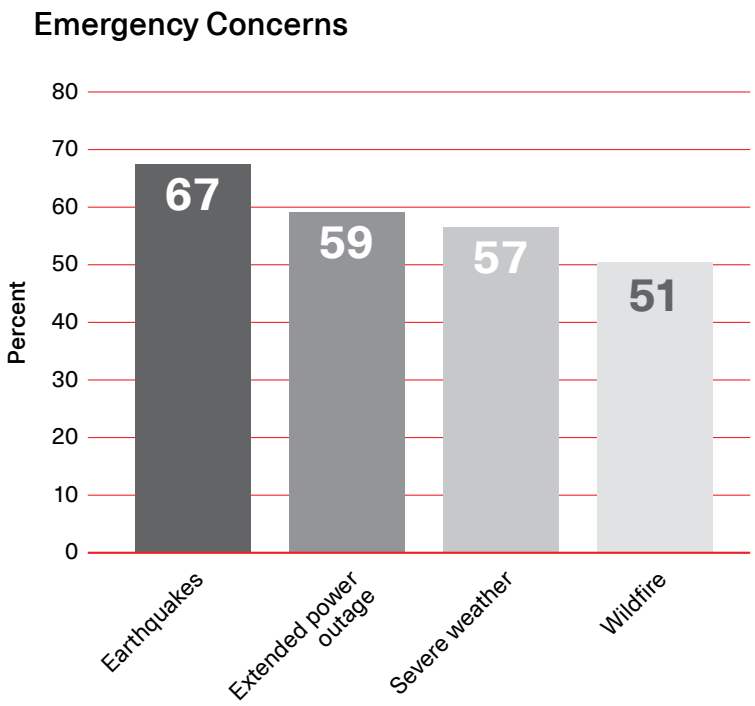

Figure 3. A 2018 Government of British Columbia survey of 1,206 adult residents' personal emergency preparedness found that two-thirds (67%) are "very" or "somewhat concerned" about an earthquake affecting their household. The next greatest concern is an extended power outage (59%), followed by severe weather (57%) and wildfire (51%).[8]

These findings about the variation in people's awareness of and concern for natural hazards, as well as their low levels of associated preparedness, are very concerning, and they raise several important questions:

1/ What are the barriers to accessing information?

2/ In the communities where information on natural hazard risks is widely available, what are the barriers to acting on the recommended preparedness steps?

3/ In what ways might "the messenger"—whether the person/organization or the assets conveying the message about natural hazard risks—be inadvertently creating barriers to preparedness rather than eliminating them?

The Red Cross commissioned Partners for Action to collaborate on addressing these questions.

The Inclusive Resilience project seeks to learn how to best engage with and encourage women, older adults, people with low income, Indigenous Peoples, and newcomers to Canada to better prepare for wildfires, flooding and/or earthquakes in order to increase awareness of these hazards, and the practical actions that can be taken.

To conduct this study, we used three research tools: surveys, focus groups and interviews.

Canadians were invited to share their attitudes and opinions about specific natural hazard risks relevant to their geographic region. We used their responses to better understand their levels of risk awareness, their degree of preparedness, the barriers to awareness and preparedness that they face, and their perceptions of—and feedback on—the natural hazard preparedness resources (referred to here as "communication assets") that the Red Cross uses to engage with the public. These resources included materials developed by the Red Cross as well as by FireSmart Canada, the BC Earthquake Alliance, and Public Safety Canada.

The project focuses on five identified at-risk populations, five geographic regions, and three hazards. Each geographic region was assigned to one or more hazards (Flood, Wildfire, Earthquake) based on its exposure. These natural hazards pose a widespread and evolving threat across Canada.

REGIONS

Regions were defined by postal code and included rural communities and both small and large urban centres. Selection was guided by the elevated risk of natural hazards potentially experienced in the region and each community's resiliency features, including access to information, communications and resources. The research tools were adapted to the hazard(s) unique to the region. A summary of the regions, risk groups and the research tools used in each component of the study is outlined in Table 1.

Region	Risk Group			Research Tool
	Flood	Wildfire	Earthquake	
Ottawa, ON	✓	✓*	✓	Survey, focus group, interview
Renfrew County, ON	✓	✓		Survey, focus group
Thompson, MB	✓	✓		Survey, focus group, interview
Richmond, BC	✓		✓	Survey, focus group, interview
Bay St. George region, Newfoundland	✓	✓		Survey, focus group

*One Ottawa community, Constance Bay, is considered a wildfire risk zone.

Table 1. Regions, Risk Groups, and Research Tools

PARTICIPANTS

All study activities included participants who belonged to one or more of the five demographic groups: women, older adults, people with low income, Indigenous Peoples, and newcomers to Canada.

The research team integrated Gender-based Analysis Plus (GBA+) into the study approach and methodology; this included examining ways in which gender identification might occur throughout the study and considering how study findings might be attributable to the intersectionality of gender identity (i.e., woman and older adults, or non-binary and newcomer to Canada). During each phase of data collection, participants were asked to self-identify their gender, with female, male, non-binary, and an open option as possible responses.

Table 2 shows how gender was treated in the project's three rounds of data collection in terms of screening process and accommodations.

Phase	Screening Process	Accommodations
Survey	Quotas were set for the study's five demographics: women, older adults, people with low income, newcomers to Canada, Indigenous Peoples. Participants who identified solely as men and met no other criteria were screened out of the subsequent interview.	No accommodation required.
Focus Groups	Demographic questions were included in the screening questionnaire. Prospective participants were only excluded when their intersectionality did not match with the criteria (geography + gender + newcomer or older adult).	If a participant met the demographic criteria of a focus group in their geographic region and also identified as non-binary or another self-identified category, they would be offered an opportunity to choose the gender option of their preference (women+ or men+) or take part at a later time in a 1:1 interview.
Interviews	Demographic questions were asked in the interview rather than the consent and screening process since gender was not an exclusionary criterion.	No accommodation required.

Table 2. Gender Considerations in the Inclusive Resilience Study

Two focus groups were conducted with men-identifying participants and three focus groups were conducted with women-identifying participants. In all focus groups, however, some participants had intersecting identity factors (e.g. women who are newcomers to Canada). Ultimately, more women than men participated across all components of the study, as outlined in Figure 4.

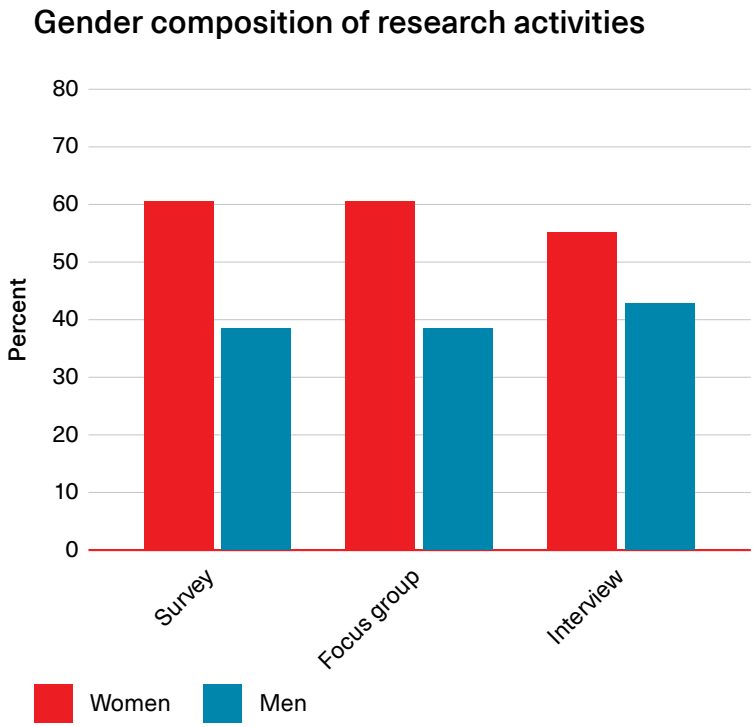

Figure 4. The gender composition for the survey and focus groups was: 62% women, 38% men (Survey 310:190, FG 18:11), and the interview was: 56% women, 44% men (5:4))

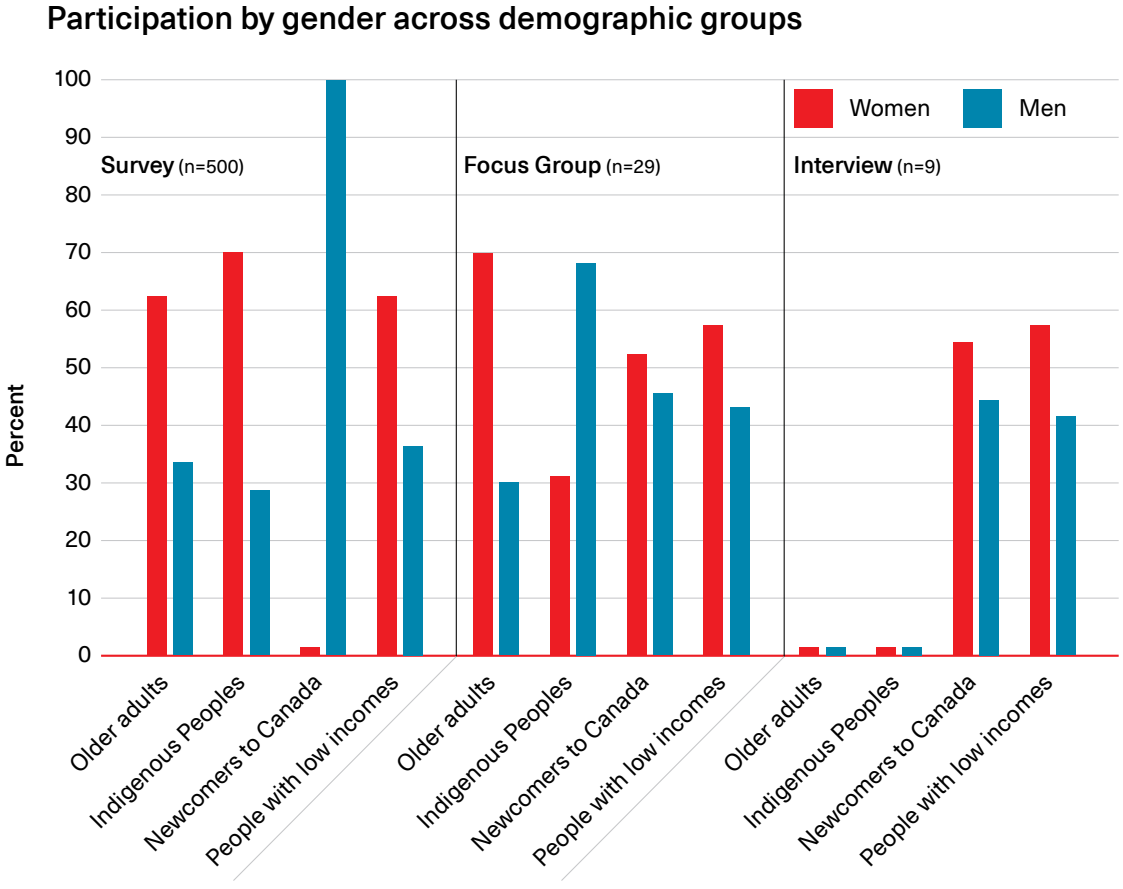

Figure 5. Disaggregation of participants by gender across each demographic group

Findings from all three phases were considered through the lens of intersectionality. Generalizable insights from the intersectional analysis are included in the Findings section (4.0).

2.2 Who's at risk?

To take an inclusive approach, it is important to recognize that different groups of people need emergency preparedness and risk reduction measures that are realistic for their individual circumstances. It is also essential to build risk awareness and preparedness in a way that ensures all people have an opportunity to make meaningful contributions to decision-making, planning and response efforts.

Finances, age, and gender are just a few of the factors shown to contribute to an individual's propensity to prepare for and respond to a disaster. We reviewed the scholarly literature on disaster risk communications and preparedness as it relates to the study's five demographics. Assessing the consistent barriers to disaster preparedness and response among certain demographics helped to guide the development of our research activities and contributed to a deeper understanding of how the Red Cross can better assist individuals in overcoming these barriers.

Literature on the topic suggests that it is essential to tailor a message about risks associated with a natural hazard in order for it to both reach and resonate with those most at-risk of experiencing that natural hazard.[9] For example, emergency communications relating to natural hazard risks, such as weather alerts on the news when there is an extreme rainfall prediction, are not often directed at any specific population.

