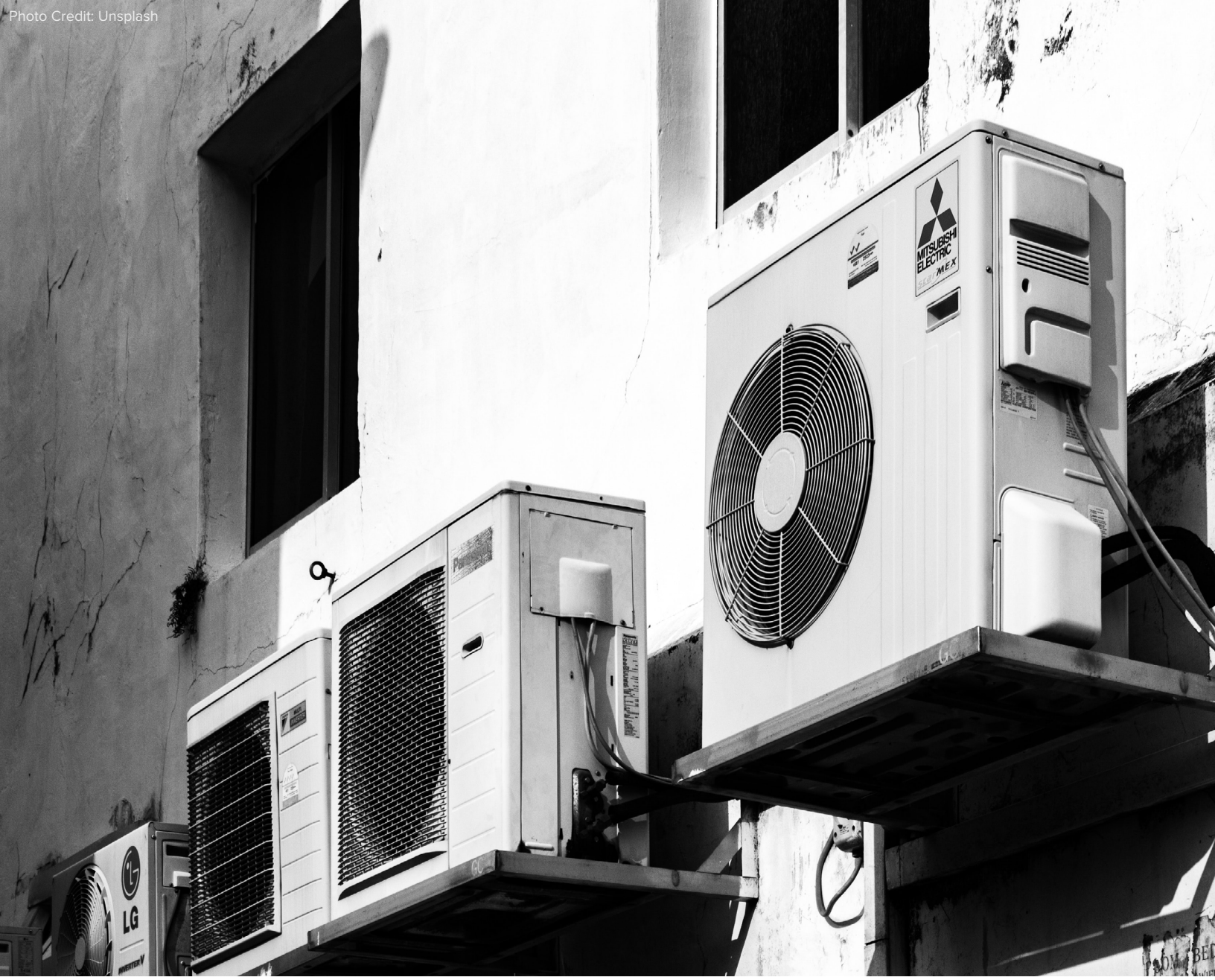

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POLICY TOOLS TO CREATE AND SUPPORT COOLER, SAFER INDOOR LIVING SPACES

APRIL 2023

VANCOUVER COASTAL HEALTH

Vancouver CoastalHealth

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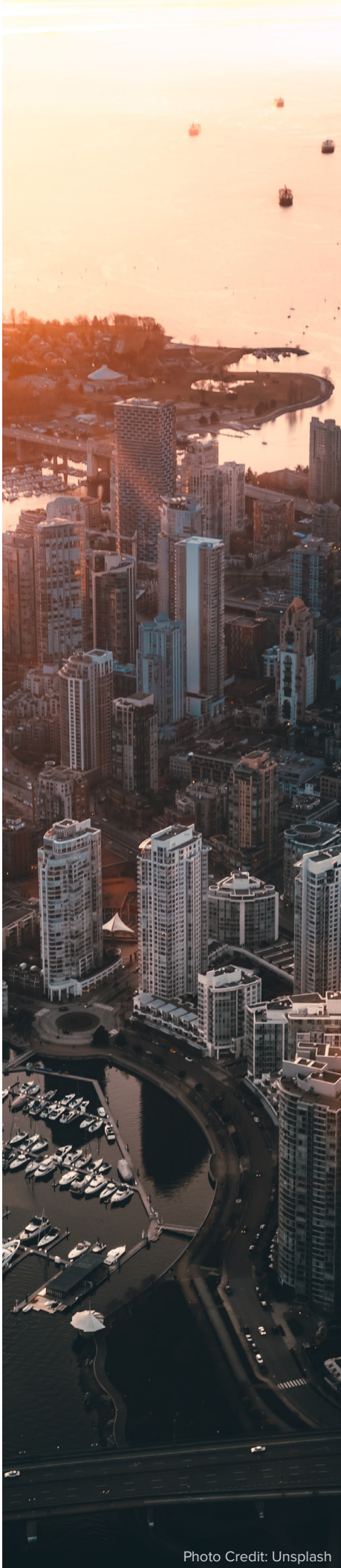
Research and report by Dr. Cheryl Young during her tenure as a medical resident within VCH Public Health, with additional research and writing from members of VCH's Healthy Environments & Climate Change team and Healthy Public Policy Unit. We would also like to acknowledge the contribution made by those who were interviewed during the project.

The work of VCH takes place on the traditional homelands of fourteen First Nation communities and three Métis Chartered communities in the region. The office where this work was carried out is located on the unceded territories of the Musqueam, Squamish, and Tsleil-Waututh Nations.



