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climate CATCH lab

Collaborative Action for Transformative Change in Health and Healthcare

Climate Change and Health

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Melbourne School of Population and Global Health

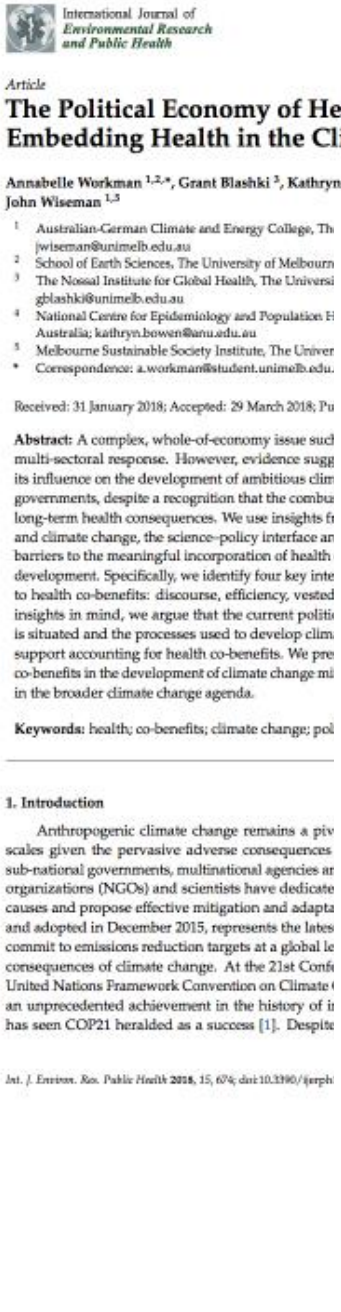
University of Melbourne

My background

Public health, and…

The world outside academia

- IPCC AR6, Ch. 7 (Health, Wellbeing and the Changing Structure of Communities)
- Other international reports – e.g. UNEP Adaptation Gaps, Emissions Gaps, UNEP GEO6, Lancet Countdown on Climate Change and Health
- ADB, GIZ, WHO, DFAT, GCF, UNDP, GEF, local government, DAAD…



International Journal of Environmental Research and Public Health

MDPI

Article

The Political Economy of Health Co-Benefits: Embedding Health in the Climate Change Agenda

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Abstract: A complex, whole-of-economy issue suc
multi-sectoral response. However, evidence sugg
its influence on the development of ambitious clim
governments, despite a recognition that the combu
long-term health consequences. We use insights fr
and climate change, the science–policy interface an
barriers to the meaningful incorporation of health
development. Specifically, we identify four key inte
to health co-benefits: discourse, efficiency, vested
insights in mind, we argue that the current politi
is situated and the processes used to develop clim
support accounting for health co-benefits. We pre
co-benefits in the development of climate change mi
in the broader climate change agenda.

Keywords: health; co-benefits; climate change; pol

1. Introduction

Anthropogenic climate change remains a piv
scales given the pervasive adverse consequences
sub-national governments, multinational agencies ar
organizations (NGOs) and scientists have dedicate
causes and propose effective mitigation and adapta
and adopted in December 2015, represents the lates
commit to emissions reduction targets at a global le
consequences of climate change. At the 21st Confe
United Nations Framework Convention on Climate
an unprecedented achievement in the history of i
has seen COP21 heralded as a success [1]. Despite

Int. J. Environ. Res. Public Health 2018, 15, 674; doi:10.3390/ijerph

Schwerdtle et al. BMC Medicine (2018) 16:1
DOI 10.1186/s12916-017-0981-7

BMC Medicine

OPINION Open Access

The health impacts of climate-related migration

Patricia Schwerdtle[1,4,5*], Kathryn Bowen[2,6] and Celia McMichael[3]

Abstract

Background: Changes in climate, in conjunction with other drivers of mobility, shape human migration. While there is an increasing focus on the adaptive potential of migration, the health impacts of climate-related migration, including planned relocation and forced displacement, have not been thoroughly examined. The Intergovernmental Panel on Climate Change stated that migration is currently, and will increasingly be, influenced by environmental degradation and climate change, and that it needs to be addressed in a focused and coordinated manner.

Discussion: This paper examines the links between climate change, migration, and health, considering diverse migration responses, including immobility, forced displacement and planned migration, as well as the associated health risks and opportunities in different contexts. Using case studies, the paper illustrates strategies to reduce the health risks associated with climate change-related migration.

Conclusion: While there is an increasing body of research examining the climate change–migration nexus, a dual approach is now required. This approach must include debate and further research regarding the health consequences and responses associated with climate migration as well as immediate strengthening of health systems to make them both climate resilient and migrant inclusive.

Keywords: Climate change, Migration, Displacement, Relocation, Public health, Governance, Adaptation, Human mobility, Environmental change

The nexus between climate change, migration, and health

Human migration in response to ecological change has been occurring since the origin of our species [1], yet the push that anthropogenic climate change is currently exerting on human migration is relatively new and gradually intensifying [2]. Environmental changes associated with increasing greenhouse gas concentrations include flooding, drought, increased frequency and intensity of climate-related disasters, and sea-level rise [3]. Globally, these environmental changes are shaping human migration, particularly through their intersection with other economic, political and social drivers of mobility [4]. Climate change acts as a threat multiplier, exacerbating existing sociopolitical and economic vulnerabilities, undermining livelihoods [5], inflating the risk of conflict [6], and making it difficult for people to remain in situ [7].

Moving beyond assumptions that climate change will lead to mass international displacement and threaten geopolitical security [8, 9], there is an increasingly nuanced understanding that human migration represents an adaptive response to the impacts of climate change [4, 10]. Indeed, there have been explicit efforts to connect migration with climate change adaptation, disaster risk reduction, resilience, and development [11].

While there is an increasing body of research and analysis focused on climate change-related migration, the impacts on human health are under-examined. Herein, we explore the nexus between climate change, migration, and human health using case studies to examine a range of climatic push factors, diverse migration pathways, and resultant health impacts.

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BioMed Central

Photo: Gil Moti / Still Pictures

Impacts and current evidence: Climate Change and Health

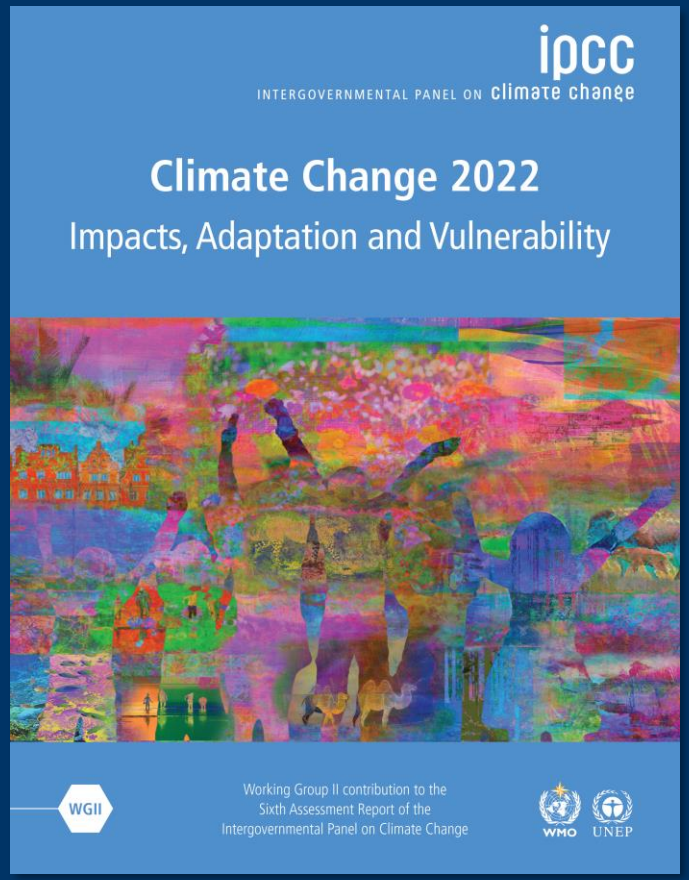
Activity – what does climate resilience mean to you?

