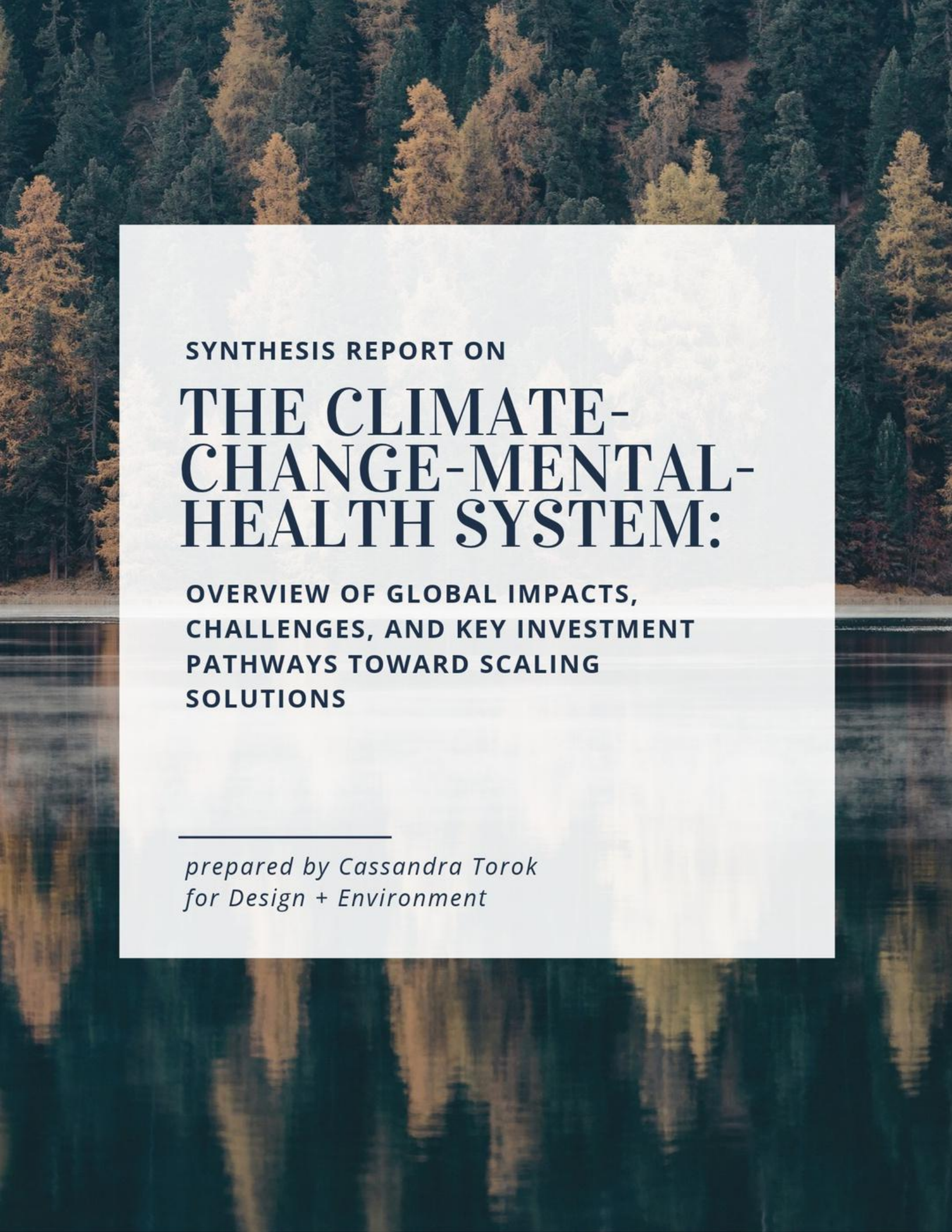


SYNTHESIS REPORT ON

THE CLIMATE-CHANGE-MENTAL-HEALTH SYSTEM:

OVERVIEW OF GLOBAL IMPACTS, CHALLENGES, AND KEY INVESTMENT PATHWAYS TOWARD SCALING SOLUTIONS

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About This Report

This report was produced by Cassandra Torok as the primary deliverable of Royal Road University's (RRU) Science and Policy of Climate Change (SPCC) graduate certificate program's practicum capstone. The project was contracted between Cassandra, as an RRU student, and Design + Environment (DE), with Dr. David Oswald as the supervisor. The report was delivered in October 2026.

Report Objective

The primary objective of this report is to summarize the current literature at the intersection of mental health and climate change, and produce a thematic analysis of key findings and implications. This intersection is to be understood from a systems and design-forward lens in order to understand climate change and mental health as co-evolving and co-beneficial sites for mitigation and adaptation strategies towards sustainable futures. The report findings should provide a high-level narrative review that reflects impact pathways, gaps and challenges, and future R&D directions.

Disclaimer

The views expressed and information contained in it are not necessarily those held by either Royal Roads University or Design + Environment.

Executive Summary

In 2026, calls are growing for the World Health Organization (WHO) to formally declare climate change a public health emergency (Brink et al., 2026; WHO, 2026a).



Image source: Shutterstock

This comes after decades of evidence proves that climate change poses significant health risks, leading experts and multilateral organizations, including the WHO (2022a), to sound alarms for urgent action (see also: Patel et al., 2018; IPCC, 2022; UNEP, 2026a)

Historically, studies have focused on the physical health outcomes of climate hazards (UN, 2025). Yet in recent years, the mental health impacts have increasingly been established as a significant contributor to the global burden of disease (UNEP, 2026a).

Literature on climate change and mental health has thus grown more broad and deep, spanning disciplines -- from neuroscience to political science -- and geographies (see **Section 2.0**).

The term climate-change-mental-health system was coined to describe this complex intersection (Berry et al., 2018).

Evidence shows that the lived experience and witnessing of crises around the world -- extreme heat domes, devastating floods, chronic droughts, the spread of vector-borne diseases -- has a significant impact on mental health, including but not limited to increasing the risk of PTSD, sleep disorders, cognitive dysfunction, violent behaviour, and loss and death by suicide (Vergunst et al., 2024; see **Section 3.0**).

Terminology connecting climate change and mental health has also developed to include *climate emotions*, such as *eco-grief*, *eco-anger*, and *solastalgia*.

Box 1: **Emerging Climate Emotions Terminology**

Climate emotions are used in behavioural sciences, psychology and popular media to denote extreme feelings (both adaptive and maladaptive) tied to the experience of climate-related losses and/or changes, and are experienced at the individual and community-level.

Eco-grief, *eco-anger*, and *eco-anxiety* are examples of climate emotions that describe specific affective phenomena related to climate change impacts.

Solastalgia is defined as the feeling of distress caused by environmental degradation or extreme change, specifically the feeling of the loss of solace, home (tangible or intangible), and/or a sense of place.

Source: Boyd et al., 2024; Klassen & Galway, 2023; Pihkala, 2022

Case Study 1: **La Rose v. His Majesty the King**

In 2019, a group of youth filed a **suit against the Government of Canada**, with the help of Our Children's Trust (OCT), Arvay Finlay, and West Coast Environmental Law (WCEL). They claim that the federal government has **failed in their duty to protect** them in the context of climate change as a significant threat to their "life, liberty, and security" (OCT, n.d.), per Section 7 of the Canadian Charter of Rights and Freedoms.

The case made it through a long procedural processes to the Federal Court of Appeal, which gave permission in 2023 for the case **to be heard in the highest court in Canada**. The case is set to begin on October 26th at the Federal Court in Vancouver, B.C., and will last five weeks.

This case is the **first of its kind in Canada**, and has the potential to set a precedent for government accountability to climate change legislation and action.

Sources: OCT, n.d.; WCEL, 2026

These terms have popularized as individual and collective phenomena that impact communities around the globe (Pihkala, 2021). Globally, these emotions are reflected in the rise of legal cases young people are bringing to courts around the world as they grapple with *moral injury* over the lack of action undermining their future (Boyd et al., 2024; Hickman et al., 2021; Weintrobe, 2021; see **Case Study 1**).

Within the context of an increasingly unstable climate, calls are growing for community, national, and global action plans that center mental health outcomes as critical climate-resilient infrastructure (Ali et al., 2026).

It is projected that the burden of climate-related health impacts will rise over the next 20 years as extreme weather events (e.g., wildfires) and chronic climatic changes (e.g. sea level rise) increase in frequency and intensity (IPCC, 2021; Lawrance et al., 2022; WHO, 2022a; see **Box 2**). This will come with not just a cost in life and capacity, but also with

Box 2: **Snapshot of the Human Toll of Mental Ill-Health**

3rd

leading contributor to the global burden of disease

12 billion

days lost to depression & anxiety each year

$16 trillion

USD in global climate-related mental health costs by 2030

Source: Lawrence et al., 2022; WHO, 2021; WHO, 2022a

deep economic costs (Patel et al., 2018; UNEP, 2026b). The Lancet's *Commission on Global Mental Health and Sustainable Development* (2018) estimates that the burden of mental disease alone will come with a price tag surpassing $16 trillion by 2030.

Box 3: **Adaptive Capacity**

Adaptive Capacity refers to the ability to regulate or change in order to maintain function and well-being. It is determined by such things as ecological, social, emotional, biological, structural, financial, and technological resources, amoung others. It is therefore connected to and informed by mental well-being and its determinants.

Source: Banyan Commons et al., 2026; Hayes et al., 2018; Vergunst & Berry, 2021

In the face of heightened risk to our collective well-being, this report details a broad review of the climate-change-mental-health literature and current recommendations for action to meet the urgent need to increase our adaptive capacity and resiliency to climate change.

Investment into this system's research and development (R&D) has shown to have a high return potential due to the many co-benefits climate-mental health interventions have for sustainable development and climate resiliency across scales (see **Section 5.0**).

To start, the Introduction (**Section 1.0**) details the basis of both climate change and mental health as co-evolving crises, as well as the need and urgency of action. **Section 2.0** then provides an overview of the Methods and Theoretical Frameworks used to complete the literature review and analysis of findings.

The Known Impacts and Causal Pathways of the system are explored in **Section 3.0**, including the heterogeneity of those impacts. Two important findings of this section are:

- ➔ The causal pathways for climate-related mental health impacts are complex, fluid, and highly-contextual, with certain groups at increased risk due to increased vulnerability.
- ➔ The uneven distribution of impacts is highly stratified by systemic inequalities, and these factors can interact and multiply risks to vulnerable populations.



Image source: Pexels

Section 4.0, Current Gaps and Challenges, presents the key areas of tension and omission within both theory and practice. These findings are summarized in three sub-headings: harm and loss metrics; stigmatization; and governance challenges.

Then, Key Investment Pathways that are necessary to support change within the climate-change-mental-health system are explored in **Section 5.0**: cognitive model development to bolster research efforts and solution development; the business case for investment in these solutions; and identifying key sectors and the evidence-based interventions currently recommended, developing, or implemented within them.

In the final section, a Conclusion summarizes the report's central findings, limitations, and future opportunities.

Linking climate change and mental health reflects a perspective of thought that everything is connected; our 'outside' and 'inside' mirror each other and cannot be separated in their management nor design.

Connecting these issues means bringing deeper understanding to how human-induced climate change and our mental health landscapes are interlocked systems that profoundly inform each other. In this way, actions taken to address harm will be more effective, informed, and targeted to the root causes of crises.

The crises of today can be fundamentally understood "as a crisis of connections" (C2C Conference, 2025); between humans and nature, between each other, and between the 'outside' (physical) and 'inside' (mental) of our health.

Image source: Canva Pro.



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Acronyms

AFR	African Region, World Health Organization (WHO)
AMR	Region of the Americas, WHO
D&EM	Disaster & Emergency Management
DALYs	Disability-Adjusted Life Years
DAMH	Development Assistance for Mental Health
EWE	Extreme weather event
EUR	European Region, WHO
EMR	High-income country, World Bank
HIC	Low-income country, World Bank
LIC	Low-income country, World Bank
LMIC	Low- to middle-income country, World Bank
MHPSS	Mental Health and Psychosocial Support
NAPs	National Adaptation Plans
ODA	Official Development Assistance
PTSD	Post-traumatic stress disorder
R&D	Research & Development
SDGs	Sustainable Development Goals
UMICs	Upper-middle income country, World Bank
WPR	Western Pacific Region, WHO

1.0. Introduction

The climate emergency is a mental health emergency, and the mental health emergency impacts climate change action and our collective capacity to adapt. These two crises are not simply risk multipliers to each other, but are two complex phenomena connected to shared root drivers of crises (Berry et al., 2018; Vidal et al., 2023).

Climate change is increasing the intensity and frequency of both extreme weather events (EWEs) (e.g., heat waves and floods) and chronic, slow-onset events (e.g., droughts and sea level rise) (IPCC, 2021). These climatic changes disrupt the Earth systems humans depend upon for maintaining the enabling conditions supporting our health and well-being, known as the Holocene geological era (Steffen et al., 2018).

These enabling conditions to health include the social, ecological, and economic *determinants of health* (see **Box 4**) and are the foundation to human development (Hayes et al., 2018; Leal Filho et al, 2022; Pörtner et al., 2021).

Box 4: **Planetary Health Determinants**

The *social, ecological, and economic determinants of health* refer to the diverse factors informing how we experience health, including protective factors that may enhance health outcomes and risk factors that may undermine outcomes.

Planetary Health is an emerging field of work that studies the determinants of health as interlocked with Earth Systems; what they are, how they influence each other, and where we can better support them across whole-of-society systems.

Source: Dey et al., 2025, 2026; Hayes et al., 2018; Leal Filho et al., 2022; WHO, 2022b

Human activities and waste, such as fossil fuel-driven economies and greenhouse gas emissions, are the primary contributors to the accelerated changes in our climate (IPCC, 2021).

Predictions from the International Panel on Climate Change (2021) show an escalation of these changes. Experts warn that this acceleration could push Earth systems further and further out of the Holocene if urgent, effective climate action is not collaborated upon globally within the next decade (Richardson et al., 2023; Steffen et al., 2018).

The recent UNEP (2026a) report is clear: the Paris Agreement's 1.5 °C promise has been compromised. We are now entering overshoot territory and must prepare for an increasingly unstable climate.



Image source: Canva Pro

Like a stable climate, mental health is also fundamental to human development and our collective adaptive capacity. Mental health can be defined in a number of ways, linking it to psychological health, quality of life, and social health (Bower et al., 2026; Vergunst et al., 2024). In this report, it is defined as:

> An essential determinant of health and well-being that informs people's ability to cope with the normal stresses of life, work productively and beneficially, engage with society, and contribute to one's community.
> *(Adapted from Vergunst et al., 2024; WHO, 2026b)*

Mental health is increasingly understood to exist along a "the dual continua of mental disorders and psychological wellbeing" (Vergunst et al., 2024); in other words, it is not simply the absence of a mental health disorder.

Certain enabling conditions are therefore required for good mental health, such as social cohesion, social trust, security, sustenance, shelter, and biodiversity (Ibrahim, 2023; Vergunst et al., 2024).

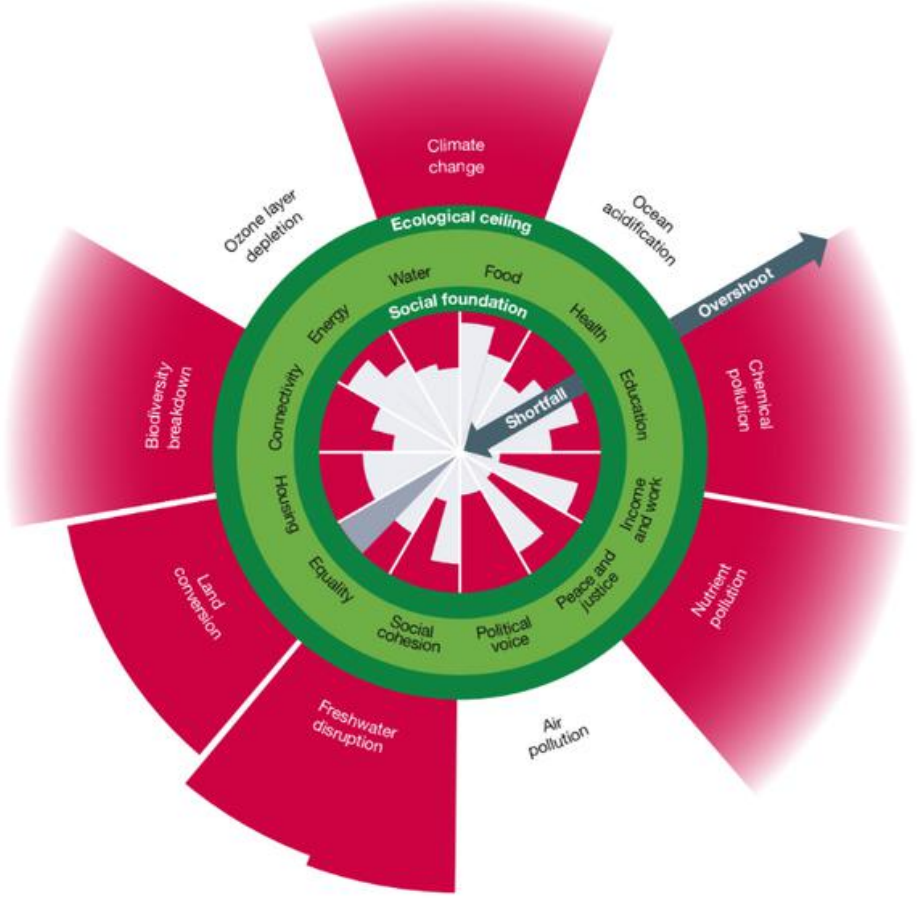
Climate change undermines these conditions and thus has a negative relationship to mental health, broadly (Bower et al., 2026; UN, 2025). Importantly, these impacts on mental health are known to reinforce the systemic inequalities already present within society, accelerating inequalities further (see **Section 3.0**).

In this way, mental health and climate change should be understood as sharing root drivers that are bound to the highly stratified social dimensions of capital, power, and ability (Parsons et al., 2024). How a community or individual experiences climate change and mental health will depend upon their socio-ecological and economic context (Bower et al., 2026; Dey et al., 2025).

