Adapting the Planetary Health Report Card for Graduate Medical Training Programs

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ABSTRACT

Background Leading medical organizations recognize climate change as an urgent threat to public health and social justice. Medical students created the Planetary Health Report Card (PHRC) to evaluate and spur climate action in medical schools. Graduate medical trainees lack a similar tool to evaluate and improve their training programs and institutions.

Objective To adapt the PHRC to graduate medical education (GME) contexts and report preliminary validity evidence.

Methods In 2023, based on literature review, we adapted the 2022 undergraduate medical PHRC metrics on curriculum and sustainability. We modified keywords in all PHRC domains to apply to GME. We recruited participants with expertise in planetary health, sustainability, and health equity affiliated with GME. Using a modified Delphi Panel method, we surveyed participants on adapted metric validity. We determined percent agreement among participants.

Results We recruited 45 eligible participants, of whom 20 (44%) completed a first-round survey. Participants included a senior medical student, residents, fellows, faculty, and program directors from the United States, Canada, and the United Kingdom. Participants had a high level of agreement on metrics in the domains of curriculum, support for trainee-led initiatives, and sustainability. Some metrics in research and community engagement domains fell below the agreement threshold.

Conclusions In the first round of a modified Delphi Panel survey, trainees and faculty agreed that metrics adapted from the PHRC are relevant to evaluating GME programs on planetary health, sustainability, and environmental justice.

Introduction

Leading international medical organizations recognize human-caused climate change as an urgent threat to public health and social justice. 1-4 This concern has given rise to the field of "planetary health," whose proponents study and advocate for environmental stewardship to protect human health and equity.⁵ In 2019, medical students created a metric-based tool called the Planetary Health Report Card (PHRC) to evaluate and inspire climate action in undergraduate medical education (UME) institutions.^{6,7} Originally piloted at 12 US and Canadian medical schools, the PHRC has now been used at 151 health professional schools in 18 countries across North America, Asia, Africa, Europe, and Oceania, as well as adapted for disciplines including nursing, occupational therapy, physiotherapy, pharmacy and veterinary medicine.^{6,7}

The PHRC evaluates medical schools across 5 domains: (1) curriculum; (2) research; (3) community outreach and advocacy; (4) support for student-led

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Editor's Note: Then online supplementary data contains the intake form and survey used in the study and the geographic spread of the survey participants.

planetary health initiatives; and (5) campus sustainability. ^{6,8,9} Medical students use PHRC findings to drive institutional change. ^{6,10,11} For example, students have successfully advocated for new curricular requirements, a sustainability office's creation, and the appointment of student representatives to institutional decision-making bodies. ⁶ Graduate medical education (GME) and UME differ in their curriculum structure, specialty-specific content, clinical duties, employment status, and variation between academic and community settings. Therefore, the PHRC requires adaptation to GME.

Efforts to incorporate planetary health and sustainability into GME are nascent and growing. 8,12,13 This project aims to adapt the PHRC to GME, allowing trainees to advocate for climate action within their institutions using a standardized tool with a successful track record. This article presents preliminary findings from this effort.

Methods

Our research team includes a contributing author (S.S.), a cofounder (K.H.) and current leaders of the UME PHRC (T.D., I.W.), and a GME program leader with experience in the Delphi Panel method (A.B.).

In 2022, to develop domains and metrics for the GME PHRC, S.S, K.H., T.D., and I.W. met and reviewed the 2022 UME PHRC, discussing differences between UME and GME relevant to the tool.¹⁴ Due to major differences in curriculum requirements, S.S. reviewed literature on GME planetary health curricula and edited the existing curriculum metrics accordingly. 12,13,15 We also saw an opportunity to shift the sustainability domain's focus from UME campuses to GME-affiliated health systems. Therefore, S.S. reviewed literature on health care sustainability best practices and edited existing sustainability metrics accordingly. 16-19 Proposed metrics in other domains matched the 2022 UME PHRC metrics, with the word "student" changed to "trainee," and "school" to "program" or "institution."

To determine expert consensus on proposed GME PHRC metrics, we chose a modified Delphi Panel method.²⁰ This method is suited to developing and measuring consensus in areas with limited preexisting literature or practice. It allows participants to review their peers' anonymized responses from prior survey rounds to inform their own choices in subsequent rounds. We drew methodological inspiration from work to develop anti-racism metrics for GME.^{21,22}

S.S and A.B. developed the first round survey instrument (see online supplementary data) using REDCap (Vanderbilt University) software hosted at Children's National Hospital.^{23,24} REDCap is a secure web-based platform designed to support validated data capture, export, and auditing in research.

