



SAMUEL CENTRE
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CONNECTEDNESS

The experiences of people with disabilities and older persons during climate-induced heat waves

Evidence, Gaps, & Future Directions

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EXECUTIVE SUMMARY

In the form of a literature review, this report examines the impacts of climate-included heat waves on persons with disabilities and older persons while also outlining the relationship of these impacts on social connectedness, including elements such as social support and social isolation. These impacts are examined alongside climate adaptation plans and heat wave strategies. Several recommendations are proposed to mitigate the impacts of climate induced heat waves on persons with disabilities and older persons, and to strengthen existing responses to heat waves. Governments should consider the impacts on people with disabilities and older persons and climate adaptation and heat preparedness strategies and include older design targeted measures to assist them. However, this can only be done with more intentional research and data collection, and in consultation with both people with disabilities and older persons.

TERMINOLOGY

- The term ‘social connectedness’ is used to describe a “feeling of belonging, a sense of connection to others.”¹
- The term ‘people with disabilities’ is used to describe “those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others.”² The report uses this term while acknowledging that many people prefer the term “disabled,” alongside other ways of identifying, and respects the choice of an individual to self-identify.
- The term ‘older persons’ is used to describe people “aged 65 and above.” The report uses this term while acknowledging that many people prefer other terms, including “seniors.”³
- The term ‘ableism’ is used to describe the “systemic discrimination against persons with disabilities.”⁴
- The term ‘ageism’ is used to describe “stereotypes, prejudices, and discrimination towards people because of their age.”⁵

¹ Priya Nair, “The Post-Migration Mental Health of Asylum Seekers and Refugees in Quebec Understanding & Addressing the Mental Health Impact of Forced Migration,” *Samuel Centre for Social Connectedness* (2019), 2.
<https://www.socialconnectedness.org/wp-content/uploads/2019/12/The-Post-Migration-Mental-Health-of-Asylum-Seekers-and-Refugees-in-Quebec.pdf>.

² United Nations, “Convention on the Rights of Persons with Disabilities and Optional Protocol,” Article 1 (, n.d.), accessed August 13, 2021.

³ Report of the Office of the United Nations High Commissioner for Human Rights, “Analytical Study on the Promotion and Protection of the Rights of Older Persons in the Context of Climate Change” (Forty-seventh session: Human Rights Council, April 30, 2021).

⁴ This definition was coined in 1981 by Seamoon House, in a special issue on disability in the feminist journal “Off Our Backs.” House, S. “A Radical Feminist Model of Psychological Disability.” *Off Our Backs*, 11, no. 5 (1981): 34-35. <http://www.jstor.org/stable/25774071>.

⁵ Liat Ayalon, “There Is Nothing New under the Sun: Ageism and Intergenerational Tension in the Age of the COVID-19 Outbreak,” *International Psychogeriatrics* 32, no. 10 (April 14, 2020): 1121, <https://doi.org/10.1017/s1041610220000575>.

INTRODUCTION

The adverse effects of climate change on people with disabilities and older people have been recognized by institutions such as the United Nations High Commissioner for Human Rights, which released a report in April 2020 on the relationship between climate change and the full and effective enjoyment of the rights of persons with disabilities, along with a report in April 2021 on climate change among older people. These reports highlight that both people with disabilities and older people are at increased risk to the adverse impacts of climate change, including threats to their rights to health, food, water, sanitation, and livelihoods.⁶

While the impacts of climate change on people with disabilities and older people are varied, this report will focus on heat-related impacts of climate change, and specifically on the impacts of heat waves. This is due to the clear link between heat mortality and climate change: more than one-third of heat-related deaths across 43 countries can be attributed to anthropogenic climate change.⁷ As a literature review, research conducted for this report examined existing research documenting the impacts of heat waves on people with disabilities and older persons and strategies aimed at mitigating these impacts. While much research has been devoted to heat wave response strategies, few studies have been dedicated to examining the intersection of heat responses and age, but particularly the intersection of heat responses and

⁶ Report of the Office of the United Nations High Commissioner for Human Rights, “Analytical Study on the Promotion and Protection of the Rights of Older Persons in the Context of Climate Change” (Forty-seventh session: Human Rights Council, April 30, 2021); Report of the Office of the United Nations High Commissioner for Human Rights, “Analytical Study on the Promotion and Protection of the Rights of Persons with Disabilities in the Context of Climate Change” (Forty-fourth session: Human Rights Council, April 22, 2020).

⁷ A. M. Vicedo-Cabrera et al., “The Burden of Heat-Related Mortality Attributable to Recent Human-Induced Climate Change,” *Nature Climate Change* 11 (May 31, 2021): 492, <https://doi.org/10.1038/s41558-021-01058-x>.

disability. In conducting the review, this report relied on search words such as: disability, physical disability, intellectual disability, psychosocial disability, disabled, persons with disabilities, vulnerable, vulnerability, chronic illness, morbidity, comorbidity, elderly, older people, seniors, mental health, health, illness, health burden, heat, heat waves, climate change, global warming, adaptation, mitigation, responses, and strategies.

It is important to recognize that both people with disabilities and older persons are not homogenous entities whose experiences can be applied universally. Moreover, this report recognizes the limitations of researching both people with disabilities and older persons, given the complex specificity inherent to both groups, and to ageism and ableism distinctively. However, as above, both groups are disproportionately impacted by climate-induced heat waves, and as van der Horst and Vickerstaff have written, “ableism may depend on age,” and vice versa, with ageism also depending on disability.⁸ The research in this report has also focused on high-emitting countries, recognizing that these countries have an obligation to reduce their emissions and include people with disabilities and older persons in climate planning.

The structure of this report is as follows. First, it will examine how heat waves impact people with disabilities and older persons. Second, it will examine these impacts in the context of social connectedness, demonstrating how a lack of social connectedness is interwoven into the ways many people with disabilities and older people experience heat waves. However, where this report elaborates on how a lack of social connectedness has impacted the way people with disabilities and older persons experience heat, it should be clear that a lack of social connectedness is a byproduct of

⁸ Mariska van der Horst and Sarah Vickerstaff, “Is Part of Ageism Actually Ableism?” *Ageing and Society*, January 7, 2021, 6, <https://doi.org/10.1017/s0144686x20001890>.

both ableism and ageism. Third, it will review existing climate adaptation strategies and heat wave preparedness plans and their viability in addressing the needs of people with disabilities and older persons. Finally, it will provide recommendations to mitigate the impacts of climate induced heat waves on persons with disabilities and older persons and strengthen existing responses to heat waves.

THE IMPACT OF HEAT WAVES ON PEOPLE WITH DISABILITIES

Before outlining how climate-induced heat waves impact people with disabilities and older persons, it is crucial to recognize that many intersections that impact how people with disabilities and older persons experience climate change have not been included in research or frameworks created about heat waves. As Jodoin, Ananthamoorthy, and Lofts write, “persons with disabilities are not a homogenous group; they face complex experiences of oppression that are determined by a confluence of social and power differentials.”⁹ Intersections that are underexamined include, but are not limited to, people with disabilities and older persons who are unhoused, those who are incarcerated, and impacts on disabled and/or older sex workers. Moreover, very little scholarship has been done on risks that those who are marginalized *within* the spaces and communities for people with disabilities and older persons themselves, such as the impact of heat waves on low-income, racialized, queer, or trans people with disabilities or older persons. Scholarship and frameworks that account for the specificity and complexity inherent to these interwoven identities is necessary.

⁹ Sébastien Jodoin, “A Disability Rights Approach to Climate Governance,” 11.

