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Failing the Future: Extreme Heat in Child Care Settings

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Executive Summary

Extreme heat events significantly impact the health and well-being of students and staff in child care settings across Canada. The impacts of heat on children are of serious concern given their unique vulnerability. Despite this, there remains no comprehensive federal or provincial law, policy or investment to ensure climate resilience in child care settings.

Heat negatively impacts children in many ways. Along with concerns about the acute impacts of extreme heat, heat slows cognitive function and hinders student performance. It negatively impacts the mental health of children. Heat is often accompanied by worse air quality, further impacting the health of children.

Heat also disproportionately impacts low-income and racialized communities. Children living in homes that are not mechanically cooled with heat pumps or air conditioning will be disproportionately burdened by exposures to heat in child care settings.

Old and under-funded child care infrastructure is not climate resilient. This is especially true in child care facilities in First Nations communities, where there remain large infrastructure deficits and inadequate housing. More outreach, consultation, and research is required to understand the impacts of climate change on First Nations children and child care facilities on First Nations lands. Strategies to address climate resiliency in First Nations child care facilities should be co-developed by First Nations communities and the Federal government.

Current government policy on extreme heat is not responsive to the needs and does not adequately address the scope of the problem of heat in child care. Children often do not have agency over their responses to heat. Mechanical cooling in child care facilities, such as air conditioning and heat pumps, is a readily available solution to heat's impacts on the health and safety of children.

CELA makes the following 16 recommendations to improve the climate resiliency of our child care settings and to better protect our children from extreme heat:

> Recommendation 1: Amend O. Reg. 137/15 to include a maximum temperature standard and apply it to all child care facilities.
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> Recommendation 2: Amend legislation or guidelines that apply to child care facilities located in schools to include a maximum indoor temperature standard of 26 degrees Celsius.
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> Recommendation 3: The maximum indoor temperature standard appropriate for children should be reviewed in two years.
>
> Recommendation 4: Upgrade Canadian child care infrastructure to be climate resilient, including heat pumps or air conditioning.
>
> Recommendation 5: Amend Ontario's Building Code to include HVAC and mechanical cooling requirements for new child care facilities and related requirements for retrofitting buildings.

Recommendation 6: Amend Ontario's Building Code to include a maximum temperature standard.

Recommendation 7: Ensure that additional funding is provided to First Nations for improvements to child care facilities.

Recommendation 8: Ensure meaningful participation of and partnership with First Nations in climate resiliency and heat mitigation efforts.

Recommendation 9: First Nations and the Federal government should co-develop a plan for monitoring climate change impacts on First Nations children in child care.

Recommendation 10: Consideration of climate resiliency and the impact of under-funded infrastructure on First Nations lands should be included in the Federal government's consultation and national strategy pursuant to the *National Strategy Respecting Environmental Racism and Environmental Justice Act*, SC 2024, c 11 *("Environmental Racism Act").*

Recommendation 11: Install indoor temperature, humidity, and ventilation monitors in every room used for child care.

Recommendation 12: The province should create maps to identify neighbourhoods vulnerable to heat that should be prioritized for mechanical cooling.

Recommendation 13: Work with local public health units to gather data.

Recommendation 14: Develop province-wide shade guidelines for outdoor spaces at child care facilities.

Recommendation 15: Schedule physical activities at cooler times of day.

Recommendation 16: Integrate equity considerations into all aspects of extreme heat response.

1. Overview

As global temperatures continue to rise because of climate change, so too will the duration, frequency, and intensity of extreme heat events.[1] Extreme heat events significantly impact the health and well-being of individuals across Canada. The health of young children and infants is of acute concern given their unique vulnerability to extreme heat. Extreme heat events have the potential to "impact young children's development and health both in the moment" and over the course of their lives.[2] Despite this, there remains no comprehensive federal or provincial law, policy, or investment to ensure climate resilience in child care settings.

The current focus of federal and provincial government policy on extreme heat is a heat alert and response system and a series of safety recommendations including: use air conditioning if available, avoid sun-exposure, do not use your oven, and open your windows at night.[3] These recommendations and alerts do not adequately address the scope of the problem and are of limited use to individuals who lack agency over their location and schedule, such as children, or to individuals without access to sufficient cooling mechanisms, such as individuals attending child care without air conditioning.

There is a serious and ongoing infrastructure deficit in First Nations, which exacerbates the impacts of climate change on Indigenous children. Additional funding is needed to address climate resilience in First Nations at child care facilities and in more informal child care settings.

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[1] Christina Koppe et al., "Heat-waves: risks and responses" (2004) 2 *World Health Organization* at 14 [*Koppe et al.*]; Yuming Guo et al., "Heat Wave and Mortality: a Multicountry, Multicommunity Study" (2017) *Environmental Health Perspectives* at 1 [*Guo et al.*].

[2] Early Childhood Scientific Council on Equity and the Environment, "Extreme Heat Affects Early Childhood Development and Health: Working Paper No. 1." (2023) at 6, online (pdf): https://harvardcenter.wpenginepowered.com/wp-content/uploads/2023/03/ECSCEE-Heat-Paper.pdf [*ECSCEE*].

[3] Government of Canada, "Extreme heat events: How to protect yourself from the health effects of extreme heat" (2024), online: *Government of Canada* https://www.canada.ca/en/health-canada/services/climate-change-health/extreme-heat/how-protect-yourself.html; Health Canada, "Keep Children Cool! Protect Your Child From EXTREME HEAT" (2020), online (pdf): https://www.canada.ca/content/dam/hc-sc/documents/services/publications/healthy-living/keep-children-cool-extreme-heat/extreme-heat-brochure-keep-children-cool-en.pdf [*Keep Children Cool!*]; Government of Canada, "Extreme heat events: Overview" (2024), online: *Government of Canada* https://www.canada.ca/en/health-canada/services/climate-change-health/extreme-heat.html [*Extreme heat events*].

Fortunately, there is a readily available solution to heat's impacts on learning, as air conditioning and heat pumps "offset most of the disruptive impacts of heat events on learning."[4] Addressing extreme heat in child care environments is a critical public health intervention, especially for children who are also living in home environments that are too hot. Safe and high quality early learning and child care programs can greatly impact the trajectory of a child's life by improving a child's cognitive abilities, increasing educational attainment, reducing poverty, promoting health and wellness, and improving social mobility from generation to generation.[5]

2. Ontario's Child Care Framework

Ontario's child care programs are subject to the regulations and provisions of the *Child Care and Early Years Act* ("*CCEYA*"). There are several types of child care contemplated by the *CCEYA*:

- licensed centre-based child care
- unlicensed or licensed home-based child care
- licensed child care agency (babysitters and nannies)
- early childhood education services

Provisions of the *CCEYA* may differ in applicability depending on whether a facility is licensed or unlicensed. Temporary care for or supervision of children, however, is exempt from the *CCEYA.* For instance, day camps or babysitters and nannies hired through parents or guardians are not subject to Ontario's child care regulations and licensing standards.[6]

Indigenous early learning and child care ("ELCC") is impacted by several federal agencies, in part due to operation of the Truth and Reconciliation Commission ("TRC") Call to Action Item 12.[7] Employment and Social Development Canada has led an initiative pursuant to section 7 of

[4] *ECSCEE, supra* note 2.
[5] Government of Canada, "Indigenous Early Learning and Child Care (ELCC) Transformation Initiative terms and conditions for contributions" (2023), online: https://www.canada.ca/en/employment-social-development/programs/indigenous-early-learning/terms-conditions.html [*ELCCTI*].
[6] Ministry of Education, "Child care rules in Ontario" (2023), online: https://www.ontario.ca/page/child-care-rules-ontario.
[7] Crown-Indigenous Relations and Northern Affairs Canada, "Delivering on Truth and Reconciliation Commission Calls to Action: Education" (July 2024), online: *Government of Canada* https://www.rcaanc-cirnac.gc.ca/eng/1524495412051/1557511602225 [*TRC*] - **TRC Call to Action #12**: We call upon the federal, provincial, territorial, and Aboriginal governments to develop culturally appropriate early childhood education programs for Aboriginal families.

