



Leading climate resilient and low carbon, sustainable health systems

Presenters: Neil Ritchie, Dr. Myles Sargent, Dr. Fiona A. Miller
Moderator: Dr. Nicole Simms

@CCHL_CCLS



#CCHLReunited

Agenda

Introduction

The Case for Sustainable Health Systems
Nicole Simms

Panelist Presentations

The State of Sustainability in Healthcare
Neil Ritchie

Creating a Culture of Sustainability
Myles Sargent

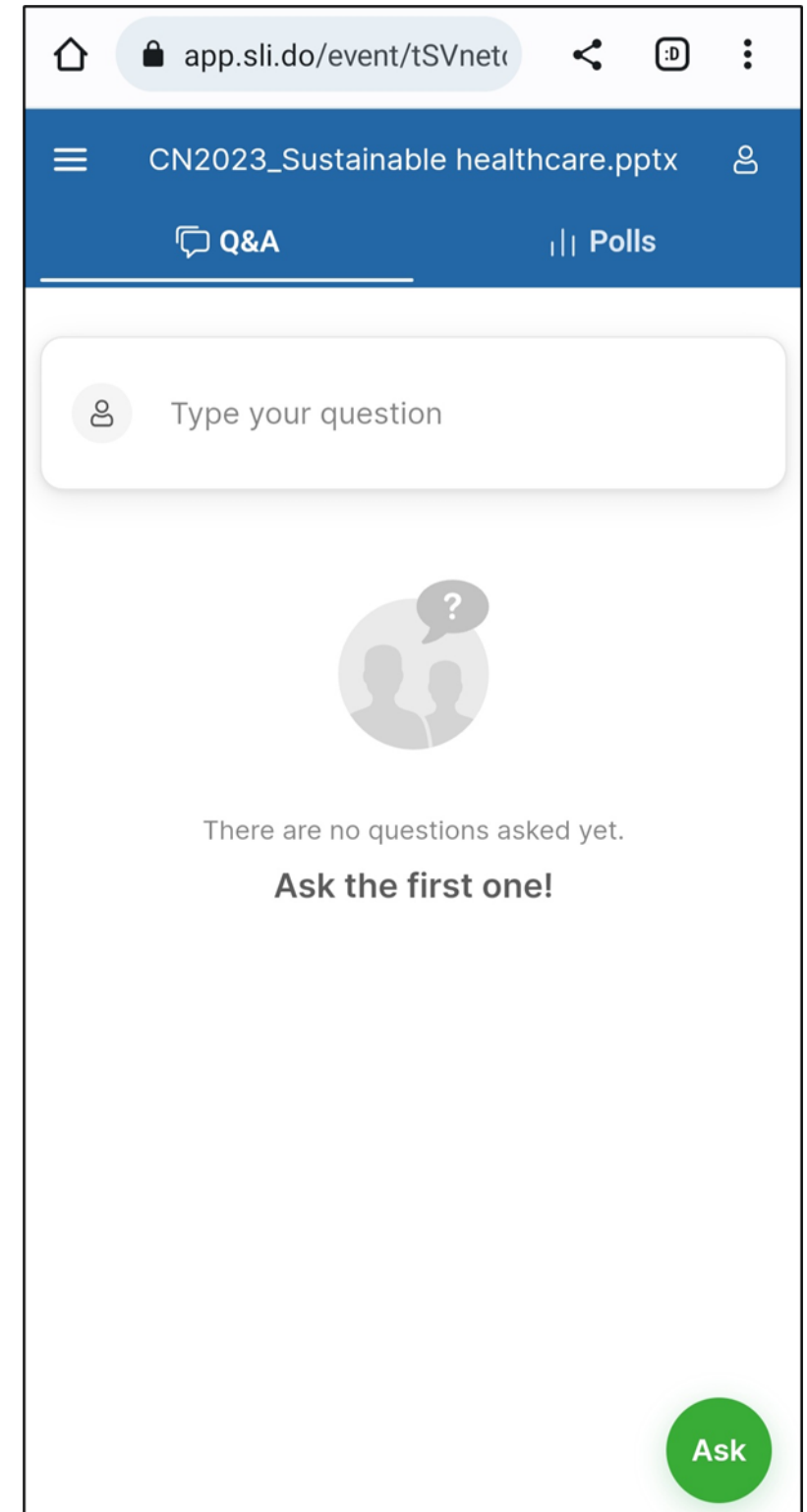
Leading sustainable health systems
Fiona A. Miller

Discussion

Closing Remarks

Logistics

Join at
slido.com
#1574 144



Land Acknowledgement

We would like to begin with a moment to acknowledge that the land upon which we have gathered today is the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples and is now home to many diverse First Nations, Inuit and Métis peoples.

We also want to reflect on the ways in which healthcare has not been equitable or inclusive of Indigenous peoples and their ways of healing and knowing. We want to acknowledge that environmental healing begins with reconciliation and recognition of the damage that colonialism has inflicted on the planet.





Making the Case for Sustainable Health Systems

Nicole Simms

CASCADES



Funder: Environment & Climate Change Canada

Grant: Community Engagement for Climate Action and Awareness

Term: April 1, 2021 – March 31, 2026

Amount: \$6M

PARTNER ORGANIZATIONS



University of Toronto



Dalhousie University



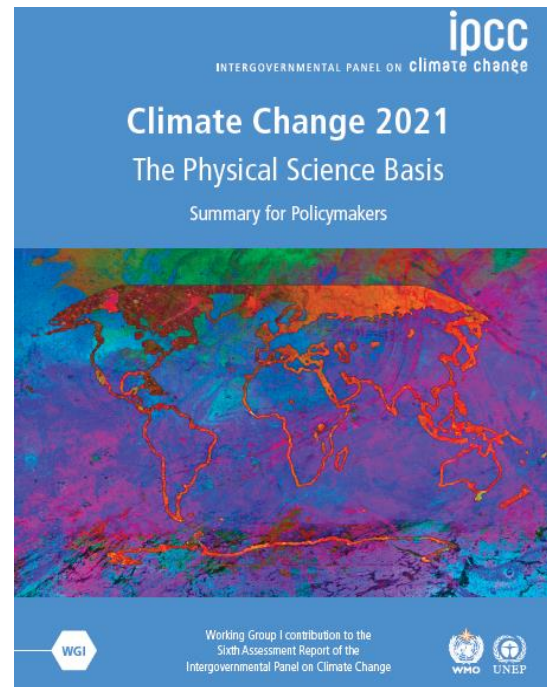
PLANETARY HEALTHCARE LAB

University of British Columbia

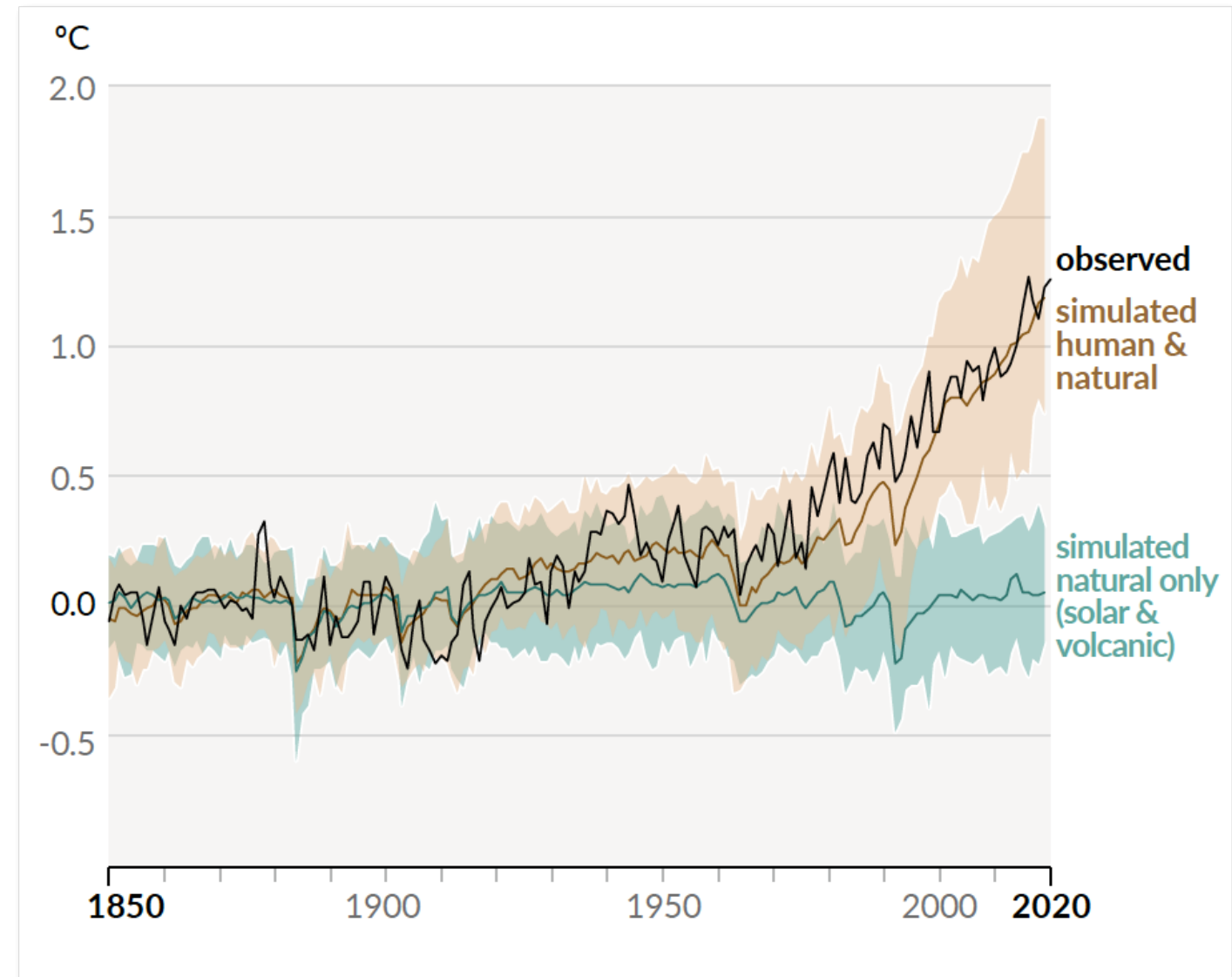


The Canadian Coalition
for Green Health Care
Coalition canadienne pour
un système de santé écologique

Climate Change




IPCC Working Group 1, 2021



Climate Impacts on Health

VANCOUVER | News

B.C. doctor makes international headlines for 'climate change' diagnosis



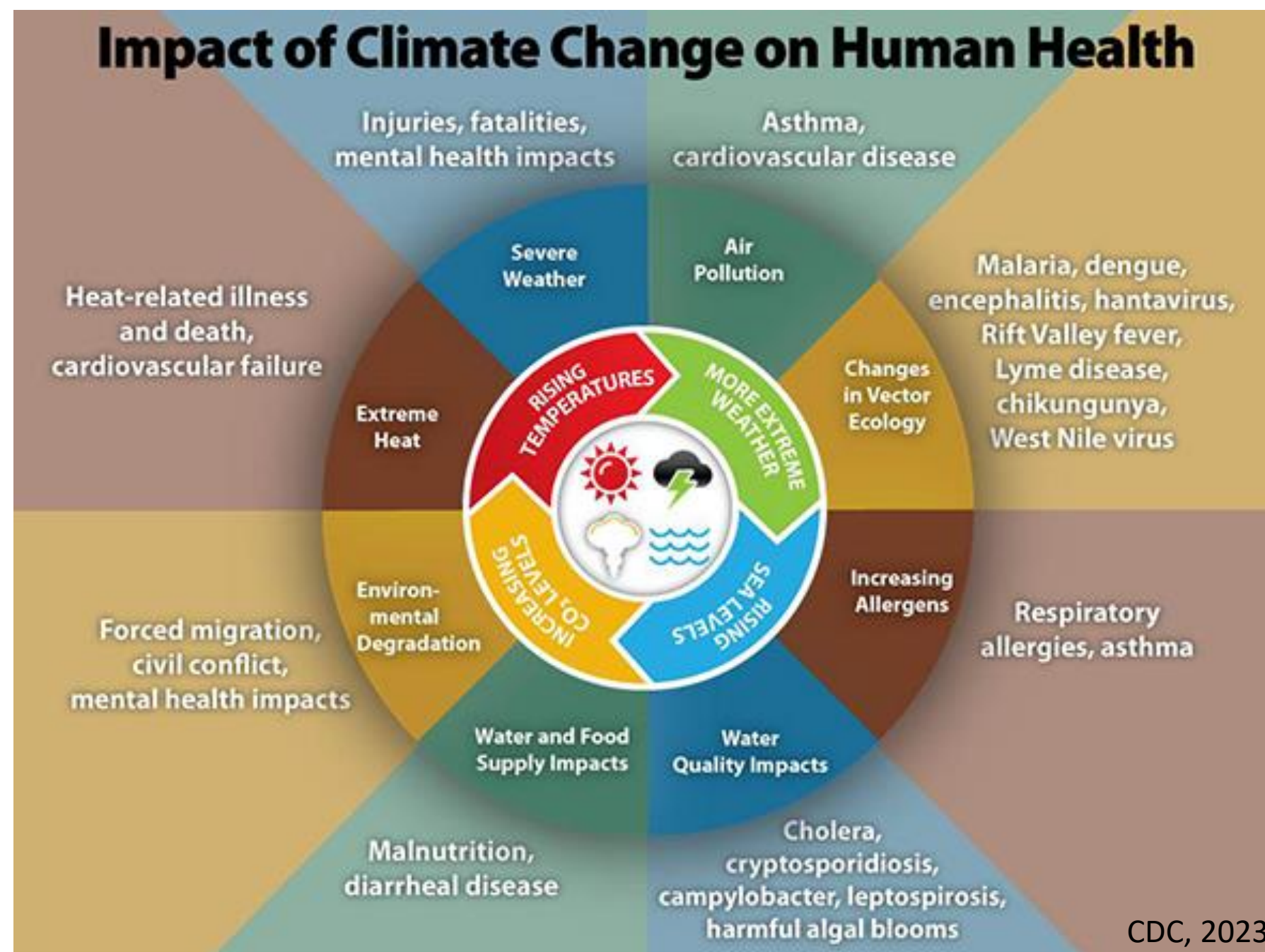
Bhinder Sojan
Multi-media Journalist, CTV News Vancouver
[Follow](#) | [Contact](#)

Updated Nov. 12, 2021 4:37 p.m. EST
Published Nov. 11, 2021 7:51 p.m. EST

VANCOUVER - A B.C. doctor has captured the world's attention by likely being the first physician to diagnose a patient with "climate change."

