Making the Health and Health Equity Case for Local Climate Solutions

CHASE
CANADIAN HEALTH ASSOCIATION FOR SUSTAINABILITY & EQUITY

Kim Perrotta MHSc
Executive Director, CHASE
Environmental Policy Class
Master of Planning
Queen's University
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Climate Change and Global Health

On a global scale – CC is already producing catastrophic impacts on human health.

- With 1.2°C of global warming, extreme climate events such as hurricanes, floods, heat waves, and droughts, are now:
  - claiming the lives of hundreds of thousands of people each year,
  - increasing food insecurity for tens of millions,
  - escalating conflicts, and
  - forcing people to flee from their homes

- United Nations. 2022. Blog Conflict and Climate. https://unfccc.int/blog/conflict-and-climate

Climate Change Health Risks in Canada: Extreme Events

CC has been increasing the frequency & intensity of extreme events across Canada

- **Hurricanes, ice storms, floods, & wildfires can:**
  - Cause immediate injuries & deaths
  - Harm the integrity of buildings & infrastructure
  - Involve evacuations, lost-time, loss of assets
  - Give rise to power outages - hypothermia & carbon monoxide poisoning

- Henderson, SB et al. 2021. Extreme Heat Events Are Public Health Emergencies. BC Medical Journal.
- Health Canada. 2022. Health of Canadians in a Changing Climate - Advancing our Knowledge for Action.
- Lancet Countdown Canada Policy Report 2022.

Climate Change Health Risks in Canada: Melting Permafrost

Increasing temperatures are melting permafrost that covers 40% of Canada's land mass. This can:

- Harm the integrity of buildings & infrastructure
- Disrupt transportation routes
- Limit access to food supplies
- Contaminate water supplies
- Release infectious diseases & toxics that have been stored in frozen plants, animals & ground

- Health Canada. 2022. Health of Canadians in a Changing Climate - Advancing our Knowledge for Action.
- Nash A Nicol AM. 2022. Climate change in the Arctic and radon gas: a rising threat from the ground up [blog]. National Collaborating Centre for Environmental Health. March.

Climate Change Health Risks in Canada: Air Pollution

CC is increasing air pollution

- **Air pollution already causes about 15,000 premature deaths & $130 B in health-related costs/year**
- Millions in Canada now being exposed to extremely high levels of wildfire smoke
- Increasing risks - asthma, respiratory infections & premature deaths
- Thousands of additional deaths/year

- Health Canada, Air Pollution. 2021;
- Schmunk R. 2020. Smoked in: A look back at B.C.'s haziest wildfire seasons over the past 20 years. CBC News. September 19.
- Matz et al, 2020 as cited by Health Canada. 2022. Health of Canadians in a Changing Climate - Advancing our Knowledge for Action.

Climate Change Health Risks in Canada: Food Insecurity

CC is increasing food insecurity.

- **Rising temperatures, droughts, floods & rising sea levels are also:**
  - Decreasing crop yields & encouraging pests
  - Particularly - Indigenous communities that rely heavily on traditional food sources

- Health Canada. 2022. Health of Canadians in a Changing Climate - Advancing our Knowledge for Action.

Climate Change Health Risks in Canada: Water Insecurity

CC is increasing water insecurity.

- **Intense rainfall, rising sea levels & deep droughts can:**
  - Deplete water supplies
  - Contaminate ground water & surface water
  - Particularly – communities relying on small drinking water systems – many Indigenous communities.

- Health Canada. 2022. Health of Canadians in a Changing Climate - Advancing our Knowledge for Action.

Climate Change Health Risks in Canada: Mental Health & Ecoanxiety

CC dramatically increasing the risks of mental health problems

- **Canadian studies have documented:**
- Post-traumatic stress disorder (**PTSD**) - who have lived through extreme events
- **Grief & anxiety** among people who are concerned about climate change
- **A sense of loss** among those who find their homes, communities & way of life disrupted

- Agyapong et al., 2018. and Abacus Data, 2019. and Cherry & Haynes, 2017 as cited by Health Canada. 2022. Health of Canadians in a Changing Climate - Advancing our Knowledge for Action.

Climate Change Health Risks in Canada: Amplifies Health Inequities & Vulnerabilities

- Some groups are more sensitive to environmental stressors – very young, older, pre-existing health conditions
- Some can experience greater exposures to CC impacts – outdoor workers, people without homes, those who live on low incomes
- Some do not have the resources to protect themselves, or recover, from those events

- Berry P Clarke K Fleury MD & Parker S. 2014. Human Health in Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation. Editors: Warren FJ and Lemmen DS. Government of Canada, Ottawa, Ontario.
- Public Health Agency of Canada, Pan-Canadian Public Health Network, Statistics Canada, and the Canadian Institute for Health Information. 2018. Key Health Inequalities in Canada report/Pan-Canadian Health Inequalities Data Tool

Addressing Climate Change Health Inequities
Example: Heat Waves

Heat Dome in BC in 2021

- 440% increase in death rate in the community
- **Much higher death rates**
  - Older people & Low-income populations
  - Homes lacking air conditioners & greenness
- **Adaptation -** Cooling centres/free transit/free pools
- **Resiliency** – More trees/parks/pools
- **Mitigation** – Heat pumps in low-income housing/neighbourhoods & long-term care