the *Department of Employment and Social Development Act* to establish "horizontal management" of Indigenous early learning and child care programs. The goal of horizontal management is to coordinate Federal government support of Indigenous child care programs and to decide on policy and criteria for administration of funding.[8] It also implements the co-developed Indigenous Early Learning and Child Care Framework ("ELCC Framework"), which sets out a path for Indigenous-led ELCC.[9]

The following federal bodies participate in horizontal management: Employment and Social Development Canada; Indigenous Services Canada; Public Health Agency of Canada; and, Crown-Indigenous Relations and Northern Affairs Canada.[10] The stated goal of the transformation initiative is for ELCC to be transferred to Indigenous control and to increase access to Indigenous child care.[11]

3. Climate Change and Extreme Heat

TEMPERATURES IN CANADA ARE RISING FASTER THAN THE GLOBAL AVERAGE.[12] In Canada, the national average temperature has increased by 2°C between 1948 and 2023, making 2023 Canada's second warmest year.[13] The hottest temperature ever recorded in Canada occurred on June 29th, 2021 in Lytton, British Columbia, where the temperature reached a scorching 49.6°C.[14] As global temperatures continue to rise as a result of climate change, so too will the duration, frequency, and intensity of extreme heat events.[15] It is estimated

[8] *ELCCTI, supra* note 5.
[9] Government of Canada, "Indigenous Early Learning and Child Care Framework" (20 April 2022), online: *Government of Canada* https://www.canada.ca/en/employment-social-development/programs/indigenous-early-learning/2018-framework.html.
[10] *ELCCTI, supra* note 5.
[11] *Ibid.*
[12] Environment and Climate Change Canada, "Canadian Environmental Sustainability Indicators: Temperature Change in Canada" (2024), online (pdf): https://www.canada.ca/content/dam/eccc/documents/pdf/cesindicators/temperature-change/2024/temperature-change-en.pdf.
[13] Environment and Climate Change Canada, "Canadian Environmental Sustainability Indicators: Temperature change in Canada" (2024) at 5, online: www.canada.ca/en/environment-climate-change/services/environmental-indicators/temperature-change.html.
[14] Jim Abraham, "Record-breaking heat in Canada," (2021), online: *Royal Meteorological Society* https://www.rmets.org/metmatters/record-breaking-heat-canada.
[15] *Koppe et al., supra* note 1 at 14; *Guo et al., supra* note 1 at 1.

that a 10-year-old in 2024 will experience 36 times more heat waves than experienced by a 10-year-old in 1970.[16]

EXTREME HEAT EVENTS HAVE MAJOR HEALTH IMPLICATIONS AND KILL MILLIONS OF PEOPLE EVERY YEAR.[17] Groups that are vulnerable to extreme heat events include the elderly, people with disabilities, children, people with pre-existing medical conditions, and people taking certain medications.[18] Notably, infants "suffer the second highest heat mortality rate among all age groups."[19] Heat-related mortality rates for children are 50 to 100 times higher than that of adults.[20]

INDOOR TEMPERATURE IS OFTEN HIGHER THAN OUTDOOR TEMPERATURE. Without indoor cooling, there is no reprieve from extreme heat days outdoors. The CBC recently tracked indoor temperatures across 10 cities in Canada, including Windsor and Toronto, as part of its Urban Heat Project.[21] The CBC installed heat sensors in 50 homes, which took temperature and humidity readings every 10 minutes over an eight-week period from June to August.[22] The homes that were tracked had no central cooling or minimal central cooling. Indoor temperatures were often higher than outdoor temperatures.[23] A similar study out of John Hopkins University found that houses without air conditioning were on average 1.4°C warmer than the outdoor temperature in the summer months.[24] These findings confirm data from British Columbia's 2021 heat dome where indoor temperatures were often higher than outdoor temperatures in homes

[16] Shwetlena Sabarwal et al., "Choosing Our Future: Education for Climate Action" (2024) at 82, online (pdf): *The World Bank* https://openknowledge.worldbank.org/server/api/core/bitstreams/9d1c318a-bcd3-49fa-b1c6-cc03e18d4670/content [*Sabarwal et al.*].
[17] *Guo et al.*, *supra* note 1 at 4; The Canadian Climate Institute, "Extreme Heat in Canada" (2024), online: https://climateinstitute.ca/reports/extreme-heat-in-canada/ [*CCI*].
[18] Anna Goshua et al., "Child-focused climate change and health content in medical schools and pediatric residencies" (2023) *Springer Nature* [*Goshua et al.*].
[19] Joshua Graff & Jeffrey Shrader, "Temperature Extremes, Health, and Human Capital" (2016) 26:1 *Spring* at 35 [*Graff and Shrader*].
[20] *Ibid*.
[21] Tara Carman & Dexter McMillan, "How CBC measured heat in homes in 5 Canadian cities" (2023), online (article): https://www.cbc.ca/news/investigates/urban-heat-project-methodology-1.6963593.
[22] *Ibid*.
[23] Tara Carman, Lori Ward & Dexter McMillan, "No escape from the heat" (13 September 2023), online (article): *CBC News* https://www.cbc.ca/newsinteractives/features/no-escape-from-the-heat.
[24] D. W. Waugh et al., "Indoor heat exposure in Baltimore: does outdoor temperature matter?" (2021) *Int J Biometeorol* 65, 479–488 at 479 [*Waugh et al.*]

without air conditioning.[25] Indoor cooling is therefore essential to mitigating the risks of extreme heat.

Indoor Temperature of 26 Degrees Celsius

There has been a growing consensus in the literature that temperatures over approximately 26°C indoors are unsafe. However, those studies are not focused on health-based indoor temperature thresholds for young children.

A 2024 study of older adults in Ottawa found that core temperature and cardiovascular strain increased progressively where indoor temperatures were above 26°C.[26] This finding is supported by a Statistics Canada study which found that over two-decades extreme heat is related to higher mortality risks for those aged 65 and older.[27] In 2022, the Government of British Columbia released a report that identified high indoor temperature as the primary cause of injury and death in the province's 2021 heat wave.[28] Moreover, the British Columbia Centre for Disease Control found that people were most in danger when indoor temperatures remained above 26°C throughout the event.[29] These reports add to the existing literature that identifies 26°C as the maximum safe temperature threshold for indoor environments.[30]

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[25] Sarah Henderson et al., "Analysis of community deaths during the catastrophic 2021 heat dome" (2022) 6(1):e189 *Environ Epidemiol* at figure 2, online: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8835552/.
[26] R. D. Meade et al., "Effects of Daylong Exposure to Indoor Overheating on Thermal and Cardiovascular Strain in Older Adults: a Randomized Crossover Trial" (2024) *Environ Health Perspect*, online: https://ehp.niehs.nih.gov/doi/10.1289/EHP13159.
[27] Statistics Canada, "The impacts of extreme heat events on non-accidental, cardiovascular, and respiratory mortality: An analysis of 12 Canadian cities from 2000 to 2020" (2024) at 8, online: https://www150.statcan.gc.ca/n1/en/pub/82-003-x/2024006/article/00001-eng.pdf?st=jzCexIUi.
[28] Government of British Columbia, "Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021" (2022) at 22, online (pdf): https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/death-review-panel/extreme_heat_death_review_panel_report.pdf [*BC Report*].
[29] *Ibid*.
[30] C. Uejio et al., "Summer indoor heat exposure and respiratory and cardiovascular distress calls in New York City, NY, US" (August 2016) *Indoor air*, 26(4), at 594-604, online: https://pubmed.ncbi.nlm.nih.gov/26086869/; F. Tartarini et al., "Indoor air temperature and agitation of nursing home residents with dementia" (April 2017) *Am J Alzheimers Dis Other Demen*, 32(5), at 272-281, online: https://pubmed.ncbi.nlm.nih.gov/28429641/; U. Lindemann et al., "Effect of indoor temperature on physical performance in older adults during days with normal temperature and heat waves" (February 2017) *Int J Environ Res Public Health*, 14(2), at 186, online: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5334740/.

A recent public health review found that adult mortality increases by 2 or 3 percent for each 1°C increase above 27°C.[31] This same review found that the mortality rate is approximately 50 to 100 times greater for children, with young children under 5 years old experiencing the greatest mortality rates.[32] Since children are vulnerable to heat, a 26°C indoor temperature threshold is an important first standard to set, with the understanding that further study of the impacts of indoor heat on young children is needed to ensure that the maximum temperature standard should not be lowered.

