

COMMUNITY RESEARCH ENGAGEMENT GROWTH DEVELOPMENT



**INVESTIGATING MENTAL HEALTH AND SOCIAL CAPITAL IN
COMMUNITIES THAT EXPERIENCED RESIDENTIAL DISPLACEMENT
AS A RESULT OF THE SAINT JOHN RIVER FLOOD OF 2018**

BY DR. JULIA WOODHALL-MELNIK AND CAITLIN GROGAN



Investigating Mental Health and Social Capital in Communities that Experienced Residential Displacement as a Result of the Saint John River flood of 2018

Julia Woodhall-Melnik and Caitlin Grogan
Presented to the Institute for Catastrophic Loss Reduction
June 2019

Introduction

The recent flooding in New Brunswick has devastated communities along the Saint John River. The New Brunswick Emergency Measures Organization (CITE) estimates that between 2,000 and 3,000 people were displaced from their homes during the flooding. Large scale natural disasters often displace residents of communities which results in temporary homelessness for residents. Further, more vulnerable segments of the population, specifically those experiencing poverty and/or social isolation, are at greater risk of longer-term housing precarity following disaster events (Fothergill and Peek, 2004; Lindell and Prater, 2003). Research finds that housing loss during and following natural disasters can lead to fatigue, depression, anxiety, grief, sleep disturbances, substance abuse, and the development of Post-Traumatic Stress Disorder (Bromet et al., 2017; Parker et al., 2016). However, the impacts of natural disasters are often measured through census data which do not adequately assess the psychosocial impacts of housing loss caused by disasters on residents (Lindell and Prater, 2003). The present study investigates the impact of flooding on the health and wellbeing of residents in New Brunswick.

Research indicates that social capital can promote resilience and limit extended periods of homelessness in communities that have experienced natural disasters (Abramson et al., 2015). Despite the known importance of social capital, most natural disaster research focuses on impacts on economic growth and physical infrastructure (Aldrich and Meyer, 2014). Further, there has been no systematic study of the impact of social capital on housing trajectories, mental health, and community building following disasters in Canada. This study fills this gap by exploring community, mental health and social capital in residents who lived through the flood of the St. John River in the spring of 2018.

The objectives of this report are: 1) to investigate residents' experiences of mental health and wellbeing following flooding that led to housing damage and, in some cases, displacement; and, 2) to understand the role of social capital in responding to damage and displacement during and after flooding.

Background

Disaster mental health literature consistently demonstrates a strong relationship between residential displacement and psychological symptoms among disaster survivors (Hori and Schafer, 2010). Individuals who relocate to a new community following a disaster, or whose housing situation remained unstable, report significantly higher psychological distress (Fussell and Lowe, 2014). The psychological stress caused by residential displacement lasts longer than the immediate period of the flood (Taspell and Tunstall, 2008). Researchers find that flooded households continue to experience low-level mental health symptoms in response to the flooding five years after the initial event (Lamond, Joseph and Proverbs, 2014). Displacement has negative implications for maintaining quality of life following a disaster (Hori and Schafer, 2010) and evacuees have lower physical and mental quality of life scores (Shoji, et al., 2015).

Research finds that many factors are negatively associated with mental health following natural disasters. Mental health deterioration following a natural disaster is negatively correlated with household income (Lamond, Joseph and Proverbs, 2014). Higher-income individuals tend to have greater access to resources which can improve mental health outcomes (Morrow-Jones and Morrow-Jones, 1991; Vasta, 2004). In addition to income, several other factors are associated with negative mental health outcomes. For example, older adults, individuals with disabilities, children, those in the criminal justice system, those who use substances (Benevolenza and DeRigne, 2019), racial minorities, women, and those with lower educational attainment (Morrow-Jones and Morrow-Jones, 1991) disproportionately experience poor mental health following natural disasters. To date, studies focus on quantifying these mental health disparities (see Goldman and Galea, 2014 for a recent review of the

literature). However, less attention is paid to residents' subjective experiences of mental health and the potentially protective contribution of social capital.

Social capital, defined as the resources an individual can draw on through his or her social networks and the value ascribed to these resources by the individual, has been embraced as a possible explanation for the differences seen in disaster mental health across populations (Wind, Fordham and Komproe, 2011). Aldrich and Meyer (2014) describe three types of social capital that are integral to community resilience following natural disasters: 1) bonding social capital which is defined as close relationships between family members and friends, 2) bridging social capital which is a product of relationships with acquaintances and other loosely connected individuals, and 3) linking social capital which is linkages between citizens and powerful groups and individuals.