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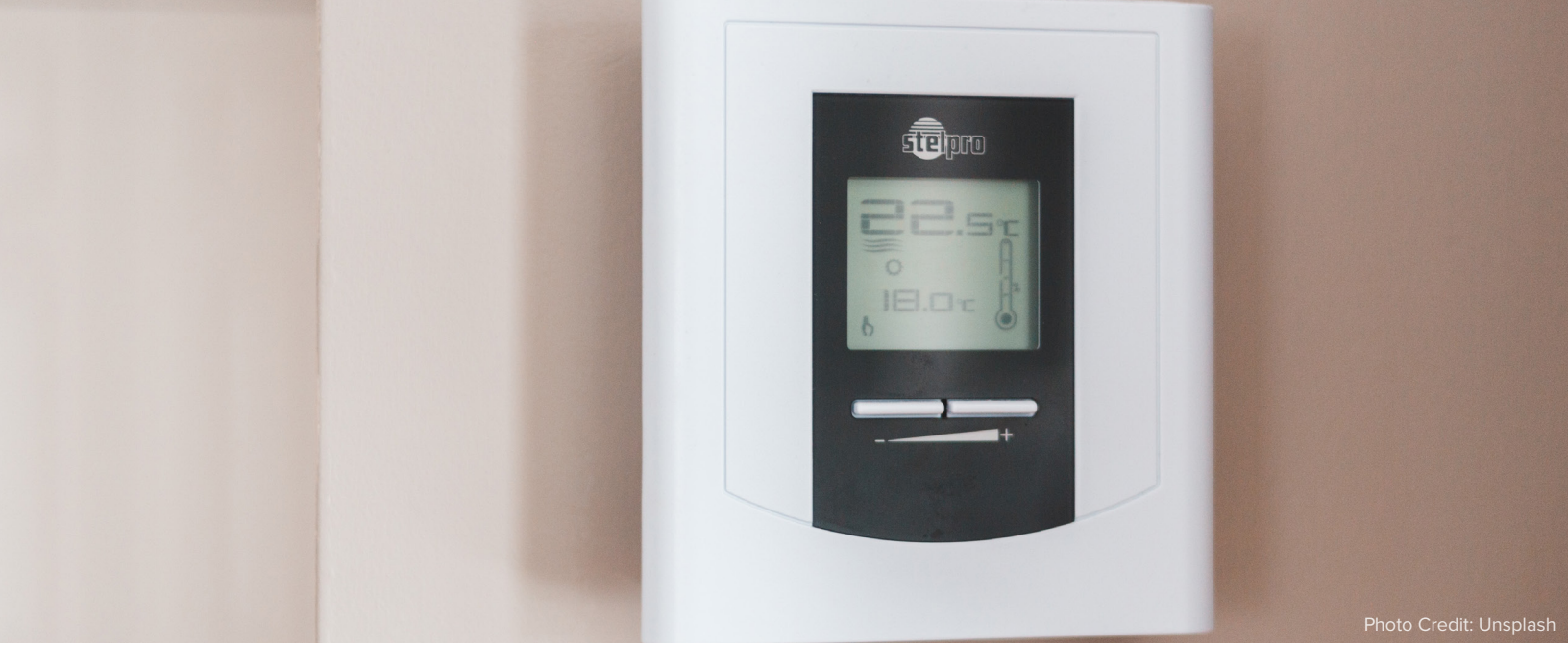

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Executive Summary

Extreme heat emergencies, like the one experienced in our region June 2021, are expected to become more common as the climate changes. Exposure to high temperatures, especially indoors, can result in heat-related illness and death. Vancouver Coastal Health (VCH) has conducted a review of policy and regulatory options that could increase the prevalence of mechanical cooling in homes within the VCH health region. This process included a jurisdictional scan of policy tools as well as 19 key informant interviews with participants from different levels of government, housing and tenancy advocacy groups and both for-profit and non-profit housing providers.

The research process revealed both "where" and "how" policy tools could be introduced into policy, acknowledging that there is not a one-size fits all approach to mechanical cooling. Rather, tools are available across various sectors with different options for cooling mechanisms and extent of coverage to be considered. This provides an opportunity for different levels of government to pursue mechanical cooling policy options that best suit their roles and responsibilities.

Key findings from the jurisdictional scan include:

- In the absence of enforceable policy interventions that that support cooling of indoor living spaces, there will continue to be preventable deaths and illness from future heat events
- Multiple policy interventions at different levels of government are needed
- There are significant challenges relating to cost and feasibility for mechanical cooling, especially in existing buildings
- Mitigating unintended consequences of cooling policies will require policy changes across adjacent sectors

VCH recognizes the policy options put forward as an important opportunity for "right to cool" advocacy, as mechanical cooling is a key component of a holistic cooling approach that includes passive design strategies, as well as public health interventions. VCH will continue to inform and support heat-related policy development in partnership with other interested parties in the region.

Introduction

VCH Public Health recognizes the connection between climate change and health to be a top priority requiring sustained and concerted mitigation and adaptation efforts. The urgency to adapt to extreme heat, for example, was made clear following the 2021 heat dome that affected our region. The VCH Healthy Environments team within the Office of the Chief Medical Health Officer (OCMHO) is leading and participating in a number of province-wide and regional efforts to prepare for future heat events and build longer-term community resiliency.

