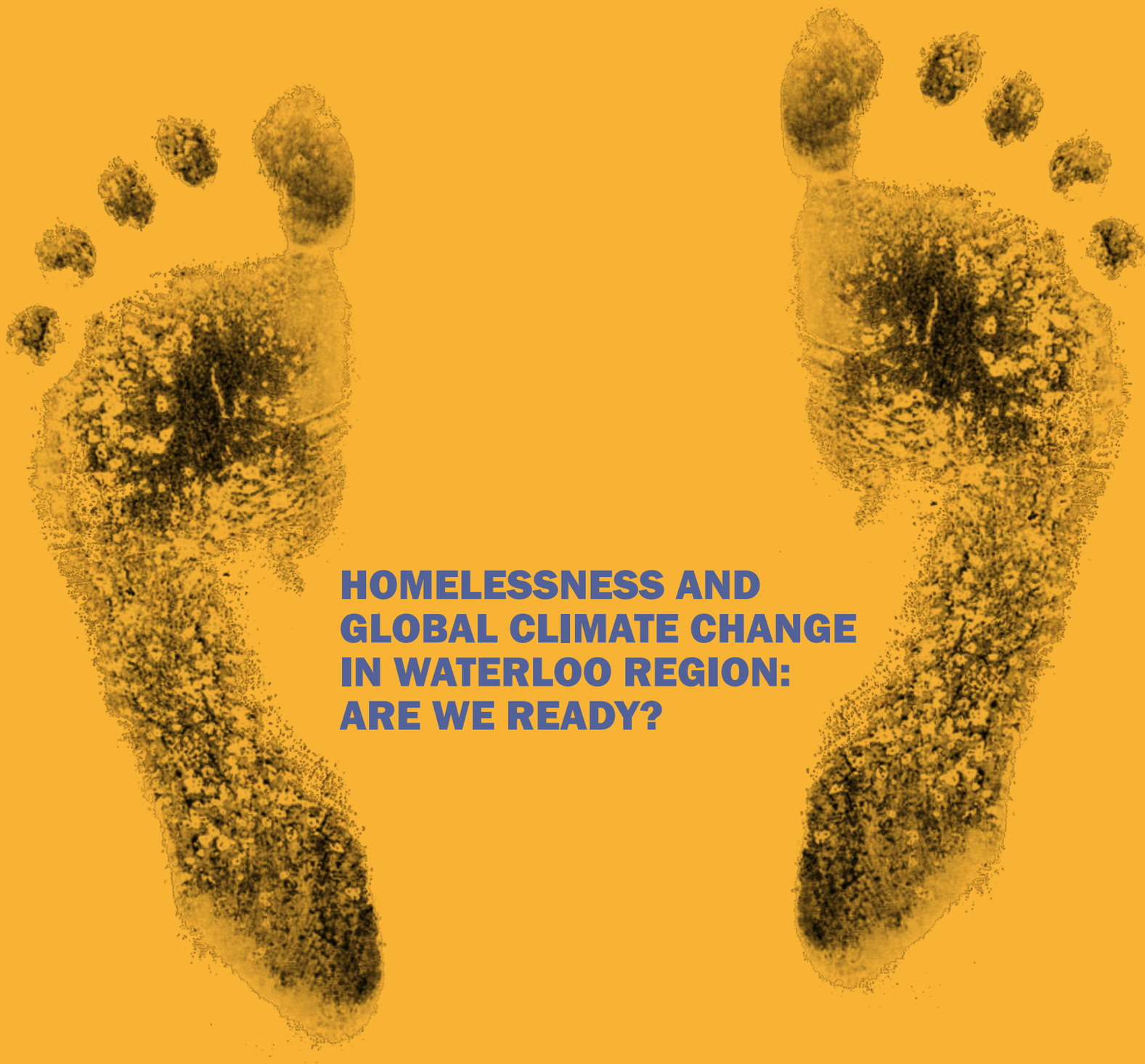

HOMELESSNESS AND GLOBAL CLIMATE CHANGE IN WATERLOO REGION: ARE WE READY?

A Report from the Study on the Vulnerability to Global Climate Change of People Experiencing Homelessness in Waterloo Region

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WHAT IS THE REPORT ABOUT?

There is little doubt within the scientific community that the consequences of global climate change pose some of the biggest threats to the health and well-being of humans [1,2]. A recent report by Global Humanitarian Forum, for example, estimates that globally every year climate change leaves over 300,000 people dead and 325 million people seriously affected. It is also estimated that 4 billion people are vulnerable to the effects of climate change and 500 million more are at extreme risk [3].

These impacts on health and well-being are not evenly distributed. "It's the poorest of the poor in the world, and this includes poor people even in the prosperous societies, who are going to be the worst hit," explained Rejendra K. Pauchauri, the chairman of the Intergovernmental Panel on Climate Change (IPCC). "People who are poor are least-equipped to be able to adapt to the impact of climate change." [4]

While some significant research exists about the vulnerability of certain groups in developing countries, there is hardly any empirical research available that addresses the vulnerability of groups with limited access to resources in Canadian urban contexts. These groups include people experiencing homelessness, low-income families, people who have recently immigrated, and elderly individuals [1,5].