4. The Vulnerability of Children

The human body is equipped with many mechanisms for heat regulation, including hormones, increasing heart rate and respiratory rate, and sweat production. Correspondingly, the longer or more intense the heat event, the harder the body has to work to maintain its healthy internal temperature.[33]

CHILDREN EXPERIENCE HEAT DIFFERENTLY THAN ADULTS. Children "have greater metabolic rates and lower cardiac output," have little agency over their schedule or heat exposure, and have still-developing bodily systems.[34] These factors all contribute to their unique vulnerability to extreme heat. Particularly, infants and young children have less developed, and therefore less efficient, bodily systems and experience heat much more intensely than adults do. For example, infants and young children have a lesser capacity to regulate their bodily temperatures via sweating, which can lead to muscle breakdown, kidney failure, seizures, or comas; in infants this can cause brain trauma and sudden infant death syndrome (SIDS).[35] Excessive heat may also impact the following bodily functions and systems: immune system, nervous system, emotional and mental capacity/retention, and respiratory system.[36]

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[31] *Graff and Shrader*, *supra* note 19 at 35.
[32] *Ibid.*
[33] *Guo et al.*, *supra* note 1 at 8.
[34] Mengmeng Li et al., "Heat Waves and Morbidity: Current Knowledge and Further Direction – A Comprehensive Literature Review" (2015) 12 *Int. J. Environ. Red. Public Health* at 5275.
[35] Eleanor Squires, Lisa Whiting & Julia Petty, "Effects of climate change on the health of children and young people" (2024), *Nurs Stand* 39(4):60-65, at 2, online: https://pubmed.ncbi.nlm.nih.gov/38419409/ [*Squires et al.*]; *Graff and Schrader*, *supra* note 19 at 35; *ECSCEE*, *supra* note 2 at 5.
[36] *ECSCEE*, *supra* note 2 at 4.

i. Disruptions in Learning

EXTREME HEAT SLOWS COGNITIVE FUNCTION. According to one Harvard study, the optimal temperature for learning and concentration is 22°C or lower.[37] Extreme heat makes concentration and retention more difficult for children, and "may limit children's educational attainment and economic prospects in the long run."[38] There are several ways in which heat affects learning. For one, it can negatively impact a child's sleep, which correspondingly affects their retention and ability to problem-solve.[39] Extreme heat can also cause a child's brain to 'overheat.' The brain generally produces 20% of the body's heat, and during prolonged extreme heat events the brain cannot cool down, leading to significant effects on children's cognitive functioning.[40] A child's "attention, memory, and information processing" are likely negatively affected.[41]

ii. Asthma, Air Quality, and Extreme Heat

HEAT ADVISORIES ARE FREQUENTLY COUPLED WITH AIR QUALITY WARNINGS. Extreme heat events increase atmospheric levels of ozone, a potent lung irritant, and increase the intensity and incidence of wildfires.[42] While poor air quality affects everyone exposed to it, children are uniquely vulnerable because they have a high number of inhales per minute and a greater inhale volume to body weight ratio than adults.[43] This means that children breathe in more air and are more vulnerable to air pollutants than adults.

Asthma is the most common chronic illness in children, affecting approximately one in ten children in Canada.[44] In heat waves, children's "smaller airways are more likely to become inflamed and obstructed" by air pollutants.[45] Consequently, a study of schools in Oakland,

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[37] *ECSCEE, supra* note 2 at 6.
[38] *Graff and Shrader, supra* note 19 at 38.
[39] *Squires et al., supra* note 35 at 3; *ECSCEE, supra* note 2 at 6.
[40] *Graff and Shrader, supra* note 19 at 39.
[41] *ECSCEE, supra* note 2 at 6.
[42] *Ibid* at 7; Michael Oppenheimer & Jesse Anttila-Hughes, "The Science of Climate Change" *Spring* 2016 26:1 [*Oppenheimer*]; *Graff and Shrader, supra* note 19 at 36; *CCI, supra* note 17.
[43] *Goshua et al., supra* note 18 at 2.
[44] *Ibid;* Canadian Paediatric Society, "Asthma in children and youth" (2023), online (article): *Caring for Kids* https://caringforkids.cps.ca/handouts/health-conditions-and-treatments/asthma-in-children-and-youth#:~:text=About%201%20in%2010%20children,these%20children%20have%20mild%20asthma..
[45] *Goshua et al., supra* note 18 at 2.

California found that children with asthma are more likely to suffer asthma attacks during heatwaves; in fact, children were 19% more likely to have an asthma-related hospital visit during a heat wave, and this number doubles as the heat wave's duration increases.[46]

AIR POLLUTION ALSO HAS AN EFFECT ON CHILDREN'S ACADEMIC ACHIEVEMENT.[47] Moreover, climate change is causing more wildfires.[48] Wildfire smoke can be harmful even at significant distances away from the fires. Canadian governments should be concerned about the effects of wildfire smoke on air quality and children as Canada experiences longer and more intense wildfire seasons.[49]

iii. Mental Health

EXTREME HEAT AFFECTS CHILDREN'S MENTAL HEALTH THROUGH SEVERAL DIFFERENT AVENUES. Firstly, the brain and body detect extreme heat events as a threat, which in turn activates the body's stress response system.[50] Any prolonged activation of the body's stress response system can have negative consequences for children's mental health. Secondly, extreme heat events increase incidence of violent crimes, domestic abuse, and suicide "through a combination of environmental factors."[51]

iv. Agency

CHILDREN HAVE LITTLE TO NO AGENCY OVER THEIR RESPONSE TO EXTREME HEAT. There has been little research into the impacts of agency on children's heat vulnerability. Regardless, it is generally accepted that children have little choice over how and where they spend their time, as most of their day is programmed by teachers, parents, or guardians.[52] Moreover, when experiencing extreme heat "children are less likely to manage their

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[46] American Thoracic Society, "Extreme heat associated with children's asthma hospital visits" (2024), online (article): *ScienceDaily* https://www.sciencedaily.com/releases/2024/05/240520122830.htm#:~:text=The%20team%20discovered%20that%20daytime,associations%20for%20nighttime%20heat%20waves.
[47] *Sabarwal et al*., *supra* note 16 at 88.
[48] Center for Climate and Energy Solutions, "Wildfires and Climate Change" (10 December 2024), online: https://www.c2es.org/content/wildfires-and-climate-change/.
[49] Natural Resources Canada, "Canada's record-breaking wildfires in 2023: a Fiery wake-up call" (2024), online (article): *Government of Canada* https://natural-resources.canada.ca/simply-science/canadas-record-breaking-wildfires-2023-fiery-wake-call/25303.
[50] *ECSCEE*, *supra* note 2 at 7.
[51] *ECSCEE*, *supra* note 2 at 7; *Oppenheimer*, *supra* note 42 at 23.
[52] *Graff and Shrader*, *supra* note 19 at 34.

own heat risk [, …] may have fewer ways to avoid heat than adults do," and may not be able to articulate the effects that heat is having on their body.[53] This is particularly true of infants and toddlers.

v. Socioeconomic Inequalities

EXTREME HEAT EVENTS DISPROPORTIONATELY AFFECT LOW-INCOME AND MINORITY COMMUNITIES. The intersectional effects of heat are important to recognize and address in any heat mitigation policies. The urban heat island ("UHI") effect describes the fact that cities are hotter than surrounding rural areas.[54] In North America, cities are 1°C to 3°C warmer than the nearby countryside.[55] The UHI effect is caused by the density of built, dark surfaces in cities, such as roads, parking lots, and high-rises, which "absorb large quantities of radiant heat from the sun."[56] A lack of nature and green space in cities contributes to this effect. In Toronto, Ontario, neighbourhoods with higher-income and whiter populations have significantly higher amounts of tree canopy cover.[57]

Racialized and low-income communities in Canada tend to live in neighbourhoods that are "far less climate-resilient" due to high concentrations of heat-absorbent materials and a lack of green-space.[58] This contributes to the phenomenon of temperature differences between neighbourhoods within cities. In Mississauga, Ontario, approximately 57% of low-income children live in areas where additional resources for greenspace would improve equity.[59] In Ottawa, Ontario,