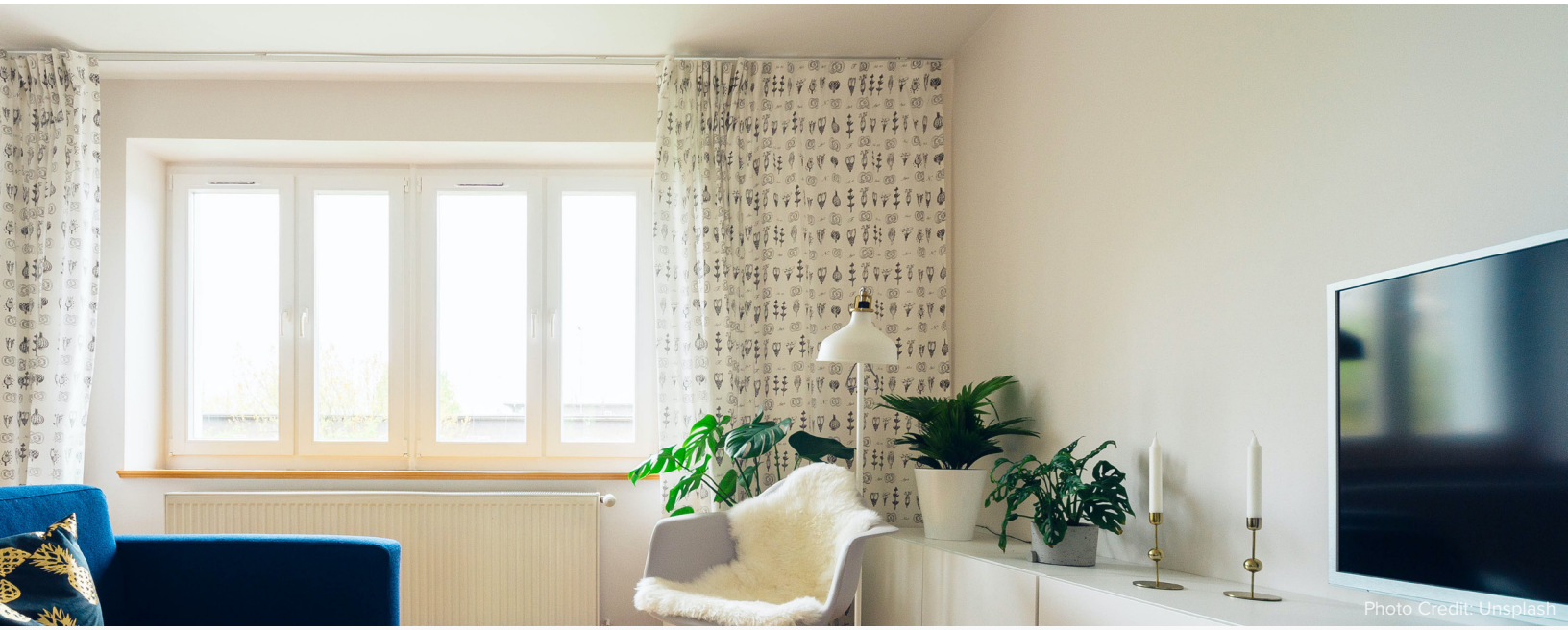
Part of this effort includes advocacy for increased access to thermally safe residential spaces. As described further below, passive design methods can reduce indoor temperatures in the physical and built environment. These include controlling impacts on indoor temperature via windows, natural ventilation, and the role trees and reflective surfaces at reducing overheating. Passive cooling methods are an important component of a holistic response to high temperatures and should accompany active cooling requirements to reduce the load on active cooling systems and increase thermal safety in the event of a power failure. For most existing residential buildings in the region, however, particularly multi-unit residential buildings, passive cooling alone is not currently sufficient to ensure safe indoor termperatures during extreme heat events.

Increasing the prevalence of mechanical cooling (e.g. air conditioning or heat pumps) in housing requires policy and regulatory changes. In this preliminary policy analysis, we seek to understand the policy tools and cooling measures available to enable safer indoor living spaces across British Columbia (BC), and set the stage for future advocacy efforts exercised through the VCH Public Health.

Rationale

From June 25 to July 1, 2021, an unprecedented extreme heat event resulted in record high temperatures across many parts of British Columbia. The BC Coroner identified 619 deaths in the province attributable to this heat dome, 145 of whom lived in the Vancouver Coastal Health region[1]. This number does not include the many excess deaths that were not directly attributed to heat but are known to increase in rate during heat events, such as deaths from overdose, suicide, and drowning[2]. Due to the effects of climate change – a consequence of human activities that emit greenhouse gasses into the atmosphere – it is anticipated that heat waves will increase in frequency and severity in coming years[3]. As we face this reality, there is profound urgency for our communities to adapt and build resilience to heat, including in our built environment and living spaces.

Research consistently shows that sustained exposure to high temperature can result in heat-related illness[4]. The risk for heat-related illness increases in people who experience an intersection of underlying physical vulnerabilities (such as older age and certain medical conditions), environmental vulnerabilities (such as living in an urban heat island), and systemic and structural barriers to accessing cooling within and outside the home (such as economic disadvantage and social isolation).



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The risk also increases with environmental vulnerabilities as the temperature rises. Although there is no absolute temperature to define a "safe" threshold for everyone, the health effects of heat can impact people at increased risk with sustained exposure to temperatures above 26°C, with further increases in morbidity and mortality as the temperature increases. During the 2021 heat dome, temperatures reached over 40^{0}C in many parts of the province, both outdoors and indoors. When such extreme heat events occur, living spaces without any form of mechanical cooling (e.g. air conditioning, heat pumps) can trap heat and become especially dangerous.

Passive cooling methods like exterior shading, building orientation, and window coatings help to keep indoor spaces cool during typical conditions[5]. Efforts should be made to increase the use of passive strategies as they can reduce the energy-related burden of mechanical cooling, and increase thermal safety during power outages. Passive cooling alone, especially when strategies are used in isolation and not in combination (e.g., natural ventilation and exterior shading), is not currently sufficient to ensure safe indoor temperatures during extreme heat events. Indeed, the Chief Coroner of BC reported that in 98% of heat-related deaths during the 2021 heat dome, the injurious heat exposure occurred indoors in a residence that did not have air conditioning. It should be noted that more research is needed to better understand the benefits and limitations of passive strategies in the VCH health region.

While as a society we have long viewed heating during winter months as a standard for housing adequacy, our changing climate and increasing understanding of heat vulnerability requires that we view mechanical cooling in living spaces as a matter not only of comfort, but also of health and safety. A healthy public policy approach to this concept recognizes that this 'right to cool' should also be reflected in legislative and regulatory mechanisms. This preliminary policy analysis seeks to understand the policy tools that could enable this right, and identify the facilitating factors, barriers, and potential unintended consequences of various potential cooling policies.

Methods

An initial jurisdictional scan of policy tools in British Columbia and Ontario was conducted by reviewing policy documents and other grey literature on indoor temperature policies and regulations, without a focus on specific cooling mechanisms. The purpose of the scan was to examine the status of cooling policy and regulation impacting homes in the VCH region and potential model policies in other jurisdictions and inform a starting point for stakeholder interviews. A summary of the scan is found in Appendix A.

Following the scan, a total of 19 interviews were conducted with key informants belonging to a number of different stakeholder groups. We engaged with staff from urban and rural local governments and provincial ministries whose work is directly involved with building- and tenancy-related policy, including engineers, city planners, policy analysts, and other energy, building, and sustainability specialists. We also sought the perspectives of housing and tenancy advocacy groups, and both for-profit and non-profit housing providers. Interviews focused on the informants' perspectives on cooling measures and policy tools, including their view of benefits, feasibility considerations, and potential unintended consequences of such measures and tools.