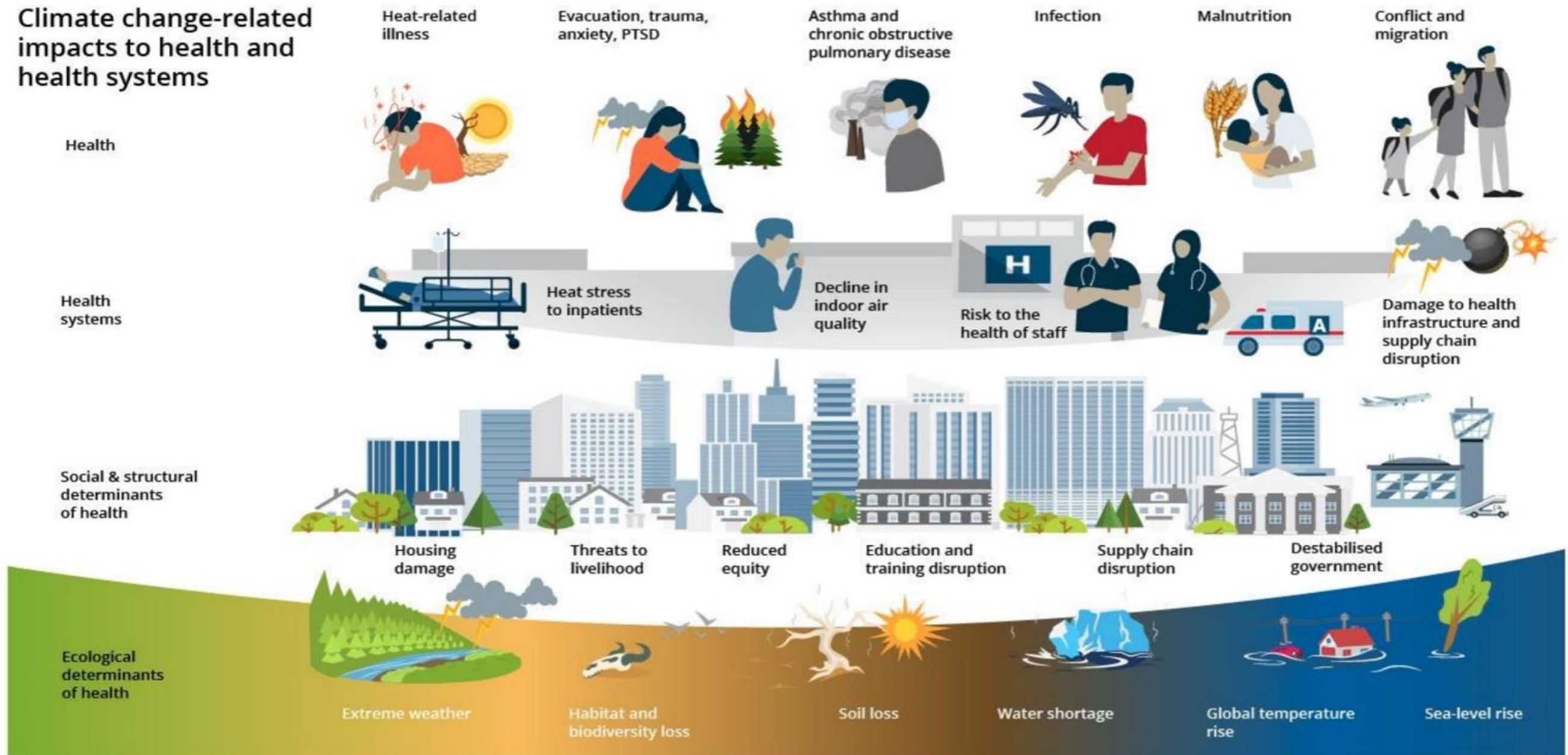
Nelson-based Dr. Kyle Merritt gave the controversial diagnosis over the summer, saying the symptoms a patient in her 70s was seeing all tied back to one thing.

Those effects included heatstroke, dehydration and breathing issues. As he treated the patient, he started thinking about underlying issues. He ultimately diagnosed her with climate change.

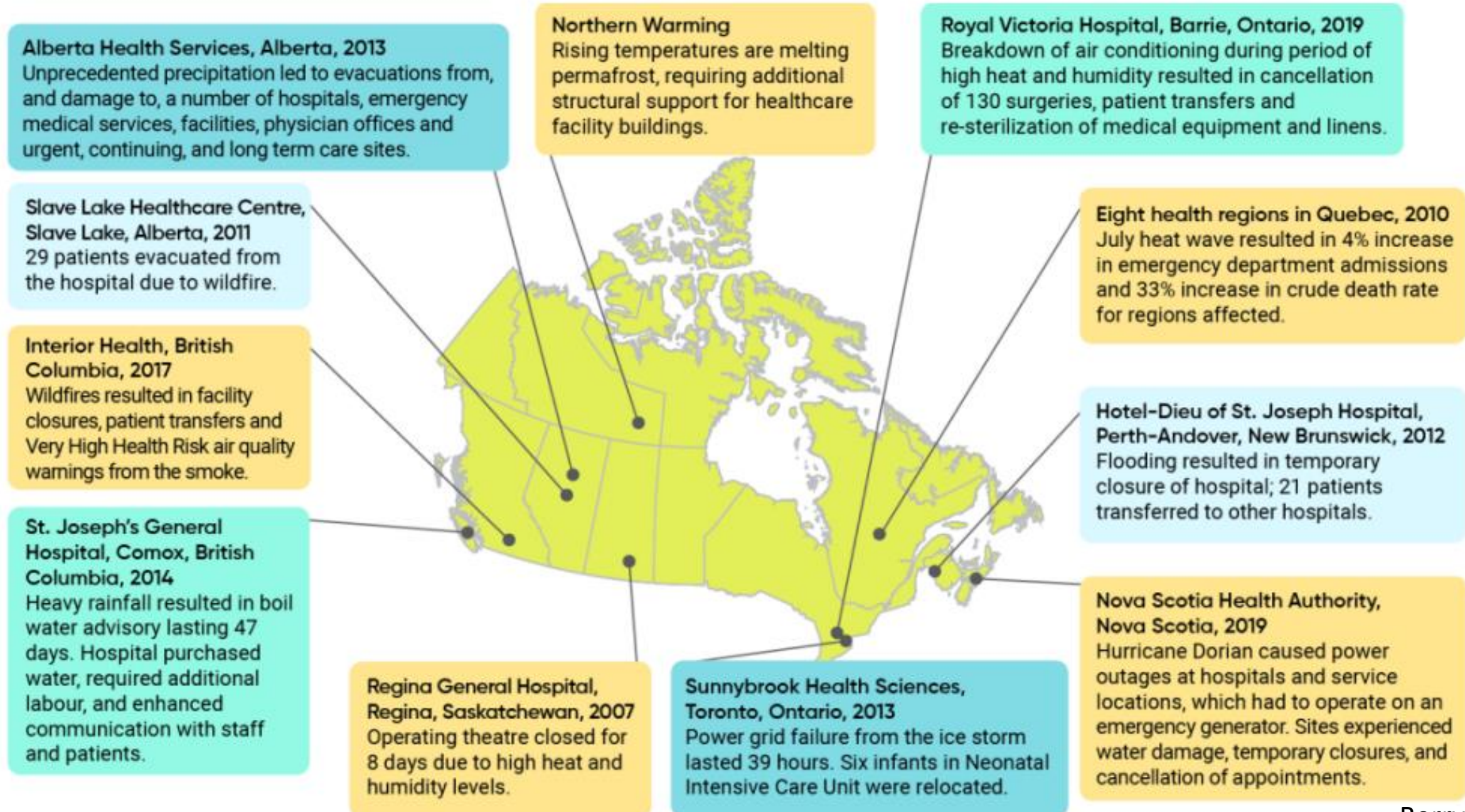


Impacts on Health & Health Systems

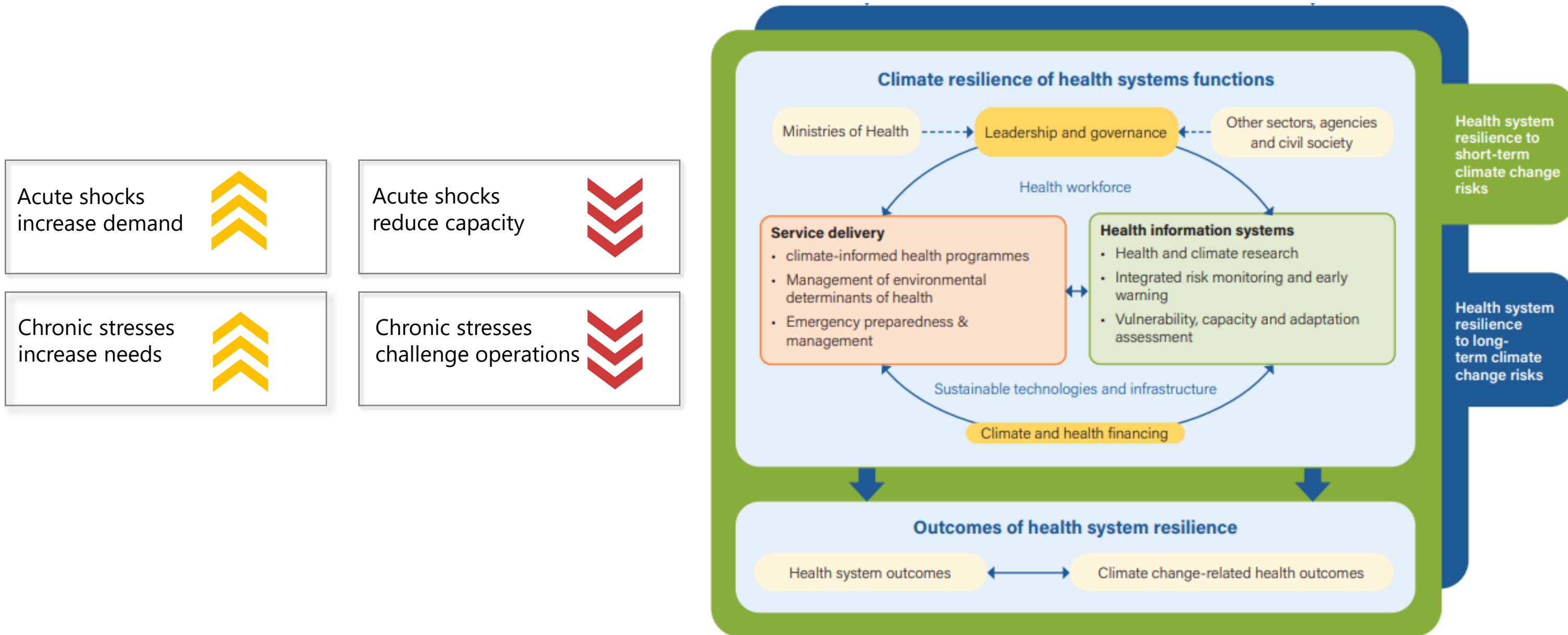
Climate change-related impacts to health and health systems



Climate variability and change impacts on Canadian health facilities



Response # 1: Adaptation & Resilience



Healthcare Impacts on Climate

The environmental footprint of health care: a global assessment

Manfred Lenzen, Arunima Malik, Mengyu Li, Jacob Fry, Helga Weisz, Peter-Paul Pichler, Leonardo Suveges Moreira Chaves, Anthony Capon, David Pencheon

Summary

Background Health-care services are necessary for sustaining and improving human wellbeing, yet they have an environmental footprint that contributes to environment-related threats to human health. Previous studies have quantified the carbon emissions resulting from health care at a global level. We aimed to provide a global assessment of the wide-ranging environmental impacts of this sector.

Methods In this multiregional input-output analysis, we evaluated the contribution of health-care sectors in driving environmental damage that in turn puts human health at risk. Using a global supply-chain database containing detailed information on health-care sectors, we quantified the direct and indirect supply-chain environmental damage driven by the demand for health care. We focused on seven environmental stressors with known adverse feedback cycles: greenhouse gas emissions, particulate matter, air pollutants (nitrogen oxides and sulphur dioxide), malaria risk, reactive nitrogen in water, and scarce water use.

Findings Health care causes global environmental impacts that, depending on which indicator is considered, range between 1% and 5% of total global impacts, and are more than 5% for some national impacts.

Interpretation Enhancing health-care expenditure to mitigate negative health effects of environmental damage is often promoted by health-care practitioners. However, global supply chains that feed into the enhanced activity of health-care sectors in turn initiate adverse feedback cycles by increasing the environmental impact of health care, thus counteracting the mission of health care.

Funding Australian Research Council, National eResearch Collaboration Tools and Resources project.

