

Climate change in the Schools of Medicine.

El cambio climático en las Facultades de Medicina.

Joaquín García-Estañ

Centro de Estudios en Educación Médica, Universidad de Murcia, Murcia. <https://orcid.org/0000-0002-7243-0240>, Correspondencia: jgestan@um.es

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According to recent studies (1-2), the majority of the Spanish population believes that climate change (CC) is real and identifies it as something negative. CC is not only one of the transcendental environmental challenges that humanity faces on a global scale, but also influences many sectors, reaching its maximum exponent in the area of health.

Thus, in Spain, between 70 and 80% of people recognize the impact that climate change has on their health or quality of life (1). The website of the Spanish Ministry of Health maintains a page with detailed information on the relationship between CC and health. Among the indirect effects, the increase in air pollution and aeroallergens, the change in the distribution of vectors of infectious diseases (malaria, dengue), or the lower availability of water and food insecurity stand out. It is also highlighted that the effects of CC directly contribute to deaths from cardiovascular and respiratory diseases, neurodegenerative diseases and many other health variables. In addition, in the current context of climate change, cold or heat waves will not disappear nor will the morbidity and mortality associated with them. On the other hand, the atmospheric blockade situations associated with climate change result in an increase in the levels of environmental pollutants.

An important initiative (4-5) of the General Council of Medical Colleges of Spain (CGCOM) has recently been published, the so-called Medical Alliance against Climate Change (AMCC). This paper describes how the health sector is one of the sectors that produces the greatest climate aggression, with specific mention of the pharmaceutical industry, which "spills more greenhouse gases into the environment than the automotive industry". In this CGCOM work, it is believed vital to create a vulnerability map of the effects of CC on health, where all medical organizations, the entire medical profession, support each other to face the multiple interrelationships between health and CC. A transversal and integrating work in which the academy cannot be absent.

Medical schools are the places where the education of future medical professionals begins and what better place to start educating about the health impacts of CC and how they will be able to protect the health of their patients. Although in the United States there are study plans on environmental and occupational health in their medical schools, in Spain, this subject is framed in Higher Level professional training titles, in addition to being part of some public health and/or epidemiology programs in the subjects of the Degree in Medicine. In many countries, students themselves are at the forefront of these efforts, such as IFMSA (6) or the UK lobbying the British Medical Association to divest its portfolio of fossil fuel investments (7).

The debate on how to include this knowledge in the Medicine study plans has been on the table for some time. Already in 2016, Maxwell and Blashki called on experts to develop agreed learning objectives and competencies. Although this request has not yet been fully formulated, there are already enough initiatives to be used by professors in medical

schools. For example, let us cite the very recent initiative of the Australian association Doctors for the Environment Australia (9) focused on the classic system of medical education based on organs and systems. In this approach, in addition, a theoretical framework and a methodology are provided, which facilitate inclusion within our own subjects. Harvard University has also contributed a specially prepared program for medical residents (10), which includes how climate change harms health, how to adapt in clinical practice, and how CC undermines health care delivery. Similar, but for undergraduate training, is the Climate Change Curriculum Infusion Project of the Icahn School of Medicine at Mount Sinai in New York, which they have successfully incorporated into their undergraduate training (11). In relation to interprofessional health education, the University of Minnesota has published a curriculum to help understand the relationship between CC and health, useful for all health professionals, for all disciplines (12). Finally, another of the efforts is the one already mentioned by the Spanish CGCOM (5), a document that offers not only updated information on the repercussions of climate change on human health, but also on the repercussions that our health activity has on climate change, as well as a very important commitment from Spanish doctors to decarbonization.

There are several ways in which the Faculties of Medicine could start the integration of the CC in their plans of study. current study. At least five (13) have been described in the literature:

- 1) Integration or dissemination of the links between CC and health in the curriculum.
- 2) Climate/health issues integrated into compulsory subjects.
- 3) Required stand-alone weather/health courses.
- 4) Elective courses on weather/health.
- 5) Clinical modules or case-based learning.

The most common approaches are to integrate climate issues into existing courses or to offer climate-focused electives. There is not much to say about the difficulty of adding more compulsory subjects. The first approach is an ideal method for introducing these new concepts into curricula, which are usually already crowded. For example, they can be integrated into the topics of vector-borne microbial diseases or neurology topics that study exposure to particulates in automobile exhaust gases and their relationship with neurodegenerative diseases such as Alzheimer's (14). The second method, offering elective courses, is preferred in many colleges, although of course, students with a lack of interest will continue in practice without basic weather concepts. This approach also goes against the concept of incorporating climate education as fundamental knowledge for all future doctors (15). Finally, integrating climate change impacts into clinical scenarios has the advantage of using an existing didactic approach to integrating climate change information. For example, the history of a patient with respiratory problems offers the opportunity to relate the CC to a specific health risk, it can be added to the existing curricular contents of simulation of clinical scenarios. The limitation of this system is that it does not provide students with a global context of climate change in relation to health and health systems.

While progress in the area of medical CC education is slow to reach medical schools, the pace may pick up as the health professions are forced to grapple with the increasingly direct implications of CC. DC. The COVID-19 pandemic is the paradigmatic example of a global health crisis with direct links to ecosystem degradation. The increase in literature on this subject, as well as multiple national and international initiatives coordinated by groups of students and teachers, encourage us in the difficult task of integrating CC into the curricula of medical schools.

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