In 2023, we recruited participants via purposive and snowball sampling. We recruited individually and via online fora of organizations, including the PHRC, Medical Students for a Sustainable Future, Health Care Without Harm Physician Network, and American Academy of Pediatrics Chapter Climate Advocates. ^{6,25-27} Participants were eligible if they attested to (1) being current trainees in residency, fellowship, or the final clinical year of medical school, or current GME faculty or program leadership; and (2) having "experience, expertise, and/or meaningful commitment to action on planetary health, climate change, health care sustainability, and health equity" (see Intake Form in online supplementary data).

We asked participants to score each domain using a 4-point modified Likert scale, indicating if they "strongly agree," "agree," "disagree," or "strongly disagree" that each domain "is a key sign of commitment to planetary health, sustainability, and environmental justice for academic graduate medical training institutions." On the same scale, we asked participants whether each proposed metric "is an accurate way for graduate medical training institutions to assess their progress" in each domain. We set greater

than 70% as the a priori agreement level required to merit inclusion of a domain or metric in the GME PHRC. We invited open-ended comments on all domains and metrics and noted when multiple respondents wrote similar comments. We completed first-round data collection and plan for at least one more round.

The Children's National Institutional Review Board deemed the study "not human subjects research."

Results

We recruited 45 eligible participants, of whom 20 (44%) completed a first round survey. Participants came from the United States, Canada, and the United Kingdom. They included trainees and faculty in various medical and surgical specialties. The TABLE summarizes participant demographics (see online supplementary data for a map of participants from all US census regions).²⁸

The BOX shows the domains and metrics proposed in the survey. Agreement exceeded 70% on all metrics in the curriculum, trainee support, and sustainability domains, with a range of 75% to 100% of participants indicating they agree or strongly agree with metric accuracy. The research and community outreach domains each had one metric fall below the agreement threshold.

Participants gave rich open-ended feedback on metric wording, scoring, and relevance to GME. Multiple participants recommended adding metrics focused on climate resilience and preparedness in health systems and surrounding communities. Others stated that programs offering faculty development and paid protected time should score higher than programs that allow GME trainees to lead planetary health initiatives without compensation. Participants expressed differing views on program and institutional obligations to offer research experiences and community-facing education.

Discussion

Our study finds that trainees and faculty with knowledge of and commitment to planetary health agree that adapted PHRC metrics can accurately evaluate GME programs' and institutions' commitment to planetary health, sustainability, and environmental justice. Consensus was strongest on metrics evaluating curriculum, support for trainee-led initiatives, and health care sustainability.

The only domains with metrics falling below the agreement threshold were research and community outreach. The second round survey will allow participants to review each other's compiled responses, so perspectives may evolve.

TABLEDemographic Summary of First Round Survey Participants

Characteristics	n (%); N=20
Age	
20-29	6 (30)
30-39	8 (40)
40-49	6 (30)
Gender	
Woman	16 (80)
Man	3 (15)
Prefer not to answer	1 (5)
Race/ethnicity ^a	``
American Indian or Alaskan Native	1 (5)
Asian	6 (30)
Middle Eastern or North African	1 (5)
Hispanic or Latino	1 (5)
White	12 (60)
Role ^a	
Senior medical student	1 (5)
Resident	7 (35)
Fellow	3 (15)
Faculty	10 (50)
Residency program director	1 (5)
Fellowship program director	2 (10)
Number of trainees in affiliated GME program	- (10)
1-20	2 (10)
21-40	6 (30)
41-60	5 (25)
61-80	1 (5)
Greater than 81	4 (20)
Not sure	1 (5)
Not applicable	1 (5)
Country	. (~)
Canada	1 (5)
United Kingdom	1 (5)
United States	18 (90)
Years in planetary health	10 (50)
0-2	4 (20)
3-5	11 (55)
6-9	2 (10)
Greater than 10	3 (15)
Specialty] 3 (13)
Emergency medicine	1 (5)
Family medicine	4 (20)
Internal medicine	3 (15)
Neurosurgery	1 (5)
Obstetrics and gynecology	1 (5)
Pediatrics	8 (40)
Radiology	2 (10)

TABLE
Demographic Summary of First Round Survey Participants (continued)

Characteristics	n (%); N=20
Primary clinical practice settings ^a	
University hospital	13 (65)
University clinic	3 (15)
Academically affiliated community hospital	6 (30)
Academically affiliated community clinic	5 (25)
Community hospital	1 (5)
Community clinic	2 (10)
Population density in practice area	
Urban	19 (95)
Suburban	1 (5)

^a Total is greater than 100% due to participant self-identification in multiple categories. Abbreviation: GME, graduate medical education.

