A person wearing a white lab coat is shown from the chest up, holding a small, round, green moss ball in their hands. The background is blurred, suggesting an outdoor setting. The text is overlaid on the image.

Planetary Health: Why It Matters & Practical Ways to Promote Sustainability and Wellbeing

Dr Shilo Lefresne

Radiation Oncology

BC Cancer Planetary Health Unit



Objectives

- Define planetary health and why it matters for wellness
- Highlight some BC Cancer Planetary Health Unit Initiatives
- Discuss opportunities for personal engagement that improve sustainability and overall health





What is Planetary Health?

- Human health, well being and equity are intrinsically linked to the health of the planet
- Many human activities have a detrimental impact on the ecosystems that we rely on
 - contributions to climate change
 - loss of biodiversity
 - pollution





Local Health / Local News

B.C. wildfires 2018: Medical issues surge as air quality advisory becomes longest on record

BCCDC warns that smoke in the air is filled with fine particles that can irritate the eyes, throat, and lungs

Pamela Fayerman, Behdad Mahichi

Published Aug 21, 2018 • 4 minute read



Important role of Outdoor Air Pollution as Lung Cancer Risk

	Global	W SDI	W-middle SDI	Middle SDI	High-middle SDI	High SDI	Central Asia	Central Europe	Western Europe	Oceania	High-income Asia Pacific	High-income North America	Upper Latin America	Western Europe	Latin America	Caribbean	Central Latin America	Typical Latin America	North Africa and Middle East	South Asia	East Asia	Oceania	South-east Asia	Central sub-Saharan Africa	Western sub-Saharan Africa	Upper sub-Saharan Africa	Western sub-Saharan Africa
Occupational exposure to beryllium	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Occupational exposure to cadmium	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Occupational exposure to chromium	14	14	14	14	14	14	14	14	14	13	13	13	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Occupational exposure to polycyclic aromatic hydrocarbons	13	13	13	13	13	12	13	13	13	12	12	12	12	12	12	12	12	12	13	13	13	13	13	13	13	13	13
Occupational exposure to nickel	12	11	11	12	12	11	12	11	11	11	11	11	13	11	13	13	13	13	12	11	12	12	12	12	12	12	12
Occupational exposure to arsenic	11	12	12	11	11	9	11	10	9	9	9	9	11	9	11	11	11	11	11	12	11	11	11	11	11	11	11
Occupational exposure to diesel engine exhaust	10	10	10	10	10	10	10	12	12	10	10	10	9	10	8	9	10	10	10	10	10	10	9	9	10	10	10
Occupational exposure to silica	9	9	9	9	9	8	9	9	8	7	8	8	8	8	9	8	9	9	9	9	8	8	8	9	9	9	9
Diet low in fruits	8	5	6	6	6	6	6	6	6	4	5	6	7	7	7	6	6	8	7	5	7	5	6	5	5	5	5
Household air pollution from solid fuels	5	1	2	5	8	13	7	8	10	14	14	14	10	13	4	5	5	7	8	3	5	2	3	1	1	6	1
Residential radon	6	6	7	7	5	5	5	5	4	8	7	4	6	5	5	7	4	6	5	7	6	7	7	7	7	8	6
Secondhand smoke	4	7	5	3	3	7	4	4	3	6	4	7	4	6	10	4	7	5	4	6	3	4	5	8	8	7	7
High fasting plasma glucose	3	4	4	4	4	2	3	3	5	3	3	2	3	2	3	3	3	2	3	4	4	3	4	4	3	3	4
Occupational exposure to asbestos	7	8	8	8	7	4	8	7	7	2	6	3	5	3	6	10	8	4	6	8	9	10	10	6	6	4	8
Ambient particulate matter pollution	2	3	3	2	2	3	1	2	2	5	2	5	2	4	1	2	2	3	2	1	2	6	2	2	4	2	2
Smoking	1	2	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	1	3	2	1	3

Ebrahimi et al.
 Global Burden of Disease Study
 2019. Lancet Respir Med
 2021;9(9):1030-1049.

Courtesy Dr Michael Brown



This is where the City of Dawson Creek takes in its water supply from the Kiskatinaw River, which is at record lows after years of drought. While recent snowfall has improved water flows, the city says the river is already beginning to freeze. (Matt Preprost/CBC)

British Columbia

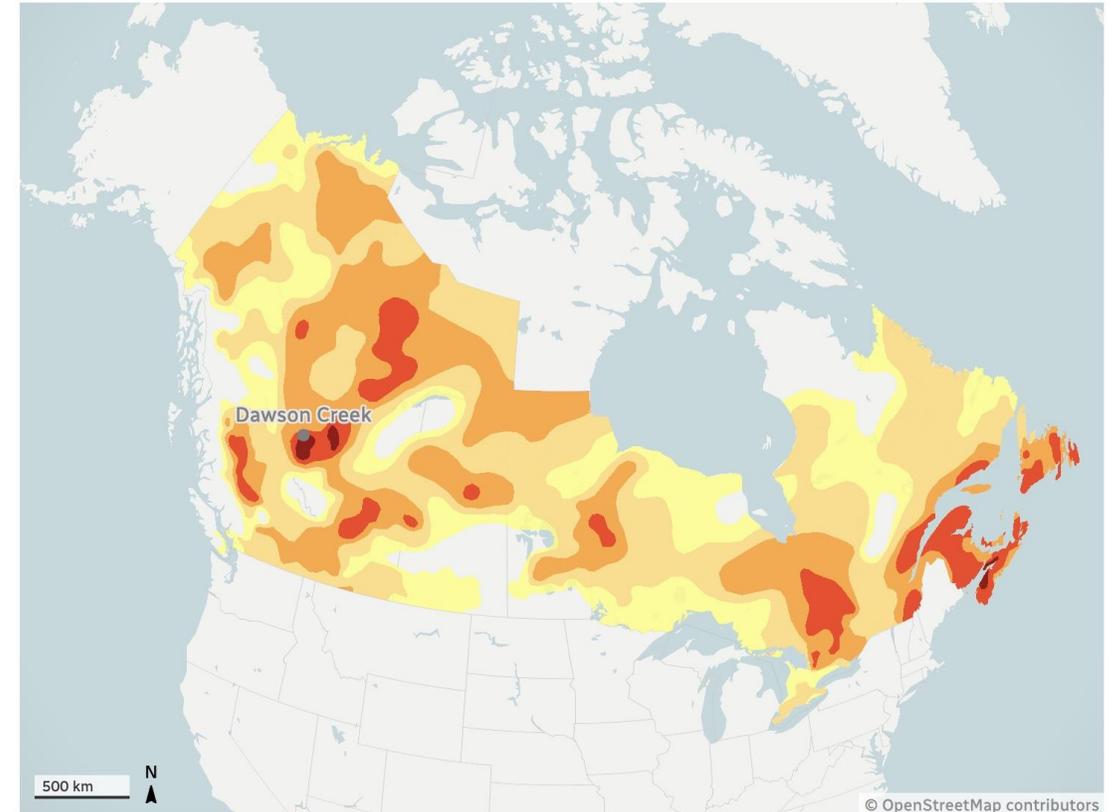
Dawson Creek, B.C., hopes to run hoses along highway in order to address water shortage

Emergency water permits needed amid historic drought in northeast B.C.

