Climate, Health & Sustainable Care

Inaugural Symposium

UNIVERSITY OF TORONTO

COLLABORATIVE CENTRE FOR Climate, Health + Sustainable Care

@climate-health

climate.health@utoronto.ca

Governance & System Change for Sustainable Health Systems

Brittany Barber, Carlene van der Heiden, Melanie Seabrook & Sara Allin, Camila Heredia

Moderator: Fiona Miller

UNIVERSITY OF TORONTO

COLLABORATIVE CENTRE FOR Climate, Health + Sustainable Care

Climate, Health & Sustainable Care

Inaugural Symposium

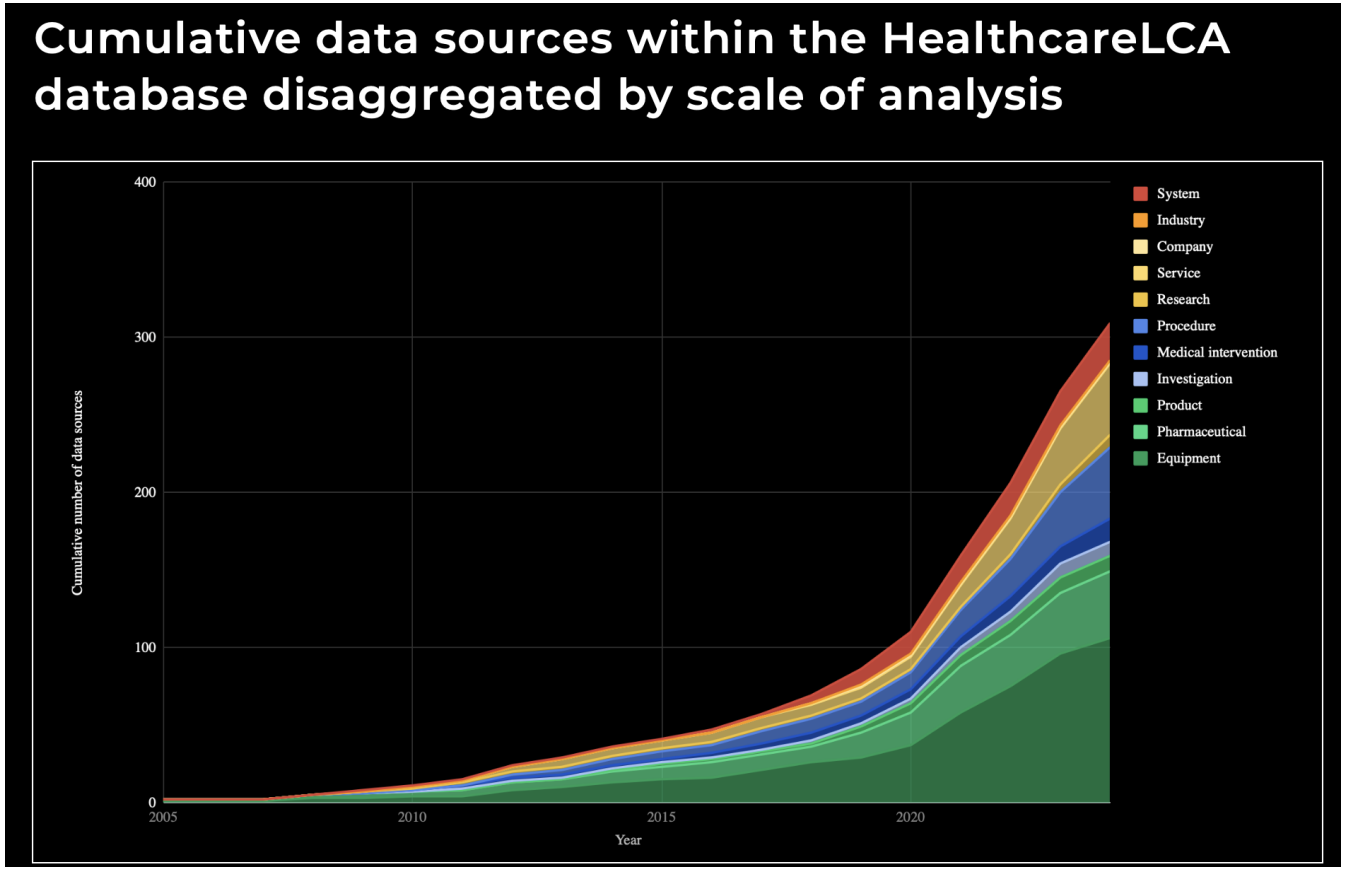
Advancing Environmentally Sustainable Learning Health Systems

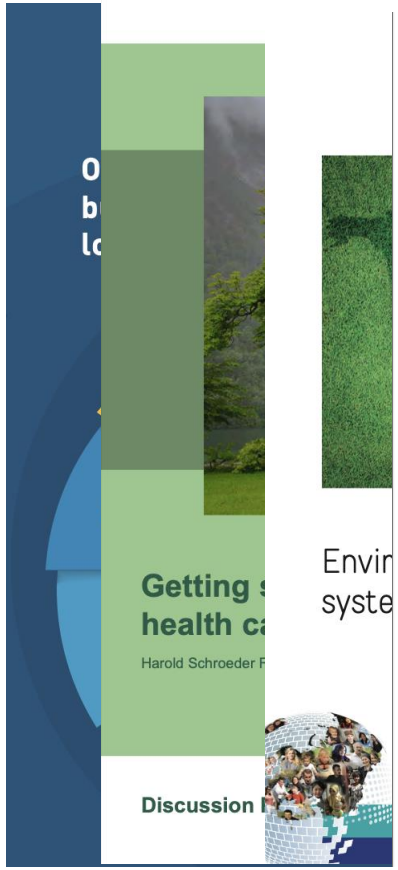
Dr. Brittany Barber
brittany.barber@dal.ca

CIHR Health Systems Impact Postdoctoral Fellow
Mentors: Drs. Douglas Sinclair, Christine Cassidy

CIHR IRSC
Canadian Institutes of Health Research | Instituts de recherche en santé du Canada

