

Youth Research and Action Agenda: Vulnerability and Resilience in the Generation Inheriting the Climate Crisis

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Foreword by the Authors

We live in a rapidly changing world where the consequences of climate change are becoming increasingly palpable, and it is incredibly essential that we acknowledge the profound impact this global phenomenon has on young people and their mental health. This research and action agenda represents our ongoing commitment to exploring the intricate connection between young people's mental health and climate change. We hope it serves as a beacon of collective wisdom and shared experiences.

The invaluable insights gleaned from the dynamic and participatory youth dialogues have shed light on the profound implications of climate change on the mental health of young people. These dialogues – which were held both virtually across the globe and in physical spaces in Nigeria and India – were avenues for young people from diverse backgrounds to converge and share their experiences, pathways and wisdom on the intersection of youth mental health and climate change. The dialogues provided vibrant spaces, which fostered connection and vulnerability, and where personal narratives blended seamlessly with empirical research.

The narratives, experiences and aspirations of dialogue participants were not only heard and validated but were also thematically analysed to build a valuable research and action agenda to guide future research and policymaking.

As you delve into the pages that follow, we hope that you feel the pulse of these dialogues, translated into a roadmap for research and action. This agenda is not an abstraction; it reflects the resilience, vulnerability and agency of the young people who contributed their voices to this endeavour. We hope that these words are a testament to the power of collective understanding and the unwavering commitment to address the mental health challenges faced by young individuals in the context of a changing climate.

Executive summary

Connecting Climate Minds (CCM) is a Wellcome-funded initiative which aims to cultivate a collaborative, transdisciplinary climate change and mental health field with a clear and aligned vision. Over the last year, we have convened experts across disciplines, sectors and countries to develop regional, thematic and global research and action agendas. These agendas set out 1) research priorities to understand and address the needs of people experiencing the mental health burden of the climate crisis, and 2) priorities to enable this research and translate evidence into action in policy and practice.

This document outlines a research and action agenda for the mental health of young people in the context of climate change. It explores the unique and shared aspects of the impact on the mental health and wellbeing of young people in different parts of the world, and identifies key risks, barriers and opportunities for intervention and resilience-building. Building on themes proposed by the research team from their own experience working with young people in the climate and mental health spaces, the agenda incorporates lived experiences of young people, as captured via a global virtual youth dialogue facilitated by young people and two pop-up in-person sessions hosted in Port Harcourt, Nigeria, and Bangalore, India.

This agenda provides lived experience-based and evidence-based justification for further research at the nexus of climate change and the mental health of young people. The outputs of this agenda are myriad, and this document should be used as a robust 'starting point' from which to identify areas of interest for further research and advocacy.

The agenda puts forth 63 priority research themes (the top 30 of which are highlighted in this summary document; the complete list can be found in the appendix and full agenda) across four key areas: impacts, risks and vulnerable groups; pathways and mechanisms; mental health benefits of climate action (adaptation and mitigation); and mental health interventions/solutions in the context of climate change. Many of these themes take a youth lens on research priorities identified as being of general interest in the field of climate and mental health; others are particular to young people, identifying unique risks, barriers and opportunities that are influenced by young peoples' lived experiences of climate change. These include, among others:

- Developmental stages of interest (critical or significant periods of development that may render young people's mental health particularly vulnerable to climate shocks);
- Intersectional and compounding variables (geographical location, demographic characteristics, self-identifying factors and socioeconomic circumstances that may contribute to young people's experiences of climate events);
- Biopsychosocial pathways linking climate events to mental health impacts;
- Taboo, stigma and prejudice related to climate-mental health;
- Climate-aware healthcare/therapeutic interventions (both clinical and at the community level); and
- The role of climate action (individual and systems-level) in impacting the mental health of youth.

Individuals reading this agenda are strongly encouraged to see these themes not just as opportunities for targeted research, but also as windows into the most pressing issues of mental health facing young people in a rapidly changing world. Thus, the research priorities presented here may be used as seeds that, when sown, can give rise to paradigm-shifting evidence, producing groundswell changes in policy and practice.

The integrity and sustainability of this research are dependent on the meaningful and respectful engagement of young people, from the conception of research questions through to the translation of evidence into policy and practice. The team learned several lessons from the approach taken in this project, and these process lessons have been captured in the agenda as well.

This agenda intends to provide a vessel for the expertise of young people's lived experience around the world and a guide, in their own words, for how they want to be honoured, protected and championed.



Figure 1: Visual Summary of Youth Dialogue

Introduction: youth, climate and mental health

Context

Climate change and mental health are two of our greatest global challenges, and awareness of the intersection between mental health and the climate crisis has grown rapidly in recent years.¹ Climate change exacerbates mental health challenges by increasing exposure to extreme heat and the traumas of extreme weather events,² destabilising the conditions needed for good mental health and wellbeing (for example, water and food insecurity, forced migration, polluted air, loss of treasured environments),² disrupting access to healthcare,³ and increasing psychological distress through awareness of climate threats and insufficient climate action.⁴ People living with mental health challenges are also particularly vulnerable to the stressors of the climate crisis, such as increased risk of physical heat stress and death during heatwaves.^{5, 6, 7}

In response to the mounting mental health toll of the climate crisis, research in the climate and mental health field has grown rapidly. Nevertheless, key evidence gaps exist in many regions, including the mental health burden attributable to climate change, the pathways and mechanisms underlying these impacts, the co-benefits of climate action for mental health and the best interventions or solutions to support mental health in a changing climate. Climate change and mental health research remains frustratingly disconnected across disciplines, sectors, and geographies, and is unevenly focused on certain topics and global regions.⁸ Moreover, siloed decision making slows the translation of evidence to aligned action across climate and mental health policy and practice.^{9, 10} A more inclusive, connected agenda is urgently needed to generate the evidence to truly understand, monitor and respond to the interconnections between climate change and mental health.

Connecting Climate Minds

Connecting Climate Minds (CCM) is a Wellcome-funded project launched in 2023 to develop an inclusive agenda for research and action in climate change and mental health. The project has two key, intertwined aims. The first is to develop an aligned and inclusive agenda for research and action that is grounded in the needs of those with lived experience of mental health challenges in the context of climate change, to guide the field over the coming years. The second is to kickstart the development of connected communities of practice for climate change and mental health in seven global regions (designated by the Sustainable Development Goals), equipped to enact this agenda. We aim to combine the strengths of a global perspective and regional focus and bring together diverse disciplinary perspectives into a shared vision that can ensure research is effective at addressing priority evidence gaps and informing changes in policy and practice at the intersection of climate change and mental health.

This document sits alongside the regional research and action agendas for the seven regions of the globe, as outlined within the CCM project: sub-Saharan Africa, North Africa & Western Asia, Central and Southern Asia, Eastern and South-Eastern Asia, Latin America & the Caribbean, Oceania, and Europe & North America. It is one of three thematic areas that were identified by the lived experience work stream that were identified as groups of special interest in the content of climate and mental health, alongside Indigenous Peoples, small farmers and fisher peoples.

Objectives of the research agenda

The research and action agenda is designed to focus future efforts to help those who are experiencing, or will experience, the compounding mental health challenges of climate change.

It aims to support those who are already responding to these challenges – through communities, research, policy and practice – by building a more connected and collaborative climate change and mental health field. It also aims to empower young people and experts across disciplines and sectors to join and make progress in this area by identifying clear priorities and fostering a more inclusive and transdisciplinary field.

The agenda addresses these aims through three core objectives, which are to:

1. Identify priorities for research that can inform action to meet the needs of young people experiencing and responding to the mental health impacts of climate change.
2. Identify what is needed to appropriately conduct research with and about young people and translate evidence to action in policy and practice.
3. Foster cross-disciplinary collaboration among researchers, funders and policy experts to advance youth-focused climate change and mental health research, and provide actionable priorities for effective collective impact.

The youth thematic agenda will be integrated with other thematic and regional agendas to inform a **global research and action agenda** for climate change and mental health. This will ensure that global research efforts and investment in climate change and mental health are grounded in specific thematic priorities.

Use of the terms climate change and mental health

Climate change, mental health and their intersection are complex and wide-ranging fields. For the purpose of this agenda, we define the scope of these terms as follows.

By **mental health challenges**, we mean thoughts, feelings and behaviours that affect a person's ability to function in one or more areas of life and often involve significant levels of psychological distress. This includes, but is not limited to, anxiety, depression, post-traumatic stress, psychosis, suicidal thoughts and substance misuse.

Mental health problems are not a weakness - they are the result of a number of complex factors both within us and outside of us, and are often responses to what is happening, and what has happened, to us or around us.

By **experiences of the effects of climate change**, we mean: 1) experiencing direct impact of climate hazards, such as more frequent and intense heat waves, wildfires/bushfires, drought, floods or storms (e.g., typhoons, hurricanes, cyclones), and 2) experiencing disruption to the social and environmental determinants of good mental health, such as being forced to move home, not being able to access food or water, losing livelihood or homelands, or disruption to cultural practices because of climate change.

Mental health challenges in the context of climate change include:

- How climate change may lead to worsening pre-existing mental health challenges.
- How climate change may contribute to prevalence or impact of existing mental health challenges.
- How climate change may impact treatment access or effectiveness for those with mental health challenges.
- How climate change may lead to new mental health challenges.

The convening work of CCM presents a key opportunity to build our understanding of diverse perspectives, framings and terminologies in the climate-mental health field for youth, which we have sought to reflect within the research and action agenda.

Connecting Climate Minds project overview

The CCM project, funded by Wellcome, was led by a consortium including the following members: Climate Cares at Imperial College London, the Red Cross Red Crescent Climate Centre, and a Lived Experience Working Group (LEWG), including the Climate Mental Health Network, SustyVibes, and Force of Nature.

Methodology

We crafted this research and action agenda through a robust and inclusive methodology to capture, combine and refine a rich diversity of perspectives while fostering connection across a growing community of practice.

The methodology for crafting this agenda was a collaborative effort involving the CCM core team, Lived Experience Working Group, Regional Communities of Practice, a Global Advisory Board and Wellcome. Methods and materials were tailored to the youth thematic context by the Lived Experience Working Group, ensuring a balance between global standardisation and youth suitability. Ongoing collaboration among the youth population facilitated the iterative development of the methodology, with processes, learnings and challenges continuously shared across regions. The process for developing the youth research and action agendas is outlined below (see Figure 2).

Figure 2: Research and action agenda development methodology



Pre-dialogue scoping

Landscape mapping was undertaken by the central team at CCM. This comprised a global scoping and framing activity, which included mapping of relevant stakeholders, disciplines and sectors; review of current academic evidence bases and policy landscapes; development of a global framework of research categories; and formation of a Global Advisory Board to advise on the development of the research and action agendas.

An initial review of global literature identified four overarching research categories (listed below) as areas of critical need for further work globally and that map the climate and mental health research space at a high level.

- **Impacts, risks and vulnerable groups:** improving our understanding of the extent to which mental health is affected by climate change and for whom. For example: what mental health outcomes are impacted or at risk; the prevalence, severity, economic and societal costs of these impacts; and who is most vulnerable to these impacts.
- **Pathways and mechanisms:** improving our understanding of how climate change affects mental health and, in particular, whether there are factors specific to climate change that increase mental health risks or create new experiences of mental health challenges. This includes considering biological, psychological, societal or environmental pathways and mechanisms.
- **Mental health benefits of climate action (adaptation and mitigation):** understanding and quantifying when and how climate adaptation and mitigation actions, across sectors, can also have win-win benefits for mental health.
- **Mental health interventions/solutions in the context of climate change:** identifying the most effective mental health interventions and solutions to support mental health in the context of climate change, across diverse sectors. This encompasses providing support to people already experiencing negative mental health impacts and reducing risk or severity of future negative impacts.

The above research categories were embedded into the youth context through engagement with young people. We administered a pre-dialogue survey designed to delve into the perspectives and insights of young people regarding the intersection of climate change and mental health. We received responses from participants in 47 countries, each contributing valuable viewpoints. These participants, with a median age of 23.5 years, shared their experiences, concerns, and knowledge through the survey platform. In total, our efforts yielded a dataset comprising 162 entries.

These responses were used to tailor the research categories that were established by the global landscaping activity. Subcategories specific and suitable to the youth context were either amended or added to cover the scope of topics brought forth in the pre-dialogue scoping survey. See the table below for the subcategories used to identify and describe data of interest from the dialogue transcripts.