CBC News · Posted: Nov 21, 2025 2:41 PM PST | Last Updated: November 21

Current drought conditions

Conditions as of Oct. 31, 2025



Drought Intensity

- D4 - Exceptional drought
- D3 - Extreme drought
- D2 - Severe drought
- D1 - Moderate drought
- D0 - Abnormally dry

Nunavut data not available

Source: [Agriculture and Agri-Food Canada](#) (Akshay Kulkarni/CBC)

Rampant heatwaves threaten food security of entire planet, scientists warn

After hottest day ever, researchers say global heating may mean future of crop failures on land and 'silent dying' in the oceans

'Heat dome' probably killed 1bn marine animals on Canada coast, experts say



Dead mussels at the waterline in British Columbia. Photograph: Christopher Harley

B.C. heat wave 'cooks' fruit crops on the branch in sweltering Okanagan and Fraser valleys

Up to 75% of some fruits too damaged to sell fresh, according to farmers



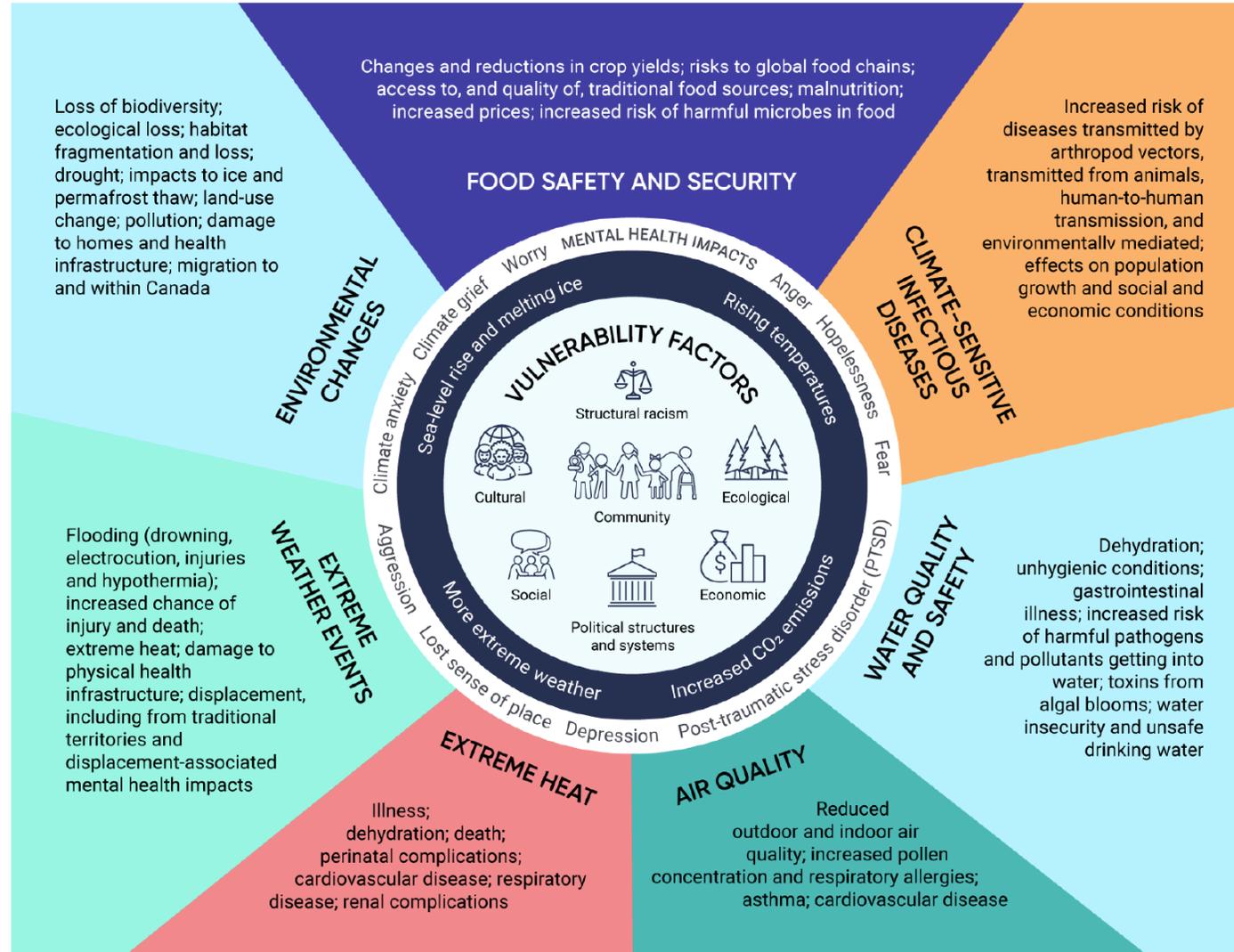
Michelle Gomez · CBC News · Posted: Jul 06, 2021 7:25 PM PDT | Last Updated: July 7, 2021



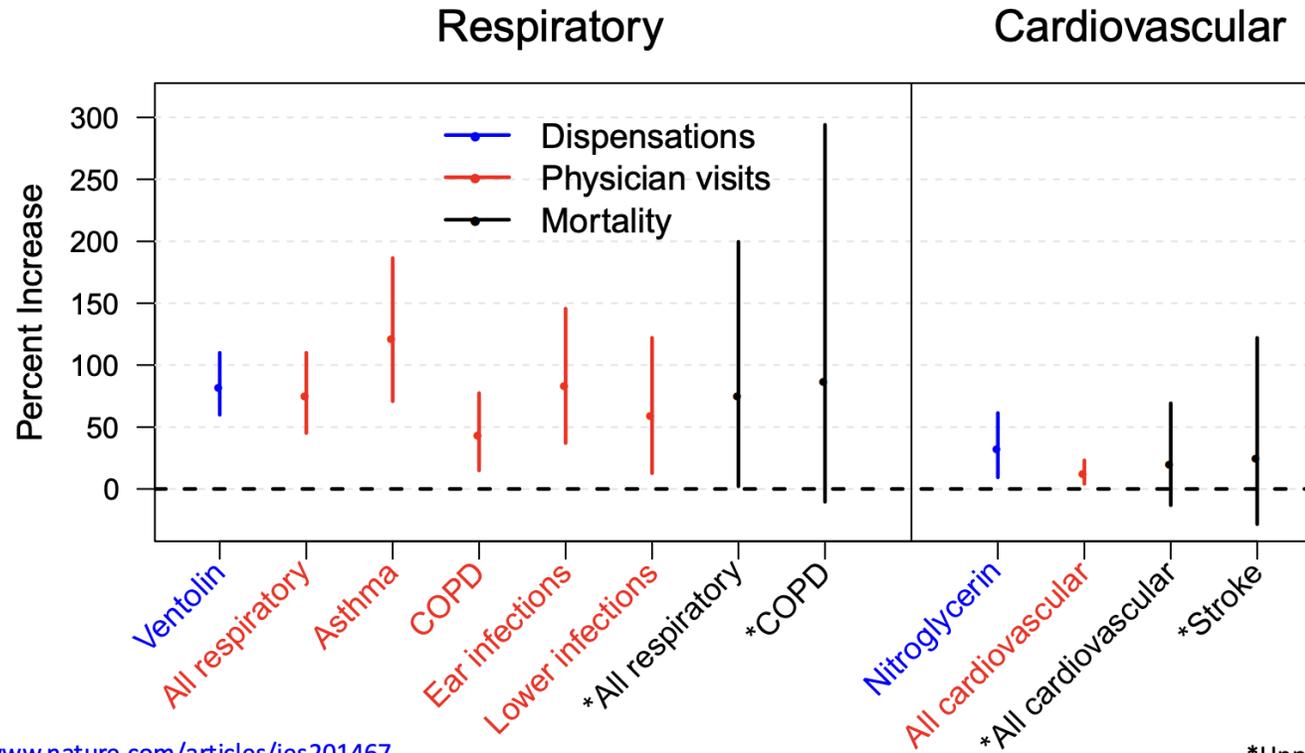
'Perfect storm': B.C. fruit farmers warn of massive crop loss after deep freeze



By **Simon Little & Cassidy Mosconi** · Global News
Posted February 7, 2024 6:25 pm · 3 min read