This relationship is also bi-directional. Since mental health informs our societal norms, behaviours, and values, our mental health landscapes shape how we interact with the ecosystems around us (Long et al., 2026; Wamsler & Bristow, 2022; Weintrobe, 2021; see **Section 5.1**).

As a result, the climate-change-mental-health system is presented here as a complex system with both virtuous feedbacks (e.g., between nature exposure and community stewardship) and vicious ones (e.g. between fossil fuel emissions and poor health).

Climate change and mental health are also both persistently underfunded fields of work, fraught with normative and practical challenges (Gribble, 2020; Leal Filho et al., 2022; UN, 2025). For mental health, this is connected to a legacy of stigmatization and governance barriers (Berry et al., 2010a; Berry & Schnitter, 2022; Watts et al., 2020). These also reflect difficulties in the lack of effective action on climate change; interventions are highly politicized, and jurisdiction over climate is fragmented and disputed (see **Section 4.0**).



The resultant history of inaction means we are approaching or exceeding tipping points across many social and planetary boundaries, and each impacts human health (Richardson et al., 2023; Steffen et al., 2018; **Figure 1**).

Figure 1 | *Current Global status of social and planetary boundaries (Fanning & Raworth, 2025, p. 49)*

As the burden of harm increases, the urgency and need for effective, informed, and design-forward climate solutions grows.

And many experts agree that investment in research and development at the intersection of climate change and mental health should be understood as an important opportunity (Berry et al., 2009; Rossa-Roccor et al., 2021; WHO, 2026b; see **Section 5.0**).

There is potential to not just produce more informed and robust climate mitigation and adaptation strategies, but to also bolster mental well-being as climate resilient infrastructure and as a pathway to deep behavioural change towards long-term sustainability.



Image source: Getty Images Signature

2.0. Methods and Theoretical Frameworks

2.1. Literature Review methodology and initial results.

Between August 2025 and September 2026, Royal Road University's (RRU) worldwide library archives were used for the search query detailed in **Table 1**. Supplementary searches for query terms were also performed on Google Scholar and ResearchGate.

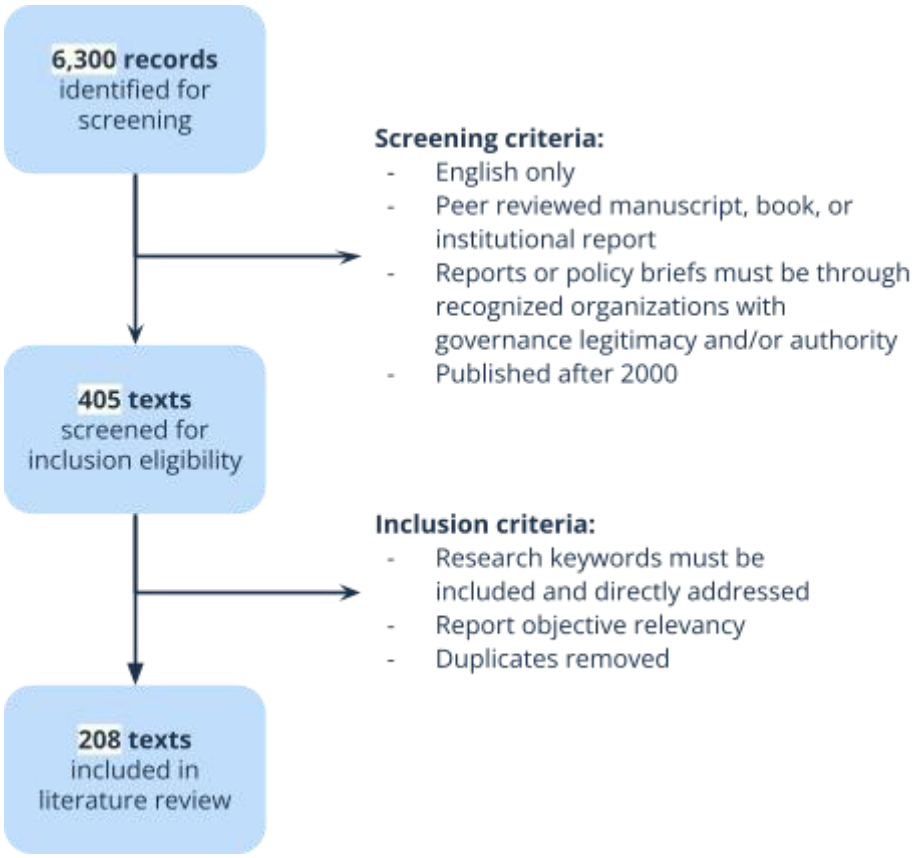
Table 1 **|** *Search query variables for literature review.*

	Variable 1: ***Climate Change***	**Variable 2:** ***Mental Health***	**Variable 3:** ***Impact***
Keywords Included	Climate Change Global Warming Flooding Extreme Heat Heat wave Wildfire Air Pollution Sea Level Rise	Mental Health Mental Well-being Mental Disorder Psychological safety Psychological well-being Psychosocial well-being	Impact Causal Pathway Cost Risk
Search Query = kw:("climate change") AND kw:("health") AND kw:("flooding" OR "extreme heat" OR "Heat wave" OR "global warming" OR "wildfire" OR "air pollution" OR "sea level rise") AND kw:("mental health" OR "mental disorder" OR "well-being" OR "psychological" OR "psychosocial" OR safety) AND kw:("impact" OR "causal pathway" OR "cost" OR "risk")			

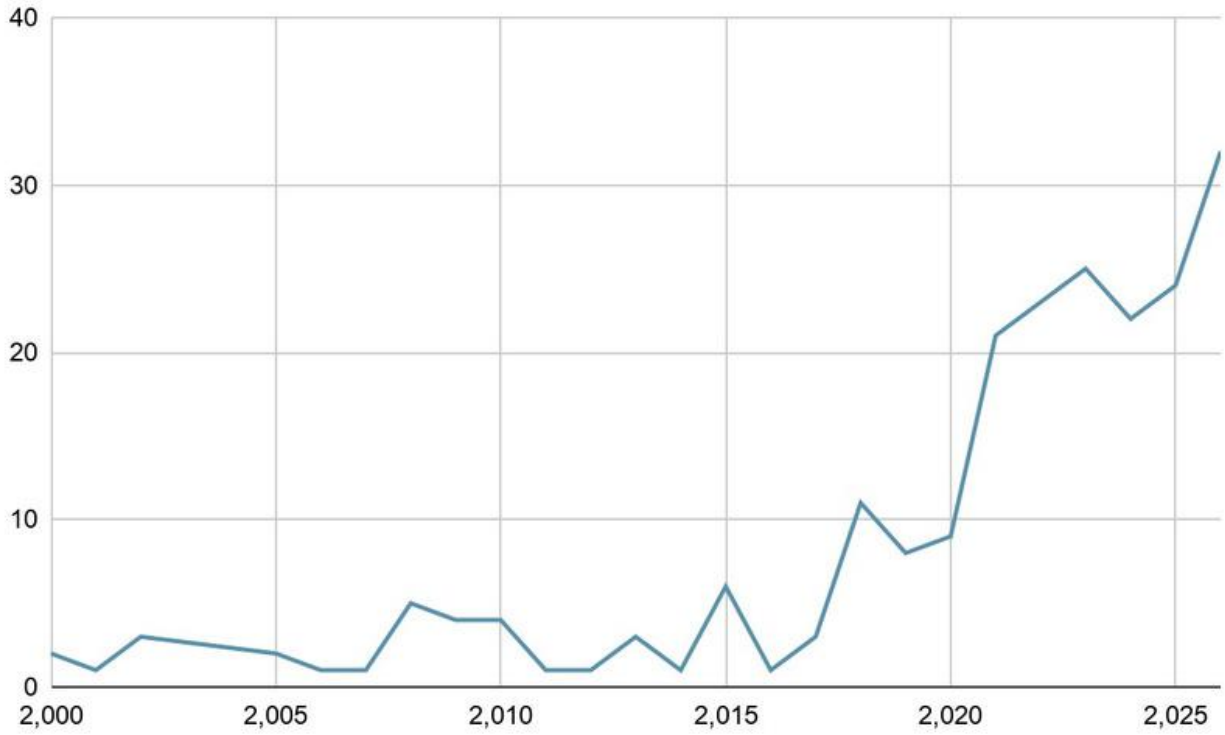
The initial search produced 6,300 records, which were then screened for those written in English, published through a recognized governance institution (e.g., WHO, UN, Canada) or a peer-review process, and released after the year 2000. This last parameter is simply a reflection of time constraints for the report production process, and presents a limitation of its contents.

This process produced 405 records, which were then screened against the inclusion criteria: research keywords must be included and directly addressed as part of the paper or report's thesis; relevancy to this report's objective (see **About This Report**); and the removal of any duplications. This resulted in the evaluation of 208 texts to support this report's findings. **Figure 2** provides a flow chart for this screening process.

Figure 2 | *Flow chart showing search result screening process.*



Graph 1 *| Snapshot of publishing years for articles analyzed in this report, 2000-2026.*



Graph 1 is a visualization of how publication of literature at this intersection has changed over time, per the sample of texts included in this report. It reflects how the volume of knowledge connecting climate change and mental health has emerged rapidly, especially post-COVID-19. The pandemic accelerated the visibility of the long-term implications of large-scale disruptions to psycho-social well-being (Hoeben et al., 2023; Loder et al., 2024; Mann et al., 2021; UGMH, 2023). Particularly during our age of advanced connective technology, such phenomena can be increasingly studied and attributed across causal pathways despite the complexity and scales involved (Brescia et al., 2025; Monaco, 2023).

Geographically, most of the literature is published in the Global North or in wealthier regions (Carlson et al., 2024; Charlson et al., 2021; Döring et al., 2026). This spatial distribution has important implications for solution production.

Literature examining research priorities within the climate-change-mental-health system note that the geographic bias of studies may obscure systemic inequalities within the data sets and limit the scalability of solutions (Brescia et al., 2025; Carlson et al., 2024; Vergunst & Berry, 2021). See **Section 4.1** for more details on this regional variation in data.

Due to the high variability of climate-related mental health impacts according to socio-ecological context (see **Section 3.0**), datasets from high-income countries (HICs) will not accurately reflect the place-based, lived experiences of population health in low- or middle-income countries (LMICs), nor their place-based capacities for solutions.

This inherent bias to the research can embed core assumptions in solution development that privilege certain stakeholders with greater access to resources than others, particularly in regards to funding and capacity (Carlson et al., 2024; Vergunst & Berry, 2021). **Section 4.3** discusses this further.

More foundational is that the key concepts involved -- such as well-being and health -- are culturally rooted in time and place (Verhagan, 2008; Cunsolo Willox et al., 2012). These terms inform an individual's and a community's mental health, as well as how they understand, experience, and interact with determinants of health (Bower et al., 2026; Cunsolo Willox et al., 2012).

Consequently, understanding of these terms may be limited by the geographic bias within the literature; Global North conceptions of health and well-being, including policy and service provision to these social constructs, will not be appropriate to all settings and peoples (Carlson et al., 2024; Crandon et al., 2022; Mahmood et al., 2025).

The literature review also reflected a broad range of disciplines involved in climate change and mental health research and development, as represented in the below word cloud.



Although research is not equally dispersed, this range does demonstrate the transdisciplinary nature of both climate change and health as 'everything, everywhere, all at once' phenomena.

It is due to this universal nature that this report applies a systems perspective to findings; using both a socio-ecological framework and a life-course developmental approach to analysis, as discussed next.

2.2. Socio-ecological and life-course development analytical frameworks.

Climate change and mental health are highly complex phenomena. Together, they should be understood as part of a fluid socio-ecological system with diverse and inter-connected relationships (Armitage et al., 2009; Charlson et al., 2022; Crandon et al., 2022).

This report uses two theoretical frameworks to present findings; to capture the place-based context of climate-related mental health impacts, and the link between human well-being and climate change.

First, it uses a socio-ecological framework, which was developed to capture how an individual's risks (via exposures and vulnerabilities within these systems), lived impacts, and symptoms are determined through relationships across and between various systems, as is their adaptive capacity (Cuartas et al., 2025b; Gislason et al., 2021; Ma et al., 2022; White, 2020).

On the following page, **Figure 3** provides a visualization of this framework. It includes a series of nested scales within which the individual is located:

CHRONOSYSTEM	the passage of time and key life-course events
EXO/MACROSYSTEMS	governmental, cultural, technological, and global ecological systems
MICRO/MESOSYSTEMS	family/caregiver, peer, school, community, and local ecological systems
INDIVIDUAL	unique bio-physiological and psychosocial aspects, norms, values, and worldviews, and immediate physical space occupied

Source: Crandon et al., 2022; Ma et al., 2022; White, 2020

Figure 3 | *A Socio-Ecological Approach to Understanding Mental Health.*

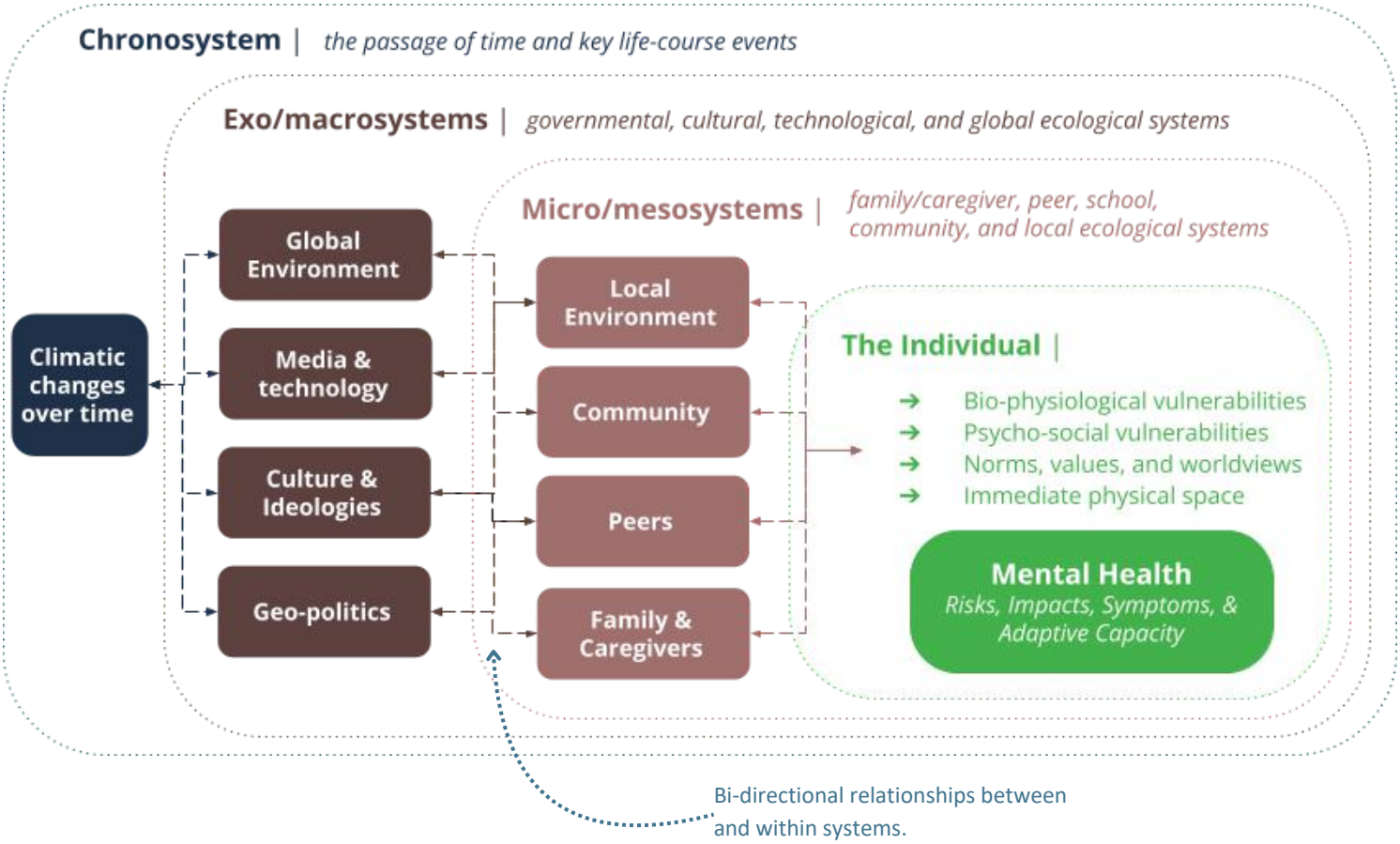


Figure adapted from Crandon et al. (2022).

A life-course developmental approach is also used to understand findings. This combines aspects of the *developmental origins of health and disease (DOHaD)* framework and the *life course approach* in order to understand exposure-behaviour relationships, primarily during critical windows of development such as pre-natal, adolescence, or pregnancy (Ha, 2024; Moore, 2024; see **Box 5**).

Box 5: **Life-course and Developmental Approaches**

The *life-course approach* was first developed in the 1990s within the health sciences to understand various health outcomes, and the fact that exposures to health hazards can have cumulative, co-occurring and/or interacting affects over an individual's entire life.

The *development origins of health and disease (DOHaD)* framework understands human developmental as fluid, with periods of greater "developmental plasticity" (Ha, 2024, p. 33) that increase the risk of poor physical and mental health outcomes during an exposure to hazards. This framework is commonly employed to examine climate hazard exposures and health outcomes.

Source: Ha, 2024; Moore, 2024

These two frameworks work together to more deeply explore the highly contextual and interacting connections along the causal pathways between hazard and outcome in **Section 3.0**.

3.0. Known Impacts and Causal Pathways within the Climate-Change-Mental-Health System

3.1. Overview of impacts and causal pathways.

The causal pathways linking climate change and mental health outcomes should be understood as fluid and bi-directional, with high variability across temporal and spatial scales in how they impact each other and are experienced at the population, community, and individual levels (Crandon et al., 2022; Moore, 2024).

Climate-related mental health impacts can occur across direct and indirect pathways, and manifest in fast- and slow-onset timelines (Bower et al., 2026; Vergunst & Berry, 2021).