Image 1: Hamish John Appleby/Climate Visuals

Image 2: Satyam Joshi/Climate Visuals

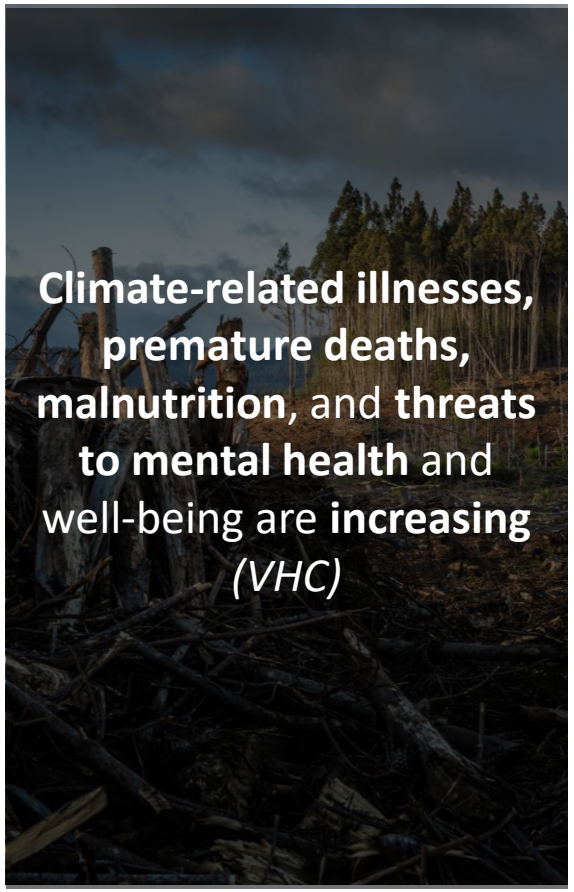
Image 2: Sudip Maiti/Climate Visuals

Climate change: global health impacts



> The scientific evidence is unequivocal: climate change is a threat to human well-being and the health of the planet.
>
> Any further delay in concerted global action will miss the brief, rapidly closing window to secure a liveable future.

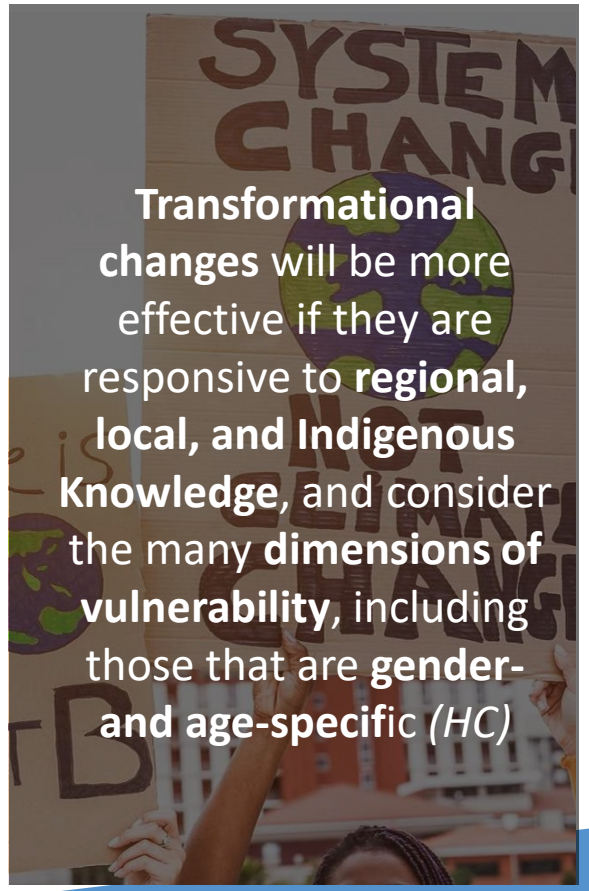
Human health – AR6 highlights



Climate-related illnesses, premature deaths, malnutrition, and **threats to mental health** and well-being are **increasing** *(VHC)*

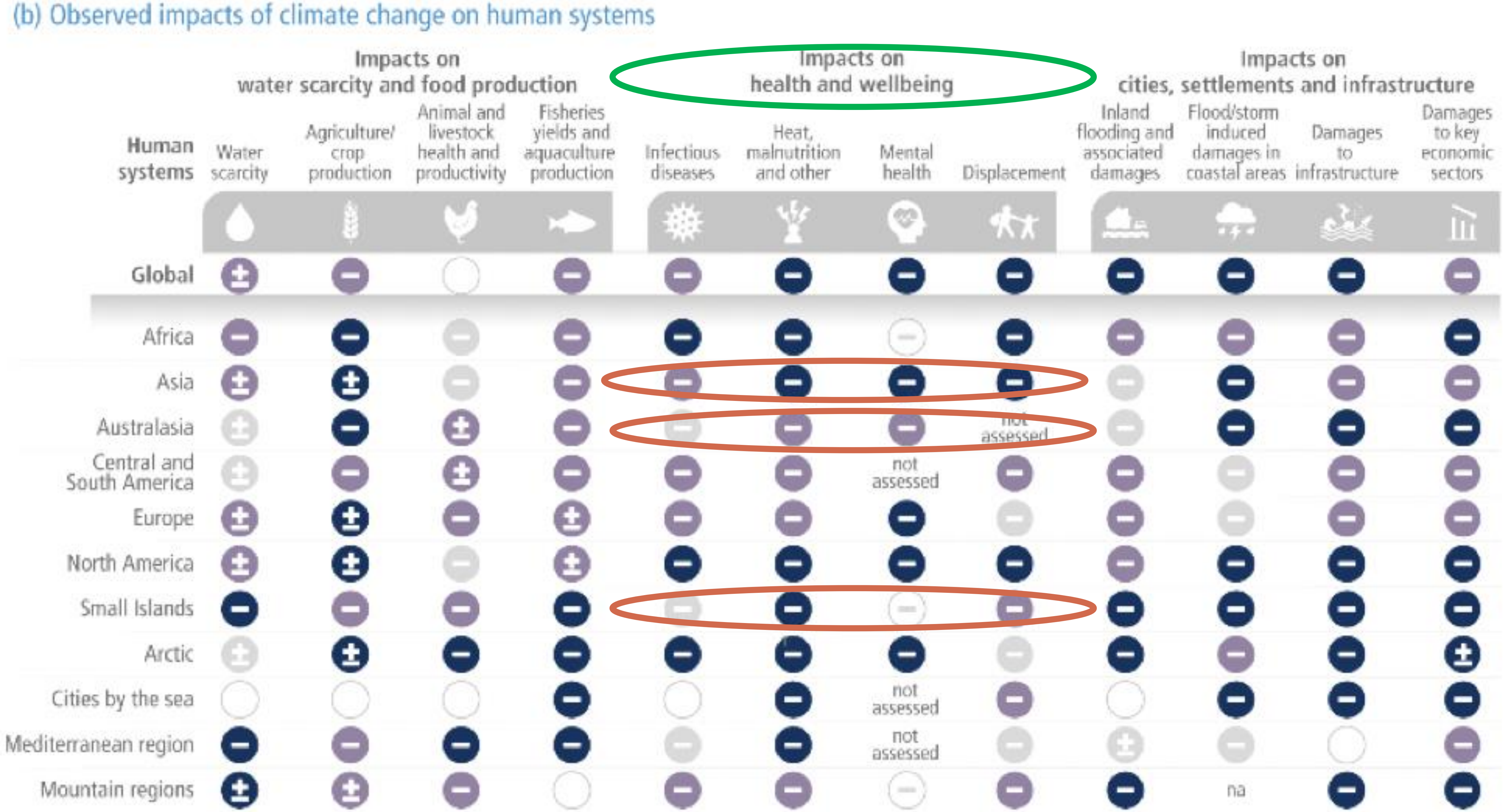
With **proactive, timely, and effective adaptation**, many risks for human health and wellbeing could be reduced and some potentially avoided *(VHC)*

Key transformations are needed to facilitate **climate resilient development** pathways for health, wellbeing *(HC)*



Transformational changes will be more effective if they are responsive to **regional, local, and Indigenous Knowledge**, and consider the many **dimensions of vulnerability**, including those that are **gender- and age-specific** *(HC)*

