Framework for Collaborative Action on Health & Climate Change

User Guide

Prepared by SHIFT Collaborative | March 2019 | Version 1

SHIFT

shift to a better world

With Thanks

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Contents

Introduction

Climate change has simultaneously been called the greatest threat and the greatest opportunity for public health this century (Lancet Commission, 2015). On the one hand, climate change will cause significant health impacts, exacerbating existing inequities. On the other hand, responding to climate change presents an opportunity to transform the very systems that shape how we live: energy, transportation, housing, and the economy. Margaret Chan, past Director-General of the WHO, called this *the* defining issue for public health in the 21st century. The Lancet Countdown (an international collaborative research project that tracks progress on public health and climate change) has reported on growing momentum globally in the past five years to address this looming crisis, and yet we are making up for lost time – the past twenty-five years of inaction has jeopardized human health and livelihoods globally[1]. This is especially acute for those who already face health, social, economic and environmental inequities. It is time now, more than ever, to learn to thrive and mobilize the inherent strength and wisdom of communities, and the power of working together for a greater good, to respond to these challenging circumstances.

Actions to address climate change are typically described either as climate change mitigation (reducing emissions of greenhouse gases to stabilize the climate) or climate change adaptation (preparing for and responding to the current and future impacts of changes to the climate). Climate change *mitigation* and *adaptation* have typically been addressed as separate goals and through different planning lenses. However, the concept of Low Carbon Resilience[2] suggests that the strategic integration of these two approaches are essential for meaningful action on climate change. The diagram below illustrates the options and consequences of considering both together in decision-making, in contrast to what can happen if we address them in isolation.

"We have been mortgaging the health of future generations to realize economic and development gains in the present."

The Rockefeller Foundation, Lancet Commission on Planetary Health

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1   http://www.lancetcountdown.org/the-report
2   http://act-adapt.org/lcr-report

Voth Photography

While we have all experienced variability in weather patterns from year to year or decade to decade, climate change refers to longer term (i.e. 30 years or more) changes in average conditions. International negotiations led to the Paris Agreement of 2015[3], where signatory countries agreed to emissions reduction targets (mitigation) aimed at keeping the average global temperature change to less than 2°C – a threshold beyond which scientists believe climate change would pose drastically increasing risks[4]. But even if that target is met, we will have to adapt to significant changes in climate in the coming years and decades. Actions at global, national and local levels are critical to meeting the challenge.

Recent impacts to individuals and communities from extreme weather events (of the type anticipated to increase with climate change) such as flooding, wildfires, and extreme heat have raised the profile and urgency in British Columbia. Climate change policy and action has a long history here, at both the provincial and local levels; however, the human health impacts of climate change have been underrepresented in these efforts. Moving forward, how can we ensure that we can better understand, prepare for, and respond to the impacts of climate change on health and well-being?

Maladaptation
e.g. air conditioning, concrete sea walls

Low Carbon Resilience
e.g. green/blue infrastructure; adapted zero emission buildings

Increasing Adaptation

Increasing Mitigation

Unsustainability
e.g. rapid deforestation, urban sprawl

New Vulnerabilities
e.g. large-scale hydro, biofuels
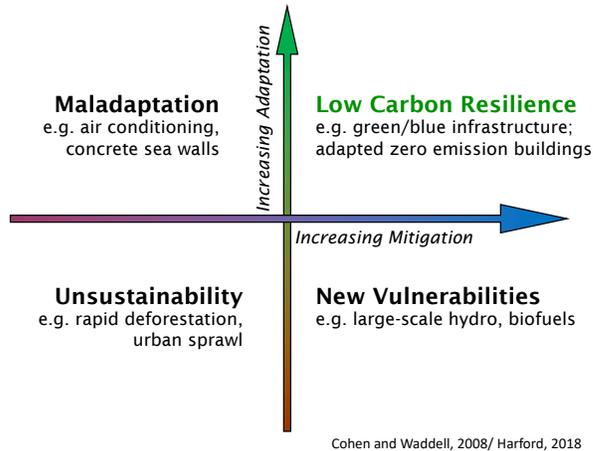
Cohen and Waddell, 2008/ Harford, 2018

3   https://unfccc.int/process-and-meetings/the-paris-agreement/what-is-the-paris-agreement
4   http://www.pnas.org/content/early/2018/07/31/1810141115

Making the Links

This Framework document builds on *"Making the Links: Climate Change, Community Health and Resilience"* (Nov 5-6, 2018) , the first gathering of its kind in BC, seeking to advance collaborative, cross-sectoral action on climate change and health in the province. One hundred and eighty participants representing the health sector, local governments, First Nations, provincial/federal government, academic institutions, non-profit organizations, community organizations, school districts, and the private sector gathered for two days in Kelowna, BC to listen to inspiring speakers and community stories and share knowledge, engage in cross-sector dialogue, and identify challenges and opportunities for collaborative action. Together, we explored the opportunities and barriers to developing shared approaches to climate change that not only protect, but also improve, community health, well-being, and resilience.

How can we ensure that climate change mitigation and adaptation efforts are linked up, to ensure greatest efficiency and benefit to human and community health?

This gathering was timely in BC for a number of reasons. First, the impacts of climate change in BC are undeniable. For example, 2017 was BC's warmest year on record and 2018 was BC's worst forest fire season on record.[5] Communities across the province are experiencing climate impacts at an accelerating rate and there is a need and urgency to not only understand the impact of climate change on ecosystems, infrastructure, and the economy, but also the impact on people and their communities. Second, there is a growing movement across the world that is mobilizing knowledge and resources to address health and climate change in an integrated way. BC is well positioned to learn

from the experiences of others and adapt promising approaches and practices to our own context. And third, there are pockets of leadership from all over the province across many sectors who have been forging the way for BC to address health impacts of a changing climate. Harnessed together, there is great potential for integrated, collaborative action on these important issues.

A draft version of this Framework (Section 2) was introduced at the *Making the Links* Symposium, as one of the various tools and means of enabling cross-sector dialogue on the intersections of health and climate change. This User Guide and the final Framework presented here, are the product of collaboration leading up to, and as part of, this Symposium[6], and reflect some of the insights of those who gathered there. As well, a two-page summary version of the framework and action areas is available at www.shiftcollaborative.ca/framework.

Framework for Collaborative Action on Health and Climate Change

Section 2 of this document presents the "Framework for Collaborative Action on Health and Climate Change," which provides a map of key issues and questions to provoke thinking about what matters at the community and regional level, and to help participants outline priorities and steps to move forward, together. Our vision for the use of this Framework is:

"Working together across sectors, disciplines and organizations to respond to climate change in ways that 1) proactively build community resilience and well-being; 2) reduce emissions while minimizing and adapting to the health impacts of climate change; and 3) transform economic and social systems to increase equity, fairness and quality of life for all."

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5   https://www.cbc.ca/news/canada/british-columbia/state-emergency-bc-wildfires-1.4803546
6   https://shiftcollaborative.ca/symposium/

Orientation to the User Guide

This User Guide is intended to support users (you!) to better understand the connections between health and climate change, and enable collaboration and aligned action to address these challenges effectively across sectors. It is a map of key issues, and a set of resources, to provoke thinking about what matters and to help you outline priorities and steps to move this forward, together. It may be used by people in a range of positions, organizations and professions, to advance planning and action to address these issues.

Purpose

The purpose of this User Guide is to:

- Provide an overview of some of the main health impacts of climate change;
- Articulate key action areas for addressing health & climate change;
- Provide guidance for how diverse actors can work collaboratively and in complementary ways to achieve this shared vision; and,
- Identify key supporting resources for further exploration.

Possible Uses

- Raise awareness:
  - » Of the links between climate change and health
  - » Of the range of sectors, roles and perspectives needed to address these issues, and
  - » Of opportunities and needs for integration & collaboration across departments, organizations, and sectors
- Enable collaboration and aligned action:
  - » Provide communities/sectors/actors with a tool to align their work towards shared goals
- Track progress:
  - » Provide a foundation for developing systems to monitor and evaluate your collective action (if applicable)

Intended Audiences

This User Guide & Framework is meant to support organizations and individuals who have a role to play in integrated climate change and health action at a community and regional level across BC, including:

- Local and regional government: elected officials and staff
- Health authority & health sector staff
- Community organizations
- First Nations and indigenous governments and communities
- Consultants / professionals
- Business sector
- Multi-sector tables / groups
- Provincial & federal governments
- Academics
- Health &/or climate change experts

Sections of the User Guide

This User Guide has three main sections to assist you in efforts to align action on health and climate change at a local and regional level, and to deepen collaboration around shared goals.

Section 1: Health Impacts of Climate Change in B.C. provides an explanation and summary of key ways that projected changes in BC's climate may translate into health outcomes.

Section 2: Framework for Collaborative Action identifies eight key action areas, orienting you to the range of responses needed to mitigate and adapt to climate change, where the focus is reducing health impacts and enhancing resilience to projected changes.