Table 1: Research subcategories tailored to the youth context

Research category	Subcategories
Impacts, risks and vulnerable groups	<p>Subcategory 1.1: Prevalence, severity, and nature of different youth mental health outcomes, challenges or experiences affected by different aspects of climate change.</p> <p>Subcategory 1.2: Understanding language and terminology related to mental health and wellbeing that resonates with young populations who may experience climate-related events, This may include descriptions of personal experience (e.g. eco-anxiety, solastalgia, etc.)</p> <p>Subcategory 1.3: Identifying population sub-groups (gender, ethnicity, race, socioeconomic status, able-bodiedness or health status, etc.) that may contribute to young peoples' increased vulnerability to climate-related events. This includes groups that may have increased resilience or specific coping strategies that they have developed out of necessity.</p>

	<p>Subcategory 1.4: Exploring the stigma and discrimination associated with climate-induced mental health issues, and strategies to address or reduce it</p>
Pathways and mechanisms	<p>Subcategory 2.1: Categorising and understanding which key developmental events in young people's lives may be disrupted by climate change and the impact on their mental health (e.g., going to school, culturally relevant celebrations, etc.).</p> <p>Subcategory 2.2: Exploring the ways in which climate-related mental health impacts may affect women and girls disproportionately, whether biologically, psychologically, socially or culturally (for example, family planning, menstruation, gender roles, etc.).</p> <p>Category 2.3: Categorising which climate-related events may have a disproportionate impact on young people in particular regions, and why (e.g., air pollution, reduced exposure to biodiversity, flooding etc.).</p> <p>Subcategory 2.4: Understanding how information and communications move between young people about the impact of climate change, and the impact on their mental health (e.g., social media, community groups, WhatsApp groups, etc.).</p> <p>Subcategory 2.5: Exploring how lapses in communicating or accessing mental health support can be a pathway for mental health to be worsened by climate change.</p> <p>Subcategory 2.6: Identify specific mental health issues that may be exacerbated or worsened by climate change and how (e.g., stress worsening anxiety through direct exposure to climate-related events, or reduced access to care)</p> <p>Subcategory 2.7: Identify biological mechanisms by which mental health and wellbeing might be negatively impacted by climate change (e.g., extreme heat making it difficult to focus) .</p> <p>Subcategory 2.8: Identifying features or locations in young peoples' environments that may contribute to their experience of climate-related events and influence how their mental health is affected (e.g., proximity to the coast, geographical features, etc.).</p> <p>Subcategory 2.9: Understanding how stigma and discrimination associated with climate-induced mental health issues may increase existing burdens or be a burden in its own right, and strategies to address or reduce it.</p>
Mental health benefits of climate action (adaptation and mitigation)	<p>Subcategory 3.1: Identifying climate actions that integrate or align with mental health benefits (co-beneficial climate actions, e.g. increased tree cover in cities).</p> <p>Subcategory 3.2: Exploring how the mental health costs and benefits of climate action may differ across population sub-groups (e.g., demographics, livelihoods, life stage).</p> <p>Subcategory 3.3: Identifying relevant stakeholders who provide support and leadership for young people in taking co-beneficial climate action (e.g., climate activists, educators, community groups, etc.).</p> <p>Subcategory 3.4: Identify key blockers to climate action for young people, and any associated emotional repercussions (e.g., fear and anger due to governmental or corporate inaction).</p> <p>Subcategory 3.5: Investigating the effects of nature-based mental health services and their accessibility in urban and rural areas.</p>
Mental health interventions/solutions in the context of climate change	<p>Subcategory 4.1: Identifying locally relevant and/or historically underrepresented ways of understanding health and mental health that benefit young people.</p>

Subcategory 4.2: Amending, implementing, and evaluating relevant mental health interventions from other settings to be appropriate for climate-related impacts.

Subcategory 4.3: Identifying sources of resilience and leadership that young people look to for guidance and support when dealing with the negative consequences of climate change.

Subcategory 4.4: Identifying damaging, harmful, or stigmatising narratives that interfere with young people's ability to cope.

Why did we do physical and virtual dialogues?

We conducted both physical and virtual youth dialogues on climate change and youth mental health to promote inclusivity and understanding of diverse perspectives. The **global virtual dialogues** allowed wide participation. However, while acknowledging the access advantages of virtual platforms, certain uncontrollable barriers hindered the involvement of some interested individuals. As a result, we provided contribution forms to young people who couldn't attend due to differences in time zones or other conflicts, from that form we received responses from 18 people in 9 countries with a median age of 23. Our **physical dialogues** held in Port Harcourt and Bangalore were essential for collecting localised insights. We chose these locations due to the predominance of engaged young people in these countries and their susceptibility to climate hazards, as well as existing networks that facilitated recruitment. This hybrid model, encompassing both physical and virtual dialogues, captured both universal and locally nuanced impacts, fostering a holistic exploration of the subject matter.

How did we recruit our participants?

Recruitment of participants involved targeted invitations extended to global youth networks, organisations and groups. Individuals aged 18-29 with pertinent experiences in either or both climate change and mental health were prioritised. This strategic approach aimed to assemble a diverse cohort that authentically represented various youth demographics. A total of 57 individuals participated in the global virtual dialogue, with 20 attendees present at the physical dialogue in India, and 18 participants at the physical dialogue in Nigeria.

The tables below provide a breakdown of virtual dialogue participant characteristics.

Table 2: Geographical spread of participants

Country	Number	Percentage
Austria	1	1%
Belgium	1	1%
Cameroon	1	1%
China	1	1%
Ecuador	1	1%
Ethiopia	1	1%
Finland	1	1%

France	1	1%
Gambia	1	1%
India	21	22%
Kenya	5	5%
Malawi	2	2%
Mongolia	1	1%
Nepal	1	1%
Nigeria	37	39%
Pakistan	3	3%
Peru	1	1%
Philippines	1	1%
Sierra Leone	3	3%
South Africa	1	1%
United Kingdom of Great Britain and Northern Ireland	2	2%
United Republic of Tanzania	2	2%
United States of America	3	3%
Zimbabwe	2	2%

Table 3: Gender of participants

Gender	Number	Percentage
Men	45	47%
Women	45	47%
Non-Binary	4	4%

How
did
we

compensate our participants for their time?

Participants were financially compensated with 20 USD to recognise their time and contributions to the dialogue, acknowledging their value in the process.

How did we build trust?

Trust in the dialogues was built through an inclusive approach with clear communication about the project, the youth thematic dialogue, its expected outcomes and the availability of mental health support during the dialogues; these were iterated via emails and communications on the dialogue day. Active listening and validation of participants' contributions further fostered trust, demonstrating a genuine commitment to understanding their diverse viewpoints.

Dialogue methodology

Virtual dialogue

The virtual dialogue (Harmony Horizon) was conducted on Zoom, with chairing, introduction and closing remarks from a member of the SustyVibes team. The dialogue commenced with the chair introducing the purpose of the session, establishing terms of reference for the meeting and introducing the psychological support. Our psychological support team included a trained professional from the SustyVibes team and a trained professional from the Climate Mental Health Network, who availed themselves for participants who may have felt uncomfortable or emotionally unsettled in the dialogue. They also shared their personal experience of mental health in the context of climate change, establishing a shared space of vulnerability for participants.

Participants were then split into 10 breakout rooms, with an approximate ratio of one moderator and one note-taker to four participants. Throughout the session, participants were allocated to breakout rooms for small group discussions and then reconvened in the main plenary to introduce the next topic of discussion.

Within the breakout rooms, note-takers captured insights from participants for further analysis after the session. They were also asked to record particular “greatest hits” quotations or stories from the session, as defined and outlined in the Lived Experience Stories Guidance for the project. Notes were stored in a shared document with the other note-takers, which a cartoonist used throughout the session to generate a shared illustrated storyboard after the session (see title page).

Breakout rooms were recorded so that transcripts could be generated and anonymised for each of the discussions. Between breakouts, participants were brought back into the plenary and participated in facilitated sharing and/or ice-breaking activities. At each break, they were also reminded of the presence of psychological support.

In-person dialogues

The youth pop-up dialogues (Rising Resilience) were conducted in the cities of Port Harcourt, Nigeria, and Bangalore, India, with dedicated facilitators for sets of breakout groups who also served as note-takers. They facilitated open communication, a sense of community and an inclusive atmosphere among the participants. In each breakout group, three to five participants engaged in meaningful discussions within our set agenda. To achieve this, we had structured questions that guided the discussions in both cities, with each breakout room focusing on specific aspects.

At the end of the session, participants wrote a note to the person seated next to them describing what they felt is missing in the support for people with lived experiences of mental health impacts from climate change, and what a climate adapted world should look like.

Excerpts from the notes on the missing support for individuals with lived experience of mental health effects due to climate change.

“People living with disabilities are hardly supported in the areas of mental health impacts from environmental impacts”

“Not enough storytelling”

“More love and care for people”

“What is lacking is intergenerational gatherings”

In their envisioning they desired...

“Climate resilient people and communities”

“World with sufficient information on climate change to avoid and prevent/reduce impacts”

“World where climate related illnesses are reduced”

Questions for the virtual and in-person dialogues are included in Appendix 1.

Safeguarding

It was paramount that participants' safety, security and comfort was prioritised in this process over the extraction of information for the research agendas. Recognising that sharing difficult and traumatic information can be unpleasant or triggering for participants, the research team took pains to create an environment that acted as an invitation to share, rather than as an exploitation of lived experience stories.

The team that designed, moderated, facilitated, note-took and analysed the youth dialogues were all young people in their own right, between the ages of 20-30. All participants were briefed on the content of the session ahead of time, so none of the subject matter was surprising, and they were able to consider what they wanted to share or omit. We shared this disclaimer firstly via email in our participant information sheet and also in the consent form, where we explained to invitees the details of the project and dialogue objectives. On the day of the dialogue, we reviewed our agenda with participants to make sure expectations were clear. Participants in the breakout rooms were invited to share, but it was made clear to them that abstaining would not affect their compensation or ability to participate in the session.

As described in the dialogue methodology, trained mental health first responders were on standby throughout the session and were available to participants if necessary. Participants were notified of their presence before the session and at regular intervals throughout the dialogues.

Participants were contacted after the session through email and given a feedback survey. The research team made themselves available should the participants have any questions or require any further support.

Survey methodology

We distributed a **pre-dialogue online survey** to virtual dialogue participants to inform dialogue design and to solicit perceptions on climate impacts, climate-related mental health impacts, and research priorities that are relatable to young people.

We distributed a **post-dialogue online survey** after the dialogues to obtain a second round of feedback on the dialogue they attended and to detail any issues or further additions to the contributions towards the dialogue. The survey allowed for a comprehensive assessment of the dialogue sessions, ensuring that participants could seamlessly provide their reflections, highlight any concerns and contribute further insights in a consolidated and user-friendly manner.

Survey participants:ⁱ

- Pre-dialogue survey: 269
- Post-dialogue survey: 72

In addition to the post-dialogue online survey, we created a **contribution form** for individuals who were unable to attend our dialogues. This form served as an inclusive avenue for those facing challenges, such as time zone differences or other issues out of their control, that prevented their participation.

Analysis methodology

A comprehensive mixed-method approach was utilised, incorporating both qualitative and quantitative methods. A coding framework was developed, merging predefined research categories related to climate change and mental health with emergent themes from the dialogues. Thematic analysis was employed to identify, refine, and prioritise these themes. Inclusion/exclusion criteria were established to maintain relevance and focus, ensuring alignment with research objectives.

Further details are available in Appendix 2.

Emerging process lessons from the youth dialogues

This project underscored the tensions between the pace and scale of research conducted under Western “scientific” paradigms and true engagement with lived experience. Historically, some of the research conducted within subgroups - such as youth - has structured its ethical threshold around a “do no harm” policy, which can result in a justification for the exploitation and use of personal stories for research purposes. In conducting the youth dialogues, the research team recognised that the safety, security and comfort experienced by young participants should be benchmarked by a net benefit to those involved in the project.

Under this principle, the research team endeavoured to co-create our research and action agenda with youth authors through participatory engagement with other young people around the world. Some lessons and key challenges from the process are summarised in Table 4 below.

Table 4: Lessons and challenges from the agenda development process

What worked	Key challenges
Peer-to-peer facilitation: It is more approachable and authentic to have sessions on “the youth perspective” delivered by young people with lived experience themselves. This sometimes posed a challenge in recruiting and training young people to take on these facilitation roles.	Reluctance in engagement: Even though we made significant efforts to build trust and make participants feel safe to engage, some participants were still reluctant to speak.

ⁱ Please note numbers are approximate and do not account for duplicate or incomplete responses.