In **Figure 4**, four routes between climate change hazards and mental-health outcomes are described.

These four routes are the most common understanding of the causality between climate change and mental health, and occur from the following hazards:

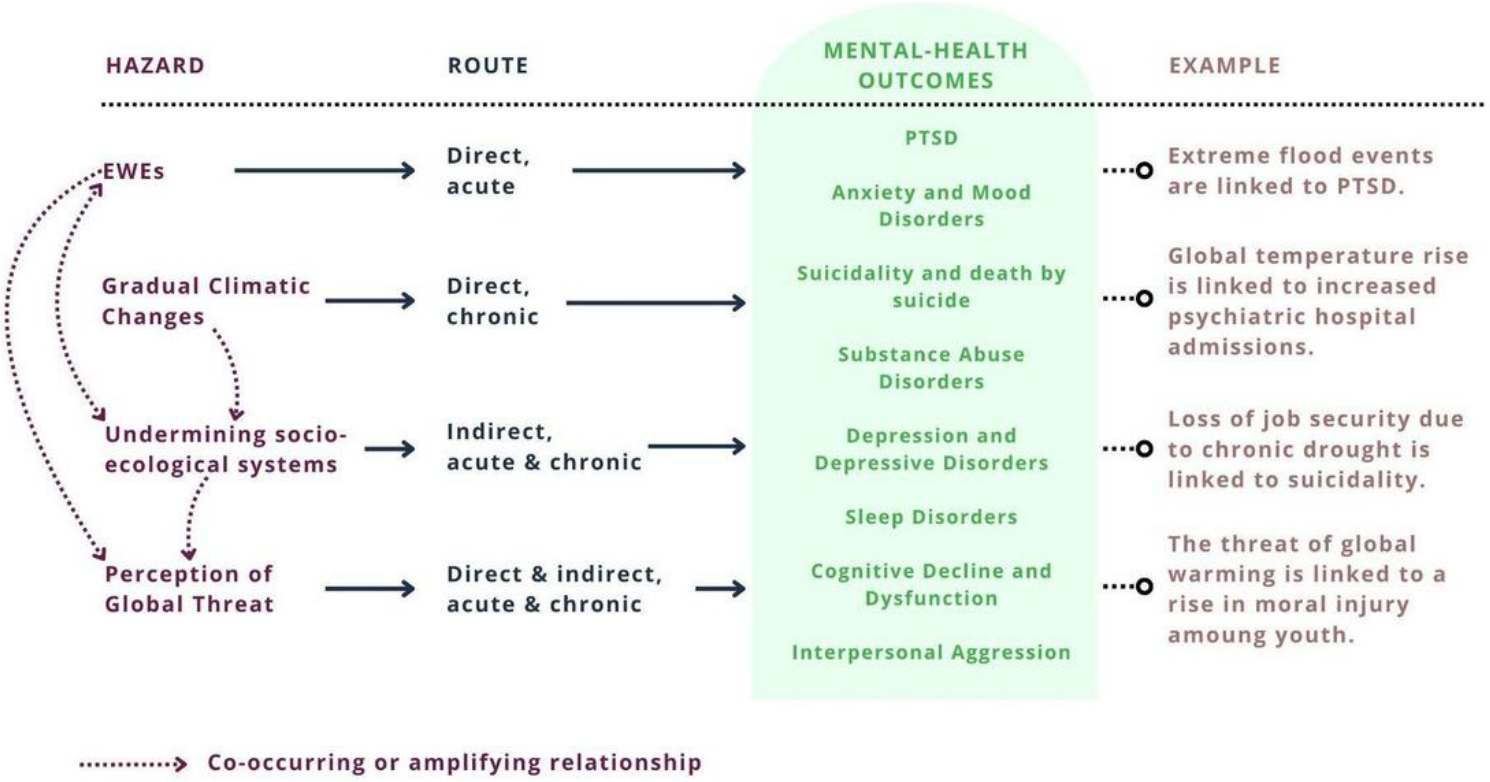


Image source: Canva Pro

→ **Extreme Weather Events (EWEs)**	e.g., heat domes, extreme flooding, hurricanes
→ **Gradual Climatic Changes**	e.g., sea level rise, global mean temperature rise, chronic drought
→ **Undermining of Socio-Ecological Systems**	e.g., disruption to food, economic, and health care infrastructure (soft and hard)
→ **Perception ofGlobal Threat**	e.g., via increased awareness and/or witnessing of climate change impacts

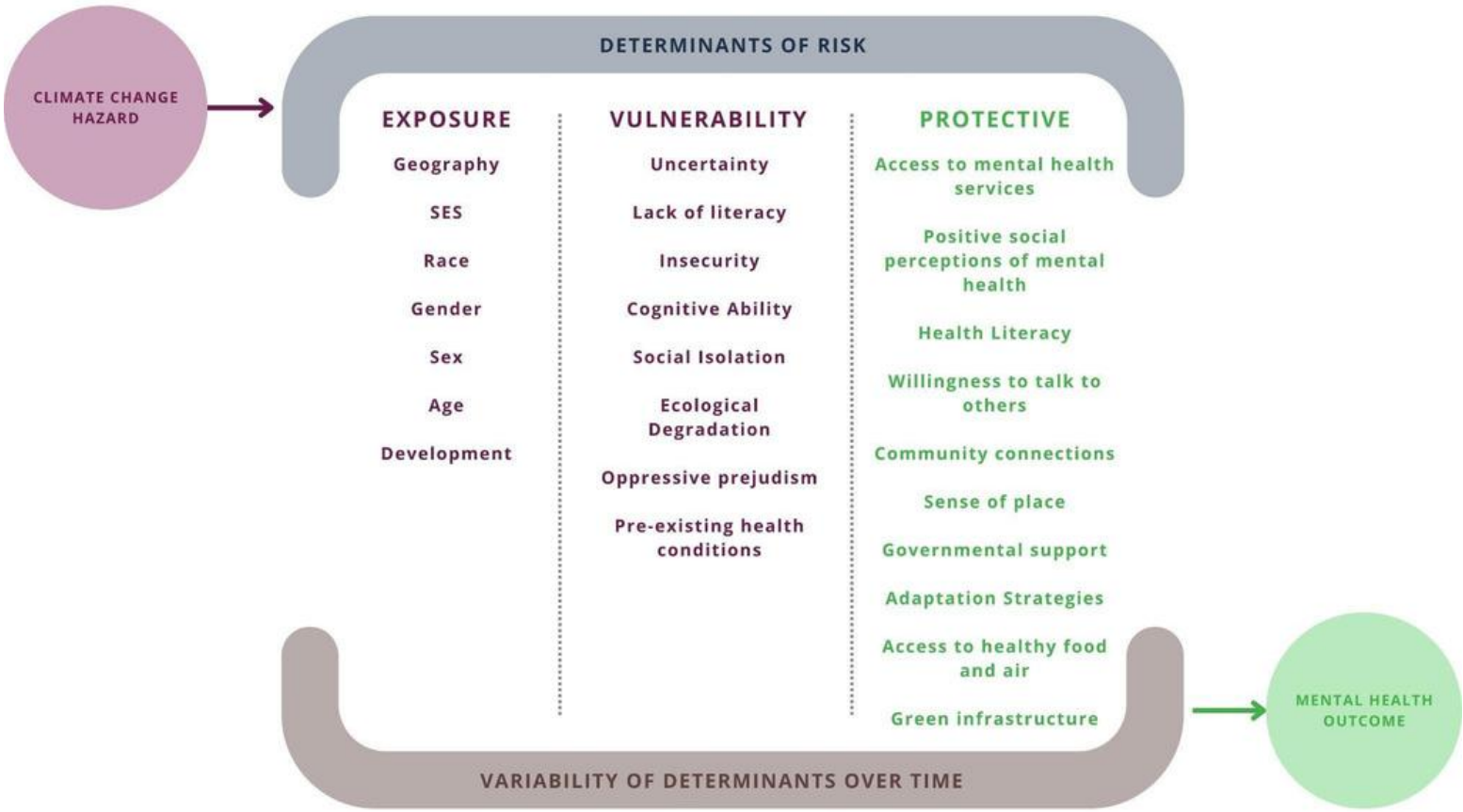
Source: Clayton et al., 2024

Figure 4 | *The four routes between Climate Change Hazards and Mental Health Outcomes, with examples.*



Source: Clayton et al., 2024; Long et al., 2026; Moore, 2024; Vergunst & Berry, 2021; WHO, 2022b

Figure 5 | *Determinants of risk between climate change hazard exposure and mental health outcomes.*



Source: Bower et al., 2026; Charlson et al., 2022; Moore, 2024; Parsons et al., 2025; WHO, 2022b

The causal pathway between hazard and exposure also does not necessarily generate a specific mental health outcome; the exposure to outcome pathway is informed by regional, community, and individual risk profiles (Leal Filho et al., 2021; Moore, 2024).

Even when a mental health outcome does occur, the presentation of that outcome depends on various determinants of risk and health (Bower et al., 2026; Moore, 2024).

Figure 5 provides a visual summary of some of the determinants of risk that shape this composition. In **Table 2**, some of the more robustly established hazard-related impacts are summarized. However, due to the gaps in research and measurement (see **Section 4.0**), this table is not exhaustive, nor does it capture the full scale of potential mental health consequences from climate change (Charlson et al., 2022; Vergunst et al., 2024).

What is understood and accepted within the literature is that risks and impacts can co-occur and amplify each other, and not just in an additive way across one's life-course. The dynamics involved -- determinants, hazards, and outcomes -- can also interact in multiplying ways (Cianconi et al., 2020; Dey et al., 2025).

In other words, repeated or co-occurring hazard exposure can multiply the degree of impact to our mental health, particularly during critical developmental windows or for more vulnerable populations (Fuller et al., 2021; Moore, 2024; Vergunst & Berry, 2021; see **Case Study 2**).

For example, repeated exposure to air pollution and extreme heat during the prenatal and postnatal period can significantly increase the risk of poor mental health outcomes for a developing fetus and baby (Fuller et al., 2021; NCWG, 2026; UN, 2025).

Image source: Getty Images



Table 2 | *Climate hazards and the known sequelae of potential mental health outcomes.*

CLIMATE HAZARD

ACUTE ← → CHRONIC

MENTAL HEALTH IMPACT SEQUELA

NON OR SUB-CLINICAL ← → CLINICAL

	Extreme Heat	Wildfire	Flooding	Air Pollution	Global Mean Temp. Rise	Sea Level Rise	Climate Change, generally
Sleep disturbances	✓	✓	✓	✓	✓		✓
Cognitive / developmental delay/decline	✓	✓	✓	✓	✓	✓	✓
Emotional & mental stress	✓	✓	✓		✓	✓	✓
Aggression or violent behaviours	✓	✓	✓		✓	✓	✓
Learning & intellectual disabilities	✓	✓	✓	✓	✓	✓	✓
Mood & anxiety disorders	✓	✓	✓	✓	✓		✓
Depressive disorders	✓	✓	✓		✓	✓	✓
PTSD	✓	✓	✓			✓	✓
Psychiatric disorders	✓	✓	✓	✓	✓		✓
Self-injurious behavior & death by suicide	✓	✓	✓		✓		✓
Sources	*Cianconi et al., 2020; Lawrance et al., 2022; Meltzer et al., 2024; Reichelt et al., 2025; Soomro et al., 2024; Tejani et al., 2026*	*Cuartas et al., 2025b; Brown et al., 2019; Cianconi et al., 2020; Lawrance et al., 2022; Reichelt et al., 2025; Silveria et al., 2021*	*Aylward et al., 2026; Cianconi et al., 2020; Hieronimi et al., 2022; Lawrance et al., 2022; Reichelt et al., 2025; Zhong et al., 2018*	*Clayton, 2021; Lawrance et al., 2022; Reichelt et al., 2025 Rothschild & Haase, 2022; Sukumaran et al., 2024; Thompson et al., 2024*	*Carleton, 2017; Clayton, 2021; Cuartas et al., 2025a; Lawrance et al., 2022; Reichelt et al., 2025; Tham et al., 2020; Vergunst & Berry, 2021*	*Burke et al., 2018; Cianconi et al., 2020; Ha, 2024; Leal Filho et al., 2021*	*Amin, 2023; Aylward et al., 2026; Boyd et al., 2024; Crandon et al., 2022; Dey et al., 2025; Fuller et al., 2021; Koder et al., 2023; Lebel et al., 2022; Vergunst & Berry, 2021)*

Case Study 2: **The BRAIN-CLIMA Project**

Read more about the BRAIN-CLIMA Project here.

The BRAIN-CLIMA project is a multi-disciplinary and collaboratory research project in Latin America examining how **heat, air pollution, neurology, and other determinants of health** are all interacting to **impact brain health, and thus, well-being**.

Preliminary findings show that **air pollution and heat can negatively impact the brain**, including its structure and function. More specifically, it reveals that climate-related hazards coupled with the socio-economic stressors known to elevate within climate change may be contributing to more **rapid brain aging. These findings have obvious implication for mental health** in affected communities.

This project is also reflective of **community-based participatory research**, which aims to apply direct research benefits to the impacted communities and also include these communities in the shape of the research itself in order to protect and promote their well-being.

Source: Banyan Commons et al., 2026; BRAIN-CLIMA Project, n.d.; NCWG, 2026; WHO, 2026b

Importantly to climate solutions, this also can work in a positive way; mitigation or protective factors that enable human health can interact with positive ecological feedbacks that amplify well-being, which in turn enables our capacity to steward the environment (Aked et al., 2010; Bratman et al., 2019; Berry et al., 2010a; Charlson et al., 2022).

For example, exposure to biodiverse natural environments have known positive impacts to mental health, including for relief and treatment of stress, anxiety, and depression (Mahmoudi et al., 2023; Nurse et al., 2010).

All together, the complexity of the relationships generate a high degree of variability and uncertainty within both the lived experience of climate hazards, and our understanding of their risks (Vergunst et al., 2024; Vidal et al., 2023).

The next section discusses how systemic vulnerabilities and injustices within the climate-change-mental-health system drive the heterogeneity of risks and impacts.

3.2. Heterogeneity of impacts: systemic inequalities and vulnerable populations.

Mental health outcomes from climate change are highly variable, creating broad heterogeneity within both the data on population health and people's lived experience (Cianconi et al., 2020; Cuartas et al., 2025a).

This variability is partially driven by systemic inequalities (Koder et al., 2023; White, 2020). These are well established within both climate and health sciences literature, and are known to affect populations' lived experience, burden of disease, and healthcare access, from assessment to diagnosis to treatment (Berry et al., 2018; NCWG, 2026; Parsons et al., 2025; UN, 2025; White, 2020).

Figure 6 *| The Compounding Effects of Climate Change on Mental Health and Well-being*



1	Climate Change Threats	**5**	Children and Youth
2	Mental Health and Well-being Impacts	**6**	Protective Factors
3	Systemic Stressors	**7**	Barriers to Resilience
4	Susceptible Groups	**8**	Solutions to Build Resilience

Source: Israni et al., 2024, p. 96.

Figure 6 reflects a visual analogy of the complex relationship between climate hazard exposures and health that produces such an inequitable range of impacts, as produced in Moore's anthology, *Climate Change and Mental Health Equity* (2024).

The image highlights that *Protective Factors* and *Barriers to Resilience* are in contrast to each other, and that these will each be more applicable to some populations over others based on community or individual factors (see **Box 6**). Both should be understood as *determinants of health* (Hayes et al., 2018; Gislason et al., 2021; Moore, 2024).

Furthermore, the visual depicts how hazards and risks can interact and amplify each other and other dynamics in a socio-ecological system, and there is robust evidence in the literature to support this (Cianconi et al., 2020; Dey et al., 2025; NCWG, 2026).

For example, exposure to violent conflict increases both within geographies experiencing a climate hazard, such as a drought, and within communities experiencing an economic recession (da Fonte et al., 2023; Hayes et al., 2018).

***Box 6:* Protective Factors and Barriers to Resilience**

Protective Factors describes those regional, community, or individual resources that can protect or mitigate harm from hazards, such as housing, food, and economic security, access to nature, and/or a sense of place. The more protective factors a community or individual has, the higher the likelihood they have less exposure to climate risks.

Barriers to Resilience are the systemic injustices that perpetuate inequality across scales, such as racism, abilism, and sexism. For example, urban design that privileges certain bodies over others may allow some to escape flood waters while those with mobility challenges will have a heightened exposure to climate risks.

Source: Israni et al., 2024

These hazards -- drought and job insecurity -- can be co-evolving phenomena, and since both can increase the risk of interpersonal violence, particularly gender-based violence, the affected community experiences an amplified risk of violent behaviour (Döring et al., 2026). That amplified risk is in turn experienced differently across the systemic inequalities already present within that community (da Fonte et al., 2023; Döring et al., 2026).

Thus, the degree of exposure and vulnerability to climate risks is found to accelerate risks to certain populations within the climate-change-mental-health system, increasing exposure of already vulnerable groups to poorer mental health outcomes.

Table 3 outlines five population groups known to experience heightened risk to these outcomes.

Table 3 | *Key vulnerable population groups within the climate-change-mental-health system.*

Population	Description of vulnerabilities
People with pre-existing mental health disorders, disabilities, and diseases	Vulnerabilities are linked to decreased capacity to respond to climate change, and an increased reliance on access to resources and healthcare, which are typically disrupted during climate change events (Hayes et al., 2018). Heightened risk is also shaped by a legacy of stigmatization and institutionalization, which increase co-morbidities in income, housing security, physical health, and exposure to violence and trauma, as examples (Dey et al., 2025; Hayes et al., 2018; Moore, 2024).
Children and adolescents, and the elderly	Higher climate-risk is linked to physiological constraints (e.g., a newborn) and cognitive or physical proficiencies (e.g., a senior living with dementia) (Crandon et al., 2022; NCWG, 2026; UN, 2025).
Indigenous communities, Māori and Pasifika peoples, People of African Descent, and racialized populations	Vulnerabilities are linked to a legacy of systemic injustices, such as those from colonialism, globalization, and limitless growth ideologies (Dey et al., 2025; Mahmood et al., 2025; Parsons et al, 2024). Indigenous conceptions of well-being are also deeply place-based, intrinsically connecting health and land, which further increases their risk of mental distress in the face of climate change (Mahmood et al., 2025; Cunsolo Willox et al., 2012)
Forced climate migrants	Vulnerability is established by the increased prevalence of health co-morbidities at the intersection of migration and socio-ecological disruptions, such as violent conflict and climatic disasters (Bedaso & Duko, 2024; Long et al., 2026; Nguyen et al., 2024)
Women and gender-diverse peoples, particularly those who are pregnant or experience co-occurring vulnerabilities	Heightened risks are shaped by the history of sexism, genderism, and systemic lack of reproductive health care support (Charlson et al., 2022; Dey et al., 2025). Also, for those who are pregnant, there are rapid physiological changes in the body that increase health risks from climate hazards (Moore, 2024; UN, 2025).