Section 3: Supporting Resources provides you with a curated selection of resources to further your understanding and engage with tools that can support you in taking steps to address the interconnections of health & climate change.

Section 1
Health Impacts of Climate Change in BC

CLIMATE CHANGE HAZARDS

Rising temperatures

Extreme weather

Sea level rise

HEALTH DETERMINANTS (Community and Individual)

Climate Change Impacts

Natural Environment

Built Environment

Community and Social Factors

Livelihood Factors

Lifestyle Factors

Community and Individual Health Outcomes

HEALTH OUTCOMES
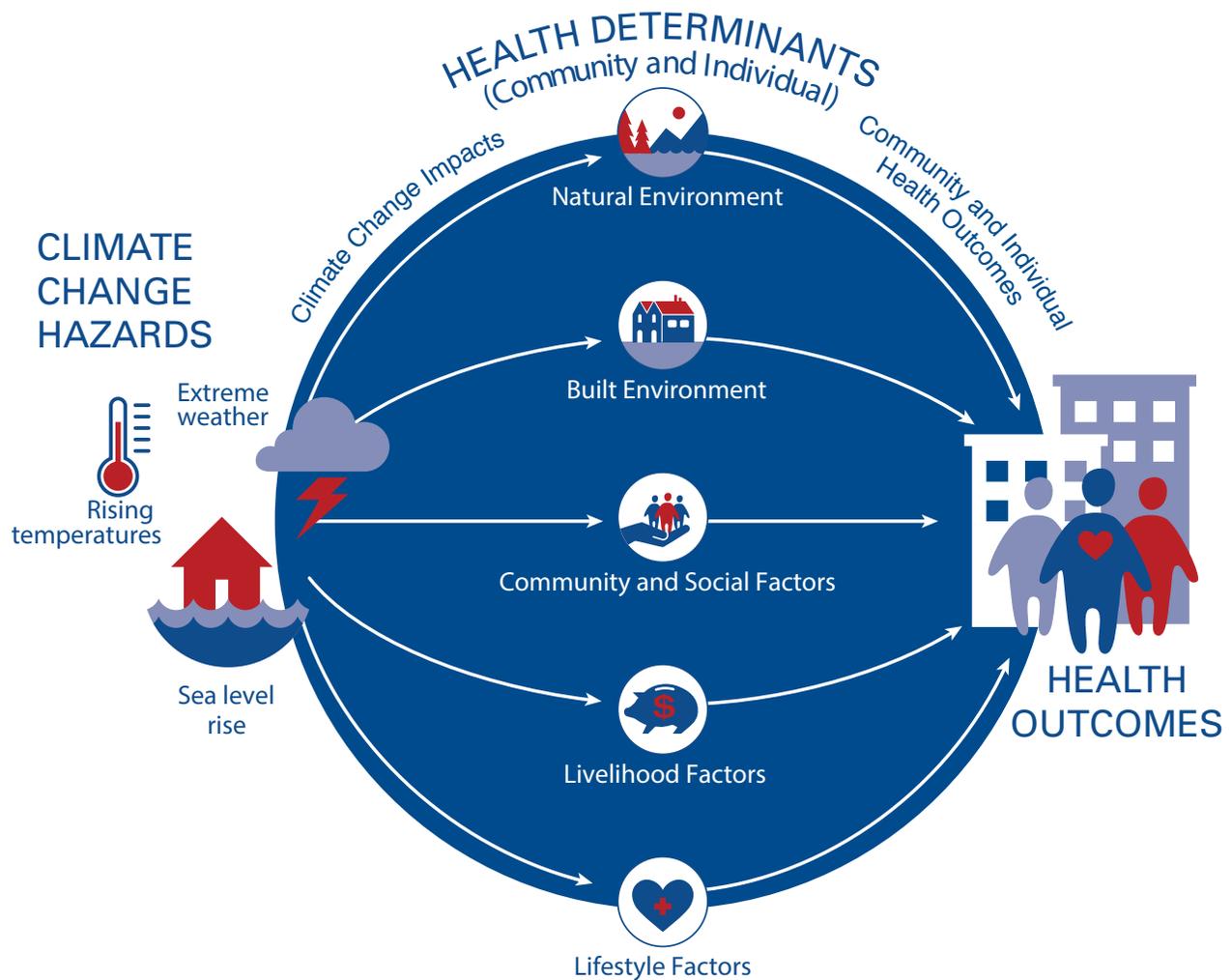
Image source: "Climate Change Health Risks." From the series, Addressing Climate and Health Risks in BC, produced by the Ministry of Health and the Provincial Climate Action Secretariat. Available at: https://www2.gov.bc.ca/assets/gov/environment/climate-change/adaptation/health/final_climate_change_and_health_backgrounder_overview.pdf
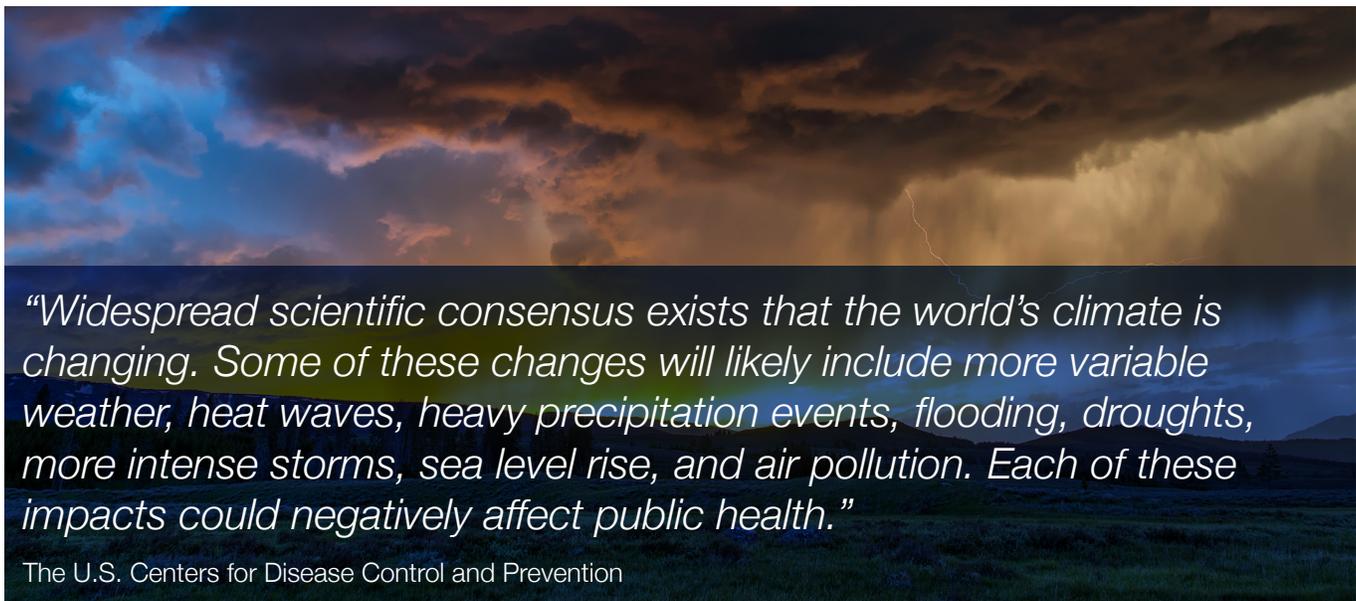
> *"Widespread scientific consensus exists that the world's climate is changing. Some of these changes will likely include more variable weather, heat waves, heavy precipitation events, flooding, droughts, more intense storms, sea level rise, and air pollution. Each of these impacts could negatively affect public health."*
>
> The U.S. Centers for Disease Control and Prevention

Looking ahead, how will the climate change in BC? While we cannot predict the future with complete accuracy, climate modelling provides us with a strong understanding of what the range of possible futures may look like, and that allows us to better inform our decision-making today. According to modelling conducted at a regional scale and on an ongoing basis for all of BC[7], scientists project the following changes:

- **Temperature:**
  - » The average annual temperature is anticipated to increase between 1.3°C and 2.7°C by 2050
  - » The incidence of extreme low temperatures is expected to decrease, while extreme high temperatures are projected to increase in magnitude and frequency

- **Precipitation:**
  - » Overall precipitation in BC is projected to increase by between 2% and 12% annually. Seasonally, this will translate into wetter winters and drier summers in much of the province. The proportion of precipitation falling as snow is projected to decrease considerably across most of the province.

- **Extreme events:**
  - » Increased frequency and intensity of heavy precipitation events is expected.
  - » Warmer temperatures together with changing precipitation patterns is expected to lead to greater risk of both flooding and drought.
  - » Warmer temperatures in the summer is anticipated to increase the risk of wildfires.

- **Sea level rise:**
  - » The amount of sea level rise along the BC coast will vary due to local factors, however, global models project an average sea level rise of anywhere from 0.26 m to 2.0 m by 2100[8].