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[53] *Graff and Shrader*, *supra* note 19 at 34.
[54] Health Canada, "Reducing Urban Heat Island to Protect Health in Canada: An introduction for public health professionals" (2020), online (pdf): https://www.canada.ca/content/dam/hc-sc/documents/services/health/publications/healthy-living/reducing-urban-heat-islands-protect-health-canada/Reducing-Urban-Heat-EN.pdf.
[55] *Ibid*.
[56] *Ibid*.
[57] Inori Roy, "As Toronto Temperatures Rise, Inequalities Widen" (2022), online (article): *The Local* https://thelocal.to/toronto-heat-wave-inequality/; Christopher S. Greene, Pamela J. Robinson & Andrew A. Millward, "Canopy of advantage: Who benefits most from city trees?" (2018) 208:24-35, online (article): *Journal of Environmental Management* https://www.sciencedirect.com/science/article/pii/S0301479717311775).
[58] Felix Landry, Jerome Dupras & Christian Messier, "Convergence of urban forest and socio-economic indicators of resilience: A study of environmental inequality in four major cities in eastern Canada" (2020) 202(3):103856 *Landscape and Urban Planning*.
[59] Canadian Urban Environmental Health Research Consortium, "Explore Equity in your City" (2024), online (map): *HealthyPlan.City* https://healthyplan.city/en?utm_source=CANUE%20Newsletter&utm_campaign=ab9f1d23d9-EMAIL_CAMPAIGN_2017_08_31_COPY_01&utm_medium=email&utm_term=0_3dbd1ae370-ab9f1d23d9-596423750 [*CANUE*].

approximately 70% of low-income children live in areas where additional resources targeting air pollution would improve equity.[60] Neighbourhoods with the highest temperatures tend to also have the "most polluted air and the highest rates of childhood asthma."[61]

Low-income and racialized communities typically have fewer resources to respond to extreme heat, further contributing to increased risk of heat-related morbidity and mortality.[62] Communities with structural, social, or economic barriers tend to also have "less air conditioning, fewer public cooling spaces, [… and a] greater likelihood of living in housing and neighbourhoods that trap rather than mitigate heat."[63]

There is an identifiable gap in research assessing heat resilience in child care facilities in low-income neighbourhoods. However, data from schools in low-income and racially diverse communities follow the same trends as housing; low-income students are more likely to go to schools without air-conditioning than higher-income students.[64] Of the 154 schools in the Greater Toronto Area without air conditioning (as of 2016), 37% were in Scarborough, which has higher proportions of low-income and racialized students as compared to the rest of Toronto.[65] Correspondingly, a study out of the United States found that the negative effects of heat on learning and academic achievement are approximately three times greater for students of colour than for white students, likely due to the difference in school infrastructure and air-conditioning.[66]

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[60] *CANUE*, *supra* note 59.
[61] *ECSCEE*, *supra* note 2 at 7; Amanda Giang & Kaitlin Castellani, (2020) "Cumulative air pollution indicators highlight unique patterns of injustice in urban Canada." *Environ. Res. Lett.* 15:12, online (pdf): https://iopscience.iop.org/article/10.1088/1748-9326/abcac5/pdf.
[62] *Goshua et al.*, *supra* note 18 at 2; Samantha Ahdoot et al., "Climate Change and Children's Health: Building a Healthy Future for Every Child" (2024) 153:3 *Pediatrics* at 77 [*Ahdoot et al.*]; *Graff and Shrader*, *supra* note 19 at 36.
[63] *ECSCEE*, *supra* note 2 at 4; Shuchen Bu et al., "Mapping Heat Vulnerability in Toronto" (6 August 2024), online (article): *University of Toronto* https://schoolofcities.github.io/heat-vulnerability-toronto/?ref=magazine.frontier.is [*Shuchen Bu et al.*].
[64] *ECSCEE*, *supra* note 2 at 9.
[65] Victor Ferreira, "It's stinking hot. So why do so few of Toronto's schools have air conditioning?" (2016), online (article): *National Post* https://nationalpost.com/news/toronto/it-s-stinking-hot-so-why-do-so-few-of-toronto-s-schools-have-air-conditioning.
[66] *Ahdoot et al.*, *supra* note 62 at 76.

vi. Cumulative Effects of Heat on Children without Air Conditioning at Home

CHILDREN WHO ATTEND CHILD CARE WITHOUT COOLING AND DO NOT HAVE COOLING AT HOME HAVE NO REPRIEVE DURING HEAT WAVES. Extreme heat events trigger the body's stress response system.[67] Prolonged activation of the body's stress response system is unhealthy, in addition to the other negative effects of heat on health. There is also a cumulative effect of heat when the body cannot be cooled over long periods of time; this is what most often leads to the most severe consequences of extreme heat.[68] Children without access to mechanical cooling at home or at school face a cumulative health risk.

5. Vulnerability of Indigenous Children on First Nations Lands

INDIGENOUS PEOPLE ARE DISPROPORTIONATELY IMPACTED BY CLIMATE CHANGE "because they tend to live in geographic regions experiencing rapid climate change and because they have a close relationship to and depend on the environment and its natural resources."[69] There are many compounding factors that further increase the vulnerability of Indigenous populations to extreme heat. Notably, Indigenous children are more likely to live in areas with poor air quality due to poor infrastructure and proximity to forests prone to wildfires, which results in increased rates of respiratory infections.[70] Extreme weather events like heat waves and wildfires will only worsen air quality and respiratory infections for Indigenous children in the future.

INFRASTRUCTURE ON FIRST NATIONS LANDS IS NOT CLIMATE RESILIENT DUE TO GOVERNMENT UNDER-FUNDING. Buildings on First Nations lands are at risk of exposure to climate events and environmental hazards, and their exposure will only "increase

[67] *ECSCEE*, *supra* note 2 at 7.
[68] *BC Report*, *supra* note 17 at 22.
[69] National Collaborating Centre for Indigenous Health, "Climate Change and Indigenous Peoples' Health in Canada" (2022) at 5, online (pdf): *Health Canada* https://www.nccih.ca/Publications/Lists/Publications/Attachments/10367/Climate_Change_and_Indigenous_Peoples_Health_EN_Web_2022-03-22.pdf.
[70] *Ibid* at 27.

over the coming decade and likely escalate rapidly thereafter."[71] Current funding of Indigenous child care from the Federal government includes $2.5 billion over the next 5 years and $542 million per year ongoing.[72] The stated purpose of this funding is to build Indigenous governance capacity, and allow for repairs and renovations of existing Indigenous ELCC centres and construction and maintenance of new centres.[73] This funding will increase by 3% each year starting in 2027 to 2028.[74] However, a recent Chiefs of Ontario report found that $58.9 billion is needed to close the infrastructure gap between First Nations and non-Indigenous communities in Ontario.[75]

First Nations families living in rural areas are less likely to use child care than those living in urban areas, suggesting that rural First Nation communities may experience challenges accessing reliable child care.[76] In fact, a recent Canadian study found that in First Nations communities, only about 30% of children between ages zero and four and 20% of children ages five to eleven attend regular child care.[77] Of the children in regular child care, 33% of zero to four year olds and 49.7% of five to eleven year olds are in informal child care, which most often means child care in a private home.[78]

There are serious housing inadequacies in some First Nations communities, impacting the young children attending child care in private homes. The Chiefs of Ontario report found that it will cost $25.8 billion to close the housing infrastructure gap between housing on First Nations lands and housing in the rest of Ontario.[79] This was the largest gap identified in the report. The housing infrastructure gap also increases the cumulative burden of heat on Indigenous children living in homes without cooling and attending child care in homes or facilities without cooling. These

[71] Associated Engineering, "Closing the Infrastructure Gap by 2030: AE Discussion Paper" (2023) at 3, online (pdf): *Indigenous Services Canada* https://afn.bynder.com/m/367574a3a5cb5abe/original/1-AFN-Closing-the-Infrastructure-Gap-by-2030-National-Cost-Estimate-English-report-1.pdf.
[72] *TRC*, *supra* note 7.
[73] *Ibid.*
[74] *Ibid.*
[75] Chiefs of Ontario, "Closing the Infrastructure Gap: Ontario Regional Analysis" (January 2024) at 4, online (pdf): https://chiefs-of-ontario.org/wp-content/uploads/2023/08/CITG-Regional-Ontario-Analysis-COO-Jan-2024.pdf.
[76] First Nations Information Governance Centre, "Understanding Child Care in First Nations Communities," (March 2018) at 2, online: *FNIGC Research Series* https://fnigc.ca/wp-content/uploads/2020/09/bd344e1dba275b7a507eec2322bce7db_fnigc_research_series_child_care_en_final.pdf.
[77] *Ibid.*
[78] *Ibid.*
[79] *Ibid.*

children have no opportunity to cool down, which is taxing and dangerous during extreme heat events.

