Creating Environmental Health Leaders When Educators Are Learning Too

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ABSTRACT: The climate crisis is upon us, already exacting a health cost, with likely acceleration over our lifetimes. Our existing medical curricula do not adequately prepare medical students to deal with climate health nor to be leaders in the public health sphere. Current faculty have themselves not often been exposed to climate health training nor often to leadership training. This affords a unique opportunity for creative implementation of strategies to educate both faculty and students on how leadership skill building can complement the science and policy of climate health.

KEYWORDS: health and climate change, climate medicine, medical education

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Introduction

The global medical community is beginning to acknowledge the enormity of the health impacts of climate change but there have been clarion calls for decades with little traction in medical education.[1] Medical students have been pushing for integration of climate health content in curricula to equip them to adequately care for patients in a rapidly changing environment. Groups such as Medical Students for a Sustainable Future (MS4SF)[2] and the Planetary Report Card[3] serve as examples of student groups leading the charge. Myriad opinion pieces have also been published by students proposing standardized and consistent content.[4-10]

The World Health Organization has called climate change the single greatest threat to human health.[11] Numerous medical societies and organizations have echoed this concern. The American College of Graduate Medical Education (ACGME) has plans to create a new climate health fellowship within internal medicine by 2035.[12] An editorial on the health impacts of climate change and biodiversity loss was published by over 200 medical and health journals, marking the first time a publication has been coordinated at this scale.[13] In August 2019, the New England Journal of Medicine launched the online "Climate Crisis and Health" hub.[14] A 2019 policy resolution from American Medical Association supports "climate change education across the medical education continuum."[15] Also in 2019, the United Nations (UN) declared a "climate emergency," and in partnership with over 7000 institutions across six continents, committed to strengthening climate change education.[16] The UN has created Sustainable Development Goals (SDG) with an emphasis on education and climate action (SDG 4 and 13).[17] The myriad forces leading to planetary crises including climate, pollution, and biodiversity loss have wide ranging implications for health.[18,19]

In response, there are increasing efforts to embed environmental content in medical school curricula, though much more needs to be done rapidly.[20,21] Many schools also have student-led climate health groups that operate in tandem with but external to traditional curricula. Some students have undertaken direct engagement with curriculum committees to work jointly to initiate climate health content into the preclinical curriculum.[9] These students who have developed coursework above and beyond the traditional also have the benefit of cultivating important leadership skills as they not only have to blaze a knowledge path for their colleagues but they must interact with medical school leadership to integrate the content. As the climate crisis is increasingly being recognized as a health crisis, future physicians will have to lead not only in education and research, but also in driving policy and advocating for disadvantaged communities.[1,11,14,15]

Along with learning the science behind environmental health, students need to develop skills to lead and advocate for community change.[22] Effective leadership is linked to improved patient outcomes, increased physician satisfaction and decreased burnout, and even improved performance of basic physician skills.[23-28] Developing such leadership skills to train on the environmental/health connection is a crucial next step in public health and congruent with physician goals. Leadership training is currently not standard in undergraduate medical education in the United States but is more advanced in the United Kingdom, the Netherlands, and Canada which have developed evidence-based leadership competency frameworks such as Medical Leadership Competency Framework (MLCF).[29-38] Thus, there is a pressing need to incorporate physician leadership curricula and guide implementation to create the climate health leaders of the future.[31] We will explore the unique challenges and opportunities this presents in medicine.[39]

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The knowledge gaps in climate health

Current medical students are faced with the unprecedented situation of having a new and evolving field of climate medicine develop during their training. This requires knowledge, expertise, and leadership. However, many existing educators do not have requisite knowledge nor recognize that these gaps exist to begin addressing climate health in their courses.[32,33] Certainly, there is a rapid evolution with several medical schools striving to integrate planetary and environmental health concepts but there is not yet uniform acceptance that the content is relevant nor that it reaches the primacy of existing topics.[34-36] Thus, being able to navigate situations in which there may be reluctance among faculty to integrate new content in an already crowded curriculum requires a unique skill set involving communication and consensus building.[37]

Currently, there is insufficient faculty to educate on the topic but an increasing need and many medical students looking for this expertise.[6,32,33,38,40] Additionally, some students may be more knowledgeable on climate health than faculty. Co-development of knowledge, skills, and attitudes related to climate health among physician faculty and students allow for direct mentorship with physician-leader role models where appropriate and an opportunity to exercise independence in areas that the student has more expertise, thus emphasizing the importance of diverse perspectives.[9,29,41-43] This demands a two-pronged approach for simultaneous elevation of the baseline level of climate health knowledge among all, trainees and faculty, and the eventual cultivation of expert physician leaders in climate health and advocacy to guide the next generation of trainees entering the system.