Generally, “high temperatures can lead to poorer sleep, altered blood flow and other physiological processes that underlie cognition, which in turn can worsen the symptoms of mental illness and reduce mental wellbeing.” However, heat waves have specific and disproportionate impacts on people with disabilities. For example, individuals with spinal cord injury are especially impacted due to both concerns around mobility and their inability to control their body temperature.¹⁰ People with epilepsy, who are at increased risk of both neurocognitive and cerebrovascular disorders, are also disproportionately impacted by extreme weather events such as heat waves.¹¹ People with a wide variety of disabilities also rely on commonly used medications that disrupt thermoregulation or fluid electrolyte balance and increase sensitivity to heat.¹²¹³ These medications include diuretics, anticholinergics, antipsychotics, beta blockers, stimulants, and hypertensives. Moreover, heat waves disproportionately impact people with mental health conditions or disabilities and psychosocial disabilities. Research has identified that “higher temperatures have been associated with increased risks of hospital admissions, including in the emergency department, for experiences diagnosed as bipolar disorder, schizophrenia, alcohol and substance misuse, dementia, and self-harm.”¹⁴ Medications used for mental health conditions can impair the body’s ability to regulate temperature, which can then lead to higher risk of severe physical symptoms

¹⁰ Marcalee Alexander et al., “A Bellweather for Climate Change and Disability: Educational Needs of Rehabilitation Professionals Regarding Disaster Management and Spinal Cord Injuries,” *Spinal Cord Series and Cases* 5, no. 1 (November 15, 2019): 93, <https://doi.org/10.1038/s41394-019-0239-z>.

¹¹ Medine I. Gulcebi et al., “Climate Change and Epilepsy: Insights from Clinical and Basic Science Studies,” *Epilepsy & Behavior: E&B* 116 (March 1, 2021): 5, <https://doi.org/10.1016/j.yebeh.2021.107791>.

¹² J. Bradley Layton et al., “Heatwaves, Medications, and Heat-Related Hospitalization in Older Medicare Beneficiaries with Chronic Conditions,” *PloS One* 15, no. 12 (2020): 1, <https://doi.org/10.1371/journal.pone.0243665>.

¹³ Ibid.

¹⁴ Dr. Emma Lawrence et al., “The Impact of Climate Change on Mental Health and Emotional Wellbeing: Current Evidence and Implications for Policy and Practice” (Imperial College London: Grantham Institute, May 2021).

during heat waves.¹⁵ However, the thermoregulation of people with psychosocial disabilities may also be affected, “due to a combination of their underlying disorders, the effects of medications, impaired judgement, and social factors.”¹⁶ Beyond the physical impacts relevant to certain types of disabilities, and the impacts of certain medications, “heatwaves may prevent persons that are sensitive to heat due to chronic health conditions from leaving their homes and accessing the services they require.”¹⁷

Despite research on the impacts that heat waves have on people with disabilities, there is a lack of research dedicated to documenting the number of mortalities that are attributable to heat for people with disabilities. However, a wide range of studies conducted globally demonstrate that people with disabilities are overrepresented among those who have died from heat waves. For example, scholars have documented that people with psychosocial disabilities have two to three times higher risk of death during heat waves.¹⁸

THE IMPACT OF HEAT WAVES ON OLDER PERSONS

As with people with disabilities, studies have shown the overrepresentation of older people among mortalities during heat waves. For example, Japan’s most recent Heat Stroke Action Plan identified that between 2010 to 2019, 80% of the heat wave deaths in Japan were people 65 and older.¹⁹ In 2019, half of the 1235 people who died

¹⁵ Ibid.

¹⁶ Cadeyrn J. Gaskin et al., “Factors Associated with the Climate Change Vulnerability and the Adaptive Capacity of People with Disability: A Systematic Review,” *Weather, Climate, and Society* 9, no. 4 (October 2017): 802, <https://doi.org/10.1175/wcas-d-16-0126.1>.

¹⁷ Sébastien Jodoin, Katherine A. Lofts, and Nilani Ananthamoorthy, “A Disability Rights Approach to Climate Governance,” *Ecology Law Quarterly* 47, no. 1 (May 25, 2020): 22, <https://ssrn.com/abstract=3610193>.

¹⁸ Dr. Emma Lawrence, “The impact of climate change on mental health and emotional wellbeing,” 11,

¹⁹ Government of Japan, “環境省_政府における「熱中症対策行動計画」の策定について(お知らせ),” www.env.go.jp, March 25, 2021, <https://www.env.go.jp/press/109381.html>.

during heat waves in France were people 65 and older.²⁰ In the past two decades, heat-related deaths for older persons in the US almost doubled, reaching a record high of 19,000 deaths in 2018, according to estimates issued in December 2020 by a commission, formed by the medical journal Lancet, that tracks the impact of climate change on health.²¹

Ageing impacts thermoregulation in several ways. Older adults (adults who are older than 50 years of age) store 1.3 to 1.8 times more body heat when exposed to the same heat load than younger adults (19-30 years).²² This higher heat storage in older people is due to a reduction in heat loss, which can begin at ages as early as 40 years old.²³ Both the capacity to sweat and skin blood flow reduce with age, which reduces the ability of older persons to dissipate heat.²⁴ As a result, older people are more prone to heat stress than their younger counterparts.²⁵ Moreover, older people are also more likely to have a chronic medical condition or a disability that affects bodily responses to heat.²⁶ For example, heat puts older people at increased risk of being hospitalized for other medical conditions such as renal failure and sepsis.²⁷ Similarly, older people are also more likely to take prescription medication that predispose them to heat-related

²⁰ “Summer Heat Killed Nearly 1,500 in France, Officials Say,” *BBC News*, September 9, 2019, <https://www.bbc.com/news/world-europe-49628275>.

²¹ “Health and Climate Change: 2020 Lancet Countdown U.S. Brief,” LANCET COUNTDOWN:, December 2020, <https://www.lancetcountdownus.org/2020-lancet-countdown-u-s-brief/>.

²² Glen P. Kenny et al., “Hyperthermia and Cardiovascular Strain during an Extreme Heat Exposure in Young versus Older Adults,” *Temperature* 4, no. 1 (August 31, 2016): 86, <https://doi.org/10.1080/23328940.2016.1230171>.

²³ Joanie Larose et al., “Age-Related Decrements in Heat Dissipation during Physical Activity Occur as Early as the Age of 40,” ed. Joseph Devaney, *PLoS ONE* 8, no. 12 (December 12, 2013): 1, <https://doi.org/10.1371/journal.pone.0083148>.

²⁴ Alison Millyard et al., “Impairments to Thermoregulation in the Elderly during Heat Exposure Events,” *Gerontology and Geriatric Medicine* 6 (January 2020): 1, <https://doi.org/10.1177/2333721420932432>.

²⁵ Alison Millyard, “Impairments to Thermoregulation in the Elderly during Heat Exposure Events,” 3.

²⁶ “Heat Stress in Older Adults | Natural Disasters and Severe Weather | CDC,” *www.cdc.gov*, February 4, 2019, <https://www.cdc.gov/disasters/extremeheat/older-adults-heat.html>.

²⁷ Stephanie Hopp, Francesca Dominici, and Jennifer F. Bobb, “Medical Diagnoses of Heat Wave-Related Hospital Admissions in Older Adults,” *Preventive Medicine* 110 (May 1, 2018): 81–85, <https://doi.org/10.1016/j.ypmed.2018.02.001>.

complications by disrupting thermoregulatory responses that maintain core body temperature, through either interfering with cognitive processes or directly impacting autonomic mechanisms, such as suppressing thirst.²⁸ Concerns created by medication are further compounded by inadequate medication storage; for example, a study in Spain found that a high number of patients observed inadequate drug storage practices, keeping their medication in the kitchen and bathroom, where it can be impacted by temperature fluctuations and high humidity.²⁹

Beyond these physical impacts, it is important to consider the various mental impacts climate-induced heat waves have been evidenced to have on older persons. Research has shown that extreme heat can cause “distress to older persons,” noting that older people have used terms such as “overwhelming,” “panic,” “anxious,” “concern,” “worried,” “desperate,” and “fear” to describe their emotions during heat waves.³⁰ Several specific concerns included: “feeling cold in air conditioning; the possibility of house fires as a result of faulty air conditioning, fears about having to go into a nursing home; and the cost of using air conditioning.”³¹

Impacts in Canada

In Canada, the impacts of climate-induced heat waves on people with disabilities and older persons are urgent and ongoing. Canada is warming at twice the global rate,³²

²⁸ J. Bradley Layton, “Heatwaves, medications, and heat-related hospitalization in older Medicare beneficiaries with chronic conditions,” 2.