<p>The pace of trust: Many young people may not feel comfortable sharing their experiences with researchers – and for good reason! Engaging with young people required researchers to move at a slower pace than the regional dialogues in order to build trust with participants. This was often at odds with the tight deadlines and pace of the project as a whole.</p>	<p>Digital fatigue: Our virtual dialogue lasted 120 minutes and might have led to participant fatigue and reduced engagement.</p>
<p>Value proposition: It is important to establish a strong value proposition for research participants. A value proposition is a justification for involvement that delivers direct financial, social, emotional or intellectual benefit. The value proposition of 'contributing to important research' by itself rings empty for many young people, especially those sharing vulnerable and intimate details about their lives. Hence, in our dialogues, our value proposition was a combination of financial incentives, the intrinsic value of contributing to impactful research within a larger community of practice and connecting to others who might be feeling similarly.</p>	<p>Time zone challenges: Coordinating participants across different time zones during our virtual dialogues was challenging.</p>
<p>Engaging in participatory research: As this research endeavoured to be participatory, the research team tried to bring in perspectives from Youth Ambassadors in the creation of the research themes. Some difficulties arose from balancing delivery and the process of gathering feedback, which could often result in too many contributors disagreeing on small details.</p>	<p>Abundance of datasets for analysis: Managing and analysing large volumes of data posed complexities, requiring careful attention to ensure meaningful insights were extracted from the diverse information gathered during the discussions in different formats.</p>
<p>A contribution form was created to gather the insights of people who couldn't attend either of our youth dialogues due to uncontrollable circumstances.</p>	
<p>Including non-participant perspectives: A contribution form was created to gather the insights of people who couldn't attend either of our youth dialogues due to extenuating circumstances.</p>	
<p>Solely led by young people: The decision to entrust the facilitation and leadership entirely to young individuals proved to be a pivotal and effective strategy. Solely youth-led sessions unlocked a unique authenticity that might have been otherwise elusive.</p>	
<p>Adaptability and inclusivity: The ability to adapt methodologies to diverse backgrounds ensured that the dialogues resonated with participants from various contexts. Fostering inclusivity in both participant recruitment and the design of dialogue structures aimed to create an environment where diverse voices were heard and valued.</p>	
<p>Blend of dialogue styles: Hosting virtual and physical dialogues allowed for a comprehensive understanding of the global and local dimensions of climate-related mental health challenges faced by youth.</p>	<p>Disclosure of sensitive information: There are some things that young people do not feel comfortable speaking about, especially in group settings. A one-to-one approach, rather than a focus-group style dialogue approach may have been more suitable for more sensitive topics.</p>

Ethics, data collection and storage

This study has been reviewed and given an ethical favourable opinion by the Imperial College Research Ethics Committee (Study title: 'Global Dialogues to Set an Actionable Research Agenda and Build a Community of Practice in Climate Change and Mental Health', study ID number: 6522690).

Details on data collection and storage can be found in the Appendix 3.

Current state and emerging needs for climate change and mental health for youth

As the climate crisis escalates, more people globally are experiencing related mental health consequences. However, the current evidence base doesn't fully capture these experiences. To develop research themes that ultimately meet the needs of those experiencing and responding to the interconnections between climate change and mental health, it is vital to know: 1) what do people from different backgrounds, contexts, and sectors – particularly those with lived experiences of mental health challenges in the context of the climate crisis – report as their experiences, needs, and resiliencies?, and 2) what evidence do people making decisions and taking actions on the ground need in order to adequately respond?

This section sets out the context of the research agenda, including a review of the literature on the current state of evidence and framing of key concepts that informed the agenda's priority research themes.

Current research on climate change and mental health for young people

Young people are uniquely vulnerable to the effects of climate change, and they have also emerged in the environmental movements as ardent voices calling for climate action and reform. While climate-related events are perilous and have ramifications for the physical health of young people, they also present serious mental health risks – with post-traumatic stress disorder, heightened levels of anxiety, depression and learning disorders being just some of the climate-related trauma effects documented in young people.¹¹ Furthermore, young people are often left out of decision-making spaces, conversations about their future and barred from agency-cultivating actions, which can lead them to bearing the consequences of the climate crisis with no opportunities to advocate or voice their needs. Young people are still developing the psychological and physiological capacity to process the consequences, while possessing little influence over the economic, political and social systems charged with responding to or preventing climate events. Adolescence and emerging adulthood are also developmental periods when the risk of developing a mental health challenge is heightened; around three quarters of mental health challenges begin for the first time before the age of 24.¹²

For these reasons, young people are considered a particular group of interest. However, their participation in this conversation is not defined by their vulnerability; they are also a population who will inherit the future of the climate and will become members and leaders in their communities. They are an essential part of the resilience of communities and underpin their capacity to mitigate and adapt to climate change. Young people are a part of this research, therefore, not just as a vulnerable group, but

also as stakeholders, actors and custodians of solutions at the intersection of climate change and mental health.

Research on climate change and mental health is in its nascence, although emerging research about the impact of climate change on mental health and emotional wellbeing has led to a groundswell in interest and advocacy.² There remains limited evidence available to fully capture the consequences of the climate crisis for the mental health of children and young people. Evidence bases tend to focus on the experiences of children in disaster or investigate trauma systems under the broad umbrella of disaster,^{13, 14} and fail to identify and investigate the specific risks associated with climate change and climate-related disasters. However, large research, policy and action bodies have started to explicitly identify the mental health consequences of the climate crisis, with calls for attention from the World Health Organisation (WHO), the [Intergovernmental Panel on Climate Change \(IPCC\)](#) and [Wellcome](#). There have also been numerous studies investigating and quantifying the impact of specific extreme weather events on mental health outcomes in young people.^{15, 16}

In recent years, some studies have looked more broadly at mental wellbeing amongst youth in the context of climate change, moving beyond traditional paradigms of mental health and illness and into a more holistic view of the dimensions of health. For instance, a study of 10,000 young people from 10 countries examined young people's psychological responses to the climate crisis and how their climate-related feelings affected their daily life and functioning.¹⁷ The young people from countries reporting the most profound effects were also those where climate-related hazards loom largest (e.g. the Philippines). Other researchers (including many involved in CCM) have examined psychological responses to the climate crisis in young people and the interactions with mental health outcomes, future planning and climate agency and engagement in India,¹⁸ several Caribbean nations,¹⁹ the UK^{20, 21} and the USA (under review). Research focussed particularly on young people is also available from the Philippines,²² Australia^{23, 24} and Tanzania.²⁵ There have been calls for a focus on the impacts of climate anxiety on youth mental health outcomes,²⁶ including for instance the influence of climate education.²⁷ Climate-aware mental health professionals and scholars, and young people themselves, have called for the importance of not pathologising strong emotional responses, and even distress and anxiety in the face of significant climate threats.^{28, 29} At the same time they have called for more climate-aware mental health support,³⁰ noting that prolonged stress and distress arising from the climate crisis, and particularly the insufficient action from older adults supposed to keep them safe, may constitute an adverse childhood event.²⁸ Such stresses and traumas in early years are related to poorer mental health outcomes later in life.²⁹

While it is unclear how exactly fears for the future may relate to specific mental health outcomes for young people, and whether eco-anxiety and related experiences are unique or overlap with experiences such as generalised anxiety, it is becoming apparent that there are likely complex interactions between the psychological consequences of climate awareness and climate experience.²⁸ For instance, US young people self-reporting direct experiences of climate events have significantly higher levels of eco-anxiety and worry more frequently about a range of issues regarding their personal futures (under review); while antenatal distress and postpartum depression in parents has been shown to be predicted by higher climate anxiety – this has potential implications for the children as well as the mother.³¹ A study of Tanzanian young people reported: "Living in conditions worsened by climate change and feeling distressed over climate change have mental health implications among young people from low-resource settings, indicating that climate change can impact youth mental health through multiple pathways."²⁵ Another global review noted that "Generation Z worries in the global North and suffers in the global South",³² while Australian data indicates that, among other things, young people are grieving a dead future, and the authors note: "The present impacts of anticipated climate change in the lives of young people need greater recognition in research, policy and public discussion about climate change."³³

Still, the field remains fragmented; existing frameworks for research, policy and action remain siloed and single-disciplinary, focusing on some dimension of youth, climate change or mental health, but rarely joining the dots between these three factors. Historically, research on climate change-driven health impacts often overlook complex biopsychosocial interactions, suggesting a need to work on preventive strategies to reduce vulnerability and build individual child resilience,³⁴ and this remains true today. Evidence remains sparse, frameworks absent, early warning systems non-existent, and many of the local-level, relevant interventions are direly under-resourced. Cascades of evidence, policy and action from international to sub-national and local levels explicitly centring youth health, with its various complex dimensions, in the context of the climate crisis, are essential. In the words of young people themselves, "Allowing the climate crisis to go unchecked threatens the safety, mental health and dreams of young people around the world."³⁰

While Koder et al note: "Younger people, notably, are experiencing climate distress disproportionately and will bear a larger share of the mental health burden caused by climate change, and yet their voices are underrepresented in theoretical and practical interventions. Enlisting young people as research collaborators and co-designers will facilitate more effective responses to the psychological aspects of the climate crisis."³⁵

This research and action agenda is doing just that.

Framing of key concepts

The overall scope and focus of CCM has been guided by the framing of climate change and mental health outlined in the introduction. 'Climate change', 'mental health' and their intersections and related terms, along with other relevant key concepts, are also understood and defined in diverse ways across contexts. Identifying, acknowledging and honouring the ways these terms are understood and used in different settings is critical to help foster connections, awareness, and recognition across disciplines, cultures, and communities. Below, we outline key conceptual understandings that arose during the creation of the youth research and action agenda.

Mental health challenges or problems, emotions and mental wellbeing

There are several words relating to mental health problems in this agenda. We did our best to reflect what we heard from dialogue participants; for example, if they discussed a particular weather event influencing their emotions, we captured that without assuming that this implied a mental health challenge or problem. Because mental health challenges or problems specifically refer to a set of illnesses or conditions that may impact on a person's thoughts, perceptions, feelings and behaviours, we did not want to assume a biomedical or pathologised lens on individuals' experiences unless it was directly mentioned. In some cases, these terms refer to an individual's affect rather than a condition.

However, emotions and mental wellbeing related to our affect are well-known to influence our adaptive functioning, the occurrence (or non-occurrence) of mental illness, and our ability to cope with or be resilient to mental health challenges. For this reason, emotions and mental wellbeing are included in this agenda because they exist as a part of the constellation of mediators and factors that contribute to young people's mental health status.

Research agenda

Background to research categories and priority research themes

This research agenda presents an aligned vision to guide the climate and mental health field for young people. Research priorities were generated through consultation with experts across disciplines, sectors and geographies and iterated with young people. The priority research themes represent areas where targeted research investment could create a full picture of impacts, their mechanisms and solutions across both mental health and climate actions. We outline why these have been identified as priorities, and how they can be addressed by combining expertise across disciplines and sectors.

Research priorities are presented within four overarching research categories that were identified as areas of critical need for further work globally (see Methodology subsection for details). Note that some priorities span multiple categories. SustyVibes and Force of Nature took the initiative to build on the initial research categories outlined by the regional research and action agendas as above, recognising that some specific factors and circumstances may influence young people's mental health. The developed subcategories aim to provide a more nuanced understanding of the intersections between climate change and various elements impacting youth mental health.

We hope that these priority research themes will serve as a catalyst, directing research efforts, guiding resource allocation by funding entities and consolidating evidence production. Ultimately, this collective effort will empower policymakers and practitioners to effectively address the evolving and anticipated mental health needs of young people in the context of climate change.

Priority research themes

Table 5. Priority research themes

Research category	Priority research theme
Impacts, risks and vulnerable groups	Educational disruptions
	Understanding how climate change disrupts key educational events in the lives of young people, and how this contributes to their vulnerability to mental health challenges.
	Identifying specific educational milestones during which youth are particularly susceptible to the negative mental health impacts of climate change.
	Indigenous youth, climate and mental health*
	Understanding how young people from Indigenous backgrounds/cultures experience mental health challenges related to climate change and how their background contributes to unique resiliency and/or vulnerability.

Coastal vulnerability

Understanding how young people living in areas prone to flooding and/or coastal areas/small island nations susceptible to the risk of sea level rise conceive/experience the mental health impacts of these phenomena.

Understanding how young people in small island nations that will experience loss of land in coming years are coping with and responding to these threats and how this affects their mental health outcomes.

Comorbidities with poor mental health in the context of climate change (e.g., disability, chronic illness)*

Understanding how disabled youth may have different experiences of climate and mental health challenges. This may include investigating specific scenarios, for example, in the circumstances of forced migration.

Understanding how young people with existing health issues (e.g., diabetes, autoimmune disorders, etc.) face specific vulnerabilities to climate-related mental health challenges.