Customizing a message to at-risk populations can be achieved by considering how the message will be received by that group. This work necessarily involves attending to language and selecting the optimal communication channel to deliver the message (e.g., social media, mail, etc.), among other criteria. Additionally, tailored risk messages must be developed in ways that consider how the message can realistically be acted on by those who may already be experiencing compounding challenges, such as those related to finances or health.[9]

2.3 What the literature says

A literature review was undertaken to better understand the kinds of barriers experienced by the demographics focal to the study that have already been documented through previous studies. A total of 39 articles fit the study criteria of the selected demographics and natural hazard preparedness. Highlights from the literature review include:

WOMEN

Women

Respondents who self-identified their gender as women. 18 years of age or older.

- Women experience structural issues (like lack of access to information, finances and resources) that prevent them from assessing natural hazard risks and responding to emergency scenarios.[10] In some cases, they are vulnerable as a result of their cultural, political, and economic circumstances related to traditional gender roles.[11]
- Even so, women tend to have higher risk perception than men, are more involved in mitigation activities than men, and within the family environment are often more prepared in general.
- Women are more likely to evacuate when faced with a major natural hazard because of their heightened perception of risk and gender norms linked to caregiving.[10, 11, 12, 13, 14, 15]

OLDER ADULTS

It's important to note that this study focuses on older adults who are living at home and not in institutional or congregate settings.

Older Adults

Older adults place importance on "social preparedness"—defined as the continuation of social relationships following a natural hazard event—which contributes to personal and community resilience.[19]

- Older people, especially those on fixed incomes, can face increased risks to disasters due to physical and mental wellbeing, disability, social isolation, financial circumstances, lack of access to resources, communication difficulties, and lower ability to use modern technologies.[16, 17, 18, 19]
- Preparedness decreases among older adults with health-related disabilities and among those living alone.[17]
- In addition, lower income older adults are less prepared than higher income older adults.
- Age affects literacy. Paired with sensory and cognitive changes, older adults can experience barriers to perceiving, understanding and acting on hazard-related information.[18, 19]
- One study makes the following recommendations for communicating hazard messages to older adults:[20]
  - ☐ Avoid complex sentence structure and complex sequential procedures that tax working memory.
  - ☐ Present information in a consistent manner that is familiar to older adults to capitalize on intact semantic memories and improve warning credibility.
  - ☐ Create a more participatory warning system design to make use of existing hazard awareness knowledge.
- A 2020 study by the Canadian Red Cross and the National Institute on Ageing recommends that "Older adults should be encouraged to continually maintain an adequate local support network that can be called upon during impending disasters and unexpected emergencies, especially if they live alone or lack easy access to relatives."[21]

- This Canadian study also recommends that both unpaid caregivers and volunteers assisting older adults should be included in the creation and distribution of resources aimed at older adults. Additionally, effort should be made to ensure that resources are culturally appropriate and that written materials are available in languages other than just English and French.

PEOPLE WITH LOW INCOME

People with Low Income

Respondents are categorized as having low income if they: (1) live alone with an income of less than $40,000 or if they (2) live in a household of two or more people with a household income of less than $70,000. 18 years of age or older.

- People with low income are often at greater risk of natural hazards due to systemic and structural issues like inadequate housing in vulnerable locations or language proficiency, which makes it difficult to understand English disaster preparedness messages.[22]
- Preparing for a disaster can be a low priority when individuals have difficulty meeting their everyday needs; for example, preparedness actions like storing additional food items or creating an emergency kit are hampered by financial constraints and spatial limitations in the home.[23]
- Low access to essential services like childcare or limited technology usage may prevent learning opportunities or participation in community meetings about natural hazards. The latter may also limit access to disaster warnings and preparedness information conveyed electronically.[9]

NEWCOMERS

Newcomers to Canada

Respondents who were not born in Canada or who have lived in Canada for less than five years. 18 years of age or older.

- Newcomers overestimate the government's role in and responsibility for providing immediate response and relief in the event of a natural hazard.[24]
- Barriers to disaster preparedness for immigrants can be similar to those experienced by people with low income: unfamiliarity with local natural hazards, limited access to culturally and linguistically appropriate hazards preparedness programs, and competing priorities (e.g., adapting to a new country and securing shelter, food, and employment). These factors can lead to inaction and a lack of urgency for emergency preparedness.[22, 25, 26, 27]
- In addition, many new immigrants have lost social support networks during the process of relocation.[24]

A study was conducted in Halton Region, ON of Hispanic immigrants (five years or less residing in Canada) using household surveys and focus groups.[25] Cerritos (2009) found the following barriers to emergency preparedness: lack of language proficiency in the local dominant language, lack of community cohesiveness, and a lack of resources to prepare for disasters. Of note, many participants described the process by which recent Hispanic immigrants lower their risk perception soon after arriving to Canada. The sense of personal security offered in many Canadian cities and the related absence of consequences from minor environmental events such as snowstorms instills the assumption that disasters do not happen in developed countries, effectively changing recent immigrants' perception of risk.

INDIGENOUS PEOPLES

It is important to note that the Indigenous demographic included in this study is not homogenous nor residing on land-based reserves; instead, it represents anyone who self-identifies as First Nations, Métis or Inuit who also lives in one of the geographic regions included in the study. A parallel study was undertaken internally by the Red Cross to inform its approach to the project and its work with Indigenous Peoples.

The literature review highlighted below is reflective of both global and community-specific studies and has limited relevance to this Canada-wide study:

- Several colonizing practices were shown to weaken the disaster resilience of an Indigenous community in Australia and increase their risks from natural hazards. These include, but are not limited to: the imposition of Western culture, interference with Indigenous governance systems, the governmental application of top-down approaches, and the inadequacy of housing that may be unsuitable to the climate or inaccessible due to its size, location or disrepair, leading to overcrowding in other housing units.[28]
- A case study of the Sandy Lake First Nation's experience with wildfire preparation and evacuation indicated the importance of investment in community preparedness before a natural hazard event.[29] In focus groups, locally relevant and culturally relevant preparation was identified as a strategy

for identifying vulnerable members of the community, preventing family separations and the isolation of elders during evacuation.

- Culturally relevant approaches were also cited in another study, which noted that they help ensure the preservation of traditional and ceremonial items.[21]

While we did not find specific studies about barriers faced by urban Indigenous Peoples in the face of emergency preparedness, some parallel insights from health-related risk communication are valuable.

- A study conducted in Manitoba in response to H1N1 risk communication found that urban Indigenous participants felt stigmatized by the labels "at-risk" and "priority group," and the researchers identified a need to develop communication strategies that reach specific demographics without focusing on ethnicity. Addressing socio-economic disparities and engaging in community-based dialogue during non-crisis times were highlighted as examples.[30]
- The same study identified that even though messaging was transmitted in Cree, Ojibwa, Michif and other dialects across many different communication platforms (radio, television, online, community sessions), it was still perceived as mass communication with strong colonial undertones.
- Additionally, it was noted that trusted spokespeople at the community level are often different from those in positions of leadership or self-governing authority within Indigenous communities.

COMMUNICATING PREPAREDNESS INFORMATION

In order to reach as many people as possible, it is generally recommended to employ multiple channels of communication. In other words, context matters. Findings from the following studies point to some interesting considerations:

- In one European study, disseminating emergency information through radio, television, SMS messaging and in-person visits was preferred over websites. Older adults (over 65) and those with lower education levels were least likely to access websites for flood-related information.[12]
- Disseminating flood awareness and preparedness information through "lo-call" flood-help telephone lines, local flood groups and resident associations were also considered useful.[12]
- In a Canadian study, 98.5% of newcomers to Canada indicated that they regularly use the internet as their main source of information.[25] Internet-based communication strategies can overcome communication barriers to reaching diverse populations since messages can be customized to meet the needs of specific populations.[25]
- An Australian study that focused on the expectations and needs of disaster-related communication to older adults, people with disabilities, culturally and linguistically diverse populations, families with young children, and people in low-income households identified three major themes: 1) trust, hope, and

source credibility; 2) preferred communicative technologies; and 3) clarity and confusion during a crisis.[9]

- In line with Adult Learning Theory, communication directed to older adults should take into account life experience by including contextual information, building on prior knowledge, and be problem-solving oriented instead of being abstract or didactic.[31]
- Messages that include jargon, technical language or euphemisms may not be understood by the public at large, and specifically, elderly people or non-native speakers. Further, many messages do not consider the physical and cognitive abilities of the elderly.[12, 20]
- Another study notes that the efficacy of risk communication depends on its ability to be integrated in community-level systems rather than those focused on the individual.[31]

Given the intersection of the challenges to natural hazard awareness and preparedness associated with these demographics, the literature suggests that individual-centered engagement should be complimented by community-based and grassroots organizations to increase access, appropriateness, and credibility of the information to at-risk groups.[30]

Social Support

A 2014 Statistics Canada survey about Canadians' methods of emergency preparedness measures for natural hazards or human-induced emergencies revealed that only one in five (21%) Canadians had a high degree of social support.[32] Social support is defined as access to five or more individuals who can provide assistance with a physical injury, emotional support, shelter or financial help resulting from an emergency.

3.0 RESEARCH METHODS

The Inclusive Resilience research team conducted a survey of 500 participants in the summer of 2021, a series of seven focus groups in the fall and winter of 2021-2022, and nine interviews in the winter and spring of 2022.

The survey engaged with the most research participants and provided a baseline of Canadians' levels of awareness of natural hazard risks and preparedness (protective and precautionary behaviours). It also indicated their choices for associated information and messaging, but it did not allow for additional insights beyond the predetermined questions. During the subsequent phase of research activities, we had focus group conversations with community members and tested communications messaging from various sources and in multiple formats (pamphlets, posters, GIFs, and videos). Lastly, we conducted interviews to gain deeper insights into the barriers to knowledge and preparedness faced by newcomers to Canada, who were underrepresented in the initial survey.

All research tools were designed to assess the awareness among Canadians belonging to the five demographics identified by the study regarding their regional natural hazard risks, their preparedness for these risks, and any associated barriers to learning about and taking steps to prepare for these risks.

The research team drew from critical awareness theory, which identifies how the social prominence of hazards (i.e., the frequency with which people discuss hazard issues with others), risk perception, and hazard-specific anxiety interact to motivate preparedness.[33] The relationship between these motivating factors and preparedness is mediated by resource (e.g., time, skill) availability, self-efficacy, and problem-focused coping, and it is moderated by trust.

To measure awareness, we asked a range of proxy questions about people's risk perception of natural hazards that pose a threat to their own community (e.g., their level of concern for natural hazards, their perceived likelihood of that natural hazard occurring where they live).
To measure preparedness, we asked questions about the types of actions people had taken to prepare for emergencies, how much time they had spent doing so, and their perceived capacity (self-efficacy) to respond to a natural hazard emergency.

Together, the three research components investigated these common elements using different techniques and explored several additional themes, including information and messaging, social networks and relationships, and community-based disaster resilience.

3.1 Survey – Taking Stock: Attitudes toward awareness of and preparedness for natural hazards

The purpose of the survey was to examine the level of natural hazard awareness and preparedness among residents of Canada belonging to the five demographics identified by the study. The survey explored whether and where people access information about floods, wildfires and/or earthquakes in their area. To determine people's social networks and relationships, which are key levers for disaster resilience, we investigated how much support they believe they would receive from their relatives, neighbourhoods, and social groups, whether in emergency or non-emergency circumstances.

Environics Research conducted a telephone survey of 500 residents of Canada between July and August 2021 on behalf of P4A and the Red Cross. Five regions were selected for the study: Ottawa, ON; Renfrew County, ON; Thompson, MB; Richmond, BC; and the Bay St. George region of Newfoundland. Random-digit dialing to landlines was used to sample residents living within the defined regions.

Each region was divided into smaller communities, as defined by postal code, and were classified into one or more Risk Groups according to natural hazard risks as detailed in Table 3. Some participants identified with several demographic characteristics, and as such, many appear in more than one column.

Region	Risk Group	All Respondents (n = 500)	Women (n = 310)	Older Adults (n = 161)	Indigenous Peoples (n = 71)	New Canadians* (n = 68)	People with Low Income (n = 169)
Ottawa, ON	Flood, Earthquake	76	55	28	6	12	18
Renfrew County, ON	Flood, Wildfire	170	110	50	14	11	67
Thompson, MB	Flood, Wildfire	71	43	15	14	9	15
Richmond, BC	Flood, Earthquake	88	44	37	1	31	18
Bay St. George region of NL	Flood, Wildfire	95	58	31	36	5	51

Table 3. Survey participants by region, Risk Group, and demographics

The demographics of this study were weighted to their incidence in the general population.