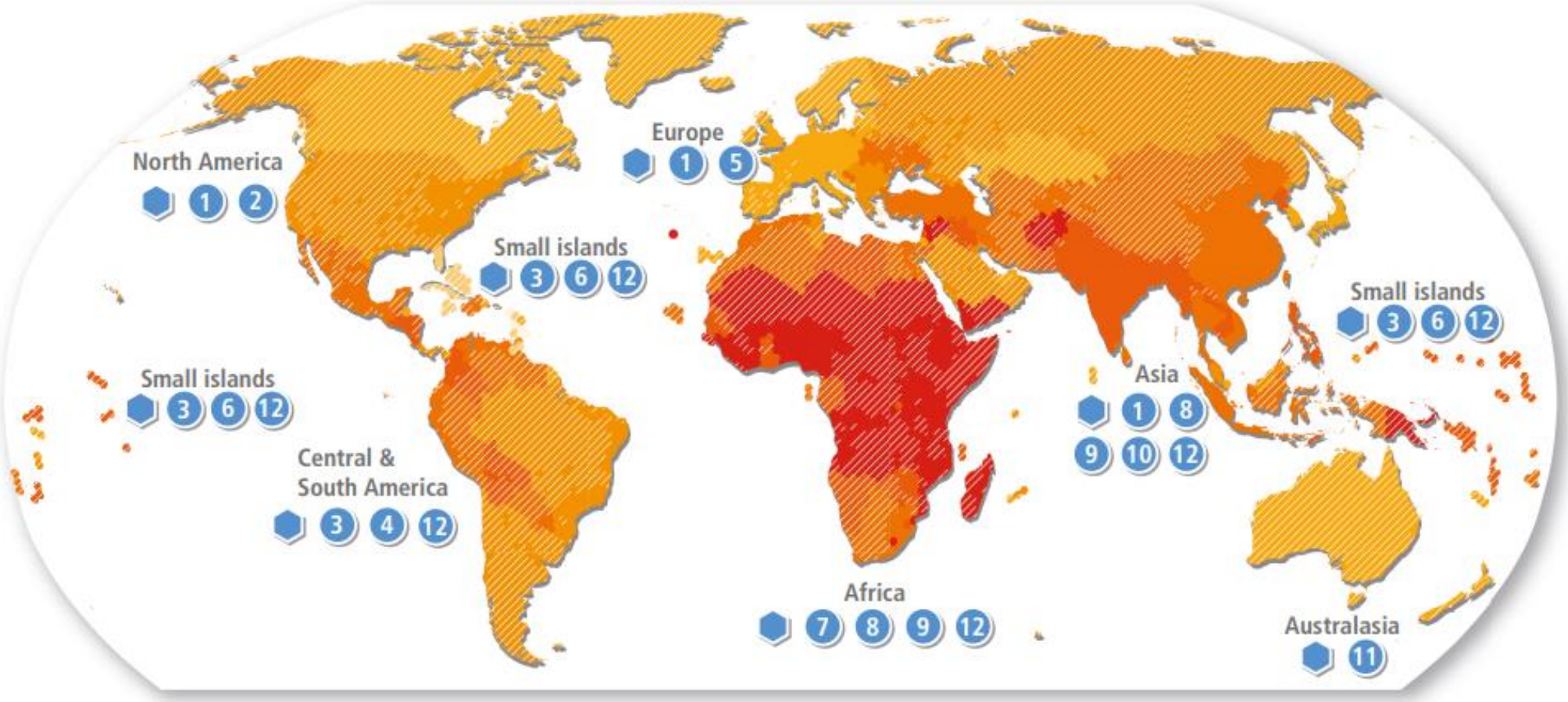
IPCC AR6: Impacts on human systems



All countries are at risk – some more than others

Observed human vulnerability to climate change is a key risk factor and differs globally

(a) Vulnerability at the national level varies. Vulnerability also greatly differs within countries.
Countries with moderate or low average vulnerability have sub-populations with high vulnerability and vice versa.



Relative vulnerability

- Very high
- High
- Medium
- Low
- Very low

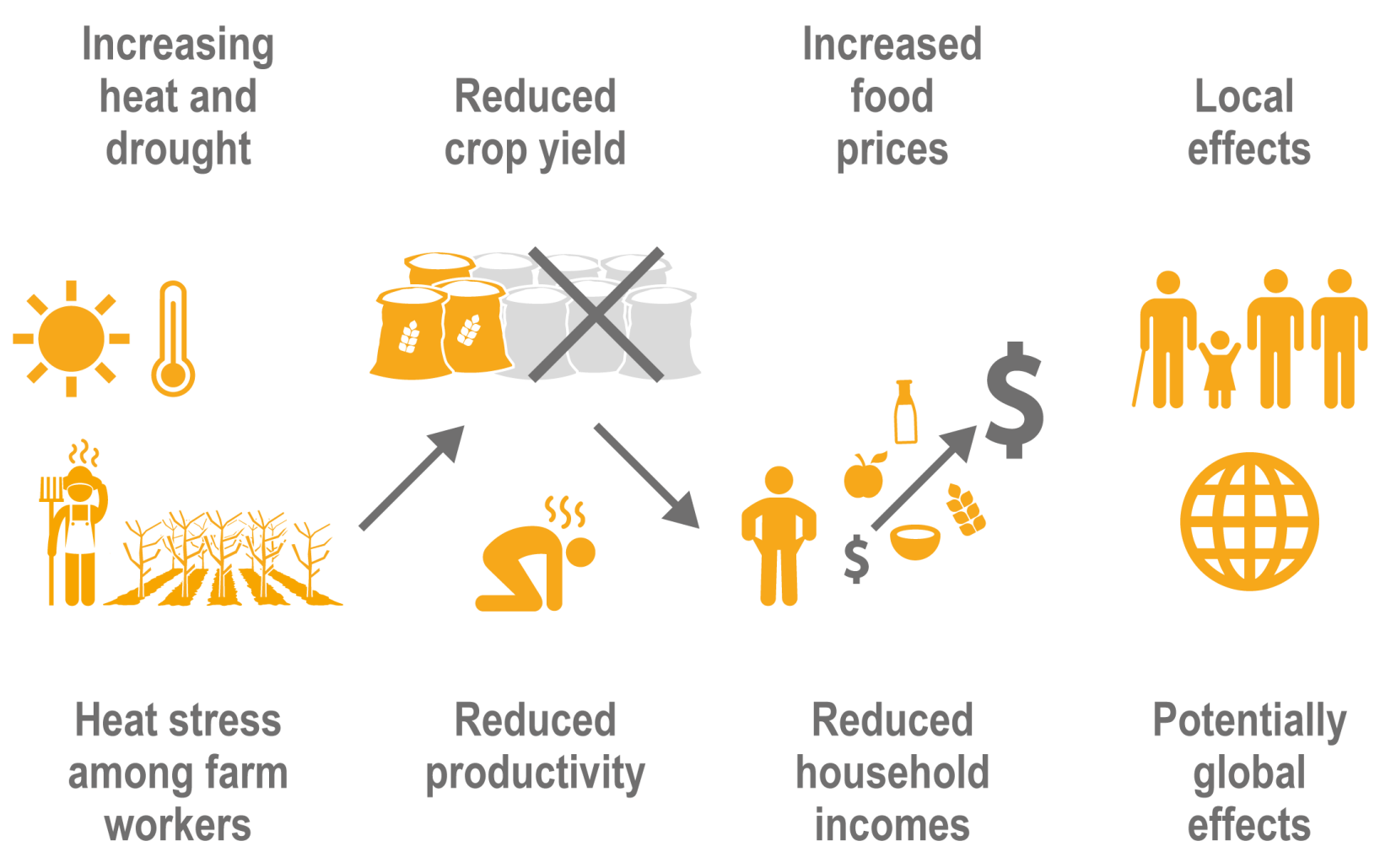
Population density

- High
- Low

Examples of Indigenous Peoples with high vulnerability to climate change and climate change responses (4.3.8, 5.10.2, 5.13.5, Box7.1, 8.2.1, 15.6.4) and the importance of Indigenous Knowledge (Box9.2.1, 11.4, 14.4, Cross-Chapter Box INDIG)