IWK Health





Proliferation of Data, Frameworks, Reports

Systems—Thinking Approach

Health organizations are required to develop their own tailored approach

Need for evidence-based framework to guide change management

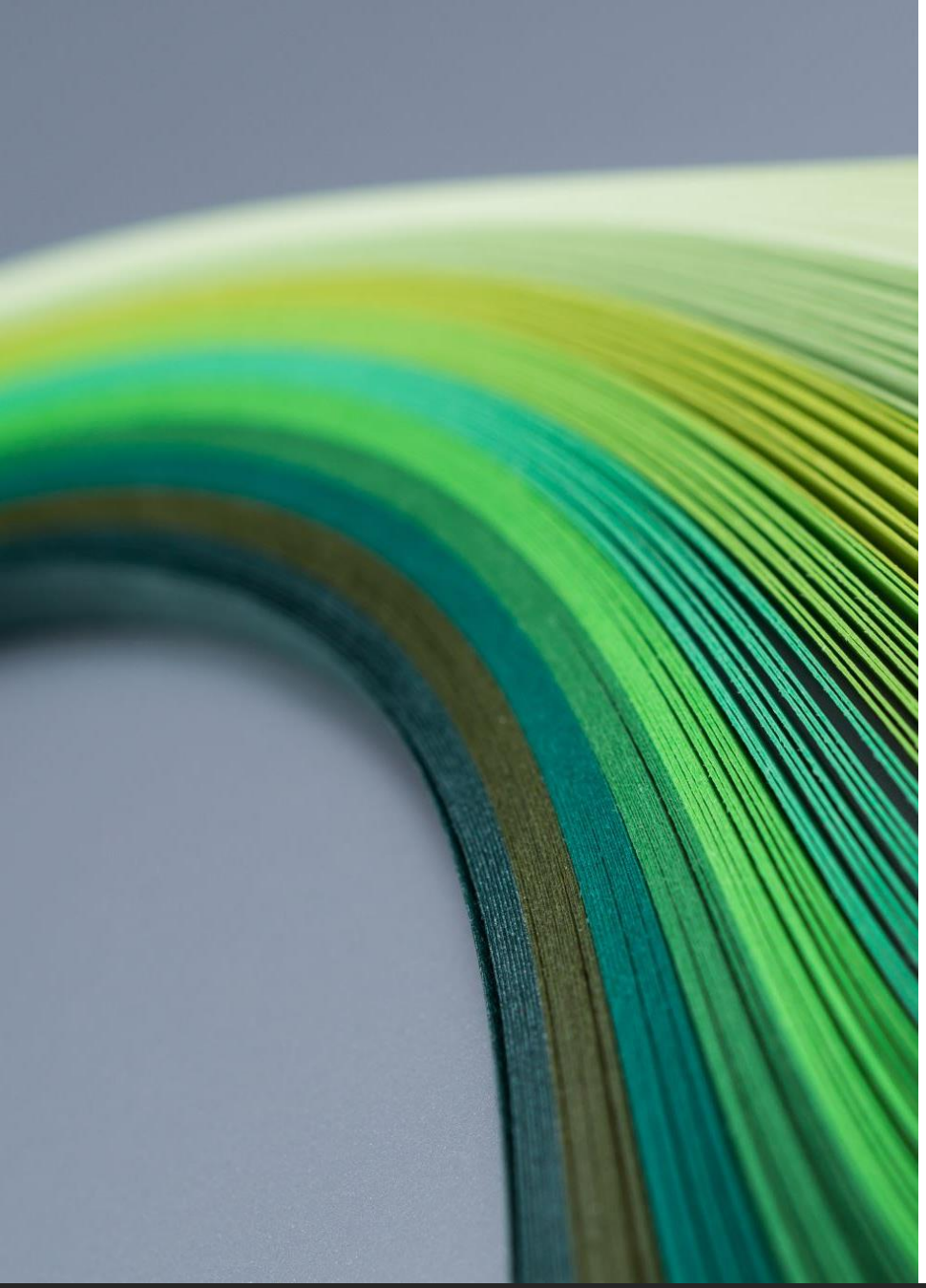
Learning Health Systems Framework

https://mssu.ca/research-learning-health-systems/

7 Characteristics of a Rapid Learning Health System

Category	LHS Characteristic
Patient Centred	1. Engaged patients
Data & Evidence Driven	2. Digital capture, linkage and timely sharing of relevant data
	3. Timely production of research evidence
System Supported	4. Appropriate decision supports
	5. Aligned governance, financial and delivery arrangements
Culture & Competencies Enabled	6. Culture of rapid learning and improvement
	7. Competencies for rapid learning and improvement

(Lavis et al., 2018)



Research Question

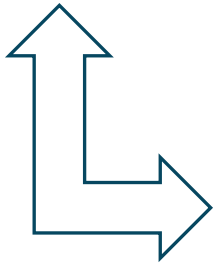
How can LHS frameworks strengthen organizational approaches to environmentally sustainable health systems?

1. What are organizational level challenges to advancing environmentally sustainable LHS?

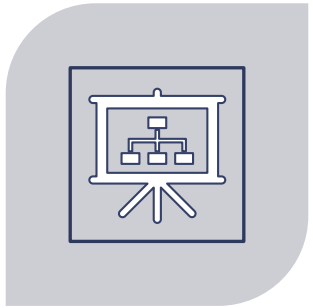
2. What are recommendations for planning environmentally sustainable LHS?

Environmental Scan

Jurisdictional scan of Nova Scotia organizational strategies and policies



Informal discussions with health system leaders, healthcare professionals, and knowledge experts in nova scotia



Deductive content analysis

Knowledge users discussed **7 key challenges and recommendations** for advancing environmentally sustainable LHS

Challenges and Recommendations for Advancing Environmentally Sustainable LHS

Patient-Centred

- Patients and families are not currently engaged.
  A planetary health framework is not embedded within patient-centred approaches to care.
- Patient involvement is critical in co-creating environmentally sustainable organizational goals and strategies.