²⁹ “Medicines Storage and Disposal Practices and Outpatient Pharmacy Services in Spain,” Hospital Pharmacy Europe, August 18, 2020, <https://hospitalpharmacyeurope.com/news/reviews-research/medicines-storage-and-disposal-practices-and-outpatient-pharmacy-services-in-spain/>.

³⁰ Alana Hansen et al., “Perceptions of Heat-Susceptibility in Older Persons: Barriers to Adaptation,” *International Journal of Environmental Research and Public Health* 8, no. 12 (December 19, 2011): 4720, <https://doi.org/10.3390/ijerph8124714>.

³¹ Ibid.

³² The Lancet Countdown on Health and Climate Change, “Policy Brief for Canada” (December 2020).

and has contributed to a 58.4 percent increase in heat-related deaths of people over 65 in less than two decades.³³ Between June 20 and July 29 2021, 569 people in British Columbia died as a result of climate-related heat waves.³⁴ The Chief Coroner's statement highlights that "of those who died, 79% were age 65 or older, 65% were age 70 or older and 40% were age 80 or older."³⁵ However, no data has been collected on the number of people with disabilities who died during the heat waves, and no other data has been released on other health impacts, including the number of hospital visits made during the heatwave by people with disabilities. This lack of data on other health impacts beyond excess mortalities is also true for older persons.

Despite the absence of data collection on the number of people with disabilities during the most recent heat waves in British Columbia, earlier studies conducted in Canada have shown that people with disabilities are at increased risk during heat waves. During the 2009 heatwave in Metro Vancouver, 18 deaths over a one-week period were attributed to "self-harm or accidental overdoses," numbers which were significantly higher than expected for the region. A 2012 study in Quebec highlighted that increases in temperature and humidity were associated with an increased use of emergency departments for mental and psychological problems, particularly in cities.³⁶ Similarly, a 2014 study in Toronto found a 149% increase in daily ER visits over a period

³³ Environment and Climate Change Canada, "Canada's Climate Is Warming Twice as Fast as Global Average," Canada.ca (Government of Canada News, April 2, 2019), <https://www.canada.ca/en/environment-climate-change/news/2019/04/canadas-climate-is-warming-twice-as-fast-as-global-average.html>.

³⁴ Lisa Lapointe, "Chief Coroner's Statement on Public Safety during High Temperatures" (Ministry of Public Safety and Solicitor General: BC Coroners Service, July 31, 2021), https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/news/2021/chief_coroner_statement_-_heat_related_deaths.pdf.

³⁵ Ibid.

³⁶ Stephen Vida et al., "Relationship between Ambient Temperature and Humidity and Visits to Mental Health Emergency Departments in Québec," *Psychiatric Services* 63, no. 11 (November 1, 2012): 1150, <https://doi.org/10.1176/appi.ps.201100485>.

of 7 days after initial exposure to high temperature for people with schizophrenia and schizotypal and delusional disorders.³⁷

THE ROLE OF SOCIAL CONNECTEDNESS

Research on how older persons and people with disabilities cope with heat has intended to focus on physical impacts, and on individual behaviours as coping strategies. However, the evidence of these physical impacts cannot be examined without the role of social connectedness (or absence thereof) in furthering the severity of these impacts on people with disabilities and older persons. Social connectedness can be understood as “the degree to which individuals are interconnected and embedded in communities,” and can be based on factors including analyses of social networks, level of social support, and levels of social engagement.³⁸ However, where this report elaborates on how a lack of social connectedness has impacted the way people with disabilities and older persons experience heat, it should be clear that a lack of social connectedness is a byproduct of both ableism and ageism. As scholars have written, “ableism feeds alienation, negative attitudes towards disability and, thus, promotes conditions of social isolation and emotional loneliness among people with disabilities.”³⁹ Across multiple geographies, people with disabilities face various challenges in daily life as a result of ableism that could affect how they experience social connectedness, including factors such as access to transportation, employment,

³⁷ Xiang Wang et al., “Acute Impacts of Extreme Temperature Exposure on Emergency Room Admissions Related to Mental and Behavior Disorders in Toronto, Canada,” *Journal of Affective Disorders* 155 (February 2014): 157, <https://doi.org/10.1016/j.jad.2013.10.042>.

³⁸ Eric Emerson et al., “Loneliness, Social Support, Social Isolation and Wellbeing among Working Age Adults with and without Disability: Cross Sectional Study,” *Disability and Health Journal* 14, no. 1 (August 2020): 1, <https://doi.org/10.1016/j.dhjo.2020.100965>.

³⁹ Loneliness in life stories by people with disabilities, page 878

and discrimination.⁴⁰ For example, people with mental health-related disabilities in Canada “experience more repeat violence, more violence at the hands of someone they know, and live with more known risk factors for violent victimization than the general population.”⁴¹ These factors mirror the experiences of many older persons, who face structural ageist barriers and assumptions, “which are often internalised by older people themselves.”⁴² Social connectedness is important in the context of heat waves, as it moves beyond individual or physical characteristics as determinants of the ability to cope with heat waves and examines the relationship between older persons and people with disabilities and their communities in their totalities.⁴³

Before explaining how social connectedness is a significant factor in determining how people with disabilities and older people are affected by heat waves, it is impossible to ignore the importance of the COVID-19 pandemic in demonstrating the importance of social connectedness. Both ageism and ableism has had a tremendous impact during the pandemic, not only in its impacts on for its prevalence in institutionalized populations, but also in emergency responses that clearly target persons with disabilities in the triage systems, as well as in the vaccine rollout in several contexts. Across Canada, it is estimated that between 70% and 82% of the deaths by COVID 19 have happened in long-term facilities, where many people with disabilities

⁴⁰ Meredith A. Repke and Catherine Ipsen, “Differences in Social Connectedness and Perceived Isolation among Rural and Urban Adults with Disabilities,” *Disability and Health Journal* 13 (August 2019): 1, <https://doi.org/10.1016/j.dhjo.2019.100829>.

⁴¹ Statistics Canada, “Violent Victimization of Canadians with Mental Health-Related Disabilities, 2014” (October 18, 2018).

⁴² Tessa Morgan et al., “Social Connectedness: What Matters to Older People?,” *Ageing and Society* 14 (November 18, 2019): 1127, <https://doi.org/10.1017/s0144686x1900165x>.

⁴³ Ibid.

and older persons live.⁴⁴ Social isolation caused by the pandemic has had significant impacts on both older persons and people with disabilities.⁴⁵ Moreover, the pandemic has impacted responses to heat. For example, countries in varying stages of lockdown have allocated time slots for outdoor activity, which “may not be correlated with vulnerability for heat.”⁴⁶ The weight of these impacts are crucial in considering how people with disabilities and older persons have experienced climate-induced heat in the past year. However, beyond the impacts of the pandemic, two factors that are relevant to matrices of social connectedness have been identified in research examining how people with disabilities and older persons experience heat waves: social support and social isolation.

Social Connectedness and Social Support

The World Bank has estimated “that 20 per cent of the world’s poorest people have some kind of disability, and tend to be regarded in their own communities as the most disadvantaged.”⁴⁷ Little attention has been paid to the intersection between disability, age, and those who are unhoused during climate induced heat waves, however, lack of access to adequate infrastructure undoubtedly exacerbates environmental hazard exposure.⁴⁸ As recently as 2017, it was documented that persons

⁴⁴ International Disability Alliance, “Quebec: The Seventh Deadliest Place in the World for Coronavirus due to Institutionalization,” International Disability Alliance, June 15, 2020, <https://www.internationaldisabilityalliance.org/quebec-covid19>.