Children and adolescents must be highlighted within solutions as an important group from a justice lens. They are only just beginning their lives and yet experience the highest burden of impact from climate change than any other generation (Gao et al., 2025; UNICEF, 2021).

In fact, research shows that nearly 90% of the current health burden from climate change occurs in children (Burke et al., 2018; UNICEF, 2021; Vergunst & Berry, 2021).

Youth are particularly vulnerable to climate risks for two primary reasons: 1) their rapid development includes high-susceptibility windows to environmental contaminants (e.g., post-natal development) (Moore, 2024); and 2) their lack of power and authority within climate action can amplify poor mental health outcomes (Burke et al., 2018; Gao et al., 2025). For example, a lack of agency is known to increase mental distress when perceiving a significant threat, i.e., climate change (Moore, 2024).

Box 7: **Climate-related health impacts on children**

88%

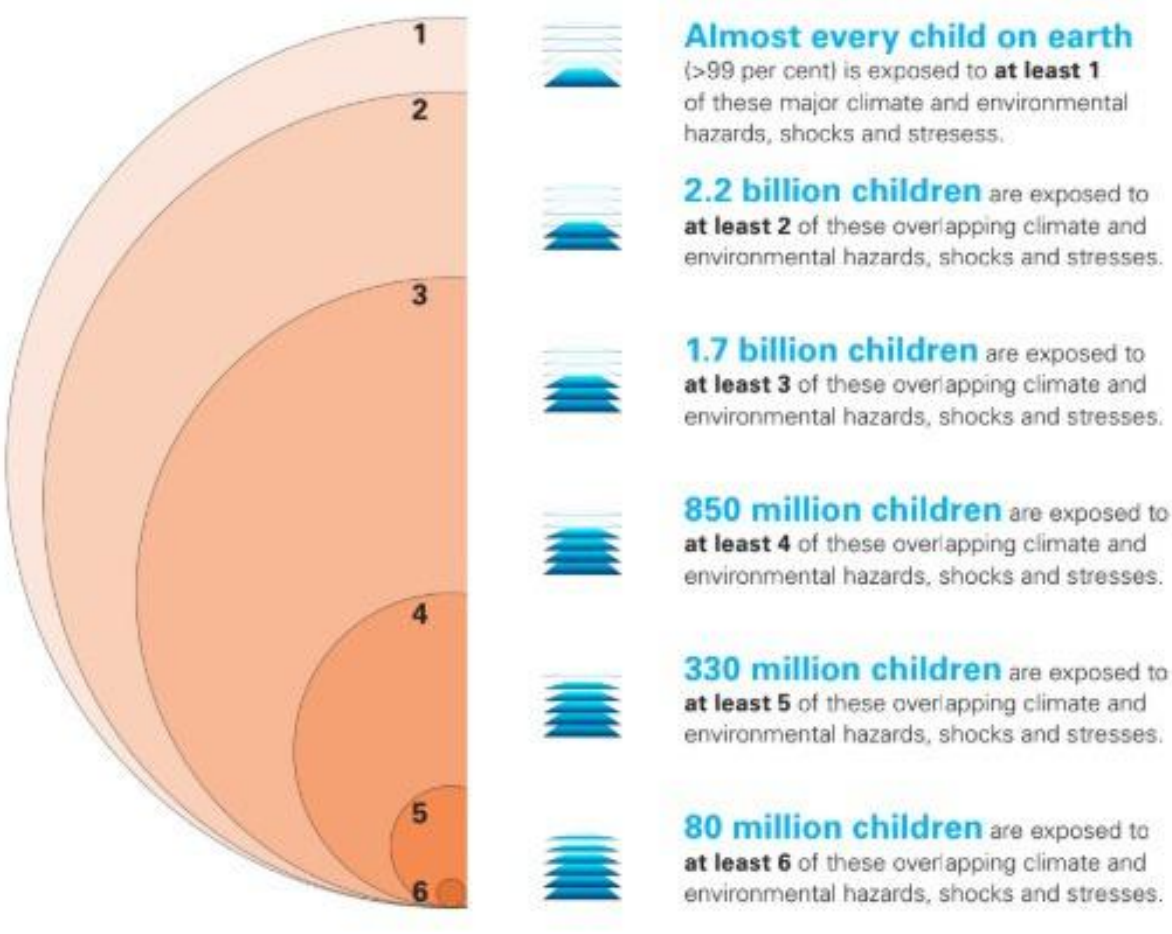
of current global health burden attributable to climate change occurs in children

Source: Burke et al., 2018; Hipps, 2026

The burden youth will experience is projected to grow within the context of an increasingly unstable climate and a lack of collaborative, effective global action to mitigate and adapt (van Nieuwenhuizen et al., 2021; UNEP, 2026a).

In 2021, UNICEF released a report capturing the alarming evidence of risks to youth from climate change. It found that around 2.2 billion children experience exposure to at least 2 overlapping hazards, shocks, and stressors at any given time, and as many as 80 million children are exposed to 6 or more overlapping hazards (UNICEF, 2021; see **Figure 7**).

Figure 7 | *Overlapping climate and environmental hazards, shocks and stressors*
Source: UNICEF, 2021, p. 11



Understanding both the complexity and heterogeneity of climate-mental health impacts stems from an evidence-based logic presented in the literature:

→ Socio-ecological disturbances generate a psychological response, and this response influences our health and behaviour.

→ How this occurs over space and time varies depending upon collective and individual risks, and access to capital and capacity.

→ Due to these connections and uncertainties, systemic inequalities can deepen as impacts feedback and interact with each other and other systems.

As noted, the exact quantity and quality of those impacts still contains a high degree of uncertainty, which limits the effectiveness of current climate-mental health solutions (Leal Filho et al., 2021; Moore, 2024; Vergunst et al., 2024).

Experts increasingly call for more in-depth, collaborative efforts -- between academics and within communities -- to characterize and test causal pathways and decrease uncertainty (Charlson et al., 2022; Vergunst & Berry, 2021).

Specifically, there are key gaps and challenges that need priority attention, which **Section 4.0** discusses next.



Image source: Canva Pro

4.0. Current Gaps and Challenges

4.1. Climate-related mental health impact metrics and literacy.

Despite the certainty that our environments impact our health, a robust understanding of climate-related mental health impacts is only just emerging (Gislason et al., 2021; Leal Filho et al., 2021).

Experts note challenges in capturing key concepts and measuring the wide array of potential harms as primary research challenges (Clayton et al., 2024; Koder et al., 2023; Lawrance et al., 2022). In practice, integrating mental health considerations into climate action, and a climate change lens into mental health, has likewise been difficult since these two phenomena have historically existed in silos from each other (Ali et al., 2026; El Omrani et al., 2024).

Central terms -- *well-being* and *health*, for example -- are culturally rooted in time and place, so our understanding of them experiences much variation.

Interpretation of harm and loss, and ergo solutions, must be place-based and community-informed (Bower et al., 2026; Moore, 2024). Scaling successful studies and interventions must reflect this since the study or promotion of good mental health in one community can look vastly different than in others, even within the same country or region (Bower et al., 2026; Hipps, 2026; van Nieuwenhuizen et al., 2021).



Image source: Prexels

In 2024, the WHO released an updated *Mental Health Atlas* on global mental health data, prevalence, and regional discrepancies. The report finds that, despite advances over recent years, mental health data remains shallow and under-reported across the world (WHO, 2024).

Graph 2 presents the global availability of mental health indicators within digital health records. It shows how, even in wealthier regions, mental health data is not readily available, indicating a significant blind spot for research and proactive policy development in the context of climate-mental health risk mitigation (WHO, 2024).

Indicators used to project mental health trends and risk assessments are also commonly narrow, such as disability-adjusted life years (DALYs), psychiatric hospital admissions, and

deaths by suicide (Lawrance et al., 2024; Patel et al., 2018). For example, in reporting on progress towards Sustainable Development Goals (SDGs), the primary mental health indicator is suicide mortality rates; a "very specific final negative outcome" (Patel et al., 2018, p. 1590) versus indicators that reflect a broader sense of how populations experience mental health and access to care.

Graph 2 | *Percentage of World Health Organization reporting countries that include mental health indicators in their digital health records, 2024*



Source: WHO, 2024

Experts recommend an expansion of indicators to include determinants of mental health, and factors shaping the demand and strength of mental health services (Lawrance et al., 2024; Patel et al., 2018; WHO, 2022a). Additionally, qualitative and self-reported data, such as on the fluid quality of mental health and well-being, must be more deeply evaluated and reported upon (Crandon et al., 2022; Lawrance et al., 2024).

Currently, this type of data appears peripheral to or non-existent within many government databases (WHO, 2024). This data is also rarely contextualized within or to climate-related issues, and therefore only offers a general understanding of prevalence or risk notwithstanding climate change stressors (Charlson et al., 2022; WHO, 2022a; WHO, 2024).

The task to capture more fluid, complex datasets can be seen as a labour-intensive and mixed-outcome process, and is not currently prioritized within many governments worldwide (WHO, 2024). This is driven partially by stigma (see **Section 4.2**), but also by capacity constraints (see **Section 4.3**).

In the face of other societal priorities -- housing and food security, for example -- many LMICs simply do not have the resources to collect and report on broad mental health

indicators (Charlson et al., 2022; Leal Filho et al., 2021; WHO, 2024). For example, the WHO (2024) found that LICs in particular rarely reported on “treatment outcomes and involuntary admissions" (p. 21), two key indicators on the prevalence of mental health needs.

Since many LMICs have historically been burdened with the legacies of oppression, extraction, and colonialism, this gap in capacity is a justice issue, and many multilateral organizations call for Global North financial aid to fill it (Carlson et al., 2024; Parsons et al., 2024; UGMH, 2024).

Importantly, the information gap for youth populations presents slightly differently in the literature.

On the one hand, there is more comparable data at scale for children and adolescents since researchers can examine the relationship between climate hazard exposures and growth or academic performance, as examples (Burke et al., 2018; Fuller et al., 2021; Reichelt et al., 2025). Yet on the other hand, there is not enough high resolution data between different life-course phases within this population, for example between older children (4-10 years old) and adolescents (11-17) despite knowing these phases include diverse biological and psychosocial development (Cianconi et al., 2020; Ha, 2024).

Also, while numerous studies have looked at extreme weather event impacts to children (see: Cuartas et al., 2025a; Hao et al., 2025; Syed & Basu, 2025), there are few studies that have empirically evaluated and tested other relationships in this system (Cianconi et al., 2020). And although there is enough literature to support broad conclusions -- that these climatic phenomena negatively impact youth’s health -- there nevertheless is a need for higher resolution data on exposure pathways, mediating factors, and how mental health impacts may present and/or persist over time (Lawrance et al., 2024; Vergunst et al., 2024).

Lastly, statistics on youth development are still not consistent across all countries (UNICEF, 2021; Vergunst & Berry, 2021; WHO, 2024).

Gaps persist in LMICs due to capacity issues, lack of services, and stigma (WHO, 2022b; WHO, 2024). This is an important gap to fill since children in these regions may experience exposure to other socio-economic risks, such as gender inequity, food insecurity, and conflict, and thus are much more susceptible to poor mental health outcomes from climate change (UNICEF, 2021; WHO, 2022b).

Box 8: **Violence against children with mental health conditions**

Children with mental health conditions are **4x** more likely to become a victim of violence

Source: Israni et al., 2024

In summary, there is consensus that the causal pathways between climate change and mental health remain understudied and undertested, and this compromises our understanding of trends, vulnerability, and risks across the climate-mental health pipeline: from hazards to health outcomes to solution development to resiliency.

Case Study 3: **The 2021 British Columbia (B.C.) Heat Dome as a case of mandated data collection.**

In 2021, B.C. experienced an extreme heat event, also known as the 'Western Heat Dome', between June 25 and July 1 in the form of a high-pressure ridge that caused temperatures in some cities to reach **20°C above the historic average**. Additionally, the Village of Lytton recorded the **highest temperature in Canada's history of 49.6°C.**

During this period, there were **619 deaths** attributed directly to extreme heat. Capturing this **significant human toll** was possible because, for the first time in Canada, the B.C. Coroners office passed a mandate to healthcare providers that required they record heat-attributable deaths. This decision reflected the **emerging awareness of climate-health impacts**, which allowed this dataset to become established and persist towards policy decisions across the globe.

+20°C
above averages

619
deaths

25%
were people with psychiatric disorders

It is in this dataset that practitioners and researchers could attribute for the first time a stark causation between **heat and mental health risks**. Of the 619 recorded deaths, almost **25% were people with schizophrenia**; a statistic now understood to reflect a heightened exposure risk that requires urgent preventative policies and guidelines.

The decisions behind this dataset reflect two opposing take-aways. First, because the B.C. Coroners Office had **understood the risks** of this extreme heat event, then the significant human toll was sufficiently recorded and set a precedent for future events. Yet, at the same time, because there was a lack of deeper awareness pre-event, then **proactive and protective heat-health plans were unavailable** in time to prevent some of the deaths and harms that occurred, particularly for some of B.C.'s most vulnerable community members.

Source: B.C. Coroners Services, 2022; Kidd et al., 2026; Yoon et al., 2024

These gaps have important flow-on effects to community and practitioner literacy.

If city planners, healthcare practitioners, and community services -- from emergency personnel to event planners -- do not have the necessary awareness of these impacts, then their agency to make informed decisions is compromised (Hayes et al., 2018; Rossa-Roccor et al., 2021; UGMH, 2026). In **Case Study 3**, the British Columbia (B.C.) heat dome is used as an example of how deeply literacy matters.

Gaps in measurement and literacy are, in part, outcomes of the persistent under-funding of mental health as a research and policy priority, both in relation to climate change and to health more generally (Gribble, 2020; Patel et al., 2018; UGMH, 2024; WHO, 2024).

Globally, governments do not adequately finance mental health (WHO, 2024). According to the WHO (2022b), an average of only 2% of health care budgets are spent on mental health. This varies across the globe, with LMICs only contributing around 1% and HICs contributing 4.3% (see **Graph 3**). **Section 4.3** discusses this in more detail.

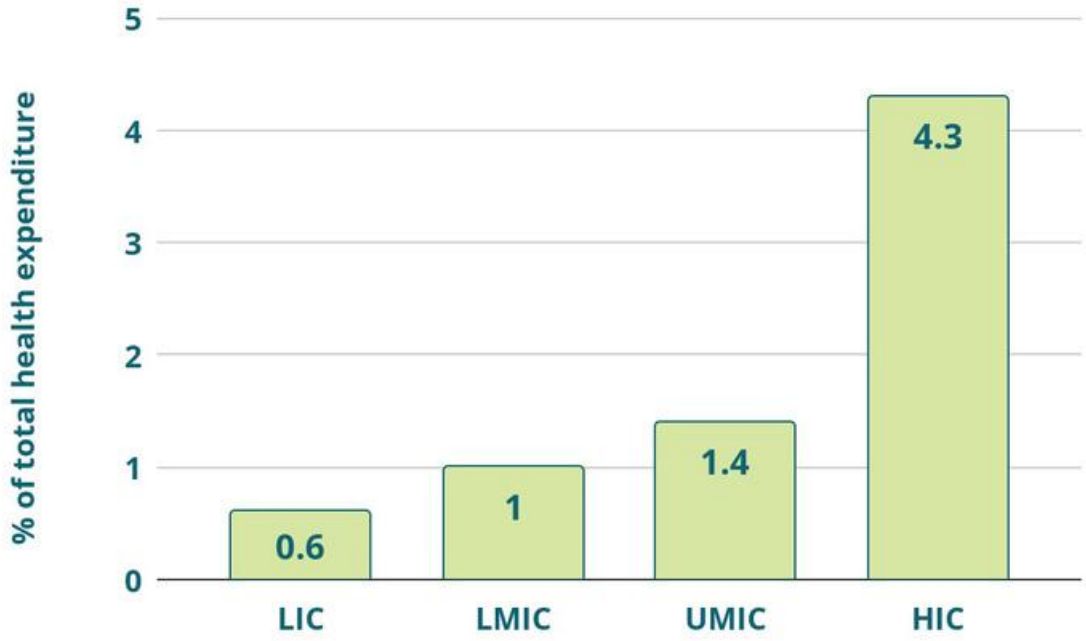
This underfunding of mental health care persists into research, too. The WHO (2022b) found that, globally, only 4.6% of health research focuses on mental health (see **Graph 4**).

Finally, lack of adequate Official Development Assistance (ODA), and specifically Development Assistance for Mental Health (DAMH), constrain global mental health financial mechanisms further. The WHO (2022b) found that of total ODA contributions towards health interventions only 0.3% went to mental health, or an average of less than $1 million USD per country (UGMH, 2023).

Taken together, the lack of mental health financing and data can mean that climate solutions in key decision-making forums, like government, are developing within a very narrow sense of the complex issues facing global populations today as climate risks escalate.