These changes in climate are an average for all of BC, and will vary somewhat from region to region – Plan2Adapt is an easy to use online tool to find out what the basic projections are for your region, searchable by Regional District and Health Authority area. Regional climate projections reports also exist for a number of parts of the province.

The changes in climate conditions will intersect with an already wide range of determinants of health, which affect an individual or community's health and

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7   Information on provincial climate change projections drawn from Pacific Climate Impacts Consortium and Plan2Adapt https://www.pacificclimate.org/analysis-tools/plan2adapt
8   IPCC AR5 (2014) https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter13_FINAL.pdf ; DeConto & Pollard (2016) https://www.nature.com/articles/nature17145

well-being. This perspective recognizes that health and well-being is the result of much more than effective healthcare, and that people's health status varies depending on a range of life circumstances, including income, social status, employment, education, gender, social supports, childhood experiences, trauma and coping skills[9]. There is also increasing recognition that the determinants of health go beyond social factors to include ecological[10], cultural and spiritual dimensions not previously reflected in predominant conceptions of health. Indigenous understandings of health and well-being[11] stretch beyond these discrete categories to recognize that well-being arises from the health of the entire community of life and the relationships that sustain this. Embracing a more holistic view of health and well-being is foundational to addressing the intersections of health and climate change.

These changes in climate will in turn have a range of impacts on individual and community health. The table on the following page (produced by the BC Ministry of Health and the BC Climate Action Secretariat) outlines:

1. **Climate Change Hazards:**
   These are some of the key ways that the climate is projected to change in BC, in ways that will affect health.

2. **Primary Impacts:**
   Changes to climate systems and patterns will translate into changes in the environmental context, identified here as "primary impacts."

3. **Health and Community Risks:**
   These primary impacts will in turn affect individual and community health in a range of interconnected and overlapping ways.

9   https://www.canada.ca/en/public-health/services/health-promotion/population-health/what-determines-health.html
10 Canadian Public Health Association (2015) "Addressing the Ecological Determinants of Health" https://www.cpha.ca/sites/default/files/assets/policy/edh-discussion_e.pdf
11 For example: Nesdole et al (2014) "Reconceptualizing determinants of health: Barriers to improving the health status of First Nations peoples" Accessed at: http://journal.cpha.ca/index.php/cjph/article/view/4308/2930

CLIMATE CHANGE HAZARDS	PRIMARY IMPACTS	HEALTH AND COMMUNITY RISKS
Sea level rise	Storm surges (temporary flooding)	· Stress, anxiety and trauma · Food and water contamination and/or shortages · Increased prevalence of water-borne pathogens and contaminants · Interruption of health services · Increased potential for mold growth · Infrastructure/property damage
	Flooding (long-term and permanent inundation)	· Stress, anxiety and trauma · Food and water contamination and/or shortages · Increased prevalence of water-borne pathogens and contaminants · Population displacement · Infrastructure/property damage
Rising temperatures	More frequent, severe and prolonged heat waves and urban "heat island" effects	· Decreased air quality due to heat (ground level ozone [smog]) · Heat-related deaths · Heat-related illnesses such as heat stroke and heat exhaustion · Mental health impacts such as stress and anxiety · Health care facility impacts such as power outages, rising temperatures in facilities without air conditioning
	Changes in infectious agents, introduction of new pests, longer disease transmission seasons in some areas	· Possible increased incidence and/or prevalence of vector-borne infectious diseases · Introduction of new pests affecting food/crop production · Possible emergence of new diseases and/or re-emergence of previously eradicated diseases
	Increased production of pollens and spores	· Increased allergies, intensification of symptoms · Increased exposure to allergens due to longer allergy seasons
Extreme weather	Increased frequency and intensity of storms	· Injury, death · Stress, anxiety and trauma · Food and water contamination and/or shortages · Increased prevalence of water-borne pathogens and contaminants · Interruption of health services · Increased potential for mold growth · Infrastructure/property damages
	More frequent, severe and prolonged drought	· Food and water contamination and/or shortages · Increased prevalence of water-borne pathogens and contaminants · Stress, anxiety and trauma
	Wildfires	· Injury, death · Stress, anxiety and trauma · Exacerbation of respiratory conditions such as asthma and emphysema due to poor air quality · Interruption of health services · Infrastructure/property damages

In summary, there are a number of key ways that human health is likely to be impacted by projected changes to the climate in BC:

- **Extreme heat** (heat-related death and illness)
- **Flooding or wildfires** (deaths, injuries, cardiovascular and respiratory illness, mental health consequences)
- **Physical injury** (due to extreme events, changes in ice and snow)
- **Indoor and outdoor air quality** (premature death, cardiovascular and respiratory illness, allergies)
- **Vector-borne illness** (e.g. lyme disease, West Nile virus)
- **Food- and water-borne Illness** (salmonella, diarrhea, gastrointestinal illness, infections, death)
- **Food and water shortages** (hunger, thirst, malnutrition)
- **Mental health & well-being** (grief, stress, anxiety, behavioural health disorders, trauma)
- **Loss of spiritual and cultural practices** and access to traditional foods and medicines
- **Cumulative impacts** (over time, due to climate change, and also in combination with other stressors and health inequities)

We are all in this together, however, it is important to bear in mind that some human populations are more affected by climate change impacts than others. Due to historical, social, political and economic factors, health inequities exist where socially and economically disadvantaged populations such as indigenous communities and people living in poverty shoulder a greater burden of ill health. They also carry a greater share of stressors which can impact their health and well-being, and may have less access to resources and opportunities. Other groups who may be at greater risk include the elderly, those who live off the land, those with pre-existing health conditions, those living with low income or housing insecurity, and those without adequate social support systems. Children are also likely to experience the cumulative effects of climate related impacts and disruptions as they unfold over the coming years[12].

12 http://nccdh.ca/images/uploads/Lets_Talk_Health_Equity_English.pdf

Section 2
Framework for Collaborative Action
Addressing the Interconnections Between Health & Climate Change

LEAD
Leadership
& Governance

INCLUDE
Health Equity
& Climate Justice

SUSTAIN
Healthy Ecosystems
& Communities

CARE
Personal and
Social Resilience

**Framework for
Collaborative Action
on Health and
Climate Change**

RESPECT
Indigenous Rights
& Culture

ACT
Innovation for
Healthy & Climate
Resilient Communities

EMPOWER
Information,
Knowledge-Sharing
& Capacity-Building

ENGAGE
Engagement
& Cross-Sector
Collaboration

Resilience

Resilience is a key guiding concept for addressing the intersections of climate change and health. There are many definitions of resilience, but for our purposes we define resilience as: "our ability to pro-actively respond and adapt to change, stress, and uncertainty in ways that ensure that all people and the planet can thrive."

The WHO adds that "[r]esilience is much more than just the absence of vulnerability; it is about whole system capacity."[13] It is also critical that we consider how "adaptation includes the dynamics of living with change while also transforming the processes that have contributed to vulnerability in the first place."[14]

At a general level, this means enhancing a community's or region's capacity to anticipate, respond to, and minimize current and future risks, while mobilizing assets, finding opportunities to create positive co-benefits and working towards adapting in the long term. A resilience approach is also a strength-based approach, calling on inherent community strengths, assets, resources and networks, and shifting away from a more conventional deficit approach which emphasizes risks, problems, and needs[15].

The co-benefits associated with responding to climate change impacts with a health perspective are many – this refers to how a given action may have benefits in multiple domains simultaneously (i.e. health, environmental, economic, social benefits). This is more likely when we bring multiple lenses to an initiative or a decision-making process. For example, in the case of climate change and health, some actions could be very wise in terms of reducing greenhouse gas emissions (i.e. ensuring that new development is designed to be complete, compact, walkable, and energy and water efficient)

but may have unintended impacts if a health lens is not considered (i.e. siting this new development in a floodplain, or designing it for maximum solar exposure when extreme heat events are projected to occur more frequently). Or, increasing the cost of energy use could reduce greenhouse gas (GHG) emissions, but could disproportionately impact already vulnerable populations if measures to address health and equity are not included. Maximizing co-benefits where possible, is an important part of building resilience.

"True resilience calls on us to rethink the systems that supply our energy, transportation, food, water, and housing… [and] to eradicate the inequities that magnify vulnerability…"

Island Press and the Kresge Foundation

But true resilience goes beyond maximizing co-benefits, to truly transforming the systems that have created such deep inequities and dysfunction to begin with. It is a step in this direction to place those most affected at the centre of the conversation on health and climate change. But it must go further. How might our work on addressing the intersections of health and climate change also become a pathway for justice, reconciliation with indigenous people and cultures, and addressing the root causes of unsustainability? We hope that this framework will contribute to advancing our shared exploration of how to create truly healthy, resilient and thriving communities in the era of climate change.

