Research on the health impact of climate must consider distributive justice and environmental sustainability

Richie, Cristina; Garcia-Gomez, Pilar ; Thio , Hok Bing; Rwei, A.Y.; Joo, C.; Staufer, U.; Muratore, D.G.; Mastrangeli, Massimo; Dedoussi, I.C.; More Authors

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OPINION

Research on the health impact of climate must consider distributive justice and environmental sustainability

Cristina Richie[1]*, Pilar Garcia-Gomez[2], Hok Bing Thio[3], Alina Rwei[4], Chirlmin Joo[4], Urs Staufer[4], Dante Muratore[4], Massimo Mastrangeli[4], Irene Dedoussi[4], Job van Exel[2], Tom van Ourti[2], Igna Bonfrer[2], Alberto Gianoli[2], Alexander Los[2], Gijsbertus T. J. van der Horst[5], Martin van Hagen[5], Lex Burdorf[5], Jasper V. Been[3], Maud Hermans[3], Ralph Stadhouders[3], Robbert J. Rottier[6], Anna Bornioli[2], Ines Chaves[3], Willem A. Dik[3]

1 University of Edinburgh, Edinburgh, Scotland, **2** Erasmus University Rotterdam, Rotterdam, Netherlands, **3** Erasmus MC, Rotterdam, Netherlands, **4** Delft University of Technology, Delft, Netherlands, **5** Erasmus University Medical Center, Rotterdam, Netherlands, **6** Erasmus MC-Sophia Children's Hospital, Rotterdam, Netherlands

* cristina.richie@ed.ac.uk

Abstract

Climate and justice are interconnected. However, simply raising ethical issues associated with the links between climate change, technology, and health is insufficient. Rather, policies and practices need to consider ethics ahead of time. If it is only added "after the fact," policy will be less efficient and opportunities for carbon minimization will be lost. This will require the cooperation of people at many levels and can be guided by two essential ethical principles: distributive justice and environmental sustainability.

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A 2022 article from *PLOS Global Public Health* noted that climate and justice are interconnected [1]. Through pollution, carbon dioxide emissions, and the deposition of nitrogen, environmental changes have massive effects on health, which more dramatically impact the vulnerable. The World Bank estimates that 6.4 million people died prematurely in 2019 due to exposure to air pollution alone and the health costs were equivalent to 6.9 percent of global GDP worldwide, or 2.8 percent in high income OECD countries [2]. Moreover, the health impacts of environmental changes are often linked to environmental racism [3] and health inequalities through the increase in climate-change related health hazards [4] which disproportionally burden those who lack the money, resources, or political power to recover from climate disasters and access health care when affected by climate health effects [5].

While attempts to reverse climate change and meet individual and population health are a priority in many countries, there are gaps in research and in action. For instance, current studies linking environmental stressors and health are often limited to after-the-fact large-scale statistics and long-term trends, thereby restricting the ability of clinicians to provide timely, cost-effective prevention and treatment strategies to people. Outside of health care delivery, this information is often too outdated to offer impactful strategies for humans to adapt behavior.

At the same time, technological interventions into climate change, studies into the effects of climate on health, and medical treatment for climate-related health complications all have a carbon footprint which further contributes to climate change and climate change health hazards. Thus, humankind finds itself caught in cycle: The health care industry contributes 4–5% of global carbon emissions already [6]. While simply eliminating research and development of health-based technological solutions to climate impacts have no short-term carbon footprint, ethically, that is not an option. Technologically, that is reckless. Scientifically, that is unsatisfying.

Simply raising these ethical issues associated with the links between climate change, technology, and health, is insufficient. Rather, policies and practices need to consider ethics ahead of time. If it is only added "after the fact," policy will be less efficient and opportunities for carbon minimization will be lost. This will require the cooperation of people at many levels and can be guided by two essential ethical principles: distributive justice and environmental sustainability [7]. Distributive justice argues that benefits and burdens of social life—from technologies to health care—should be equally distributed [8]. Environmental sustainability ensures that basic human needs are met within the boundaries of the ecosystem which sustains us [9].

Distributive justice

Prevention and early diagnostics are essential to proactively maintaining individual health in the face of climate change, therefore, on account of the principle of justice, there is a corresponding obligation to ensure facilitating structures. These may include technological availability and health care access, as well as addressing social determinates of health.

Considering the vast gaps between, and within, countries in access to medical technologies, any climate innovation, like wearable cytokine aptasensors for real-time analysis of environmental impact, [10] should be widely available. To achieve this, these, and other technologies, need to be cost-effective and widely available, which likely requires sharing the financial burden between (and within) countries based on ability to contribute and (past and current) responsibility for climate change. Information about individual health gathered from people using personalized climate technologies can benefit populations who must wait for access and roll-out periods. Thus, structures of justice benefit all.

Additionally, ensuring that public health research is more robustly funded is an ethical requirement, particularly because the burdens of climate change fall disproportionality along the social determinants of health (SDH) [11]. SDH include factors largely outside of one's control, like quality education, income, vocation, race, and ethnicity. These SDH place people living in the global South, and some minorities within populations, more at risk for particular noncommunicable diseases—including those related to climate—while also making positive health outcomes less likely.

Policies must be created to prevent health deterioration due to pollution and climate change through both personalized interventions on health and broad environmental health policies. Gaps in health—which include access to medical technologies and healthy environments—violate distributive justice and place the poor at a double disadvantage of being less able to prevent and treat climate change health problems. This is not only a threat to their biological health but also to individual and community well-being—their capacity to prosper and flourish.