Additionally, Environics Research oversampled specific communities where the incidence of people included in the demographics of this study is higher.

***A note on survey participation by newcomers to Canada**

The level of participation by newcomers to Canada was lower than the expected number of participants and was the lowest relative to all other groups (n=1).

Therefore, the survey looked at all New Canadians (i.e., those born outside of Canada regardless of tenure living in Canada) for the purposes of analysis (n = 68). This significantly weakens the generalizability of these findings to newcomers to Canada (i.e. those who have arrived in Canada within the last five years).

The literature review preceding the survey revealed some common challenges faced by researchers studying newcomer populations. They included: mistrust in the research process, language barriers between researchers and participants, cultural differences, small population sizes at the scale of the research study, and the precarious housing and/or legal status of recent immigrants.[34, 35, 36, 37]

The ability to include newcomers to Canada in the sample was limited by specific features of the survey design, which we discuss immediately below.

SURVEY DESIGN RESTRAINTS ON SAMPLING NEWCOMERS

With reference to the survey design, the two main barriers to newcomers' inclusion in the survey relate to the geographies selected for the survey and the method of survey delivery.

1/ Postal Codes

The study identified a specific set of postal code-defined communities in all five regions.

Postal codes, however, do not reveal demographic characteristics about an area. During analysis, the research team merged postal codes with 2016 Canadian census data to determine the demographics of the selected postal code areas. Integrating the data sets revealed that the selected postal codes underrepresented newcomers.

For example, residents of Renfrew County, ON showed the highest level of participation in the survey, yet very few newcomers reside in Renfrew County relative to the four other communities.[38] The second highest level of participation occurred in Constance Bay, in the Ottawa geographic region and in which even fewer newcomers to Canada reside.[38]

Additionally, because of the date of the census, no data about newcomers to Canada within the last five years was available.

2/ Landline Dialing

The survey was administered via random digit dialing of a list of landline telephone numbers within the selected postal codes. The exclusion of adults from households with no landline telephone, or those who exclusively use mobile phones, or those without any type of telephone may have biased the survey against newcomers in each region.

In the last decade, the percentage of Canadian households with landlines steadily decreased as the percentage with mobile phones rapidly increased.[39] Data on newcomers' landline telephone usage were unavailable.

Newcomers to Canada are key adopters of the landline-to-mobile phone transition. One Toronto-based research group found that newcomers to Canada are more likely to use their mobile phones for almost every activity (i.e., messaging, phone or video calls, social media, online banking, video streaming) than the general population.[40]

3.2 Focus Groups – Feedback on hazard messaging from five communities

The purpose of the focus groups was to better understand perceptions of and preferences for natural hazard preparedness communications across the five focus demographics and to research ways that organizations might foster inclusive disaster risk reduction and preparedness for these audiences.

A focus group is a research technique that involves assembling a group of demographically similar people to participate in a guided discussion, during which the researcher gathers data based on group interactions and individuals' comments about the research topic.

During the focus group, participants were asked questions about how, and from whom, they prefer to receive emergency preparedness-related messaging, what barriers they experience in accessing this kind of messaging, and what they think would help to achieve community resilience to natural hazards. The focus group participants also reviewed existing communication assets about floods, wildfires and earthquakes; they then provided feedback on how informative the asset was and whether it would motivate them to take preparedness actions.

COMMUNICATION ASSETS

A total of 11 assets were tested, with six assets tested per focus group. The choice of assets selected for testing depended on the Risk Group in which the focus group was being conducted. Assets were developed by the Red Cross, FireSmart Canada, the BC Earthquake Alliance, and Public Safety Canada. For a complete list of these assets, see Appendix 2.

FOCUS GROUP PARTICIPANTS

We conducted seven online focus groups with 29 people living in five regions, including Ottawa, ON, Renfrew County, ON, Richmond, BC, Thompson, MB and the Bay St. George area of Newfoundland. The focus groups allowed for representation from several demographics of interest as identified by the Red Cross.

Each focus group had three to eight participants. The ideal number of participants for a focus group in social science research is between six and eight people. However,

most researchers assert that online focus groups should include fewer participants than face-to-face focus groups (three-to-five for synchronous online focus groups) to maintain a natural flow of conversation, encourage dialogue between participants, and ensure that all information can be covered.[41, 42, 43]

A summary of focus group participants is highlighted in Table 4.

Region	Risk Group Flood, Wildfire, and/or Earthquake	Number of Participants	Demographics				
			Gender	Older Adults	People with Low Income	Newcomers to Canada	Indigenous People
Ottawa, ON	Flood, Earthquake	8	women	0 (ages 18-54)	3*	7	0
Ottawa, ON	Flood, Earthquake	4	men	0 (ages 25-44)	1*	2	2
Renfrew, ON	Flood, Wildfire	3	women	0 (ages 45-64)	1	0	0
Newfoundland (Stephenville – Flat Bay – Port-au-Port – St. George)	Flood, Wildfire	3	women (1) and men (2)	3	1*	0	0
Thompson, MB	Flood, Wildfire	3	women	3	0	0	0
Richmond, BC	Flood, Earthquake	4	men	0 (ages 18-44)	1	4	0
All Canada (Ottawa, ON Richmond, BC, Newfoundland)	Flood, Wildfire, Earthquake	4	women (3) and men (1)	10	0	0	1
TOTAL	**N/A**	**29**	**18 women 11 men**	**10**	**7**	**13**	**3**

Table 4. Summary of focus group participants

***Income status disclosure was voluntary.** Some participants in this group did not disclose their household income.

3.3 Interviews – Conversations with newcomers to Canada

Based on low levels of participation by newcomers to Canada during the survey phase of the study (people who arrived in Canada under five years prior), the research team determined the need to further engage with this population in a different way to solicit insights.

The content of these interviews was thus similar to the survey in order to imbed redundancy into the study design. In other words, the interview sought to gain insight into newcomers' levels of natural hazard awareness and preparedness, as well as explore their social networks, relationships and preferences for natural hazard information sources. Unlike the initial survey questions, however, the interview questions were mostly open-ended to facilitate an open conversation.

Nine interviews were conducted with newcomers to Canada in each of the three communities: Ottawa, ON, Thompson, MB and Richmond, BC. These communities were selected since they have the largest proportion of newcomers to Canada in the study and the greatest balance across the three hazards of interest in the study sample.[44] A summary of interview participants is shown in Table 5.

Region	Risk Group	Number of Participants	Demographics		
			Gender	People with Low Income	Housing status
Ottawa, ON	Flood, Earthquake	4	2 men 2 women	3*	3 tenants 1 homeowner
Thompson, MB	Flood, Wildfire	1	1 woman	0	1 tenant
Richmond, BC	Flood, Earthquake	4	2 men 2 women	3	4 tenants

Table 5. Summary of Interview Participants

4.0 FINDINGS & DISCUSSION

Pathways to Building Awareness and Preparedness Among At-Risk Populations in Canada

Overall, differences between the demographic groups included in the study were minor. In the sections below, we highlight where differences between demographic groups pointed to interesting considerations.

Please note: While statistically generalizable insights can be drawn from the survey, the focus groups were designed to generate qualitative feedback on emergency preparedness communications. The design and very small sample sizes mean that focus group insights are to be used as starting points for further exploration, not as generalizations.

4.1 Survey results – What we heard

NATURAL HAZARD RISK PERCEPTION:

- Close to one in five (17%) of those in the Flood Risk Group say their home has been affected by a flood in the past. The result was the same for the Earthquake Risk Group—close to one in five (17%) respondents say their home has been affected by an earthquake.
- 5% of those in the Wildfire Risk Group say their home has been affected by a wildfire. In Thompson, MB wildfire experience is substantially higher at 17%.
- Respondents' perceived risk of natural hazards is highest for flooding, with 41% of respondents rating this hazard a high or moderate risk where they live, followed by wildfires (34%), and earthquakes (24%).
- Minor differences (ranging from 39% to 48%) in respondents' overall concern about natural hazards and their perception of risks can largely be attributed to geography more so than to demographic group.

> Respondents' overall concern about natural hazards was limited, with just 45% ranking their concern as "very" or "somewhat concerned."

- Natural hazards are the top concern compared to finances, housing affordability, or crime and security, except in Thompson, MB, where it is the latter. However, few participants were concerned that their homes would be affected.

		Women %	Men %	Older Adults %	Indigenous People %	People with Low Income %	Newcomers to Canada %
Very Concerned		12	10	12	13	12	0
Somewhat Concerned		36	29	34	27	31	44
Perceived high / moderate risk	Flood	43	38	37	44	38	44
	Wildfire	35	33	31	37	33	11
	Earthquakes	24	23	29	6	18	33

Table 6. Results from a question about participant concern and risk perception about natural hazards like floods, earthquakes, or wildfires damaging their home.

Participant levels of concern for natural hazards were comparable across demographic group, with the exception of New Canadians.

NATURAL HAZARD RISKS PREPAREDNESS:

Most respondents (57%) have spent no time at all preparing for an emergency in the past year.

- While most respondents have not prepared for an emergency recently, a majority have put together a first aid kit (70%) and a list of emergency contact numbers (57%). People may have undertaken these actions for reasons unrelated to emergency preparedness (e.g., basic household safety, recreational activities, childcare, etc.).
- By comparison, few survey respondents report having made specific emergency-related preparations. Less than half say they have an emergency kit, and only one in three reports creating an emergency exit/evacuation plan, designating a meeting place, or storing a three-day supply of food.
- Among the 23% of survey participants who sought out information about natural hazards, the most common sources are the Internet (45%) or government websites (20%).
- Survey respondents with low incomes spend less time on emergency preparations than the four other demographic groups in the study and are less likely to have stockpiled three days' worth of supplies. Along with older adults, they are also less likely to have prepared first aid kit supplies.
- Survey participants in the Earthquake Risk Group are more likely to report risk-specific mitigation efforts than those in the Flood or Wildfire Risk Groups. This group is also more likely to spend time preparing for emergencies in general and more likely to indicate that they have assembled a three-day supply kit.

- Most respondents (80%) could not identify any specific challenges that make it difficult for them to prepare for emergency situations. Barriers related to age, health, or disability were mentioned by 6%, while awareness was noted as a barrier by only 5%.

INFORMATION AND MESSAGING:

23% of survey respondents say they have looked for information about natural hazards over the past year. Of those who have sought out information about natural hazards, general Internet sources and government websites are preferred.

Preferred Communication Channels

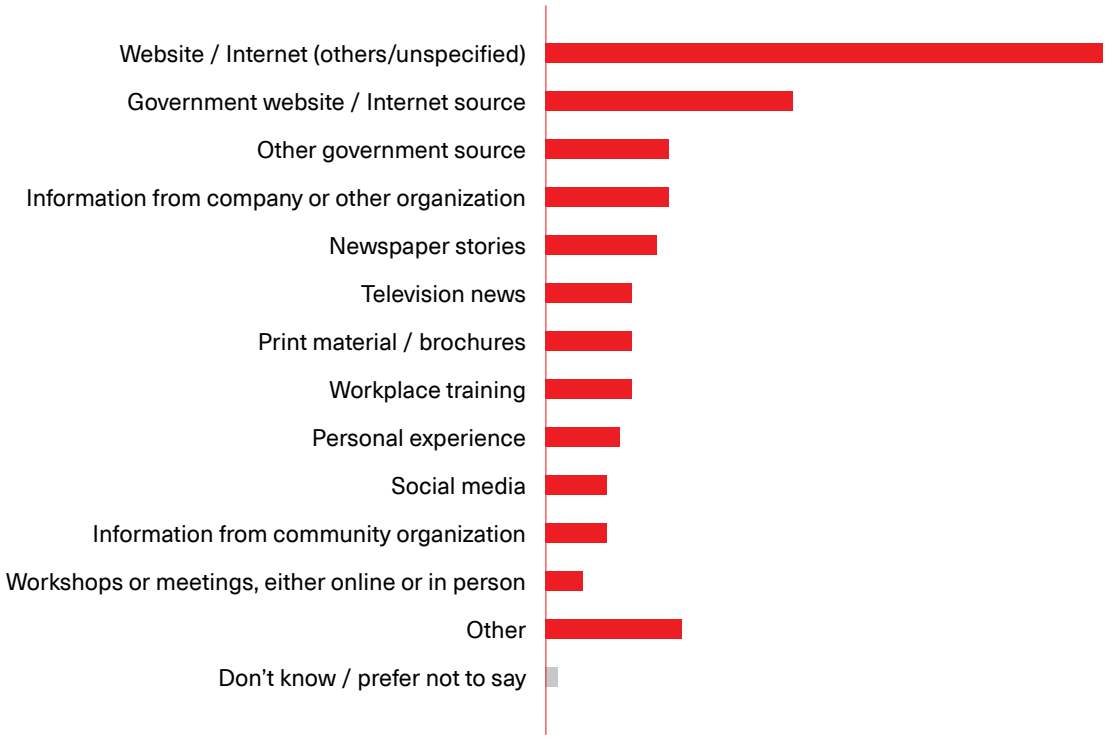

Figure 6. Preferred communication channels for preparedness information according to survey respondents.