⁴⁵ Amanda Ribeiro Gonçalves et al., “Perceptions, Feelings, and the Routine of Older Adults during the Isolation Period Caused by the COVID-19 Pandemic: A Qualitative Study in Four Countries,” *Aging & Mental Health*, March 1, 2021, 1, <https://doi.org/10.1080/13607863.2021.1891198>.

⁴⁶ G.S. Martinez et al., “Protect the Vulnerable from Extreme Heat during the COVID-19 Pandemic,” *Environmental Research* 187 (August 1, 2020): 2, <https://doi.org/10.1016/j.envres.2020.109684>.

⁴⁷ United Nations, “Factsheet on Persons with Disabilities | United Nations Enable,” Un.org, 2010, <https://www.un.org/development/desa/disabilities/resources/factsheet-on-persons-with-disabilities.html>. <https://www.un.org/development/desa/disabilities/resources/factsheet-on-persons-with-disabilities.html>

⁴⁸ Erin Goodling, “Intersecting Hazards, Intersectional Identities: A Baseline Critical Environmental Justice Analysis of US Homelessness,” *Environment and Planning E: Nature and Space* 3, no. 3 (December 18, 2019): 845, <https://doi.org/10.1177/2514848619892433>.

with more severe disabilities in Canada aged 25 to 64 years are more likely to be living in poverty (28%) than their counterparts without disabilities (10%) or with milder disabilities (14%).⁴⁹ Difficulties of meeting housing payments increase the risk that both people with disabilities and older people “may have insufficient ‘after housing’ funds to pay for essentials such as food, power, mobility aides or medical treatment.”⁵⁰ Moreover, specific attention should be paid to energy poverty in this context. Energy poverty is already a concern in many countries: for example, 19% of households in France do not have the financial ability to maintain an adequate temperature in housing.⁵¹ Such financial concerns affect the ability of both people with disabilities and older people to cope during heat waves. For example, in a study exploring factors motivating the ways older people cope with heat, the energy cost from running air conditioning systems was cited as a common concern.⁵² While the cost of owning air conditioning is a concern in and of itself, studies done on the adaptation of older people to heat have noted that many older people turn off their air conditioners simply because they can’t afford it.⁵³ This is significant given that studies have shown that older people spend most of their time at home “in comparison with employed people.”⁵⁴ Ultimately, the poverty that many older people and people with disabilities disproportionately face deny them agency in being able to afford fans and air conditioning and in their ability to make changes to their

⁴⁹ Stuart Morris et al., “Canadian Survey on Disability” (, November 28, 2018).

⁵⁰ Christen Cornell, Nicole Gurrán, and Tess Lea, “Climate Change, Housing, and Health: A Scoping Study on Intersections between Vulnerability, Housing Tenure, and Potential Adaptation Responses” (, 2020).

⁵¹ FEANTSA and Abbe Pierre Foundation, “Sixth Overview of Housing Exclusion in Europe” (2021).

⁵² The Living Environment and Thermal Behaviours of Older South Australians: A Multi-Focus Group Study, page 9

⁵³ Alana Hansen et al., “Perceptions of Heat-Susceptibility in Older Persons: Barriers to Adaptation,” 4720.

⁵⁴ Dalia Streimikiene et al., “Climate Change Mitigation Policies Targeting Households and Addressing Energy Poverty in European Union,” *Energies* 13, no. 13 (July 1, 2020): 7, <https://doi.org/10.3390/en13133389>.

home as they see fit,⁵⁵ but also deny them personal agency in being able to take care of themselves during heat waves. Moreover, that many people with disabilities and older persons live in poverty also put them at greater risk to heat due to the urban heat island effect, disproportionately exposing them to the risks of extreme heat.⁵⁶ Overall, across many societies, a lack of social support in the form of poverty greatly contributes to the risks people with disabilities and older persons face during heat waves.

Social Connectedness and Social Isolation

As scholars have written, “social isolation increases the likelihood of adverse outcomes following natural disasters of all kinds.”⁵⁷ Studies have shown that older adults are more likely than others to report being socially isolated and lonely, and in some countries, older people are more likely to live alone.⁵⁸ This is particularly true in wealthier countries, including in the United States, Canada, and European countries.⁵⁹ Around the world, older people are more likely to live in smaller households than their younger counterparts.⁶⁰ Research has also shown that the number of older people living alone is gendered. Older women are considerably more likely than older men (20% vs. 11%) to live in solo households.⁶¹ This can be partially explained by a tendency among

⁵⁵ Joann Varicknickal, “Health Vulnerability to Extreme Heat Events in Hamilton, Ontario,” *Handle.net* (Thesis, 2020), <https://doi.org/http://hdl.handle.net/11375/25914>.

⁵⁶ Angel Hsu et al., “Disproportionate Exposure to Urban Heat Island Intensity across Major US Cities,” *Nature Communications* 12, no. 1 (May 25, 2021): 5, <https://doi.org/10.1038/s41467-021-22799-5>.

⁵⁷ Alistair Woodward, Kristie L Ebi, and Jeremy J Hess, “Commentary: Responding to Hazardous Heat: Think Climate Not Weather,” *International Journal of Epidemiology* 49, no. 6 (November 5, 2020): 1824, <https://doi.org/10.1093/ije/dyaa194>.

⁵⁸ Merja Tarvainen, “Loneliness in Life Stories by People with Disabilities,” *Disability & Society* 36, no. 6 (June 16, 2020): 878, <https://doi.org/10.1080/09687599.2020.1779034>.

⁵⁹ Pew Research Center, “Religion and Household Makeup around the World,” Pew Research Center’s Religion & Public Life Project, December 12, 2019, <https://www.pewforum.org/2019/12/12/religion-and-living-arrangements-around-the-world/>.

⁶⁰ *Ibid.*

⁶¹ Jacob Ausubel, “Globally, Women Are Younger than Their Male Partners, More Likely to Age Alone,” Pew Research Center, January 3, 2020, <https://www.pewresearch.org/fact-tank/2020/01/03/globally-women-are-younger-than-their-male-partners-more-likely-to-age-alone/>.

women to live a few years longer and partner with men who are older.⁶² This is important in the context of evidence of older women having higher mortality rates during severe weather events attributable to climate change, such as heat waves. For example, the majority of European studies “have shown that women are more at risk, in both relative and absolute terms, of dying in a heat wave.”⁶³ While there may be “some physiological reasons for an increased risk” in older women, social factors have been cited as an integral underlying element explaining different mortality rates between heat waves for older men and older women.⁶⁴ For example, different studies, including studies done in Paris and in Chicago, have shown that older men are more at risk in heat waves than older women.⁶⁵ This could be explained in part, by the level of social connectedness or social isolation experienced by older men.⁶⁶ Similarly, other “evidence suggests that in high-income countries, men and boys are more likely to have mental health problems related to climate change that increase their risk of mortality (eg, suicide and social isolation) and that unmarried men are at greater risk of dying from heat waves than unmarried women.”⁶⁷ Ultimately, social isolation is a major determinant of heat risk for both persons with disabilities and older persons. In Canada, the Chief Coroner of British Columbia stated that many of the heat mortalities during June and July of 2021 were people “living in private residences with minimal ventilation” and people living alone.⁶⁸

⁶² Global Health Observatory, “Life Expectancy for Women,” [www.who.int](https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/life-expectancy-for-women), accessed August 12, 2021, <https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/life-expectancy-for-women>.

⁶³ R. Sari Kovats and Shakoob Hajat, “Heat Stress and Public Health: A Critical Review,” *Annual Review of Public Health* 29, no. 1 (April 2008): 44, <https://doi.org/10.1146/annurev.publhealth.29.020907.090843>.

