


One Health

Luís Campos¹ 

¹ Portuguese Council for Health and Environment, Portugal.

Keywords: Climate Change; Hospitals; One Health; Physicians

One Health concept was introduced by Calvin Schwabe, in a veterinary medical textbook in 1964, to reflect the similarities between animal and human medicine and stress the importance of collaboration between veterinarians and physicians to help solve global health problems.

In 2021 The Food and Agriculture Organization of the United Nations, the World Organization for Animal Health, the United Nations Environment Programme, and the World Health Organization adopted a more broadly definition of this concept as an integrated, unifying approach that recognizes that the health of humans, animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent.

Which are the main environmental changes that are affecting human health? These environmental conditions of human health are overpopulation, climate change, degradation of ecosystems, loss of biodiversity, and depletion of natural resources.

It took us 200 000 years to reach a world population of one billion (1803) and 220 years to reach 8 billion people, which happened on 15 November 2022. Since 1970, our ecological footprint has exceeded the Earth's rate of regeneration. The effects of climate change are global warming (thinning of the ice sheet, water level rising, more acidic ocean), extreme temperatures, shortage of food, increase in allergens, loss of biodiversity, more severe storms, floods, wildfires, and droughts, more poverty, displacements, and health risks. The global temperature increased by 1.2°C since the preindustrial era, from 1880 until 2022, and it is estimated that the global temperature, in 2100, is very likely to be 2.1°C-3.5°C higher, in the intermediate global greenhouse gases (GHG) emissions scenario, compared to the 1850-1900 period. Recently, on July 6th, the highest average temperature recorded on the planet was recorded. The Arctic Sea is likely to be practically ice-free in September before 2050.¹ The mean global sea level rose by 0.20 m, between 1901 and 2018, and it is estimated that it will further rise by 0.44-0.76 m in 2100. In the last decade, deaths from floods, droughts, and storms were 15 times higher in highly vulnerable regions. Atmospheric CO₂ concentrations were higher, in 2019 than at any other time in the last 2 million years. There was an increase in the frequency and intensity of hot extremes

(including heatwaves), heavy precipitation, and major tropical cyclones across most land regions, and extreme daily precipitation events are projected to increase by approximately 7% for each 1°C of global warming. Global drought could impact more than 75% of the World Population by 2050. Climate change could drag more than 100 million people back into extreme poverty by 2030.

These changes are due to past and future GHG emissions. Some of them are irreversible, especially changes in the ocean, ice sheets, and global sea levels. Also, the healthcare sector has a very large climate footprint, which is equivalent to 4.4% of global net GHG emissions. In Portugal, this rate is even higher (4.8%).² These emissions are primarily derived from the healthcare supply chain, through the production, transport, and disposal of goods and services, such as pharmaceuticals and other chemicals, food and agricultural products, medical devices, hospital equipment, and instruments.

The world is also experiencing a degradation of ecosystems, loss of biodiversity and depletion of natural resources. Since the industrial revolution, human activities have increasingly destroyed forests, grasslands, and wetlands, threatening human lives and well-being. It is estimated that 75% of the Earth's ice-free land surface has already been significantly altered and more than 85% of the wetland area has been lost. In the last 50 years, there was an average decrease of 70% in the population sizes of mammals, birds, amphibians, reptiles, and fish and one million species are at risk of extinction.³ The fashion industry accounts for about 8%-10% of greenhouse gas emissions from human activity and nearly 20% of wastewater.

The recognition that human activities began to have a substantial global effect on the Earth's systems led to the proposal to define the current geological epoch, as the Anthropocene epoch.

What are the effects of climate change and the degradation of ecosystems on health?

Every year, environmental factors take the lives of around 13 million people. Globally, 9 out of 10 people breathe air containing high levels of pollutants exceeding WHO guideline limits. Air pollution and rising allergens are increasing the incidence of cardiocerebrovascular diseases, lung cancer, chronic obstructive pulmonary disease, asthma and allergies. The changes in vector ecology are increasing vector-borne diseases,

like malaria, dengue, yellow fever, Zika virus and Japanese encephalitis, causing more than 700 000 deaths annually. Climate change, but also, deforestation, illegal and poorly regulated wildlife trade, intensified agriculture, livestock production and antimicrobial resistance increase the risk of zoonotic diseases, diseases transmitted from animals, such as salmonellosis, West Nile virus, emerging coronaviruses, rabies, brucellosis and Lyme disease.⁴ These diseases represent 60% of pathogens that cause human diseases. Almost 100% of pandemics have been caused by zoonoses. Every year, more than 3.4 million people die as a result of water-related diseases, such as cholera, typhoid and dysentery. Food-borne diseases cause 420 000 deaths each year worldwide. Since 1970, weather, climate, and water hazards accounted for 50% of all disasters and 45% of all reported deaths. More than 10 million people lost their lives due to major drought events in the last century and, every year, an estimated 339 000 people die worldwide as a result of wildfire smoke. More than five million extra deaths a year can be attributed to extreme temperatures which also directly affect the organism and increase the risk of cardiocerebrovascular diseases. Climate change is increasingly having stronger and longer-lasting impacts on people, which can, directly and indirectly, affect their mental health and psychosocial well-being. All of these consequences affect particularly vulnerable groups such as children, the elderly, multimorbidity patients, the homeless, and poor people. In the last 20 years, heat-related diseases have increased by more than 50% among the elderly. The climate emergency must be seen as a public health emergency.