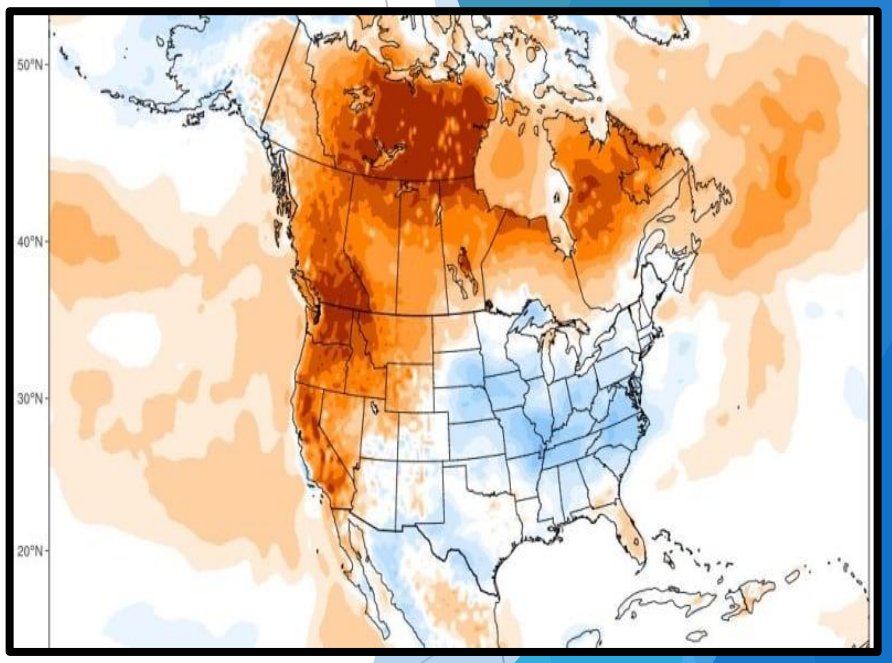


Image: CBCNews, Aug 16, 2022

- Henderson et al., 2022. Env Epidemiology

Questions:

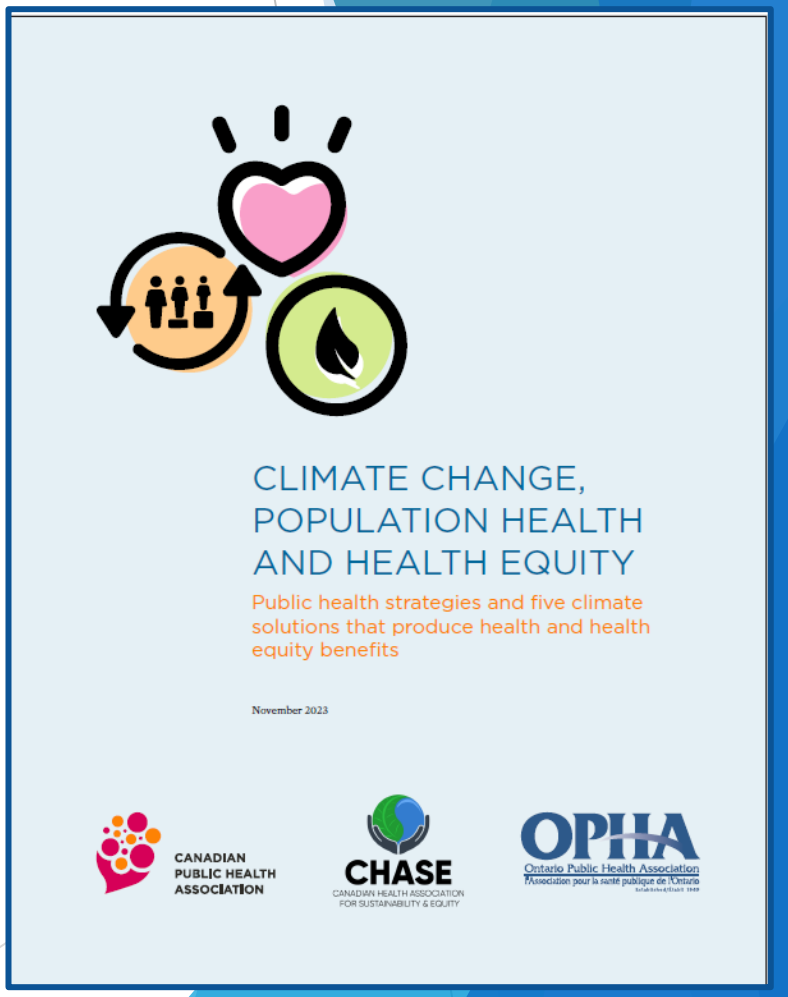
What climate-related impacts have you seen in your communities?

How do you think they affected public health?

Who was particularly hard hit?

Climate Change Solutions & Immediate Health & Health Equity Benefits

- CPHA, CHASE, OPHA
- Funding – McConnell Foundation
- 14 case studies & 4 webinars
- Health & Health Equity Benefits – 5 Local Climate Change Solutions
- **Report, Bogs & Webinars:** https://chasecanada.org/public-health-addressing-health-health-equity-and-climate-change/



Project Goal #1: Educate the Public

- One communications survey found that:
  - 75% in Canada are concerned or very concerned about climate change
  - **But few could identify the actions needed to fight climate change**
- Need people to understand what a de-carbonized community looks like
- Public health can help with this.

Reference: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health and Health Inequity; Hatch, C. What do Canadians really think about climate change? Climate Access & Climate Narratives Initiative. March 2021

Project Goal #2: Support Climate Solutions with Health Benefits

One US study found that the public can be motivated to support climate solutions when presented with:

- health risks associated with climate change
- health benefits associated with climate solutions
- clear calls to action.
- All 3 together – can influence people across the political spectrum

References: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health and Health Inequity; Kotcher John et al.2021.Advocacy messages about climate and health are more effective whenthey include information about risks, solutions, and a normative appeal: Evidence from a conjoint experiment *Journal of Climate Change and Health*.Vol.3.August.

Goal #3: Ensure that Health & Equity is Considered

- Our communities need to be re-designed & re-developed to transition away from fossil fuels & prepare for the changing climate.
- Essential to consider health & health equity impacts when doing so.
- **In some cases, health-related savings will actually pay for the investments needed.**
- We want to maximize the benefits associated with the investments that we will be making.

Reference: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health and Health Inequity.

What do we mean by Health Inequities?