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13 http://www.who.int/globalchange/publications/building-climate-resilient-health-systems/en/

14 Island Press and the Kresge Foundation (2015). Bounce Forward: Urban Resilience in the Face of Climate Change. https://kresge.org/sites/default/files/Bounce-Forward-Urban-Resilience-in-Era-of-Climate-Change-2015.pdf

15 For example, see this presentation by Emily York, Oregon Climate and Health Program, at Making the Links: https://shiftcollaborative.ca/wp-content/uploads/2018/11/Oregon-Story-Emily-York-10-31-18-web.pdf . And this infographic from the RAND Corporation: https://www.rand.org/pubs/infographics/IG114.readonline.html

Guiding Principles

This set of guiding **principles** informs our framing of the action areas below. These principles were designed to integrate key values and priorities needed to support a vision of community health & resilience in the face of climate change.

Healthy humans and ecosystems are inextricably linked	We are facing unprecedented damage and even collapse of many of the natural systems that make human life possible, and at the same time, there are an increasing number of ecological approaches to addressing climate change. Tending to the health of ecosystems is essential to ensuring human health into the future.
Health and well-being for all	Equity is at the core of an ethical response to climate change. Health disparities (between populations and individuals currently, and across future generations) are symptoms of underlying social and environmental conditions which must be addressed.
Indigenous rights & reconciliation	The rights, wisdom and leadership of indigenous peoples and communities need to be at the heart of decision-making and actions. The intersections of health and climate change cannot be addressed without embedding reconciliation in actions and decisions.
Responsibility to prevent, manage and minimize risk	We all have a responsibility to address future risks due to climate change, now. This builds on the long-established wisdom of taking a preventative approach to human health, as opposed to relying on crisis intervention alone.
Engaging the public and stakeholders	The intersections of climate change and health affect everyone, and require widespread engagement and awareness-building to address. Efforts must be made to address inequities in decision-making processes. In particular, those most affected by the issues should be meaningfully involved in the development of strategies.
Strength-based approaches	Resilience is recognized and enhanced when we build from the existing and inherent strengths of individuals and communities, to enable creative and empowered responses.
Systemic thinking	Health and climate change are both what we call "complex" systemic issues with many moving parts and few easy solutions. The goal is not to eliminate complexity but to find wise and elegant pathways for working with the complexity.
Ongoing innovation & learning	In many ways, we are carving a path by walking it, and this requires flexibility and creativity. We must be able to learn as we go, take risks, correct course where necessary and incorporate new information as it becomes available.
Maximize co-benefits	Co-benefits refer to how a given action can have benefits in multiple domains simultaneously (i.e. health, environmental, economic, social).

The set of **eight "collaborative action areas"** below, outlines a range of collaborative actions and approaches that are needed to improve health while addressing the impacts and underlying causes of climate change[16]. Each of these action areas describes where work will be needed across sectors, organizations and levels of government, to determine and implement strategies to reduce risk and enhance resilience. Examples of possible collaborative actions for each of these areas are provided to spark ideas, while recognizing that strategies and solutions will be specific to each community and region. A two-page summary version of the framework and action areas is available at www.shiftcollaborative.ca/framework.

LEAD
Leadership & Governance

INCLUDE
Health Equity & Climate Justice

SUSTAIN
Healthy Ecosystems & Communities

CARE
Personal and Social Resilience

Framework for Collaborative Action on Health and Climate Change

RESPECT
Indigenous Rights & Culture

ACT
Innovation for Healthy & Climate Resilient Communities

EMPOWER
Information, Knowledge-Sharing & Capacity-Building

ENGAGE
Engagement & Cross-Sector Collaboration

16 These action areas were inspired by the "Framework for a National Strategy on Climate, Health, and Well-Being for Australia" (Horsburgh, Armstrong, & Mulvenna, 2017) http://www.caha.org.au/national_strategy_framework_launch ; and the Oregon Climate and Health Resilience Plan: https://indd.adobe.com/view/23f48239-7243-4cb3-a855-795fc47c891c

LEAD: Leadership & Governance

The recent report from the Intergovernmental Panel on Climate Change (IPCC) makes it startlingly clear: bold, visionary and collaborative leadership is needed now to avert the most devastating consequences of climate change and ensure a healthy quality of life for all. In the face of many competing priorities, the kind of bold action needed now will require champions and leaders to take bold steps that seem impossible. *How can we call forth inspired and committed leadership in individuals and collectives, in order to forge a path together through inevitable uncertainty and complexity?*

POSSIBLE COLLABORATIVE ACTIONS:

→ Amplifying the voice and reach of emerging leaders in many roles and organizations

→ Clarifying different leadership roles for agencies, organizations and levels of government, to enable strategic action.

→ Aligning communications and messaging to motivate and lead communities in a common direction.

→ Being agile in the use of decision-making and organizing structures to best fit needs (eg: using emerging information during a crisis event to make real-time decisions and convene partners to enable mobilization in appropriate configurations – see Manitoba Case Study 3, in Berry et al 2014[17])

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17 https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/assess/2014/pdf/Chapter7-Human-Health_Eng.pdf

INCLUDE: Health Equity & Climate Justice

The impacts of climate change are not equally or fairly distributed across people or communities. Already socially and economically disadvantaged populations will be more adversely affected by the health impacts of climate change, and generally have less capacity to adapt to the increased stressors. In addition, planning and decision-making processes continue to marginalize already vulnerable groups. However, many of the drivers of existing socioeconomic inequities are also at the root of climate change[18]. *How can we respond to climate change in ways that transform economic and social systems to increase equity, fairness and quality of life for all?*

POSSIBLE COLLABORATIVE ACTIONS:

→ Conduct a climate change and health vulnerability assessment and/or mapping: the use of geographic data and tools allows for more sophisticated mapping of risk factors and social vulnerabilities to identify and protect specific locations and groups of people

→ Develop effective ways of communicating vulnerabilities without further marginalizing affected populations or perpetuating inequities

→ Bring an equity lens to climate change policies (e.g. how policies impact different populations and areas economically, socially) and decision-making processes.

→ Apply tools such as sex and gender based analysis[19] in assessing climate impacts and determining more equitable and effective courses of action.

18 https://www.apha.org/-/media/files/pdf/topics/climate/climate_health_equity.ashx?la=en&hash=14D2F64530F1505EAE7AB16A9F9827250EAD6C79
19 http://sgba-resource.ca/en/

SUSTAIN: Healthy Ecosystems and Communities

Climate change exacerbates the challenges faced by already stressed environmental systems. Beyond a certain point, humans cannot physically survive without healthy air, water and food systems, and these all depend on, and influence, the health of broader ecosystems. *How might we better work across sectors to protect, restore and regenerate the natural systems that sustain us?*

POSSIBLE COLLABORATIVE ACTIONS:

→ Include key stakeholders on air, water, ecological and food systems in planning and decision-making processes relating to health and/or climate change – integrate these lenses and values, for example through multi-criteria decision-making methods, or on cross-sectoral tables.

→ Raise awareness for the public and decision-makers of the critical health links between air, water, food, ecosystem health and the impacts of climate change.

RESPECT: Indigenous Rights & Culture

Here in BC we live on the largely unceded territories of the first peoples of these lands, where all of our actions on climate change and health – past, present and future—take place. Indigenous communities' connection to their traditional territory is vital to their identity and is particularly affected by the impacts of climate change. A commitment to reconciliation is at the heart of building resilience for all of our communities, and cannot be fully realized without including Indigenous peoples' stake and leadership in addressing climate change. *How might our work at the intersections of climate change and health provide leadership to the ongoing process of reconciliation?*

POSSIBLE COLLABORATIVE ACTIONS:

→ Commit to developing cultural competency in all of our organizations[1]

→ Create opportunities to lead together with Indigenous people and organizations on addressing the impacts of climate change for health & well-being

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1   See this resource for a primer on cultural competency for health organizations: http://www.fnhma.ca/journey-walk-together/

ENGAGE: Engagement & Cross-Sector Collaboration

Addressing the causes and impacts of climate change requires integrated action across all sectors (including health, all levels of government, academic, non-profit and business sectors) and groups in society. However, we are often stuck in silos, facing significant barriers to aligning our visions, resources and actions to move in a common direction. It is particularly important that those who are affected, are included in developing responses to those impacts. As well, climate change spans past, current and future generations; the voices and actions of both young and old are needed. *How can we evolve our approaches, mobilize our collective creativity and wisdom, and align resources to effectively address the complexities and intersections of climate change and health?*

Voth Photography

POSSIBLE COLLABORATIVE ACTIONS:

→ Create space for the engagement and involvement of every generation, including youth, as we build the field of health and climate change.

→ Start where people are (responsibilities, interests & values) and personalize co-benefits (to engage hearts and minds) through an appropriate model of engagement.

→ Establish formal partnerships between key agencies around a climate change and health issue of high priority to both, which can deepen relationships that will then extend to other needs (e.g. an MOU between a health authority and local government around areas of shared interest can create working relationships and familiarity so that they are more likely to call on one another in times of crisis or need).

→ Convene stakeholders around priority issue areas (i.e. flood or wildfire risk, vulnerable populations) or a broader topic or vision (e.g.: community resilience, climate change and health) from time to time – cultivate the sense of being in it together.