How will these groups be affected by the changing climate? Will their current coping strategies work in the changing weather conditions? These are some of the questions that this report addresses. More specifically, this report presents the results of a study that explored the vulnerability of people experiencing absolute homelessness in two urban centres of Waterloo Region. Vulnerability is defined by the IPCC as "the degree to which a system [including people] is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes" [6].

Generally, vulnerability is determined by two key concepts: exposure-sensitivity and adaptive capacity [7]. **Exposure-sensitivity** is the nature of a climate or weather condition (exposure) coupled with whether or not the individual faces this (sensitivity). For example, a severe rainstorm is an exposure for all, but only those who do not have shelter from the storm are particularly sensitive to it – and thus exposure-sensitivity is high if the rainstorm occurs and a person does not have shelter. **Adaptive capacity** is the ability to respond successfully to the range of exposure-sensitivities, or how well an individual can deal with a particular event. In the case of the rainstorm example, adaptive capacity is related to things such as being able to dry clothing after the storm, one's health status to withstand being wet during a rainstorm, being able to identify places to go for shelter in subsequent events, and so on.

This study was developed to explore both, exposure-sensitivity and adaptive capacity of people experiencing absolute homelessness. For this purpose, it was important to understand how this specific group of people experience the exposure to extreme weather situations and how they manage those situations. Thus, the first objective of this study is:

Objective 1: **To assess the current vulnerability to climate change (i.e., exposure sensitivity and adaptive capacity) of people experiencing homelessness in the urban areas of Waterloo Region.**

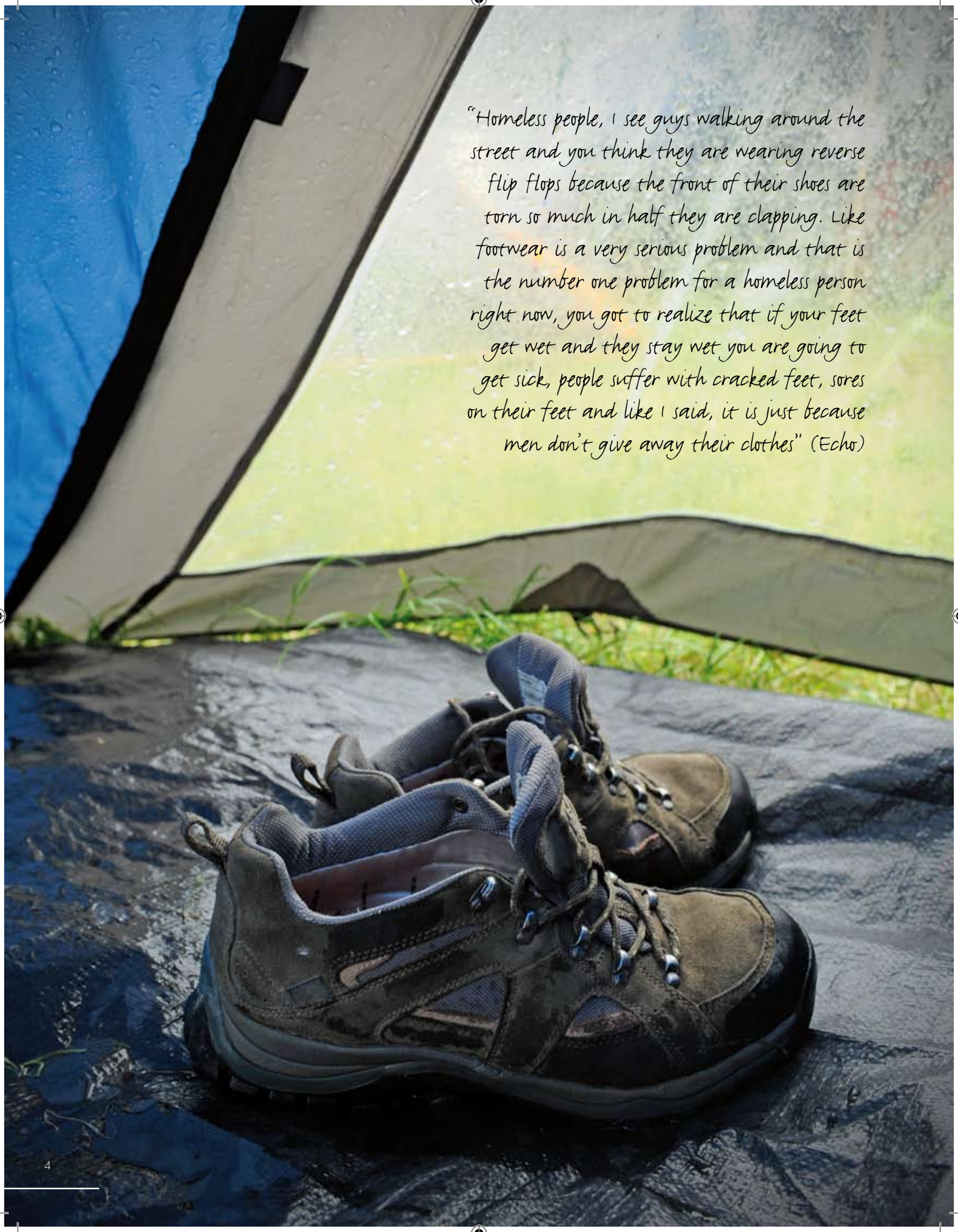
Because the weather is expected to change significantly within this century, it is also important to understand how the type of exposure may change and to what degree current adaptation strategies will be sufficient. This led to the second objective of this study:

Objective 2: **To identify future changes in the target group's vulnerability given what we know from climate and air quality science.**

With this knowledge in place key stakeholders and decision makers can plan accordingly and assess whether current strategies are adequate in addressing future vulnerabilities to global climate change. That is, future vulnerability can be prevented by carefully planning ahead. Of course, for this study to be useful in that process the key stakeholders need to have easy access to the generated knowledge, resulting in the third objective:

Objective 3: **To implement an effective knowledge transfer and community engagement process for the dissemination of the research findings.**

This report presents the results of Objectives 1 and 2 and is part of the knowledge transfer strategy for Objective 3. In the following, we will first describe how the study was conducted before presenting the results. Results will be discussed in general terms as well as in regard to specific weather conditions, including rain, extreme heat and cold in the summer, and extreme cold and snow in the winter. The report ends by providing some concluding thoughts and by looking ahead.



"Homeless people, I see guys walking around the street and you think they are wearing reverse flip flops because the front of their shoes are torn so much in half they are clapping. Like footwear is a very serious problem and that is the number one problem for a homeless person right now, you got to realize that if your feet get wet and they stay wet you are going to get sick, people suffer with cracked feet, sores on their feet and like I said, it is just because men don't give away their clothes" (Echo)

HOW WAS THE RESEARCH CONDUCTED?

This study was initiated by University of Waterloo researcher Dr. Johanna Wandel and a Masters student, Wendy de Gómez. Dr. Wandel's research program is specialized in vulnerability and adaptation to climate and weather. She invited Dr. Manuel Riemer, a community psychologist at Wilfrid Laurier University, to join the team and contribute his expertise in community engagement and participatory action research. Together they partnered with Lynn Randall and Marie Morrison from the Region of Waterloo, Social Planning, Policy and Program Administration Division, who provided important insights into the context of social planning in Waterloo Region.

Following the three main objectives explained in the previous section, the study has two main research components plus the knowledge transfer and community engagement process. The two research components are:

1. **In order to understand current exposure-sensitivity and adaptive capacity, 48 interviews were conducted with individuals who have experience with absolute homelessness in Kitchener-Waterloo and Cambridge**

2. **Review of available global and local climate data and models and respective literature informing possible future vulnerabilities of people experiencing absolute homelessness in the Waterloo Region.**

Below are some details for each of these components:

Interviews

- Ten service agencies in Waterloo Region collaborated with the research team by providing feedback and supporting recruitment. The research partner, the Region of Waterloo, Social Planning, Policy and Program Administration Division, provided general guidance to the research team and was involved in the major decisions concerning the research design and process.

- Participants were recruited by talking to people at locations that are known gathering places for people experiencing homelessness and with the help of staff at different service agencies and shelters. While this dual recruitment strategy resulted in a mix of people who use shelters and those who primarily camp, most of those who camp were from Cambridge while in Kitchener the majority of interviewees stayed in emergency shelters.

- In total, the team interviewed 48 individuals who have experienced absolute homelessness in Waterloo Region at the time of the interview or within two years prior. Thirty-one of these were living in Kitchener-Waterloo and the other 17 in Cambridge. All participants were 16 or older and 10 of them were women.

- Four trained interviewers conducted semi-structured qualitative interviews (about 1h each) documenting **how individuals experience** weather/ climatic conditions and **how they cope with the weather conditions**.

- The research team included two peer advisors (people who had experienced homelessness), who supported two students in conducting the interviews and provided general advice to the university-based researchers.

- All interviews were conducted during the summer (July and August) of 2009. It is important to note that the summer of 2009 was statistically cooler than the 1971-2000 climate reference period, with both daily mean temperature and mean daily minimum temperatures consistently below the long-term mean. In particular, average daily temperature and average daily minimum temperatures were 17.22 and 11.4 degrees respectively, a value more than two degrees below the long term mean and mean minimum July temperatures of 19.8 and 13.7 degrees.

- The results were reported back to groups of individuals who currently experience homelessness via community workshops in Kitchener and Cambridge to validate the accuracy of the researchers' interpretation of the data.

REVIEW OF CLIMATE DATA

This report draws on climate data as summarized in the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4)6. The IPCC AR4 summarizes 21 global climate models using multi-model datasets for the A1B emissions scenario (which assumes continued economic and population growth, global cooperation and balanced energy sources). Specific climate projections are summarized in IPCC AR4 Working Group 1 Chapter 11 (Regional Climate Projections) and IPCC AR4 Working Group 2 Chapter 14 (North America). While this report draws on downscaled global climate models reviewed in the IPCC, there were no model data runs that were specific to this study.