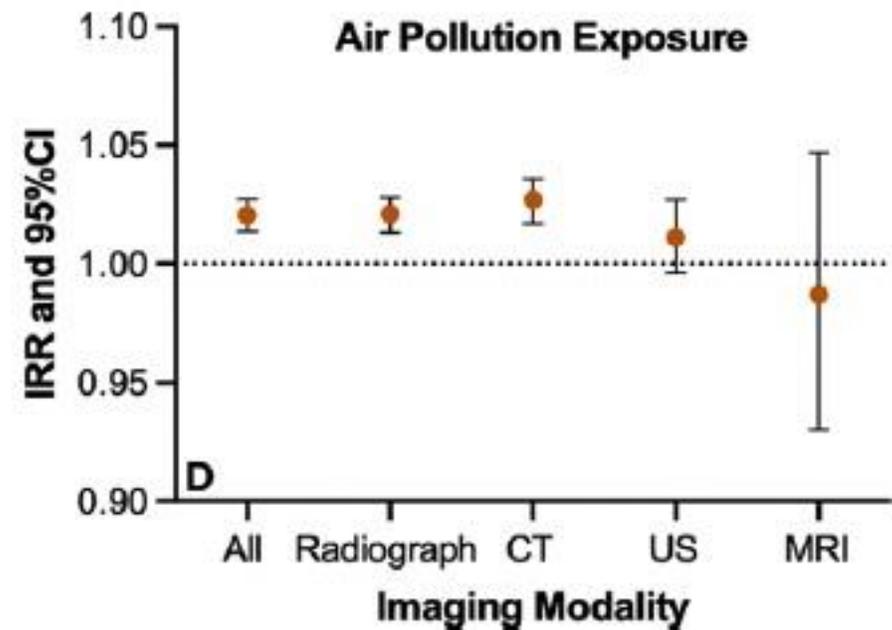
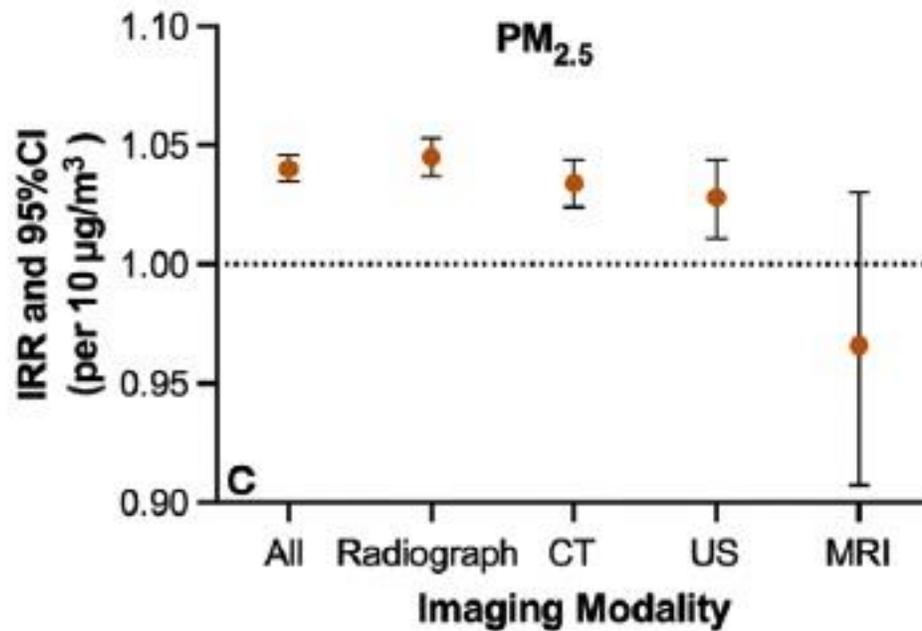
Acute effects on a smoky day (100 mg/m³ PM_{2.5})



<https://www.nature.com/articles/jes201467>

*Unpublished data

Increased Emergency Department Medical Imaging: Association with Short-Term Exposures to Ambient Heat and Particulate Air Pollution



Rising Costs to Health Care System

PROJECTED HEALTH COSTS

Billions of \$ per year by end of century

Canada does not need to be locked into a future of mounting costs, illness, and death resulting from climate change health impacts.

If governments accelerate action to strengthen health systems and address the root causes of vulnerability, the health risks and costs related to climate change can be substantially reduced.

● High-emissions scenario
● Low-emissions scenario

● \$0.2B
● \$0.1B

● \$0.8B
● \$0.5B

Lyme disease

Ground-level ozone illnesses

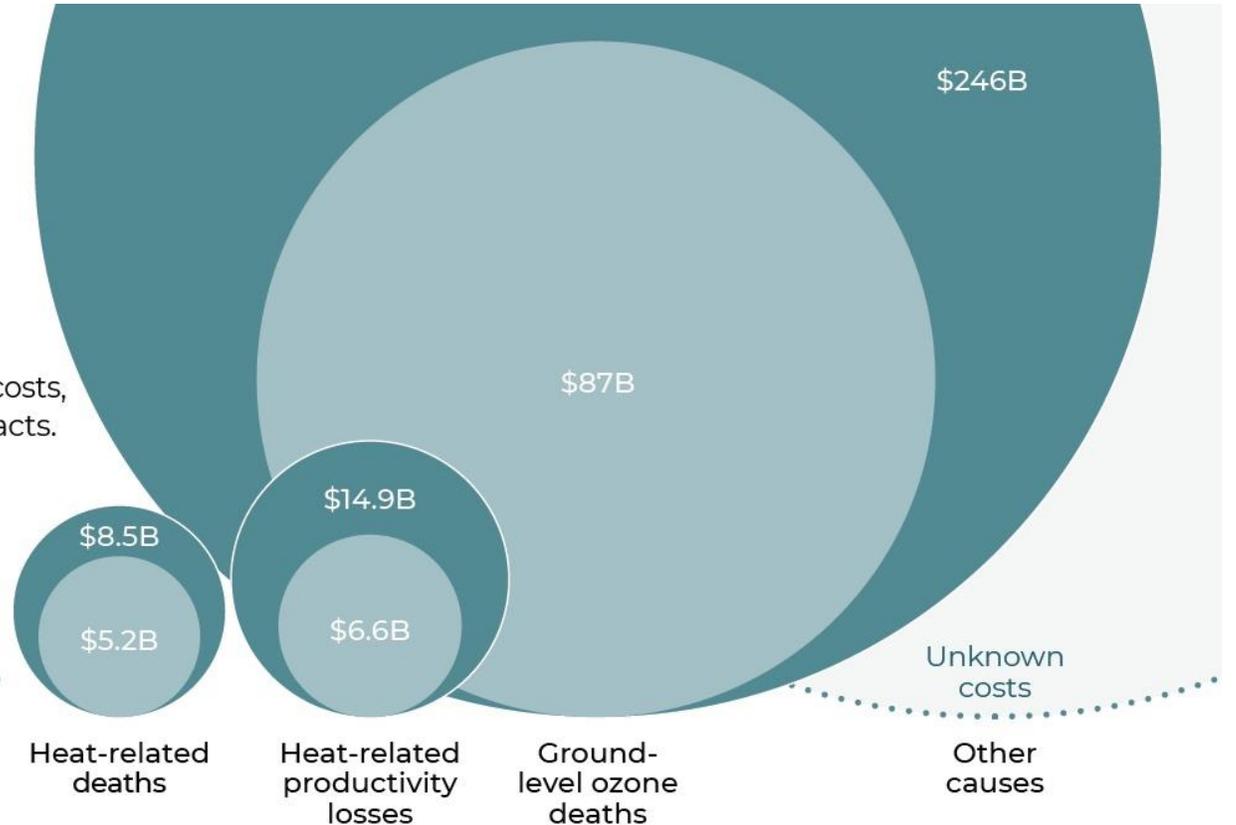
Heat-related deaths

Heat-related productivity losses

Ground-level ozone deaths

Unknown costs

Other causes



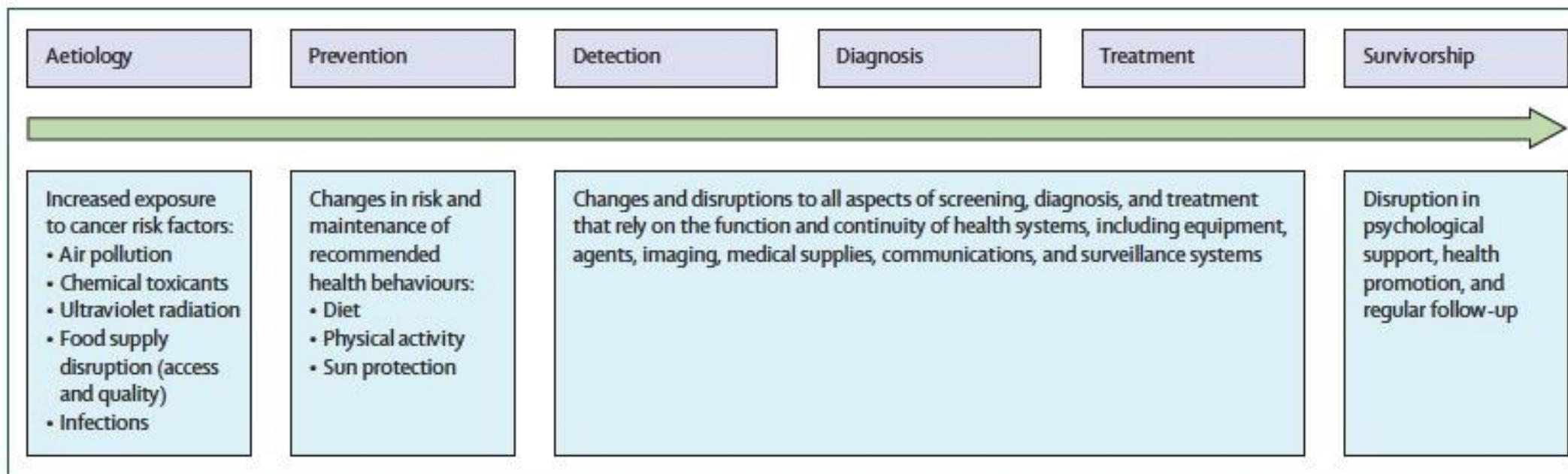


Figure 1: Climate change impact across the cancer control continuum

Climate change is likely to affect cancer control actions all along the cancer control continuum from increasing causal factors and modifying behaviours for prevention and early detection, to disrupting health system factors that underlie early detection, diagnosis, treatment, and survivorship practices.