Data and Evidence Driven

- Emissions data is not systematically measured and monitored across health organizations and health regions.
- Embedded project teams to support timely production and sharing of emissions data

System Supported

- Challenges persist for gathering and sharing data to inform decision-making policies, procedures, and practices.
- Centralized data management system and embedded research scientists to support identification of evidence-based environmentally sustainable practice

Culture and Competencies

- Limited knowledge of direct and indirect emissions and competencies for stewarding sustainable practices
- Organizational executive leadership and training to implement a multi-pronged strategy

Implications

- A LHS framework provides structure for identifying and addressing organizational challenges and coordinating efforts for health system change

- Value-based healthcare ***largely ignores environmental and social value*** and ***costs from the provision of health care***

- Further research is required to explore *implementation strategies* to advance environmentally sustainable LHS

Advancing Environmentally Sustainable Learning Health Systems

Dr. Brittany Barber
brittany.barber@dal.ca

CIHR Health Systems Impact Postdoctoral Fellow
Mentors: Drs. Douglas Sinclair, Christine Cassidy

CIHR IRSC
Canadian Institutes of Health Research | Instituts de recherche en santé du Canada

IWK Health

Canadian Blood Services

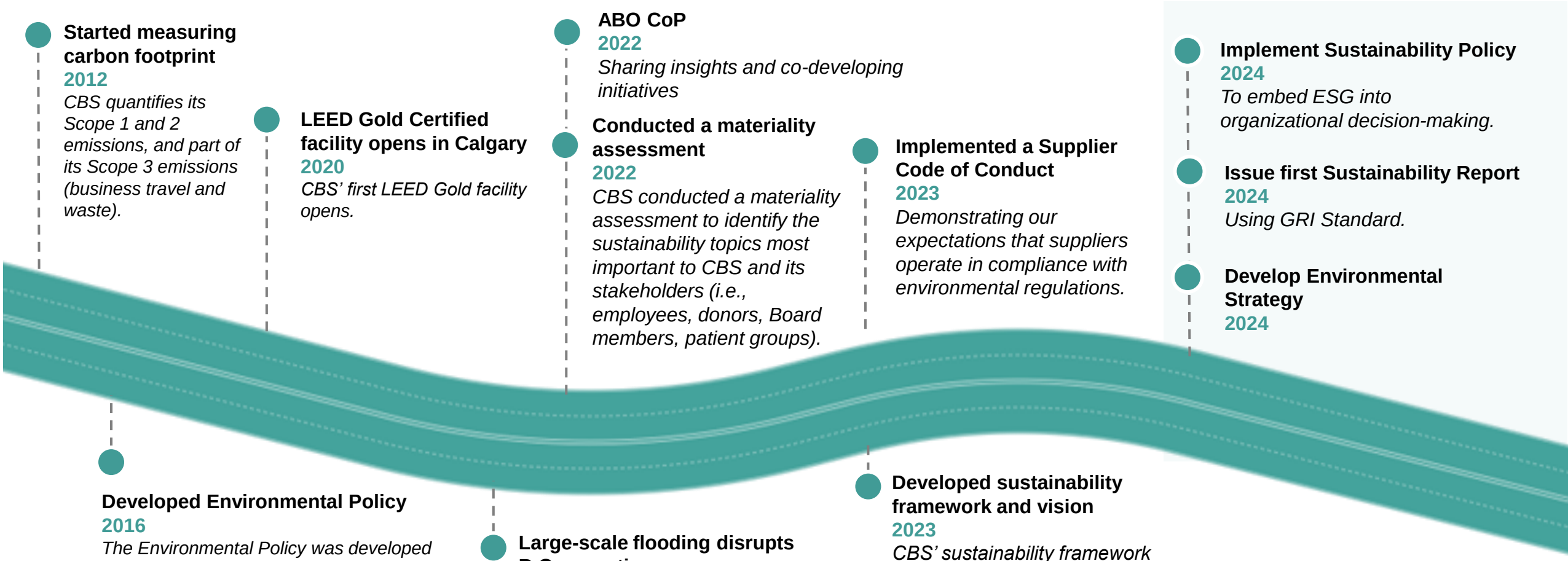
BLOOD
PLASMA
STEM CELLS
ORGANS
& TISSUES

Empowering Leaders, Inspiring Change: Navigating Tensions for Sustainable Practices

October 2024

CBS' Environmental Journey

CBS has taken several initiatives to increase environmental sustainability through the implementation of several policies and activities. The development of the recent environmental strategy serves to solidify CBS effort and increase its commitments.



Started measuring carbon footprint
2012
CBS quantifies its Scope 1 and 2 emissions, and part of its Scope 3 emissions (business travel and waste).

LEED Gold Certified facility opens in Calgary
2020
CBS' first LEED Gold facility opens.

ABO CoP
2022
Sharing insights and co-developing initiatives

Conducted a materiality assessment
2022
CBS conducted a materiality assessment to identify the sustainability topics most important to CBS and its stakeholders (i.e., employees, donors, Board members, patient groups).

Implemented a Supplier Code of Conduct
2023
Demonstrating our expectations that suppliers operate in compliance with environmental regulations.

Implement Sustainability Policy
2024
To embed ESG into organizational decision-making.

Issue first Sustainability Report
2024
Using GRI Standard.

Develop Environmental Strategy
2024

Developed Environmental Policy
2016
The Environmental Policy was developed to outline CBS' commitment to environmental sustainability and compliance.

Large-scale flooding disrupts B.C. operations.
2021
highlighting the importance of climate resilience.