BOX Proposed GME PHRC Domains and Metrics

Domain 1: Planetary Health Curriculum

- *Metric 1.1* Did your training program offer elective curriculum (trainee-selected modules) to engage trainees in education for sustainable health care or planetary health in the past year?
- Metric 1.2 Does your graduate medical curriculum address the relationship between climate change and health risks to patients cared for in your specialty?
- *Metric 1.3* Does your graduate medical curriculum address the relationship between anthropogenic environmental toxins and health risks to patients cared for in your specialty?
- Metric 1.4 Does your graduate medical curriculum address the inequitable health impacts of climate change and
 anthropogenic environmental toxins on marginalized populations, such as those with low socioeconomic status, women,
 communities of color, Indigenous communities, children, homeless populations, and older adults?
- Metric 1.5 Does your graduate medical curriculum address the inequitable health impacts of climate change globally?
- Metric 1.6 Does your graduate medical curriculum address important human-caused environmental threats that are relevant to your program's surrounding community?
- Metric 1.7 Does your graduate medical curriculum address the carbon footprint of health care systems?
- Metric 1.8 Does your graduate medical curriculum teach methods for advancing the environmental sustainability of health care systems?
- Metric 1.9 Is your training program currently in the process of improving education for sustainable health care/planetary health?
- Metric 1.10 Does your graduate medical training program have a designated faculty lead responsible for incorporating planetary health and sustainable health care throughout the curriculum?
- Metric 1.11 Does your graduate medical curriculum include training in advocacy skills to advance planetary health and sustainable health care?

Domain 2: Interdisciplinary Research in Health and the Environment

- Metric 2.1 Are there researchers engaged in planetary health research and health care sustainability research at your institution?
- Metric 2.2 Is there a dedicated department or institute for interdisciplinary planetary health research at your institution?
- *Metric 2.3* Is there a process by which communities disproportionately impacted by climate change and environmental injustice give input or make decisions about the research agenda at your institution?
- *Metric 2.4* Does your institution have a planetary health website, or a website centralizing various institutional resources related to health and the environment?
- Metric 2.5 Has your institution recently hosted a conference or symposium on topics related to planetary health?
- Metric 2.6 Is your institution a member of a national or international planetary health or education for sustainable health care organization?

BOX Proposed GME PHRC Domains and Metrics (continued)

Domain 3: Community Outreach and Advocacy in Environment and Health

- Metric 3.1 Does your institution partner with community organizations to promote planetary and environmental health?
- Metric 3.2 Does your institution offer community-facing courses or events regarding planetary health?
- *Metric 3.3* Does your institution have regular coverage of issues related to planetary health and/or sustainable health care in institutional update communications?
- *Metric 3.4* Does your institution engage in professional education activities targeting individuals who have completed training with the aim of ensuring their knowledge and skills in planetary health and sustainable health care remain up to date during their professional career?
- Metric 3.5 Does your institution have accessible educational materials for patients about environmental health exposures?
- Metric 3.6 Does your institution have accessible educational materials for patients about climate change and health impacts?