The reversal of the threat posed by climate change and environmental degradation still seems possible but it depends on the decisions of each country, organization, and person in the coming years. There is a sense of urgency in this matter.

The World Health Organization, several scientific societies, and professional bodies in different countries have already taken positions about the impact of climate change and environmental degradation on the health of the population.⁵ The Portuguese Society of Internal Medicine was the first Internal Medicine society in the world to take a public stance and issue recommendations on this topic (2017).⁶ The editors of more than 200 medical journals worldwide, launched a collective call for emergency action to limit global temperature rise, restore biodiversity, and protect health (2021).

The European Federation of Internal Medicine also published a position paper in the European Journal of Internal Medicine making the same appeal (2022).⁷

It was the conscience that we are going to leave this planet in a worse state than we received from our parents, it was the conscience that we have no right to ensure our own wealth at the expense of the next generations, and the conscience that we doctors, besides being caregivers, must also be advocates for our patients, that motivated us to create the Portuguese Council for Health and Environment, which was founded on 19 October 2022. Our vision is that current and future generations will have the right to a happy and healthy life on a planet no longer threatened by climate change and environmental

degradation. Our objectives are bringing together the main organizations related to health to intervene jointly on the issues of climate change, environmental degradation and its impact on health, the identification and publication of good practices of environmental sustainability, promotion of awareness, education, and research in this area, to advocate the need for the health sector to reduce its ecological footprint and to help the health system to respond to the current epidemiological transition and to the increased risk of unexpected events. We currently have 62 members, including 12 of the most important health associations, six professional associations including the medical and veterinary associations, 20 scientific societies, six academic institutions, eight pharmaceutical laboratories, three private health groups, two patient associations, and others, like the National Health Institute and the Tropical Medicine Institute.

Robert Swan, the first man to arrive at both poles, said “The greatest threat to our planet is the belief that someone else will save it”. Changing the destiny announced for humanity requires everyone’s commitment, and we, health professionals, have an added responsibility in this fight.

References

- Pörtner HO, Roberts DC, Tignor M, Poloczanska ES, Mintenbeck K, Alegría A, editors. Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press;2022. [Accessed 1 March 2023] Available in: https://report.ipcc.ch/ar6wg2/pdf/IPCC_AR6_WGII_FinalDraft_FullReport.pdf
- National Health Service 2020. Delivering a “Net Zero” National Health Service. [Accessed 20 June 2022] Available in: <https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-health-service.pdf>
- Almond RE, Grooten M, Petersen T. WWF Living Planet Report 2020 - Bending the curve of biodiversity loss. Gland: WWF; 2020. [Accessed 17 December 2022] Available in: <https://f.hubspotusercontent20.net/hubfs/4783129/LPR/PDFs/ENGLISH-FULL.pdf>
- United Nations Environment Program. Frontiers2018/2019 Emerging Issues of Environmental concerns. Nairobi: UNEP; 2019. [Accessed 20 January 2023] Available in: <https://www.unep.org/resources/frontiers-201819-emerging-issues-environmental-concern>
- Romanello M, McGushin A, Di Napoli C, Drummond P, Hughes N, Jamart L, et al. The 2021 report of the Lancet Countdown on health and climate change: code red for a healthy future. *Lancet*. 2021;398:1619-62. doi: 10.1016/S0140-6736(21)01787-6. Erratum in: *Lancet*. 2021;398:2148.
- Campos L. Climate Change, Health, and our Responsibility: SPMI Recommendations. *Med Interna*. 2017;24: 83-4.
- Campos L, Barreto JV, Bassetti S, Bivol M, Burbridge A, Castellino P, et al. Physicians’ responsibility toward environmental degradation and climate change: A position paper of the European Federation of Internal Medicine. *Eur J Intern Med*. 2022;104:55-8. doi:10.1016/j.ejim.2022.08.001

■ Ethical Disclosures


Conflicts of Interest: The authors have no conflicts of interest to declare.

Financial Support: This work has not received any contribution grant or scholarship.

Provenance and Peer Review: Not commissioned; externally peer reviewed.

Consent for Publication: Not applicable.

Corresponding Author:

Luís Campos 

E-mail: secretariado.cpsa@gmail.com