LIMITATIONS

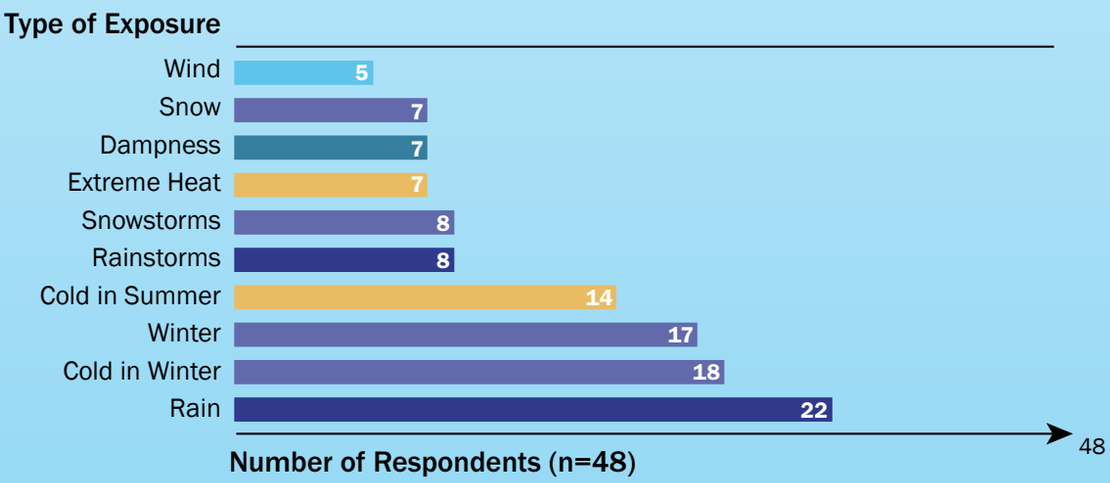
There are some important limitations of this study that should be mentioned. First, the research team tried to recruit a sample that represents the cross-section of people experiencing absolute homelessness in Kitchener-Waterloo and Cambridge. However, because the team did not have census data for this population, it is not clear to what degree the sample is fully representative. In Cambridge one of the peer interviewers is well known to those who camp which facilitated recruitment of this group in Cambridge and could explain the higher numbers of campers in the Cambridge sample.

Second, this was a phenomological study, which means that we tried to understand the experience of extreme weather from the perspective of those experiencing absolute homelessness. The interviews were conducted using open-ended questions and the themes emerged from the analysis of the data. We did not challenge the interviewees in regard to the accuracy of their statements but instead tried to capture their voice as directly as possible. Thus, it is important to note that the results presented in this report reflect the opinions of those 48 individuals who were interviewed. It also means that the frequencies reported below represent those who mentioned a specific weather conditions as problematic during their interview. This does not imply, though, that those who did not explicitly mention the condition may also struggle with it at times.

Third, the data collection was limited to the summer of 2009. That is, we did not collect any data during the other three seasons. Also, the summer of 2009 was unusually cold as mentioned above. There is a possibility that responses may have been different if collected during the other seasons or during a warmer summer.

Fourth, climate projections always have a certain level of uncertainty attached to them. Climate modeling is a complex science that involves many variables, not all of which are included in any one General Circulation Model (GCM). GCMs use specific emissions scenarios as inputs, and our current lack of global targets introduces further uncertainty. Finally, downscaling of GCMs to the regional level is coarse at best, and locally-specific climate variability is poorly understood and captured. The expected increase in average yearly temperature within this century presented in this report, for example, is related to both the volume of green house gases emitted into the atmosphere on a global scale and the precision of the regional GCM downscaling used. What is presented in this report is based on a review of the most widely accepted climate models using a commonly accepted emissions scenario providing the estimates with the greatest degree of consensus available with current scientific methods.

WEATHER-RELATED STRESSORS



WHAT WAS LEARNED: AN OVERVIEW

WEATHER CONDITIONS EXPERIENCED AS PROBLEMATIC (EXPOSURE-SENSITIVITY)

In the interviews the research team wanted to understand what climate conditions are seen as problematic by those experiencing them directly because of their individual sensitivities including their living situation. No pre-established categories were provided; instead, interviewees described the weather conditions and how they experience them in their own words. Then, in the analysis of the interview data the research team tried to find common terms and themes to describe the different conditions and how they were experienced.

The results of this analysis suggest that problematic weather conditions experienced by the participants (in order of frequency) were: rain, extreme cold in winter and winter conditions in general, extreme cold in the summer, rain- and snowstorms, extreme heat, dampness, snow and wind. (See also Figure on page 6)

The team also gained insight on the particular challenges that people experiencing homelessness seem to face in extreme weather situations, such as keeping belongings dry in rain-storms. Existing problems, such as physical and mental health issues, often appear to be exacerbated through problematic weather conditions. For example, some individuals reported an increased experience of depression during periods of rain. Other reported factors which contributed to increased exposure-sensitivity and decreased adaptive capacity included drug and alcohol use, being stereotyped (e.g., not being welcomed in malls and other public places who could provide shelter), safety issues (e.g., camping far away from the city centre in order to protect belongings), lack of appropriate housing, being isolated, and not having access to appropriate clothing and footwear.

HOW PEOPLE DEAL WITH PROBLEMATIC WEATHER CONDITIONS (ADAPTIVE CAPACITY)

Besides the challenges reported above, study participants also explained that they experience a relatively high level of service provision including devoted efforts of staff and volunteers, which in turn contributes to greater adaptive capacity among people experiencing homelessness. This is particularly the case in the winter and to a higher degree perceived to be present in Kitchener compared to Cambridge. The latter, however, may be due to the fact that most people interviewed in Kitchener were recruited through social service providers including different shelters while in Cambridge most participants were recruited by different means (see previous section).