Some Indigenous children also attend kindergarten programs in First Nations-administered schools on First Nations lands, which contributes to available child care. In 2023 to 2024, 524 First Nations across Canada administered education programs on their lands that were funded through the Federal government's elementary and secondary education program.[80] Of these education programs, 315 delivered half-day or full-day kindergarten programs for children aged 4 years, and 339 delivered half-day or full-day kindergarten programs for children aged 5 years.[81]

The co-developed Indigenous ELCC Framework calls for better research, monitoring, and accountability in Indigenous ELCC programs.[82] The Assembly of First Nations recommends that climate policy adopt a First Nations Climate Lens.[83] The First Nations Climate Lens centres Indigenous knowledge systems, stepping away from technological and capitalistic solutions and instead focusing on "relationships that value the nexus of people and land," self-determination, language revitalization, and future generations.[84]

The under-funding of housing, schools, and child care facilities in First Nations communities, and the corresponding heightened exposures to environmental harms for Indigenous children, is an example of environmental racism in Canada. The *National Strategy Respecting Environmental Racism and Environmental Justice Act*, SC 2024, c 11 ("*Environmental Racism Act*") requires the Federal government to develop a national strategy to address environmental racism and advance environmental justice. The *Environmental Racism Act* provides an opportunity for the Federal government to acknowledge, assess, and address ongoing environmental racism in First Nations communities, including the impact on children of infrastructure that is not climate resilient.

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[80] *TRC*, *supra* note 7.
[81] *Ibid.*
[82] Government of Canada, "Indigenous Early Learning and Child Care Framework," (2018) at 24, *Cat. No. Em20-97/2018E-PDF*, online (pdf): https://www.canada.ca/content/dam/canada/employment-social-development/programs/indigenous-early-learning/1352-IELCC_Report-EN.pdf [*ELCC Framework*].
[83] Assembly of First Nations, "National Climate Strategy" (October 2023), online (pdf): https://afn.bynder.com/m/77556e1d9da51db7/original/2023-Climate-Strategy-Report.pdf.
[84] *Ibid* at 24.

6. Legal Framework in Ontario Child Care

Law and Policy Related to Extreme Heat in Child Care Settings

Provincial child care facilities are governed by the following legislative framework.

i. Child Care and Early Years Act

Child care centres are regulated by the *CCEYA* and regulations under the *CCEYA*, such as O. Reg. 137/15.[85] Section 49 of the *CCEYA* states that it "is a matter of provincial interest that there be a system of child care and early years programs and services that,

> […]
>
> (b) promotes the health, safety and well-being of children;
>
> […]
>
> (h) is co-ordinated with other community and human services;
>
> (i) is flexible and able to adapt to local circumstances."[86]

O. Reg. 137/15 contains two provisions regulating minimum temperature in child care centres and home child care agencies: sections 23 and 28 of the Regulation ensure that the indoor temperature in child care settings "is maintained at a level of at least 20 degrees Celsius."[87] O. Reg. 137/15 also includes provisions requiring child care centres and home child care to have certain designated spaces and to have certain furnishings.[88] Amendments to this regulation should adopt a maximum temperature standard of 26 degrees Celsius and provide for needed cooling infrastructure in child care centres and home child care facilities to address extreme heat.

ii. Education Act: Child Care Facilities Located in Schools

Child care centres located in schools are deemed to be part of the school and must meet the same standards and requirements.[89]

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[85] *Child Care and Early Years Act*, 2014, S.O. 2014, c. 11, Sched. 1 [*CCEYA*].
[86] *Ibid* at ss 49(1).
[87] O. Reg. 137/15, s 23, 28.
[88] O. Reg. 137/15, s 15, 19, 27.
[89] *CCEYA*, *supra* note 85 at s 75.

Section 265(1)(j) of the *Education Act* requires a school's principal to "give assiduous attention to the health and comfort of the pupils, to the cleanliness, **temperature** and ventilation of the school."[90] This provision indicates the importance of temperature to the health and comfort of students, but is of no practical effect when schools do not control their indoor temperature. There is a need for infrastructure upgrades to allow for compliance with this provision.

The Minister of Education is given authority through the *Education Act* to "establish policies and guidelines to promote the safety of pupils."[91] This provision gives the Minister of Education power to address extreme heat in schools. A policy or guideline that would set a maximum indoor temperature and require schools to be outfitted with mechanical cooling, such as air conditioning or heat pumps, requires funding to implement. The Ministry of Education took this approach with respect to ventilation during the COVID-19 pandemic. Specifically, the Ministry of Education's guidelines for respiratory illnesses include requirements that kindergarten classes and learning spaces in schools without mechanical ventilation, and mechanically ventilated spaces that are not supported by MERV-13 filters must have a standalone HEPA filter unit.[92] Per this policy, the Ministry of Education "deployed over 100,000 HEPA filter units and other ventilation devices to schools" across Ontario.[93] A similar approach could be adopted to address cooling infrastructure in child care facilities within schools.

iii. Health Protection and Promotion Act

In addition to inspection and order-making powers under the *Health Protection and Promotion Act* ("*HPPA*"), section 7 requires that the Minister of Health and Long-Term Care specify the mandatory health programs and services provided by boards of health.[94] Under the Ontario Public Health Standards ("OPHS") and the *Healthy Environments and Climate Change Guideline, 2018* (the "Guideline"), requirement 3 with respect to climate change adaptation provides that "[boards] of health shall engage in actions to mitigate heat health impacts using tools such as the *Harmonized Heat Warning and Information System for Ontario, 2016*."[95]

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[90] *Education Act*, RSO 1990, c. E.2, ss 265(1)(j) [*emphasis added*].
[91] *Ibid*, at ss 301(7).
[92] Ministry of Education, "Respiratory illness: health and safety measures in schools" (2024), online: *Ontario* https://www.ontario.ca/page/respiratory-illness-health-and-safety-measures-schools#section-3.
[93] *Ibid.*
[94] *Health Protection and Promotion Act*, RSO 1990, c. H.7, ss 7, 10-13.
[95] Ministry of Health and Long-Term Care, "Healthy Environments and Climate Change Guideline, 2018" (2018), online (pdf): https://files.ontario.ca/moh-guidelines-healthy-environments-climate-change-en-2018.pdf [*HECCG*].

Moreover, under the 2019 Health Hazards Response Protocol, "public health units are required to prevent and reduce the burden of illness from health hazards in the physical environment, including extreme weather and extreme temperatures."[96]

The 2018 OPHS require public health units to "use surveillance data to communicate information on risks" with the goal of effective responses to current and evolving conditions and impacts of climate change.[97] The 2018 OPHS also require public health units to "assess health impacts related to climate change in accordance with the *Healthy Environments and Climate Change Guideline, 2018*."[98] The Guideline requires health units to monitor the impacts of climate change to inform local vulnerability plans, engage in multi-sectoral collaboration, and communicate identified health risks with the public.[99] The Guideline suggests the use of the Ontario Climate Change and Health Toolkit when monitoring the health impacts of climate change and when conducting relevant health vulnerability and adaptation assessments.[100]

iv. Occupational Health and Safety Act

Occupational health and safety laws protect the health and well-being of early childhood educators and other staff in child care settings. Under section 25(2)(h) and 27(2)(c) of the *Occupational Health and Safety Act* ("*OHSA*"), employers and supervisors have a duty "to take every precaution reasonable in the circumstances for the protection of the worker."[101] This section includes a responsibility to develop hot and cold environment policies and procedures to protect workers from extreme heat and cold.[102] In addition, section 54(1)(e) and 54(1)(f) of the *OHSA* state:

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[96] Ministry of Health, "Harmonized Heat Warning and Information System for Ontario, 2023" (2023), online (pdf): https://files.ontario.ca/moh-harmonized-heat-warning-and-information-system-for-ontario-hwis-en-2023-05-29.pdf.
[97] Ministry of Health, "Ontario Public Health Standards: Requirements for Programs, Services and Accountability" (June 2021) at 19-20, online (pdf): https://files.ontario.ca/moh-ontario-public-health-standards-en-2021.pdf [*OPHS*].
[98] *Ibid* at 35.
[99] *Ibid*.
[100] Kristie Ebi, et al., "Ontario Climate Change and Health Toolkit" (2016), online (pdf): *Ontario* https://files.ontario.ca/moh-ontario-climate-change-toolkit-en-2016-08-01.pdf [*Ontario Climate Change and Health Toolkit*].
[101] *Occupational Health and Safety Act*, RSO 1990, c. O.1, at s 25, 27.
[102] Government of Ontario, "Guideline No. 33: Working in Extreme Temperature Conditions" (2022), online: https://www.ontario.ca/document/safety-guidelines-film-and-television-industry/guideline-no-33-working-extreme-temperature.

> An inspector may, for the purposes of carrying out his or her duties and powers under this Act and the regulations, […]
>
> > (e) conduct or take tests of any equipment, machine, device, article, thing, material or biological, chemical or physical agent in or about a workplace and for such purposes, take and carry away such samples as may be necessary;
> >
> > (f) require in writing an employer to cause any tests described in clause (e) to be conducted or taken, at the expense of the employer, by a person possessing such special expert or professional knowledge or qualifications as are specified by the inspector and to provide, at the expense of the employer, a report or assessment by that person.

In a 2007 Ontario Labour Relations Board decision, the tribunal found that temperature is a physical agent."[103] The Board held that "section 54(1)(f) of *OHSA* allowed an inspector to issue an order to have a heat stress assessment."[104] The adjudicator also agreed with the Ministry that heat stress could be considered under the broad language of section 25(2) of the *OHSA*.[105] In general, the Ontario Court of Appeal found that the *OHSA* should be interpreted liberally, such that the legislation's public welfare and remedial purpose can be fulfilled.[106]

7. Solutions to Extreme Heat in Child Care

CANADA'S EXTREME HEAT RESPONSE PLANS AND RECOMMENDATIONS ARE INADEQUATE. Currently, Canada has a heat alert and response system by which the government alerts communities affected by extreme heat and informs people about "recognizing, preparing for and adapting to extreme heat events."[107] Both the Federal and Provincial governments have released heat response recommendations, where it is recommended that people experiencing extreme heat:

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[103] *Cancoil Thermal Corp. v. United Food and Commercial Workers International Union, Local 175*, 2007 CanLII 15121 (ON LRB) at para 79, online: *CanLII* https://canlii.ca/t/1rbls#par79.
[104] *Ibid.*
[105] *Ibid*, at para 77.
[106] *Ontario (Ministry of Labour) v. Hamilton (City)*, 2002 CanLII 16893 (ON CA) at para 16, online: *CanLII* https://canlii.ca/t/1dwq1#par16.
[107] *Extreme heat events*, *supra* note 3.

- avoid sun exposure;
- take a break from the heat by taking a cold bath/shower or going to a cooling centre, such as a public library;
- reschedule outdoor activities;
- block out the sun with curtains;
- refrain from using ovens; and
- use air conditioning.[108]

These recommendations are only helpful to populations with the resources to respond and the freedom to modify their behaviour. These recommendations do not offer long-term or systemic solutions, but are only methods of individual, momentary relief if you are an individual with the ability to take these steps. Further, these recommendations do not address economic, social, or structural barriers to mitigating the impacts of climate change. This type of approach does not adequately address the extreme heat exposures faced by children in child care facilities. Without meaningful government action, extreme heat events stand to exacerbate inequalities, starting with children's learning and education.

8. CELA Recommendations

Recommendation 1: AMEND O. REG. 137/15 TO INCLUDE A MAXIMUM TEMPERATURE STANDARD AND APPLY IT TO ALL CHILD CARE FACILITIES.

O. Reg. 137/05, passed pursuant to the *Child Care and Early Years Act*, includes minimum temperature standards for licensed child care facilities at sections 23 and 28. However, these sections do not apply to unlicensed child care facilities. Therefore, CELA recommends the following amendments to O. Reg. 137/05 (bolded):

> 23. Every **child care provider** shall ensure that the temperature in each child care centre it operates is maintained at a level of at least 20 degrees Celsius **and at a level of a maximum of 26 degrees Celsius**.
>
> …

[108] *Keep Children Cool!*, *supra* note 3.

28. Every **child care provider** shall ensure that in each premises where the licensee oversees the provision of home child care, the temperature is maintained at a level of at least 20 degrees Celsius **and at a level of a maximum of 26 degrees Celsius.**

Recommendation 2: AMEND LEGISLATION OR GUIDELINES THAT APPLY TO CHILD CARE LOCATED IN SCHOOLS TO INCLUDE A MAXIMUM INDOOR HEAT STANDARD OF 26°C. Child care facilities located within school buildings must meet the standards set by the *Education Act.* A maximum indoor temperature standard could be provided by amendments to the *Education Act* or the *Occupational Health and Safety Act*, or alternatively, be created by an *Education Act* guideline or regulation pursuant to the *OHSA*. CELA recommends that the standard apply in all classrooms used for teaching, learning, or eating purposes, and also include washrooms.

Recommendation 3: THE MAXIMUM INDOOR TEMPERATURE STANDARD APPROPRIATE FOR CHILDREN SHOULD BE REVIEWED IN TWO YEARS. The literature to date focuses on temperature thresholds over which adults begin to experience heat-related health impacts. It is crucial that the standard reflect the unique vulnerabilities of children and be reviewed and lowered as appropriate in a short time-frame.

Recommendation 4: UPGRADE CANADIAN CHILD CARE INFRASTRUCTURE TO BE CLIMATE RESILIENT. To mitigate the effects of extreme heat, Canadian child care centres and home child care need to be heat resilient. This involves updating Canadian schools and other child care settings such that they include mechanical cooling such as air conditioning or heat pumps. In the Federal government's 2030 Emissions Reduction Plan ("ERP"), per the *Canadian Net-Zero Emissions Accountability Act*, the government expresses an intention to retrofit existing buildings and to create new, net-zero buildings going forward. The ERP creates several investments for upgrading Canadian buildings, the most relevant being a $458.5 million investment "to support the low-income stream of the Greener Homes Loan Program, which will support increased energy savings."[109] This stream of funding could be used to assist with home-based child care.

[109] Ministry of Environment and Natural Resources, "Canada's 2030 Emissions Reduction Plan – Chapter 2" (2023), online: *Government of Canada* https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview/emissions-reduction-2030/plan/chapter-2.html#toc5 [*2030 ERP*].

There are several additional funds available to Canadian child care centres and schools for infrastructure updates, including: the Investing in Canada Infrastructure Program, Capital Priorities Program, School Renewal Allocation via the School Facilities Fund under Core Education Funding, and School Condition Improvement Fund under Building, Expanding, and Renewing Schools.[110]

Case Study: Taiwan

In Taiwan, air conditioning units were installed into every public classroom in 2022 at a cost of $1.1 billion USD.[111] The result was 180,000 air conditioning units installed in more than 3,300 elementary and middle schools nationwide.[112]

As of March 2022, there were 5,545 licensed child care centres and 145 licensed home child care agencies in Ontario – a number larger than but not too far from the project in Taiwan.[113] Federal and provincial government funding for child care has focused on the Canada-wide Early Learning and Child Care Agreement and did not target infrastructure needs.[114] Funding for mechanical cooling in child care facilities must be additional to the needed funding targeting child care spaces and affordability.

