

Developing Transdisciplinary Leadership to Address Planetary Health: A Competency-Based Approach

Elizabeth Cerceo, MD, DCM, Cooper University Health Care and Cooper Medical School of Rowan University; **Hardeep Singh, MD, MPH**, Safety, Quality & Well-being Institute, Houston Methodist; and **Cecilia Sorensen, MD**, Columbia Irving Medical Center, Columbia University Mailman School of Public Health, and Columbia University

September 21, 2026

Introduction

Climate change, biodiversity loss, and pollution present pressing challenges for humanity, with far-reaching implications for human health and health care delivery systems, the well-being of communities worldwide, and life-supporting ecosystems globally (WHO, 2015; IPCC, 2022; USGCRP, 2023). Multi-sectoral solutions can address adverse impacts on planetary health (i.e., the health of human civilization and the state of the natural systems on which it depends) (Horton and Lo, 2015; Whitmee et al., 2015). To implement these solutions, leadership is needed from health professionals, including physicians, advanced practice providers, nurses, pharmacists, and allied health professionals; hospital and health system management; public health professionals; health policy experts; health professional societies; industry leaders; government; and beyond (Watts et al., 2021). Planetary health can be conceptualized as an ecological and collective challenge with important policy dimensions, requiring emerging leaders to act within and beyond the health care sector, integrating health perspectives into climate and environmental policies while driving interdisciplinary collaboration (Watts et al., 2021; Cerceo and Vasan, 2023; Salas, 2020). Because leadership in this area is not confined to health care systems, effective solutions to complex problems would cross boundaries and siloes, extending to

local and federal government and private industry, as well as health professional societies, schools, and agencies.

Planetary health leadership requires acquiring new knowledge not traditionally taught in standard health professional curricula. This calls for leaders with wide interests and diverse expertise (YEC Women, 2017). In this commentary, an expert-authored, proposed framework of skills and competencies from a variety of professional backgrounds is presented to equip planetary health leaders to tackle transdisciplinary challenges. While distinct competencies are outlined for each background, the goal of all planetary health leaders should be to pursue additional skills and competencies from related disciplines to enable decisive action and bridge transdisciplinary boundaries (Watts et al., 2021; Salas, 2020; Huikko-Tarvainen, 2021). Each of the following sections provides an outline of skills and competencies needed for various types of health leaders (see *Table 1*), each of whom might have multiple competencies to address their diverse roles.

This framework of skills and competencies is proposed by the authors as a starting point for discussion. It does not represent a validated, consensus-based, or National Academy of Medicine (NAM)-endorsed standard. Further validation, refinement, and adaptation of the framework would be useful.

Leaders in Hospital and Health Systems Sustainability

Hospitals and health systems, as significant contributors to the health care sector's environmental footprint, would benefit from planetary health leadership to enable actions to reduce their environmental health impact while building climate-resilient health care systems (Lenzen et al., 2020). Clinical and administrative leaders in this space can implement energy-efficient technologies, transition to renewable energy sources, and adopt sustainable procurement practices among other interventions. These actions not only reduce greenhouse gas emissions but also generate operational efficiencies and cost savings. Examples include clinician-led decarbonization efforts at the University of Pittsburgh health system, Boston Medical Center Health System's clean energy prescription program, and system-level progress in the UK National Health Service (NHS) and the European Union (University of Pittsburgh, 2024; Dillon, 2023; van Hove and Leng, 2019; Schmidt et al., 2025). Despite these successes, sustainability remains underprioritized in most health systems.

Planetary health leaders in this space should not be limited to the C-suite or to physicians (MacPherson and Hill, 2017). Equally important is fostering a culture of sustainability among other health care professionals and staff, while aligning efforts with the communities that health care systems serve. Leaders across nursing, environmental services, engineering, pharmacy, food services, and procurement are essential to operationalizing sustainability, strengthening collaboration, and advancing climate-smart health care through informed decision making on infrastructure, supply chains, and clinical practices (Cerceo and Franzblau, 2021). For instance, they need to understand how to make effective business arguments, weigh return-on-investment strategies, and have sufficient knowledge on architecture and engineering to support system resilience and climate-smart health care transformation such as preferred anesthetic gases, air

exchange standards, device reprocessing, and supply chain optimization (see *Table 1*, Competency Domains 1–4).