Anxiety, depression and mood disturbance due to uncertain future outlook

Understanding how persistent uncertainty about the future (due to climate-related disturbances and disruptions) affects young people's mental health in the long term and how this is similar or different to the effects of other disturbances, such as civil war or economic downturns.

Taboo/stigmatisation of mental health in society

Understanding if there are specific societal stigmas and taboos associated with mental health due to climate-related events.

Understanding how mental health stigma and historical trauma affect help-seeking behaviour and access to care for young people experiencing the mental health impacts of climate change.

Helplessness and government inaction

Understanding how the experience of witnessing government inaction or counterproductive actions against climate change may amplify feelings of helplessness in young people and the extent to

which this impacts their mental health.

Disruptive events and trauma

Understanding how extreme weather events (including but not limited to drought, floods, tropical cyclones, typhoons, extreme heat and wildfires) that directly disrupt young people's lives influence the prevalence, severity and nature of mental health outcomes, challenges and experiences.

Understanding the specific outcomes (e.g., anxiety disorders, post-traumatic stress disorder, mood disorders, etc.) that are associated with different climate events (e.g., floods, heatwaves, drought, etc.) for young people, in both the short and long term.

Identifying specific risks, triggers and stressors related to climate change that increase mental health burdens for particularly vulnerable youth sub-groups.

Indirectly disruptive events and trauma

Understanding the psychological impacts of climate change awareness from personal or vicarious experiences in young people, how these experiences vary (between individuals and culturally) and how they might impact mental health and wellbeing outcomes.

Pathways and mechanisms

Exacerbation of existing mental health challenges

Understanding how different climate events (e.g., floods, typhoons, drought) operate through non-biological pathways (e.g., social, infrastructure or economic disruptions) to exacerbate mental health challenges (e.g., anxiety, depression, mood disorders).

Understanding the climate change-related mechanisms that increase the risk of mental health challenges within population subgroups in young people and identifying the most vulnerable groups.

Proposed vulnerable groups for further study include the young poor living in informal settlements, youth in Indigenous populations, youth living in rural areas, youth with pre-existing mental health or health conditions, disabled young people, young women and girls (particularly those living in drylands, arid/semi-arid regions and coastal areas prone to flooding and rising sea levels), young people belonging to families of fisher peoples or (subsistence) farmers situated in drought and fire-prone regions, and displaced youth such as migrants, asylum seekers and climate refugees.

Disruption of daily life and economic impact

Understanding the effects on mental health challenge prevalence among youth when climate events disrupt their abilities to engage in pro-social behaviour – such as being employed, volunteering or engaging with their community – and how this might lead to changing mental health outcomes.

Understanding whether experiencing mental health challenges as a result of climate-related events affects young people's ability to participate in pro-social behaviour – such as being employed, volunteering or contributing to their community – and what effect, if any, this has on their social bonds or cultural connection to their community.

Identifying which economic sectors (e.g., fisher peoples, small farmers, informal sector workers) are particularly vulnerable to climate events and losses and how this influences the mental health of the young people whose families depend on these sectors.

Cultural and social fragmentation and acculturation*

Understanding how the loss of traditional lands and livelihoods affects young peoples' relationships with their culture and how this influences their mental health.

Understanding how mental health challenges brought on by climate change may contribute to the absence or underdevelopment of connections within groups of young people or between young people and other social groups.

Understanding how forced migration due to climate events brings young people into contact (or conflict) with other cultural groups (acculturation) and how this impacts their mental health.

The onset of heat-related mental health challenges and symptoms, such as stress headaches, depression, suicidal ideation and mood dysregulation

Understanding how heat influences young peoples' experience of mental health challenges – particularly neurological symptoms and symptoms of stress such as headaches, mood dysregulation, depression and suicidal ideation – and exploring whether there is a causal pathway between heat and the onset or worsening of these conditions.

Disproportionate impact on women and girls

Understanding the pathways by which young women and girls' mental health is disproportionately affected by climate change.

Assessing the effect of increases in gender-based violence brought on by climate-related events on young women and girls' mental health.

Understanding the role of young women and girls as community leaders in creating connected, cohesive, climate-resilient societies and how this impacts their mental health.

Determining whether climate-related events disrupt young women and girls' ability to access family planning support and how this impacts their mental health.

Understanding whether the mental health impacts of the climate crisis influence young women and girls' relationship with motherhood or their family planning choices.

Forced migration due to environmental disasters

Understanding how forced migration due to environmental disasters affects the mental health of young people and which specific aspects of youth mental health are particularly affected.

Pollution and health concerns

Understanding how pollution (land, water and air) can affect young people's development and likelihood of experiencing mental health challenges.

Disruption of access to healthcare and mental health services

Understanding the readiness of the mental health workforce and healthcare system to deal with climate change and mental health in young people.

Understanding how technology can be used to improve the provision of, and access to, mental health support for young people affected by climate change.

Intergenerational understanding*

Understanding how intergenerational divides (e.g., perceived stigma, disillusionment, distrust, etc.) contribute to climate-related mental health challenges in young people.

Understanding the role, if any, of intergenerational knowledge exchange in helping young people cultivate hope, perceived agency and action in the face of climate change and how this impacts mental health outcomes.

Exploring how traditional and Indigenous ways of knowing can help young people cope with climate change, especially in light of the loss of land, culture or livelihoods, and how this impacts young people's mental health and wellbeing.

Exposure to violence*

Exploring whether young people experience increased exposure to violence in the wake of climate events and how this impacts their mental health.

Understanding how the loss of traditional or long-standing means of subsistence or ways of living can contribute to young people's propensity to violence and how this influences the prevalence of mental health challenges in those affected.

Mental health benefits of climate action (adaptation and mitigation)

Strengthened hope and action

Understanding the role of peer networks in supporting young people to develop perceived agency in the context of climate change and how this impacts mental health outcomes.

Assessing the effects on mental health outcomes of young people who take climate action in the community versus in isolation.

Inclusion of youth in decision-making processes

Evaluating strategies to meaningfully include young people – through co-creation, participatory research or other means – in designing, evaluating and implementing climate and mental health interventions.

Understanding the extent to which fostering agency in young people by including them in climate and environmental decision-making spaces within communities (and beyond) affects their mental health outcomes.

Rest

Understanding how burnout contributes to young people's mental health challenges when engaging in climate action.

Exploring how rest can act as a means of addressing the mental health impacts of climate change without interfering with young people's adaptation and mitigation methods.

Identifying and evaluating ways to measure climate change's impact on young people's ability to rest and exercise self-care and how this affects their mental health.

Activities and spaces that enable co-beneficial action

Understanding which co-beneficial activities may contribute to encouraging positive and sustainable climate actions and fostering good mental health and wellbeing in youth communities.

Understanding which community gathering spaces (for example, sports teams or parks and nature-related recreational activities) might be supportive mechanisms for the mental health of youth in the context of climate change.

Education and awareness

Evaluating how educational institutions can best provide support and leadership for young people in taking climate action that improves individual and collective mental wellbeing (e.g., climate activism, education, community groups, etc.).

Identifying strategies for schools to provide education about climate change, especially amongst young students, that is informative, strengthens perceived agency and mental wellbeing, and protects against creating or exacerbating mental health challenges.

Mental health interventions/solutions in the context of climate change

Strengthening of healthcare systems

Assessing the readiness of the mental health workforce and healthcare system to deal with climate change and mental health in young people. This could include managing impacts of reduced service accessibility during and following climate hazards; reviewing climate literacy, training needs and wellbeing of service providers; and enhancing community-based support.

Understanding the role of mental health promotion strategies in creating positive mental health outcomes for young people in the context of the climate crisis.

Exploring how to implement early warning signals that allow

healthcare systems to prepare and plan to support young people as they experience the mental health impacts of climate events.

Evaluating the role of technology to improve the provision of and access to, mental health support for young people affected by climate change.

Creating safe spaces/connecting with others

Understanding whether and how discussion, contemplative practice and sharing of the mental health impacts of climate change affect the mental health of young people.

Identifying robustly tested therapeutic interventions concerning climate change and mental health for young people and understanding for whom they are accessible and what barriers exist to accessing them.

Assessing the comparative effects on young people's mental health outcomes from therapeutic interventions concerning climate change and mental health conducted at the individual level versus in communities or groups.

Climate-informed mental health training for practitioners

Identifying, developing and evaluating continuing mental health and emotional wellbeing education programs that include climate change information for healthcare practitioners, medical students and other health professionals who work with young people.

Measuring the degree to which young people feel seen, heard and validated by healthcare practitioners when seeking mental healthcare in the context of climate change.

Religious, spiritual or faith-based interventions

Understanding the role of religious, spiritual or faith-based interventions in supporting young people as they face the mental health challenges associated with climate change.

Community-focused interventions

Understanding the role of strengthening psychosocial resilience at the community level, versus at the individual level and how this affects climate-related mental health outcomes for young people.

Indigenous knowledge and holistic health paradigms*

Understanding which aspects of Indigenous knowledge and holistic views of health protect and help communities when experiencing the mental health consequences of climate change, and which of these can be effectively integrated into or supported by the healthcare system.

Understanding how young people access Indigenous knowledge and holistic health paradigms to address climate-related mental health challenges.

Assessing how integrating Indigenous knowledge and holistic views of health into healthcare systems and interventions affects climate-related mental health outcomes.

*Sub-categories marked with an asterisk emerged during pre-dialogue scoping and not through the dialogues themselves. See “Further research priorities from pre-dialogue scoping” for more information.

Overview of themes for impacts, risks and vulnerable groups

Why were these themes chosen as priorities?

The priority research themes in this category offer a comprehensive exploration of the intricate relationship between climate change and mental health, shedding light on the extent of its impact and the specific vulnerabilities of various groups.

Educational disruptions

This theme investigates how disruptions in education and economic opportunities contribute to vulnerabilities in mental health.

“My country is currently experiencing excruciating impacts of climate change across society, and the environment is not conducive to learning. And it exacerbates existing mental health issues. As a student, it limits the possibilities, wellbeing, and educational capacity in the classroom.”

-Virtual dialogue

“When that drought happened in my community, most Ethiopians in school were dislocated from the school, whether from high school or whether from elementary, since they have lost the opportunity to get the basic need, food, house, and many needs to them to achieve, and continue to their learning.”

-Virtual dialogue

These participant responses shed light on the challenges students face amid environmental changes; impacts are not only felt in the classroom but also outside, hindering them from pursuing their education in the face of climate-induced disruptions, with consequences for their mental health and wellbeing.

Indigenous youth, climate and mental health*

Indigenous youths are particularly vulnerable to the impacts of climate change; they possess distinctive culture, language and social systems that often go unrecognised, which are accompanied by further socio-cultural and economic disadvantages.³⁶ Land and sea are key determinants of general health, psychological and cultural wellbeing for many Indigenous youth; threats due to climate change disrupt these unique determinants of health for young people in Indigenous communities.³⁷ due to their close

relationship with the environment and their often-marginalised socioeconomic status. This theme explores how environmental changes, such as loss of traditional lands, altered ecosystems and extreme weather events, can also act as mental health triggers. These impacts can include increased stress, anxiety, depression, and a sense of loss of cultural identity. Additionally, lack of resources and support systems within these Indigenous communities can exacerbate these mental health challenges.

Coastal Vulnerability

Residents in some coastal regions face annual floods due to their geographical location. The recurrent flooding not only affects livelihoods but also instils a sense of uncertainty, especially among young people who witness these events regularly.

“My village is in delta state. Almost every year, floods come because the village is in a coastal region and cover the entire village...People who live there and their livelihoods are affected. Young people witness all this and have a sense of helplessness...”

-Virtual dialogue

Comorbidities with poor mental health in the context of climate change (e.g., disability, chronic illness)*

Comorbidities, such as physical impairment, health issues and poor mental health, amplify the multifaceted and nuanced challenges faced by vulnerable groups. These interrelated factors create a compounding impact, exacerbating the vulnerabilities of individuals already grappling with health issues. The intersection of climate change and comorbidities sheds light on the complexity of coping mechanisms, access to resources and overall wellbeing, disproportionately affecting marginalised communities and people and underscoring the urgent need for targeted interventions and support systems.

Anxiety, depression and mood disturbance due to uncertain future outlook

In the dialogues, participants shared that the anticipation of future climate events, such as extreme weather, may induce fear, anxiety and uncertainty about the safety of homes and livelihoods.

“The victim of this negative climate impact are stressed mentally. Due to this stress they not value futures, they are disappointed about the futures, and decided to do suicide and [inaudible]. So, the future is not bright, it is black rather than bright, this is one negative impact.”

-Virtual dialogue

Taboo/stigmatisation of mental health in society

This theme examines the stigma and taboo that surround mental health issues. Insights from the dialogues demonstrated how these societal perceptions act as barriers, discouraging open discussions and inhibiting individuals, especially the youth, from seeking help or sharing their mental health concerns in the context of climate change.