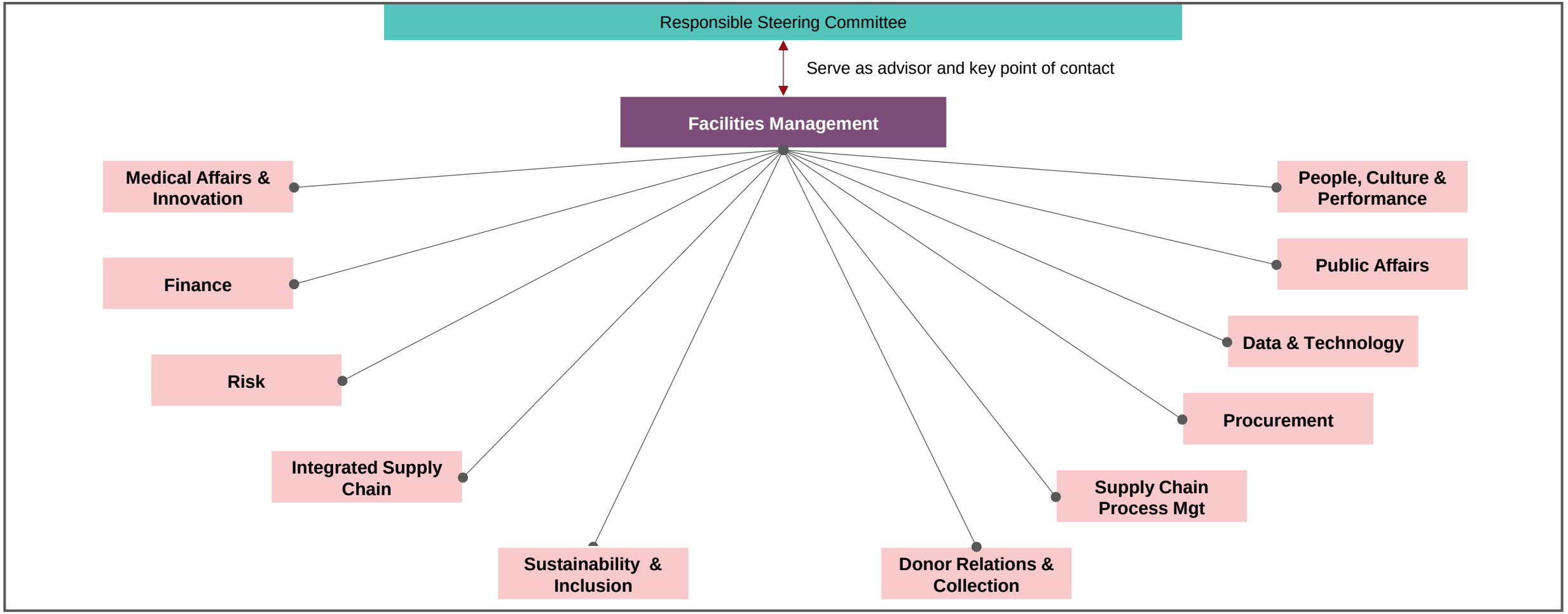
Developed sustainability framework and vision
2023
CBS' sustainability framework defines and categories CBS' approach to environmental and social issues.

Putting together the pieces – understanding context

Interaction models shows how departments and leadership should share information and work together

Putting together the pieces – stakeholder mapping

Interaction models shows how departments and leadership should share information and work together



Integrated Environmental Sustainability Vision

The vision aligns to CBS's sustainability framework and overall brand promise, which will be easy to embed in broader transformation efforts

Operating a climate resilient and environmentally responsible lifeline for Canada

Safeguard

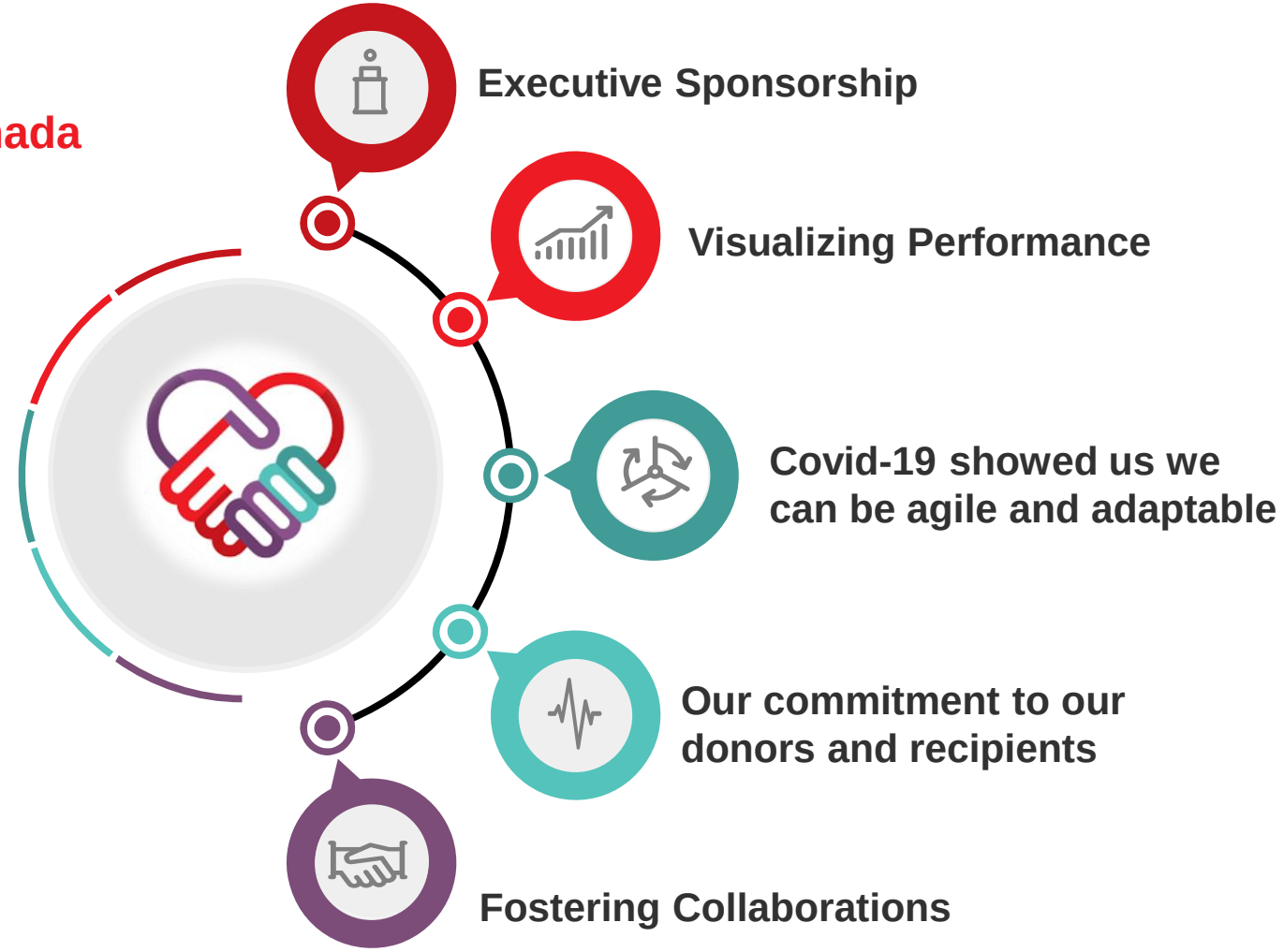
Anticipate disruptions and manage climate impacts to maintain support for patient, donors and their care.