Leaders in Clinical Care

The authors agree that planetary health leaders must develop and implement climate-aware clinical care practices and clinical protocols for diagnosing, treating, and managing conditions directly linked to climate exposures. Examples include establishing standardized approaches for managing heat-related illnesses, respiratory conditions exacerbated by wildfire smoke and air pollution, vector-borne diseases, mental health impacts, and climate disasters. These protocols could address the needs of vulnerable populations—including children, older adults, pregnant individuals, outdoor workers, and those with preexisting conditions—and develop standards for avoiding low-value care, including overtesting, overdiagnosis, and overtreatment (Ali et al., 2024).

Planetary health leaders also play a crucial role in building resilience within health care systems to withstand climate-related disruptions. This involves participating in climate vulnerability assessments, developing comprehensive emergency preparedness plans for extreme weather events, and ensuring continuity of care during climate crises. Leaders can also champion infrastructure investments that enhance resilience, such as backup power systems, flood protection plans, and heat-resistant building designs (Cerceo and Singh, 2024; see *Table 1*, Competency Domains 1, 2, 5).

Leaders in Public and Population Health

Public and population health leaders operate at the intersection of health equity and climate resilience, building technical capacity for health impact surveillance, developing early warning systems for climate threats, and performing vulnerability assessments for at-risk communities. These leaders can implement community-protective interventions before, during, and after climate

TABLE 1 | Proposed Competencies in Planetary Health

Domain	Proposed Competencies for Planetary Health Leadership [a]
Leadership and Professional Development in Planetary Health	Competency 1.1: Develop leadership skills to drive planetary health initiatives within health care and health professional organizations. Competency 1.2: Foster mentorship and interdisciplinary collaboration to develop the next generation of planetary health leaders within and outside the organization. Competency 1.3: Engage in reflective practice and learning from feedback to assess whether progress is consistent with planetary health leadership goals.
Planetary Health Science and Systems Thinking	Competency 2.1: Analyze the impact of climate change on human health, including direct and indirect pathways (e.g., heat-related illnesses, vector-borne diseases, air pollution, etc.). Competency 2.2: Apply systems thinking to analyze the interconnectedness between environmental changes and health outcomes, identifying intervention leverage points. Competency 2.3: Evaluate the bidirectional relationship between health systems and environmental health, quantifying both contributions to environmental degradation and potential for positive impact.
Health Care Sustainability and Institutional Leadership	Competency 3.1: Assess and implement sustainable practices within health care systems, including waste reduction, energy efficiency, and green procurement. Competency 3.2: Build and lead multidisciplinary sustainability coalitions across departments, integrating expertise from clinical, operational, financial, and facilities management teams. Competency 3.3: Establish governance structures and accountability frameworks that embed sustainability metrics into organizational performance evaluations and strategic planning processes.
Health System Resilience and Adaptation	Competency 4.1: Conduct climate vulnerability assessments for health care facilities and service delivery models to identify critical infrastructure and operational vulnerabilities. Competency 4.2: Design and implement climate-resilient health care infrastructure and supply chains capable of maintaining operations during extreme weather events. Competency 4.3: Develop surge capacity protocols and resource allocation frameworks specifically tailored to managing climate-related health emergencies and disaster response.
Climate-Responsive Clinical Practice	Competency 5.1: Develop climate-informed clinical protocols for diagnosing and treating conditions directly related to environmental exposures (e.g., heat illness, wildfire smoke effects, emerging infectious diseases). Competency 5.2: Implement targeted screening and prevention strategies for populations with heightened vulnerability to climate-related health risks. Competency 5.3: Transform clinical workflows to simultaneously reduce environmental impact and improve patient outcomes through resource stewardship, telemedicine integration, and precision medicine approaches.