“In our society, mental health is very stigmatised, and if ignored, becomes an even bigger problem. It is very encouraging as a young person to see there is focus on this topic, and that the situation will improve.”

-In-person (Port Harcourt)

“We need to stop that taboo that mental health is something that is, you're not just strong enough. Be a man and be a woman, face it or something. That's what they think that people would say to them. And that's what makes them vulnerable.”

-In-person (India)

Helplessness and government inaction

During pre-dialogue scoping and the dialogues themselves, frequent reference was made to the role of government inaction. The concept of 'moral injury' and 'betrayal' have been explored before in the realm of climate and mental health research, specifically with youth, wherein young people feel failed or left behind by people in power.⁴ The role of government inaction in contributing to poor mental health outcomes merits further investigation.

Conversely, some young people described how seeing the government provide no support for their communities in times of need spurred them into taking matters into their own hands and taking collective action.

"Why does our heart break? I think that feeling of 'no one is getting it and the government is doing everything opposite.'"

-In-person (India)

"...hearing stories on the news gave me a gradually growing push for action. Friends in Nigeria were regularly hit with disasters while the government refused to act, people becoming scared to leave their homes."

-Virtual dialogue

Disruptive events and trauma

This theme delves into the immediate consequences of climate-induced events on mental health.

"...we had a very bad flooding in previous years, we were at our home, and suddenly we found on the news that there is a flood coming into our homes, into our towns... there was, like, three to four feet of water in the city. We had to leave our houses, whatever, the property, each and everything, to leave our house and go to some other places. So, that experience, for me and for the other people, was very catastrophic, because we didn't have anything to do."

-Virtual dialogue

"I know a young man who has mental health issues. He started having nightmares after the floods, and after one year still now life is miserable for him. He feels as though the flood is coming right away and he has no control."

-Virtual dialogue

These participants detailed how first-hand experiences of disasters, such as floods, that can manifest in or worsen mental health challenges, leading to loss of agency, emotional distress and a range of negative emotions. Additionally, we can sometimes see a ripple effect of these events on the mental health of young people, considering their empathetic responses to the experiences of their peers and the wider community.

Indirectly disruptive events and trauma

Due to their propensity for empathy and social interaction and their inclination to look to their communities for cues, young people are highly responsive to the experiences of their peers.³⁸

"Hearing about friends being regularly hit with disasters and hearing stories on the news gave me a gradually growing push for action. Friends in Nigeria were regularly hit with disasters while the government refused to act, and people became scared to leave their homes."

-Virtual dialogue

Overview of themes for pathways and mechanisms

Why were these themes chosen as priorities?

These themes were chosen as priorities due to their critical relevance in understanding the ways and mechanisms with which climate change and mental health intersect as challenges for young people thriving.

Exacerbation of existing mental health challenges

Dialogues surfaced the need to explore the pathways and mechanisms by which climate change can exacerbate pre-existing mental health issues. This includes how environmental changes may influence conditions such as depression, anxiety and a pervasive sense of hopelessness.

“Climate change impacts them a lot. Plus, if you already feel depressed and hopeless, and then see the impacts of climate change on your home or the people you care about, you can become more hopeless and depressed”

-Virtual dialogue

Understanding the interplay between climate change and existing mental health challenges will provide insights into more effective intervention strategies.

Disruption of daily life and economic impact

This theme references the broader repercussions of climate change to understand how it disrupts daily life and creates economic challenges. These may act as potential pathways and mechanisms through which mental health challenges arise or are worsened.

“Sometimes when you wake up to go to work, you’re faced with very heavy rainfall. A very heavy rainfall that you just have to sit and be looking blankly in your house, not doing anything.”

-Virtual dialogue

Cultural and social fragmentation and acculturation*

The disruption of cultural norms, social structures and community bonds often lead to a sense of disruption, leaving young people psychologically affected. Additionally, the process of acculturation, where younger generations adapt to new environmental conditions, can induce stress and identity struggles, further impacting mental wellbeing and developmental stages.

The onset of heat-related mental health challenges and symptoms, such as stress headaches, depression, suicidal ideation and mood dysregulation

Participants described how heat can contribute to the onset of symptoms, such as headaches, depression, suicidal ideation and mood dysregulation. Further research on the specific physical outcomes of extreme heat and how these might contribute to mental health issues should be investigated specifically for young people, who may be particularly vulnerable.

“It has been the most stressful thing to observe how the, not just the air, the visibility, how we are living in the city in the [hot] later months of the year. So, even my friends who I’ve asked, my family members, they don’t feel comfortable going out, it causes severe headaches, and have caused us a lot of stress just in general.”

-Virtual dialogue

Disproportionate impact on women and girls

Recognising that women and girls are vulnerable to climate impacts, this theme focuses on the specific impacts of climate change on mental health for women and girls ([Awiti for the IDHi, 2022](#)). By addressing the unique challenges faced by women and girls in the face of environmental disruptions, the research aims to inform gender-sensitive interventions and policies. *“Mothering a newborn baby and forest fires raging during this period. I have been in forest fires before but being with my baby in it gave me so much fear.”*

Forced migration due to environmental disasters

Climate change-induced environmental disasters, such as floods, mudslides and others, have led to forced relocations. Individuals and communities are compelled to move to safer areas as a direct consequence of the impact of these disasters on their homes and living conditions.

“In Sierra Leone, we had a mudslide during August, and it impacted the lives of people, more especially the young people. And greatly, when it come to their emotions, their stress, because we lost almost over 300 houses due to the mudslide.”

-Virtual dialogue

Pollution and health concerns

In urban settings, individuals describe the escalating impact of air pollution on mental health. Changes in temperature, increased pollution and the associated health issues contribute to stress and anxiety. The disparities in access to clean air, illustrated by the contrast between privileged and underprivileged communities, highlight the urgent need for evidence-informed, equitable environmental policies.

“...in Lima, the capital of Peru, the increase in air pollution due to traffic and industrialisation has led to serious mental health problems. Continuous exposure to air pollution has also been associated with higher rates of psychiatric disorders, such as anxiety and depression.”

-Virtual dialogue

“I’ve always lived in a city, and the nation’s capital in fact, and I’ve seen things changing in front of me. When I was a child, the temperatures, and the winters used to be different than now, the months have shifted. The pollution has increased 20x, 30x, I’ve never seen anything like that before. And especially since [the] past ten years, since the policies changed in and around Haryana and Punjab, regarding farmers burning their post-harvest leftovers. It has been the most stressful thing to observe how the, not just the air, the visibility, how we are living in the city in the later months of the year. So, even my friends who I’ve asked, my family members, they don’t feel comfortable going out, it causes severe headaches, and have caused us a lot of stress just in general. And we are privileged, we live in societies, and we still have to buy some kind of air filter, which cost at least ten to Rs15,000, which is a lot for someone who is living in just... If I live in a society, right across the road there are slums, these kutcha houses, where our domestic workers come from. They don’t have any accessibility to clean air. And it is so disheartening to see that, they are falling sick left, right and centre. And so are we, even if we have air filters, even if we use mask, it does not do anything. We are smoking 20 cigarettes a day just with the air.”

-Virtual dialogue

Disruption of access to healthcare and mental health services

The lack of availability and accessibility of healthcare services in underserved communities is exacerbated by changes in climate leading to disruptions in the provision of basic services. Extreme weather events such as floods or wildfires, can damage healthcare infrastructure and disrupt the delivery of essential services. This can result in delayed or inadequate treatment for mental health conditions, exacerbating existing challenges and creating new ones.

Intergenerational understanding*

Pre-dialogue scoping and dialogue participants identified the importance of older generations, including teachers, parents and employers, as an enabler of sustained climate action in communities.

Exposure to violence*

Climate change-related events, such as natural disasters and resource scarcity, can increase the risk of exposure to violence. Displacement, competition for resources and social unrest in the wake of environmental changes can lead to heightened tensions and conflicts, which in turn may impact mental health and wellbeing.^{39, 40} Those who have been exposed to violence might experience trauma, anxiety, PTSD and other mental health issues as a result.⁴¹

Overview of themes for *mental health benefits of climate action* (*adaptation and mitigation*)

Why were these themes chosen as priorities?

Strengthened hope and action

Participants highlight the significance of peer support networks formed by individuals who have undergone similar climate-related experiences. These networks serve as crucial support systems and as possibilities of hope, allowing young people to share their challenges, coping mechanisms and insights.

“Community and collaboration is necessary...Through collaborating with people, talking with peers, finding your safe space you can create your own agency and create positive action that doesn't just help your mental health but also helps your community and the world.”

-Virtual dialogue

Inclusion of youth in decision-making processes

Pre-dialogue scoping with Youth Ambassadors identified the benefits of including young people in healthcare and climate intervention decision-making processes at the local and community level. The participation of youth in creating healthcare systems that are resilient to climate impacts is essential and can contribute to increased agency, connectedness and awareness amongst young people.

“It is important to have those spaces for volunteering and internships; but the youth should also be involved at decision-making levels designing agendas and research. They should be involved to identify research priorities and bring youth perspectives on what should be prioritised; as well as offering suggestions for public policy. They should be in the room to make their voices heard. Yet, this also needs to come from adults and decision makers realising they need to provide this space for young people to even participate.”

-Virtual dialogue

Rest

Amidst the collective efforts to address environmental challenges, incorporating periods of rest allows individuals to recharge, reduce stress and foster overall wellbeing for themselves. Recognising the importance of balance, rest becomes a valuable practice, promoting mental resilience and sustaining the motivation needed for sustained climate action.

"...because of natural disasters, and growing concerns for our climate survival. I have [?] sleepless nights and overwhelming stress."

-Virtual dialogues

"I try to keep busy. I try to go to bed, get some sleep, eat some food and spend some time with people who make the world feel like it's a lot lovelier."

-Virtual dialogues

Activities and spaces that enable co-beneficial action

Participants highlighted the importance of exercise and outdoor activities for their mental health, specifically mentioning the challenge of limited spaces in the city.

"Just trying to enjoy the cool breeze, and then go and hike the mountains and hills, or rather, the hills, that's really what I really like to do whenever I'm stressed."

-Virtual dialogue

Pre-dialogue scoping research raised the importance of co-beneficial activities which may contribute to both encouraging positive and sustainable climate actions and fostering good mental health and wellbeing; for example, cycling, walking or taking public transport.²

Additionally, community gathering spaces such as sporting events, public parks and community activities were identified as important actors in youth support systems and should be leveraged to support sustainable and co-beneficial climate action for young people.

Education and awareness

Participants emphasised the importance of empowering young people through training and education on climate change and its effects on mental health. Building awareness about the causes and effects of climate change within communities is viewed as a crucial step in preparing for its impacts.

"Young people should be encouraged to be involved in advocacy, and a series of training, which is aimed at educating them on climate change and its effect on our mental health. They should know the causes and effects of climate change in their various communities."

-Virtual dialogue

"Researching and enlightening can be empowering. Knowing the weather forecast can help with planning. Feeling like you're on top of things and are aware can be empowering when it comes to [environmental changes]."

-Virtual dialogue

Overview of themes for mental health interventions/solutions in the context of climate change

Why were these themes chosen as priorities?

Strengthening of healthcare systems

Research is clear about the importance of constructing climate-resilient health systems, which include preparedness and response plans, vulnerability and adaptation assessments, health infrastructure,

trained healthcare workers and risk communication.⁴² Practitioners and policy makers often underestimate the breadth and severity of impacts that climate change can have on healthcare systems and the individuals that they support.⁴³ These challenges are also present in mental health systems, which must be prepared for the rise in mental health challenges that a changing climate may bring; specifically for young people, having suitable, appropriate outreach tools, accessible services and adequate infrastructure will be essential. Evidence is needed to identify existing and new interventions for youth and understand what young people need by way of robust and resilient healthcare systems.

Creating safe spaces/connecting with others

Participants emphasised the importance of establishing safe spaces for young people. These spaces serve as platforms for connection, volunteering, internships and active involvement in decision-making processes. Engaging with like-minded people helps combat feelings of isolation and fosters a sense of shared burden.

"[Name] also says, safe space, so creating safe space for young people to be able to be involved in research. And I think this means a lot of things, right? Safe spaces to be vulnerable about the issues. But also, more importantly, to just be honest about the things you don't know, how to collect data, how to write."

-Virtual dialogue

Climate-informed mental health training for practitioners

The dialogues made clear that young people want healthcare practitioners – and, in particular, therapists, psychiatrists and psychologists – to be aware of the shifting physical, social, economic and geopolitical environments that young people occupy. Of key importance is understanding the role that climate change plays in young peoples' conception of current and future threats, either directly or indirectly.