Interviewees cited a range of things which help them manage weather stressors, including access to shelters, drop-in centres, soup kitchens, and public spaces, especially libraries, receiving a basic allowance (e.g., Personal Need Allowance) and clothing vouchers as well as having good connections to service staff and friends. For some participants, it seemed as if it took them quite a while to learn about available services and others reported difficulties accessing the services because of transportation challenges.

WHAT CAN WE EXPECT FOR THE FUTURE IN THIS REGION?

Climate models forecast warming of 2.8° to 4.3°C over the 1980-1999 climatic reference period by the end of this Century. This is a significant increase and is slightly higher than what is expected for the global average. Experts expect a slightly higher degree of warming during the winter months than during the remaining seasons. Thus, during the coming decades winters are expected to be milder than they currently are, with a shorter snow season. Warming in the summer months, however, is expected to begin to be noticeable first, that is, some of this warming will be noticeable during the next fifteen years. The winter patterns are expected to emerge within the next 25 years.

Beyond temperature, more precipitation is expected during the winter and spring (+9 to 19% in winter and +7 to 16% in spring), with a modest increase (+4 to 11%) in fall. Models range from a slight decrease to a slight increase during the summer. This signal is not expected to be clear until 60 or more years from now.

Climate models focus on climate and precipitation seasonal and annual averages; however, climate is frequently experienced through particular extreme weather events. While climate models are less reliable in projecting heat waves, rainstorms and snow events, existing data suggests that it is likely that there will be more frequent extreme events such as heat waves and rain and snowstorms in coming years.

In the following sections we will elaborate some of these findings in more detail. This will include a discussion of how people try to deal with the different weather conditions and what kind of challenges they currently face. In addition, we will describe how these conditions will likely change in the future.

"Those days when it is pouring rain and you have nothing to do, you run and hide under the bridge." (Diane)

"Like if I get wet, if I get to change I have to put my wet clothes in a bag with my dry clothes and they are going to get all smelly. We don't have the luxuries to go home and put them in a dryer." (Echo)

WHAT WAS LEARNED ABOUT RAIN, STORMS, AND FLOODS

Rain was the most frequently mentioned problem for people in this region. Sudden rainstorms, in particular, can be problematic because it can be difficult to find appropriate shelter in time according to the participants.

WHAT IS THE EXPERIENCE LIKE?

People talked about getting soaked, struggling with wet gear (e.g., tents and sleeping bags), having no access to waterproof gear, lacking appropriate footwear, and getting caught in flooding. Getting soaked feet was cited as a major concern for individuals experiencing homelessness in this region.

Several people reported that they struggled with finding appropriate and safe storage for their gear during the day. This either led to getting their gear lost (because it was picked up by city staff or stolen), or their gear got soaked in the rainstorms. Lost gear was difficult to replace because people usually only receive one tent and sleeping bag per year. Some reported that soaked gear and clothing were difficult to dry because they knew of only a few suitable places for drying and those seemed to be not always easily accessible.

According to several respondents, this exposure to rain and wetness led them to experience trench foot, colds, flu, and pneumonia. Several participants reported that exposure to severe weather (such as rain and storms) has a negative impact on their mental well-being, such as feeling depressed.

HOW DO PEOPLE DEAL?

In order to protect themselves, people primarily try to find shelter. During the day when most shelters are reported to be closed, popular places are public spaces such as the libraries, shopping malls, restaurants, coffee shops and the municipal bus terminal as well as places providing services to the homeless including food banks and drop-in centres. Challenges with shopping malls, restaurants, and coffee shops are that often people do not feel welcomed; this seems to be especially true in malls where people experiencing homelessness are often asked to leave. The money people receive as a Personal Needs Allowance seems to help because it allows them to buy a coffee and find shelter in a coffee shop. Some people report difficulties with getting to these places in time when a sudden rainstorm hits the area and often they cannot afford transportation.

People also protect themselves by seeking temporary shelter under bridges, loading docks, awnings, and in trucks, cars, and emergency exits. However, if there are severe storms, participants mentioned that some of these places do not provide sufficient shelter.

"It was one night when it was raining loud and we were tenting near the Grand and it was more or less rising up, but there more or less was flooding." (Doug)

Some people, especially those interviewed in Cambridge, reported that they use tents to protect themselves, which is not always successful. Some tents do not seem to be waterproof and in severe rainstorms tents can get flooded. Only one respondent reported owning a rain poncho.

"Oh, I was always smart enough to get a tent and I would go off to a bush and hide. I wouldn't have to collapse it every day or anything like that and only a few people knew about it." (Rick)

WHAT CAN WE EXPECT IN THE FUTURE?

One study reports a 24% increase in the frequency of extreme precipitation in the adjacent continental U.S. between 1948 and 2008[8]. However, a review of regional climate projections suggests that in the short-term future (next 5-10 years) the current rate of precipitation will not change significantly in this region. Climate models, however, do project a modest increase in annual precipitation by 2100, though the greatest increases are expected during the winter and spring months (median model values of +11% and +12% respectively).