TABLE 1 | Proposed Competencies in Planetary Health *Continued*

Domain	Proposed Competencies for Planetary Health Leadership [a]
Competencies for Health Policy Leaders	Competency 6.1: Apply systems thinking to identify high-impact policy levers for planetary health leadership and institutional change across health governance systems. Competency 6.2: Lead transdisciplinary coalitions that develop evidence-based policy proposals integrating health co-benefits into climate mitigation and adaptation frameworks across institutional, community, and governmental levels. Competency 6.3: Craft and deliver compelling, evidence-based narratives that translate climate health science into actionable policy guidance tailored to specific decision-maker priorities and constraints. Competency 6.4: Evaluate and communicate evidence supporting the integration of planetary health considerations into local and federal policies, including public health infrastructure, sustainability initiatives, and climate adaptation strategies. Competency 6.5: Build and sustain multi-sectoral partnerships that bridge traditional institutional divides between clinical, public health, environmental, and policy stakeholders to develop comprehensive planetary health governance frameworks. Competency 6.6: Develop communication strategies that frame planetary health initiatives in terms of shared values, demonstrable health benefits, and economic advantages while effectively addressing misinformation and overcoming ideological resistance.
Competencies for Industry Leaders	Competency 7.1: Design and implement decarbonization strategies across health care operations including energy, waste, and supply chains using sustainability metrics to measure environmental and cost impacts. Competency 7.2: Build strategic cross-sector partnerships that integrate planetary health objectives with business imperatives by leveraging complementary stakeholder capabilities across clinical, public health, government, and commercial entities to scale innovative climate health solutions. Competency 7.3: Develop financial models that assess the health and business value of sustainability investments to support planetary health initiatives. Competency 7.4: Lead organizational culture transformation that embeds planetary health principles throughout governance structures, employee engagement programs, and external stakeholder communications while developing talent pipelines for emerging sustainability roles. Competency 7.5: Evaluate regulatory landscapes and engage with the development of policy frameworks that support environmental sustainability, green innovation, and collective action on planetary health challenges.
Competencies for Leaders in Medical Societies	Competency 8.1: Utilize the platform of medical societies to communicate evidence relevant to climate-focused policies, foster physician engagement, and inform policy development at institutional, national, and global levels. Competency 8.2: Develop and integrate evidence-based planetary health education into medical curricula, continuing medical education (CME), and professional training programs.

TABLE 1 | Proposed Competencies in Planetary Health *Continued*

Domain	Proposed Competencies for Planetary Health Leadership [a]
Competencies for Leaders in Medical Societies	Competency 8.3: Facilitate interdisciplinary collaboration by convening key stakeholders, health care professionals, researchers, policymakers, and industry leaders to advance planetary health goals through research, conferences, and strategic initiatives.
Competencies for Leaders in Medical Education	Competency 9.1: Integrate planetary health topics into medical education curricula, ensuring alignment with clinical and public health training. Competency 9.2: Utilize case-based learning, simulations, and experiential learning to teach planetary health principles effectively. Competency 9.3: Call for the inclusion of planetary health topics in standardized medical licensing and certification examinations. Competency 9.4: Design, implement, and evaluate CME programs that integrate planetary health science, climate-responsive clinical practice, health care sustainability, and system-level adaptation strategies. Competency 9.5: Engage in research on climate and health education to inform evidence-based teaching.

SOURCE: Created by the authors.

NOTE: [a] This framework of skills and competencies is proposed by the authors as a starting point for discussion. It does not represent a validated, consensus-based, or NAM-endorsed standard. Further validation, refinement, and adaptation of the framework would be useful.

events, while also diagnosing and investigating health problems related to climate change. Their expertise is crucial for communicating the health and economic benefits of climate solutions, evaluating climate-related health impacts at scale, and reducing disparities worsened by climate change (Sorensen and Fried, 2024).

Additionally, public health leaders can foster transdisciplinary collaboration across sectors to ensure a collective vision and action. They can strengthen pathways that rapidly translate scientific knowledge into meaningful health policy, while engaging vulnerable and marginalized communities to understand their lived experiences of climate change. During climate-related events, these leaders mobilize community partnerships to identify and solve health problems, particularly among vulnerable populations.

Leaders can use evidence-based, culturally responsive communication to translate climate health risks into clear, actionable messages, particularly for communities disproportionately

affected by climate change. Transparent, consistent, and data-driven campaigns delivered through trusted messengers can overcome information barriers, promote preventive behaviors, and strengthen community engagement, as demonstrated by initiatives such as New York City's "Be A Buddy" program (New York City Mayor's Office of Climate & Environmental Justice, 2019; Myers et al., 2015; see *Table 1*, Competency Domains 1, 2, 5, 6).

Leaders in Health Policy

Health policy leaders' influence extends beyond traditional health care boundaries and shapes the fundamental system governing public health, health care delivery, and environmental protection. The authors believe these leaders need to understand how regulatory frameworks and governance structures are related to environmental health. By applying evidence-based approaches that quantify both the health and economic impacts of climate-related threats, policy leaders can

design comprehensive policies that simultaneously address immediate health needs while building long-term climate resilience. The skills required to achieve this goal include navigating complex political landscapes, building coalitions across ideological divides, and creating governance structures that institutionalize planetary health considerations across all health-related decision making processes (see *Table 1*, Competency Domains 1, 2, 6).