Simultaneous extreme events compound risks

Multiple extreme events that compound the risks are more difficult to manage



Challenge 1: Heat-related health impacts

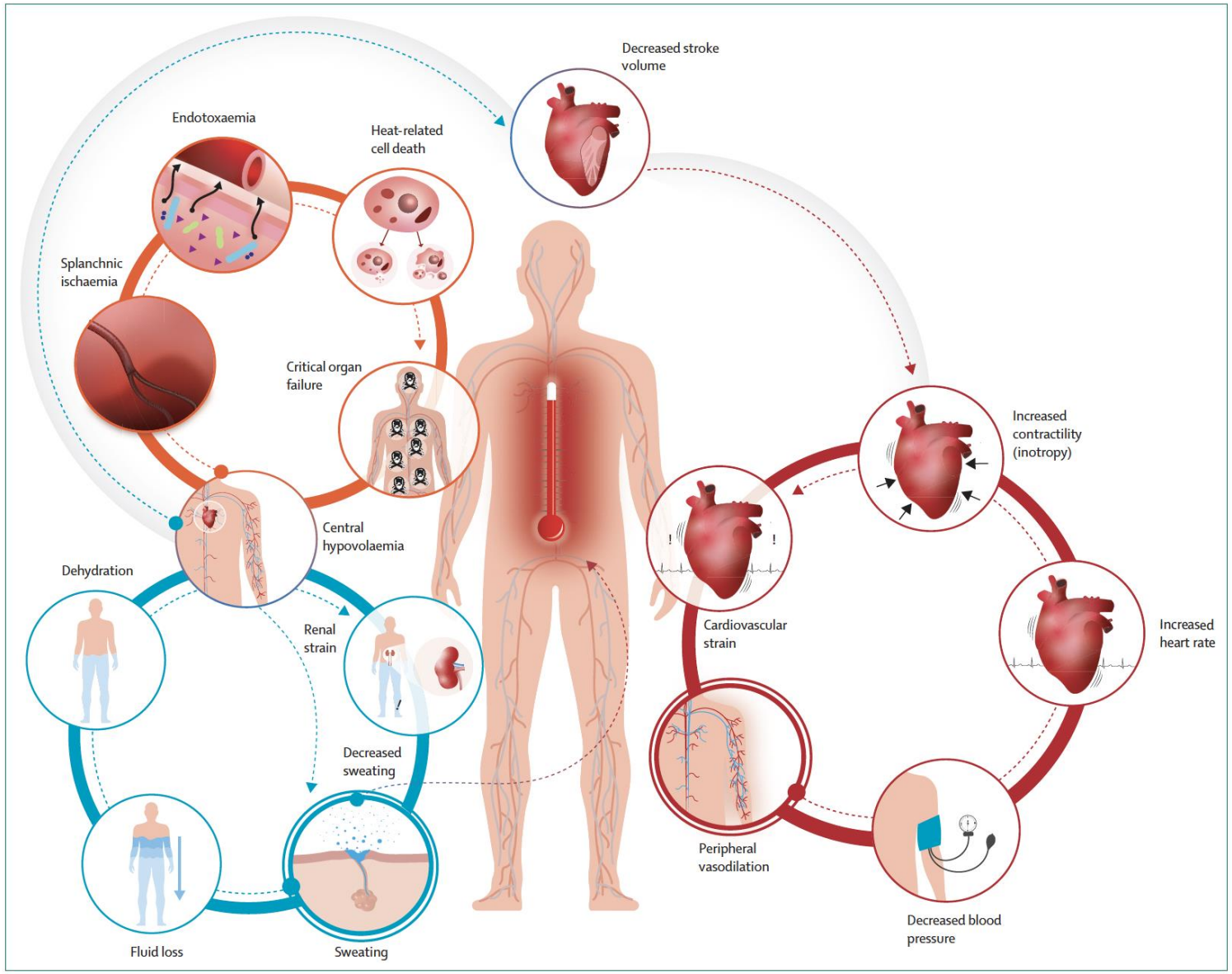


Figure: Illustration of the physiological pathways of human heat strain

Source: Ebi et al (2021). https://doi.org/10.1016/S0140-6736(21)01208-3

Heat-related physiological impacts

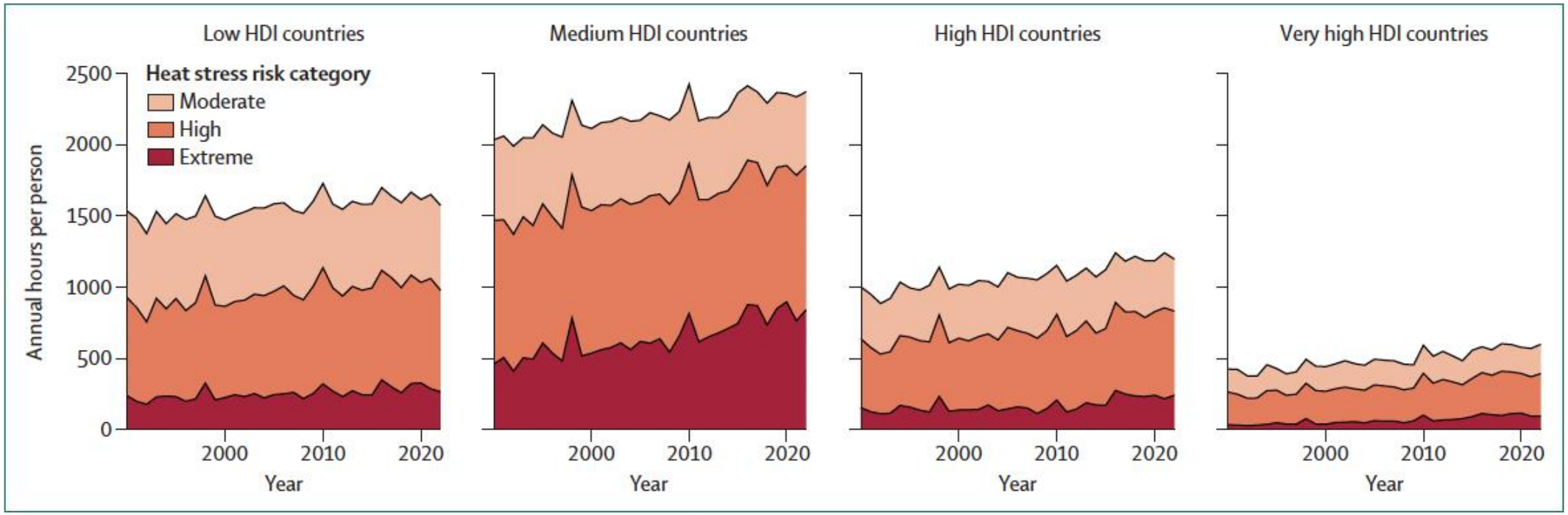


Figure 1: Average annual hours per person from 1991 to 2022 when light physical activity entailed at least a moderate, high, or extreme heat stress risk, arranged by HDI country groupings

HDI=Human Development Index.

Source: Romanello et al (2023). https://doi.org/10.1016/S0140-6736(23)01859-7

What is the right answer here?

How many hours of labour were lost in 2022 due to extreme heat?

1. 5 million
2. 95 million
3. 350 million
4. 490 billion

Heat exposure led to the loss of 490 billion potential labour hours in 2022, a nearly 42% increase from 1991 to 2000

Heat-related mental health impacts

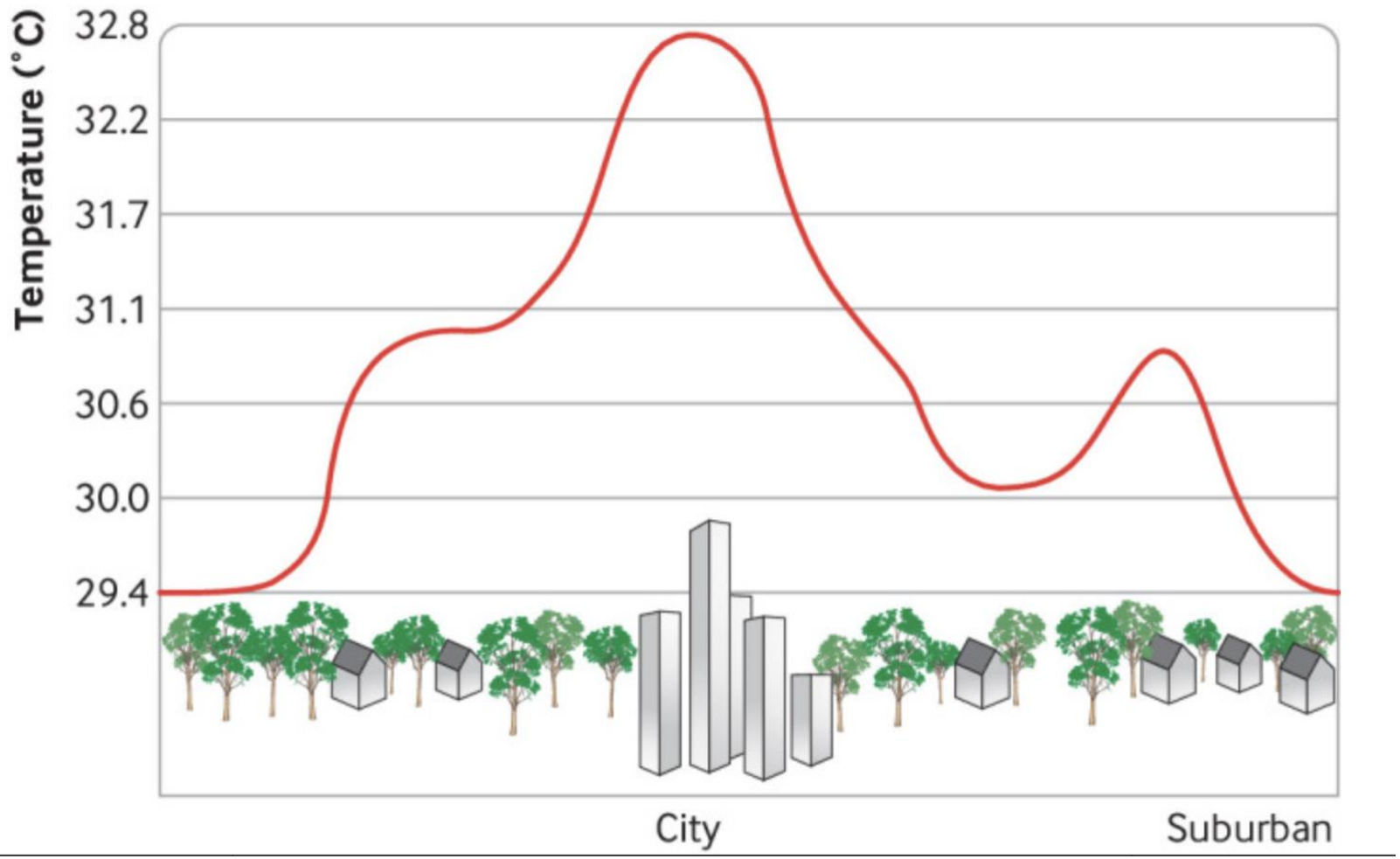
Table 1 | Summary of risk estimates of clinical mental health presentations due to climate-change-related exposure