Extreme rain events may also lead to flash floods in areas where homeless individuals seek shelter. Furthermore, these events can trigger long-term adverse health effects, including illnesses associated with moulds and compromised air quality indoors[9]. Therefore, people experiencing homelessness who are either residing inside shelters or outside may be left in a precarious position and could encounter chills and potentially contract pneumonia because they have to walk around for the rest of the day or week in wet clothing and shoes without being able to anticipate extreme weather events.

WHAT WAS LEARNED ABOUT EXTREME HEAT AND COLD IN THE SUMMER

Extreme heat in the summer was another problem reported by several respondents. Surprisingly, unseasonal cold was also seen as a significant problem in the summer mainly because individuals without permanent shelter frequently do not seem to have appropriate protection such as warm clothing out of season.

WHAT IS THE EXPERIENCE LIKE?

During extreme heat days in the summer people struggle to stay hydrated. Often, they find it difficult to get access to potable water since they report an inadequate number of functional public water fountains. Respondents also mentioned that there are not enough places to get relief from the sun. Being fully exposed to the sun has led to self-reporting of heat exhaustion and "sun stroke" by several of the interviewees.

"They should have a place, a lot of people get sun stroke they should have a house on days like that." (Debbie)

"I don't know I think [it] is even more detrimental to your health to be out in the sun and you are out in the sun now for 10 minutes and it is not good." (Nick)

Quite a few people also reported unseasonal cold during summer nights to be a problem. Temperatures can drop quite significantly during the night, especially during the spring and fall. The average minimum night-time temperature in May through August was 7 °C in the years 2005 to 2009, with incidents of below freezing temperatures early in the summer season. Those experiencing homelessness often lack protective measures, such as shelter, warm gear and clothing during particular cold nights. The exposure to unseasonal cold in the summer is reported to lead to chills and exacerbate influenza, colds, and pneumonia.

"It was summertime at the time … I was fortunate I did not stay homeless for more than a couple of months, um, it was summertime, but it was really interesting, because up until that time I would have sworn that in the summertime you would be fine at night - I mean it's summertime - I nearly got hypothermia one August night. The temperature had gone down I think it was maybe in the low teens like it was not cold by any stretch of the imagination but I had no blankets I was sleeping on a piece of cardboard and I ended up waking up at 5:00 AM and I was dizzy and completely disoriented, and I knew it was just too damn cold." (Wes)

HOW DO PEOPLE DEAL?

In order to protect themselves from extreme heat people soak their t-shirts with water to maximize evaporative cooling, try to find shade, and ride air-conditioned public buses. They also try to stay hydrated. Participants' preferred way of accessing potable water was using public drinking fountains; however, many of the respondents reported difficulties finding functioning fountains. In finding alternative means of getting access to water they reported using garden hoses from residents' homes and using bathrooms in public places such as malls. It was also mentioned that the restaurant chain Subway provides free water.

Dealing with unseasonal cold in the summer can also be quite challenging. The cold often comes unexpectedly and people report not having appropriate protective clothing and gear. Ways to deal with the cold include using cardboard to insulate the body from the ground when sleeping, layering clothing (if available), sleeping over vents, huddling together, and sleeping in emergency exits and bank machine kiosks.

"Yeah, they have to be because you can't put a tent up in Victoria Park because the cops even take your tent which is stupid and they take all your stuff and then you are back to nothing and it is impossible to get another tent voucher." (Shayne)

Tents and sleeping bags, provided by service agencies, have also been mentioned as helpful in dealing with these conditions. However, respondents reported difficulties finding safe and adequate places to put up their tents. Often, they are asked by the police to leave the place where they put up their tent and in several cases respondents reported that the police had taken away their tent and other gear. Some people also reported that they lost their gear because they could not find a good and safe place to store it during the day, and city staff picked it up.

WHAT CAN WE EXPECT IN THE FUTURE?

Long-term climate projections anticipate that this area will experience warmer summers with more extreme heat days, which could increase the threat of heat-related health problems. In the Eastern North America (including Waterloo Region) there is a greater than 95% likelihood that any given summer will be considered an "extreme" warm summer by 2100 relative to the 20th Century[6]. The annual number of 'hot days' (1961-2000) with temperatures of 30°C or above was 8 in Toronto, 8 in Ottawa, and 15 in Windsor. According to Cheng and Campbell (2005), these numbers could more than double in these cities by 2050, and triple in Windsor, and nearly quadruple in Toronto and Ottawa by the 2080s[10].

The temperature increases in this area are expected to be exacerbated given that we expect an enhancement in the urban heat islands effect. This effect occurs because built structures in cities such as concrete, asphalt, and metal absorb heat that is then re-radiated thereby causing urban areas to be 5–11°C warmer than surrounding rural regions[5]. Air pollution is expected to increase as well with higher temperatures which increase the potential for (photochemical oxidant) smog formation, with corresponding increased health impacts[11]. Since 2005 there have been 96 days when the air quality has been poor or very poor in Waterloo Region and an advisory has been called[12]. Future increases in ambient ozone concentrations will also be particularly detrimental for those people who spend the majority of time outside and who may already have weakened respiratory and immune systems. In addition, many people experiencing homelessness are concurrently experiencing compounding stresses such as psychiatric illnesses and many types of psycho-tropic medication greatly enhance the risk of sun-stroke, heat exhaustion, sunburn and dehydration[5].