Tackling the climate emergency with the BC Cancer Planetary Health Unit

April 07, 2022

The BC Cancer Planetary Health Unit is an exciting step forward in establishing low waste, low carbon health care across BC Cancer centres.



Dr. Maura Brown, Dr. Shilo Lefresne, and Dr. Caroline Mariano.

<http://www.bccancer.bc.ca/about/news-stories/stories/tackling-the-climate-emergency-with-the-bc-cancer-planetary-health-unit>



Planetary Health Unit

BC Cancer is committed to reducing waste and our carbon footprint

Did you know...

Using exam table paper does not reduce the spread of infections. We disinfect the examination table after each patient visit.

BC Cancer current uses over 2000 km of exam table paper every year!

As of June 1, 2022 we are no longer routinely covering the examination table with paper. Please let your care team know if you would be more comfortable also having a paper cover.

Any other ideas about how we can improve sustainability?
email: planetaryhealthunit@bccancer.bc.ca



PPE RECYCLING PROGRAM

HELP US DIVERT 75% OF WASTE BY 2030!



- On average, Canadian Healthcare ranks **3rd globally for single-use plastic waste** per capita
- About **30% of all healthcare waste** consists of **plastics**
- An average of **18 lbs of waste** is produced **per hospital bed, every day**
- Knee replacement surgery uses **64 plastic wrappers, 51 gloves, 29 sterile towels, 14 blue wraps, and 5 gowns**

ACCEPTED



DISPOSABLE MASKS & RESPIRATORS



BLUE WRAP, HAIRNETS & GOWNS



VISORS, GLOVES & EYE WEAR

NOT ACCEPTED



NO GARBAGE WASTE



NO SHARPS & BIOHAZARDS



NO LIQUIDS



VITACORE.COM

INFO@VITACORE.COM

1-888-593-2218



Planetary Health Unit

BC Cancer is committed to reducing waste and our carbon footprint

Did you know...

Plastic bags break down into harmful microplastics linked to health risks including cancer.



Cutting single-use plastic bags at Regional Cancer Centres helps reduce the ecosystem and the health burden of microplastics.



By removing small office garbage bins in non-clinical areas, our Regional Cancer Centres can keep thousands of plastic bags out of the landfill every year.

Scan the QR code for more information on microplastics
To Contact the Planetary Health Unit email: planetaryhealthunit@bccancer.bc.ca





BC CANCER LIBRARY

[BC Cancer Library](#) / [Home](#) / [Planetary Health](#) / [Actions & Tools](#)

Planetary Health

Health and oncology topics in climate change, environmentalism, sustainability, global warming, carbon footprint, and pollution.

[Resources](#)

[Organizations](#)

[Reports](#)

[Multimedia](#)

[Actions & Tools](#)

[Return to Home](#)

New Links 2023

- [Sustainable Travel Guidance \(2023\)](#)

As a community, we have an opportunity and obligation to collectively decrease our carbon emissions associated with travel locally, regionally and abroad

Home Carbon Reduction

- [BrightAction](#)
Empower Your Community on Climate Change Solutions: Explore actions [more...](#)
- [Recyclepedia BC](#)
BC's most comprehensive source of information for the province's 17 Extended Producer Responsibility programs, curbside recycling systems, and other waste reduction/reuse options for products and materials
- [Switch It Up BC](#)
Working to raise awareness of the climate and health risks of residential natural gas. [more...](#)

Big Climate Actions

- [BC Public Pension Divestment](#)
Request divestment of your pension plan's portfolio. [more...](#)
- [NoFlyClimateSci](#)

Tools

- [Excessive Packaging - Waste Reduction](#)
GreenCare toolkit for Waste Reduction includes instructions to report concerns about "excessive packaging" (e.g. plastic wrap) on purchased healthcare resources, to support the search for lower waste vendor options.
- [RightCycle PPE recycling](#)
Vendor program to collect and recycle used professional PPE products.
- [Visualizations & Data Tools](#)
Yale Program on Climate Change Communication. SASSY=Six Americas Super Short Survey. Canadian data.

Sustainable travel

considers the
ecologic impact of
different methods of
travel locally and
abroad

evaluates the goals of
travel and chooses
the lowest carbon
option to meet those
goals

How Does Not Flying Compare to Other Sustainable Lifestyle Changes

It is impossible to calculate the exact greenhouse gas emissions of an individual person and the potential emissions reduction. All figures are approximations. However, it is clear that flights make a substantial impact on one's personal climate footprint.

Sources:

Flight and car emissions – Atmosfair (2020): <https://tinyurl.com/swcqvgtg>

Rest – Milieu Centraal (2020): <https://tinyurl.com/uceem5d>

stay-grounded.org

STAY GROUNDED



-80 kg
CO₂e/year

Buy a water-saving shower head



-90 kg
CO₂e/year

Replace all your old light bulbs with LED lamps



-155 kg
CO₂e/year

Avoid food waste



-300 kg
CO₂e/year

Buy all your clothes second hand



-450 kg
CO₂e/year

Heat your home more efficiently



-460 kg
CO₂e/year

Eat vegetarian



-700 kg
CO₂e

Avoid one return flight Berlin-Rome



-850 kg
CO₂e/year

Go vegan



-1.100 kg
CO₂e/year

Place 10 solar panels on your roof



-2.000 kg
CO₂e/year

Live without car



-5.100 kg
CO₂e

Avoid one return flight from Madrid to Rio de Janeiro

Choose sustainable travel options



choose a virtual collaboration tool instead of an in-person meeting



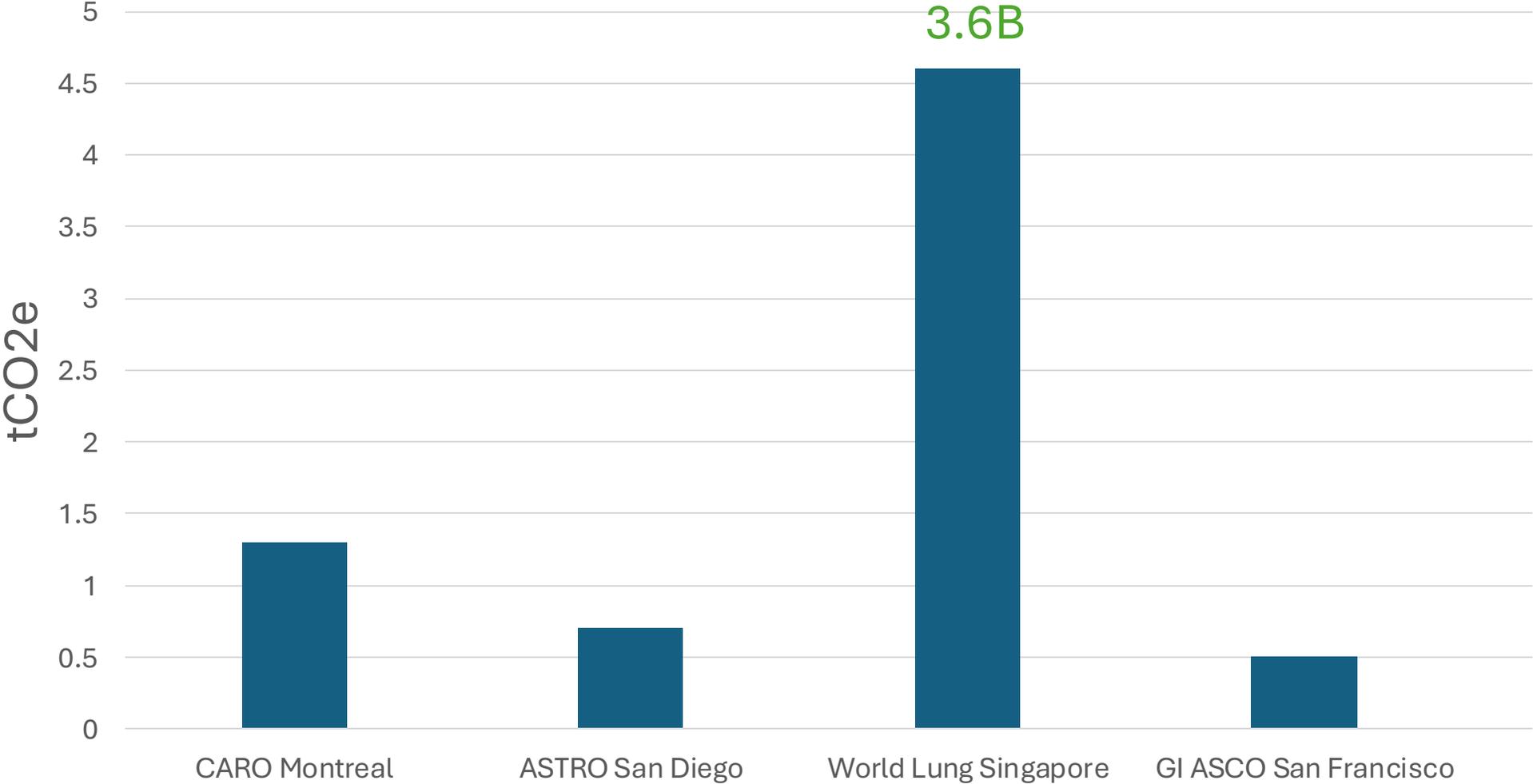
choose bus or train (if feasible) over air-travel when travel is unavoidable