- People with low income are notably less likely to look for information.

SOCIAL NETWORKS AND SELF-EFFICACY:

- One in three respondents (32%) report that they are very confident in their ability to handle an emergency situation, and half (50%) have many people they can turn to for help.

- Women (79%) have lower confidence than men (91%) in their ability to handle an emergency situation; however, women (55%) are more likely to report that they have many people they can turn to in an emergency than men (45%).
- Indigenous respondents report strong confidence in their ability to handle an emergency (86%) and are most likely to say they have many people they can turn to for help (68%)

4.2 Focus Group results – What we heard

Although percentages are used to report some findings from Zoom polls at the start of each session, these focus group results are not statistically generalizable. The purpose of the focus groups was to generate qualitative insights to build upon the preceding quantitative survey.

- 17% of participants have been personally affected by floods, 14% by wildfires and 3% by earthquakes.
- While natural hazards are the top concern compared to finances, housing affordability or crime, only 34% of participants rated it as a top concern. Concern about crime in Thompson, MB is higher than in all other regions.
- Emergency preparedness was ranked as *"very important"* for most people.
- Most people talk about floods, wildfires and earthquakes seasonally.
- People's most preferred communication channel for emergency response information is mail and social media. Several people mentioned that they would expect to see preparedness information in the form of advertisements on social media, such as ads on Facebook and YouTube. Further detail of these preferences is illustrated in Figure 7 while Figure 8 shows focus group participants' communication channel preferences by demographic.
- Municipal/local government was the most preferred choice for sources of emergency preparedness information, followed by other levels of government (which includes responses that read *"the government," "government,"* or *"government organizations/agencies"*) and the *"Red Cross."* The majority of the people who listed the "Red Cross" were newcomers to Canada. In reference to wildfire response, one participant noted, *"This is the government's responsibility, so I would like to get this information from government."*

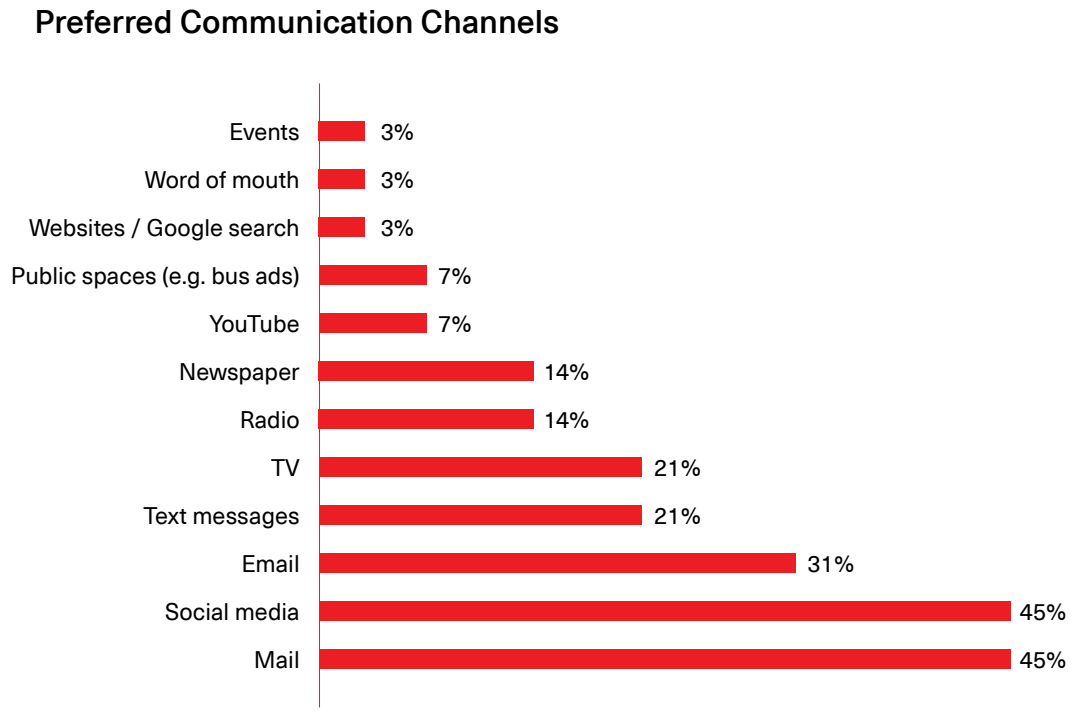

Figure 7. Preferred communication channels for preparedness information listed by focus group participants (n=29).

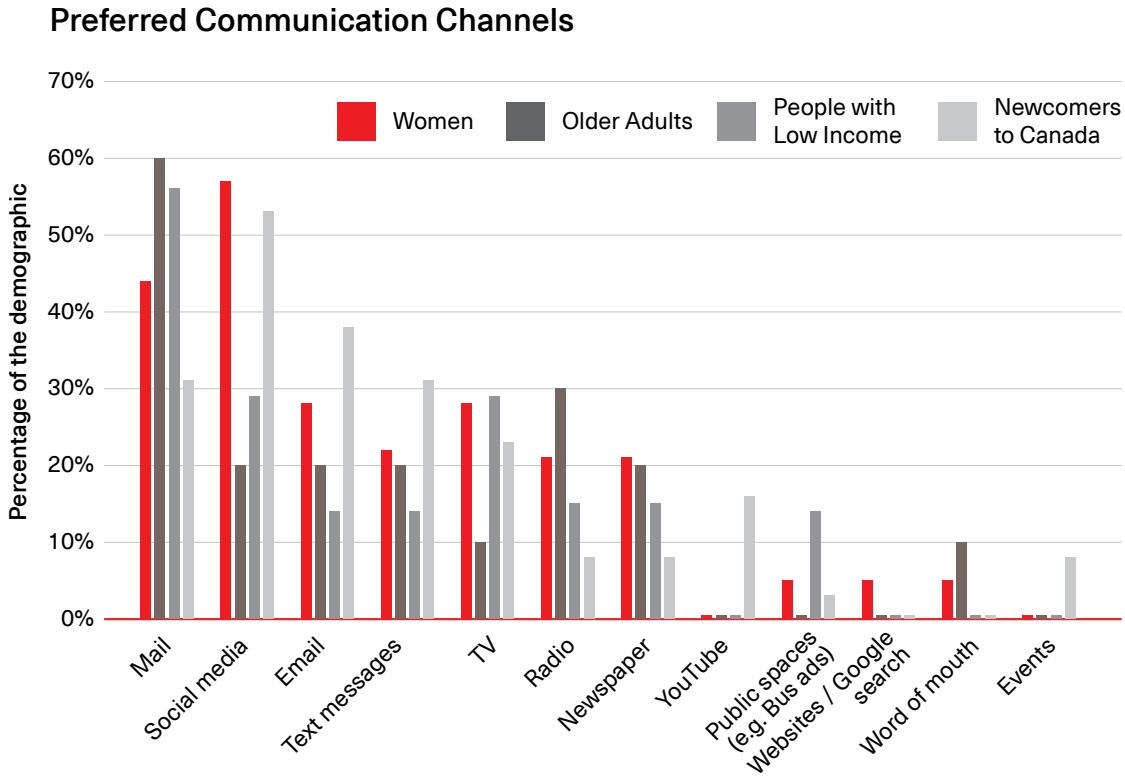

Figure 8. Preferred communication channels for preparedness information by focus group demographic (n=29).

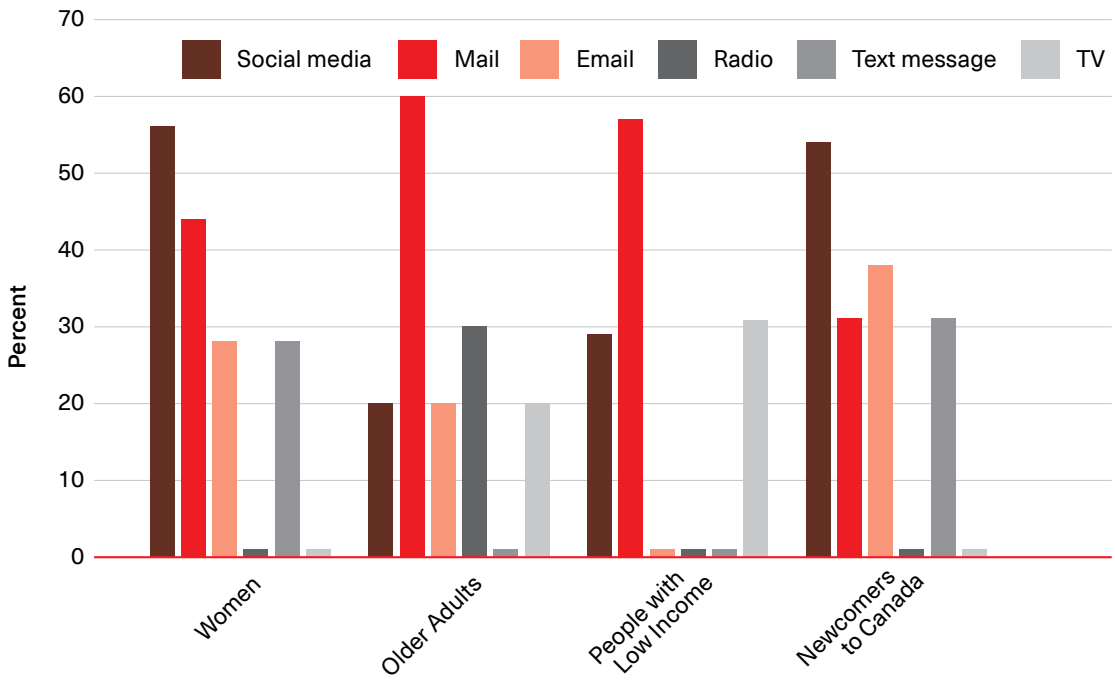

Figure 9: Top communication channel preferences by focus group demographic (n=29)

Focus group participants were asked to name up to three communication channels by which they prefer to receive emergency messaging. Figure 8 shows these preferences within each demographic group. As such, the percentage refers to the proportion of a demographic group that prefers that particular channel for emergency communications; it does not show the preferences of each demographic compared with the total focus group sample. For example, 56% of women across all focus groups prefer to receive communications by social media, whereas only 20% of the older adults who participated felt the same way.

Figure 9 shows the top communication channel preferences by demographic group, once again represented as the proportion of the demographic group. Since participants can belong to multiple demographics (e.g., a newcomer woman with low income) *and* since they could select one to three preferred communication channels, the preferences of some focus group participants are overrepresented compared to others.

The greatest barrier to preparedness: *"It won't happen to me"*, *"I know I should, but I haven't"*

- The greatest barrier to preparedness was denial and indifference. That is, the belief that one will not be personally affected by a natural hazard(s) in one's region due to a lack of risk perception and/or misperception about the hazard(s) Cost was the second greatest barrier to preparedness identified in the focus groups, and all of those who listed this barrier were from low-income households.
- Awareness of the natural hazard risk(s) and how to prepare for them was the third greatest barrier to preparedness among participants.