This may come in the form of training for therapists that is: sensitive to vicarious trauma and the emotions of young people, such as eco-anxiety; or addresses first-hand trauma of climate-related events, such as addressing post-traumatic stress disorder and shock.

"I think, definitely, a good therapist would go back and read about it, and come back with the knowledge, so that they can help you better. "

-Virtual dialogue

Religious, spiritual or faith-based interventions

The role of religious, spiritual and faith-based practices in young peoples' experiences of climate and mental health must be more thoroughly understood, both to recognise the role of these practices in contributing to young peoples' understanding of climate change and also to the systems of healing and resilience that they use to cope.

For example, one participant described being raised in a religious setting and feeling like when his community experienced natural disasters, it signalled the "end of the world". He also described an accompanying feeling of being "responsible" or "doing something wrong" to bring on these events.

Conversely, many participants described how religious, spiritual and faith-based communities provided sources of comfort, support and structure to them as they dealt with the mental health consequences of climate change. Understanding and resourcing traditional practices should be a priority when looking to strengthen healthcare systems.

Community-focused interventions

This theme underscores the necessity for interventions that are rooted in and tailored to specific communities. Rather than importing strategies from other places, participants called for a more localised approach that considers the unique needs, culture and context of the communities in question.

Indigenous knowledge and holistic health paradigms*

Indigenous communities possess invaluable traditional knowledge and holistic health paradigms. It is important to understand and honour how these can contribute towards climate mental health interventions. These knowledge systems often emphasise a holistic approach to health that highlights the interconnectedness of mental, physical and environmental wellbeing.⁴⁴ It is imperative to develop culturally relevant strategies that address the unique mental health needs of youth in Indigenous communities.

Further research priorities from pre-dialogue scoping

In the pre-scoping stages for the youth dialogues, several important research priorities pertaining to youth, climate and mental health were identified in the pre-scoping stages for the youth dialogues that were not mentioned in the dialogues themselves. These categories either emerged during landscape mapping as salient themes in the literature, from consultation with the research team who has experience working with young people in the context of climate, or from the pre-dialogue scoping survey that was administered before the dialogues were carried out. These categories are indicated with an asterisk in the priority research theme table.

There may be several reasons why these research priorities arose in the pre-dialogue scoping but did not crop up in the dialogues. Some of the topics may be sensitive or stigmatised, and thus young people did not feel comfortable sharing in the presence of peers or after developing only superficial relationships with the research project and the facilitators. Other priorities may not be well-suited to being explored in conversation with young people and may be better identified through observation or other forms of study; this may indicate why some of the emergent research priorities identified by looking at youth-relevant literature in the context of climate change and mental health did not surface during the dialogues. For some young people, the specific mechanisms through which their mental health is affected (or the support that helps them) may not be immediately obvious and therefore may not be mentioned within the dialogues. Finally, there may be information that young people do not *want* to share about their experiences, which may influence the breadth and scope of the research priorities generated. This is valid and is a part of maintaining the autonomy and dignity of the courageous young people who were kind enough to give time to the research project.

What are examples of methodologies, metrics and datasets that could be used to address these themes?

There are a variety of methodologies to address the priority research themes listed above. The implementation of these methods should be at the discretion of the responsible research teams and should be carried out under the advice of, and collaboration with, the young participants.

For understanding young peoples' emotional and psychological experiences of different events, semi-structured interviews are best, and where possible, should be done in peer settings and with safeguarding taken into account. Generally, research questions that seek to compare outcomes between interventions are best suited to randomised control trials (RCTs). For assessing the vulnerability of particular groups of young people, compiling risk profiles with special attention paid to historical and cultural context in the region may be suitable. For evidence- and intervention-gathering on specific topics (e.g., nature-based solutions), meta-analyses could be suitable, but only when supported by rigorous and robust review of 'grey literature' and other informal epistemological sources that may not make it into journals.

In each of these studies, it must be considered that there may be other influences on mental health that affect the mental health outcome of interest. Each of these other factors (e.g., familial context, epigenetic or genetic factors, conflict, economic hardship, racial or ethnic discrimination, colonialism) must be taken as potential confounders and potentially synergistic factors that contribute to the burden of climate change on the mental health of young people. They also may act as relevant pathways, or mediators along pathways, to be explored.

Action agenda

A desired state of climate change and mental health for young people

We envision a world where the health of our planet and the health of our minds and bodies are one. In this world, young people look towards their futures as places of opportunity, growth and connection. They can live, play and learn in landscapes and waterscapes that provide them with nourishment and education, instead of being sources of pollutants. The air they breathe fills their lungs with life-giving oxygen that fuels their curious minds and limbs. The things that bring them happiness and security are the same things that make the world around them a place of opportunity and safety: connectedness, friendships and family, a bond to nature, relationships with their neighbours (human, animal, plant and otherwise), ease of mobility, an understanding of their place in the world and community leaders who are their custodians.

When they look towards the future, they plan their families, adventures, jobs and activities; they don't dread a tomorrow that is uncertain and unpromised. When they experience difficulties with their mental health, their experiences are validated, listened to and met with compassion. Their trials are the mistakes and fumbles of youth, rather than the experience of growing old too quickly as they witness their lives and livelihoods destroyed before their eyes by climate events. When they are asked what they want to be when they grow up, a world of opportunity unfurls in front of them.

We envision a world where young people don't worry about what they've done wrong to deserve natural disasters; where they go to school hand-in-hand with their friends, instead of staying at home to help their parents piece their lives back together after floods. When issues arise, they take action in local ways, and their voices are heard by leaders who recognise them as the architects of the next tomorrow. Healthcare services exist to affirm, validate and serve their vision of health. For many youth, the natural world is their best friend and greatest teacher. They learn ways of being from older generations, drawing on the wisdom of the land and of the people who have come before them. These older generations are trusting, considerate and patient, looking to younger people to learn new ways of navigating a changing world. In this world, young people find solace in community-centred spaces that safeguard their mental and physical health and speak to one another about their hopes, fears and dreams.

This world exists and is within our reach.

Creating an enabling environment for research at the intersection of climate change and mental health, and translating evidence into action in policy and practice

The identified research priorities will only be of value if they are enacted. The climate and mental health field is relatively new and rapidly growing, and now is the time to ensure that it is designed to deliver a mentally healthier future in the context of the climate crisis. In a field that spans multiple disciplines and

sectors, each with different cultures and ways of working, and on a topic with low awareness in many countries, what is needed to support capacity-building efforts? What principles must guide the field, and what are the challenges and opportunities to create an environment that would enable such research? And in such a field, how are the voices of those who have been historically excluded validated, understood and cared for?

Furthermore, the research environment is only as effective as the action it facilitates. The research agenda outlined here must be implemented through engagement with partners in practice and in policy, to bridge the gap between those experiencing the real-time impact of climate change and the solutions that are within our reach.

This section presents a synthesis of the challenges, opportunities, partners and next steps to:

- Implement the research agenda and foster an enabling research environment for climate change and mental health, and
- Translate evidence generated through research into policy and practice.

The scope of this research agenda, and the need for further research

Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book. It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged. It was popularised in the 1960s with the release of Letraset sheets containing Lorem Ipsum passages, and more recently with desktop publishing software like Aldus PageMaker including versions of Lorem Ipsum.

Challenges holding back research and evidence translation

Several barriers appear to hinder progress in furthering research on climate change and the mental health of young people and in creating and implementing appropriate solutions in policy and practice. These issues – listed below – are further compounded by bureaucratic bottlenecks and other multisectoral laxity in perceiving, identifying and bringing these issues to the forefront to drive meaningful change. Addressing these barriers is crucial for advancing research and action in this important area.

- **Youth underrepresentation:** The insufficient engagement of young people as co-creators, contributors or actors in research, policy and intervention systems has led to their perspectives and experiences being overlooked, leading to a disconnect between their needs and proposed solutions.
- **Youth tokenism:** Tokenistic approaches, which involve superficially including young people in initiatives without genuinely valuing their contributions or giving them a meaningful stake in decision-making processes, can lead to a lack of genuine youth perspectives and insights being considered in the development of interventions and policies. Meaningful youth engagement, particularly in the realm of policy advocacy, requires young people to have a deep understanding of the issues for which they are advocating.

- **Existing (structural) inequalities/power dynamics:** Power dynamics and structural barriers within institutions and systems can limit the inclusion of youth (particularly those who are marginalised) in research and policy discussions, perpetuating inequalities in the response to youth climate mental health challenges.
- **Language/communication barriers:** The use of complex clinical language in climate-related mental health discourse creates a barrier for young people, often leading to feelings of stigmatisation and a lack of grounding in lived realities. Simplifying language to resonate more with young people's experiences is key for effective communication and engagement.
- **Lack of intersectionality and recognition of potential mediating and/or confounding factors:** Young people from different socioeconomic positions, races, ethnicities, genders, sexes, sexualities and disabled communities have different experiences of youth, climate and mental health. The implementation of research and its subsequent translation into policy and action must actively acknowledge and validate these intersectional identities so that any steps taken do not uphold or exacerbate existing harmful paradigms.

Opportunities and enablers

- **Co-production with young people:** Young people must be meaningfully engaged as co-creators of research, support and interventions that will ultimately serve them. Any truly impactful and sustainable means of advancing the agenda for a climate-resilient future for young people requires their buy-in at every step, starting with deep listening to their needs and continuing with participatory means of creating research and interventions for youth mental health. Practitioners and researchers should see young people as lived experience experts.
- **Leveraging existing social structures and groups to provide mental health and psychosocial support for young people in the climate crisis:** Faith-based groups, sports teams, educational spaces and cultural practices should all be recognised as legitimate and essential forms of psychosocial support. Special attention should be paid to using language and terminology that resonates with young people, instead of ascribing dense clinical paradigms to their experiences, which may both stigmatise them and discourage them from seeking help.

Relevant potential partners

- **Youth organisations,** spanning local partners, grassroots organisations at a subnational level and crosscutting global initiatives.
- **Educational institutions.**
- **Religious, spiritual or faith-based organisations.**
- **Local healthcare systems and staff,** including psychologists and psychiatrists.
- Those with **Indigenous and traditional** views of understanding health, healing and trauma.

Priority next steps and recommendations to investors and actors

Below is a summary of key actions and priority next steps to implement the research agenda and to translate evidence generated through research into policy and practice.

1. Increase investment in climate-mental health services for youth.

Policymakers and investors need to prioritise evidence-based climate-related mental health services and expand the scope of the research as well as access to services in this area. This will uncover gaps and enhance our understanding of the nuanced mental health impacts from climate change while also ensuring robust climate change and mental health support systems are in place.

2. Integrate mental health assessments into climate impact assessments.

Integrating mental health assessments into climate impact assessment ensures a comprehensive understanding of the psychological implications of climate change, enabling more informed decision-making and targeted interventions.

3. Develop climate-aware programs for therapists, counsellors and other medical professionals (i.e., promoting climate education).

There are often insufficient numbers of climate-aware therapists, counsellors and medical professionals to support communities experiencing climate disasters. Expanding the development of specialised programs to equip mental health professionals, medical professionals, therapists and counsellors with climate-awareness training would provide holistic management of the impacts. Promoting climate education within the health space to enhance their capacity may help to address eco-anxiety and climate-related stressors.

4. Advocate for youth-inclusive policymaking.

This project highlighted young people's overwhelming interest in and connection to climate change and mental health. Policymakers should be aware of internalised biases and stereotypes (such as casting young people as naïve, foolish, brash or idealistic) that may lead them to exclude young people from decision-making spaces. Specific recommendations may include youth representation in policy roundtables, panels for discussion and focus groups.

Discussion: strengths, limitations and next steps for the research and action agenda

This research agenda does not purport to speak on behalf of all young people, nor does it purport to cover the entire scope of the relationship between climate change and mental health. It should be seen as a comprehensive starting point for further research. The research themes here are limited by the research team's ability to reach different groups and lived experiences and is also subject to the positionality of the researchers, the priorities of the funders, the resources available to find, access and compensate contributors, and the time allocated.

Furthermore, there were themes identified in the pre-dialogue scoping that were not supported by evidence or material in the dialogues themselves. However, this does not mean that these themes are not worthy of exploration; for example, there was no evidence generated about the experience of young women and girls' mental health in the context of climate change. This does not mean that this is not something worthy of further research, but rather that the participants or methods did not lend themselves to discussing this particular topic.