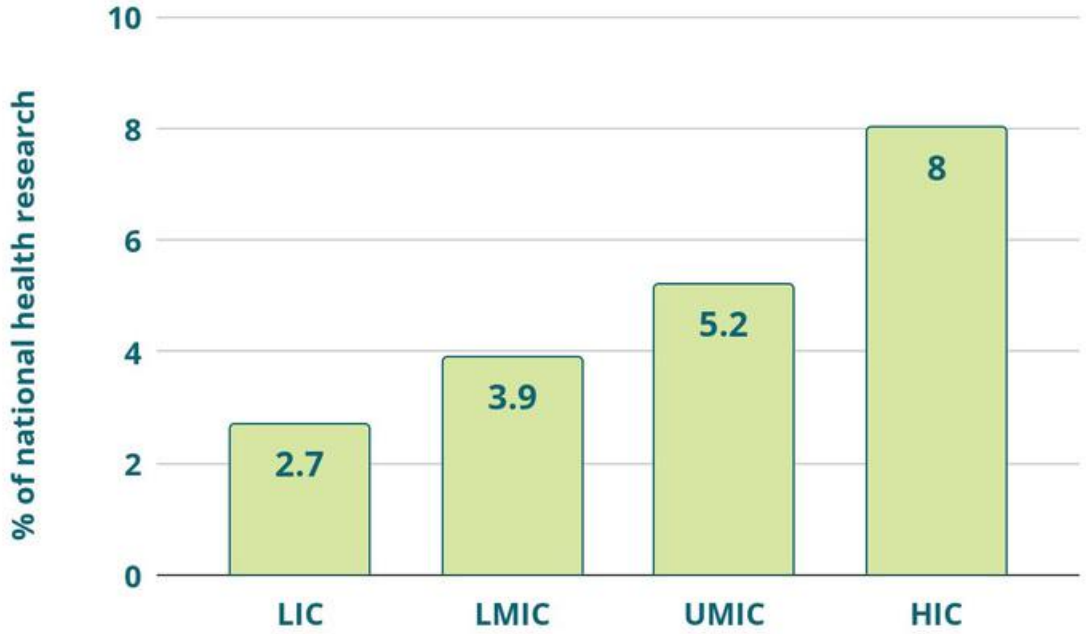
See **Section 4.3** for more on governance challenges, but first, this report turns to the central issue of stigma.

Graph 3 | *Mental health compared to total health government expenditure for WHO reporting countries, by World Bank income region, 2024*



Source: WHO, 2024

Graph 4 | *Global percentage of health research that focuses on mental health, by World Bank income group, 2022*



Source: WHO, 2022b

4.2. Stigmatization and systemic inequalities.

Fundamentally, stigmatization has impacted mental health literacy and access to care, preserving the invisibility, exclusion, and human rights issues for people living with mental health conditions and systemic inequalities (Patel et al., 2018; UGMH, 2023; WHO, 2022b).

Stigmatization can take many forms: lack of social connectedness when suffering from depression, lack of psychological safety at work, or governments criminalizing self-harm and suicide (UGMH, 2021; UGMH, 2023; Vergunst & Berry, 2021).

There is no country in the world that is not burdened with some degree of stigmatization (Becker & Kleinman, 2013; Berry et al., 2010b; WHO, 2022b). However, this burden is geographically distinct. People living within LMICs experience significantly more mental health stigmatization, and the subsequent lower rates in literacy and access to care, than people in HICs (UGMH, 2023; WHO, 2022b; see **Section 4.3**).

In parallel, anthropogenic climate change hasalso been subject to polarization and politicalization based on geo-social norms (O'Brien, 2017; Rossa-Roccor et al., 2021; Vergahen, 2008).

For decades, climate action has experienced socio-political barriers to its mainstream understanding as a human-caused threat (Lawrance et al., 2022; Verhagen, 2008; Yap & Leow, 2024). As scientists and advocates raised red flags and established human behaviour as a cause of the climate crises, powerful organizations and leaders have worked to discredit causality and sow disinformation (Hickman et al., 2021; O'Brien, 2017).

Stigma is both a *normative mechanism* that negatively performs on a group or individual, and an active *structural barrier* between people and help.

In this way, both mental health and climate change have normative challenges to cognitive acceptance and effective interventions (Berry et al., 2018; Wamsler & Bristow, 2022). This not only makes understanding their interaction more difficult, but also maintains the legacy of harm to vulnerable groups more than others based on systemic inequalities (Crandon et al., 2022; Salami et al., 2026).

Since these populations can experience stigma in multiple ways, both as a source of social exclusion and as a structural barrier, stigmatization should be understood as a powerful and harmful dynamic within the climate-change-mental-health system.

Case Study 4: **The state of mental health in Uganda.**

Uganda is currently experiencing a mental health crisis, with the prevalence of mental disorders reaching **a third of the population** in the past decade. Violent conflict, the AIDs epidemic, and harm from colonialism have contributed to this crisis.

1 of 3
people living with a mental health disorder

suicide
is a punishable crime

only 50%
of people with poor mental health seek help

Yet the political will and capacity to act remains challenging. Uganda's government **does not perform broad data collection**, narrowly focusing on clinical diagnosis, **nor provide adequate access** to high-quality care. Instead, the primary treatment method remains institutionalization, which is largely criticized as inadequate.

In Uganda, **stigmatization of mental health is a prevailing barrier**. Stigma comes in the form of social exclusion and human rights abuses. People with mental health conditions are subject to extreme shame and ostracization, and this is especially true for people who have co-occurring social stigmas such as people living with AIDs or in extreme poverty.

Also, **suicide remains a punishable crime** in Uganda based on old, unreformed legislation that carries a sentence of up to two years in prison. United for Global Mental Health's (2021) report on decriminalizing suicide found evidence that this penal code is occasionally still enforced on citizens that are suspected to be suicidal or to have attempted suicide, despite the human rights violations this reflects. This increases the fear of seeking help with the end result being that **less than half of people experiencing poor mental health will seek out care** in their communities.

Nevertheless, Uganda has also been the site of **innovative, community-based initiatives** to alleviate the mental health burden. For example:

EQUIP Pilot Program. Ensuring Quality in Psychological Support (EQUIP) is a proven WHO-led initiative deployed in Uganda that builds mental health service capacity through an online training portal for health care workers.

StrongMinds. This social initiative was founded in Uganda and Zambia to train community members to be informed 'lay mental health workers' and fill the gap in service provision. This program has served over 100,000 community members and counting.

Perinatal Screening. Midwives in Uganda have begun to screen pregnant women for depressive and mood disorders, and treat impacted women with group therapies with considerable success.

Source: Ddunga & Shelton, 2026; Murray et al., 2015; UGMH, 2021; WHO, 2022b; WHO, 2024

At the community-level, this can mean that stigma can limit access to mental health care since service provision may not be critical of the systemic inequalities those with the most need are burdened with (UGMH, 2023; WHO, 2022b). For example, access to care may require a degree of mobility, awareness, or funds that the most vulnerable do not possess (Berry et al., 2010b; WHO, 2022b).

Researchers also have explored how the unwillingness to talk about highly-politicized topics such as climate change and mental ill-health further degrade individual agency to seek help when either impact their lives (Biermann et al., 2026; Rossa-Roccor et al., 2021; WHO, 2022b). For mental health in some regions, this can extend so far as to impact the people who work in mental health care, dissuading populations from entering this workforce and further limiting a country's ability to provide essential services (WHO, 2026b).

Thus, in countries where stigma has deep roots, individuals are less likely to seek help or report poor mental well-being (Biermann et al., 2026; WHO, 2026b), and it is also less likely that broad mental health services are even available to approach for that help and collect that data (UGMH, 2023; WHO, 2024). For example, data from LMICs is almost entirely collected from psychiatric institutions, not from primary health care or community-based services (WHO, 2024).

***Box 9:* The prevalence of institutionalization in mental health care**

8.4 million
people are admitted into mental hospitals per year

66%
of government mental health funds goes to mental hospitals

>20%
of government mental health funds goes to primary or community-based care

Source: UGMH, 2023; WHO, 2026b

This reflects the siloing of mental health conditions within institutions, an approach seen worldwide, and thought to be greatly influenced by persistent social stigmas (see **Box 9**). And since institutionalization is more common to LMICs (although not exclusive to these regions), data on poor mental health prevalence and service quality is comparatively weak since it is broadly missing indicators that reflect the full continuum of mental health and well-being within populations, such as primary caregiver assessments or self-reported quality of life metrics (Patel et al., 2018; WHO, 2024).

Stigma is therefore an informing factor preventing comprehensive datasets and high-quality care towards global mental health equity, particularly in regions where mental health remains culturally ostracized or politically de-prioritized.

And due to this, stigma contributes to the bias noted within the literature (**Section 2.1**); Global South conceptions of mental health, and what good health is in relation to health care, the environment, and other socio-ecological systems, are broadly missing from literature and policy.

Section 5.0 includes research and applied solutions that target stigma as a primary barrier to equitable change.



Image source: Shutterstock.

4.3. Governance gaps and challenges.

Following partly from the noted challenges, there stems a significant implementation gap between the emerging awareness of impacts from the climate-change-mental-health system and the government agencies working in climate and mental health care (UGMH, 2026; UNEP, 2026a, 2026b; WHO, 2024).

There are three key drivers to this gap:

1	The lack of adequate mental health funding to meet the prevalence of mental health needs.
2	The silo effect common to governance of health and climate domains.
3	The political and normative challenges of climate change and mental health as stigmatized and politicized phenomena.

As noted, mental health is the 3rd leading contributor to the global burden of disease, where 1 in 8 people worldwide have a mental health condition (see **Box 10**).

The prevalence of poor mental health was especially significant during COVID-19, but even accounting for the pandemic, many populations around the world are slowly experiencing greater levels of mental and emotional distress, with few geographic exemptions (WHO, 2022b; WHO, 2024). For example, most countries are witnessing upward trends in death by suicide and suicidality, particularly within their younger populations (WHO, 2022b).

Box 10: **Global mental health snapshot.**

3rd
leading contributor to the global burden of disease

1 in 8
people have a mental health condition, globally

suicide is the
3rd
cause of death, people aged 15-29

Source: UGMH, 2023

Yet, as mentioned in **Section 4.1**, governments are not adequately financing mental health care, with only an average of 2% of health expenditure allocated to mental health.

The WHO and Lancet Commission on Global Mental Health, as part of their strategic briefs on mental health, recommend that LMICs should spend at least 5% of their current health budgets on mental health care, and HICs should target at least 10% (see **Box 11**). And yet across income groups, the total amount allocated to mental health rarely meets these recommendations. The average LMIC spends less than 2%, and the average HIC only allocates just over 4% (see **Graph 5**).

***Box 11:* The Lancet *Commission's* recommendation on government mental health expenditure**

LMIC target: 5%

of total health expenditures

HIC target: 10%

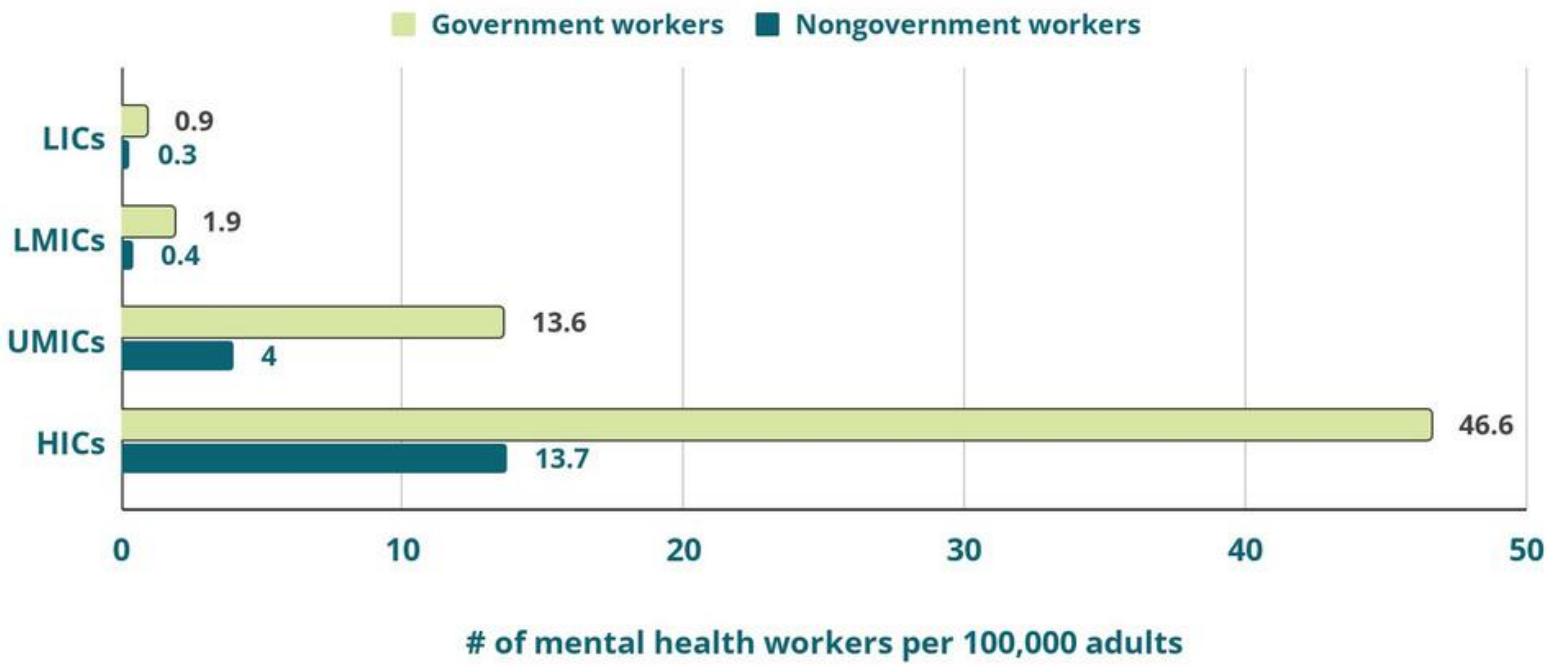
of total health expenditures

Source: Patel et al., 2018

Insufficient financing has important implications for the availability of mental health professionals and programs, as well as the quality of the care provided (Crandon et al., 2022; Leal Filho et al., 2021; WHO, 2024).

The WHO's *Mental Health Atlas* (2024) provides a global stocktake on the number of mental health practitioners and services, as visualized in **Graphs 5 and 6**.

Graph 5 | *Mental health workers per 100,000 adults, by World Bank income group, 2024*



Source: WHO, 2024

Graph 6 | *Countries with at least two functional mental health programs per 100,000 adults, by World Health region, 2020*



Source: WHO, 2024

Both depict variable mental health service provision based on income and region. Notably, the availability of mental health programs in the African region is substantially lower than the global average, and the LIC workforce provides an average of only 1 mental health worker for every 100,000 adults (WHO, 2024).

Generally, lack of public spending on mental health coupled with the prevalence of conditions means the burden of care may be falling on the individual (Bower et al., 2026; Clayton et al., 2024; WHO, 2024).
This seems to be especially true for post-acute or long-term care (Ali et al.., 2026; WHO, 2024).

Table 4 shows the proportion of countries where people with mental health conditions are paying less than 20% of the costs associated with care (WHO, 2024). This table reveals how, in certain regions, mental health patients must cover more than 20% of the cost of care, and this increases for those with long-term, complex needs (UGMH, 2023; WHO, 2024). This means that patients experiencing a life-threatening health challenge may also face a significant financial barrier to care.

Experts warn that, within the context of climate change, the increased risks of poor mental health could overwhelm existing infrastructure, as well as exacerbate the social and financial costs people already experience because of climate change (Banyan Commons et al., 2026; Patel et al., 2018; UNEP, 2026b; WHO, 2026b).

Table 4 | *Proportion of countries in which people with a mental health condition pay up to 20% of the cost of care, by World Bank income group and WHO region.*

	Inpatient care (%)	Outpatient care (%)	Psychotropic medication (%)	Psychological therapy (%)
Globally	73	64	58	50
LIC	32	21	21	21
LMIC	61	50	42	44
UMIC	84	84	74	60
HIC	93	74	70	57

Source: WHO, 2024

Another driver that challenges climate change and mental health governance is the silo effect. Since both domains are two 'everything, everywhere, all at once' phenomena, jurisdictional authority can be fragmented (Bower et al., 2026; Dey et al., 2025; UNEP, 2026c).

Designating responsibility to a ministry has benefits -- budget allocations, staffing, and other resources -- but it also comes with costs (Ibrahim, 2023; Vidal et al., 2023). The climate or health agency can become a silo of knowledge production and policy development, with little cross-over authority to other agencies with responsibilities that impact their domains (Ali et al., 2026; Bower et al., 2026; Golden et al., 2025; Schumann et al., 2026).

Graph 7 | *Percentage of reporting countries with functional collaboration framework with key stakeholders.*



Source: WHO, 2024

The WHO's (2024) *Atlas* provides some evidence to support that cross-governance partnerships for mental health care are not universally available. **Graph 7** from that report shows how, on average, only half of government's health administration includes collaboratory frameworks with key stakeholders, such as educational, justice, or emergency response agencies.

These partnerships are critical to the prevention of harm within the climate- change-mental-health system since impact pathways cross social, ecological, and economic boundaries (Golden et al., 2025; Lawrance et al., 2022; UN, 2025).

Yet the WHO's (2024) *Atlas* report also spotlights how some countries do not even have a mental health plan (see **Table 5**). Most alarmingly, the report finds that only half of countries with mental health plans "were both fully compliant with human rights and also had the appropriate resources to implement the national mental health policy or plan effectively" (WHO, 2024, p. 2).

There are also distinct gaps for key vulnerable populations within the plans available, too, particularly for youth and senior populations (see **Box 12**). As identified in **Section 3.2**, these populations have heightened risks to climate-change-mental-health impacts and as a result require policy-specific responses that are broadly missing from current governance infrastructure.

Table 5 | *Percentage of reporting countries with a distinct mental health policy or plan in 2024, by World Health region*

	% (total #)
Globally	81 % (117)
Africa	74% (25)
The Americas	77% (24)
South-East Asia	78% (7) 96%
Europe	(27) 81%
Eastern Mediterranean	(17) 85%
Western Pacific	(17)

Source: WHO, 2024

Box 12: **Percentage of countries with distinct mental health plans for key vulnerable populations.**

56%

of reporting countries have a distinct policy or plan for youth populations

42%

of reporting countries have a distinct policy or plan for senior populations

Source: UGMH, 2023

A last challenge to governance are the normative impacts of stigma and politicalization, which remain fundamental barriers to building awareness , agency, and capacity.