Social capital provides access networks which allow access to various resources in disaster situations (Aldrich and Meyer, 2014). These resources include information, aid, financial resources, and psychological support, which are associated with positive mental health outcomes (Aldrich and Meyer, 2014). Social capital has been embraced in disaster studies, explaining variations seen in mental health across populations.

Social capital is consistently associated with various mental health outcomes including depression, anxiety, PTSD, psychological distress, and poor self-reported mental health (Bassett and Moore, 2013). A lack of social capital is linked to negative mental health outcomes and social capital is considered a social determinant of mental health (Wind, Fordham and Komproe, 2011). Studies have shown that disaster affected households with more social capital recovered more easily from disasters and at a significantly faster pace (Wei and Han, 2018).

Research Methods

Epidemiological research on natural disasters and mental health is notoriously difficult to conduct, thus limiting the potential for this research to provide the knowledge needed to inform disaster responses (Goldman and Galea, 2014; North, 2016). Post-disaster research is crucial for improving relief interventions, but such research poses ethical, methodological and logistical challenges for researchers (Hunt et al., 2016). Research methodology must take in to account that populations affected by disaster may be traumatized and highly vulnerable (Hunt et al., 2016). As such, we developed a research plan to ensure that we were able to collect the data we needed in a way that would be minimally invasive for residents. As such, this study collected data through key informant interviews and focus groups with impacted community members. This study received approval from the Research Ethics Board at the University of New Brunswick in Saint John.

Key Informant Interviews

Key informants in the present study include local community leaders and those involved in the disaster relief efforts. They were chosen based on their community involvement and their intimate knowledge and/or involvement in the disaster relief process. To maintain their confidentiality, we refer to them as "key informants" throughout this report. Key informants (n=10) were contacted via phone and email and asked to participate in one-time, semi-structured interview that would last for approximately one hour. The semi-structured interview was guided by the questions focusing on the Key Informants' community involvement, knowledge about disaster relief and community mental health impacts. With participant consent, interviews were audiotaped and transcribed for analysis. Interviews were conducted in January, February and March of 2019.

Focus Groups

In order to reach as many residents as possible, we held focus groups with residents who were impacted by the flood. These focus groups were designed to facilitate small group conversations about

issues that matter to local community members. The participants in these focus group were individuals (n=20) who experienced temporary or prolonged residential displacement because of the flood. We held four focus groups in total and the number of participants in each group ranged from four to eight. Three of the focus groups were held on the Kingston Peninsula and one was held in Jemseg. These locations were chosen as they were centrally convenient for the participants who responded to our call for participation. Each consultation was approximately two hours long and was held at an accessible location such as a community center.

We recruited participants by advertising the focus groups on local television and radio networks and in local newspapers. We also hung up participation flyers in affected communities. With the consent of group moderators, recruitment posters were also placed on local social media groups and sent out through community listservs. All advertisements included a phone number and email address for participants to contact to ask questions about and register for the consultations. The consultations were held in March and April of 2019.

Upon arrival to each consultation, participants were asked to register, during which the research team reviewed and answered questions about study information letters and consent forms. Each participant was then provided with a short demographics survey and a question on mental health to allow them to privately construct a written response. Each participant was also provided with a demographics sheet and a short open-ended qualitative survey about their experiences with mental health during and after the flood. After this paperwork was completed, we began our discussion of social capital with the larger group by asking participants to share their experiences with residential damage or displacement. The conversations were semi-structured and often took on lives of their own, as participants recanted their experiences and the lasting impacts. The topics of residential displacement and damage, impacts on mental health and wellbeing, and social capital were discussed in all four focus groups. Two note takers were present at each focus group and Dr. Woodhall-Melnik led and took notes on each focus group. Each focus group had a total of three sets of notes. The final data products were 12 focus group notes. This allowed for researcher triangulation and provided more complete coverage of the conversations.

Analysis

The data collection for this project followed a grounded theory approach. The research team and the Principal Investigator documented potential emergent themes during and after each Key Informant interview and focus group. These emergent themes were used to augment the semi-structured interview guides where appropriate. The research team followed Burnard's (1991) proposed coding methodology. All analyses were organized using MS Excel.

The research team began by analyzing the Key Informant interview transcripts. Five transcripts were randomly selected for inclusion in the open coding process. The analysis team consisted of Caitlin Grogan, Nikki Ewart and Dr. Julia Woodhall-Melnik. Each team member was randomly assigned three of the five transcripts to review. This allowed the research team to confirm consistency and allowed the team greater opportunity to discuss findings and emergent themes. The analysis team met to discuss themes that emerged in the five transcripts and developed a preliminary list of themes and sub-themes. The team then assigned definitions to each theme and sub-theme which were used to guide the analysis. These themes were used as a preliminary codebook. The analysis team used the preliminary codebook to analyze all 10 transcripts. Changes to the codebook were made when deemed appropriate and with consensus of the analysis team. There were 27 themes in total (see Appendix A for a complete list of themes).