Local, State, and Federal Government: Scaling Solutions

Health policy leaders are pivotal in advancing planetary health through their multilevel influence across local, state, and federal governance structures. At the local level, these leaders can drive immediate impact by implementing city and county ordinances that protect vulnerable communities from climate hazards, establishing local sustainability standards for health care facilities, and creating community-based early warning systems for climate-related health threats. Simultaneously, at the state level, they can navigate complex regulatory frameworks to develop comprehensive climate health action plans, secure dedicated funding for public health adaptation measures, and foster regional coordination among health care systems facing similar climate vulnerabilities. Policy-focused planetary health leaders can inform and support the work of local, state, and federal governments as consultants, advisors, or subject matter experts. By emphasizing health benefits, these leaders can strengthen support for green infrastructure, renewable energy, and community-based climate adaptation initiatives.

Sustaining Climate Health Leadership

The authors agree that planetary and climate health leaders must strategically adapt to sustain and advance progress by leveraging local and state governance structures. Simultaneously, they can continue to educate policymakers and the public about the health consequences of environmental policy decisions, connecting climate threats like

air pollution, extreme heat, and natural disasters to tangible health outcomes. Partnerships with accreditation bodies can support progress by helping establish standards. Evidence-based messaging can be framed around universal values such as economic security, family health, and community well-being. Furthermore, by embedding planetary health principles into institutional governance, health care operations, and accreditation standards, leaders can create durable, system-level change. The collective power of organized, cross-sector coalitions, including clinicians, scientists, public health officials, and public supporters, could potentially maintain and even accelerate the implementation of environmental and health protections.

Industry Leaders

Industry leaders can leverage their market influence, technical expertise, and supply chain control to catalyze health care actions. They can also strategically redirect capital investment toward developing clean energy technologies and circular-economy innovations, reducing waste in manufacturing processes, supporting sustainable health care supply chains, and improving operational resilience of the health sector. Furthermore, they can collaborate with suppliers and health care systems to implement comprehensive roadmaps to reduce emissions. Suppliers with strong Corporate Social Responsibility goals may work to decarbonize production or provide repurposing options for medical instruments. For instance, the NHS net-zero supply chain initiative aims to catalyze industry-wide innovations in sustainable medical products, carbon-neutral manufacturing, and responsible material sourcing (NHS Supply Chain, n.d.).

Industry leaders can develop collaborative partnerships with health care providers to create solutions that benefit both the environment and the economy. Examples include partnerships to develop biodegradable medical supplies or efficient waste management systems (see *Table 1*, Competency Domains 1, 2, 7).

Health Professional Education and Society Leaders

Medical societies could be vital in advancing planetary health by shaping professional norms, supporting education, and endorsing systemic change. They can raise awareness of the health impacts of climate change, promote climate-smart clinical practices, and integrate planetary health into continuing medical education and professional development. Their policy statements, position papers, and educational activities can influence public policy on clean energy, environmental justice, and health system sustainability (Bush et al., 2022; American College of Physicians, 2025; Crowley et al., 2022). They can develop planetary health-focused educational resources for health care professionals, amplify messaging, and disseminate best practices and research. The Medical Society Consortium on Climate and Health aligns the interests of approximately 60 medical societies, while other groups, such as the NAM, have created initiatives to help achieve a climate-resilient and sustainable health sector (The Medical Society Consortium on Climate and Health, n.d.; NAM, n.d.). Several organizations, such as the American Medical Association and the American College of Physicians, have passed resolutions and promoted climate health content in their conferences (American Medical Association, 2022; Crowley, 2016). The Planetary Health Alliance and the World Health Organization help build consensus across national boundaries, accelerating the integration of planetary health principles into clinical practice, research, and education (Planetary Health Alliance, n.d.; WHO, 2024; see *Table 1*, Competency Domains 1, 2, 8).

Competencies for Health Professional Educational Leaders

Leaders in medical education have the responsibility to embed planetary health principles into the training of future health care professionals, placing broad public health concerns on par with biochemical pathways (Matsas et al., 2022; Cerceo et al., 2022; Mian and Khan, 2020). Medical education

leaders can prioritize developing future planetary health champions to sustain progress (Rabin et al., 2020; Saltzman, 2019; NHS Leadership Academy, 2011). Leadership training could integrate climate and health principles with systems thinking and interdisciplinary collaboration at an early stage, recognizing that physicians' roles go beyond healing individual patients to preventing disease in those patients they may never see (Watts et al., 2021).

Specific leadership training based on a competency framework, such as the NHS Clinical Leadership Competency framework, can be integrated into different levels of medical training (NHS Leadership Academy, 2011). The Global Consortium on Climate and Health Education has developed a comprehensive framework of core competencies to prepare health professionals to respond effectively to the climate crisis, organized into five domains: Knowledge and Analytic Skills, Collaboration and Communication, Policy, Public Health Practice, and Clinical Practice (Sorensen et al., 2023; McLean et al., 2022).