Findings

POLICY TOOLS

This review focuses on existing policy tools applicable to the VCH region in which operational or outcome-based requirements for cooling measures could be introduced. These policy tools pertain to building construction, building maintenance, residential tenancy, and tools within the health sector. In recognition of Indigenous self-determination and guidance shared by Indigenous groups during climate-related engagement with VCH, Government of BC, and others, policy tools that pertain specifically to reserve land were not examined at this time. Table 1 summarizes the reach, factors that enable the introduction of cooling measures, feasibility considerations and barriers to introducing cooling measures, and potential unintended consequences and gaps of each tool identified. Potential policy avenues are organized here across three categories: Building construction and maintenance; Tenancy; and Health Sector.

Table 1. Policy tools in which requirements for cooling measures could be introduced

Policy Avenue	Reach and enabling factors	Feasibility considerations and barriers	Potential unintended consequences and considerations
Building construction and maitenance			
National Building Code	Broad reach Forms basis for other provincial new builds	Not legally binding Long update cycle (5 years)	If requirements are too stringent, may not be adopted by the provincial code Does not apply to the majority of buildings in the VCH region
Alterations to Existing Buildings code	Broad reach Form basis for other provincial codes regarding renovation and retrofitting existing builds Expected release 2030	Not legally binding Unclear what will happen post-2030 and if existing buildings are expected to meet the new code	If requirements are too stringent, may not be adopted by the provincial code Will be many years before its implementation
Federal and provincial incentive programs	Encourage property owners/developers to introduce cooling mechanisms and reduce potential tenant costs	Programs with high threshold to qualify and grants with short application windows may be prohibitive	Grants and rebates for individual property owners may only benefit those who have the means to renovate and often less vulnerable to heat-related illness Mostly available to single detached homes, few options for those in other forms of housing with fewer options, may worsen with densification May require extensive renovation, potential tenancy disruption
BC Building Code	Binding regulation, covers new buildings Many municipalities and local governments do not have capacity to go beyond the Code Influences the Vancouver Building Bylaw	Long update cycle	Municipal bylaws still apply
BC Existing Buildings Renewal Strategy	Expected release in 2024, implementation of code before 2030 Binding regulation that covers existing building renovations and retrofits	Costly	Long timeline for implementation
BC Step Code	Addresses mitigation of energy spending over adaptation measures	Not required for local governments	Code may de-incentivize AC depending on energy spending/efficiency considerations Local governments that use 2020 weather files rather than the 2050/2080 files may result in buildings being under-adapted
Municipal Building Codes	Only applicable to the City of Vancouver Gives City of Vancouver autonomy over building construction that can go beyond the provincial code		If the city uses 2020 weather files rather than the 2050/2080 files, may result in buildings being under-adapted
Municipal Standards of Maintenance Bylaws	Gives municipality autonomy over rental housing regulation that can go beyond the provincial act There is already a precedent for temperature related regulation	Most municipalities do not have a SOM bylaw Requires local government capacity and enforcement	May require extensive renovation, potential tenancy disruption
Municipal and regional district development and zoning bylaws	Gives municipality and regional district autonomy over residential building development All local governments have them	Variable use Requires local government capacity and enforcement	

Table 1. Policy tools in which requirements for cooling measures could be introduced. Continued.			
Policy Avenue	**Reach and enabling factors**	**Feasibility considerations and barriers**	**Potential unintended consequences and considerations**
Tenancy			
BC Residential Tenancy Act	Covers a large proportion of the population, including those vulnerable to heat-related illness Many municipalities and local governments rely on this Act as they do not have the capacity to go beyond the provincial standard	Relies on enforcement	Some non-profit housing and government-owned housing are exempt
Strata Property Act	Applicable only to strata housing, many of which are inhabited by the owner	Relies on enforcement	
Health sector			
Provincial coverage medical equipment/devices	If portable air conditioners are included on the list, would cover some of the most vulnerable to heat-related illness	Requires eligibility Requires access to a medical practitioner for prescription	Depending on eligibility and medical assessment, may be some who are not eligible but vulnerable to heat-related illness and others who are eligible but not in highest need Would miss/under provide for those who face barriers to physician access

COOLING MEASURES

There are a number of cooling measures that could be introduced into existing policies, each with different mechanisms and extent of coverage. Mechanical cooling of an indoor space could be achieved through central air conditioning (including chillers or hydronic fan coil systems in large buildings), heat pumps, portable air conditioners, and window air conditioners. Different levels of mechanical cooling coverage include provision of cooled air in every unit, in one room of a unit, in common areas such as hallways and foyers, or in a designated cooling room in each building. Finally, an outcome-based requirement to not exceed a maximum indoor temperature (without requirements for specified means to achieve this outcome) is another measure that could be introduced into policy.

Table 2 summarizes the reach and enabling factors, feasibility considerations and barriers, and potential negative impacts and gaps of each cooling measure identified. A number of practical guidance documents have been created in BC that advance our knowledge of overheating and of the role that passive and active strategies play in creating cooler spaces. These include resources created by BC Housing (additional source here), and Engineers and Geoscientists BC.