Presentation	Exposure	Location	Reported estimate	Study design
Mental-health-related mortality	Heat	Global	RR=1.022 (95% CI, 1.015–1.029) for every 1 °C increase in temperature (all ages)	Meta-analysis[30]
Mental-health-related morbidity	Heat	Global	RR=1.009 (95% CI, 1.007–1.015) for every 1 °C increase in temperature (all ages)	Meta-analysis[30]
Mental-health-related ED visits	Heat	California	4.8% (95% CI, 3.6–6.0) increased risk for every 5.6 °C increase in temperature (6–18 yr)	Time series[80]
	Heat	China	RR=1.435 (95% CI, 1.048–1.965) (adults)	Time series[81]
Suicide	Heat	Global	RR=1.09 (95% CI, 1.06–1.13) for every 7.1 °C increase in temperature (adults)	Meta-analysis[82]
Anxiety, stress-related and somatoform disorders	Heat	Global	RR=1.007 (95% CI, 1.001–1.013) for every 1 °C increase in temperature (all ages)	Meta-analysis[30]
	Flood	Korea	Anxiety prevalence at 8.6% pre-flood versus 22.5% after floods ($P<0.01$) (14–95 yr)	Case–control study[83]
	Drought	Australia	Personal drought-related stress IRR, 1.50 (95% CI, 1.32–1.72) (adult farmers)	Longitudinal cohort study[84]
Mood disorders	Heat	Global	RR=1.011 (95% CI, 1.003–1.018) for every 1 °C increase in temperature (all ages)	Meta-analysis[30]
Depressive disorders	Bushfire	Australia	Major depressive episode OR, 1.83 (95% CI, 1.17–2.85) (adults)	Longitudinal cohort study[45]
	Flood	UK	Depression OR, 8.48 (95% CI, 1.04–68.97) (adults)	Longitudinal cohort study[85]
PTSD	Bushfire	Australia	PTSD OR, 1.14 (95% CI, 1.53–3.20) (adults)	Longitudinal cohort study[45]
	Flood	Korea	PTSD prevalence at 0.3% pre-flood versus 46.6% after floods ($P<0.01$) (14–95 yr)	Case–control study[83]
	Flood	UK	PTSD OR, 7.74 (95% CI, 2.24–26.79) (adults)	Longitudinal cohort study[85]
Psychotic disorders	Heat	USA	ED visits IRR, 1.05 (95% CI, 1.03–1.07) (all ages)	Case–crossover study[29]
Substance use disorders	Heat	Global	RR, 1.008 (95% CI, 0.996–1.021) (adults)	Meta-analysis[30]
	Heat	USA	ED visits IRR, 1.08 (95% CI, 1.07–1.10) (adults)	Case–crossover study[29]
	Bushfire	Australia	Self-report heavy drinking OR, 1.39 (95% CI, 1.01–1.89) (adults)	Longitudinal cohort study[45]
Organic mental disorders	Heat	Global	RR=1.008 (95% CI, 1.001–1.015) (adults)	Meta-analysis[30]
Adverse drug reactions	Heat	Sweden	Hyponatraemia with heat and medications including serotonergic antidepressants	Case–crossover design[41]
	Heat	France	ED visits for heat-related pathology with anticholinergics, antipsychotics and anxiolytics	Case–control study[40]
Climate anxiety	Awareness	Global	59% very or extremely worried about climate change (16–25 yr)	Cross-sectional survey[20]
Developmental disorders	Storm	USA	Attention-deficit hyperactivity disorder HR, 5.5 ($P=0.01$) (2–5 yr)	Case–control study[86]

RR, relative risk; CI, confidence interval; IRR, incidence rate ratio; OR, odds ratio; HR, hazard ratio.

Source: Crandon et al (2022). https://doi.org/10.1038/s41562-022-01477-6

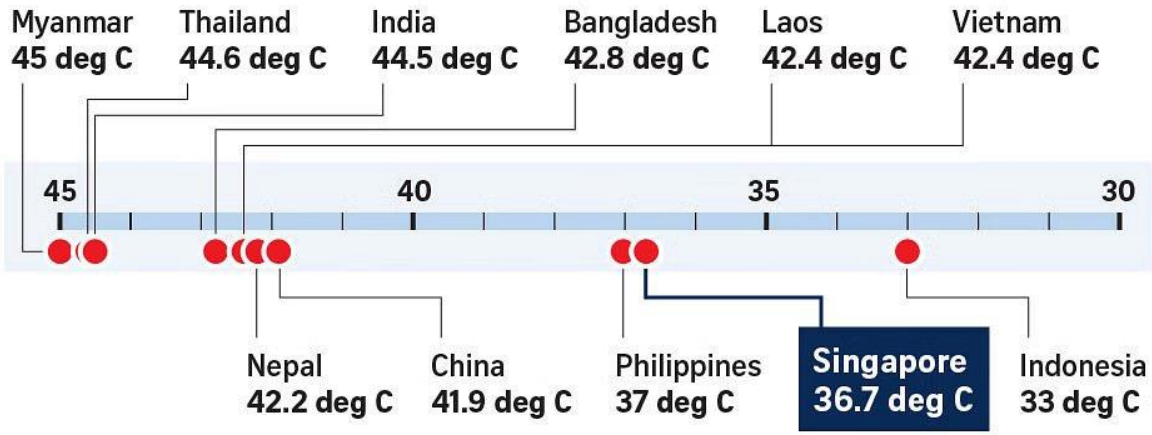
Urbanisation and heat health risks

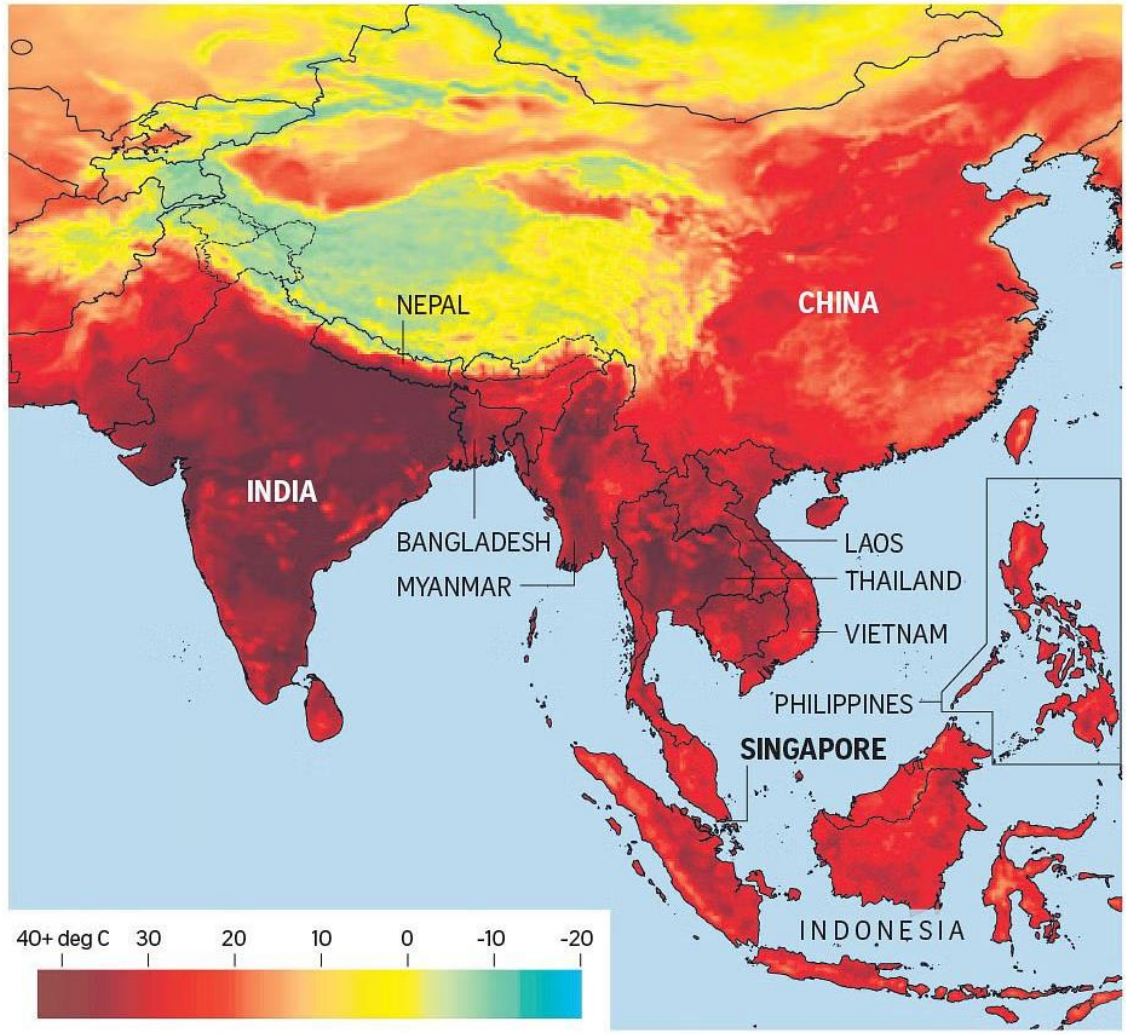


Source: Tong et al (2021). https://doi.org/10.1136/bmj.n2467

Heatwave in Asia

Scorching temperatures are searing much of Asia. Shown here are maximum temperatures recorded over the past week.





