

## OPINION EDITORIAL

# The Relationship between Climate Change and Mental Health

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## INTRODUCTION

Since the beginning of the industrial era, human activities have caused an unprecedented increase in greenhouse gas (GHG) emissions. The atmospheric concentration of carbon dioxide, a major GHG, has risen by 40% since 1750 and the increase does not show signs of slowing [1]. It is well established that GHG emissions seriously destabilize our climate systems. Indeed, the three most recent decades represent the warmest on record [1]. In addition, the Antarctic ice sheet has continued to lose 159 gigatons of mass each year, contributing to rapid sea-level increase [2]. These climatic changes diminish aquatic resources, reduce crop yields, alter the geographic range of various species, and increase the frequency and severity of extreme weather events, ultimately affecting the health of humans and societies as a whole.

Climate change and its effects contribute to conflict, economic instability, food and water insecurity, human displacement, and by extension, morbidity and mortality. In 2009 The Lancet Commission on Managing the Health Effects of Climate Change identified climate change as “the biggest global health threat of the 21st century” [3]. While the physical health impacts of climate change are relatively well understood, considerably less is known about the impacts on mental health. This article will provide an overview of existing literature on the effects of climate change on mental health, summarizing its direct, indirect, and long-term impacts and will conclude by proposing several pathways through which we can strengthen mental health care systems in light of climate change.

## DIRECT EFFECTS ON MENTAL HEALTH

Climate change directly affects mental health through psychological trauma associated with exposure to climate-related natural disasters [4]. In the literature, climate-related natural disasters are commonly subdivided into acute or short-term, and sub-acute or longer-term events. Acute disaster events, such as floods, storms, and wildfires, typically occur over a period of days. Post-traumatic stress disorder (PTSD) is one of the most well-researched mental health outcomes associated with acute disasters. One systematic review reported PTSD prevalence rates of up to 60% in the first one to two years after exposure to a natural disaster [5]. In addition to PTSD, acute weather events are also associated with stress, anxiety, depression, substance use disorders, and overall poor wellbeing [6,7,8].

Furthermore, sub-acute disaster events occur over months or years, such as long-duration heat waves and droughts also have an impact on mental health. Heatwaves are commonly associated with increased rates of suicide. For example, a South Korean analysis found that for every 1°C increase in mean temperature, the risk of suicide increased by 1.4% [9]. With temperatures continuing to rise due to climate change, it is possible that within the coming decades the increase in heat-related suicides may negate many of the advancements made by suicide prevention programs [10].

## INDIRECT EFFECTS ON MENTAL HEALTH

The indirect effects of climate change on mental

health are driven by climate-induced pressures on the functional capacity and overall wellbeing of communities [4]. As mentioned, climate change reduces crop yields, alters weather patterns, and intensifies climate-related disasters, thereby contributing to negative outcomes such as food and water insecurity and massive population displacement. In 2019 alone, natural disasters caused the internal displacement of nearly 25 million people [11]. Internal displacement contributes to less-than-optimal living conditions and lack of access to adequate food and water, leaving individuals prone to negative mental health outcomes [12]. Similarly, economic disruptions brought about by reduced crop yields, for example, contribute to job loss and poverty [13]. One study found that the odds of major depression were more than five times higher among those who had lost their jobs in the past 7-12 months compared to those who had not [14]. Economic hardship may also result in problems such as family stress, decreased social support, and food insecurity, all of which have mental health implications.

### **LONG-TERM EFFECTS ON MENTAL HEALTH**

Lastly, long-term effects involve a sense of worry and fear regarding the impending threat of climate change and its predicted impacts on future generations [4]. Unlike direct and indirect effects, long-term effects are not necessarily tied to a specific climate change-related process or event and instead manifest as negative feelings regarding the slow yet unrelenting progression of climate change over time. Due to the massive scale and complexity of climate change, many feel overwhelmed and hopeless in acting against it. For example, individuals may become distressed by the repeated lack of accountability from governments and industry regarding GHG emissions. While scientific evidence on the detrimental impacts of climate change is clear, little systems-level action has been taken thus far.

Children and youth are particularly affected by these feelings of worry and fear [15]. Interviews with fifth-grade children from the United States revealed that 82% expressed feelings of sadness, fear, and anger

related to environmental problems, and 72% shared pessimistic feelings when asked what they thought Earth would look like in 100 years [16]. Compared to older generations, children and youth are generally more knowledgeable on and invested in the issue of climate change, offering hope beyond the immediate mental health challenges [15].

### **CLIMATE CHANGE AND POTENTIAL MENTAL HEALTH VULNERABILITIES**

Climate change adversely affects our mental health in a multitude of ways through direct, indirect, and long-term processes. It is important to note that the mental health effects of climate change disproportionately burden populations who may already face health barriers. For instance, among Inuit in Canada, the rapidly changing climate in northern areas has resulted in a level of disconnection to the land, which is closely tied to cultural identity and mental health [17]. Globally, those living in low- and middle-income countries (LMICs) endure considerable climate change-related burdens, such as overpopulated coastal communities and damage from climate-related natural disasters, and these countries often lack strong health systems or adequate mental health supports. With this in mind, the mental health impacts of climate change should be addressed as a health equity issue.

### **WHERE DO WE GO FROM HERE?**

Going forward, additional research is needed to fully ascertain the relationship between climate change and mental health, particularly among groups facing other health barriers. In addition, we must improve awareness of the mental health effects of climate change among the general public and policymakers alike. Further research and recognition of these issues will support the development of comprehensive mental health care policy and the inclusion of mental health in climate change adaptation planning. We must situate mental health within a broader understanding of climate change, working to advance frontline mental health care through improved access and funding for mental health services, increased mental health

surveillance and monitoring, resilience planning within the mental health care system, and specialized mental health training for care providers and first responders [18]. Ultimately, an awareness of the relationship between climate change and mental health will help strengthen our care systems.

Reducing the mental health impacts of climate change will require collaboration and accountability on a global level. Countries must urgently prioritize GHG emission targets and other climate change adaptation initiatives, as well as promote transparency in political decision-making processes. Further, governments in high-income countries must promote equity in the development and implementation of mental health policy among those populations already facing health barriers, such as those living in LMICs. Due to the indiscriminate and sweeping nature of climate change, we must work together as a global community to reduce its burden on mental health and improve overall quality of life.

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