Box 13: **Suicide criminalization**

Suicide is a criminal offence in

20

countries worldwide

Source: UGMH, 2021

Stigma can impact how governments promote access to well-being within their populations; the greater the stigma associated with mental health disorders, the more likely mental ill-health will be met with institutionalization, criminalization, and, at worse, violence (UGMH, 2023; WHO, 2024).

Suicide criminalization is a stark reflection of how stigma has shaped government response. In some countries, suicide is a criminal offense (UGMH, 2021; WHO, 2024). This not only impacts a person who attempts or dies by suicide, but also their households (UGMH, 2021).

For example, if a person attempts suicide in Kenya and survives, then they face imprisonment and a fine upon themselves or a member of their household (UGMH, 2021). If they do not survive, then Kenya is one of four remaining countries where the will of the deceased may be challenged and invalidated (UGMH, 2021).

Such normative challenges have important implications to National Adaptation Plans (NAPs) and like climate change strategies since mental health impacts may not be included or prioritized, and populations who are at increased risk to these impacts may not receive adequate, preventive support (Banyan Commons et al., 2026; Biermann et al., 2026; El Omrani et al., 2024).

In several reviews of national-level climate-health policy landscapes, mental health considerations were found to be widely missing as an important outcome (see **Case Study 5**).

Therefore, challenging these normative underpinnings is necessary to solution development, since they are impacting how we address and manage climate change.

On this note, the report turns to a final discussion on evidence-based solutions across various high-potential pathways.

Case Study 5: **Climate change and mental health integration within public policy, example studies**

There is a growing **global call to deeply integrate** mental health into climate policies and a climate change frame into health policies. This has been positioned as a priority in order to bolster adaptation plans and national resilience in the face of increasing climate risks.

Below are **four studies** that looked into different aspects of integration and their main findings.

Integrating consideration of *climate change* and *mental health* together within global policy frameworks is a priority action.

Hoeben et al. (2023).
This study examined public health integration into European climate change adaptation policy documents. Health was found to be integrated narrowly and heterogeneously across different scales (national, urban), with mental health specifically overlooked within most documents.

Stewart-Ruano et al. (2025).
Authors looked at mental health consideration within global heat-health plans. Despite the study finding that many heat-health plans mention mental health, authors noted that specific impacts and targeted interventions were largely missing.

Ai et al. (2026).
This study assessed the degree of mental health and climate change integration within Australian policy, including climate policy, mental health policy, and climate-health policy. The review found most policies exhibited awareness of integration but did not deeply reflect implementation of mental health or climate integration. Authors also identified specific barriers to deeper integration to include gaps in service, collaboration, and data.

Morneau et al. (2026).
This project reviewed national climate adaptation policies across the globe for their integration of health considerations. The study found that, despite the broad inclusion of aspects of health, national climate plans rarely assigned fiscal or structural mechanisms to support these.

Source: Charlson et al., 2022; El Omrani et al., 2024; WHO, 2022a

5.0. Key Investment Pathways towards Climate-Mental Health Well-being

5.1. Cognitive model development to bolster research and solutions.

Many researchers agree that continued development of the systems model supporting the study of climate change and mental health is necessary to promote literacy and develop transdisciplinary and cross-sectoral consideration of this system.



Image source: Prexels

Cognitive models create directionality to our understanding and address of issues via meaning-making processes, and this in turn influences research on the causality of complex phenomena (Berry et al., 2018; Dey et al., 2025; O'Brien & Sygna, 2013); to ask more critical questions of what is causing and driving the changes we are witnessing at various scales and how impacts are experienced.

Characterization of the many relationships within the climate change and mental health system has been identified as a global research priority (Charlson et al., 2022; Lawrance et al., 2024). Transdisciplinary consensus on how this system performs upon the world would support both a broader -- more disciplines involved -- and deeper -- more researchers asking questions -- effort towards this characterization.

The call for complex systems thinking is already broadening study of this system's dynamics and potential (see: Breuer & Ikiz, 2026; Loder et al., 2024; Rothschild & Haase, 2023). Researchers from many disciplines, such as those identified in **Section 3.0**, are collaborating to produce a diverse and intersectional knowledge network.

And as more researchers and stakeholders contribute to the literature, a more robust model of this system takes shape to, in turn, support more informed policy (Banyan Commons et al., 2026; Biermann et al., 2026; Steffen et al., 2018; see **Case Study 6**).

Case Study 6: **Heat Ready London**

Read more about Heat Ready London here.

The City of London is developing evidence-based and cross-sectoral adaptation strategies in order to increase its climate resilience. One such plan is the city's recent **Heat Ready London strategy;** a mitigation and adaptation plan to address the growing burden to infrastructure, health, and well-being from extreme heat.

London is **one of England's hottest regions**, and has had significant losses and damages, both in human life and non-human life, due to the increasing frequency and severity of heat dome events. Heat Ready London is a **plan to mitigate some of these harms, as well as empower adaptation** to the socio-economic impacts of extreme heat events.

The contributors to the report utilized literature at the nexus of climate change and mental health to support their findings, and **acknowledges climate change as a risk multiplier** for these impacts. It is still in development, with a **phased approach to implementation beginning in 2026** in order to ensure city-wide stakeholders have time to respond and integrate the strategies calls-to-action.

Source: Greater London Authority, 2026

As a systems understanding emerges, it has become increasingly visible that climate change and mental health together can create vicious cycles; as climate change undermines mental health, the ability to behave and adapt in the face of socio-ecological crises is compromised, which increases the risk of unsustainable behaviours perpetuating themselves, allowing the momentum of anthropogenic climate change to continue (Bower et al., 2026; Long et al., 2026; Parsons et al., 2025).

Figure 8 presents a simple model of the developing systems understanding; how anthropogenic climate change increases exposure to hazards that have negative mental health outcomes, which in turn has ripple effects to health back through to human activities (Bower et al., 2026; Long et al., 2026; Parsons et al., 2025; Schumann et al., 2026).

Positioning the climate-change-mental-health system within this model reflects a socio-ecological approach to its relationships, and works to highlight the ecological, social, and economic costs less visible in the historic literature (Berry & Schnitter, 2022; Parsons et al., 2025; UNEP, 2026b).

This system in turn interacts with other climate change stressors, such as the steady momentum towards and past planetary boundaries (Fanning & Raworth, 2025). Since these boundaries also inform human health and well-being, this interaction can create compounding risks to global burdens of disease and adaptive capacity, with the potential of a rapid decline in Planetary Health (see **Figure 9**).

***Figure 8** | Simplistic systems model of climate-change-mental-health system.*

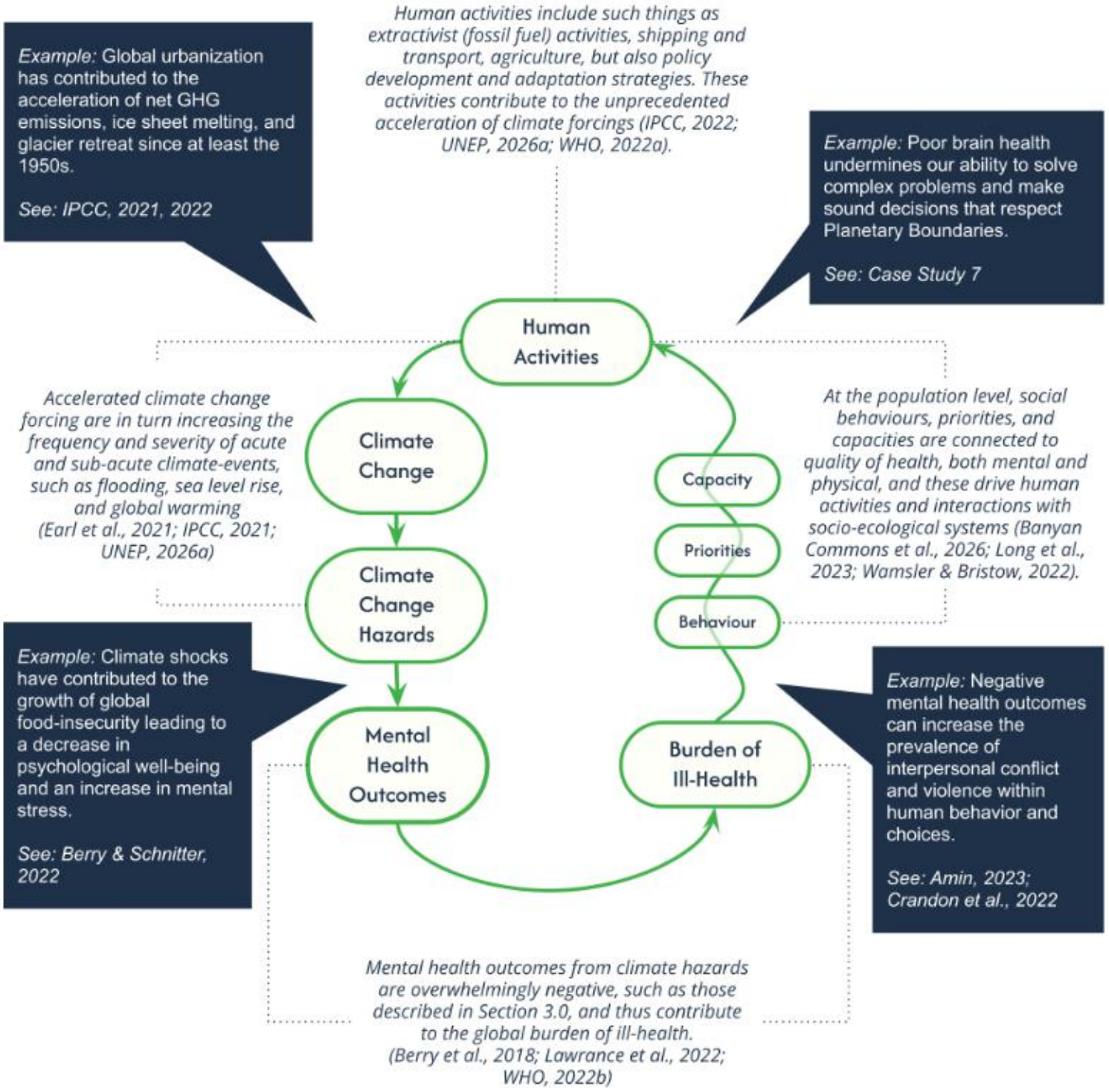
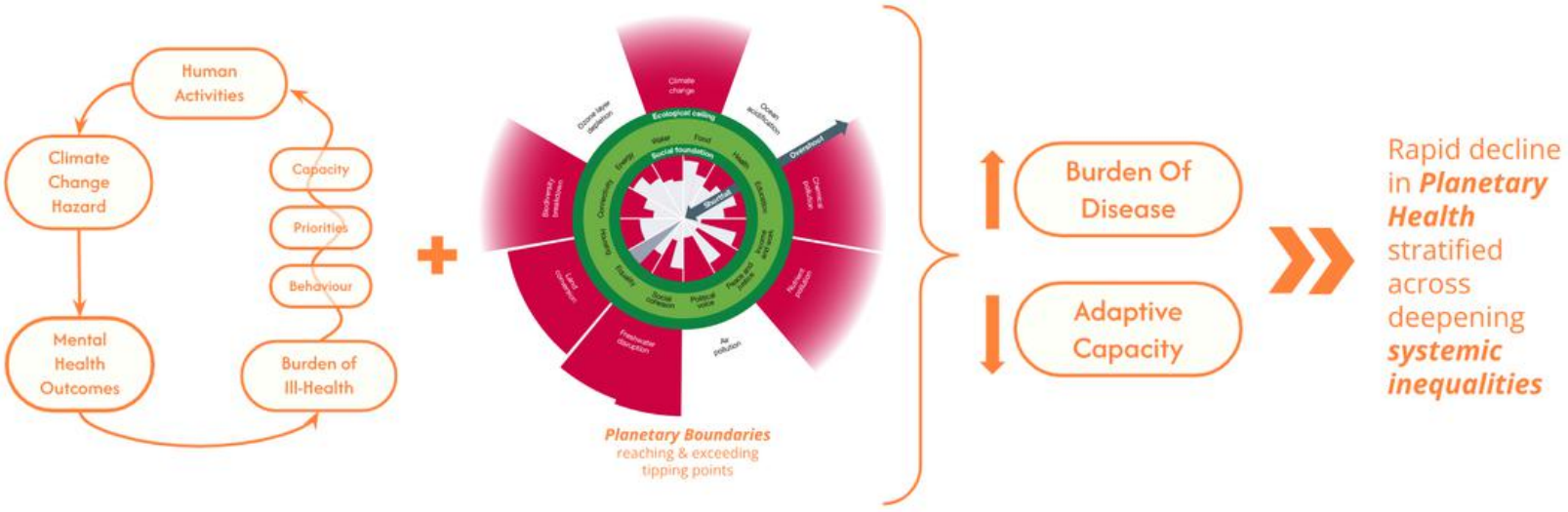


Figure 9 | *Visualization of the compounding interactions between climate change, mental health, and planetary boundaries.*



Source: Fanning & Raworth, 2024; Lawrance et al., 2024; UNEP, 2026a; WHO, 2024

As noted in **Section 4.3**, critical pieces of climate action infrastructure, such as National Adaptation Plans (NAPs), broadly lack consideration of mental health (see **Case Study 5**). This is slowly changing as systems thinking allows researchers and stakeholders alike to acknowledge the deep interconnections between our climate and our health.

However, interventions will remain ineffective at scale without addressing another important systemic issue: the economic imperative. The business case for climate-mental health solutions needs to be established in order to incentivize systems-level investment. This is discussed next.

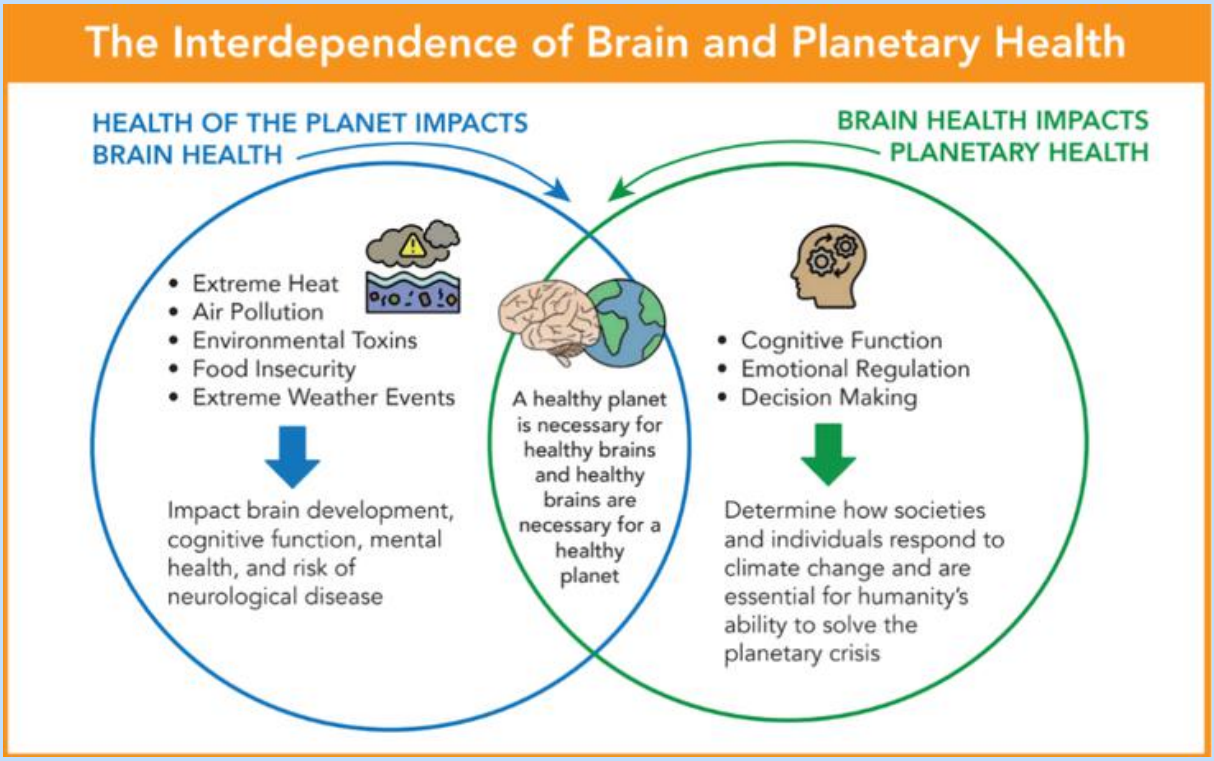


Image source: Canva Pro.

Read the *Neuro Climate Science and Policy Report* here.

Case Study 7: **The interconnected systems understanding emerging in neuroscience.**

In 2026, the Neuro-Climate Working Group (NCWG), alongside their partners, released a report on the **impacts of climate change to brain health**. It found that climate-related extreme weather events (e.g., extreme heat and air pollution) and chronic climatic changes (e.g., to food and water quality) negatively impacted brain health, including seeing **declines in cognitive function and emotional regulation**.



Importantly, this report presented the relationship between climate change and brain health as **bi-directional; our brain health also impacts Planetary Health**. This graphic from the report depicts this relationship, and reflects the emergence of cognitive models that more **deeply integrate humans** -- and our complete physical and mental selves -- **into Earth systems**.

In establishing these systems as bi-directional, the contributing authors hope to **"identify solutions that cross sectors, disciplines, and borders"** (Banyan Commons et al., 2026, p. 36); a key benefit to a systems understanding of the issues we face today.