Three members of the research team (Caitlin Grogan, Emily Fox, and Dr. Julia Woodhall-Melnik) repeated this coding procedure with written notes from the focus groups. The team began with five randomly selected focus group notes. Each team member reviewed and assigned preliminary codes to

three of the five notes. The analysis team then met to discuss the initial reviews and to construct a preliminary codebook. The analysis team used the preliminary codebook to analyze all 12 sets of focus group notes. Changes to the codebook were made when appropriate and with team consensus. There were 32 themes in total (see Appendix A for a complete list of themes).

Findings

As noted above, a variety of data sources were collected for this project. In preparing this report, Dr. Julia Woodhall-Melnik reviewed the themes and chose to present data that were most beneficial to answering the main research questions in this study. The research team suspects that additional findings will be presented in future papers, reports and presentations. For a table displaying all the themes and their definitions, see Appendix A.

Findings from Key Informant Interviews

Perceptions of Community Mental Health and Wellbeing

Key informants were asked to reflect upon their perceptions of community mental health and wellbeing. As noted above, the data from this study are extremely rich and many of the themes captured information on mental health and wellbeing; however, for this section, the authors report on two particularly salient themes: 1) community emotions and 2) first responders' wellbeing.

Community Emotions

The key informants discussed their perceptions of community mental health and wellbeing and used terms such as "anxiety," "devastation," "mental exhaustion," "worry" and "betrayal." They talked about the immediate stress and anxiety experienced by residents who experienced property damage and loss. One key informant stated:

[The flood] happened slowly, people were watching. There was a lot of anxiety about what was going to happen, there was a lot of physical energy that was exerted in trying to preserve their home, their property. The stress of some giving, you know, losing that fight and not keeping the waters at bay was difficult. Knowing that their losses would be probably greater than what government assistance was going to be. I'm sure that it was very stressful and a difficult time for many.

The stress experienced by residents was also attributed to having to leave homes quickly, the emotional attachment to home and the financial investments that are made in homes. One key informant said:

[Y]ou think of the biggest thing you'll buy in your life probably you know [is your house]... And when danger comes to your home regardless of what form it's then that the home owner becomes very anxious... People have families and it's in our society today everybody has to try to make ends meet and there's lots of stress out there involved in that. People with families, young families, doesn't matter their age... if you're a home owner when you think of the damage that can be done to your home it's not just that you're having emotional feelings about it it's the worry about how you're going to pay to fix it up.

This key informant echoed the sentiments of others when they described the large amount of stress and disruption that comes along with losing a valued asset. Residents had emotional connections to their homes and their homes were also major financial investments. Home damage and loss resulted in considerable financial burden, stress and anxiety for residents.

In addition to feelings of stress and anxiety, Key Informants noted that residents felt exhausted and betrayed by the river. Some of the residents along the St. John River have occupied the land for multiple generations. Flooding is not new to this area. Every year, the residents expect some minor flooding from the spring freshet. However, this flooding often lasts a few days and does not compare to the magnitude of the flooding in the spring of 2018. The quotes below illustrate the exhaustion and betrayal felt by residents:

Mental exhaustion certainly for everyone, because as the folks down in Maugerville said, they're used to being locked into their homes for three or four days with the freshet, but it was 11.

There is a deep psychic connection, psychological, spiritual, cultural high to their sense of place, that is unique in Canada, and when the land betrays them, it hurts their soul.

The sense of betrayal and the mental exhaustion illuminated by these Key Informants illustrates the emotional and mental damage that occurs when people experience stressful events that are unanticipated, unprecedented and last for long periods of time. According to the one Key Informant, the residents' connection to the river can produce deep feelings of hurt and betrayal when they are required to leave their homes.

Although many of the Key Informants described the negative impacts of the flood on mental health and wellbeing, it is important to note that the community displayed resilience and adaptability during and following the spring flood of 2018. All the Key Informants described the sense of community and comradeship that was formed as residents worked together to support their neighbours. One of the Key Informants said that participation in response and recovery efforts seemed to play a protective role for some community members who may have otherwise experienced negative impacts on mental health or wellbeing. All the key informants noted that sandbagging was truly a community effort which united communities. Residents united to help neighbours and, in some cases, complete strangers.