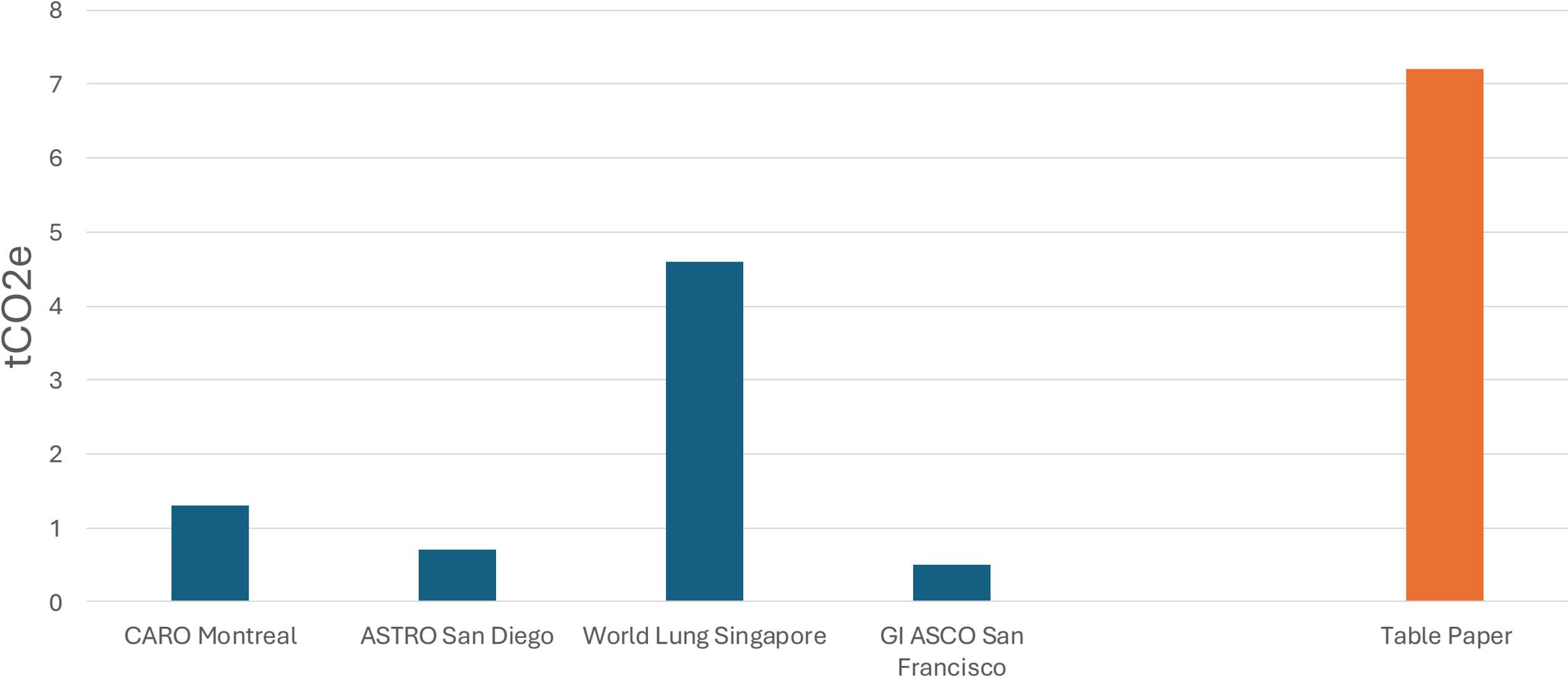
when air-travel is unavoidable, calculate your carbon footprint associated with that travel and consider goals

<https://flightfree.org/flight-emissions-calculator>

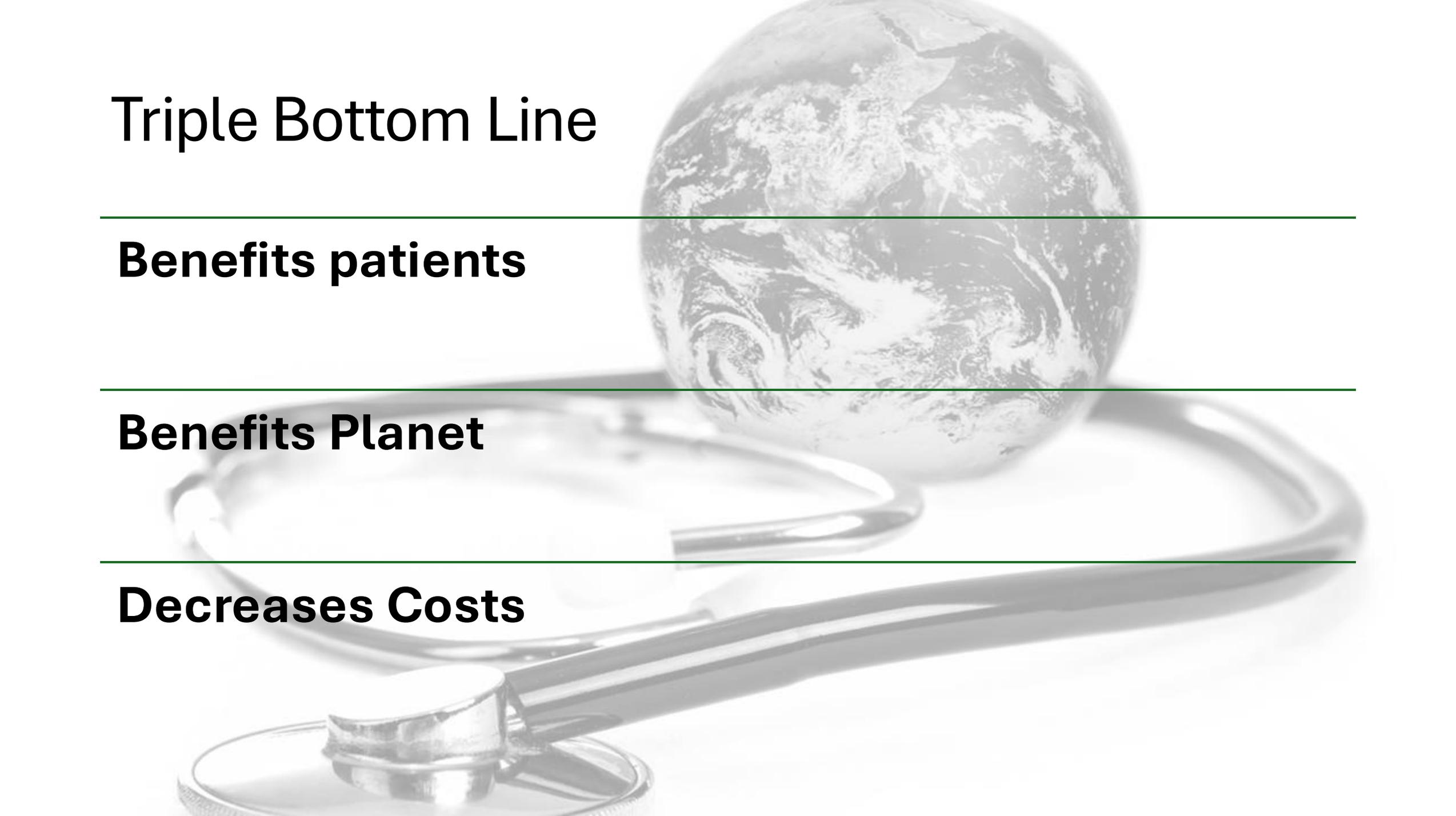
tCO2e Emitted Per Passenger for One Round Trip Flight