⁶⁴ *Ibid.*

⁶⁵ *Ibid.*

⁶⁶ *Ibid.*

⁶⁷ Kim van Daalen et al., “Climate Change and Gender-Based Health Disparities,” *The Lancet Planetary Health* 4, no. 2 (February 2020): 44, [https://doi.org/10.1016/s2542-5196\(20\)30001-2](https://doi.org/10.1016/s2542-5196(20)30001-2).

⁶⁸ Ministry of Public Safety and Solicitor General, “Chief Coroner’s Updated Statement on Public Safety during Heat Wave | BC Gov News,” news.gov.bc.ca, July 2, 2021, <https://news.gov.bc.ca/releases/2021PSSG0062-001295>.

The relationship between social connectedness, social support, and social isolation is also important when examining the specific risks climate change poses to people with disabilities and older persons living in residential institutions. Many people with disabilities and older persons continue to live in institutions, despite the advocacy and research attesting to the importance of living in the community when it comes to centering an individual's agency. As advocate Chester Finn states, "what happens in my apartment is up to me by my rights and rules."⁶⁹ These institutions greatly impact how these individuals experience climate-induced heat waves. Nursing home residents have been shown to become more dehydrated than older adults who live in the community, drastically affecting their ability to cope during heat waves.⁷⁰ These concerns are exacerbated by a lack of knowledge among health care providers and personnel working in these institutions. For example, an evaluation of the Dutch national heat plan among long-term care institutions in Amsterdam identified barriers relating to shortage of and expertise among personnel, and residents' independence: for every seven care managers, one considered consulting a physician when residents are taking medication to be 'less important.'⁷¹ A Berlin study found that most hospitals and retirement homes in Berlin did not have heat action plans, and that the prevalence of cooling facilities such as air conditioning was very low.⁷² Moreover, people with disabilities are

⁶⁹ Chester Finn, "Group Homes versus Living in the Community - Samuel Centre for Social Connectedness — Samuel Centre for Social Connectedness," Samuel Centre for Social Connectedness, July 28, 2021, <https://www.socialconnectedness.org/group-homes-versus-living-in-the-community/>.

⁷⁰ Masaaki Nagae et al., "Chronic Dehydration in Nursing Home Residents," *Nutrients* 12, no. 11 (November 20, 2020): 2, <https://doi.org/10.3390/nu12113562>.

⁷¹ Anton E Kunst and Rieneke Britstra, "Implementation Evaluation of the Dutch National Heat Plan among Long-Term Care Institutions in Amsterdam: A Cross-Sectional Study," *BMC Health Services Research* 13, no. 1 (April 11, 2013): 6, <https://doi.org/10.1186/1472-6963-13-135>.

⁷² Daniel Engler, "Dealing with High Temperatures: A Survey Assessing the Degree of Heat Risk Awareness and the Adaptation Measures Applied in Hospitals and Retirement Homes in Berlin" (Master of Sciences Thesis, 2017).

overrepresented in carceral systems and institutions. At a general level, this affects people with disabilities in multiple areas, including in their access to housing, employment, and other necessary social services, but this also enhances their direct physical risk to the impacts of climate change. For example, research done in the United States identified that “despite the lack of systematic surveillance, tracking, and reporting of deaths in jails and prisons due to extreme temperature exposure, unrelated to faulty heating or cooling systems or climate related disasters, numerous cases are described primarily within court documents, gray literature, and the media.”⁷³ All of this evidence speaks to the importance of social connectedness as a critical factor in hindering or mitigating the ability of persons with disabilities and older persons to cope with climate-induced heat waves.

The impacts of climate-induced heat waves on people with disabilities and older persons are well-documented. But what are governments doing to address these impacts?

ADAPTATION FRAMEWORKS

Globally, countries are developing adaptation plans to respond to the impacts of climate change.⁷⁴ The IPCC defines adaptation as the “the process of adjustment to actual or expected climate and its effects.”⁷⁵ As Nicole Bonnett and S. Jeff Birchall have

⁷³ Cynthia A. Golembeski, Kimberly Dong, and Ans Irfan, “Carceral and Climate Crises and Health Inequities: A Call for Greater Transparency, Accountability, and Human Rights Protections,” *World Medical & Health Policy* 13, no. 1 (February 22, 2021): 69–96, <https://doi.org/10.1002/wmh3.382>.

⁷⁴ For example, 25 European Union countries have adopted a climate change adaptation strategy/plan. European Environment Agency, “Number of Countries That Have Adopted a Climate Change Adaptation Strategy/Plan — European Environment Agency,” www.eea.europa.eu, December 7, 2018, <https://www.eea.europa.eu/airs/2018/environment-and-health/climate-change-adaptation-strategies#:~:text=To%20date%2C%2025%20EU%20Member>.

⁷⁵ IPCC, “Glossary — Global Warming of 1.5 °C,” ipcc.ch (Global Warming of 1.5 °C, 2018), <https://www.ipcc.ch/sr15/chapter/glossary/>.

noted, adaptation efforts differ worldwide in relation to the varying climate impacts, economic and social factors, noting that “adaptation types are diverse and constantly evolving as new, innovative methods are developed and contemporary adaptations are examined.”⁷⁶ Moreover, scholars have highlighted that while there has been increases in the consideration of social vulnerability in climate change policy, “most applied and region-specific management activities focus on emergency response and short-term recovery” rather than long-term mitigation measures aimed at curbing these social vulnerabilities, such as alleviating poverty.⁷⁷

In research and frameworks addressing and adaptation to climate change, people with disabilities and older persons are often mentioned only in passing in the context of an analysis that focuses on vulnerability. Such approaches center the vulnerability of people with disabilities and older persons without empowering them as leaders in addressing their own needs during and identifying possible solutions. Many adaptation strategies or heat wave plans that mention such “vulnerability” also fail to provide targeted strategies or recommendations on how these impacts can be mitigated specifically for these groups. For example, in Canada, at the federal level, neither Canada’s Emergency Management Framework, nor the Federal Adaptation Policy, mention disability at all, much less in the context of heat-related impacts.⁷⁸

⁷⁶ Nicole Bonnett and S. Jeff Birchall, “Vulnerable Communities: The Need for Local-Scale Climate Change Adaptation Planning,” in *Encyclopedia of the UN Sustainable Development Goals*, 2018, 1–10, https://doi.org/10.1007/978-3-319-71063-1_87-1.

⁷⁷ Christine Eriksen et al., “Rethinking the Interplay between Affluence and Vulnerability to Aid Climate Change Adaptive Capacity,” *Climatic Change* 162, no. 1 (September 2020): 28, <https://doi.org/10.1007/s10584-020-02819-x>.

⁷⁸ Government of Canada (2011), Federal Adaptation Policy Framework, Environment Canada, Gatineau, QC. <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/2017-mrgnc-mngmnt-frmwrk/index-en.aspx>
<https://www.canada.ca/en/environment-climate-change/services/climate-change/federal-adaptation-policy-framework.html>

There was also no evidence that people with disabilities and older persons participated in policy design, or that they were consulted in the decision-making process in creating such adaptation strategies or heat plans. This is contrary to plans such as Australia's National Climate Resilience and Adaptation Strategy, which states that "to identify action that will be appropriate and effective, decision makers should seek to understand and respect the knowledge and experience of those affected, and actively involve them in decision-making processes whenever possible," although not referencing people with disabilities or older persons specifically.⁷⁹ Provincial strategies in Canada have also paid insufficient or zero attention to the people with disabilities or older persons. For example, British Columbia's Climate Preparedness and Adaptation Strategy does not mention heat-related impacts on older people and people with disabilities at all.⁸⁰ In general, climate adaptation strategies fail to acknowledge people with disabilities or older persons entirely, much less in the context of their needs during heat waves. As Thomas and Soliman have written "the absence of a national moralistic stand against heat related deaths could be attributed to ageism or the belief that there is less urgency since deaths in the older population are an anticipated consequence of age and chronic illness."⁸¹ As an example of the prevalence of this concerning belief, during British Columbia's heat dome from the week of June 25 to July 1st, 2021, Premier John

⁷⁹ Australian Government, "National Climate Resilience and Adaptation Strategy," 2015, <https://www.environment.gov.au/system/files/resources/3b44e21e-2a78-4809-87c7-a1386e350c29/files/national-climate-resilience-and-adaptation-strategy.pdf>.