Source: Banyan Commons et al., 2026 (above graphic: p. 36); NCWG, 2026

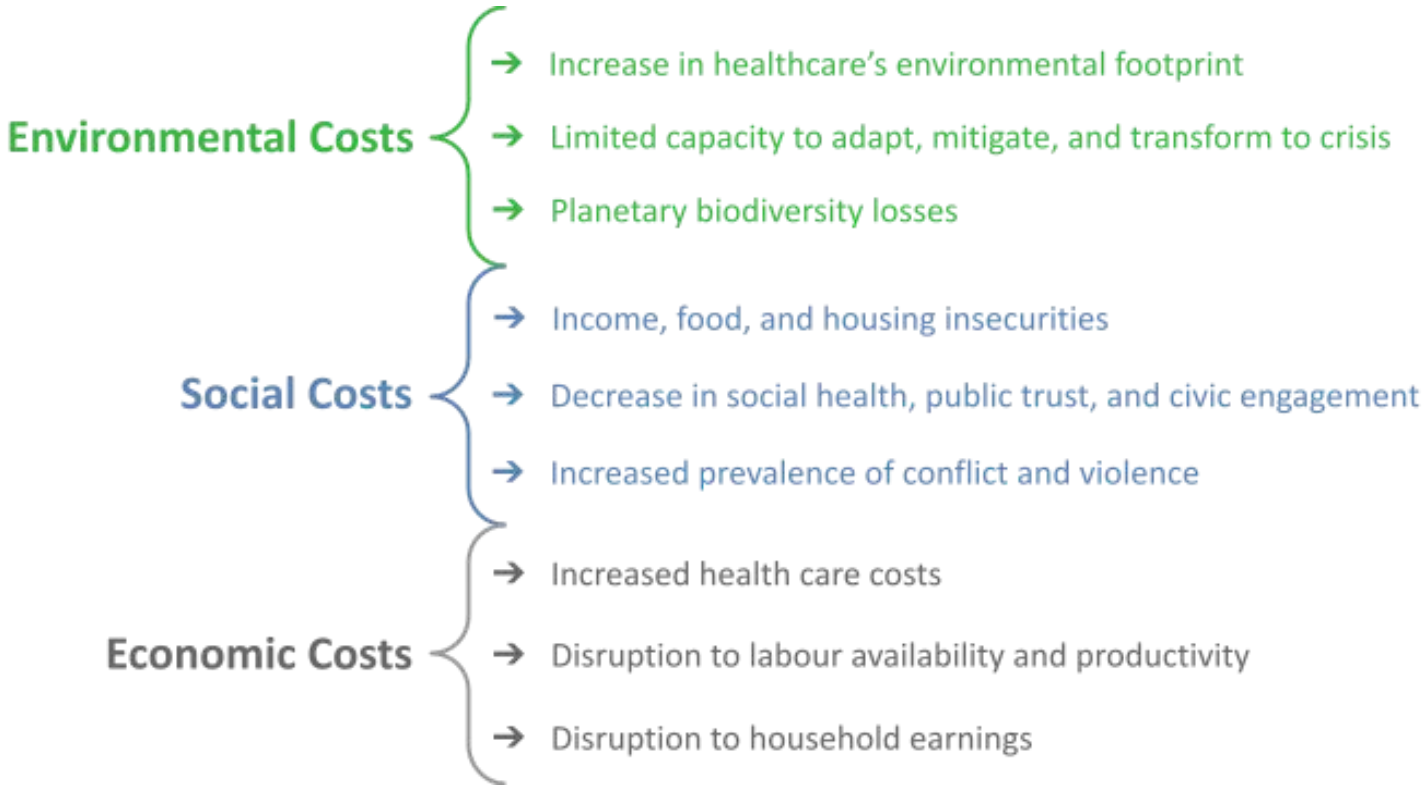
5.2. Business case of mental-health outcomes within climate solutions.

Despite the growing evidence to support the need for a paradigm shift in how we understand value, today's business-as-usual remains rooted in the economic imperative above all others (O'Brien & Sygna, 2013; Steffen et al., 2018; WHO, 2022b).

Strategic action to disrupt the climate-change-mental-health system must therefore include a strong business case that weighs both the costs of inaction and the opportunities of investment (Carlson et al., 2024; UGMH, 2020; World Bank, 2025).

The vicious cycles between climate change and mental health can incur deep environmental, social, and economic costs (Bower et al., 2026; Schumann et al., 2026; see **Figure 10**). And since climate change disrupts food, job, and housing security, these costs can compound further, such as via labour availability and productivity (Berry & Schnitter, 2022; IPCC, 2021). Studies also increasingly find an association between climate change, mental health, and interpersonal conflict and violence, with high-risk implications both to economies and civil society (Amin, 2023; Cuartas et al., 2025b; da Fonte et al., 2023).

Figure 10 | *Examples of ESG costs within the climate-change-mental-health system.*



Sources: Berry & Schnitter, 2022; Bower et al., 2026; Charlson et al., 2022; Schumann et al., 2026; UMGH, 2020; UNEP, 2026a

Box 14: **The cost of mental health risks vs the return on mental health investment.**

$2.5 trillion USD
Annual average cost each year to global economy due to poor mental health

$5 to $1 USD
ROI for employer investment into organizational mental health, average

$925 billion USD
Estimated costs to businesses from lost working days to depression & anxiety

$310 billion USD
Potential value gained in extra healthy life years

$16 trillion USD
Projected annual cost of poor mental health to global economy by 2030

$230 billion USD
Potential gains on investment from mental health treatment, to 2030

Source: Lawrance et al., 2022; Patel et al., 2018; UGMH, 2020

One study from A&O Sherman found that an estimated "12 billion working days are lost to depression and anxiety each year" (A&O Shearman, 2026), and the Lancet *Commission* on climate change and mental health warns that total global losses from climate change impacts could reach upwards of $16 trillion by 2030 (Patel et al., 2018).

These costs are remarkable financial and security risks to nations and businesses across the globe. Yet action does not only rest on establishing these risks; it requires proven opportunities for investments.

Thankfully, there is a growing effort to capture the rewards of strategic action. Reports from organizations like UGMH (2020), the WHO (2022b), and the World Bank (2025) have found that for every dollar spent on mental health care coverage, there is an average return of between $2 USD to $5 USD or more.

These returns come in the form of averted negative health care costs, gains in productivity and healthy life years, as well as flow-on benefits to societal cohesion, trust, and engagement (A&O Shearman, 2026; Bower et al., 2026; UGMH, 2020; WHO, 2022b).

Research highlighting returns on mental health has been around for at least two decades, contributing to a strong and diverse evidence-base that investment opportunities exist (Aked et al., 2010; Chapman et al., 2019; Okesanya et al., 2026). On the following page, three different examples are shared from this literature (**Case Study 8**).

The potential of these returns is even more crucial within the context of climate-health risks because of the relationship between mental health and adaptive capacity.

Good mental health and well-being has obvious and important implications for how a society functions, participates, and interacts within itself, as well as to other societies and environments. Therefore, investment is good for governments and businesses alike as it supports a strong, healthy, and capable civic and labour base.

Case Study 8: **Mental health ROI in Canada, Australia, and Nigeria, example case studies.**

Below are three examples of successful climate-related mental health programs:

Text4Hope Program, Canada

What:
A national text-based telehealth service to support mental health in disaster-inflicted communities.

Value:
Per $1 USD invested, $15 USD in returns.

Developed in response to national wildfires, Bell Canada invested in a CBT-based texting service that provided daily supportive texts and resources to 10,000 people. Valuation is based on averted deaths (World Bank, 2025).

Specialist-led Climate-Mental health therapy, Nigeria

What:
A family-based group therapy program offered in flood-prone communities.

Value:
Per $1 USD invested, $5 USD in returns.

These specialist-led mental health services are offered in partnership with other telehealth and community-based care programs to reduce psychological distress from flooding risks and harms. Valuation is based on averted DALYs over 1 year against the initial investment (World Bank, 2025).

Early Heat Warning Systems, South Australia

What:
A low-cost targeted heat-health warning system.

Value:
Per $1 AU invested, $2-3.3 AU in returns.

Developed after the 2008-09 extreme heat events, this project is a partnership between government, frontline workers, and meteorologists. It uses texts to warn at-risk individuals of extreme heat, including follow-up protocols and resources. Valuation is based on averted harms and deaths against the low-cost initial investment and operational costs (Williams et al., 2022).

The implementation gap discussed in **Section 4.3** should be seen as a considerable opportunity for strategic interventions that can maximize potential for broad co-beneficial action to protect both our environments and our minds (Berry, 2009; Mahmoudi et al., 2023; Rossa-Roccor et al., 2021).

As previous sections noted, since national climate strategies (e.g., NAPs) have yet to deeply integrate mental health, they can be a prudent place to incentivize this investment, especially for HICs who have a greater capacity to invest broadly and at a country-wide level (Stewart-Ruano et al., 2025; see **Case Study 9**).

***Case Study 9:* The business case for climate change-mental health action in Canada.**

In Canada, climate change and mental health come with **economic costs in the form of increased health care and disruptions to labour.**

A 2026 report from the CSA Public Policy Centre estimates that **poor mental health itself costs $180 billion CAD annually** due to the lack of upstream, proactive measures (Morawczynski et al., 2026). The report does not mention climate change, but does embed the priority of climate resiliency for Canada as it is likely that these costs will only escalate within the crisis-prone context of climate change.

A 2026 report from the CSA Public Policy Centre estimates that **poor mental health itself costs $180 billion CAD annually** due to the lack of upstream, proactive measures (Morawczynski et al., 2026). The report does not mention climate change, but does embed the priority of climate resiliency for Canada as it is likely that these costs will only escalate within the crisis-prone context of climate change.

Other **studies into extreme heat in Canada** estimate the cumulative socio-economic **costs to be in the billions**, and a **similar price tag is equated to droughts** before health costs are even factored in.

The CSA report cautions that without effective action these costs could reach **upwards of $600 billion by mid-century.**

> "We still lack an in-depth understanding of national-level trends, such as prevalence estimates of climate-mental health outcomes, and there is a lack of research on anticipated future risks and climate-mental health projections for Canada"
>
> *(Clayton et al., 2024, p. 14)*

Yet, Canada's current **National Adaptation Strategy does not deeply consider mental health** in its framework. It **reflects some of the limitations discussed in Section 4.0**: limited mental health indicators to support broad data collection and informed planning, lack of mental health-based financial mechanisms or incentives, and shallow cross-sectoral partnership in key sectors, such as D&EM and energy, or for vulnerable populations, such as people with pre-existing mental health conditions.

Source: Berry & Schnitter, 2022; Clayton et al., 2024; Howard et al., 2026; Lowe et al., 2024; Morawczynski et al., 2026

For LMICs, however, NAPs or like documents may not be the most appropriate entry point for investment due to the systemic implementation challenges for mental health-informed solutions, especially if DAMH is low or non-existent (see **Section 4.0**).

Investments here must be led by place-based, community-led engagement to ensure culturally-appropriate and targeted interventions generate the most benefit and do not perpetuate systemic injustices (Bower et al., 2026; Hipps, 2026; Moore, 2024; van Nieuwenhuizen et al., 2021).

Importantly, countries worldwide remain constrained due to the gaps and challenges problematizing climate-change-mental-health data, so any investment must ensure the uncertainty within this system is met with appropriate feedback and data collection mechanisms to ensure investment is appropriate to the needs of the communities it services (Armitage et al., 2009; Lawrance et al., 2022; O'Brien, 2017; Vidal et al., 2023).

Whatever the scale of investment, it will be necessary to engage and partner with key stakeholders for solutions to be successful, including within and across key sectors, which **Section 5.3** discusses next.

5.3. Examples of interventions in key sectors.

Climate and mental health are deeply interconnected phenomena that challenge traditional governance silos. As this report discusses, they must be considered systemically to mitigate the vicious cycles between them that burden populations with ill-health, high costs, and diminishing capacity (van Nieuwenhuizen et al., 2021; Vergunst et al., 2024).



Image source: Canva Pro.

Solutions for this system must span sectors and disciplines, linking the diverse knowledge and infrastructure needed to support people as we navigate some of the most threatening crises in history (Golden et al., 2025; Lawrance et al, 2022, 2024; WHO, 2026a).

Yet at the same time, there is no universal consensus on the definition of mental health, nor only one way climate change impacts are experienced across different socio-ecological contexts (Crandon et al., 2022; Li & Monroe, 2019; Moore, 2024). Thus, experts increasingly agree that community-based, participatory research and development is essential to advancing solutions at this intersection (Bower et al., 2026; Charlson et al., 2022; Long et al., 2026).

Climate justice, too, must be central since stigmatization and systemic inequalities mean certain groups experience more harm than others (Cuartas et al., 2025b; Gislason et al., 2021; White, 2020). In other words, the vulnerable populations identified in **Section 3.2** must experience both targeted support as well as strong agency over what that support looks like (Cuartas et al., 2025b; Mahmoudi et al., 2023; Parsons et al., 2024).

This section examines interventions in key sectors: Research & Development, Education, Health Care, Disaster & Emergency Management (D&EM), Urban Planning, and Governance. The importance of each as a critical partner is briefly outlined before providing examples of known interventions relevant to these domains.

The main takeaway: co-beneficial solutions to mitigate climate change impacts and promote mental well-being already exist.

Around the world, organizations and multi-lateral partnerships are increasingly at work in this field, developing solutions, scaling solutions, and advocating for our mental health in the face of climate risks.

What's needed now is to continue this momentum, adapt solutions to place, and call-in more stakeholders.

Image source: Pexels.



5.3.1. Research & Development.

Since this is a recently emerged field of study, the importance of this sector is clear. As **Section 3.0** and **4.0** detail, there is an established need for more study of this system and its interventions.

This requires addressing the funding and data collection gaps, but also establishing an independent, transdisciplinary, and international research network and agenda committing to standardizing and characterizing this system (Charlson et al., 2022; Lawrance et al., 2022, 2024). Other research priorities are the need for greater collaboration between disciplines, higher resolution data on impact pathways, and more empirical studies that evaluate solution implementation (Golden et al., 2025; Patel et al., 2018; Vergunst & Berry, 2021; WHO, 2022a).

These efforts are all, to varying degree, already in-development, which is reflected below.

Table 6 | *List of interventions in R&D, examples.*

Target	Intervention
Data Collection	**Integration of the 2018 Lancet *Commission's* global indicators** on mental health in the context of sustainable development into research and data collection efforts (Patel et al., 2018; see also Lawrance et al., 2022, 2024)
	Development of research best practices at this intersection, prioritizing the **standardization of methods, metrics, and datasets** (Charlson et al., 2022; Lawrance et al., 2024; Vergunst & Berry, 2021)
	Establish community-informed "open data security, privacy, and sharing protocols" (Lawrance et al., 2024)
	Continued characterization of impacts across socio-ecological contexts and life-course phases with the aim of producing **higher resolution data** (Berry et al., 2018; Crandon et al., 2022; Lawrance et al., 2022)
	Perform **gap analysis studies** on mental health data collection to target priority sectors and populations (Howard et al., 2026; WHO, 2024)
Governance Challenges	Development of an **international research and action agenda** to guide knowledge production and establish co-learning networks, such as Connecting Climate Minds' (CCM) Global Research and Action Agenda (Lawrance et al., 2024; see also Charlson et al., 2022)
	Establishing global **DAMH standardization and benchmarks** via evidence-based studies in order to evaluate need, gaps, and trends in mental health financing (UGMH, 2020)

Read CCM's **Global Research and Action Agenda** here.

Stigma and systemic inequalities	**Research and knowledge production networks** that explore social stigma and agency, including its mechanisms, costs, and risks, such as the INDIGO Network (Li & Monroe, 2019; Sangervo et al., 2022; WHO, 2022b)
	IIntegration of **a lived experience lens into climate-mental health reporting**, such as UGMH's report on decriminalizing suicide (UGMH, 2021; see also Lawrance et al., 2024)
Evaluating climate-mental health interventions	**Community-based research** evaluating climate-related mental health interventions, tools, and services, such as studies on the efficacy of youth-based mental health programs in schools or on CHW-led programs (Kim et al., 2019; Klassen & Galway, 2018; UGMH, 2020; WHO, 2022b)
	Support **guidance on climate-health adaptation** plans, such as WHO's Heat-Health Adaptation Plan (HHAP) Guidelines (WHO, 2026b; see also Biermann et al., 2026)
	Evaluation of the degree and quality of **climate change and mental health integration** within policy landscapes at various scales (see **Case Study 5**) (Ali et al., 2026; El Omrani et al., 2024; Hoeben et al., 2023; Morneau et al., 2026)

The WHO's **HHAP Guide** informed the **Heat Ready London** strategy (see **Case Study 6**).

5.3.2. Education.

The normative changes necessary to disrupt the climate-change-mental-health system will require deep social change, and the education sector plays a significant role here (O'Brien, 2017; Okesanya et al., 2026; Vidal et al., 2023; WHO, 2022a).

There is much literature to support that such change is difficult and requires many different forms of appropriate educational reforms, from the global to the local, from early education to life-long learning (Gao et al., 2025; Ojala, 2022; Okesanya et al., 2026). **Table 7** provides examples of recommended research-based and applied solutions.

Table 7 | *List of interventions in Education, examples.*

Who	What
Research-based solutions.	
Governments, CSOs, and Philanthropists	**Expanding access to education** across all life course phases, especially for populations traditionally excluded from learning opportunities such as minorities, women and girls, and people experiencing poverty (Noor et al., 2026; OECD, 2025; UN, 2025; WHO, 2022a)
	Expand mental health training and skill development opportunities, including targeted education to key sectors and stakeholders (Briermann et al., 2026; OECD, 2025; WHO, 2022a)
	Incentivize mental health as a research priority in educational institutions (Biermann et al., 2026; WHO, 2022a)
Education ministries, educators, and school boards	Integration of **emotional, justice, and resiliency skill building** into elementary and secondary education curriculum, such as **Climate Justice Education (CJE)** or **Global Citizenship Education (GCE)** (Andreotti, 2021; Ojala, 2022; UGMH, 2020; Vamvalis, 2023)
	Development of **age- and culturally-appropriate curricula** on climate change and mental health, with the necessary professional development to empower educators to teach this programming (Ben Zvi Assaraf et al., 2024; Kim et al., 2019; Lawrance et al., 2024; WHO, 2022a)
	Remedial learning programs for youth post-climate hazard exposure to support adaptive capacities and resiliency (CLEAN, 2025)
Post-Secondary Health Schools and Teachers	Integrating **climate change and mental health into health care** training and skill development (Okensanya et al., 2026; Lawrance et al., 2024; WHO, 2022a, 2024)

Applied solutions.	
Community Health Worker (CHW) programs	I**mplement Community Health Worker(CHW)-led programs** to build capacity in climate emergency health care provision, such as Pakistan's Heat Emergency Awareness and Treatment (HEAT) program (World Bank, 2025)
Connecting Climate Minds (CCM) & Planetary Health Alliance (PHA)	Develop knowledge hubs at the intersection of climate change and health in order **to promote co-learning networks** (CCM, n.d.; PHA, n.d.)
Stanford University, University of Copenhagen, & Victoria University (amoung others)	Offer **post-secondary courses** within degree programs that focus **on climate change and health,** such as within Stanford's Human and Planetary Action Lab and Victoria University's Master of Public Health degree. (PHA, n.d.)
University of Waterloo (UoW)	The **Accelerating Climate Education (ACE) program** works to integrate climate change knowledge and consideration across the university's disciplines, programs, and degrees to create a new generation of professionals informed of climate risks (UofW, n.d.)
Work Safe B.C.	**Awareness campaigns** on the importance of **psychological health and safety** at work and on **climate-related risks** in the workplace, such as to heat stress exposure (CSA Group, 2022; WorkSafe B.C., 2026)

Browse the Planetary Health Alliance's **inventory** of post-secondary **courses**.