WHAT WAS LEARNED ABOUT WINTER

Winters are difficult to deal with for several reasons. Extreme cold was frequently mentioned as the biggest challenge. The average minimum temperature in the winter between January and March was -14°C in the years 2005 through 2009.

WHAT IS THE EXPERIENCE LIKE?

Several individuals reported that they anticipate cold periods since they could "feel it deep inside their bodies".

"Any type of chill goes into the bones, it doesn't matter it goes into the bones and penetrates through the skin and moves through the flesh right up to ... it's an awful thing to shake." (Keith)

Low temperatures are compounded by wind, with some individuals reporting the wind chill effect in the winter as very unpleasant. Wind affected both gear (tents) and a person's body. Most respondents talked about the need to get out of the wind.

"Well it wasn't too bad up until February. Then it got very cold. I lit a few little candles and huddled up around them. I spend most of my time out of the wind. I didn't really have a heavy winter coat all I had was a pair of cowboy boots. I got cold this winter." (George).

"Dug a hole in the ice to get away from the wind." (Bruce).

Beyond low temperatures, snow is very difficult to deal with in the winter. This is especially true for snowstorms which often surprise people experiencing homelessness. Slush from melting snow also caused problems for people because they would get wet feet, a condition compounded by a lack of appropriate footwear among respondents.

"The wintertime is rough and walking in that deep snow just drags you down." (Brenda)

Participants reported that winter conditions have negative effects on their physical and mental health. They self-report frequent colds, pneumonia, and kidney and bladder infections. Several people reported that they feel "down", have low energy, and are depressed.

"Well, sometimes I don't have energy, so I can't deal with it. Plus in the winter I get this thing ... I get depressed in the winter... My body is lacking vitamins and so definitely the winter is very tough for me. It is hard to get up and want to do something." (Chantel)

HOW DO PEOPLE DEAL?

The Out-of-the-Cold program is frequently cited as an important way to stay warm in the winter. People are very thankful for the protection that this program offers. However, they also report challenges. For example, they explained that they have to get to a different place each night and often cannot afford public transportation. Walking is reported to be challenging at times because sidewalks are not always shovelled.

"I would walk up there sometimes, but in the winter it's ridiculous when there is a ton of snow and you are just lifting your feet up and it takes you like an hour and a half just to get up there." (Blair)

Other protective strategies include staying in public buildings (e.g., libraries), empty moving trucks, emergency exits or at a friend's house. Several people reported that they wear all of their clothing, which can be unpleasant and problematic if they get wet.

"It was really hard with clothing. I was ..., when I was out in the winter I was wearing the same clothes for days and days, I felt so disgusting." (Bruce)

A few people reported that they tried to be admitted to residential alcohol and drug rehabilitation programs or committed a minor crime to get themselves into jail as a means of shelter. One responded mentioned cutting his own arms open in order to be admitted to a psychiatric hospital as a strategy to get out of the cold. Some people turned to drugs and alcohol since they perceived that this would allow them to "better" deal with the harsh winter conditions.

WHAT CAN WE EXPECT IN THE FUTURE?

According to the IPCC climate models for the Eastern North America project a median warming 3.8°C over the winter months by 2100, with model outputs ranging from 2.1 to 6.0°C. Winter precipitation is expected to increase by a median value of 11%, over the same time period, with model outputs ranging from 2 to 28%. By 2100, the probability of a winter season being extremely wet relative to the 1980-1999 reference period is expected to be 0.24.

HUMIDITY

Some people reported that humidity, which compounds the effects of extreme heat in the summer, affects them negatively, especially when they suffer from other health conditions such as asthma and rheumatism.

"For me it's rain and humidity. I have chronic bronchial asthma and I am allergic to the rain and humidity I can't breathe when it is out there." (Valerie)

"But when it is humid and you find it a little harder for breathing and you can feel it in your bones, like your bones, like your bones ache a little bit more cause you can feel the humidity and the temperature is building and you know it is going to storm, after two or three days of humidity and you end up with a week's worth of weather like this when you got a lot of moisture in the airs. I can feel it right through my bones, through my shoulder, through my ankles." (Ted)

Besides these weather stressors mentioned by the respondents of this study there are also other weather-related risk factors that are expected to be negatively affected by climate change, but that may not be something that people experiencing homelessness are aware of. For example, a warmer climate is associated with an increase in the incidence of vector-borne diseases. These diseases are those that are transmitted by insects, rodents, and other vectors from one person to another.

The West Nile Virus is a well-known example of such a disease which has spread from coast to coast in North America in only a few years. Research has suggested that there is a relationship between warm dry summers resulting from climate change and the introduction of the virus to North America in 1999[13]. The main transmitter of West Nile Virus is the Culex species of mosquitoes, which are most active at night. This puts those who sleep outside at increased risk. Those over the age of 55 and people with compromised immune systems are at higher risk of becoming ill if infected by the WestNile Virus. This can include those with chronic illnesses such as alcoholism, diabetes, and heart disease, which are quite common health conditions amongst people experiencing homelessness[5].

While there are increased negative health impacts such as vector-borne diseases and air pollution which are caused by factors that are related to changing weather conditions, these links are not always clear. None of our respondents directly addressed these issues as problematic nor described any adaptation strategies to deal with them. This lack of awareness can put people experiencing homelessness at further risk. However, it is important to note that the Region of Waterloo Public Health has an existing Vector-Borne Disease Program Plan.