5.2%

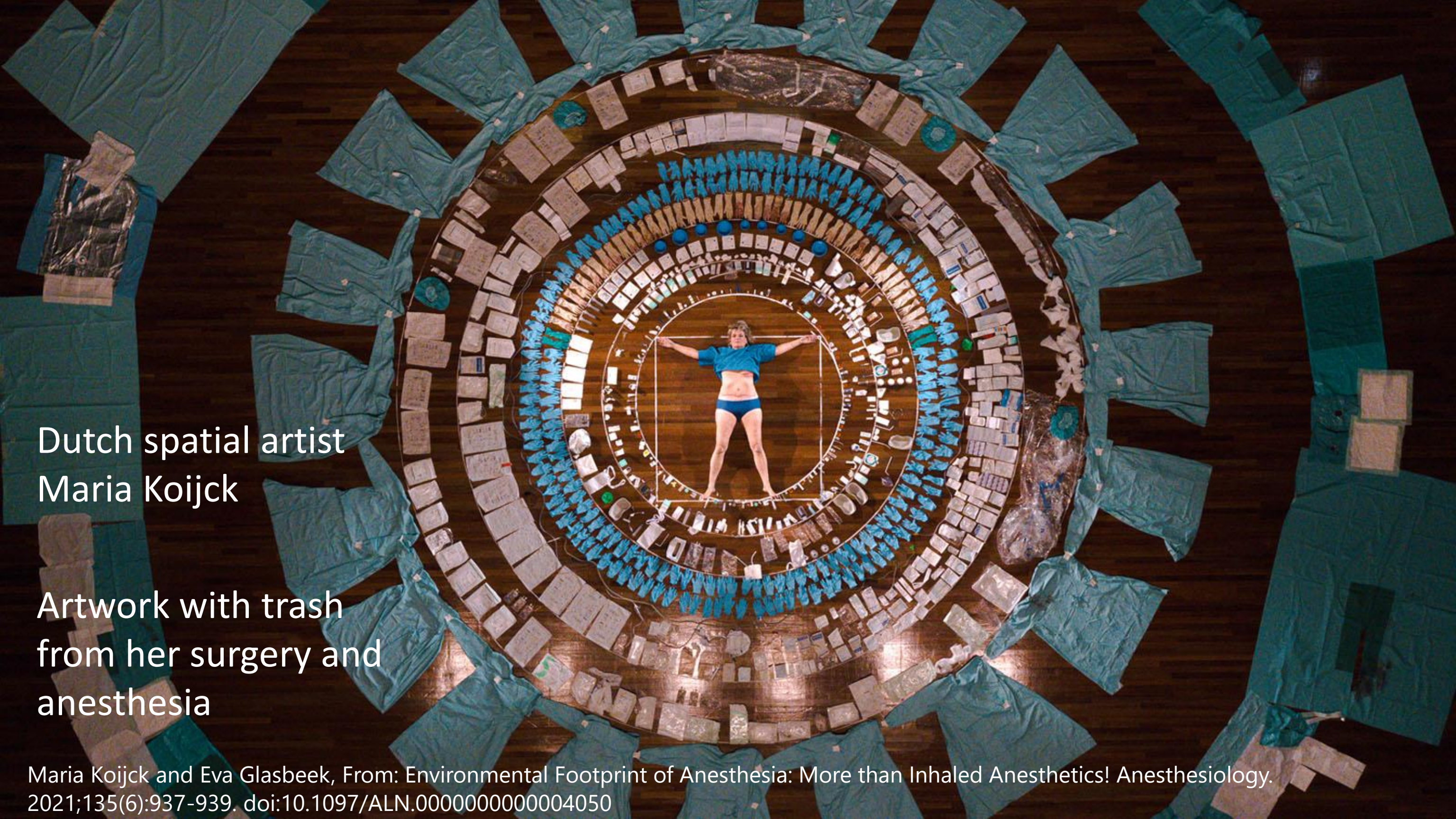
Of Global Emissions (2.4Gt CO₂e)

Equivalent to

5th

Highest Emitting Country

THE LANCET
Planetary Health

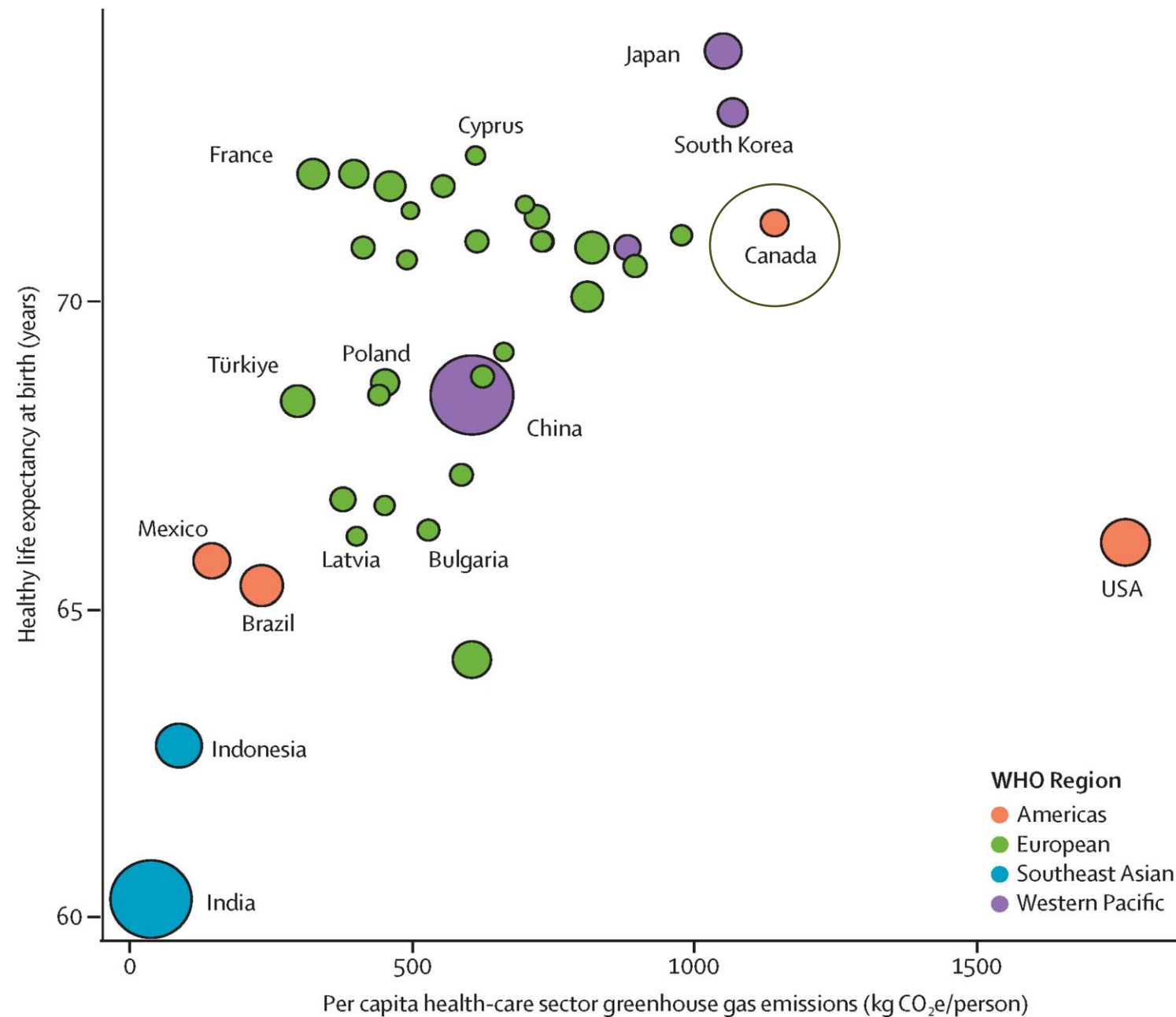


Dutch spatial artist
Maria Koijsck

Artwork with trash
from her surgery and
anesthesia

Maria Koijsck and Eva Glasbeek, From: Environmental Footprint of Anesthesia: More than Inhaled Anesthetics! *Anesthesiology*. 2021;135(6):937-939. doi:10.1097/ALN.0000000000004050

Canada's Status



~4.6% of national emissions

>60% embedded in care delivery, including products and services

Response #2: Mitigation

“The health care sector contributes significantly to climate change, which means that **if the sector does not introduce climate friendly policies and practices, it paradoxically will continue to contribute directly and indirectly to negative health impacts** through its emissions of CO₂ and other greenhouse gases.

To meet the growing demand of health care resources without furthering climate change, **future health services must be built on sustainable and low-carbon systems and models.**”

Panelists



Neil Ritchie

Past Executive Director, Canadian
Coalition for Green Health Care



Dr. Myles Sargent

Executive Director, Canadian
Coalition for Green Health Care;
Partnerships Lead, PEACH



Dr. Fiona A. Miller

Director, Centre for Sustainable
Health Systems; Director, CASCADES



The State of Sustainability in Healthcare

Neil Ritchie

Past Executive Director, Canadian Coalition for Green Health Care

WHO WE ARE

A national not-for profit coalition of health care organizations and professionals, a green health care resource network and a national catalyst for environmental stewardship in Canadian health care



**The Canadian Coalition
for Green Health Care**

**Coalition canadienne pour
un système de santé écologie**

WHO WE ARE

Our Vision:

An Environmentally Sustainable, Climate Resilient, Net Zero Canadian Health System

Our Mission:

To build capabilities and capacity in health care organizations and their staff to enable the development of green health policies and practices



**The Canadian Coalition
for Green Health Care**

**Coalition canadienne pour
un système de santé écologique**

A GREEN HEALTH RESOURCE NETWORK

- The Circular Economy and Green Procurement
- Energy and Waste Management
- Green Food
- Green Transportation
- Safer Chemicals
- Water Conservation



**The Canadian Coalition
for Green Health Care**

**Coalition canadienne pour
un système de santé écologique**

Chat GPT: What can hospitals do to fight climate change ?

- Reduce health care's carbon footprint
- Promote waste reduction and recycling
- Prioritize sustainable procurement practices
- Invest in green spaces
- Educate and empower staff and communities



**The Canadian Coalition
for Green Health Care**

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Poll Question:

Overall, is your organization's environmental performance:

- Getting better
- Staying the same
- Getting worse
- Don't know



The Canadian Coalition
for Green Health Care

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un système de santé écologie



Overall, is your organization's environmental performance:

Trends from the Green Hospital Scorecard

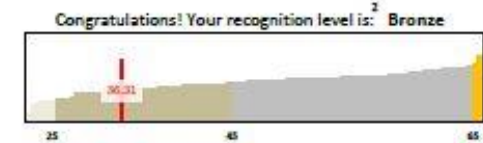
- Corporate Leadership
- Energy use/Intensity
- Waste/Recycling
- Food and Water Use
- Pollution Prevention Policy & Planning
- Transportation
- Anaesthetic gases
- Climate change



Peer Group (PG): Community
BEDS: 137
AREA: 29,729 m²

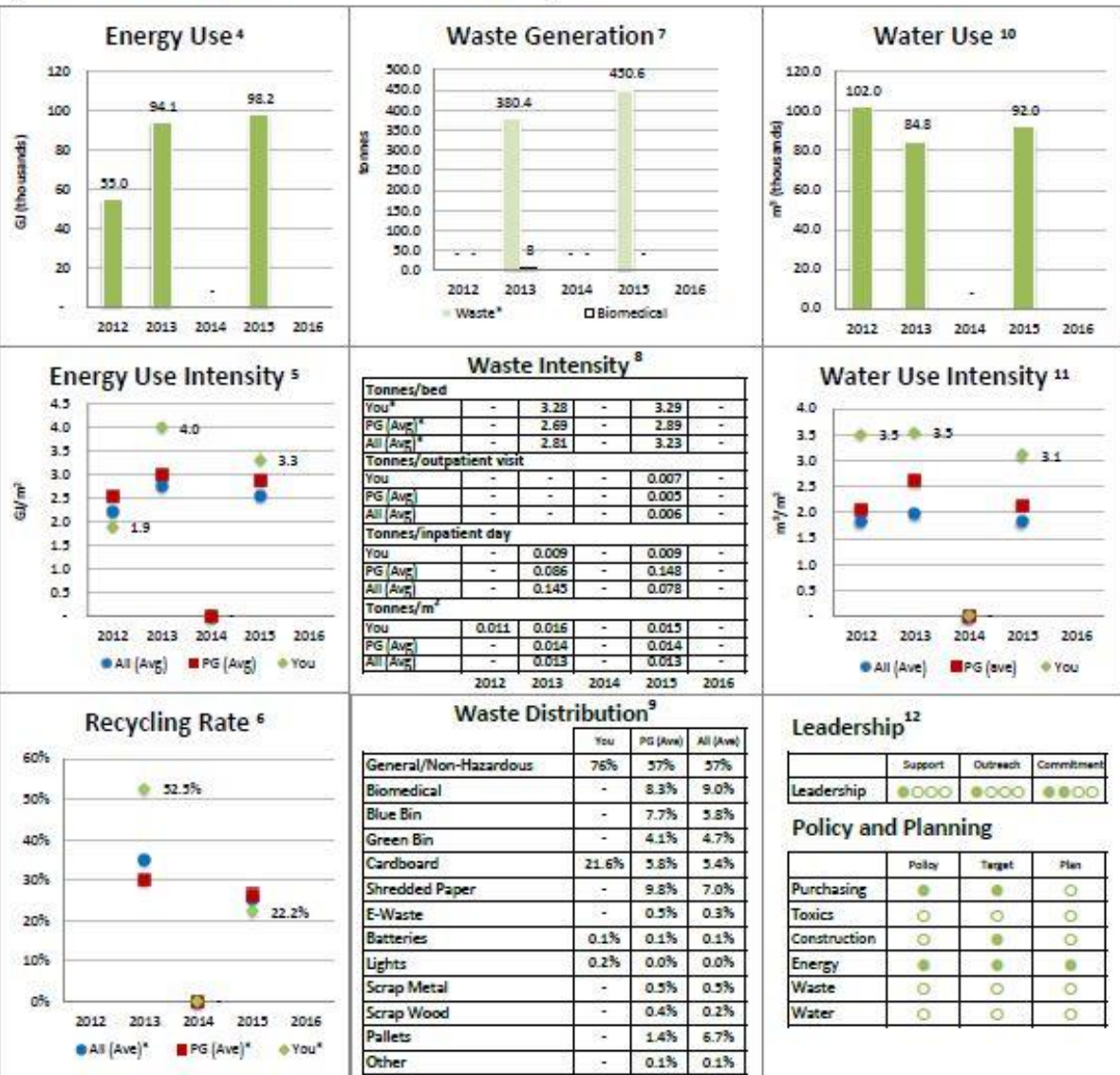


Energy Use (reported units) ¹	Reported	Conversion
Electricity	10,362,295 kWh	37,304 GJ
Natural Gas	706,779 m ³	27,041 GJ
Purchased Heat	9,395,000 kWh	33,822 GJ
Purchased Cooling	-	- GJ
Fuel Oil	-	- GJ
Propane	-	- GJ
Total Energy		98,168 GJ
Total GHG Emissions (tonnes of CO ₂ e)		4,044
Acres of Mature Trees to Absorb CO ₂ e		1,561