Some services for mental health and wellbeing were offered to residents during the 2018 flood. For example, in addition to assisting residents with basic necessities, the Red Cross provided access to safety and wellbeing volunteers. One key informant described this:

So, these people, the safety and well-being volunteers, are volunteered to come with a background knowledge. So, some of these volunteers have been psychologists in their professional life, they could have been guidance counsellors, maybe nurses maybe even doctors. So, these people who come with this knowledge and they understand how to protect themselves and how to distance themselves from situations. So, it's something that you can't teach.

In addition to supports offered by the Red Cross, the Emergency Measures Organization (EMO) performed wellness checks on affected residents. Residents were provided with cards with contact

information for public mental health services and were reminded to call the number provided on the cards if they needed supports. Despite this, one key informant noted that many residents were quite "stoic" and did not want to reach out for support.

First Responders' Wellbeing

Prior to the start of this study, the research team hypothesized that the devastation caused by the flood would have impacts on residents' mental health; however, our analysis indicated that flooding can also impact the mental health and wellbeing of first responders. Many of the first responders who worked overtime during the spring 2018 flood lived in flooded areas themselves. During the flood, these first responders worked extra hours and this presented challenges for those who also have flooded properties. One of the Key Informants described this:

I mean what people have to understand, [a first responder] had the whole lower part of his house under water and he worked here while his house was impacted. Right? And that's – that was a common occurrence that we found during the ice storm in 2017. What happens is, is that people forget that these first responders live in the community. So, they're impacted as well. So, that's great that they're all coming here to help everybody else, but who's actually helping them? And that's something that first responders – it's kind of that whole paradox, right? So, you have to really make sure that you have the resources available to help the people that are helping everybody else.

In addition to the stress that can occur when responders are unable to attend to their own homes, one of the Key Informants described the challenges that exist for first responders who are working with people who have lost or experienced damage to their homes. First responders often work long hours during natural disasters. This Key Informant described the importance of self-care and mental health resources for individuals who provide support to residents who experience flooding.

Social Capital and Flood Response

The Key Informants were asked about different resources and services offered to residents during and following the flood. They were also asked to discuss response and recovery efforts and to describe the support that community members received. This section presents data from two themes: 1) community response; and 2) resources.

Community Response

All the Key Informants described the importance of the community in the response and recovery processes. They noted that the level of community engagement in these processes was extraordinary and extremely important. Many community members volunteered filling sandbags. For example, they helped neighbours secure their properties, cooked meals for ferry operators, other volunteers and first responders, assisted neighbours by lending trucks and boats and took displaced people into their homes. One of the Key Informants described the impacts of this form of volunteerism on the community:

Just everybody sort of pitching in, you know. And I think one of the positive things, when we talk about side-effects is that it brings the community together. I really think that neighbourhoods

solidify a little bit more and the people in the neighbourhoods start to know each other a little better by helping each other out.

Those with close friends and relatives were able to use bonding social capital from friends and family, as they relied on them for support and resources; however, bridging social capital was particularly important to the 2018 spring flood response. Community members who were loosely connected, who in some cases were loose acquaintances or strangers to flooded households, assisted people who needed support. Many of the Key Informants in this study noted that, despite the tragedy associated with flooding, communities were able to build positive networks and relationships.

Resources

The Key Informants were asked to describe the formal supports and resources offered to residents. The Canadian Red Cross provided support for all individuals who were displaced. They offered shelter, food, gift cards, water, and clothing. They continued to connect with residents who were displaced for longer periods of time to offer additional support. Some individuals connected with the Red Cross, whereas others relied on friends, family and other resources for access to housing, food and clothing. The theme of self-reliance emerged in the research which described the desire of some individuals to decline access to formal supports. This theme will be reported on in subsequent papers. Federally, the Canadian Armed Forces were not called in to assist in 2018. The Key Informants were polarized about the use of the army. Some felt that the extra “person power” should have been provided, whereas others felt that residents should rely on local and provincial assistance. Provincially, resources were provided by the EMO during and following the flood. The EMO allocated funds to persons who had property damage.

At the municipal level, resources, responses and service provision varied by town and city. In smaller, unincorporated areas, residents relied heavily on volunteer emergency responders and on provincial supports. In municipalities, such as Saint John and Fredericton, local branches of the EMO and municipal governments provided supports. The disparities between unincorporated areas and municipalities were elaborated on by one Key Informant:

Last year happened to be huge...how you can [offer help], particularly in the rural areas, that's another thing. There's a massive disparity between municipalities and what they call LSDs... Yeah, but they also have like volunteer committees that kind of oversee the LSD, but they have no legislative power. All their money and decisions...they have to ask the...[provincial] government to make it happen. They have no budget. So, Quispamsis is a municipality, Darlings Island is an LSD. So, the Uber Rob guy, the guy who drove his boat [for transportation for residents of Darlings Island] ...everyone he knew in Quispamsis had full service, had access to police, fire, and a municipality that was on the ground there managing flood control. Across the river, no. They needed that guy in a motorboat [for transportation].