Strengths

This research has surfaced needs and experiences not previously captured in the literature, offering fresh perspectives on the pathways through which climate change is associated with youth mental health. This has been achieved through the engagement of a diverse array of experts, both in terms of disciplinary backgrounds, lived experiences and geographic locations. The landscape mapping done at the beginning of the project provided an evidence-based grounding for the establishment of priority areas of research. Youth ambassadors also provided input to influence the framing and content of the final agenda. The cross-geographical knowledge sharing and experiences have contributed significantly to a more comprehensive understanding of the complex interplay between climate change and mental health. Young people facilitated the dialogue, creating a peer-to-peer setting that encouraged more open sharing for participants and thus richer insights.

This agenda's strengths are all firmly rooted in its deep trust for the experiences of young people; we allowed the contributors to guide the flow and direction of the dialogue. Although subcategories for analysis were outlined *a priori*, these did not influence the questions posed in the dialogues themselves. Another commendable aspect of this research and action agenda is the meaningful inclusion of young people with lived experiences. This approach has not only brought authenticity and relevance to the research at hand but has also set new standards in how lived experiences are integrated into research and intervention design. This important aspect sought to ensure that the research outcomes are grounded in the realities of those most affected. Furthermore, the project has facilitated awareness among various stakeholders about the climate-mental health nexus, serving as a platform for capacity building and offering opportunities for personal and professional growth among participants.

Finally, a strength of this agenda is the inclusion of important process-related learnings. Not only does it present priority research themes in the area of youth, climate and mental health, but it also describes the process of generating these research priorities through novel approaches to lived experience inclusion, and the barriers and opportunities encountered. This makes the agenda a far more powerful tool for researchers looking to advance research and action for young people's mental health in the context of climate change.

Limitations

Despite these strengths, the research agenda has a number of limitations. The field is rapidly evolving and thus necessitates a quick response in developing a research agenda. However, this urgency often comes at the cost of building deep, trust-based relationships, particularly with groups that have historically been marginalised in research. For example, young people were only engaged in dialogue as a once-off; if there had been time to build longer-term relationships with the participants, insights from the dialogues may have been more robust. Another significant limitation is the reliance on virtual platforms for research and collaboration; while inclusive in theory, this has inadvertently excluded participants with limited access to technology, highlighting a significant digital divide, even taking into consideration the steps that were taken to overcome these limitations, such as the in-person dialogues. This challenge is compounded by the complexities involved in establishing new processes, especially in global data sharing and ethics. These new processes, while a breakthrough in many ways, also reveal the intricacies of creating frameworks that are universally applicable yet sensitive to local contexts and needs. The challenges this work seeks to overcome are substantial. While the project may have seen relevant expertise there is a need to bridge this gap and strike that balance between both fields by leveraging existing knowledge and collaborating with experts.

The breadth and scope of the data gathered for this agenda is limited by its focus on young people's subjective experiences. While this is also a strength in that it centred the lived experience of young people, it meant that the perspectives of other important actors and stakeholders – parents, educators, healthcare practitioners, community leaders, faith leaders and others – are notably absent.

Another limitation which must be mentioned is that there may be stories or information that young people do not *want* to share about their experiences. This may influence the breadth and scope of the research priorities generated. This is a limitation that is inherent to working with lived experience, and freedom to not contribute is a part of maintaining the autonomy and dignity of the young people who participated in the dialogues.

One of the most important limitations that should be taken into consideration for future research is the need to further explore intersectionality in the context of youth, climate and mental health. Of notable absence in the priority research table is the experiences of disabled youth in the context of climate and mental health. This is an inherent limitation to this research and action agenda, and reflects a limitation more broadly in the climate and mental health space. For instance, we could not identify any studies that have explicitly examined the link between climate change and mental health in ethnic minority groups or sought to investigate how this affects youth in particular. This research and action agenda surfaced the need to understand these complex and intersectional factors as potential mediators or pathways for climate change to impact mental health.

Next steps

It is imperative to address the limitations outlined above and to build upon the strengths of this agenda, as the field of climate change and mental health research stands at a critical juncture. There is a clear need to move towards more inclusive, integrated, technologically accessible research methodologies. This effort should ensure that the voices of these groups are not just heard but are integral to decision-making processes. By doing so, the field can continue to evolve and make impactful contributions to both science and society, thereby enhancing our understanding and ability to respond effectively to the challenges at the intersection of climate change and mental health.

Conclusion

This research and action agenda is a response to the urgent need to streamline, expedite and unite the generation and sharing of knowledge at the intersection of youth, climate change and mental health. Young people are uniquely vulnerable to the consequences of climate disasters, and they also face unique challenges in the field of mental health; these two threats to good health and wellbeing interact through a series of complex pathways. Young people's experience of 'climate change and mental health' is not simply an aggregation of the two categories, but rather, it is their lived and embodied experiences of growing up in a rapidly changing world.

Equally, young people are some of the most powerful advocates in climate change and mental health spaces. They exercise unique forms of resistance, build bridges in their communities and rise to the challenges of leadership that will be required in an uncertain future. When given the opportunity and resources, their energy and wisdom are a powerful guide towards interventions and solutions to climate and mental health challenges.

This agenda identifies that there is much work to be done, but also much to be gained. We need to: better understand and quantify the magnitude of the association between climate change and mental health problems; identify and safeguard those particularly vulnerable to the effects of climate-induced mental health challenges; tailor and expand existing effective interventions; and design new evidence-based interventions to address the mental health impacts of climate change. Researchers, funders, policymakers and others in positions of power must prioritise the tangible realities of people living through these crises and lend credence to the solutions being championed by communities on the front lines. Underrepresented voices should be not only represented in decision-making in policy, research and healthcare; they should be actively sought out and elevated.

This research and action agenda presents a starting point for exploring the complex experiences of young people and should be taken as a call to action to prioritise the right of young people to survive and thrive in a just future.

In the voices of young people: hearing from the contributors to this work

This section showcases the invaluable insights and perspectives shared by our youth force who played instrumental roles in the success of our youth dialogue. These incredible youths served as contributors, notetakers, facilitators and researchers, impressively contributing their experiences, thoughts and emotions throughout the project. To provide a glimpse into their remarkable contributions, we have handpicked a select few to share their valuable opinions and reflections.

1. Hope Lekwa

Researcher

What motivated you to contribute to this work?

"Being in this space has allowed me to see and understand how climate change impacts beyond what the eyes can see, reaching depth emotionally and psychologically, and destabilising the potentials of people, especially the younger generation. And it's been a privilege to work with other amazing young people against this tide."

Were there specific moments or discussions during the dialogues that stood out for you?

"Moments that remain with me were time were the stories that were shared in the physical dialogues, that brought us lots of emotions, I remember a participant narrating the experience locale in a soot-impacted community. He narrated how a woman's health had been severely deteriorated by constant inhalation of the soot to the extent that the implications were visible. Listening to that story built a lot of emotions in me and also crystallised what systemic ignorance and neglect can look like."

2. Favour Ezedike

Facilitator

What motivated you to contribute to this work?

"I am enthusiastic about things related to climate change."

Were there specific moments or discussions during the dialogues that stood out for you?

"Yes, learning that several others close to my age (from different parts of the world) had also come to the same conclusion on some important life decisions [because of climate change] such as living child-free."

3. Tamaraebi Olobio - United Kingdom

Facilitator

What motivated you to contribute to this work?

"I am enthusiastic about things related to climate change."

Were there specific moments or discussions during the dialogues that stood out for you?

“Yes, one of the contributors narrated how he lost a lot of money millions due to flooding another person enlightened us on ghost fishing and another person a journalist described how the interviews they do with people in the affected areas take a toll on her mental health.”

4. Sacha Wright

Researcher

What motivated you to contribute to this work?

“The issue of climate change and mental health cuts to the very core of what it means to be a young person world today; understanding how our wellbeing is inextricably linked to the wellbeing of our planet. As a young person, it is easy to often feel powerless in the changing world around us. However, working in this field has allowed me to see that climate change and mental health doesn’t just reveal the vulnerabilities of young people, but also open the door to the incredible resilience, energy and expertise that youth can bring. I wanted to contribute to this work to bring voice to the lived experience of young people around the world so that we can come together and imagine a radically better and more compassionate future.”

Were there specific moments or discussions during the dialogues that stood out for you?

“The entire process of the dialogues was incredibly powerful, moving and emotional. At one point, one of the contributors was describing the effects of changing weather patterns on his mental health. He turned his camera on and showed us that he was standing on his kitchen island, and that his house around him was filled with waist-high, rushing, cold water due to floods. In that moment, it became so clear why it is important to discuss how events like this affect people, especially youth in vulnerable settings.”

Who produced this report

This report is the result of a collaborative and dedicated effort by the combined teams of SustyVibes and Force of Nature. The team, driven by a shared commitment to advancing knowledge and understanding in the realms of climate change and mental health, worked collectively to bring forth valuable insights and perspectives. Through the synergy of these two teams, each contributing expertise and perspectives, the report embodies a rich synthesis of ideas, research, and practical approaches. This joint endeavour underscores the strength that emerges when diverse talents and passions converge toward a common goal, highlighting a united commitment to fostering positive change in the intersecting domains of climate and mental health.

Authorship team

Sacha Wright, Research and Curriculum Coordinator, Force of Nature

Sacha is the Research and Curriculum Coordinator at Force of Nature, a social enterprise that exists to mobilise young people to tackle the world's messiest problems - starting with their mental health. She holds a Master's Degree in Public Health from the London School of Hygiene and Tropical Medicine. All of her work centres around studying the confluence of social, biological and environmental factors that contribute to the wellbeing of life on Earth.

Hope Lekwa, Head of Research, SustyVibes

Hope Lekwa is a sustainability researcher, with research publications in international peer-reviewed journals. He currently serves as the Head of Research at SustyVibes and has a background in International Relations. Lekwa passionately engages in the critical intersections of climate change, youth, and mental health. Hope's active involvement in the sustainability space reflects his commitment to addressing pressing challenges through research and advocacy.

Jennifer Uchendu, Founder SustyVibes

Jennifer Uchendu is the founder of SustyVibes, a youth-led and youth-focused organisation driving sustainability advocacy and implementation in Africa. Recently, her work has focused on climate change and mental health where she is exploring safeguarding and support systems for Africans through research, advocacy and community action. Jennifer has a master's degree in Development Studies from the Institute of Development Studies, UK under the prestigious Chevening Scholarship. She is also an alumnus of the Cambridge Institute For Sustainability Leadership and the Lagos Business School. In 2017, Jennifer co-authored the e-book: "A Guide to Business Sustainability in Nigeria."

Svetlana Chigozie Onye-Sanya, Project Lead, The Eco-anxiety Africa Project

Svetlana is a writer and researcher who focuses on environmental justice, ecofeminism, and the impact of colonialism on societal structures. She also explores the historical causes of global environmental disparities. Recently, her research on the environmental and human consequences of green colonialism in countries experiencing conflict was published. As the Project Lead of The Eco-Anxiety Africa Project, she examines the connections between climate change and mental health in Africa.

Ayomide Olude, Project Manager, The Eco-anxiety Africa Project

Ayomide is a sustainability project manager with over three years of experience with nonprofits. She works with environmental-focused social enterprises to develop and deliver data-driven impact projects aligned with sustainable development goals. Ayomide is interested in the intersections between environment and mental wellbeing, especially for Africans. She currently explores this intersection through her work at The Eco-anxiety Africa Project.

Molly Ogbodum, Researcher, SustyVibes

Molly has a multidisciplinary background in Public Health, Mental Health, Research, Communications and community development with research publications in international peer-reviewed journals as well as presentations in scientific conferences. Molly is currently a Climate Justice advocate where she seeks to understand & establish the nexus between climate change and mental health among vulnerable populations. Her aspirations include continued advocacy & increased access to mental health services for Young People, and collaboration with researchers and other experts to advance the field of mental health.

This is the independent work of the authors with the support and input of the Connecting Climate Minds team.

Acknowledgements

We would like to acknowledge the incredible team of co-authors and contributors who made this work possible. In light of the frequent homogenisation of youth identities, we recognise that it will never be possible to represent the ‘youth perspective’ on something as vast and multi-faceted as climate change and mental health. Rather, we set out to establish research methods to deeply understand the impact of climate on the mental health of young people: not with the view to exploit their experiences, but to validate and amplify their lived experience as a means of advocacy. We hope that this can lay the groundwork for meaningful engagement with young people in research that centres on the value that they can derive from contributing to research, rather than simply the value that research can derive from them.