Certain populations are at greater risk of adverse acute and chronic health effects from environmental stressors:

- **Physiologically sensitive populations** e.g., infants, older people
- **Structurally disadvantaged populations:**
  - Social Determinants of Health e.g., income, gender, race
  - Intersectional factors that compound one another
  - Disadvantages that result from inter-personal & systemic biases in our society e.g., sexism, racism, colonialism, classism

Reference: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health and Health Inequity

Five Local Climate Solutions Selected

Transportation Sector:

- Investing in public transit
- Developing walkable communities
- Building safe & connected active transportation infrastructure

Buildings/Green Infrastructure:

- Creating green or greener buildings
- Enhancing carbon sinks with nature-based infrastructure such as trees, parks & forests

References: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health and Health Inequity; Intergovernmental Panel on Climate Change (IPCC).2018.Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by governments

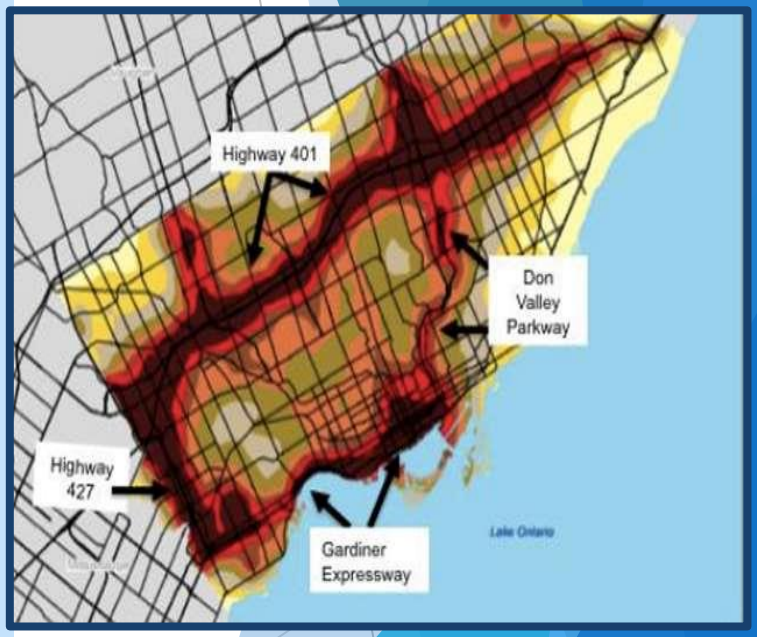
Health Risk Factor - Transportation Sector
Traffic Related Air Pollution (TRAP)

Air Pollution:

- 15,300 deaths/year - $120 Billion/year

TRAP: 100-500 meters

- 1200 deaths/year - $9.5 Billion/year
- Increases risk of asthma in children, CVD, lung cancer & premature deaths
- Likely to cause childhood leukemia & lung cancer in adults; may cause breast cancer
- Neighbourhoods with higher levels of material deprivation – more likely to be near highways



References: : CHASE/CPHA/OPHA, 2023. Climate Change, Population Health and Health Inequity Health Canada, Air Pollution. 2021; Health Canada, TRAP. 2022; Image: TPH, May 2014

Health Risk Factor - Transportation Sector
Physical In-activity

Chronic diseases:

- 150,000 premature deaths/year
- About $200 Billion/year in health-related costs
- **Type 2 Diabetes:**
  - 10% of Canadians over a 10-year period
  - $15.36 Billion over a 10-year period

Physical Activity:

- Reduces the risk of 25 chronic diseases
- 150-200 minutes/week - reduce early deaths by to 26%

Reference: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health, and Health Equity; Samitz et al. 2011; CDPA, 2017; Bilandzic and Roseela 2017/
Photo: Kim Perrotta

Health Climate, Health & Health Equity Benefits
Public Transit

Reduces GHGs:

- A number of modelling studies - VKT & GHGs can be cut significantly by investing in transit.

Increases Physical Activity:

- Montreal Study - round trip on public transit - 25% of daily physical activity recommended

Reduces Air Pollution:

- GTHA – transit-oriented plan – produce $2 billion/year health-related benefits – reducing air pollution & increasing physical activity

References: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health, and Health Equity; Photo: City of Saskatoon, Saskatchewan

Climate, Health & Health Equity Benefits
Public Transit

Increases access to jobs & services:

- 20-40% of people do not drive.

Reduces living costs:

- Costs $6,000-$13,000/year – one car

Reduces vehicle-related deaths:

- 2000 vehicle-related deaths/year

Existing Health Inequities:

- 5% of population – low income – poor transit

References: CHASE/CPHA/OPHA Report Active Travel Factsheet, 2021; Litman, 2017; CAA, 2020; Canada, 2018: Beck et al., 2007; Allen & Farber, 2017;
Photos: Chad Transit, NS; Zunga Bus, Powell River, BC

Climate, Health & Health Equity Benefits
Active Transportation Infrastructure

Many studies – over 2 decades - have demonstrated that safe & connected AT infrastructure:

- Encourages walking & cycling for transportation
- Reduces GHGs & air pollution
- Increases safety of pedestrians & cyclists
- Increases levels of physical activity
- Improves health
- Particularly important for women, older populations, & those with mobility challenges

Reference: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health, and Health Equity Photo: K Perrotta, Union Station, Toronto

Climate, Health & Health Equity Benefits
Active Transportation Infrastructure

A 2017 Long-Term Study that followed >250,000 people in 22 communities in the UK for 5 years found:

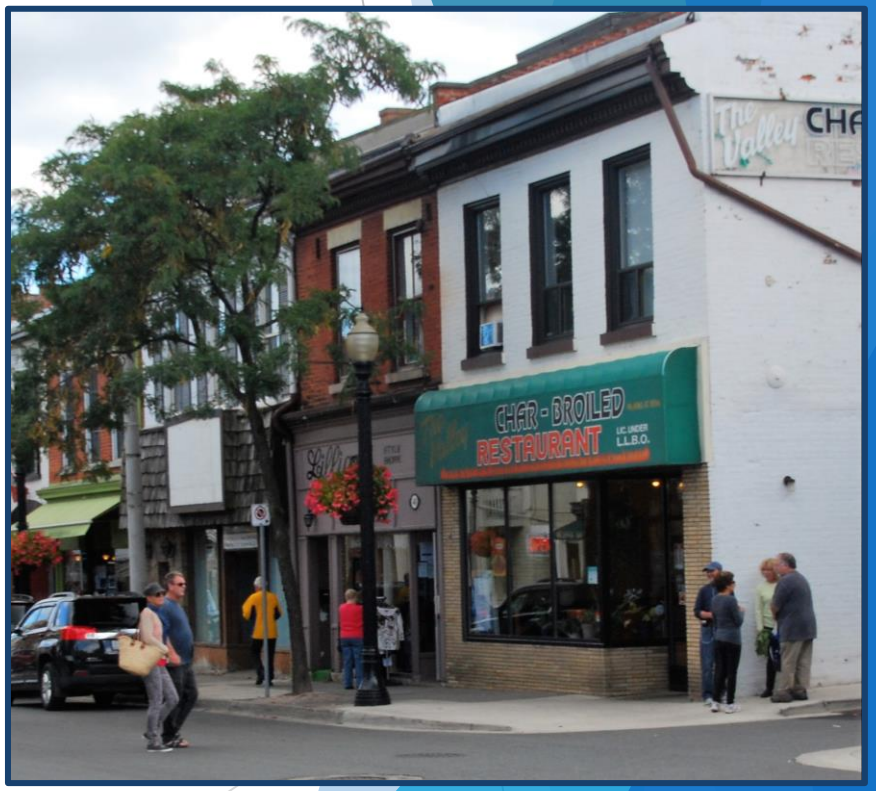
- 80-90% of Cycling Commuters & 50-54% of Walking Commuters met physical activity guidelines
- **Commuting by cycling** – lowered the risk of CVD, cancer & premature deaths from all causes
- **Commuting by walking** - lowered risk of CVD - six miles or two hours/week

References: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health, and Health Equity; Celis-Morales CA 2017. Photo: K Perrotta, Hamilton, Ontario.

Climate, Health & Health Equity Benefits
Walkable Neighbourhoods

Five Ds – Density, Diversity, Design, Destinations, Distance to Transit

- Reduce GHGs
- Increase levels of physical activity
- Reduce weight, diabetes, premature deaths
- Reduce air pollution
- Improve health equity by increasing access to essential amenities
- Greater health benefits for low-income populations



Ref: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health, and Health Equity. Photo: K Perrotta, Hamilton, Ontario.

Climate, Health & Health Equity Benefits
Walkable Neighbourhoods

A 2022 Canadian study - 1.8 million adults over 15 years found that:

- Relative to those living in the least walkable neighbourhoods, those living in the most walkable neighbourhoods were:
  - **9% less likely to die prematurely from CVD**
  - **13% less likely - from Stroke**
  - **3% less likely - all causes**

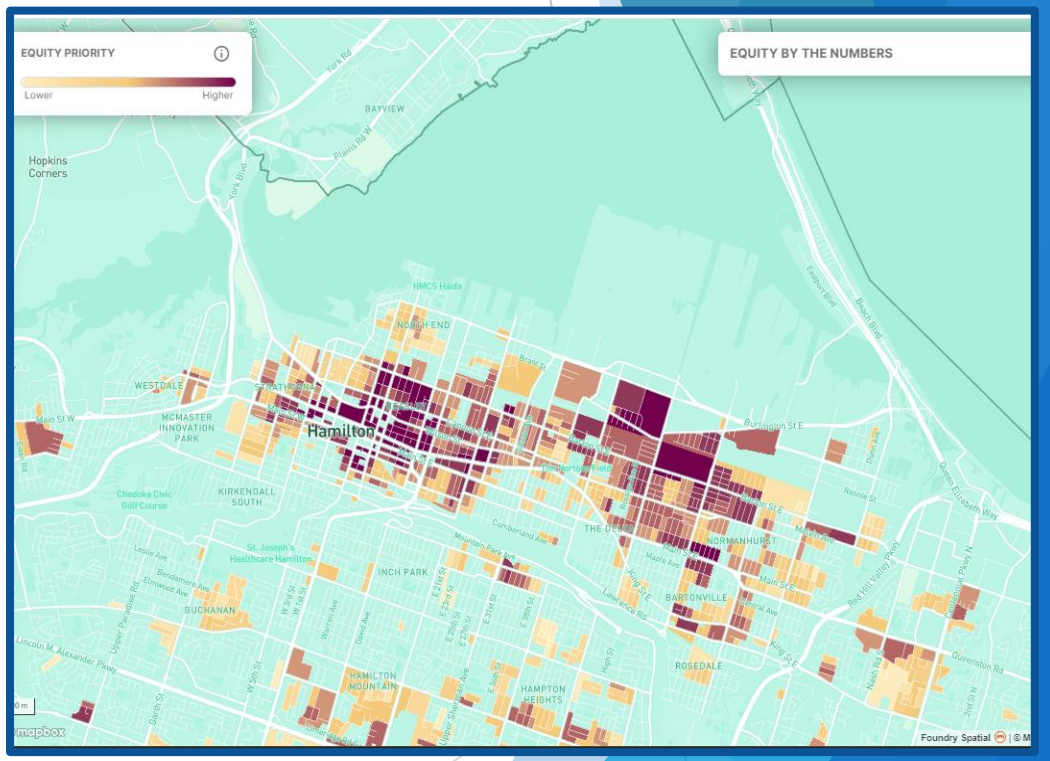
- Those living in the most walkable neighbourhoods who:
  - Had little education
  - Lived in low-income households
  - Lived in highly deprived neighbourhoods

  Were 9%, 5% & 25% less likely to die prematurely from CVD than similar populations living in the least walkable neighbourhoods

Reference: : CHASE/CPHA/OPHA, 2023. Climate Change, Population Health and Health Inequity; Lang Justin et al.2022.Neighbourhood walkability and mortality: Findings from a 15-year follow-up of a nationally representative cohort of Canadian adults in urban areas.*Environmental International*.Vol 161. 149