Planetary health can be integrated into existing courses, such as public health, epidemiology, or health systems management, along with organ system-based modules (Rajagopalan and Landrigan, 2021; Sorensen and Garcia-Trabanino, 2019). Case studies on disaster preparedness can include discussions on how climate change exacerbates natural disasters and impacts vulnerable populations. Sustainable health care practices can be integrated as quality improvement activities for medical trainees that align with Accreditation Council of Graduate Medical Education Clinical Learning Environment Review Pathways (Tuck et al., 2024; Kalwaney and Cerceo, 2024). Leaders of boards and other standardized medical exams can include climate and environmental issues in their examination blueprints regardless of specialty.

Mentorship and networking opportunities are also important for nurturing emerging leaders and can include trainees working on sustainability initiatives, engaging in climate activism, or collaborating with community organizations to address

environmental health disparities. Meetings of health professional societies and organizations are an excellent venue for networking and mentoring (Medical Students for a Sustainable Future, n.d.; Childs, 2020; Practice Greenhealth, 2025). The University of Colorado's Diploma in Climate Medicine trains clinicians to champion climate-resilient policies, credibly address environmental justice issues, and lead health care systems in decarbonization and resiliency (University of Colorado Anschutz School of Medicine Climate and Health Program, n.d.).

Educators also play a role in calling for institutional change within academic organizations. They can lead efforts to reduce the carbon footprint of medical schools and other health professional schools, promote sustainable practices on campuses, and call for integrating planetary health into accreditation standards. By aligning their clinical sites with the principles they teach, educators demonstrate that planetary health is not just an academic subject but a lived commitment (see *Table 1*, Competency Domains 1, 2, 9).

Summary

Planetary health leadership encompasses a wide array of roles across health systems, public agencies, government/policymakers, industry, medical societies, and medical education. Each sector contributes unique strengths, expertise, and perspectives to the collective effort of addressing the climate crisis. The goal is not to mold a single archetype of a leader but to embrace and cultivate a diversity of talents, experiences, and backgrounds across the various disciplines involved, reflecting the complexity of current challenges. A transdisciplinary approach to planetary health would require meaningful collaboration among people from diverse disciplines, the integration of health considerations into climate policy, and investment in the education and development of future leaders who are knowledgeable about other disciplines and can work with them. Concerted efforts would strengthen the capacity to build a

sustainable and resilient health care system in the face of a rapidly changing planet.

References

- Ali, K. J., S. Ehsan, A. Tran, M. Haugstetter, and H. Singh. 2024. Diagnostic excellence in the context of climate change: A review. *The American Journal of Medicine* 137:1035-1041. <https://doi.org/10.1016/j.amjmed.2024.06.010>.
- American College of Physicians. 2025. *Toolkit: Climate Change and Health*. Available at: <https://www.acponline.org/advocacy/advocacy-in-action/toolkit-climate-change-and-health> (accessed December 18, 2025).
- American Medical Association. 2022. *AMA adopts new policy declaring climate change a public health crisis*. Available at: <https://www.ama-assn.org/press-center/ama-press-releases/ama-adopts-new-policy-declaring-climate-change-public-health-crisis> (accessed December 18, 2025).
- Bush, T., W. A. Jensen, and T. R. Katsumoto. 2022. US medical organizations and climate change advocacy: A review of public facing websites. *BMC Public Health* 22:1950. <https://doi.org/10.1186/s12889-022-14339-7>.
- Cerceo, E., and N. Franzblau. 2021. Effectively utilizing wellness and engagement surveys. *Journal of Hospital Administration*. <https://doi.org/10.5430/jha.v10n6p27>.
- Cerceo, E., P. Saberi, and J. Becker. 2022. Interactive curriculum to teach medical students health and climate change. *Journal of Climate Change Health* 5:100105. <https://doi.org/10.1016/j.joclim.2021.100105>.
- Cerceo, E., and H. Singh. 2024. National policies to accelerate climate action in US healthcare. *Nature Climate Change* 14:889-891. <https://doi.org/10.1038/s41558-024-02105-z>.
- Cerceo, E., and N. Vasan. 2023. Creating environmental health leaders when educators are learning too. *Journal of Medical Education and Curricular Development* 10:23821205231219162. <https://doi.org/10.1177/23821205231219162>.