We extend our heartfelt gratitude to the vibrant and resilient force of young individuals whose voices have shaped and enriched the Youth Research Agenda. Your unwavering commitment to sharing your experiences, insights, and aspirations has been the driving force behind this comprehensive agenda. We also express our appreciation to the Core Team, Lived Experience Working Group team members, youth dialogue facilitators, and notetakers who played instrumental roles in conducting the youth dialogues and contributing to the thematic analysis. Additionally, our sincere thanks go to the funders of this global project who recognise the significance of addressing the intersection of climate change and mental health especially among the youth. Together, we have created a foundation for meaningful research, advocacy, and action that empowers the younger generation in the face of environmental challenges. Your collective efforts are invaluable, and we look forward to the continued collaboration in advancing the understanding and support for youth mental health in the context of a changing climate.

Funding

This report was funded by Wellcome.

Conflicts of interest

The authors declare no conflict of interest.

Glossary

For a glossary describing relevant concepts and key words for the Connecting Climate Minds research and action agendas, please download from [here](#).

Suggested citation: Wright, S., Lekwa, H., Uchendu, J., Onye-Sanya, S. C., Olude, A., Ogbodum, M., Ojukwu, E. A., Thompson, D., Connecting Climate Minds Global Methods Group, Lawrance, E. L. Connecting Climate Minds Climate Change and Mental Health Research and Action Agenda for Young People. Full agenda. Connecting Climate Minds. 2024. doi.org/10.25561/115891

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Appendices

Appendix 1: Breakout room questions from dialogues

Discussions were guided by the facilitators, and structured loosely around the following questions:

Global virtual dialogue

Breakout 1:

1. If you have experienced direct impacts of climate change, how have these experiences impacted your mental health?
2. To what extent do you feel that climate change can impact young people who already have mental health issues?

Breakout 2:

1. How can young people be meaningfully involved in climate and mental health Research?
2. If you have been involved in related research on climate change or /and mental health - how was the experience? What worked or did not work?

Breakout 3:

1. How do you maintain positive mental health as a young person? (Coping mechanisms, outlets, support systems etc.)
2. Does the above also help with climate-related mental health impacts?
3. What else do you feel might support you?

Physical dialogue questions

Breakout 1:

1. What environmental issues have you noticed in your community/region?
2. How have these environmental issues in your community, impacted your mental wellbeing, and are there specific vulnerabilities and stressors that stand out?

Breakout 2:

1. Have you been involved in related research on climate change or/and mental health - how was the experience? What worked or did not work?
2. How can young people be meaningfully involved in climate and mental health research?

Appendix 2: Coding frameworks for the research and action agenda

1. Coding framework for research agenda

Research Category	Sub-categories
<p>1. Impacts, risks and vulnerable groups</p> <p>This category is about improving our understanding of the ways in which mental health is affected by climate change. For example, what mental health outcomes are impacted or at risk, the prevalence, severity, economic and societal cost of these impacts, and who is more vulnerable to these impacts.</p> <p>This category also includes the ways we can go about getting this improved understanding of mental health impacts of climate change - the methods and metrics we need to assess and monitor mental health in ways that are relevant to climate change, contextually appropriate, comparable etc.</p>	<p><u>Cross cutting considerations to keep in mind for all sub-categories:</u></p> <p>Timeframe</p> <p>Geographical variation</p>
	<p>1.1. Research that focuses on the prevalence, severity and nature of the experience of different mental health outcomes/challenges/experiences affected by different aspects of climate change. This may include research to understand the emergence of climate-specific mental health experiences and their relationship to already defined mental health challenges.</p>
	<p>1.2. Quantifying the fraction of mental health burden (including mortality) caused by climate change.</p>
	<p>1.3. Understanding the risk factors to mental health that are caused or affected by climate change as well as protective factors.</p>
	<p>1.4. Identifying population sub-groups (e.g. demographics, livelihoods, life stage, pre-existing mental health challenges) who experience increased vulnerability to mental health challenges caused by climate change, and conversely those experiencing resilience to these effects (i.e. vulnerable groups).</p>
	<p>1.5. Quantifying the cost (e.g. economic, social) of the additional mental health burden caused by climate change and insufficient climate action.</p>
	<p>1.6. Methods research to identify the most appropriate ways to assess and monitor the mental health impacts of climate</p>

	<p>change [including adapting pre-existing scales, creating new ones, determining appropriate mental health metrics and indicators for inclusion in global processes like Lancet Countdown]. This can also include the need for cross-cultural validation and development of culturally appropriate metrics.</p>
<p>2. Pathways and mechanisms</p> <p>This category is about improving our understanding of <i>how</i> mental health is affected by climate change.</p> <p>We are interested in research themes that can help identify, categorise and understand the range of ways that climate change or climate action may act to affect mental health. This can include considering pathways and mechanisms that are biological, psychological, societal or environmental in nature, and may be direct or indirect.</p> <p>Note that mechanisms can include mechanisms to the development, maintenance, and/or resolution of mental challenges, so this includes also mechanisms relevant to guide development or understand workings of interventions</p>	<p><u>Cross cutting considerations to keep in mind for all sub-categories:</u></p> <p><i>What factors are linked with increased vulnerability or increased resilience for the associated mental health outcomes.</i></p>
	<p>2.1. Categorising and understanding the societal mechanisms by which climate change negatively impacts mental health [e.g. changes to livelihoods, disruption to cultural practices, food and water insecurity, forced migration, political factors]</p>
	<p>2.2. Categorising and understanding the environmental mechanisms by which climate change negatively impacts mental health [e.g. air pollution, reduced exposure to biodiversity]</p>
	<p>2.3. Categorising and understanding the psychological mechanisms by which climate change negatively impacts mental health [e.g. how temperature affects cognitive changes relevant to symptoms of mental health challenges].</p>
	<p>2.4. Categorising and understanding the biological mechanisms by which climate change negatively impacts mental health [e.g. impacts of psychotropic medication on thermoregulation, neurodevelopmental factors].</p>
	<p>2.5. Understanding mechanisms whereby climate action or mental health interventions benefit climate and mental health (i.e. co-beneficial mechanism).</p>
	<p>2.6. Methods research to identify the most appropriate ways to assess and monitor pathways and mechanisms by which climate change negatively impacts mental health and wellbeing (e.g. systems mapping across disciplines)</p>
<p>3. Mental health benefits</p>	<p>3.1. Identifying climate actions that integrate or align with mental health benefits [co-beneficial climate actions, e.g.</p>

<p>of climate action [adaptation and mitigation]</p> <p>This category is about how climate adaptation and mitigation actions, across sectors, can also have win-win benefits for mental health. This includes quantifying costs and benefits of climate action for mental health, understanding what is needed to support better alignment between climate action and mental health action, and identifying where this integration is already happening across strategies and policies.</p>	<p>increased tree cover in cities]</p> <p>3.2. Quantifying co-benefits of climate action for mental health (including number of people experiencing the benefit, size of effect, economic considerations).</p> <p>3.3. Exploring how the mental health costs and benefits of climate action may differ across population sub-groups (e.g. demographics, livelihoods, life stage)</p> <p>3.4. Understanding the governance structures/decision support tools that enables alignment of action for climate change and for mental health across sectors</p> <p>3.5. Mapping and monitoring the integration of mental health within adaptation and mitigation policies across sectors [e.g. National Adaptation Plans, energy, transport, food, water, agriculture]</p> <p>3.6. Exploring opportunities for mental health to be integrated into other climate priority areas i.e. loss and damage and climate finance.</p> <p>3.7. Determining best approaches for climate action (e.g. emissions reductions or climate adaptation) within the mental health sector (ensuring psychiatric facilities can be kept cool in heat waves; green space projects in mental healthcare facilities)</p> <p>3.8. Methods research to identify the most appropriate ways to assess and monitor mental health benefits of climate action [e.g. place-based approaches, methods for attributing and quantifying co-benefits, methods for assessment of the mental health implications of decisions in other sectors]</p>
<p>4. Mental health interventions/solutions in the context of climate change</p> <p>This category is about identifying the most effective mental health</p>	<p><u>Cross cutting considerations to keep in mind for all sub-categories:</u></p> <p>LEVEL (e.g.)</p> <p>Individual, Family, Community, Systems</p> <p>MECHANISM (e.g.)</p>

<p>interventions/solutions to support mental health in the context of climate change.</p> <p>This might be about providing support to people already experiencing negative mental health impacts, or about reducing risk or severity of future negative mental health impacts. This includes learning from knowledge held by different disciplines, communities and cultures, understanding how existing mental health interventions are affected by climate change, identifying and evaluating existing interventions that are relevant to the context of climate change, and developing new interventions. Interventions are relevant at all levels (individual, family, community, systems) and across sectors.</p>	<p><i>Biological, Psychological, Social, Environmental</i></p> <p><i>SECTOR (e.g.)</i></p> <p><i>Education, Healthcare, Public Health</i></p> <p><i>Effectiveness considerations include impacts across different population groups, and implementation considerations might include providers, cost and time.</i></p> <p>4.1. Understanding different ways of knowing, being and doing in different cultures and communities that can build individual, community and ecological resilience</p> <p>4.2. Understanding how existing mental health interventions are affected by climate change</p> <p>4.3. Identifying and evaluating mental health interventions that are already designed for or relevant to the context of climate change and/or integrate climate change considerations</p> <p>4.4 Amending, implementing and evaluating relevant mental health interventions from other settings to be appropriate for climate-related impacts?</p> <p>4.5. Co-designing, implementing and evaluating novel interventions that meet climate-related mental health needs</p> <p>4.6. Comparing cost-effectiveness, implementation considerations, and effectiveness across interventions for a particular setting and particular population group to determine "best buys"</p> <p>4.7. Identifying, developing and evaluating approaches to awareness-raising and capacity building to upskill workforces to recognise and respond to the mental health impacts of the climate crisis (e.g. mental health professionals, emergency responders)</p>
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2. Coding framework for action agenda

Action Category	Sub-category
1. Creating an enabling environment for research at the intersection of climate change and mental health	1.1 Desired state of research <ul style="list-style-type: none"> This code captures <i>what good looks like</i> for climate change and mental health research in the region that implements the research agenda. What are the features of the kind of research that is desired or valuable? Are there specific attributes or milestones that would signify this state of research?
	1.2 Opportunities and enablers <ul style="list-style-type: none"> This code captures opportunities to progress the climate and mental health research field in the region towards the desired state, and factors that would enable progress. May be general or specific, and may link to what is required to overcome the challenges outlined in the next code.
	1.3 Challenges holding back research <ul style="list-style-type: none"> This code captures challenges that are stopping the climate and mental health field in the region from currently being in the desired state, or are predicted to emerge in trying to create investment in and implementation of the research agenda.
	1.4 Partners/stakeholders <ul style="list-style-type: none"> This code captures any key individuals, organisations or stakeholder types identified as being particularly important to engage for implementation of the research agenda in the region and securing required investment.
	1.5 Priority next steps/recommendations to investors and actors <ul style="list-style-type: none"> This code captures the concrete next steps that need to be taken as priorities to create the conditions in the region to implement the research agenda. This section will be used in the agenda to inform potential investors and key actors/decision makers where the priorities should be for next steps.
2. Translating a growing evidence base into action that can respond to the	2.1 Desired state of evidence to action in policy and practice <ul style="list-style-type: none"> This code captures <i>what good looks like</i> for action on climate change and mental health in the region based on current and future evidence.

mental health impacts of climate change	<ul style="list-style-type: none"> What are the features of the kind of pathways for translating evidence into action that are desired or valuable? Are there specific attributes or milestones that would signify that evidence-based action is occurring?
	2.2 Opportunities and enablers <ul style="list-style-type: none"> This code captures opportunities to progress evidence-based action on climate and mental health in the region towards the desired state, and factors that would enable progress. May be general or specific, and may link to what is required to overcome the challenges outlined in the next code.
	2.3 Challenges holding back action <ul style="list-style-type: none"> This code captures challenges that are stopping desired actions to protect mental health from the climate crisis in the region, or to enable co-beneficial climate action. The code may also include challenges that are predicted to emerge in trying to ensure that current and future evidence translates into change on the ground and at all levels of policy and practice.
	2.4 Partners/stakeholders <ul style="list-style-type: none"> This code captures any key individuals, organisations or stakeholder types identified as being particularly important to engage for translation of evidence into relevant action and securing required investment.
	2.5 Priority next steps/recommendations to investors and actors <ul style="list-style-type: none"> This code captures the concrete next steps that need to be taken as priorities to translate the emerging evidence base on climate and mental health into action in policy and practice. This section will be used in the agenda to inform potential investors and key actors/decision makers where the priorities should be for next steps.

Data collection and storage

Dialogues were conducted virtually on Zoom following informed consent from all participants. Dialogues and breakout groups were recorded and transcribed by a third-party provider (Way with Words). Survey distribution and data collection was carried out using the online platform Qualtrics. Data was stored and managed by Imperial College London using a secure server. Data will be stored by Imperial College London for 10 years after study completion.

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