Overcoming the three obstacles—denial and indifference, financial barriers and awareness—to natural hazard preparedness requires the following:

- ☐ Improved preparedness communications/information. Participants expressed a need for increasing awareness through general communication, requesting *"more frequent preparedness messages," "monthly newsletter or blog with suggestions for inspiration or preparation," "accessible resources like a magnet for your fridge,"* and *"more available information."*
- ☐ Better education about risks. Participants recommended increasing their awareness through education initiatives, like community workshops and education in schools. Two participants mentioned that their children learn about emergency preparedness in their school curriculum. Other participants suggested, *"maybe having free webinars and events from the community centres to spread awareness," "maybe community meetings for your area,"* and *"educating people on what they need to do beforehand."*
- ☐ Increased financial resources. All participants with low income voiced concern for this barrier, offering statements such as, *"being able to put money away for this," "government can chip in," "more financial literacy," "maybe a subscription service to lower one-time financial costs,"* and *"affordable standard emergency kit."*

The more highly favoured assets shown in focus groups were handouts with checklists and how-to guides as well as short, well-paced videos in which real people (as opposed to cartoons) perform preparedness actions. Calls to action were also preferred.

The message:

- People prefer **practical and actionable messages** (e.g., *"not trying to cram too much in," "short and sweet"*, *"to the point"*).
  - A particularly text-heavy asset was met with one respondent saying, *"I would scroll past."* (Note that this comment also suggests the assumption that the person is getting their information online.)
  - Written instructions for how to create an emergency kit, for instance, were specifically requested.
  - One participant said, *"I like the flood checklist and emergency kit listings.... There were actions identified which are very useful."*
- **Since most people are unaware of their risk(s) and have not experienced a natural hazard personally, simply explaining the existence of natural hazard risks from floods, wildfires and/or earthquakes is helpful.** One respondent stated, *"my main concern is that having all this info available is of no value in the face of denial. I wonder if more testimonials from those who have been impacted by earthquake might add to this info."* Another participant admitted, *"I'm not going to take action unless there's a threat in my community. I wouldn't feel any reason to go to that [an asset's] website."*
- Similarly, for the **#FloodReady infographic**, there were **calls for assets that consider living arrangements beyond single-family houses**. One person asked, *"how does this affect people living in apartments? I think that's the main demographic [in my city]."*
- One participant with low income communicated that it would be **helpful to add estimated costs** on those assets that depicted recommendations to better protect a home from flooding. Another person similarly noted that the first aid kits they have come across are too expensive. The Red Cross "Kit on a Budget" video was helpful in conveying an idea of how much it costs to put a first aid kit together.

The messenger:

- People's preferred assets were generally those **developed by the Red Cross**.
- **Participants said they prefer to receive information from the government and the Red Cross**, with some people using the words "trust" and "credible" when referring to both. One individual noted that they liked that the Red Cross

representative in the video asset was wearing a Red Cross vest and found that added to the credibility of the message, and an older adult mentioned their long history of associating the Red Cross with emergency preparedness: "for our generation…Red Cross was a big influence in our lives for emergency preparedness."

- **Diverse speakers were desired**. In response to a Red Cross video in which an older white man provided the information, one respondent stated: "My first reaction is that I have listened to enough white male advice. How about a woman of colour? A variety of speakers might work instead of one older white male."
- Besides the Red Cross and government bodies, people mentioned **other sources** from whom they would like to receive emergency preparedness assets, including their **children's schools**, their **workplaces** and their **insurance companies**. One respondent added, "like previously mentioned, insurance company is a good one. Imagine an insurance company advertisement says, 'emergency kit can lower your premiums.'"

HOW TO CONVEY THOSE KEY MESSAGES:

- **Multiple formats that can be easily shared**. Video assets should be accompanied by a link or an app so people can find more resources and share links and information with others.

Participants enjoyed colourful assets and found text-heavy materials with few colours to be "boring."

- **Preference for eye-catching mail, mainly by older adults**
  - **Older adults** make up nearly half (46%) of the group who expressed a preference for mail. In focus groups, older adults raised concerns about the inability to rely on the internet in the event of an emergency, as well as not having social media accounts. One older adult cautioned, "Don't depend on social media because not everyone has it."
  - **Visuals**: Focus group participants who expressed a preference for mail also highly favoured **clear, eye-catching materials that can be made permanent fixtures in their home**, such as fridge magnets or materials that can be hung up on a wall or door. One respondent noted, "Snail mail that can be posted on fridge gives the visual reminder and opportunity to re-examine materials multiple times."

Participants spoke about the efficacy of a certain "fear factor"—assets that instilled a sense of fear and conveyed a sense of urgency.

- Make videos personal or relatable by showing real-life depictions of floods, wildfires and/or earthquakes. One participant asked, *"What flood would look like because [I] haven't experienced. Could show images?"* And another noted, *"I also prefer the scenario based images... it's a very good reminder... we tend to forget this things [sic] as well"*

- For participants to be willing to act on the hazard risk, they need to be able to relate to the information. In reference to a flood-themed infographic, one participant typed in the online chat, "It does not encourage me to take action because it doesn't [sic] appear to affect me. it could be made more applicable to my situation." In response to another asset, one participant noted "[my city] is flat, there is no natural slope, so this is not applicable."
- **People's preferred communication channels through which to receive emergency preparedness assets depends on the format:**
  - If the asset is a **video**, they would prefer to view it on **YouTube and social media** (e.g. Twitter, TikTok, Facebook).
  - If it is a **brochure**, they would largely prefer to receive it by **mail or posted in a place they frequent** (i.e., their workplace).
  - Except for older adults' preference for mail, no notable trends in demographics were identified in regard to which communication channels each group of participants wanted to receive these kinds of assets, whether social media, television, mail, email, or newspapers.

VISIONING EXERCISE: COMMUNITY RESILIENCE TO HAZARD EVENTS

When participants were asked to brainstorm about what community resilience in the face of a natural hazard event might look like and how it can be achieved, the theme of "knowing one's neighbour" emerged.

In a brainstorming activity, participants discussed how the theme of **"knowing one's neighbour"** concerned both who their neighbours are and what their unique needs for emergency preparedness and response might be. The **needs of older adults** featured strongly in the discussion, and one participant also raised the matter of **language considerations** in community-level preparedness messaging. The ensuing conversation about community resilience demonstrated that the characteristics of a resilient neighborhood are highly valued even as some participants assumed it to be idealistic or currently out of reach. Some common responses are as follows:

Plan to Assist Older Adults and Others

- "A needs checklist is essential. Canvas neighbourhoods to locate special needs (wheelchair accessibility, etc.) and have local government provided with information on the essentials to respond to specific situations."
- "Given the point about links not being useful to some seniors, I wonder if this video and the other messages could add something about knowing who might be your senior neighbours who might not be so communications savvy."
- "I would add… some kind of buddy system or something for seniors or others who would not have access to emergency info. There are older adults who maybe shouldn't be living on their own and still are. So how are their needs considered… [and] who is responsible for monitoring them?"

Role play to prepare

- "I would also like a plan for community level where there is a team that has different roles to play in disasters."
- "How can people be more involved [in emergency awareness and preparedness] is to have a mock [disaster simulation] day, 'Today we're having an earthquake. Today we're having a flood.' You've got to come in your roles now."
- "Maybe have checkpoints or a big group to check in on each other, maybe if we knew more about each other and who may need priority help (for example elderly, those with disabilities, etc.)"
- "I can invite my nearby neighbours and my co-operative community to meet to discuss and share info with each other."

Tailor communications

- "Over 70% of the population here in North Manitoba is of Indigenous, Inuit ancestry so anything that you do by way of communication, you need to make sure that you're engaging, and these folks understand."

One older adult participant noted that his neighbourhood has changed such that he no longer knows his neighbours and would not feel comfortable asking them for assistance with emergency preparedness and/or response.

During the visioning exercise, several participants brought up local authorities and agencies that can (and in some cases, already do) play a role in building community resilience. Still, most participants were focussed on the actions of individuals and neighbours, (e.g., "Increased individual advocacy. Not having to wait for institutions to show up. Being a helper.") rather than institutions, with the exception of responses such as the following:

Local government

- "Town council should be bringing this [preparedness information] to our attention."
- "Local elected representatives should take a lead and hold community meetings to seek inputs."
- "[I check] my local government's disaster resilience resources"
- Coordinated, regularly scheduled efforts: "All the public institutions and community groups should be encouraged to have a [emergency] plan and sort of share and cross-pollinate."
- "I feel [disaster resilience] should be a cooperative effort with local government whereby community volunteers meet quarterly to develop local initiatives (awareness, evacuation plans, etc.)."
- "Insurance companies and local governments would be the two things [to increase community knowledge of natural hazard preparedness.]"
- "Outdoor Education courses at local colleges that integrate emergency response and preparedness."
- "Information from school districts."
- "Workplace emergency plans."

4.3 Newcomer Interview Results – What we heard

Do you think you might experience a flood, wildfire, or earthquake where you currently live?
(n=9)

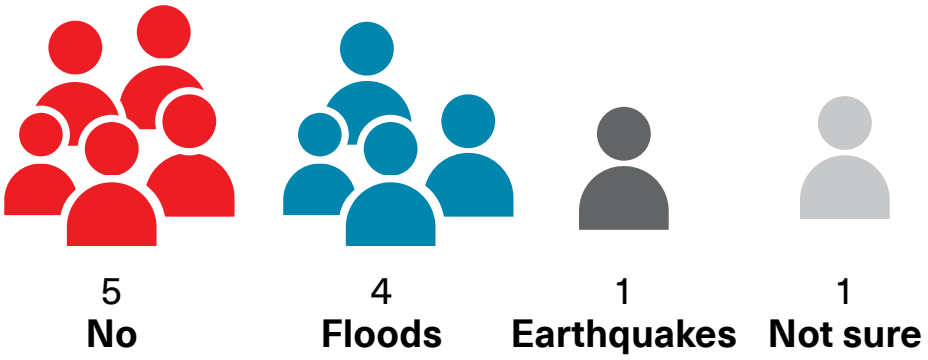

Figure 10. Do you think you might experience a flood, wildfire, or earthquake where you currently live?

Most newcomers (55%) do not think they will experience a natural hazard where they currently live. Despite the fact that all participants belong to the Flood Risk Group, only 44% of participants think they might experience a flood. In conversation, however, it became clear that many newcomers are aware of the existence of natural hazard risks that occur where they live—they simply do not feel that they will be personally affected. "We do hear about, like, the fires, but they are not in my area. They are nearby, though," said one participant who belonged to the Wildfire Risk Group.

In reference to living on a floodplain, one participant explained the history of flooding in their area: "So, my house now is built on this area. It's a new house, but they told me before they built this house, it's not a good area to live." The participant conveyed their certainty that floods would no longer pose a threat due to changes made during the construction of their neighbourhood: "I think now they've prepared everything, nothing to worry about."

> Unlike in the survey findings, interview participants did not show a heightened sense of risk perception for their local risks. Some do not know about those hazards at all.

One participant assumed that government regulation would prohibit development in floodplains, which is not the case where historical development has already occurred: "It never came up to my mind, actually. I always thought there will be some kind of regulations to protect people from making houses in these areas prone to these disasters, but I never actually thought about looking about how bad will this be if I am living in this place."

Most newcomers would look for information about preparing for a flood, wildfire or earthquake on websites (unspecified) and through Google searches (67%)

When asked where they would look for information about preparing for a flood, wildfire or earthquake, newcomers to Canada name the internet as their top information source, but few could point to specific organizations that might distribute such information. Indeed, as shown in Figure 11, not only do participants list unspecified websites as their source of information, but they would also prefer preparedness information to come from an unspecified level of government. The majority of participants would prefer to receive preparedness information from "government" or "the government."

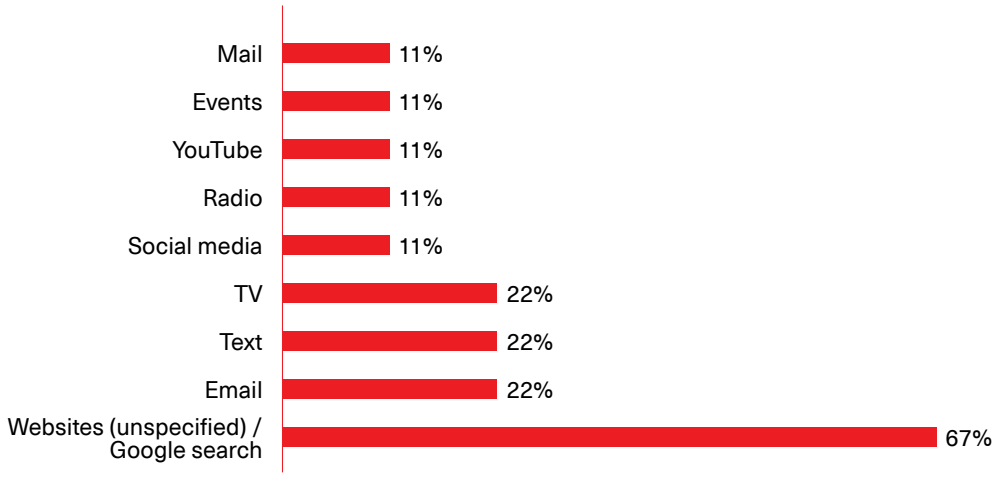

Figure 11. Preferred communication channels for preparedness information listed by interview participants.