Sources: AFP, AIR TEMPERATURE FROM THE GLOBAL DETERMINISTIC PREDICTION SYSTEM, ENVIRONMENT AND CLIMATE CHANGE CANADA

STRAITS TIMES GRAPHICS

Challenge 2: Air Pollution

What do you think?

What proportion of the global population breathes air that exceeds WHO guideline limits?

1. 45%
2. 23%
3. 99%
4. 79%

WHO data show that almost all of the global population (99%) breathes air that exceeds WHO guideline limits and contains high levels of pollutants, with low- and middle-income countries suffering from the highest exposures.

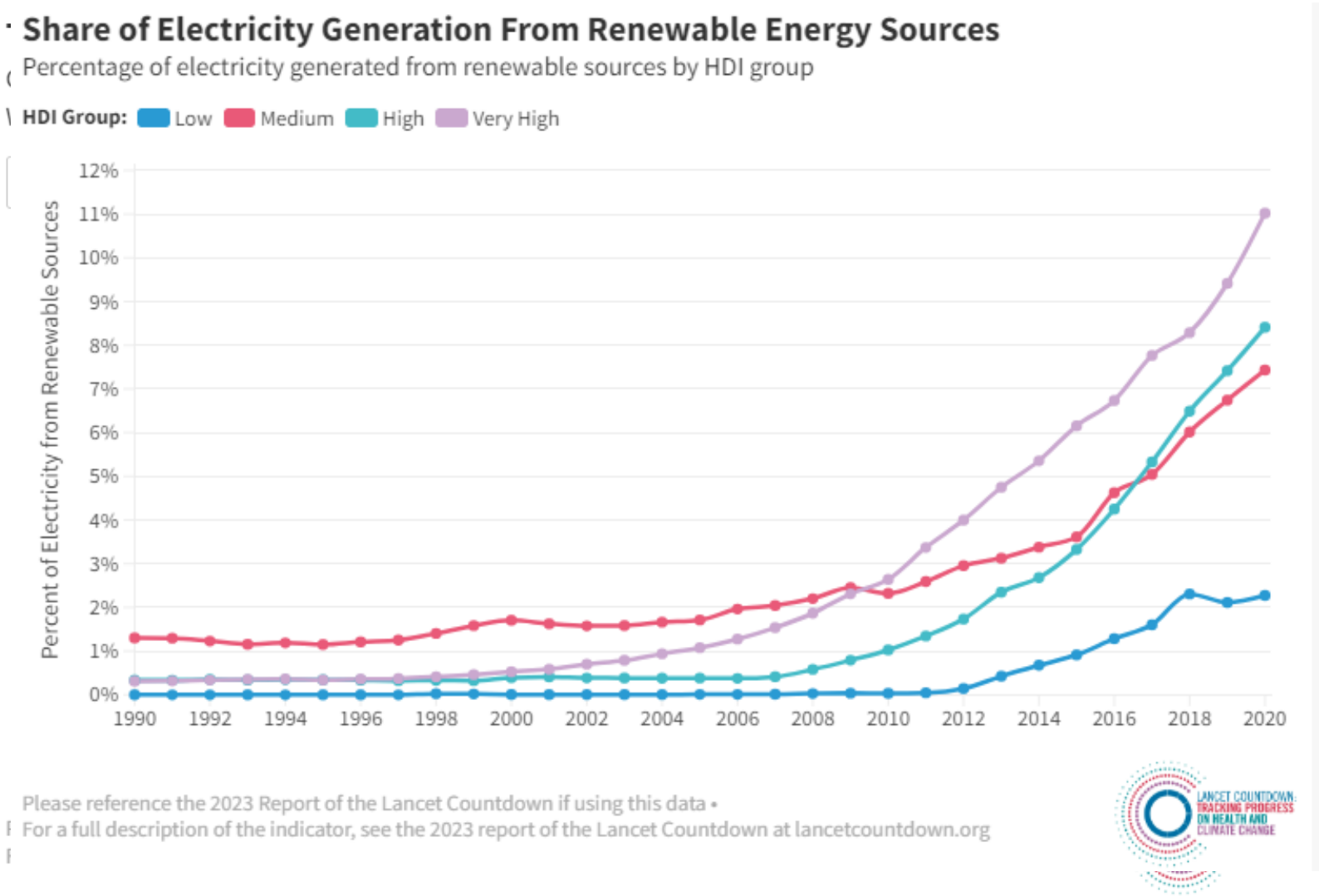
What do you think?

How many preventable deaths occur each year due to air pollution?

1. 7 million
2. 875,000
3. 1.2 million
4. 9 million

An estimated 7 million preventable deaths each year are linked to air pollution, with the majority in South East Asia and the Western Pacific regions.

Air pollution - energy



Household Air Pollution

Mortality from exposure to household air pollution in 2020 in urban and rural areas in selected countries, by HDI group and WHO region

Please reference the 2023 Report of the Lancet Countdown if using this data •
For a full description of the indicator, see the 2023 report of the Lancet Countdown at lancetcountdown.org

Key takeaways

Health impacts of climate change are being felt globally

Climate change will exacerbate current & underlying burden of disease

Populations will be exposed differently depending on regions

Without adaptation & mitigation climate change could result in a dramatically increased health burden in many countries and regions, with significant impacts on health systems and facilities

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Opportunities and Solutions

Who is doing what?

- Progress on strengthening responses to health impacts of climate change is variable across the world
- Increasing attention to health in global climate mechanisms (UNFCCC, COP)
- WHO is taking a role in guiding LDC member countries to develop health adaptation plans and health-specific climate assessments
- Many bilateral donors (e.g. US, Australia, Japan, Korea, Germany) and multilateral agencies are also taking interest (ADB, World Bank)
- Funders (e.g. DFAT) – now including climate change in their health designs

Awareness and priority increasing

41 funders, partners endorse new guiding principles for financing climate and health solutions to protect health

What do you think?

What proportion of countries include health priorities in their NDCs?

1. 75%
2. 90%
3. 35%
4. 72%

Over 90% of countries include health priorities in their NDCs

What do you think?

How much multilateral climate funding is explicitly directed to human health projects?

1. 25%
2. 0.5%
3. 27%
4. 9%

Only 0.5% of multilateral climate funding is allocated to projects that explicitly address human health

Awareness and priority increasing

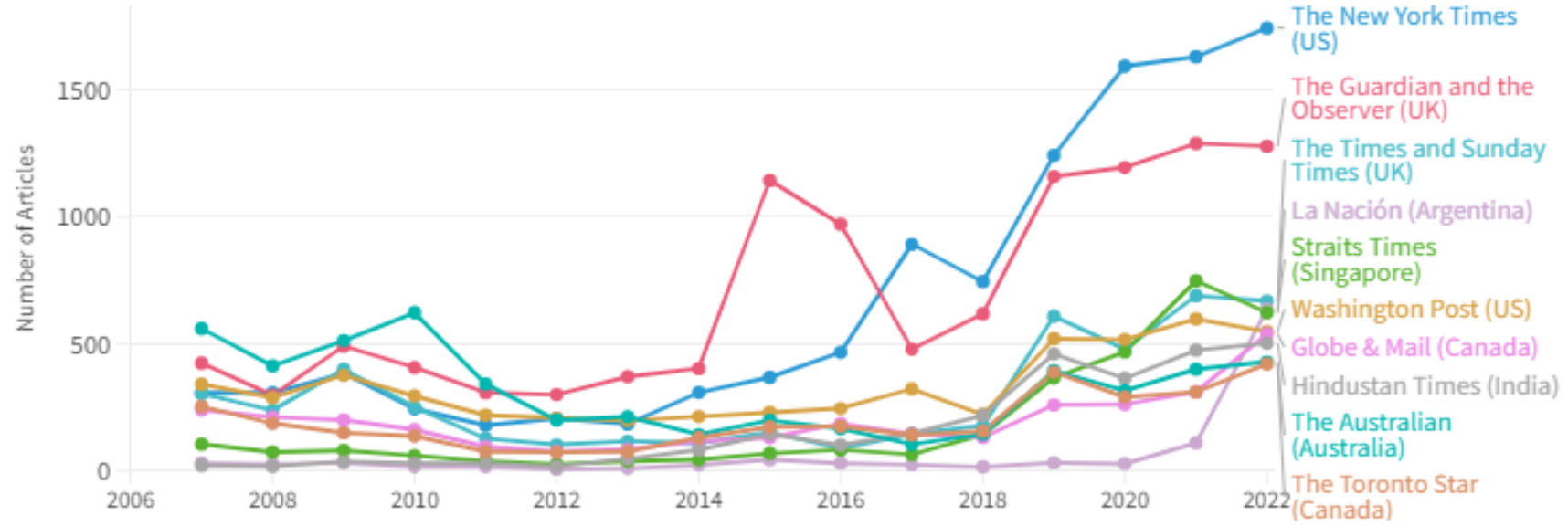
Coverage of Health and Climate Change in News Outlets Around the World