Engage

Inspire and empower all stakeholders to adopt sustainable practice in everyday actions.

Improve

Embed evidence-based practices to reduce and mitigate CBS' environmental impact to drive excellence.



Canadian Blood Services

BLOOD
PLASMA
STEM CELLS
ORGANS
& TISSUES

Team Acknowledgement

~ Ian Roggers, Ann Lagrandeur, Sarah Buckle, Harsha Dave, Hannah Rundle ~

Public Health Systems Governance for Intersectoral Action on Extreme Heat in Three Canadian Provinces

Mélanie Seabrook, MSc

Sara Allin, PhD

Climate, Health & Sustainable Care Symposium | October 22, 2024

University of Toronto

NAO
North American Observatory on Health Systems and Policies

Acknowledgements

Study team:

Sara Allin, PhD
Principal Investigator

Erica Di Ruggiero, PhD
Co-Principal Investigator

Fiona Miller, PhD
Co-Principal Investigator

Stephanie Simpson, PhD

Mélanie Seabrook, MSc

Anjali Joshi-Dave

Edward Xie, MD

Ana Patricia Ayala, AHIP
Research Librarian

Jane Zhao, MSc

Funding:

This project is funded by the Canadian Institutes of Health Research (CIHR) Catalyst Grant: "Chief Public Health Officer (CPHO) Report 2022: Mobilizing Public Health Action on Climate Change in Canada" (#502936)

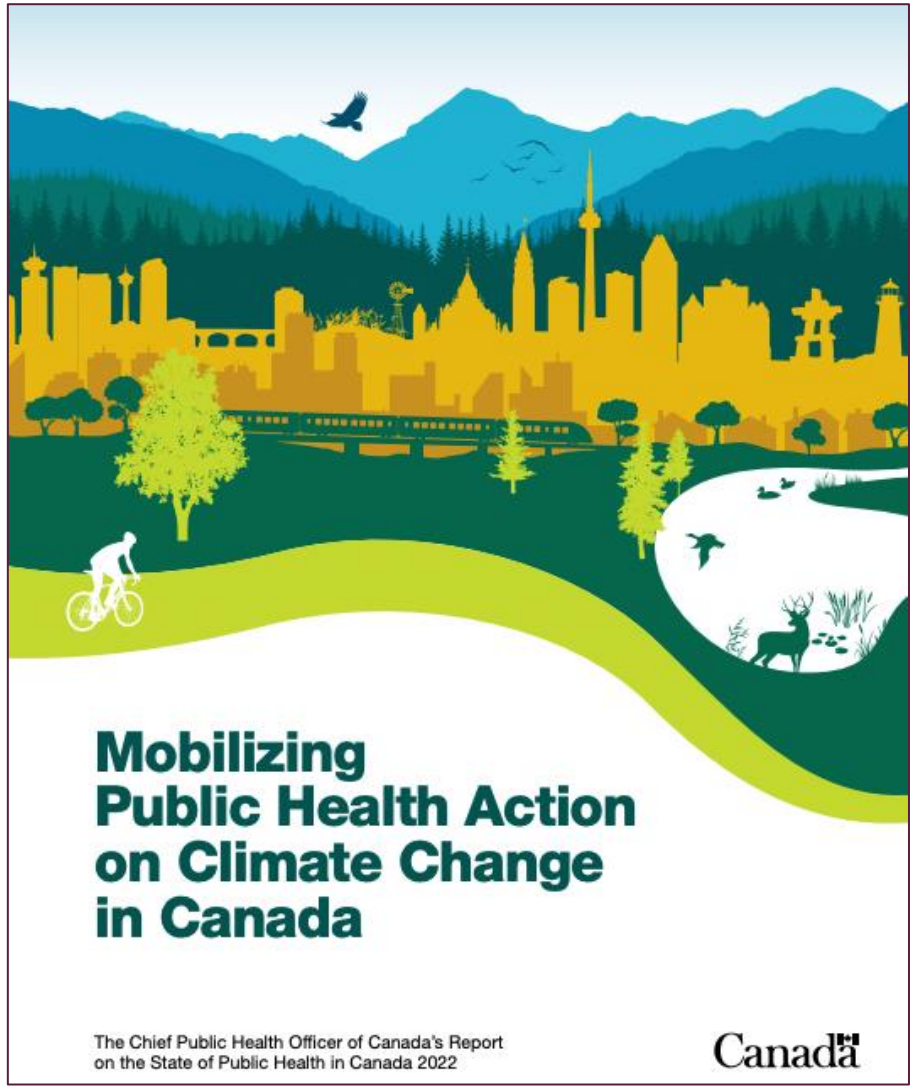
CIHR IRSC Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

Institute of Health Policy, Management and Evaluation
UNIVERSITY OF TORONTO

NAO North American Observatory on Health Systems and Policies

Intersectoral collaboration is needed to address the health effects of climate change

- Climate change action requires **coordination** among public health authorities, governments, and community organizations.
- **Public health authorities play important roles** as intersectoral advocates, convenors, and health impact mitigators.
- **Cities** are at the forefront of intersectoral climate resilience.