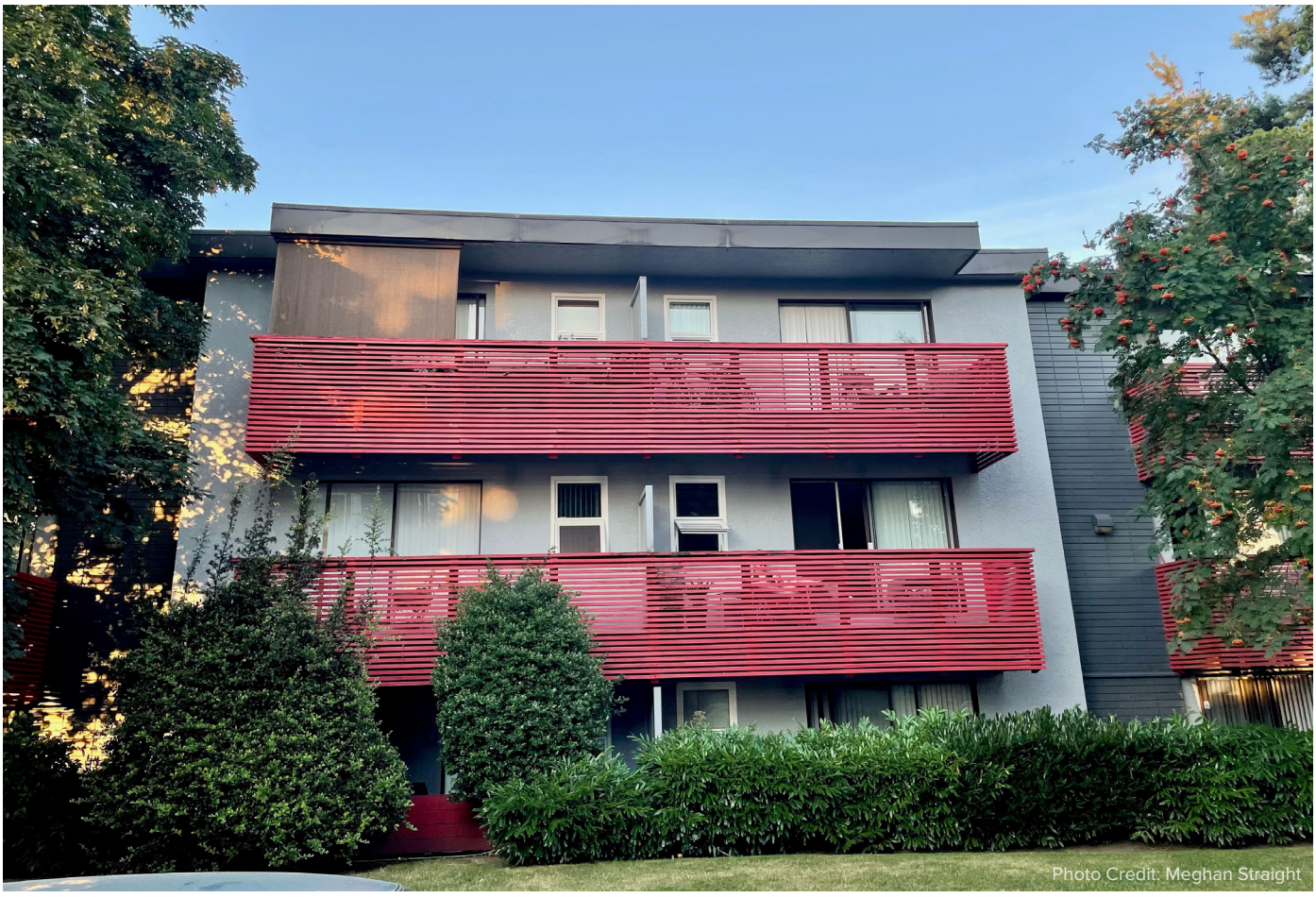

Photo Credit: Meghan Straight

Table 2. Cooling measures for consideration in policy			
Cooling measure	**Reach and enabling factors**	**Feasibility considerations and barriers**	**Potential negative impacts and gaps**
Specific cooling mechanism			
Central air conditioning	Very effective in achieving and maintaining cooling	Costly Could add to building height and take up Floor Space Ratio May not be feasible in some buildings due to infrastructure and electrical load Possibility to offset electrical cost if upgrades to energy efficiency are done at the same time	In areas with zoning bylaws for height and floor space ratio restrictions, this may reduce number of units in a building, depending on type of central AC system used Would be unused if tenant is unable/unwilling to pay increased electricity cost Without protections for tenants, could result in property owners seeking to evict tenants for upgrade If requiring more electricity without efficiency improvements, may result in fewer "green" buildings If requiring deep retrofits, may need to temporarily displace inhabitants
Heat pumps	Very effective in achieving and maintaining cooling Existing resident may be able to remain in home during installation Works as a heater Less energy demanding, less concern for electrical load capacity	Costly Further analysis of feasibility considerations for large-scale application of heat-pump type technologies in existing multi-family residential buildings may be required Installations requiring building envelope penetrations may require specific guidance Permitting process in some jurisdictions are prohibitive Installation and maintenance harder to access in remote areas	May require extensive renovation, potential tenancy disruption Potential noise issues
Portable air conditioning or window air conditioning	Would not require renovations	Some buildings may not be able to take on the electrical load required of many portable air conditioners Not all windows can accommodate exhaust vent/window AC	May still be unused if tenant is unable/unwilling to pay increased electricity cost Generally cools only one room per device

Table 2. Cooling measures for consideration in policy, continued.

Cooling measure	Reach and enabling factors	Feasibility considerations and barriers	Potential negative impacts and gaps
Extent of coverage			
Air conditioning in every unit	Resident can stay in home during heat events	Some buildings might not be able to accomodate increased electrical loads without an entire electrical system overhaul May require retrofitting	May result in increased cost which may be passed down to residents Increased electricity costs Issues pertaining to retrofitting as above may apply
Air conditioning in at least one room of every unit	Resident can stay in home during heat events If portable air conditioner used, would not require renovations	Ideally in a habitable room where people spend time If used, issues pertaining to portable AC may apply	Increased electricity costs
Air conditioning in common areas	If feasible, may be relatively inexpensive for larger buildings	If used, issues pertaining to heat pumps as above may apply	Does not address overheating in residential units
Air conditioned designated cooling space in every residential building	Resident can remain in building during a heat event Relatively less costly and may be easier to implement	A designated space not always available in all buildings Limited capacity Not a habitable space for spending long periods of time Could take up floor space ratio	May be a barrier to those who are unable/unwilling to leave their residential unit In areas with zoning bylaws for floor space ratio restrictions, this could reduce number of units in a building
Maximum temperature requirement *The reach and enabling factors, feasibility considerations and barriers, and potential negative impacts and gaps as described above would apply depending on the cooling mechanism and extent of coverage used*			
May be met with any of the above cooling mechanisms and extent of coverage	Flexibility for type of mechanism to meet standard Maximum temperature could be in keeping with health (i.e. 26°C) Precedent exists with the Vancouver Building Bylaw, which will require all Part 3 builds after 2025 to have mechanical cooling capable of cooling to 26°C	Challenging to enforce	