⁸⁰ Human Rights Watch, "Record Canada Heat Harms Older People and People with Disabilities, July 2021," <https://www.hrw.org/news/2021/07/09/record-canada-heat-harms-older-people-and-people-disabilities>.

⁸¹ Norma Thomas and Hussein Soliman, "Journal of Gerontological Social Work Preventable Tragedies Heat Disaster and the Elderly," *Journal of Gerontological Social Work* 38, no. 4 (2008): 63, https://doi.org/10.1300/J083v38n04_06.

Horgan responded to the concerns that many British Columbians had raised by simply stating that “fatalities are a part of life.”⁸²

HEAT ACTION PLANS

Like climate adaptation plans, a number of countries have implemented heat preparedness plans or strategies. For example, in 2019, “at least 16 European countries had implemented heat prevention plans and warning systems.”⁸³ However, many technical aspects within heatwave plans, such as the inability of many countries or localities to provide a consistent definition of a heat wave, complicate responses to climate induced heat waves.⁸⁴ For example, Environment Canada’s heat alert system has been described as generic, as it does not respond to differing health needs.⁸⁵ However, this report will focus on heat strategies that are specific to the ability of people with disabilities and older persons to cope during heat waves.

Recommendations to Check-on People

Recommendations to check-on on “vulnerable” people, including older people with disabilities, are commonly included in both heat preparedness plans as well as communication delivered by government authorities throughout heat waves. However, these are generally vague. For example, the UK government’s website states that “older

⁸² Alyse Kotyk, “‘Part of Life’: B.C. Premier Walks Back Comments on Heat Wave after Facing Backlash,” British Columbia, June 30, 2021, <https://bc.ctvnews.ca/part-of-life-b-c-premier-walks-back-comments-on-heat-wave-after-facing-backlash-1.5491572>

⁸³ Mathilde Pascal et al., “Evolving Heat Waves Characteristics Challenge Heat Warning Systems and Prevention Plans,” *International Journal of Biometeorology*, April 3, 2021, 2, <https://doi.org/10.1007/s00484-021-02123-y>.

⁸⁴ For example, the UK government has noted that “there is no official definition of what constitutes a heatwave in the UK.”

UK Parliament, “Heatwaves: Adapting to Climate Change,” publications.parliament.uk, n.d., <https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/826/82604.htm>.

⁸⁵ CTV News, “New Heat Wave Alert System Designed for Quebec in Wake of Climate Change,” Montreal, July 21, 2021, <https://montreal.ctvnews.ca/new-heat-wave-alert-system-designed-for-quebec-in-wake-of-climate-change-1.5517393>.

people living on their own should be visited daily to check they are well,” without specifying who is responsible for this.⁸⁶ Moreover, initiatives where neighbors check-in on one another have also been shown to be insufficient. In one key example of this, a Montreal study found that “from 21 reported heat-related community deaths of people with mental illnesses, of which many lived alone, 14 were contacted 24 h prior to their death by health care professionals, family members, neighbors and friends.”⁸⁷ Moreover, the refrain to “check-in” on neighbors and family members fails to take into consideration those who do not have established networks in the first place, and the isolation experienced when one does not have a support system to “check-in” on them.

Transportation

In a study evaluating heat preparedness strategies in four different U.S. cities, transportation was highlighted as both a “resource and a barrier” for people trying to move to cooler locations during heat waves.⁸⁸ For example, while some community members found free or reduced-cost transportation programs for older people or people with disabilities useful, “an underlying concern across a diversity of participants was that not everyone used these services or that public transportation did not sufficiently get people to specific locations such as cooling centers.”⁸⁹ An important factor in this context was whether buses were air conditioned, as well as additional costs relating to transportation.⁹⁰

⁸⁶ UK Government, “Looking after Yourself in Very Hot Weather | Nidirect,” nidirect, November 9, 2015, <https://www.nidirect.gov.uk/articles/looking-after-yourself-very-hot-weather>.

⁸⁷ Karine Price, Stéphane Perron, and Norman King, “Implementation of the Montreal Heat Response Plan during the 2010 Heat Wave,” *Canadian Journal of Public Health = Revue Canadienne de Sante Publique* 104, no. 2 (February 11, 2013): 99, <https://pubmed.ncbi.nlm.nih.gov/23618220/>.

⁸⁸ Natalie R. Sampson et al., “Staying Cool in a Changing Climate: Reaching Vulnerable Populations during Heat Events,” *Global Environmental Change* 23, no. 2 (April 2013): 480, <https://doi.org/10.1016/j.gloenvcha.2012.12.011>.

⁸⁹ Ibid.

⁹⁰ Ibid.

Cooling Centres

While the establishment of cooling centres are a common element of heat preparedness strategies across urban areas, they present several challenges for both people with disabilities and older people. First, at a general level, cooling centers are often not accessible for people with disabilities and older people with physical impairments or challenges related to mobility, where moving locations is a challenge.⁹¹ This is exacerbated by the accessibility of cooling centers themselves. In one study done in Arizona in 2017, it was found that cooling centers were not easily accessible because they had low visibility from major streets and sidewalks, inaccessible gates, or unclear entrances that prevented people from going.⁹² Second, studies have highlighted the burden created by moving to a cooling center, and then returning to a home that is unbearably hot and without air conditioning.⁹³ In British Columbia, during the heat waves of 2021, cooling centers were open until 7 PM.⁹⁴ Finally, certain studies have noted that cooling centers are often stigmatized, having been described as “only for seniors or homeless individuals,” and deterring people from accessing them during heat waves.⁹⁵ Similar strategies, such as water fountains or temporary water stations, have also been prevalent in heat wave preparedness strategies, but often must be implemented alongside access to public washrooms, “as many seniors mentioned avoiding drinking

⁹¹ Kyusik Kim et al., “A Comparative Assessment of Cooling Center Preparedness across Twenty-Five U.S. Cities,” *International Journal of Environmental Research and Public Health* 18, no. 9 (April 30, 2021): 4801, <https://doi.org/10.3390/ijerph18094801>.

⁹² Vjollca Berisha et al., “Assessing Adaptation Strategies for Extreme Heat: A Public Health Evaluation of Cooling Centers in Maricopa County, Arizona,” *Weather, Climate, and Society* 9, no. 1 (December 21, 2016): 77, <https://doi.org/10.1175/wcas-d-16-0033.1>.

⁹³ Jennifer L. Martin, “Responding to the Effects of Extreme Heat: Baltimore City’s Code Red Program,” *Health Security* 14, no. 2 (April 2016): 76, <https://doi.org/10.1089/hs.2015.0054>.

⁹⁴ Denise Wong, “Lower Mainland Cooling Centres, Spray Parks amid August Heat Wave - NEWS 1130,” www.citynews1130.com, August 11, 2021, <https://www.citynews1130.com/2021/08/11/lower-mainland-cooling-centres-heat/>.

⁹⁵ Jalonne White-Newsome et al., “Strategies to Reduce the Harmful Effects of Extreme Heat Events: A Four-City Study,” *International Journal of Environmental Research and Public Health* 11, no. 2 (February 13, 2014): 1980, <https://doi.org/10.3390/ijerph110201960>.

water out of fear they may not be able to access a washroom away from home.”⁹⁶

However, these strategies pose the same challenges with people with disabilities and older persons with specific mobility concerns.