While addressing climate health knowledge gaps can be facilitated by continued medical education (CME) courses, required sessions would be necessary but not sufficient to develop the requisite depth and breadth of content acquisition to justify expert status. Medical societies can begin by embedding climate health sessions at national meetings or creating dedicated conference on environmental and climate health topics relevant to the specialty. There are new diploma courses for physicians and other medical professionals that can provide valuable baseline knowledge though this is separate additional coursework, independent of other requirements and individuals need to pursue this in addition to traditional CME requirements.[44,45] Many groups have designed their own lecture seminar series with experts in the field.[46-48] Educational experiences that marry advocacy, health and public policy, and the ecological determinants of health serve the dual purpose of developing leadership skills through organizing and advancing change.[49,50]

Novel models of co-development of knowledge may be more operational and timely as students and faculty can work together to develop expertise and comprehension on a topic.[9,38,41] In a case-based learning example, a standard question about how climate could impact the patient scenario could be inserted with faculty and students working toward a shared understanding of the involved factors.[9] Such faculty role-modeling of flexible adaptation to new knowledge is also important in professional identity formation and development as students can see how professors and clinicians adapt to changing subjects and enact life-long learning. Students and faculty can co-develop climate health content. Fortunately, there are already existing curricular structures onto which climate health content can be interwoven as most programs have incorporated the social determinants of health (SDH) in medical education.[51] Such content can be expanded to include the ecological determinants of health, which considers how physical, chemical, and biological factors interact with public policy, community, institutional, and interpersonal factors.[52,53] Elective courses on environmental health can highlight deliverables such as podcasts and patient-centered infographics which can then be returned to the pool of available educational tools for students, faculty, and patients.[54]

Education-based solutions

Given the complexity and multi-sectoral nature of the impact, there is a need to quickly and expeditiously integrate climate health content across the medical education continuum, extending into residency and faculty development to create truly comprehensive educational content.[55-57] Our medical students, residents, faculty, and staff must acquire the knowledge, skills, and attitudes to adapt to changing conditions and new diseases, understanding the scientific principles by which climate change and environmental hazards impact health. Educating on the many effects of climate and pollution on health requires a systematic approach to the curriculum which considers tenets of basic science and physiology and which illustrates the impacts of pollution and climate effects as well as existing elements that highlight social justice, the social determinants of health, and advocacy.[56]

Climate health education must specifically highlight the myriad interactions and impacts of the environment on structural racism and healthcare disparities. Inclusive development of curricula should call on a diversity of perspectives both in the academic setting and outside of it, valuing the lived experiences and the knowledge generated in communities. Environmental hazards through pollution and climate change impact all patients but have disproportionate effects on those with the least resources.[58] Thus, work to incorporate systemic racism, environmental justice, and topics of diversity, equity, and inclusion grounded in experiential learning which places emphasis on the voice of the community and can inform ethical and practical solutions.[51] Ecological determinants of health can be infused into sessions on interview strategies, making environmental considerations on par with social and family history.[59-63]

Overarching educational strategies that emphasize creative problem solving in policy and public health should be explored.

Research has pointed to a decrease in creativity with our existing educational system and providing a dichotomous, yes/no answer for complex problems is both reductionistic and inadequate.[64] It oversimplifies complex systems and multiple voices, reducing the many to a solitary voice and perspective and minimizing opportunity for creative and inclusive solutions. Creativity is often considered only important in the arts but cognitive flexibility allows individuals to effectively change strategies for better decision-making in multiple domains.[65] Flexible thinking can also be modeled and taught, which is needed to generate novel ideas and to understand connections between concepts.[66-71]