One participant indicated that since moving to Canada, they continue to use the same sources of information to learn about local issues as they did before immigrating, which suggests that they have not encountered any agencies or local organizations that might be able to provide region-specific, disaster-related knowledge or assistance: "I never come to here before I immigrate to here, you know. I never come to North America before I move to here so everything for me is from internet or from the government or something like that—or from YouTube."

Many newcomers commented on their heavy dependence on cellphones, (e.g., "I use my phone for everything," "It's always in hand"), which may explain their preference for online sources.

No participants could recall seeing or receiving any recent messages about helping them prepare for a flood, wildfire, or earthquake. They can recall texts and news alerts about other, ongoing emergencies, but not those relating to preparedness.

> "Well, I usually get some messages, like a warning for severe weather conditions, like strong wind or things like that, I usually get them by message, by phone message. And that's usually my only source of information for preparing."

When asked about the information they would ideally like to have included in preparedness messaging, many pointed to a desire for simple, actionable steps they should take to prepare, including listing necessary items to assemble for an emergency kit.

One participant wanted a "Top 10" list of basic items and actions to prepare for an emergency: "Some basic stuff I need to prepare during an emergency, maybe a top 10. Because, you know, so many advise [sic] what you need to prepare, but if the information will be good for me, it's the top 10 emergency items you have to keep at your home."

That same participant expressed their experience with language barriers when receiving information from public entities: "I can communicate with you, but somehow when I listen some news from CBC Vancouver or something like that, sometimes I have to retrieve from the dictionary to understand, you know, the Canadian use, the English style. So if the English is more, you know, user-friendly to people who are not very native in English, it will be better."

Similarly, another participant noted that their ability to understand and to act on preparedness information would be helped by receiving a few clear steps for emergency preparedness: "I can understand English, but especially if it's something short and brief. So this is why I asked, if they can send us what to do... One, two, three, four, very clear."

One participant expressed interest in knowing safe locations and contacts who would help in an emergency situation: "I would like to prefer, like, having information about possible safe places to go to in case of emergency."

While the majority of interviewees (89%) have not taken any specific actions to prepare for a flood, wildfire, or earthquake, some interview participants, as in the survey, have implemented a number of general emergency preparations in the home (e.g., installing smoke detectors, having extra blankets in the event of a power outage).

The top barrier to the emergency preparedness of many (67%) newcomers to Canada was a lack of awareness. This includes not knowing their own risk, nor what to do in the event of an emergency, nor where to find information, nor how to prepare.

As one respondent admitted, "maybe because I don't know what to do, what to prepare, maybe because I think I'm already prepared. I don't know."

Denial/indifference was listed by nearly half (44%) of participants. That is, these participants know about natural hazards in their local area but do not feel that they themselves will be affected.

"Maybe it's a kind of comfort zone I have in my mind: it's not going to happen here. But you never know, right?" reasoned one participant.

Another participant rationalized their lack of preparedness by weighing their perceived lack of natural hazard risk against their motivation to prepare: "there's nothing motivating—there's no incentive—I guess, or it doesn't seem like there's a big reason to, I don't know how likely it is."

22% of respondents listed cost and no time/having other priorities as barriers to becoming more prepared for natural hazards.

The cost associated with preparedness items and actions is not worth one participant's perceived low risk of natural hazards: "if the costs build up then it would be a disincentive to prepare, if it doesn't seem likely," they said.

Another participant was open to making emergency preparations, but it would involve shopping around for the most affordable options: "I will do some search on the internet to see where is the cheapest to buy for me for my family because we are new to here and, yeah, we have to spend wisely, you know. It's very expensive now in Canada I can tell you, more than I think."

One participant listed having other priorities and a lack of awareness as their top two barriers: "I mean the most [sic] reason is procrastination, I always put it the very least priority. And the second stuff is I really can say I don't know where to buy and I don't know what items is [sic] the most important."

Similarly, another participant listed dual barriers of indifference and not having enough time: "I think a lot about it, but then when getting busy with office work or things like those, these things take a back seat... And then in the evening there is always a long list of things to do... Other than that, you know, it's just complacency, nothing else."

As in the focus groups, one participant brought up the physical barriers associated with responding to an emergency in an apartment dwelling: "One time... my mom, she was visiting from India. And she had arthritis. The fire alarm started and then we can't take the elevator, so we need to take the stairs to go down. It was kind of troublesome for my mom, especially, to go down from 19th floor till the ground floor. And when we went there, we realised it was like kind of false alarm... And it was not a good

experience.... Those who are at a higher rise than us, how they would be going down [sic], I don't know."

911 was reported as the top source of emergency response assistance for most (67%) newcomers to Canada. Thus, newcomers to Canada not only seem to have a heightened sense of the government's responsibility for emergency preparedness — as indicated by naming government as their preferred source of emergency preparedness information — but they also cite the government as their preference for direct emergency response over friends, family or neighbours. These responses highlight a common perception that the government should be their primary source of assistance in emergencies.

No newcomers to Canada reported having individuals or someone to turn to for help in the event of a natural hazard-related emergency. Instead, they could only point to institutions (i.e., government agencies) or emergency services (i.e., 911-dialing) for expected assistance.

One participant stated that they would seek help from public agencies and by dialling 311. Several participants noted that they do not have many friends or family in their area or in the country.

When prompted to elaborate, two newcomer women listed their neighbours as potential supports. However, both assumed that neighbours are limited in their capacity to help in the same way they are.

"If we are living in the same town, so I would say we all in the same boat," one participant stated. "There will be a moral support there, but not practically."

The other participant noted, "Because if here have [sic] earthquake, fire, because most of my friends live [near me], they are also suffering so I don't call them. Maybe I will call 911 and – yeah. I can't think of anybody I can call to help, no."

4.4 Discussion

AWARENESS AND RISK PERCEPTION

Relatively few people in the regions selected for this study report having personally experienced these risks, despite the region being at elevated risk of natural hazard events. Awareness and perceptions of natural hazard risks are generally low. Less than half of survey (45%) and focus group (34%) participants are "somewhat" or "very concerned" about natural hazards, and only some (44%) interview participants believe they will experience a natural hazard(s) where they live.

The survey findings indicate that the minor differences in awareness and preparedness appear to be more related to geography than to demographics. That is, no significant differences in risk perceptions and awareness emerged between the five demographic groups in the survey, as illustrated in Table 6.

However, the interview research revealed that only 25% of newcomers to Canada from Richmond and no newcomers to Canada from Ottawa said they expect to be affected by an earthquake.

Therefore, we suspect that the low levels of participation by newcomers to Canada in the survey might have failed to detect the apparent differences in newcomers to Canada's risk awareness and perception of earthquakes that were subsequently revealed in interviews. Indeed, people's familiarity with the local environment and dominant language proficiency have been shown to influence disaster awareness, which may be relevant to some of the newcomers to Canada in the interview sample.[22, 25]

Some studies in the literature report a positive relationship between prior hazard experience, risk perception and preparedness; that relationship is indirect though, and it is mediated by social and environmental factors such as age, time, and the severity of the event.[45, 46, 47, 48] As such, any direct influence between these three factors remains ambiguous. A 2020 Canadian survey, for example, found that risk awareness was higher among those with past natural hazards experience; even so, only 20% of these Canadians were prepared for natural hazard(s). Relative to all Canadians, though, experienced Canadians' natural hazard preparedness rates are high--nearly double the national average (11%).[5] We contribute to the mixed findings on this relationship, as outlined in our analysis: the reasons for the mismatch between perceived and actual risk among the larger survey sample remain unknown and warrants further exploration.

AWARENESS-TO-PREPAREDNESS: PREPAREDNESS AND ASSOCIATED BARRIERS

Survey respondents in the Earthquake Risk Group, particularly in Richmond, BC, are more likely to spend time preparing for emergencies in general and are more likely to indicate that they have assembled a three-day supply kit. The results are echoed in the 2014 Survey of Emergency Preparedness and Resilience in Canada, where emergency planning activities were most common in British Columbia.[31]

The fact that residents of Richmond were significantly more concerned about earthquakes than others in the Earthquake Risk Group and that they expressed the highest concern about all three natural hazards (61%) in the survey suggests a more widespread culture of natural hazard risk awareness and preparedness in this region of the country.

When this concern was explored in the interviews, however, it became apparent that this culture of awareness and preparedness does not extend to everyone. Newcomers to Canada were largely (89%) unprepared for any natural hazard risks, including those residing in British Columbia—none of whom had taken steps to prepare.

"Awareness" (i.e., knowing one's risk, what to do in the event of an emergency, where to find information and how to prepare) was the greatest barrier to preparedness identified by newcomers to Canada. In a 2009 study, recent immigrants to Canada self-identified that their lack of proficiency in the local dominant language and lack of community cohesiveness impedes their ability to become prepared for emergencies.[25] The findings from that study might relate to the interviewees' identified "Awareness" barrier given that the language-proficiency factor limits immigrants' ability to access essential information and services; moreover, the lack-of-community-cohesiveness factor may lead to isolation and a lack of support.[25] Several newcomers to Canada interviewees noted that their degree of awareness could be improved if they were told explicitly what to do in the event of an emergency, where to get items to prepare, and how to use and/install those items.

Additionally, the barrier of "No time/having other priorities" was identified more often in the interviews with newcomers to Canada than in the surveys and focus groups, which suggests that newcomers have other demands on their time and resources that compete with emergency preparedness activities. This feedback corresponds to a Canadian study on immigrant's disaster preparedness by Yong et al. (2017) that describes the process of integrating to a new country involving a large adjustment of time, resources and emotional labour. Yong et al. identified these circumstances using the term "immigrant condition," which can then negatively affect immigrants' risk perception and disaster preparedness.[24]

Survey respondents who identified as having low income spend significantly less time on emergency preparedness than other populations. They are also less likely to have first aid kits or a three-day supply kit. These findings are also reflected in the 2014 Survey of Emergency Preparedness and Resilience, in which individuals from lower-income households were less likely to have engaged in emergency preparedness behaviours.[32] In the focus groups, participants with low income exclusively identified cost as a barrier to preparing for natural hazards. Thus, the real and/or perceived cost of preparing for natural hazards presents an obstacle for those living in low-income households, a finding that is also evident in the literature.[9, 22, 23]

Similarly, older adults were less likely to have assembled first aid kits. This finding raises concern given that 80% of older adults have one or more chronic health conditions that require medication and/or medical equipment; in the event of an

emergency, their first aid kit should include medication and other essential health equipment.[21] General emergency preparedness was ranked as 'highly important' for most focus group participants, but the focus group did not explore the specific preparedness actions undertaken by participants. In the survey, however, most participants (57%) indicated that they had spent no time at all preparing for an emergency in the past year.

Though participants with low income and newcomers to Canada experience specific barriers, the overall findings from the focus groups and interviews are not dissimilar from the top barriers/challenges to creating an emergency plan that were identified by British Columbians in a provincial survey: personal laziness, lack of knowledge and lack of time.[8] Matching language with this study, "laziness" could perhaps fit into the "Denial/indifference" or "Other priorities" categories and "lack of knowledge" with the "awareness" category.

It is worth noting that the focus group and interview results are inconsistent with the survey, in which most respondents (80%) could not identify any specific challenges that make it difficult for them to prepare for emergency situations. Given that only one question in the survey addressed potential barriers to preparedness in the survey and that its structure was less conversational than the focus groups and interviews, the apparent lack of barriers identified by survey respondents could be a product of the format of this research activity rather than an absence of actual barriers.

INFORMATION AND MESSAGING

Most people (59%) in the focus groups were unfamiliar with public service campaigns providing information on preparing for floods, wildfires and earthquakes. No newcomers to Canada could recall recent messages about helping them prepare for one of these three natural hazards.

> Campaigns and public officials and organizations involved in natural hazard preparedness are not widely known across the regions and population groups in this study.