Communication

Beyond the challenges of transportation and locating to cooler spaces, how warnings and information on heat waves are communicated have been cited as another barrier for both people with disabilities and older people. Generally, the phenomenon of message fatigue has been cited as a barrier during long heat periods.⁹⁷ But specifically, studies have identified that certain communicative technologies such as computers, mobile phones, and disaster-related applications (or apps) create access barriers for some older people or people with disabilities,⁹⁸ who may not have access to such technology in the first place due to varying socioeconomic factors. For example, D/Deaf people often have limited access to information in appropriate formats (such as sign language and close captions) and other mediums used to deliver warnings during heat waves (including TV, radio, and door-to-door messaging) are also audio-based.⁹⁹ Similarly, although cities such as Philadelphia have created interactive maps on their website, one which allows users to search for addresses or resources in their

⁹⁶ Allison Eady et al., “Reducing the Risks of Extreme Heat for Seniors: Communicating Risks and Building Resilience,” *Health Promotion and Chronic Disease Prevention in Canada* 40, no. 7/8 (July 2020): 222, <https://doi.org/10.24095/hpcdp.40.7/8.01>.

⁹⁷ Jennifer L. Martin, “Responding to the Effects of Extreme Heat: Baltimore City’s Code Red Program,” 75.

⁹⁸ Amanda Howard et al., “‘They’ll Tell Us When to Evacuate’: The Experiences and Expectations of Disaster-Related Communication in Vulnerable Groups,” *International Journal of Disaster Risk Reduction* 22 (June 1, 2017): 140, <https://doi.org/10.1016/j.ijdr.2017.03.002>.

⁹⁹ Emma Calgaro et al., “Silent No More: Identifying and Breaking through the Barriers That D/Deaf People Face in Responding to Hazards and Disasters,” *International Journal of Disaster Risk Reduction* 57 (April 2021): 2, <https://doi.org/10.1016/j.ijdr.2021.102156>.

communities, such websites can exclude people with particularly sensory or physician difficulties or those who do not have internet access.¹⁰⁰

Outreach

Given the challenges posed by certain communicative technologies, research has identified that outreach based on other methods, such as telephone outreach and home-based outreach, where residents receive information through agencies, NGOs, healthcare providers or volunteer networks are necessary considerations to reach older people during emergency situations.¹⁰¹ However, “reliance on volunteers and social networks can be problematic where they are not adequately resourced.”¹⁰² Moreover, other cited concerns include the “difficulty of identifying and reaching people most in need of support during heat waves, particularly those who lived unsupported in their own homes,” and the capacity of frontline practitioners to respond to these needs, particularly at short notice.¹⁰³ Such concerns have prompted several cities, such as Paris, France, and Kassel, Germany, to have established voluntary registration systems where citizens can register themselves to receive timely information and alerts about heat waves.¹⁰⁴ That being said, the effectiveness of these voluntary systems is not well-documented. However, the government of France’s website notes that according to a 2015 survey, only 4% of older people say they have signed up for the registers of

¹⁰⁰ Jim McLennan, Danielle Every, and Amy Reynolds, “Disability and Natural Hazard Emergency Preparedness in an Australian Sample,” *Natural Hazards* 107 (March 1, 2021): 1497, <https://doi.org/10.1007/s11069-021-04642-8>.

¹⁰¹ Elisabeth Anne-Sophie Mayrhuber et al., “Vulnerability to Heatwaves and Implications for Public Health Interventions - a Scoping Review,” *Environmental Research* 166 (October 1, 2018): 14, <https://doi.org/10.1016/j.envres.2018.05.021>.

¹⁰² Gemma Schuch, Silvia Serrao-Neumann, and Darryl Low Choy, “Managing Health Impacts of Heat in South East Queensland, Australia,” *Disaster Health* 2, no. 2 (April 3, 2014): 89, <https://doi.org/10.4161/2167549x.2014.960717>.

¹⁰³ Lorraine Williams et al., “Evaluation of the Heatwave Plan for England Final Report” (November 2019).

¹⁰⁴ Elisabeth Anne-Sophie Mayrhuber et al., “Vulnerability to Heatwaves and Implications for Public Health Interventions – A Scoping Review,” 48.

vulnerable people kept by municipalities.¹⁰⁵ To mitigate this challenge, certain Italian cities, such as Rome have created registries through records of hospital admissions, general physicians, and social workers.¹⁰⁶ Finally, it is important to highlight that many heat responses rely on the use of police services, though many people with disabilities and older persons may distrust and actively avoid police. For example, in 2019, “confidence in the police among Canadians who reported having a mental or cognitive, or physical disability was generally lower when compared to people who said they did not have a disability.”¹⁰⁷

Household Preparedness

In the context of household preparedness, many heat wave strategies emphasize certain preventive behaviours individuals can take inside their own home. These include, for example, recommendations to hydrate, or shut blinds. However, some of these strategies are often not available to people with disabilities or older people. For example, an evaluation of England’s heat wave highlighted that “a few focus group participants said they were not always able to take appropriate behaviours, such as opening and closing windows, due to their strength or physical disabilities.”¹⁰⁸ Similarly, studies have shown that “public messaging and education for those who are most

¹⁰⁵ Sante Publique France, “Quelles Mesures Pour Prévenir Les Risques Liés à La Chaleur ?,” www.santepubliquefrance.fr, accessed August 13, 2021, <https://www.santepubliquefrance.fr/determinants-de-sante/climat/fortes-chaleurs-canicule/articles/quelles-mesures-pour-prevenir-les-risques-lies-a-la-chaueur>.

¹⁰⁶ Elisabeth Anne-Sophie Mayrhuber et al., “Vulnerability to Heatwaves and Implications for Public Health Interventions – A Scoping Review,” 48.

¹⁰⁷ Dyna Ibrahim, “Public Perceptions of the Police in Canada’s - ProQuest,” www.proquest.com, November 25, 2020, <https://www.proquest.com/docview/2490276447?pq-origsite=gscholar&fromopenview=true>.

¹⁰⁸ Lorraine Williams et al., “Evaluation of the Heatwave Plan for England Final Report,” 108.

vulnerable might not reach them as those are isolated and lack strong social networks.”¹⁰⁹

Although access to air conditioning is highlighted as important across studies and news reports, requirements to provide air conditioning are rarely mandated in climate adaptation strategies or heat preparedness plans. While certain countries, such as the Netherlands, provide that specific cooling measures be implemented for residents of institutions both at the institutional and individual countries, many countries do not require in their heat plans that establishments for older people or people with disabilities provide cooler locations or air conditioning in their facilities.¹¹⁰ Similar requests can be seen as wildfires spread across British Columbia: the province rejected calls for individualized air quality supports for people with disabilities and those at risk from wildfire smoke.¹¹¹ Governments are reluctant to provide devices such as air quality supports or air conditioning, however experts have noted that one way to ensure people with disabilities and older persons have access to air conditioning is to classify it as a medical device.¹¹² It is also important to highlight that research has suggested that for some people with disabilities, “simply enhancing their level of household material preparedness may not necessarily lead to improved safety during a stressful natural hazard emergency: anxiety and lack of self-confidence may leave them vulnerable

¹⁰⁹ Elisabeth Anne-Sophie Mayrhuber et al., “Vulnerability to Heatwaves and Implications for Public Health Interventions – A Scoping Review,” 51.

¹¹⁰ Ibid., 49.

¹¹¹ CTV News, “New Heat Wave Alert System Designed for Quebec in Wake of Climate Change,” Montreal, July 21, 2021, <https://montreal.ctvnews.ca/new-heat-wave-alert-system-designed-for-quebec-in-wake-of-climate-change-1.5517393>.