→ Convene key institutions, agencies and organizations to establish agreements that enable collective assets in the community to be coordinated to enhance resilience (e.g.: better coordinating hospital, community centre, school and local business facilities and equipment for emergency response)

→ Engage multiple stakeholders and/or the public in planning processes that explicitly address climate change, health and resilience (e.g.: climate change planning, community planning)

EMPOWER: Information, Communications & Capacity-Building

The ongoing development and maintenance of local and expert research, monitoring and data is a foundation for informed design and decision-making. To make the most of available resources, we must also improve the accessibility and openness of data and information sharing systems to unleash our collective capacity to translate information into action. In support of all other action areas, effective communications, meaningful engagement, capacity-building and education will be needed to enhance climate and health literacy across sectors. *How can we generate and apply information and build capacity in ways that empower all stakeholders to take responsibility and aligned action?*

Voth Photography

POSSIBLE COLLABORATIVE ACTIONS:

→ Share information and spark conversation through social media and online platforms to reach younger audiences and engage people in creative ways.

→ Partner with key community leaders (e.g.: Medical Health Officers, elected officials, prominent business leaders, etc) to raise awareness throughout the community of the co-benefits of reducing GHG emissions and adapting to climate change.

→ Use storytelling about the human experience in climate change communications, and to engage people about their own lived experiences and ideas for building resilience.

→ Develop, deliver and integrate climate change and health training for professionals in key sectors.

→ Develop partnerships between government, academia, community organizations or others, to fund and produce research and information (e.g.: vulnerability mapping) that is of greatest value for decision-making and action

→ Promote open data systems and develop data sharing agreements across institutions to enable better understanding, decision-making and action on health & climate change

ACT: Innovation for Healthy & Climate Resilient Communities

As a province we need to reduce our GHG emissions by 80% in the next 30 years[20]. This is nothing short of a profound call to rethink and transform the systems we depend on to live (i.e.: energy, transportation, food, economy). At the same time, there are many opportunities to innovate through aligned strategies that simultaneously reduce GHG emissions while protecting and also improving health and well-being in the face of climate impacts. Preparedness and the capacity to respond to, recover from, and build resilience to both chronic stressors as well as extreme events relating to climate change, has direct implications for health outcomes. But to achieve all of this, we have to go beyond business as usual and reimagine how communities can function in ways that will be resilient in the face of drastically changing conditions. *How can we innovate through the strengths and tools available in various sectors, to create low carbon systems and conditions that can drastically improve health & resilience in an uncertain future?*

Alexis Sidor

POSSIBLE COLLABORATIVE ACTIONS:

→ Include health authority staff in development or review of community plans & policies (e.g. development applications, major infrastructure projects, community energy & emissions plans, official community plans, climate change adaptation plans, sustainability plans, transportation plans).

→ Design multi-stakeholder planning processes to build social capital and resilience (and otherwise address health & well-being) while developing specific plans for climate change adaptation, flood risk mitigation, neighbourhood design.

→ Convene multiple agencies to work together to develop neighbourhood response and resilience capacity, including a community response to mental health & wellness, both proactively and in response to extreme events

→ Engaging more broadly across agencies to be prepared for and engage in EOCs and emergency response (e.g.: role of business, institutions, building/neighbourhood level mobilization, etc)

→ Bring the story of human health impacts and opportunities to communications and planning for emissions reduction, to convey the immediate relevance and urgency of mitigation – emphasize opportunities to make fundamental changes that enhance equity and well-being for all.

→ Produce estimates of the costs of inaction and develop engaging ways to convey this information to the public and decision-makers to build the case for the value and benefit of making deeper changes to systems.

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20 https://blog.gov.bc.ca/app/uploads/sites/436/2019/02/CleanBC_Highlights_Report_Updated_Mar2019.pdf

CARE: Support Personal and Social Resilience

We can't build a resilient future if we ourselves are not healthy and resilient. The demands of being aware of and involved in addressing the intersections of climate change and health – whether in an acute sense such as emergency responders, or the long game of raising awareness and changing mindsets and actions to adapt and transform systems – are growing, and place a real strain on those at the frontlines of climate impacts and responses. *How can we ensure that supporting personal resilience and caring for each other is at the heart of our efforts to build a healthy and climate resilient future for us all?*

POSSIBLE COLLABORATIVE ACTIONS

→ Include personal resilience and caring for self and each other in all climate change engagement and planning processes.

→ Develop supports for individuals and groups to process and share experiences of working on the frontlines of the short and long emergency of addressing the impacts of climate change and health[21]

→ Design forums for people to express their fears, concerns, grief, confusion or other responses to climate change in community with others.

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21 For example, see this presentation by Bree Odd of the United Way Community Wellness Team: https://shiftcollaborative.ca/wp-content/uploads/2018/11/Bree-Odd-UW-Building-Resiliency-web.pdf
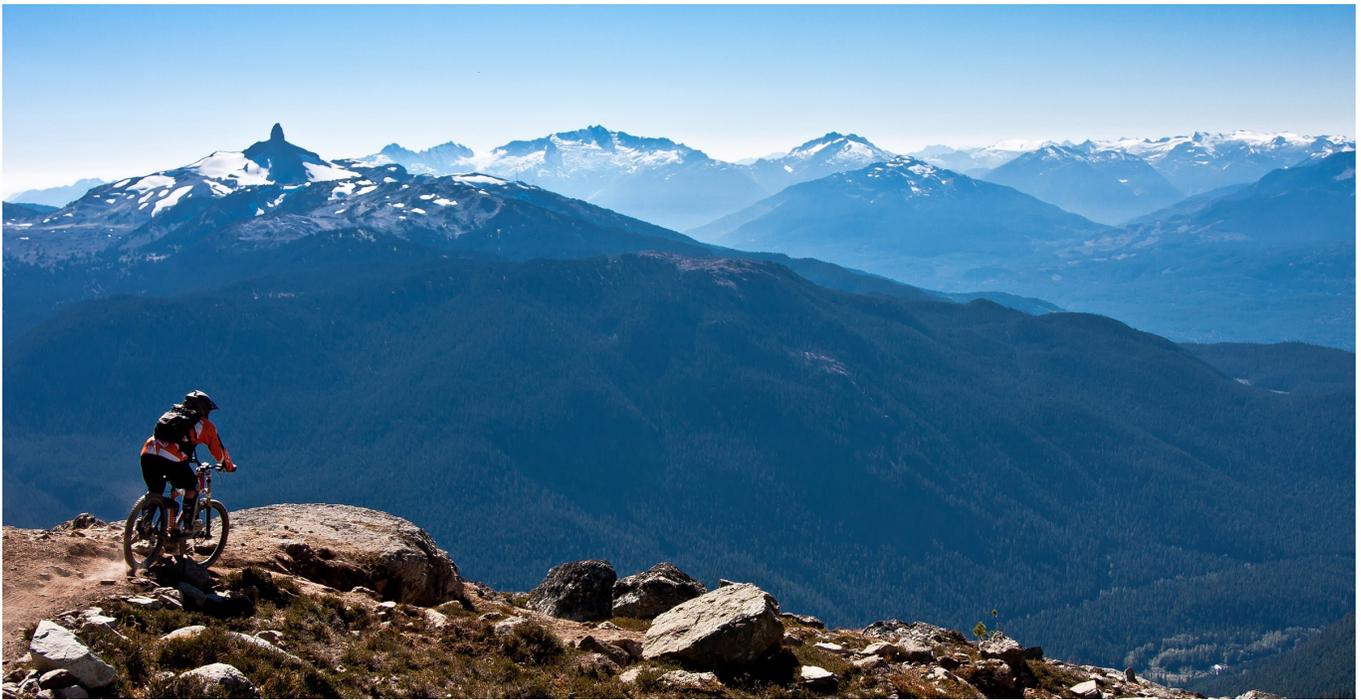
Conclusion

The framework described above is intended to provide a map of key issues to consider, and ideas of what types of collaborative action are needed in these areas. There are many gaps, and we hope that you will take this as a starting place to build, develop and enhance the ideas and actions suggested here. While there are many things we share in common, making sense of the challenges and opportunities facing us at the intersections of climate change and health, and developing effective solutions, are context specific and will require collaborative thinking and action at local and regional scales. This needs to be supported by enabling conditions at a provincial, national and international levels. This framework is intended to be a living document that will evolve, change and be applied in different ways over time. We look forward to hearing back from you as you apply and adapt these ideas to your particular communities and situations. Updates and suggestions are always welcome, at info@shiftcollaborative.ca. We wish you well in your efforts to build a strong fabric of collaborative action to enhance resilience of all life in the context of a changing climate, and look forward to being inspired by your stories of trying, failing, learning and succeeding.