People most frequently named "the government" as their preferred source of emergency preparedness information. This is unsurprising, given that the Canadian public has previously expressed opinions that the government is responsible for disaster management and that all levels of government are credible sources of information and resources on emergency preparedness.[24, 32]

Still, newcomers to Canada were disproportionately represented in the preference for information from the "the government" (93% of this response came from newcomers); this result is similar to a Canadian study that found that government officials were the most trusted sources of emergency information for recent immigrants, followed by the media and then the Red Cross.[25] In the focus groups, participants' third top source of preferred emergency preparedness information was also the Red Cross, and the majority of the participants who provided this answer

are newcomers to Canada. In the interviews, 911 was reported as the top source of emergency response assistance for most (67%) newcomers to Canada, which aligns with the results of the SEPR, in which 911 was the most likely source of initial information and assistance in a weather emergency or natural disaster for recent immigrants (in Canada for <10 years).[32]

A study conducted in the United States speculated that participant responses identifying government as a trusted source of information for emergencies was simply a default answer; that is, immigrants were unaware of any other public entities who are tasked with providing such information: "If it's not the government ... who else?" wondered a Latin American immigrant.[27] However, one recent study in Canada inferred that trust toward Canadian government officials in providing emergency information is associated with the generally positive process of immigration and integration to Canada.[49] Notably, this sense of trust, safety and security imbued by Canadian society may ultimately serve to diminish newcomers to Canada's urgency of emergency planning over time.[49]

Trust is considered to be an essential quality of risk communication; without it, credibility suffers and messaging has little impact.[50] In one study, trust, hope and source credibility were cited as foundational to effective risk communication with older people, people with disabilities, culturally and linguistically diverse populations, families with young children, and people in low-income households.[9]

The preferred communication channels vary from person-to-person. In the focus groups, it was found that all forms are useful for at least one of the communication assets (e.g., email, social media, direct mail, TV commercials). Focus group participants were asked to list up to three forms of communication, and overall, there was an even split between a preference for mail and social media. Figure 6, 7, 8 and 9 in the Results section show a breakdown of the preferred communication channels in each research activity.

Of those who prefer that emergency preparedness information come through social media, over half (54%) were newcomers to Canada. In the interviews, many newcomers commented on their dependence on cellphones (e.g., "I use my phone for everything," "It's always in my hand").

Older adults make up nearly half (46%) of the group who expressed a preference for mail. In focus groups, older adults raised concerns about the inability to rely on the Internet in the event of an emergency, as well as not having social media accounts. In the surveys, significantly more older adults reported having copies of physical documents than any other demographic group.

Those who expressed a preference for mail, including in response to the assets shown in the focus groups, stated that clear, eye-catching resources that can be made permanent fixtures in the home were highly favorable (e.g., "Snail mail that can be posted on fridge gives the visual reminder and opportunity to re-examine materials multiple times").

It should be noted that the composition of media in any given community will contribute to an individual's media preference. For instance, in Thompson, Manitoba one of the most remote communities included in the study, all focus group and interview participants (n=4, women) listed local radio as among their top communication channels for emergency preparedness. As a 2014 survey of Canadians' emergency preparedness found, a person's choice regarding the source of information or the type of assistance they receive in an emergency may vary depending on the type of event, the province where the individual lives and certain socio-demographic characteristics, including age, immigration status, education, household income and previous experience with an emergency.[32] In other words, context matters; risk messages and their mode of delivery should be tailored accordingly, wherever possible.

Across all the focus groups, the most highly favoured assets were those with checklists, how-to guides, and representations of real people performing preparedness actions. People's preferred assets were generally those developed by the Red Cross. Similarly, newcomers to Canada sought clear, actionable information in the form of how-to guides for emergency kit assembly and steps to take in the event of an emergency resulting from floods, wildfires and/or earthquakes.

Furthermore, the kind of information people seek about a given hazard is thought to provide an indication of their motivation to cope with that hazard.[51] Seeking information about a hazard's consequences is thought to be an early phase in the multi-step process of a person deciding to act to reduce their risk; put simply, in asking about their risk exposure, a person is merely appraising the threat.

On the other hand, information about how the hazard may affect a person's circumstances goes a step further, linking the hazard's consequences to themselves. This is thought to lead the person in assessing the available coping options for that hazard.[51] By this measure, the fact that most interview and focus group participants are in search of "how-to" information about managing natural hazard risks implies that they desire diagnostic information about the hazard and are therefore further along the path to preparing for natural hazard events.

SOCIAL NETWORKS AND SELF-EFFICACY

In the survey, women reported lower levels of confidence in their ability to handle an emergency situation than men but are also more likely to report that they have many people they can turn to in an emergency. This suggests that women have more access to others they can turn to, which may mitigate their lower perceived efficacy to handle an emergency. In interviews, newcomer women and men both initially reported that they did not have anyone to turn to for help, but when prompted, more women than men brought up the possibility of contacting neighbours and friends. Still, several interview participants noted that they do not have many friends or family in their area nor in the country.

We detected several similarities here to those found in a Serbian study of flood preparedness, in which women expressed lower levels of self-confidence in their preparedness for a flood event than men.[13] Regarding confidence and trust in

seeking aid following a flood, however, women stated that they would rely on a wide array of actors including family, local organizations, neighbours, places of worship, police activities and humanitarian agencies while men listed fewer actors: the fire department, emergency aid bodies, and themselves. In general, women are reported to be more risk-aware and more focused on risk mitigation and evacuation than men.[10, 11, 12, 13, 14, 15]

From the Indigenous Peoples included in the survey, we found that urban and off-reserve Indigenous respondents report strong confidence in their ability to handle an emergency and are most likely to say they have many people they can turn to for help. It is unclear the degree to which our results can be generalized to existing literature and/or to on-reserve preparedness levels in Canada. [28, 29, 30, 52]

According to a 2014 national survey, Canadian immigrants were shown to be less likely to have large social support networks they could rely on in an emergency.[32] For example, recent immigrants (in Canada for <10 years) were about three times less likely to know their neighbours than more established immigrants (in Canada for >10 years) and people born in Canada.[50] Another Canadian study found that recent immigrants are less likely to live in communities with strong social capital (e.g., social connections); as such, it seems likely that community cohesiveness presents a serious challenge to newcomers to Canada's preparedness.[49]

VISIONS FOR COMMUNITY DISASTER RESILIENCE

Overcoming the economic barriers to disaster preparedness can be helped by building social capital, which is defined as the resources produced through social networks that may be drawn upon by individuals for collective benefit.[53] During the Visioning Exercise of the focus groups, participants recognized the importance of their social connections, noted the collaborations with—and between—institutions, and identified actions that individuals can take. In other words, they expressed a sense of agency. Even so, participants suggested that they have not actually taken steps to work toward building stronger resilience among their friends and neighbours. After all, very few Canadians (2%) report having taken steps to help their community reduce their natural hazard risks.[32] Given the paucity of community-level disaster resilience in Canada, findings from the Visioning Exercise are essential for building momentum at the community level towards disaster preparation activities. The themes identified by participants in the Visioning Exercise for community resilience echo those found in the literature, the key points of which are as follows:

Relationships are the most important levers of emergency preparedness.[54] Studies have found that communities with strong social ties are more resilient since "resilience isn't personal grit; it's the capacity of a neighbourhood or community to respond, mitigate, and adapt to crisis".[55, 56] Disaster preparedness and response programs are also more successful when there is community buy-in or ownership. Organized grassroots efforts may be more successful if they are integrated into the community through neighbourhood associations, schools, workplaces, and other existing organizations.[57] In other words, building stronger partnerships can enhance disaster planning.[58]

Furthermore, alongside individual and household outreach, community-based disaster preparedness is necessary to increase the preparedness of diverse community groups.[59] Research on the effectiveness of the We're Ready! Community Disaster Preparedness workshops in High River, Alberta, compared results from a workshop with the Filipino community, which already had stronger social connections, with results from a workshop with residents who did not know each other well or at all. While the workshops increased social capital, community disaster planning was more effective in the Filipino community because they already had strong social connections, and they were also more motivated to continue building momentum for emergency preparedness with spin-off projects.[60] In summary, a community-based approach to disaster preparedness is especially beneficial since it can leverage existing social connections, strengthen those ties, *and* build out new connections within communities.

4.5 Limitations

GENERALIZABILITY, RELIABILITY AND VALIDITY

The findings from this qualitative research study are not statistically generalizable because of the small sample size of the research participants. However, to ensure construct validity and to increase the ability for thematic generalization, the research team incorporated concepts and research questions from grey literature and academic literature from the field of disaster studies.[61] Indeed, the findings align closely with those found in Canadian studies on general emergency preparedness and natural hazard-specific preparedness as well as an array of international research on vulnerable populations and disasters—all of which supports our thematic generalizations. [5-20, 22-33, 49-58] In other words, similar themes have been found across numerous studies of different population groups and over time.[60]

Nevertheless, in-depth insights into at-risk Canadians' levels of natural hazard risk awareness, preparedness and perspectives are important regardless of the extent of generalizability because they identify existing barriers to individual-, household- and community-level disaster resilience. Knowing these barriers then presents opportunities for addressing them.

Reliability was ensured by clearly demonstrating that the operations of the study (e.g., data collection) can be repeated with similar results.[62] Empirical data were collected from three main data sources: (a) surveys with high-risk participants across five regions of Canada belonging to one or more Risk Group(s); (b) focus groups with high-risk participants across five regions of Canada belonging to one or more Risk Group(s); (c) interviews with newcomers to Canada in three regions of Canada. These three data collection methods also facilitated triangulation (accumulation of data from different sources and/or studies); this is especially important for achieving confidence in the validity of conclusions in disaster studies given the unique methodological challenges of conducting research before, during, and after natural hazard events (e.g., timing of data collection relative to the onset of an emergency event; natural hazards cannot be exactly or ethically replicated, etc.).[62]

This research builds on previous research in the following ways:

- While there are some Canadian studies of high-risk populations and emergency preparedness, the majority of studies to-date have taken place in other countries (ex. Australia, Europe). This research is important for understanding how awareness and preparedness unfold in a Canadian setting for at-risk populations, and the ways that varied geography and regional differences in Canada contribute to levels of, or barriers to, awareness and preparedness.
- This study adds to the limited literature available about preferred sources and channels for emergency preparedness messaging by at-risk populations.
- Previous studies point to a reliance on external parties/authorities for emergency preparedness and management. This study confirms these results and provides further specificity in terms of the type of external resource most preferred or expected (government especially).

5.0 RECOMMENDATIONS

Creating pathways from awareness to preparedness

Awareness and Preparedness

Questions relating to awareness and preparedness were posed during the survey, focus groups and interviews. The research team analyzed responses to these questions to determine the top barriers and drew from the qualitative feedback during the focus groups and interviews to inform the recommendations offered below.

Barrier	Demographic	Context	Recommendation
Awareness – Natural hazard risk(s)	**General**	There appears to be an entrenched belief that natural hazards only occur during some seasons, which is inaccurate in the case of flooding and earthquakes. Certain types of floods are more likely to occur during some seasons (e.g., rainy season which is typically spring and summer, ice jams during spring, etc.). However, other types of floods such as pluvial (surface) flooding can occur during any season. Similarly, earthquakes can strike at any time in seismic hazard zones. Climate change is also increasing flood severity and frequency.	Natural hazard risk preparedness campaigns should coincide with the season in which they are perceived to most likely occur in order to meet the expectations of—and capture the attention of—the greatest number of people. However, messaging should include content that clarifies that floods and earthquakes can occur during any season (e.g., "Any time is a good time for flood risk preparedness"). Reiterating the constant relevance of emergency preparedness to natural hazard risks will help to overcome the two greatest—and simultaneous—barriers to emergency preparedness identified in the focus groups and interviews: 1/ **denial and indifference** perception of, and/or complete lack of perception of one's local natural hazard risk exposure could refer to either denial ("I know it exists, but it won't happen to me") or indifference ("I know it exists, but the risk is so slim/I don't care/I'm not concerned/I haven't thought about it much, etc.); and 2/ **a lack of awareness** (i.e. not knowing one's risk, what to do in the event of an emergency, where to find information, and how to prepare).