- Childs, J. 2020. About time? Getting sustainable healthcare into the medical school curriculum. *Medical Teacher* 42:714-715. <https://doi.org/10.1080/0142159x.2019.1669781>.
- Crowley, R. A., for the Health and Public Policy Committee of the American College of Physicians. 2016. Climate change and health: A position paper of the American College of Physicians. *Annals of Internal Medicine* 164:608-610. <https://doi.org/10.7326/m15-2766>.
- Crowley, R., S. Mathew, and D. Hilden, for the Health and Public Policy Committee of the American College of Physicians. 2022. Environmental health: A position paper from the American College of Physicians. *Annals of Internal Medicine* 175:1591-1593. <https://doi.org/10.7326/m22-1864>.
- Dillon, K. 2023. Boston Medical Center Health System's new pilot program will allow doctors to prescribe energy bill credits for patients. *HealthCity*, October 16. Available at: <https://healthcity.bmc.org/boston-medical-center-health-systems-new-pilot-program-will-allow-doctors/> (accessed December 18, 2025).
- Horton, R., and S. Lo. 2015. Planetary health: A new science for exceptional action. *The Lancet* 386:1921-1922. [https://doi.org/10.1016/s0140-6736\(15\)61038-8](https://doi.org/10.1016/s0140-6736(15)61038-8).
- Huikko-Tarvainen, S. 2021. Elements of perceived good physician leadership and their relation to leadership theory. *Leadership in Health Services (Bradford, England)* 35:14-29. <https://doi.org/10.1108/lhs-01-2021-0002>.
- IPCC (Intergovernmental Panel on Climate Change). 2022. Climate change: A threat to human wellbeing and health of the planet, press release, February 28. Available at: <https://www.ipcc.ch/report/ar6/wg2/resources/press/press-release/> (accessed December 18, 2025).
- Kalwaney, S., and E. Cerceo. 2024. Plant-Based diets: A vital component of graduate medical education programs on climate and health. *Journal of Graduate Medical Education* 16:40-44. <https://doi.org/10.4300/JGME-D-23-00913.1>.
- Lenzen, M., A. Malik, M. Li, J. Fry, H. Weisz, P. P. Pichler, L. S. M. Chaves, A. Capon, and D. Pencheon. 2020. The environmental footprint of health care: A global assessment. *The Lancet Planetary Health* 4:e271-e279. [https://doi.org/10.1016/s2542-5196\(20\)30121-2](https://doi.org/10.1016/s2542-5196(20)30121-2).
- MacPherson, C. C., and J. Hill. 2017. Are physicians obliged to lead environmental sustainability in health care organizations? *AMA Journal of Ethics* 19(12):1164-1173. <https://doi.org/10.1001/journalofethics.2017.19.12.ecas2-1712>.
- Matsas, B., E. Goralnick, M. Bass, E. Barnett, B. Nagle, and E. E. Sullivan. 2022. Leadership development in US undergraduate medical education: A scoping review of curricular content and competency frameworks. *Academic Medicine* 97:899-908. <https://doi.org/10.1097/acm.0000000000004632>.
- McLean, M., G. Behrens, H. Chase, O. El Omrani, F. Hackett, K. Hampshire, N. Islam, S. Hsu, and N. Sood. 2022. The medical education planetary health journey: Advancing the agenda in the health professions requires eco-ethical leadership and inclusive collaboration. *Challenges* 13:62. <https://doi.org/10.3390/challe13020062>.
- Medical Students for a Sustainable Future. n.d. Available at: <https://ms4sf.org/> (accessed December 18, 2025).
- Mian, A., and S. Khan. 2020. Medical education training toward a greener future. *Nature Medicine* 26:156. <https://doi.org/10.1038/s41591-019-0702-1>.
- Myers, T. A., E. Maibach, E. Peters, and A. Leiserowitz. 2015. Simple messages help set the record straight about scientific agreement on human-caused climate change: The results of two experiments. *PLoS One* 10:e0120985. <https://doi.org/10.1371/journal.pone.0120985>.
- NAM (National Academy of Medicine). n.d. Action Collaborative on Achieving a Climate Resilient and Sustainable Health Sector. Available at: <https://nam.edu/our-work/programs/climate-and-health/climate-collaborative/> (accessed December 18, 2025).