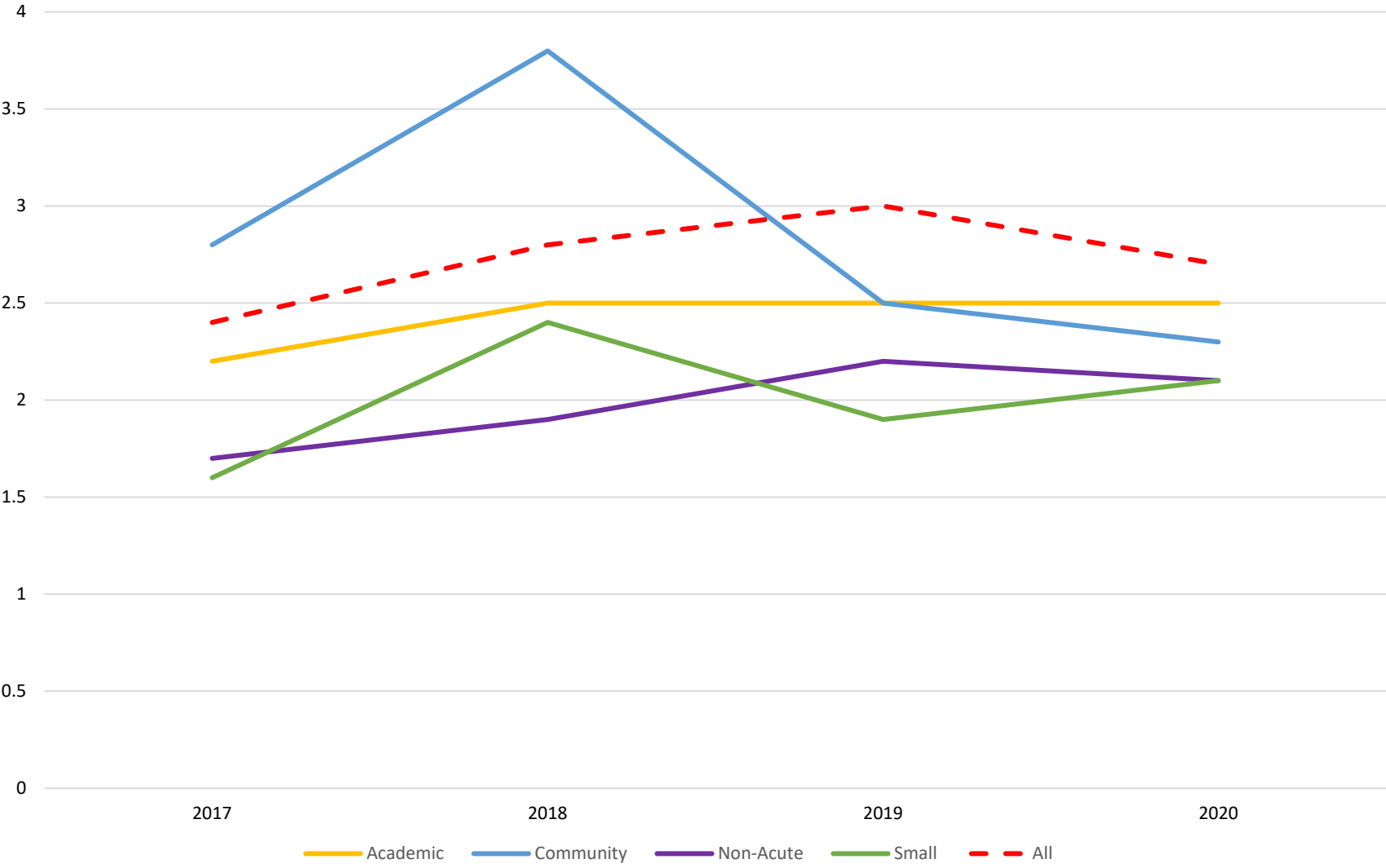
Your Hospital Performance Change from Last Year³

Leadership	Policy	Energy	Waste	Recycle	Water	GHG
-	-	-	-	-	-	-

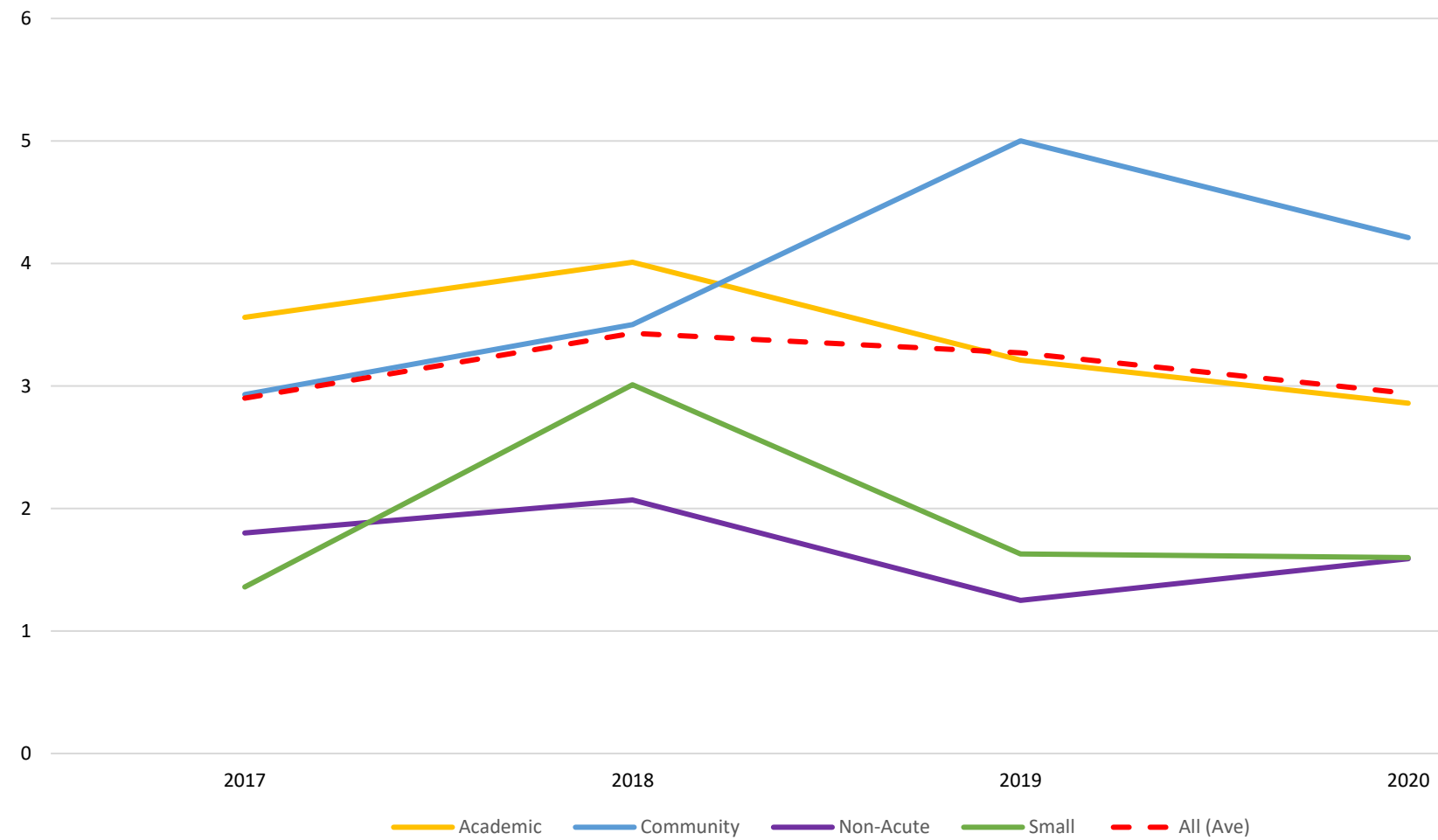


*Waste and recycling rate definitions changed between 2012 and 2013 reporting years. See reverse for guidance on interpretation of results.

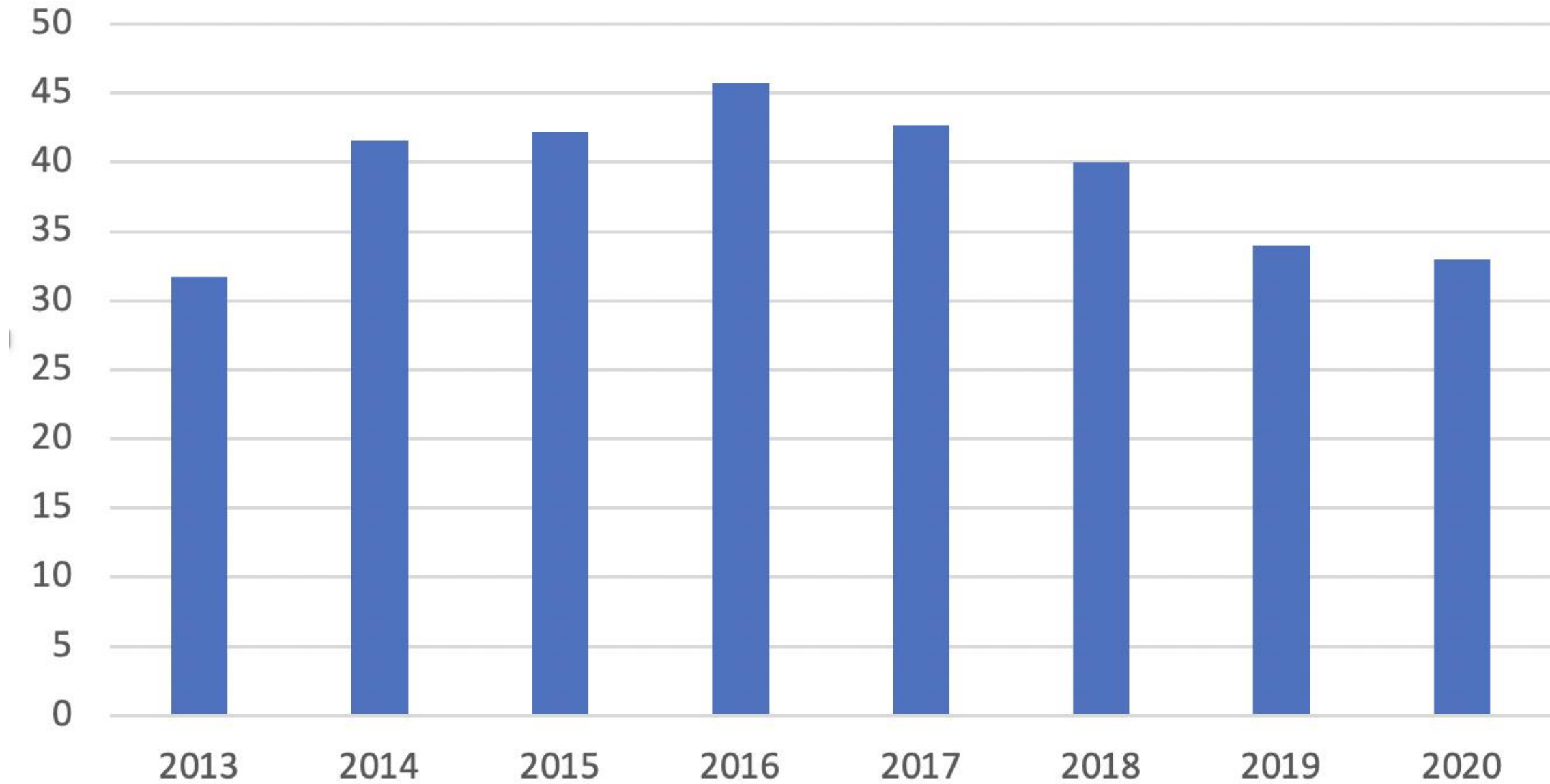
Energy Use Intensity Average Comparison by Peer Group over Previous 4 Years



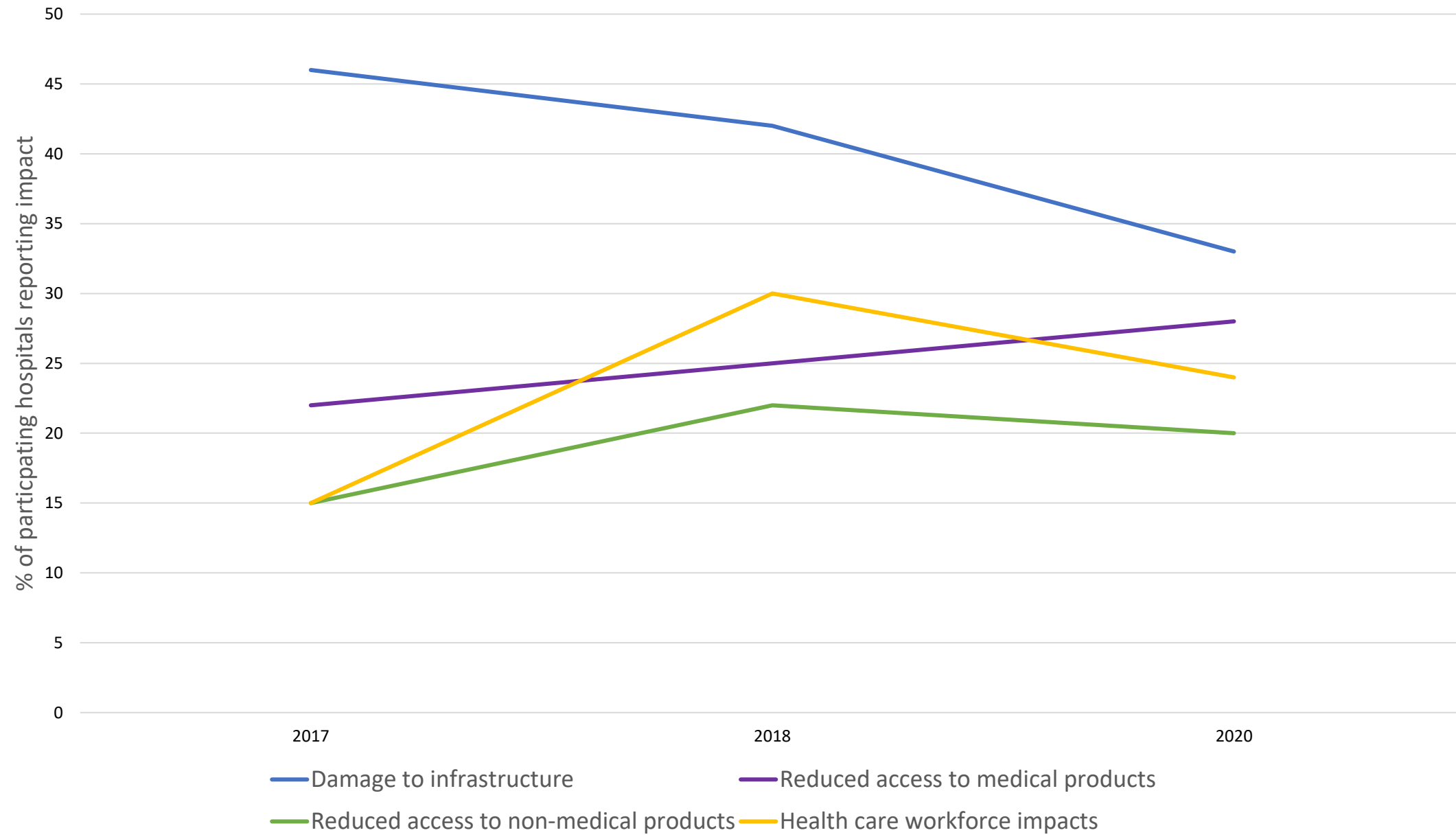
Waste Intensity Average Comparison by Peer Group over Previous 4 years