The case of Uber Rob is particularly interesting. Rob volunteered his time and his boat to transport residents from Darlings Island to mainland Quispamsis so they could access grocery stores, supplies, school and work, among other things. A variety of residents did not want to leave their homes, and this placed them at increased risk of injury and adverse outcomes as they were isolated from services and supports. These residents felt that their homes would be left vulnerable to looting and theft if they evacuated. With Rob's help, they were able to access services and goods. However, this was problematic for the government who wanted these residents to evacuate. In 2019, the government provided boats to assist with transportation. Rob also volunteered with his boat in 2019. Due to disparities in the

availability of services and supports, residents of the smaller, unincorporated areas (LSDs) had to rely more on volunteer emergency services and supports, such as Rob's transportation service, than those in municipalities.

The Key Informants discussed the importance of resources provided by formal agency and government supports. However, they also noted the importance role that personal resources played in flood response and recovery.

...To watch people that would have had more resources, like they knew somebody that owned trucks or they knew somebody that had a gravel pit or a work crew that could come and show up, versus other people that didn't have those resources available to them and were kind of in desperation...I think the saddest things that I saw were houses that people had walked away from – you know, that just had no means to try to secure their homes....There were people there that had literal, you know, friends with work crews that showed up with sandbags and were there 24/7, brought in Shop-Vacs and pumps and all of this, and you know, in their nice houses. And then literally three houses down the road, it's just an older lady that they took to her son's, and the house is like underwater, you know? For me, it was a real example to, you know, how our society works sometimes...those with the means fare okay, and those that don't have those means suffer the worst.

The Key Informants reported socioeconomic disparities during the flood and in the recovery phase. Those with economic resources were able to pay for expenses up front and wait for Provincial reimbursement, whereas those without struggled to make timely repairs. Those with social connections and strong community relationships were able to leverage their bridging social capital which provided them with additional assistance.

Participant Demographics

In total, 20 residents participated in the focus groups. 13 participants identified as female and 7 identified as male. The majority (N=17) were married or common-law and only 3 were single. 17 of the 20 participants answered the question on income. Of these 17, the majority (N=11) had annual household incomes between \$20,000 and \$69,999. 4 participants had higher household incomes between \$80,000 and \$124,999 and two participants reported household incomes greater than \$200,000. 6 of the participants were under the age of 45 and 12 were between the ages of 45 and 64. 2 of the participants were between 65 and 74 years of age.

19 of the 20 participants supplied information on their household composition. The majority (N=15) lived in 2 person households. 1 participant lived in a 3 person household, 2 participants lived in a 4 person household and 1 participant lived in a 5 person household. 8 of the 20 participants were evacuated from their homes during the 2018 flood. The other participants experienced residential damage or life disruptions as a result of the flood. Of the 8 evacuated, 4 stayed with family members or friends and 4 stayed in secondary accommodations that they rented. 3 participants were out of their homes for less than 2 weeks, 3 were out of their homes from 1 to 2 months, and one participant had yet to return to their home at the time of the focus group.

Findings from Focus Groups and Written Experiences of Mental Health

Residents were asked about the impacts of the flood on their mental health and wellbeing in the focus groups. They were also asked to write about the impacts that the flood had on their mental health while they were filling out their participant demographic form. The research team observed that the flood had clear negative impacts on the mental health and wellbeing of residents. However, the team also observed some positive impacts on community mental health and wellbeing. This section presents data from the themes: 1) positive mental health and wellbeing; and 2) negative mental health and wellbeing.

Impacts on Mental Health and Wellbeing

Positive Impacts on Mental Health and Wellbeing

For the most part, the flooding devastated residents. However, the research team observed some positive impacts of the flooding response on the mental health and wellbeing of the communities that were impacted. The positive impacts came from witnessing and participating in response efforts. The focus group notes indicated that residents felt “lucky” and “blessed” that they were helped by so many volunteers and neighbours. They learned that they could count on their neighbours which provided them with a sense of relief and community and they were generally amazed by the sheer number of people that were helping in their communities.

In addition to the impacts of community on mental health and wellbeing, the focus group notes indicated that the disaster allowed people to focus on different priorities. The residents stated that the flood gave them a new perspective on the role of property and things in their lives and allowed them to see what is important in life. In other words, the loss and damage of their goods and property allowed them to be thankful that their families, friends and neighbours remained safe.