Section 3
Supporting Resources
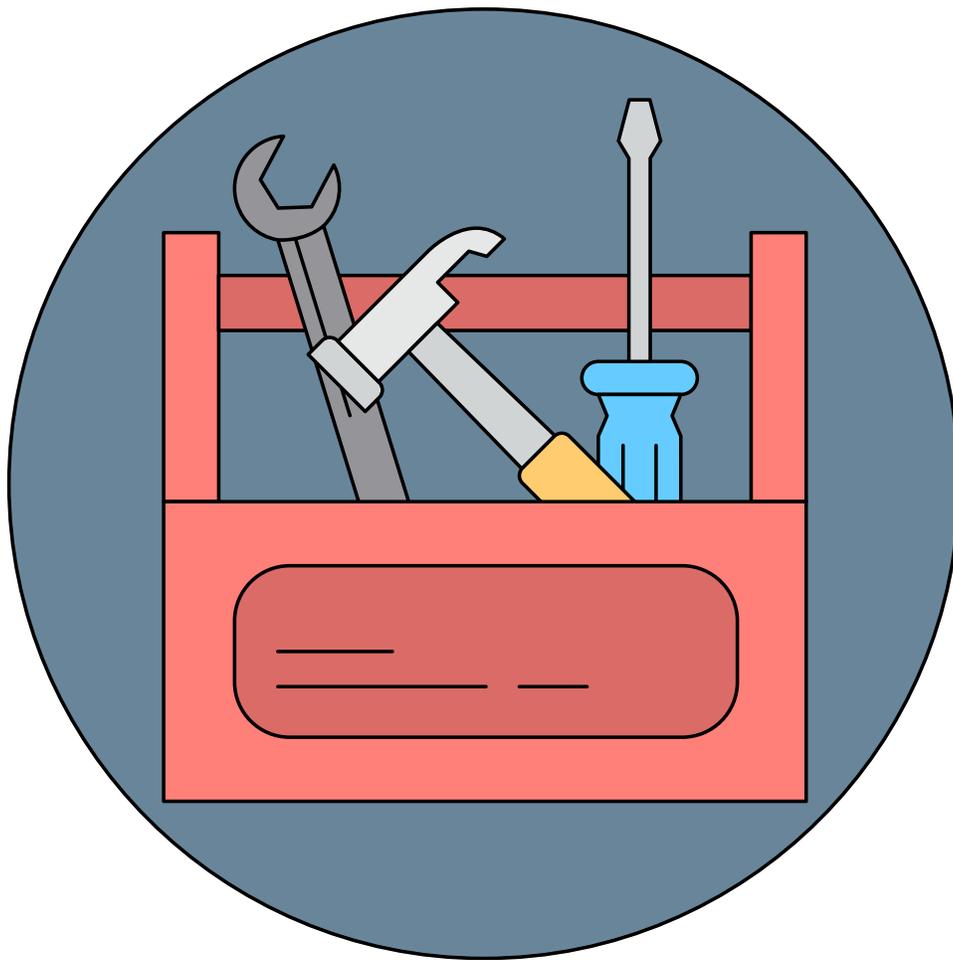
The following is an annotated list of resources relating to the intersections of climate change and health for communities and regions. This is intended to provide direction on where to seek further information on the following key topics:

- Understanding climate change
- Individual, community and public health impacts of climate change
- Policy & planning at the intersections of climate change and health
- Case studies: collaborative action on health and climate change
- Climate change resiliency and adaptation planning

UNDERSTANDING CLIMATE CHANGE

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC):
THE 1.5 HEALTH REPORT (REPORT)
http://climatetracker.org/wp-content/uploads/2018/10/The-1.5-Health-Report.pdf

The IPCC special report examines the impact of warming temperatures on overall health. It urges that limiting warming to 1.5°C compared to 2°C could have significant benefits for ecosystems, public health, and well-being. Its intent is to equip policy makers and practitioners with the information needed to take appropriate action to address climate change, while being mindful of local context and resident's needs. The report stresses that while it is not too late to take action to limit global warming, it will require unprecedented changes in how we think about land, buildings, energy, transport, and cities.

CLIMATE INSIGHTS 101 (VIDEO SERIES)
http://pics.uvic.ca/education/climate-insights-101

This online series of three courses was developed by the Pacific Institute for Climate Solutions in BC, and provides in depth information on the causes of climate change, and pathways for adaptation and mitigation. Courses are broken down into modules, with an interactive approach that includes opportunities to test your knowledge.

CLIMATE 101 WITH BILL NYE (VIDEO)
https://www.youtube.com/watch?v=3v-w8cyfoq8

This is an accessible introduction to the basics of climate change, by popular science educator Bill Nye. Skip to 4:10, for an introduction to the basic science of climate change.

PAYING THE PRICE: THE ECONOMIC IMPACTS OF CC FOR CANADA (REPORT)
http://nrt-trn.ca/climate/climate-prosperity/the-economic-impacts-of-climate-change-for-canada/paying-the-price

The National Roundtable on Energy and the Environment (NRTEE) offer this national study that estimates what the economic consequences of climate change could be for Canada, and suggests that adaptation would be a cost-effective option in the long run.

PACIFIC CLIMATE IMPACTS CONSORTIUM: PLAN2ADAPT (TOOL)

https://pacificclimate.org/analysis-tools/plan2adapt

PCIC's "Plan2Adapt" tool provides an at-a-glance picture of climate projections at various regional scales, in the form of maps, graphs and data tables. Results can be filtered specifically by Regional District boundary, and/or by Health Authority region. This is a common tool used by local governments in BC for basic regional climate projection information.

PACIFIC CLIMATE IMPACTS CONSORTIUM: DATA PORTAL (DATABASE)

https://www.pacificclimate.org/data

In addition, PCIC offers a selection of different data sources that can be used in modelling and assessments. These include BC climate station data, hydrological data, and statistically downscaled climate scenarios.

BC CLIMATE ACTION TOOLKIT (DATABASE)

www.toolkit.bc.ca/

The BC Climate Action Toolkit was developed to support knowledge sharing and collaboration among local governments in BC as they work towards deep reductions in greenhouse gas emissions (mitigation) in their organizations and communities. It offers a range of supports – from the latest news, to best practices and strategic guidance.

RETOOLING FOR CLIMATE CHANGE (DATABASE)

www.retooling.ca/

Retooling is the climate change adaptation counterpart to the Climate Action Toolkit, providing access to a range of resources and tools aimed at supporting local governments, First Nations, and the natural resource sector (among others) in BC, in adapting to a changing climate.

PREPARING FOR CLIMATE CHANGE: BRITISH COLUMBIA'S ADAPTATION STRATEGY (POLICY)

https://www2.gov.bc.ca/assets/gov/environment/climate-change/adaptation/adaptation_strategy.pdf

BC's adaptation strategy provides three strategies that are aimed at helping the Province achieve their vision of being "prepared for and resilient to the impacts of climate change." Each strategy contains a set of core deliverables, which are markers to help ensure that each strategy is met.

BRITISH COLUMBIA'S CLIMATE LEADERSHIP PLAN (POLICY)

https://www2.gov.bc.ca/assets/gov/environment/climatechange/action/clp/clp_booklet_web.pdf

This strategy is a part of BC's commitment to reaching the 2050 target of reducing greenhouse gas emissions to eighty per cent below 2007 levels. One guiding principle in this strategy is that everyone has a role to play in addressing climate change; partners across Canada need to collaborate in order to align policies and to achieve the most effective results. One particularly important aspect of this strategy is the development of a Climate Leadership Team (CLT), which is composed of diverse leaders from BC businesses, First Nations, local governments, communities, academia, and the environmental sector.

BRITISH COLUMBIA'S CLIMATE ACTION PLAN (REPORT)
http://www.toolkit.bc.ca/sites/default/files/climateaction_plan_web.pdf

This report outlines the steps that British Columbia is taking to address climate change and the environmental and health impacts of climate change. It illustrates four key ways that the province is responding to the challenges and opportunities presented by climate change, including: establishing clear targets for greenhouse gas emission reductions; implementing policy measures and legislation to reduce emissions in every sector; creating strategies to help residents adapt to the impacts of climate change; and educating and engaging the public on how we can address climate action.

INDIVIDUAL, COMMUNITY & PUBLIC HEALTH IMPACTS OF CLIMATE CHANGE

BC GOVERNMENT: CLIMATE IMPACTS ON HEALTH FACT SHEETS (FACT SHEETS)
https://www2.gov.bc.ca/gov/content/environment/climate-change/adaptation/resources

The BC government has composed a series of five fact sheets exploring how climate change and its principal hazards impact the health sector. Each fact sheet contains an overview of climate change and health impacts in BC, and is accompanied by a list of opportunities for adaptation. The series includes: Overview; Facilities; Communities; Public Health; Front-line Health Care.

CLIMATE CHANGE IMPACTS ON THE HEALTH OF CANADIANS (REPORT)
http://publications.gc.ca/collections/collection_2017/aspc-phac/HP5-122-2017-eng.pdf

The Public Health Agency of Canada published this accessible overview of health impacts due to climate change, in 2017. It reviews the key types of impacts, and emphasizes the opportunities for co-benefits extending across existing health inequities, climate change mitigation and climate change adaptation. It also outlines key concepts, considerations and approaches to adaptation.

