A model for comprehensive climate and medical education

Climate change is a public health emergency.[1] Clinicians worldwide now face the reality of caring for patients during wildfires, heat waves, floods, and shifting infectious disease patterns. Health-care workers need better preparation to care for communities facing the health effects of climate change.[2] Medical students have been key advocates in these efforts, driving research, community partnerships, and education.[3–5]

When we began medical school during record-setting Californian wildfires and a global pandemic, our curriculum did not address the effect of climate change on human health, nor the disproportionate effects on communities made vulnerable by racism and poverty. Here, we detail how we integrated the effects of climate change on health into more than a dozen courses at our institution, starting with the preclinical curriculum and then progressing through all levels of training.

In this Comment, we use the example of reproductive health and obstetrics and gynaecology education to describe this longitudinal approach.

Our student team first addressed the preclinical curriculum, highlighting the effect of climate change on disease pathophysiology across human health. We began with a review of our required preclinical curriculum, identifying areas of opportunity for integration on the basis of peer-reviewed literature. We worked closely with course faculty leads to incorporate climate topics into pre-existing course materials using an equity lens, emphasising the disproportionate health effects of climate change on low-resourced communities.[4–6] For example, we supplemented our reproductive health course with lecture slides identifying air pollution and heat exposure as environmental teratogens that increased the risk of adverse birth outcomes, especially for Black women and people with asthma.[7]

Transitioning to clinical integration, our team expanded on knowledge gained in the preclinical setting to teach students how to identify climate-related disease pathology. In the obstetrics and gynaecology clerkship, we integrated climate and health effects into relevant didactic sessions and case presentations. For example, we highlighted how wildfire smoke contributes to preterm birth in our home state of California, USA.[8] Students also learned how to discuss climate-related topics in patient encounters.

Lastly, we extended our efforts into the education of junior doctors, aiming to equip junior doctors with tools to counteract climate change's impacts on patients. These efforts emphasised how climate and health presentations are rooted in upstream factors that contribute to health inequities. For example, we developed a didactic session for the obstetrics and gynaecology junior doctor programme focused on taking environmental histories, providing climate-related patient education, and connecting junior doctors with advocacy resources.[9] Given the vital role that junior doctors play in medical student education, these efforts will not only provide junior doctors with tools to care and advocate for patients affected by climate change, but will also be passed down to medical students during clinical rotations.

Although we use the obstetrics and gynaecology curriculum as an example of our longitudinal approach to climate and health education, our work has spanned across more than a dozen courses to date. Five best practices were crucial to our success:

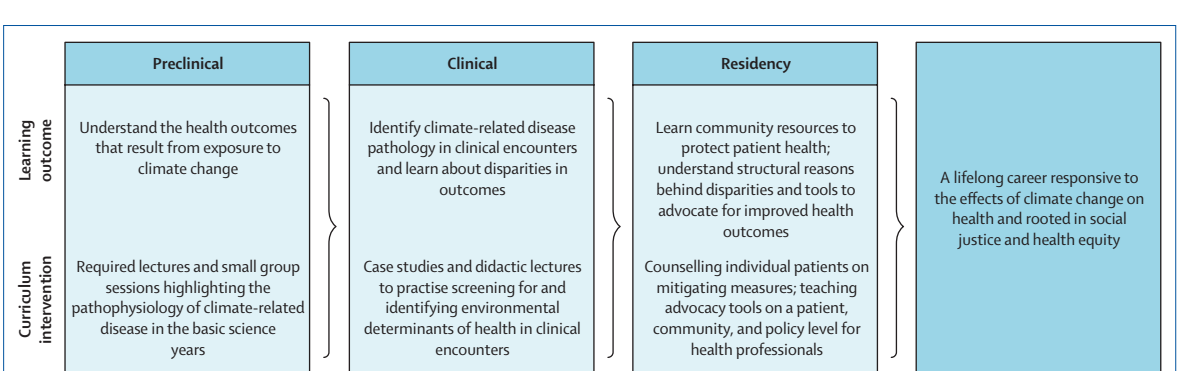

Figure: **Providing an equity frame to medical training through climate and health education**

setting tangible education objectives as defined by the School of Medicine administration and relevant national climate educational efforts allowed us to develop targeted, effective educational interventions;[10] soliciting iterative feedback from faculty and trainees enabled us to benchmark the school's progress in planetary health education; aligning with the Deans of Curriculum and Scholarship gave us a platform to directly interact with course faculty leads and integrate our research systematically; grounding our work in local effects and health equity by collaborating with at-risk community members ensured our educational materials were relevant to our patient population and showed how climate change is one of many social determinants of health; and connecting with national student and physician groups such as Medical Students for a Sustainable Future and Physicians for Social Responsibility enabled us to share resources, knowledge, and best practices.

As climate change forces the world to grapple with a new understanding of normal, it is crucial that clinicians are prepared for the novel health effects that climate change will have on the communities they serve. A longitudinal approach to climate and equity education throughout medical training aims to not only build competency and awareness on the effects of climate change on health, but also provide an equity frame (figure). This approach empowers clinicians to effectively counsel patients within hospitals in addition to advocating for resources and policies outside clinical walls to best protect the health of their communities, ultimately preparing trainees for a career rooted in social justice and health equity.

We declare no competing interests. AJ and AL contributed equally.

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