WHAT DOES THIS ALL MEAN?

The exposure sensitivity to extreme weather conditions among those experiencing absolute homelessness is relatively high. The participants in this study reported multiple weather conditions, such as extreme rain, heat, and cold that they experience as problematic. The impact of these weather conditions can be amplified by pre-existing conditions prevalent among those experiencing homelessness such as mental health issues, respiratory and cardiovascular diseases, social isolation and drug and alcohol use. Climate models suggest that some of these weather conditions will get worse in Waterloo Region as the effects of global climate change unfold. Thus, there is a significant risk that people experiencing absolute homelessness will be vulnerable to the impacts of global climate.

Whether this potential risk becomes a real risk will depend on the adaptive capacity, that is, how well people can deal with the exposure-sensitivity. The data suggest that having easy access to protective shelter when needed and having appropriate gear and a safe place to store it are currently among the most effective ways for people to deal with problematic weather conditions. Many of the protective measures currently implemented by the network of service providers in Cambridge and Kitchener-Waterloo are perceived as very helpful and many of our respondents expressed their appreciation for the services offered. Areas for improvement, such as having a legal and safe place to camp, having easy access to safe storage for their gear, and having access to better foot wear, were mentioned as well. The perceived lack of easy access to water and less available shelter space in the summer could become more problematic as the number of extreme heat days increases.

Based on the findings of this study the research team and their regional partner recommend a careful review of existing and planned services in order to assess whether they will be sufficient in preventing future vulnerabilities to global climate change. It is the responsibility of each local community to raise awareness and put measures into place that will decrease the vulnerability of those experiencing homelessness from the problematic weather conditions mentioned in this report. This is relevant now, and even more for the future when weather conditions will increase in severity. While some of these weather conditions may not change in the very near future, there is now a window of opportunity to plan and prepare for the time when more extreme weather conditions can be expected in Waterloo Region and other regions in Canada. **We do not want to wait to build strong levees until the flood hits our shore...**

...Continued on back page

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WHAT IS NEXT?

There is now an opportunity to carefully plan and prepare for the weather changes and potential vulnerabilities due to global climate expected in the future. The goal is to engage the different stakeholders in a discussion of what the implications of this study are for current long-term strategic plans. Current planning efforts in Waterloo Region include implementation of both the Region of Waterloo Affordable Housing Strategy (2008 – 2013) and the Homelessness to Housing Stability Strategy for Waterloo Region (2007 – 2010). A primary focus of these two Strategies is on longer-term solutions including adequate, affordable housing and support services. Specific actions within the Homelessness to Housing Stability Strategy that address more immediate needs for people experiencing absolute homelessness include ensuring both fixed (drop-in) and mobile street outreach services are available across the urban areas of Waterloo Region. Also, Region of Waterloo, Public Health released an Extreme Cold Weather Protocol in April and a Humidex and Air Quality Advisory Protocol in June (both universally targeted). At the same time, in order to align the documents, Region of Waterloo Social Services revised its Cold Weather Plan (specific to people experiencing homelessness) which has been in existence for over a decade. The outcomes of this research will inform the next Homelessness to Housing Stability Strategy currently under development and anticipated to be released following community consultations in spring 2011.

Are these current plans adequate in addressing the potential impacts of global climate change or are adjustments needed? If not, what kind of changes may be needed? These are the types of questions the research team in partnership with their partners from the Region are trying to explore next. For this purpose a Community Reference Group was formed. In addition, a Scenario Thinking Workshop that will engage a broader group of stakeholders and community members is planned for the fall.

Community Reference Group: This group guides and supports the research team in ensuring that the research can be used for planning in Waterloo Region. The group is composed of our peer advisors, Sonia Poirier, Craig Singleton and José Silva, who have experienced absolute homelessness in their lives, Doug Rankin from the Kitchener Downtown Community Health Centre, Anne Tinker from Bridges Shelter in Cambridge, Lynn Randall from the Region of Waterloo, Social Planning, Policy and Program Administration Division, Donna Garstin from the Region of Waterloo Public Health, and Manuel Riemer, Jacqueline de Schutter, Kate Klein, and Wendy de Gómez from the research team.

Scenario Thinking Workshop: This will be an interactive workshop providing all interested stakeholders with an opportunity to come together, think about the implications of the research findings in very concrete terms, and identify the needs for the future. Those attending this workshop will be asked to imagine different scenarios of how the short and long-term future may look like in the Waterloo Region for those experiencing homelessness. What kind of extreme weather situations will they experience? Which of these situations are especially difficult to deal with? What resources will be necessary? The participants are encouraged to use the data and images from our research in creating these scenarios. The scenarios will provide the participants with a more concrete idea of what kind of community-based response may be needed now and within the long-term future to deal with the impact of global climate change in a responsible way. A broad range of stakeholders interested and knowledgeable in the issues related to global climate change adaptation are encouraged to participate in this workshop, including but not limited to people experiencing homelessness, representatives from service agencies, government representatives, urban planners, private sector representatives, and other community members.

If you are interested in participating in this workshop, please contact Dr. Manuel Riemer.

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