HUMAN HEALTH IN CANADA IN A CHANGING CLIMATE: SECTOR PERSPECTIVES ON IMPACTS AND ADAPTATION (REPORT)
https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/assess/2014/pdf/Chapter7-Human-Health_Eng.pdf

This particular chapter on Human Health provides an overview of the health risks of climate change, broken down into sections for each health impact category (e.g.. extreme weather events, air quality). The chapter also discusses both community-level and regional-level vulnerabilities and proposes adaptations measures and strategies to help protect public health.

U.S. GLOBAL CHANGE RESEARCH PROGRAM: CLIMATE AND HEALTH ASSESSMENT (REPORT)
https://health2016.globalchange.gov

This report is divided into nine chapters, with each chapter providing a detailed description of a different climate-related health burden. The report highlights findings from the climate and health assessment,

which provides a context for understanding health risks, recognizing vulnerable populations, and identifying emerging climate issues. The chapters include: Climate Change and Human Health; Temperature-Related Death and Illness; Air Quality Impacts; Extreme Events; Vector-Borne Diseases; Water-Related Illness; Food Safety, Nutrition, and Distribution; Mental Health and Well-Being; Populations of Concern.

CENTERS FOR DISEASE CONTROL AND PREVENTION: CLIMATE EFFECTS ON HEALTH (FACT SHEETS)
https://www.cdc.gov/climateandhealth/effects/default.htm

The Centers for Disease Control and Prevention and the American Public Health Association provide a series of five fact sheets on the different climate-related impacts on human health. Each fact sheet discusses the climate-health connection in detail and provides a series of actions we can take to prepare for the impacts of climate change. The series includes: Extreme Rainfall and Drought; Warmer Water and Flooding; Climate Change and Quality of the Air We Breathe; Extreme Heat; Climate Change and Vector-Borne Diseases.

THE LANCET COMMISSION, HEALTH AND CLIMATE CHANGE: POLICY RESPONSES TO PROTECT PUBLIC HEALTH (REPORT)
http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.737.1300&rep=rep1&type=pdf

The Lancet Commission's report explores the impacts of climate change on human health and the policy responses needed to help mitigate the effects. The report includes ten underlying recommendations that are a call for accelerated action from health departments, other government departments and health professionals.

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH: CLIMATE CHANGE AND HEALTH EQUITY (ISSUE BRIEF)
https://www.cdph.ca.gov/Programs/OHE/CDPH%20Document%20Library/CCHEP-General/CDPH_CC-and-Health-Equity-Issue-Brief.pdf

The CDPH's issue brief explores climate change and health impacts as well as the capacity for climate resilience amongst different populations. It also includes a list of climate mitigation and adaptation actions that communities can focus on to improve residents' overall health and quality of life.

AMERICAN PUBLIC HEALTH ASSOCIATION: HOW CLIMATE CHANGE AFFECTS YOUR HEALTH (INFOGRAPHICS)
https://www.apha.org/news-and-media/multimedia/infographics/how-climate-change-affects-your-health

The APHA provides a series of five infographics to illustrate the public health implications of climate change. The infographics are used as a communication medium to convey the message that we need strong interventions and comprehensive climate change strategies in order to help protect human health. The five topics for the infographics include: Air Quality; Extreme Weather; Rising Temperatures; Vector-Borne Diseases; Overview.

UN ENVIRONMENT PROGRAM'S 2018 ADAPTATION GAP REPORT
https://www.unenvironment.org/news-and-stories/press-release/growing-gap-between-ambition-and-action-world-prepares-future

The Adaptation Gap Report provides a global perspective on adaptation progress to date. Section 2 of this Report from the UNEP focuses on gaps in the degree of action on climate change adaptation to address health outcomes in particular. The message is consistent with many other reports that emphasize the co-benefits of addressing health along with adaptation and the root causes of climate change.

POLICY & PLANNING AT THE INTERSECTIONS
OF CLIMATE CHANGE AND HEALTH

MEASURING PROGRESS ON ADAPTATION AND CLIMATE RESILIENCE: RECOMMENDATIONS TO THE GOVERNMENT OF CANADA REPORT

http://act-adapt.org/measuring-progress-on-adaptation-and-climate-resilience-recommendations-to-the-government-of-canada/

This report was produced by an expert panel convened by the Government of Canada to provide guidance on measuring overall progress on adaptation and climate resilience, as part of agreements in the Pan-Canadian Framework on Clean Growth and Climate Change. It includes a section on Protecting and Improving Human Health and Well-Being, focused on the key determinants of health as they relate to climate change impacts, and objectives and indicators that could be used to monitor and evaluate progress toward increasing the resilience of people, communities, and health practitioners to a broad range of health impacts associated with climate change.

LANCET COUNTDOWN 2018 REPORT: BRIEFING FOR CANADIAN POLICYMAKERS (POLICY)

http://www.lancetcountdown.org/media/1418/2018-lancet-countdown-policy-brief-canada.pdf

This briefing for Canadian policy makers was developed together with the Canadian Medical Association and the Canadian Public Health Association, drawing on data from the 2018 Lancet Countdown to make evidence-informed recommendations for policy. It focuses on the links between climate change and health, and the implications for Canadian policy makers.

US CENTRE FOR DISEASE CONTROL: BUILDING RESILIENCE AGAINST CLIMATE EFFECTS [BRACE] (GUIDEBOOK)

https://www.cdc.gov/climateandhealth/BRACE.htm

The BRACE framework provides a guide for public health practitioners to include climate change science and projections in their planning and response activities. It has been adopted by various jurisdictions in the United States, and Vancouver Coastal Health has recently been using this to guide them in integrating climate change into their work.

FRAMEWORK FOR A NATIONAL STRATEGY ON CLIMATE, HEALTH AND WELL-BEING FOR AUSTRALIA (FRAMEWORK)

https://d3n8a8pro7vhmx.cloudfront.net/caha/pages/40/attachments/original/1498008324/CAHA_Framework_for_a_National_Strategy_on_Climate_Health_and_Well-being_v05_SCREEN_%28Full_Report%29.pdf?1498008324

This framework is structured around seven main Areas of Policy Action, which have all emerged from collaboration with health professionals, decision makers, and experts in the field of climate change and health. Supplementing each Area of Policy Action is the desired outcome and specific policy recommendations to achieve these outcomes. Although the framework is for Australia, many of the policy directions and outcomes are general to community health and environmental health and thus are transferrable to a Canadian context.

WORLD HEALTH ORGANIZATION: OPERATIONAL FRAMEWORK FOR BUILDING CLIMATE RESILIENT HEALTH SYSTEMS (FRAMEWORK)
http://apps.who.int/iris/bitstream/handle/10665/189951/9789241565073_eng.pdf?sequence=1

The framework is divided into ten components, which collectively are the building blocks for climate resilient health systems. Each component includes detailed objectives for implementation and examples of measurable outputs. The framework also emphasizes six areas that are considered main connections to these building blocks, including: leadership and governance; health workforce; health information systems; essential medical products and technologies; service delivery; and financing.

WORLD HEALTH ORGANIZATION: PROTECTING HEALTH FROM CLIMATE CHANGE: VULNERABILITY AND ADAPTATION ASSESSMENT (GUIDEBOOK)
http://www.who.int/iris/handle/10665/104200

This guidebook provides flexible guidance on how to conduct a vulnerability and adaptation assessment for the health risks of climate change, including development of policies and actions to enhance resilience to a changing climate. Such an assessment can provide inputs into decision-making such as understanding the extent and magnitude of possible health risks due to climate change, as well as identifying ways of reducing the impact of future conditions.

THE RESOURCE INNOVATION GROUP PUBLIC HEALTH AND CLIMATE CHANGE: A GUIDE FOR INCREASING THE CAPACITY OF LOCAL PUBLIC HEALTH DEPARTMENTS (GUIDEBOOK)
http://static1.1.sqspcdn.com/static/f/551504/17577779/1334000902043/Public+Health+Guide_FINAL.pdf?token=zbmhCultAg0QePuvwwQKeQYHiQE%3D

This guidebook is intended to help provincial and regional health departments address the impacts of climate change on public health and to develop a climate action plan. The guidebook is divided into four sections, with each section including a series of activities to help move departments closer to implementation. The four sections are: an overview of the impacts of climate change on public health; opportunities and strategies for integrating climate planning across programs; identifying and building external collaborations to help meet goals in a resource-efficient way; and recommendations for communicating with different stakeholders.