Negative Impacts on Mental Health and Wellbeing

As noted above, the negative impacts of the flood on mental health and wellbeing were frequently discussed in the focus groups. Participants’ discussions of mental health included reflections on their mental health during the flood, during the recovery, and leading up to the spring freshet in 2019. Those who reflected on their mental health during the flood described themselves as stressed. Some noted that they felt betrayed by the St. John River. Residents along the river expect annual flooding during the Freshet. However, they had not anticipated a flood that was the magnitude of the 2018 flood. They felt that the river that they had grown to understand had betrayed them. Some participants described their feelings using terms like “anguish.”

Participants experienced extreme conditions which they attributed to poor mental health. For example, they had experienced extreme sleep deprivation while they secured their homes and properties. They attributed some of their stress to their inability to get rest during the flood. One participant referred to her experience as a “bad dream.” The participants described feeling a lack of control and feeling helpless while trying to save their homes. Not all residents were able to save their homes and one resident noted that she felt a sense of relief when her power was turned off and she was no longer able to fight to save her home. After she evacuated, this participant began to feel as if she was missing a meaningful community event and experienced guilt that she was not able to help others.

Not all the focus group participants were displaced from their homes. Residents who lived near flood areas but did not flood described feeling “survivor’s guilt.” Some experienced property damage and others had their schedules interrupted as they lived in communities where ferries and roads were unavailable during the flood. These residents talked about the anxiety they felt when they left their houses in the morning and knew that they would have a long commute, which meant a long day. For some residents, they viewed their longer commute as limiting their ability to help their neighbours. These residents described feeling guilty that they were unable to help. Other residents felt stressed and torn, as they had to check on older family members that they could not easily reach during the road and ferry closures.

Many of the participants spoke of their mental health after the flood waters receded. Many of the homes and cottages were located in known flood zones and as such were uninsurable. Residents with properties that were damaged or destroyed were asked to apply to a provincial fund to access financial support. This requires that homeowners have their damages assessed, keep receipts for their repairs and document all repairs. This was problematic for some residents who paid neighbours, community members, family members and friends cash for supplies or services. These residents did not always get receipts. One woman who was separated from her husband was unable to receive provincial support because he would not provide his signature on the claim form so she could receive financial assistance. When she attended the focus group, she had not repaired her house and was unstably housed with a family member. Filing for provincial claims produced a lot of stress for people who were unable to navigate the claims system or who were unable to provide the documentation they needed.

The focus groups were held just prior to the spring Freshet in 2019. In other words, the spring Freshet was just around the corner. Participants began to speak about their projections for 2019. Some of the participants felt that major flooding would not occur two years in a row, whereas others described flooding as their “new normal.” Many compared their feelings to those of someone who has Post-Traumatic Stress Disorder. They noted an impending sense of panic while waiting to see what the Freshet would bring in 2019. They were already looking at online flood predictions and described feelings of anxiety, worry and dread.

Discussion & Recommendations

As noted above, the data from this study are extremely rich; therefore, there are many themes that are not included in this report which will be presented in other venues in the future. The findings indicate that natural disasters can have a positive impact on community mental health and wellbeing. During the flood, community members were able to help one another and form new connections. Doing so felt therapeutic to some community members. Weisscecker (2011) and Hayes and Poland (2018) use the term “post-traumatic growth” to describe the positive side-effects of climate disasters on mental health. Positive side-effects include community building, feelings of gratefulness for support and a new ability to refocus on “things that matter” such as family and friends rather than possessions. The Key Informant interviews and focus groups indicate that people were experiencing some post-traumatic growth following the flood of 2018; however, this post-traumatic growth cooccurred with negative mental health impacts.

The findings indicate that the flood increased anxiety, stress and worry in participants. Participants also experienced a form of survivors’ guilt. Those who had homes that were unaffected or not as badly impacted as others described feeling lucky but also guilty that their property was okay when others’ properties were not. In addition to survivors’ guilt, participants who were evacuated or could not help in

response efforts felt guilty that they were not able to aid other community members. The terms “eco-anxiety” and “eco-guilt” are used to describe the worry that many individuals feel about climate change and the guilt that is felt when people behave in ways that are not environmentally friendly (Mallett, 2012). However, the present findings indicate that eco-anxiety and eco-guilt are present in survivors of climate-related disasters. Interventions to reduce anxiety and guilt in people who have experienced these disasters and worry about future disasters should be implemented.