Key Messages

1. **In the absence of enforceable policy interventions that support mechanical cooling, there will continue to be preventable deaths and morbidity from future heat events.** Without changes to the existing housing policy landscape, conflicting interests among the different stakeholders – particularly within the profit-driven housing system in which the majority of the population lives – mean that those with the means to provide air conditioning (e.g. developers and property owners) are unlikely to be sufficiently incentivized to prioritize it as a standard for safety. This would leave those without economic advantage to continue facing a disproportionate burden of effects from heat events. As with any well-designed policy, it is imperative that any cooling policy implemented has practical mechanisms for enforcement.
2. **Multiple policy interventions at different levels of government are needed.**
   a. Variation in building features and tenancy type across the region means that no one policy tool could apply to every indoor living space. For example, updates to the BC Building Code apply only to new buildings, leaving existing buildings requiring another policy tool – an Alterations to Existing Buildings Code for BC, which is still under development. Changes to the Residential Tenancy Act would not apply to people who live in the homes they own, who may still face barriers to introducing mechanical cooling to their spaces. The RTA also does not apply to some government-owned housing, which would require changes to internal development and renovations policies and processes.
   b. Different policy tools have different scheduled update cycles. For example, the National Building Code operates on a 5-year update cycle, with the BC Building Code following suit typically 2-3 years later, meaning that any BC Building code changes can take 8 years to occur. Other policies, such as local government Standards of Maintenance bylaws, may be updated ad hoc and opportunity for change are dependent on a policy window opening.
   c. Different jurisdictions and communities have different perceived and real barriers to implementing cooling policies. For example, although the Residential Tenancy Act allows for individual local governments to enact bylaws that go beyond the act, many smaller communities would not have the resource capacity or legislative mechanisms in place to do so (only 22 local governments across BC have a Standards of Maintenance bylaw). Meanwhile the Vancouver Charter has enabled the City of Vancouver to create and update its Building Bylaw, which will require that all new Part 3 buildings after 2025 have mechanical cooling capable of cooling to 26°C. Provincial-level policy interventions (e.g. BC Building Code, RTA, provincial incentive programs) will be required if changes are to be seen across all community types, although this may be a challenge in a province with great variation in climate (majority of residential dwellings in Southern Interior have AC).
3. **Adherence to policy interventions would come with considerable costs for existing buildings.** When the City of Vancouver recently conducted a cost estimation study pertaining to their proposed building code changes – including a bylaw that would require all new Part 3 buildings constructed after 2025 to have mechanical cooling capable of maintaining a temperature of 26°C – they found that addition of mechanical cooling to such new builds would increase construction costs by 0-3.5%[6]. This is a relatively minor increase relative to overall building costs, but

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this applies only to the addition of mechanical cooling at the time of construction. In the VCH region, most existing residential buildings do not have mechanical cooling[7]. Many of the older buildings were not designed to withstand the frequency and intensity of the extreme heat events that we experience today and in years to come. As a result, large scale renovations and deep retrofits would be required in much of our building stock if mechanical cooling such as central air conditioning and heat pumps were installed. Renovations may even be needed in some of the newer buildings without mechanical cooling, as some were designed to achieve a level of air tightness that helps with efficiency during the winter months but also results in greater heat-trapping in the summer months. This problem is exacerbated further with high window-to-wall ratios (i.e. large windows) more common in new designs. Such retrofitting comes with considerable costs, which will require large investments from government for the non-profit housing sector especially, as heat vulnerability disproportionally affects many of this sector's residents. These costs are also highly variable, depending on existing building features and the cooling mechanism considered.

4. **Different cooling measures to achieve safe indoor temperatures are required depending on feasibility constraints.** Outside of cost, other feasibility considerations constrain the type of cooling mechanism that can be used, and these considerations vary greatly across our region's building stock. A building's electrical load capacity and the electric grid as a whole may limit the types of cooling mechanisms that it can accommodate. For example, portable air conditioners tend to use more energy than other cooling mechanisms. While some buildings may be able to take on the additional electrical load that would come from multiple portable air conditioners (as with buildings that use baseboard heating in the winter, which demonstrates likely adequate electrical capacity for a similar level of energy demand from cooling in the summer), others might require additional electrical capacity. As mitigation strategies aim toward decarbonisation, electrical capacity and grid resilience will continue to be a limiting factor across many sectors. It is also important to mention that although passive cooling methods are not explored in this analysis, they should go hand-in-hand with active cooling requirements to reduce the load on the active cooling system and reduce temperatures in the event of a power failure.

   Other building-level feasibility considerations at the development phase include zoning bylaws that set maximum allowable limits to building height and floor space ratio that could be taken up by some types of central air conditioning mechanisms and designated cooling spaces. Restrictions on building envelope alterations required in heat pump installation may also limit cooling options. No one cooling measure can be uniformly applied to every building type without trade-offs in cost, feasibility, and resident benefit.

   One possible solution is a requirement to not exceed a specified maximum indoor temperature without a requirement to use a specified cooling mechanism. This outcome-based approach would give housing providers flexibility with cooling measure implementation – including passive means – while meeting a standard in keeping with health (i.e. 26°C). The extent to which the maximum temperature applies (i.e. every unit, one room in every unit, or a designated cooling space in a building) also comes with trade-offs.

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5. **Mitigating some of the potential unintended consequences of cooling policies will require policy changes across adjacent sectors.** The housing crisis in the VCH region and across the country disproportionately affects those who are disadvantaged economically or through other processes. Any change to housing policy must consider any unintentional consequences that could exacerbate the crisis and/or place further burden on equity-denied groups, such as the potential for decreased housing affordability or supply if fewer affordable units are developed in order to provide mechanical cooling. Cooling policies that could result in issues of tenancy (e.g. evictions for renovations) must be addressed and mitigated, which will likely require accompanying policies outside of those pertaining to cooling and building construction alone (e.g. specific tenancy and financial protections for renters). Furthermore, the benefits of some cooling mechanisms, even if implemented successfully, may still not be fully realized by all groups; those who do have access to air conditioning but are economically disadvantaged may not be able to afford to keep it on, which speaks to the role of targeted rebate programs and other means to provide financial assistance to heat-vulnerable people. Inequities in how people experience the negative impacts of climate change mean that policies to address upstream, structural causes of heat vulnerability must be prioritized across multiple sectors of government, including through poverty reduction.

Policy Options

Policy and regulatory changes are needed for the “right to cool” to be realised across all homes in our region. Table 3 provides a non-exhaustive list of options for different levels of government and housing stakeholders to incorporate cooling mechanisms into policies and processes. It is also worth noting that governments can choose to enact policies with a pragmatic and additive approach; consideration for implementation and enforcement feasibility may mean that initial cooling policies that are more readily adopted can make way for more comprehensive policies over time.