Overall Score Green Hospital of the Year



Top climate-related Impacts reported by participating hospitals



Participating hospitals* reporting **no climate-related impacts** at their facility
Canadian Coalition for Green Health Care: Green Hospital Scorecard results

	2017	2018	2020
% of participating hospitals reporting no climate-related impacts	42	24	18

*Number of participating hospitals and number of responses per year:

2017: Hospital participants: 99 Responses: 229
2018: Hospital participants: 83 Responses: 203
2020: Hospital participants: 85 Responses: 187

1. New Accreditation Governance Standard:

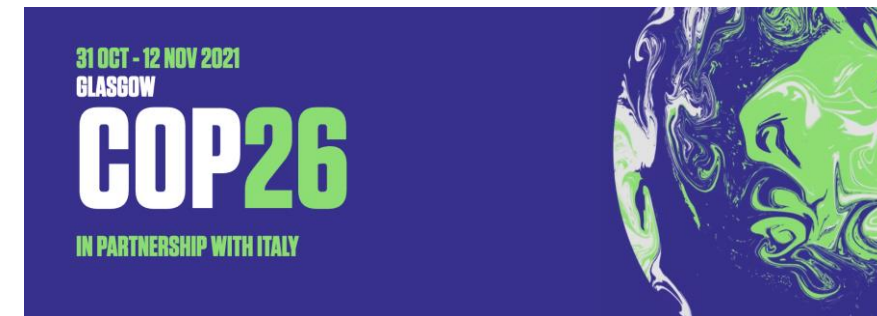
The governing body ensures that the organization promotes environmental stewardship in its operations

2. Canada's Commitment to an Environmentally Sustainable, Low Carbon, Climate Resilient Health System at COP 26

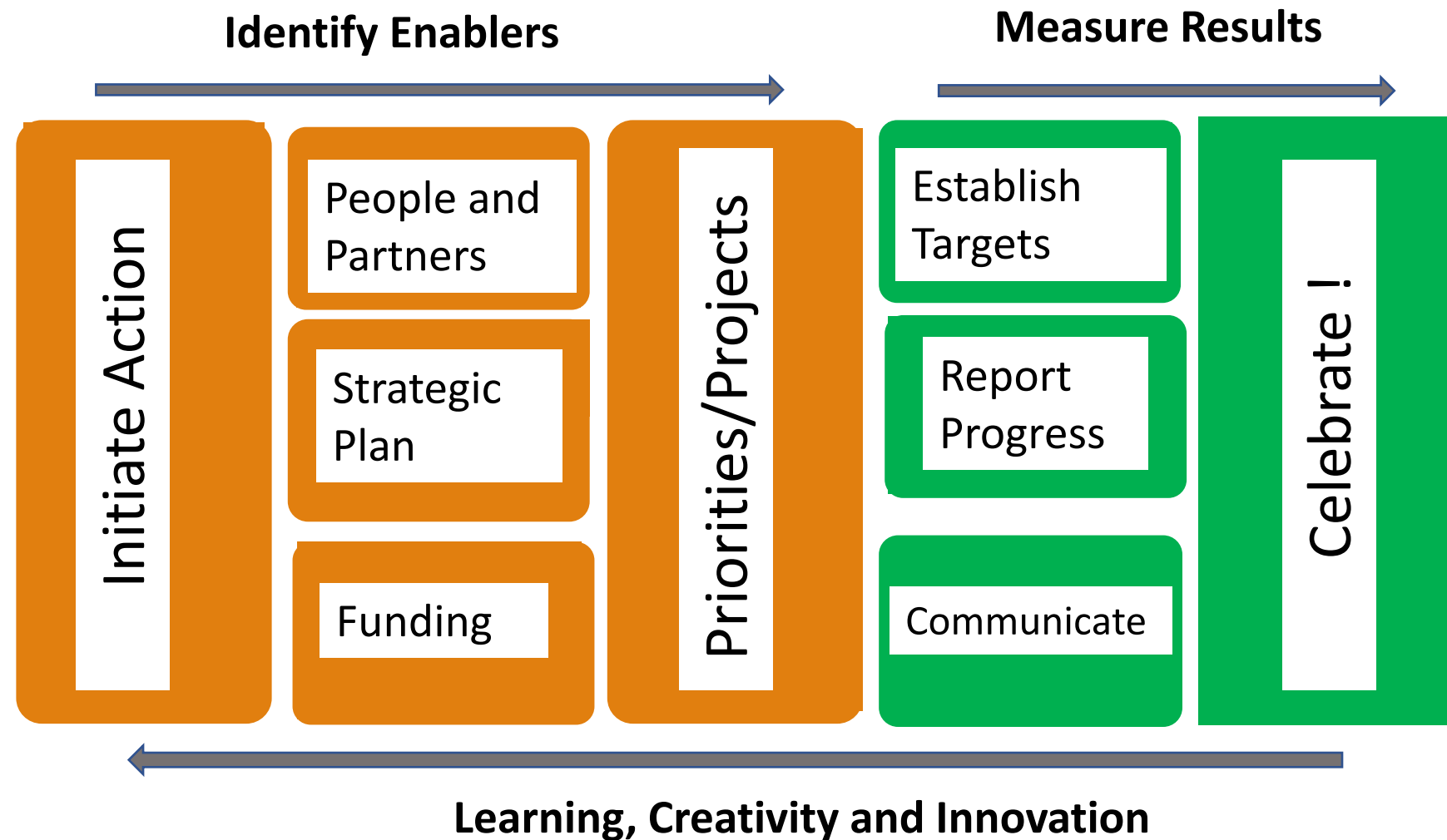
New Requirements for Environmental Stewardship in Health Care



ACCREDITATION
CANADA



A Leader's Roadmap to Environmental Stewardship



*We need to move our actions
to the boardrooms and the
bedsides*



Thank you !

neil.ritchie@greenhealthcare.ca

902 489-9123



Creating a Culture of Sustainability

Myles Sargent

Executive Director, Canadian Coalition for Green Health Care;
Partnerships Lead, PEACH



To cultivate **partnerships** across health care facilities
in Ontario to support environmental **action**

Global greenhouse gas emissions and warming scenarios

Our World
in Data

- Each pathway comes with uncertainty, marked by the shading from low to high emissions under each scenario.
- Warming refers to the expected global temperature rise by 2100, relative to pre-industrial temperatures.

Annual global greenhouse gas emissions
in gigatonnes of carbon dioxide-equivalents

150 Gt

The red line is the path for the next 8 years-
we need a 50 % reduction in global CO₂.



100 Gt

50 Gt

Greenhouse gas emissions
up to the present

0

1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100

No climate policies
4.1 – 4.8 °C

→ expected emissions in a baseline scenario
if countries had not implemented climate
reduction policies.


Current policies
2.5 – 2.9 °C

→ emissions with current climate policies in
place result in warming of 2.5 to 2.9°C by 2100.

Pledges & targets (2.1 °C)

→ emissions if all countries delivered on reduction
pledges result in warming of 2.1°C by 2100.

2°C pathways
1.5°C pathways



Ultimately, we need to
develop a culture of
sustainability in all
our organizations.

**What are the barriers to
making sustainability part of
the organization's mission?**



slido



What are the barriers to making sustainability part of the organization's mission?

ⓘ Start presenting to display the poll results on this slide.



The PEACH approach..

share great stories
mobilize knowledge
partner with sector leaders
create impactful projects
go after the big problems

ONTARIO

Kenora

• Dryden



Thunder Bay •

Timmins



• Sault Ste. Marie

Sudbury



North Bay



Ottawa

Kingston



TORONTO

Kitchener



• London



• Windsor

Categories

Leadership
 Education
 Supply Chain - 4 Rs
 Drugs and Devices
 Buildings and Energy
 Food
 Transportation
 Natural Systems

Projects and Partnerships



Leadership



Daphne Odjig, 1991

The strategy..

UHN – culture of sustainability
CHEO – carbon targets
Sunnybrook – task force

The person responsible..

Leader of Sustainability

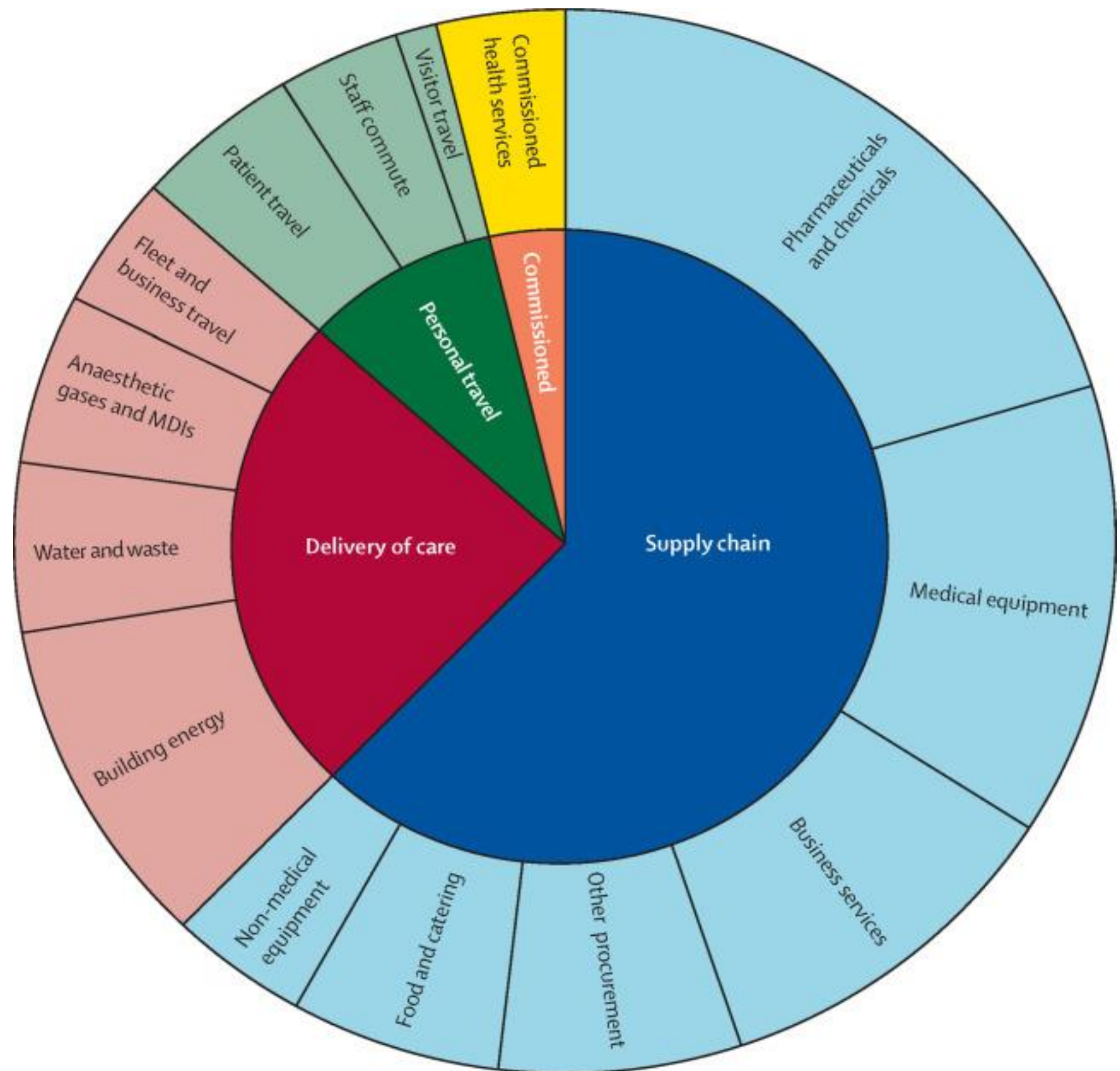
Project A Sustainability guidebook for Health care leadership