tCO2e Emitted Per Passenger for One Round Trip Flight



Triple Bottom Line



Benefits patients

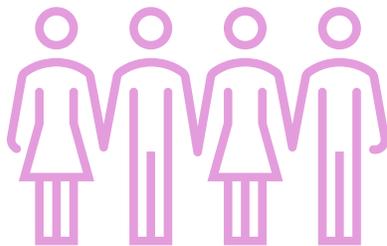
Benefits Planet

Decreases Costs

Deprescribing – Apr 2024-May 2025



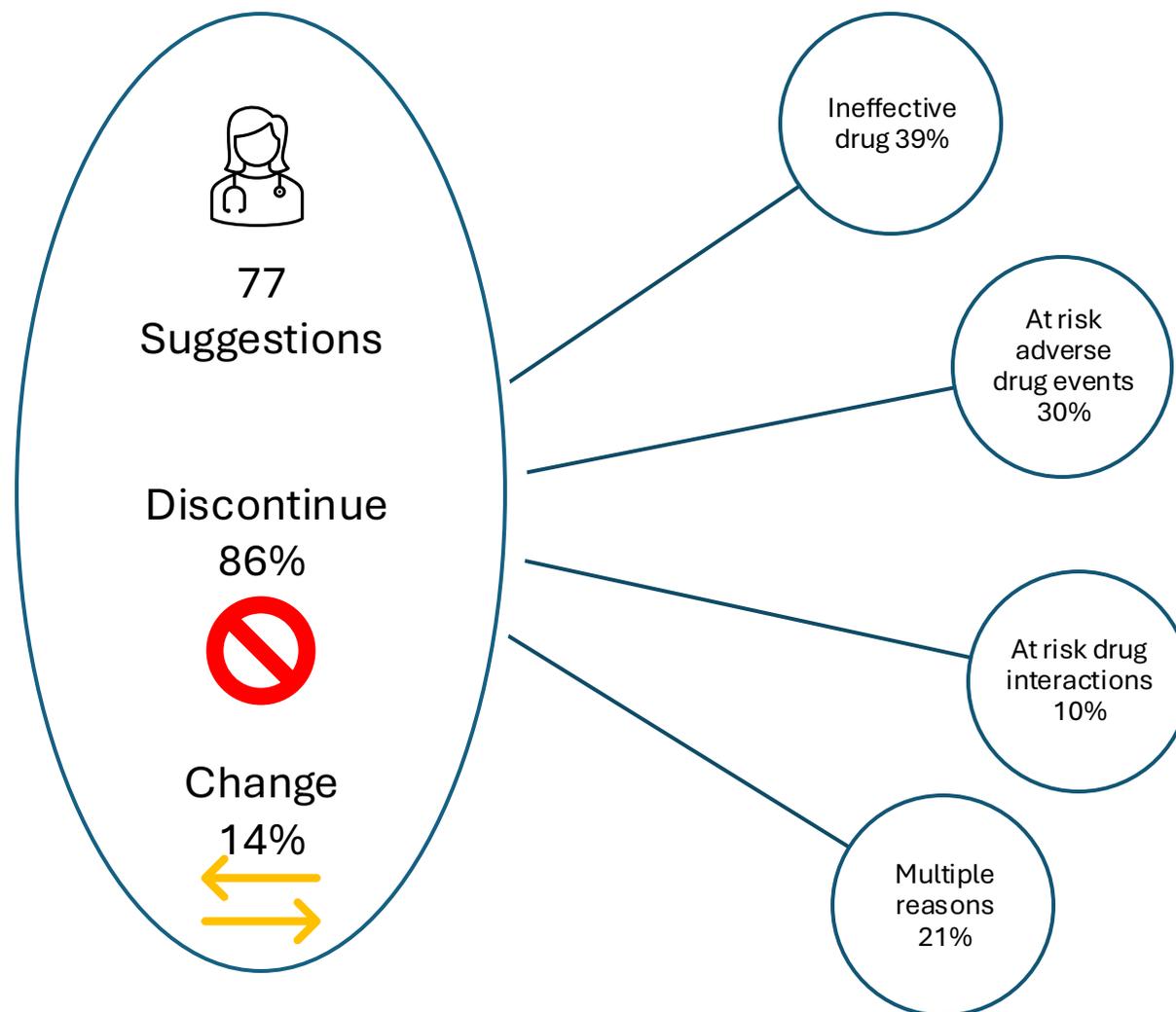
48 patients



Ave # of meds/patient: 8

Modified from Dr Lauren Curry

Project Results



Modified from Dr Lauren Curry

Palliative CT sim-less Radiotherapy for Bone Metastases

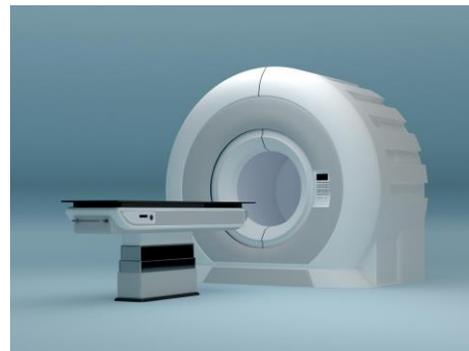
Diagnostic CT Scan



CT simulation



Treatment
Delivery on
LINAC



Palliative CT sim-less Radiotherapy for Bone Mets



Palliative CT sim-less Radiotherapy for Bone Mets

10 patient pilot completed

Very high patient satisfaction

Benefits

Decreased resource utilization, decreased costs

Less tests for patients, decreased time to radiotherapy

Decreased patient travel -> decreased carbon emissions



In Progress

- Planetary Health Approach to Catered Events Guideline
- Eating for Health and the Planet after Cancer Diagnosis



National Day of Action Planetary Health,
Oct 6 2025

planetaryhealthunit@bccancer.bc.ca

Opportunities for personal engagement

How Does Not Flying Compare to Other Sustainable Lifestyle Changes

It is impossible to calculate the exact greenhouse gas emissions of an individual person and the potential emissions reduction. All figures are approximations. However, it is clear that flights make a substantial impact on one's personal climate footprint.

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Rest – Milieu Centraal (2020): <https://tinyurl.com/uceem5d>

stay-grounded.org

STAY GROUNDED



-80 kg
CO₂e/year

Buy a water-saving shower head



-90 kg
CO₂e/year

Replace all your old light bulbs with LED lamps



-155 kg
CO₂e/year

Avoid food waste



-300 kg
CO₂e/year

Buy all your clothes second hand



-450 kg
CO₂e/year

Heat your home more efficiently



-460 kg
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Eat vegetarian



-700 kg
CO₂e

Avoid one return flight Berlin-Rome



-850 kg
CO₂e/year

Go vegan



-1.100 kg
CO₂e/year

Place 10 solar panels on your roof



-2.000 kg
CO₂e/year

Live without car



-5.100 kg
CO₂e

Avoid one return flight from Madrid to Rio de Janeiro



Active Transportation

Benefits

Mechanism to increase physical activity during our daily routines

improved heart health, lower the risk of chronic illnesses

reduce stress, elevate mood, support better mental health.