Project Aim: Identify and strengthen collaborative governance mechanisms to address extreme heat

Objective 1: Describe collaborative governance mechanisms to address extreme heat among public health and partners at provincial and local levels.

Approach: Rapid scoping review of academic (n=14) and grey (n=328) literature for QC, ON, and BC (2005-2023); Develop comparative case studies.

Objective 2: Assess the perceived effectiveness of existing governance mechanisms through local case studies set in Toronto, Montreal, and Vancouver.

Approach: Comparative case studies (N=27) of heat response strategies in Toronto (8), Montreal (12), and Vancouver (7).

Objective 3: Identify and communicate actions to strengthen governance arrangements.

Approach: Deliberative dialogue to develop and share recommendations.

Theoretical framework: Collaborative Governance

Formal and informal structures and mechanisms that shape the setting, pursuit, and measurement of progress toward common goals, and establish roles and interactions among multiple actors

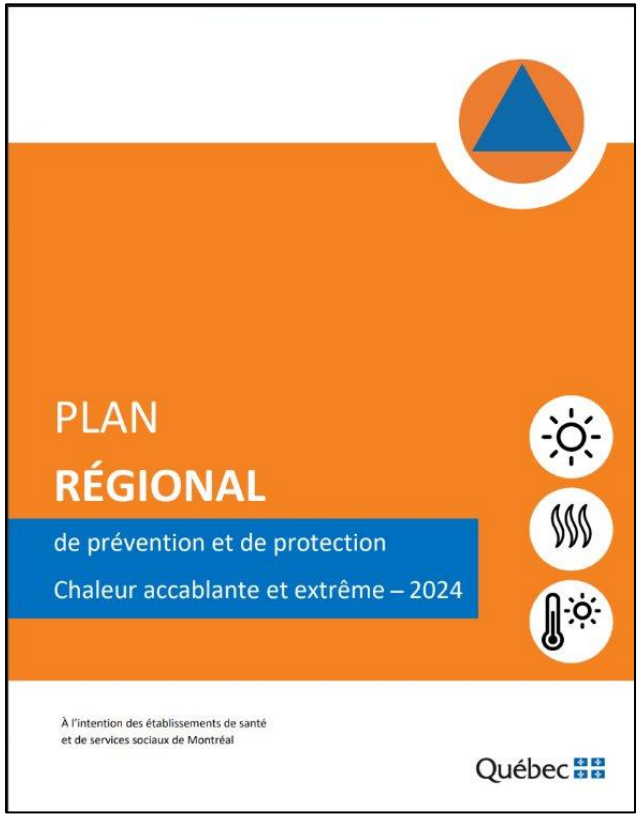
1. **Participant-governed networks:** decentralized collaborative coordination
2. **Lead organization-governed networks:** hierarchical coordination & decision-making
3. **Network administrative organization governance:** new organization established to oversee collaboration

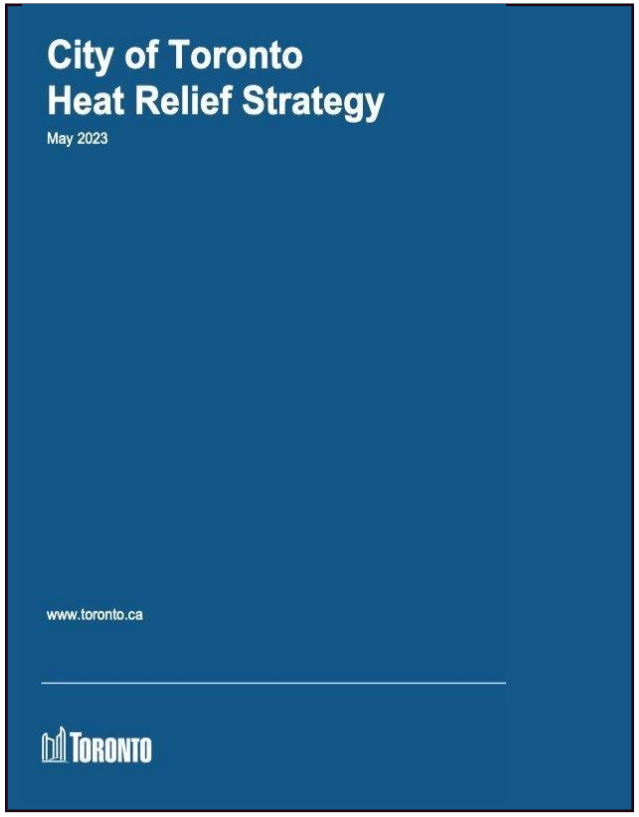
Effective Collaborative Governance

Number of participants
Level of trust
Consensus
Specialist expertise
Decision transparency
Accountability
Policy Capacity
Resourcing
Monitoring & Evaluation

Keith G. Provan, Patrick Kenis, Modes of Network Governance: Structure, Management, and Effectiveness, *Journal of Public Administration Research and Theory*, Volume 18, Issue 2, April 2008, Pages 229–252, https://doi.org/10.1093/jopart/mum015

Findings: Mandated Heat Response

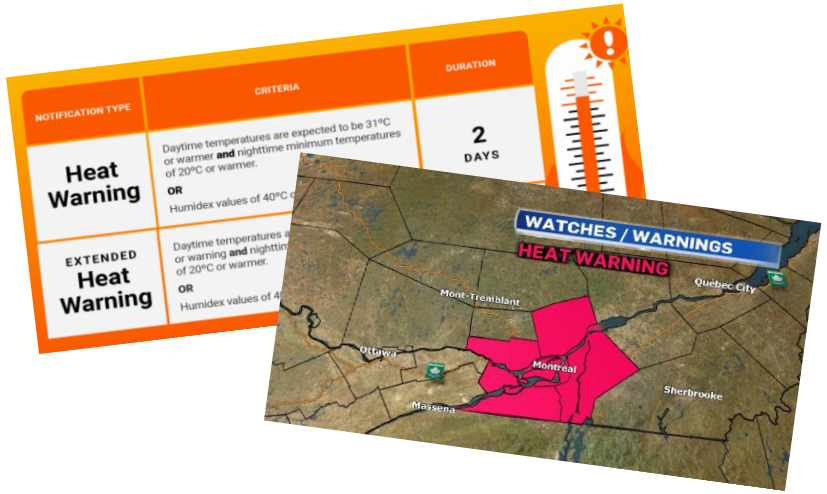




Coordinating Authorities	Montréal Civil Security / Montréal Public Health	Toronto Emergency Management	Vancouver Emergency Management Agency