Barrier	Demographic	Context	Recommendation
Awareness – Knowledge of preparedness for tenants and/ or different housing types	**Newcomers to Canada, People with Low Income, Older Adults**	There is a lack of resources designed for vertical communities (e.g., apartment dwellers) and for tenants. Though not deliberately addressed in any research activities, four low-income newcomers to Canada spoke of a lack of awareness of emergency response procedures in apartment buildings. Similarly, one participant was unaware of the division of responsibilities between landlords and tenants (14% of survey respondents and 89% of interviewees were renters*). Three newcomers to Canada with low-income mentioned concerns around emergency evacuation in high-rise buildings. **focus group participants were not asked about their property ownership*	The Red Cross should add apartment-friendly and tenant guides to their roster of emergency preparedness assets.
Awareness – Community resources	**Newcomers to Canada**	Newcomers to Canada lack knowledge of community preparedness resources. Only one newcomer had taken steps to prepare for natural hazard risks, and no newcomers could recall interacting with preparedness messaging for a flood, wildfire, or earthquake.	There is an urgent need for communication about preparedness for the first three days following an earthquake, flood, or wildfire in order to increase newcomers' awareness of actions they may need to take. Emergency preparedness organizations should leverage existing community-based resilience programs and assets (e.g., local public health agencies, crisis support hotlines) to provide newcomers with more appropriate information for emergency preparedness, response assistance and support.
	Newcomers to Canada, People with Low Income, Older Adults	To reach specific demographics, outreach can be done in collaboration with local-level institutions and groups.	Red Cross should collaborate with community and cultural organizations to promote emergency preparedness resources and programs. Community and cultural events, condominium association committees and school districts were suggested as potential outreach opportunities and partners by focus group participants.
Preparedness - Mobility	**Older Adults**	Older adults and those with elderly relatives voiced concerns about mobility issues during an emergency response.	Red Cross should develop assets that address accessibility for emergency preparedness and response.

Barrier	Demographic	Context	Recommendation
Preparedness – Emergency Kits	**Older Adults**	Comparatively low rates of first aid kit assembly were reported among older adults who responded to the survey, which presents an important opportunity for further investigation.	Older adult-specific communications and instructions about first aid kits and other emergency kits should consistently highlight medication and medical equipment as essential items to have on-hand in the event of a natural hazard-related emergency. Community organizations supporting older adults should be encouraged to reinforce this messaging.
Preparedness – Cost	**People with Low Income, Older Adults**	All participants with low income voiced concern about costs as a barrier to taking preparedness actions, offering statements such as, "being able to put money away for this," "government can chip in," "more financial literacy," "maybe a subscription service to lower one-time financial costs," "affordable standard emergency kit."	Consider promoting subsidized emergency kits with a retail partner and distributing messaging that itemizes emergency kit contents with the related costs for essential items. Make sure that emergency kit contents are demographically relevant (e.g. including information about culturally appropriate food, documents, medications, and medical devices).

Communications

Focus Group participants reviewed 11 communication assets from different natural hazard campaigns. The research team analyzed their feedback to provide the following recommendations.

Distribution	Audience	Context	Recommendation
Online	**General**	Online distribution channels have the potential to reach the broadest population, including newcomers to Canada, for whom general and natural hazard-related emergency preparedness is very low.	Messages concerning disaster preparedness should be disseminated online regardless of whether the demographics of the target geography are known. Social media-based messaging should always be paired with other distribution methods.
Print	**At-Risk Groups**		Customized mail-out campaigns for print materials should be used. Specific risk groups and audiences can be identified using a Social Vulnerability Index or other indicator data to facilitate a targeted distribution of physical materials that have been customized for different demographic groups.[23]

Distribution	Audience	Context	Recommendation
Community Organizations and Schools	Older Adults, Newcomers to Canada	Four older adults in the focus groups mentioned the older adults' groups through which they regularly receive local information, including that relating to emergencies. Additionally, a total of four focus group and interview participants mentioned learning about emergency preparedness through their children, who shared what they were learning in school, possibly as part of curricula.	In recognition of the time and resources involved in distributing physical materials to individual households, the Red Cross could deliver brochures and flyers to community organizations and education and cultural hubs in areas identified by the Social vulnerability Index (or other dataset) for further dissemination. Red Cross brochures and activities could be distributed via schools and sent home with children for parents to review and complete as a family.

Messenger	Audience	Context	Recommendation
Red Cross, Local Governments	General	People prefer—and thus may expect—to receive information from the government. Besides the Red Cross, local governments are looked to for emergency preparedness information. Natural hazards are experienced locally and managed locally; municipal governments are estimated to be the first line of response in more than 90% of all emergencies across Canada, which demonstrates their critical role in emergency preparedness and response.[24]	Red Cross should collaborate with various levels of government for outreach and education campaigns.

Messaging	Audience	Context	Recommendation
Message Tailoring/ Customizing	Newcomers to Canada	Newcomers to Canada expressed an expectation that materials will be disseminated in the dominant language. In conversations with interviewees, however, some participants revealed a desire for materials in a relevant mother tongue.	Attention should also be paid to accommodating the language needs of newcomers' and older adults' support networks, such as volunteers and unpaid caregivers.[21]
	General		Care should be taken to ensure that the messenger is trusted, credible and relevant. Where possible, visual representations in communications materials, including videos, should reflect the demographics and dominant housing types within a given community.

Distribution	Audience	Context	Recommendation
Content	General		Organizations undertaking risk communication campaigns should continue developing how-to style guides, lists, and videos with real people that promote low-cost preparedness actions.

Community Resilience

Focus Group participants were asked to offer suggestions during a community resilience visioning session. The following recommendations have been drawn from their suggestions.

Barrier	Demographic	Context	Recommendation
Lack of social capital	Newcomers to Canada, Older Adults	No newcomers to Canada reported having family, friends, neighbours, community organizations, or other individuals to turn to for help in the event of a natural hazard-related emergency. Instead, they could only point to institutions (i.e., the government) or emergency services (i.e., 911-dialing) for expected assistance. Additionally, it was observed that older adults with disabilities and/or mobility issues and families with elderly relatives need more assistance during an emergency.	The theme of "knowing one's neighbour" emerged from the community resilience visioning exercise during the focus groups. Participants offered the following suggestions: ■ **Create a buddy system** for older adults so someone is checking on them and prioritizing their assistance. ■ **Designate a floor captain** in an apartment or condo building to ensure that those who need more assistance aren't left behind and are accounted for at the muster point. ■ **Work with community organizations** to offer mock [disaster simulation] days and create roles for participants. ■ **Create informal information-sharing networks** like neighbourhood newsletters, phone trees and email listservs
Perceived lack of coordination between governments and communities	General	Focus Group participants suggested that natural hazard resilience should be a cooperative effort and that organizations (government, businesses like insurance companies, educational institutions, community and grassroots organizations, etc.) all have a role to play.	Encourage collaboration and coordination among community stakeholders to promote disaster risk awareness and preparedness campaigns and activities, identify capacity issues, address gaps in planning and outreach, and create volunteer roles and training for community members.

Barrier	Demographic	Context	Recommendation
Lack of confidence	**Women**	Survey and focus group participants who identified as women were more likely to report lower levels of self-confidence in their ability to handle an emergency situation.	Collaborate with women-focused support services to provide women-focused opportunities to engage in community-level emergency preparedness initiatives, like workshops and mock disaster days. Consider the intersectional implications for recruitment (e.g. accessibility, childcare, cost) and how specific funding or subsidies might augment program reach.

Collaborations with local levels of government, in particular, are recommended because:

1/ municipal/local government was the second most-preferred choice for emergency preparedness information, and

2/ natural hazard emergencies are most often local events.

6.0 RESEARCH TEAM

Julie Wright *Director, Partners for Action*

Julie took on the role of Director at Partners for Action in December 2020. Previously, she led Waterloo Global Science Initiative (WGSI) through its start-up phase to successfully launching a decade-long Summit series and catalyzing collaborations related to decarbonizing electricity and promoting energy access globally, high school education, and the U.N. Sustainable Development Goals (SDGs). WGSI played an important role localizing the SDGs in Canada as a field catalyst and partnered with the University of Waterloo's Faculty of Environment to launch the Sustainable Development Solutions Network (SDSN) Canada. Prior to WGSI, Julie spent ten years in communications and public affairs roles for companies, clients, and campaigns in the tech, cultural and non-profit sectors at the forefront of sector disruption.

Evalyna Bogdan *Contract Researcher*

Evalyna is Assistant Professor, Faculty of Liberal Arts and Professional Studies, Disaster and Emergency Management program, at York University. She began collaborating with P4A as a SSHRC Postdoctoral Researcher and a MEOPAR Postdoctoral Fellow at the University of Waterloo and continued this collaboration while a Postdoctoral Associate at the University of Calgary. Across all her research and practitioner work, her focus has been on understanding how diverse and competing priorities are navigated in policies and practices addressing socio-environmental problems, in the context of flooding, food and farming, and fuel (oil and gas). To examine these complex challenges, Evalyna applies an interdisciplinary lens and innovative educational and engagement approaches.

Shawna Hamilton *Graduate Student*

Shawna recently completed a Master's of Environmental Studies within the Department of Geography and Environmental Management at the University of Waterloo. Prior to beginning her graduate degree, Shawna completed a BSc in Brain and Cognition at the University of Guelph and contributed to research projects related to environmental philosophy. Shawna's Master's research explores the mental health risks of climate change, including the rise of 'ecoanxiety' and disaster-related impacts.

Rachel Krueger *Graduate Student*

Rachel is a graduate student in the School of Environment, Enterprise and Development at the University of Waterloo. Her interest in community flood resilience began during a co-op job placement at the City of Mississauga's stormwater division as part of her undergraduate degree. Rachel's master's research focusses on improving Canadians' flood risk awareness and action by drawing on behavioural science and risk communication.

APPENDIX 1

NATURAL HAZARDS: RESEARCH TERMS AND DEFINITIONS

Natural Hazard

For the purposes of this report (and the survey, focus groups and interviews on which it is based), a natural hazard specifically refers to flooding, wildfire, or earthquakes.

Flood

For the purposes of this report (and the survey, focus groups and interviews on which it is based), flood specifically refers to flooding caused by extreme weather or seasonal conditions, such as overland flooding or sewage backup from storms.

Wildfire

An uncontrolled fire in an area of combustible vegetation (including forest fires); it can occur in rural and urban areas.

Earthquake

The shaking and vibration of the Earth's crust due to plate tectonics.

Risk Group

Each community is assigned to one or more Risk Groups (Flood, Wildfire, Earthquake) based on local hazard risk.

At-Risk

A population that is at-risk of experiencing a natural hazard because they live in a geographic region with risk exposure. For the purpose of this study, at-risk populations have exposure to flood, wildfire, and/or earthquake hazards.

Critical Awareness

The extent to which people believe hazards are important enough to think about and discuss with others. It is thought that critical awareness, risk perception and hazard anxiety in combination are prerequisites for an individual to consider preparing for an emergency.

STUDY DEMOGRAPHIC: TERMS AND DEFINITIONS

Newcomers to Canada

Respondents who were not born in Canada or who have lived in Canada for less than five years. 18 years of age or older.

Older adults

Respondents who are 65 years of age or older.

Women

Respondents who self-identified their gender as women. 18 years of age or older.

People with low income

Respondents are categorized as having low income if they: (1) live alone with an income of less than $40,000 or if they (2) live in a household of two or more people with a household income of less than $70,000. 18 years of age or older.

Indigenous Peoples

Respondents who self-identified as First Nations, Inuk/Inuit, or Métis. 18 years of age or older.

APPENDIX 2

Asset Evaluation

Asset	Hazard	Messenger	Type	Channel	Geography
Be Ready Trifold	ALL	Canadian Red Cross	print pamphlet	mail, website	ALL
6 Reasons	ALL	Public Safety Canada	infographic	website, social media	ALL
Be Prepared	flood	Canadian Red Cross	GIF	website, social media	Newfoundland, Thompson, Ottawa
9 Steps	earthquake	BC Earthquake Alliance	infographic	website, social media	Ottawa, Richmond, Newfoundland
How to Prepare for Earthquakes	earthquake	Canadian Red Cross	video	website, social media	Ottawa
Kit on a Budget	ALL	Canadian Red Cross	video	website, (YoutTube) social media (TikTok)	ALL
How to Prepare for Wildfires - Senior man	wildfire	Canadian Red Cross	video	website, social media	Newfoundland, All Canada (Thompson)
Last Minute Checklist	wildfire	FireSmart	video	website, social media	Newfoundland, Thompson
How to Prepare for Floods - Indigenous woman	Floods	Canadian Red Cross	video	website, social media	Thompson, Renfrew county, Richmond
Shakeout Rack Card	earthquake	BC Earthquake Alliance	print card	mail or handout	Richmond
Did You Know wildfire gif	wildfire	Canadian Red Cross	infographic	website, social media	Renfrew County

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