Domain 4: Support for Trainee-Led Planetary Health Initiatives

- Metric 4.1 Does your graduate medical training program or institution offer support for trainees interested in enacting a sustainability initiative/QI project?
- *Metric 4.2* Does your graduate medical training program or institution offer opportunities for trainees to do research related to planetary health and/or sustainable health care?
- Metric 4.3 Does your graduate medical training program or institution have a webpage where trainees can find specific
 information related to planetary health and/or sustainable health care activities and mentors within the institution? For
 example, projects achieved, current initiatives underway at the institution, and/or contact information of potential
 mentors.
- *Metric 4.4* Does your graduate medical training program or institution have a registered trainee organization dedicated toward fostering a culture of planetary health engagement, scholarship, and advocacy at your institution, supported by faculty advisors?
- *Metric 4.5* Is there a trainee liaison representing sustainability interests who serves on a training program or institutional decision-making council to advocate for curriculum reform and/or sustainability best practices?
- *Metric 4.6* In the past year, has your institution or training program had one or more co-curricular planetary health programs or initiatives in the following categories:
 - a) Projects where trainees are able to gain experience in organic agriculture and sustainable food systems, such as gardens, farms, community-supported agriculture, fishery programs, or urban agriculture projects
 - b) Panels, speaker series, or similar events related to planetary health that have trainees as an intended audience
 - c) Events in which trainees learn directly from members of a local environmental justice community about the climate and environmental challenges they face, and how health professionals can partner with their community to address these exposures and impacts
 - d) Cultural arts events, installations, or performances related to planetary health that have trainees as an intended audience
 - e) Local volunteer opportunities related to building community resilience to anthropogenic environmental impacts
 - f) Wilderness or outdoor programs (eg, that organize hiking, backpacking, kayaking, or other outings for trainees)

Domain 5: Sustainability

- Metric 5.1 Does your health care system/institution have an executive-level leader responsible for the institution's work on improving sustainability?
- Metric 5.2 Does your health care system/institution have an active, interdisciplinary sustainability team in which trainees can participate?
- Metric 5.3 How ambitious is your health care system/institution's plan to reduce its own carbon footprint?
- Metric 5.4 Does your health care system/institution procure renewable energy and/or engage in community partnerships for renewables to power, heat, and cool its buildings, infrastructure, and operations?
- Metric 5.5 Do the design and construction of new buildings and renovation of old buildings at your health care system/institution conform to a published sustainability rating system or building code/guideline?
- Metric 5.6 Has your health care system/institution implemented strategies to encourage and provide environmentally friendly transportation for staff and patients, in order to reduce the environmental impact of commuting?
- *Metric 5.7* Does your health care system/institution implement an organics recycling program (compost) and a conventional recycling program (aluminum/paper/plastic/glass) for nonmedical waste?

BOX Proposed GME PHRC Domains and Metrics (continued)

- Metric 5.8 Does your health care system/institution have an active program to reduce environmental harm from
 operating room and other medical waste, including decreasing emissions from anesthetic gases, reducing single use
 plastic and toxic items, and increasing reuse and reprocessing of medical devices?
- Metric 5.9 Does your health care system/institution apply sustainability criteria when making decisions about offered food and beverage selections (eg, local sourcing, reduced meat, decreased plastic packaging)?
- Metric 5.10 Does your health care system/institution apply sustainability criteria, including emissions and chemical/toxin impacts, when making decisions about supply procurement?
- Metric 5.11 Do your institution's endowment portfolio and retirement investment offerings include investment in fossil fuel and other environmentally harmful companies?
- Metric 5.12 Has your affiliated health care system/institution conducted a climate and health vulnerability and adaptation assessment and developed a climate resilience plan, anticipating the needs of community members facing disproportionate risk of climate-related harm?

Abbreviations: GME, graduate medical education; PHRC, Planetary Health Report Card; QI, quality improvement.

Following this study, we plan to pilot the GME PHRC with trainees across specialties and institutions. The pilot group will create a scoring rubric based on open-ended comments from the Delphi Panel. Because sponsoring institutions may house multiple GME programs, we anticipate cross-specialty collaboration within institutions, and scoring that recognizes both programlevel and institution-wide initiatives.

This study has multiple limitations. While study team members reviewed and tested the survey instruments, no psychometric review was completed. Our respondents came mainly from urban, academic settings, which may limit applicability to rural and community-based programs. Furthermore, we know little about why our nonrespondents chose not to complete the survey and whether their participation would have changed outcomes.

Health systems increasingly recognize their duty to limit environmental harm and to prepare trainees to prevent, diagnose, and treat the diseases of a changing planet. ^{16,17,29} We believe the GME PHRC will be a valuable tool in these efforts, promoting standardized comparison and cross-pollination between GME programs.

Conclusions

In the first round of a modified Delphi Panel survey, trainees and faculty in GME programs agree that metrics adapted from the PHRC are relevant to evaluating GME programs and institutions on planetary health, sustainability, and environmental justice.

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