The knowledge gap in leadership skills

Medical schools have a wide variation in leadership development curricula with very few aligned with an established leadership competency framework[72] and none that center leadership around advocacy issues per se. Despite that, the educational agenda has been driven by passionate academics and clinicians who support eco-ethical leadership.[39,73-75] Just as medical educators assess competencies in other areas of medical education such as patient care and interpersonal communication, we should promote competencies in leadership ability. Many of these competencies are those which we would seek to support regardless of the context. In a survey of 195 global leaders asked to identify the top qualities of leaders, the most important was having high ethical and moral standards (67%) with communication skills as a close second (56%–59%). Also high on the list was nurturing and empowering others, being efficient learners and having flexibility to change opinions, and providing a safe environment.[74]

In any rapidly evolving field such as environmental health, the rate of new research and knowledge generation is brisk. Thus, being committed to professional and intellectual growth not only demonstrates to trainees a growth mindset and promotes lifelong learning but also is a cornerstone to basic medical practice. Other leadership skills such as intellectual humility, while important in any field, are crucial in work that cuts across many sectors and fields such as environmental health. Incorporating multiple voices and promoting diversity in leadership can be elevated by medical schools as diverse teams have been shown to provide better outcomes than more homogeneous ones.[76] Existing physician leaders in environmental health can serve as important examples and case studies. Innovations and momentum built by physician leaders of national organizations demonstrate the need for these highly effective skills in medicine.

Why leadership training in climate health is important

Educational models to instill principles of climate health do not automatically create climate health physician leaders, a field which demands both knowledge and leadership skills. Similarly, education alone does not necessarily create leaders who can advocate and engage with public policy. Many of the key abilities of successful leaders overlap with those of excellent physicians such as empathy, trustworthiness, and communication ability.[77] There are still components of leadership that will not be manifest in the clinical exam room and which require time and effort to develop. Creative and problem-based solutions may not be a component of everyday medical care but, as one navigates healthcare systems and organizations, issues will arise that have no clear cookie-cutter solution but rather require a multidisciplinary approach involving multiple stakeholders. For example, if a physician wants to address healthcare sustainability by decreasing single use disposables in medical practice, she cannot make a unilateral decision. Rather, she must develop relationships with leaders in supply chain, explore various options and perhaps understand life cycle analyses, engage with infection prevention experts, and discuss cost-benefit data with those in finance. This requires stepping "out of our lane" which can feel uncomfortable as many physicians do not want to be seen as dictating someone else's job. However, we must recognize that we bring a valuable perspective to the health system and have an obligation to highlight our concerns and educate others on a physician's perspective.

Multidisciplinary team-based solutions are one example where physician leadership can play a valuable role where collaborations between medical students, nurses, non-profits, and physicians can work together on issues facing a community. Physicians can become involved in medical societies and organizations which can also be a proving ground to develop advocacy skills for policies at the nexus of climate, the planet, and health. These parallel organizations can provide not only the support and outside perspective into environmental health issues but also create opportunities to advance evidence-based policy solutions. Organizations such as the American Medical Association and the American College of Physicians have passed resolutions and promoted climate health content in their conferences.[78-80] Medical students can thus see promoting health and public policy in the ecological sphere as part of preventative health and as a means to protect vulnerable communities.[52,53]

When medical students see these type of actions being role modeled, they can similarly be empowered to take their own actions. Programs such as the University of California San Francisco are building a network of faculty champions to incorporate environmental health and sustainability issues into education through work focused on mentoring and professional development.[81] Such institutional recognition of the importance of the subject is needed to support a pipeline of environmental health professionals who are primed to be leaders in the field.[81-83] Healthcare students in the Netherlands have driven integration of environmental health topics.[84]

As with any work in leadership, it is also necessary to embrace that it is not necessary or appropriate for every medical student become the same kind of leader. Future physicians can become a leader in their local practice, embed

sustainability practices, and teach about environmental health to their patients as part of preventative health. Others may engage in scholarship. Still others may lead policy at a local, regional, or national level. Recognizing the value of these various manifestations of leadership is critical to addressing environmental health, as it is with other SDH. As such, a diversity of leadership roles and positions with active engagement across the spectrum from patient advocacy to work on policy change is valuable for medical students to learn from.[85]