READY FOR CHANGE: PREPARING PUBLIC HEALTH AGENCIES FOR THE IMPACTS OF CLIMATE CHANGE (GUIDEBOOK)
http://static1.1.sqspcdn.com/static/f/551504/7222325/1283279810727/PubHealthPrepManual5-10LR.pdf?token=N7jExcigzoQdq4gyo%2F2FUdSsCAc%3D

This manual provides guidance on specific threats of climate-related health impacts by discussing vulnerable populations, presenting ideas in action, proposing elements that health agencies could

incorporate into a comprehensive plan, and providing additional resources. While this manual was developed specifically for Oregon and county health departments as well as community-based health organizations, many of the resources and materials provided throughout could also be useful for a variety of health facilities or groups.

BC CENTRE FOR DISEASE CONTROL: DEVELOPING A MUNICIPAL HEAT RESPONSE PLAN: A GUIDE FOR MEDIUM-SIZED MUNICIPALITIES (GUIDEBOOK)
http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Health-Environment/Developing%20a%20municipal%20heat%20response%20plan.pdf

This guide is a response to public concerns that smaller and medium-size municipalities may lack the infrastructure and resources to develop heat-response plans that larger centres have. The guide is based on data obtained through consultations with health authorities and municipalities and a review of the literature. It is intended to provide the resources and guidance to help BC municipalities develop extreme heat plans, and specifically to integrate these plans with existing emergency preparedness strategies.

OREGON HEALTH AUTHORITY CLIMATE AND HEALTH RESILIENCE PLAN (VIDEO SERIES)
https://www.oregon.gov/oha/PH/HealthyEnvironments/climatechange/Pages/resilience-plan.aspx#videos

This is a series of eight videos created by the Oregon Health Authority has part of their Climate and Health Resilience Plan project. The video series covers topics such as climate and air quality, climate and health equity, public health and climate action, food systems and community resilience, and climate change collaboration.

CASE STUDIES: COLLABORATIVE ACTION ON HEALTH AND CLIMATE CHANGE

NATURAL RESOURCES CANADA: TORONTO'S HEAT HEALTH ALERT SYSTEM (CASE STUDY)
https://www.nrcan.gc.ca/environment/resources/publications/impacts-adaptation/tools-guides/16295

This case study looks at the City of Toronto's heat health alert system and how proactive adaptation can protect lives in the face of increasing climate-related threats. It illustrates the important role of collaboration between the City of Toronto, Toronto Public Health, and other agencies in providing the public with vital information and resources, as well as in preventing heat-related illnesses and fatalities.

CITY OF SURREY CLIMATE ADAPTATION STRATEGY (POLICY)
https://www.surrey.ca/files/ClimateAdaptationStrategy.pdf

The City of Surrey's Adaptation Strategy uses the ICLEI's five-milestone planning framework to support community resilience strategies and to respond proactively to the challenges of climate change. The strategy includes a section on human health and safety, in which they highlight four overarching goals to help increase resilience for health, as well as adaptation actions to help facilitate each goal. While each adaptation action includes a lead City department accountable for implementation, the strategy recognizes the crucial role of senior governments in helping cities adapt to climate change.

OREGON HEALTH AUTHORITY CLIMATE AND HEALTH RESILIENCE PLAN (POLICY)

http://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/CLIMATECHANGE/Pages/Publications-Training.aspx8

After completing a "Climate and Health Profile Report," the Oregon Health Authority undertook this initiative to develop a climate change and health plan to guide actions by the Health Authority and in partnership with others.

US CENTRE FOR DISEASE CONTROL: ADAPTATION IN ACTION (CASE STUDIES)

https://www.cdc.gov/climateandhealth/pubs/adaptation-in-action.pdf

This report profiles a number of successes from the early days of the CDC's Climate-Ready States and Cities Initiative. Two cities and a number of states were at that time involved in the initiative, and this report highlights various projects being carried out by Minnesota, San Francisco, Arizona, Michigan, New York City, Maine and California.

WORLD METOROLOGICAL ORGANIZATION AND WORLD HEALTH ORGANIZATION: ITERATIVE DEVELOPMENT AND TESTING OF A HEAT WARNING AND INFORMATION SYSTEM IN ALBERTA, CANADA (CASE STUDY 4E)

http://ane4bf-datap1.s3-eu-west-1.amazonaws.com/wmocms/s3fs-public/ckeditor/files/WHO-WMO_Climate_Services_for_Health.pdf?zWclQxQElu4ame2wAx0RTdAVocWVYBGH

This case study examines Alberta Health's collaboration with several agencies to develop a Heat Warning and Information System (HWIS). The HWIS facilitates a coordinated approach to issue heat warnings to the public and to provide guidance on the severity, duration, and geography of the extreme heat event. This case study illustrates the importance of collaboration among local, provincial, and federal levels to share expertise and to develop resources to protect human health during heat events.

WORLD METOROLOGICAL ORGANIZATION AND WORLD HEALTH ORGANIZATION: FORECASTING WILDLAND FIRE SMOKE HAZARDS IN URBAN AND RURAL AREAS IN MANITOBA, CANADA (CASE STUDY 5H)

http://ane4bf-datap1.s3-eu-west-1.amazonaws.com/wmocms/s3fs-public/ckeditor/files/WHO-WMO_Climate_Services_for_Health.pdf?zWclQxQElu4ame2wAx0RTdAVocWVYBGH

This case study examines the direct and indirect health impacts of exposure to smoke from wildland fires. It describes the Manitoba Department of Health's effort to reduce health impacts by utilizing a range of tools to forecast, monitor, and communicate the risks from wildland fire smoke to partner agencies and to the public. By using field-deployable smoke monitors, communications hardware, and a web-based map application, they are able to alert health services of smoke risks, guide emergency management actions, and address confirmed risks of smoke and heat exposure.

CLIMATE CHANGE RESILIENCY AND ADAPTATION PLANNING

ICLEI: CHANGING CLIMATE, CHANGING COMMUNITIES: GUIDE AND WORKBOOK FOR MUNICIPAL CLIMATE ADAPTATION (GUIDEBOOK)

http://www.icleicanada.org/images/icleicanada/pdfs/GuideWorkbookInfoAnnexes_WebsiteCombo.pdf

The ICLEI created this guide to help local governments develop climate change adaptation plans. The guide follows a five-milestone approach, with each step representing a vital part of the adaptation process. The milestone framework (initiate, research, plan, implement, monitor/review) is not linear, but rather is seen as an iterative process.

FCM & ICLEI: PARTNERS FOR CLIMATE PROTECTION PROGRAM (FRAMEWORK)

https://fcm.ca/en/programs/partners-climate-protection

The Partners for Climate Protection (PCP) program, from ICLEI — Local Governments for Sustainability (ICLEI Canada) and FCM, offers a five-step milestone framework that local governments can use to guide their emissions reductions actions (climate change mitigation). Free membership provides access to tools, case studies, resources, and support.

UKCIP: MANAGING ADAPTATION: LINKING THEORY AND PRACTICE (REPORT)

https://www.ukcip.org.uk/wp-content/PDFs/UKCIP_Managing_adaptation.pdf

This report provides resources and information to assist organizations in moving from awareness to action. By looking at pathways, assessment approaches, and decision-making approaches, it is intended to help those undertaking a climate change risk based assessment as part of their adaptation process. It references and specifically supplements an eight-step risk, uncertainty, and decision-making framework. The eight stages are: identify problem and objectives; establish decision-making criteria; assess risk; identify options; appraise options; make decision; implement decision; and monitor.

ROCKEFELLER RESILIENT CITIES FRAMEWORK (FRAMEWORK)

http://assets.rockefellerfoundation.org/app/uploads/20150530121930/City-Resilience-Framework1.pdf

This framework is based around city resilience, which is the capacity of cities – and particularly the vulnerable populations living and working in them – to recover and thrive in the event of a disruption to its physical and social systems. The framework offers twelve key indicators that help define a resilient city, which are especially useful on a local and provincial level for understanding how to build and maintain resilient and healthy communities and regions.

COLORADO RESILIENCY FRAMEWORK (FRAMEWORK)

https://sites.google.com/a/state.co.us/coloradounited/resiliency-framework

This framework provides information on resiliency planning in Colorado by outlining each step of the planning process – from public and stakeholder engagement to risk and vulnerability assessments and important calls to action. Every step is listed as its own section, and each section is further broken down into subsections, providing an organized layout that is easy to follow. One important aspect of

this framework is the Resiliency Roadmap, which provides ideas for community engagement as well as information on the leadership roles and responsibilities of different stakeholder groups.

COLUMBIA BASIN TRUST: COMMUNITIES ADAPTING TO CLIMATE CHANGE INITIATIVE (CASE STUDY)
https://www.retooling.ca/_Library/Case_Studies/CACCI_RDCK_KasloCaseStudy.pdf

This case study describes the Regional District of Central Kootenay's, in partnership with the Village of Kaslo, one-year climate change adaptation planning process. It provides an example of how to address climate change and adaptation through a rural lens, as well as the need for collaboration in the adaptation planning process.

SHIFT Collaborative offers strategy, coaching, training and tools to support learning and leadership development, strategic impact and collaborative innovation for a healthier and more resilient world.

www.shiftcollaborative.ca