Health Risk Factor - Buildings & Neighbourhoods
Extreme Heat

- Associated with skin rashes, heat strokes, aggressive behaviour, adverse reproductive outcomes, ERVs, & premature deaths
  - 291 deaths in Montreal in 2010
  - 619 deaths in BC in 2021
- One study - 26 Canadian cities - found that extreme heat can increase premature deaths by 2-13%



References: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health and Health Inequity Health Canada. 2022; Health of Canadians in a Changing Climate - Advancing our Knowledge for Action. Image: HealthyPlan.City – Hamilton-Summer Temperature & Low income Individuals

Climate, Health & Health Equity Benefits Greenspace

Carbon Sink

Cools & Cleans the air

- Captures & filters air pollutants
- Cools temperature
- At a local & community level

Health Inequities:

- Materially deprived neighbourhoods more likely to have higher levels of air pollution & less green

References: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health, and Health Equity; DSF, 2015; Doiron D, 2020. Photo: Beech Street Play Area, Peel Region

Climate, Health & Health Equity Benefits Greenspace

Improves Mental & Physical Health:

- Decreases stress, ADD/ADHD symptoms, & depression
- Associated with healthier births, healthier weights, improved cognitive function, & decreased risk of diabetes & premature deaths from all causes
- Children & low-income populations appear to benefit the most

One long-term study:

- 1.3 million Canadians – higher levels of greenness - 250-500 m
- Decreased premature deaths from 6 causes by 8-12%

References: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health, and Health Equity; Zupancic, TPH, 2015; Cottageri, 2022; Villeneuve, 2022; De la Fuente, 2021; Crouse, 2017.

Climate, Health & Health Equity Benefits
Green Buildings & Building Retrofits

Poor Indoor Environmental Quality (IEQ):

- Can increase the risk of CVD, strokes, premature deaths, asthma, & respiratory diseases.
- Extreme heat & cold; Viruses & bacteria
- Mould & dampness; Air pollutants & toxics

Poor IEQ can Amplify Health Inequities:

- More likely to live in poor IEQ
- Less likely to have the resources to protect themselves

References: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health, and Health Equity; Vardoulakis, 2015; Kosatsky, 2009, Belanger, 2014; Health Canada, 2022 Photo: K Perrotta, Bain Co-op, Toronto.

Climate, Health & Health Equity Benefits
Green Buildings & Building Retrofits

Several studies - green buildings & retrofits have improved health & climate resilience:

- Stabilizing temperatures; Reducing mould; Improving indoor air quality

Can Reduce Health Inequities:

- By reducing energy costs
- 1 in 10 households spend >6% on energy

Reference: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health, and Health Equity; Torrie, 2020; MacNaughton, 2018; Chatterjee, 2021; Das & Martiskainen, 2022. Photo: Kim Perrotta, Student Housing, Hamilton

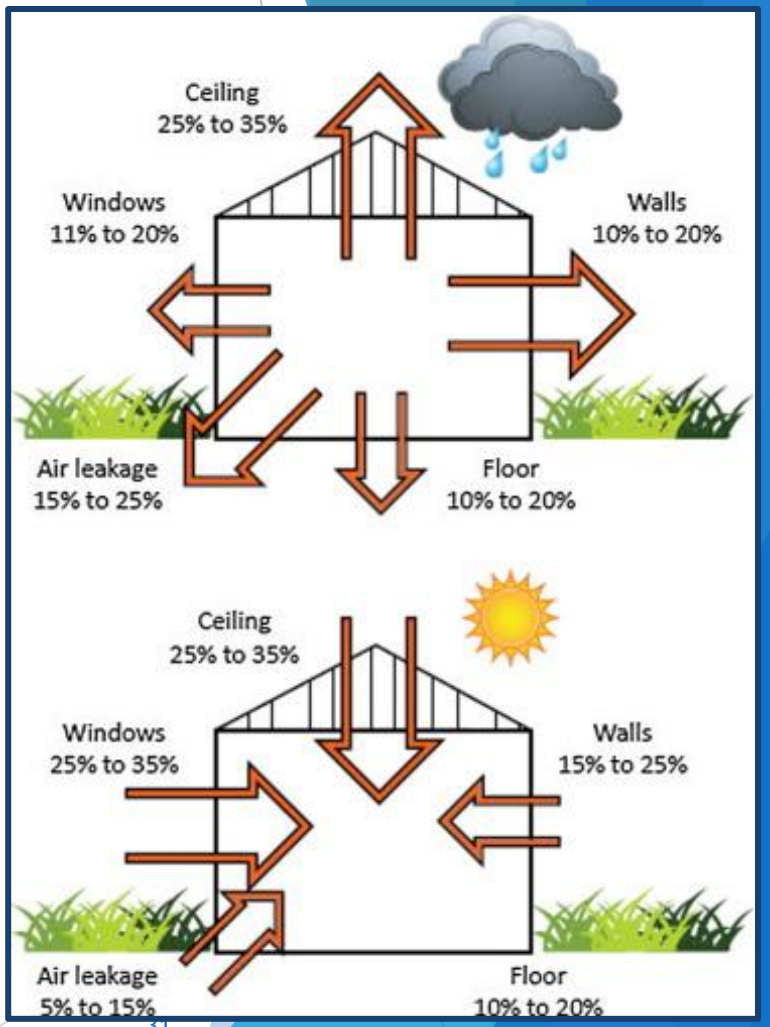
Climate, Health & Health Equity Benefits
Green Buildings & Building Retrofits

Reduce Greenhouse Gases:

- IEA has estimated that energy demand for space heating in Canada can be reduced by 85% by 2050 by improving building envelopes & heat pumps

Reduces Outdoor Air Pollution

- Oil & gas release NOx & other pollutants
- US study - $47 Billion in health-related costs – burning natural case in residential buildings



Reference: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health, and Health Equity. IEA, 2019; Buonocore j et al. 2021. Graphic: https://www.sciencedirect.com/science/article/pii/S1110016817301734