Number of news articles covering health and climate change, 2007-2022

Initial screen shows 10 outlets with the most coverage across the time period

Enter outlet name(s) to show

The New York Times (US) | The Guardian and the Observer (UK) | The Times and Sunday Times (UK) | La Nación (Argentina)
Straits Times (Singapore) | Washington Post (US) | Globe & Mail (Canada) | Hindustan Times (India)
The Australian (Australia) | The Toronto Star (Canada)



Please reference the 2023 Report of the Lancet Countdown if using this data •
For a full description of the indicator, see the 2023 report of the Lancet Countdown at lancetcountdown.org


China
Pakistan
India
Indonesia
Australia
ATACH countries and areas
yes

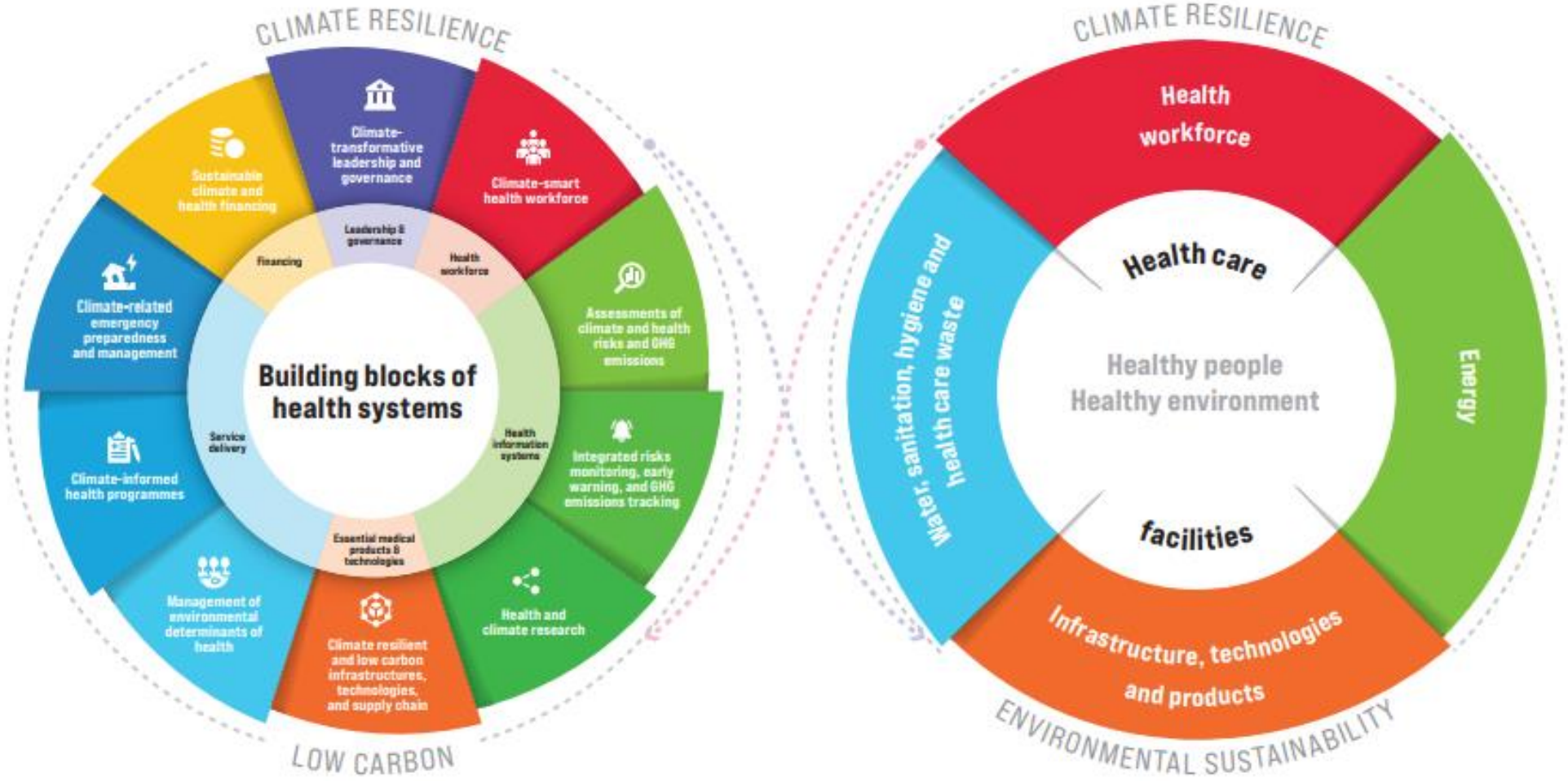
Opportunity 1: Climate Resilient Development

The solutions framework:

- Involves marginalised groups
- Prioritises equity and justice
- Reconciles different interests, values and world views
- Requires scaled-up investment and international cooperation

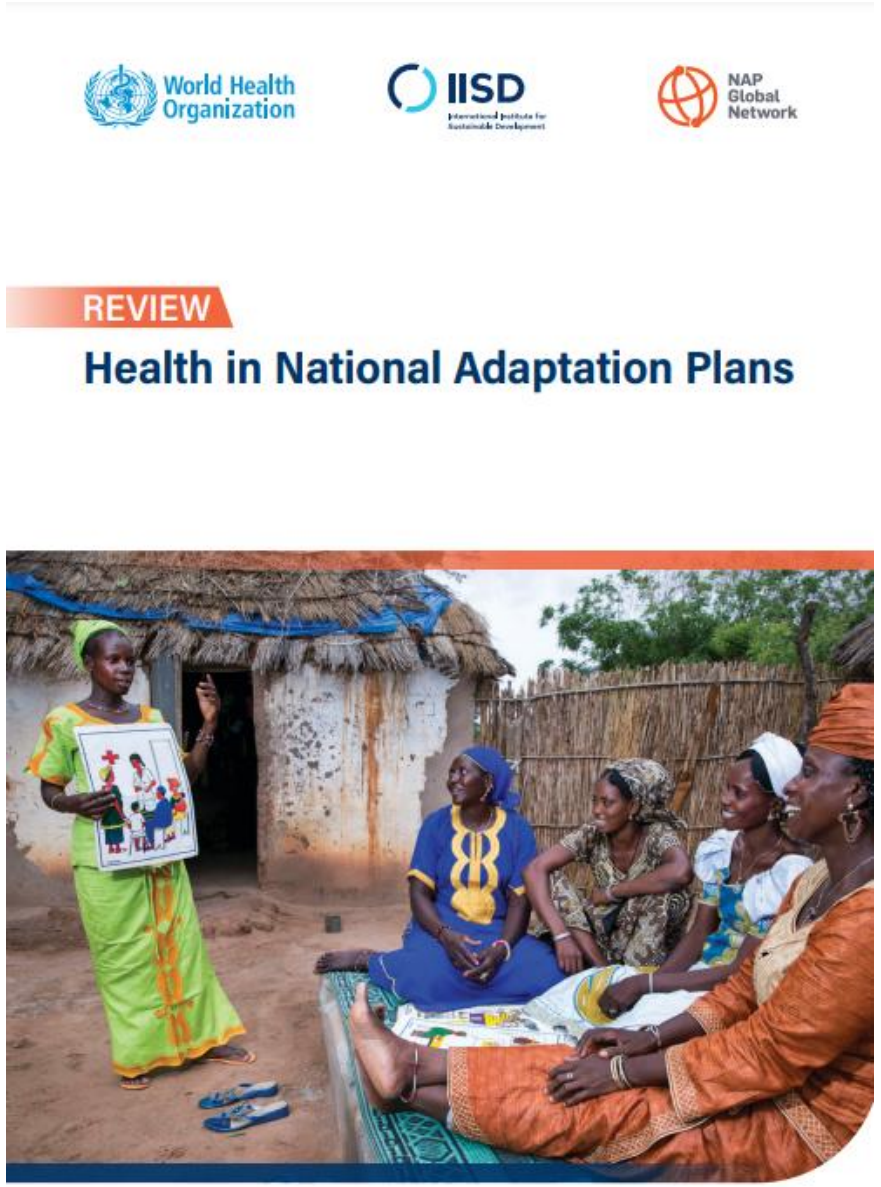
[Mika Baumeister / Unsplash; Aulia Erlangga/CIFOR CC BY-NC-ND 2.0]