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Table 3. Policy options for different levels of government and housing providers.	
Government of Canada	
National Research Council Canada; Institute for Research in Construction; Canadian Commission on Building and Fire Codes	Ensure that the next update to the National Building Code incorporates active cooling requirements
Government of British Columbia	
Ministry of Attorney General and Responsible for Housing:	Provide more funding for retrofitting of existing buildings, particularly in the non-profit housing sector e.g. BC Housing
Residential Tenancy Branch	Include mechanical cooling and/or maximum indoor temperature considerations into the Residential Tenancy Act Improve tenant protections from evictions due to renovations
Building and Safety Standards Branch	Include mechanical cooling and/or maximum indoor temperature considerations into the next update of the BC Building Code and into the BC Existing Buildings Renewal Strategy
Housing Policy Branch	Introduce policy that prohibits landlords and strata councils from prohibiting the use of air conditioning for aesthetic reasons
Ministry of Environment and Climate Change Strategy	Allow for mechanical cooling measures to be eligible for rebates and grants, with priority given to low-income households
Ministry of Health	Include portable air conditioners as medical devices for eligible patients
Ministry of Social Development and Poverty Reduction	Work with other ministries to provide financial relief during heat events
Provincial government agencies and corporations	
BC Hydro	Improve affordability for low-income folks (e.g. extend eligibility requirements for electrical bill relief programs) Prioritize electrical grid resilience work
BC Housing	Identify opportunities to introduce cooling during deep retrofits
Local governments	
Municipalities and regional districts with Standard of Maintenance Bylaws	Include mechanical cooling and/or maximum indoor temperature considerations into the Standard of Maintenance bylaw
City of Vancouver Building Bylaw	Include mechanical cooling and/or maximum indoor temperature considerations into the upgrade mechanism for existing buildings
Municipal zoning bylaws	Provide exemptions to height and Floor Space Ratio requirements when mechanical cooling that would take up either is implemented by developers Include mechanical cooling and/or maximum indoor temperature considerations into the bylaw
Housing developers	
	Identify opportunities to include air conditioning in building construction
Property owners and strata councils	
	Do not prohibit the use of air conditioning among tenants for aesthetic reasons Identify where feasibility considerations could be addressed if they pose a barrier to tenants using air conditioning

Limitations

The potential benefits, feasibility considerations, and potential negative consequences of the policy tools and cooling measures presented are qualitatively described, without any quantitative assessment (e.g. fIn the scope of this analysis, potential health or economic impacts were not modeled, calculated or otherwise estimated). Some factors may be challenging to compare against others, particularly as they pertain to equity and ethics considerations (e.g. costs vs. affordability), while some are more readily measurable and could be further assessed (e.g. electricity demand, certain costs). Another limitation is in the variety and number of stakeholders consulted; an effort was made to consult with available stakeholders representing a variety of interests, but more consultation with specific heat-vulnerable groups such as seniors, people with disabilities, and people experiencing poverty or isolation is needed to add additional perspective on the benefits and consequences of the cooling policies meant to protect them. Finally, the development of completely new policy tools was considered outside the scope of this analysis, but could be instrumental in long-term, region-wide adaptation and mitigation strategies.

Next Steps

Findings from this preliminary policy analysis reveals many opportunities for VCH Public Health to advocate for cooling policies that would enable the health and safety of the communities we serve. Development of policy recommendations and knowledge mobilization will require further exploration into the details of the enabling factors, barriers, and unintended consequences of specific policy tools as introduced in this report, as well as analyses of power, institutions, and stakeholder interests.

Alongside advocacy efforts, VCH continues to inform and support heat-related research, interventions and resource development to support local governments, non-governmental organizations and populations susceptible to heat impacts. Examples from 2022 include resources for wellness checks during heat events, partnering on indoor air temperature surveys, and funding for cooling kits for heat-vulnerable populations. A 2023 priority project is engagement with people with lived experience who are vulnerable to heat, which will be used to inform future heat-related supports. We also continue to explore concepts including multi-solving, solutions spaces, and just transitions in order to explore options to accelerate this work.

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Appendix A: Jurisdictional Scan		
Residential Buildings		
British Columbia		
Residential Tenancy Act	Does not stipulate any minimum nor maximum temperature	Residential Tenancies Act allows for municipalities to introduce bylaws that go beyond the RTA As a result, there is a patchwork of municipal SOM bylaws: 22 municipalities of SoM bylaws, of which 11 have one with a minimum temperature requirement (3 within the VCH region), and one with a maximum temperature requirement for Part 3 Buildings built starting in 2025 (City of Vancouver)
BC Building Code	Section 9.93 Residential buildings intended for use in the winter months on a continuing basis shall be equipped with heating facilities conforming to this Section. At the outside winter design temperature, required heating facilities shall be capable of maintaining an indoor air temperature of not less than a) 22°C in all living spaces, b) 18°C in unfinished basements, c) 18°C in common service rooms, ancillary spaces and exits in houses with a secondary suite, and d) 15°C in heated crawl spaces	If requirements are too stringent, may not be adopted by the provincial code Will be many years before its implementation
BC Municipal VCH		
Vancouver Building By-law, Green Buildings Policy for Rezonings	The CoV Sustainability Group is bringing to City Council proposed amendments to this by-law, which includes the following item that would apply to all Part 3 new builds (i.e. >3 storeys) starting in 2025: “All dwelling units within Part 3 buildings must be served by active mechanical cooling capable of maintaining an indoor air temperature of 26°C, with windows closed.”	The only municipal bylaw requiring a maximum temperature, although it only applies to Part 3 buildings that are newly built starting in 2025
City of Vancouver, Standards of Maintenance Bylaw	18.1 (1) Heating systems shall be maintained in a safe and good working condition so as to be capable of safely attaining and maintaining an adequate temperature standard, free from fire and accident hazards and in all residential accommodation capable of maintaining every room at a temperature of 72° Fahrenheit (22° Celsius) measured at a point 5 feet (1.52 m) from the floor.	Has minimum temperature, no max temp
North Vancouver, CITY OF NORTH VANCOUVER BYLAW NO. 7931 Rental Premises Standards of Maintenance and Prevention of Nuisances Bylaw	A heating system shall be provided, maintained in good repair and capable of providing and maintaining air temperature at 20 degrees Celsius in each room of a dwelling unit measured from a point in the centre of a room 1.5 metres above the floor.	Has minimum temperature, no max temp
Richmond, RENTAL PREMISES STANDARDS OF MAINTENANCE Bylaw	2.2.1 Furnaces and other heating equipment installed within a rental premises must be capable of continuously maintaining each room in every rental unit within the rental premises at a minimum temperature of 22 degrees Celsius, measured at a point 1.5 meters (5 feet) from the floor and in the centre of the room.	Has minimum temperature, no max temp