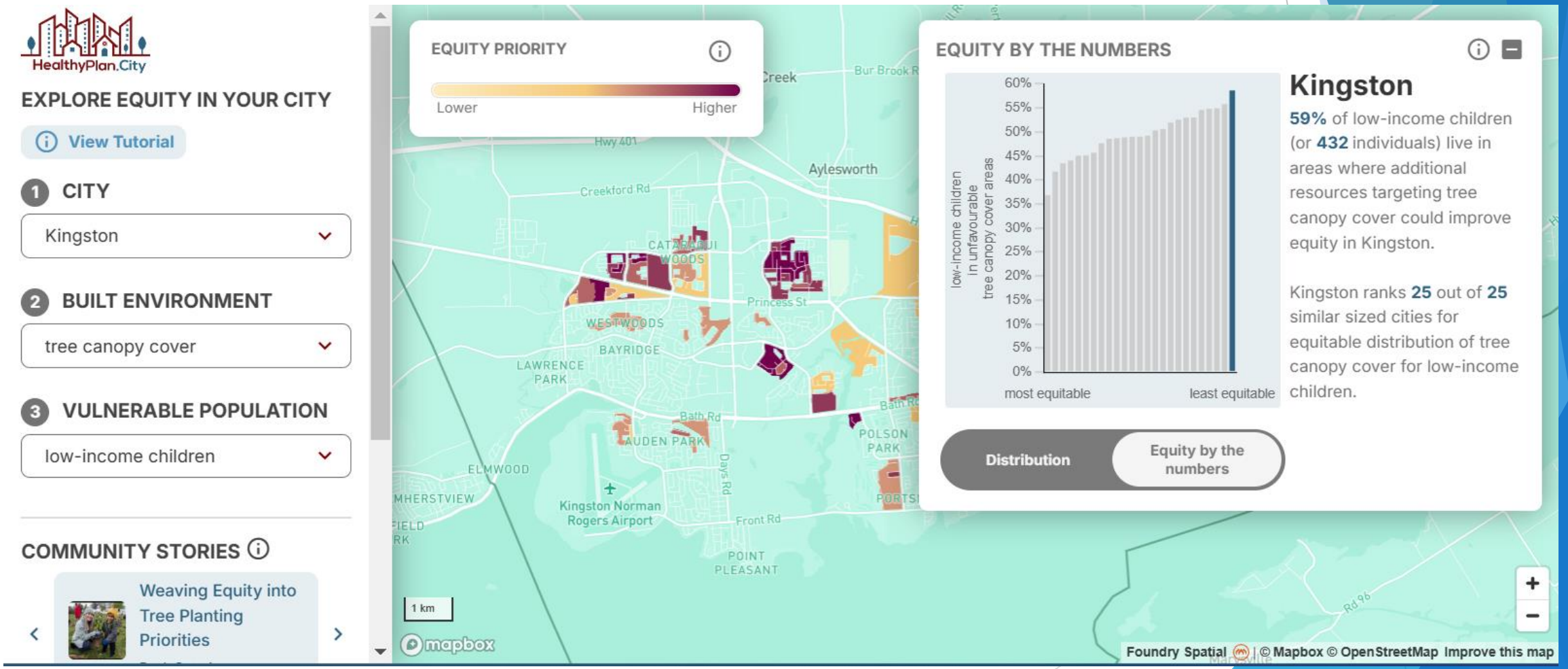
Climate, Health & Health Equity Benefits
Heat Pumps

Cold Climate air-source heat pumps (ccASHP) - Operate to temperatures as low as -25°C

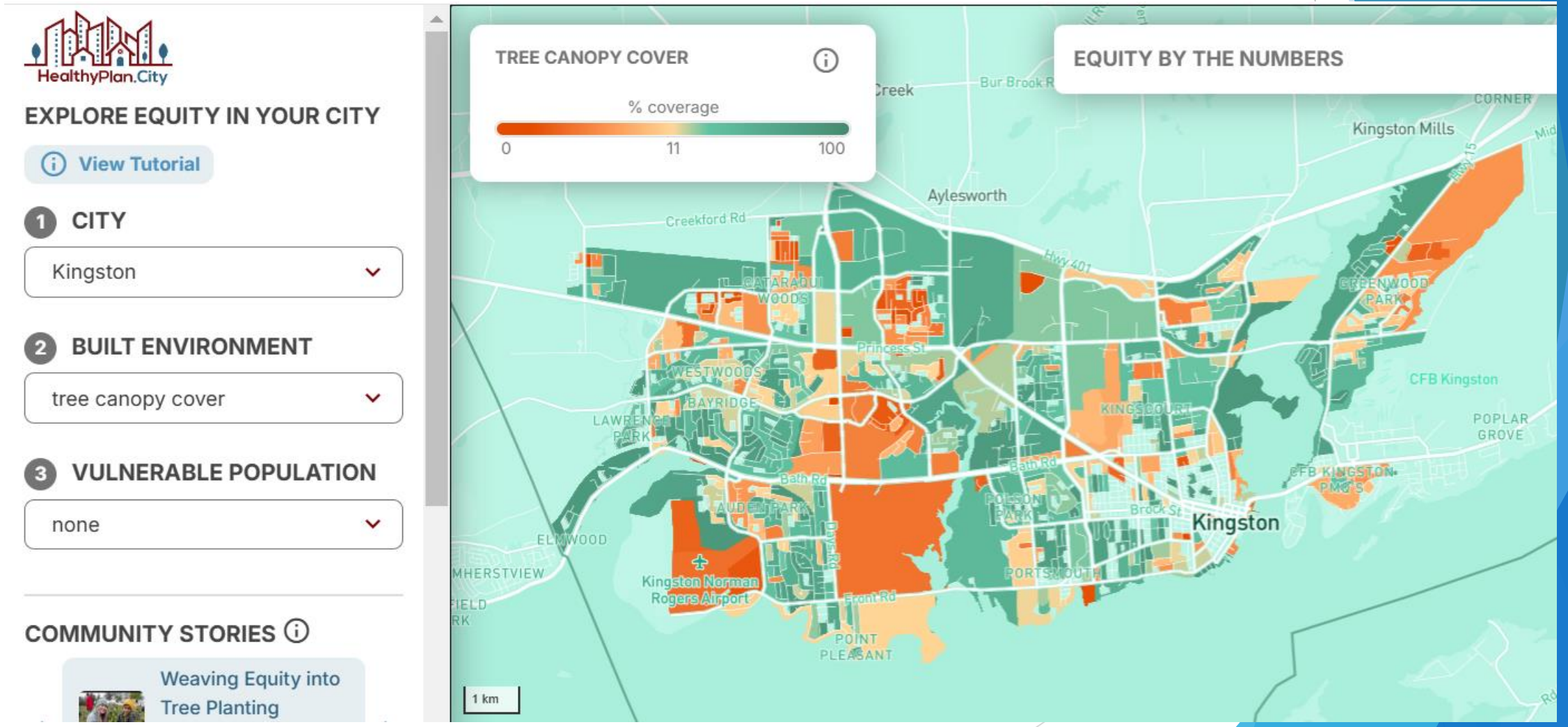
- Completely replace conventional oil- or natural gas-fired **heating systems & air conditioning**
- **Use 70% less energy than conventional home heating**
- When electricity is from renewable energy sources, Heat Pumps can cut GHGs from the heating & cooling of buildings by 100%