WHO Operational framework



Source World Health Organization (WHO). (2023). *Operational framework for building climate resilient and low carbon health systems*. https://iris.who.int/bitstream/handle/10665/373837/9789240081888-eng.pdf?sequence=1

Other mechanisms: Health Component of a National Adaptation Plan



Opportunity 2: Integrated 'win-win' solutions

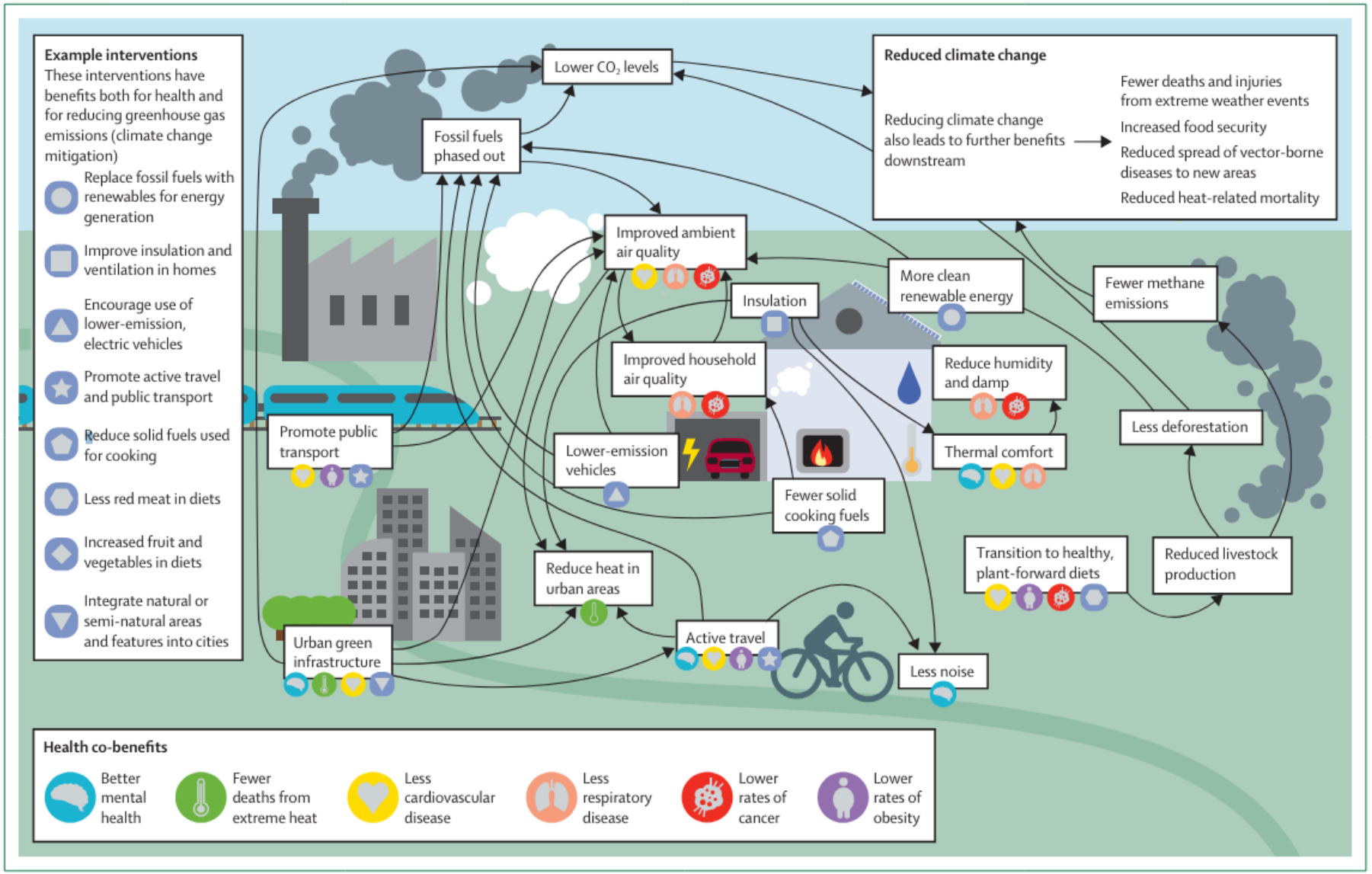
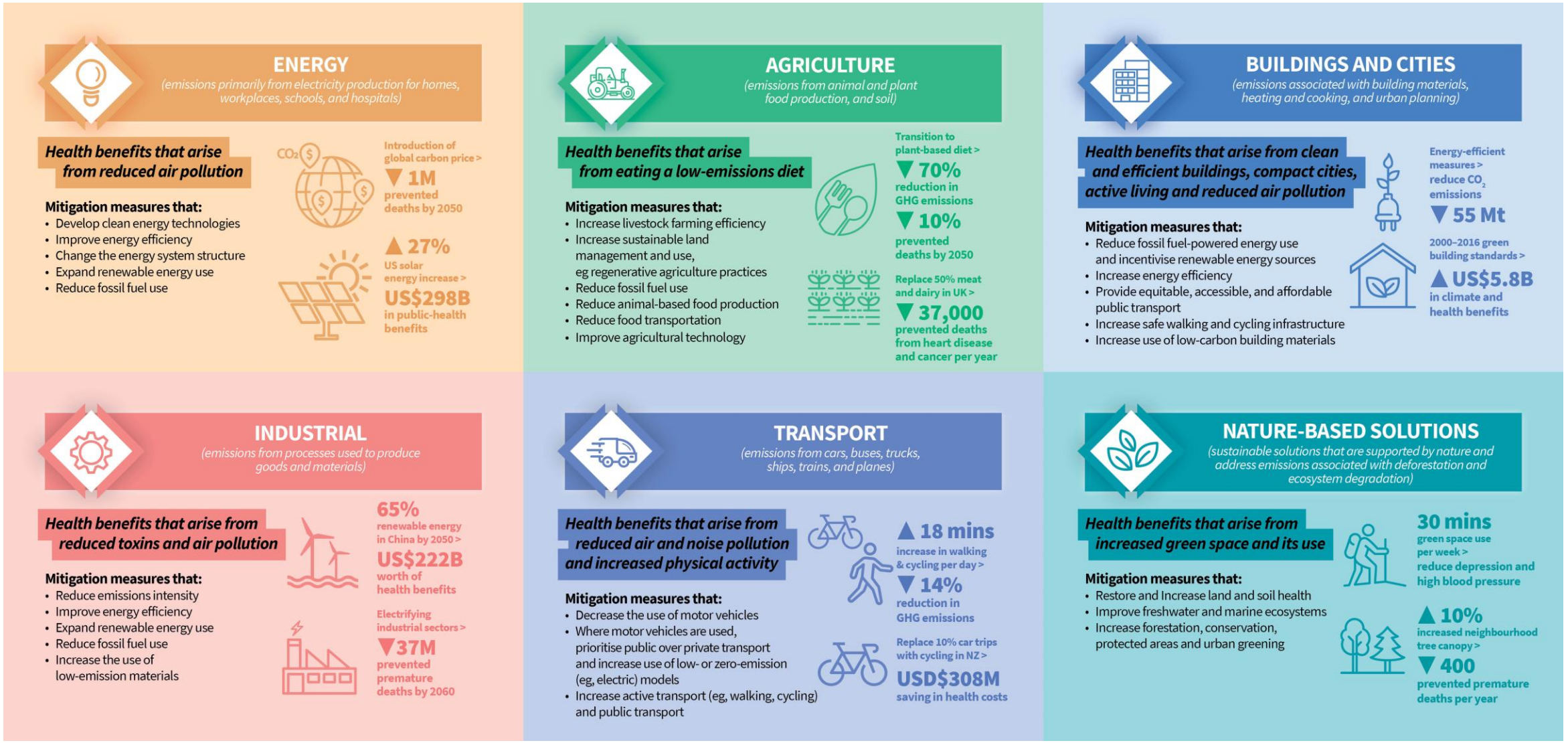


Figure 1: **Key pathways and connections between climate mitigation actions and health**

Source Whitmee et al (2023). https://doi.org/10.1016/ S0140-6736(23)02466-2

Why consider co-benefits?



Source: MCF (2021).

To finish:

Practical

- Be strategic to access climate change funding to address current underlying health burdens – ‘nothing new’/’win-win’ arguments
- Advocacy – bilaterals, multilaterals
- Consider health co-benefits of action in your policy area (e.g. transport, infrastructure, finance)

Research/policy

- Understand decision-making dynamics and leverage entry points
- Interrogate funding dynamics – stakes are high
- Synergies across international agreements

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Thank you

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For more information

Melbourne Climate Futures

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Collaborative Action for Transformative Change in Health and Healthcare

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