Recommendation 5: AMEND ONTARIO'S BUILDING CODE TO INCLUDE HVAC REQUIREMENTS FOR NEW CHILD CARE FACILITIES AND RELATED REQUIREMENTS FOR RETROFITTING BUILDINGS. Canada's Emissions Reduction Plan acknowledges the importance of building codes as "key enablers of a net-zero buildings

[110] Government of Canada, "Investing in Canada Infrastructure Program" (3 July 2024), online: *Government of Canada* https://housing-infrastructure.canada.ca/plan/icp-pic-INFC-eng.html; Ministry of Education, "Education Capital Policies and Programs Manual" (April 2024), online (pdf): *Ontario* https://efis.fma.csc.gov.on.ca/faab/Memos/B2024/B08_Attach1_EN.pdf; *Ibid* at 34; *Ibid* at 43.
[111] Department of Information Services, "Government achieves air conditioning for every classroom ahead of schedule" (2022), online (press release): *Executive Yuan* https://english.ey.gov.tw/Page/61BF20C3E89B856/b61dbdff-ec65-4f29-b67e-2bb95101c3e2 [*Department of Information Services 2022*].
[112] *Ibid*.
[113] Ministry of Education, "Ontario's Early Years and Child Care Annual Report 2022" (2022), online: *Ontario* https://ontario.ca/page/ontarios-early-years-and-child-care-annual-report-2022;
[114] Government of Canada, "Supporting Child Care in Ontario" (2024), online: *Newsroom* https://news.ontario.ca/en/backgrounder/1004937/supporting-child-care-in-ontario; Child Care Now, "Ontario's child care shortage demands government leadership instead of for-profit expansion" (12 August 2024, online: https://childcarenow.ca/2024/08/12/ontarios-child-care-shortage-demands-government-leadership-instead-of-for-profit-expansion/; Building Blocks for Child Care, "Child Care Crisis in Ontario" (29 February 2024), online: https://b2c2.ca/child-care-crisis-in-ontario/.

sector."[115] Widespread adoption and enforcement of these codes would also ensure climate resilience in the future. The 2024 amendments to the Ontario Building Code (the "2024 Building Code"), which became effective January 1st, 2025, include minimum temperature requirements in dwellings and various other kinds of buildings.[116] Moreover, part 12 of the 2024 Building Code is entitled "Resource Conservation and Environmental Integrity" and includes provisions for energy efficiency, carbon dioxide equivalents, and peak electric demand. CELA recommends the addition of maximum extreme heat mitigation measures, including mechanical cooling requirements, into Ontario's building code.

Recommendation 6: AMEND ONTARIO'S BUILDING CODE TO INCLUDE A MAXIMUM TEMPERATURE STANDARD. Section 9.33.3.1 of the 2024 Building Code states that heating facilities shall be capable of maintaining an indoor air temperature of not less than 22°C in all living spaces, and then goes on to outline minimum temperature requirements in common service rooms, unfinished basements, and crawl spaces. This section should be amended to include a maximum temperature requirement of 26°C in all spaces used for child care.

Indigenous Child Care

Recommendation 7: ENSURE THAT ADDITIONAL FUNDING IS PROVIDED TO FIRST NATIONS FOR IMPROVEMENTS TO CHILD CARE ENVIRONMENTS. The existing infrastructure deficit in First Nations communities means that infrastructure improvement projects on First Nations lands require more funding to appropriately address the threats of climate change. While federal funding considers repairs and renovations of existing Indigenous ELCC centres and construction and maintenance of new centres, it is insufficient to meaningfully address the needs of ELCC centres in First Nations communities. Future funding must include additional funds for ensuring that child care programs are delivered in safe, healthy, and climate resilient environments.

Recommendation 8: ENSURE MEANINGFUL PARTICIPATION OF AND PARTNERSHIP WITH FIRST NATIONS IN CLIMATE RESILIENCY AND HEAT

[115] *2030 ERP*, *supra* note 109.
[116] Ministry of Municipal Affairs and Housing Building and Development Branch, "Building Code Compendium" (May 2024), *ServiceOntario Publications* at s 6.2.1.1A, 9.33.3.1, 12.3.1.3 [*2024 BC*].

MITIGATION EFFORTS.[117] The Federal government must ensure that First Nations communities are meaningful partners in the development of plans to address climate resilience in their child care facilities, including in relation to extreme heat. The infrastructure needs in a community, and the development of culturally appropriate buildings and curricula, should be accounted for in plans to protect Indigenous children from extreme heat.

Case Study: Tít̓q̓et First Nation

Tít̓q̓et, a community part of the St'át'imc Nation in B.C., has been severely affected by climate change and extreme weather events such as wildfires and heat events. These events have disrupted traditional livelihoods such as fishing, hunting, and gardening. With funding support from Health Canada, a consultant worked with a Tít̓q̓et local Heat Team to develop a heat response plan that integrates existing emergency plans and builds on local knowledge. The Tít̓q̓et Heat Team has raised awareness of heat preparedness through various means, including a video made by Chief Sidney Scotchman, social media posts, and community meetings. During heat events, staff regularly check in on Elders and the most vulnerable, delivering water and distributing air conditioners. Cooling spaces were also established in two community buildings through the installation of tinted windows and a heat pump. When developing the heat response plan, both the consultant and the Tít̓q̓et Heat Team saw immense value in engaging with community members and Elders to align temperature and weather data with lived experiences and local knowledge.[118]

Recommendation 9: FIRST NATIONS AND THE FEDERAL GOVERNMENT SHOULD CO-DEVELOP A PLAN FOR MONITORING CLIMATE CHANGE IMPACTS ON FIRST NATIONS CHILDREN IN CHILD CARE.[119] The co-developed 2018 ELCC Framework highlights the lack of information available to parents, service providers, and governments about Indigenous ELCC and advocates for the development of a better monitoring

[117] Human Rights Watch, "'My Fear is Losing Everything:' The Climate Crisis and First Nations' Right to Food in Canada" (October 2020), online: https://www.hrw.org/report/2020/10/21/my-fear-losing-everything/climate-crisis-and-first-nations-right-food-canada [*HRW*].
[118] Interior Health, "How First Nation communities are addressing climate change" (26 June 2024), online (podcast): https://www.interiorhealth.ca/stories/how-first-nation-communities-are-addressing-climate-change#how-the-ti--t--q--et-heat-team-prepares-for-extreme-heat-events.
[119] *HRW*, *supra* note 117.

and reporting system in the Indigenous ELCC context.[120] CELA encourages the co-development of a plan to monitor and report climate impacts on Indigenous children in ELCC settings.

Recommendation 10: CONSIDERATION OF CLIMATE RESILIENCY AND THE IMPACT OF UNDER-FUNDED INFRASTRUCTURE ON FIRST NATIONS LANDS SHOULD BE INCLUDED IN THE FEDERAL GOVERNMENT'S CONSULTATION AND NATIONAL STRATEGY PURSUANT TO THE *ENVIRONMENTAL RACISM ACT*. The *Environmental Racism Act* requires the Federal government to develop a national strategy to advance environmental justice and to assess, prevent, and address environmental racism. A study must also include information and statistics on the location of environmental hazards. Pursuant to the *Environmental Racism Act,* CELA urges the Federal government to include consideration of and consultation with First Nations communities about the climate resiliency of their schools and child care facilities in their national strategy.

Data Collection

Recommendation 11: INSTALL INDOOR TEMPERATURE, HUMIDITY, AND VENTILATION MONITORS IN EVERY ROOM USED FOR CHILD CARE. Many child care facilities do not have a way to measure the internal temperature of the building. Because of this, educators may rely on weather reports to estimate the indoor temperature. However, outdoor temperature has been found to be a poor indicator of indoor temperature.[121] It is vital that indoor temperature be measured so that staff know the actual temperature of rooms being used for child care and can implement appropriate mitigation measures. Enforcement of this recommendation could be pursued through amendments to the *Child Care and Early Years Act*, O. Reg. 137/05, or the *Occupational Health and Safety Act*.

Recommendation 12: THE PROVINCE SHOULD CREATE MAPS TO IDENTIFY NEIGHBOURHOODS VULNERABLE TO HEAT THAT SHOULD BE PRIORITIZED FOR MECHANICAL COOLING. Heat vulnerability maps show where "hotspots" overlap with child care centres and schools and thus identify which areas are most vulnerable to extreme heat events. Similar projects have been undertaken to identify vulnerable populations by Toronto

[120] *ELCC Framework*, *supra* note 82 at 24.
[121] *Waugh et al.*, *supra* note 24 at 479.