Ref: CHASE/CPHA/OPHA, 2023. Climate Change, Population Health, and Health Equity; Janssen Erik Janssen. 2023; Turner Chris. 2023. McDiarmid Climate Consulting. 2022 Photo: Heat Pump, CBC https://www.cbc.ca/news/science/heat-pump-faq-1.6824634

HealthyPlan.City - Built Environment and Health Equity Indicators



HealthyPlan.City - Built Environment and Health Equity Indicators



Questions:

Using the HealthyPlan.City Tool, look at your own community and see what built environment indicators are the greatest concern in your community for one or more of the equity-deserving populations?

https://healthyplan.city/en

Public Health Agencies in Canada

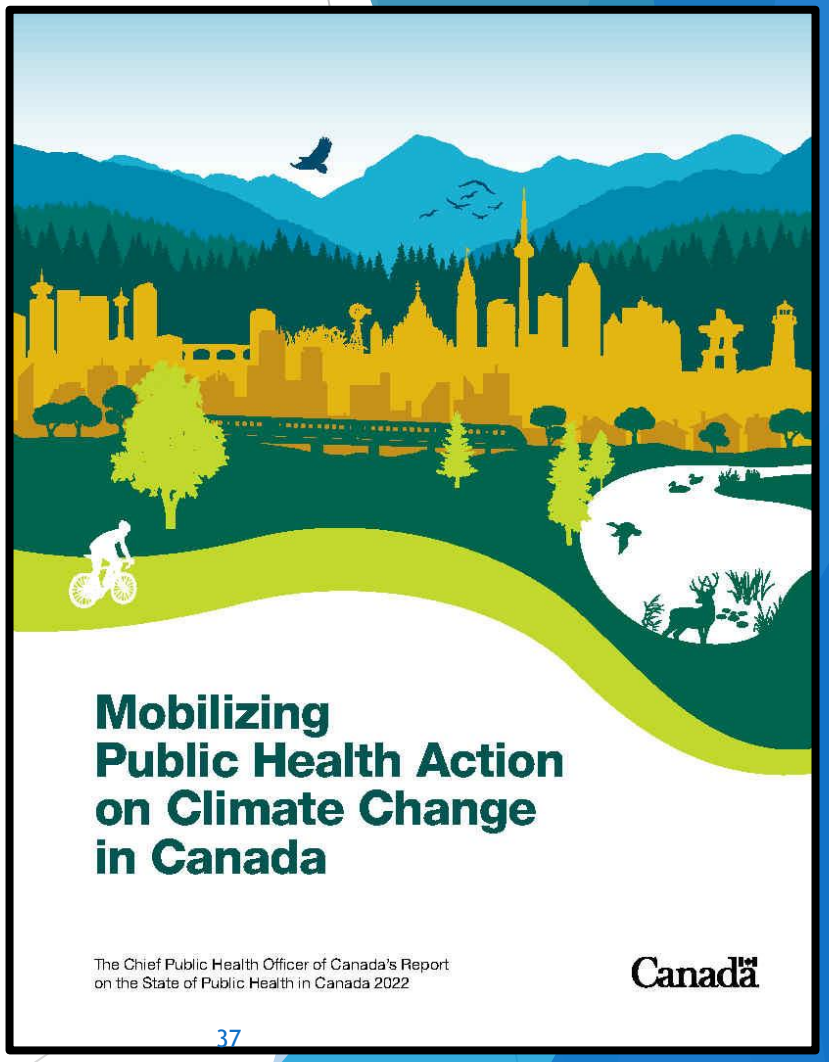
- **How is public health different from a public healthcare system?**
- **Most of Canada -** Arms-length agencies of the province
- **Ontario**
  - Funded by the Province primarily
  - Departments of Cities – Toronto, Hamilton, Ottawa
  - Departments of Regional Municipalities – Halton Region, Durham Region, Peel Region
  - Independent Boards – Simcoe Muskoka District Health Unit

Chief Public Health Officer - 2022

"We must continue to bring climate considerations into public health work to prepare for, and respond to, the now inevitable health impacts. This means supporting communities to adapt to the climate risks they will face."

"But we also need to put health at the centre of climate action and focus on efforts that will lead to significant and near immediate health and environmental benefits…It is clear, climate action is good for our health and public health systems have a critical role to play."