Appendix A: Jurisdictional Scan. Continued.		
Residential Buildings		
BC Municipal Non-VCH		
Delta, The Residential Standards of Maintenance Bylaw	Heating equipment shall be maintained in good repair and safe working condition free from fire and accident hazards, so as to attain and maintain, at all times, every room at a temperature of 22°C (72°F) measured at a point 1.5 metres (5 feet) from the floor and in the centre of the room.	Has minimum temperature, no max temp
Saanich, MINIMUM PROPERTY MAINTENANCE STANDARDS BYLAW	Every dwelling shall be provided with a heating system capable of maintaining a room temperature of 20 degrees Centigrade at one and half (1.5) metres above floor level and one (1) metre from exterior walls in all habitable rooms, bathrooms and toilet rooms.	Has minimum temperature, no max temp
New Westminster, BUSINESS REGULATIONS AND LICENSING (RENTAL UNITS) BYLAW	Heating equipment shall be maintained in a safe and good working condition so as to be capable of safely attaining and maintaining an adequate temperature standard free from fire and accident hazards, and, in all rental units, capable of maintaining every room at a temperature of 22 C (72 F) measured at a point 1.5 meters (5 feet) from the floor and in the centre of the room.	Has minimum temperature, no max temp
Vernon, "Rental Unit Standard Of Maintenance Bylaw	Furnaces and other heating equipment installed within a residential property or rental unit must be capable of continuously maintaining each room in every rental unit within the rental premises at a minimum temperature of 22 degrees Celsius (72 degrees Fahrenheit), measured at a point 1.5 meters (5 ft.) from the floor and in the centre of the room.	Has minimum temperature, no max temp
Maple Ridge, Rental Premises Standards of Maintenance Bylaw	Heating equipment shall be maintained in a safe and good working condition so as to be capable of safely attaining and maintaining an adequate temperature standard, free from fire and accident hazards and in all rental premises capable of maintaining every room at a temperature of 22 C (72 F) measured at a point 1.5 meters (5 feet) from the floor, and in the centre of the room.	Has minimum temperature, no max temp
CITY OF TERRACE BYLAW NO. 2017 – 2013	Minimum 22 C	Has minimum temperature, no max temp
Chilliwack, Building Maintenance and Occupancy Standards Bylaw	Minimum 19 C	Has minimum temperature, no max temp
Town of Creston, Bylaw No. 1951	Minimum 21 C	Has minimum temperature, no max temp

Appendix A: Jurisdictional Scan. Continued.		
Residential Buildings		
Ontario		
Provincial Ministry of Municipal Affairs and Housing	The Ontario Residential Tenancies Act does have minimum temperature requirements, and it applies to all rental dwellings: O. Reg. 517/06: MAINTENANCE STANDARDS under Residential Tenancies Act, 2006, S.O. 2006, c. 17 Maintenance of room temperature 15. (1) Heat shall be provided and maintained so that the room temperature at 1.5 metres above floor level and one metre from exterior walls in all habitable space and in any area intended for normal use by tenants, including recreation rooms and laundry rooms but excluding locker rooms and garages, is at least 20 degrees Celsius. O. Reg. 517/06, s. 15 (1). (2) Subsection (1) does not apply to a rental unit in which the tenant can regulate the temperature and a minimum temperature of 20 degrees Celsius can be maintained by the primary source of heat. O. Reg. 517/06, s. 15 (2). (3) Every residential complex shall have heating equipment capable of maintaining the temperature levels required by subsection (1). O. Reg. 517/06, s. 15 (3). (4) No rental unit shall be equipped with portable heating equipment as the primary source of heat. O. Reg. 517/06, s. 15 (4). (5) Only heating equipment approved for use by a recognized standards testing authority shall be provided in a room used or intended for use for sleeping purposes. O. Reg. 517/06, s. 15 (5).	Residential Tenancies Act does not stipulate any maximum temperature requirements. There is a patchwork of municipal bylaw requirements for minimum and maximum temperatures in the province. Many municipalities have bylaws wherein if a residential rental facility has air conditioning, that it must be kept in good repair. But not many have specific maximum temperature requirements.
Toronto, ON Bylaw	TORONTO MUNICIPAL CODE CHAPTER 629, PROPERTY STANDARDS 629-38. Heating and air conditioning F. All air-conditioning systems shall be operated from June 2 to September 14 so as to maintain an indoor temperature of not more than 26 degrees Celsius	Applies only within those dates. There have been multiple occurrences in recent years where temperatures exceeded 30deg in May, in some cases where landlords kept the heat on. To date, there has not been amendments to this bylaw, but many instances where the city “encourages” landlords to turn the heat off on hot Spring days. Applies to apartments already equipped with AC. There is no requirement for a landlord to install an air conditioner, leaving those without AC (and thus in a riskier environment) unprotected Does not include measurement requirements for compliance

Appendix A: Jurisdictional Scan. Continued.		
Residential Buildings		
Ontario		
Mississauga, ON Bylaw	Adequate Temperature By-law 0110-2018 "adequate and suitable cooling" means air temperature in the dwelling unit that does not exceed 26 degrees Celsius (26°C) ADEQUATE AND SUITABLE HEAT AND COOLING 4. (1) Every landlord of a rented or leased dwelling unit shall maintain adequate and suitable cooling in all areas of the dwelling unit. (2) Subsection 4(1) does not apply if: (a) the rented or leased dwelling unit is not equipped or furnished with an air conditioning system or unit; (b) a landlord and tenant have expressly agreed that the rented or leased dwelling unit will not be air conditioned by or at the expense of the landlord; or (c) a tenant is able to directly regulate the temperature such that adequate and suitable cooling can be provided and maintained and such regulation of the temperature by the tenant has been enabled, if necessary, by the landlord. 5. For the purposes of determining compliance with subsections 2(1) or 4(1), the temperature shall be measured at 1.5 meters above floor level and 1 meter from exterior walls in all rooms intended for normal use by tenants.	Applies year round Applies to apartments already equipped with AC. There is no requirement for a landlord to install an air conditioner, leaving those without AC (and thus in a riskier environment) unprotected
LTCFs		
British Columbia		
VCH	VCH "Design Guidelines for Complex Residential Care Developments" has guidance for max temp of 27 in resident rooms and 24 in common areas. VCH "Heat Stress: Planning for and Preventing in Residential Care" aims to cool the facility to 24 degrees	
Ontario		
Provincial Ministry of Long-Term Care	Year round minimum temperature requirement of 22 degrees Celsius LTCHs that are not centrally air-conditioned to designate a minimum of one separate DCA for every 40 residents. May 2021: Sections 20, 21 and 26 of O. Reg. 79/10 under the Long Term Care Homes Act, 2007 came into force, requiring the implementation of a Plan and some changes to DCA requirements: Section 20 (3) now requires that DCAs be served by air conditioning, which is required to be maintained at a comfortable level for residents. Separate Designated Cooling Areas (DCAs) are required to be air-conditioned in LTCHs built prior to April 1, 1998. After 1998, all new or rebuilt LTCHs were required to have air-conditioned dining, activity and lounge areas and in 2015, new LTCHs were also required to have air-conditioned corridors. A Plan is to be implemented on any day when the indoor or outdoor temperature reaches 26°C, not just between May 15 and September 15 each year.	No maximum temperature. 26 is a threshold after which a "Plan" must be implemented. Both old and new builds must have AC in their DCAs

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