Advocacy work is necessarily multi-disciplinary. Physicians may be collaborating within a health system or externally with government organizations, industry, medical societies, research consortiums, and many more. Social engagement with environment and climate work necessarily demands facile and sensitive leadership. Thus, it is critical to recognize that, while the health voice is essential, it is not the only voice. Acknowledging the needs of individual communities and considering solutions and patient care that address multiple stakeholders is important for success. Speakers from the community could share their unique perspective on environmental issues. This plants the trainees' experience squarely in the community and in real circumstances of inequities. Students have already shown themselves to be powerful change agents within communities and an environmental focus can provide many opportunities for collaboration with community groups. Developing strong advocacy skills will support our students, residents, and faculty as they encounter challenging ethical situations and equip them to look deeply at the foundations of the disparities and vulnerabilities.

Leadership-based strategies

Many organizations, including the American Medical Association (AMA), recognize that physicians can no longer just deliver high-quality care. In complex systems, they need to lead teams and drive change.[86] While the skills are particularly useful in creating change agents to affect environmental and social movements, leadership education should be a core aspect of medical education, available to all and not only a subset.[87] Some schools have built in scholarly concentrations in leadership and innovation.[88] Others have partnered with business schools to implement strategies for leadership training.[89] The AMA's Accelerating Change in Medical Education Consortium was created to share ideas and experiences around leadership.[90]

Specific leadership training based on a competency framework such as the Medical Leadership Competency Framework (MLCF) can be integrated into different levels of medical training, including UME. A scoping review of leadership curricula identified five common themes with Teams and Teamwork being most common (cited by 11 of the 25 curricula, 44%). Other common themes included in the 25 curricula were Personal Leadership Style and Values (28%), Conflict Management and Resolution (28%), Communication Skills (24%), Advocacy (24%), and Self-Awareness (20%).[29]

Faculty development is needed not only to advance climate health in the curriculum, but also to develop individual leadership skills. The more medical education faculty see themselves as role models for future generations of physicians, the more empowered they will be to make changes in their own institutions and beyond. This can begin at the local level within medical schools and hospitals by engaging leadership to improve sustainability goals within a faculty's specific department and institutionally. Faculty can oversee climate health and other public health and community-focused research and quality improvement projects but need to be empowered with the knowledge and training to do so. Advocacy can be promoted through mentorship and help in writing and publishing op-eds and opinion pieces. Faculty can actively share their personal examples of advocacy.[91] Culture change which prioritizes climate health can then be extended from the medical school into the health systems.

Specific climate health leadership experiences could be codified in course work leading to a certificate, a distinction, or carved into a separate track or scholarly concentration with the understanding that foundational content in climate health and leadership be made available to all, regardless of future training aspirations. Fellowships and advanced training provide opportunities to explore environmental health as a specialty.[44,92,93] Recognition of such additional work would not only provide the student with valuable training for future practice, but also provide a malleable skill set that could be applied to other public health. As a burgeoning field, there are numerous opportunities for students to work on quality improvement and research projects.

Limitations

Certainly, there could be a line of thought asking whether physicians should be involved with climate change.[94] However, the climate crisis is a health crisis in which physicians cannot sit complacently on the sideline but must rather bring our expertise to bear to continually reframe the climate conversation back to one of health. Climate concerns have become a partisan issue rather than one that is rooted in patient health and outcomes.[95] The health voice is critical to address patient concerns and to ground debates in public health rather than politics.[96] One could also argue that a physician's place is at the individual patient's bedside. To this, we would respond "yes, and," much as they do in improvisation. Yes, physicians should be at the bedside, and they should also be advocating for public health beyond the four walls of the clinical examination room.

Conclusions

Medical education has a commitment to train the physician leaders of the future. Part of this public contract involves promoting evidence-based policies that support solutions at the nexus health and climate. It involves elevating the role of physicians to be both caring directly for patients and caring for the

public health and wellbeing of populations. Medical schools are now called to develop the physician leaders of the future to navigate the climate crisis as the greatest public health threat in our lifetimes. Physicians need to be comfortable with the science behind climate change as well as the health impacts in addressing issues at a community or organizational level. They must be able to use this information to affect policy change and transformation in their health system and beyond their community boundaries. Empowerment through mastery of content builds confidence in finding the paths for success and in building teams and coalitions to work on projects.

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