- New York City Mayor's Office of Climate & Environmental Justice. 2019. *Be a Buddy*. Available at: <https://www.nyc.gov/content/climate/pages/initiatives/be-a-buddy> (accessed December 18, 2025).
- NHS (National Health Service) Leadership Academy. 2011. *Clinical Leadership Competency Framework*. 3rd edition. Coventry: NHS Institute for Innovation and Improvement.
- NHS Supply Chain. n.d. *A net zero supply chain and suppliers*. Available at: <https://www.supplychain.nhs.uk/programmes/sustainability/net-zero-supply-chain-and-suppliers/> (accessed December 18, 2025).
- Planetary Health Alliance. n.d. *What is planetary health?* Available at: <https://planetaryhealthalliance.org/what-is-planetary-health/> (accessed December 18, 2025).
- Practice Greenhealth. 2025. *CleanMed Conference*. Available at: <https://practicegreenhealth.org/resources/cleanmed-conference> (accessed December 18, 2025).
- Rabin, B. M., E. B. Laney, and R. P. Philipsborn. 2020. The unique role of medical students in catalyzing climate change education. *Journal of Medical Education and Curricular Development* 7:238212052095765. <https://doi.org/10.1177/2382120520957653>.
- Rajagopalan, S., and P. J. Landrigan. 2021. Pollution and the heart. *The New England Journal of Medicine* 385:1881-1892. <https://doi.org/10.1056/NEJMr203028>.
- Salas, R. N. 2020. The climate crisis and clinical practice. *The New England Journal of Medicine* 382:589-591. <https://doi.org/10.1056/nejmp2000331>.
- Saltzman, H. M. 2019. Medical school curricula should highlight environmental health. *Academic Medicine* 94:1406. <https://doi.org/10.1097/ACM.0000000000002874>.
- Schmidt, A. E., K. Brugger, I. Horváth, M. Falkenbach, G. A. Williams, A. van Schaaijk, R. Batenburg, and M. Wismar. 2025. Green skills for a sustainable future: Building a climate-smart health and care workforce in the European Union. Copenhagen: European Observatory on Health Systems and Policies, WHO Regional Office for Europe.
- Sorensen, C., H. Campbell, A. Depoux, M. Finkel, R. Gilden, K. Hadley, D. Haine, G. Mantilla, R. McDermott-Levy, T. M. Potter, T. L. Sack, S. Tun, and C. Wellbery. 2023. Core competencies to prepare health professionals to respond to the climate crisis. *PLOS Climate* 2:e0000230. <https://doi.org/10.1371/journal.pclm.0000230>.
- Sorensen, C., and R. Garcia-Trabanino. 2019. A new era of climate medicine—Addressing heat-triggered renal disease. *The New England Journal of Medicine* 381:693-696. <https://doi.org/10.1056/nejmp1907859>.
- Sorensen, C. J., and L. P. Fried. 2024. Defining roles and responsibilities of the health workforce to respond to the climate crisis. *JAMA Network Open* 7:e241435. <https://doi.org/10.1001/jamanetworkopen.2024.1435>.
- The Medical Society Consortium on Climate and Health. n.d. Available at: <https://medsocietiesforclimatehealth.org/> (accessed December 18, 2025).
- Tuck, M. G., C. Y. Colbert, R. Philipsborn, and T. Cooney. 2024. Prescribing change: The dire need to address climate and health in graduate medical education. *Journal of Graduate Medical Education* 16:1-4. <https://doi.org/10.4300/JGME-D-24-00927.1>.
- University of Colorado Anschutz School of Medicine Climate and Health Program. n.d. *Diploma in Climate Medicine*. University of Colorado Anschutz. Available at: <https://medschool.cuanschutz.edu/climateandhealth/diploma-in-climate-medicine> (accessed December 18, 2025).
- University of Pittsburgh. 2024. *Office of Sustainability in the Health Sciences*. Available at: <https://sustainability.health.pitt.edu> (accessed December 18, 2025).
- USGCRP (United States Global Change Research Program). 2023. *Fifth National Climate Assessment*. Crimmins, A. R., C. W. Avery,