¹¹² CBC Radio, “To Prepare for Future Heat Waves, Classify Air Conditioners as Medical Devices, UBC Expert Says,” CBC, July 25, 2021, <https://www.cbc.ca/radio/whitecoat/to-prepare-for-future-heat-waves-classify-air-conditioners-as-medical-devices-ubc-expert-says-1.6111655>.

despite notionally adequate material preparedness and thus in need of additional social support during the course of an emergency because of greater emotional vulnerability.”¹¹³

Data Collection

Studies have reported that internal data collection “continuously improve heat health warning systems and interventions.”¹¹⁴ However, as described above, while many countries are collecting data on heat-related deaths, they are not documenting other health impacts for people with disabilities and older people, such as the number of hospital admissions during heat waves, stratified by age and other demographic identifiers. This can be seen, for example, in existing reports on how the 2021 heat waves in British Columbia have impacted people with disabilities and older persons, which do not include data on other health impacts such as hospital admissions. This is contrary to countries such as Italy, which require that clinical care data for admission into hospitals during heat waves consider individual risk factors, including certain disabilities and chronic conditions, mental health conditions, consumption of alcohol and other drugs, and the use of certain medications.¹¹⁵

¹¹³ Jim McLennan, “Disability and Natural Hazard Emergency Preparedness in an Australian Sample,” 1497.

¹¹⁴ Elisabeth Anne-Sophie Mayrhuber et al., “Vulnerability to Heatwaves and Implications for Public Health Interventions – A Scoping Review,” 50.

¹¹⁵ Ministerio de Sanidad, “Plan Nacional de Actuaciones Preventivas de Los Efectos Del Exceso de Temperaturas Sobre La Salud” (, 2020), https://www.mscbs.gob.es/ciudadanos/saludAmbLaboral/planAltasTemp/2020/docs/Plan_Calor_2020.pdf.

RECOMMENDATIONS AND IMPACT

As reviewed above, people with disabilities and older persons are disproportionately at risk to climate induced heat waves, and climate adaptation plans and heat wave strategies often rely on measures that are inadequate or wholly detrimental to people with disabilities and older persons. Drawing conclusions from the research analyzed in this report, the below recommendations are provided to highlight opportunities for mitigation.

- **Governments have an obligation to reduce the impacts of climate change on people with disabilities and older persons by reducing emissions.**

Federal, provincial, and local governments in Canada should protect people with disabilities and older persons against the adverse impacts of climate-induced heat waves by mitigating climate change through measures to urgently reduce GHG emissions, such as removing fossil fuel subsidies.

- **Governments have an obligation to meaningfully consult people with disabilities and older persons in creating climate adaptation strategies and heat wave responses.**

Federal, provincial, and local governments must actively consult people with disabilities and older persons in policies and plans on heat waves. The insight of people with disabilities and older individuals and communities should be prioritized in determining and defining their realities before, during, and after climate-induced heat waves. This includes consulting with local organizations who are better equipped to speak to the needs and realities of their own communities, “not only in times of disaster, but also in everyday life.”¹¹⁶ Meaningful consultation involves ensuring that the leadership of people with disabilities and older persons is centered, but also that it is accessible. As Leah

¹¹⁶ Khanh That Ton et al., “Expanding the Capabilities of People with Disabilities in Disaster Risk Reduction,” *International Journal of Disaster Risk Reduction* 34 (March 2019): 11, <https://doi.org/10.1016/j.ijdr.2018.11.002>.

Lakshmi Piepzna-Samarasinha asserts, “access is an act of love for our communities.”¹¹⁷

- **Governments have an obligation to approach ageism and ableism as cross-cutting issues in their work spaces.**

Federal, provincial, and local governments must deepen their knowledge of ableism and ageism, in order to actively aim to undermine the ableist and ageist assumptions impacting people with disabilities and older people within climate adaptation and heat preparedness frameworks, alongside within the systems they operate in.

- **To prevent people with disabilities and older persons from advocating where work has already been done, governments should carefully research existing evidence on heat wave responses.**

It is people with disabilities and older persons who should define their own needs in determining how responses to heat waves can be improved in the communities in which they live. However, this report will outline several takeaways from research that should be considered in building heat wave strategies.

- Heat wave responses must require data collection that is intersectional in assessing the demographics of those who die during heat waves but is also inclusive of other health impacts, including hospital admissions.
- Heat wave responses should prioritize accessibility in the communication of information. This involves avoiding an over reliance on internet-based platforms and extends to both telephone and door-to-door outreach.
- Heat waves responses should consider the accessibility of cooling centers. This includes providing transparency about the accessibility of cooling centers and

¹¹⁷ Elizabeth A. Harrison and Alison G. Kopit, “Accessibility at the Bisexual Health Summit: Reflections and Lessons for Improving Event Accessibility,” *Journal of Bisexuality* 20, no. 3 (July 2, 2020): 278, <https://doi.org/10.1080/15299716.2020.1774834>.

creating strategies to ensure cooling centers are accessible for those with mobility needs, as well as other access needs. This includes, for example, providing access to air-conditioned transportation that can bring people to cooled environments.

The recommendations provided concerning adaptation plans and heat wave strategies are only useful if they are accompanied by meaningful measures directed at improving social connectedness, and the overall material lives, of persons with disabilities and older persons.

In this context, this report recommends that:

- Federal, provincial, and local governments should take steps to ensure that air conditioning is considered a medical device, as many advocates have proposed.¹¹⁸
- Federal, provincial, and local governments should take steps to provide public housing for people with disabilities and older persons that do not segregate them, but rather, allow them to live and participate in the community. As scholars have written, “focusing on public housing is one of the most cost-effective strategies because they accommodate groups that are more vulnerable to heat.”¹¹⁹ In the context of housing, it is important that people with disabilities and older persons

¹¹⁸ CBC Radio, “To Prepare for Future Heat Waves, Classify Air Conditioners as Medical Devices, UBC Expert Says.”

¹¹⁹ Amir Baniassadi et al., “Effectiveness of Mechanical Air Conditioning as a Protective Factor against Indoor Exposure to Heat among the Elderly,” *ASME Journal of Engineering for Sustainable Buildings and Cities* 1, no. 011005 (December 26, 2019): 9, <https://doi.org/10.1115/1.4045678>.

are living in housing that considers green spaces, insulation, the reduced use of concrete, reflective surfaces, and energy efficient appliances.¹²⁰

CONCLUSION

Researching and reflecting on how climate-induced heat waves impact people with disabilities and older persons requires thinking beyond heat waves and climate change and examining the ableist and ageist assumptions that underpin the systems we live within. Throughout this process of research, I have been conscious of just how much ableism and ageism is indicative of the lack of research that exists on this topic, but how much they are pervasive within the research itself. For example, in many of my searches on how heat impacted people with disabilities and older persons, the research that appeared focused on productivity losses due to heat stress or centered only on the vulnerability of people with disabilities and older persons, without emphasizing their knowledge and agency.

As a final note, while this report has focused on existing research in the form of a literature review, it is crucial to note that the above recommendations should also be considered through a rights-based approach, as governments have an obligation to monitor and prepare for these foreseeable risks and ensure that people with disabilities are included in any planning. The Convention on the Rights of Persons with Disabilities(UNCRPD) requires states to ensure the protection and safety of persons with disabilities in situations of risk, including the occurrence of natural disasters.¹²¹

¹²⁰ Michelle Brennan, Paula M O'Shea, and Eamon C Mulkerrin, "Preventative Strategies and Interventions to Improve Outcomes during Heatwaves," *Age and Ageing* 49, no. 5 (July 7, 2020): 729–32, <https://doi.org/10.1093/ageing/afaa125>.

¹²¹ Under Article 11 of the UNCRPD, States are specifically obligated to take measures to ensure the safety of people with disabilities in the event of a natural disaster.

Moreover, the United Nations Human Rights Council has emphasized the rights of older persons in the context of heat, including the rights to life, health, and the right to adequate housing.¹²² As such, governments should consider their legal obligations in urgently centering the leadership of people with disabilities and older persons in developing heat responses.

¹²² Report of the Office of the United Nations High Commissioner for Human Rights, “Analytical Study on the Promotion and Protection of the Rights of Older Persons in the Context of Climate Change” (Forty-seventh session: Human Rights Council, April 30, 2021).

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