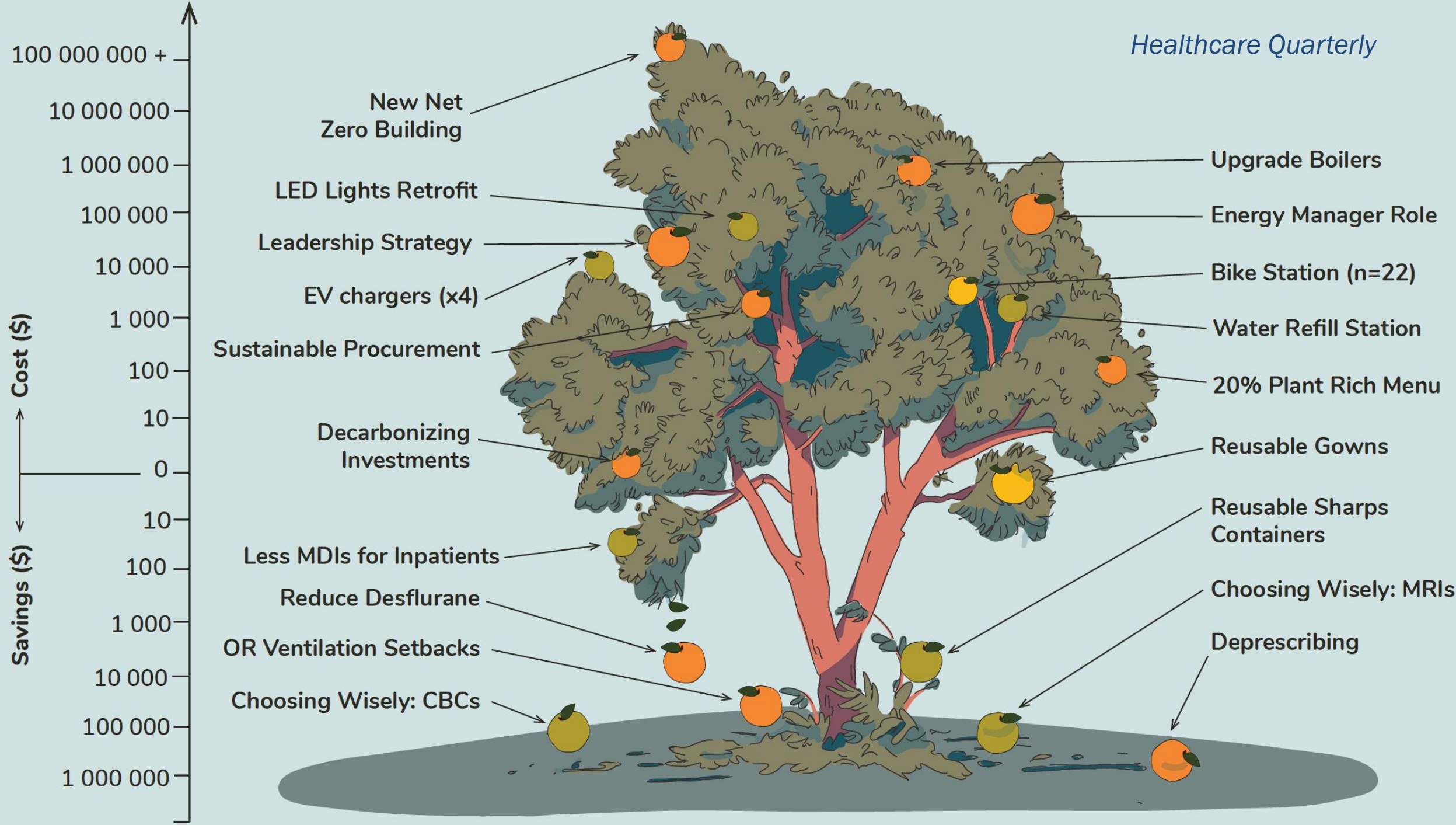
THE LANCET Planetary Health

Carbon footprint assessment
of the NHS in England

Imogen Tennison, et al 2021

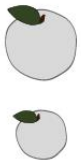
Supply chain = 2/3 of GHGs





**Low Hanging
PEACH Tree**

**Financial
ROI**



Immediate (< 1 year)

Delayed or No ROI

**GHG
Savings**



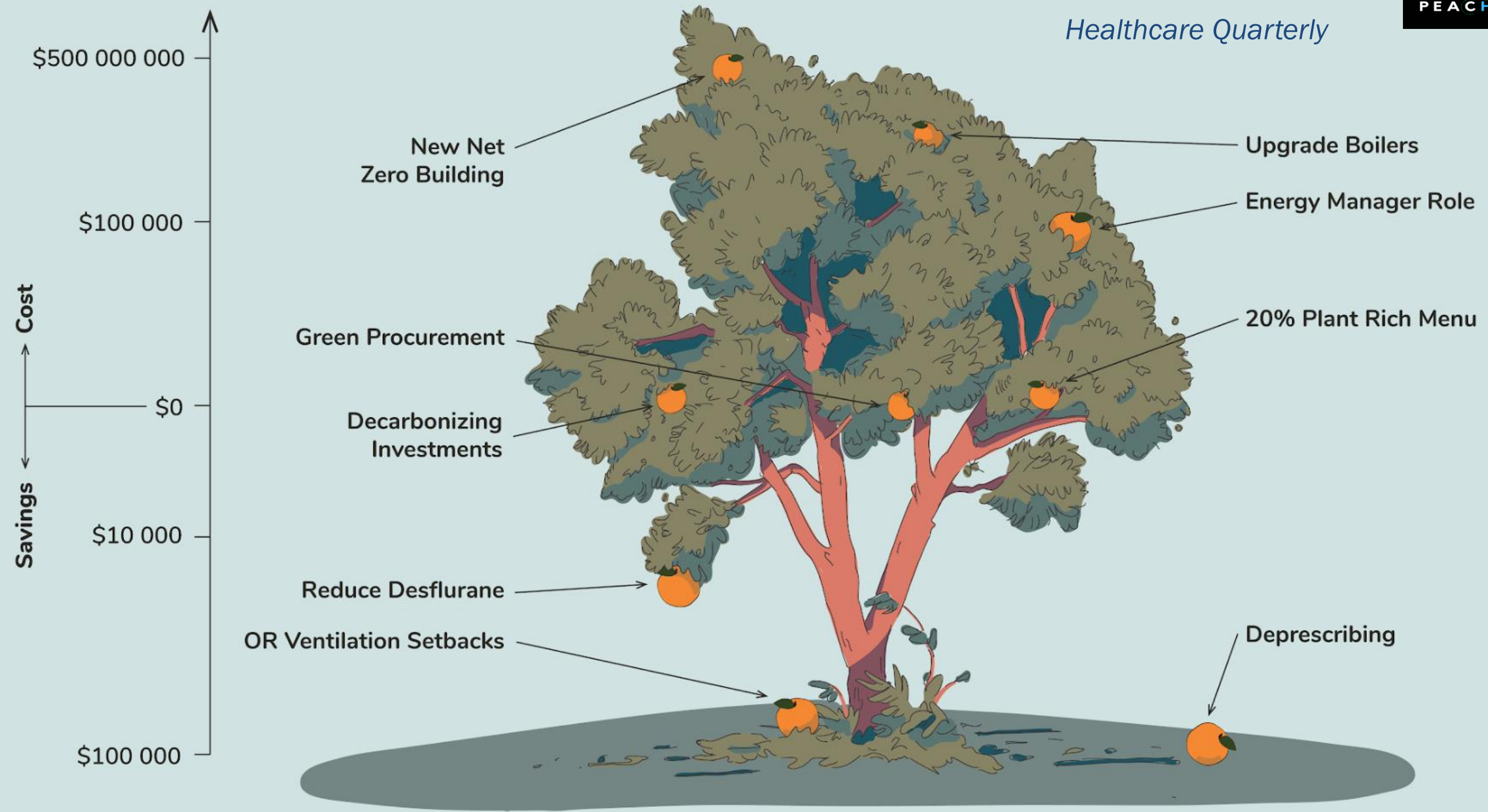
Game Changers
(>100 Tonnes CO₂)



Difference Makers
(>50 Tonnes CO₂)



Needle Nudgers
(>0.5 Tonnes CO₂)



Game Changers

Financial ROI



Immediate (< 1 year)

Delayed or No ROI

GHG Savings



Game Changers (>100 Tonnes CO₂)

ENVIRONMENTAL STEWARDSHIP: AN IMPLEMENTATION GUIDE FOR BOARDS, EXECUTIVE LEADERS, AND CLINICAL STAFF:

MEETING HOSPITAL
STANDARDS AND BEYOND



ENVIRONMENTAL STEWARDSHIP: AN IMPLEMENTATION GUIDE FOR BOARDS, MANAGEMENT, AND CLINICAL STAFF:

MEETING LONG TERM CARE
STANDARDS AND BEYOND



ACTION ITEMS



LEADERSHIP

- ☐ Implementation of a Sustainability Strategy
- ☐ Appoint a leadership person for sustainability

- ☐ Divest foundation funds from fossil fuels to low-carbon funds ●



EDUCATION

The [Choosing Wisely Canada](#) (CWC) program was developed to educate clinicians on minimizing unnecessary tests and investigations. Hospitals can be recognized for their efforts.

- ☐ Recognized by CWC as a "Using Blood Wisely Hospital" ●
- ☐ Recognized by CWC as a "Using Labs Wisely Hospital" ●
- ☐ Recognized by CWC as a "CWC Hospital" ●



SUPPLY CHAIN

- ☐ Procurement contracts contain weighting for sustainability of 10% or higher \$
The supply chain represents over 65% of health care's carbon footprint. Hospitals work with procurement organizations that award contracts to suppliers using a scoring system. If 'sustainability' is part of the scoring, suppliers are motivated to develop sustainable products, compatible with a circular economy.

- ☐ Facility uses reusable gowns and linens ●
Reusable gowns and linens are as safe as single-use items. Where reusable PPE infrastructure is available there can be significant cost savings.
- ☐ Hospital has a reusable sharps container program, or equivalent \$
Traditional sharps (needles, scalpels, etc) are disposed of in 'sharps' containers which are autoclaved or, in some cases, incinerated which generates significant GHGs and other pollutants. The reusable containers can be emptied and sterilized by the company, and then reused in the hospital, resulting in significant financial and environmental savings.
- ☐ Operating room (OR) reduces waste by having pick lists for each surgeon ●
Meant to optimize OR efficiency, operative pick lists, or surgeon's preference cards, indicate which surgical instruments need to be opened for a given procedure. Studies show that up to 87% of opened items are not used; thus, streamlining lists reduces waste of instruments and instrument wrapping material, reduces emissions required to reprocess and transport instruments, and leads to overall cost reductions.



DRUGS AND DEVICES

- ☐ Pharmacy has a sustainable prescribing strategy ●
Sustainable prescribing is done to decrease unnecessary medications, errors, interactions, and side effects. It is also important because pharmaceutical production and disposal release a significant amount of GHGs.

This section contains some of the **action items** that have the greatest impact in reducing the hospital's carbon footprint. This list also includes the **expected cost** to help choose between items. Some of these items will be a real challenge!

CAPITAL COST

- Savings, or no cost
- \$ Small cost
- \$\$ Medium cost
- \$\$\$ Large cost

- ☐ Desflurane is minimized to less than 5% of OR gases ●
Anesthetic gases are released directly into the atmosphere following their use, and exert considerable greenhouse effects (higher than CO2). From these, desflurane has the worst GHG burden in comparison to other gases (2200 times more than CO2).



BUILDINGS AND ENERGY

- ☐ Heating, Ventilation and Air Conditioning (HVAC) Systems are energy efficient \$\$\$
Older generation boilers and chillers produce most of a facility's GHGs. Upgrading to energy-efficient HVAC systems, using ground, air or water sources heat pumps, using wind or solar to generate electricity can further reduce GHGs.
- ☐ Over 90% of the facility has been converted to LED lighting \$\$\$
Replacing old light fixtures with modern energy-efficient LED fixtures can significantly reduce energy expenditures.
- ☐ OR ventilation is set back to 8 to 10 cycles per hour, or lower, overnight \$
Other countries (such as the UK) do not run their OR ventilation at full settings during off-hours, whereas in Canada hospitals may not 'set-back' their ventilation settings because of safety concerns regarding infectious diseases. However, there is no evidence that this is an unsafe practice.
- ☐ Facility, or proposed new build, is [LEED Gold standard](#) or higher \$\$\$
New builds operate with minimal GHG emissions.
- ☐ Facility has a dedicated energy manager or equivalent consultation service \$
A dedicated energy manager is hired to oversee and optimize all aspects of a hospital's energy use, and coordinate programs through the hospital.



FOOD

- ☐ Plant-based food options to patients are increased by 25% \$
GHG reductions are associated with providing a more plant-based diet and decreasing the quantity of meat products offered to patients.
- ☐ Hospital uses a composter for food waste \$
An aerating composter, whether on-site or as part of municipal waste management system, decreases the amount of GHGs released by food waste.



TRANSPORTATION

- ☐ Facility has a secure area to store bikes, or other accommodations that encourage bike riding \$
Installment of bike stations (ranging in size and cost) can encourage employees to bike to work by providing a safe location to store bikes.
- ☐ Min. 2% of parking spaces at the facility are dedicated to carpooling or EV charging \$
Car travel by staff, patients and visitors is a significant contributor to GHG emissions within health care. Therefore, encouraging carpooling can decrease environmental impact.



NATURE-BASED SOLUTIONS

- ☐ The facility has 25% green cover including green roof, food gardens, tree canopy, pollinator gardens and natural grass (except lawns) \$
Plants absorb CO2 and reduce heat island effect. They provide beauty and evidence suggests plants lead to improved patient outcomes.

Natural Systems



Christi Belcourt, 2014

Trees have many benefits!

Trees for Life

PEACH Health Ontario
Forests Ontario
Landscape Ontario
Eco-health Ontario
Ontario Parks
One Bench One Tree
Trees for Hamilton

'Trees for Health' - 800,000+ trees over next 10 years





The Canadian Coalition
for Green Health Care
Coalition canadienne pour
un système de santé écologique



Innovators

Agriculture

Clinic



H



LTC

Gov't

Community

University

Biodiversity



Leading sustainable health systems

Fiona A. Miller, PhD
Professor, University of Toronto
Director, CASCADES

Canadian College of Health Leaders
June 5, 2023

This project was undertaken with the financial support of the Government of Canada.

Ce projet a été réalisé avec l'appui financier du gouvernement du Canada.