The health effects of flooding are disproportionately experienced. Research suggests that women, older adults, children, newcomers and low-income households are at increased risk of negative health outcomes after disasters (PHAC, 2017). The present findings indicate that caregivers, who provide support to aging parents and community members, experience challenges during and following floods. Natural disasters may impact caregivers’ ability to commute and to leave their homes. Further, those who are stuck in traffic, providing community aid and/or trying to save their homes experience severe time constraints. Additional care supports should be provided to those who need them during floods.

The Key Informants and focus group participants described age as an important to flooding responses. Older adults who require health, mobility and social supports can be isolated during floods and this can be problematic. The findings of this study indicate a need to focus on health preparedness, which includes urging residents to fill first aid kits and prescriptions for medications. Additionally, individuals who are at higher risk of physical or social isolation or at higher risk of a health emergency should follow voluntary evacuation requests.

Gender and income both play important roles in flood recovery. In the case of the woman who was unable to receive provincial financial support, she was hindered by her ex-husband who she perceived as controlling. She remained unhoused and unable to pay for repairs as her husband continued to refuse to sign the paperwork. Participants described the disadvantage that is experienced by low-income households who are unable to pay for repairs out of pocket while they wait for government reimbursement. The findings indicate a need to provide streamlined and simplified access to financial assistance for flood victims. This is especially important for households with limited access to socioeconomic capital.

The findings indicate that rurality is also a vulnerability for residents who experience flooding. There are more resources and services offered in municipalities than in rural areas. New Brunswick has an extremely low population density which indicates that it is a rural province (Statistics Canada, 2017). Many rural areas in New Brunswick are unincorporated. Rural populations tend to have lower incomes and an older average age (Statistics Canada, 2014). Additionally, New Brunswick’s regional hospitals are in larger cities, which can make rural access to emergency physical and mental health care challenging. Unincorporated, rural areas receive their emergency services from volunteers and must make provincial requests to access physical resources and additional funding. This creates substantial challenges for rural residents who require timely access to formal supports during natural disasters. Future research on flooding should focus on best practices for providing timely supports to smaller, rural areas.

The findings of this study indicate that first responders who live in communities impacted by flooding can experience additional stress as they attempt to secure their own homes while working extra hours. Programs to address the mental health of first responders are in place. For example, New Brunswick offers critical incident stress management (CISM) programming through the province’s Addictions and Mental Health Services. CISM programming is for front line workers who experience extreme stress, which includes first responders who respond to extreme weather events. CISM is a widely applied and

effective model for mitigating the negative impacts of stress in first responders (Everly et al., 2002). CISM programming could be augmented to address the multifaceted stress experienced by first responders who assist others while experiencing home damage or loss themselves.

Participants indicated challenges during the recovery stage. Many expressed difficulties navigating the provincial funding system to claim reimbursements for damage. Systems for providing reimbursements to flood victims should be easier to navigate. This may involve supplying communities with recovery assistance personnel who focus specifically on helping residents navigate the funding system and the use of claim forms with more flexibility and fewer requirements. The findings suggest a need to provide residents with more accessible information on filing claims with the provincial government. This information can be provided to residents on an annual basis, prior to the freshet. This would allow residents to prepare and absorb information during a period of lower stress.

Conclusion

This report highlights the impacts of the 2018 spring flood in New Brunswick on the mental health of residents. The community came together to help one another which led to positive community growth, which promotes good mental health. However, the impacts of the flood had negative impacts on the affected residents. Stress, worry, anxiety, feelings of betrayal and despair, and PTSD were described by residents. Those with more access to resources and social capital networks appeared to fare better during the flood response and recovery. In the case of the 2018 flood, socioeconomic, demographic and geographic factors contributed to unequal access to resources and supports.

In 2019, the St. John River once again rose to high levels during the spring freshet and residents along the river were subjected to another season of significant flooding. With knowledge of the mental health concerns experienced in 2018, the research team's next step is to determine the impacts of multi-year flooding on residents. Additional focus will be placed on residents' own views of what resources, programs and supports may best help improve mental health during and following floods. This knowledge base will provide practitioners with suggestions for interventions to support populations as the impacts of climate change worsen.

References

Abramson, D. M., Grattan, L. M., Mayer, B., Colten, C. E., Arosemena, F. A., Bedimo-Rung, A., & Lichtveld, M. (2015). The resilience activation framework: a conceptual model of how access to social resources promotes adaptation and rapid recovery in post-disaster settings. *The journal of behavioral health services & research*, 42(1), 42-57.

Aldrich, D. P., & Meyer, M. A. (2015). Social capital and community resilience. *American Behavioral Scientist*, 59(2), 254-269.