Public Health and the University of Toronto.[122] Data on which child care facilities are air-conditioned is a relevant filter to add to existing vulnerability maps to ensure that child care in "hotspots" is prioritized for infrastructure upgrades.

Recommendation 13: WORK WITH LOCAL PUBLIC HEALTH UNITS TO GATHER DATA. Public health units should be gathering data on extreme heat and child care facilities because of the requirement of the *Healthy Environments and Climate Change Guideline, 2018* and Ontario Public Health Standards to create climate change and health vulnerability assessments.[123] Public heath units could use new and improved data on heat in child care facilities to inform their reports by ensuring that appropriate data is collected, including monitoring indoor and outdoor temperatures, absences during extreme heat events, child care closures, and air quality. CELA recommends that public health units employ the Ontario Climate Change and Health Toolkit in conducting these health vulnerability and adaptation assessments.[124]

Outdoor Spaces

Recommendation 14: DEVELOP PROVINCE-WIDE SHADE GUIDELINES FOR OUTDOOR SPACES AT CHILD CARE FACILITIES. Exposure to the sun increases the temperature of not only childrens' bodies, but also of the outdoor space itself. By increasing the amount of shade in playgrounds and outdoor play areas, by any method, child care facilities are reducing outdoor temperatures and protecting their students. Developing provincial guidelines would allow for flexible implementation such that child care providers could act according to their specific needs and spaces. O Reg. 137/15 contains many requirements for buildings, equipment, and playgrounds of child care centres and home child care to ensure the health and well-being of children and could be amended to include shade guidelines.

Case Study: Irma Coulson Public School, Milton, Ontario

A Canadian non-profit, Evergreen, has released "A Climate Ready Schools guide to designing for shade" along with other resources for adapting school yards to climate change, including a

[122] *Shuchen Bu et al., supra* note 63.
[123] *HECCG, supra* note 95; *OPHS, supra* note 97 at 35.
[124] *Ontario Climate Change and Health Toolkit, supra* note 100.

Shade Audit Information Guide + Tool.[125] A shade audit "can determine existing shade usage patterns and assess and identify optimal shading from both natural and built shade requirements."[126]

Irma Coulson Public School in Milton, Ontario, became Canada's first "climate-ready school" in 2022. A climate-ready school is one that has "multi-use, natural outdoor play and learning environments that also promote health and resilience in the face of a changing climate."[127] The renovated school ground now includes more vegetation and permeable surfaces, resulting in 100% absorption "of rainfall on the school site while mitigating flood risk in their neighbourhoods."[128] Tree canopy was also increased at the school, as the project increased the total number of trees on site by 291%.[129] This project was completed through partnership between Evergreen, the Halton District School Board, and several community donors such as the Balsam Foundation and the LCBO's Spirit of Sustainability campaign.[130]

Case Study: Australia

The Cancer Council of New South Wales, Australia, has developed Guidelines to Shade and a Shade Advocacy Toolkit to help schools understand the importance of shade, identify their shade needs, and implement shade projects.[131]

[125] Evergreen, "A Climate Ready Schools guide to designing for shade" (2024), online (toolkit): *Evergreen Resource Hub* https://evergreen.ca/resource-hub/resources/a-climate-ready-schools-guide-to-designing-for-shade/ [*Evergreen 2024*]; Waterloo Region Shade Work Group "Shade Audit Information Guide + Tool: A Guide for Creating Shady Outdoor Spaces" online (pdf): https://www.regionofwaterloo.ca/en/health-and-wellness/resources/Documents/ShadeAudit_GuideTool.pdf.

[126] *Evergreen 2024*, *supra* note 125.

[127] Evergreen, "Canada's first climate ready school" (2022), online: https://www.evergreen.ca/projects/canadas-first-climate-ready-school/ [*Evergreen 2022*].

[128] *Ibid*.

[129] Evergreen and the Halton District School Board, "Climate Ready Schools" (2023) at 29, online (pdf): https://www.evergreen.ca/wp-content/uploads/2023/10/Climate_Ready_Schools_Case_Study_2023.pdf.

[130] *Evergreen 2022*, *supra* note 127.

[131] Cancer Council NSW, "Guidelines to Shade" (May 2020), online (pdf): *SunSmart* https://www.cancercouncil.com.au/wp-content/uploads/2020/05/Guidelines_to_shade_WEB2.pdf; Cancer Council, "Shade Advocacy Toolkit" (March 2025), online (pdf): https://www.cancercouncil.com.au/wp-content/uploads/2024/10/CPA-Skin-25_0225-Shade-Advocacy-Toolkit-2025-FINAL.pdf.

Case Study: Spain and France

Barcelona, Spain: Green, Blue, Grey: Solutions for Adapting to Climate Change (GBG_AS2C)
Funded by the European Commission's Urban Innovative Action ("UIA") program, Barcelona completed the GBG_AS2C initiative in 2021 as part of the city's Climate Plan.[132] The GBG_AS2C aimed to increase Barcelona's climate resilience by converting schoolyards into climate shelters by creating water points (i.e. misting stations or water fountains) and incorporating greenery and shade into school yards, and by using permeable materials to do so. The project transformed the playgrounds of 12 schools across the city, reclaiming 1,000 square meters for vegetation and soil, planting 74 trees, installing 26 new water points, and creating 2,213 square meters of shade.[133]

Paris, France: Openness, Adaptation, Sensitisation, Innovation, and Social Ties (OASIS)
Paris' OASIS project is a sister project to Barcelona's GBG_AS2C, and is also funded by the UIA. OASIS is similar to GBG_AS2C in that it is a project to transform schoolyards into climate shelters "through innovative techniques, nature based solutions, in an integrated approach."[134] Paris originally committed to turning only 10 schoolyards into climate shelters, but now has the goal of transforming all schoolyards in the city. As of 2023, Paris has transformed 130 schools across the city and the OASIS project has spread to other cities across France.[135] OASIS schoolyards can now be found in Toulouse, Caluire-et-cuire, Bordeaux, and more.[136]

Reschedule Activities to Cooler Times of the Day

Recommendation 15: SCHEDULE PHYSICAL ACTIVITIES AT COOLER TIMES OF DAY. Physical activities should be scheduled for times of the day when temperatures are cooler

[132] Ajuntament de Barcelona, "Climate shelters in schools," online: https://www.barcelona.cat/barcelona-pel-clima/ca/escoles-refugi-climatic.
[133] *Ibid.*
[134] Urban Innovative Actions, "Paris" online: https://uia-initiative.eu/en/uia-cities/paris-call3.
[135] European Union, "OASIS takes off! – Final Journal" (2023), online (blog): *Portico* https://portico.urban-initiative.eu/news-and-events/news/oasis-takes-final-journal.
[136] CAUE de Paris, "Observatoire des cours Oasis", online: https://www.observatoire-oasis.fr/.

to promote well-being and success. In prolonged heat waves, certain activities may need to be rescheduled to a later, cooler date, or cancelled altogether to ensure success and safety.

Equity Considerations

Recommendation 16: INTEGRATE EQUITY CONSIDERATIONS INTO ALL ASPECTS OF EXTREME HEAT RESPONSE. Efforts should be made to address the existing disparities in child care and school funding and infrastructure. Priority for funding and support should be given to under-resourced communities facing environmental injustice, and First Nations, Inuit, and Métis child care facilities where extreme heat events may be pronounced and under-funding has caused infrastructure deficits.

9. Conclusion

The impacts of climate change are unfair; children are not responsible for climate change but are experiencing disproportionate impacts. Extreme heat poses a serious threat to the health and well-being of Ontario's children. Our children deserve safer and healthier early learning environments, and mechanical cooling is essential to protect children exposed to longer summers and more frequent extreme heat events. A mandatory indoor temperature standard should be implemented. We also recommend a review of the standard after further study of the impacts of indoor heat on young children to ensure it should not lowered.

Additional funding for infrastructure upgrades are needed, specifically in First Nations communities dealing with ongoing injustice because of serious under-funding and infrastructure deficits.

Implementation of CELA's recommendations will serve to better protect our children from the unfair impacts of climate change and make our child care facilities more climate resilient.