Environmental sustainability

Environmental sustainability must cut across all nations and sectors. Global decarbonization requires effective and united policies. Initiatives, like those agreed at COP27, are a start, but

commitment and action of the biggest environmental polluters is pivotal for rapid and substantial change. More political pressure on highly polluting nations ought to be considered and climate sanctions and compensation mechanisms could be established. Climate change imperils all and simply relying on the good will of nations and organisations is a present threat to the wellbeing of people globally.

Moreover, sector emissions need to be evaluated. It is counter-productive to use and produce high-carbon technologies to address climate, since these also contribute to climate change throughout their lifecycle, from development, to deployment, to dissemination, to disposal [12]. Climate-tech and health care tech also consume resources through their digital infrastructure [13].

Therefore, while technology offers powerful tools to improve longevity and quality of life in the face of climate change, they themselves must be developed and implemented sustainably. Carbon emissions of technologies must be addressed in the engineering pipeline, from conceptual design, to prototype development, to mass manufacturing [14]. Engineering companies may need incentives to make devices sustainable, but cannot be a substitute for a rigorous change in attitudes towards pro-environmental behaviors [15].

While lifecycle carbon assessments are becoming increasingly available and are useful for understanding the environmental impact of technologies, intuitively and empirically, humankind must simply live more parsimoniously, which is primarily a responsibility for people in the global North.

Effective policies to reduce the impacts of climate on health must be implemented on a global scale, promoting distributive justice and environmental sustainability. Ethics must be *proactive* rather than *reactive*. Ethical policies have the ability to relieve citizens around the globe from economic, societal, and personal burdens of climate-related health problems if all stakeholders collaborate to unite justice, sustainability, and health for all.

Author Contributions

Conceptualization: Cristina Richie, Pilar Garcia-Gomez, Hok Bing Thio, Alina Rwei, Chirlmin Joo, Urs Staufer, Dante Muratore, Massimo Mastrangeli, Irene Dedoussi, Job van Exel, Tom van Ourti, Igna Bonfrer, Alberto Gianoli, Alexander Los, Gijsbertus T. J. van der Horst, Martin van Hagen, Lex Burdorf, Jasper V. Been, Maud Hermans, Ralph Stadhouders, Robbert J. Rottier, Anna Bornioli, Ines Chaves, Willem A. Dik.

Funding acquisition: Cristina Richie, Pilar Garcia-Gomez, Hok Bing Thio, Alina Rwei, Chirlmin Joo, Urs Staufer, Dante Muratore, Massimo Mastrangeli, Irene Dedoussi, Job van Exel, Tom van Ourti, Igna Bonfrer, Alberto Gianoli, Alexander Los, Gijsbertus T. J. van der Horst, Martin van Hagen, Lex Burdorf, Jasper V. Been, Maud Hermans, Ralph Stadhouders, Robbert J. Rottier, Anna Bornioli, Ines Chaves, Willem A. Dik.

Investigation: Cristina Richie, Pilar Garcia-Gomez, Hok Bing Thio, Alina Rwei, Chirlmin Joo, Urs Staufer, Dante Muratore, Massimo Mastrangeli, Irene Dedoussi, Job van Exel, Tom van Ourti, Igna Bonfrer, Alberto Gianoli, Alexander Los, Gijsbertus T. J. van der Horst, Martin van Hagen, Lex Burdorf, Jasper V. Been, Maud Hermans, Ralph Stadhouders, Robbert J. Rottier, Anna Bornioli, Ines Chaves, Willem A. Dik.

Methodology: Cristina Richie, Pilar Garcia-Gomez, Hok Bing Thio, Alina Rwei, Chirlmin Joo, Urs Staufer, Dante Muratore, Massimo Mastrangeli, Irene Dedoussi, Job van Exel, Tom van Ourti, Igna Bonfrer, Alberto Gianoli, Alexander Los, Gijsbertus T. J. van der Horst, Martin van Hagen, Lex Burdorf, Jasper V. Been, Maud Hermans, Ralph Stadhouders, Robbert J. Rottier, Anna Bornioli, Ines Chaves, Willem A. Dik.

Project administration: Cristina Richie.

Writing – original draft: Cristina Richie, Pilar Garcia-Gomez, Hok Bing Thio, Alina Rwei, Chirlmin Joo, Urs Staufer, Dante Muratore, Massimo Mastrangeli, Irene Dedoussi, Job van Exel, Tom van Ourti, Igna Bonfrer, Alberto Gianoli, Alexander Los, Gijsbertus T. J. van der Horst, Martin van Hagen, Lex Burdorf, Jasper V. Been, Maud Hermans, Ralph Stadhouders, Robbert J. Rottier, Anna Bornioli, Ines Chaves, Willem A. Dik.

Writing – review & editing: Cristina Richie, Pilar Garcia-Gomez, Hok Bing Thio, Alina Rwei, Chirlmin Joo, Urs Staufer, Dante Muratore, Massimo Mastrangeli, Irene Dedoussi, Job van Exel, Tom van Ourti, Igna Bonfrer, Alberto Gianoli, Alexander Los, Gijsbertus T. J. van der Horst, Martin van Hagen, Lex Burdorf, Jasper V. Been, Maud Hermans, Ralph Stadhouders, Robbert J. Rottier, Anna Bornioli, Ines Chaves, Willem A. Dik.

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