- D. R. Easterling, K. E. Kunkel, B. C. Steward, and T. K. Maycock, Eds. Washington, DC: US Global Change Research Program. Available at: https://toolkit.climate.gov/sites/default/files/2025-07/NCA5_2023_FullReport.pdf (accessed December 18, 2025).
- van Hove, M., and G. Leng. 2019. A more sustainable NHS. *BMJ* 366:14930. <https://doi.org/10.1136/bmj.l4930>.
- Watts, N., M. Amann, N. Arnell, S. Ayeb-Karlsson, J. Beagley, K. Belesova, M. Boykoff, P. Byass, W. Cai, D. Campbell-Lendrum, S. Capstick, J. Chambers, S. Coleman, C. Dalin, M. Daly, N. Dasandi, S. Dasgupta, M. Davies, C. Di Napoli, P. Dominguez-Salas, P. Drummond, R. Dubrow, K. L. Ebi, M. Eckelman, P. Ekins, L. E. Escobar, L. Georgeson, S. Golder, D. Grace, H. Graham, P. Haggard, I. Hamilton, S. Hartinger, J. Hess, S. C. Hsu, N. Hughes, S. Jankin Mikhaylov, M. P. Jimenez, I. Kelman, H. Kennard, G. Kieseewetter, P. L. Kinney, T. Kjellstrom, D. Kniveton, P. Lampard, B. Lemke, Y. Liu, Z. Liu, M. Lott, R. Lowe, J. Martinez-Urtaza, M. Maslin, L. McAllister, A. McGushin, C. McMichael, J. Milner, M. Moradi-Lake, K. Morrissey, S. Munzert, K. A. Murray, T. Neville, M. Nilsson, M. O. Sewe, T. Oreszczyn, M. Otto, F. Owfi, O. Pearman, D. Pencheon, R. Quinn, M. Rabbaniha, E. Robinson, J. Rocklöv, M. Romanello, J. C. Semenza, J. Sherman, L. Shi, M. Springmann, M. Tabatabaei, J. Taylor, J. Triñanes, J. Shumake-Guillemot, B. Vu, P. Wilkinson, M. Winning, P. Gong, H. Montgomery, and A. Costello. 2021. The 2020 report of The *Lancet* Countdown on health and climate change: Responding to converging crises. *The Lancet* 397:129-170. [https://doi.org/10.1016/s0140-6736\(20\)32290-x](https://doi.org/10.1016/s0140-6736(20)32290-x).
- Whitmee, S., A. Haines, C. Beyrer, F. Boltz, A. G. Capon, B. F. de Souza Dias, A. Ezech, H. Frumkin, P. Gong, P. Head, R. Horton, G. M. Mace, R. Marten, S. S. Myers, S. Nishtar, S. A. Osofsky, S. K. Pattanayak, M. J. Pongsiri, C. Romanelli, A. Soucat, J. Vega, and D. Yach. 2015. Safeguarding human health in the Anthropocene epoch: Report of the Rockefeller Foundation–*Lancet* Commission on planetary health. *The Lancet* 386:1973-2028. [https://doi.org/10.1016/s0140-6736\(15\)60901-1](https://doi.org/10.1016/s0140-6736(15)60901-1).
- WHO (World Health Organization). 2024. *Climate change and health*. Available at: https://apps.who.int/gb/ebwha/pdf_files/WHA77/A77_R14-en.pdf (accessed December 18, 2025).
- WHO. 2015. *WHO calls on countries to protect health from climate change*. Available at: <https://www.who.int/news/item/17-11-2015-who-calls-on-countries-to-protect-health-from-climate-change> (accessed December 18, 2025).
- YEC Women. 2017. Jack of all trades, master of all? What today's renaissance leaders need to succeed. *Forbes*, May 23. Available at: <https://www.forbes.com/sites/yec/2017/05/23/jack-of-all-trades-master-of-all-what-todays-renaissance-leaders-need-to-succeed/> (accessed December 18, 2025).

DOI

<https://doi.org/10.31478/202609a>

Suggested Citation

Cerceo E., H. Singh, and C. Sorensen. 2026. Developing Transdisciplinary Leadership to Address Planetary Health: A Competency-Based Approach. *NAM Perspectives*. Commentary, National Academy of Medicine, Washington, DC. <https://doi.org/10.31478/202609a>.

Author Information

Elizabeth Cerceo, MD, DCM, is Professor, Department of Medicine, Cooper University Health Care, and Executive Director of Climate Health, Cooper Medical School of Rowan University. **Hardeep Singh, MD, MPH**, is Director, Safety, Quality & Well-being Institute, Houston Methodist. **Cecilia Sorensen, MD**, is Associate Professor, Department of Emergency Medicine, Columbia

Irving Medical Center; Associate Professor, Department of Environmental Health Sciences, Columbia University Mailman School of Public Health; and Director, Global Consortium on Climate and Health Education, Columbia University.

Dr. Singh serves as a Steering Committee Member of the National Academy of Medicine's Action Collaborative on Achieving a Climate Resilient and Sustainable Health Sector (Climate Collaborative) and co-leads their Health Care Delivery Working Group. Dr. Sorensen also serves as a Steering Committee Member of the Climate Collaborative and additionally co-leads their Education Working Group.

Correspondence

Questions or comments should be directed to Hardeep Singh at hdsingh@houstonmethodist.org.

Disclaimer

The views expressed in this paper are those of the authors and not necessarily of the authors' organizations, the National Academy of Medicine (NAM), or the National Academies of Sciences, Engineering, and Medicine (the National Academies). The paper is intended to help inform and stimulate discussion. It is not a report of the NAM or the National Academies. Copyright by the National Academy of Sciences. All rights reserved.