Link to CPHO Report



Case Studies: Ottawa Public Health
Walkable Neighbourhoods & Green Buildings

OPH is a Department of the city

- **Co-located two staff in the Planning Dept** to help develop the new Official Plan
  - One staff - **15-minute neighbourhoods**
  - One Staff – **Resiliency to Extreme Heat**
- **High Performance Development Standard for buildings**
  - Mitigate health impacts for occupants & residents
  - Protect fresh air intakes from TRAP
  - Community energy planning, sustainable roofing, soil volumes, bird safe designs

Ref: https://chasecanada.org/2022/06/24/public-health-and-planning-co-creating-15-minute-neighbourhoods-in-ottawa/

Case Study: Vancouver Coastal Health
Transit & AT

VCH is an arms-length agency of the province

- **Establish a Healthy Environments Team -** fold social & environmental determinants of health - into the built environment
  - Meet staff in key agencies such as TransLink
  - Provide formal comments
  - Medical Health Officer depute to political bodies
- **E.g. TransLink** – transit impacts on physical activity, access & social equity, air pollution, GHGs, & vehicle-related injuries & deaths

Ref: https://chasecanada.org/2023/01/12/shaping-communities-with-the-social-and-environmental-determinants-of-health-in-Vancouver/ **Photo: Laura Chow**

Case Study: Niagara Region Public Health & Emergency Services Department - Active Transportation & Transit

- **Health Equity-Informed Planning** adopted in 2020
- **Public Health manages the process**
  - 3 levels of HIA – Rapid, Intermediate & Comprehensive
  - Rapid HIA – desktop exercise, secondary data, project manager & public health staff
- **Assess project's potential to amplify or mitigate negative health impacts on priority populations for each SDOH**
- **E.g. Road Re-construction near 3 schools & 4 adult living facilities** - Increase active travel, safety for pedestrians & cyclists, & access to services

Ref: https://chasecanada.org/2022/07/20/applying-health-equity-informed-planning-to-operations-in-niagara-region/

Case Study: Peel Health - Greenspace – Trees

Peel Health is a Department in Peel Region

- **2012 Climate Vulnerability Report & 2019 Health Status report -** extreme heat as a health risk
- Member of the Region's Urban Forest Working Group & Climate Change Steering Committee & Advisory Committee for **Tree Planting Prioritization Tool**
  - Tool based on benefits of trees, data sources & weighting recommended by Committee
  - Tool can be used to prioritize low-income neighbourhoods for tree planting

Ref: https://chasecanada.org/2023/06/15/bringing-health-and-health-equity-into-natural-heritage-in-peel-region/
Photo: Peel Region, Alton Bike Lanes

Case Study: Island Health - Building Retrofits & Heat Pumps

Vancouver Island Health Authority - Agency of the province - many small & remote communities

In 2013 – Healthy Built Environment Portfolio – address health & health equity

- **Province** provides policy positions & resources.
- **HBE Coordinator** - builds capacity & supports EHOs
- **EHOs** – work with **community health networks** that include elected leaders, First Nations reps, community groups, staff from local municipalities

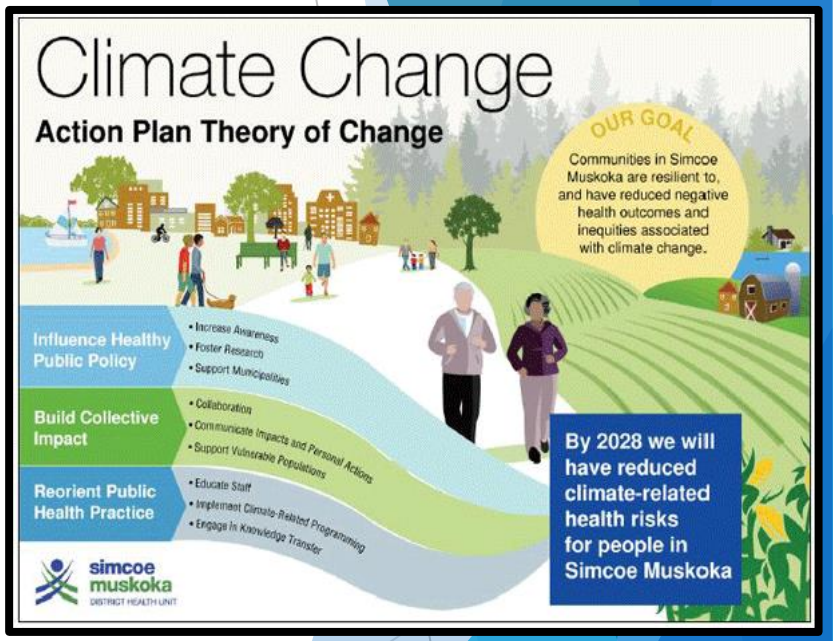
E.g. Cowichan Valley Regional District - air pollution concern - swapping out wood stoves for heat pumps

Ref: https://chasecanada.org/2023/05/11/swapping-heat-pumps-for-wood-stoves-in-cowichan-valley-bc/

Case Study: Simcoe Muskoka District Health Unit – Climate Change & Indigenous Perspective

SMDHU is a local public health agency - independent Board of Health - 26 municipalities in Ontario

- Three-pronged program for Climate Health
  - **Influence Healthy Public Policy** – updated built environment policies to include climate perspective
  - **Develop Collective Impact** – established SM Climate Change Exchange – 40 members from organizations
  - **Re-orient public health practice** – with climate change mitigation & adaptation built into all work
- Contracted Indigenous consultant to do research on **Indigenous perspective on climate adaptation**



Ref: https://chasecanada.org/2022/11/25/addressing-climate-health-in-simcoe-muskoka-ontario/

Common Themes - 10 Public Health Case Studies

- **Climate Change Mitigation** – Benefits recognized but not always officially
- **Intersectoral Collaboration is essential** – context shapes this
- **Need to Engage Disadvantaged populations**
- **Senior Management Support is Pivotal**
- **Requires cultivating relationships & committing resources**
- **Specialized Training can be helpful**
- **Requires Increased and Sustainable Funding for Public Health**

Public Health Promoting Local Climate Actions

https://chasecanada.org/public-health-addressing-health-health-equity-and-climate-change/

CHASE

CANADIAN HEALTH ASSOCIATION
FOR SUSTAINABILITY & EQUITY

E-Mail: Kim@chasecanada.org

Website: **chase-canada.org**

LinkedIn: Kim Perrotta