Bassett, E., & Moore, S. (2013). Social capital and depressive symptoms: The association of psychosocial and network dimensions of social capital with depressive symptoms in Montreal, Canada. *Social Science & Medicine*, 86, 96–102.

Benevolenza, M. A., & DeRigne, L. (2019). The impact of climate change and natural disasters on vulnerable populations: A systematic review of literature. *Journal of Human Behavior in the Social Environment*, 29(2), 266–281.

Bromet, E. J., Atwoli, L., Kawakami, N., Navarro-Mateu, F., Piotrowski, P., King, A. J., ... & Florescu, S. (2017). Post-traumatic stress disorder associated with natural and human-made disasters in the World Mental Health Surveys. *Psychological medicine*, 47(2), 227-241.

Everly, G. S., Flannery, R. B., & Eyler, V. A. (2002). Critical incident stress management (CISM): A statistical review of the literature. *Psychiatric Quarterly*, 73(3), 171-182.

Fothergill, A., & Peek, L. A. (2004). Poverty and disasters in the United States: A review of recent sociological findings. *Natural hazards*, 32(1), 89-110.

Fussell, E., & Lowe, S. R. (2014). The impact of housing displacement on the mental health of low-income parents after Hurricane Katrina. *Social Science & Medicine*, 113, 137–144.

Goldmann, E., & Galea, S. (2014). Mental health consequences of disasters. *Annual review of public health*, 35, 169-183.

Hori, M., & Schafer, M. (2010). Social costs of displacement in Louisiana after Hurricanes Katrina and Rita. *Population & Environment*, 31(1–3), 64–86.

Hunt, M., Tansey, C. M., Anderson, J., Boulanger, R. F., Eckenwiler, L., Pringle, J., & Schwartz, L. (2016). The Challenge of Timely, Responsive and Rigorous Ethics Review of Disaster Research: Views of Research Ethics Committee Members. *PLoS ONE*, 11(6), 1–15.

Lamond, J. E., Joseph, R. D., & Proverbs, D. G. (2015). An exploration of factors affecting the long term psychological impact and deterioration of mental health in flooded households. *Environmental Research*, 140, 325–334.

Lindell, M. K., & Prater, C. S. (2003). Assessing community impacts of natural disasters. *Natural hazards review*, 4(4), 176-185.

Mallett, R. K. (2012). Eco-guilt motivates eco-friendly behavior. *Ecopsychology*, 4(3), 223-231.

Morrow-Jones, Hazel & R. Morrow-Jones, Charles. (1991). Mobility Due to Natural Disaster: Theoretical Considerations and Preliminary Analyses. *Disasters*. 15. 126-32.

North, C. S. (2016). Disaster Mental Health Epidemiology: Methodological Review and Interpretation of Research Findings. *Psychiatry: Interpersonal & Biological Processes*, 79(2), 130–146.

Parker, G., Lie, D., Siskind, D. J., Martin-Khan, M., Raphael, B., Crompton, D., & Kisely, S. (2016). Mental health implications for older adults after natural disasters—a systematic review and meta-analysis. *International psychogeriatrics*, 28(1), 11-20.

Public Health Agency of Canada (2017). Science Narrative: Climate Change Impacts on the Health of Canadians. Government of Canada: Ottawa, ON. ISBN: 978-0-660-08106-9.

Shoji Yabuki, Kazuo Ouchi, Shin-ichi Kikuchi, Shin-ichi Konno, Yabuki, S., Ouchi, K., ... Konno, S.-I. (2015). Pain, quality of life and activity in aged evacuees living in temporary housing after the Great East Japan

earthquake of 11 March 2011: a cross-sectional study in Minamisoma City, Fukushima prefecture. *BMC Musculoskeletal Disorders*, 16(1), 1–6.

Statistics Canada. 2014. Canada's rural population declining since 1851. *Canadian Demography at a Glance*, Catalogue No. 98-003-X.

Statistics Canada. 2017. New Brunswick [Province] and Canada [Country] (table). *Census Profile*. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>

Tapsell, S. M., & Tunstall, S. M. (2008). "I wish I'd never heard of Banbury": The relationship between 'place' and the health impacts from flooding. *Health & Place*, 14(2), 133–154.

<https://doi.org/10.1016/j.healthplace.2007.05.006>

Weissbecker, I. (Ed.) *Climate Change and Human Well-Being: Global Challenges and Opportunities*; Springer: Washington, DC, USA, 2011; ISBN 978-1441997418.

Wind, T. R., Fordham, M., & Komproe, I. H. (2011). Social capital and post-disaster mental health. *Global Health Action*, 4, 1–9. <https://doi.org/10.3402/gha.v4i0.6351>