JAMA Internal Medicine | Original Investigation

Prospective Associations of Daily Step Counts and Intensity With Cancer and Cardiovascular Disease Incidence and Mortality and All-Cause Mortality

Borja del Pozo Cruz, PhD; Matthew N. Ahmadi, PhD; I-Min Lee, MBBS, ScD; Emmanuel Stamatakis, PhD

- 78 500 participants tracked steps then followed for 7 years
- More daily steps associated with
 - lower risk of death from any cause, from cardiovascular disease and cancer
- The more steps the better (peak 10 000), and brisker pace

263 540
participants,
followed 5 years

Commuting by
bike or mixed-
mode
associated with

- Lower risk of cancer, heart attack and stroke
- Lower risk of death from cancer, heart attack or stroke
- Lower risk of death from any cause

Commuting by
walking
associated with

- Lower risk of heart attack and stroke
- Lower risk of death from heart attack and stroke

Association between active commuting and incident cardiovascular disease, cancer, and mortality: prospective cohort study

Carlos A Celis-Morales,¹ Donald M Lyall,² Paul Welsh,¹ Jana Anderson,² Lewis Steell,¹ Yibing Guo,¹ Reno Maldonado,¹ Daniel F Mackay,² Jill P Pell,² Naveed Sattar,¹ Jason M R Gill¹

Health Benefits of Time Spent in Nature

Decreased stress and anxiety

Improved mental health and well being

Improved immune function, lower BP

People who spend more time in nature do more to protect it





Side effects may include:

- Living longer
- Increased energy
- Decreased anxiety
- Better mood
- Pain reduction
- Reduced stress levels
- Improved heart health

Ask your doctor.
www.parkprescriptions.ca

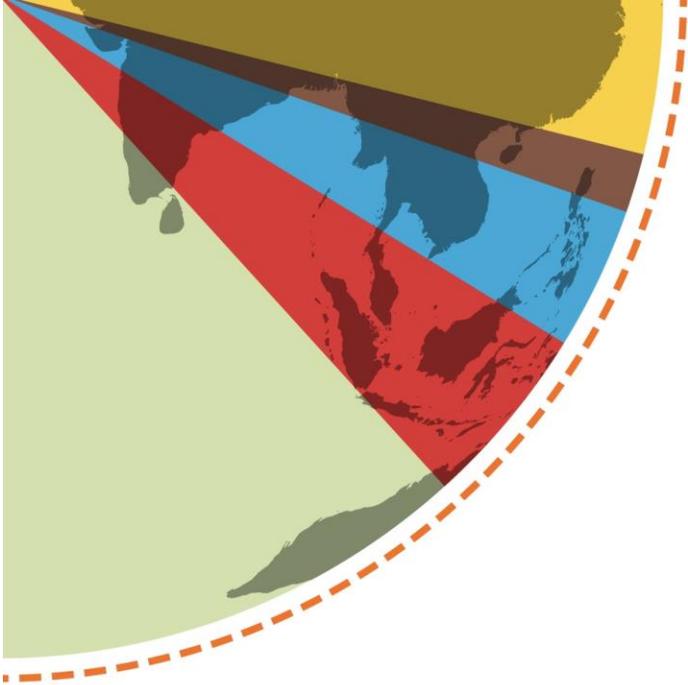


- Spend at least 2 hours a week, 20 minutes at a time in nature spaces
- Health benefits occur when people feel like they've had 'meaningful contact with nature'



Choose your region





Summary Report of the EAT-Lancet Commission

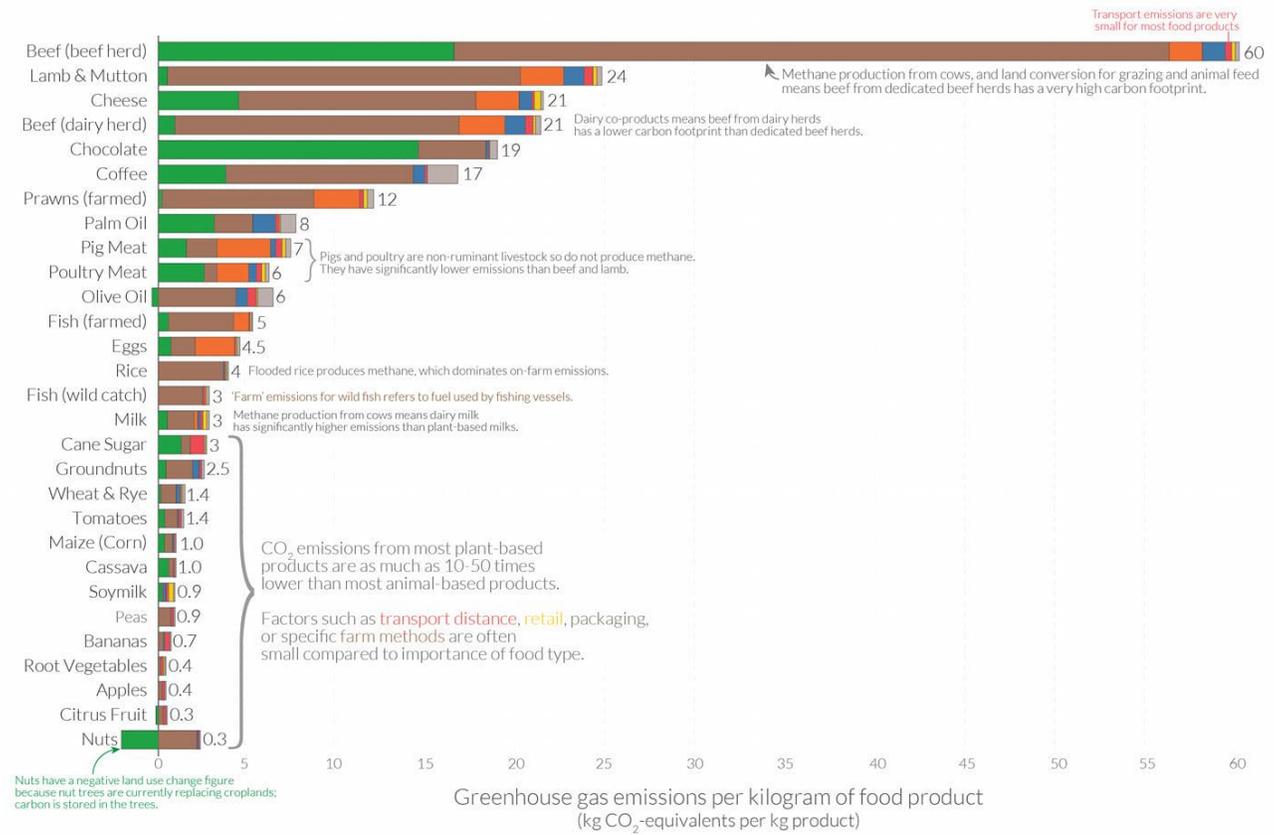
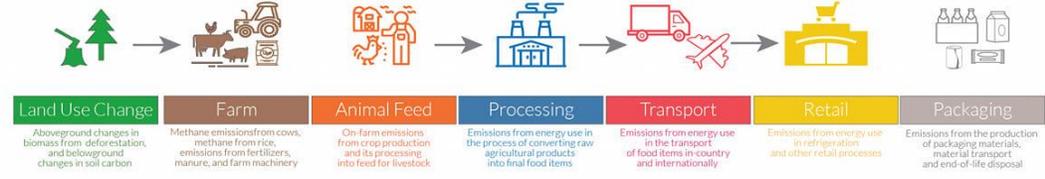
Healthy Diets From Sustainable Food Systems

Food Planet Health



Food is the single strongest lever to optimize human health and environmental sustainability on Earth.

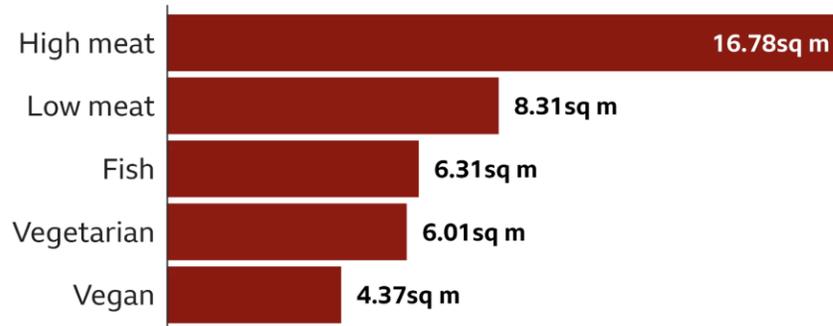
Food: greenhouse gas emissions across the supply chain



Note: Greenhouse gas emissions are given as global average values based on data across 38,700 commercially viable farms in 119 countries. Data source: Poore and Nemecek (2018). Reducing food's environmental impacts through producers and consumers. *Science*. Images sourced from the Noun Project. OurWorldinData.org - Research and data to make progress against the world's largest problems. Licensed under CC BY by the author Hannah Ritchie.

Meat production uses lots of land

How much land is needed to support a person on different types of diet* each day?



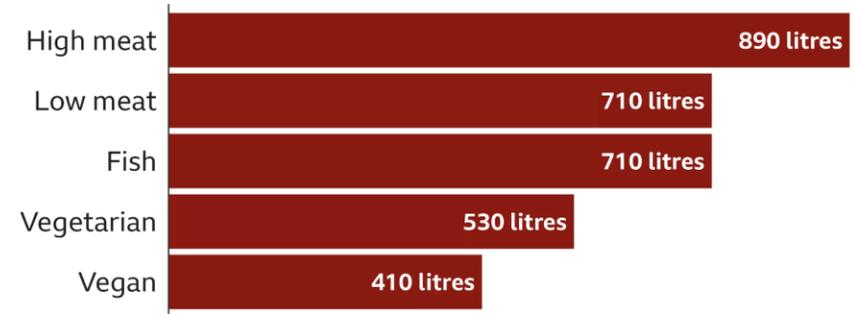
*Based on an adult eating 2,000 calories a day

BBC NEWS: LEAP Project/Nature Foods



High-meat diets need more water

How much water is used to produce food for different types of diet per person* each day?