5.3.3. Health Care.

This sector is of clear import. Mental Health support is marked by stigmatization, criminalization, and lack of literacy and funding, as noted previously. But also climate-informed health care is also weak, with many practitioners under-trained in climate change impacts to health (Berry et al., 2010b; Koder et al., 2023).

Overall, this means there are extensive opportunities in this sector for change. Specifically, culturally-appropriate and trauma-informed interventions must be prioritized, as well as understandings of the determinants of mental health (Ali et al., 2026; Berry et al., 2010b; Gislason et al., 2021). Thankfully, there are proven solutions.

Read **Case Study 3** for an example in mandated tracking.

Table 8 | *List of interventions for Health Care, examples.*

Target	Intervention
Data Collection	Early, accessible, and continuous **screening and assessment for mental health** prevalence and needs, especially during critical youth life-course phases (Lawrance et al., 2024)
	Mandated tracking of climate-related impacts and deaths, such as during the B.C. Heat Dome (see **Case Study 3**)
	Planned **follow-up and monitoring protocols** for people who attempt suicide (UGMH, 2020)
	Anti-stigma campaigns, such as Australia's A-B-C campaign or the UGMH's #carenotcustody (UGMH, 2025; WHO, 2022b)
Stigma and systemic inequalities	**Suicide decriminalization**, such as UGMH's advocacy work for the 20 remaining countries where suicide remains a legislated crime (UGMH, 2020)
	Truth and Reconciliation for Indigenous communities that enforces **culturally-safe health care**, such as Aotearoa/New Zealand's integration of the Talanoa process (Berry et al., 2010b; Dey et al., 2025; Pavlova et al., 2024)
	Perinatal mental health screening, prevention, and support, such as the UK's Mom & Baby Units or Uganda's midwife program (APP, n.d.; WHO, 2022b)
	Tailored **primary care packages** with mental health supports **for vulnerable populations**, such as migrants and people with pre-existing mental health conditions (Bedaso & Duko, 2024; Lawrance et al., 2022)

Learn more from UGMH's **anti-stigma** campaign.

LMIC Target: **5%**
HIC Target: **10%**

Governance challenges	**Budget reform** that at least **meets the Lancet *Commission's* recommendations** for mental health expenditure as a percentage of national health spending (see **Box 11**) (Patel et al., 2018)
	Policy reform and collaboration that moves away from a siloed health sectors to **'health in all sectors',** such as B.C.'s Population and Public Health Framework (Ali et al., 2026; Government of B.C., 2026)
	Develop informed and supported strategies to **shift towards community-based mental health care**, such as through WHO's guidelines on deinstitutionalization or heat-health adaptation plans (WHO, 2026b)
	Establishing **communities of practice** to service the public and up-skill practitioners, such as the Climate Psychology Alliance (Lawrance et al., 2022, 2024)
Patient-centered care	Implement **community-based mental health care** programs, such as Uganda's EQUIP and StrongMind programs (see **Case Study 4**) (UGMH, 2025; WHO, 2022b, 2026)
	Nature exposure for mental health treatment and infrastructure, such as forest therapy or horticultural therapy (Bratman et al., 2019; Ikei et al., 2025; Simpattanawong et al., 2024; Vélez et al., 2025)
	Health care worker training that centres equity and partnership with vulnerable populations, especially people with pre-existing mental health conditions, such as compassion interventions for frontline healthcare workers (Pavlova et al., 2024)

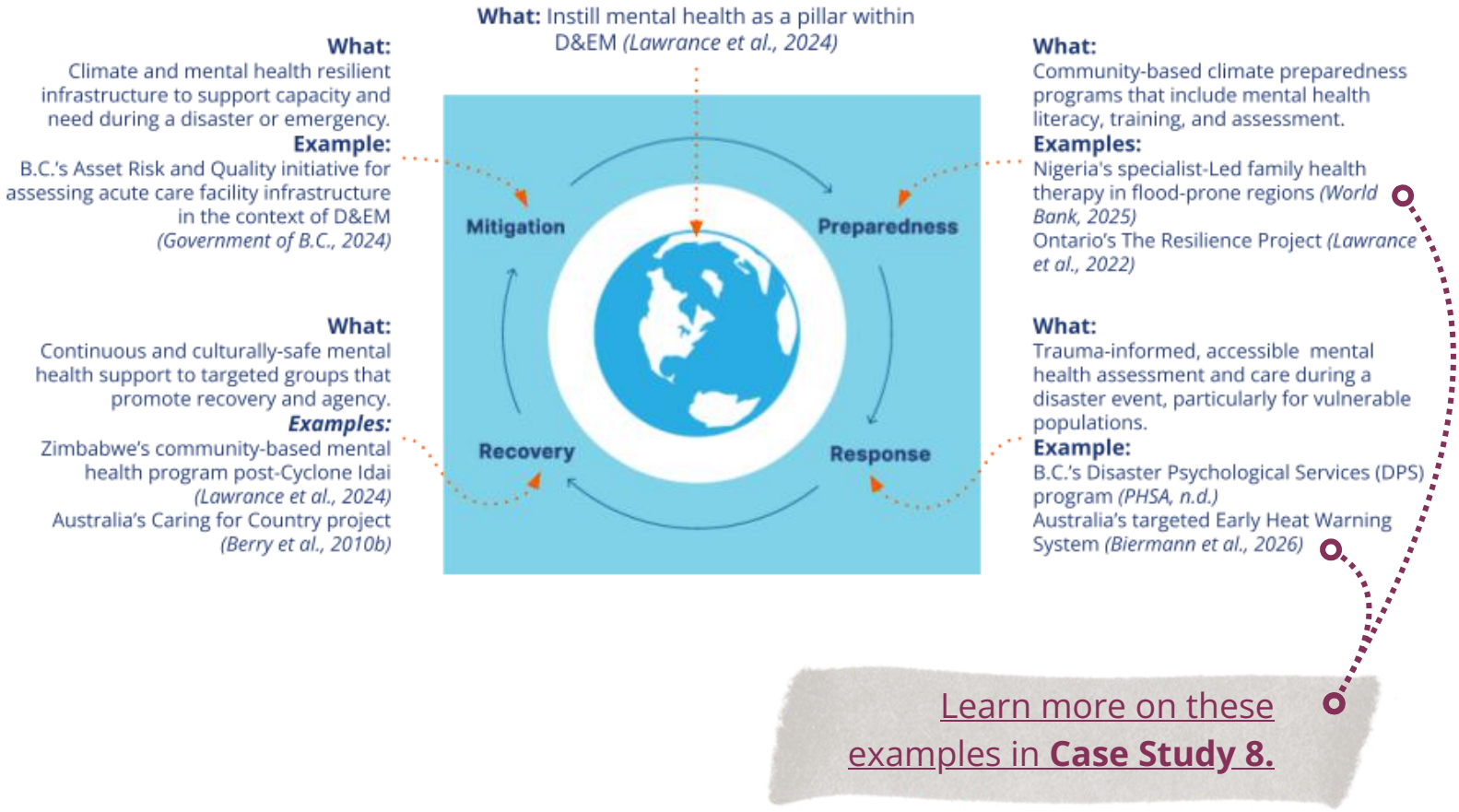
5.3.4. Disaster and Emergency Management.

This sector has a natural overlap with mental health since disasters and emergencies have deeply established health impacts (Corvalen et al., 2022; Gislason et al., 2021; Hayes et al., 2018).

Furthermore, D&EM is an important source of mental health data and experience (Charlson et al., 2021; Hayes et al., 2021). Lessons from Hurricane Katrina and the BC Heat Dome, as examples, helped to characterize pathways between mental health and climate change, which in turn supports better policy (Biermann et al., 2026; Cianconi et al., 2020; Lawrance et al., 2022). However, mental health consideration remains shallow partly because of D&EM's acute format, which does not adequately meet needs (Ali et al., 2026; Berry et al., 2010b). Thus, this sector is an important site for climate-health solutions.

In **Figure 11**, a common D&EM framework is used to identify interventions proven to fill current service gaps.

Figure 11 | *Interventions across the D&EM cycle, examples.*



Learn more on these examples in **Case Study 8.**

5.3.5. Urban Planning.

The built environment is already a robustly established node for climate solutions (Aked et al., 2010; Loder et al., 2024; Mahmoudi et al., 2023). How we design the spaces we move, interact, and live within has obvious implications for emissions, waste, inequality, and biodiversity (IPCC, 2021, 2022).

The links between the built environment and well-being are likewise established, with growing understanding of the implications for psychological and mental health (Bazaz et al., 2018; IPCC, 2022). For these reasons, this sector affords co-beneficial intervention opportunities for climate action and mental well-being, which the below examples reflect.

Table 9 | *List of interventions in Urban Planning, examples.*

Target	Intervention
Mitigation of climate-related mental health impacts	**Prioritize green and blue infrastructure** across the entire planning pipeline; from risk assessment to development to retrofits, such as through using an **Urban Cultivation Approach** or the Lancet's **Shaping Cities for Health**. (Joshi et al., 2023; Mahmoudi et al., 2023)
	Prioritize **diverse, active mobility within urbanscapes** that challenge right-of-way of vehicles over people, such as through applied research from UBC's **ReROW** (Lawrance et al., 2022; UBC, n.d.)
	Prioritize third spaces as climate-resilient, multi-functional public infrastructure. (Bower et al., 2026; Charlson et al., 2022)
	Public programs for **better-insulated homes**, such as with heat pump rebates or community-based co-ops like Ontario's SolarShare (Mahmoudi et al., 2023; Nurse et al., 2010; SolarShare, n.d.)
Integration of climate change and mental health considerations	Integrate **climate resiliency and mental well-being into urban planning** education, policy, and standards (Mahmoudi et al., 2023; IPCC, 2022)
	Integrate **climate justice into urban planning** education, policy, and standards (Okereke, 2018; Mahmoudi et al., 2023)
	Prioritize social connectivity in city planning since social isolation, loneliness, and trust are all key determinants of population health (Bower et al., 2026; Nguyen et al., 2024)
	Targeted city planning **strategic development that meet future needs of vulnerable populations**, particularly climate migrants (Bedaso & Duko, 2022; Mahmoudi et al., 2023; Parsons et al., 2025)

Check our the **Neighbourhood Houses in BC** as examples of community-led third spaces.

5.3.6. Governance.

Finally, there is the overarching need for sound governance support of interventions at this intersection (Hayes et al., 2018; UNEP, 2026b). **Section 4.3** discussed the major governance gaps and challenges -- funding, prioritization, and service infrastructure -- and these all call for multi-sectoral coordination under strong, committed leadership to mental well-being.

The **2018 Lancet *Commission*** has advocated for deeper integration of **mental health across the SDGs**.

Table 10 | *List of intervention examples in Governance, general.*

Target	Intervention
Data collection	**Mandated reporting on mental health indicators**, such as those within national quality of life frameworks or those recommended by the Lancet *Commission* on mental health and sustainable development (Howard et al., 2026; Patel et al., 2018)
	Evaluate **data gaps for mental health** prevalence, services, and well-being (Charlson et al., 2022; WHO, 2022b, 2024)
	Perform **climate-informed risk assessments** on key determinants to mental health (Howard et al., 2026; Ibrahim, 2023; Long et al., 2026)
Stigma and systemic inequalities	Commit and deliver upon the **UN Sustainable Development Goals 2030** (Patel et al., 2018; UGMH, 2023; UN, 2025)
	Commit and deliver upon **Universal Health Coverage** (UGMH, 2023)
	Honour **Indigenous communities' autonomy and sovereignty** to promote the provision of equitable care, services, and justice (Berry et al., 2010b; Dey et al., 2025; Gislason et al., 2021; Rossa-Roccor et al., 2021)
	Fulfillment of ODA, and specifically DAMH, through multilateral partnerships (UGMH, 2023)
	Provide accessible anti-stigma training for the public and within key sectors, such as those identified in this report (UGMH, 2023; WHO, 2022b)
	Gender-equity policy integrations, such as extending and expanding Parental Leave or Work Time Reduction policies, to promote well-being (Monaco, 2023; UN, 2025)
	Establish **Youth Advisory Boards** into local- and regional government decision-making protocols (Mohamed et al., 2025; Vamvalis, 2023)

Governance challenges	**Meet the 2018 Lancet Commissions' mental health spending targets** of 5% (LMICs) and 10% (HICs) of health expenditure (Patel et al., 2018; WHO, 2022b)
	Integrate **mental health policy** into all sectors and agencies within government (El Omrani et al., 2024; Stewart-Ruano et al., 2025; WHO, 2022a)
	Mandated implementation of **quality of life frameworks** across government agencies (Howard et al., 2026; VanderWeele et al., 2025)
	Honour and integrate the **UN Convention on the Rights of Persons with Disabilities** into national legislation (Mann et al., 2021; Okesanya et al., 2026; UGMH, 2020)
	Incentivize public-private partnerships, civil society organizations, and philanthropy in mental health initiatives, such as through new financial mechanisms like Social Impact Bonds (UGMH, 2024)
Place-based capacity building	Adapt **national adaptation plans to community needs**, and ensure they have the skills and resources to enact them (Ali et al, 2026; El Omrani et al., 2024; Lawrance et al., 2024)
	Support policy and legislation that **empowers green skill development and economies** (Monaco, 2023)
	Support and incentivize community-based climate-mental health programs, such as local climate councils, Climate Cafes or CHW-led programs (Lawrance et al., 2022; Wamsler & Bristow, 2022; World Bank, 2025)

Browse the global Climate Cafe map, a network of spaces to **process climate emotions** and promote ***active hope***.

6.0. Conclusion

The climate-change-mental-health system has emerged as an urgent threat to our collective well-being and adaptive capacities. As we turn towards solutions, the importance of community, justice, and a sense of place must remain front of mind.

The idea that climate change impacts our mental health feels intuitive, as does the fact our health informs our relationship to Earth systems. But climate action has not adequately met the need to urgently address this system's harmful impacts (**Section 3.0**). This is quickly changing as research expands across disciplines and sectors.

Nonetheless, the relationships and connections within the whole system as an emerging model requires a paradigm shift in our knowledge, language, and communication. As seen in **Section 4.0**, there remain struggles to articulate and deepen the ways we measure impact in this system, how we capture causality and vicious feedback loops, and how we share and integrate the emerging evidence that mental health is both 'outcome and determinant' (Long et al., 2026, p. 746) of climate change. These gaps and challenges are global priorities for research and action.

Throughout the literature, there are calls for deeper systems thinking and a design-forward lens to promote these efforts, and to see the substantive opportunities for transformative change. And, as **Section 5.0** shows, there are proven sites to leverage co-beneficial solutions that respect Planetary Health and promote our collective abilities to obtain mental well-being.

Fundamentally, mental health and climate change are phenomena that transcend culture, discipline, sector, and government in their importance. They are deeply interconnected and complex parts of being human, and thus require strong, coordinated action across and within communities around the world.

As we confront today's escaping socio-ecological crises, this action is vital to ensure our sustainable futures.



Image source: Canva Pro.



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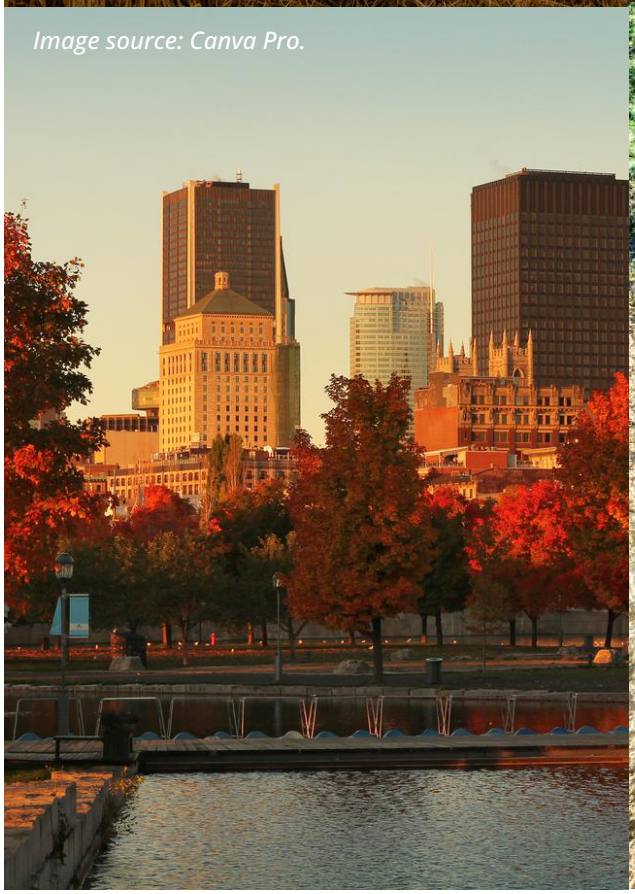


Image source: Canva Pro.



Image source: Pexels.

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