Canada 



Dalla Lana
School of Public Health



Institute of Health Policy, Management and Evaluation
UNIVERSITY OF TORONTO



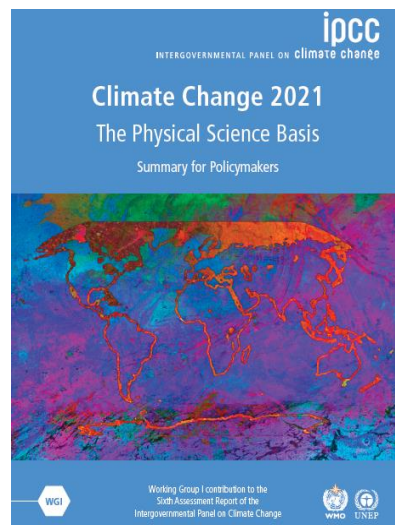
Sustainable health systems

Opportunities & challenges for change



Climate change

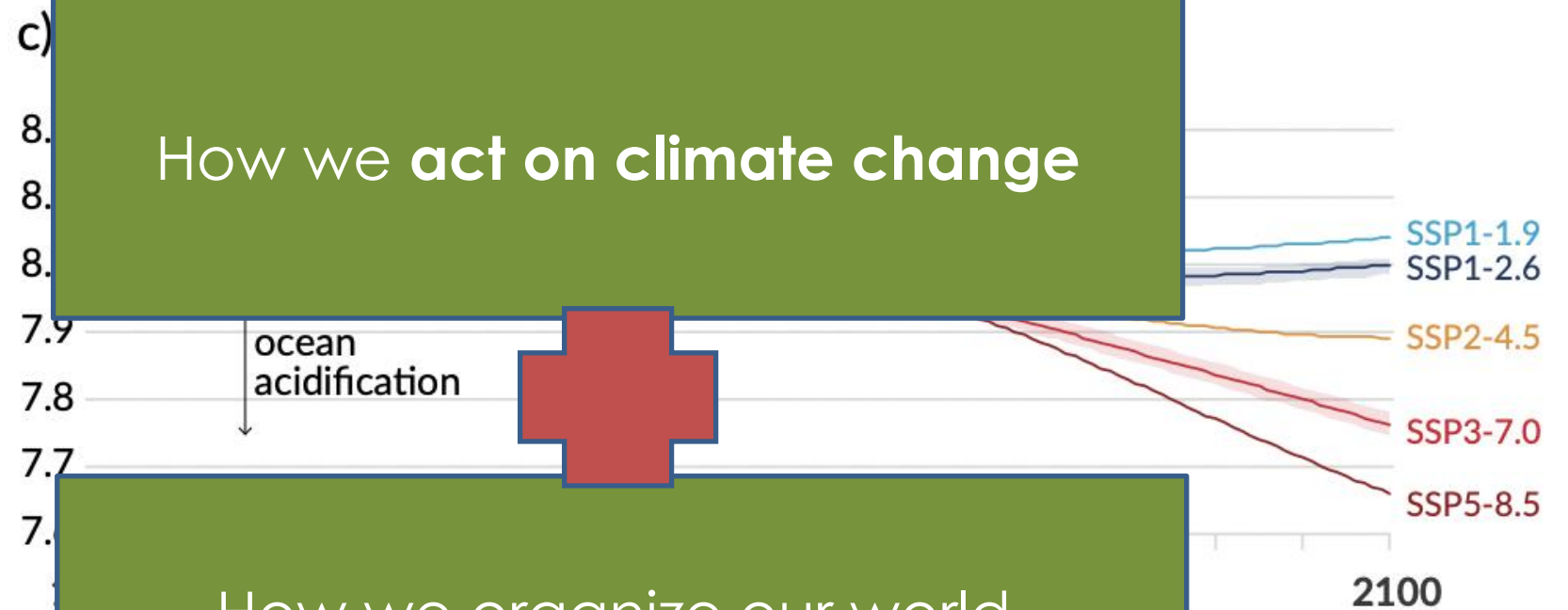
IPCC Working Group 1,
2021



What drives these different futures?

How we **act on climate change**

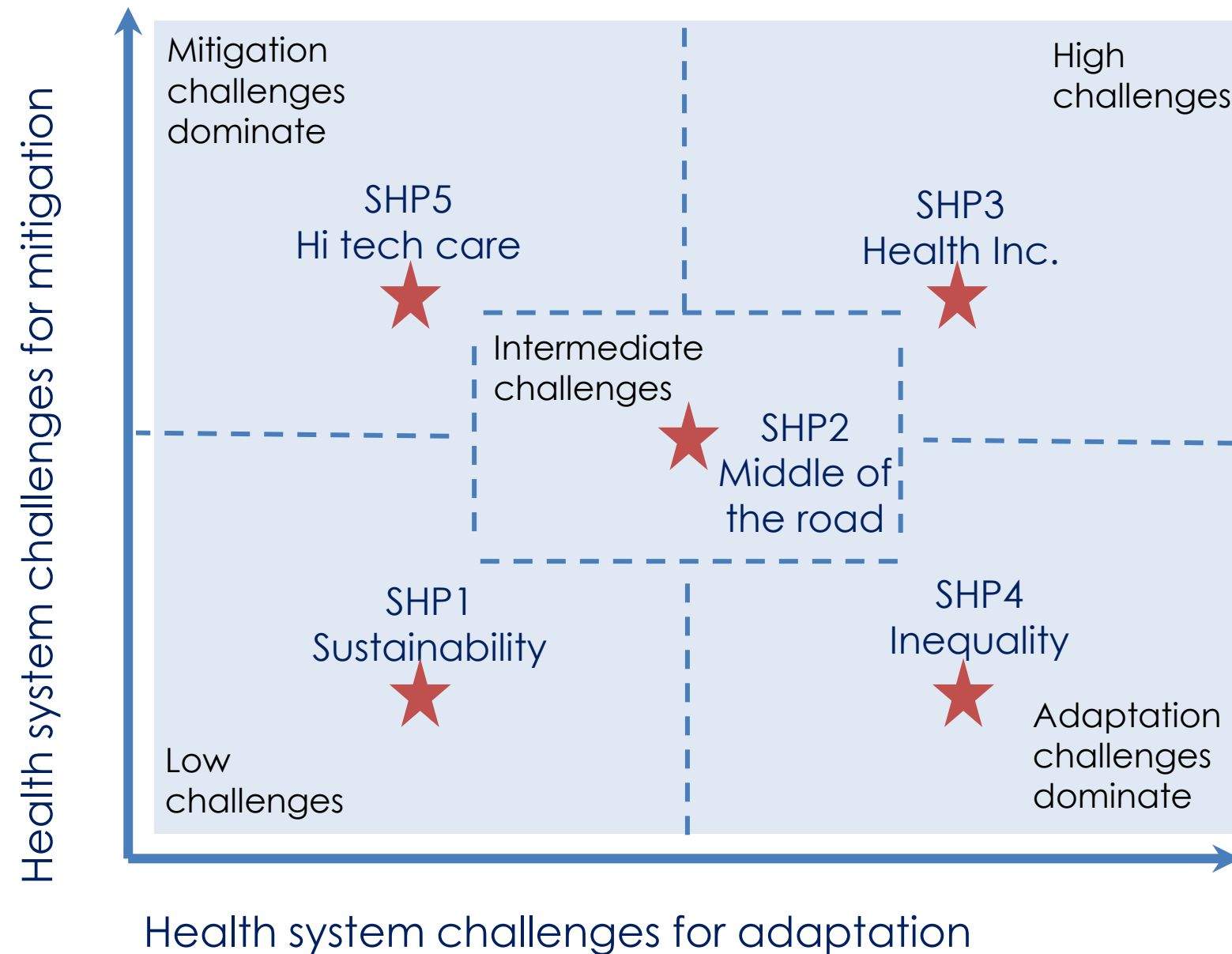
How we organize our world,
irrespective of climate change



Shared Socio-economic Pathways – Challenge space



Shared Health System Pathways – Challenge Space

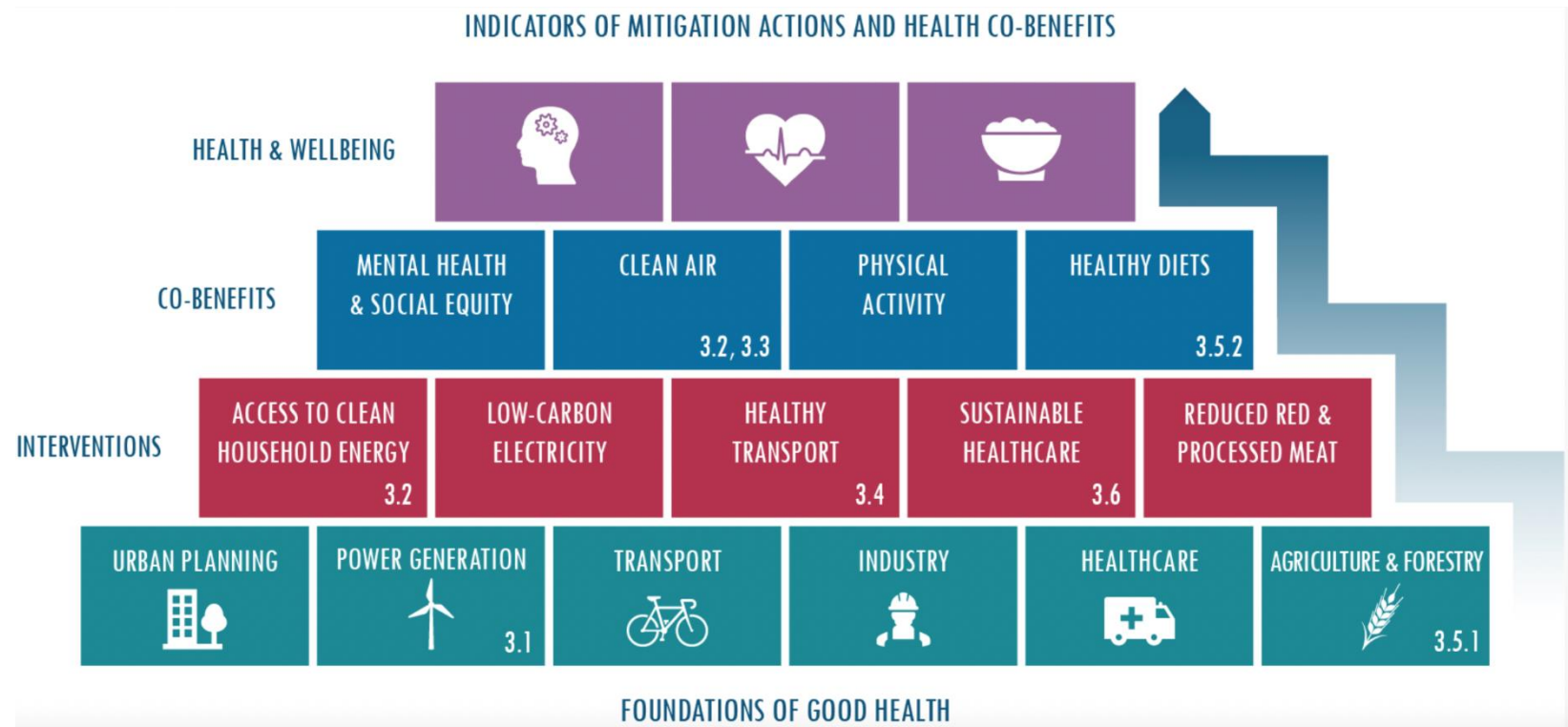


1. Alignment



1. Alignment

- Health co-benefits



Lancet Countdown. Tracking Progress on Health & Climate Change. The health benefits of the response to climate change. 2022. <https://www.lancetcountdown.org/data-platform/mitigation-actions-and-health-co-benefits>

1. Alignment

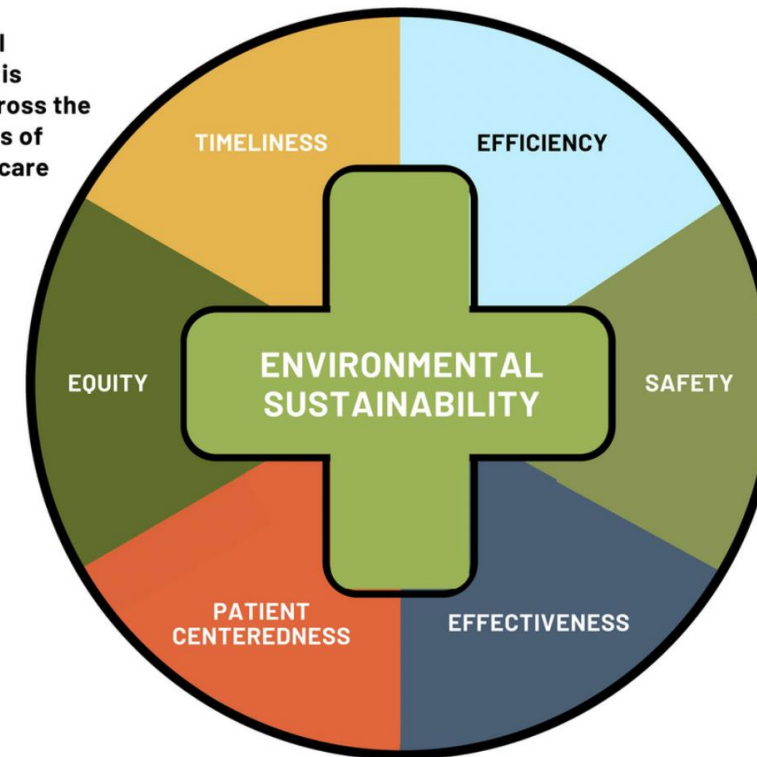
- Health co-benefits
- Appropriateness



1. Alignment

- Health co-benefits
- Appropriateness
- Quality improvement

Environmental Sustainability is Embedded Across the Six Dimensions of Quality Healthcare



TRAINING FOR BETTER HEALTH OUTCOMES:
INTEGRATING SUSTAINABILITY INTO HEALTHCARE QUALITY IMPROVEMENT EDUCATION

Why • The Case for Change
What • CASCADES Project Charter
How • Integrate Sustainability into Healthcare Quality Improvement Education



1. Alignment

- Health co-benefits
- Appropriateness
- Quality improvement
- Person-centred & integrated care



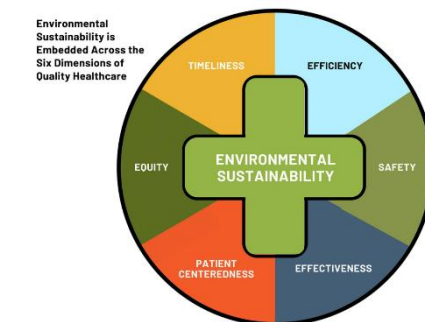
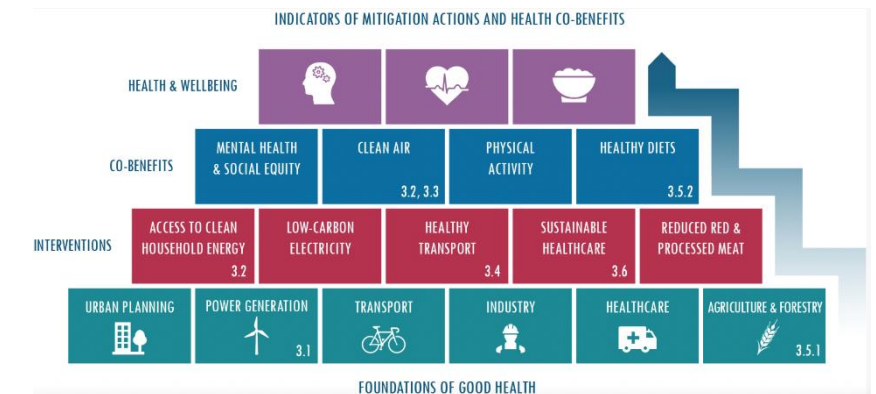
NHS Health Education England. Integrated Care Toolkit.