*Based on an adult eating 2,000 calories a day

BBC NEWS: LEAP Project/Nature Foods



Health

Eating more ultra-processed foods tied to increased risk of early-onset colorectal cancer

Findings of large U.S. diet study point to need for healthier choices, Canadian medical experts say

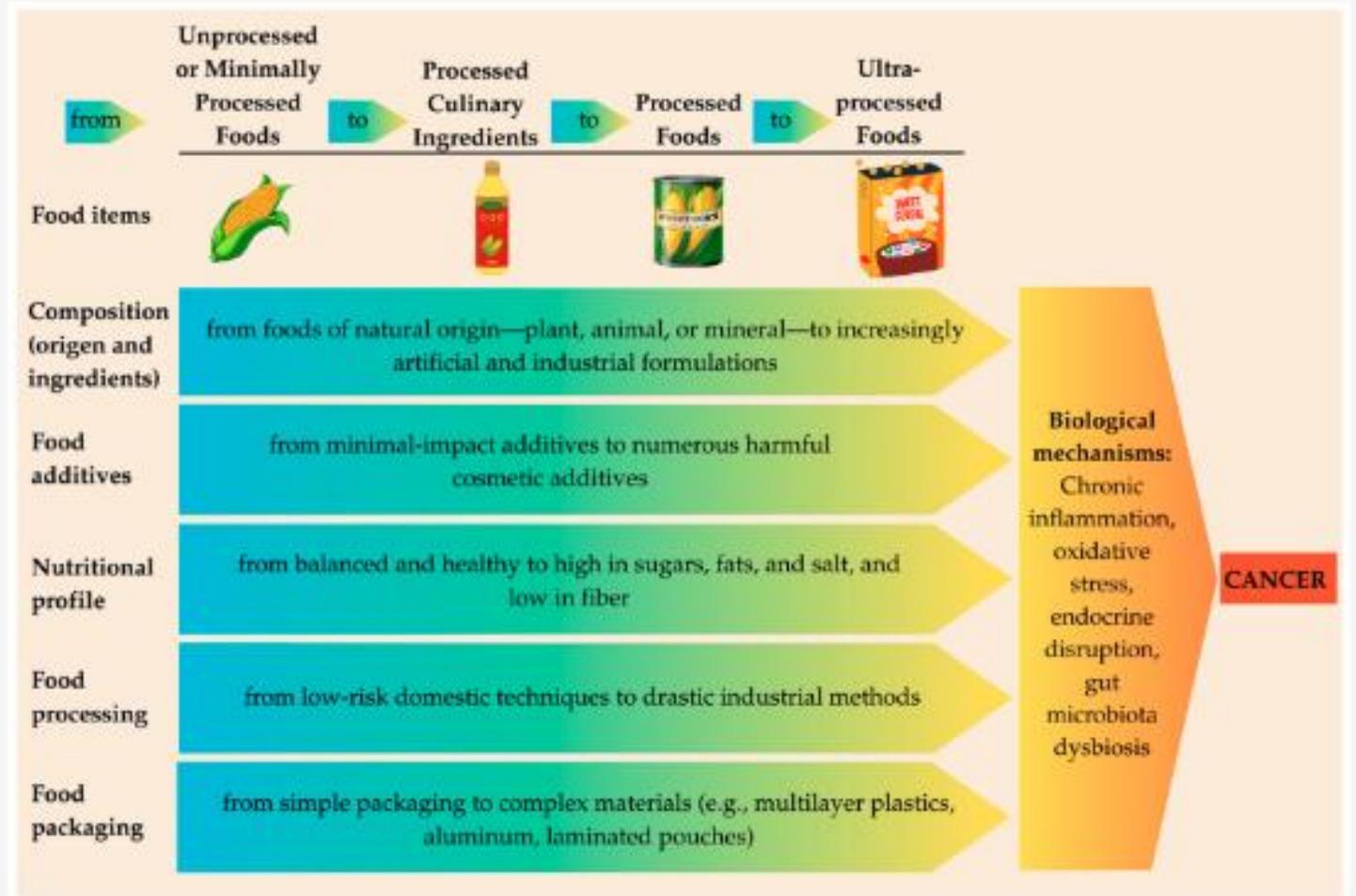
Original Investigation

Ultraprocessed Food Consumption and Risk of Early-Onset Colorectal Cancer Precursors Among Women

Chen Wang, MD^{1,2}; Mengxi Du, PhD^{1,2,3}; Hanseul Kim, PhD^{2,4} ; [et al](#)



Figure 2. From unprocessed or minimally processed to ultra-processed foods: food processing intensity and its synergistic links to carcinogenesis.



Reducing Home Gas Use

Decreasing use of natural gas appliances ex. stoves

Transition to renewal sources of electricity for home heating

Decrease use of natural gas fire places

Improve energy efficiency of your home





Health Effects of Natural Gas

Natural gas appliances can decrease air quality in your home

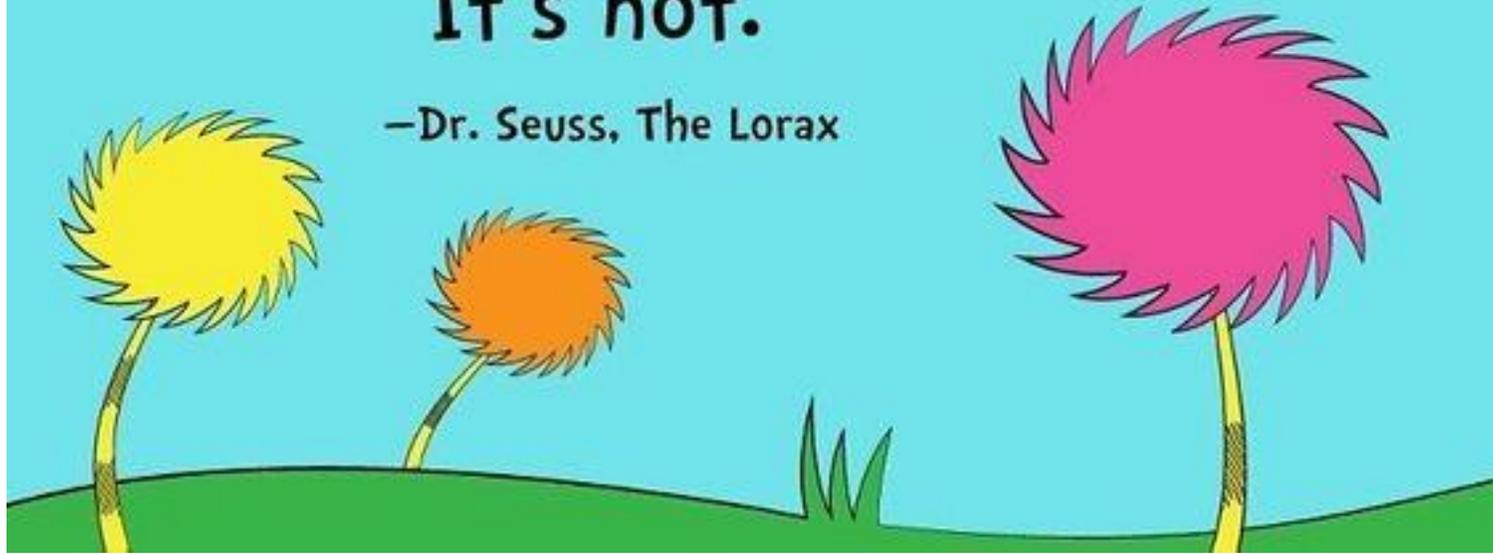
Emit nitrogen dioxide and carbon monoxide

Exposure worsen asthma and respiratory issues especially in poorly ventilated homes



**Unless someone like you
cares a whole awful lot,
Nothing is going to get better.
It's not.**

—Dr. Seuss, *The Lorax*





Amplify your Impact

- Set a SMART Goal
- Tell your friends and colleagues & **political representatives**



- **“Ours is not the task of fixing the entire world at once, but of stretching out to mend the part of the world that is within our reach.” ~ Clarissa Pinkola Estés**