Findings: Strategy Components

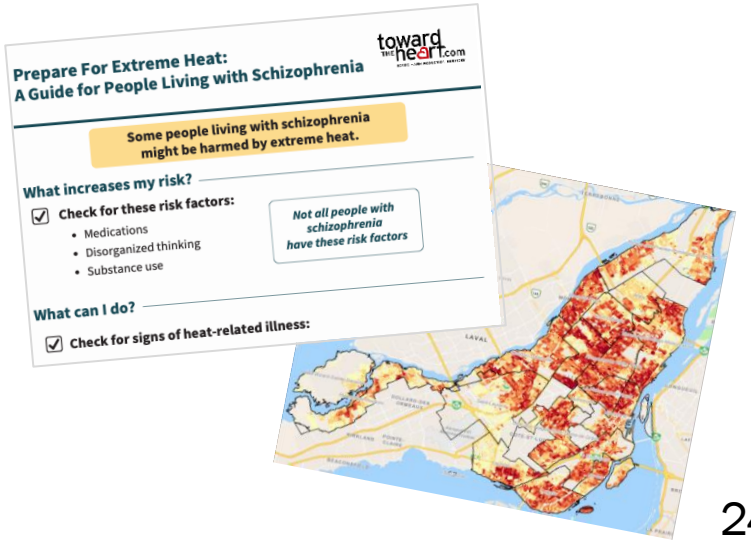
Alerting Systems



Health Information

Cooling Services

Targeted Outreach



Findings: Governance Approaches

Actors Involved:
Municipal and regional authorities including public health, emergency management, and climate resilience departments, as well as community organizations

Lead Authorities:

Montreal: Civil Security & Public Health

Toronto: Emergency Management

Vancouver: Emergency Management

Nature of Collaboration:
Integrated, cross-sectoral response (MTL) versus siloed and portfolio-specific (TO & VAN); limited collaboration between levels of government

Montreal Civil Security Structure:

→ "Lead organization-governed network"

→ Concerted approach to decision-making, with a hierarchical structure

Accountability:
No formal accountability mechanisms and challenges around performance measurement; actors largely hold themselves accountable for fulfilling strategic & operational objectives

Yearly plan updates:

→ Fall debriefs to inform the next year's strategy, generally with limited changes year to year

Findings: Challenges and Enablers to Collaboration

Challenges partnering with Community Organizations

- Community-led heat response initiatives
- Expertise with addressing the unique needs of their communities
- Government agencies face challenges in meaningfully engaging with community organizations

Facilitators of Effective Governance

- Clearly defined roles & responsibilities
- High levels of trust, goal, and value consensus
- Adaptability to focusing events or external shocks (e.g., 2021 BC Heat Dome; COVID-19)
- Sustained relationships

Next Steps

- Continued analysis: Within- and across-case analysis of collaborative governance arrangements
- Hold a deliberative dialogue to develop recommendations to strengthen collaborative governance arrangements
- Partner with communities to address the gap between government heat response strategies and community-led initiatives

NAO

North American Observatory
on Health Systems and Policies

naobservatory@utoronto.ca

@nao_health

NaoHealthObservatory.ca

Global environmental impact of essential medicines

Camila Heredia, Aine Workentin, Gillian Parker, Nav Persaud

MAP Centre for Urban Health Solutions, St. Michael's Hospital, Unity Health Toronto

Climate, Health & Sustainable Care Inaugural Symposium

October 2024

St. Michael's
Inspired Care. Inspiring Science.
Centre for Urban Health Solutions

BACKGROUND

- Medicines affect the environment: production, packaging, distribution, use, and excretion.

- Essential medicine lists → promote generation of ecotoxicity data.

What is the environmental impact of essential medicines?

Are there less environmentally harmful alternatives?

METHODS

- 158 national lists
- 2084 medicines
- Impact measures: persistence, bioaccumulation, ecotoxicity, environmental risk
- Sample: 5 essential medicines known to be environmentally harmful

RESULTS

Categories

- **propionic acid derivative anti-inflammatories** (ibuprofen)
- **fluoroquinolones** (ciprofloxacin)
- **sex hormones** (ethinylestradiol and levonorgestrel)
- **selective serotonin reuptake inhibitor antidepressants** (sertraline)

Propionic acid derivatives

- nonsteroidal anti-inflammatory**,** analgesic and antipyretic effects.
- found in wastewater and freshwater environments.
- examples: **ibuprofen,** ketoprofen, and naproxen.

Image: https://www.poison.org/articles/ibuprofen

Ibuprofen:

- very high concentration and toxicity in wastewater.
- not well removed with conventional methods.
- excreted ibuprofen and metabolites → water and soil.
- alternatives → ketoprofen, naproxen, diclofenac, celecoxib, etoricoxib, meloxicam.

Fluoroquinolones

- wide spectrum antibiotics.
- excreted largely unchanged → microbial resistance.
- examples: **ciprofloxacin,** levofloxacin, and norfloxacin.

Ciprofloxacin:

- water persistence, biodegradation resistance.
- genetic toxic effects on aquatic organisms.
- soil concentration not high but inhibits growing activities.
- alternatives → levofloxacin, norfloxacin, ofloxacin, nitrofurantoin.

Image: https://ast.m.wikipedia.org/wiki/Ficheru:Ciprofloxacin.jpg

Sex hormones

- estrogens: organisms' feminization and reproduction disruption.
- progestins: aquatic micropollutants.
- examples: **ethinylestadiol, levonorgestrel,** estradiol, and drospirenone.