<https://learning.wm.hee.nhs.uk/node/898>

1. Alignment

- Health co-benefits
- Appropriateness
- Quality improvement
- Person-centred & integrated care

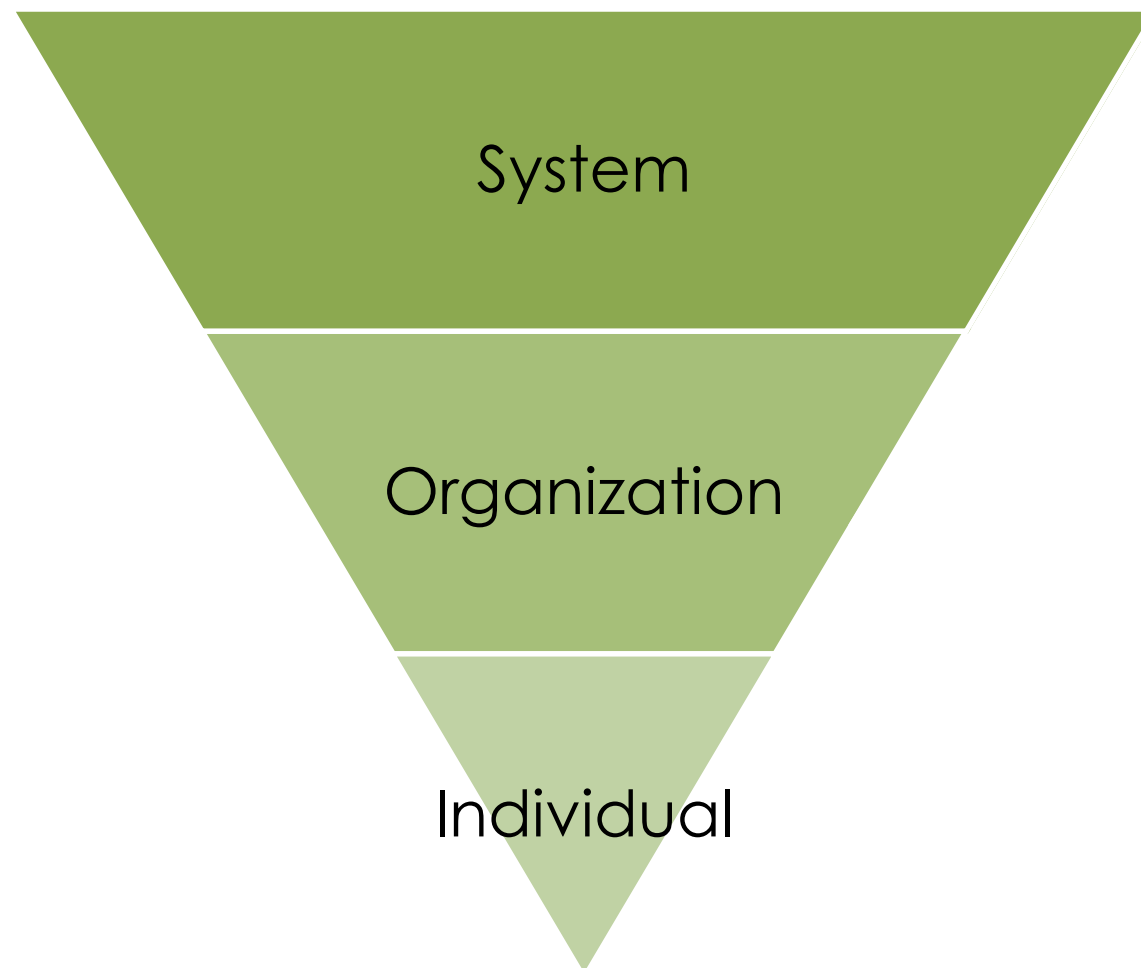
Leaders must build alignments & make clear that sustainability is already our job



2. System perspective

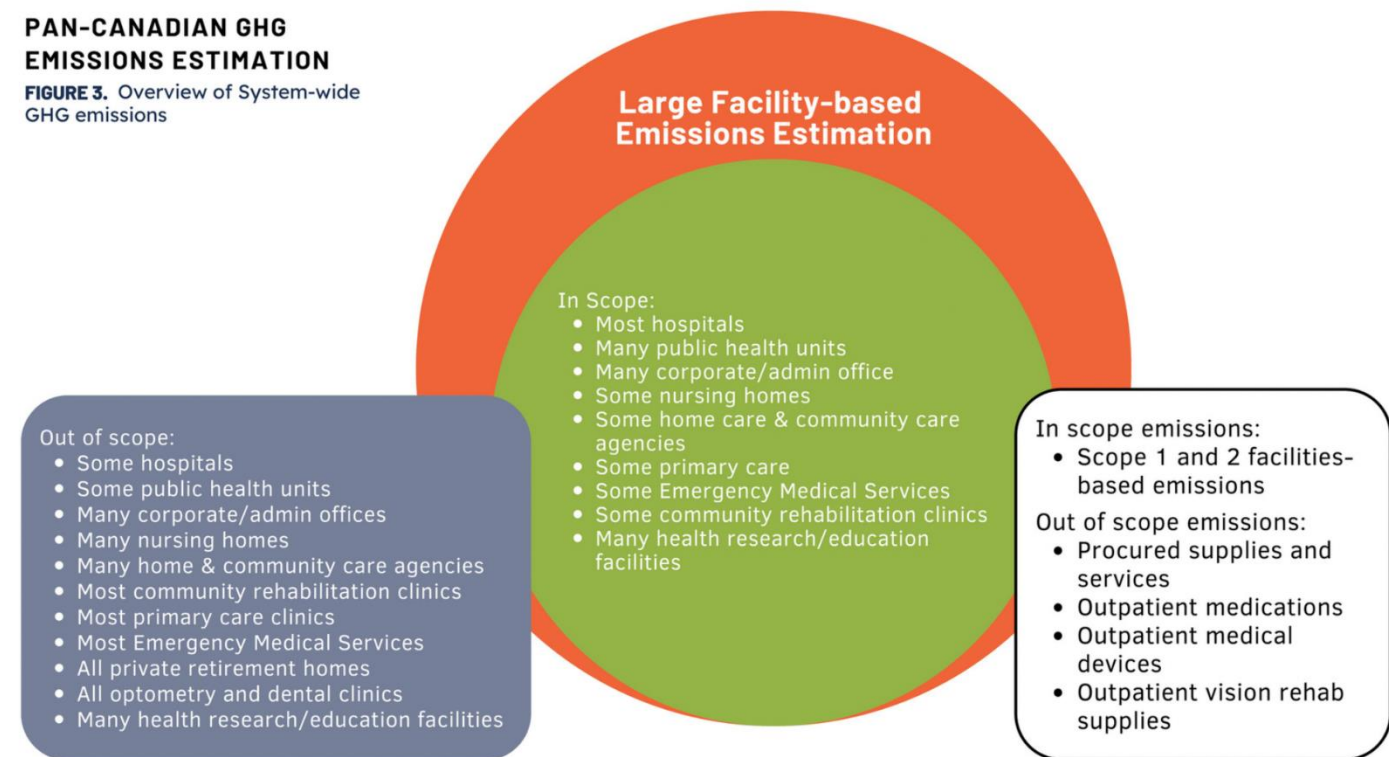


2. System perspective



PAN-CANADIAN GHG EMISSIONS ESTIMATION

FIGURE 3. Overview of System-wide GHG emissions

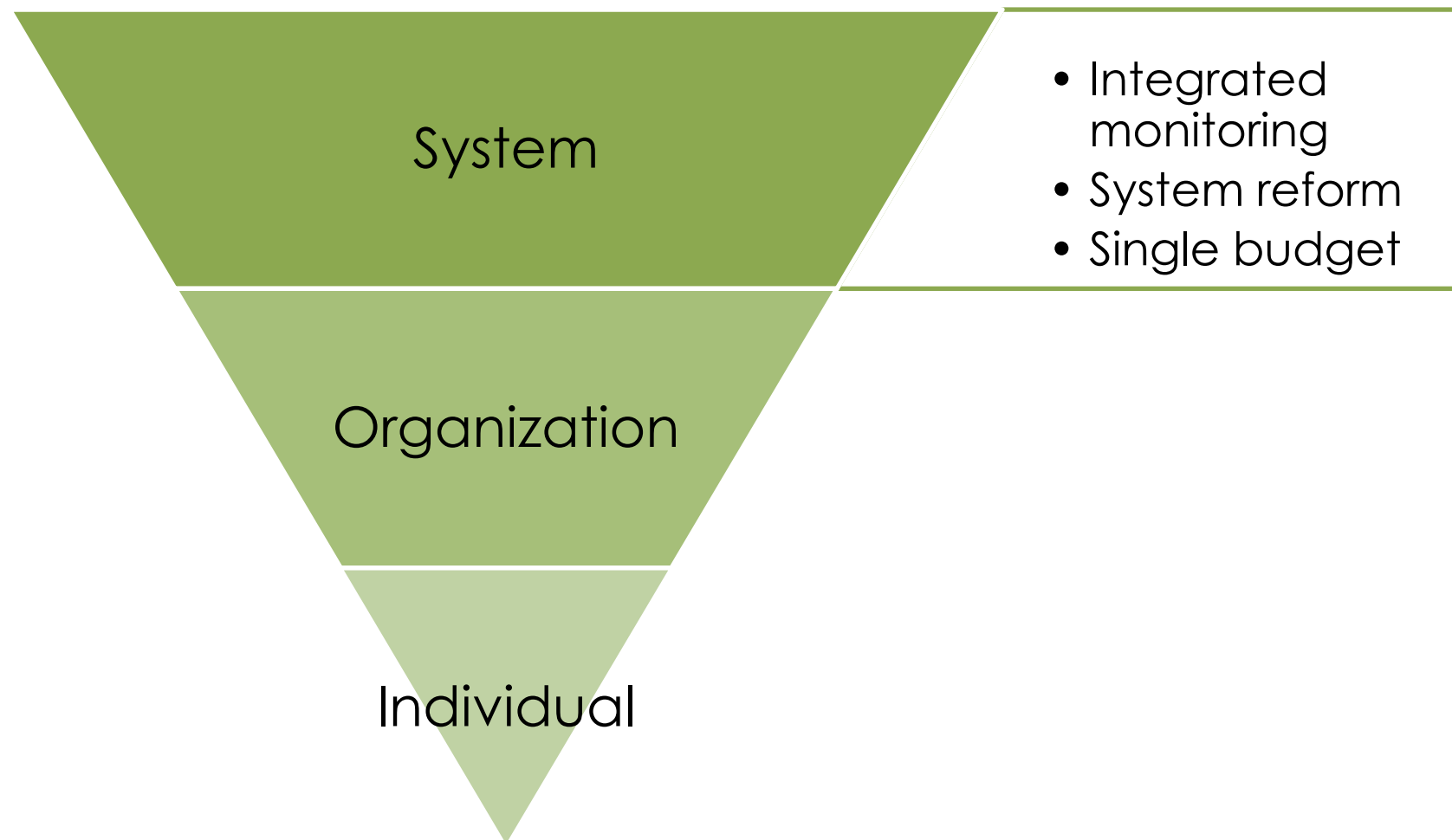


GREENHOUSE GAS EMISSIONS ESTIMATION IN CANADIAN HEALTHCARE

Why • The Case for Change
What • Resources, Products and Recommendations
How • Strategy to Implement and Create Change

2. System perspective

Leaders must have a system perspective & build and support networks to address system needs



Availability
inverse to
needs.
Have more
data and
capacity at
meso and
micro levels

3. Lead for transformation



3. Lead for transformation

Leaders must foster continuous learning & improvement & performance manage for change

“

The overriding function of management is to provide order and consistency to organizations, whereas the primary function of leadership is to produce change and movement.

Management is about seeking **order and stability**.

Leadership is about seeking adaptive and constructive **change**.

Kotter, 1990

”

Supports for leaders

CARE PATHWAYS

Deliver care differently

- High quality & Low carbon
- Sustainable & Resilient

SYSTEM ENABLERS

Design systems differently

- High impact enablers
- Structure & embed

FILL THE IMPLEMENTATION GAP



ORGANIZATIONAL READINESS FOR SUSTAINABILITY

Why • The Case for Change
What • The Activity Matrix
How • Strategy and Partnerships

Canada CASCADES



STRENGTHEN CAPACITY FOR CHANGE



TRAINING FOR BETTER HEALTH OUTCOMES: INTEGRATING SUSTAINABILITY INTO HEALTHCARE QUALITY IMPROVEMENT EDUCATION

Why • The Case for Change
What • CASCADES Project Charter
How • Integrate Sustainability into Healthcare Quality Improvement Education

Canada CASCADES



FOSTER PAN-CANADIAN COORDINATION



GREENHOUSE GAS EMISSIONS ESTIMATION IN CANADIAN HEALTHCARE

Why • The Case for Change
What • Resources, Products and Recommendations
How • Strategy to Implement and Create Change

Canada CASCADES



<https://cascadescanada.ca/resources/>

Poll Question

Is quality improvement useful in efforts to produce a climate resilient, low carbon and sustainable health system in your setting?

Yes – very much

Yes – a little

No – not very much

No – not at all

Not sure

Join at
slido.com
#1574 144





Is quality improvement useful in efforts to produce a climate resilient, low carbon and sustainable health system in your setting?



Thank you

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<https://cascadescanada.ca>





Discussion



Closing Remarks