Ethinylestadiol and levonorgestrel :

- reproductive health impact on vertebrates and plants.
- development of male secondary sex characteristics in female species.
- polluting levels in water and soil.
- alternatives → desogestrel, etonogestrel, <u>estradiol, estriol.</u>

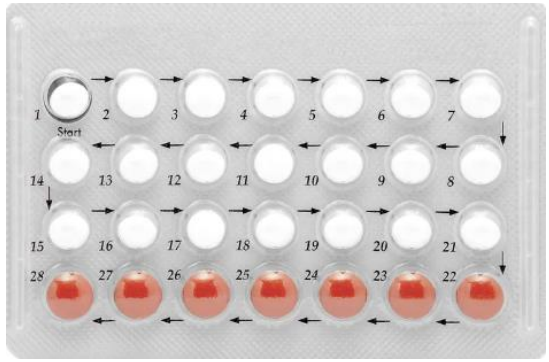


Image: https://www.britannica.com/topic/oral-contraceptive

Selective serotonin reuptake inhibitors

- found in wastewater, surface water, drinking water and sediments.
- examples: **sertraline,** escitalopram, and paroxetine.

Sertraline:

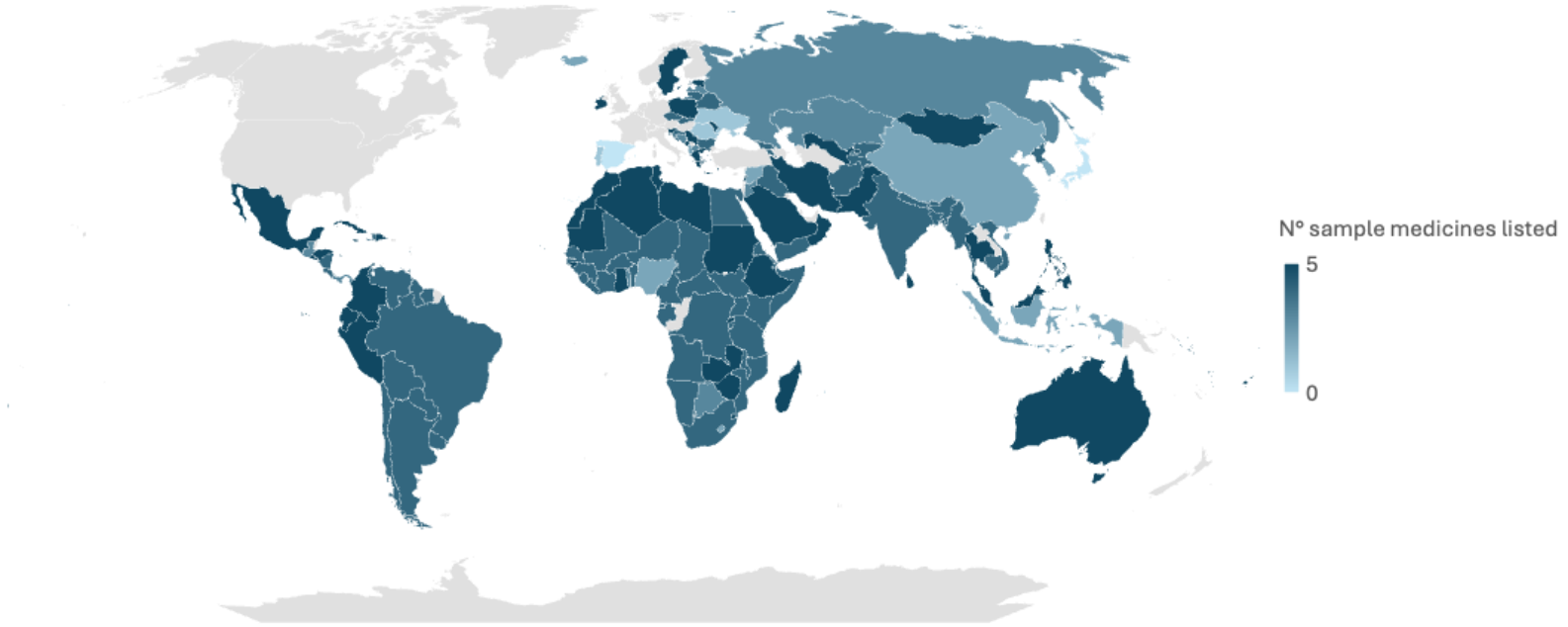
- in fish: similar to therapeutic levels in humans.
- negative effects on animal behaviour and reproduction.
- elimination includes metabolites → similar effects.
- alternatives → bupropion, citalopram, duloxetine, fluoxetine, venlafaxine.

Image: https://www.drugs.com/zoloft.html

	N° countries listing it	Persistence	Bioaccumulation	Toxicity	Risk (PEC/PNEC)	N° alternatives (similar ATC code)
Ciprofloxacin	149	Potentially persistent	Low	Very high chronic	Moderate to high (4·22 to 86)	25
Ethinylestradiol	137	Breaks down slowly in the environment	High	Very high chronic	Moderate to high (4·1 to 14·33)	8
Ibuprofen	147	Breaks down in the environment	Low	High chronic	Moderate (2·34)	23
Levonorgestrel	135	Persistent	Below high limit	Very high chronic	High (141)	10
Sertraline	70	Breaks down slowly in the environment	No potential	Very high acute	Moderate (6·96)	9

- 5 selected medicines: all in 2023 WHO model list and in 55 country lists.

- Japan and Spain: listed none. Spain listed no alternatives either. Japan listed norfloxacin and ofloxacin.



DISCUSSION AND CONCLUSIONS

- Five medicines with known environmental harms prioritized for global use despite alternatives being available.

- Essential medicines lists could promote the collection and sharing of information about the environmental effects of medicines.

Thank you!

nav.persaud@utoronto.ca

EssentialMeds.org

St. Michael's
Inspired Care.
Inspiring Science.
Centre for Urban Health Solutions

Please provide feedback to inform future events

If you're heading out early,
Please fill out the
Symposium Evaluation Survey